

DATA BOOK



**GENERAL
INSTRUMENT**
POWER SEMICONDUCTOR DIVISION

INTRODUCTION

General Instrument Corporation is a major multinational company manufacturing a wide range of products from data systems, broadband communications and semiconductor products. The corporation, which has been in existence over 50 years, has manufacturing and sales locations throughout the world serving all major electronic markets.

The Power Semiconductor Division, a leading producer of discrete semiconductor devices has manufacturing facilities in the United States and the Far East. These devices include low and medium power rectifiers from standard thru ultrafast recovery, bridge assemblies and transient voltage suppressors. We offer the widest selection of rectifier package types and junction structures including plastic encapsulated, glass passivated, superectifier, and surface mounts. Advanced junction technologies include double diffusion, double diffused fast and ultra-fast recovery, narrow base epitaxial, PAR and Schottky.

Particular emphasis has been focused on the superectifier product family including our new super surface mounted devices. The superectifier, when introduced over ten years ago increased rectifier reliability by several orders of magnitude. Today it still remains unmatched as the cost performance leader in axial leaded rectifiers. Now the superectifier features of metallurgically bonded junction, glass passivation, and flame retardant encapsulation are available in our line of super surface mounted rectifiers. For the ultimate in surface mounted rectifier reliability it's super surface mount.

The information contained in this data book is intended to provide the necessary technical and support data to assist the design engineer. It is our policy to maintain high standards of product manufacturing. The General Instrument logo (GI), printed on every component, ensures that it reaches the highest level of quality and reliability. In the complex and competitive semiconductor industry, high standards of quality using the latest methods of statistical quality controls are of the utmost importance since they constitute for our customers, the assurance of reliable product performance.

Not every application problem can be solved using a standard device, in this case we often develop special products to meet the customer requirements. If in doubt, call your local Sales Office or our Application Engineering Laboratory for further information.

SYMBOLS

C _J	Junction Capacitance	T _J	Junction Temperature
I _F	Forward Current	T _L	Lead Temperature
I _(AV)	Average Forward Rectifier Current	t _r	Rise Time
I _{FSM}	Peak Forward Surge Current	t _{rr}	Reverse Recovery Time
I _o	Mean Forward Current	V _{BR}	Reverse Breakdown Voltage
I _R	Reverse Leakage Current	V _{FM}	Instantaneous Forward Voltage
I _{rr}	Reverse Recovery Current	V _{FR}	Forward Recovery Voltage
I _{RSM}	Maximum Non-Repetitive Reverse Peak Current	V _R	Dc Reverse Voltage
I _T	On-State Test Current	V _{RM}	Maximum Recurrent Peak Reverse Voltage
I ² _T	Rating for Fusing	V _{RMS}	RMS Input Voltage
P _D	Steady State Power Dissipation	V _{RRM}	Repetitive Peak Reverse Voltage
P _{PK}	Peak Power Dissipation	V _{RSM}	Maximum Non-Repetitive Peak Reverse Voltage
R _{θJA}	Thermal Resistance (Junction to Ambient)	V _C	Clamping Voltage at I _{RSM}
R _{θJC}	Thermal Resistance (Junction to Case)	V _{RWM}	Working Peak Reverse Voltage
R _{θJL}	Thermal Resistance (Junction to Lead)	V _Z	Zener Voltage
T _A	Ambient Temperature (Stand-off Voltage)	Z _k	Dynamic Impedance
T _C	Case Temperature		

DRAWINGS

All dimensions are in inches and (millimeters.)
Figures not to scale.

TEMPERATURES

Ratings at 25°C ambient temperature unless
otherwise specified.

The General Instrument data book is not a document
for official acceptance tests. Relevant is only the
detailed data sheet, which is available on request.
The Manufacturer reserves the right to change the contained
data at any time in order to improve performance and supply
the best product possible.

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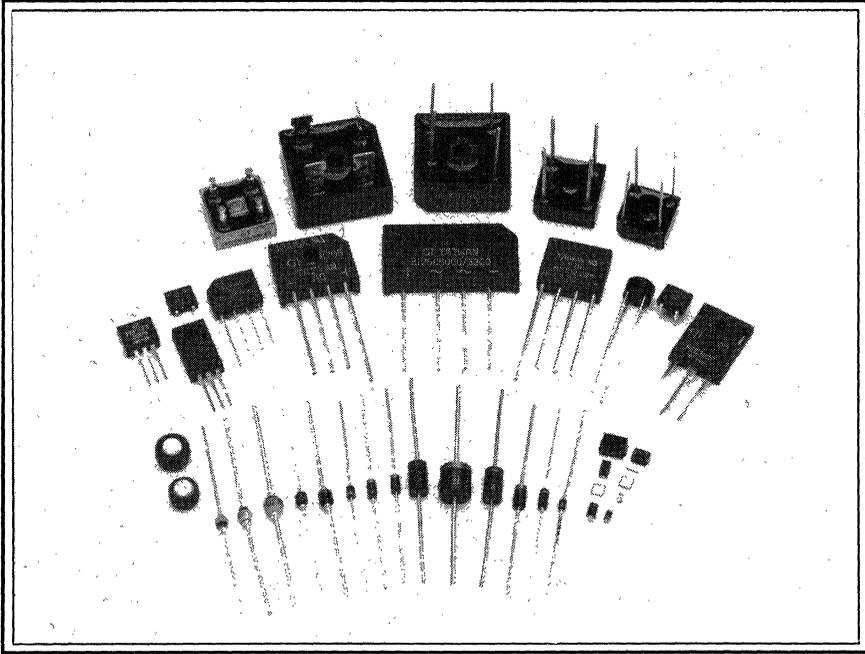
**POWER
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10th Edition**

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GLL4747	500	*J,JTX1N3957	28	KBU4B	448	MBRF1035	80
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SRP100D	400	TGL41-18	506	TMPG06-13A	554	T SMA43	520
SRP100G	400	TGL41-180	506	TMPG06-15	554	T SMA43A	520
SRP100J	400	TGL41-180A	506	TMPG06-15A	554	T SMA47	520
SRP100K	400	TGL41-18A	506	TMPG06-16	554	T SMA47A	520
SRP300A	406	TGL41-20	506	TMPG06-16A	554	T SMA51	520
SRP300B	406	TGL41-200	506	TMPG06-18	554	T SMA51A	520
SRP300D	406	TGL41-200A	506	TMPG06-18A	554	T SMA56	520
SRP300G	406	TGL41-20A	506	TMPG06-20	554	T SMA56A	520
SRP300J	406	TGL41-22	506	TMPG06-20A	554	T SMA62	520
SRP300K	406	TGL41-22A	506	TMPG06-22	554	T SMA62A	520
SRP600A	414	TGL41-24	506	TMPG06-22A	554	T SMA68	520
SRP600B	414	TGL41-24A	506	TMPG06-24	554	T SMA68A	520
SRP600D	414	TGL41-27	506	TMPG06-24A	554	T SMA75	520
SRP600J	414	TGL41-27A	506	TMPG06-27	554	T SMA75A	520
SRP600G	414	TGL41-30	506	TMPG06-27A	554	T SMA82	520
SRP600K	414	TGL41-30A	506	TMPG06-30	554	T SMA82A	520
SS12	516	TGL41-33	506	TMPG06-30A	554	T SMA91	520
SS13	516	TGL41-33A	506	TMPG06-33	554	T SMA91A	520
SS14	516	TGL41-36	506	TMPG06-33A	554	T SMA100	520
SS15	516	TGL41-36A	506	TMPG06-36	554	T SMA100A	520
SS16	516	TGL41-39	506	TMPG06-36A	554	T SMA110	520
SS19	518	TGL41-39A	506	TMPG06-39	554	T SMA110A	520
SS1B	518	TGL41-43	506	TMPG06-39A	554	T SMA120	520
SS22	530	TGL41-43A	506	TMPG06-43	554	T SMA120A	520
SS23	530	TGL41-47	506	TMPG06-43A	554	T SMA130	520
SS24	530	TGL41-47A	506	T SMA6.8	520	T SMA130A	520
SS25	530	TGL41-51	506	T SMA6.8A	520	T SMA150	520
SS26	530	TGL41-51A	506	T SMA7.5	520	T SMA150A	520
SS29	532	TGL41-56	506	T SMA7.5A	520	T SMA160	520
SS2B	532	TGL41-56A	506	T SMA8.2	520	T SMA160A	520
SS32	544	TGL41-6.8	506	T SMA8.2A	520	T SMA170	520
SS33	544	TGL41-6.8A	506	T SMA9.1	520	T SMA170A	520
SS34	544	TGL41-62	506	T SMA9.1A	520	T SMA180	520
SS35	544	TGL41-62A	506	T SMA10	520	T SMA180A	520
SS36	544	TGL41-68	506	T SMA10A	520	T SMA200	520
SS39	546	TGL41-68A	506	T SMA11	520	T SMA200A	520
SS3B	546	TGL41-7.5	506	T SMA11A	520	T SMB6.8	536
TGL41-10	506	TGL41-7.5A	506	T SMA12	520	T SMB6.8A	536
TGL41-100	506	TGL41-75	506	T SMA12A	520	T SMB7.5	536
TGL41-100A	506	TGL41-75A	506	T SMA13	520	T SMB7.5A	536

NUMERICAL INDEX

TSMB8.2	536	TSMB160A	536	TSMC100	548	ZGP10-100	302
TSMB8.2A	536	TSMB170	536	TSMC100A	548	ZGP10-100A	302
TSMB9.1	536	TSMB170A	536	TSMC110	548	ZGP10-100B	302
TSMB9.1A	536	TSMB180	536	TSMC110A	548	ZGP10-110	302
TSMB10	536	TSMB180A	536	TSMC120	548	ZGP10-110A	302
TSMB10A	536	TSMB200	536	TSMC120A	548	ZGP10-110B	302
TSMB11	536	TSMB200A	536	TSMC130	548	ZGP10-120	302
TSMB11A	536	TSMC6.8	548	TSMC130A	548	ZGP10-120A	302
TSMB12	536	TSMC6.8A	548	TSMC150	548	ZGP10-120B	302
TSMB12A	536	TSMC7.5	548	TSMC150A	548	ZGP10-130	302
TSMB13	536	TSMC7.5A	548	TSMC160	548	ZGP10-130A	302
TSMB13A	536	TSMC8.2	548	TSMC160A	548	ZGP10-130B	302
TSMB15	536	TSMC8.2A	548	TSMC170	548	ZGP10-140	302
TSMB15A	536	TSMC9.1	548	TSMC170A	548	ZGP10-140A	302
TSMB16	536	TSMC9.1A	548	TSMC180	548	ZGP10-140B	302
TSMB16A	536	TSMC10	548	TSMC180A	548	ZGP10-150	302
TSMB18	536	TSMC10A	548	TSMC200	548	ZGP10-150A	302
TSMB18A	536	TSMC11	548	TSMC200A	548	ZGP10-150B	302
TSMB20	536	TSMC11A	548	UF4001	204	ZGP10-160	302
TSMB20A	536	TSMC12	548	UF4002	204	ZGP10-160A	302
TSMB22	536	TSMC12A	548	UF4003	204	ZGP10-160B	302
TSMB22A	536	TSMC13	548	UF4004	204	ZGP10-170	302
TSMB24	536	TSMC13A	548	UF4005	204	ZGP10-170A	302
TSMB24A	536	TSMC15	548	UF4006	204	ZGP10-170B	302
TSMB27	536	TSMC15A	548	UF4007	204	ZGP10-180	302
TSMB27A	536	TSMC16	548	UF5400	206	ZGP10-180A	302
TSMB30	536	TSMC16A	548	UF5401	206	ZGP10-180B	302
TSMB30A	536	TSMC18	548	UF5402	206	ZGP10-190	302
TSMB33	536	TSMC18A	548	UF5403	206	ZGP10-190A	302
TSMB33A	536	TSMC20	548	UF5404	206	ZGP10-190B	302
TSMB36	536	TSMC20A	548	UF5405	206	ZGP10-200	302
TSMB36A	536	TSMC22	548	UF5406	206	ZGP10-200A	302
TSMB39	536	TSMC22A	548	UF5407	206	ZGP10-200B	302
TSMB39A	536	TSMC24	548	UF5408	206		
TSMB43	536	TSMC24A	548	W005G	430		
TSMB43A	536	TSMC27	548	W001G	430		
TSMB47	536	TSMC27A	548	W002G	430		
TSMB47A	536	TSMC30	548	W004G	430		
TSMB51	536	TSMC30A	548	W006G	430		
TSMB51A	536	TSMC33	548	W008G	430		
TSMB56	536	TSMC33A	548	W10G	430		
TSMB56A	536	TSMC36	548	ZGL41-100	502		
TSMB62	536	TSMC36A	548	ZGL41-100A	502		
TSMB62A	536	TSMC39	548	ZGL41-110	502		
TSMB68	536	TSMC39A	548	ZGL41-110A	502		
TSMB68A	536	TSMC43	548	ZGL41-120	502		
TSMB75	536	TSMC43A	548	ZGL41-120A	502		
TSMB75A	536	TSMC47	548	ZGL41-130	502		
TSMB82	536	TSMC47A	548	ZGL41-130A	502		
TSMB82A	536	TSMC51	548	ZGL41-140	502		
TSMB91	536	TSMC51A	548	ZGL41-140A	502		
TSMB91A	536	TSMC56	548	ZGL41-150	502		
TSMB100	536	TSMC56A	548	ZGL41-150A	502		
TSMB100A	536	TSMC62	548	ZGL41-160	502		
TSMB110	536	TSMC62A	548	ZGL41-160A	502		
TSMB110A	536	TSMC68	548	ZGL41-170	502		
TSMB120	536	TSMC68A	548	ZGL41-170A	502		
TSMB120A	536	TSMC75	548	ZGL41-180	502		
TSMB130	536	TSMC75A	548	ZGL41-180A	502		
TSMB130A	536	TSMC82	548	ZGL41-190	502		
TSMB150	536	TSMC82A	548	ZGL41-190A	502		
TSMB150A	536	TSMC91	548	ZGL41-200	502		
TSMB160	536	TSMC91A	548	ZGL41-200A	502		



QUALITY ASSURANCE

**GENERAL
INSTRUMENT**

QUALITY ASSURANCE

CUSTOMER INFORMATION

INTRODUCTION

Quality and Reliability of the Power Semiconductor Division extends its services to the areas of materials and product analysis, statistical quality control, reliability evaluation, quality inspection and development of new test methods.

Headquartered in New York, it assumes the responsibility for the development, implementation and administration of the Quality Assurance and statistical quality control programs for all operations of the Division, both domestic and foreign.

At our manufacturing plants, rigid and extensive in-process statistical quality controls are utilized such that the quality and reliability of our products are consistent and repeatable. The laboratories of our facilities are equipped with the latest high-level instrumentation and staffed with skilled technicians and engineers.

Professional expertise and the most modern scientific equipment maintains our position of excellence and leadership as the foremost producer of semiconductor devices, and assures that the quality levels of our products, from inspection and test of raw materials to final approval of completed devices, meet the highest standards of the industry.

We offer...

- ◆ Top-flight specialists and modern facilities.
- ◆ Experienced Test and Reliability Engineers.
- ◆ Statistical Quality Control.
- ◆ Fully equipped laboratories able to perform all types of scientific investigation.

SERVICES OF THE MATERIALS AND DEVICE ANALYSIS SECTION

- ◆ Testing, inspection and evaluation of materials utilizing the facilities of the electrical, mechanical, high-reliability and chemical analysis departments of our laboratories.
- ◆ Research and development of testing methods.
- ◆ Inspection of materials to ensure compliance by suppliers and contractors to specifications.
- ◆ Failure analysis to determine the cause of breakdown in materials or components.
- ◆ Qualification testing of military devices in accordance with applicable military specifications. The laboratories are qualified to perform testing to MIL-S-19500, MIL-STD-750, MIL-STD-202, and also are qualified to MIL-STD-883 tests under MIL-M-38510. Qualification approvals (QPL listing) were awarded by the United States, Canadian and West German Departments of Defense.
- ◆ A continuing program of military reliability (JAN-TX) also is in progress to assure conformance to the requirements for aerospace and the military.

TEST CONDITIONS

OPERATING LIFE

Conditions: Rated voltage,
rated current, for 1000 hours
at rated maximum junction temperature

DC BLOCKING

Conditions: Rated voltage for 1000 hours
at rated maximum junction temperature
in inert environment.

STORAGE LIFE

Conditions: Rated maximum ambient
temperature for 1000 hours in inert
environment

LEAD PULL

Conditions: Axial pull to destruction.

LEAD FATIGUE

Conditions: number of 90-degree
bends with 0.5 kg weight attached
to lead.

MOISTURE RESISTANCE

Conditions: 85°C, 85% Relative
Humidity for 1000 hours.

FLAMMABILITY

Conditions: Encapsulating compound,
General Instrument's proprietary
formulas, GI-4B or GI-5A is self-extin-
guishing, recognized and registered
by Underwriters' Laboratories, U.S.
under 94V-O rating.

SOLDERABILITY

Conditions: 95% coverage within
1.2 mm of device body.

TEMPERATURE CYCLING

Conditions: - 65°C to +175°C.

SHOCK

Conditions: 5 blows of 1500g's.

VIBRATION (CONSTANT)

Conditions 20 g's at 60 Hz \pm 20 Hz.

ACCELERATION

Conditions: 20,000 g's.

SALT ATMOSPHERE

Conditions: 5% solution for
24 hours at 40°C.

HIGH RELIABILITY-TEST CAPABILITIES

◆ **Barometric Pressure:**

This equipment simulates low atmospheric pressure encountered in non-pressurized environments up to 200,000 feet.

◆ **Humidity:**

This equipment evaluates units in an accelerated manner, and monitors the effects of their resistance to high humidity and heat conditions. Typical RH of 90 to 98% is achieved.

◆ **Salt (Spray) and Salt Atmosphere:**

The equipment provides an accelerated laboratory corrosion test simulating the effects of seacoast atmospheres. Salt concentration and velocity per day can be maintained between 10,000 and 50,000 mgm/m²/day. Salt Atmosphere - Salt spray 5%- 20% salt solution.

◆ **Thermal Shock Temp.-Cycling:**

This test determines the resistance of devices to exposure at extremely high and low temperatures. Chamber limits - 74°C to 250° C.

◆ **Mass Spectrometer Leak Detector (Fine Leak):**

To determine the effectiveness (or the hermeticity) of the seal on devices with internal cavities which are evacuated or contain air or gas. Machine limits 1 - 10⁻⁹ to 10 - 10⁻⁶ atm.

◆ **Gross Leak:**

Determine seal leak greater than 10 - 10⁻⁶ ATM cc/Sec.

◆ **Constant Acceleration:**

Determines the effects of a centrifugal force on devices up to 700,000g under space environment (refrigerated vacuum).

◆ **Shock:**

Subjects the devices to conditions resulting from sudden applied forces or abrupt changes in motion produced by rough handling, transportation or field operation from 10 to 4,500g.

◆ **Vibration Fatigue:**

Tests the effects of vibration within the frequency range of 60 Hz at 0-70g.

◆ **Vibration Noise:**

Measures the amount of electrical noise produced by the devices under vibration from 9-5kHz and 0-70g.

◆ **Non-Operating Life:**

To determine the effects on devices at elevated temperatures. Temperature ranges up to 300 °C.

◆ **Operating Life Test:**

To operate the devices under intended condition to screen and eliminate marginal devices and eliminate mortality.

- ◆ Steady State Operating Life
- ◆ Reverse Bias Operating Life
- ◆ Intermittent Operating Life

◆ **Solderability - Lead Integrity (Lead Tension):**

Determine the solderability on all devices from 0 to 400 °C.

Lead Tension - Designed to check the capabilities of the devices to withstand straight pulls.

◆ **Lead Integrity (bending stress):**

Check the quality of leads, welds and seals of the devices to withstand bends under specific weights.

◆ **Lead integrity (lead torque):**

Check the devices, leads and seals for resistance to twisting motion. Equipment limits from .5 cmkg to 100 mkg.

◆ **Hi-Power Microscopic Inspection:**

Examine internal and external construction of our devices up to 600 times.

◆ **Bond Strength:**

This determines strength of lead bonding between the active area of the device and connecting packaging lead.

**MILITARY APPROVED
RECTIFIERS**

0.2 AMPERE TO 6.0 AMPERES

**GENERAL
INSTRUMENT**

GENERAL INSTRUMENT

1 IN PRICE, # 1 IN SERVICE, # 1 IN MILITARY

General Instrument Power Semiconductor Division, is the world's largest manufacturer of rectifiers and bridges, supplying over 2 billion annually. We're proud to be number one in **quality and reliability** as we are in being number one in **price and service**. And no one beats our delivery. Think bigger and better. Design-in General Instrument JAN, JANTX and JANTXV rectifiers and bridges, and see why we're The Decisive Factor in military rectifiers.

DELIVERY

As you well know, ensuring on time delivery, for those hard-to-get parts, is one of the most important and frustration aspects of a purchasing agent's many responsibilities. We remove that stumbling block for all the JAN, JANTX and JANTXV devices we produce. As the world's largest rectifier manufacturer, you can ALWAYS count on JAN parts from stock. In addition, we have **MORE BURN-IN CAPACITY THAN ANYONE**, which guarantees shorter JANTX lead times. That's why you can count on General Instrument Power Semiconductor Division to be the Decisive Factor in your military project.

PRICING

WE ARE NOW, AND WILL ALWAYS BE, THE PRICE LEADER IN JAN, JANTX AND JANTXV MILITARY RECTIFIERS!

TECHNICAL ASSISTANCE

You'll find that buying from General Instrument Power Semiconductor Division makes a lot of sense. Consider the potential headaches we head off or eliminate with our technical assistance and support. Every one of our components is supplied with concise product data sheets that give engineers and designers complete details on electrical parameters, mechanical data, and maximum ratings as well as other vital information. Equally important is our accessibility. When questions arise with initial design, redesign, or current application, just pick up the telephone and call our applications engineering department at (516) 933-3164. We're extremely well staffed with experienced professionals to clearly and accurately answer every question.

AVAILABILITY

The following is intended as a quick guide and reference to the types of components General Instrument Power Semiconductor Division supplies:

JAN COMPONENTS

The most economical Hi-Rel device, JAN components are MIL qualified and subjected to environmental and life sample tests to assure quality conformance. JAN devices are 100 % tested, lot traceable and must pass a number of other tests (see comparison chart.) Aside from military circuits they are frequently used in commercial applications requiring superior potential life cycle performance that can not be guaranteed with standard commercial components.

JANTX AND JANTXV COMPONENTS

In addition to JAN processing, JANTX and JANTXV devices are subjected to extra environmental and electrical test as outlined in MIL-S-19500. (See comparison chart.) These screening procedures eliminate the possibility of infant mortality failures that might occur in the early stages of component system use.

PDA (percent defects allowable) requirements are applied to every lot, thereby assuring continuous quality and reliability. This effectively restricts the probability of shipping defective lots. The selection of JANTX and JANTXV level components assures both **maximum component reliability and standardized reliability testing procedures**.

SPECIFICATION CONTROL DRAWINGS

Additional reliability testing, electrical screenings, or special markings are often required. General Instrument Power Semiconductor Division will guarantee that all those standards are met. We can guarantee this thanks to our state-of-the-art testing facility which provides the capability to screen devices to those special requirements.

HIGH RELIABILITY SCREENING SEQUENCE

GROUP A Testing - Group A testing is performed on each lot which consists of visual inspection mechanical inspections and specified electrical parametric testing

Group B Testing - Group B Testing is performed on each lot and consists of reliability testing.

Group C Testing - Group C Testing is performed on a 6 month periodic basis, and consists of long term reliability and environmental testing.

Microscopic Inspection - 100% microscopic inspection is performed on all JANTXV level devices only.

Traceability - Traceability is maintained per the applicable specification and MIL-S-19500.

JAN, JANTX, JANTXV

High Temperature Storage (Non-operating) - Devices are stored in high temperatures ranging from 150°C to 200°C for stabilization.

Temperature Cycling - Devices are cycled for temperatures ranging from -65°C to +175°C to weed out structural weakness, i.e. welds, glass to metal seals and molecular lattice structure.

Shock - Specified devices are subjected to a mechanical shock test.

Acceleration - Specified devices are subjected to centrifuge.

Seal Leak (Fine) - Devices are tested with a helium mass spectrometer to locate any leaks down to 1×10^{-8} CC's per second leak rate.

Seal Leak (Gross) - Devices are checked for leaks too large for detection by tracer gases.

100% Electrical Test - Devices are subjected to all parameters of the applicable specification.

High Temperature Reverse Bias - Devices are subject to reverse bias for forty eight hours under elevated temperature.

Power -Burn In - Devices are subjected to ninety six hours of burn-in to the conditions in the applicable specifications.

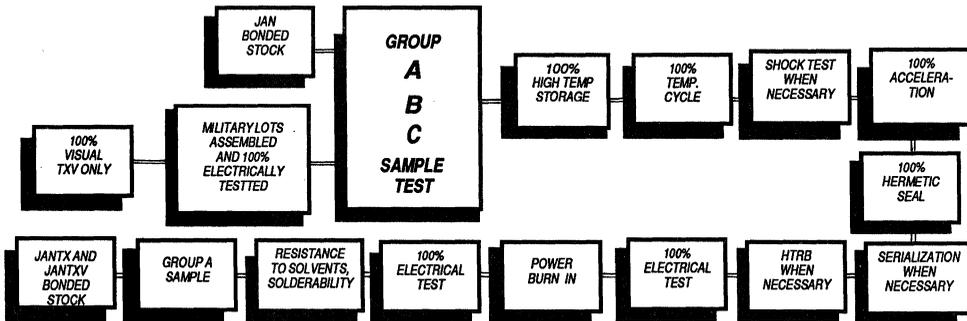
100% Delta Electrical Test - Devices are subjected to all parameters of the applicable specification and delta calculations are determined. Those devices not meeting the requirements are rejected.

Resistance to Solvents - Devices are exposed to various solvents to ensure marking permanency.

Solderability - Testing is performed to determine the degree of solder coverage on the leads.

HIGH-RELIABILITY COMPARISON CHART

	JAN	JANTX	JANTXV
Microscopic Inspection (Internal Visual)	No	No	Yes
Traceability (Lot)	Yes	Yes	Yes
100% Electrical Test	Yes	Yes	Yes
High Temp Storage (Non-Operating)	Yes	Yes	Yes
Temperature Cycling	No	Yes	Yes
Acceleration (When Applicable)	No	Yes	Yes
Seal Leak (Fine)	No	Yes	Yes
Seal Leak (Gross)	No	Yes	Yes
High Temp Reverse Bias (When Applicable)	No	Yes	Yes
Electrical Test (Read & Record)	No	Yes	Yes
Power Age (Burn-in)	No	Yes	Yes
Electrical Test (Read & Record) (with Delta Limits)	No	Yes	Yes
Group A Inspection per MIL-S-19500	Yes	Yes	Yes
Group B Inspection per MIL-S-19500	Yes	Yes	Yes
Group C Inspection per MIL-S-19500	Yes	Yes	Yes
PDA (Max. Pct. Def Allow.) thru Power Burn-in	No	Yes	Yes



QUALIFIED PRODUCTS LIST

PRODUCTS QUALIFIED UNDER MILITARY SPECIFICATION MIL-S-19500			
GOVERNMENT DESIGNATION	DETAIL SPEC	GOVERNMENT DESIGNATION	DETAIL SPEC
<i>DIODES</i>		<i>RECTIFIERS (continued)</i>	
JAN, JANTX, 1N483B	/118	JAN, JANTX, 1N5615	/429
JAN, JANTX, 1N485B	/118	JAN, JANTX, 1N5617	/429
JAN, JANTX, 1N486B	/118	JAN, JANTX, 1N5619	/429
JAN, JANTX, 1N645	/240	JAN, JANTX, 1N5621	/429
JAN, JANTX, 1N647	/240	JAN, JANTX, 1N5623	/429
JAN, JANTX, 1N649	/240	JAN, JANTX, 1N5624	/432
JAN, JANTX, 1N645-1	/240	JAN, JANTX, 1N5625	/432
JAN, JANTX, 1N647-1	/240	JAN, JANTX, 1N5626	/432
JAN, JANTX, 1N649-1	/240	JAN, JANTX, 1N5627	/432
<i>RECTIFIERS</i>		JAN, JANTX, 1N5907	/477
JAN, JANTX, 1N3611	/228	JAN, JANTX, 1N5809	/477
JAN, JANTX, 1N3612	/228	JAN, JANTX, 1N5811	/477
JAN, JANTX, 1N3613	/228		
JAN, JANTX, 1N3614	/228		
JAN, JANTX, 1N3957	/228		
JAN, JANTX, 1N4245	/286		
JAN, JANTX, 1N4246	/286		
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JAN, JANTX, 1N5620	/427		
JAN, JANTX, 1N5622	/427		

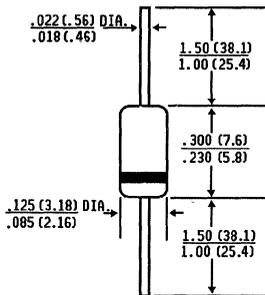


JAN AND JANTX 1N483B THRU 1N486B

LOW POWER MINIATURE GLASS PASSIVATED JUNCTION DIODE

VOLTAGE - 70 to 225 Volts CURRENT - 200 Milliamperes

DO-204MB



Dimensions in inches
and
(millimeters)

*Brazed-lead assembly by Patent No. 3,930,306 of 1976

FEATURES

- ◆ Qualified to MIL-S-19500/118C
- ◆ High temperature metallurgically bonded
- ◆ 0.2 amperes operation at $T_A=25^\circ\text{C}$ with no thermal runaway
- ◆ Hermetically sealed package
- ◆ Ideally suited for miniaturized equipment
- ◆ Glass passivated cavity-free junction
- ◆ High temperature soldering guaranteed $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204MB one piece glass, hermetically sealed
Terminal: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

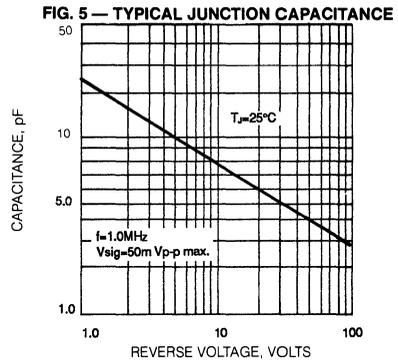
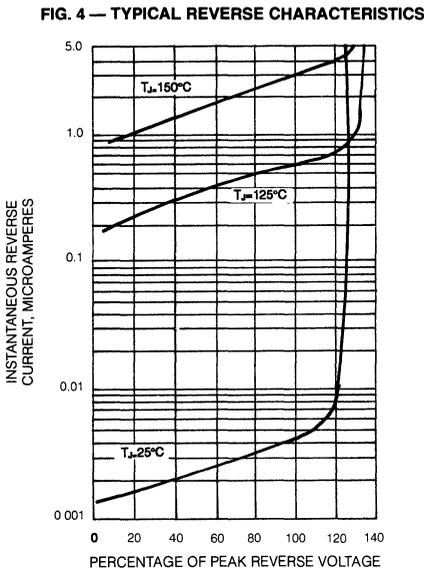
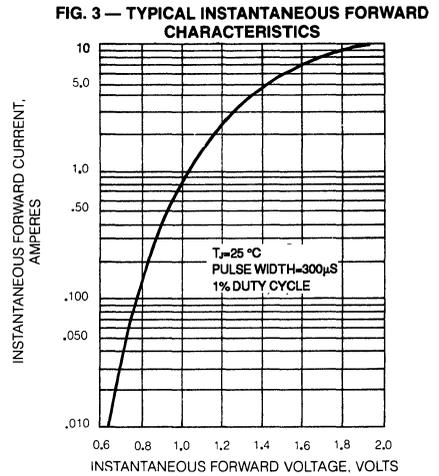
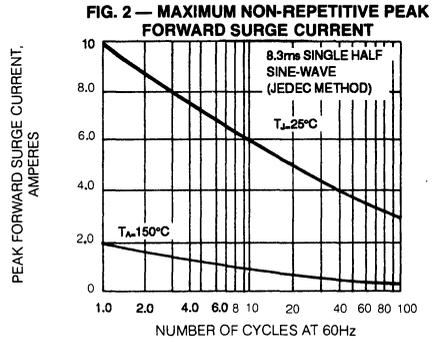
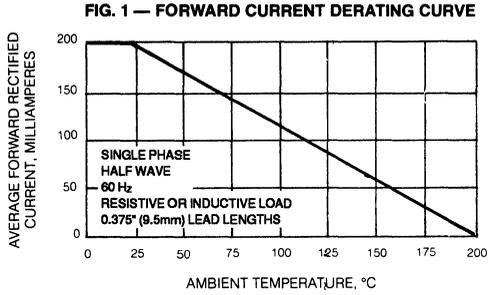
Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%

	SYMBOLS	JAN1N483B	JAN1N485B	JAN1N486B	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	70	180	225	Volts
Maximum RMS Voltage	V_{RMS}	50	127	159	Volts
Maximum DC Blocking Voltage	V_{DC}	70	180	225	Volts
Minimum Reverse Breakdown Voltage at 100 μA	V_{BR}	80	200	250	Volts
Maximum Average Forward Rectified Current $T_A=25^\circ\text{C}$.375" (9.5mm) Lead Length at $T_A=150^\circ\text{C}$	$I_{(AV)}$		200		Milliamps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) $T_A=150^\circ\text{C}$	I_{FSM}		2.0		Amps
Maximum Instantaneous Forward Voltage at 100mA	V_F		1.0		Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R		25		μA
Typical Junction Capacitance (NOTE 1)	C_J		15.0		pf
Typical Thermal Resistance (NOTE 2)	$R_{\theta JA}$		80.0		$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}		-65 to +200		$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Vdc.
2. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, P.C. Board Mounted.

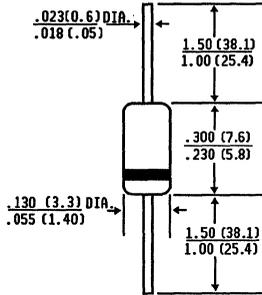
**MAXIMUM RATING AND CHARACTERISTIC CURVES
JAN AND JANTX 1N483B THRU 1N486B**





JAN AND JANTX 1N645 THRU 1N649 JAN AND JANTX 1N645-1 THRU 1N649-1

MINIATURE GLASS PASSIVATED SILICON DIODES
VOLTAGE- 225 to 600 Volts CURRENT - 400 Milliampers



*Dimensions in inches
and
(millimeters)*

FEATURES

- ◆ Qualified to MIL-S-19500/240E
- ◆ Glass passivated cavity-free junction
- ◆ 0.4 amperes operation at $T_A = 25^\circ\text{C}$ with no thermal runaway
- ◆ High temperature metallurgically bonded
- ◆ Ideally suited for miniaturized equipment
- ◆ Hermetically sealed package
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10\text{seconds}/.375"$ (.9.5mm) lead length/5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Axial leads
 Solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	JAN 1N645	JAN 1N645-1	JAN 1N647	JAN 1N647-1	JAN 1N649	JAN 1N649-1	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	225	225	400	400	600	600	Volts
Maximum RMS Voltage	V_{RMS}	156	156	280	280	420	420	Volts
Maximum DC Blocking Voltage	V_{DC}	225	225	400	400	600	600	Volts
Minimum Reverse Breakdown Voltage at $100\mu\text{A}$ $50\mu\text{A}$	V_{BR}	270	-	480	-	720	-	Volts
Maximum Average Forward Rectified $T_A = 25^\circ\text{C}$ Current .375" (9.5mm) Lead Length at $T_A = 150^\circ\text{C}$	$I_{(AV)}$	400				150		milli Amps
Peak Forward Surge Current, 8.3ms single half sine- wave superimposed on rated load (JEDEC Method) at $T_A = 150^\circ\text{C}$	I_{FSM}	5.0						Amps
Maximum Instantaneous Forward Voltage at 400mA $1.5A T_A = 150^\circ\text{C}$ $9.0A T_A = 25^\circ\text{C}$ $0.5A T_A = -55^\circ\text{C}$	V_F	0.95				1.0		Volts
Maximum DC Reverse Current $T_A = 25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A = 100^\circ\text{C}$	I_R	25	50	25	50	50	50	nA μA
Maximum Average Reverse Current at Peak Reverse Voltage, $I_o = 150\text{mA}$ $T_A = 150^\circ\text{C}$, .375" 9.5mm Lead Lengths	$I_{R(AV)}$	100						μA
Maximum Junction Capacitance (NOTE 1)	C_J	20.0						pf
Typical Thermal Resistance (NOTE 2)	$R_{\theta JA}$	80.0						$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to 175						$^\circ\text{C}$
Storage Ambient Temperature Range	T_{STG}	-65 to +200						$^\circ\text{C}$

NOTES :

1. Measured at 1 MHz and applied reverse voltage of 4.0 Vdc.
2. Thermal Resistance from Junction to Ambient at .375", (9.5mm) lead lengths, P.C. Board mounted.

**MAXIMUM RATINGS AND CHARACTERISTIC CURVES
JAN AND JANTX 1N645 THRU 1N649
JAN AND JANTX 1N645-1 THRU 1N649-1**

FIG. 1 — FORWARD CURRENT DERATING CURVE

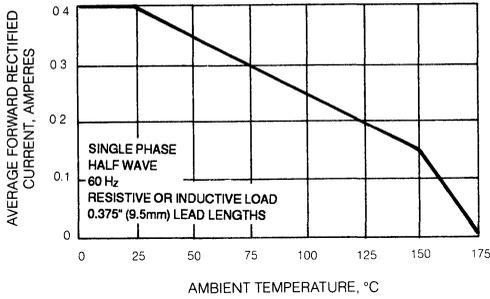


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

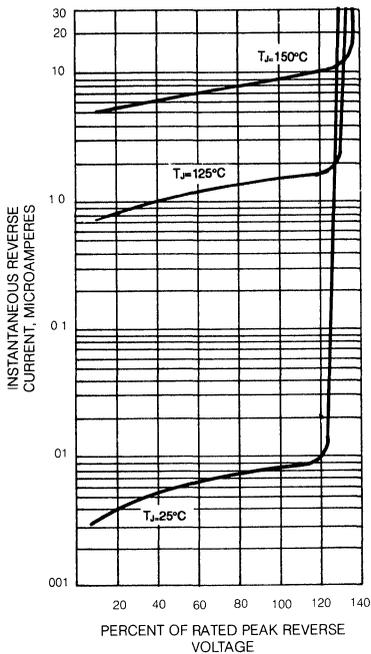


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

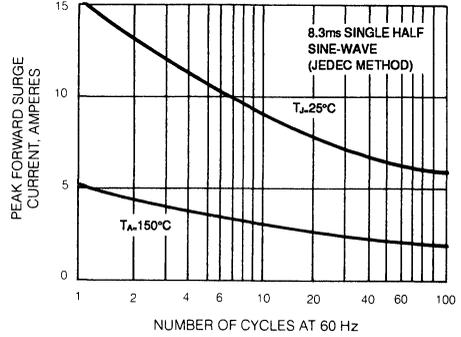


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

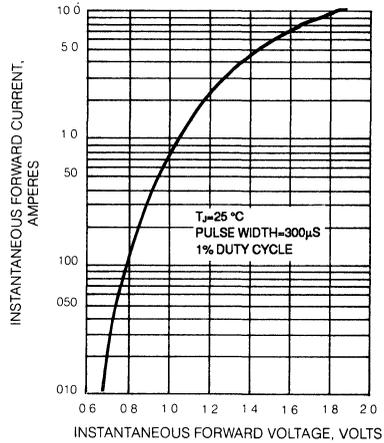
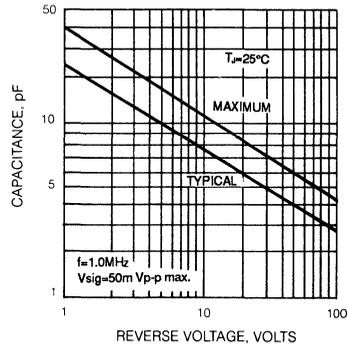


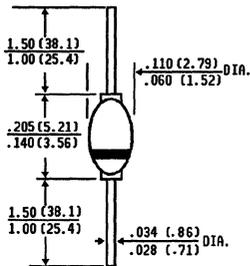
FIG. 5 — JUNCTION CAPACITANCE





JAN AND JANTX 1N3611 THRU 1N3614 AND 1N3957

MINIATURE GLASS PASSIVATED JUNCTION RECTIFIER
VOLTAGE - 200 to 1000 Volts CURRENT - 1.0 Ampere



Dimensions in inches
and
(millimeters)

FEATURES

- ◆ Qualified to MIL-S-19500/228E
- ◆ High temperature metallurgically bonded
- ◆ Hermetically sealed package
- ◆ Glass passivated cavity-free junction
- ◆ 1.0 Ampere operation at $T_A=100^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_f less than $0.1 \mu\text{A}$
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Colorband denotes cathode
Mounting Position: Any
Weight: 0.02 ounce, 0.56 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	JAN 1N3611	JAN 1N3612	JAN 1N3613	JAN 1N3614	JAN 1N3957	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
Minimum Reverse Breakdown Voltage at $100\mu\text{A}$	V_{BR}	240	480	720	920	1150	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Length at $T_A=100^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A=150^\circ\text{C}$	I_{FSM}	30.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A $T_A=25^\circ\text{C}$ $T_A=-65^\circ\text{C}$	V_F	1.1 1.5					Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$ $T_A=150^\circ\text{C}$	I_R	1.0 300.0					μA
Typical Reverse Recovery Time (NOTE 1)	T_{RR}	2.0					μS
Typical Junction Capacitance (NOTE 2)	C_J	10.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	40.0					$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to +175					$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +200					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=0.25\text{A}$.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Vdc.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths P.C. Board mounted.

MAXIMUM RATINGS AND CHARACTERISTIC CURVES JAN AND JANTX 1N3611 THRU 1N3614 AND 1N3957

FIG. 1 — FORWARD CURRENT DERATING CURVE

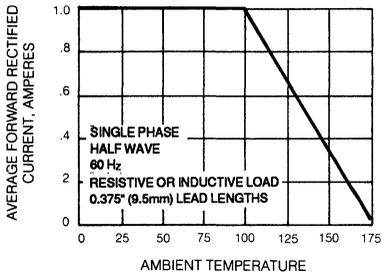


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

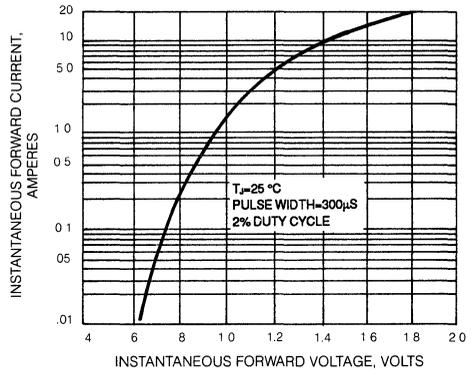


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

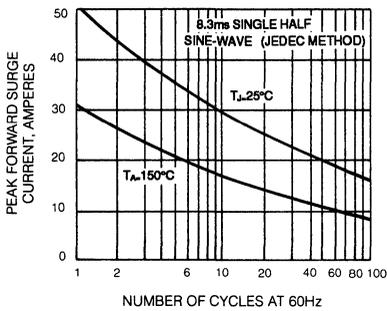


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

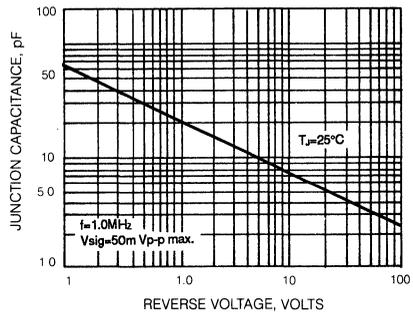
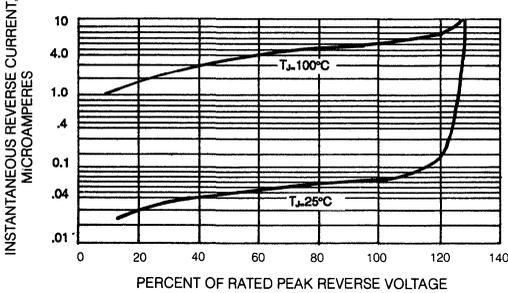


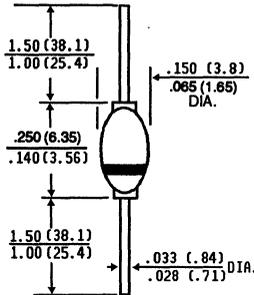
FIG. 5 — TYPICAL REVERSE CHARACTERISTICS





JAN AND JANTX 1N4245 THRU 1N4249

GLASS PASSIVATED JUNCTION MEDIUM SWITCHING RECTIFIER
VOLTAGE - 200 to 1000 Volts CURRENT - 1.0 Ampere



FEATURES

- ◆ Qualified to MIL-S-19500/286C
- ◆ High temperature metallurgically bonded
- ◆ Glass passivated cavity-free junction
- ◆ 1.0 Ampere operation at $T_A=100^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than 0.1 μA
- ◆ Hermetically sealed package
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	JAN 1N4245	JAN 1N4246	JAN 1N4247	JAN 1N4248	JAN 1N4249	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
Minimum Reverse Breakdown Voltage at 100 μA	V_{BR}	240	480	720	960	1150	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Length at $T_A=100^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A=100^\circ\text{C}$	I_{FSM}	25.0					Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.3					Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	1.0 150.0					μA
Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0					$^\circ\text{C}/\text{W}$
Typical Junction Capacitance (NOTE 1)	C_J	15.0					pf
Maximum Reverse Recovery Time (NOTE 2)	T_{RR}	5.0					μS
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

1. Measured at 1MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=0.25\text{A}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.56mm) Lead lengths P.C. Board mounted.

**MAXIMUM RATING AND CHARACTERISTIC CURVES
JAN AND JANTX 1N4245 THRU 1N4249**

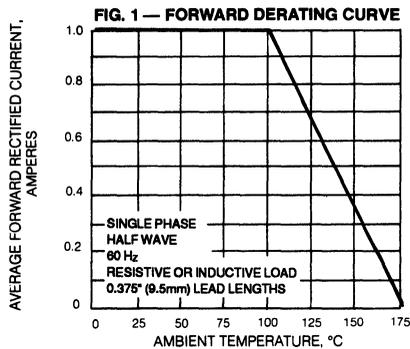


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

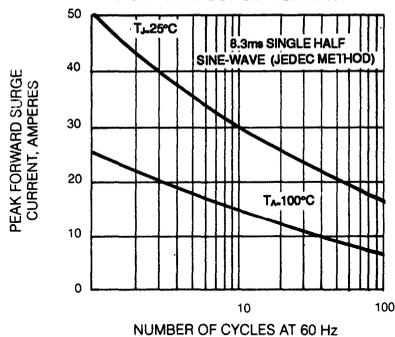


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

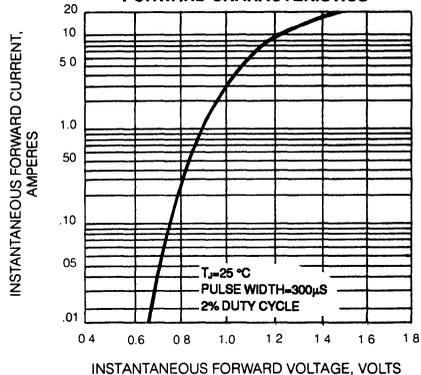


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

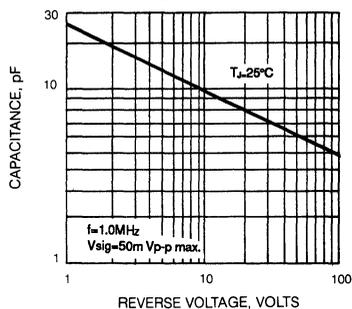
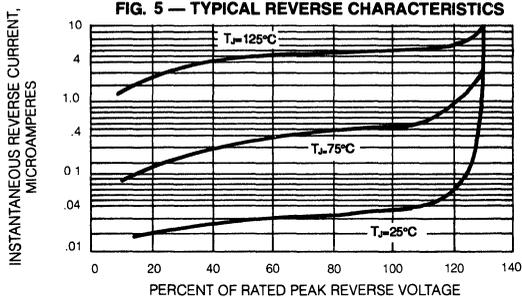


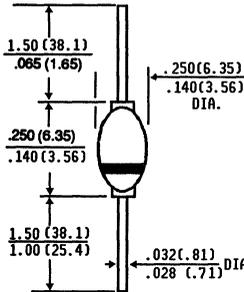
FIG. 5 — TYPICAL REVERSE CHARACTERISTICS





JAN AND JANTX 1N4942 THRU 1N4948

GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER
VOLTAGE - 200 to 1000 Volts CURRENT - 1.0 Ampere



FEATURES

- ◆ Qualified to MIL-S-19500/359B
- ◆ High temperature metallurgically bonded
- ◆ Glass passivated cavity-free junction
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Hermetically sealed package
- ◆ Typical temperature soldering guaranteed: $350^\circ\text{C}/10\text{seconds}/.375"$, (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denoted cathode
Mounting Position: Any
Weight: .02 ounce, .56 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	JAN 1N4942	JAN 1N4944	JAN 1N4946	JAN 1N4947	JAN 1N4948	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
Minimum Reverse Breakdown Voltage at $100\mu\text{A}$	V_{BR}	220	440	660	880	1100	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Length at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A=100^\circ\text{C}$	I_{FSM}	15.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A $T_A=25^\circ\text{C}$ $T_A=-65^\circ\text{C}$	V_F	1.3 1.5					Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	1.0 200.0					μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	150			250	500	nS
Maximum Junction Capacitance (NOTE 2)	C_J	45	35	25	20	15	pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0					$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions $I_F = 5\text{A}$, $I_R = 1\text{A}$, $I_{rr} = 25\text{A}$.
2. Measured at 1 MHz and applied reverse voltage of 12 volts.
3. Thermal resistance from Junction to Ambient at .375"(9.5mm) lead lengths P.C.Board mounted.

MAXIMUM RATINGS AND CHARACTERISTIC CURVES JAN AND JANTX 1N4942 THRU 1N4948

FIG. 1 — FORWARD CURRENT DERATING CURVE

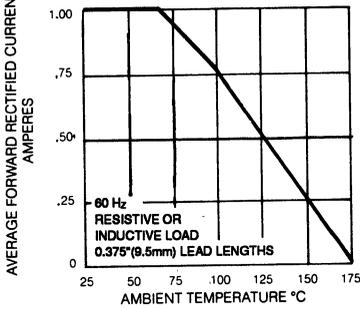


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

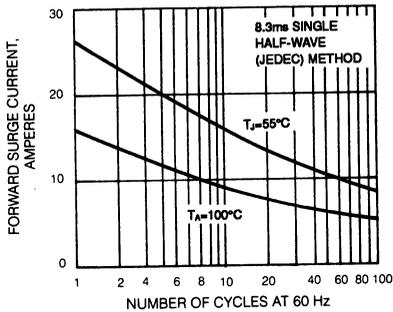


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

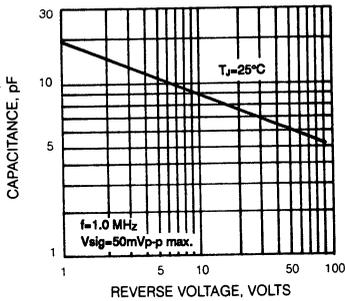


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

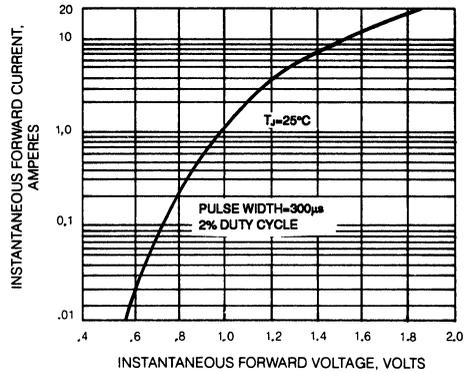


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

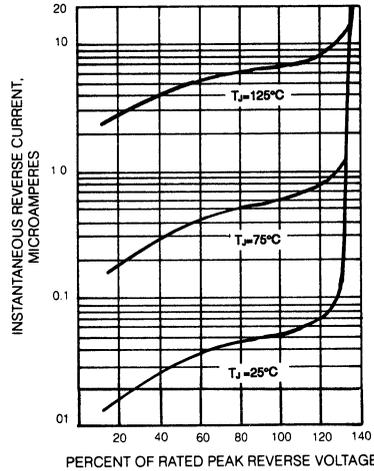
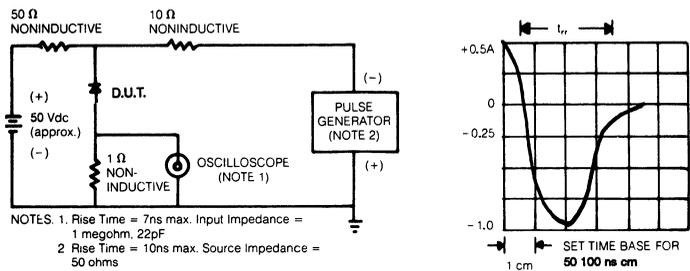


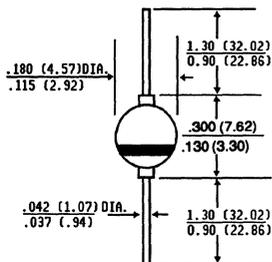
FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM





JAN AND JANTX 1N5415 THRU 1N5420

GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER
VOLTAGE - 50 to 600 Volts CURRENT- 3.0 Amperes



FEATURES

- ◆ Qualified to MIL-S-19500/411D
- ◆ Glass passivated cavity-free junction
- ◆ High temperature metallurgically bonded
- ◆ Fast switching for high efficiency
- ◆ 3.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Hermetically sealed package
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375" (9.5mm) lead length/5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .037 ounce, 1.04 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	JAN 1N5415	JAN 1N5416	JAN 1N5417	JAN 1N5418	JAN 1N5419	JAN 1N5420	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	500	600	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	350	420	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	500	600	Volts
Minimum Reverse Breakdown Voltage at $100\mu\text{A}$	V_{BR}	55	110	220	440	550	660	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Length at $T_A=55^\circ\text{C}$	$I_{(AV)}$	3.0						Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A=100^\circ\text{C}$	I_{FSM}	80.0						Amps
Minimum Peak Reverse Power at 20 μs pulse width	P_{RM}	1000						Watts
Maximum Instantaneous Forward Voltage at	V_F	1.5A $T_A=25^\circ\text{C}$ 9.0A $T_A=25^\circ\text{C}$ 0.5A $T_A=-55^\circ\text{C}$	1.2 1.5 1.3				Volts	
Maximum DC Reverse Current at Rated DC Blocking Voltage	I_R	1.0 20.0						μA
Maximum Junction Capacitance (NOTE 1)	C_J	550	430	250	165	140	120	pf
Maximum Reverse Recovery Time (NOTE 2)	T_{RR}	150	150	150	150	250	400	nS
Maximum Thermal Resistance (NOTE 3)	$R_{\theta J L}$	20.0						$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +200						$^\circ\text{C}$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
3. Thermal Resistance from Junction to Lead at .375", (9.5mm) lead lengths with both leads attached to heat-sinks.

MAXIMUM RATINGS AND CHARACTERISTIC CURVES JAN AND JANTX 1N5415 THRU 1N5420

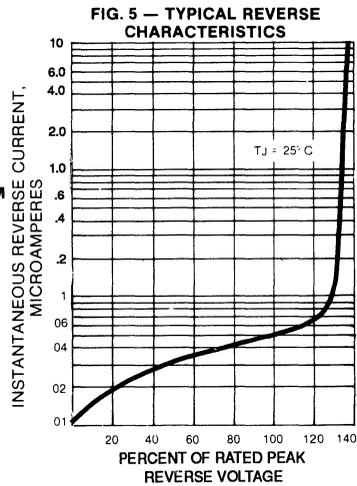
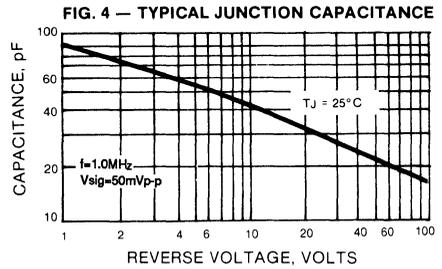
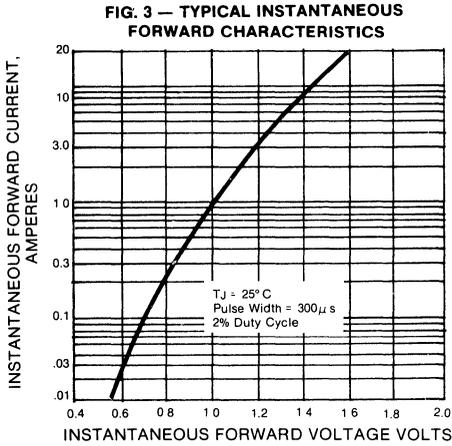
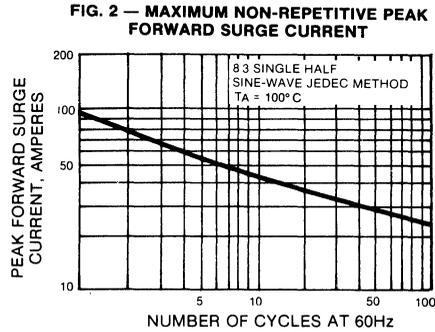
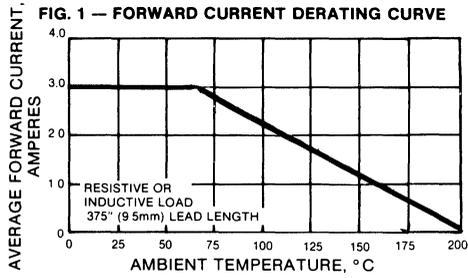
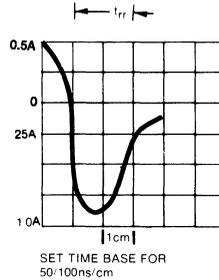
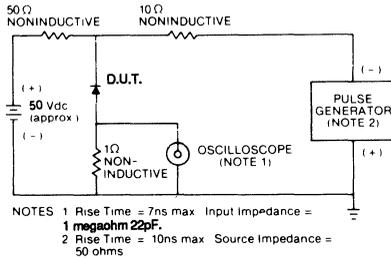


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

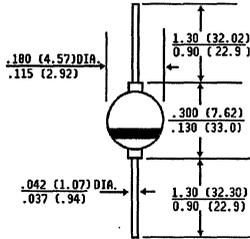




JAN AND JANTX 1N5550 THRU 1N5554

GLASS PASSIVATED JUNCTION MEDIUM SWITCHING RECTIFIER

VOLTAGE - 200 to 1000 Volts CURRENT - 3.0 Amperes



FEATURES

- ◆ Qualified to MIL-S-19500/420A
- ◆ Glass passivated cavity-free junction
- ◆ Medium switching for good efficiency
- ◆ High temperature metallurgically bonded
- ◆ 3.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Hermetically sealed package
- ◆ High temperature soldering guaranteed:
350°C/10seconds/.375".(9.5mm)
lead length/5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .037 ounce, 1.04 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

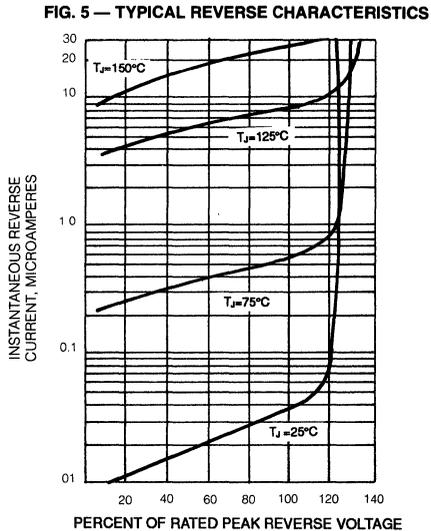
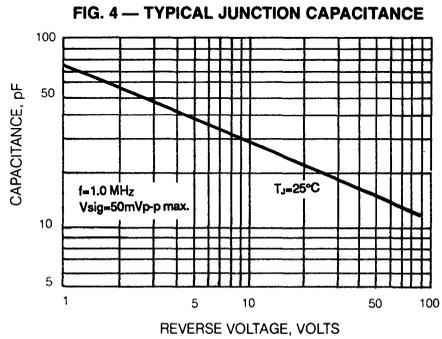
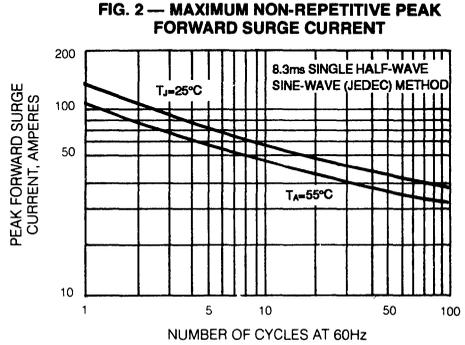
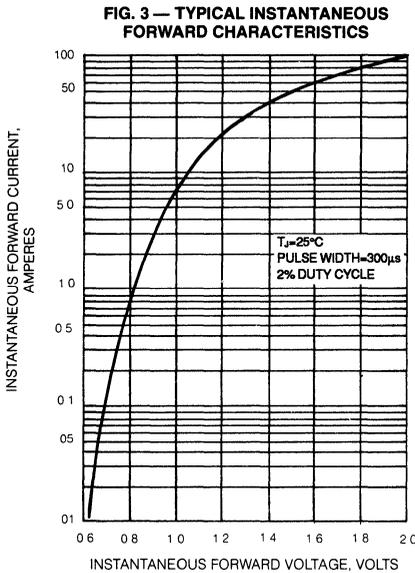
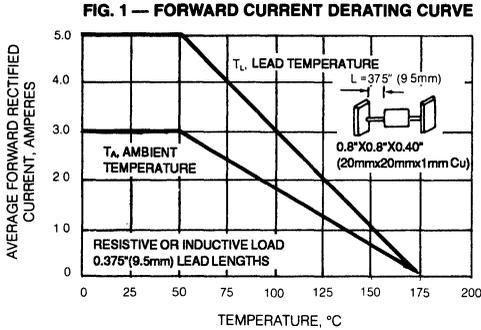
Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%

	SYMBOLS	JAN 1N5550	JAN 1N5551	JAN 1N5552	JAN 1N5553	JAN 1N5554	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	200	4500	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	200	400	600	800	1000	Volts
Minimum Reverse Breakdown Voltage at 50µA	V _{BR}	240	480	660	880	1100	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Length at $T_A=55^\circ\text{C}$ $T_L=55^\circ\text{C}$	I _(AV)	3.0 5.0					Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A=55^\circ\text{C}$	I _{FSM}	100.0					Amps
Maximum Instantaneous Forward Voltage at 9.0A $T_A=25^\circ\text{C}$ $T_A=-55^\circ\text{C}$	V _F	1.2		1.3		Volts	
Maximum Reverse Current at Rated DC Blocking Voltage ^ø $T_A=25^\circ\text{C}$ $T_A=100^\circ\text{C}$	I _R	1.0 75.0					µA
Maximum Reverse Recovery Time (NOTE 1)	T _{RR}	2.0					µS
Maximum Thermal Resistance (NOTE 2)	R _{θJL}	22.0					°C/W
Operating Junction Temperature Range	T _J	-65 to +175					°C
Storage Temperature Range	T _{STG}	-65 to +200					°C

NOTES:

1. Reverse Recovery Test Conditions: I_F = 0.5A, I_R = 1.0A, I_{rr} = .25A.
2. Thermal Resistance from Junction to Lead at .375", (9.5mm) lead lengths with both leads attached to heat sink.

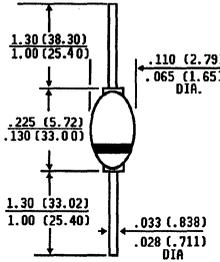
**MAXIMUM RATINGS AND CHARACTERISTIC CURVES
JAN AND JANTX 1N5550 THRU 1N5554**





JAN AND JANTX 1N5615 THRU 1N5623

GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER
VOLTAGE - 200 to 1000 Volts CURRENT - 1.0 Ampere



Dimensions in inches
and
(millimeters)

FEATURES

- ◆ Qualified to MIL-S-19500/429C
- ◆ High temperature metallurgically bonded
- ◆ Hermetically sealed package
- ◆ Glass passivated cavity-free junction
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than 0.1 μA
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Colorband denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	1N5615	1N5617	1N5619	1N5621	1N5623	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
Minimum Reverse Breakdown Voltage at $50\mu\text{A}$	V_{BR}	220	440	660	880	1100	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Length at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A=100^\circ\text{C}$	I_{FSM}	25.0					Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.6					Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	0.5 25.0					μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	150	150	250	300	500	nS
Maximum Junction Capacitance (NOTE 2)	C_J	45	35	25	20	15	pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JL}$	38.0					$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to +175					$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +200					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Conditions: $I_F=1.0\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=0.25\text{A}$.
2. Measured at 1.0 MHz and applied reverse voltage of 12 Volts.
3. Thermal Resistance from Junction to lead at .375" (9.5mm) lead lengths P.C. Board mounted.

MAXIMUM RATINGS AND CHARACTERISTIC CURVES JAN AND JANTX 1N5615 THRU 1N5623

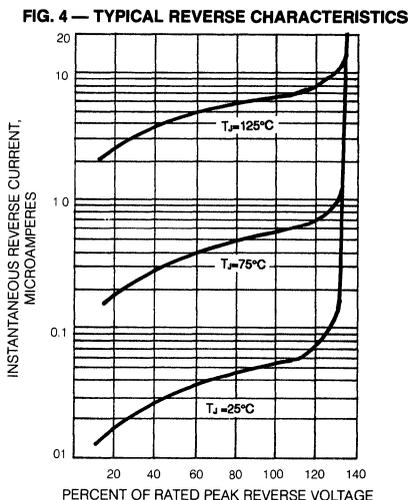
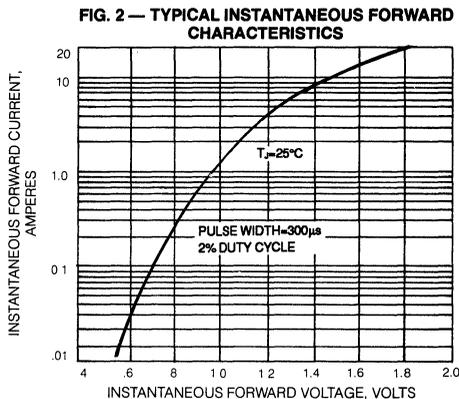
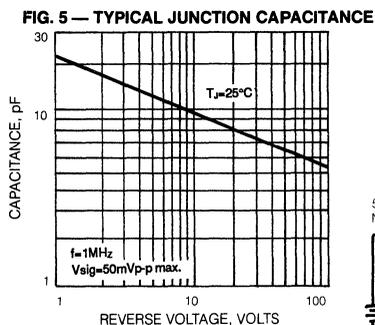
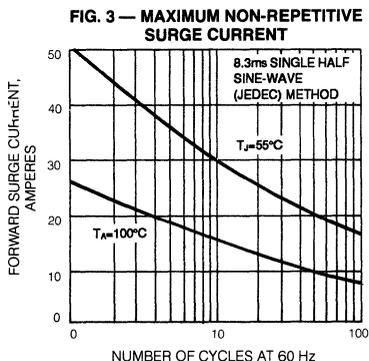
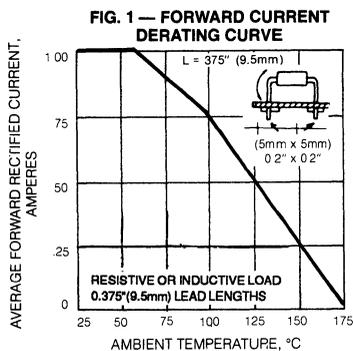
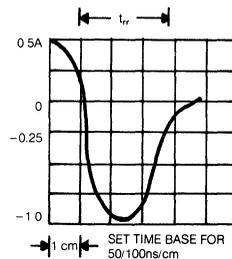
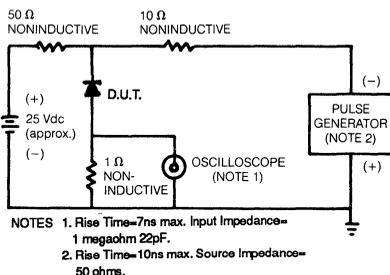


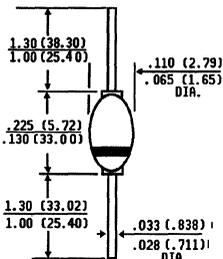
FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM





JAN AND JANTX 1N5614 THRU 1N5622

GLASS PASSIVATED JUNCTION MEDIUM SWITCHING RECTIFIER
VOLTAGE - 200 to 1000 Volts CURRENT - 1.0 Ampere



Dimensions in inches
and
(millimeters)

FEATURES

- ◆ Qualified to MIL-S-19500/427C
- ◆ High temperature metallurgically bonded
- ◆ Hermetically sealed package
- ◆ Glass passivated cavity-free junction
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than 0.1 μA
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Colorband denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	JAN 1N5614	JAN 1N5616	JAN 1N5618	JAN 1N5620	JAN 1N5622	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
Minimum Reverse Breakdown Voltage at $50\mu\text{A}$	V_{BR}	220	440	660	880	1100	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Length at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A=100^\circ\text{C}$	I_{FSM}	30.0					Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.3					Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	0.5 25.0					μA
Maximum Reverse Recovery Time (NOTE 1)	T_{RR}	2.0					μS
Typical Junction Capacitance (NOTE 2)	C_J	15.0					pf
Maximum Thermal Resistance (NOTE 3)	$R_{\theta J L}$	38.0					$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to +175					$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +200					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Conditions: $I_F=1.0\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=0.25\text{A}$.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 V_{DC} .
3. Thermal Resistance from Junction to lead at .375" (9.5mm) lead lengths P.C. Board mounted.

MAXIMUM RATINGS AND CHARACTERISTIC CURVES JAN AND JANTX 1N5614 THRU 1N5622

FIG. 1 - FORWARD CURRENT DERATING CURVE

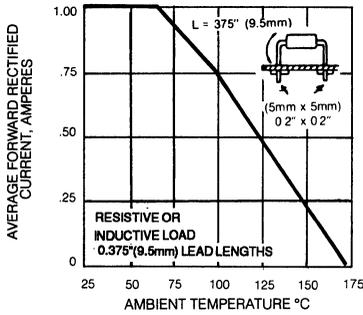


FIG. 2 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

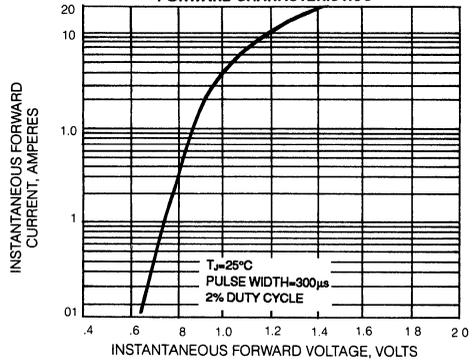


FIG. 3 - MAXIMUM NON-REPETITIVE SURGE CURRENT

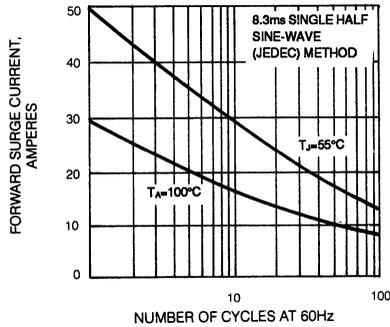


FIG. 4 - TYPICAL REVERSE CHARACTERISTICS

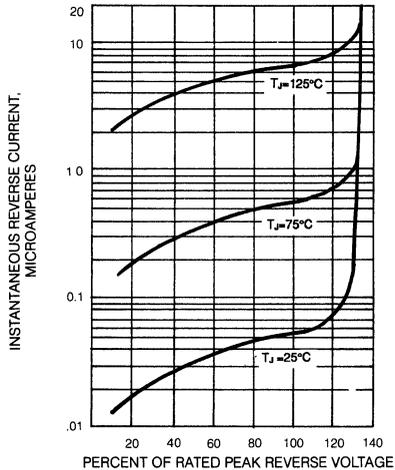


FIG. 5 - TYPICAL JUNCTION CAPACITANCE

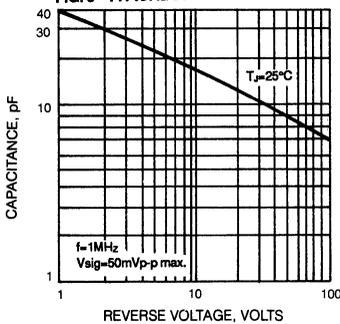
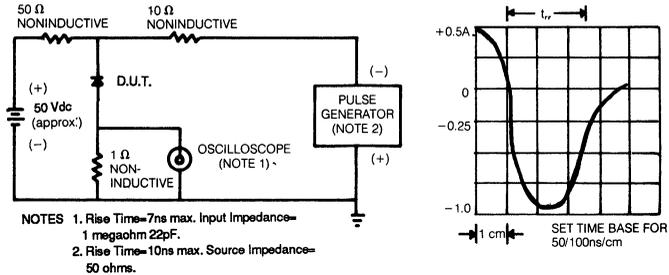


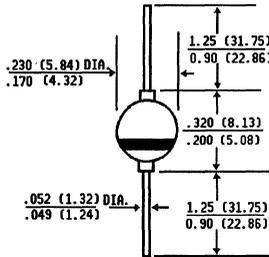
FIG. 6 - REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM





JAN AND JANTX 1N5624 THRU 1N5627

GLASS PASSIVATED JUNCTION RECTIFIER
VOLTAGE - 50 to 800 Volts CURRENT - 3.5 Amperes



Dimensions in inches
and
(millimeters)

FEATURES

- ◆ Qualified to MIL-S-19500/432
- ◆ High temperature metallurgically bonded
- ◆ Hermetically sealed package
- ◆ Glass passivated cavity-free junction
- ◆ 3.5 Ampere operation at $T_A = 55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/ $.375''$, (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Colorband denotes cathode
Mounting Position: Any
Weight: .037 ounce, 1.04 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	JAN 1N5624	JAN 1N5625	JAN 1N5626	JAN 1N5627	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	Volts
Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	Volts
Minimum Reverse Breakdown Voltage at $50 \mu\text{A}$	V_{BR}	240	460	660	880	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Length at $T_A = 55^\circ\text{C}$	$I_{(AV)}$	3.5				Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A = 100^\circ\text{C}$	I_{FSM}	125.0				Amps
Maximum Instantaneous Forward Voltage at 3.5A $T_A = 25^\circ\text{C}$ $T_A = -65^\circ\text{C}$	V_F	1.0 1.5				Volts
Maximum DC Reverse Current $T_A = 25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A = 150^\circ\text{C}$	I_R	1.0 100.0				μA
Typical Junction Capacitance (NOTE 1)	C_J	40.0				pf
Maximum Reverse Recovery Time (NOTE 2) $T_J = 25^\circ\text{C}$	T_{RR}	5.0				μS
Maximum Thermal Resistance (NOTE 3)	$R_{\theta JL}$	18.0				$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +200				$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, $I_{rr} = 0.25\text{A}$.
3. Thermal Resistance from Junction to Lead at .375", 9.5mm lead lengths, with both leads attached to heat sink.

MAXIMUM RATING AND CHARACTERISTIC CURVES JAN AND JANTX 1N5624 THRU 1N5627

FIG. 1 — FORWARD CURRENT DERATING CURVE

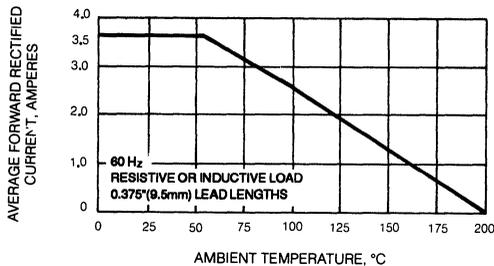


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

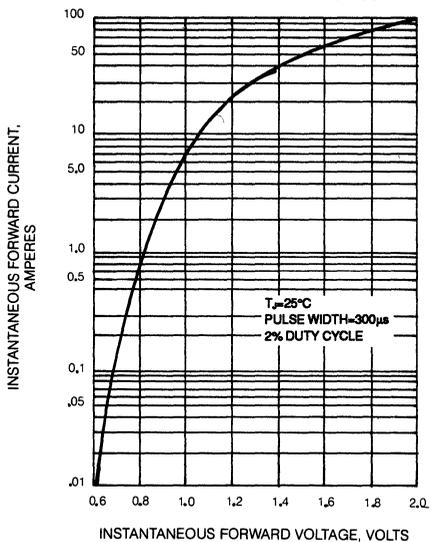


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

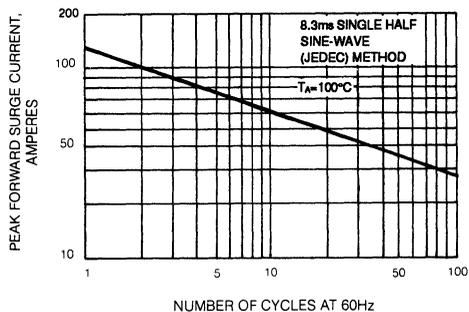


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

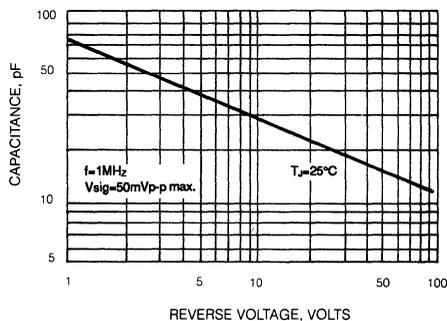
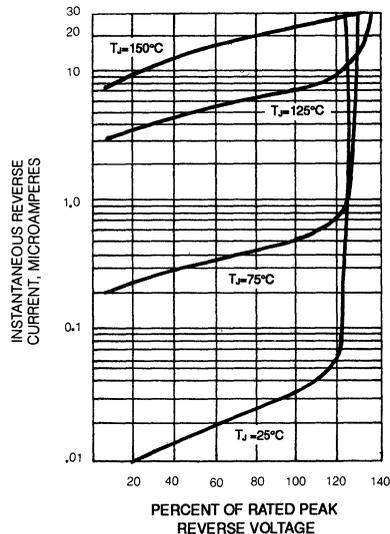


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

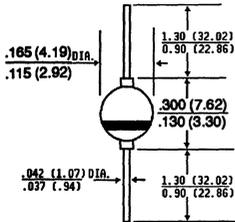




JAN AND JANTX 1N5807 THRU 1N5811

GLASS PASSIVATED JUNCTION FAST EFFICIENT RECTIFIER

VOLTAGE RANGE - 50 to 150 Volts CURRENT-6.0 Amperes



Dimensions in inches
and
(millimeters)

FEATURES

- ◆ Qualified to MIL-STD-19500/477
- ◆ Glass passivated cavity free junction
- ◆ Superfast recovery times for very high efficiency
- ◆ Low forward voltage, high current capability
- ◆ Hermetically sealed package
- ◆ High surge capability
- ◆ High temperature metallurgically bonded
- ◆ High temperature soldering guaranteed: 350°C, .375", (9.5mm), from case for 10 seconds at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass hermetically sealed
Terminals: Axial leads, solderable to MIL-STD-202 Method 208
Polarity: Colorband denotes cathode end
Mounting Position: Any
Weight: 0.037 ounce, 1.04 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

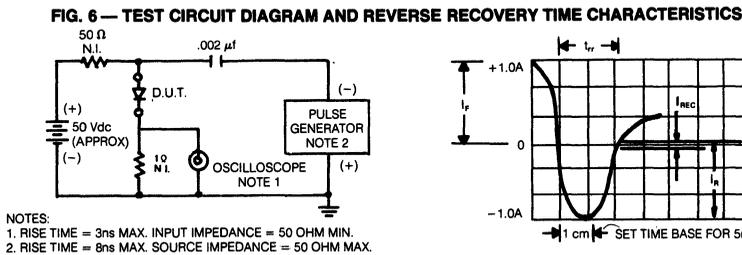
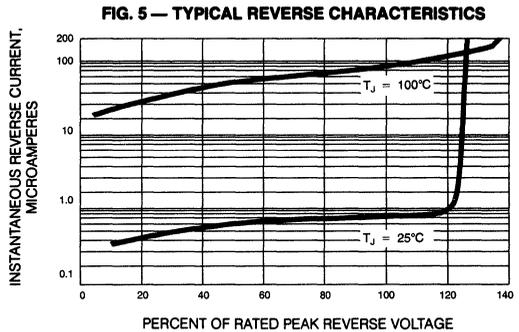
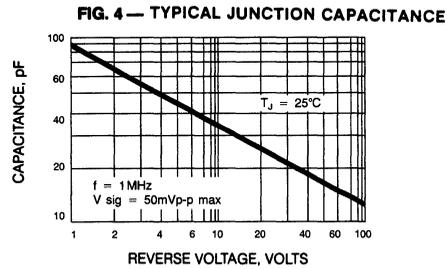
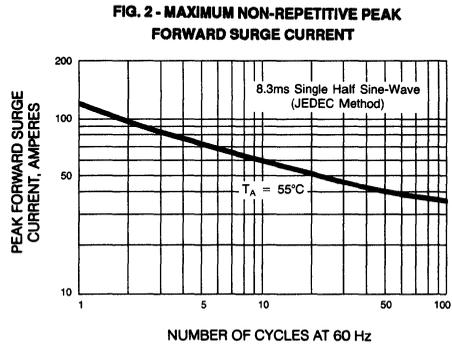
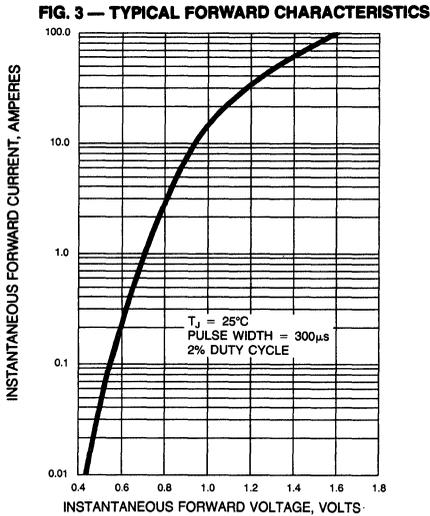
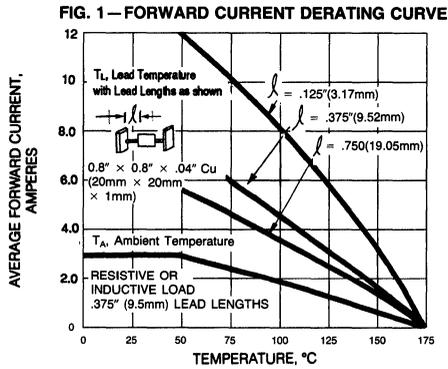
Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%

	SYMBOLS	JAN1N5807	JAN15809	JAN1N5811	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	Volts
Minimum Reverse Breakdown Voltage at 100µA	V _{BR}	60	110	160	Volts
Maximum Average Forward Rectified Current T _A =55°C .375" (9.5mm) Lead Length at T _L =75°C	I _(AV)		3.0 6.0		Amps
Peak Forward Surge Current, 3.ms single half sine-wave superimposed on rated load (JEDEC Method) at T _A = 55°C	I _{FSM}		125.0		Amps
Maximum Instantaneous Forward Voltage at	V _{FM}		0.875 0.975 0.800 1.075		Volts
			4.0A T _A = 25°C 6.0A T _A = 25°C 4.0A T _A = 100°C 4.0A T _A = -65°C		
Maximum DC Reverse Current at Rated DC Blocking Voltage	I _R		5.0 150.0		µA
			T _A = 25°C T _A = 100°C		
Maximum Reverse Recovery Time (NOTE 1) T _J = 25°C	T _{RR}		30.0		nS
Maximum Forward Recovery Time at 500 mA	T _{FR}		15.0		nS
Maximum Forward Voltage Recovery at 500 mA	V _{FR}		2.2		Volts
Maximum Junction Capacitance (NOTE 2)	C _J		60.0		pf
Maximum Thermal Resistance (NOTE 3)	Rθ _{JL}		22.0		°C/W
Operating Junction Temperature Range	T _J		-65 to +175		°C
Storage Temperature Range	T _{STG}		-65 to +200		°C

NOTES:

1. Reverse Recovery Test Condition: I_F = 1.0A, I_R = 1.0A, I_{RR} = 0.1A, di/dt = 100 A/µs.
2. Measured at 1 MHz and applied reverse voltage of 10 volts.
3. Thermal Resistance from Junction to Lead at .375", 9.5mm lead lengths, with both leads attached to heatsinks.

MAXIMUM RATINGS AND CHARACTERISTIC CURVES JAN AND JANTX 1N5807 THRU 1N5811



SCHOTTKY RECTIFIERS

0.6 TO 40 AMPERES

**GENERAL
INSTRUMENT**

LOW CURRENT AXIAL SCHOTTKY RECTIFIERS

TYPE	SB020 thru SB040	SB120 thru SB1100	1N5817 thru 1N5819	SB320 thru SB3100	1N5820 thru 1N5822	SB520 thru SB5100
PACKAGE	MPG06	DO-41	DO-41	DO-201AD	DO-201AD	DO-201AD
IO(A)	0.6	1.0	1.0	3.0	3.0	5.0
VR-20(V)	SB020	SB120	1N5817	SB320	1N5820	SB520
VR-30(V)	SB030	SB130	1N5818	SB330	1N5821	SB530
VR-40(V)	SB040	SB140	1N5819	SB340	1N5822	SB540
VR-50(V)		SB150		SB350		SB550
VR-60(V)		SB160		SB360		SB560
VR-90(V)		SB190		SB390		SB590
VR-100(V)		SB1100		SB3100		SB5100

MEDIUM CURRENT SCHOTTKY RECTIFIERS

SINGLE RECTIFIERS

TYPE	MBRF735 thru MBRF760	MBR735 thru MBR760	SBLF1030 thru SBLF1040	SBL1030 thru SBL1040	MBRF1035 thru MBRF10100	MBR1035 thru MBR10100	MBRF1635 thru MBRF1660	MBR1635 thru MBR1660
PACKAGE	ITO-220	TO-220	ITO-220	TO-220	ITO-220	TO-220	ITO-220	TO-220
BARRIER HEIGHT	HIGH	HIGH	LOW	LOW	HIGH	HIGH	HIGH	HIGH
IO(A)	7.5	7.5	10.0	10.0	10.0	10.0	16.0	16.0
VR-30(V)			SBLF1030	SBL1030				
VR-35(V)	MBRF735	MBR735			MBRF1035	MBR1035	MBRF1635	MBR1635
VR-40(V)			SBLF1040	SBL1040				
VR-45(V)	MBRF745	MBR745			MBRF1045	MBR1045	MBRF1645	MBR1645
VR-50(V)	MBRF750	MBR750			MBRF1050	MBR1050	MBRF1650	MBR1650
VR-60(V)	MBRF760	MBR760			MBRF1060	MBR1060	MBRF1660	MBR1660
VR-90(V)					MBRF1090	MBR1090		
VR-100(V)					MBRF10100	MBR10100		

MEDIUM CURRENT SCHOTTKY RECTIFIERS

DUAL RECTIFIERS

TYPE	SBLF1030CT thru SBLF1040CT	SBL1030CT thru SBL1040CT	MBRF1535CT thru MBRF1560CT	MBR1535CT thru MBR1560CT	SBLF1630CT thru SBLF1640CT	SBLF1630CT thru SBL1640CT	MBRF2035CT thru MBRF20100CT	MBR2035CT thru MBR20100CT	MBRF2535CT thru MBRF2560CT	MBR2535CT thru MBR2560CT
PACKAGE	ITO-220CT	TO-220CT	ITO-220CT	TO-220CT	ITO-220CT	TO-220CT	ITO-220CT	TO-220CT	ITO-220CT	TO-220CT
BARRIER HEIGHT	LOW	LOW	HIGH	HIGH	LOW	LOW	HIGH	HIGH	HIGH	HIGH
IO(A)	10.0	10.0	15.0	15.0	16.0	16.0	20.0	20.0	30.0	30.0
VR=30(V)	SBLF1030CT	SBL1030CT			SBLF1630CT	SBL1630CT				
VR=35(V)			MBRF1535CT	MBR1535CT			MBRF2035CT	MBR2035CT	MBRF2535CT	MBR2535CT
VR=40(V)	SBLF1040CT	SBL1040CT			SBLF1640CT	SBL1640CT				
VR=45(V)			MBRF1545CT	MBR1545CT			MBRF2045CT	MBR2045CT	MBRF2545CT	MBR2545CT
VR=50(V)			MBRF1550CT	MBR1550CT			MBRF2050CT	MBR2050CT	MBRF2550CT	MBR2550CT
VR=60(V)			MBRF1560CT	MBR1560CT			MBRF2060CT	MBR2060CT	MBRF2560CT	MBR2560CT
VR=90(V)							MBRF2090CT	MBR2090CT		
VR=100(V)							MBRF20100CT	MBR20100CT		

MEDIUM CURRENT SCHOTTKY RECTIFIERS

DUAL RECTIFIERS CONT.

TYPE	SBLF2030PT thru SBLF2040PT	SBL2030PT thru SBL2040PT	SBLF3030PT thru SBLF3040PT	SBL3030PT thru SBL3040PT	MBRF3035PT thru MBRF3060PT	MBR3035PT thru MBR3060PT	SD241P	MBRF4035PT thru MBRF4060PT	MBR4035PT thru MBR4060PT
PACKAGE	ITO-3P	TO-3P	ITO-3P	TO-3P	ITO-3P	TO-3P	ITO-3P	ITO-3P	TO-3P
BARRIER HEIGHT	LOW	LOW	LOW	LOW	HIGH	HIGH	HIGH	HIGH	HIGH
IO(A)	20.0	20.0	30.0	30.0	30.0	30.0	30.0	40.0	40.0
VR=30(V)	SBLF2030PT	SBL2030PT	SBLF3030PT	SBL3030PT					
VR=35(V)					MBRF3035PT	MBR3035PT		MBRF4035PT	MBR4035PT
VR=40(V)	SBLF2040PT	SBL2040PT	SBLF3040PT	SBL3040PT					
VR=45(V)					MBRF3045PT	MBR3045PT	SD241P	MBRF4045PT	MBR4045PT
VR=50(V)					MBRF3050PT	MBR3050PT		MBRF4050PT	MBR4050PT
VR=60(V)					MBRF3060PT	MBR3060PT		MBRF4060PT	MBR4060PT

**AXIAL PLASTIC
SCHOTTKY RECTIFIERS**

0.6 TO 5.0 AMPERES

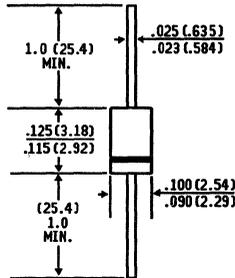
**GENERAL
INSTRUMENT**

SB020 THRU SB040

MINIATURE LOW CURRENT SCHOTTKY BARRIER RECTIFIER
VOLTAGE - 20 to 40 Volts CURRENT - 0.6 Amperes

FEATURES

MPG06



Dimensions in inches
and
(millimeters)

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ Guardring for transient protection
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed:
250°C/10 seconds/.375" (9.5 mm) lead lengths at 5 lbs. (2.3 kg) tension

MECHANICAL DATA

Case: Molded Plastic

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Band denotes cathode

Mounting Position: Any

Weight: 0.0064 ounces, 0.181 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	SB020	SB030	SB040	UNITS
Maximum Recurrent Peak Reverse Voltage	VRRM	20	30	40	Volts
Maximum RMS Voltage	VRMS	14	21	28	Volts
Maximum DC Blocking Voltage	VDC	20	30	40	Volts
Maximum Average Forward Rectified Current at .375", (9.5mm) Lead Length $T_L = 60^\circ\text{C}$	I(AV)	0.6			Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) $T_L = 70^\circ\text{C}$	I _{FSM}	20.0			Amps
Maximum Instantaneous Forward Voltage at 0.6A(NOTE 2)	V_F				0.55
Maximum Instantaneous Reverse Current at Rated DC Blocking (NOTE 2)	I_R	0.5			mA
	I_R	10.0			mA
					°C/W
Typical Thermal Resistance (NOTE 1)	R θ JA	46.0			

NOTES:

1. Thermal Resistance from Junction to Ambient Vertical P.C. Board Mounting, 0.5", 1.27mm Lead Length with 1.5" sq. (38.1mm²) copper pads.
2. Pulse Test: Pulse width =300μs, Duty Cycle =2%.

RATINGS AND CHARACTERISTIC CURVES SB020 THRU SB040

FIG. 1 — FORWARD CURRENT DERATING CURVE

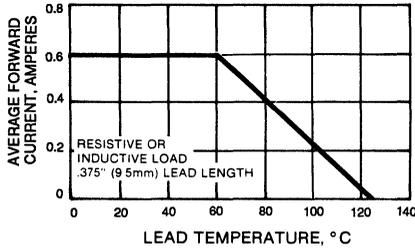


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

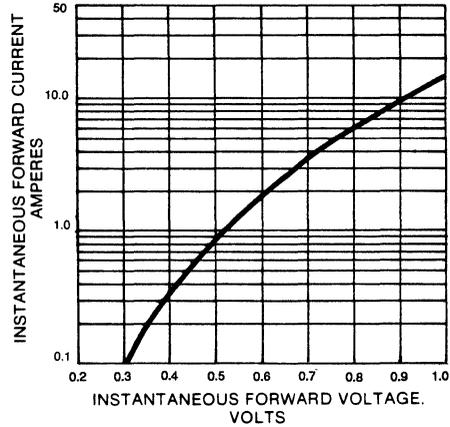


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

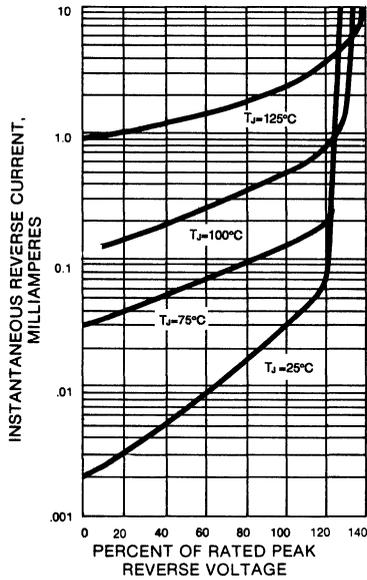


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

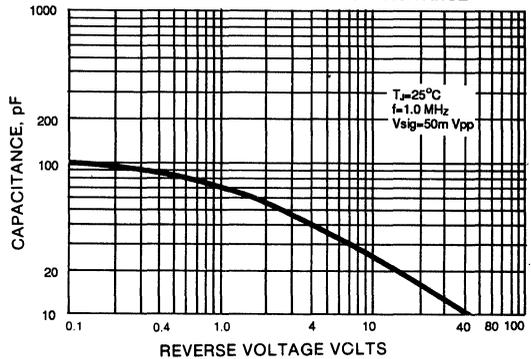
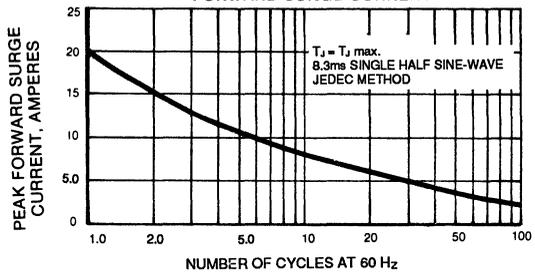


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT



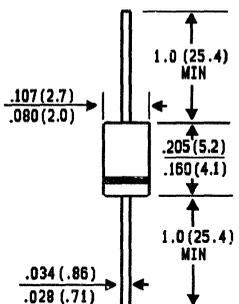
1N5817 THRU 1N5819

HIGH CURRENT SCHOTTKY BARRIER RECTIFIERS
VOLTAGE - 20 to 40 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ Low cost
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Guardring for stress protection
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375" (9.5 mm) lead lengths at 5 lbs., (2.3 kg) tension

DO-41



Dimensions in inches
and
millimeters

MECHANICAL DATA

Case: JEDEC DO-41 Molded Plastic

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounces, .34 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N5817	1N5818	1N5819	UNITS
* Maximum Recurrent Peak Reverse Voltage	VRRM	20	30	40	Volts
Maximum RMS Voltage	VRMS	14	21	28	Volts
* Maximum DC Blocking Voltage	VDC	20	30	40	Volts
* Maximum Non-Repetitive Peak Reverse Voltage	VRSM	24	36	48	Volts
* Maximum Average Forward Rectified Current .375", 9.5mm Lead Length at $T_L = 90^\circ\text{C}$	$I_{(AV)}$	1.0			Amps
* Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) $T_L = 70^\circ\text{C}$	I_{FSM}	25.0			Amps
* Maximum Forward Voltage at 1.0A	V_F	.450	.550	.600	Volts
* Maximum Forward Voltage at 3.1A	V_F	.750	.875	.900	Volts
* Maximum Instantaneous Reverse Current at Rated DC Reverse Voltage (NOTE 3) $T_A = 25^\circ\text{C}$ $T_A = 100^\circ\text{C}$	I_R	1.0 10.0			mA
Typical Thermal Resistance (NOTE 1)	$R_{\theta JL}$	15.0			$^\circ\text{C/W}$
Typical Junction Capacitance (NOTE 2)	C_J	110.0			pf
* Storage and Operating Junction Temperature Range	T_J, T_{STG}	-65 to +125			$^\circ\text{C}$

NOTES: 1. Thermal Resistance from Junction to Lead, PC Board Mounting with .375(9.5mm) Lead Lengths and 1.5 in² (38.1 mm²) copper pads.

2. Measured at 1 MHz and applied reverse voltage of 4.0 volts.

3. Pulse Test: 300μs Pulse Width, 2% Duty Cycle.

*JEDEC registered values

RATINGS AND CHARACTERISTIC CURVES 1N5817 THRU 1N5819

FIG 1 - FORWARD CURRENT DERATING CURVE

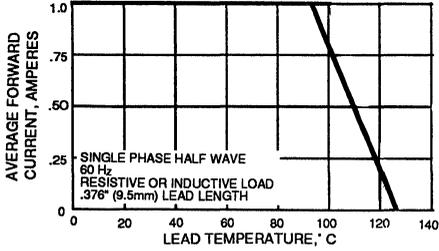


FIG 3 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

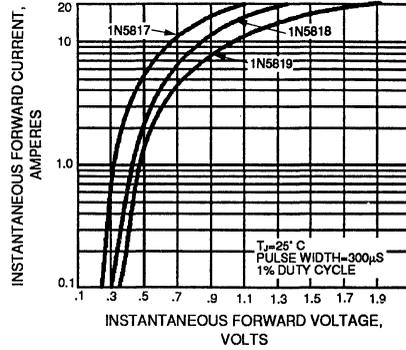


FIG 2 - TYPICAL REVERSE CHARACTERISTICS

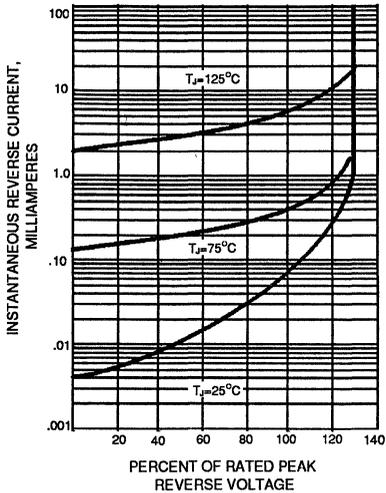


FIG 4 - MAXIMUM NON-REPETITIVE PEAK SURGE CURRENT

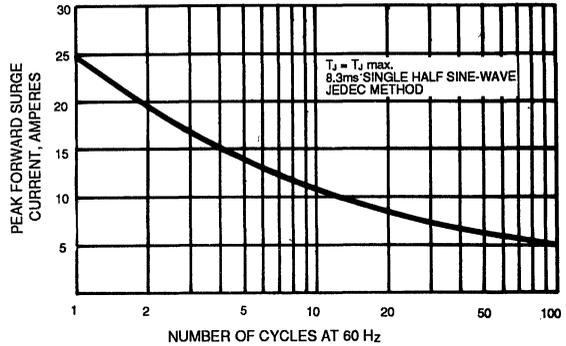
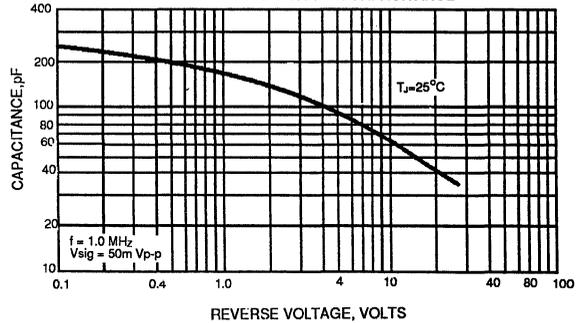


FIG 5 - TYPICAL JUNCTION CAPACITANCE

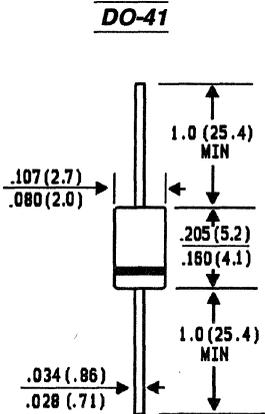


SB120 THRU SB160

MINIATURE SCHOTTKY BARRIER RECTIFIER
VOLTAGE RANGE - 20 to 60 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ Low cost
- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ Guardring for transient protection
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375" (9.5mm) lead lengths/5lbs., (2.3kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-41 Molded Plastic
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.012 ounces, .34 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SB120	SB130	SB140	SB150	SB160	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	20	30	40	50	60	Volts
Maximum RMS Voltage	V _{RMS}	14	21	28	35	42	Volts
Maximum DC Blocking Voltage	V _{DC}	20	30	40	50	60	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Length See Fig.1	I _(AV)	1.0					Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	40.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A (NOTE 2)	V _F	0.50		0.70		Volts	
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage (NOTE 2) T _A =25°C T _A =100°C	I _R	0.5					mA
	I _R	10.0		5.0		mA	
Typical Thermal Resistance (NOTE 1)	R _{θJL}	15.0					°C/W
Operating Junction Temperature Range	T _J	-65 to +125		-65 to +150		°C	
Storage Temperature Range	T _{STG}	-65 to +150					°C

NOTES:

1. Thermal Resistance Junction to Lead P.C. Board Mounting .375" (9.5 mm) Lead Lengths.
2. Pulse Test: Pulse Width = 300µs, Duty Cycle=2.0%.

RATINGS AND CHARACTERISTIC CURVES SB120 THRU SB160

FIG. 1 — FORWARD CURRENT DERATING CURVE

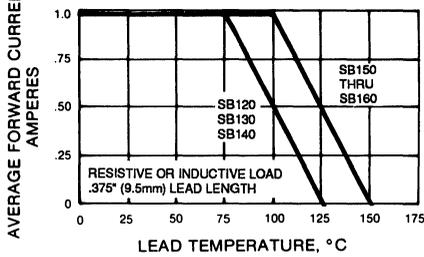


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

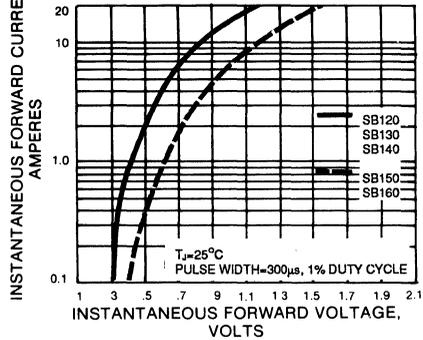


FIG. 3A — TYPICAL REVERSE CHARACTERISTICS

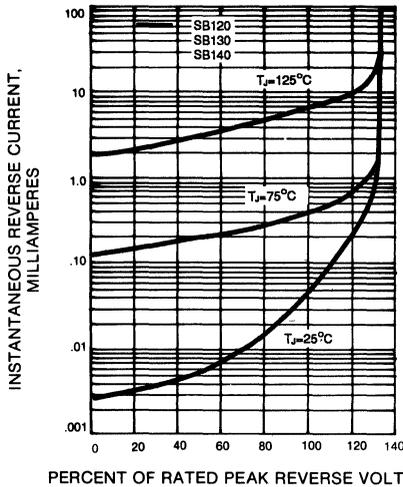


FIG. 3B — TYPICAL REVERSE CHARACTERISTICS

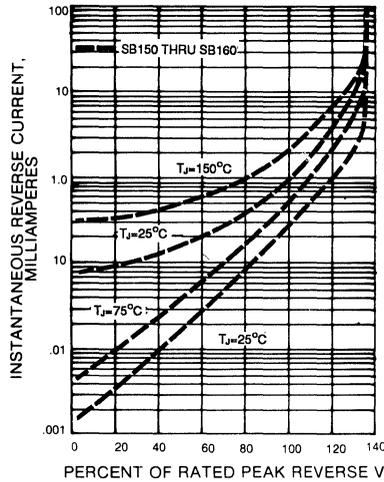


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

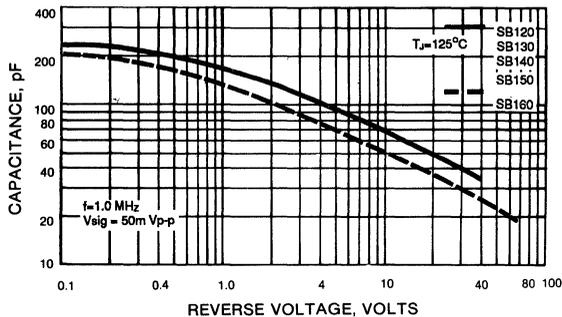
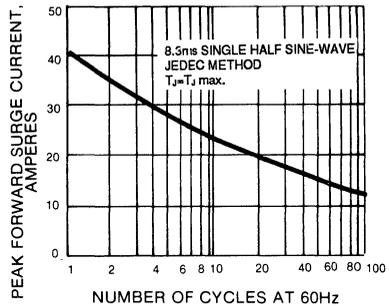


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

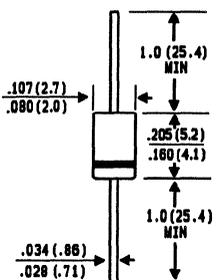


SB190 AND SB1100

MINIATURE LOW CURRENT SCHOTTKY BARRIER RECTIFIER
VOLTAGE RANGE -90 and 100 Volts CURRENT -1.0 Ampere

FEATURES

DO-41



Dimensions in inches
and
(millimeters)

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ Guardring for transient protection
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375" (9.5mm) lead lengths at 5 lbs. (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-41 Molded Plastic
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.012 ounces, .34 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SB190	SB1100	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	90	100	Volts
Maximum RMS Voltage	V_{RMS}	64	71	Volts
DC Blocking Voltage	V_{DC}	90	100	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) lead lengths at $T_L=135^\circ\text{C}$	$I_{(AV)}$	1.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I_{RRM}	1.0		Amps
Voltage Rate of Change (rated V_R)	dv/dt	1000		V/ μs
Maximum Instantaneous Forward Voltage at (NOTE 1) $I_F = 1.0\text{A}, T_A = 25^\circ\text{C}$	V_F	0.79		Volts
Maximum Instantaneous Forward Voltage at (NOTE 1) $I_F = 1.0\text{A}, T_A = 100^\circ\text{C}$	V_F	0.69		Volts
Maximum Instantaneous Reverse Current $T_A = 25^\circ\text{C}$	I_R	0.5		mA
at Rated DC Reverse Voltage (NOTE 1) $T_A = 100^\circ\text{C}$	I_R	5.0		mA
Typical Thermal Resistance Junction to Ambient (NOTE 2)	$R_{\theta JA}$	47.0		$^\circ\text{C}/\text{W}$
Junction to Lead	$R_{\theta JL}$	8.0		$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES: 1. Pulse Test: Pulse Width=300 μs , Duty Cycle=2%.
 2. Units vertical mounted on P.C. Board with .375", 9.5mm Lead Length with 1.5" sq. (38.1mm²) copper pads.
 3. Pulse width=2.0 μs , $f=1.0\text{KHz}$.

RATINGS AND CHARACTERISTIC CURVES SB190 THRU SB1100

FIG. 1—FORWARD CURRENT DERATING CURVE

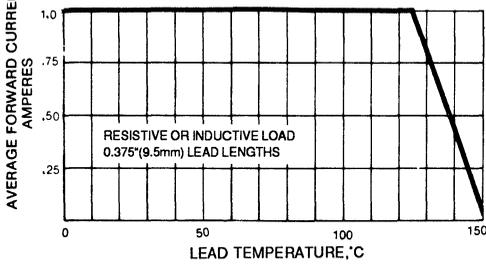


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

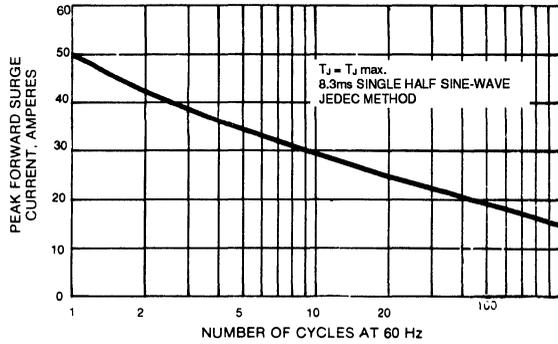


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

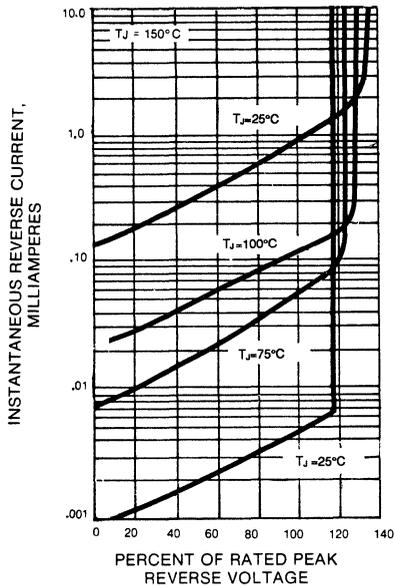


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

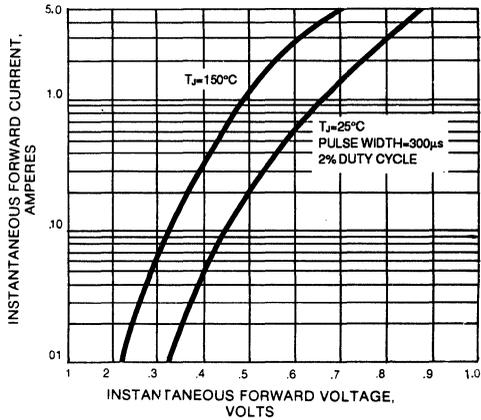
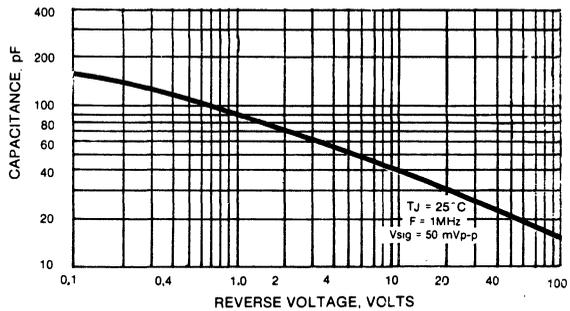


FIG. 5 — TYPICAL JUNCTION CAPACITANCE



1N5820 THRU 1N5822

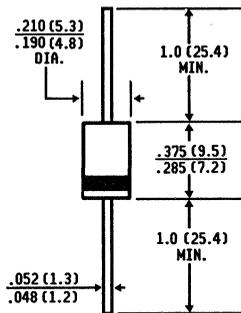
MEDIUM CURRENT SCHOTTKY BARRIER RECTIFIER
VOLTAGE - 20 to 40 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ Guardring for transient protection
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375" (9.5 mm) lead lengths at 5 lbs. (2.3 kg) tension

MECHANICAL DATA

DO-201AD



Dimensions in inches
and
(millimeters)

Case: JEDEC DO-201AD Molded Plastic
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.04 ounces, 1.12 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	1N5820	1N5821	1N5822	UNITS
* Maximum Recurrent Peak Reverse Voltage	V_{RRM}	20	30	40	Volts
Maximum RMS Voltage	V_{RMS}	14	21	28	Volts
* Maximum DC Blocking Voltage	V_{DC}	20	30	40	Volts
* Non-Repetitive Peak Reverse Voltage	V_{RSM}	24	36	48	Volts
* Maximum Average Forward Rectified Current .375", 9.5mm Lead Length at $T_L = 95^\circ\text{C}$	$I_{(AV)}$	3.0			Amps
* Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_L = 75^\circ\text{C}$	I_{FSM}	80.0			Amps
* Maximum Instantaneous Forward Voltage at 3.0 (NOTE 1)	V_F	.475	.500	.525	Volts
* Maximum Instantaneous Forward Voltage at 9.4 (NOTE 1)	V_F	.850	.900	.950	Volts
* Maximum Average Reverse Current at Rated DC Blocking Voltage $T_A = 25^\circ\text{C}$ (NOTE 1) $T_A = 100^\circ\text{C}$	I_R I_R	2.0 20.0			 mA mA
Typical Thermal Resistance (NOTE 2)	$R_{\theta JL}$	20.0			$^\circ\text{C}/\text{W}$
* Storage and Operating Junction Temperature Range	T_J, T_{STG}	-65 to +125			$^\circ\text{C}$

NOTES:

1. Pulse Test: Pulse Width=300 μs , Duty Cycle=2%.
2. Thermal Resistance from Junction to Lead Vertical PC Board Mounting, .500" (12.7 mm) Lead Length with 2.5" sq. (63.5mm²) copper pads.

*JEDEC registered values

RATINGS AND CHARACTERISTIC CURVES 1N5820 THRU 1N5822

FIG. 1 — FORWARD CURRENT DERATING CURVE

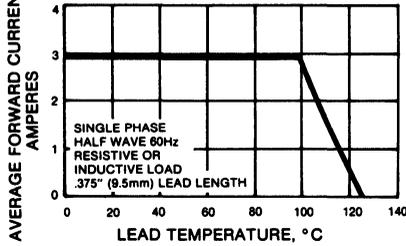


FIG 3 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

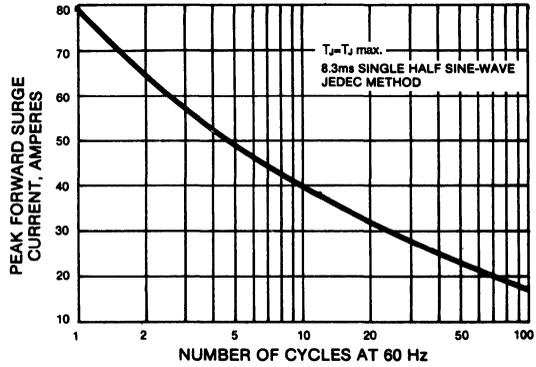


FIG. 2 — TYPICAL REVERSE CHARACTERISTICS

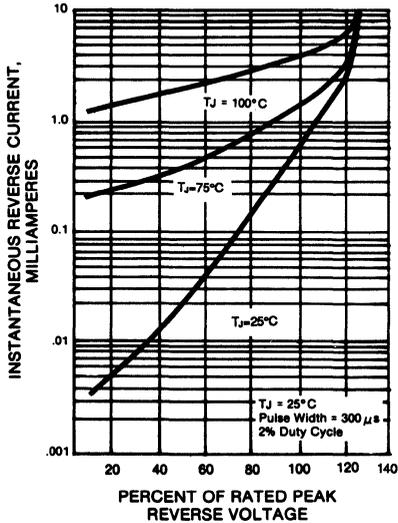


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

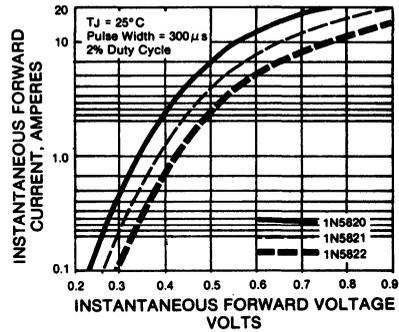
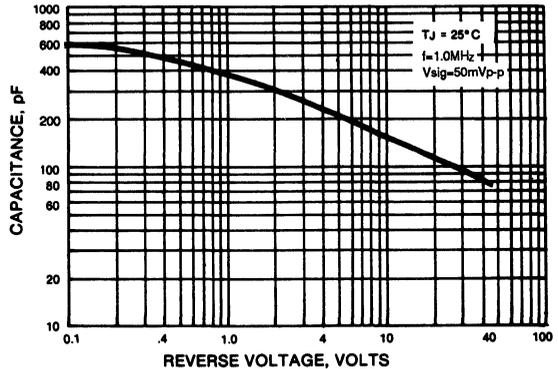


FIG 5 — TYPICAL JUNCTION CAPACITANCE

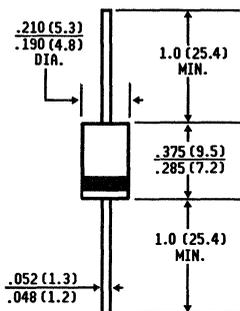


SB320 THRU SB360

MEDIUM CURRENT SCHOTTKY BARRIER RECTIFIER
VOLTAGE - 20 to 60 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory
- ◆ Flammability Classification 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ Guardring for transient protection
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed:
 250°C/10 seconds/.375" (9.5 mm) lead lengths at 5 lbs. (2.3 kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-201AD Molded Plastic
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.04 ounces, 1.12 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SB320	SB330	SB340	SB350	SB360	UNITS
Maximum Recurrent Peak Reverse Voltage	VRRM	20	30	40	50	60	Volts
Maximum RMS Voltage	VRMS	14	21	28	35	42	Volts
Maximum DC Blocking Voltage	VDC	20	30	40	50	60	Volts
Maximum Average Forward Rectified Current at .375", 9.5mm Lead Length (see fig. 1)	I(AV)	3.0					Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	IFSM	80.0					Amps
Maximum Instantaneous Forward Voltage at 3.0A	VF	.50		.74			Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage (NOTE 2)	IR	0.5					mA
	IR	20.0					mA
Typical Thermal Resistance (NOTE 1)	RθJA	20.0			10.0		°C/W
Operating Junction Temperature Range	TJ	-65 to +125			-65 to +150		°C
Storage Temperature Range	TSTG	-65 to +150					°C

NOTES:

1. Thermal Resistance from Junction to Lead Vertical PC Board Mounting, .500" (12.7 mm) Lead Length with 2.5*sq. (63.5mm²) copper pads.
2. Pulse Test: Pulse width = 300µs, Duty Cycle = 2%.

RATINGS AND CHARACTERISTIC CURVES SB320 THRU SB360

FIG. 1 — FORWARD CURRENT DERATING CURVE

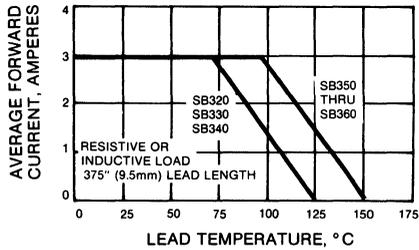


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

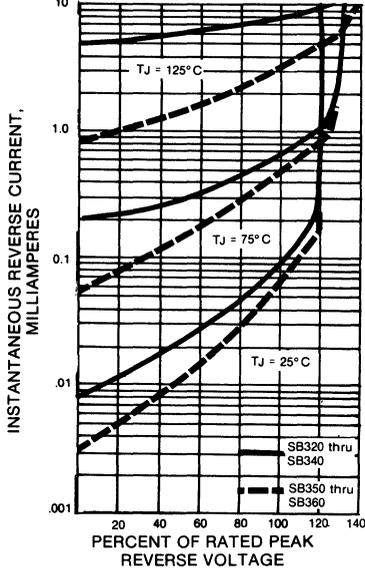


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

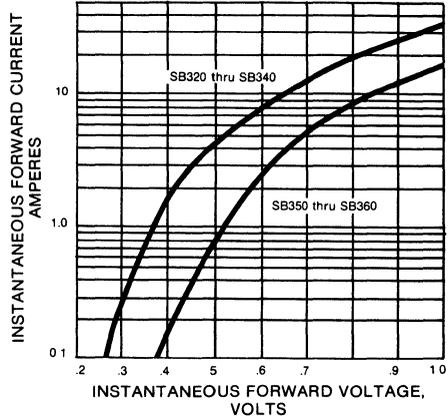


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

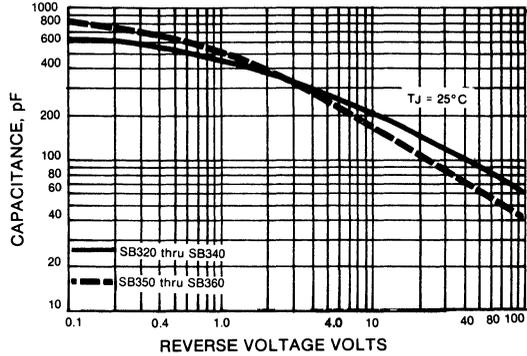
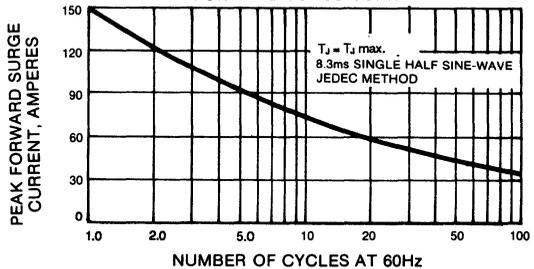


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

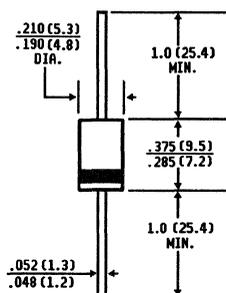


SB390 AND SB3100

MEDIUM CURRENT SCHOTTKY BARRIER RECTIFIER
VOLTAGE RANGE -90 and 100 Volts CURRENT -3.0 Amperes

FEATURES

DO-201AD



Dimensions in inches
and
(millimeters)

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375(9.5 mm) lead lengths at 5 lbs. (2.3 kg) tension

MECHANICAL DATA

Case: JEDEC DO-201AD Molded Plastic
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color Band denotes cathode
Mounting Position: Any
Weight: .04 ounces, 1.12 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SB390	SB3100	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	90	100	Volts
Maximum RMS Voltage	V_{RMS}	64	71	Volts
Maximum DC Blocking Voltage	V_{DC}	90	100	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Lengths at $T_L=100^\circ\text{C}$	$I_{(AV)}$	3.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I_{RRM}	1.0		Amps
Voltage Rate of Change, (rated V_R)	dv/dt	1000		V/ μs
Maximum Instantaneous Forward Voltage at (NOTE 1) $I_F = 3A, T_A = 25^\circ\text{C}$ $I_F = 3A, T_A = 100^\circ\text{C}$	V_F	0.79 0.69		Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage $T_A = 25^\circ\text{C}$ (NOTE 1) Peak Reverse Voltage $T_A = 100^\circ\text{C}$	I_R	0.1 10.0		mA
Typical Thermal Resistance Junction to Ambient (NOTE 2)	$R_{\theta JA}$	20.0		$^\circ\text{C}/\text{W}$
Junction to Lead	$R_{\theta JL}$	5.0		
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES:

1. Pulse Test Pulse Width=300 μs , Duty Cycle=2%.
2. Units vertical mounted on P.C. Board with .375", 9.5mm lead lengths.
3. Pulse width=2.0 μs , f=1.0m KHz.

RATINGS AND CHARACTERISTIC CURVES SB390 THRU SB3100

FIG. 1 — FORWARD CURRENT DERATING CURVE

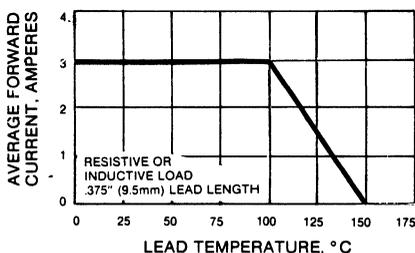


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

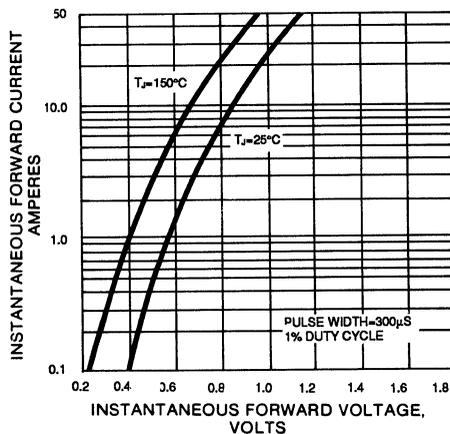


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

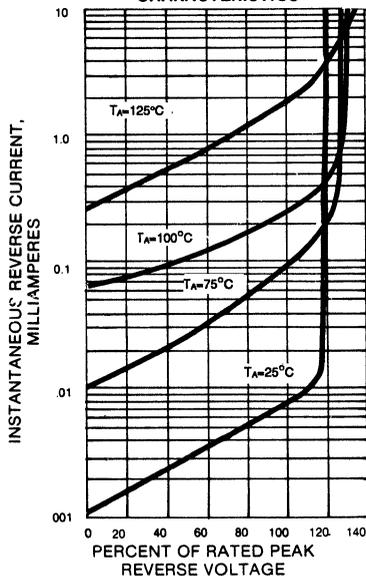


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

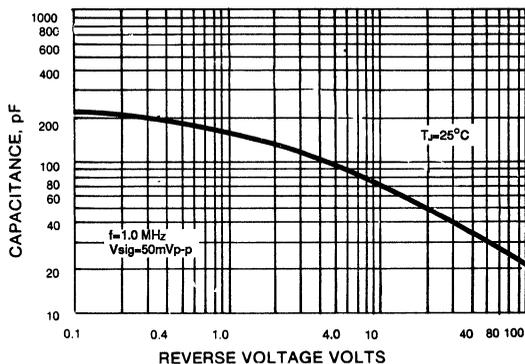
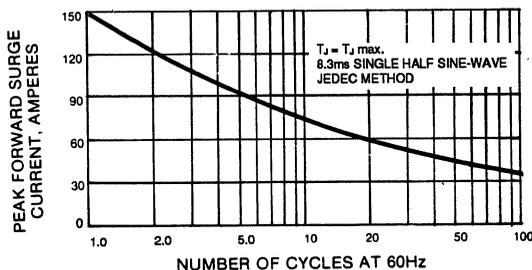


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

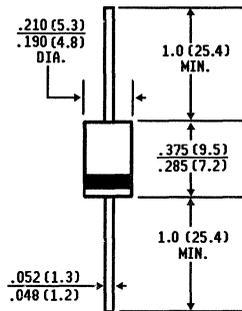


SB520 THRU SB560

HIGH CURRENT SCHOTTKY BARRIER RECTIFIERS
VOLTAGE - 20 to 60 Volts CURRENT - 5.0 Amperes

FEATURES

DO-201AD



Dimensions in inches
and
millimeters

- ◆ Low cost
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ Guardring for transient protection
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375" (9.5 mm) lead lengths at 5 lbs., (2.3 kg) tension

MECHANICAL DATA

Case: JEDEC DO-201AD Molded Plastic

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.04 ounces, 1.12 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	SB520	SB530	SB540	SB550	SB560	UNITS
Maximum Recurrent Peak Reverse Voltage	VRRM	20	30	40	50	60	Volts
Maximum RMS Voltage	VRMS	14	21	28	35	42	Volts
Maximum DC Blocking Voltage	VDC	20	30	40	50	60	Volts
Maximum Average Forward Rectified Current .375", 9.5mm Lead Length See Fig.1	I(AV)	5.0					Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at rated T_L	IFSM	150.0					Amps
Maximum Instantaneous Forward Voltage at 5.0A	V _F	0.55		0.67			Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage $T_A = 25^\circ\text{C}$ (NOTE 2) $T_A = 100^\circ\text{C}$	I _R I _R	0.5			25.0		mA mA
Typical Thermal Resistance (NOTE 1)	R _{ΘJL}	15.0			10.0		°C/W
Operating Junction Temperature Range	T _J	-65 to +125			-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +125					°C

NOTES:

1. Thermal Resistance Junction to Lead Vertical P.C. Board Mounting, .375" (9.5mm) Lead Length.
2. Pulse Test: Pulse Width=300μs, Duty Cycle=2%.

RATINGS AND CHARACTERISTIC CURVES SB520 THRU SB560

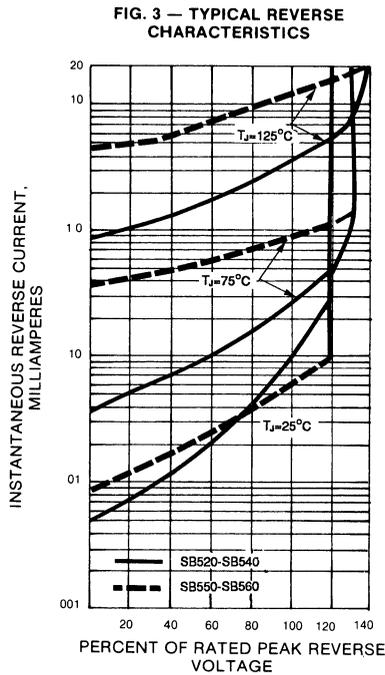
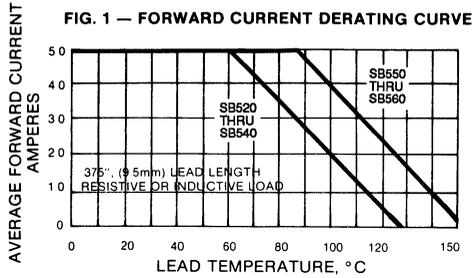


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

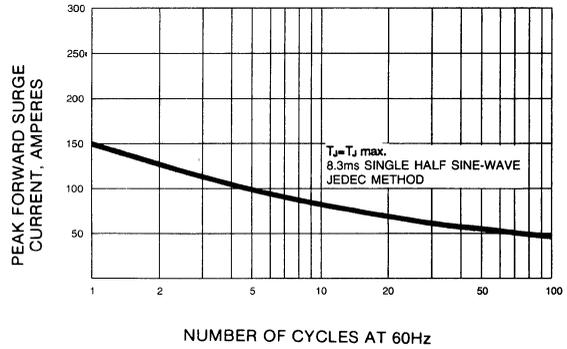


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

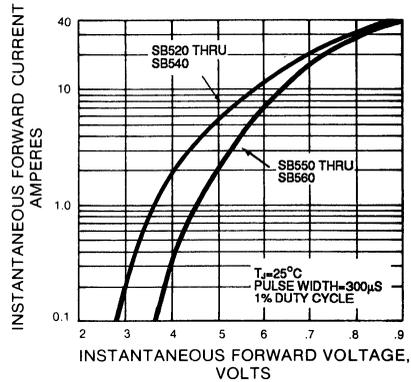
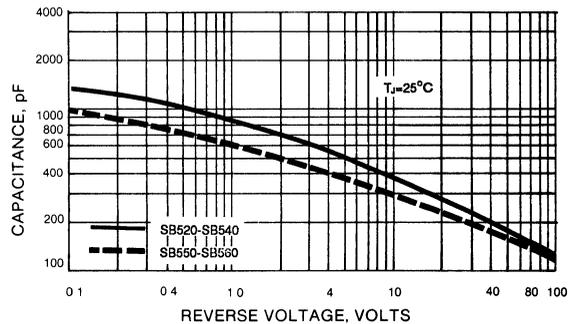


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

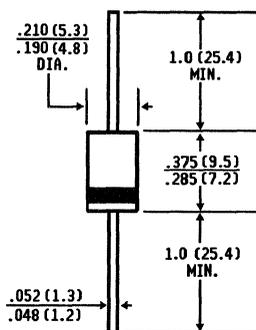


SB590 AND SB5100

MEDIUM CURRENT SCHOTTKY BARRIER RECTIFIER
VOLTAGE RANGE - 90 and 100 Volts CURRENT - 5.0 Amperes

FEATURES

DO-201AD



Dimensions in inches
and
(millimeters)

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ High temperature guaranteed: 250°C/10 seconds/.375" (9.5 mm) lead lengths at 5 lbs. (2.3 kg) tensions
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection

MECHANICAL DATA

Case: JEDEC DO-201AD Molded Plastic

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color Band denotes cathode

Mounting Position: Any

Weight: .04 ounces, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SB590	SB5100	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	90	100	Volts
Maximum RMS Voltage	V_{RMS}	64	71	Volts
Maximum DC Blocking Voltage	V_{DC}	90	100	Volts
Maximum Average Forward Rectified Current .375" (9.5 mm) lead length at $T_L=125^\circ\text{C}$	$I_{(AV)}$	5.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (2.0us, 1KHz)	I_{RRM}	1.0		Amps
Voltage Rate of Change, (rated V_R)	dv/dt	1000		V/ μs
Maximum Instantaneous Forward Voltage at (NOTE 1) $I_F = 5A, T_A = 25^\circ\text{C}$ $I_F = 5A, T_A = 100^\circ\text{C}$	V_F	0.79 0.69		Volts
Maximum Instantaneous Reverse Current at DC Blocking Voltage (NOTE 1) $T_A=25^\circ\text{C}$ $T_A=100^\circ\text{C}$	I_R	0.5 20.0		mA
Typical Thermal Resistance, Junction to Ambient (NOTE 2)	$R_{\theta JA}$ $R_{\theta JL}$	15.0 6.0		$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES: 1. Pulse Test: Pulse Width=300 μs , Duty Cycle=2%.

2. Units vertical mounted on a P.C. Board with .500" (12.7mm) Lead Length with 2.5* sq. (63.5mm²) copper pads.

RATINGS AND CHARACTERISTIC CURVES SB590 THRU SB5100

FIG. 1 — FORWARD CURRENT DERATING CURVE

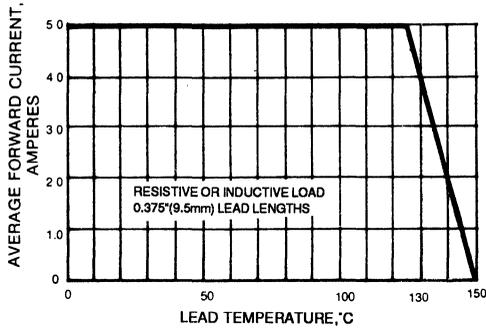


FIG. 2 — TYPICAL REVERSE CHARACTERISTICS

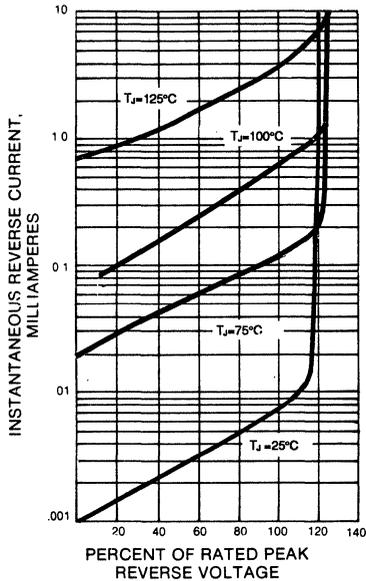


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

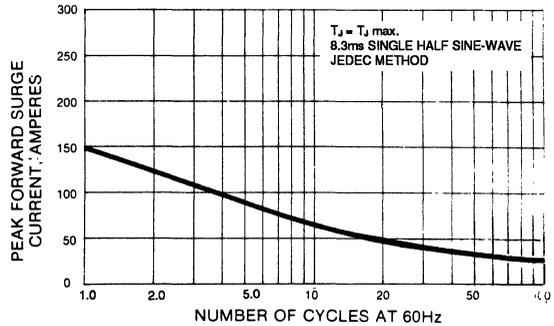


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

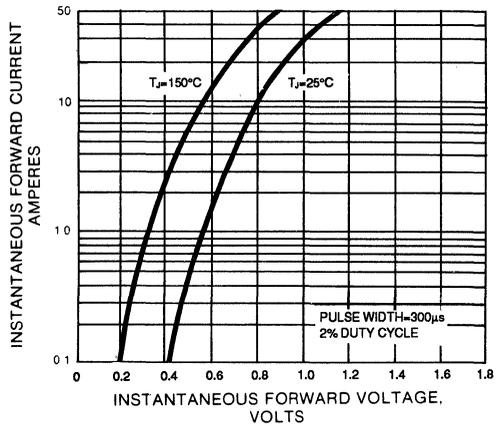
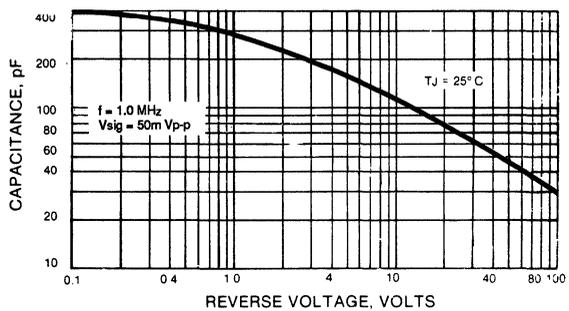


FIG. 5 — TYPICAL JUNCTION CAPACITANCE



MEDIUM CURRENT SCHOTTKY RECTIFIERS

7.5 TO 40.0 AMPERES

**SEE
NEW
ISOLATED
PACKAGES**



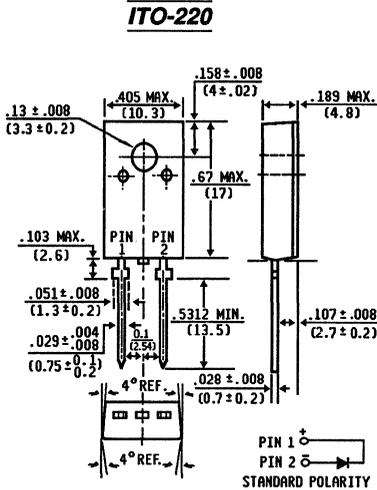
**GENERAL
INSTRUMENT**

MBRF735 AND MBRF745

SCHOTTKY RECTIFIER
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 7.5 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic
Terminals: Leads Solderable per MIL-STD-202, Method 208
Polarity: As marked **Mounting Position:** Any
Mounting Torque: 5 in.- lb. max.
Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	MBRF735	MBRF745	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V _{RWS}	35	45	Volts
Maximum DC Blocking Voltage	V _{DC}	35	45	Volts
Maximum Average Forward Rectified Current at T _C =105°C	I _(AV)	7.5		Amps
Peak Repetitive Forward Current (Square Wave, 20 KHz) at T _C =105°C	I _{FRM}	15.0		Amps
Peak Repetitive Forward Current (Square Wave, 20 KHz) at T _C =105°C	I _{FRM}	15.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	1.0		Amps
Maximum Instantaneous Forward Voltage at: I _F =7.5A, T _C =125°C I _F =15A, T _C =125°C I _F =15A, T _C =25°C	V _F	0.57 0.72 0.84		Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage (NOTE 2) T _C =125°C T _C =25°C	I _R	15.0 0.1		mA mA
Voltage Rate of Change (rated V _R)	dv/dt	1000		V/μs
Typical Thermal Resistance (NOTE 1)	RθJC	3.5		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES: 1. Thermal Resistance Junction to Case.
 2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.
 3. 2.0μs Pulse Width, f= 1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF735 AND MBRF745

FIG. 1—FORWARD CURRENT DERATING CURVE

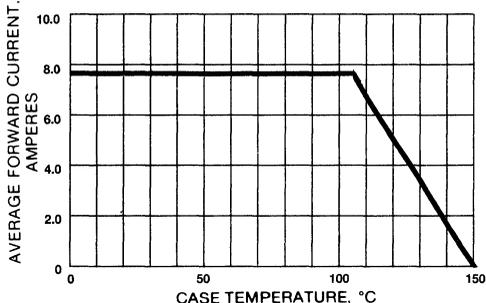


FIG. 2—MAXIMUM REVERSE CHARACTERISTICS

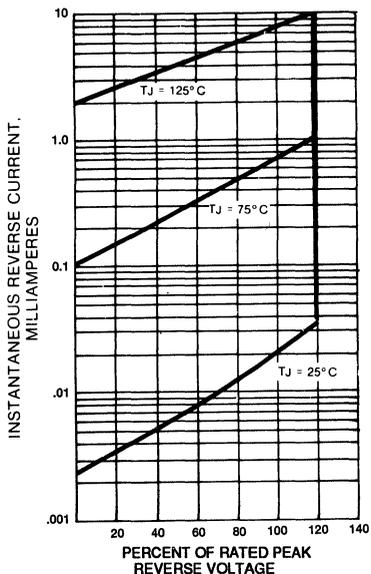


FIG. 3 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

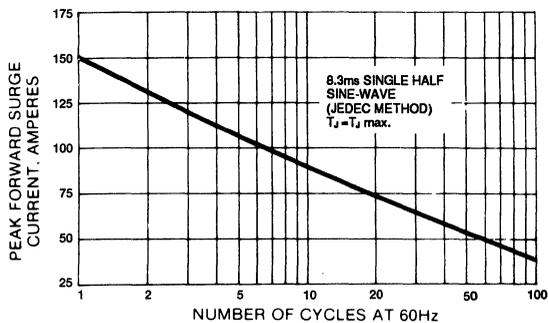


FIG. 4—TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

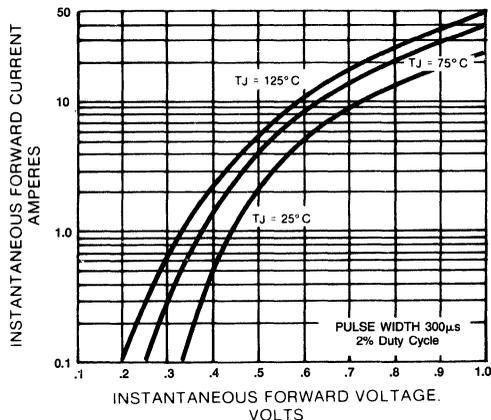
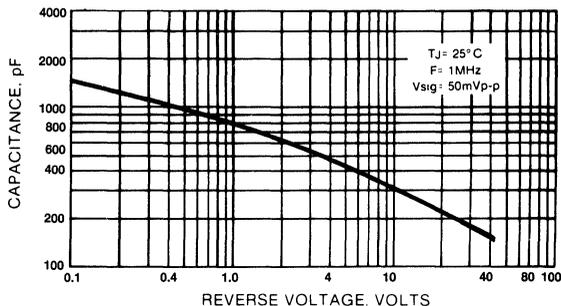


FIG. 5—TYPICAL JUNCTION CAPACITANCE



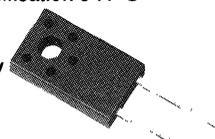
MBRF750 AND MBRF760

SCHOTTKY RECTIFIER

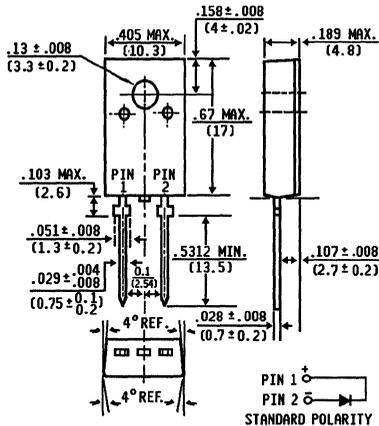
VOLTAGE RANGE - 50 and 60 Volts CURRENT - 7.5 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS



ITO-220



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic
Terminals: Leads Solderable per MIL-STD-202, Method 208
Polarity: As marked
Mounting Position: Any
Mounting Torque: 5 in. - lb. max.
Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

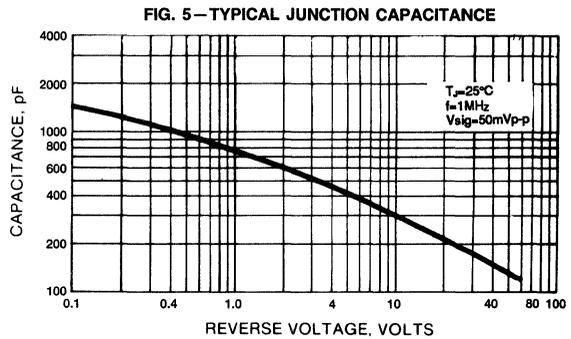
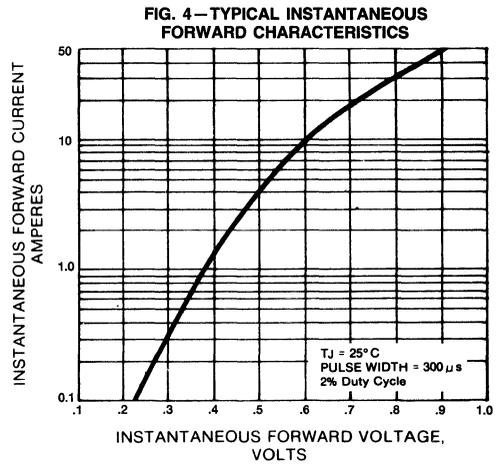
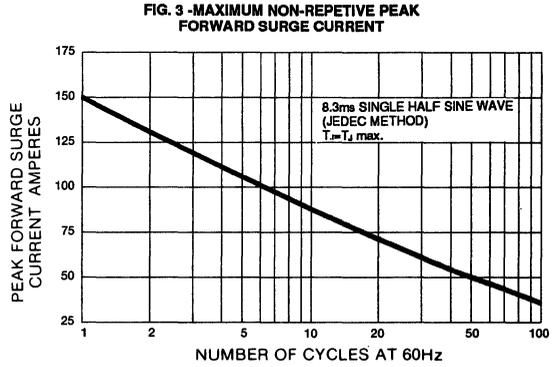
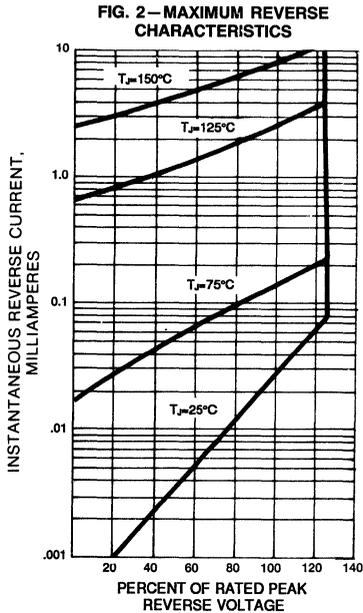
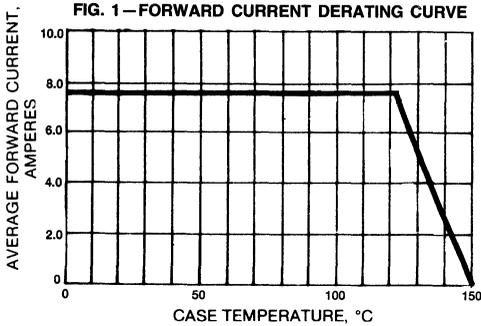
Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBRF750	MBRF760	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V _{DC}	50	60	Volts
Maximum Average Forward Rectified Current at T _C =125°C	I _(AV)	7.5		Amps
Peak Repetitive Forward Current (Square Wave, 20 KHz) at T _C =125°C	I _{FRM}	15.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	0.5		Amps
Maximum Instantaneous Forward Voltage at (NOTE 2) I _F = 7.5A, T _C = 125°C	V _F	0.65		Volts
Forward Voltage at (NOTE 2) I _F = 7.5A, T _C = 25°C		0.75		
Maximum Instantaneous Reverse Current at T _C =125°C	I _R	50.0		mA
Rated DC Blocking Voltage (NOTE 2) T _C = 25°C		0.5		
Voltage Rate of Change (rated V _R)	dv/dt	1000		V/μs
Typical Thermal Resistance (NOTE 1)	R _{θJC}	3.5		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES:

1. Thermal Resistance Junction to Case.
2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.
3. 2.0μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF750 AND MBRF760



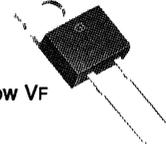
MBR735 AND MBR745

SCHOTTKY RECTIFIER

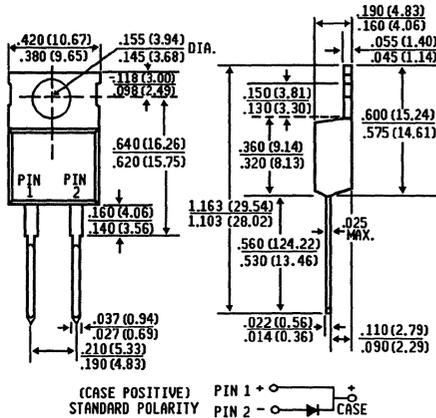
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 7.5 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



TO-220



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD- 202, Method 208

Polarity: As marked **Mounting Position:** Any

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

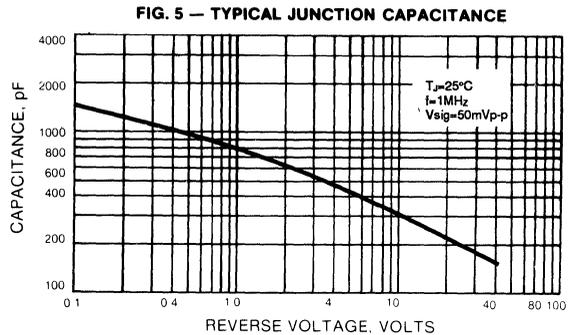
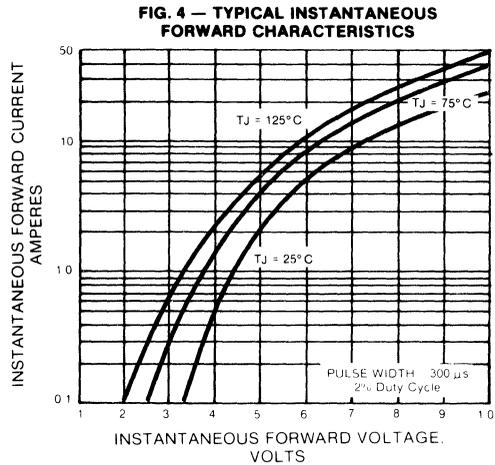
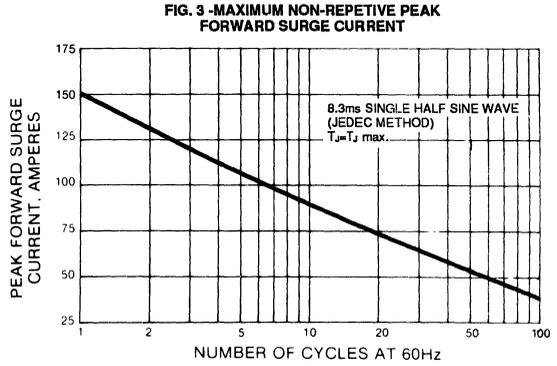
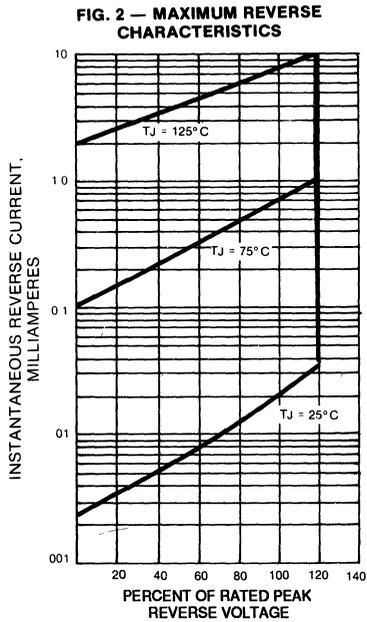
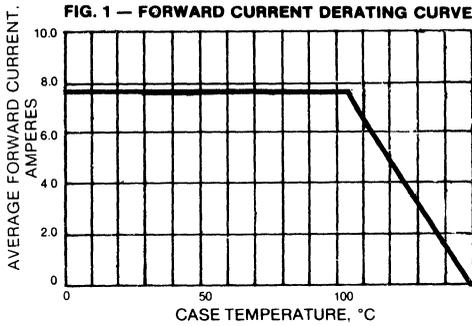
Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	MBR735	MBR745	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V _{DC}	35	45	Volts
Maximum Average Forward Rectified Current at T _C =105°C	I _(AV)	7.5		Amps
Peak Repetitive Forward Current(Square Wave, 20 KHz) at T _C =105°C	I _{FSM}	15.0		Amps
Peak Forward Surge Current,8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	1.0		Amps
Maximum Instantaneous Forward Voltage at I _F =7.5A, T _C =125°C	V _F	0.57		Volts
Forward Voltage at I _F =15A, T _C =125°C		0.72		
Forward Voltage at I _F =15A, T _C =25°C		0.84		
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage (NOTE 2)	I _R	15.0		mA
		0.1			mA
Voltage Rate of Change (rated V _R)	dv/dt	1000		V/μs
Maximum Thermal Resistance (NOTE 1)	R _{θJC}	3.0		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES:

1. Thermal Resistance Junction to Case.
2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.
3. 2.0μs, 1.0 KHz

RATINGS AND CHARACTERISTIC CURVES MBR735 AND MBR745



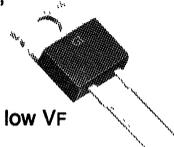
MBR750 AND MBR760

SCHOTTKY RECTIFIER

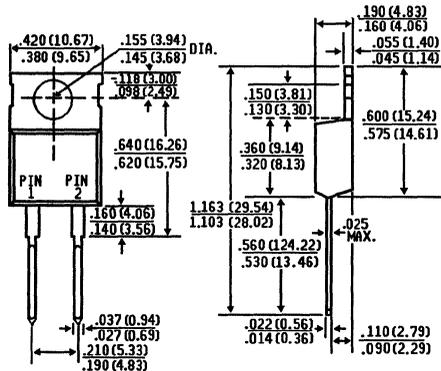
VOLTAGE RANGE - 50 and 60 Volts CURRENT - 7.5 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



TO-220



(CASE POSITIVE) STANDARD POLARITY

PIN 1 +
PIN 2 -

CASE

Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic
Terminals: Leads Solderable per MIL-STD- 202, Method 208
Polarity: As marked
Mounting Position: Any
Weight: .08 ounces, 2.24 gram

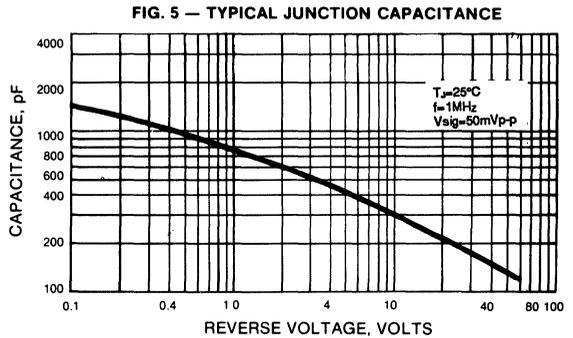
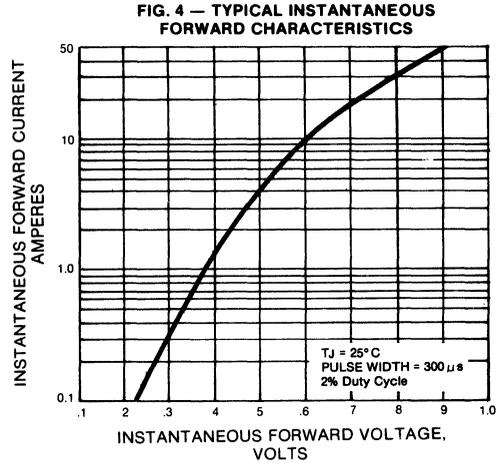
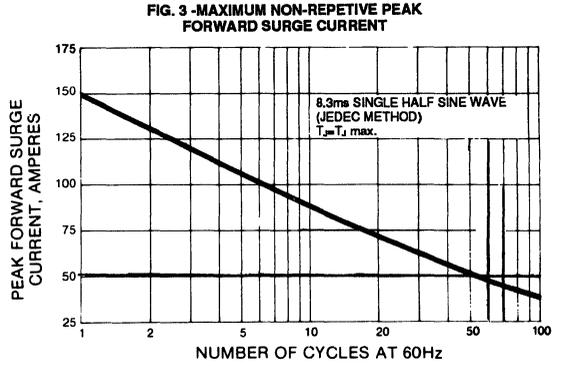
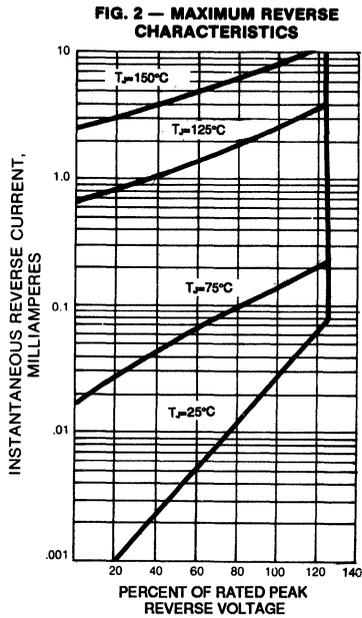
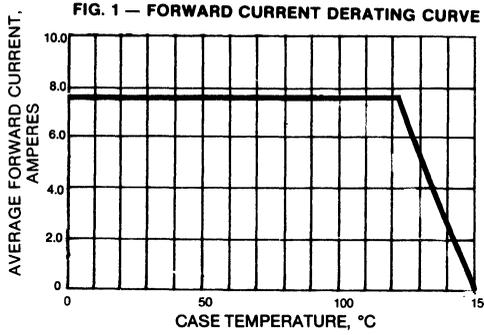
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive or inductive load, derate current by 20%.

	SYMBOLS	MBR750	MBR760	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V _{RWS}	50	60	Volts
Maximum DC Blocking Voltage	V _{DC}	50	60	Volts
Maximum Average Forward Rectified Current at T _C =125°C	I _(AV)	7.5		Amps
Peak Repetitive Forward Current (Square Wave, 20 KHz) at T _C =125°C	I _{FRM}	15.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	0.5		Amps
Maximum Instantaneous Forward Voltage at (NOTE 2)	V _F	I _F =7.5A, T _C =125°C	0.65	Volts
		I _F =7.5, T _C =25°C	0.75	
Maximum Instantaneous Reverse Current at T _C =25°C		0.5		mA
Rated DC Blocking Voltage (NOTE 2)	I _R	50.0		mA
Voltage Rate of Change (rated V _R)	dv/dt	1000		V/μs
Typical Thermal Resistance (NOTE 1)	R _{θJC}	3.0		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

- NOTES:**
1. Thermal Resistance from Junction to Case.
 2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.
 3. 2μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR750 AND MBR760



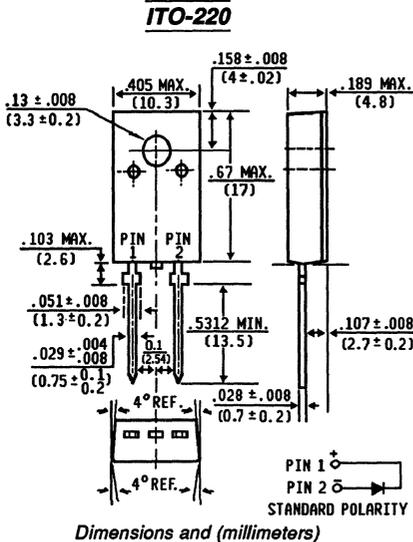
MBRF1035 AND MBRF1045

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 35 and 45 Volts CURRENT - 10.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Metal to silicon rectifier majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_f
- ◆ High surge capacity
- ◆ Guardring for transient protection
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Internal Insulation: 1.5K VRMS
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25" (6.35mm) from case



MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic

Terminals: Leads Solderable per MIL-STD- 202, Method 208

Polarity: As marked **Mounting Position:** Any

Mounting Torque: 5 in.- lb.max.

Weight: .08 ounces, 2.24 gram

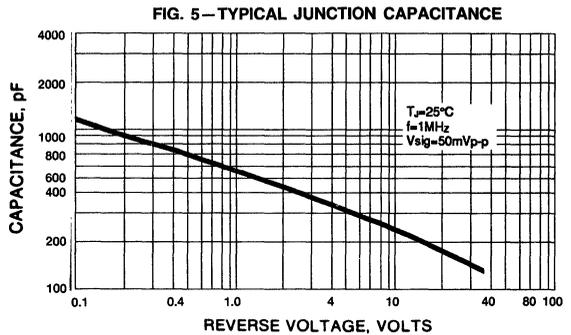
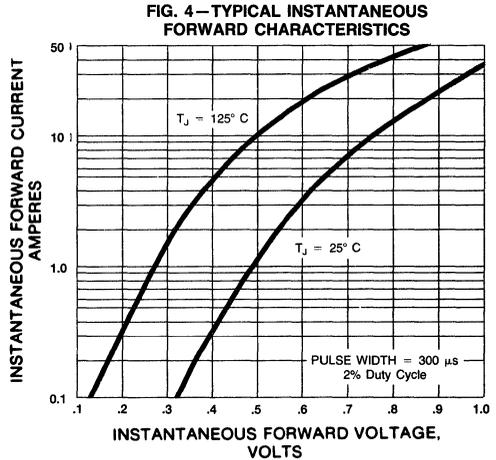
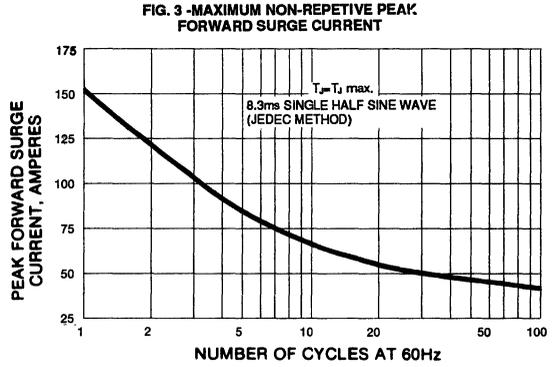
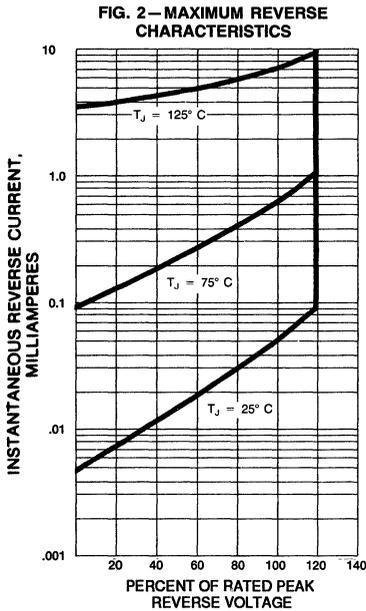
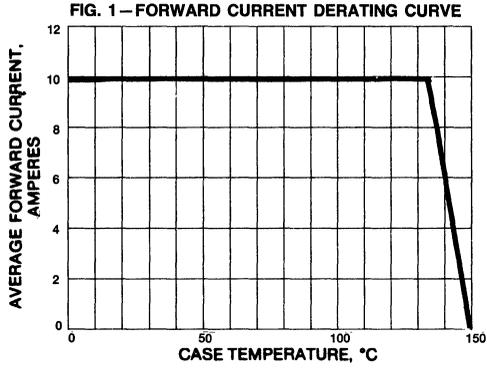
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	MBRF1035	MBRF1045	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V_{RWS}	35	45	Volts
Maximum DC Blocking Voltage	V_{DC}	35	45	Volts
Maximum Average Forward Rectified Current at $T_C=135^\circ\text{C}$	$I_{(AV)}$	10.0		Amps
Peak Repetitive Forward Current, (Square Wave 20 KHz) at $T_C = 135^\circ\text{C}$	I_{FSM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 2))	I_{RSM}	1.0		Amps
Voltage Rate of Change at (rated V_R)	dv/dt	1000		V/ μs
Maximum Instantaneous Forward Voltage at (NOTE 1) $I_F= 10\text{A}, T_C= 125^\circ\text{C}$ $I_F= 20\text{A}, T_C= 125^\circ\text{C}$ $I_F= 20\text{A}, T_C= 25^\circ\text{C}$	V_F	0.57 0.72 0.84		Volts
Maximum Instantaneous Reverse Current at DC Blocking Voltage (NOTE 1) $T_C = 125^\circ\text{C}$ $T_C = 25^\circ\text{C}$	I_R	15.0 0.1		mA mA
Typical Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.2		$^\circ\text{C}/\text{W}$
Typical Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Typical Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES: 1. Pulse Test: Pulse Width 300 μs , Duty Cycle 2%.
2. 2.0 μs Pulse Width, $f=1.0\text{KHz}$.

RATINGS AND CHARACTERISTIC CURVES MBRF1035 AND MBRF1045



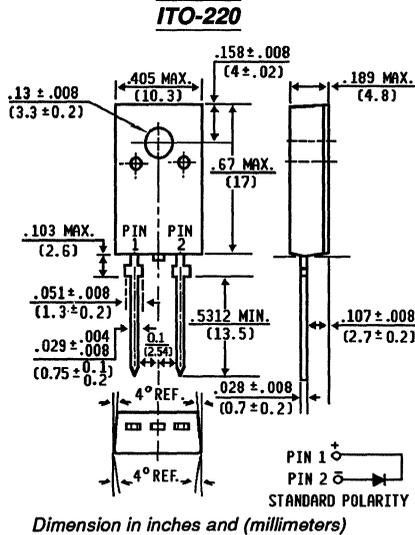
MBRF1050 AND MBRF1060

SCHOTTKY RECTIFIER

VOLTAGE RANGE -50 and 60 Volts CURRENT -10.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low Vf
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ Guardring for transient protection
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Internal Insulation: 1.5K VRMS
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25"(6.35mm) from case



MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic
Terminals: Leads Solderable per MIL-STD-202, Method 208
Polarity: As marked
Mounting Position: Any
Mounting Torque: 5 in. - lb. max.
Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%

	SYMBOLS	MBRF1050	MBRF1060	UNITS
Maximum Recurrent Peak Reverse Voltage	VRRM	50	60	Volts
Maximum Working Peak Reverse Voltage	VRWM	50	60	Volts
Maximum DC Blocking Voltage	VDC	50	60	Volts
Maximum Average Forward Rectified Current at T _C =133°C	I _(AV)	10.0		Amps
Peak Repetitive Forward Current, (Square Wave 20 KHz) at T _C = 133°C	I _{FRM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 2)	I _{RRM}	0.5		Amps
Voltage Rate of Change at (rated V _R)	dv/dt	1000		V/μs
Maximum Instantaneous Forward Voltage at (NOTE 1) I _F =1.0A, T _C =25°C I _F =10A, T _C =125°C I _F =20A, T _C =125°C I _F =20A, T _C = 25°C	V _F	0.80 0.70 0.85 0.95		Volts
Maximum Instantaneous Reverse Current at Rated DC Block Voltage (NOTE 1) T _C = 125°C T _C = 25°C	I _R	50.0 0.15		mA mA
Typical Thermal Resistance, Junction to Case	R _{ΘJC}	2.2		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES: 1. Pulse Test Pulse Width 300 μs, Duty Cycle 2%.
 2. 2.0μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF1050 AND MBRF1060

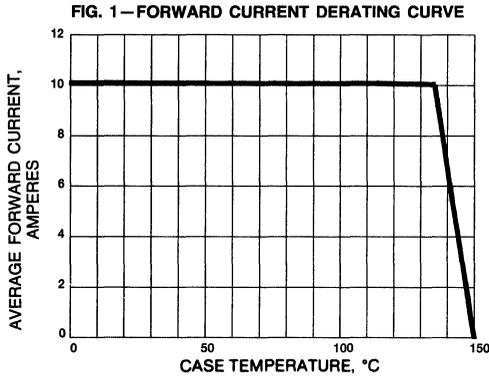


FIG 2. - MAXIMUM NON-REPETTIVE PEAK FORWARD SURGE CURRENT

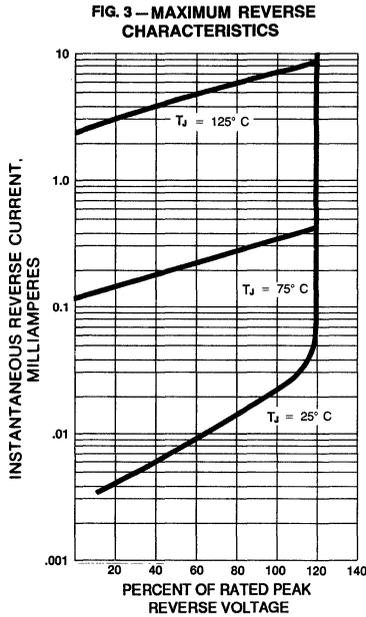
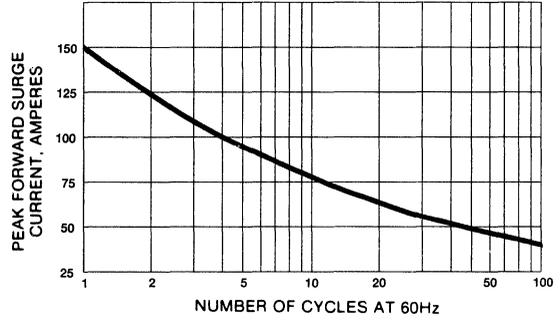


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

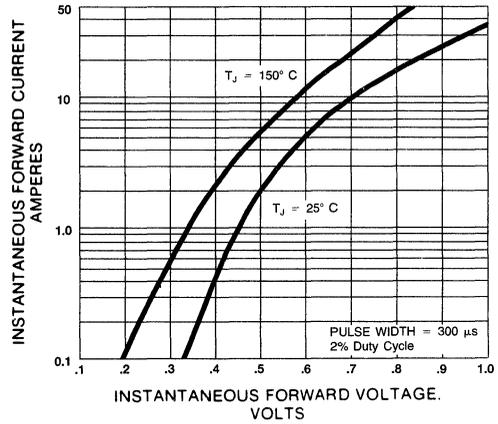
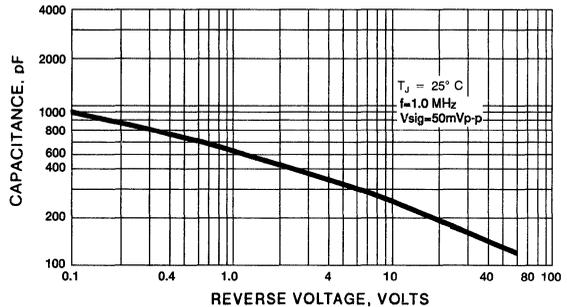


FIG. 5 — TYPICAL JUNCTION CAPACITANCE



MBRF1090 AND MBRF10100

SCHOTTKY RECTIFIER

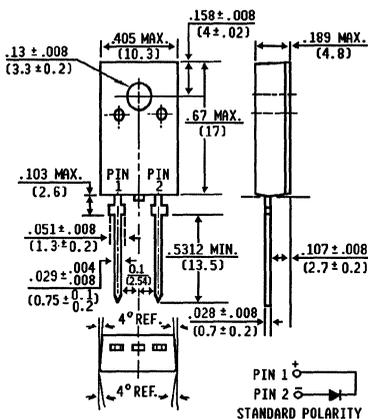
VOLTAGE RANGE - 90 and 100 Volts CURRENT -10.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ Internal insulation: 1.5k VRMS
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25"(6.35mm) from case



ITO-220



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic
Terminals: Leads Solderable per MIL-STD-202, Method 208
Polarity: As marked **Mounting Position:** Any
Mounting Torque: .08 ounces, 2.24 gram
Weight: .08 ounces, 2.24 gram

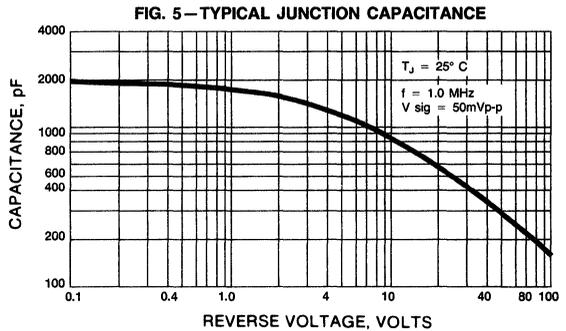
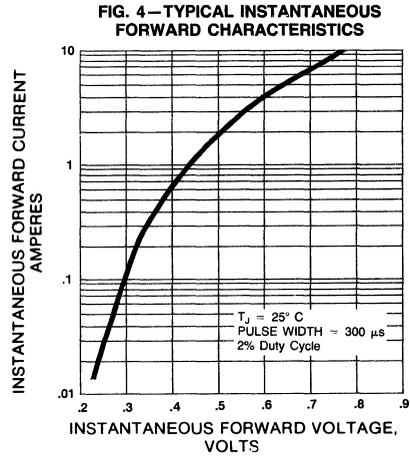
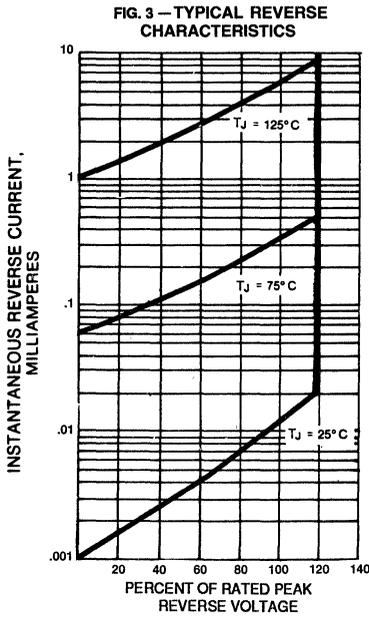
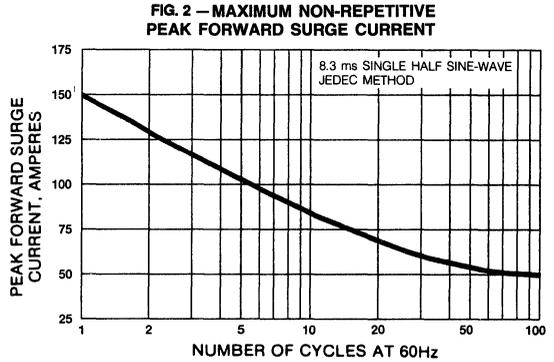
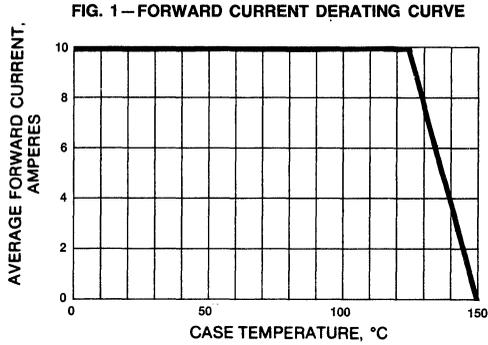
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	MBRF1090	MBRF10100	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	90	100	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	90	100	Volts
Maximum DC Blocking Voltage	V _{DC}	90	100	Volts
Maximum Average Forward Rectified Current at T _C =125°C	I _(AV)	10.0		Amps
Peak Repetitive Forward Current, rated V _R (Square Wave 20 KHz) at T _C =125°C	I _{FRM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 2)	I _{RRM}	0.5		Amps
Voltage Rate of Change (rated V _R)	dv/dt	1000		V/μs
Maximum Instantaneous Forward Voltage at (NOTE 1)	V _F	I _F = 10A, T _C = 25°C	0.80	Volts
		I _F = 10A, T _C = 125°C	0.70	
		I _F = 20A, T _C = 125°C	0.85	
		I _F = 20A, T _C = 25°C	0.95	
Maximum Instantaneous Reverse Current at rated DC Blocking Voltage	I _R	T _C =125°C (NOTE 1)	150.0	mA
		T _C =25°C	0.15	mA
Typical Thermal Resistance, Junction to Case	R _{θJC}	2.2		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES: 1. Pulse Test: Pulse Width 300 μs, Duty Cycle 2%.
 2. 2.0μs Pulse Width, f=1.0 kHz.

RATINGS AND CHARACTERISTIC CURVES MBRF1090 AND MBRF10100



MBR1035 AND MBR1045

SCHOTTKY RECTIFIER

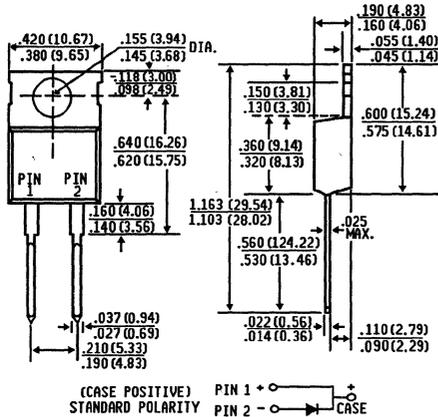
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 10.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25"(6.35mm) from case



TO-220



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD- 202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: .08 ounces, 2.24 gram

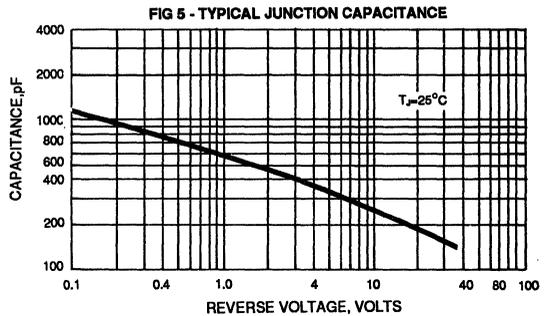
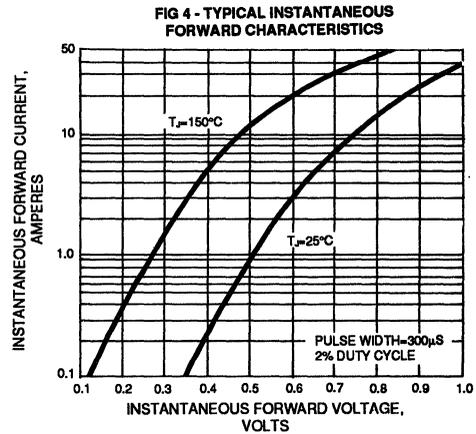
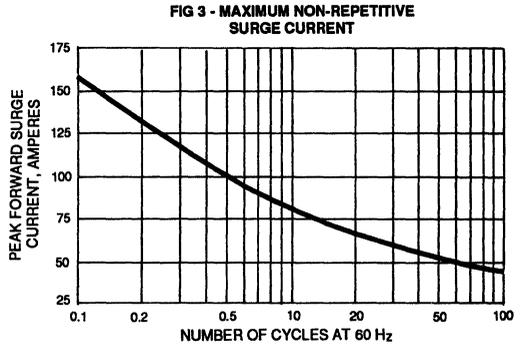
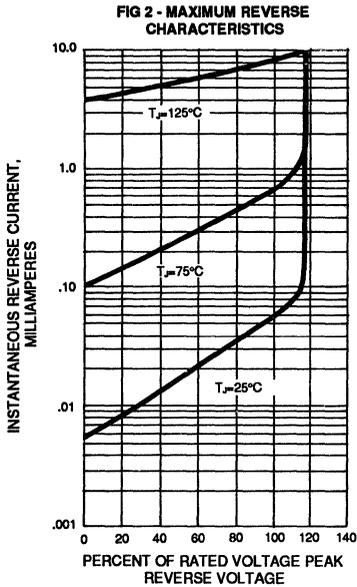
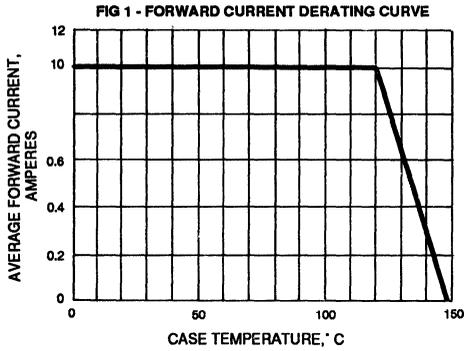
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	MBR1035	MBR1045	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V _{DC}	35	45	Volts
Maximum Average Forward Rectified Current at T _C =135°C	I _(AV)	10.0		Amps
Peak Repetitive Forward Current, (Square Wave 20 KHz) at T _C = 135°C	I _{FSM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 2)	I _R	1.0		Amps
Voltage Rate of Change at (rated V _R)	dv/dt	1000		V/μs
Maximum Instantaneous Forward Voltage (NOTE 1)	V _F	0.57 0.72 0.84		Volts
		I _F =10A, T _C =125°C		
		I _F =20A, T _C =125°C		
		I _F =20A, T _C =25°C		
Maximum Instantaneous Reverse Current at rated DC Blocking Voltage (NOTE 1)	I _R	15.0 0.1		mA mA
		T _C = 125°C		
		T _C = 25°C		
Maximum Thermal Resistance, Junction to Case	R _{θJC}	2.0		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES: 1. Pulse Test: Pulse Width 300 μs, Duty Cycle 2%.
2. 2.0 μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR1035 AND MBR1045



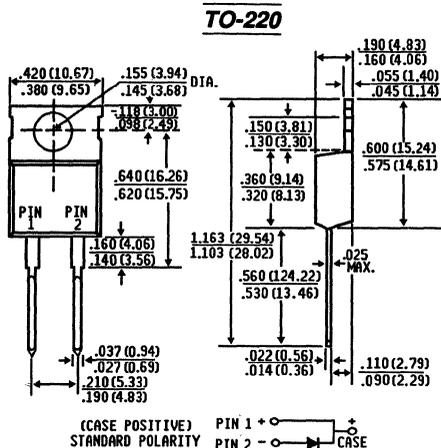
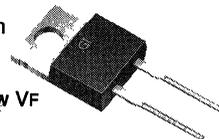
MBR1050 AND MBR1060

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 50 and 60 Volts CURRENT - 10.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25" (6.35mm) from case



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD- 202, Method 208

Polarity: As marked **Mounting Position:** Any

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	MBR1050	MBR1060	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V _{DC}	50	60	Volts
Maximum Average Forward Rectified Current T _C =133°C	I _(AV)	10.0		Amps
Peak Repetitive Forward Current, (Square Wave 20 KHz) at T _C =133°C	I _{FSM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 2)	I _{RRM}	0.5		Amps
Voltage Rate of Change at (rated V _R)	dv/dt	1000		V/μs
Maximum Instantaneous Forward Voltage (NOTE 1)	V _F	0.80 0.70 0.85 0.95		Volts
		I _F =10A, T _C =25°C I _F =10A, T _C =125°C I _F =20A, T _C =125°C I _F =20A, T _C =25°C		
Maximum Instantaneous Reverse Current at rated DC Blocking Voltage (NOTE 1)	I _R	50.0 0.15		mA mA
		T _C =25°C		
Maximum Thermal Resistance, Junction to Case	R _{θJC}	2.0		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES:

1. Pulse Test: Pulse Width 300 μs, Duty Cycle 2%.
2. 2.0 μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR1050 AND MBR1060

FIG. 1 — FORWARD CURRENT DERATING CURVE

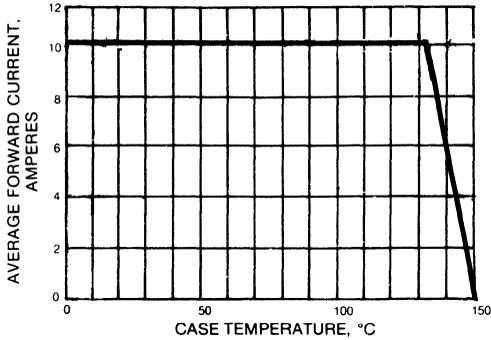


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

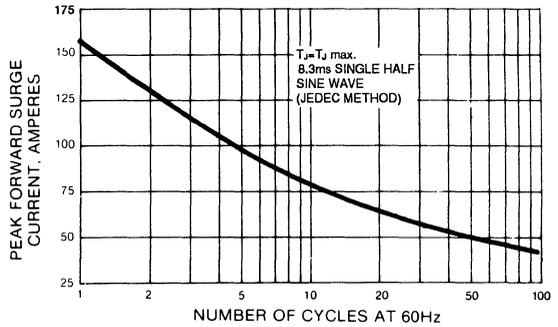


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

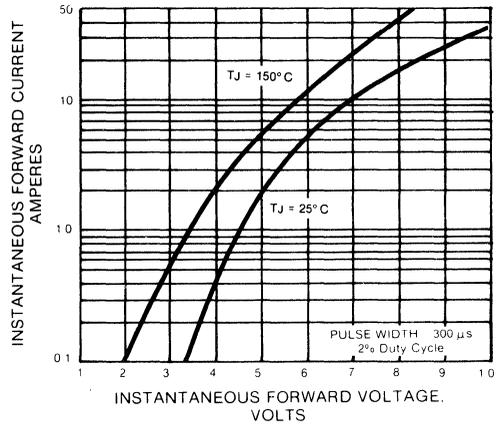


FIG. 3 — MAXIMUM REVERSE CHARACTERISTICS

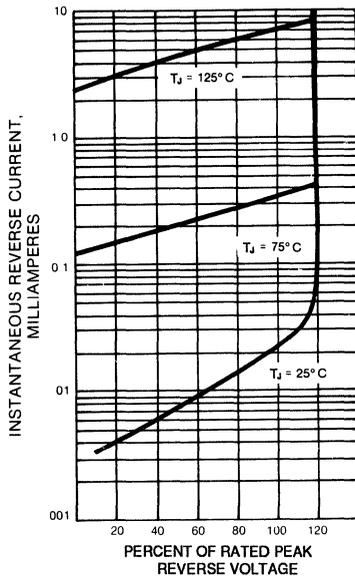
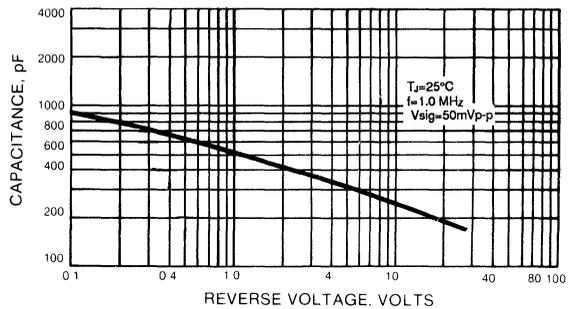


FIG. 5 — TYPICAL JUNCTION CAPACITANCE



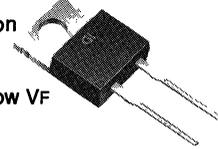
MBR1090 AND MBR10100

SCHOTTKY RECTIFIER

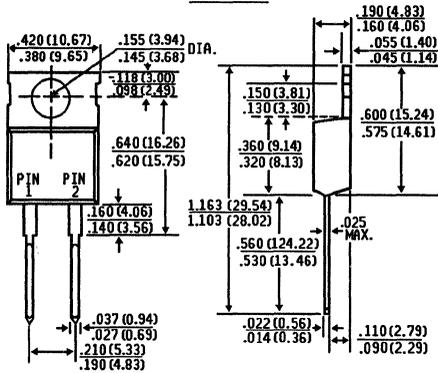
VOLTAGE RANGE - 90 and 100 Volts CURRENT -10.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ High temperature soldering guaranteed: 250°C/10seconds/.25"(6.35mm)



TO-220



(CASE POSITIVE) STANDARD POLARITY
 PIN 1 +
 PIN 2 - CASE

Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded plastic

Terminals: Leads solderable per MIL-STD-202, Method 208

Polarity: As marked **Mounting Position:** Any

Weight: .08 ounces, 2.24 gram

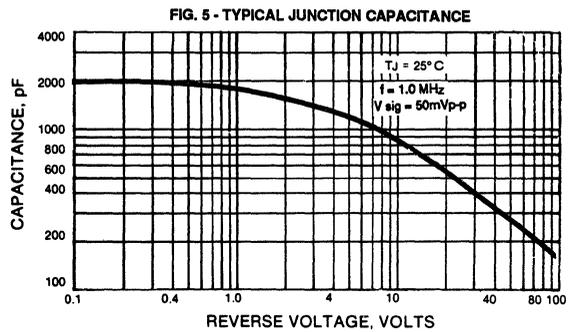
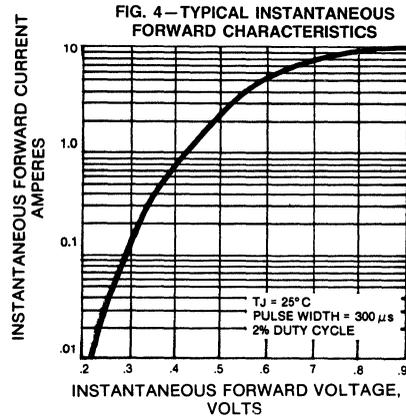
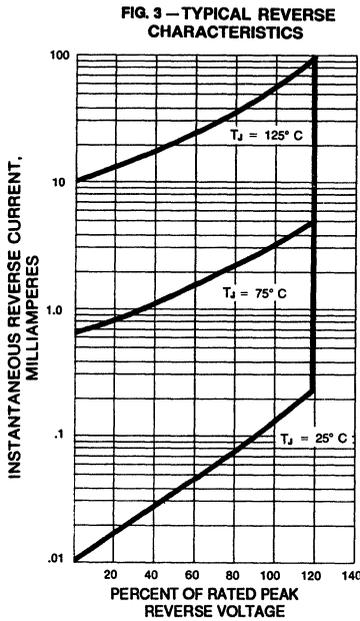
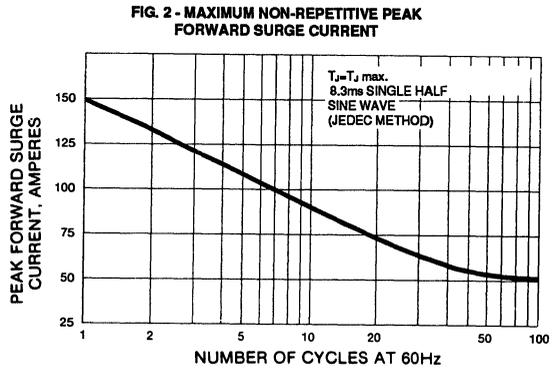
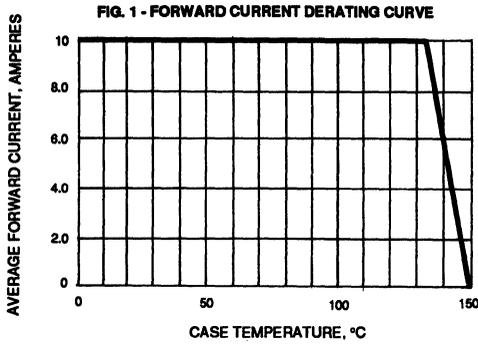
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBR1090	MBR10100	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	90	100	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	90	100	Volts
Maximum DC Blocking Voltage	V _{DC}	90	100	Volts
Maximum Average Forward Rectified Current at T _C =133°C	I _(AV)	10.0		Amps
Peak Repetitive Forward Current, (Square Wave 20 KHz) at T _C =133°C	I _{FSM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 2)	I _{RRM}	0.5		Amps
Voltage Rate of Change, (rated V _R)	dv/dt	1000		V/μs
Maximum Instantaneous Forward Voltage at (NOTE 1)	V _F	0.80 0.70 0.85 0.95		Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage (NOTE 1)	I _R	0.1		mA
	I _R	25.0		mA
Maximum Thermal Resistance, Junction to Case	R _{θJC}	2.0		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES: 1. Pulse Test Pulse Width 300 μs, Duty Cycle 2%.
 2. 2.0μs Pulse Width, 1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR1090 AND MBR10100



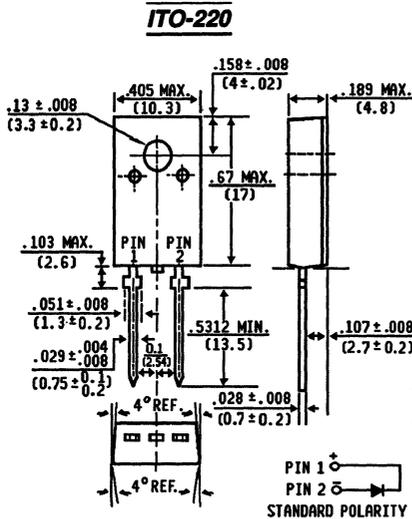
SBLF1030 AND SBLF1040

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 30 and 40 Volts CURRENT - 10.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Isolated overmolded package
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ Guardring for transient protection
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Internal Insulation: 1.5K VRMS



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic
Terminals: Leads Solderable per MIL-STD-202, Method 208
Polarity: As marked
Mounting Position: Any
Mounting Torque: 5 in - lbs max.
Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive or inductive load, derate current by 20%.

	SYMBOLS	SBLF1030	SBLF1040	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	30	40	Volts
Maximum RMS Voltage	V _{RMS}	21	28	Volts
Maximum DC Blocking Voltage	V _{DC}	30	40	Volts
Maximum Average Forward Rectified Current	I _(AV)	10.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	250.0		Amps
Maximum Instantaneous Forward Voltage I _F =10A, (NOTE 2)	V _F	0.60		Volts
Maximum Average Reverse Current at T _C =25°C	I _R	1.0		mA
Rated DC Blocking Voltage per element T _C =100°C		50.0		mA
Typical Thermal Resistance (NOTE 1)	R _{θJC}	3.5		°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-40 to +125		°C

NOTES:

1. Thermal Resistance from Junction to Case.
2. Pulse Test: 300 μs Pulse Width, 2% Duty Factor.

RATINGS AND CHARACTERISTIC CURVES SBLF1030 AND SBLF1040

FIG. 1 - FORWARD CURRENT DERATING CURVE

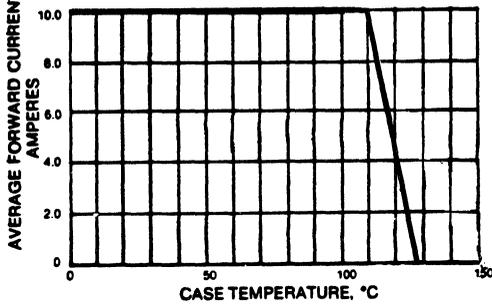


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

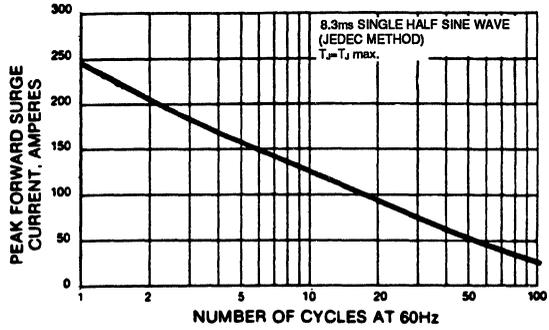


FIG. 3 - TYPICAL REVERSE CHARACTERISTICS

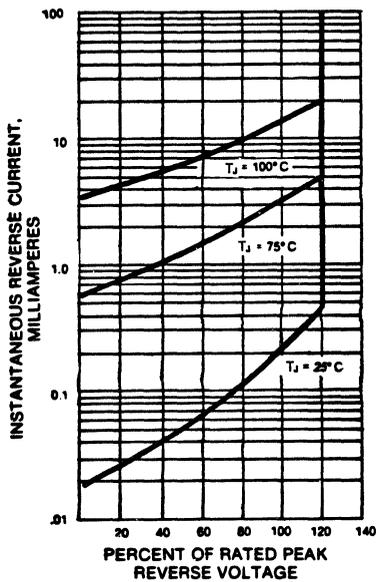


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

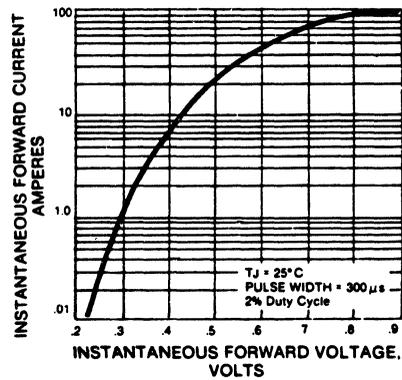
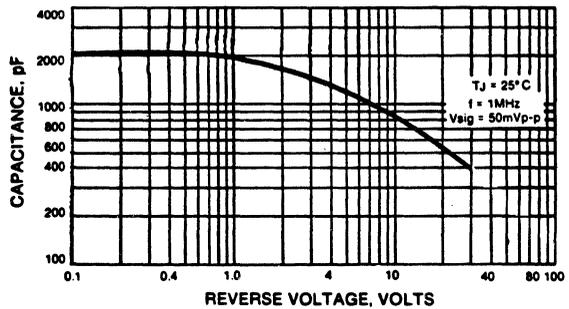


FIG. 5 - TYPICAL JUNCTION CAPACITANCE



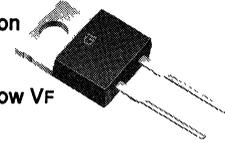
SBL1030 AND SBL1040

SCHOTTKY RECTIFIER

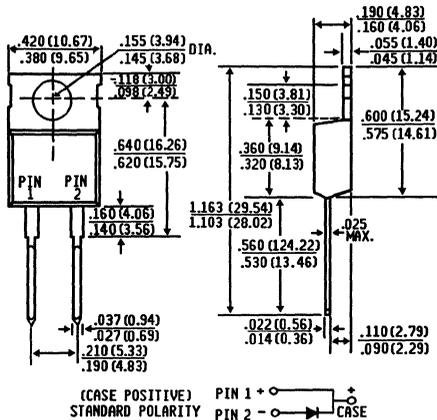
VOLTAGE RANGE - 30 and 40 Volts CURRENT - 10 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



TO-220



Dimensions in inches
(millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: .08 ounces, 2.24 gram

CROSS REFERENCE GUIDE

GI	FUJI	SHINDENGEN
SBL1040	ERC62-004	S5S4M
SBL1030	---	S5S3M

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive or inductive load, derate current by 20%.

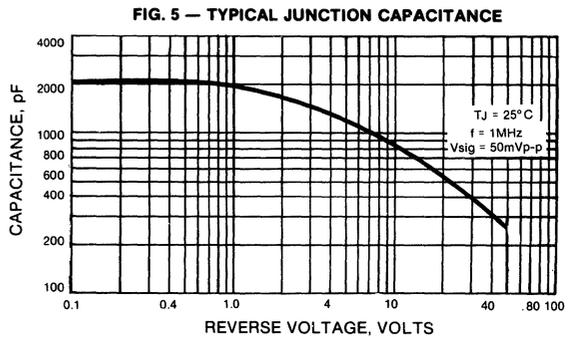
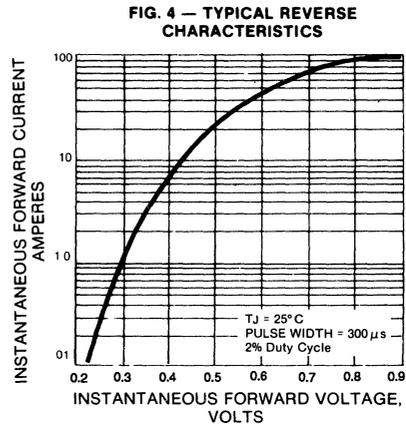
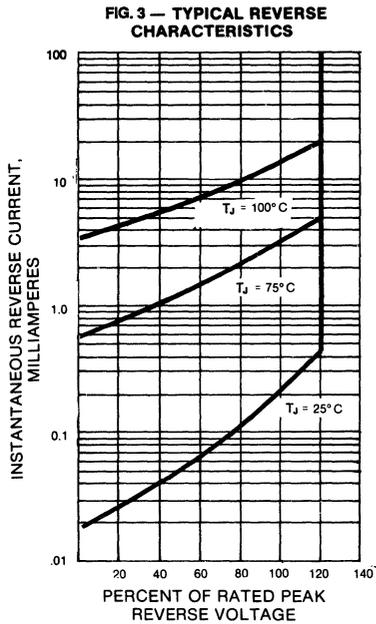
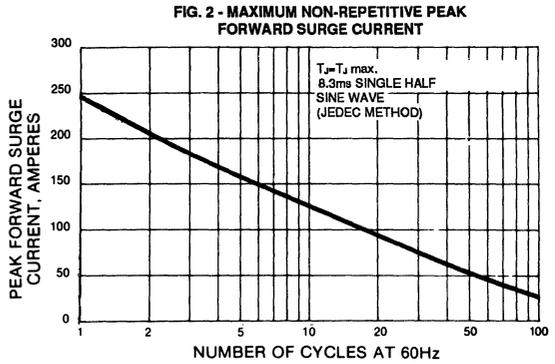
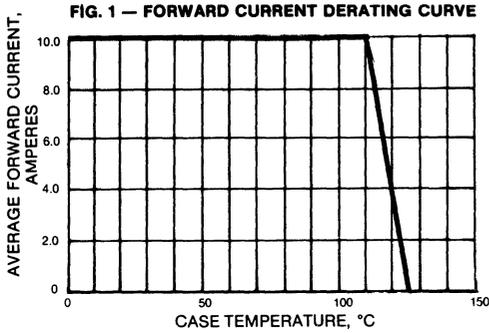
SYMBOLS	SBL1030	SBL1040	UNITS	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	30	40	Volts
Maximum RMS Voltage	V _{RMS}	21	28	Volts
Maximum DC Blocking Voltage	V _{DC}	30	40	Volts
Maximum Average Forward Rectified Current at T _C =110°C	I _(AV)	10.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	250.0		Amps
Maximum Instantaneous Forward Voltage at I _F =10A, T _C =25°C (NOTE 2)	V _F	0.60		Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage (NOTE 2)	I _R	1.0		mA
		50.0		
Typical Thermal Resistance (NOTE 1)	R _{θJC}	3.0		°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-40 to +125		°C

NOTES:

1. Thermal Resistance from Junction to Case.

2. Pulse Test: 300 μs Pulse Width, 2% Duty Cycle.

RATINGS AND CHARACTERISTIC CURVES SBL1030 AND SBL1040



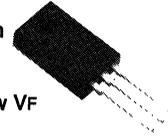
SBLF1030CT AND SBLF1040CT

SCHOTTKY RECTIFIER

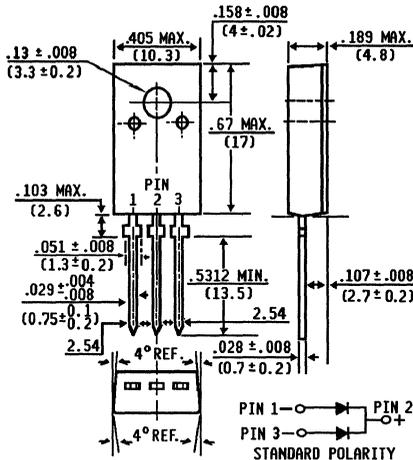
VOLTAGE RANGE - 30 and 40 Volts CURRENT - 10.0 Amperes

FEATURES

- ◆ Isolated Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Dual rectifier construction, positive center-tap
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k V_{RMS}
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25" (6.35mm) from case



ITO-220 CT



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: ITO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Mounting Torque: 5 in. - lb. max.

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive or inductive load, derate current by 20%.

	SYMBOLS	SBLF1030CT	SBLF1040CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	30	40	Volts
Maximum RMS Voltage	V_{RMS}	21	28	Volts
Maximum DC Blocking Voltage	V_{DC}	30	40	Volts
Maximum Average Forward Rectified Current at $T_C=95^\circ\text{C}$	$I_{(AV)}$	10.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	175.0		Amps
Maximum Instantaneous Forward Voltage Per Leg at $I_F = 5.0A, T_C = 25^\circ\text{C}$ (NOTE 2)	V_F	0.55		Volts
Maximum Instantaneous Reverse Current at $T_C = 25^\circ\text{C}$ Rated DC Blocking Voltage per element $T_C = 100^\circ\text{C}$	I_R	50.0	0.5	mA
Typical Thermal Resistance per element (NOTE 1)	$R_{\theta JC}$	3.5		$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-40 to +125		$^\circ\text{C}$

Notes:

1. Thermal Resistance from Junction to Case per element.
2. Pulse Test: 300 μs Pulse Width, 2% Duty Cycle.

RATINGS AND CHARACTERISTIC CURVES SBLF1030CT AND SBLF1040CT

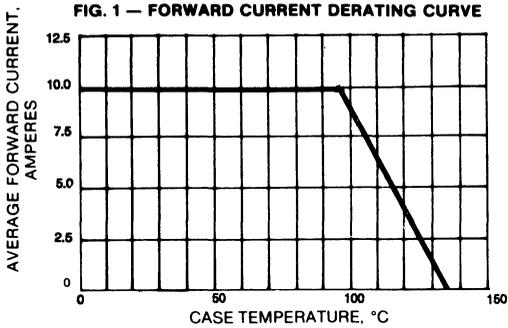


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

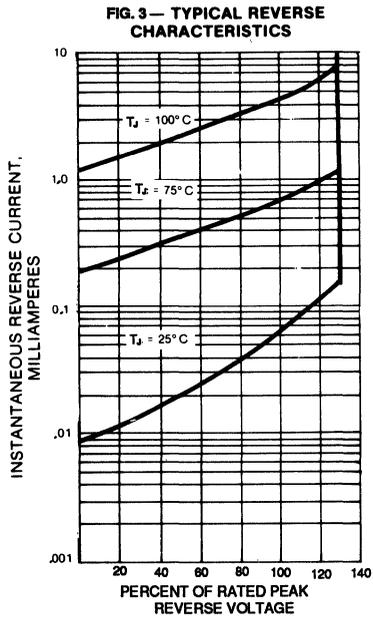
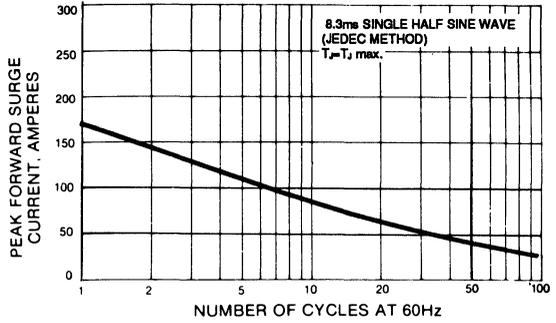


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

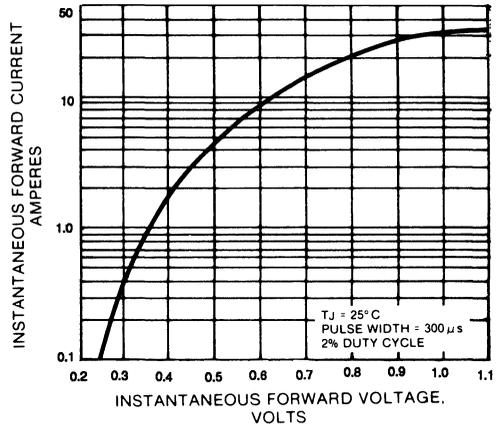
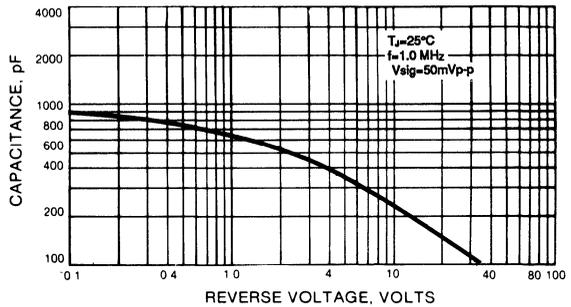


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



SBL1030CT AND SBL1040CT

SCHOTTKY RECTIFIER

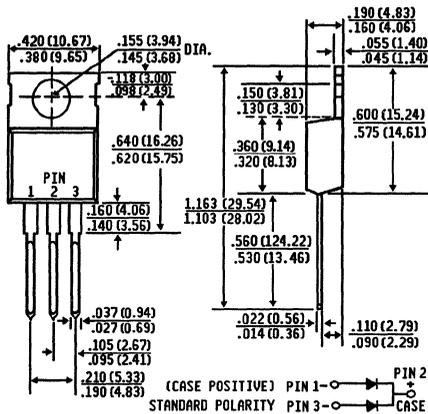
VOLTAGE RANGE - 30 and 40 Volts CURRENT - 10.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Dual rectifier construction, positive center-tap
- ◆ Guardring for transient protection
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25" (6.35mm) from case



TO-220



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic
Terminals: Solderable per MIL-STD-202, Method 208
Polarity: As marked
Mounting Position: Any
Weight: .08 ounces, 2.24 gram

CROSS REFERENCE GUIDE

	GI	FUJI	SHINDENGEN
SBL1040CT		ESAC82-004	---

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive or inductive load, derate current by 20%.

	SYMBOLS	SBL1030CT	SBL1040CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	30	40	Volts
Maximum RMS Voltage	V_{RMS}	21	28	Volts
Maximum DC Blocking Voltage	V_{DC}	30	40	Volts
Maximum Average Forward Rectified Current at $T_C=95^\circ\text{C}$	$I_{(AV)}$	10.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	175.0		Amps
Maximum Instantaneous Forward Voltage Per Leg at $I_F=5.0A, T_C=25^\circ\text{C}$ (NOTE 2)	V_F	0.55		Volts
Maximum Instantaneous Reverse Current at $T_C=25^\circ\text{C}$		0.5		
Rated DC Blocking Voltage per element $T_C=100^\circ\text{C}$	I_R	50.0		mA
Typical Thermal Resistance per element (NOTE 1)	$R_{\theta JC}$	3.0		$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_{J, TSTG}$	-40 to +125		$^\circ\text{C}$

NOTES:

1. Thermal Resistance from Junction to Case per element.
2. Pulse Test: 300μs Pulse Width, 2% Duty Cycle.

RATINGS AND CHARACTERISTIC CURVES SBL1030CT AND SBL1040CT

FIG. 1 — FORWARD CURRENT DERATING CURVE

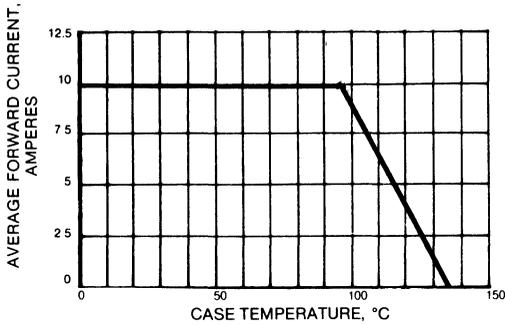


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

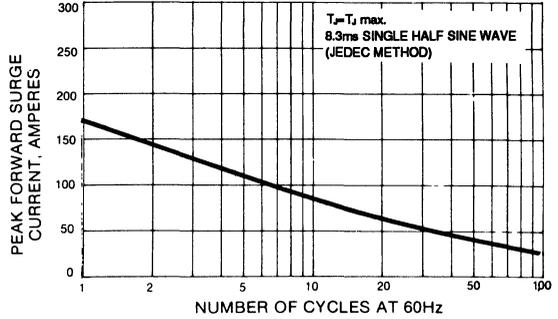


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

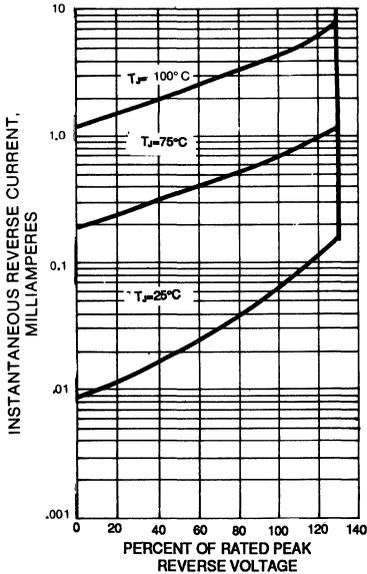


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

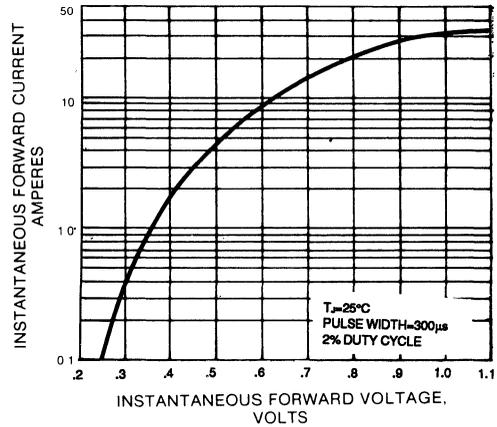
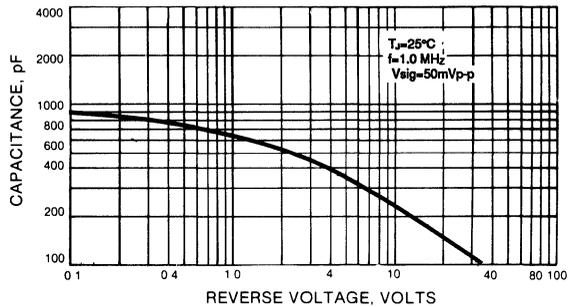


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



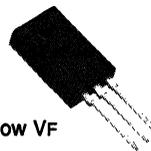
MBRF1535CT AND MBRF1545CT

SCHOTTKY RECTIFIER

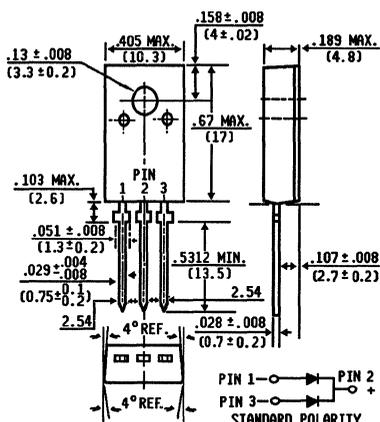
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 15.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS



ITO-220 CT



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: ITO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked **Mounting Position:** Any

Mounting Torque: 5 in. - lb. max.

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive or inductive load, derate current by 20%.

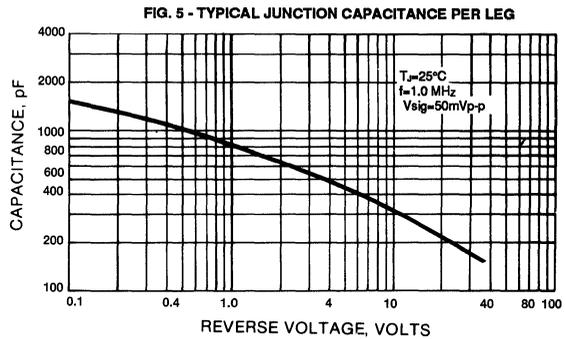
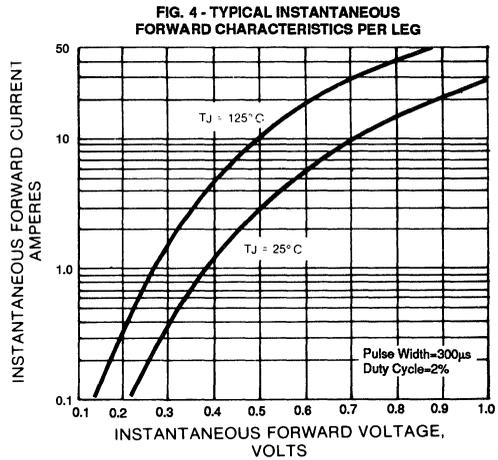
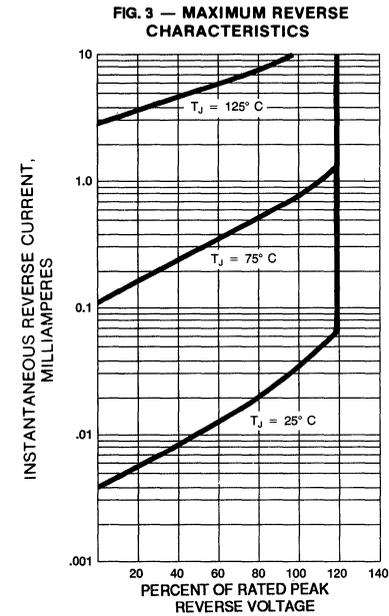
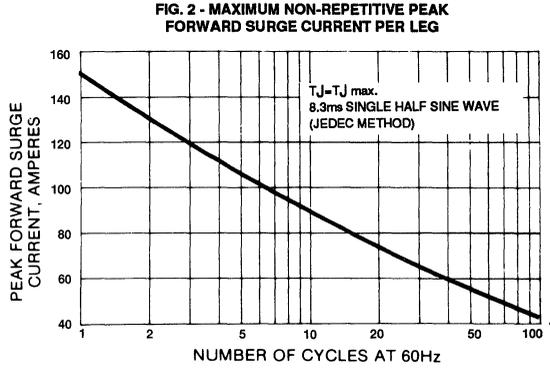
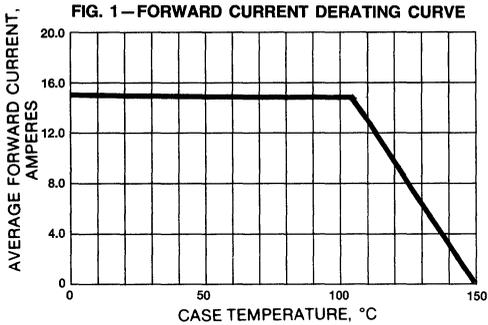
	SYMBOLS	MBRF1535CT	MBRF1545CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	35	45	Volts
Working Peak Reverse Voltage	V_{RWM}	35	45	Volts
DC Blocking Voltage	V_{DC}	35	45	Volts
Maximum Average Forward Rectified Current at $T_C=105^\circ\text{C}$	$I_{(AV)}$	15.0		Amps
Peak Repetitive Forward Current (Square Wave, 20 KHz) per leg at $T_C=105^\circ\text{C}$	I_{FRM}	15.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge (NOTE 3)	I_{RRM}	1.0		Amps
Maximum Instantaneous Forward Voltage	V_F	$I_F=7.5A, T_C=125^\circ\text{C}$	0.57	Volts
Forward Voltage		$I_F=15A, T_C=125^\circ\text{C}$	0.72	
Per Leg at (NOTE 2)		$I_F=15A, T_C=25^\circ\text{C}$	0.84	
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per element (NOTE 2)	I_R	$T_C=125^\circ\text{C}$	15.0	mA
		$T_C=25^\circ\text{C}$	0.1	
Voltage Rate of Change at (Rated V_R)	dv/dt	1000		V/ μs
Typical Thermal Resistance per element (NOTE 1)	$R_{\theta JC}$	3.5		$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES: 1. Thermal Resistance from Junction to Case per element.

2. Pulse Test: 300 μs Pulse Width, 2% Duty Cycle.

3. 2.0 μs Pulse Width, 1.0KHz

RATINGS AND CHARACTERISTIC CURVES MBRF1535CT AND MBRF1545CT



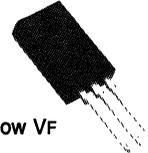
MBRF1550CT AND MBRF1560CT

SCHOTTKY RECTIFIER

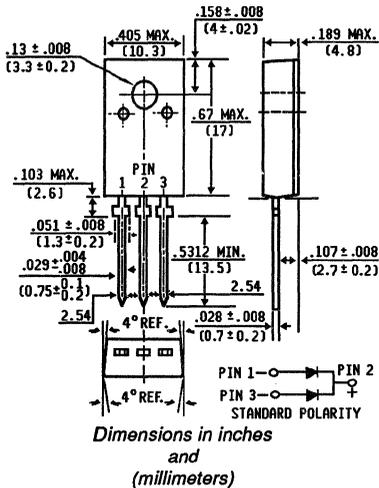
VOLTAGE RANGE - 50 and 60 Volts CURRENT - 15.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS



ITO-220 CT



MECHANICAL DATA

Case: ITO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked **Mounting Position:** Any

Mounting Torque: 5 in. - lb. max.

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive or inductive load, derate current by 20%.

	SYMBOLS	MBRF1550CT	MBRF1560CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	35	42	Volts
Maximum DC Blocking Voltage	V _{DC}	50	60	Volts
Maximum Average Forward Rectified Current at T _C =105°C	I _(AV)	15.0		Amps
Peak Repetitive Forward Current (Square Wave, 20 KHz) at T _C =105°C per leg	I _{FRM}	15.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	0.5		Amps
Maximum Instantaneous Forward Voltage Per Leg at (NOTE 2) I _F =7.5A, T _C =125°C	V _F	0.65		Volts
I _F =7.5A, T _C =25°C		0.75		
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per element (NOTE 3) T _C =125°C	I _R	50.0		mA
T _C =25°C		0.5		
Voltage Rate of Change, (Rated V _R)	dv/dt	1000		V/μs
Typical Thermal Resistance per element (NOTE 1)	R _{θJC}	3.5		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES: 1. Thermal Resistance from Junction to Case per element.

2. Pulse Test: 300μs Pulse Width, 2% Duty Cycle.

3. 2.0μs Pulse Width, 1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF1550CT AND MBRF1560CT

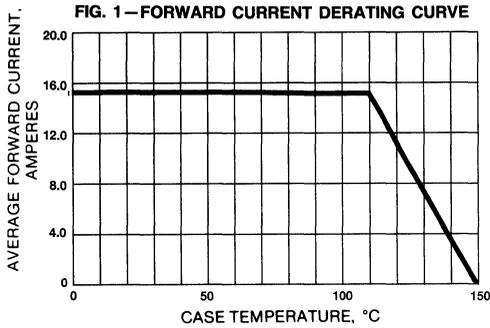


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

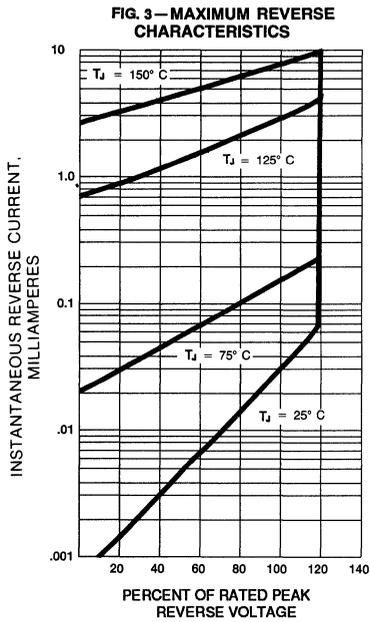
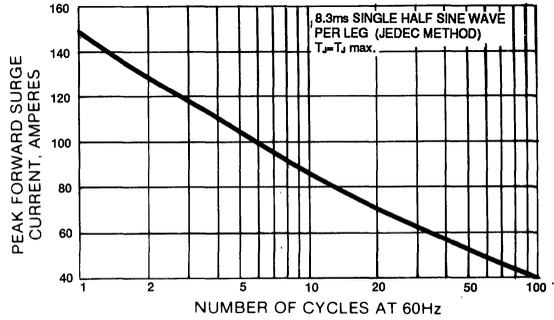


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

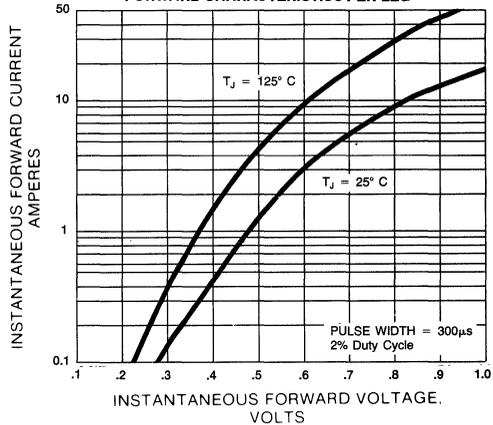
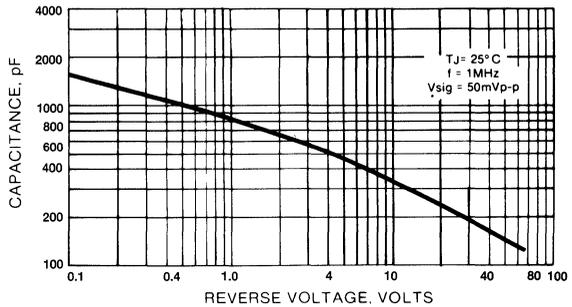


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG

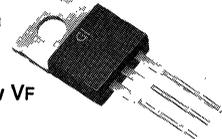


MBR1535CT AND MBR1545CT

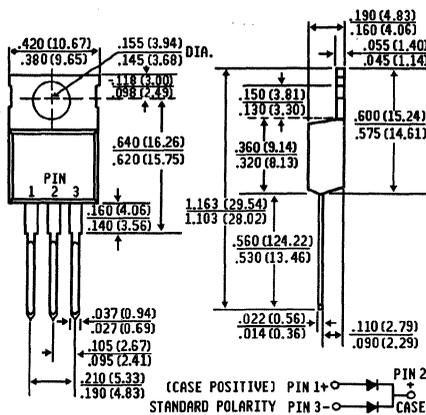
SCHOTTKY RECTIFIER
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 15.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss
- ◆ high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



TO-220 CT



MECHANICAL DATA

- Case:** JEDEC TO-220 Molded Plastic
Terminals: Leads Solderable per MIL-STD-202, Method 208
Polarity: As marked
Mounting Position: Any
Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBR1535CT	MBR1545CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	35	4.5	Volts
Maximum DC Blocking Voltage	V _{DC}	35	45	Volts
Maximum Average Forward Rectified Current at T _C = 105°C	I _(AV)	15.0		Amps
Peak Repetitive Forward Current per diode at T _C =105°C (Rated V _R , Square wave, 20KHz)	I _{FRM}	15.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	1.0		Amps
Maximum Instantaneous Forward Voltage Per Leg I _F =7.5A, T _C =125°C I _F =15A, T _C =125°C I _F =15A, T _C =25°C	V _F	0.57 0.72 0.84		Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per element T _C =125°C T _C = 25°C	I _R	15.0 0.1		mA
Voltage Rate of Change at (Rated V _R)	dv/dt	1000		V/μs
Maximum Thermal Resistance per element (NOTE 1)	RθJC	3.0		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES:

1. Thermal Resistance Junction to Case.
2. Pulse Test: 300μs, Pulse Width, 2% Duty Factor.
3. 2.0μs, Pulse Width 1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR1535CT AND MBR1545CT

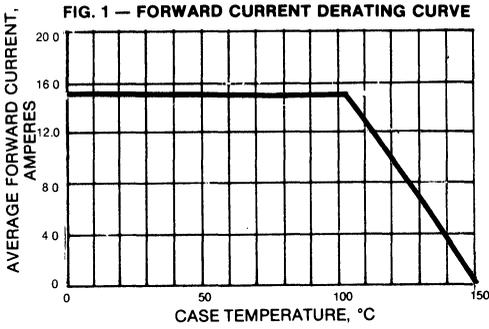


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

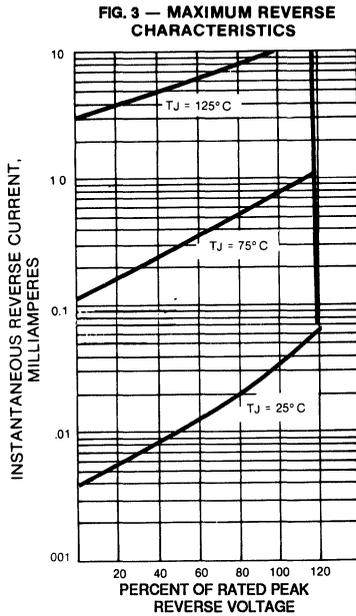
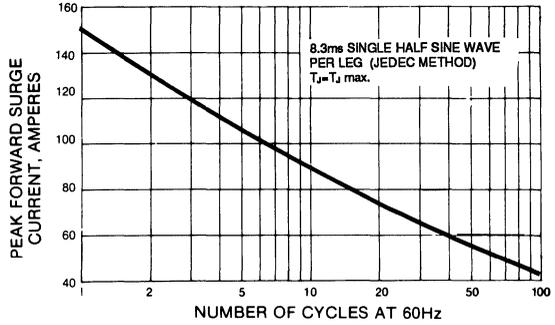


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

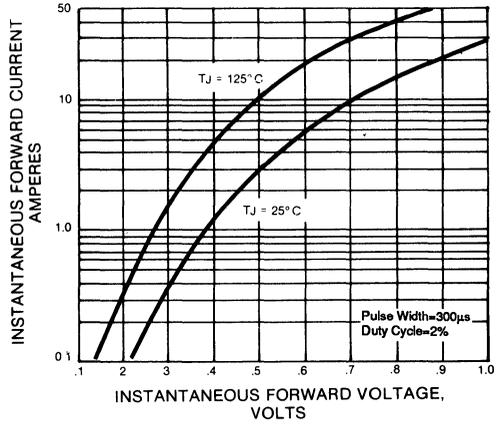
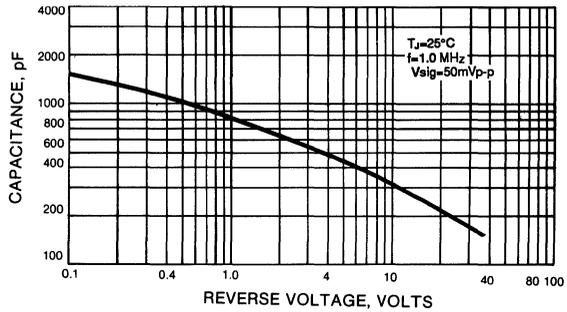


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



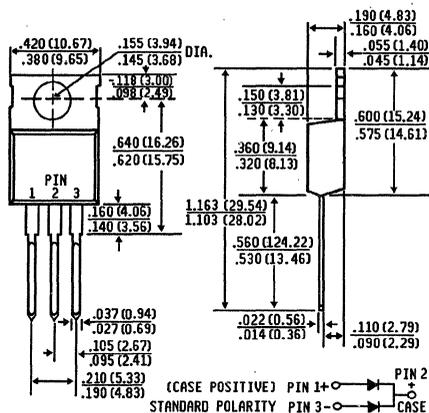
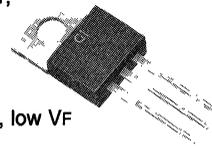
MBR1550CT AND MBR1560CT

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 50 and 60 Volts CURRENT - 15.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive or inductive load, derate current by 20%.

	SYMBOLS	MBR1550CT	MBR1560CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V_{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V_{DC}	50	60	Volts
Maximum Average Forward Rectified Current at $T_C=105^\circ\text{C}$	$I_{(AV)}$	15.0		Amps
Peak Repetitive Forward Current (Rated V_R , Sq. Wave, 20KHz) at $T_C=105^\circ\text{C}$	I_{FRM}	15.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I_{RRM}	0.5		Amps
Maximum Instantaneous Forward Voltage per leg $I_F=7.5\text{A}, T_C=25^\circ\text{C}$ (NOTE 2) $I_F=7.5\text{A}, T_C=125^\circ\text{C}$	V_F	0.75 0.65		Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per element $T_C=25^\circ\text{C}$ $T_C=125^\circ\text{C}$	I_R	1.0 50.0		mA
Voltage Rate of Change (Rated V_R)	dv/dt	1000		V/ μs
Typical Thermal Resistance per element (NOTE 1)	$R_{\theta JC}$	3.0		$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES: 1. Thermal Resistance from Junction to Case per element.
2. Pulse Test: 300 μs Pulse Width, 2% Duty Factor.
3. 2.0 μs Pulse Width, $f=1.0\text{KHz}$.

RATINGS AND CHARACTERISTIC CURVES MBR1550CT AND MBR1560CT

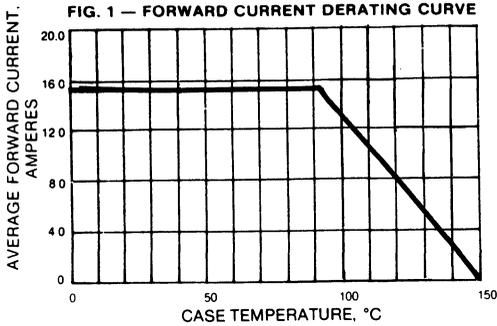


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

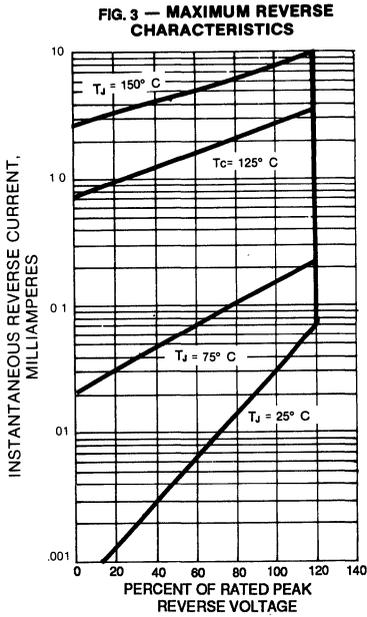
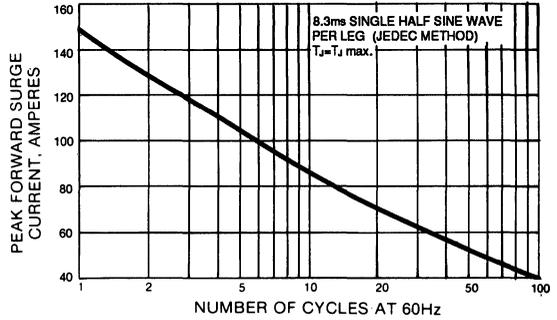


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

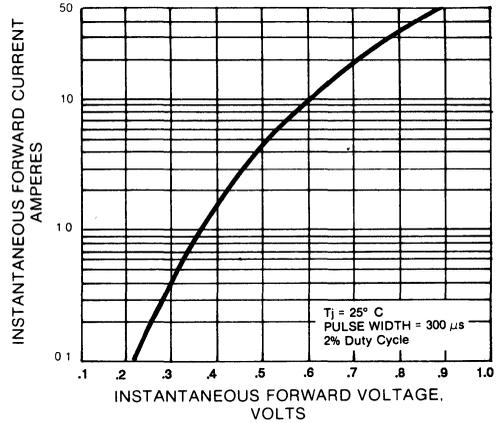
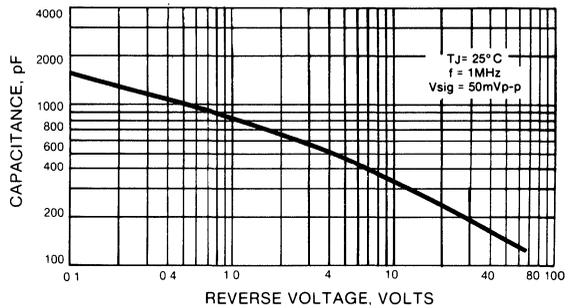


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



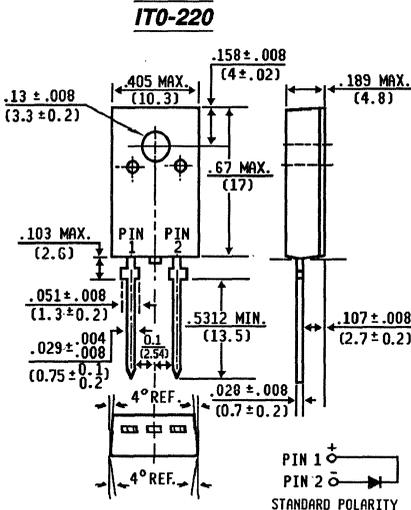
MBRF1635 AND MBRF1645

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 35 and 45 Volts CURRENT - 16.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any **Mounting Torque:** 5 in. -lbs. max.

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

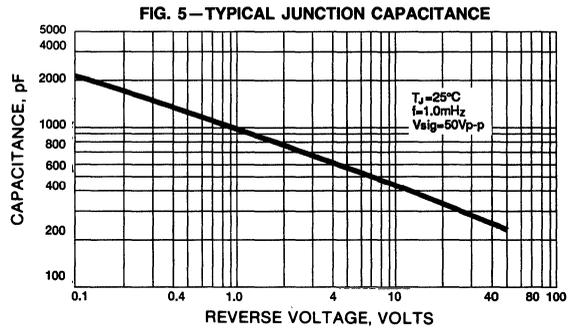
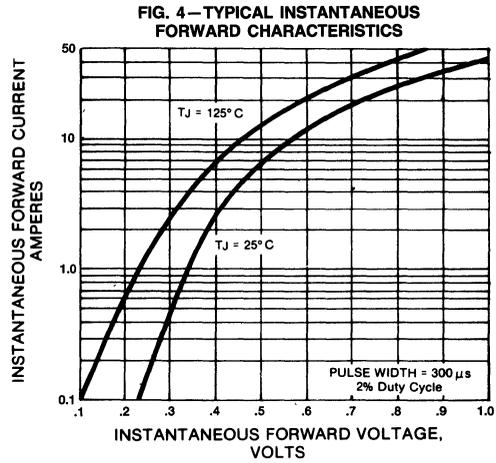
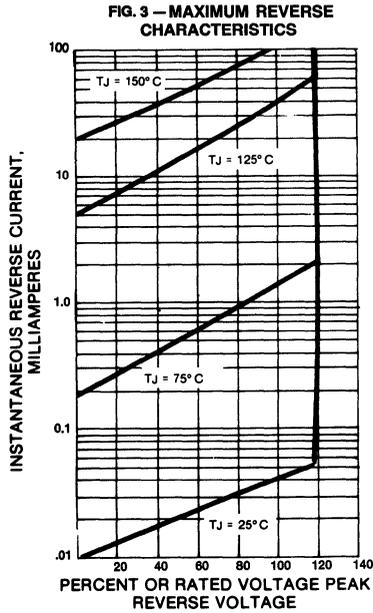
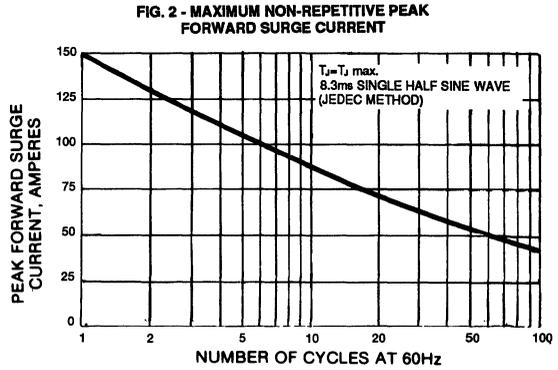
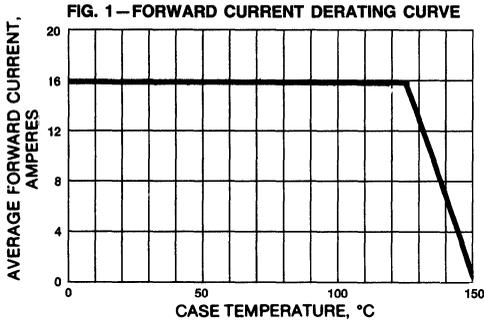
Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	MBRF1635	MBRF1645	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V_{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V_{DC}	35	45	Volts
Maximum Average Forward Rectified Current at $T_C = 125^\circ\text{C}$	$I_{(AV)}$	16.0		Amps
Peak Repetitive Forward Current, (Square Wave, 20 KHz) at $T_C = 125^\circ\text{C}$	I_{FSM}	32.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 2)	I_{RSM}	1.0		Amps
Voltage Rate of Change at (Rated V_R)	dv/dt	1000		V/ μs
Maximum Instantaneous Forward Voltage at (NOTE 1) $I_F = 16\text{A}, T_C = 125^\circ\text{C}$ $I_F = 16\text{A}, T_C = 25^\circ\text{C}$	V_F	0.57	0.63	Volts Volts
Maximum Instantaneous Reverse Current at Peak Reverse Voltage (NOTE 1) $T_C = 125^\circ\text{C}$ $T_C = 25^\circ\text{C}$	I_R	40.0	0.2	mA
Typical Thermal Resistance, Junction to Case	RQJC	2.0		°C/W
Operating Junction Temperature Range	T_J	-65 to +150		°C
Storage Temperature Range	T_{STG}	-65 to +175		°C

NOTES:

1. Pulse Test: 300 μs Pulse Width, 2%Duty Cycle.
2. 2.0 μs Pulse Width, 1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF1635 AND MBRF1645



MBRF1650 AND MBRF1660

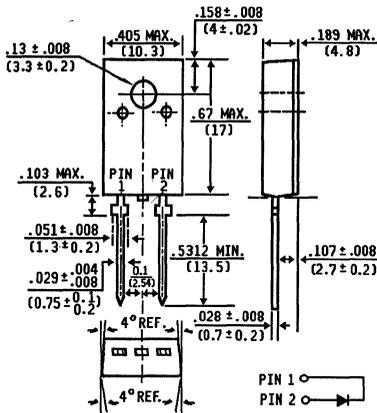
SCHOTTKY RECTIFIER

VOLTAGE RANGE - 50 and 60 Volts CURRENT - 16.0 Amperes

FEATURES

- ◆ Isolated Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k V_{RMS}

ITO-220



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any Mounting Torque: 5 in. - lbs. max.

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	MBRF1650	MBRF1660	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V _{DC}	50	60	Volts
Maximum Average Forward Rectified Current at T _C =125°C	I _(AV)	16.0		Amps
Peak Repetitive Forward Current, (Square Wave, 20 KHz) at T _C = 125°C	I _{FRM}	32.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150		Amps
Peak Repetitive Reverse Surge Current (NOTE 2)	I _{RSM}	0.5		Amps
Voltage Rate of Change at (Rated V _R)	dv/dt	1000		V/μs
Maximum Instantaneous Forward Voltage at (NOTE 1)	V _F	I _F =16A, T _C =125°C	0.62	Volts
		I _F =16A, T _C = 25°C	0.75	Volts
Maximum Instantaneous Reverse Current at Peak Reverse Voltage (NOTE 1)	I _R	T _C =125°C	50.0	mA
		T _C =25°C	1.0	
Typical Thermal Resistance, Junction to Case	R _{ΘJC}	2.0		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES:

1. Pulse Test: 300μs Pulse Width, 2% Duty Cycle.
2. 2.0μs Pulse Width, 1.0 KHz

RATINGS AND CHARACTERISTIC CURVES MBRF1650 AND MBRF1660

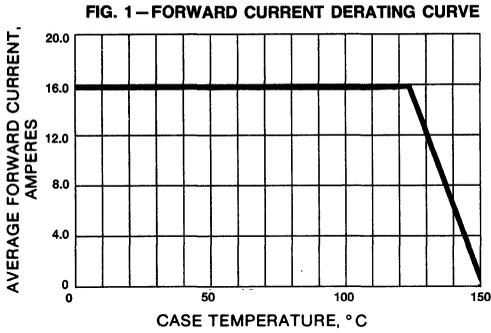


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

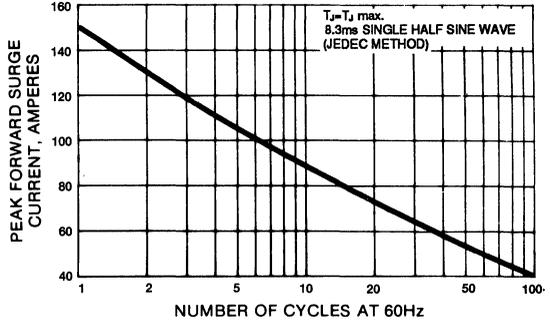


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

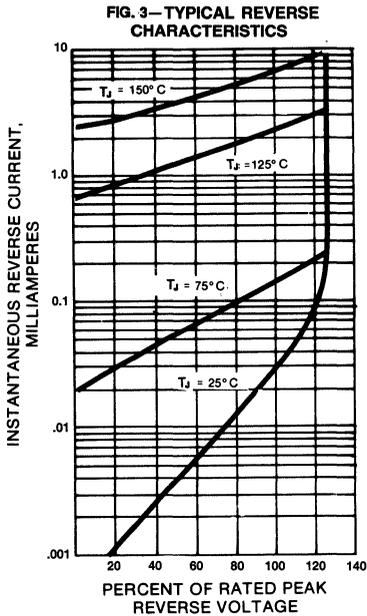
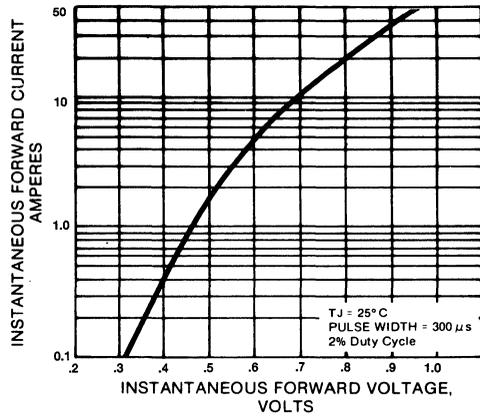
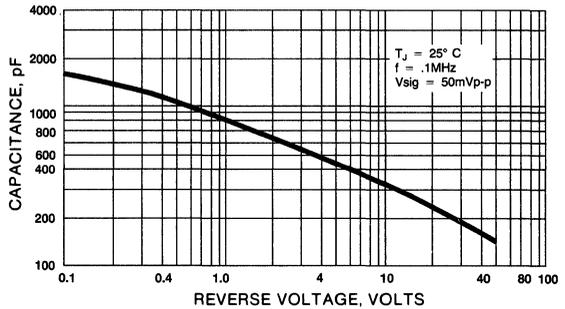


FIG. 5 - TYPICAL JUNCTION CAPACITANCE



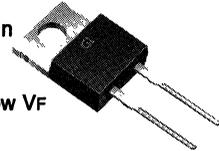
MBR1635 AND MBR1645

SCHOTTKY RECTIFIER

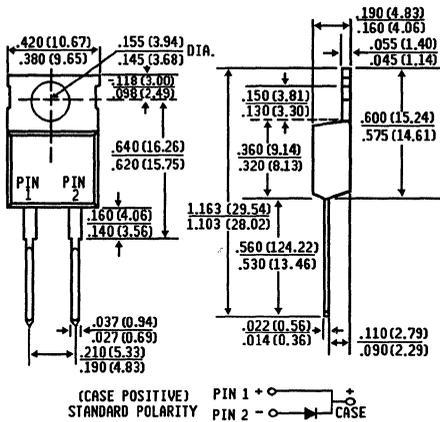
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 16.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



TO-220



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	MBR1635	MBR1645	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V_{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V_{DC}	35	45	Volts
Maximum Average Forward Rectified Current at $T_C=125^\circ\text{C}$	$I_{(AV)}$	16.0		Amps
Peak Repetitive Forward Current, (Rated V_R , Sq. Wave 20 KHz) at $T_C=125^\circ\text{C}$	I_{FRM}	32.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 2)	I_{RRM}	1.0		Amps
Voltage Rate of Change, (rated V_R)	dv/dt	1000		V/ μs
Maximum Instantaneous Forward Voltage (NOTE 1) $I_F=16\text{A}, T_C=25^\circ\text{C}$ $I_F=16\text{A}, T_C=125^\circ\text{C}$	V_F	0.63	0.57	Volts
Maximum Instantaneous Reverse Current at Peak Reverse Voltage $T_C=25^\circ\text{C}$ (NOTE 1) $T_C=125^\circ\text{C}$	I_R	0.2	40.0	mA
Maximum Thermal Resistance (NOTE 3)	$R_{\theta JC}$	1.5		$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES:

1. Pulse Test Pulse Width 300 μs , Duty Cycle 2%.
2. 2.0 μs Pulse Width, 1.0 KHz.
3. Thermal Resistance from Junction to Case.

RATINGS AND CHARACTERISTIC CURVES MBR1635 AND MBR1645

FIG. 1 — FORWARD CURRENT DERATING CURVE

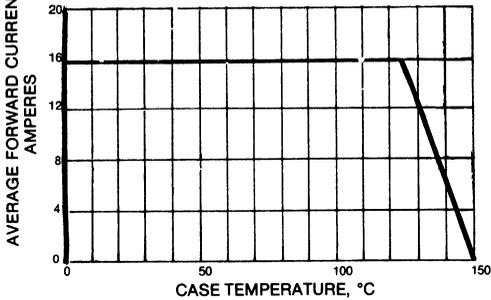


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

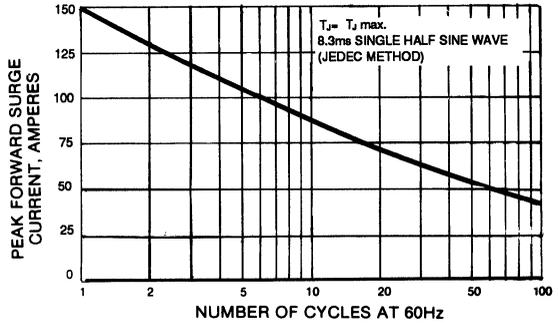


FIG. 3 — MAXIMUM REVERSE CHARACTERISTICS

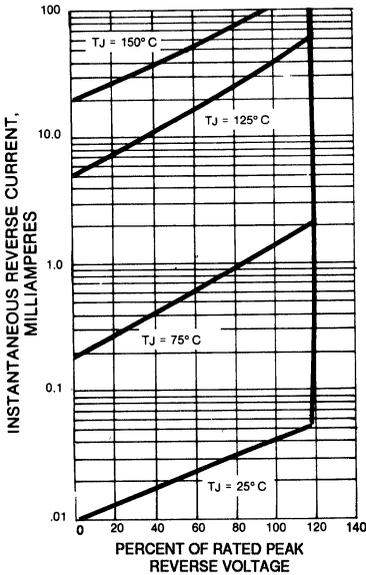


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

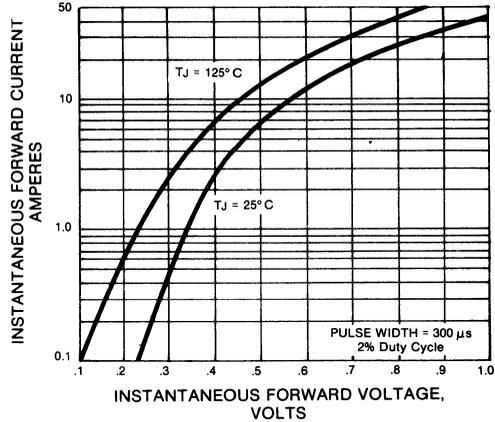
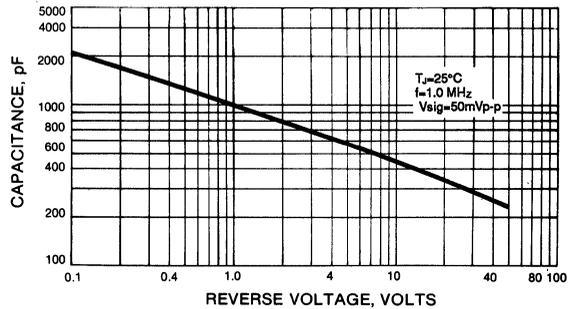


FIG. 5 — TYPICAL JUNCTION CAPACITANCE



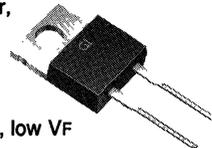
MBR1650 AND MBR1660

SCHOTTKY RECTIFIER

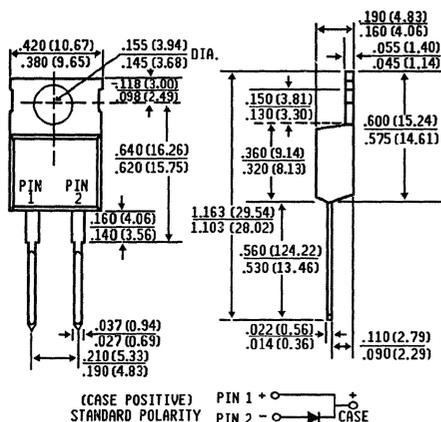
VOLTAGE RANGE - 50 and 60 Volts CURRENT - 16.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



TO-220



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive or inductive load, derate current by 20%.

	SYMBOLS	MBR1650	MBR1660	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V _{DC}	50	60	Volts
Maximum Average Forward Rectified Current at T _C =125°C	I _(AV)	16.0		Amps
Peak Repetitive Forward Current (Rated V _R , Sq. Wave, 20 KHz) at T _C =125°C	I _{FRM}	32.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	0.5		Amps
Maximum Instantaneous Forward Voltage Per Leg I _F =16A, T _C = 25°C I _F =16A, T _C =125°C (NOTE 2)	V _F	0.75 0.65		Volts
Maximum Instantaneous Reverse Current at T _C = 25°C	I _R	1.0		mA
Rated DC Blocking Voltage T _C =125°C	I _R	50.0		mA
Voltage Rate of Change (Rated V _R)	dv/dt	1000		V/μs
Maximum Typical Thermal Resistance (NOTE 1)	R _{θJC}	3.0		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +150		°C

NOTES:

1. Thermal Resistance from Junction to Case.
2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.
3. 2.0μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR1650 AND MBR1660

FIG. 1 — FORWARD CURRENT DERATING CURVE

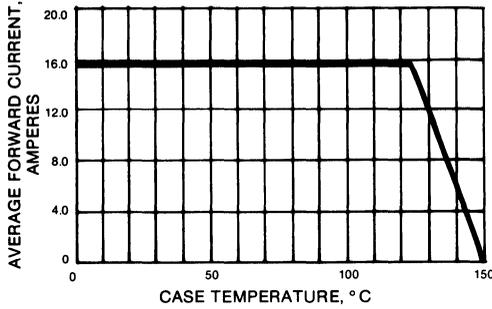


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

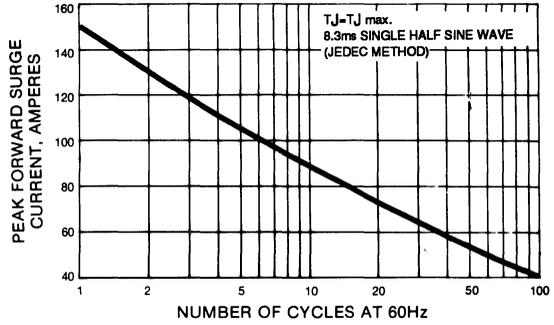


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

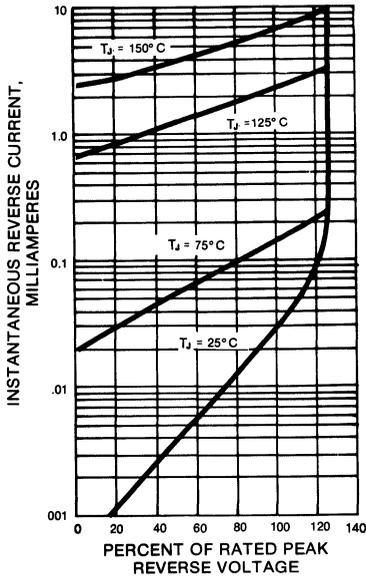


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

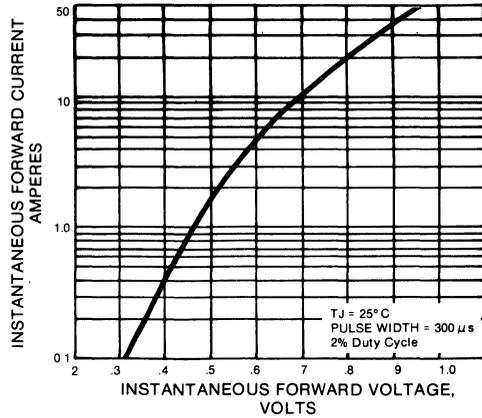
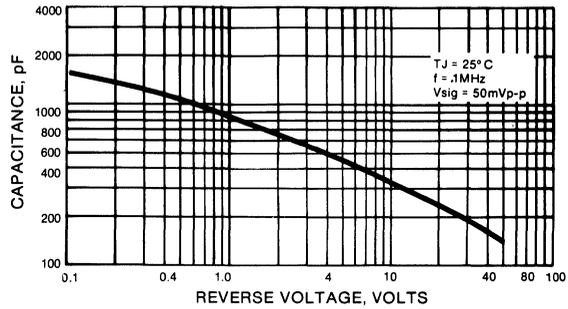


FIG. 5 — TYPICAL JUNCTION CAPACITANCE



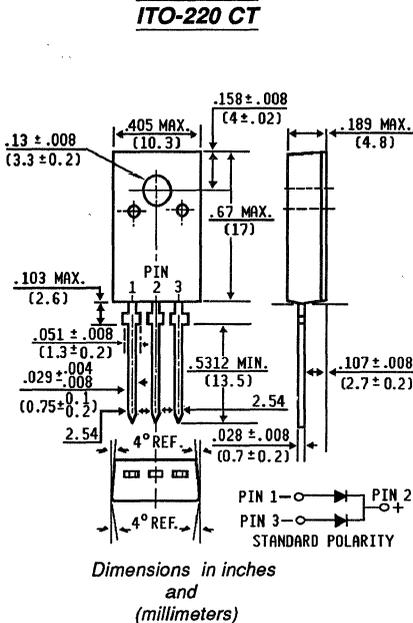
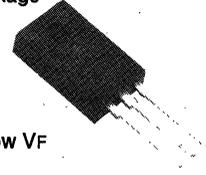
SBLF1630CT AND SBLF1640CT

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 30 and 40 Volts CURRENT - 16.0 Amperes

FEATURES

- ◆ Isolated Plastic Package has Underwriters Flammability Classification 94V-O
- ◆ Isolated overmolded package
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5K VRMS



MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Mounting Torque: 5 in. - lbs. max.

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

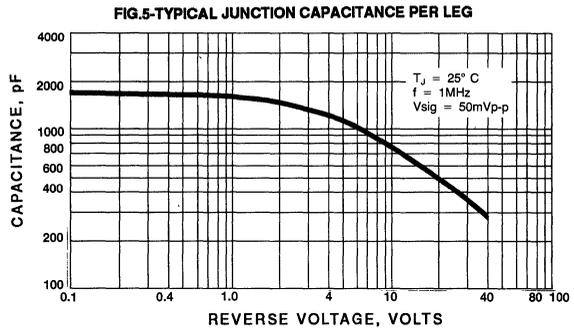
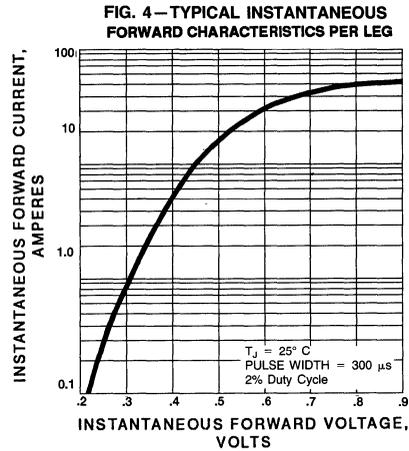
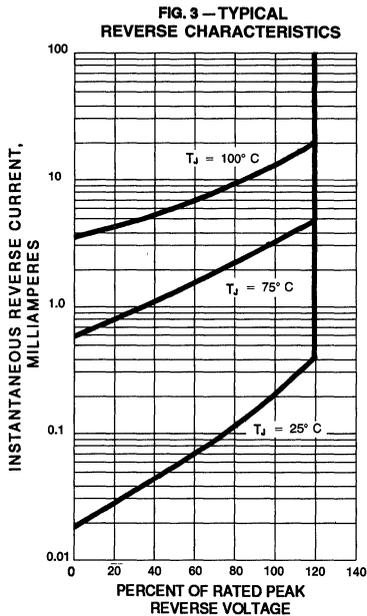
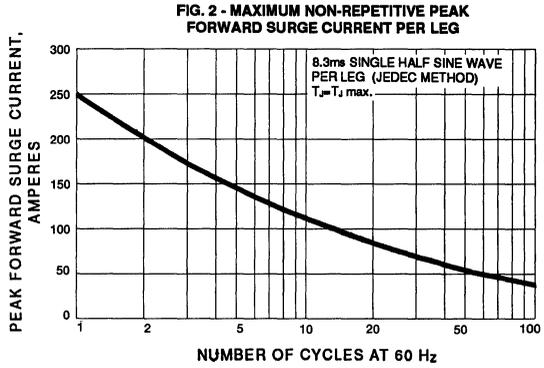
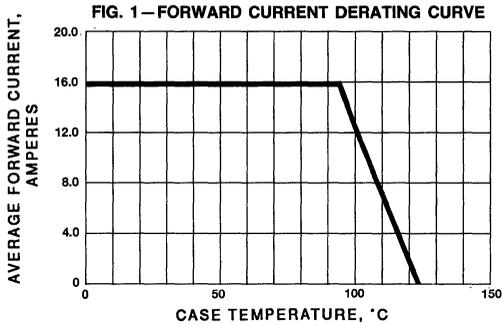
Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive or inductive load, derate current by 20%.

	SYMBOLS	SBLF1630CT	SBLF1640CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	30	40	Volts
Maximum RMS Voltage	V_{RMS}	21	28	Volts
Maximum DC Blocking Voltage	V_{DC}	30	40	Volts
Maximum Average Forward Rectified Current at $T_C = 95^\circ\text{C}$	$I_{(AV)}$	16.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	250.0		Amps
Maximum Instantaneous Forward Voltage per leg $I_F = 8.0\text{A}$ (NOTE 2)	V_F	0.55		Volts
Maximum Instantaneous Reverse Current at $T_C = 25^\circ\text{C}$		0.5		
Rated DC Blocking Voltage per element $T_C = 100^\circ\text{C}$	I_R	50.0		mA
Typical Thermal Resistance (NOTE 1)	$R_{\theta JC}$	2.2		$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-40 to +125		$^\circ\text{C}$

NOTES:

1. Thermal Resistance from Junction to Case per element.
2. Pulse Test: 300 μs Pulse Width, 2% Duty Factor.

RATINGS AND CHARACTERISTIC CURVES SBLF1630CT AND SBLF1640CT



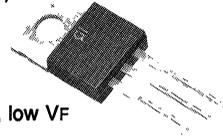
SBL1630CT AND SBL1640CT

SCHOTTKY RECTIFIER

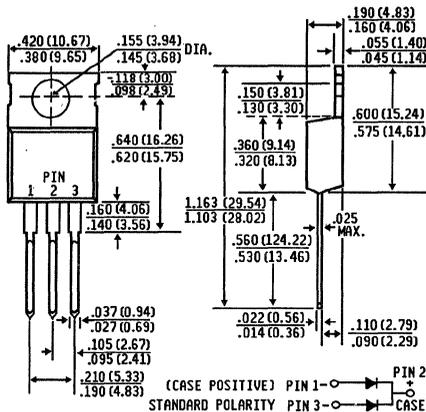
VOLTAGE RANGE - 30 and 40 Volts CURRENT - 16.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



TO-220 CT



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic
Terminals: Leads Solderable per MIL-STD-202, Method 208
Polarity: As marked
Mounting Position: Any
Weight: .08 ounces, 2.24 gram

CROSS REFERENCE GUIDE

GI	FUJI	SHINDENGEN
SBL1640CT	ESAD82-004	---

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive or inductive load, derate current by 20%.

	SYMBOLS	SBL1630CT	SBL1640CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	30	40	Volts
Maximum RMS Voltage	V _{RMS}	21	28	Volts
Maximum DC Blocking Voltage	V _{DC}	30	40	Volts
Maximum Average Forward Rectified Current at T _C = 95°C	I <sub(av)< sub=""></sub(av)<>	16.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	250.0		Amps
Maximum Instantaneous Forward Voltage per leg I _F =8.0A (NOTE 2)	V _F	0.55		Volts
Maximum Instantaneous Reverse Current at T _C = 25°C	I _R	0.5		mA
Rated DC Blocking Voltage per element T _C =100°C	I _R	50.0		mA
Typical Thermal Resistance per element (NOTE 1)	R _{θJC}	3.0		°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-40 to +125		°C

NOTES:

1. Thermal Resistance from Junction to Case per element.
2. Pulse Test: 300µs Pulse Width, 2% Duty Factor.

RATINGS AND CHARACTERISTIC CURVES SBL1630CT AND SBL1640CT

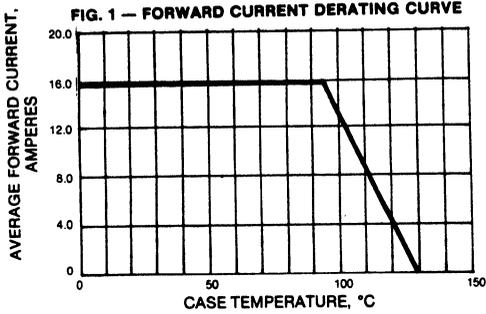


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

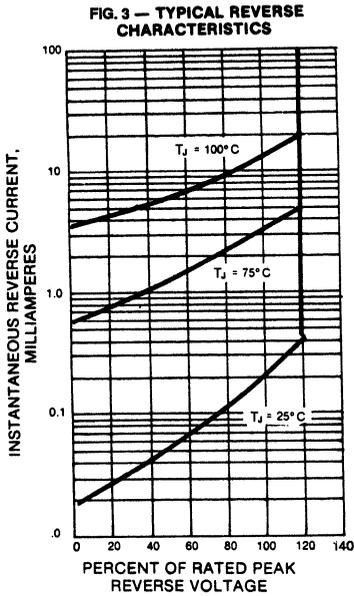
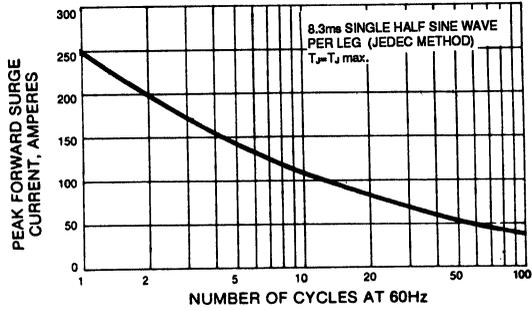


Fig. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

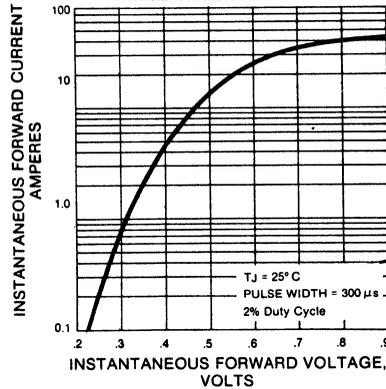
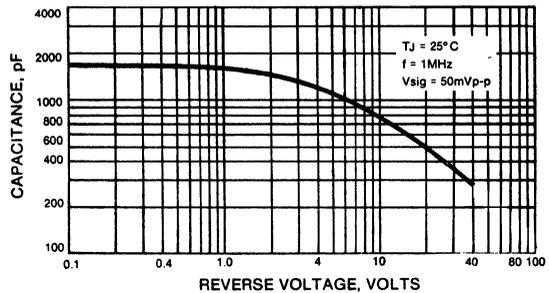


FIG. 5-TYPICAL JUNCTION CAPACITANCE PER LEG



MBRF2035CT AND MBRF2045CT

SCHOTTKY RECTIFIER

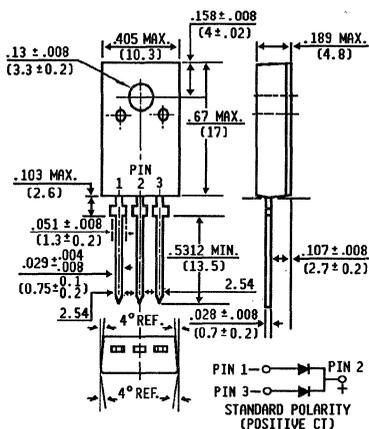
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 20.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classification 94 V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ Guardring for transient protection
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Internal Insulation: 1.5k VRMS



ITO-220 CT



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic
Terminals: Leads Solderable per MIL-STD-202, Method 208
Polarity: As marked **Mounting Position:** Any
Mounting Torque: 5 in. - lbs. max.
Weight: .08 ounces, 2.24 gram

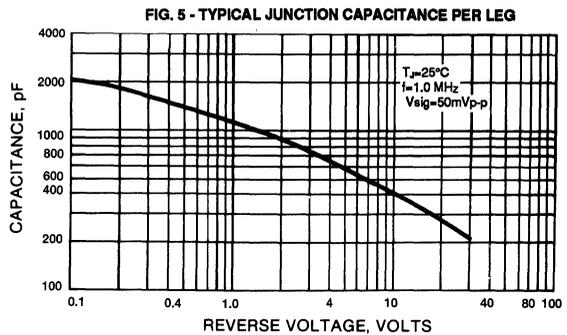
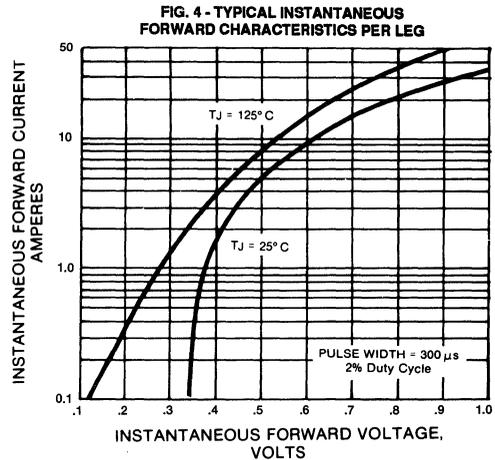
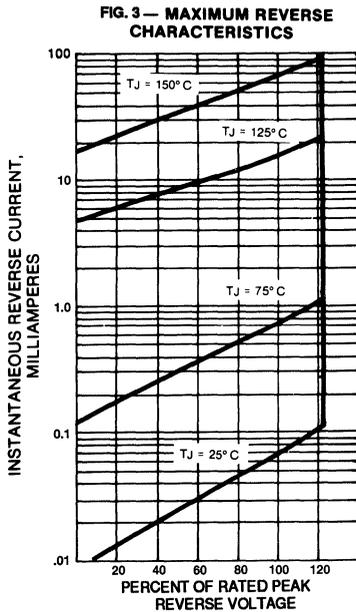
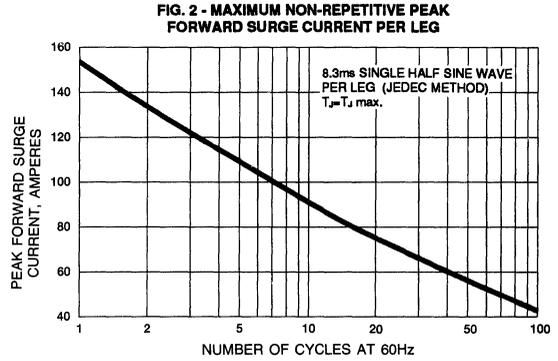
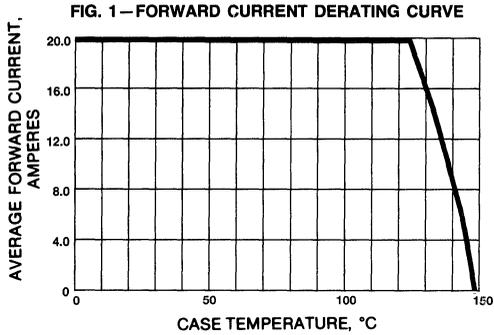
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBRF2035CT	MBRF2045CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	35	45	Volts
Working Peak Reverse Voltage	V _{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V _{DC}	35	45	Volts
Maximum Average Forward Rectified Current at T _C =135°C	I _(AV)	20.0		Amps
Peak Repetitive Forward Current per diode leg (Rated V _R , Sq. wave, 2.0KHz) at T _C =135°C	I _{FRM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	1.0		Amps
Maximum Instantaneous Forward Voltage Per Leg (NOTE 2)	V _F		0.57 0.84 0.72	Volts
			I _F = 10A, T _C = 125°C I _F = 20A, T _C =25°C I _F = 20A, T _C =125°C	
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per element	I _R		0.1 25.0	mA
			T _C = 25°C T _C = 125°C	
Voltage Rate of Change (Rated V _R)	dv/dt	1000		V/μs
Typical Thermal Resistance per element (NOTE 1)	R _{θJC}	2.2		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES: 1. Thermal Resistance from Junction to Case per element.
 2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.
 3. 2.0μs Pulse Width, f= 1 KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF2035CT AND MBRF2045CT



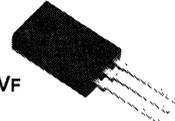
MBRF2050CT AND MBRF2060CT

SCHOTTKY RECTIFIER

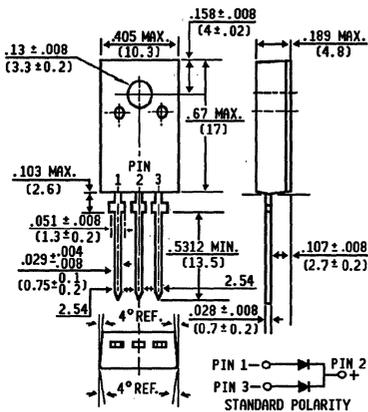
VOLTAGE RANGE - 50 and 60 Volts CURRENT - 20.0 Amperes

FEATURES

- ◆ Isolated Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_f
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRms



ITO-220 CT



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic
Terminals: Leads Solderable per MIL-STD- 202, Method 208
Polarity: As marked
Mounting Position: Any **Mounting Torque:** 5 in. - lbs. max.
Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	MBRF2050CT	MBRF2060CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V_{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V_{DC}	50	60	Volts
Maximum Average Forward Rectified Current at $T_C=133^\circ\text{C}$	$I_{(AV)}$	20.0		Amps
Peak Repetitive Forward Current per leg (Rated V_R , Sq. wave, 2.0 KHz) at $T_C=133^\circ\text{C}$	I_{FRM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I_{RRM}	1.0		Amps
Maximum Instantaneous Forward Voltage	V_F	$I_F=10\text{A}, T_C=25^\circ\text{C}$	0.80	Volts
per leg (NOTE 2)		$I_F=10\text{A}, T_C=125^\circ\text{C}$	0.70	
		$I_F=20\text{A}, T_C=25^\circ\text{C}$	0.95	
		$I_F=20\text{A}, T_C=125^\circ\text{C}$	0.85	
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per element	I_R	$T_C=25^\circ\text{C}$	0.15	mA
		$T_C=125^\circ\text{C}$	150.0	
Voltage Rate of Change (Rated V_R)	dv/dt	1000		V/ μs
Typical Thermal Resistance per element (NOTE 1)	$R_{\theta JC}$	2.2		$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES: 1. Thermal Resistance from Junction to Case per element.

2. Pulse Test: 300 μs Pulse Width, 2% Duty Factor.

3. 2.0 μs Pulse Width, $f=1\text{ KHz}$.

RATINGS AND CHARACTERISTIC CURVES MBRF2050CT AND MBRF2060CT

FIG. 1 — FORWARD CURRENT DERATING CURVE

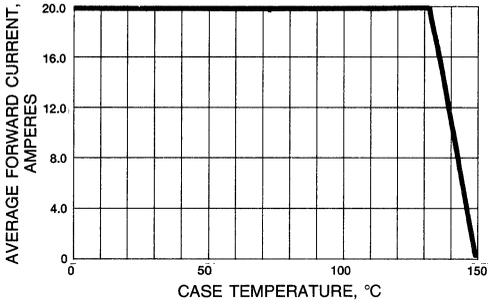


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

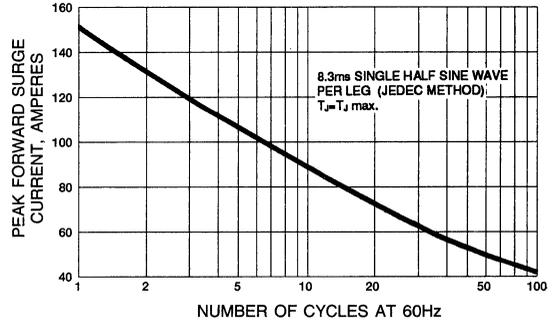


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

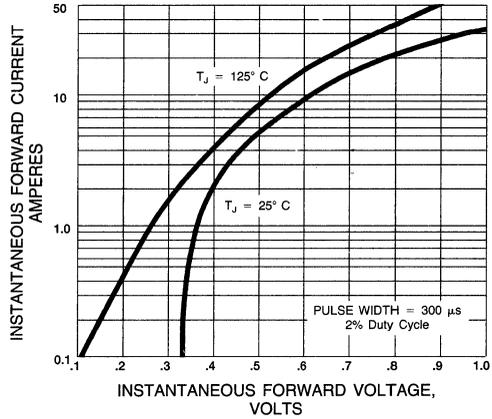


FIG. 3 — MAXIMUM REVERSE CHARACTERISTICS

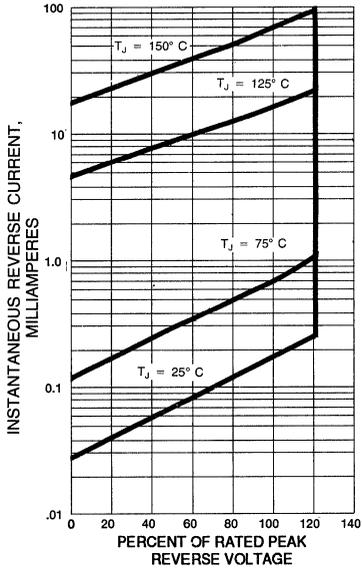
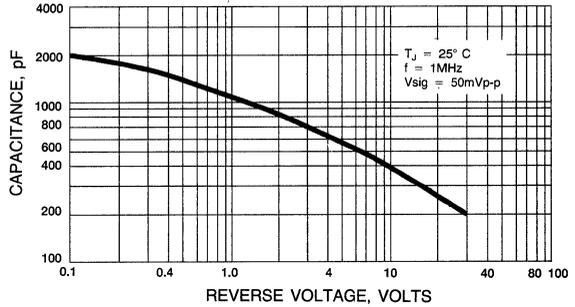


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



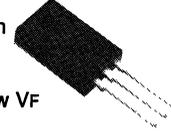
MBRF2090CT AND MBRF20100CT

SCHOTTKY RECTIFIER

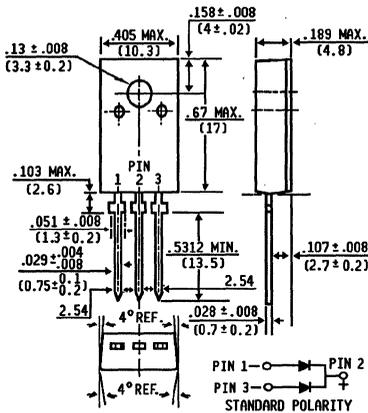
VOLTAGE RANGE -90 and 100 Volts CURRENT - 20.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low Vf
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25" (6.35mm)



ITO-220 CT



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked **Mounting Position:** Any

Mounting Torque: 5 in. - lbs. max.

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
For capacitive load, derate current by 20%

	SYMBOLS	MBRF2090CT	MBRF20100CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	90	100	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	90	100	Volts
Maximum DC Blocking Voltage	V _{DC}	90	100	Volts
Maximum Average Forward Rectified Current at T _C = 133°C	I _(AV)	20.0		Amps
Peak Repetitive Forward Current, per leg (Square Wave 20 KHz) at T _C =133°C	I _{FSM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RSM}	0.5		Amps
Voltage Rate of Change, (rated V _R)	dv/dt	1000		V/μs
Maximum Instantaneous Forward Voltage per leg (NOTE 2)	V _F	0.80 0.70 0.95 0.85		Volts
Maximum Instantaneous Reverse Current at Rated DC BLocking Voltage (NOTE 2)	I _R	0.15 150.0		mA
Typical Thermal Resistance per element (NOTE 1)	R _{θJC}	2.2		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES:

1. Thermal Resistance from Junction to Case per element.
2. Pulse Test: Pulse Width 300 μs, Duty Cycle 2%.
3. 2.0 μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF2090CT AND MBRF20100CT

FIG. 1 – FORWARD CURRENT DERATING CURVE

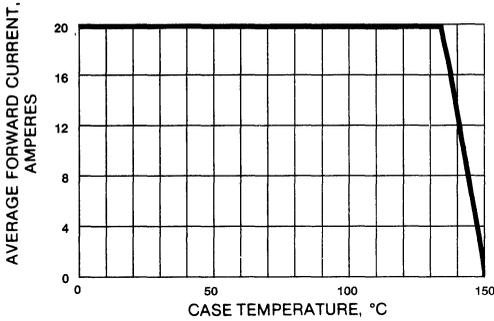


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

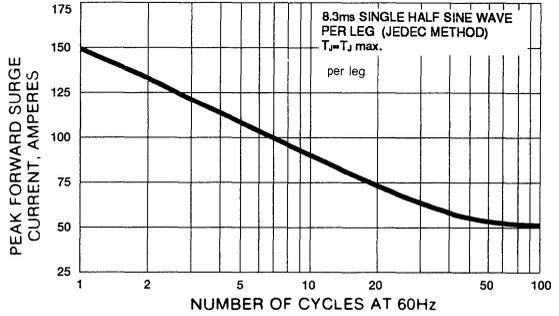


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

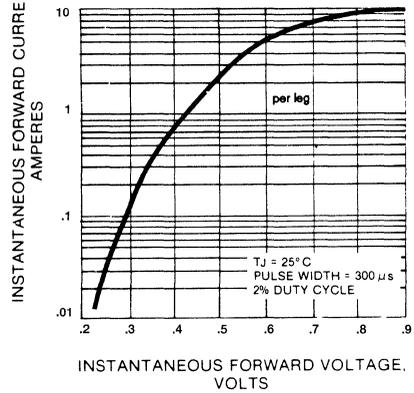


FIG. 3 – TYPICAL REVERSE CHARACTERISTICS

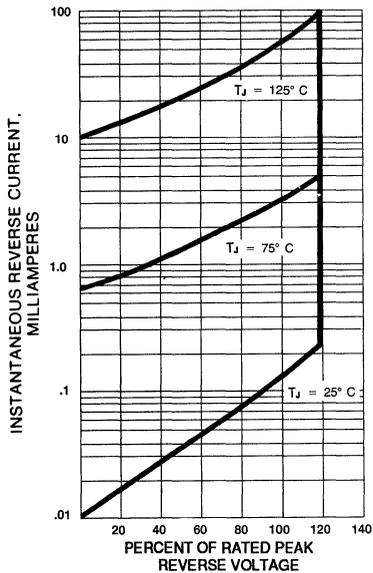
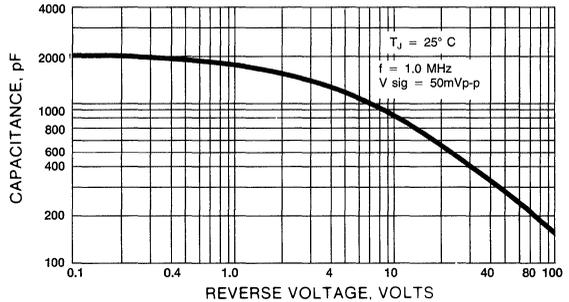


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



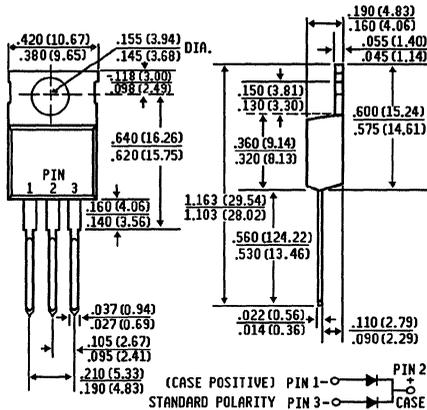
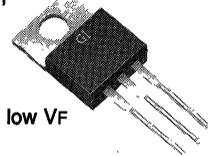
MBR2035CT AND MBR2045CT

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 35 and 45 Volts CURRENT - 20.0 Amperes

FEATURES

- ◆ Plastic Package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_f
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ Guardring for transient protection
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked **Mounting Position:** Any

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	MBR2035CT	MBR2045CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V_{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V_{DC}	35	45	Volts
Maximum Average Forward Rectified Current at $T_C=135^\circ\text{C}$	$I_{(AV)}$	20.0		Amps
Peak Repetitive Forward Current per leg (Rated V_R , Sq. wave 2.0 KHz) at $T_C=135^\circ\text{C}$	I_{FRM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I_{RRM}	1.0		Amps
Maximum Instantaneous Forward Voltage per leg (NOTE 2)	V_F	0.57		Volts
Forward Voltage per leg		0.84		
		0.72		
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per element	I_R	0.1		mA
		15.0		
Voltage Rate of Change (Rated V_R)	dv/dt	1000		V/ μs
Typical Thermal Resistance per element (NOTE 1)	$R_{\theta JC}$	2.0		$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES:

1. Thermal Resistance from Junction to Case per element.
2. Pulse Test: 300 μs Pulse Width, 2% Duty Factor.
3. 2.0 μs Pulse Width, $f=1$ KHz.

RATINGS AND CHARACTERISTIC CURVES MBR2035CT AND MBR2045CT

FIG. 1 — FORWARD CURRENT DERATING CURVE

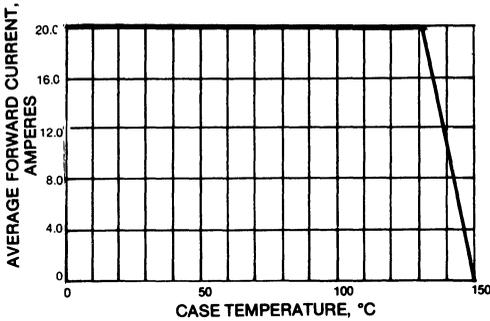


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

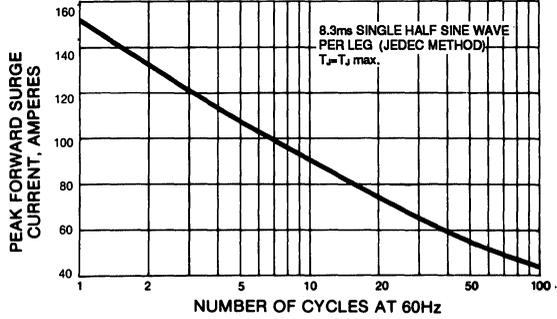


FIG. 3 — MAXIMUM REVERSE CHARACTERISTICS

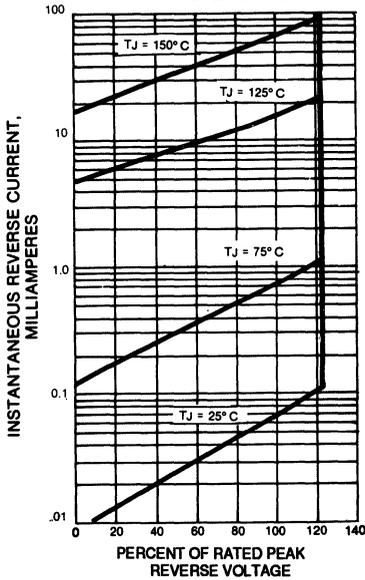


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

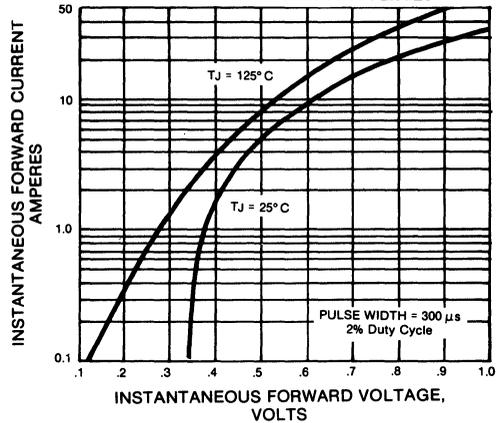
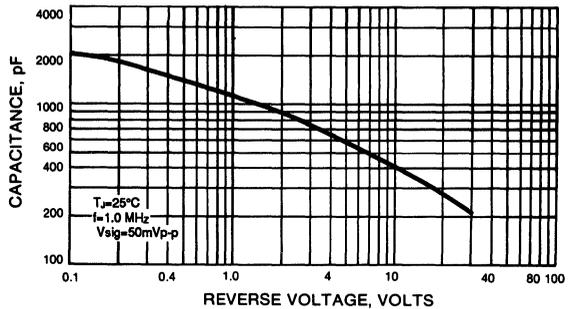


FIG. 5-TYPICAL JUNCTION CAPACITANCE PER LEG



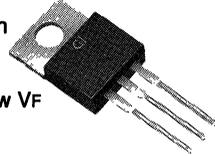
MBR2050CT AND MBR2060CT

SCHOTTKY RECTIFIER

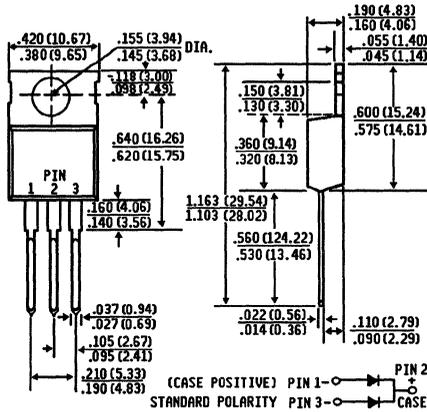
VOLTAGE RANGE - 50 and 60 Volts CURRENT - 20.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_f
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



TO-220 CT



Dimensions in inches and (millimeters)

MECHANICAL DATA

- Case:** JEDEC TO-220 Molded Plastic
Terminals: Leads solderable per MIL-STD-202, Method 208
Polarity: As marked **Mounting Position:** Any
Weight: .08 ounces, 2.24 gram

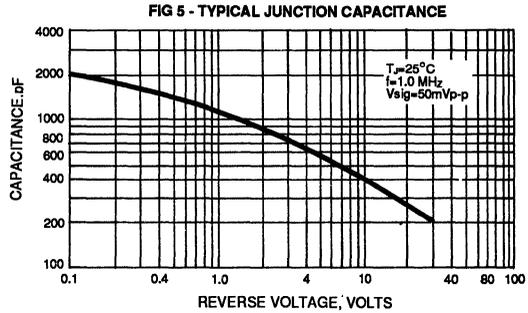
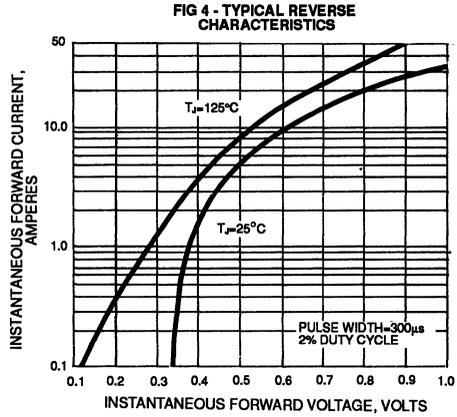
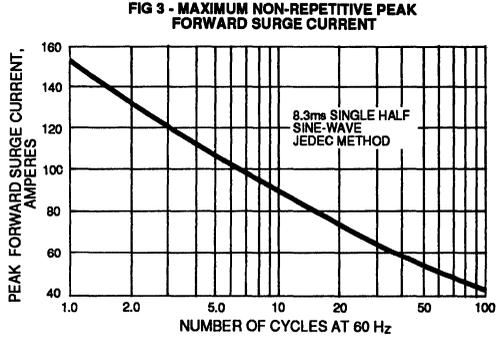
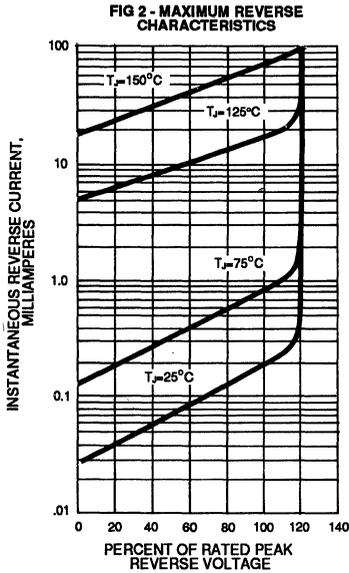
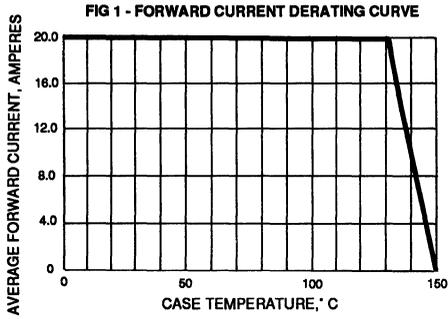
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBR2050CT	MBR2060CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V_{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V_{DC}	50	60	Volts
Maximum Average Forward Rectified Current at $T_C=133^\circ\text{C}$	$I_{(AV)}$	20.0		Amps
Peak Repetitive Forward Current per leg (Rated V_R , Sq. wave, 2.0 KHz) at $T_C=133^\circ\text{C}$	I_{FRM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I_{RRM}	0.5		Amps
Maximum Instantaneous Forward Voltage per leg (NOTE 2)	V_F	$I_F=10A, T_C=25^\circ\text{C}$ 0.80 $I_F=10A, T_C=125^\circ\text{C}$ 0.70 $I_F=20A, T_C=25^\circ\text{C}$ 0.95 $I_F=20A, T_C=125^\circ\text{C}$ 0.85		Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per element	I_R	$T_C=25^\circ\text{C}$ 0.15 $T_C=125^\circ\text{C}$ 150.0		mA
Voltage Rate of Change (Rated V_R)	dv/dt	1000		V/ μs
Maximum Thermal Resistance per element (NOTE 1)	$R_{\theta JC}$	2.0		$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

- NOTES: 1. Thermal Resistance from Junction to Case per element.
 2. Pulse Test: 300 μs Pulse Width, 2% Duty Factor.
 3. 2.0 μs , Pulse Width, f=1 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR2050CT AND MBR2060CT



MBR2090CT AND MBR20100CT

SCHOTTKY RECTIFIER

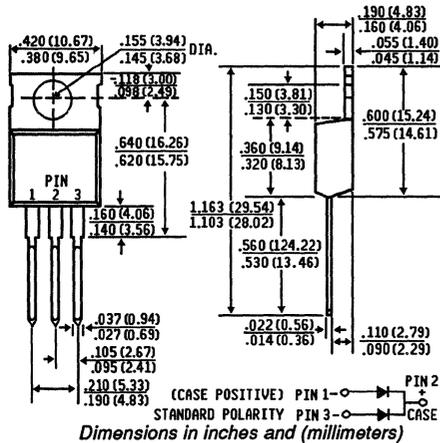
VOLTAGE RANGE -90 and 100 Volts **CURRENT** - 20.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25"(6.35mm) from case



TO-220CT



MECHANICAL DATA

Case: JEDEC TO-220 Molded plastic
Terminals: Leads solderable per MIL-STD-202, Method 208
Polarity: As marked **Mounting Position:** Any
Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBR2090CT	MBR20100CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	90	100	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	90	100	Volts
Maximum DC Blocking Voltage	V _{DC}	90	100	Volts
Maximum Average Forward Rectified Current at T _C = 133°C	I _(AV)	20.0		Amps
Peak Repetitive Forward Current, per leg (Square Wave 20 KHZ) at T _C =133°C	I _{FSM}	20.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (2.0μs Pulse Width, 1 KHZ)	I _{RSM}	0.5		Amps
Voltage Rate of Change, (rated V _R)	dv/dt	1000.0		V/μs
Maximum Instantaneous Forward Voltage (NOTE 1)	V _F			Volts
		I _F = 10A, T _C = 25°C	0.80	
		I _F = 10A, T _C = 125°C	0.70	
		I _F = 20A, T _C = 125°C	0.85	
		I _F = 20A, T _C = 25°C	0.95	
Maximum Instantaneous Reverse Current at rated DC Blocking Voltage	I _R		0.15	mA
	I _R		150.0	mA
Maximum Thermal Resistance, Junction to Case	R _{θJC}	2.0		°C/W
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES: 1. Pulse Test Pulse Width 300μs, Duty Cycle 2%.

RATINGS AND CHARACTERISTIC CURVES MBR2090CT AND MBR20100CT

FIG. 1 — FORWARD CURRENT DERATING CURVE

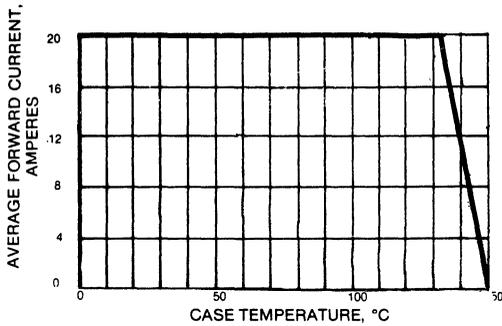


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

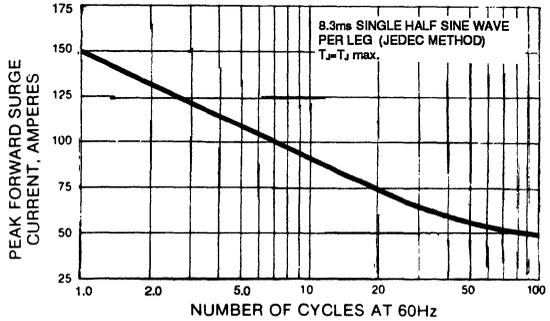


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

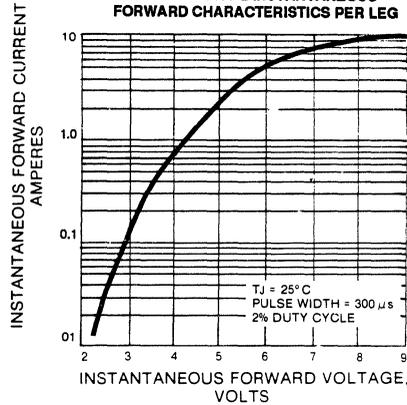


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

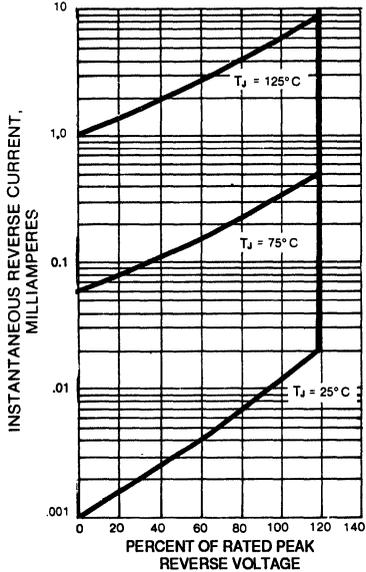
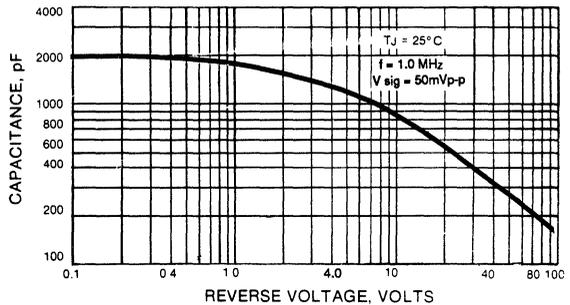


FIG. 5 — TYPICAL JUNCTION CAPACITANCE



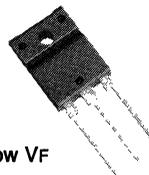
SBLF2030PT AND SBLF2040PT

SCHOTTKY RECTIFIER

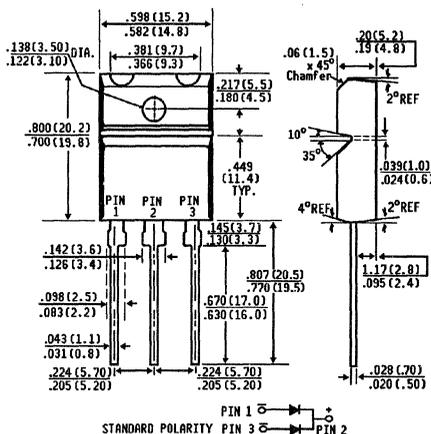
VOLTAGE RANGE - 30 and 40 Volts CURRENT - 20.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.17", (4.3mm) lead lengths at 5 lbs. (2.3kg) tension
- ◆ Internal Insulation: 1.5k V_{RMS}



ITO-3P



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: ITO-3P Molded Plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Mounting Torque: 5 in. - lb. max.

Weight: .47 ounces, 13.2 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive or inductive load, derate current by 20%.

	SYMBOLS	SBLF2030PT	SBLF2040PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	30	40	Volts
Maximum RMS Voltage	V_{RMS}	21	28	Volts
Maximum DC Blocking Voltage	V_{DC}	30	40	Volts
Maximum Average Forward Rectified Current at $T_C=105^\circ\text{C}$	$I_{(AV)}$	20.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	250.0		Amps
Maximum Instantaneous Forward Voltage Per Leg $I_F=10.0$ (NOTE 2)	V_F	0.55		Volts
Maximum Instantaneous Reverse Current at $T_C=25^\circ\text{C}$		1.0		mA
Rated DC Blocking Voltage per element $T_C=100^\circ\text{C}$	I_R	50.0		mA
Typical Thermal Resistance (NOTE 1)	$R_{\theta JC}$	2.0		$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-40 to +125		$^\circ\text{C}$

NOTES:

1. Thermal Resistance from Junction to Case per element.

2. Pulse Test: 300 μs Pulse Width, 2% Duty Factor.

RATINGS AND CHARACTERISTIC CURVES SBLF2030PT AND SBLF2040PT

FIG. 1 - FORWARD CURRENT DERATING CURVE

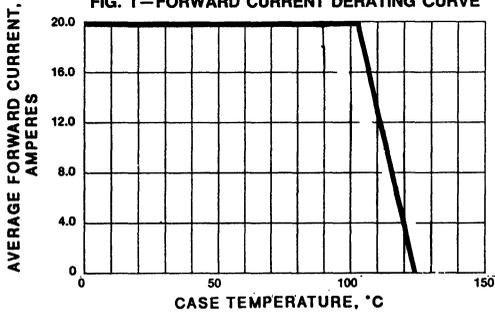


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

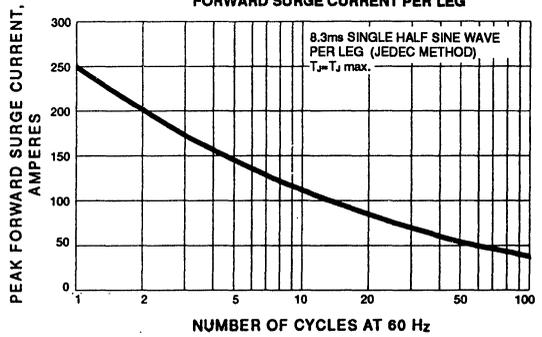


FIG. 3 - TYPICAL REVERSE CHARACTERISTICS

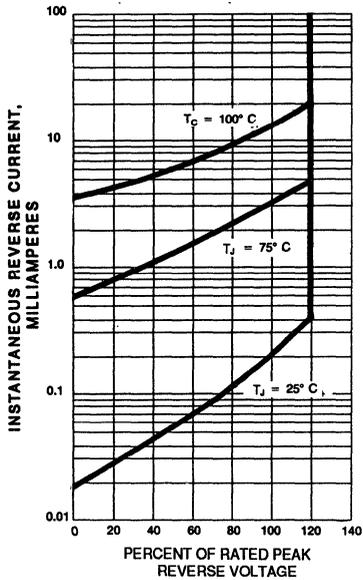


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

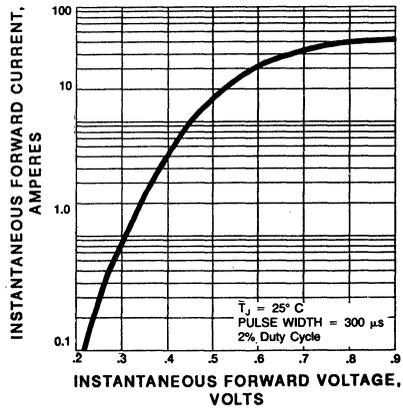
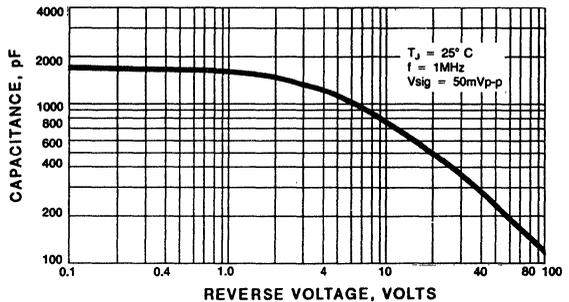


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



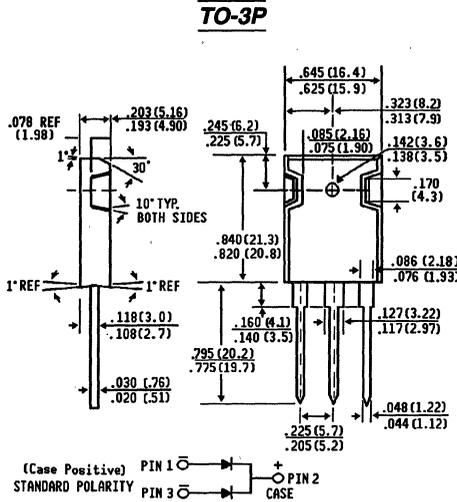
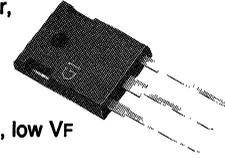
SBL2030PT AND SBL2040PT

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 30 and 40 Volts CURRENT - 20.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.17", (4.3mm) from case
- ◆ Guardring for transient protection



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC TO-3P Molded Plastic
Terminals: Lead solderable per MIL-STD-202, Method 208
Polarity: As marked
Mounting Position: Any
Weight: 0.2 ounces, 5.6 gram

CROSS REFERENCE GUIDE

GI	FUJI	SHINDENGEN
SBL2040PT	ESA83-004	-

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive or inductive load, derate current by 20%.

	SYMBOLS	SBL2030PT	SBL2040PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	30	40	Volts
Maximum RMS Voltage	V _{RMS}	21	28	Volts
Maximum DC Blocking Voltage	V _{DC}	30	40	Volts
Maximum Average Forward Rectified Current at T _C =105°C	I <sub(av)< sub=""></sub(av)<>	20.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	250.0		Amps
Maximum Instantaneous Forward Voltage per leg I _F = 8.0 (NOTE 2)	V _F	0.55		Volts
Maximum Instantaneous Current at Rated DC Blocking Voltage per element	I _R	1.0		mA
Typical Thermal Resistance per leg (NOTE 1)	R _{θJC}	1.5		°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-40 to +125		°C

NOTES: 1. Thermal Resistance from Junction to Case per element.
 2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.

RATINGS AND CHARACTERISTIC CURVES SBL2030PT AND SBL2040PT

FIG. 1 — FORWARD CURRENT DERATING CURVE

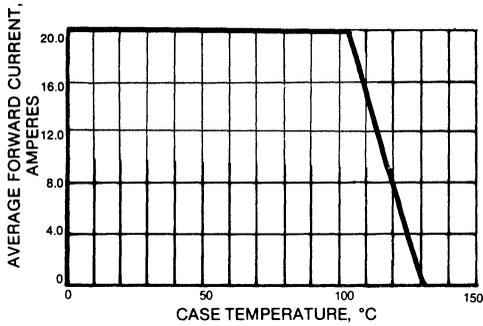


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

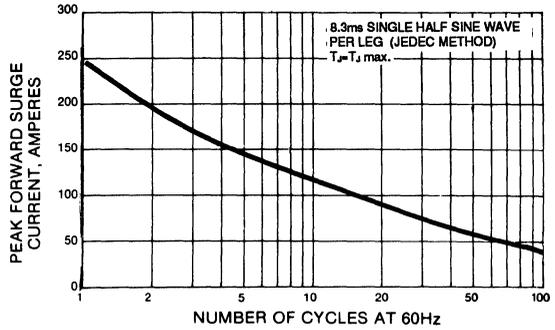


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

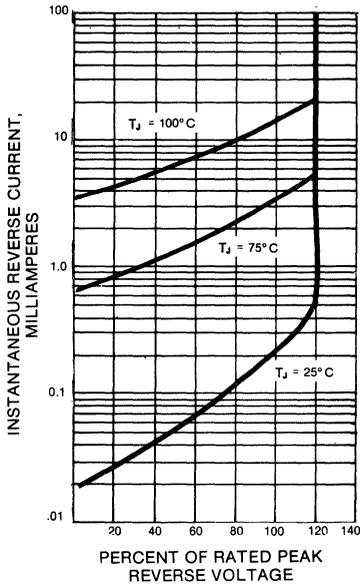


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

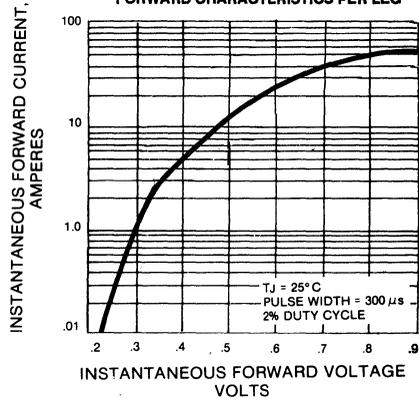
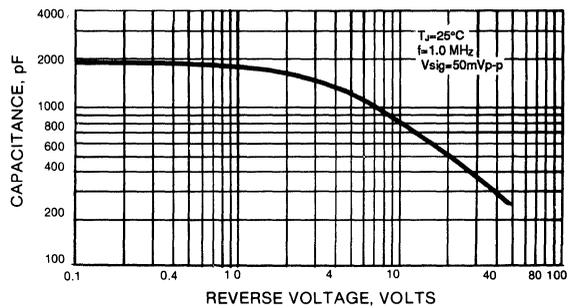


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



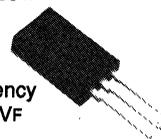
MBRF2535CT AND MBRF2545CT

SCHOTTKY RECTIFIER

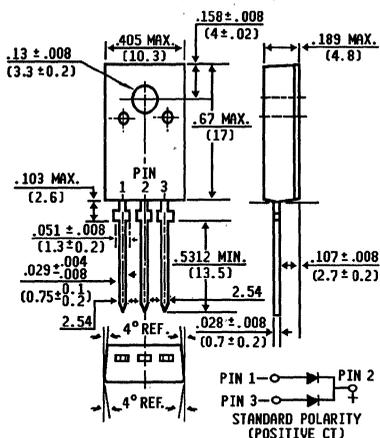
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 30.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power, loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS



ITO-220 CT



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic
Terminals: Leads, solderable per MIL-STD-202, Method 208
Polarity: As marked **Mounting Position:** Any
Mounting Torque: 5in. - lb. max.
Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBRF2535CT	MBRF2545CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V _{DC}	35	45	Volts
Maximum Average Forward Rectified Current at T _C =130°C	I _(AV)	30.0		Amps
Peak Repetitive Forward Current per leg (rated V _R , Square Wave, 20 KHz) at T _C =130°C	I _{FRM}	30.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	1.0		Amps
Maximum Instantaneous Forward Voltage Per Leg I _F =30A, T _C =25°C (NOTE 2) I _F =30A, T _C =125°C	V _F	0.82 0.73		Volts
Maximum Instantaneous Reverse Current at T _C =25°C Rated DC Blocking Voltage per leg (NOTE 2) T _C =125°C	I _R I _R	0.2 40.0		mA mA
Typical Thermal Resistance, (NOTE 1)	R _{ΘJC}	1.8		°C/W
Voltage Rate of Change (rated V _R)	dv/dt	1000		V/μs
Operating Junction Temperature Range	T _J	-65 to + 150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES: 1. Thermal Resistance from Junction to Case per leg.
 2. Pulse Test: 300μs Pulse Width, 2%, Duty Factor
 3. 2.0μs, Pulse Width 1 KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF2535CT AND MBRF2545CT

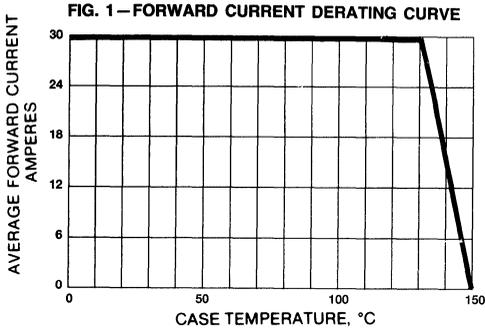


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

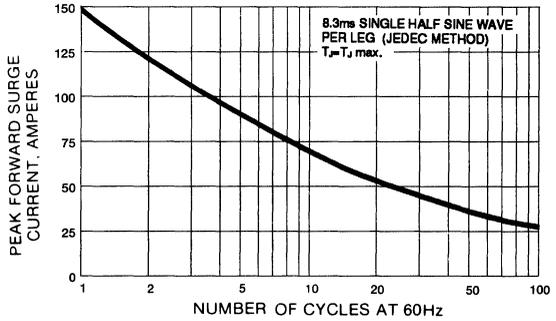


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

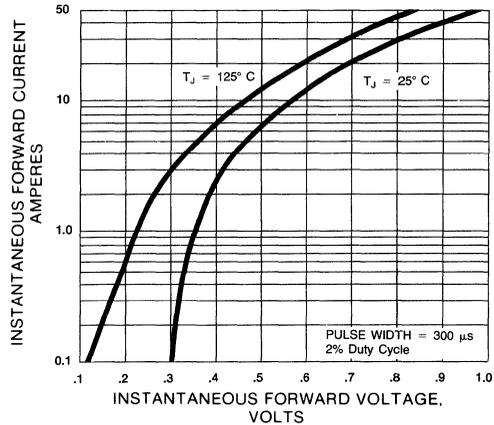


FIG. 3 - MAXIMUM REVERSE CHARACTERISTICS PER LEG

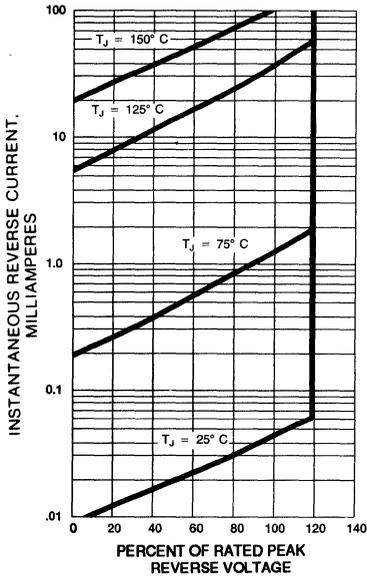
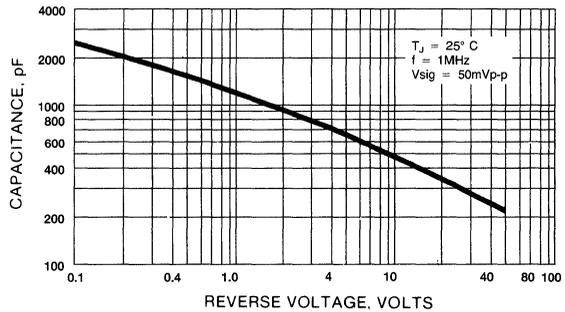


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



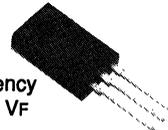
MBRF2550CT AND MBRF2560CT

SCHOTTKY RECTIFIER

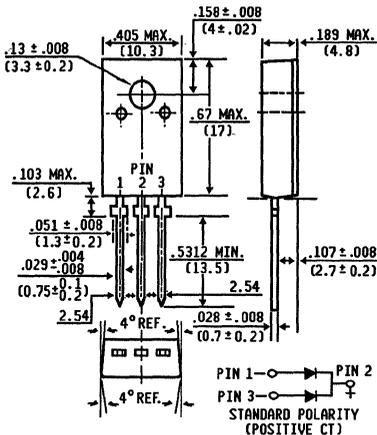
VOLTAGE RANGE - 50 and 60 Volts CURRENT - 30.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/25", (6.35mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5K VRMS



ITO-220 CT



Dimensions in inches and millimeters

MECHANICAL DATA

Case: ITO-220 Fully Overmolded Plastic
Terminals: Leads Solderable per MIL-STD-202, Method 208
Polarity: As marked **Mounting Position:** Any
Mounting Torque: 5 in. - lb max.
Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBRF2550CT	MBRF2560CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V _{DC}	50	60	Volts
Maximum Average Forward Rectified Current at T _C =125°C	I _(AV)	30.0		Amps
Peak Repetitive Forward Current per leg (Rated V _R , Sq. Wave, 20 KHz) at T _C =125°C	I _{FRM}	30.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	1.0		Amps
Maximum Forward Voltage per leg I _F =15.0A, T _C =25°C (NOTE 2) I _F =15.0A, T _C =125°C	V _F	0.75 0.65		Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per leg (NOTE 2) T _C =25°C T _C =125°C	I _R	1.0 50.0		mA
Typical Thermal Resistance (NOTE 1)	R _{θJC}	1.8		°C/W
Voltage Rate of Change (rated V _R)	dv/dt	1000		V/μs
Operating Junction Temperature Range	T _J	-65 to + 150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES: 1. Thermal Resistance from Junction to Case per leg.
 2. Pulse Test: 300μs Pulse Width, 2%, Duty Factor
 3. 2.0μs, Pulse Width, f = 1.0 KHz

RATINGS AND CHARACTERISTIC CURVES MBRF2550CT AND MBRF2560CT

FIG. 1 - FORWARD CURRENT DERATING CURVE

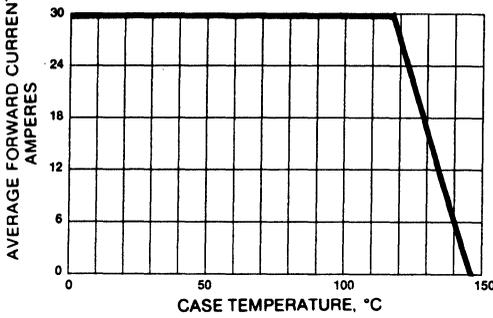


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

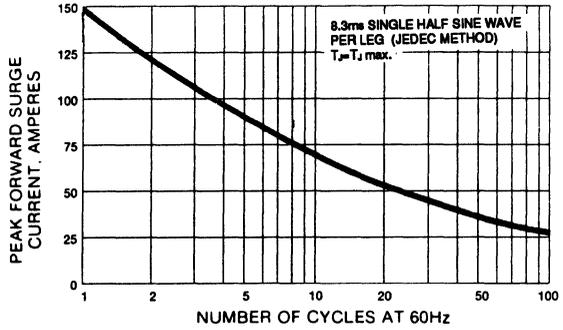


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

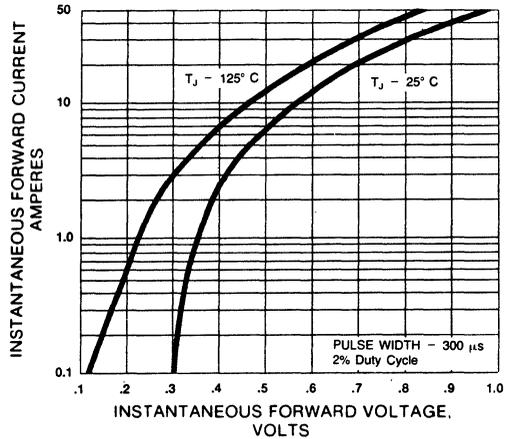


FIG. 3 - MAXIMUM REVERSE CHARACTERISTICS PER LEG

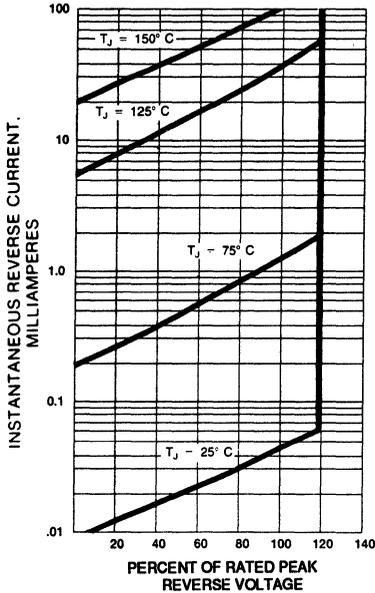
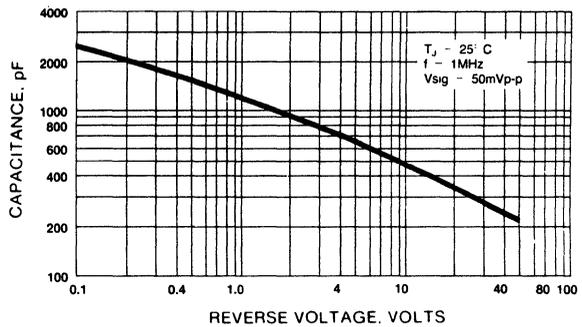


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



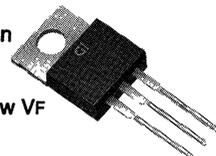
MBR2535CT AND MBR2545CT

SCHOTTKY RECTIFIER

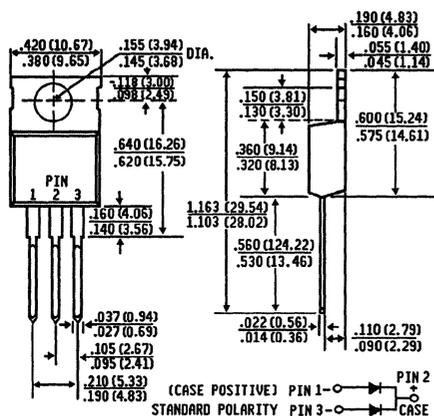
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 30.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



TO-220 CT



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic

Terminals: Leads, solderable per MIL-STD- 202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

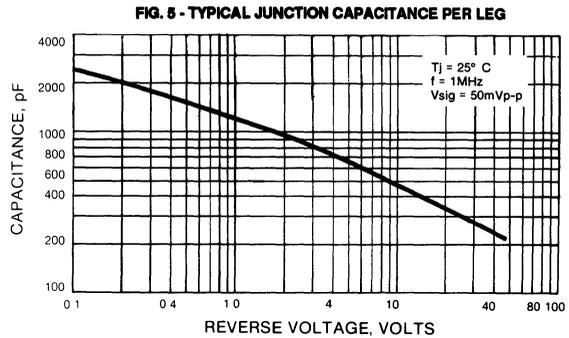
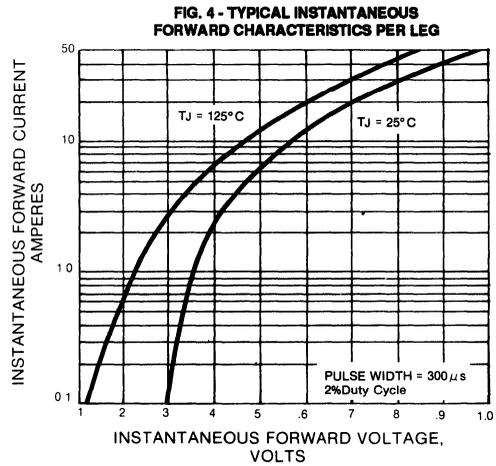
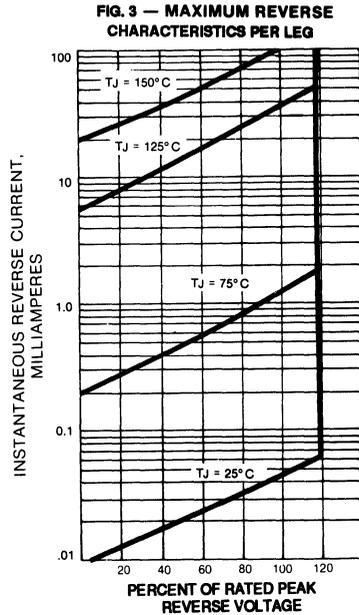
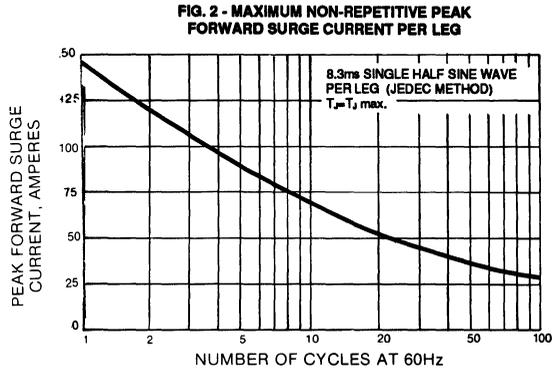
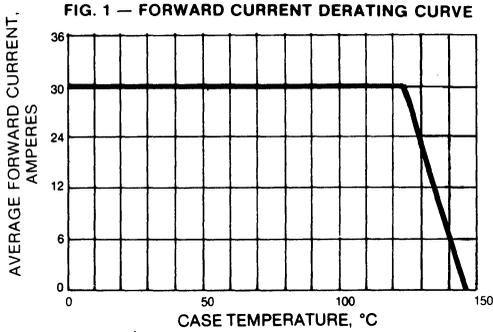
Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBR2535CT	MBR2545CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V _{DC}	35	45	Volts
Maximum Average Forward Rectified Current at T _C =130°C	I <sub(av)< sub=""></sub(av)<>	30.0		Amps
Peak Repetitive Forward Current per leg (rated V _R , Square Wave, 20 KHz) at T _C =130°C	I _{FRM}	30.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0		Amps
Peak Repetitive Reverse Current (NOTE 3)	I _{RRM}	1.0		Amps
Maximum Instantaneous Forward Voltage per leg I _F = 30A, T _C =25°C I _F = 30A, T _C =125°C (NOTE 2)	V _F	0.82 0.73		Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per leg (NOTE 2) T _C =25°C T _C =125°C	I _R	0.2 40.0		mA
Maximum Thermal Resistance (NOTE 1)	R _{ΘJC}	1.5		°C/W
Voltage Rate of Change (rated V _R)	dv/dt	1000		V/us
Operating Junction Temperature Range	T _J	-65 to + 150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES:

1. Thermal Resistance from Junction to Case per leg.
2. Pulse Test: 300μs Pulse Width, 2%, Duty Factor.
3. 2.0μs, Pulse Width, f= 1 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR2535CT AND MBR2545CT



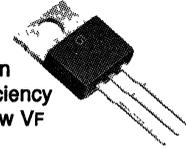
MBR2550CT AND MBR2560CT

SCHOTTKY RECTIFIER

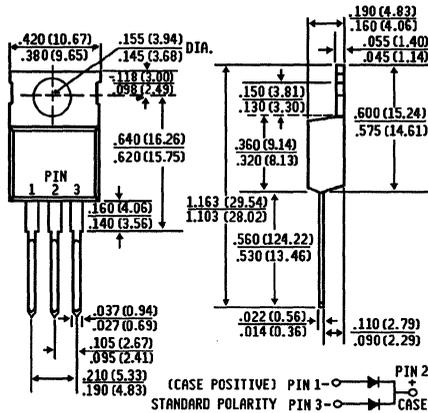
VOLTAGE RANGE - 50 and 60 Volts CURRENT - 30 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.25", (6.35mm) from case
- ◆ Guardring for transient protection



TO-220 CT



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 Molded Plastic

Terminals: Leads, solderable per MIL-STD-202 Method 208

Polarity: As marked

Mounting Position: Any

Weight: .08 ounces, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	MBR2550CT	MBR2560CT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V_{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V_{DC}	50	60	Volts
Maximum Average Forward Rectified Current at $T_C=125^\circ\text{C}$	$I_{(AV)}$	30.0		Amps
Peak Repetitive Forward Current per leg (rated V_R , Square wave, 20 KHz) at $T_C=125^\circ\text{C}$	I_{FRM}	30.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I_{RRM}	0.5		Amps
Maximum Instantaneous Forward Voltage per leg $I_F=15.0\text{A}$, $T_C=25^\circ\text{C}$	V_F	0.75		Volts
Forward Voltage per leg $I_F=15.0\text{A}$, $T_C=125^\circ\text{C}$ (NOTE 2)		0.65		
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per leg (NOTE 2) $T_C=25^\circ\text{C}$	I_R	1.0		mA
$T_C=125^\circ\text{C}$		50.0		
Typical Thermal Resistance, (NOTE 1)	$R_{\theta JC}$	1.5		$^\circ\text{C}/\text{W}$
Voltage Rate of Change (rated V_R)	dv/dt	1000		V/us
Operating Junction Temperature Range	T_J	-65 to + 150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES:

1. Thermal Resistance from Junction to Case per leg.

2. Pulse Test: 300μs Pulse Width, 2%, Duty Factor.

3. 2.0μs, Pulse Width, f=1 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR2550CT AND MBR2560CT

FIG. 1 - FORWARD CURRENT DERATING CURVE

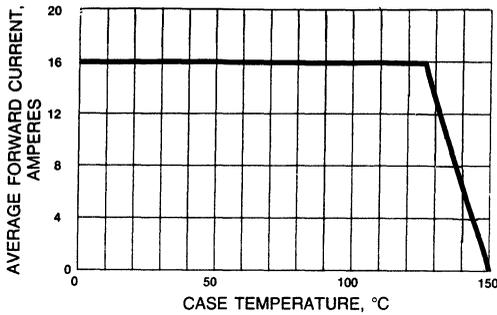


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

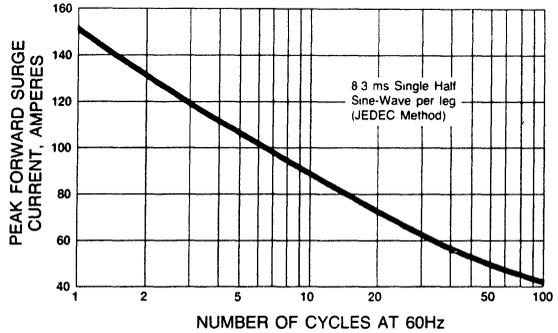


FIG. 3 - MAXIMUM REVERSE CHARACTERISTICS PER LEG

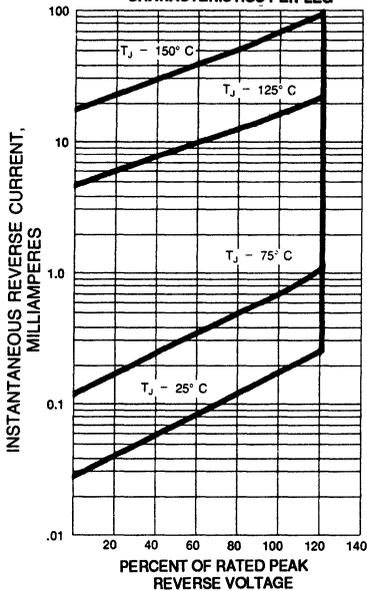


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

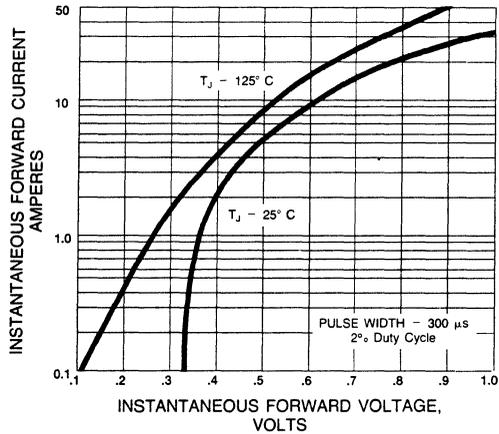
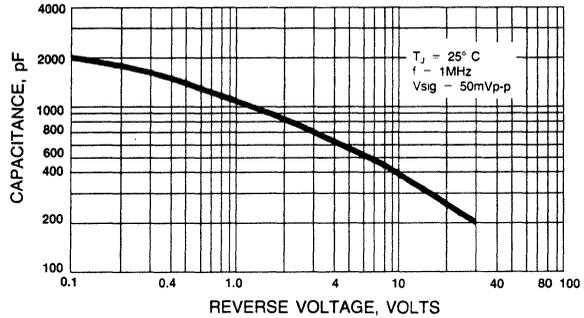


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



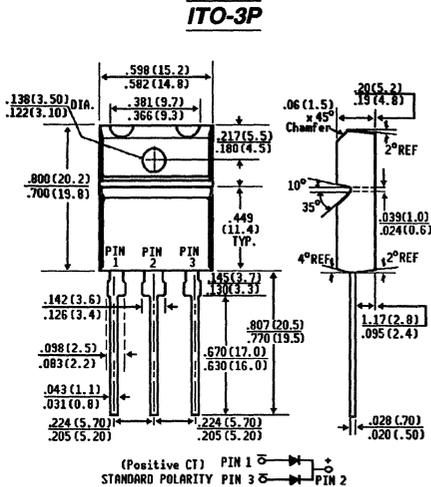
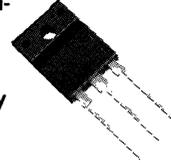
MBRF3035PT AND MBRF3045PT

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 35 and 45 Volts CURRENT - 30.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low Vf
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C, .17 (4.3mm) lead length at 5 lbs. (2.3kg) tension
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-3P Fully Overmolded Plastic

Terminals: Lead solderable per MIL-STD-202, Method 208

Polarity: As marked **Mounting Position:** Any

Mounting Torque: 5 in. - lb. max.

Weight: .47 ounces, 13.2 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%

	SYMBOLS	MBRF3035PT	MBRF3045PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V _{DC}	35	45	Volts
Maximum Average Forward Rectified Current at T _C =105°C	I _(AV)		30.0	Amps
Peak Repetitive Forward Current per leg (rated V _R , Square wave, 20 KHz) at T _C =105°C	I _{FRM}		30.0	Amps
Peak Forward Surge Current, 8.3ms single half sine -wave superimposed on rated load (JEDEC Method)	I _{FSM}		200	Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RSM}		2.0	Amps
Maximum Instantaneous Forward Voltage per leg	V _F	I _F =20A, T _C =125°C (NOTE 2)	0.60	Volts
Forward Voltage		I _F =30A, T _C =25°C	0.76	
per leg		I _F =30A, T _C =125°C	0.72	
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per leg (NOTE 2)	I _R	T _C =25°C	1.0	mA
		T _C =125°C	60.0	
Typical Thermal Resistance (NOTE 1)	R _{θJC}		1.7	°C/W
Voltage Rate of Change (rated V _R)	dv/dt		1000	V/μs
Operating Junction Temperature Range	T _J		-65 to +150	°C
Storage Temperature Range	T _{STG}		-65 to +175	°C

NOTES: 1. Thermal Resistance from Junction to Case per element
 2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.
 3. 2.0μs Pulse Width, f=1.0KHz

RATINGS AND CHARACTERISTIC CURVES MBRF3035PT AND MBRF3045PT

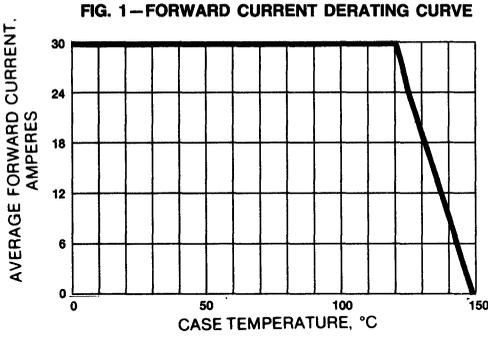


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

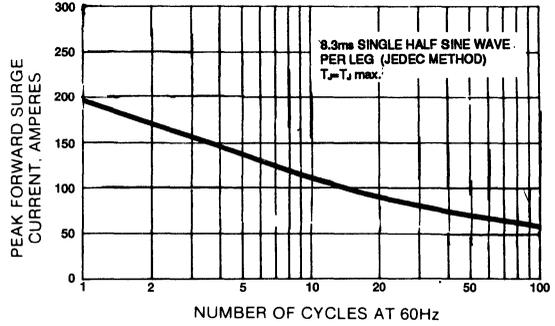


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

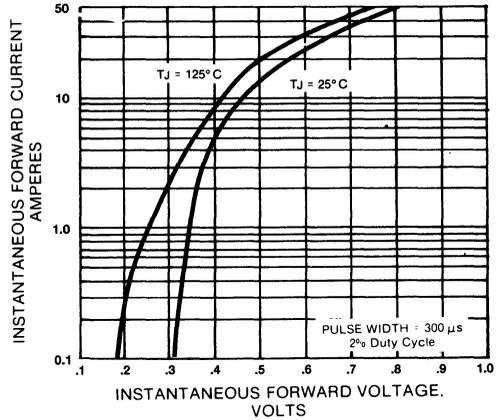


FIG. 3 - MAXIMUM REVERSE CHARACTERISTICS PER LEG

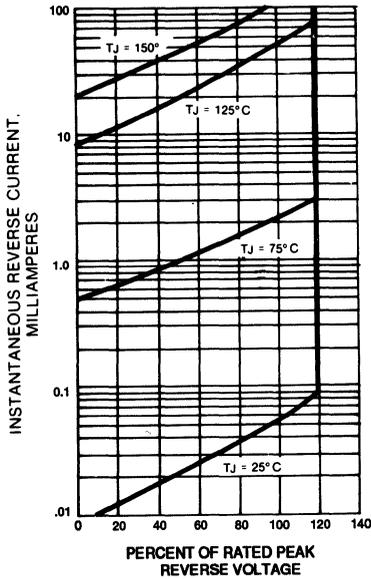
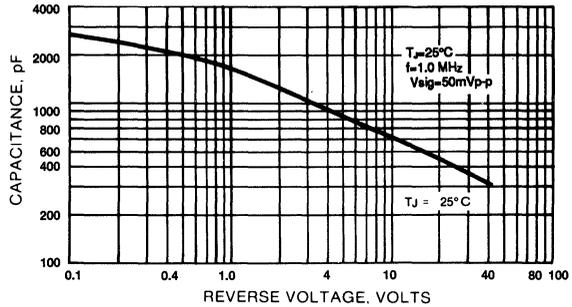


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



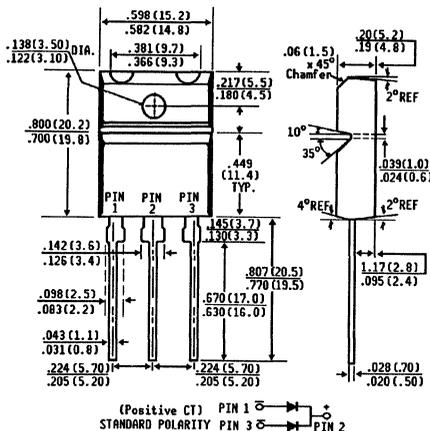
MBRF3050PT AND MBRF3060PT

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 50 and 60 Volts CURRENT - 30.0 Amperes

FEATURES

ITO-3P



Dimensions in inches and (millimeters)

- ◆ Dual rectifier construction, positive center-tap
- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C, .17 (4.3mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS



MECHANICAL DATA

Case: ITO-3P Fully Overmolded Plastic
Terminals: Lead Solderable per MIL-STD-202, Method 208
Polarity: As marked **Mounting Position:** Any
Mounting Torque: 5 in. - lb. max.
Weight: .47 ounces, 13.2 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBRF3050PT	MBRF3060PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V _{DC}	50	60	Volts
Maximum Average Forward Rectified Current at T _C =105°C	I _(AV)	30.0		Amps
Peak Repetitive Forward Current per leg (rated V _R , Square wave, 20 KHz) at T _C =105°C	I _{FRM}	30.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	300.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RSM}	1.0		Amps
Maximum Instantaneous Forward Voltage per leg (NOTE 2)	V _F	0.75	0.65	Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage per leg (NOTE 2)	I _R	5.0	100.0	mA
Typical Thermal Resistance (NOTE 1)	R _{θJC}	1.7		°C/W
Voltage Rate of Change (rated V _R)	dv/dt	1000		V/us
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES:

1. Thermal Resistance from Junction to Case per leg.
2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.
3. 2.0μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF3050PT AND MBRF3060PT

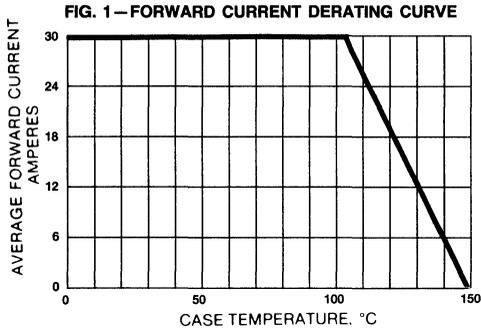


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

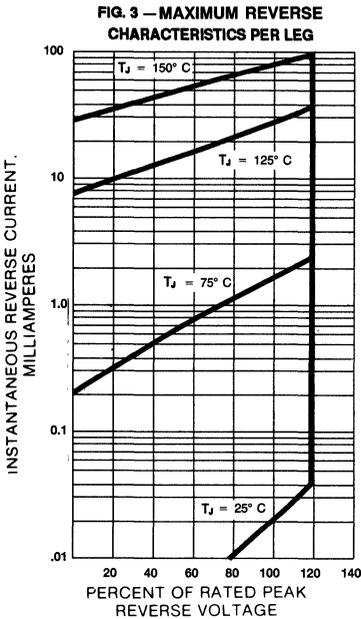
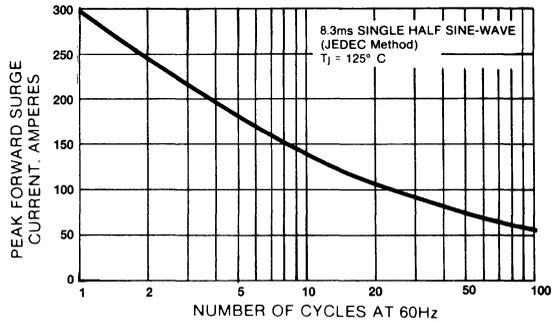


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

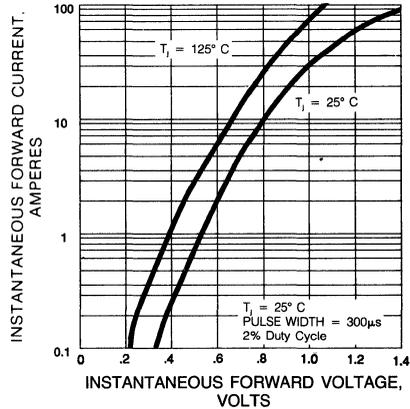
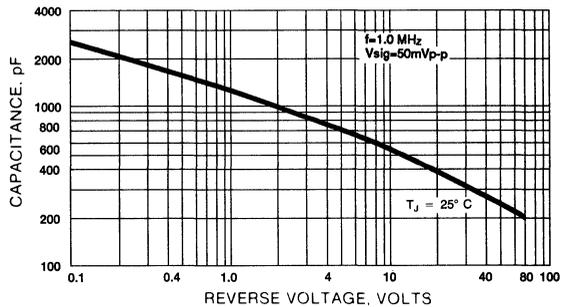


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER LEG



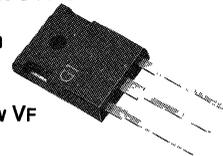
MBR3035PT AND MBR3045PT

SCHOTTKY RECTIFIER

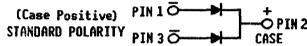
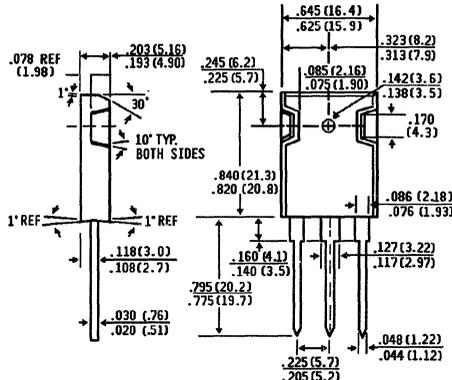
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 30.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds, .17 (4.3mm) from case
- ◆ Guardring for transient protection



TO-3P



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO3P Molded Plastic

Terminals: Lead solderable per MIL-STD-202 Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.2 ounces, 5.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
For capacitive load, derate current by 20%

	SYMBOLS	MBR3035PT	MBR3045PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V_{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V_{DC}	35	45	Volts
Maximum Average Forward Rectified Current at $T_C=105^\circ\text{C}$	$I_{(AV)}$	30.0		Amps
Peak Repetitive Forward Current per leg (rated V_R , Square wave, 20 KHz) at $T_C=105^\circ\text{C}$	I_{FRM}	30.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	200.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 2)	I_{RSM}	2.0		Amps
Maximum Instantaneous Forward Voltage per leg $I_F=20A, T_C=125^\circ\text{C}$ (NOTE 3) $I_F=30A, T_C=25^\circ\text{C}$ $I_F=30A, T_C=125^\circ\text{C}$	V_F	0.60 0.76 0.72		Volts
Maximum Instantaneous Reverse Current at Rated DC Blocking Voltage) per leg (NOTE 3) $T_C=25^\circ\text{C}$ $T_C=125^\circ\text{C}$	I_R	1.0 60.0		mA
Maximum Thermal Resistance (NOTE 1)	$R_{\theta JC}$	1.4		$^\circ\text{C/W}$
Voltage Rate of Change at (Rated V_R)	dv/dt	1000		$\text{V}/\mu\text{s}$
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

- NOTES: 1. Thermal Resistance from Junction to Case per leg.
2. $2.0\mu\text{s}$, Pulse Width, $f=1.0\text{ KHz}$.
3. Pulse Test: $300\mu\text{s}$ Pulse Width, 2% Duty Factor.

RATINGS AND CHARACTERISTIC CURVES MBR3035PT AND MBR3045PT

FIG. 1 — FORWARD CURRENT DERATING CURVE

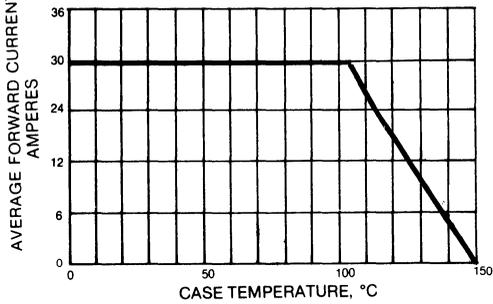


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

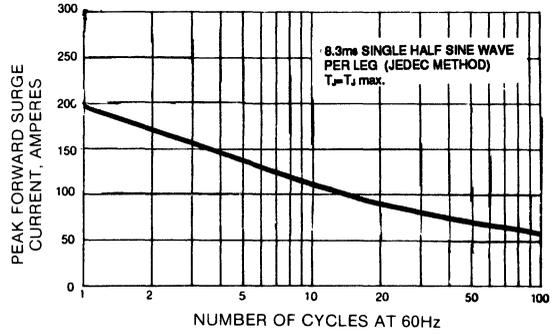


FIG. 3 — MAXIMUM REVERSE CHARACTERISTICS PER LEG

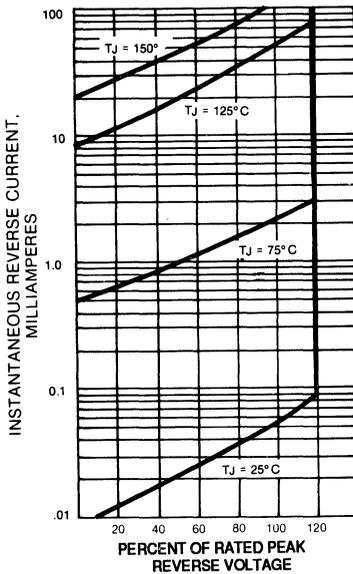


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

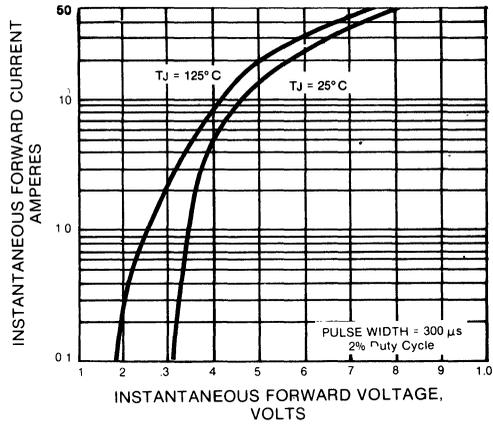
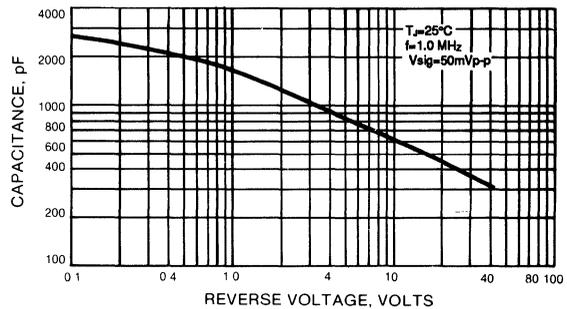


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



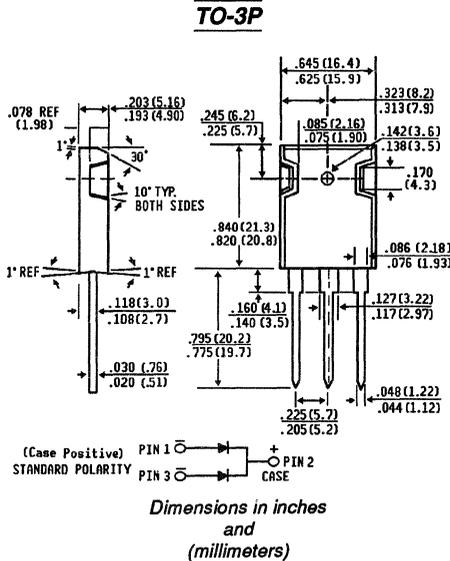
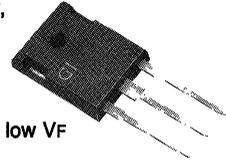
MBR3050PT AND MBR3060PT

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 50 and 60 Volts CURRENT - 30.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds, .17 (4.3mm) from case



MECHANICAL DATA

Case: JEDEC TO-3P Molded Plastic
Terminals: Lead solderable per MIL-STD-202 Method 208
Polarity: As marked
Mounting Position: Any
Weight: 0.2 ounces, 5.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

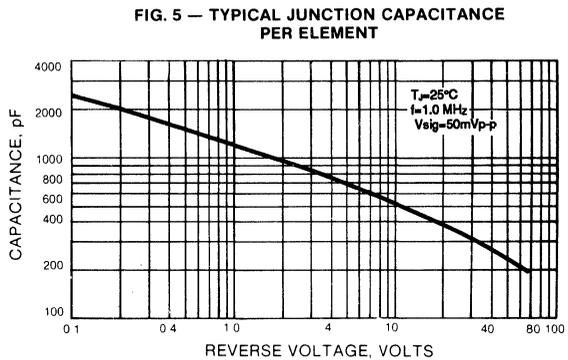
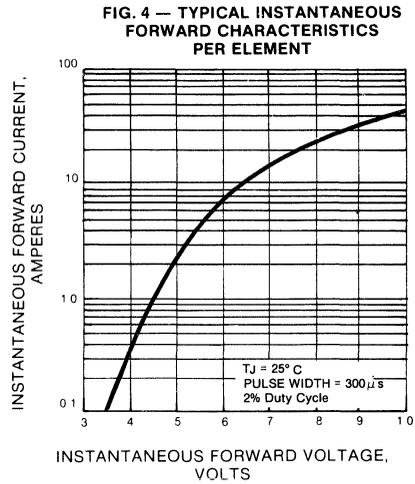
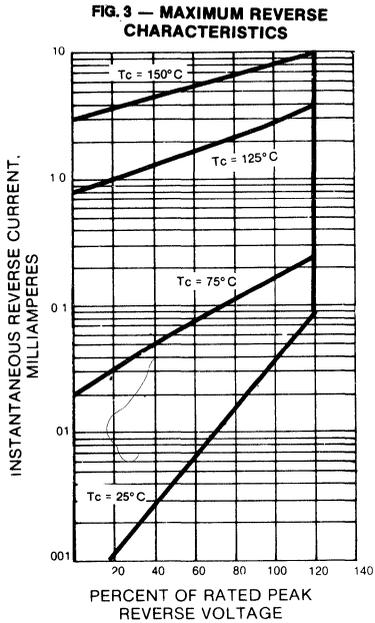
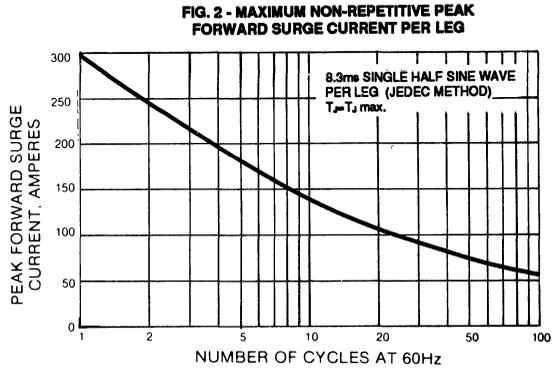
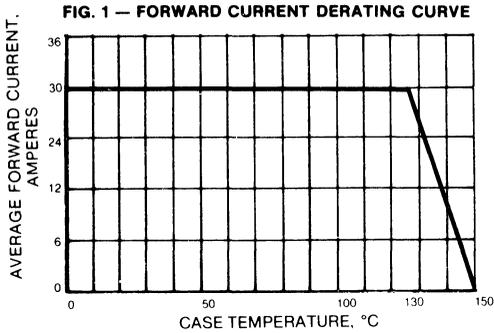
Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive or inductive load, derate current by 20%.

	SYMBOLS	MBR3050PT	MBR3060PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V _{DC}	50	60	Volts
Maximum Average Forward Rectified Current at T _C =105°C	I _(AV)		30.0	Amps
Peak Repetitive Forward Current per leg (rated V _R , Square wave, 20 KHz) at T _C =105°C	I _{FRM}		30.0	Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}		300.0	Amps
Peak Repetitive Reverse Current (NOTE 3)				
Maximum Instantaneous Forward Voltage Per Leg I _F =20A, T _C =25°C (NOTE 2)				
I _F =20A, T _C =25°C	V _F	0.65	0.75	Volts
Maximum Average Reverse Current at T _C =25°C	I _R		5.0	mA
Rated Peak Reverse Voltage (NOTE 3) T _C =100°C			100.0	mA
Maximum Thermal Resistance (NOTE 1)	R _{θJC}		2.0	°C/W
Voltage Rate of Change (rated V _R)	dv/dt		1000	V/μs
Operating Junction Temperature Range	T _J		-65 to +150	°C
Storage Temperature Range	T _{STG}		-65 to +175	°C

NOTES:

1. Thermal Resistance from Junction to Case per leg.
2. 300μs Pulse Width, 2% Duty Factor.
3. 2.0μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR3050PT AND MBR3060PT



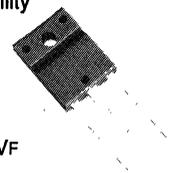
SBLF3030PT AND SBLF3040PT

SCHOTTKY RECTIFIER

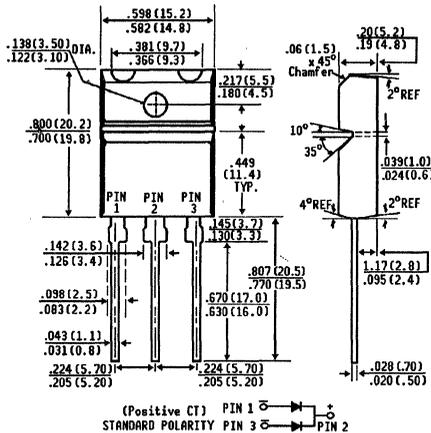
VOLTAGE RANGE - 30 and 40 Volts CURRENT - 30.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Isolated Plastic (1500 VRMS) package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds, 17 (4.3mm) from case
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS



ITO-3P



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

- Case:** ITO-3P Fully Overmolded Plastic
Terminals: Lead solderable per MIL-STD-202 Method 208
Polarity: As marked
Mounting Position: Any
Mounting Torque: 5 in.-lb. max.
Weight: .47 ounces, 13.2 ounces

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SBLF3030PT	SBLF3040PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	30	40	Volts
Maximum RMS Voltage	V _{RMS}	21	28	Volts
Maximum DC Blocking Voltage	V _{DC}	30	40	Volts
Maximum Average Forward Rectified Current at T _C =100°C	I _(AV)	30.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	275.0		Amps
Maximum Instantaneous Forward Voltage per leg I _F 5=15, T _C = 25°C (NOTE 2)	V _F	0.55		Volts
Maximum Instantaneous Reverse Current at T _C =25°C	I _R	1.0		mA
Rated DC Blocking Voltage per leg T _C = 100°C	I _R	75.0		mA
Maximum Thermal Resistance (NOTE 1)	R _{θJC}	2.5		°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-40 to +125		°C

NOTES:

1. Thermal Resistance from Junction to Case per leg.
2. Pulse Test: 300µs Pulse Width, 2% Duty Factor.

RATINGS AND CHARACTERISTIC CURVES SBLF3030PT AND SBLF3040PT

FIG. 1 — FORWARD CURRENT DERATING CURVE

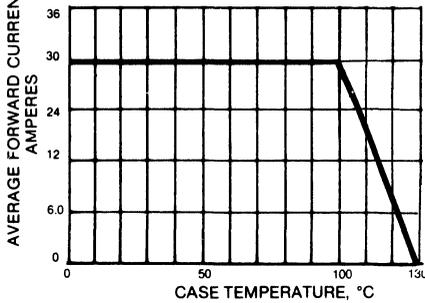


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

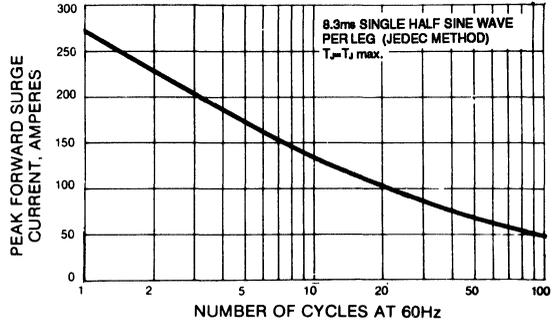


FIG. 4 — TYPICAL FORWARD CHARACTERISTICS PER LEG

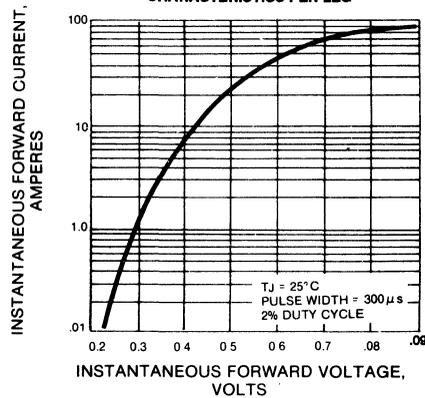


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS PER LEG

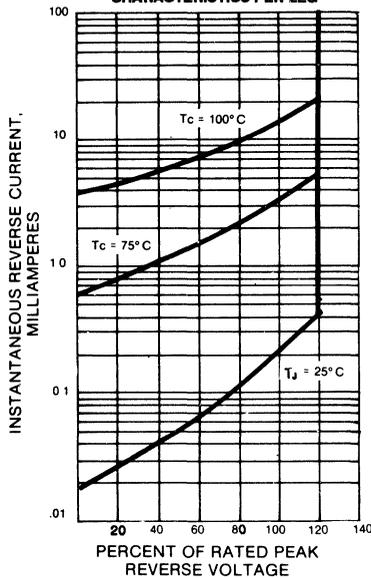
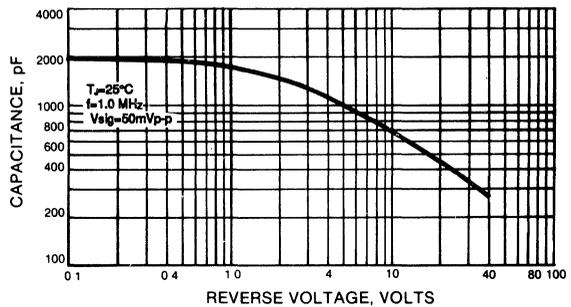


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER LEG



**GENERAL
INSTRUMENT**

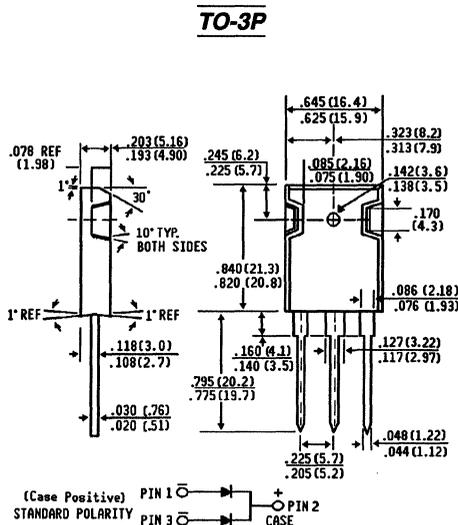
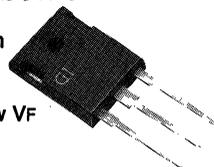
SBL3030PT AND SBL3040PT

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 30 and 40 Volts CURRENT - 30.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds, 17 (4.3mm) lead lengths at 5 lbs., (2.3kg) tension
- ◆ Guardring for transient protection



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-3P Molded Plastic
Terminals: Lead solderable per MIL-STD-202, Method 208
Polarity: As marked
Mounting Position: Any
Weight: 0.2 ounces, 5.6 gram

CROSS - REFERENCE GUIDE

GI	FUJI	SHINDENGEN
SBL3030PT	---	S30SC3M
SBL3040PT	ESAD83-004	S30SCAM

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SBL3030PT	SBL3040PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	30	40	Volts
Maximum RMS Voltage	V_{RMS}	21	28	Volts
Maximum DC Blocking Voltage	V_{DC}	30	40	Volts
Maximum Average Forward Rectified Current at $T_C=100^\circ\text{C}$	$I_{(AV)}$	30.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	275.0		Amps
Maximum Instantaneous Forward Voltage per leg $I_F=15$, $T_C=25^\circ\text{C}$ (NOTE 2)	V_F	0.55		Volts
Maximum Instantaneous Reverse Current at $T_C = 25^\circ\text{C}$ Rated DC Blocking Voltage per leg $T_C = 100^\circ\text{C}$	I_R	75.0		mA
Maximum Thermal Resistance (NOTE 1)	$R_{\theta JC}$	2.0		$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-40 to +125		$^\circ\text{C}$

NOTES:

1. Thermal Resistance from Junction to Case per leg.
2. Pulse Test: 300 μs Pulse Width, 2% Duty Factor.

RATINGS AND CHARACTERISTIC CURVES SBL3030PT AND SBL3040PT

FIG. 1 — FORWARD CURRENT DERATING CURVE

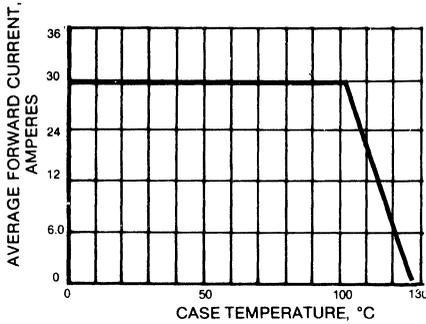


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

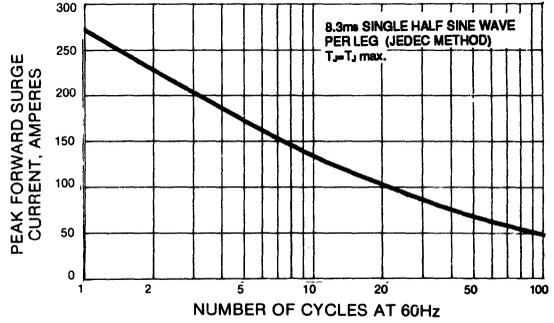


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS PER LEG

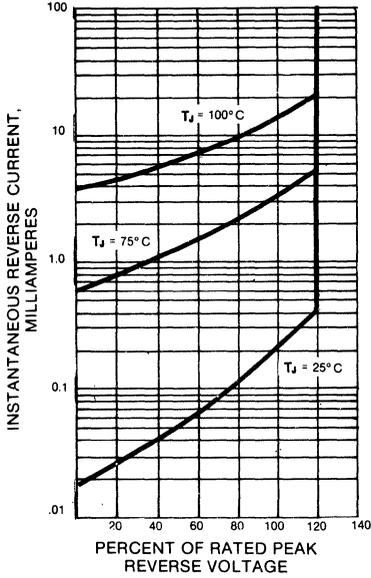


FIG. 4 — TYPICAL FORWARD CHARACTERISTICS PER LEG

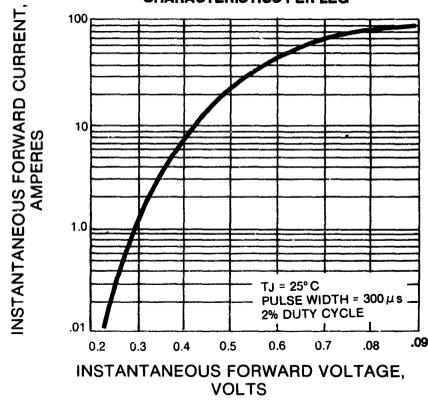
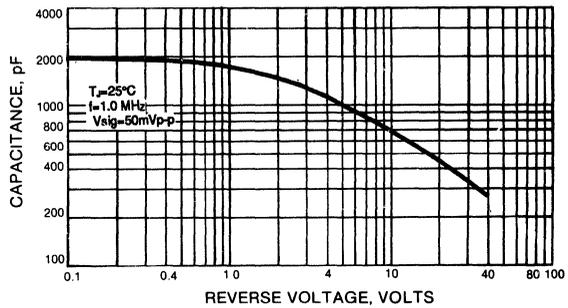


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER LEG

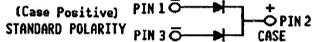
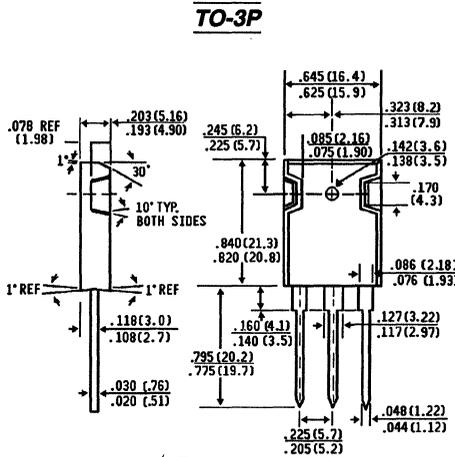


SD241P

SCHOTTKY RECTIFIERS VOLTAGE RANGE - 45 Volts CURRENT - 30.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction using an epitaxial construction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low Vf
- ◆ High surge capacity
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C, .17", 4.3mm from case for 10 seconds
- ◆ Guardring for transient protection



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-3P Molded Plastic

Terminals: Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.2 ounces, 5.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	SD241P	UNITS
Maximum Recurrent Peak Reverse Voltage at $T_C=25^\circ\text{C}$	V_{RRM}	45	Volts
Maximum Blocking Voltage at $T_C=25^\circ\text{C}$	V_{DC}	45	Volts
Maximum Working Peak Reverse Voltage	V_{RWM}	35	Volts
Maximum Average Forward Rectified Current at $T_C=105^\circ\text{C}$	$I_{(AV)}$	30.0	Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	400.0	Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I_{RSM}	2.0	Amps
Maximum Instantaneous Forward Voltage per leg (NOTE 2)	V_F	0.47 0.60	Volts
Maximum Instantaneous Reverse Current Reverse Voltage per leg at 35V (NOTE 2)	I_R	1.0 100.0	mA
Voltage Rate of Change at $V_R=35\text{V}$	dv/dt	1000	V/ μs
Maximum Thermal Resistance (NOTE 1)	$R_{\theta JC}$	1.4	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-65 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175	$^\circ\text{C}$

NOTES:

1. Thermal Resistance from Junction of Case per leg.
2. Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2%.
3. 2.0 μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES SD241P

FIG. 1—FORWARD CURRENT DERATING CURVE

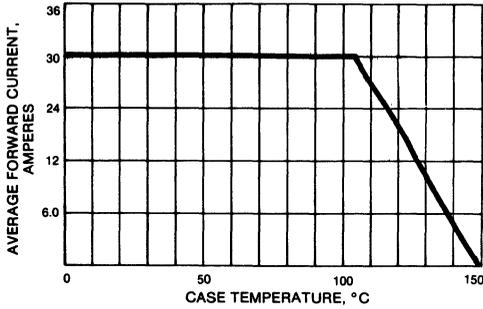


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

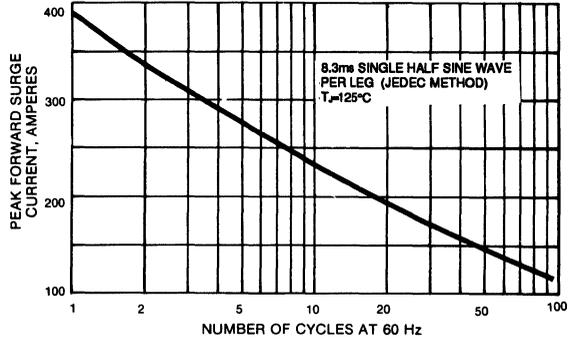


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

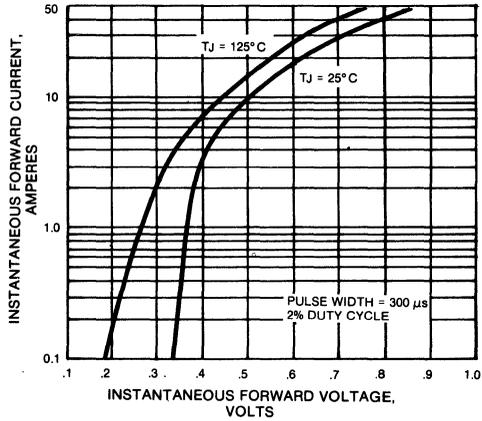


FIG 3-TYPICAL REVERSE CHARACTERISTICS PER LEG

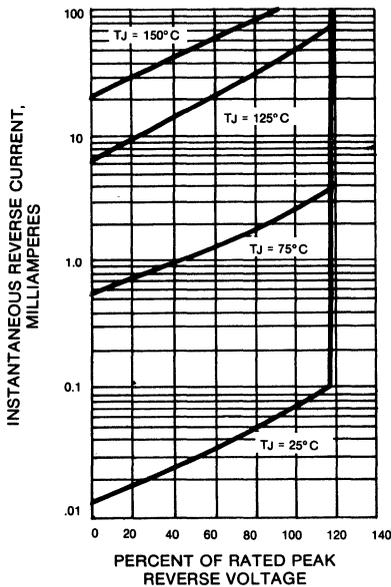
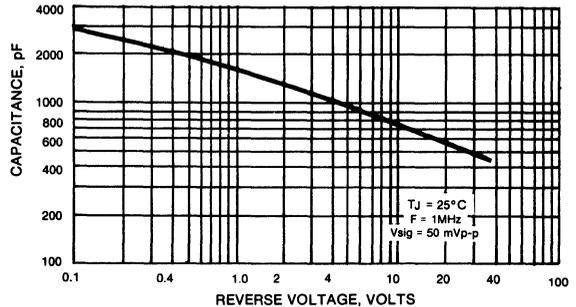


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



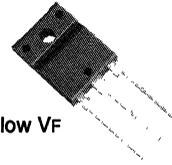
MBRF4035PT AND MBRF4045PT

SCHOTTKY RECTIFIER

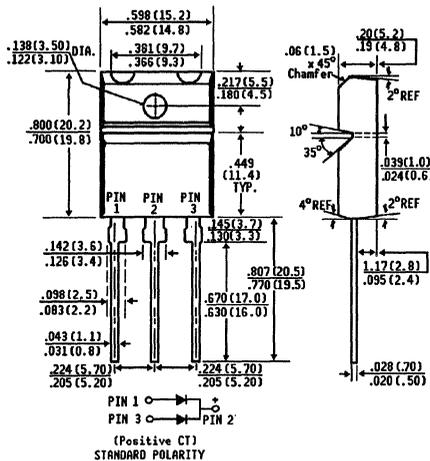
VOLTAGE RANGE - 35 and 45 Volts CURRENT - 40.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Isoated plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS
- ◆ High temperature soldering guaranteed: 250°C/10 seconds .17"(4.3mm) from case



ITO-3P



Dimensions in inches and (millimeters)

MECHANICAL DATA

- Case:** ITO-3P Fully Overmolded Plastic
Terminals: Leads solderable per MIL-STD-202, Method 208
Polarity: As marked **Mounting Position:** Any
Mounting Torque: 5 in. - lb. max.
Weight: .47 ounces, 13.2 ounces

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBRF4035PT	MBRF4045PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	35	45	Volts
Maximum Working Peak Voltage	V _{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V _{DC}	35	45	Volts
Maximum Average Forward Rectified Current at T _C =120°C	I _(AV)		40.0	Amps
Peak Repetitive Forward Current per leg (Rated V _R , Square wave, 20 KHz) at T _C =120°C	I _{FRM}		40.0	Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}		400	Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}		2.0	Amps
Maximum Instantaneous Forward Voltage per leg I _F =20A, T _C =25°C (NOTE 2) I _F =20A, T _C =125°C	V _F		0.70 0.60	Volts
Maximum Instantaneous Reverse Current at T _C =25°C	I _R		10.0	mA
Rated DC Blocking Voltage (NOTE 2) T _C =125°C	I _R		100.0	mA
Typical Thermal Resistance (NOTE 1)	R _{θJC}		1.6	°C/W
Voltage Rate of Change (Rated V _R)	dv/dt		1000	V/μs
Operating Junction Temperature Range	T _J		-65 to +150	°C
Storage Temperature Range	T _{STG}		-65 to +175	°C

- NOTES: 1. Thermal Resistance from Junction to Case per leg.
 2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.
 3. 2.0μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF4035PT AND MBRF4045PT

FIG. 1 - FORWARD CURRENT DERATING CURVE

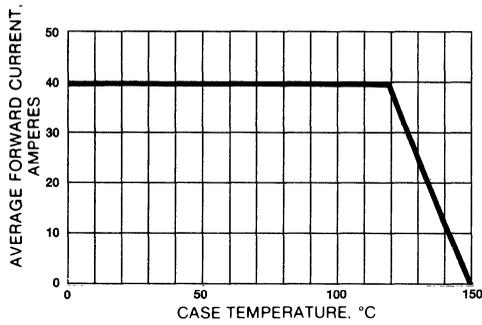


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

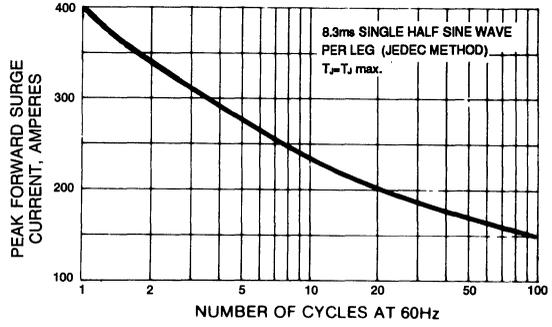


FIG. 3 - MAXIMUM REVERSE CHARACTERISTICS PER LEG

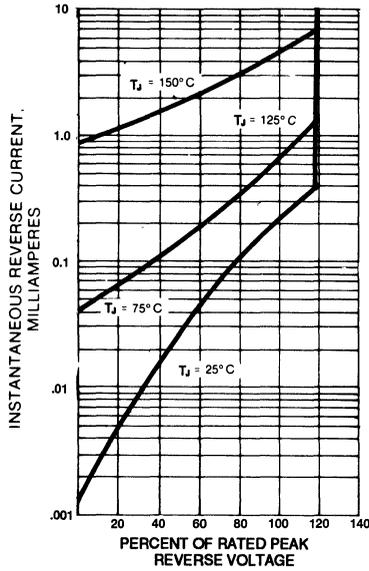


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

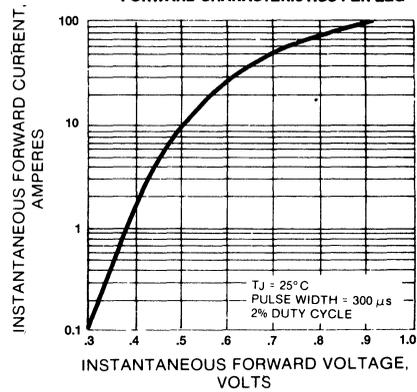
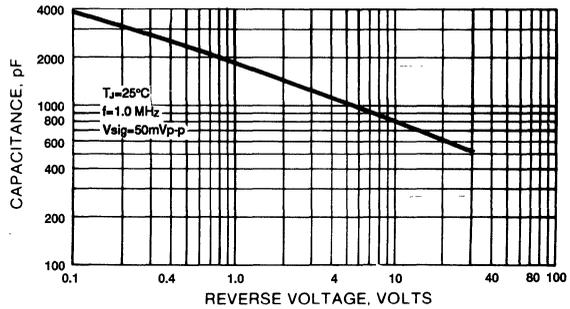


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



MBRF4050PT AND MBRF4060PT

SCHOTTKY RECTIFIER

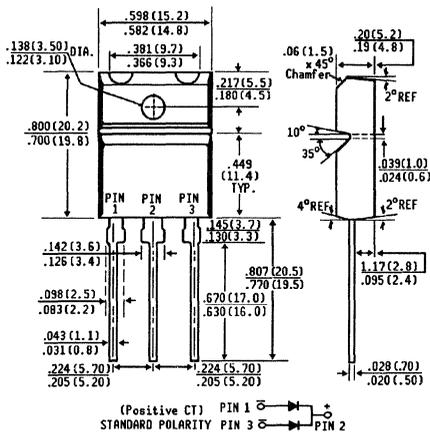
VOLTAGE RANGE - 50 and 60 Volts CURRENT - 40.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Isoated plastic package has Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ Internal Insulation: 1.5k VRMS
- ◆ High temperature soldering guaranteed: 250°C/10 seconds .17"(4.3mm) from case



ITO-3P



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-3P Fully Overmolded Plastic
Terminals: Leads solderable per MIL-STD-202, Method 208
Polarity: As marked **Mounting Position:** Any
Mounting Torque: 5 in. - lb. max.
Weight: .47 ounces, 13.2 ounces

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	MBRF4050PT	MBRF4060PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	60	Volts
Maximum Working Peak Voltage	V_{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V_{DC}	50	60	Volts
Maximum Average Forward Rectified Current at $T_C=120^\circ\text{C}$	$I_{(AV)}$		40.0	Amps
Peak Repetitive Forward Current per leg (Rated V_R , Square wave, 20 KHz) at $T_C=120^\circ\text{C}$	I_{FRM}		40.0	Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}		400.0	Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I_{RRM}		1.0	Amps
Maximum Instantaneous Forward Voltage per leg $I_F=20\text{A}$, $T_C=25^\circ\text{C}$ (NOTE 2) $I_F=20\text{A}$, $T_C=125^\circ\text{C}$	V_F		0.80 0.70	Volts
Maximum Instantaneous Reverse Current at $T_C=25^\circ\text{C}$			10.0	
Rated DC Blocking Voltage (NOTE 2) $T_C=125^\circ\text{C}$	I_R		100.0	mA
Typical Thermal Resistance (NOTE 1)	$R_{\theta JC}$		1.6	$^\circ\text{C/W}$
Voltage Rate of Change (Rated V_R)	dv/dt		1000	$\text{V}/\mu\text{s}$
Operating Junction Temperature Range	T_J		-65 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}		-65 to +175	$^\circ\text{C}$

NOTES: 1. Thermal Resistance from Junction to Case per leg.
 2. Pulse Test: 300 μs Pulse Width, 2% Duty Factor.
 3. 2.0 μs Pulse Width, $f=1.0$ KHz.

RATINGS AND CHARACTERISTIC CURVES MBRF4050PT AND MBRF4060PT

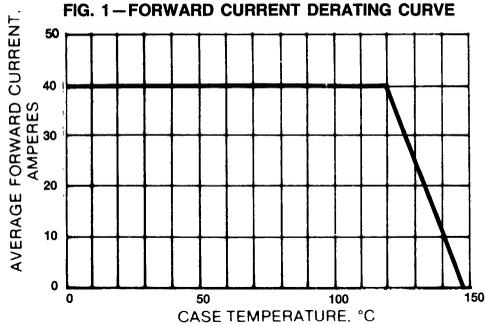


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

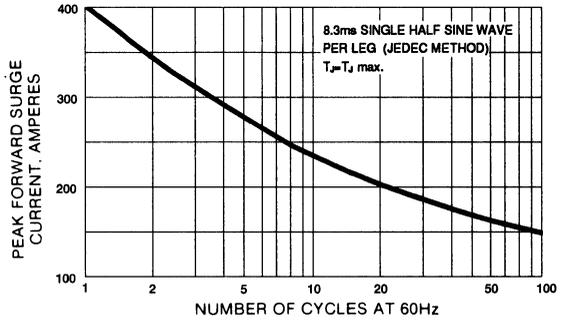


FIG. 4—TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

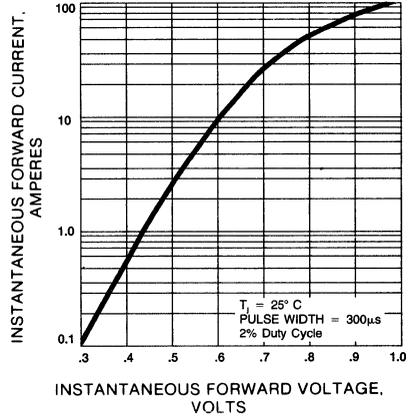


FIG. 3-MAXIMUM REVERSE CHARACTERISTICS PER LEG

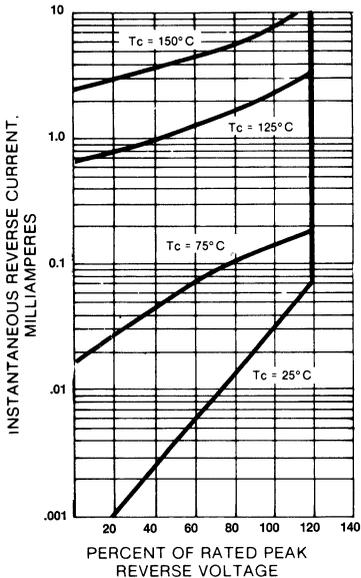
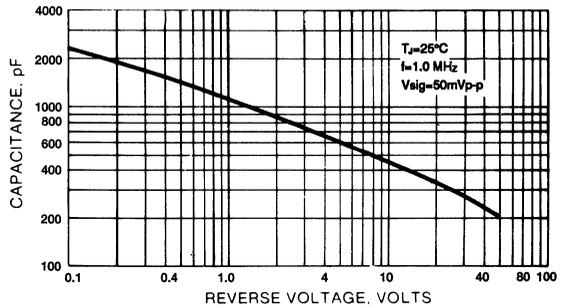


FIG. 5—TYPICAL JUNCTION CAPACITANCE PER LEG



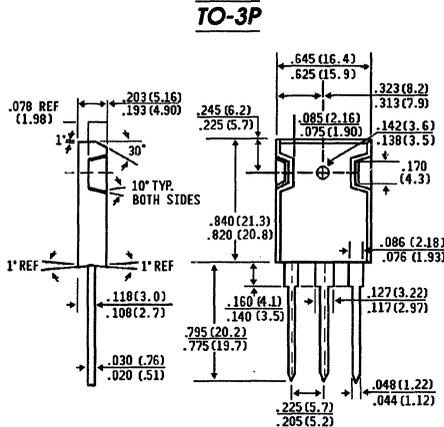
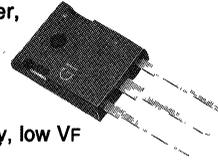
MBR4035PT AND MBR4045PT

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 35 and 45 Volts CURRENT - 40.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low Vf
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ High temperature soldering guaranteed: 250°C/10 seconds .17" (4.3mm) from case



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-3P Molded Plastic

Terminals: Leads Solderable per MIL-STD- 202, Method 208

Polarity: As marked **Mounting Position:** Any

Weight: 0.2 ounces, 5.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	MBR4035PT	MBR4045PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	35	45	Volts
Maximum Working Peak Reverse Voltage	V _{RWM}	35	45	Volts
Maximum DC Blocking Voltage	V _{DC}	35	45	Volts
Maximum Average Forward Rectified Current at T _c = 125°C	I _(AV)	40.0		Amps
Peak Repetitive Forward Current per leg (Rated V _R , Square wave, 20 KHz) at T _c =120°C	I _{FRM}	40.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	400.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I _{RRM}	2.0		Amps
Maximum Instantaneous Forward Voltage per leg I _F =20A, T _C =25°C (NOTE 2) I _F =20A, T _C =125°C	V _F	0.70 0.60		Volts
Maximum Instantaneous Reverse Current at T _C =25°C Rated DC Blocking Voltage per leg (NOTE 2) T _C =125°C	I _R	10.0 100.0		mA
Typical Thermal Resistance (NOTE 1)	R _{θJC}	1.4		°C/W
Voltage Rate of Change (Rated V _R)	dv/dt	1000		V/μs
Operating Junction Temperature Range	T _J	-65 to +150		°C
Storage Temperature Range	T _{STG}	-65 to +175		°C

NOTES:

1. Thermal Resistance from Junction to Case per leg.
2. Pulse Test: 300μs Pulse Width, 2% Duty Factor.
3. 2.0μs Pulse Width, f=1.0 KHz.

RATINGS AND CHARACTERISTIC CURVES MBR4035PT AND MBR4045PT

FIG. 1 — FORWARD CURRENT DERATING CURVE

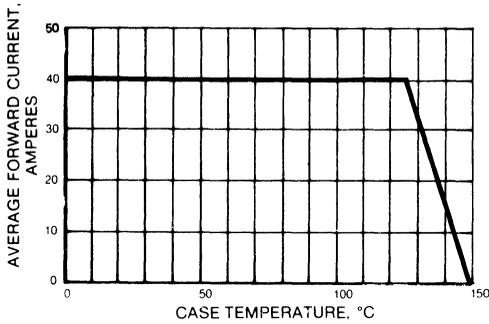


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

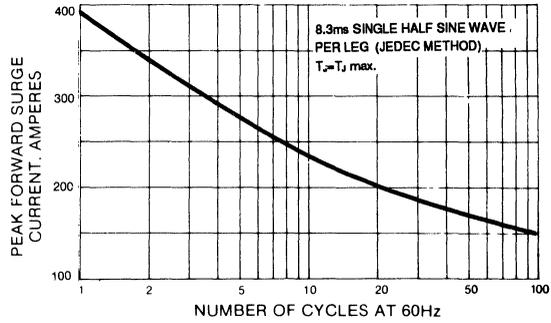


FIG. 3 — MAXIMUM REVERSE CHARACTERISTICS PER LEG

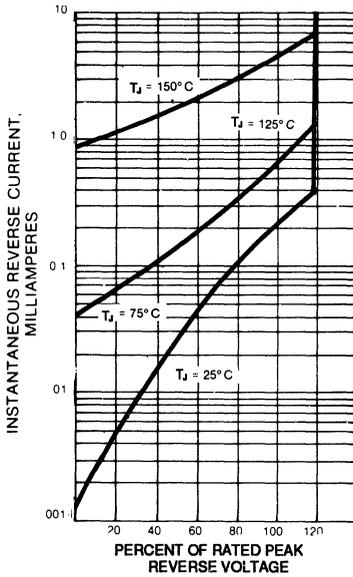


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

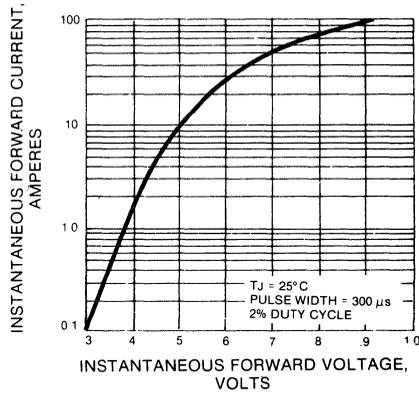
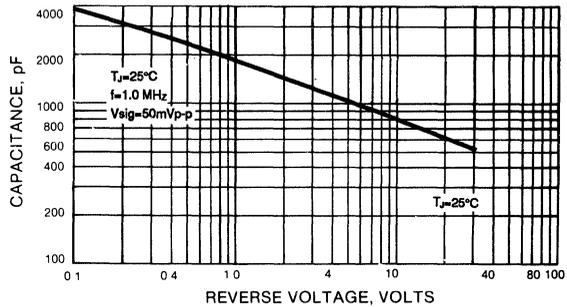


FIG. 5-TYPICAL JUNCTION CAPACITANCE PER LEG



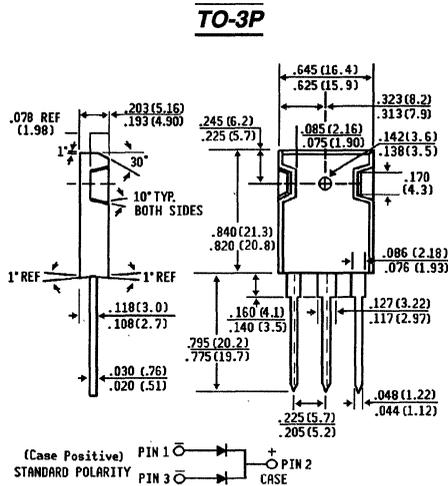
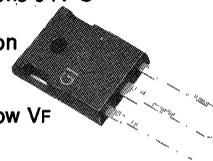
MBR4050PT AND MBR4060PT

SCHOTTKY RECTIFIER

VOLTAGE RANGE - 50 and 60 Volts CURRENT - 40.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Plastic package has Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low VF
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.17" (4.3mm) from case



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-3P Molded Plastic

Terminals: Leads Solderable per MIL-STD-202 Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.2 ounces, 5.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	MBR4050PT	MBR4060PT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	60	Volts
Maximum Working Peak Reverse Voltage	V_{RWM}	50	60	Volts
Maximum DC Blocking Voltage	V_{DC}	50	60	Volts
Maximum Average Forward Rectified Current at $T_C=120^\circ\text{C}$	$I_{(AV)}$	40.0		Amps
Peak Repetitive Forward Current per leg (Rated V_R , Square wave, 20 KHz) at $T_C=120^\circ\text{C}$	I_{FRM}	40.0		Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	400.0		Amps
Peak Repetitive Reverse Surge Current (NOTE 3)	I_{RRM}	1.0		Amps
Maximum Instantaneous Forward Voltage per leg $I_F=20\text{A}, T_C=25^\circ\text{C}$ (NOTE 2) $I_F=20\text{A}, T_C=125^\circ\text{C}$	V_F	0.80 0.70		Volts
Maximum Instantaneous Reverse Current at $T_C=25^\circ\text{C}$ Rated DC Blocking Voltage (NOTE 2) $T_C=125^\circ\text{C}$	I_R	10.0 100.0		mA
Typical Thermal Resistance (NOTE 1)	$R_{\theta JC}$	1.4		$^\circ\text{C}/\text{W}$
Voltage Rate of Change at (Rated V_R)	dv/dt	1000		$\text{V}/\mu\text{s}$
Operating Junction Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES:

1. Thermal Resistance from Junction to Case per leg.
2. Pulse Test: 300 μs Pulse Width, 2% Duty Factor.
3. 2.0 μs Pulse Width, $f=1.0$ KHz.

RATINGS AND CHARACTERISTIC CURVES MBR4050PT AND MBR4060PT

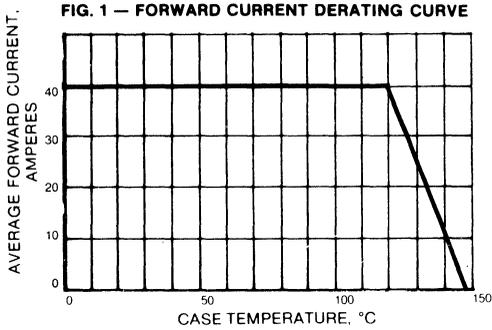


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

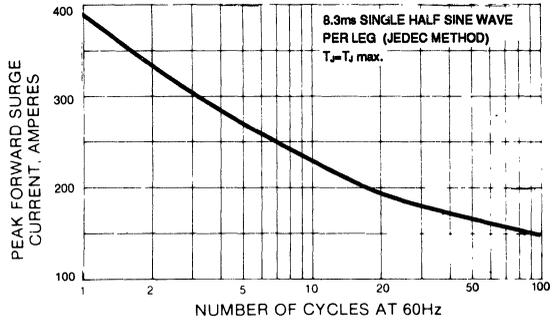


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

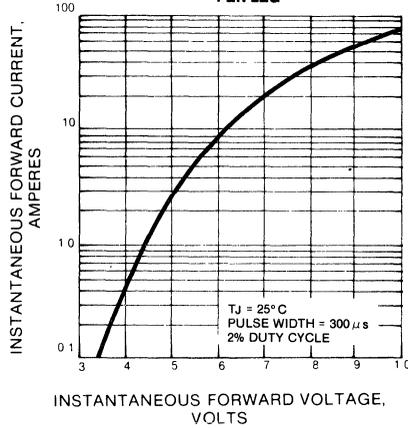
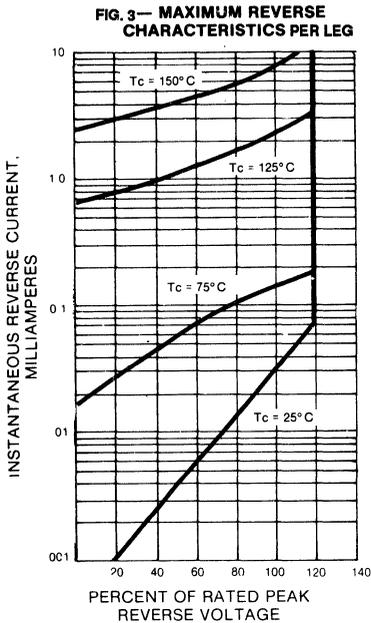
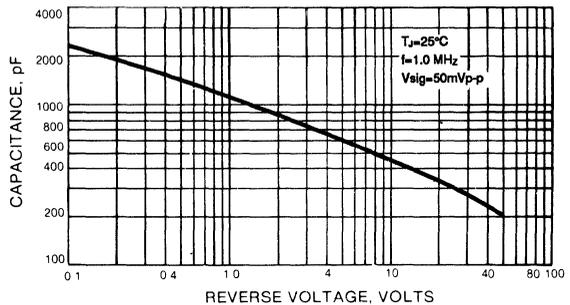


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER LEG



FAST EFFICIENT RECTIFIERS

1.0 AMPERE TO 30.0 AMPERES

**SEE
NEW
ISOLATED
PACKAGES**



**GENERAL
INSTRUMENT**

LOW CURRENT AXIAL FAST EPITAXIAL RECTIFIERS

TYPE	FE1A thru FE1A	GI1001 thru GI1004	FE2A thru FE2D	BYV27-50 thru BYV27-200	GI1101 thru GI1104	FE3A thru FE3D	BYV28-50 thru BYV28-200	FE5A thru FE5D	FE6A thru FE6D	GI1301 thru GI1304
PACKAGE	DO-204AP	DO-204AP	DO-204AP	DO-204AP	DO-204AP	G4	G4	G4	G4	G4
I _O (A)	1.0	1.0	2.0	2.0	2.5	3.0	3.5	5.0	6.0	6.0
VR-50(V)	FE1A	GI1001	FE2A	BYV27-50	GI1101	FE3A	BYV28-50	FE5A	FE6A	GI1301
VR-100(V)	FE1B	GI1002	FE2B	BY27-100	GI1102	FE3B	BYV28-100	FE5B	FE6B	GI1302
VR-150(V)	FE1C	GI1003	FE2C	BY27-150	GI1103	FE3C	BYV28-150	FE5C	FE6C	GI1303
VR-200(V)	FE1D	GI1004	FE2D	BYV27-200	GI1104	FE3D	BYV28-200	FE5D	FE6D	GI1304
VR-300(V)										
VR-400(V)										
VR-500(V)										
VR-600(V)										
VR-800(V)										
VR-1000(V)										
TRR(nS)	35	25/35	35	25	25/35	35	30	35	35	30/50

LOW CURRENT AXIAL FAST EFFICIENT RECTIFIERS

(cont.)

TYPE	EGP10A thru EGP10D	EGP20A thru EGP20D	EGP30A thru EGP30D	EGP50A thru EGP50D	UF4001 thru UF4007	UF5400 thru UF5408
PACKAGE	DO-41	DO-15	GP-20	GP20	DO-41	DO-201AD
I _O (A)	1.0	2.0	3.0	5.0	1.0	3.0
VR-50(V)	EGP10A	EGP20A	EGP30A	EGP50A	UF4001	UF5400
VR-100(V)	EGP10B	EGP20B	EGP30B	EGP50B	UF4002	UF5401
UV-150(V)	EGP10C	EGP20C	EGP30C	EGP50C		
VR-200(V)	EGP10D	EGP20D	EGP30D	EGP50D	UF4003	UF5402
VR-300(V)	EGP10F	EGP20F	EGP30F	EGP50F		UF5403
VR-400(V)	EGP10G	EGP20G	EGP30G	EGP50G	UF4004	UF5404
UV-500(V)						UF5405
VR-600(V)					UF4005	UF5406
VR-800(V)					UF4006	UF5407
VR-1000(V)					UF4007	UF5408
TRR(nS)	50	50	50	50	50/75	50/75

MEDIUM CURRENT FAST EFFICIENT RECTIFIERS

SINGLE RECTIFIERS

TYPE	FESF8AT thru FESF8JT	FES8AT thru FES8JT	GI1401 thru GI1404	BYW29-50 thru BYW29-200	FESF16AT thru FESF16JT	FES16AT thru FES16JT
PACKAGE	ITO-220	TO-220	TO-220	TO-220	ITO-220	TO-220
IO(A)	8	8	8	8	16	16
VR=50(V)	FESF8AT	FES8AT	GI1401	BYW29-50	FESF16AT	FES16AT
VR=100(V)	FESF86T	FES86T	GI1402	BYW29-100	FESF16BT	FES16BT
VR=150(V)	FESF8CT	FES8CT	GI1403	BYW29-150	FESF16CT	FES16CT
VR=200(V)	FESF8DT	FES8DT	GI1404	BYW29-200	FESF16DT	FES16DT
VR=300(V)	FESF8FT	FES8FT			FESF16FT	FES16FT
VR=400(V)	FESF8GT	FES8GT			FESF16GT	FES16GT
VR=500(V)	FESF8HT	FES8HT			FESF16HT	FES16HT
VR=600(V)	FESF8JT	FES8JT			FESF16JT	FES16JT
TRR(nS)	35/50	35/50	35	25	35/50	35/50

MEDIUM CURRENT FAST EFFICIENT RECTIFIERS

DUAL RECTIFIERS

TYPE	FEPF6AT thru FEPF6DT	FEP6AT thru FEP6DT	FEPF16AT thru FEPF16JT	FEP16AT thru FEP16JT	GI2401 thru GI2404	BYV32-50 thru BYV32-200	FEPF30AP thru FEPF30JP	FEP30AP thru FEP30JP
PACKAGE	ITO-220CT	TO-220CT	ITO-220CT	TO-220CT	TO-220CT	TO-220CT	ITO-30	TO-3P
IO(A)	6	6	16	16	16	18	30	30
VR=50(V)	FEPF6AT	FEP6AT	FEPF16AT	FEP16AT	GI2401	BYV32-50	FEPF30AP	FEP30AP
VR=100(V)	FEPF6BT	FEP6BT	FEPF16BT		GI2402	BYV32-100	FEPF30BP	FEP30BP
VR=150(V)	FEPF6CT	FEP6CT	FEPF16CT	FEP16CT	GI2403	BYV32-150	FEPF30CP	FEP30CP
VR=200(V)	FEPF6DT	FEP6DT	FEPF16DT	FEP16DT	GI2404	BYV32-200	FEPF30DP	FEP30DP
VR=300(V)			FEPF16FT	FEP16FT			FEPF30PT	FEP30PT
VR=400(V)			FEPF16GT	FEP16GT			FEPF30GP	FEP30GP
VR=500(V)			FEPF16HT	FEP16HT			FEPF30HP	FEP30HP
VR=600(V)			FEPF16JT	FEP16JT			FEPF30JP	FEP30JP
TRR(nS)	35	35	35/50	35/50	35	25	35/50	35/50

**GLASS PASSIVATED
FAST EPITAXIAL
RECTIFIERS**

1.0 AMPERE TO 6.0 AMPERES

**GENERAL
INSTRUMENT**

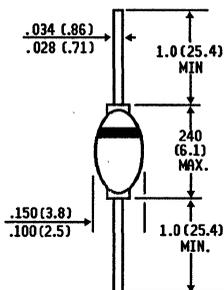
FE1A THRU FE1D

GLASS PASSIVATED FAST EFFICIENT RECTIFIER
Voltage - 50 to 200 Volts Current - 1.0 Amperes

FEATURES

PATENTED*

DO-204AP



Dimensions in inches and (millimeters)

*Braze-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times-epitaxial construction
- ◆ Low forward voltage, high current capability
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Hermetically sealed
- ◆ Low Leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ High temperature soldering guaranteed 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: Unitized glass hermetically sealed

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.002 ounce, 0.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	FE1A	FE1B	FE1C	FE1D	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _L = 75°C	I _(AV)	1.0				Amps
Peak Forward Surge Current 8.3 ms single half sine-wave superimposed on rated load (JEDEC Method) T _A = 55°C	I _{FSM}	30.0				Amps
Maximum Instantaneous Forward Voltage at 1.0A	V _F	0.95				Volts
Maximum DC Reverse Current T _A = 25°C at Rated DC Blocking Voltage T _A = 100°C	I _R	2.0 50.0				μA
Maximum Reverse Recovery Time (Note 1)	T _{RR}	35.0				Ns
Typical Junction Capacitance (Note 2)	C _J	45.0				pf
Typical Thermal Resistance (Note 3)	R _{θJA}	65				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175				°C

NOTES:

1. Reverse Recovery Test Conditions : I_F = 0.5A, I_R = 1.0A, recover to 0.25A.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths.

RATINGS AND CHARACTERISTIC CURVES FE1A THRU FE1D

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

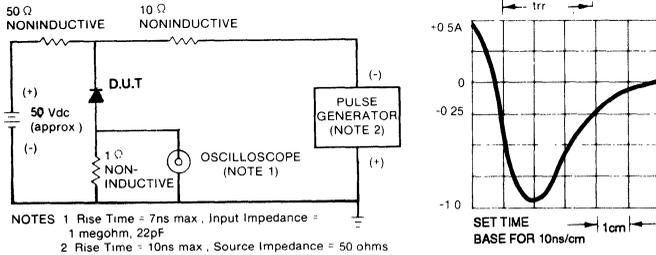


FIG 2-MAXIMUM AVERAGE FORWARD CURRENT DERATING

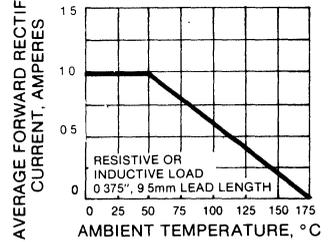


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

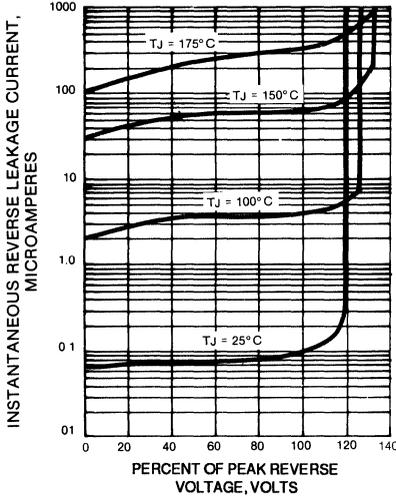


FIG 4-TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

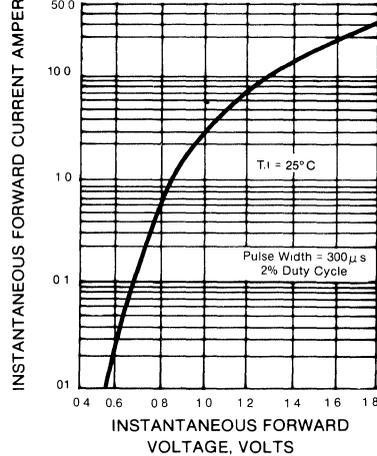


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

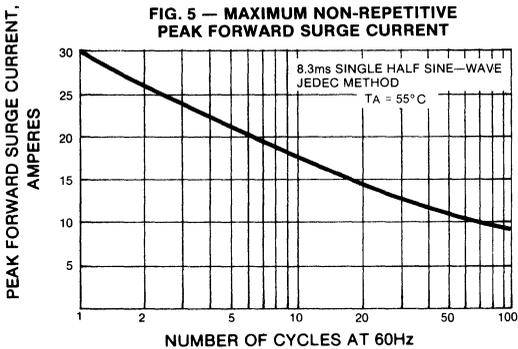
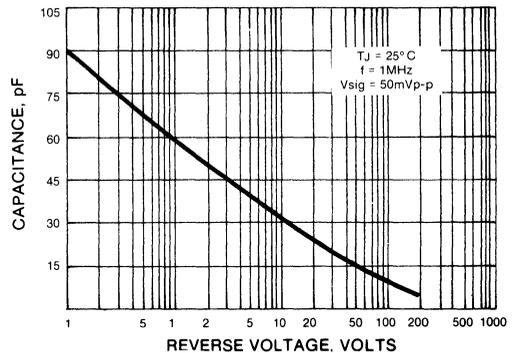


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



GI1001 THRU GI1004

MINIATURE GLASS PASSIVATED FAST EPITAXIAL RECTIFIER

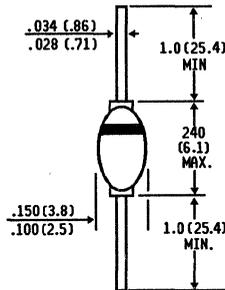
Voltage - 50 to 200 Volts Current - 1.0 Ampere

FEATURES

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times-epitaxial construction
- ◆ Low forward voltage, high current capability
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Hermetically sealed
- ◆ Low Leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ High temperature soldering guaranteed 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*

DO-204AP



Dimensions in inches and (millimeters)

* Brazed-Lead assembly is covered by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-204AP Unitized glass hermetically sealed

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.02 ounce, 0.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	GI1001	GI1002	GI1003	GI1004	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V_{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_L = 75^\circ\text{C}$	$I_{(AV)}$	1.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0				Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	0.975				Volts
Maximum DC Reverse Current $T_A = 25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A = 100^\circ\text{C}$	I_R	50.0				μA
Maximum Reverse Recovery Time $T_J = 25^\circ\text{C}$ (NOTE 1)	T_{RR}	25.0				nS
Typical Junction Capacitance (NOTE 2)	C_J	45.0				pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JL}$	20.0				$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175				$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, recover to 0.25A.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
3. Thermal Resistance from Junction to Lead at .375" (9.5mm) Lead Lengths, both leads attached to heat sinks.

RATINGS AND CHARACTERISTIC CURVES G11001 THRU G11004

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

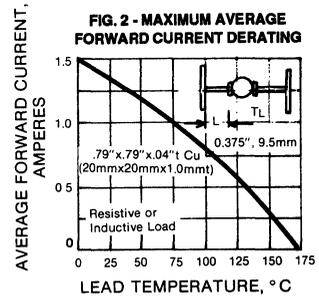
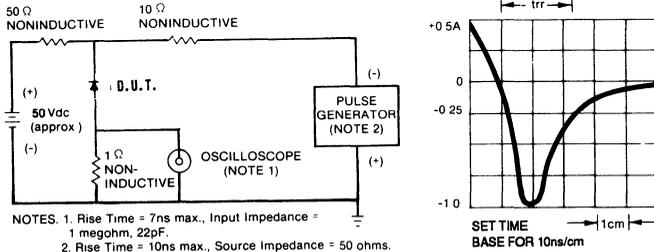


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

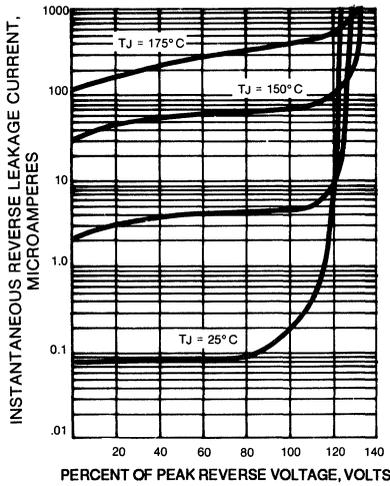


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

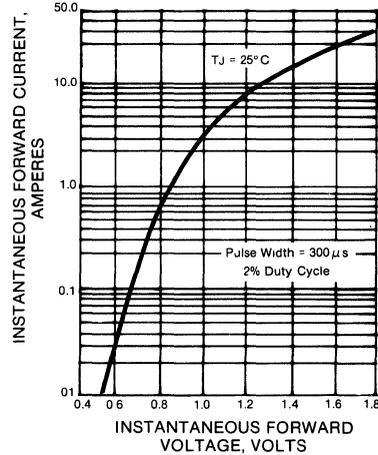


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

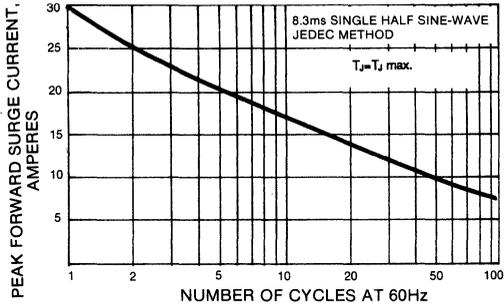
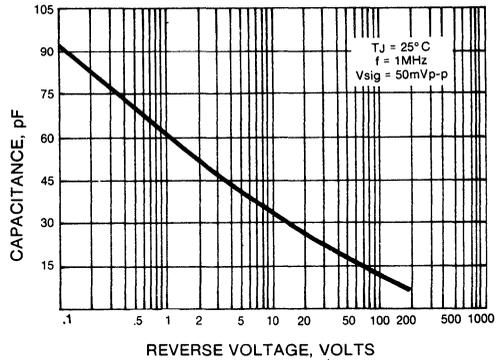


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



FE2A THRU FE2D

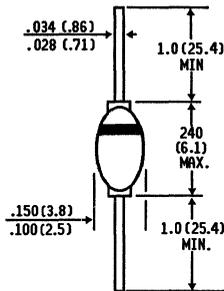
MINIATURE GLASS PASSIVATED FAST EPITAXIAL RECTIFIER

Voltage - 50 to 200 Volts Current - 2.0 Amperes

FEATURES

PATENTED*

DO-204AP



Dimensions in inches and (millimeters)

*Braze-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times-epitaxial construction
- ◆ Low forward voltage, high current capability
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Hermetically sealed
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204AP Unitized glass hermetically sealed

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.002 ounce, 0.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	FE2A	FE2B	FE2C	FE2D	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _L =75°C	I _(AV)	2.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) T _A =55°C	I _{FSM}	50.0				Amps
Maximum Instantaneous Forward Voltage at 1.0A	V _F	0.95				Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =150°C	I _R	50.0				µA
Maximum Reverse Recovery Time (NOTE 1) T _J =25°C (NOTE 1)	T _{RR}	35.0				nS
Typical Junction Capacitance (NOTE 2)	C _J	45.0				pf
Typical Thermal Resistance (NOTE 3)	R _{θJA}	60.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175				°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Vdc.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES FE2A THRU FE2D

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

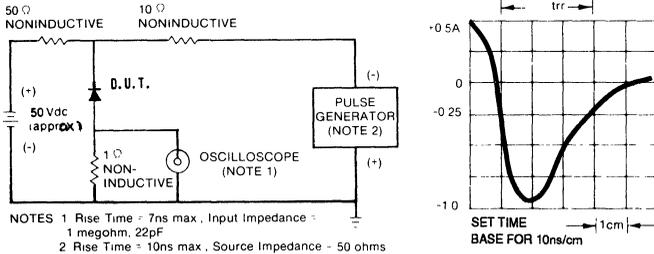


FIG. 2 - MAXIMUM AVERAGE FORWARD CURRENT DERATING

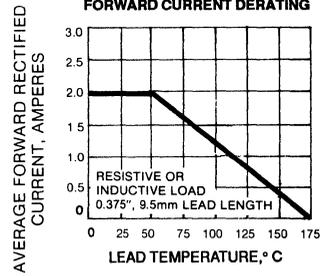


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

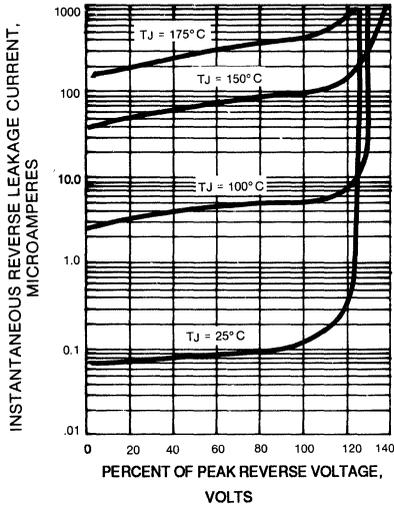


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

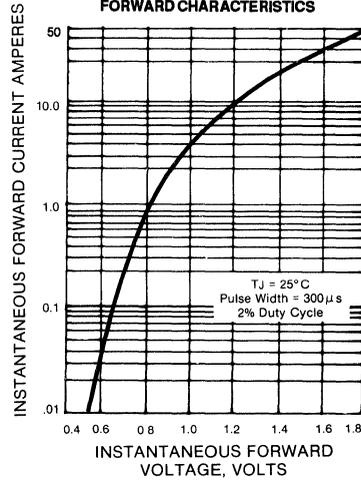


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

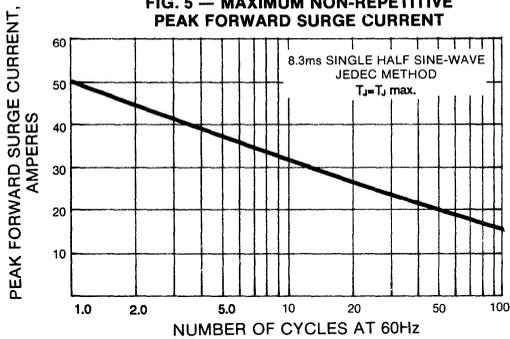
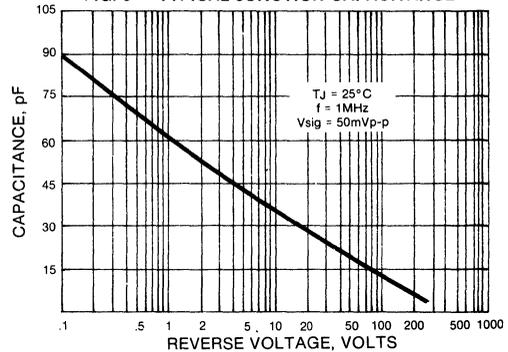


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



BYV27-50 THRU BYV27-200

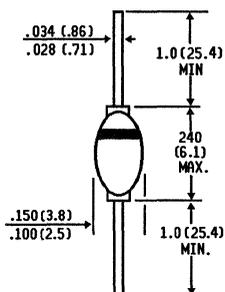
GLASS PASSIVATED FAST EPITAXIAL RECTIFIER

Voltage - 50 to 200 Volts Current - 2.0 Amperes

FEATURES

PATENTED*

DO-204AP



Dimensions in inches and (millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times-epitaxial construction
- ◆ Low forward voltage, high current capability
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Hermetically sealed
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375" (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204AP Unitized glass hermetically sealed

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.02 ounce, 0.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	BYV27-50	BYV27-100	BYV27-150	BYV27-200	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V_{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	150	200	Volts
Minimum Reverse Breakdown Voltage at 100 μ A	V_{BR}	55	110	165	220	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Lengths at $T_L=85^\circ\text{C}$	$I_{(AV)}$	2.0				Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed on rated load (JEDEC Method) $T_A=175^\circ\text{C}$	I_{FSM}	50.0				Amps
Maximum Instantaneous Forward Voltage at 3.0A $T_J=175^\circ\text{C}$ $T_J=25^\circ\text{C}$	V_F	0.88 1.07				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$ $T_A=165^\circ\text{C}$	I_R	1.0 150.0				μ A
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	25.0				nS
Typical Junction Capacitance (NOTE 2)	C_J	45.0				pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JL}$	20.0				$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175				$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, recover to 0.25A.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

3. Thermal Resistance from Junction to Lead at .375" (9.5mm) Lead Lengths, both leads attached to heatsinks.

RATINGS AND CHARACTERISTIC CURVES BYV27-50 THRU BYV27-200

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

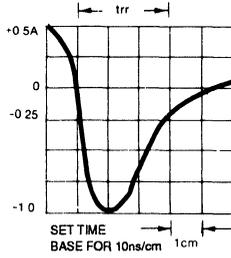
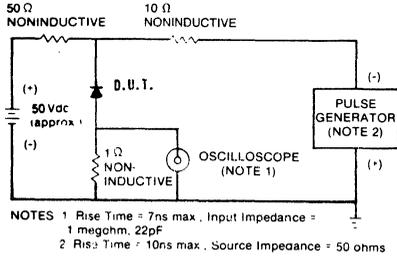


FIG. 2 - MAXIMUM AVERAGE FORWARD CURRENT DERATING

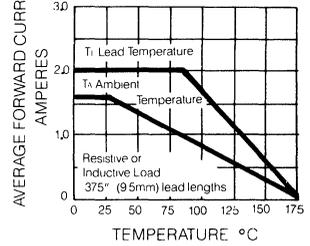


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

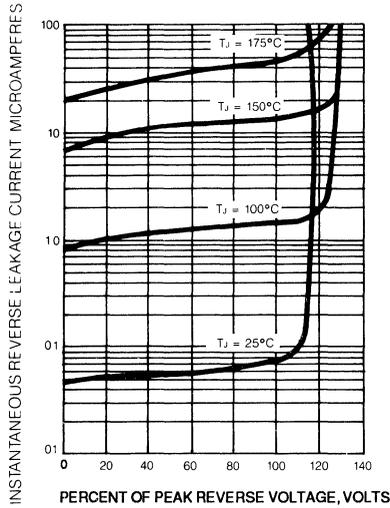


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

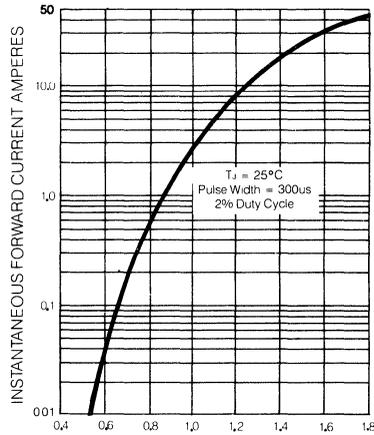


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

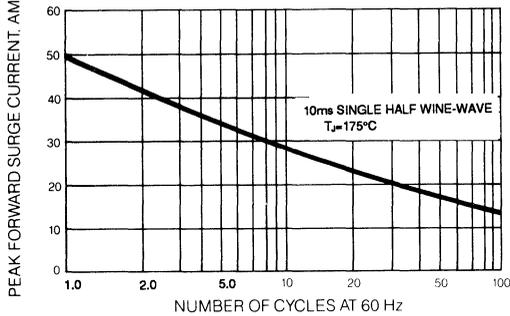
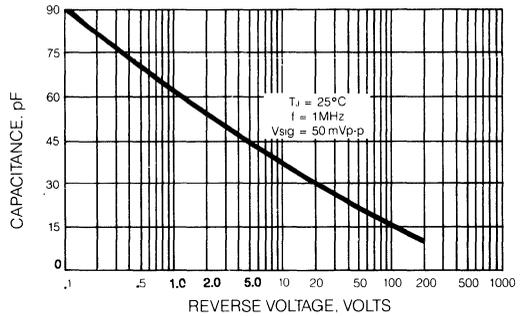


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



GI1101 THRU GI1104

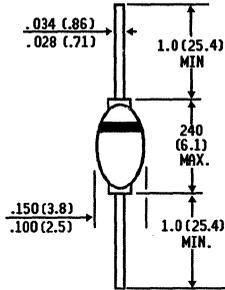
GLASS PASSIVATED FAST EPITAXIAL RECTIFIER

Voltage - 50 to 200 Volts Current - 2.5 Amperes

FEATURES

PATENTED*

DO-204AP



Dimensions in inches and (millimeters)

*Braze-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times-epitaxial construction
- ◆ Low forward voltage, high current capability
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Hermetically sealed
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204AP Unitized glass hermetically sealed

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.02 ounce, 0.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	GI1101	GI1102	GI1103	GI1104	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V_{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_L=75^\circ\text{C}$	$I_{(AV)}$	2.5			(NOTE 3) 2.0	Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0				Amps
Maximum Instantaneous Forward Voltage at 2.0A	V_F		.975		(NOTE 4) 1.25	Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R		2.0		10.0	μA
Maximum Reverse Recovery Time (NOTE 1)	T_{RR}		25.0		50.0	nS
Typical Junction Capacitance (NOTE 2)	C_J		45.0			pf
Typical Thermal Resistance (NOTE 5)	$R_{\theta JL}$		20.0			$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}		-65 to +175		-65 to +150	$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, recover to 0.25A.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
3. $T_L=55^\circ\text{C}$, .375" (9.5mm) Lead Length.
4. IFM=1.0ADC.
5. Thermal Resistance from Junction to Lead at .375" (9.5mm) Lead Lengths, both leads attached to heat sinks.

RATINGS AND CHARACTERISTIC CURVES GI1101 THRU GI1104

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

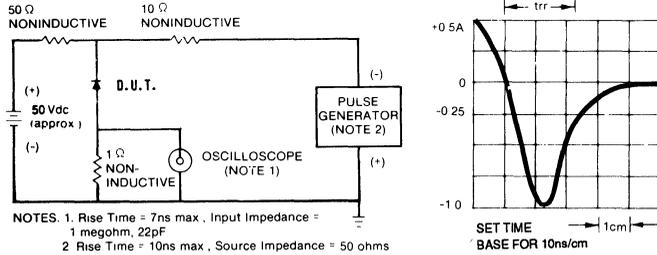


FIG. 2 — MAXIMUM AVERAGE FORWARD CURRENT RATING

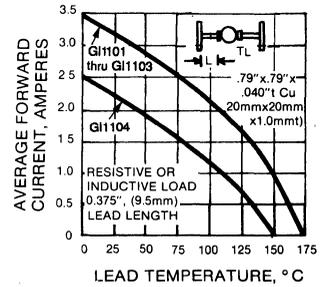


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

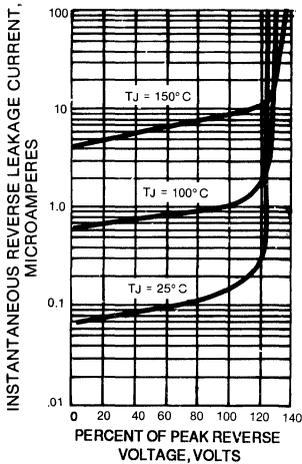


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

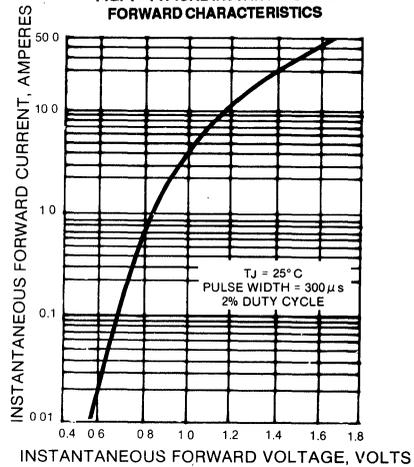


FIG. 4 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

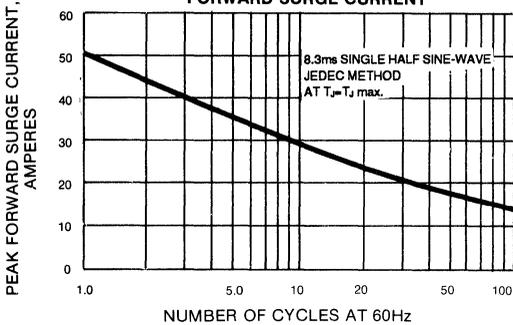
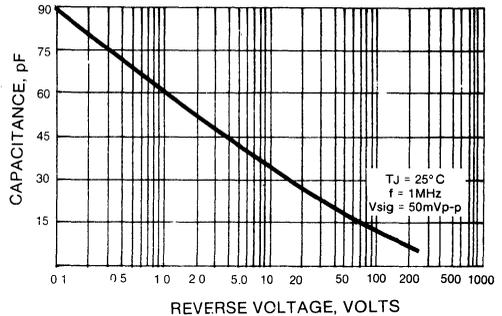


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



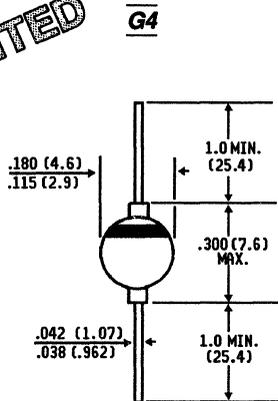
FE3A THRU FE3D

GLASS PASSIVATED FAST EPITAXIAL RECTIFIER

Voltage - 50 to 200 Volts Current - 3.0 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1978

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times-epitaxial construction
- ◆ Low forward voltage, high current capability
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Hermetically sealed
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: Unitized glass hermetically sealed

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.037 ounce, 1.04 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	FE3A	FE3B	FE3C	FE3D	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V_{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	3.0				Amps
Peak Forward Surge Current 8.3 ms single half sine-wave superimposed on rated load (JEDEC Method) $T_A=55^\circ\text{C}$	I_{FSM}	125.0				Amps
Maximum Instantaneous Forward Voltage at	V_F	0.95				Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	50.0				μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	35.0				nS
Typical Junction Capacitance (NOTE 2)	C_J	100.0				pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	55.0				$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175				$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, recover to 0.25A.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board mounted.

RATINGS AND CHARACTERISTIC CURVES FE3A THRU FE3D

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

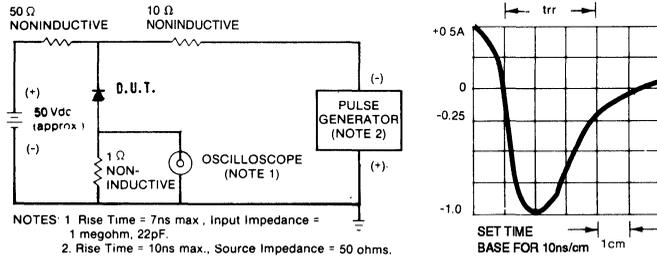


FIG. 2 - MAXIMUM AVERAGE FORWARD CURRENT DERATING

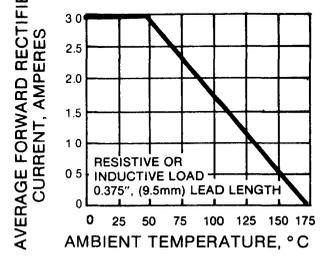


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

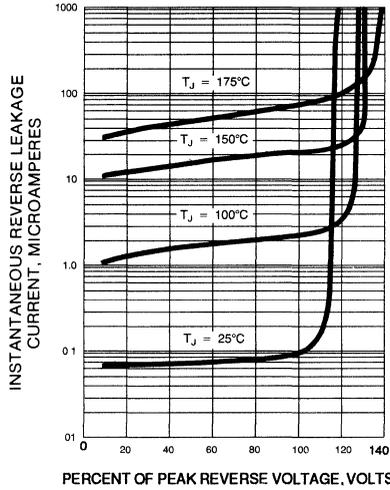


FIG. 4 — TYPICAL FORWARD CHARACTERISTICS

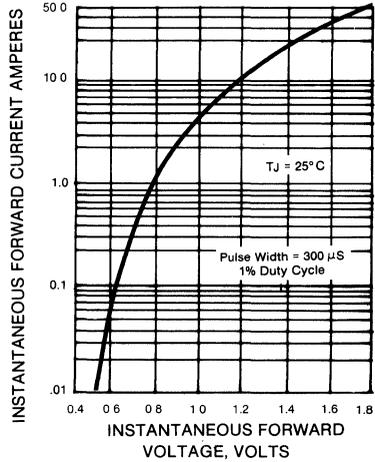


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

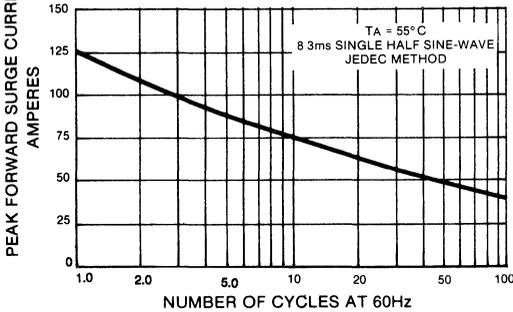
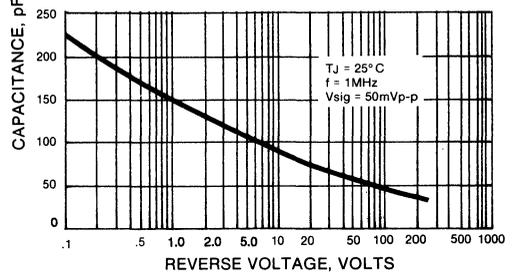


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



BYV28-50 THRU BYV28-200

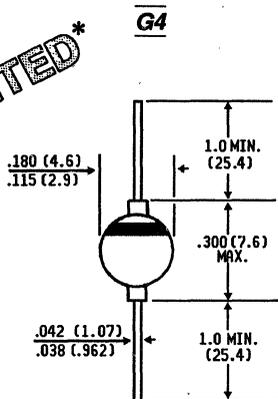
GLASS PASSIVATED FAST EPITAXIAL RECTIFIERS

Voltage - 50 to 200 Volts Current - 3.5 Amperes

FEATURES

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times-epitaxial construction
- ◆ Low forward voltage, high current capability
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Hermetically sealed
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: Unitized glass hermetically sealed

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.037 ounce, 7.4 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	BYV28-50	BYV28-100	BYV28-150	BYV28-200	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	Volts
Minimum Reverse Breakdown Voltage at 100 μA	V _{BR}	55	110	165	220	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _L =85°C	I _(AV)	3.5				Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed on rated load (JEDEC Method) T _A =175°C	I _{FSM}	90.0				Amps
Maximum Instantaneous Forward Voltage at 3.0A T _J =175°C T _J =25°C	V _F	0.89 1.1				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _A =25°C T _A =165°C	I _R	1.0 150.0				μA
Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	30.0				nS
Typical Junction Capacitance (NOTE 2)	C _J	100.0				pf
Typical Thermal Resistance (NOTE 3)	R _{θJL}	20.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175				°C

NOTES:

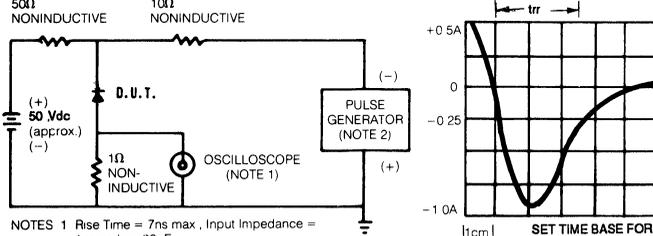
1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

3. Thermal Resistance from Junction to Lead at .375" (9.5mm) Lead Lengths, both leads attached to heatsinks.

RATINGS AND CHARACTERISTIC CURVES BYV28-50 THRU BYV28-200

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



NOTES 1 Rise Time = 7ns max, Input Impedance = 1 megohm, 22pF
2 Rise Time = 10ns max, Source Impedance = 50 ohms

FIG. 2 — MAXIMUM AVERAGE FORWARD CURRENT DERATING

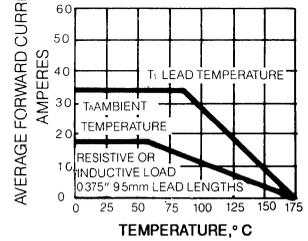


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

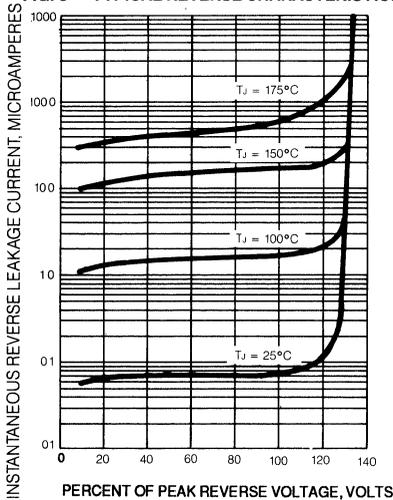


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

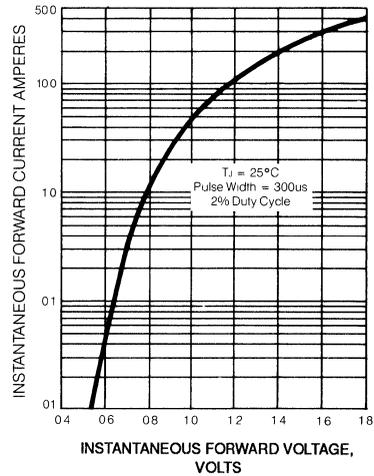


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

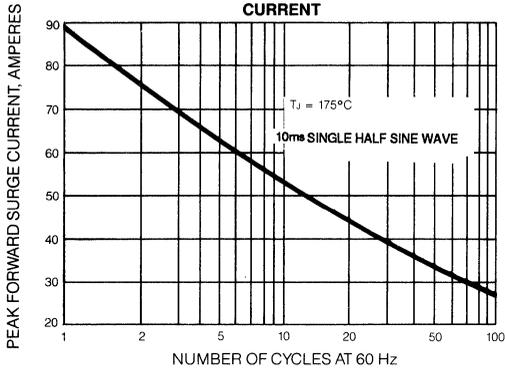
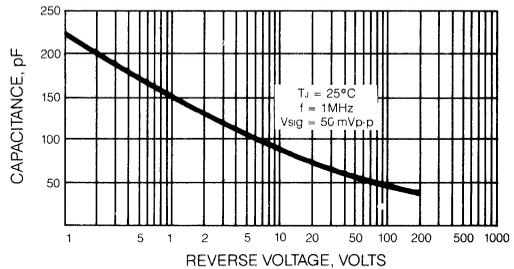


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



FE5A THRU FE5D

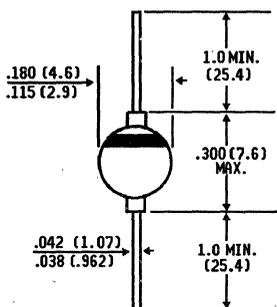
GLASS PASSIVATED FAST EPITAXIAL RECTIFIER

Voltage - 50 to 200 Volts Current - 5.0 Amperes

FEATURES

PATENTED*

G4



Dimensions in inches and (millimeters)

*Braze-lead assembly to Patent No. 3,930,306 of 1976

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times-epitaxial construction
- ◆ Low forward voltage, high current capability
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Hermetically sealed
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: Unitized glass hermetically sealed

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.037 ounce, 1.04 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	FE5A	FE5B	FE5C	FE5D	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _L =55°C	I _(AV)	5.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) T _A = 55°C	I _{FSM}	135.0				Amps
Maximum Instantaneous Forward Voltage at 5.0A	V _F	0.95				Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =150°C	I _R	50.0				μA
Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	35.0				nS
Typical Junction Capacitance (NOTE 2)	C _J	100.0				pf
Typical Thermal Resistance (NOTE 3)	R _{θJL}	20.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175				°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 V_{DC}.

3. Thermal Resistance from Junction to Lead at .375" (9.5mm) Lead Lengths, both leads attached to heatsinks.

RATINGS AND CHARACTERISTIC CURVES FE5A THRU FE5D

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

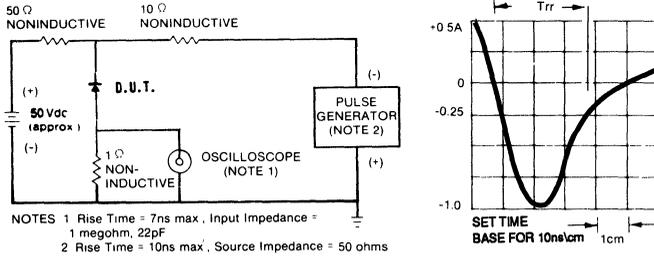


FIG. 2 - MAXIMUM AVERAGE FORWARD CURRENT DERATING

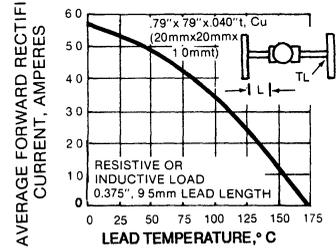


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

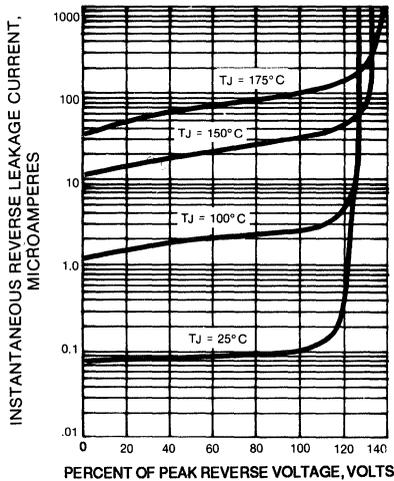


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

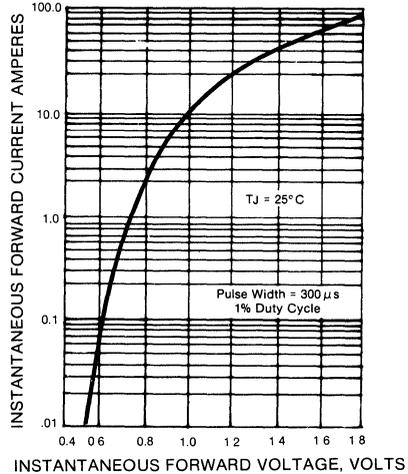


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

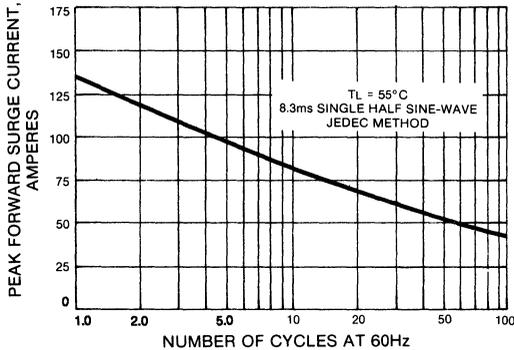
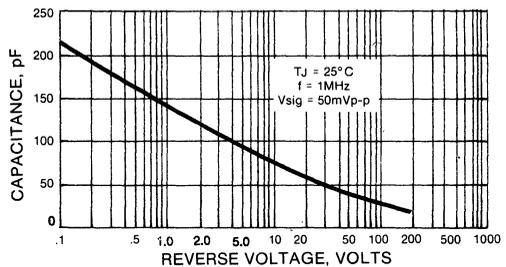


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



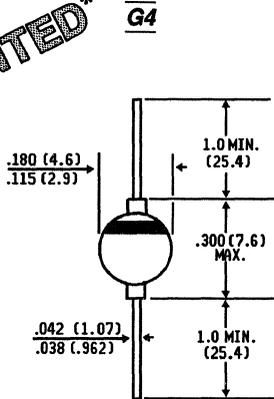
FE6A THRU FE6D

GLASS PASSIVATED FAST EFFICIENT RECTIFIER

Voltage - 50 to 200 Volts Current - 6.0 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

* Brazed - lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times-epitaxial construction
- ◆ Low forward voltage, high current capability
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Hermetically sealed
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: Unitized glass hermetically sealed

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.037 ounce, 1.04 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	FE6A	FE6B	FE6C	FE6D	UNITS
Maximum Recurrent Peak Reverse Voltage	VRRM	50	100	150	200	Volts
Maximum RMS Voltage	VRMS	35	70	105	140	Volts
Maximum DC Blocking Voltage	VDC	50	100	150	200	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _L =55°C	I _(AV)	6.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) T _A =55°C	I _{FSM}	135.0				Amps
Maximum Instantaneous Forward Voltage at 6.0A	V _F	0.975				Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =150°C	I _R	50.0				μA
Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	35.0				nS
Typical Junction Capacitance (NOTE 2)	C _J	100.0				pf
Typical Thermal Resistance (NOTE 3)	R _{ΘJL}	18.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175				°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R= 1.0A, recover to 0.25A.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 V_{DC}.

3. Thermal Resistance from Junction to Lead at .375" (9.5mm) Lead Lengths, both leads attached to heatsinks.

RATINGS AND CHARACTERISTIC CURVES FE6A THRU FE6D

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

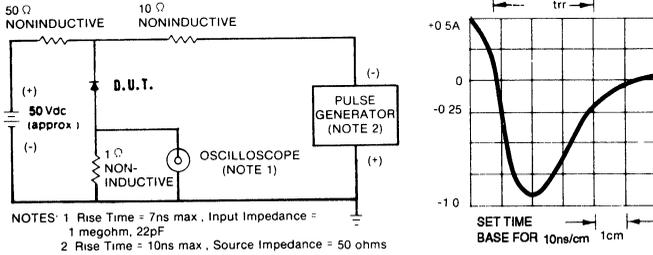


FIG. 2 - MAXIMUM AVERAGE FORWARD CURRENT DERATING

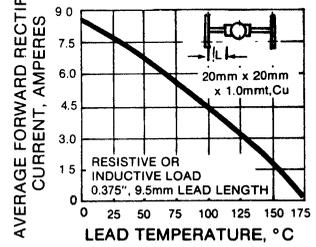


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

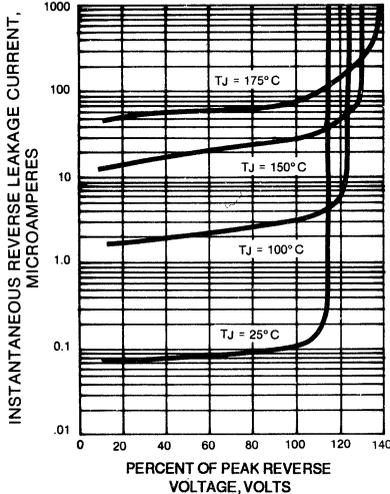


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

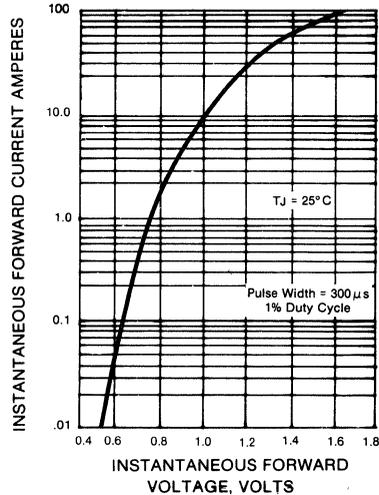


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

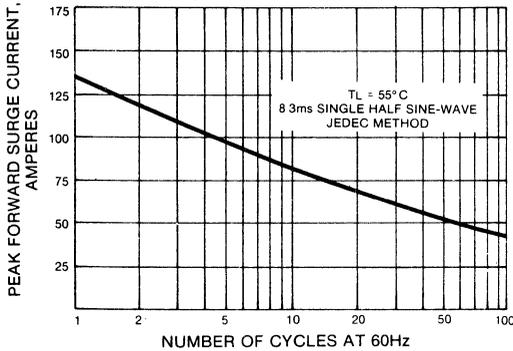
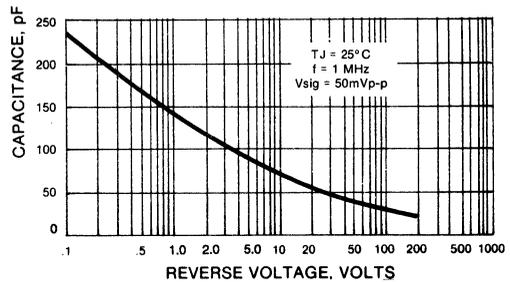


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



GI1301 THRU GI1304

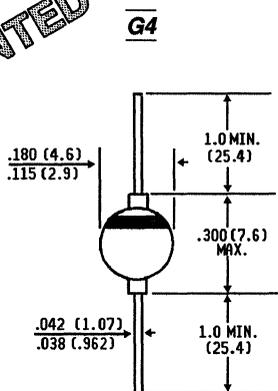
GLASS PASSIVATED FAST EFFICIENT RECTIFIER

Voltage - 50 to 200 Volts Current - 6.0 Amperes

FEATURES

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times-epitaxial construction
- ◆ Low forward voltage, high current capability
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Hermetically sealed
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*



Dimensions in inches and (millimeters)

* Brazed - lead assembly is covered by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: Unitized glass hermetically sealed

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.037 ounce, 1.04 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	GI1301	GI1302	GI1303	GI1304	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _L =75°C	I _(AV)	6.0			(NOTE 3) 5.0	Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0				Amps
Maximum Instantaneous Forward Voltage at 6.0A	V _F	0.925			(NOTE 4) 1.25	Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =100°C	I _R	5.0 150.0			20.0 500.0	μA
Maximum Reverse Recovery Time (NOTE 1)	T _{RR}	30.0			50.0	nS
Typical Junction Capacitance (NOTE 2)	C _J	95.0				pf
Typical Thermal Resistance (NOTE 5)	θ _{JL}	18.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175			-65 to +150	°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R = 1.0A, recover to 0.25A.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
3. T_L = 55°C, .375" (9.5mm) Lead Length.
4. I_{FSM} = 3.0A_{DC}.
5. Thermal Resistance from Junction to Lead at .375" (9.5mm) Lead Lengths, both leads attached to heatsinks.

RATINGS AND CHARACTERISTIC CURVES GI1301 THRU GI1304

FIG. 1 - REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

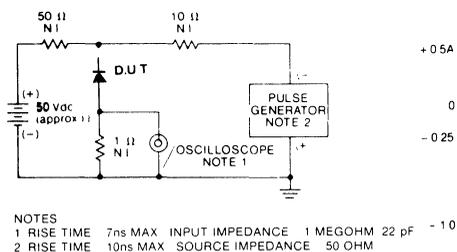


FIG. 2 - MAXIMUM AVERAGE FORWARD CURRENT DERATING

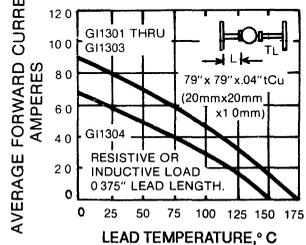


FIG. 3 - TYPICAL REVERSE CHARACTERISTICS

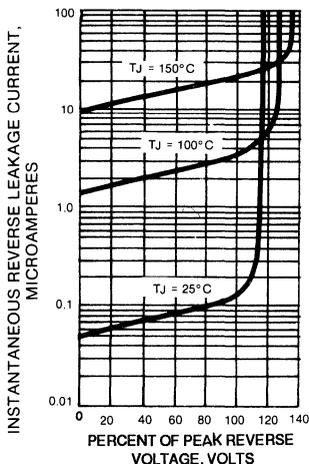


FIG. 5 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

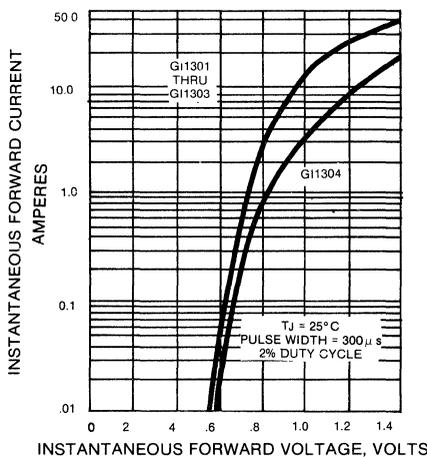


FIG. 4 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

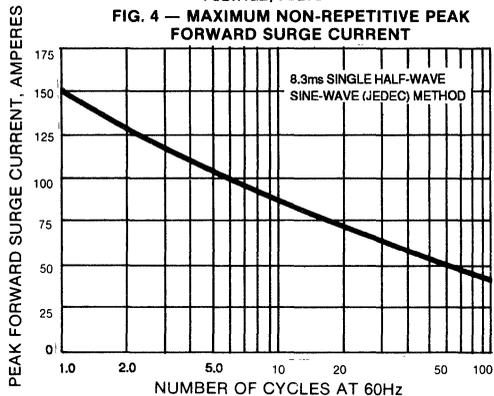
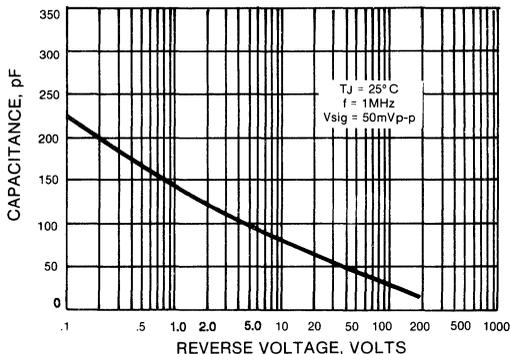


FIG. 6 - TYPICAL JUNCTION CAPACITANCE



SUPERRECTIFIER

**GLASS PASSIVATED
PLASTIC FAST EFFICIENT
RECTIFIERS**

1.0 AMPERE TO 5.0 AMPERES

**GENERAL
INSTRUMENT**

EGP10A THRU EGP10G

MINIATURE GLASS PASSIVATED FAST EFFICIENT RECTIFIER

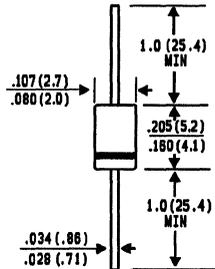
Voltage - 50 to 400 Volts Current - 1.0 Ampere

FEATURES

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times for high efficiency
- ◆ Low forward voltage, high current capability
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ Plastic package has Underwriters Laboratories Flammability Classification 94V-O
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*

DO-41



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, 0.3 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	EGP 10A	EGP 10B	EGP 10C	EGP 10D	EGP 10F	EGP 10G	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _A =55°C	I _(AV)	1.0						Amps
Peak Forward Surge Current 8.3 ms single half sine-wave superimposed on rated load T _A =55°C	I _{FSM}	30.0						Amps
Maximum Instantaneous Forward Voltage a 1.0A	V _F	0.95				1.25		Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =150°C	I _R	5.0						μA
Maximum Reverse Recovery Time (NOTE 1) T _J = 25°C	T _{RR}	50.0						nS
Typical Junction Capacitance (NOTE 2)	C _J	20.0				10.0		pf
Typical Thermal Resistance (NOTE 3)	R _{θJA}	50.0						°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150						°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{RT}=.25A.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

3. Thermal Resistance from Junction to Ambient, .375"(9.5mm) lead lengths, P.C. board mounted.

RATINGS AND CHARACTERISTIC CURVES EGP10A THRU EGP10G

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

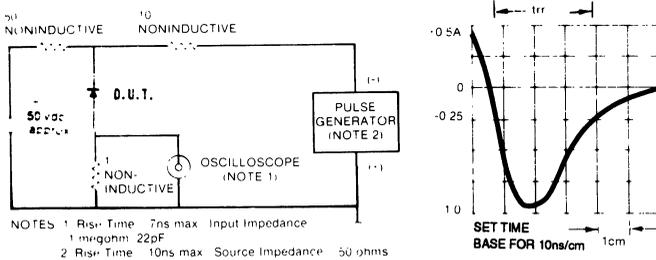


FIG. 2 - MAXIMUM AVERAGE FORWARD CURRENT DERATING

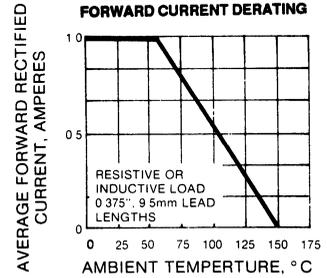


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

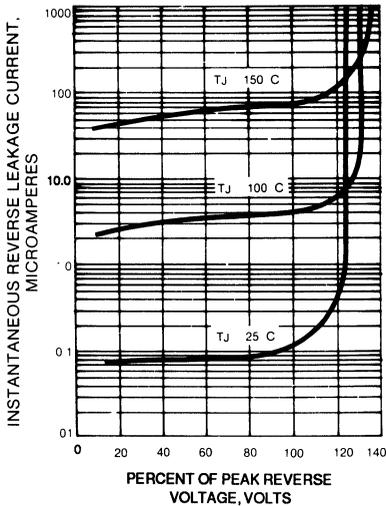


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

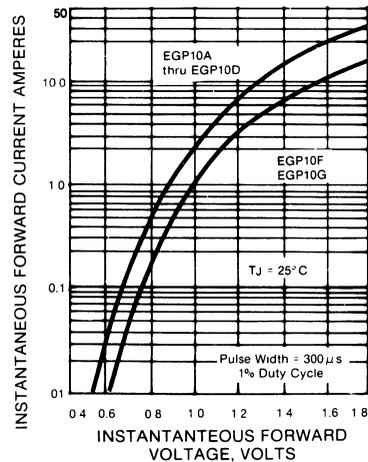


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

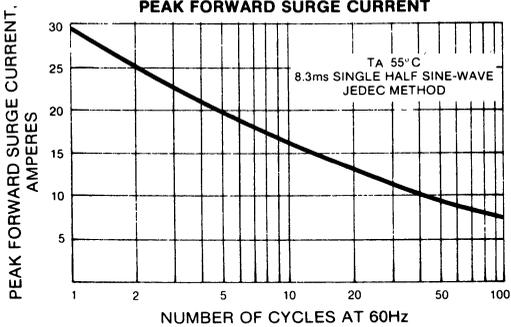
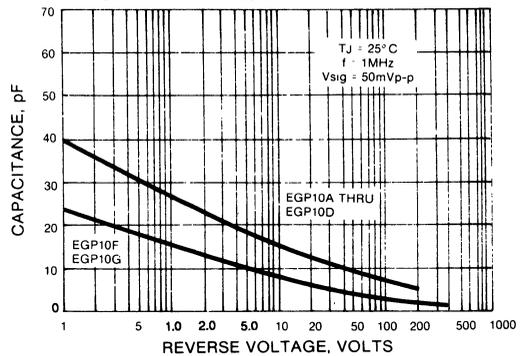


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



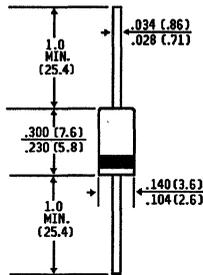
EGP20A THRU EGP20G

MINIATURE GLASS PASSIVATED FAST EFFICIENT RECTIFIER
Voltage - 50 to 400 Volts Current - 2.0 Amperes

FEATURES

PATENTED*

DO-15



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times for high efficiency
- ◆ Low forward voltage, high current capability
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ Plastic package has Underwriters Laboratories Flammability Classification 94V-O
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-15 Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.015 ounce, 0.4 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	EGP 20A	EGP 20B	EGP 20C	EGP 20D	EGP 20F	EGP 20G	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _A = 55°C	I _(AV)	2.0						Amps
Peak Forward Surge Current 8.3 ms single half sine-wave superimposed on rated load T _A =55°C	I _{FSM}	75.0						Amps
Maximum Instantaneous Forward Voltage a 1.0A	V _F	0.95			1.25			Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =150°C	I _R	5.0						μA
Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	50.0						nS
Typical Junction Capacitance (NOTE 2)	C _J	70.0			40.0			pf
Typical Thermal Resistance (NOTE 3)	R _{θJA}	30.0						°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150						°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{rr} = .25A.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
3. Thermal Resistance from Junction to Ambient, .375"(9.5mm) lead lengths, P.C. board mounted.

RATINGS AND CHARACTERISTIC CURVES EGP20A THRU EGP20G

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

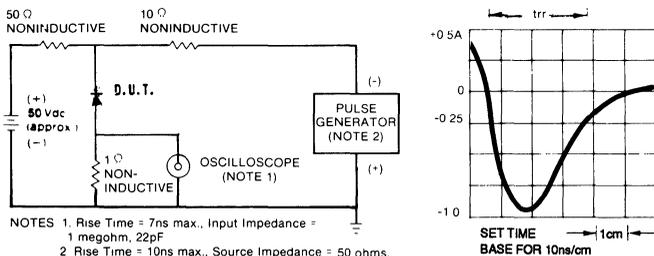


FIG. 2 - MAXIMUM AVERAGE FORWARD CURRENT DERATING

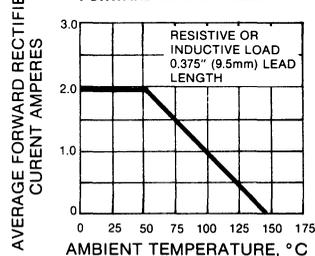


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

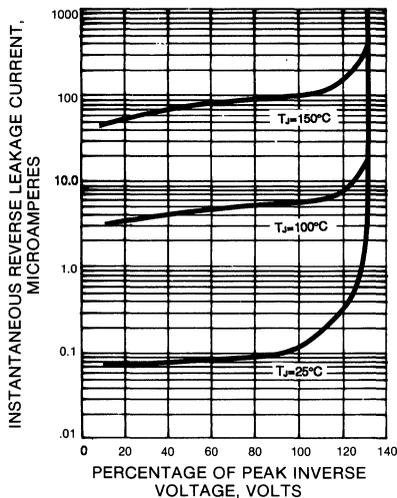


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

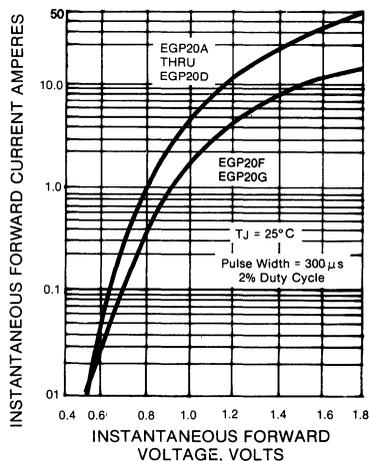


FIG. 5 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

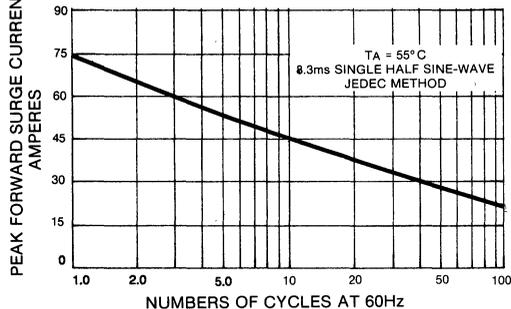
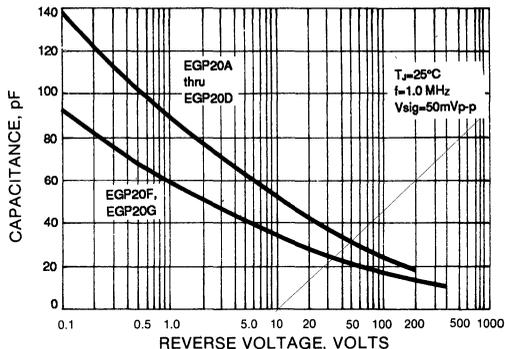


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



EGP30A THRU EGP30G

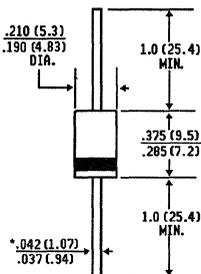
GLASS PASSIVATED FAST EFFICIENT RECTIFIER

Voltage - 50 to 400 Volts Current - 3.0 Amperes

FEATURES

PATENTED*

**DO-201AA
MODIFIED**



*(Not to JEDEC Dimensions)

Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times for high efficiency
- ◆ Low forward voltage, high current capability
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ Plastic package has Underwriters Laboratories Flammability Classification 94V-O
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-201AA Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.03 ounce, 0.8 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	EGP 30A	EGP 30B	EGP 30C	EGP 30D	EGP 30F	EGP 30G	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _A =55°C	I _(AV)	3.0						Amps
Peak Forward Surge Current 8.3 ms single half sine-wave superimposed on rated load T _A =55°C	I _{FSM}	125.0						Amps
Maximum Instantaneous Forward Voltage a 3.0A	V _F	0.95			1.25			Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =150°C	I _R	5.0			50.0			µA
Typical Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	50.0						nS
Typical Junction Capacitance (NOTE 2)	C _J	90.0			55.0			pf
Typical Thermal Resistance (NOTE 3)	R _{θJA}	55.0						°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150						°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{rr}=25A.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
3. Thermal Resistance from Junction to Ambient, .375"(9.5mm) lead lengths, P.C. board mounted.

RATINGS AND CHARACTERISTIC CURVES EGP30A THRU EGP30G

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

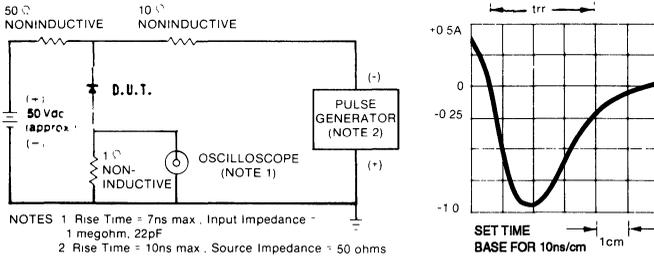


FIG. 2 — MAXIMUM AVERAGE FORWARD CURRENT RATING

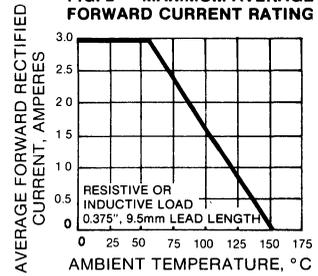


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

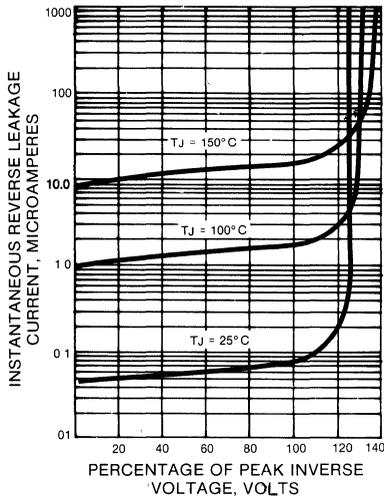


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

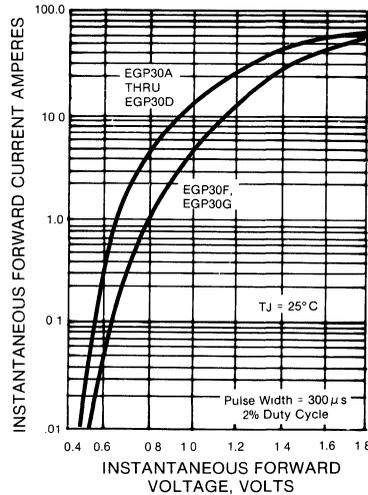


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

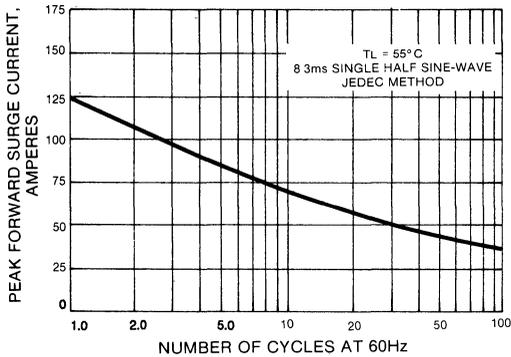
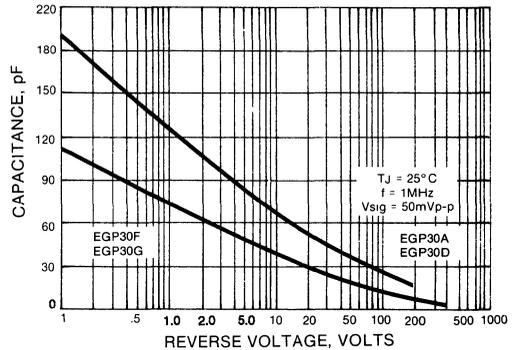


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



EGP50A THRU EGP50G

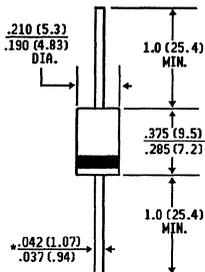
GLASS PASSIVATED FAST EFFICIENT RECTIFIER

Voltage - 50 to 400 Volts Current - 5.0 Amperes

FEATURES

PATENTED*

**DO-201AA
MODIFIED**



*(Not to JEDEC Dimensions)

- ◆ Glass passivated cavity-free junction
- ◆ Superfast recovery times for high efficiency
- ◆ Low forward voltage, high current capability
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature metallurgically bonded, no compression contacts
- ◆ Plastic package has Underwriters Laboratories Flammability Classification 94V-O
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375"; (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-201AA Molded plastic over glass

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.03 ounce, 0.8 gram

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	EGP 50A	EGP 50B	EGP 50C	EGP 50D	EGP 50F	EGP 50G	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _L =55°C	I _(AV)	5.0						Amps
Peak Forward Surge Current 8.3 ms single half sine-wave superimposed on rated load T _L =55°C	I _{FSM}	150.0						Amps
Maximum Instantaneous Forward Voltage a 3.0A	V _F	0.95			1.25			Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =150°C	I _R	50.0						µA
Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	50.0						nS
Typical Thermal Resistance (NOTE 3)	R _{θJL}	20.0						°C/W
Typical Junction Capacitance (NOTE 2)	C _J	100.0						pf
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150						°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{rr}=.25A.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

3. Thermal Resistance from Junction to Lead at .375", 9.5mm Lead Lengths, both leads to heatsink.

RATINGS AND CHARACTERISTIC CURVES EGP50A THRU EGP50G

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

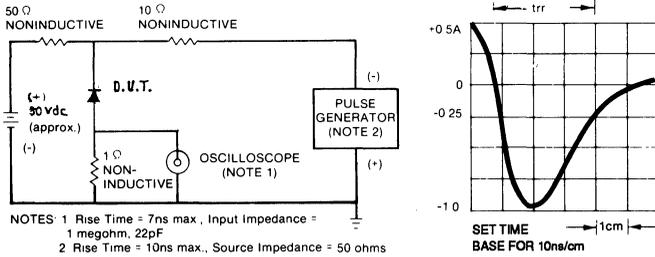


FIG. 2 — MAXIMUM AVERAGE FORWARD CURRENT RATING

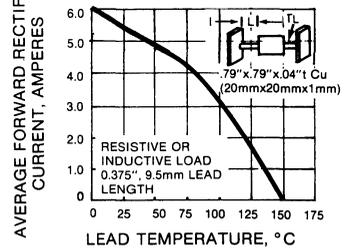


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

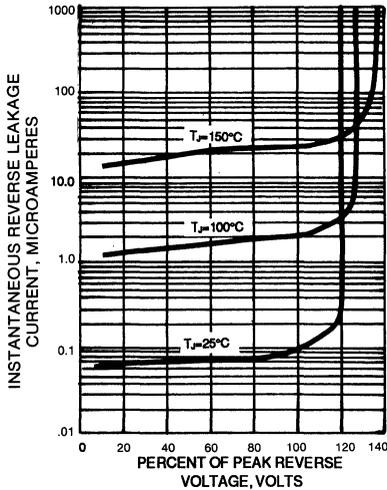


FIG. 4 — TYPICAL FORWARD CHARACTERISTICS

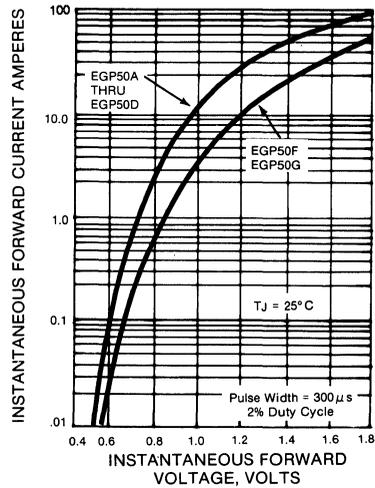


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

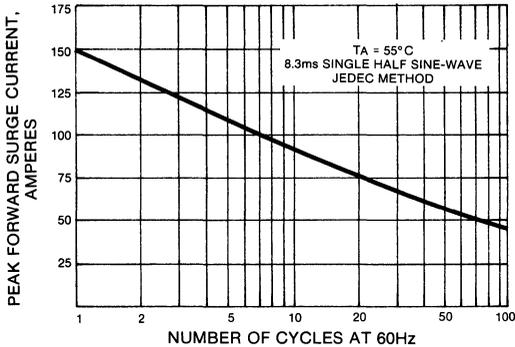
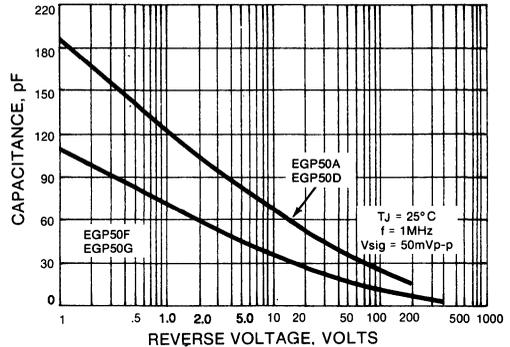


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



**GENERAL
INSTRUMENT**

PLASTIC FAST EFFICIENT RECTIFIERS

1.0 AND 3.0 AMPERES

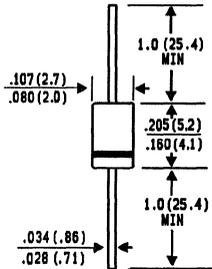
**GENERAL
INSTRUMENT**

UF4001 THRU UF4007

MINIATURE ULTRAFAST EFFICIENT PLASTIC RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 1.0 Ampere

FEATURES

DO-41



Dimensions in inches and (millimeters)

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Low cost
- ◆ Ultrafast recovery times for high efficiency
- ◆ Low Forward Voltage
- ◆ Low Leakage
- ◆ High Surge Capability
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds/.375" (9.5mm) lead lengths at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes Cathode end
Weight: 0.012 ounce, 0.3 gram
Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

		UF	UF	UF	UF	UF	UF	UF	
	SYMBOLS	4001	4002	4003	4004	4005	4006	4007	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375" (9.5mm) Lead Length $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0							Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.0			1.7			Volts	
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	10.0			50.0			μA	
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{rr}	50.0			75.0			nS	
Typical Junction Capacitance (NOTE 2)	C_J	20.0			15.0			pF	
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0						$^\circ\text{C}/\text{W}$	
Operating and Storage Temperature Range	T_J, T_{STG}	-50 to +150							$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
2. Measured at 1 MHz and applied reverse voltage of 4.0 Volts.
3. Thermal Resistance from Junction to Ambient, .375", 9.5mm Lead Lengths, P.C. board mounted.

RATINGS AND CHARACTERISTIC CURVES UF4001 THRU UF4007

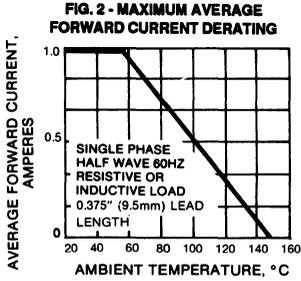


FIG. 2 — TYPICAL FORWARD CHARACTERISTICS

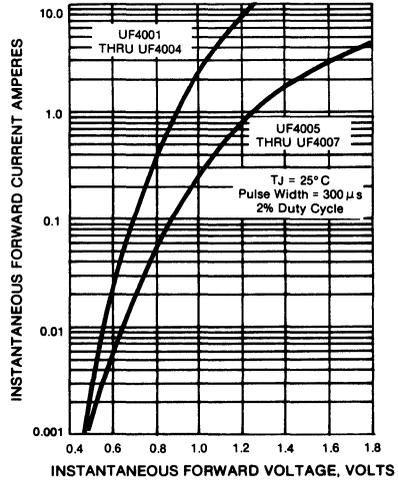


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

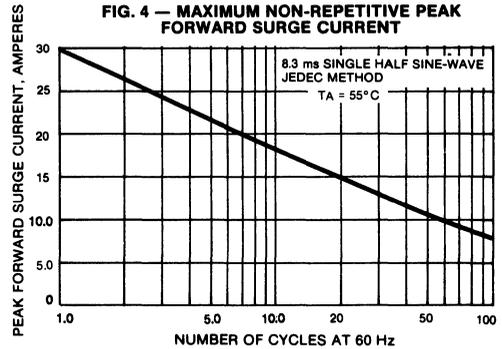
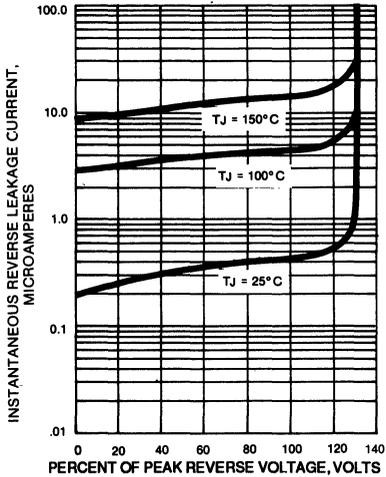


FIG. 6 — TYPICAL JUNCTION CAPACITANCE

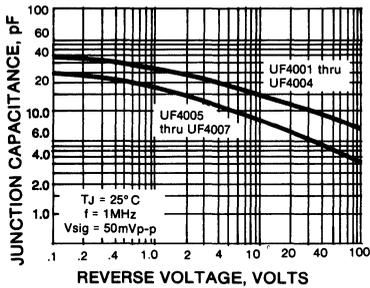
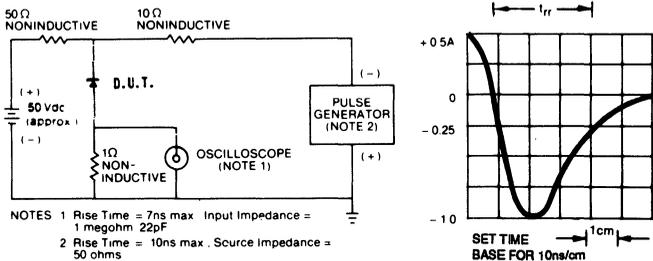


FIG. 5 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



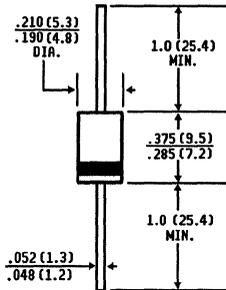
UF5400 THRU UF5408

ULTRAFAST EFFICIENT PLASTIC RECTIFIER

Voltage - 50 to 1000 Volts Current - 3.0 Amperes

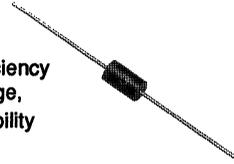
FEATURES

DO-201AD



Dimensions in inches
and
(millimeters)

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Low cost
- ◆ Ultrafast recovery times for high efficiency
- ◆ Low forward voltage, high current capability
- ◆ Low leakage
- ◆ High surge capability
- ◆ High temperature soldering guaranteed: 250°C .375"(9.5mm) lead lengths for 10 seconds at 5 lbs. (2.3 kg) tension



MECHANICAL DATA

Case: JEDEC DO-201AD, molded plastic

Terminals: Axial Leads solderable per MIL-STD-202, Method 208

Polarity: Color band denotes Cathode end

Mounting Position: Any

Weight: 0.04 ounce, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	UF 5400	UF 5401	UF 5402	UF 5403	UF 5404	UF 5405	UF 5406	UF 5407	UF 5408	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	300	400	500	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	210	280	350	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	300	400	500	600	800	1000	Volts
Maximum Average Forward Rectified Current, .375" (9.5 mm) Lead Length at T _A =55°C	I _(AV)	3.0									Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) T _A =55°C	I _{FSM}	150.0									Amps
Maximum Instantaneous Forward Voltage at 3.0A	V _F	1.0				1.7				Volts	
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =100°C	I _R	10.0				50.0				µA	
Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	50.0				75.0				nS	
Typical Junction Capacitance (NOTE 2)	C _J	75.0				50.0				pf	
Maximum Thermal Resistance (NOTE 3)	R _{θJL}	20.0									°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-50 to +150									°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.

2. Measure at 1MHz and applied reverse voltage of 4.0 volts.

3. Thermal Resistance from Junction to Lead, .375"(9.5mm) lead lengths, both leads attached to heatsink.

RATINGS AND CHARACTERISTIC CURVES UF5400 THRU UF5408

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

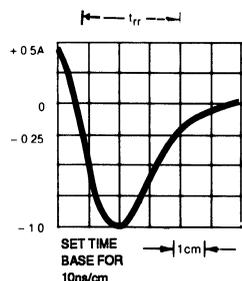
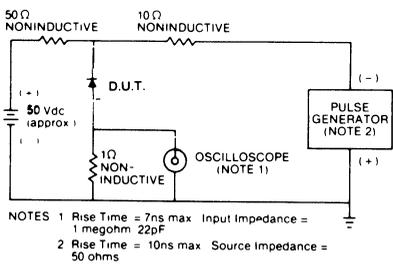


FIG. 2 — MAXIMUM AVERAGE FORWARD CURRENT RATING

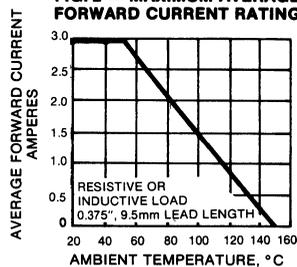


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

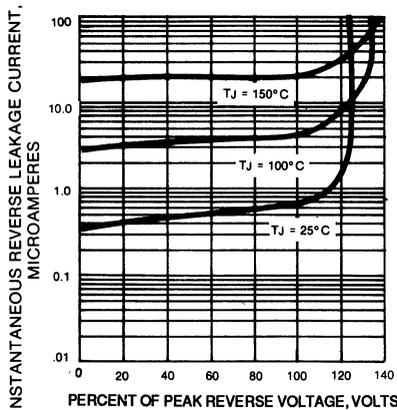


FIG. 4 — TYPICAL FORWARD CHARACTERISTICS

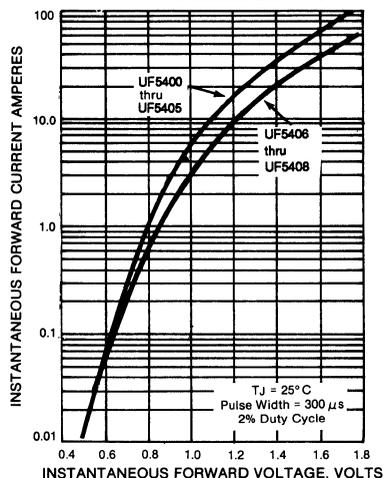


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

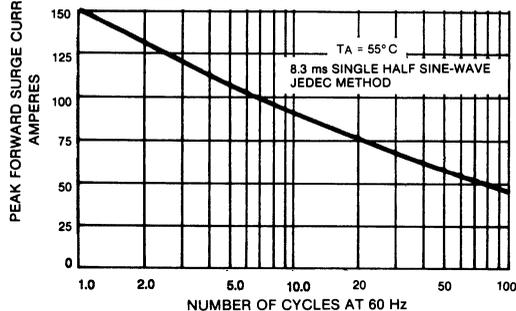
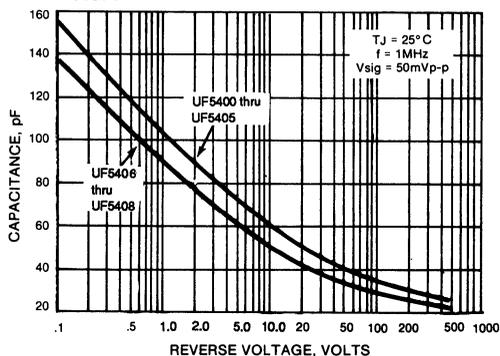


FIG. 6 — TYPICAL JUNCTION CAPACITANCE



**MEDIUM CURRENT
FAST EFFICIENT
RECTIFIERS**

6.0 TO 30.0 AMPERES

**SEE
NEW
ISOLATED
PACKAGES**



**GENERAL
INSTRUMENT**

FEPF6AT THRU FEPF6DT

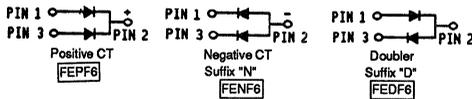
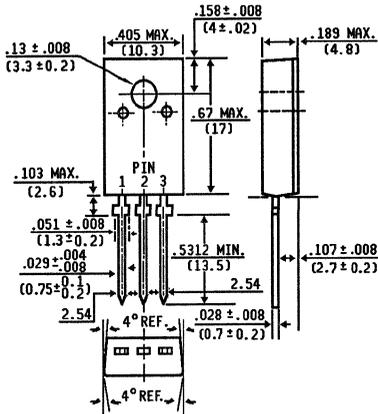
FAST EFFICIENT GLASS PASSIVATED RECTIFIER
Voltage - 50 to 200 Volts Current - 6.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive center-tap
- ◆ Isolated Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junctions
- ◆ Superfast recovery times for high efficiency
- ◆ Low power loss
- ◆ Low forward voltage, high current capability
- ◆ For use in low voltage, high frequency inverters, free wheeling and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C, .25", (6.35mm) from case for 10 seconds
- ◆ Internal Insulation: 1.5k VRMS



ITO-220 CT



MECHANICAL DATA

Case: ITO-220 fully overmolded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Mounting Torque: 5 in.-lb. max.

Weight: 0.08 ounce, 2.24 gram

Dimensions in inches and millimeters

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	FEPF6AT	FEPF6BT	FEPF6CT	FEPF6DT	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V_{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_C=55^\circ C$	$I_{(AV)}$	6.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) $T_A=55^\circ C$	I_{FSM}	100.0				Amps
Maximum Instantaneous Forward Voltage per leg at 3.0A	V_F	0.975				Volts
Maximum DC Reverse Current $T_A=25^\circ C$ at Rated DC Blocking Voltage $T_A=100^\circ C$	I_R	50.0				μA
Maximum Reverse Recovery Time (NOTE 1) per leg $T_J = 25^\circ C$	T_{RR}	35.0				nS
Typical Thermal Resistance (NOTE 2)	$R_{\theta JC}$	4.0				$^\circ C/W$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150				$^\circ C$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5A$, $I_R=1.0A$, recover to 0.25A.
2. Thermal Resistance from Junction to Case per leg.

RATINGS AND CHARACTERISTIC CURVES FEFP6AT THRU FEFP6DT

FIG. 1 — FORWARD CURRENT DERATING CURVE

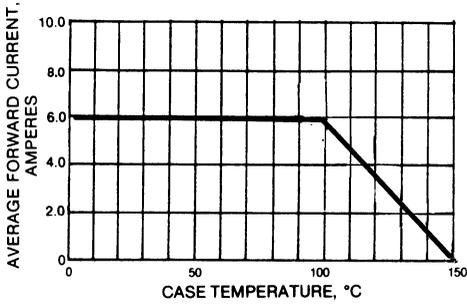


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

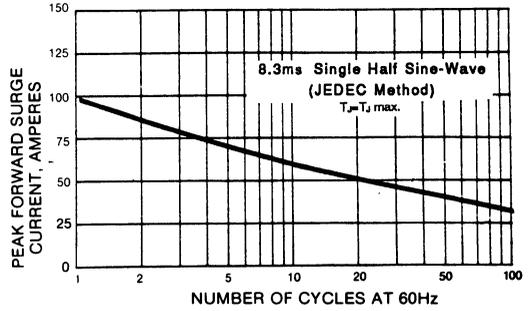


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS PER LEG

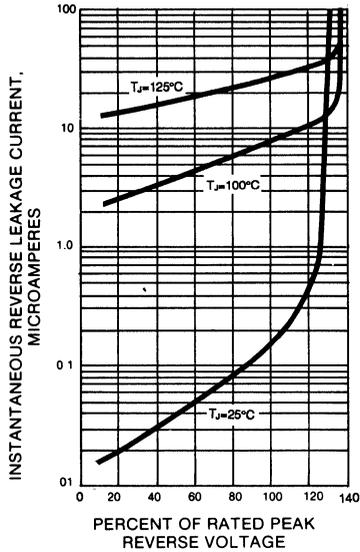


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

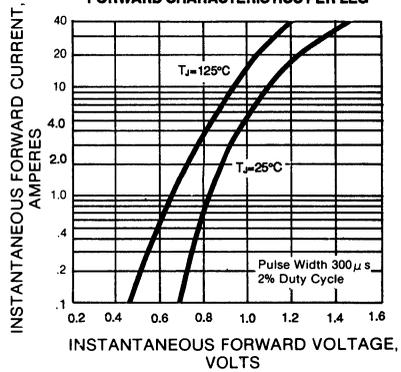
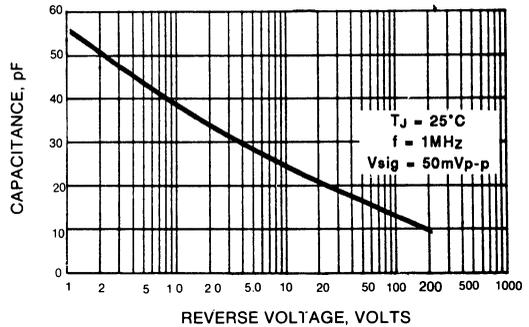


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG

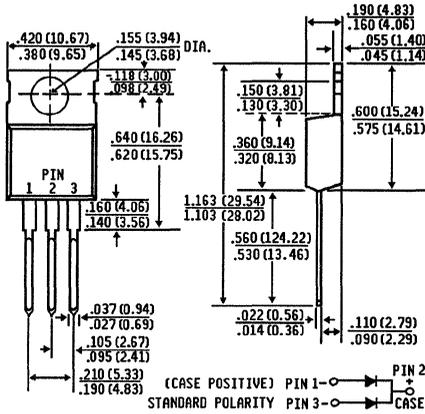


FEP6AT THRU FEP6DT

FAST EFFICIENT GLASS PASSIVATED RECTIFIER
Voltage - 50 to 200 Volts Current - 6.0 Amperes

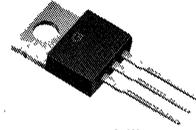
FEATURES

TO-220 CT



Dimensions in inches and (millimeters)

- ◆ Dual rectifier construction, positive center-tap
- ◆ Plastic package has carries Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junctions
- ◆ Superfast recovery times for high efficiency
- ◆ Low power loss
- ◆ Low forward voltage, high current capability
- ◆ For use in low voltage, high frequency inverters, free wheeling and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C, .25", (6.35mm) from case for 10 seconds



MECHANICAL DATA

Case: JEDEC TO-220CT molded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.08 ounce, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	FEP6AT	FEP6BT	FEP6CT	FEP6DT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current T _C =100°C	I _(AV)	6.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	100.0				Amps
Maximum Instantaneous Forward Voltage per leg at 3.0A	V _F	0.975				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage	I _R	5.0 50.0				μA μA
Maximum Reverse Recovery Time (NOTE 2) per leg	T _{RR}	35.0				nS
Typical Thermal Resistance (NOTE 3)	R _{θJC}	3.6				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150				°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{RR}= 25A.
2. Thermal Resistance from Junction to Case per leg.

RATINGS AND CHARACTERISTIC CURVES FEP6AT THRU FEP6DT

FIG. 1 — FORWARD CURRENT DERATING CURVE

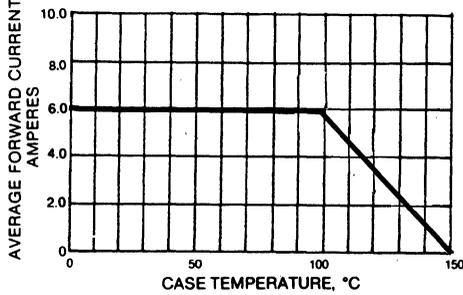


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

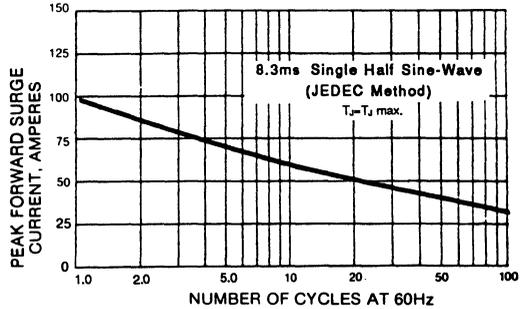


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS PER LEG

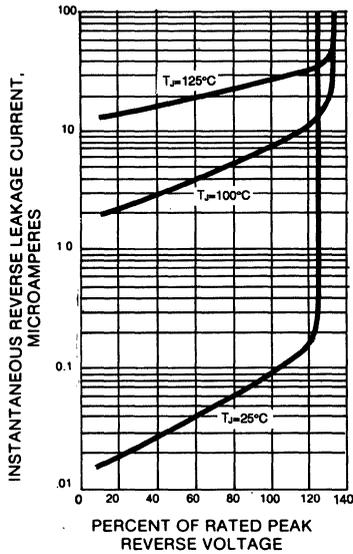


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

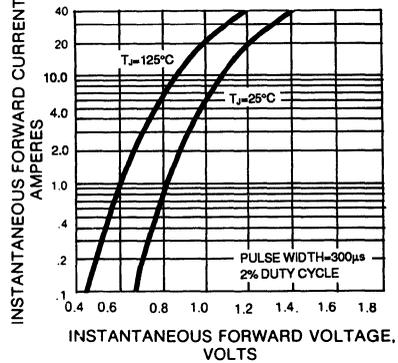
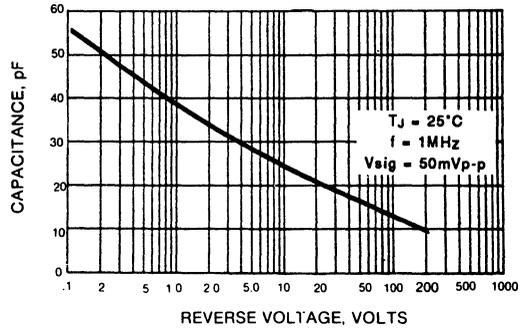


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG

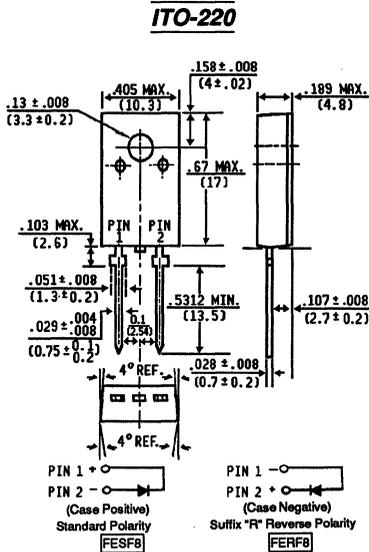
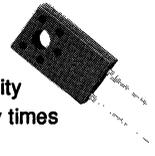


FESF8AT THRU FESF8JT

FAST EFFICIENT GLASS PASSIVATED RECTIFIER
Voltage - 50 to 600 Volts Current - 8.0 Amperes

FEATURES

- ◆ Isolated Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junctions
- ◆ Low power loss
- ◆ Low leakage, high voltage
- ◆ High surge capability
- ◆ Superfast recovery times for high efficiency
- ◆ High temperature soldering guaranteed: 250°C, .25", (6.35mm) from case for 10 seconds
- ◆ Internal Insulation: 1.5K VRMS



MECHANICAL DATA

Case: ITO-220 fully overmolded plastic
Terminals: Plated Lead solderable per MIL-STD-202, Method 208
Polarity: As marked
Mounting Position: Any
Mounting Torque: 5 in.- lbs. max.
Weight: 0.08 ounce, 2.24 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

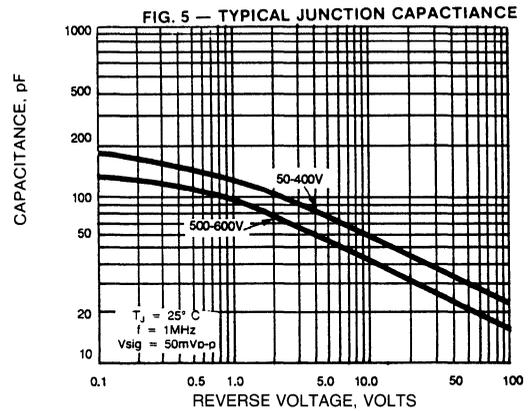
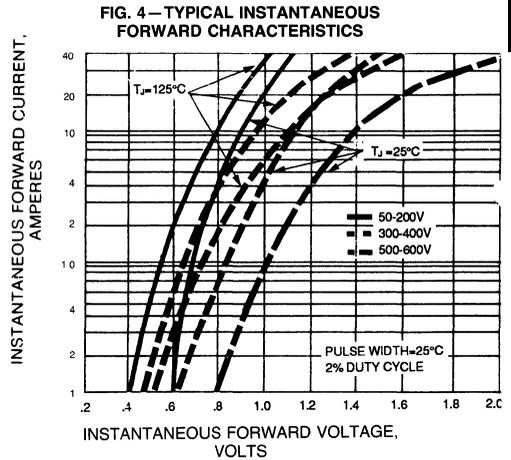
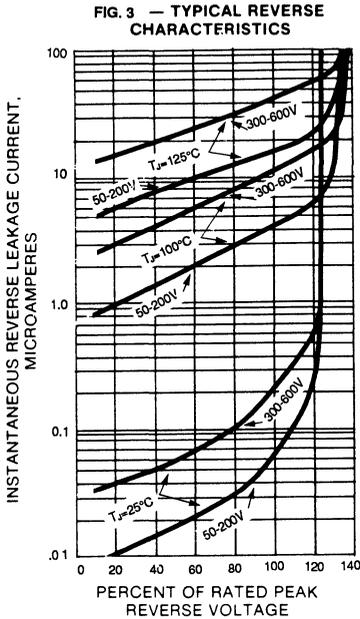
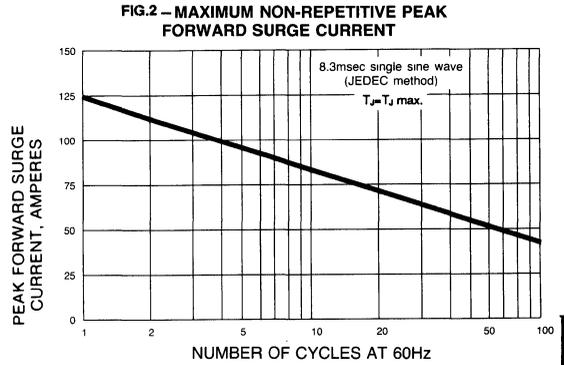
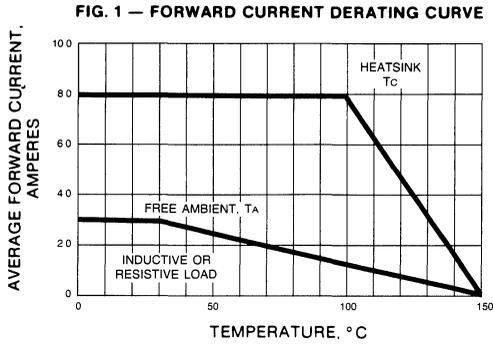
Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

		FESF 8AT	FESF 8BT	FESF 8CT	FESF 8DT	FESF 8FT	FESF 8GT	FESF 8HT	FESF 8JT	UNITS
Maximum, Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	500	600	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	350	420	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	500	600	Volts
Maximum Average Forward Rectified Current at T _C =100°C	I _(AV)	8.0								Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	125.0								Amps
Maximum Instantaneous Forward Voltage at 8.0A	V _F	0.95		1.3		1.5				Volts
Maximum DC Reverse Current T _C =25°C at Rated DC Blocking Voltage T _C =100°C	I _R	10.0 500.0								μA
Maximum Reverse Recovery Time (NOTE 2) T _J =25°C	T _{RR}	35.0			50.0					nS
Typical Junction Capacitance (NOTE 1)	C _J	85.0				60.0			pf	
Typical Thermal Resistance (NOTE 3)	R _{θJC}	3.0								°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150								°C

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.
3. Thermal Resistance from Junction to Case.

RATINGS AND CHARACTERISTIC CURVES FESF8AT THRU FESF8JT SERIES



**GENERAL
INSTRUMENT**

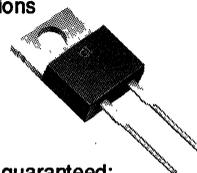
FES8AT THRU FES8JT

FAST EFFICIENT GLASS PASSIVATED RECTIFIER

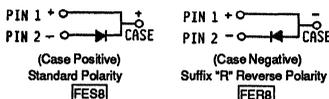
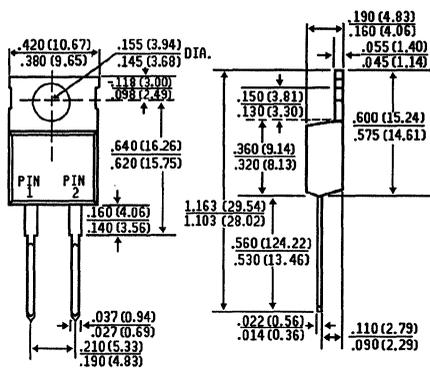
Voltage - 50 to 600 Volts Current - 8.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junctions
- ◆ Low leakage, high voltage
- ◆ Low leakage
- ◆ High surge capability
- ◆ Superfast recovery times for high efficiency
- ◆ High temperature soldering guaranteed: 250°C, .25", (6.35mm) from case for 10 seconds



TO-220



Dimensions in inches and millimeters

MECHANICAL DATA

Case: JEDEC TO-220 molded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Torque: 5 in. - lb. max.

Weight: 0.08 ounce, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

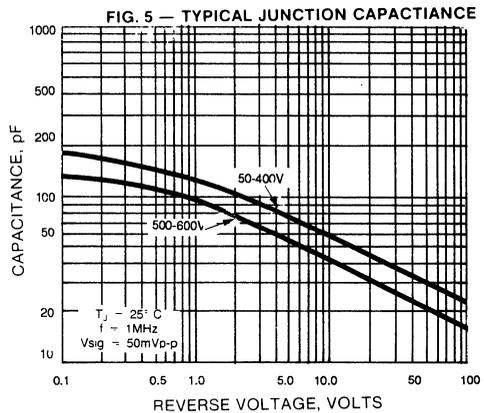
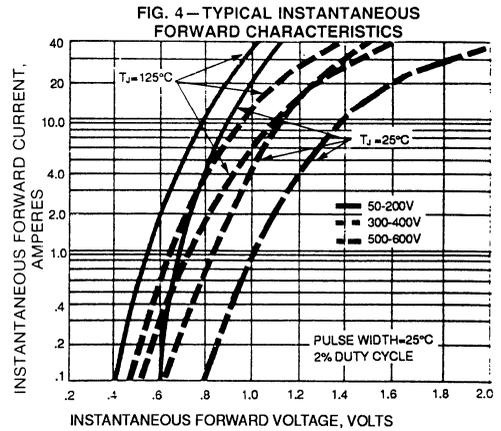
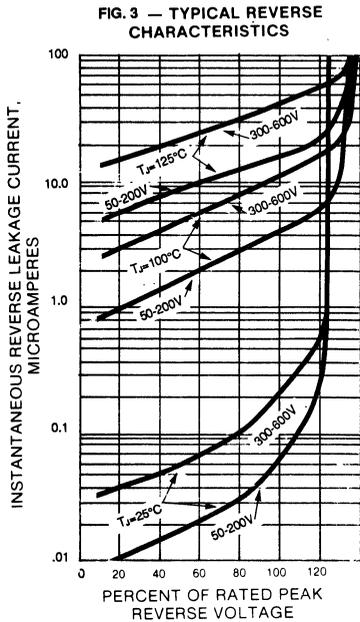
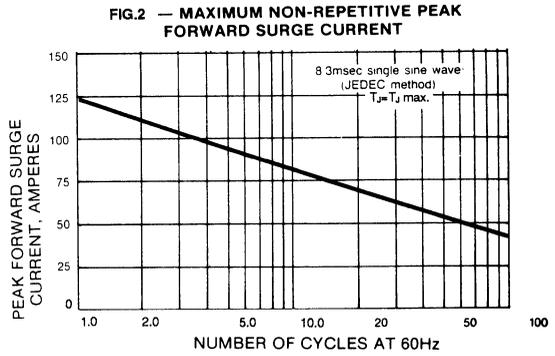
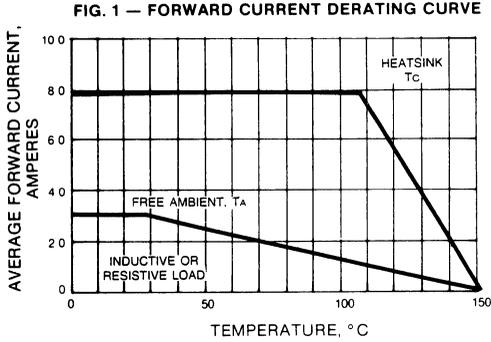
Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	FES SYMBOLS	FES 8AT	FES 8BT	FES 8CT	FES 8DT	FES 8FT	FES 8GT	FES 8HT	FES 8JT	UNITS	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	500	600	Volts	
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	350	420	Volts	
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	500	600	Volts	
Maximum Average Forward Rectified Current at T _C =100°C	I <sub(av)< sub=""></sub(av)<>	8.0								Amps	
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	125.0								Amps	
Maximum Instantaneous Forward Voltage at 8.0A	V _F	0.95		1.3			1.5			Volts	
Maximum DC Reverse Current at Rated DC Blocking Voltage	I _R	10.0				500.0					µA
Maximum Reverse Recovery Time (NOTE 2) T _J = 25°C	T _{RR}	35.0			50.0					nS	
Typical Junction Capacitance (NOTE 1)	C _J	85.0						60.0		pf	
Typical Thermal Resistance (NOTE 3)	R _{θJC}	2.5								°C/W	
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150								°C	

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: I_F=0.5A, I_R= 1.0A, recover to 0.25A.
3. Thermal Resistance from Junction to Case.

RATINGS AND CHARACTERISTIC CURVES FES8AT THRU FES8JT SERIES



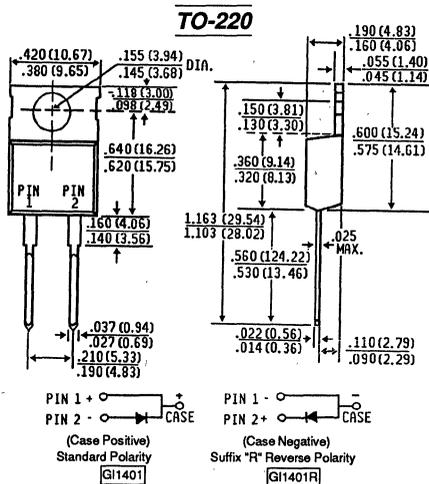
GI1401 THRU GI1404

FAST EFFICIENT GLASS PASSIVATED RECTIFIER

Voltage - 50 to 200 Volts Current - 8.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated cavity-free junction
- ◆ Low power loss
- ◆ Low leakage
- ◆ High surge capability
- ◆ Superfast recovery times for high efficiency
- ◆ High temperature soldering guaranteed: 250°C, .25", (6.35mm) from case for 10 seconds



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 molded plastic

Terminals: Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.08 ounce, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	GI1401	GI1402	GI1403	GI1404	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current at T _C =125°C	I _(AV)	8.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	125.0				Amps
Maximum Instantaneous Forward Voltage at I _F =4A, T _J =100°C I _F =8A, T _J =100°C I _F =4A, T _J =25°C I _F =8A, T _J =25°C	V _F	0.800 0.895 0.900 0.975				Volts
Maximum DC Reverse Current T _C =25°C at Rated DC Blocking Voltage T _C =100°C	I _R	5.0 150.0				μA
Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	35.0				nS
Typical Junction Capacitance (NOTE 2)	C _J	85.0				pf
Typical Thermal Resistance (NOTE 3)	R _{θJC}	2.5				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150				°C

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: I_F= 0.5A, I_R=1.0A, recover to 0.25A.
3. Thermal Resistance from Junction to Case.

RATINGS AND CHARACTERISTIC CURVES GI1401 THRU GI1404

Fig. 1—FORWARD CURRENT DERATING CURVE

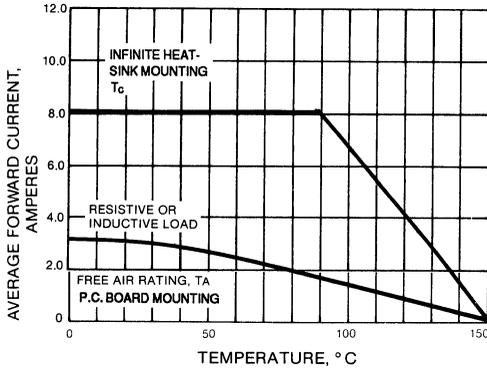


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

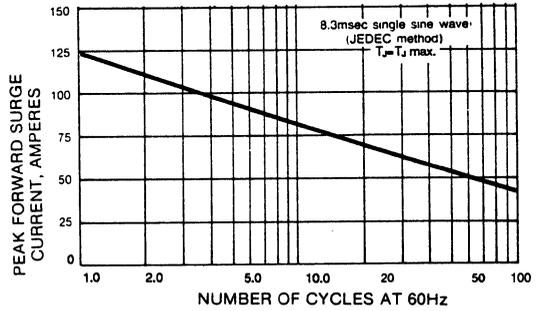


Fig. 4—TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

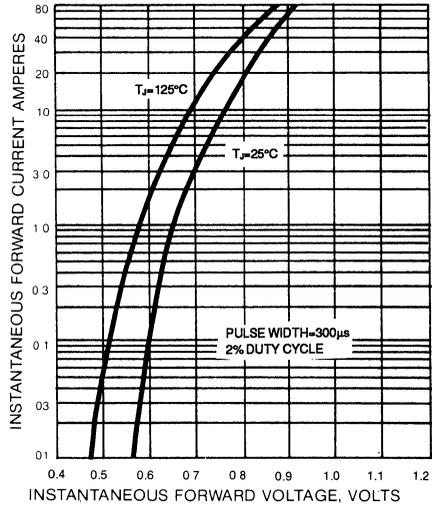


Fig. 3 — TYPICAL REVERSE CHARACTERISTICS

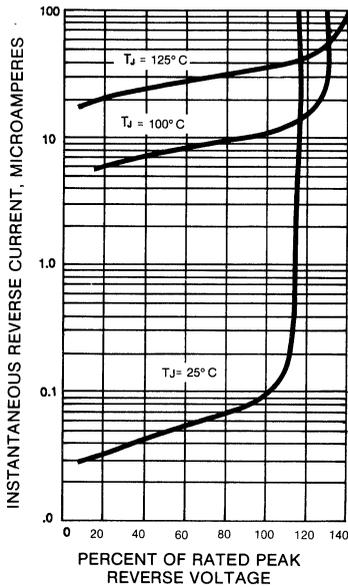
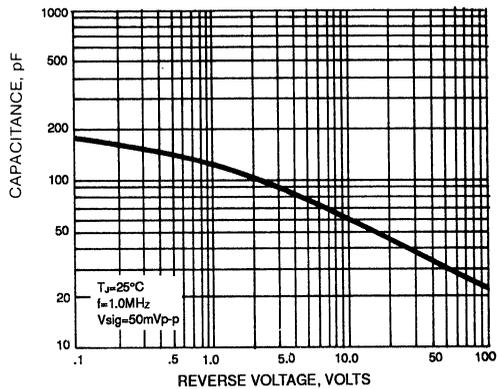


FIG. 5 - TYPICAL JUNCTION CAPACITANCE



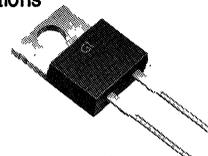
BYW29-50 THRU BYW29-200

FAST EFFICIENT GLASS PASSIVATED RECTIFIER

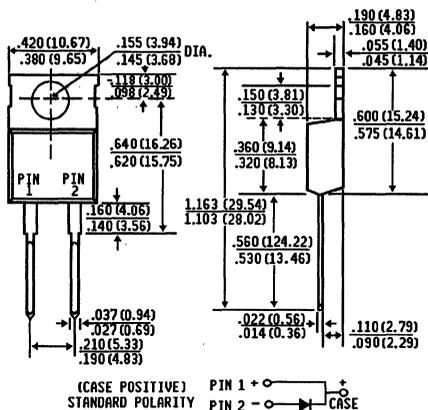
Voltage - 50 to 200 Volts Current - 8.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junctions
- ◆ Low power loss
- ◆ Low leakage
- ◆ High surge capability
- ◆ Superfast recovery times for high efficiency
- ◆ High temperature soldering guaranteed: 250°C, (6.35mm) from case for 10 seconds



TO-220



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 molded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.08 ounce, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	BYW29-50	BYW29-100	BYW29-150	BYW29-200	UNITS
Maximum Recurrent Peak Reverse Voltage	VRRM	50	100	150	200	Volts
Maximum RMS Voltage	VRMS	35	70	105	140	Volts
Maximum DC Blocking Voltage	VDC	50	100	150	200	Volts
Maximum Average Forward Rectified Current at T _C = 125°C	I _(AV)	8.0				Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed T _J =150°C	I _{FSM}	100.0				Amps
Maximum Instantaneous Forward Voltage I _F =20A, T _J =25°C I _F =8A, T _J =150°C	V _F	1.3 0.8				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _C =25°C T _C =100°C	I _R	10.0 500.0				μA
Maximum Reverse Recovery Time (NOTE 2)	T _{RR}	25.0				nS
Typical Junction Capacitance (NOTE 1)	C _J	45.0				pf
Maximum Thermal Resistance (NOTE 3)	RθJC	3.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150				°C

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: I_F=1A to V_R=30V, with di/dt=100A/μs.
3. Thermal Resistance from Junction to Case.

RATINGS AND CHARACTERISTIC CURVES BYW29-50 THRU BYW29-200

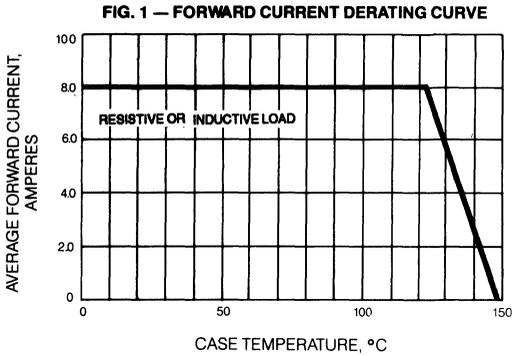


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

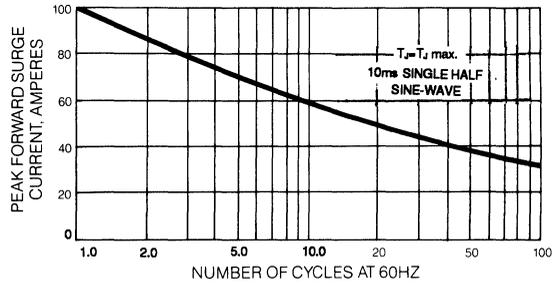


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

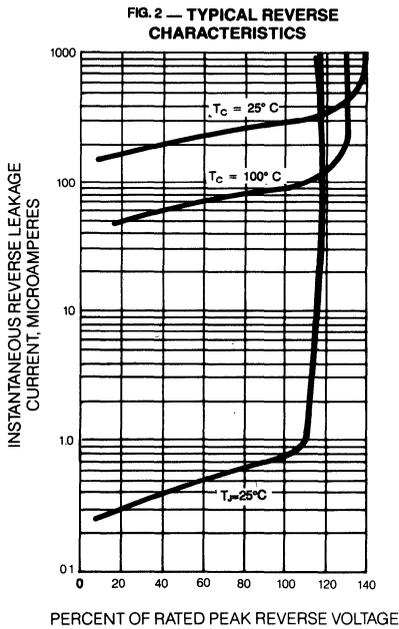
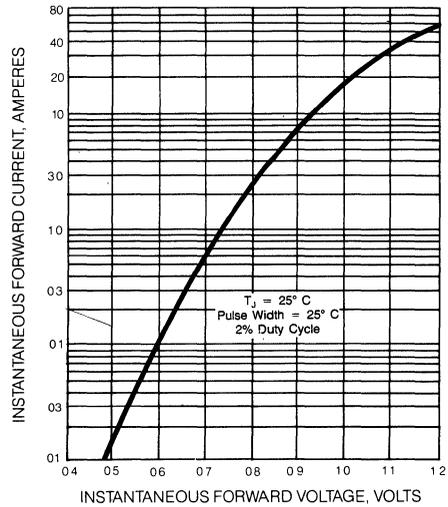
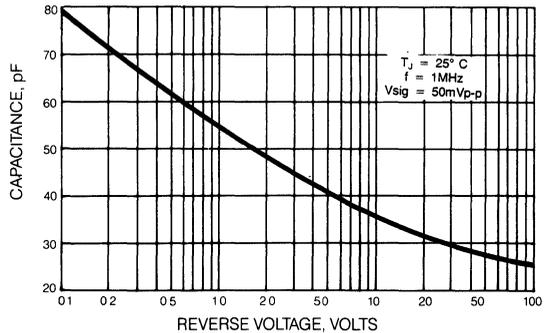


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

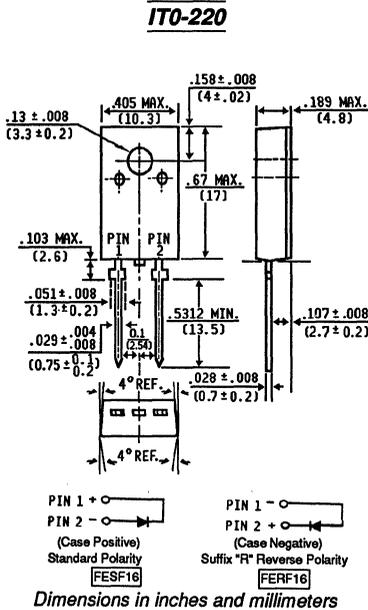


FESF16AT THRU FESF16JT

FAST EFFICIENT GLASS PASSIVATED RECTIFIER
Voltage - 50 to 600 Volts Current - 16.0 Amperes

FEATURES

- ◆ Isolated plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junctions
- ◆ Low power loss
- ◆ Low forward voltage, high current capability
- ◆ High surge capability
- ◆ Superfast recovery times for high efficiency
- ◆ High temperature soldering guaranteed: 250°C, .25", (6.35mm) from case for 10 seconds
- ◆ Internal Insulation: 1.5k VRMS



MECHANICAL DATA

- Case:** JEDEC ITO-220 Fully overmolded plastic
- Terminals:** Plated Lead solderable per MIL-STD-202 Method 208
- Polarity:** As marked
- Mounting Position:** Any
- Mounting Torque:** 5 in. - lb. max.
- Weight:** 0.08 ounce, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	FESF	FESF	FESF	FESF	FESF	FESF	FESF	UNITS	
		16AT	16BT	16CT	16DT	16FT	16GT	16HT		16JT
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	500	600	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	350	420	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	500	600	Volts
Maximum Average Forward Rectified Current at T _C =100°C	I(AV)	16.0								Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	250.0								Amps
Maximum Instantaneous Forward Voltage at 16A	V _F	0.95			1.3		1.5		Volts	
Maximum DC Reverse Current T _C =25°C at Rated DC Blocking Voltage T _C =100°C	I _R	10.0			500.0				µA	
Maximum Reverse Recovery Time (NOTE 2) T _J =25°C	T _{RR}	35.0			50.0				nS	
Typical Junction Capacitance (NOTE 1)	C _J	175.0				145.0			pf	
Typical Thermal Resistance (NOTE 3)	R _{θJC}	1.7							°C/W	
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150							°C	

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.
3. Thermal Resistance from Junction to Case.

RATINGS AND CHARACTERISTIC CURVES FESF16AT THRU FESF16JT

Fig. 1 — FORWARD CURRENT DERATING CURVE

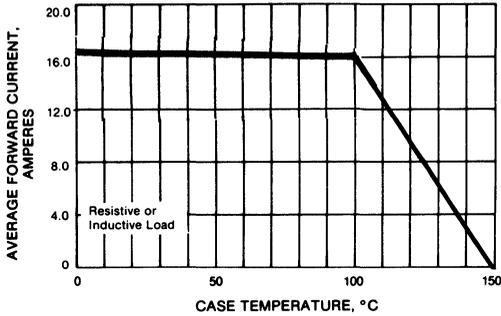


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

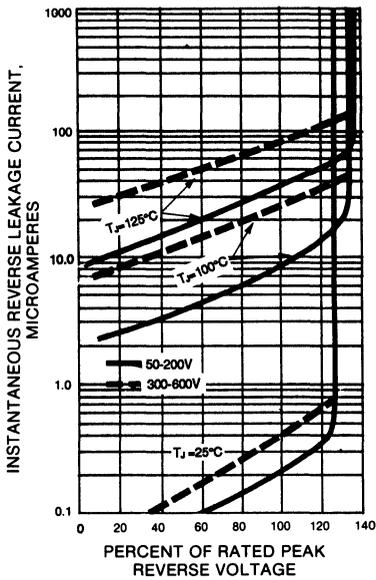


FIG. 2 — MAXIMUM NON REPETITIVE PEAK FORWARD SURGE CURRENT

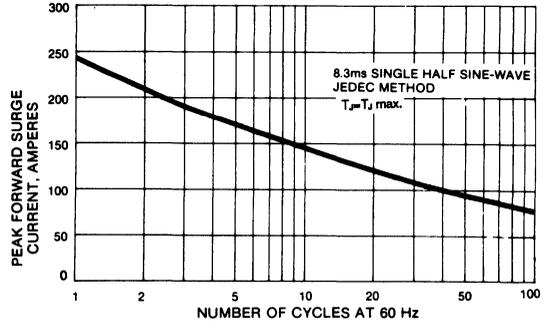


Fig. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

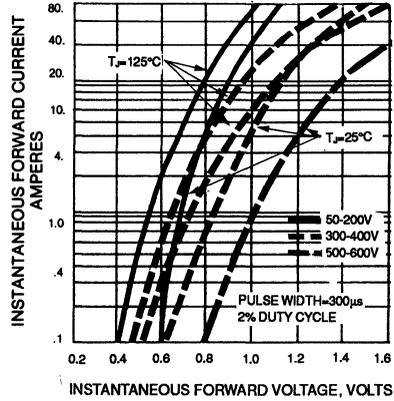
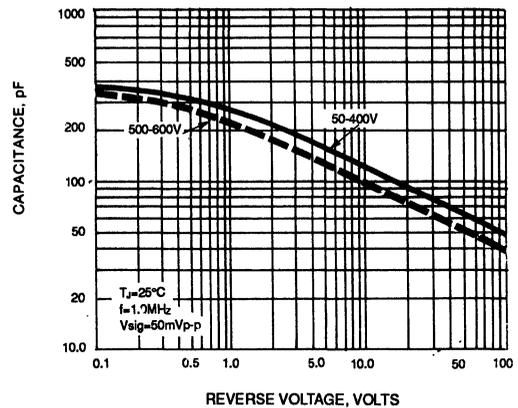


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

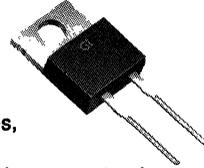


FES16AT THRU FES16JT

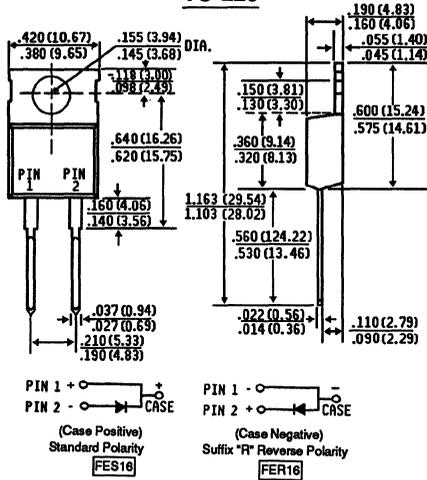
FAST EFFICIENT GLASS PASSIVATED RECTIFIER
Voltage - 50 to 600 Volts Current - 16.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junctions
- ◆ Low power loss
- ◆ Low forward voltage, high current capability
- ◆ High surge capability
- ◆ Superfast recovery times, for high efficiency
- ◆ High temperature soldering guaranteed: 250°C, .25", (6.35mm) from case for 10 seconds



TO-220



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 molded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.08 ounce, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

		FES SYMBOLS	FES 16AT	FES 16BT	FES 16CT	FES 16DT	FES 16FT	FES 16GT	FES 16HT	FES 16JT	UNITS	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	500	600		Volts	
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	350	420		Volts	
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	500	600		Volts	
Maximum Average Forward Rectified Current at T _C =100°C	I _(AV)	16.0									Amps	
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	250.0									Amps	
Maximum Instantaneous Forward Voltage at 16A	V _F	0.95			1.3		1.5				Volts	
Maximum DC Reverse Current T _C =25°C at Rated DC Blocking Voltage T _C =100°C	I _R	10.0					500.0					µA
Maximum Reverse Recovery Time (NOTE 2) T _J =25°C	T _{RR}	35.0			50.0						nS	
Typical Junction Capacitance (NOTE 1)	C _J	175.0					145.0					pf
Typical Thermal Resistance (NOTE 3)	R _{θJC}	1.5									°C/W	
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150									°C	

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.
3. Thermal Resistance from Junction to Case.

RATINGS AND CHARACTERISTIC CURVES FES16AT THRU FES16JT SERIES

Fig. 1 — FORWARD CURRENT DERATING CURVE

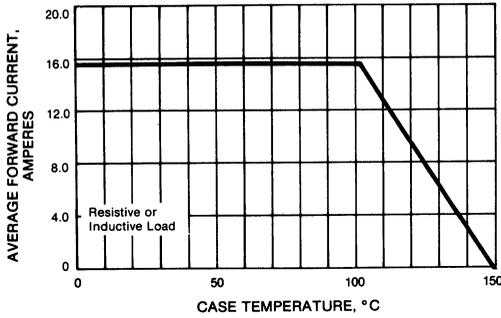


FIG. 2 — MAXIMUM NON REPETITIVE PEAK FORWARD SURGE CURRENT

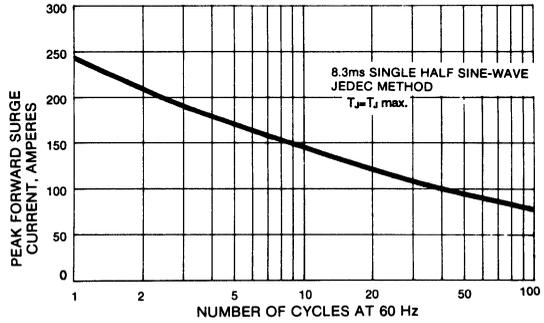


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

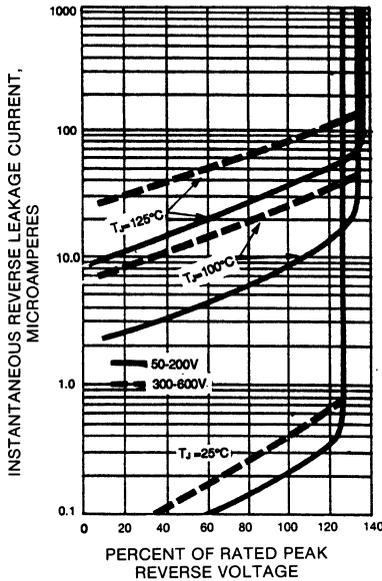


Fig. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

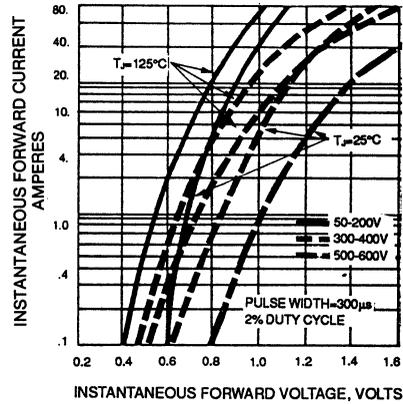
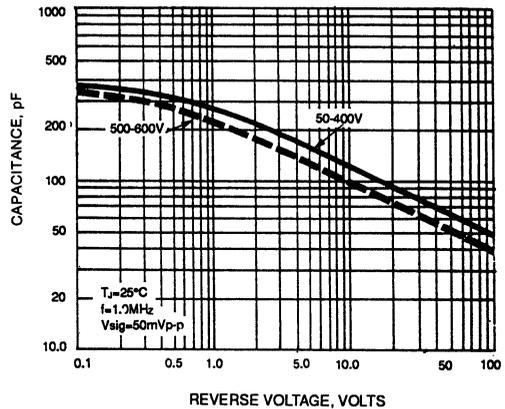


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

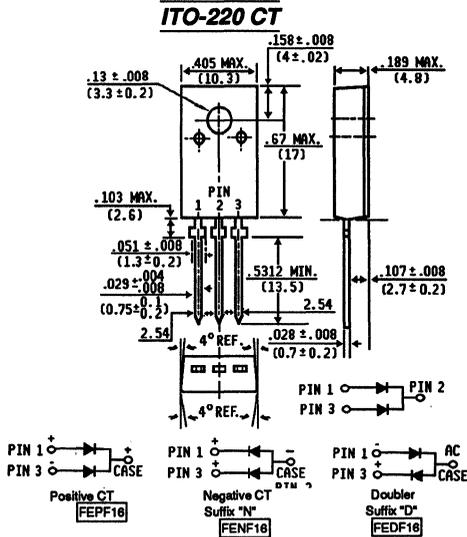
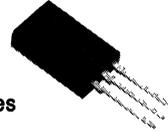


FEPF16AT THRU FEPF16JT

FAST EFFICIENT GLASS PASSIVATED RECTIFIER
Voltage - 50 to 600 Volts Current - 16.0 Amperes

FEATURES

- ♦ Dual rectifier construction, positive centertap
- ♦ Isolated plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ♦ Glass passivated chip junctions
- ♦ Low power loss
- ♦ Low forward voltage, high current capability
- ♦ High surge capability
- ♦ Superfast recovery times for high efficiency
- ♦ High temperature soldering guaranteed: 250°C, .25", (6.35mm) from case for 10 seconds
- ♦ Internal Insulation: 1.5K VRMS



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: ITO-220 fully overmolded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Mounting Torque: 5 in. - lbs. max.

Weight: 0.08 ounce, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

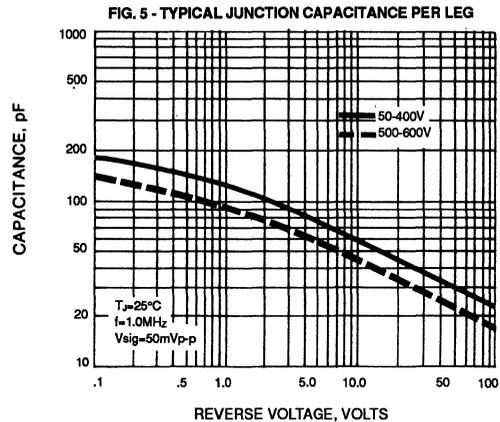
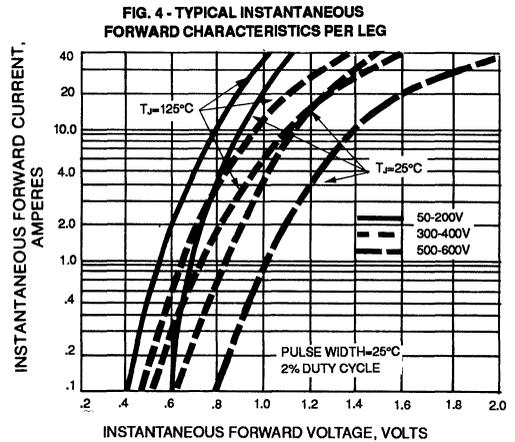
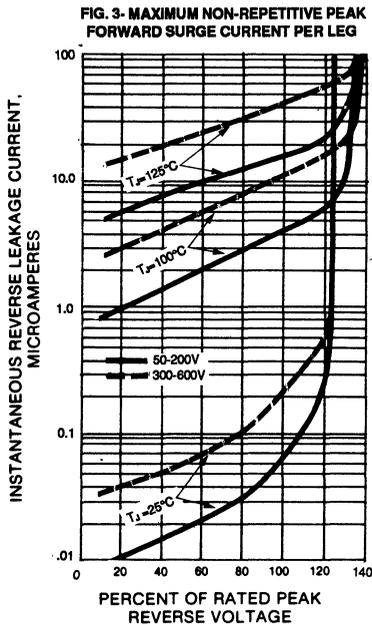
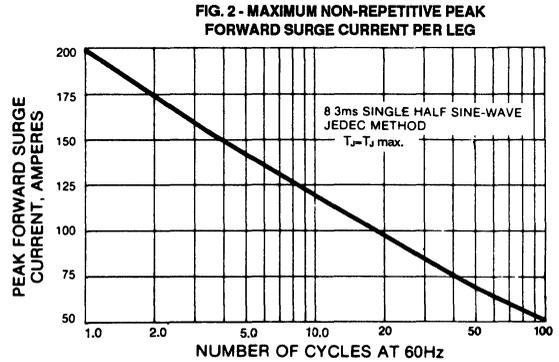
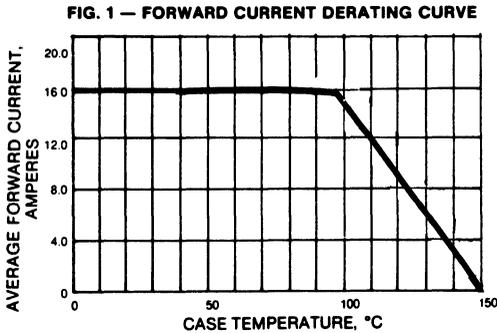
Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	FEPF								UNITS
		16AT	16BT	16CT	16DT	16FT	16GT	16HT	16JT	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	500	600	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	350	420	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	500	600	Volts
Maximum Average Forward Rectified Current at T _C =100°C	I <sub(av)< sub=""></sub(av)<>	16.0								Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	200.0								Amps
Maximum Instantaneous Forward Voltage at 8.0A per leg	V _F	0.95		1.3		1.5				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _C =25°C T _C =100°C	I _R					10.0 500.0				μA
Maximum Reverse Recovery Time (NOTE 2) per leg T _J =25°C	T _{RR}	35.0			50.0					nS
Typical Junction Capacitance per leg (NOTE 1)	C _J	85.0				60.0				pf
Typical Thermal Resistance (NOTE 3)	R _{θJC}	2.2								°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150								°C

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.
3. Thermal Resistance from Junction to Case per leg.

RATINGS AND CHARACTERISTIC CURVES FEFP16AT THRU FEFP16JT SERIES



FEP16AT THRU FEP16JT

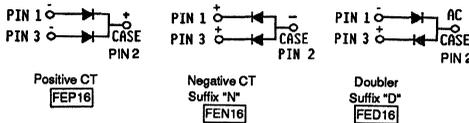
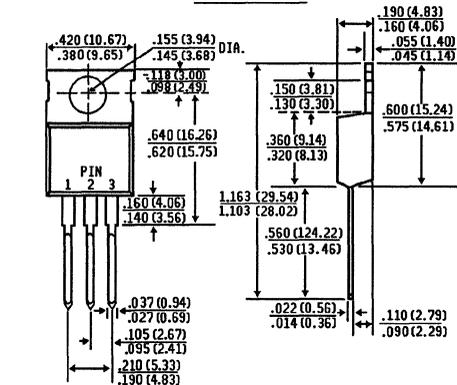
FAST EFFICIENT GLASS PASSIVATED RECTIFIER
Voltage - 50 to 600 Volts Current - 16.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive centertap
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junctions
- ◆ Low power loss
- ◆ Low forward voltage, high current capability
- ◆ High surge capability
- ◆ Superfast recovery times for high efficiency
- ◆ High temperature soldering guaranteed: 250°C, .25", (6.35mm) from case for 10 seconds



TO-220 CT



Positive CT
FEP16

Negative CT
Suffix "N"
FEN16

Doubler
Suffix "D"
FED16

Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 molded plastic

Terminals: Plated Leads solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.08 ounce, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	FEP SYMBOLS	FEP 16AT	FEP 16BT	FEP 16CT	FEP 16DT	FEP 16FT	FEP 16GT	FEP 16HT	FEP 16JT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	500	600	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	350	420	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	500	600	Volts
Maximum Average Forward Rectified Current at T _C =100°C	I _(AV)	16.0								Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	200.0								Amps
Maximum Instantaneous Forward Voltage per leg at 8.0A	V _F	0.95			1.3		1.5			Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _C =25°C	I _R	10.0								μA
Maximum DC Reverse Current at Rated DC Blocking Voltage T _C =100°C	I _R	500.0								
Maximum Reverse Recovery Time (NOTE 2) per leg T _J = 25°C	T _{RR}	35.0			50.0					nS
Typical Junction Capacitance per leg (NOTE 1)	C _J	85.0						60.0		pf
Maximum Thermal Resistance (NOTE 3)	R _{θJC}	3.0								°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150								°C

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.
3. Thermal Resistance from Junction to Case per leg.

RATINGS AND CHARACTERISTIC CURVES FEP16AT THRU FEP16JT

FIG. 1 — FORWARD CURRENT DERATING CURVE

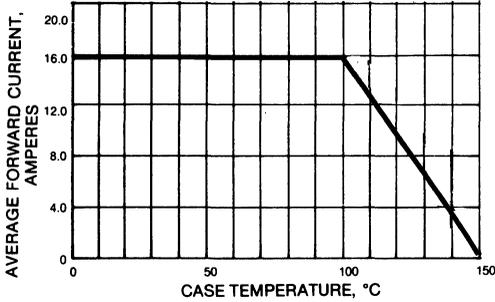


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

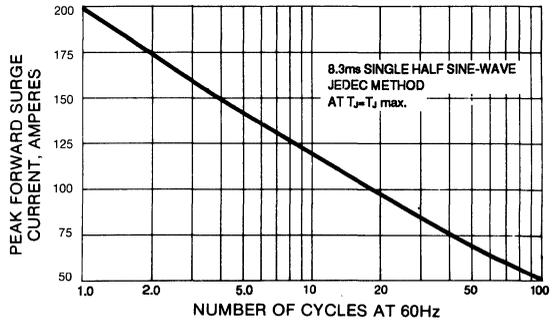


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

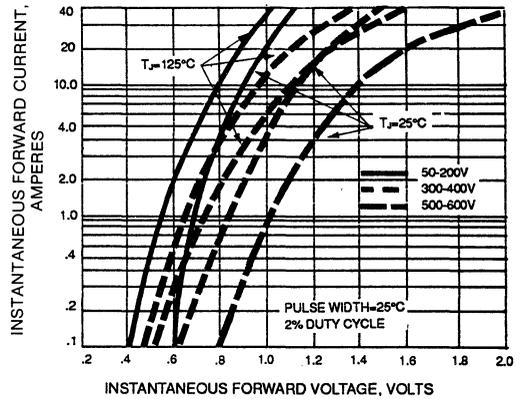


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS PER LEG

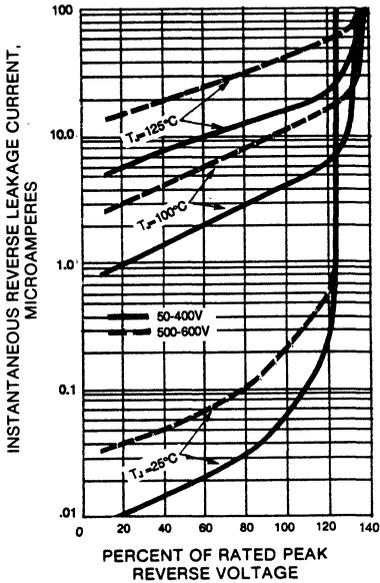
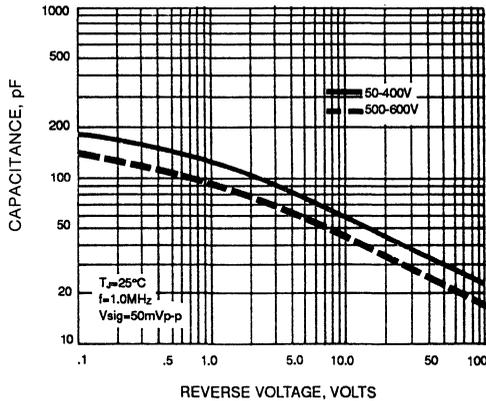


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



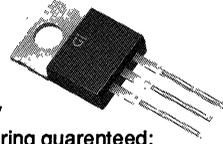
**GENERAL
INSTRUMENT**

GI2401 THRU GI2404

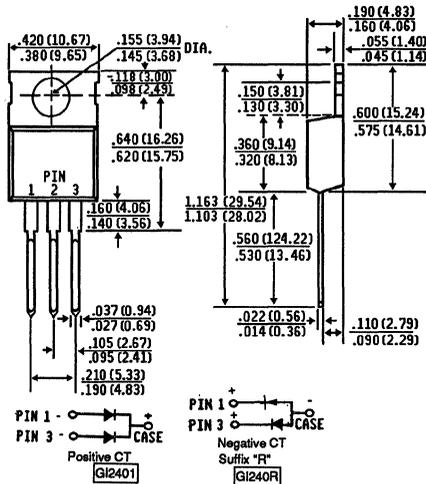
GLASS PASSIVATED FAST EFFICIENT RECTIFIER
Voltage - 50 to 200 Volts Current - 16.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive centertap
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junctions
- ◆ Low power loss
- ◆ High surge capability
- ◆ Superfast recovery times for high efficiency
- ◆ High temperature soldering guaranteed: 250°C, .25", (6.35mm) from case for 10 seconds



TO-220 CT



MECHANICAL DATA

Case: JEDEC TO-220 molded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.08 ounce, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	GI2401	GI2402	GI2403	GI2404	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V_{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current at $T_C=125^\circ\text{C}$	$I_{(AV)}$	16.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	125.0				Amps
Maximum Instantaneous Forward Voltage per leg $I_F=4\text{A}$, $T_J=100^\circ\text{C}$ $I_F=8\text{A}$, $T_J=100^\circ\text{C}$ $I_F=4\text{A}$, $T_J=25^\circ\text{C}$ $I_F=8\text{A}$, $T_J=25^\circ\text{C}$	V_F	0.800 0.895 0.900 0.975				Volts
Maximum DC Reverse Current $T_C=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_C=100^\circ\text{C}$	I_R	5.0 150.0			5.0 500.0	μA
Maximum Reverse Recovery Time per leg (NOTE 2)	T_{RR}	35.0				nS
Typical Junction Capacitance per leg (NOTE 1)	C_J	85.0				pf
Maximum Thermal Resistance (NOTE 3)	$R_{\theta JC}$	1.75				$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150				$^\circ\text{C}$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, recover to 0.25A.
3. Thermal Resistance from Junction to Case per leg.

RATINGS AND CHARACTERISTIC CURVES GI2401 THRU GI2404

Fig. 1—FORWARD CURRENT DERATING CURVE

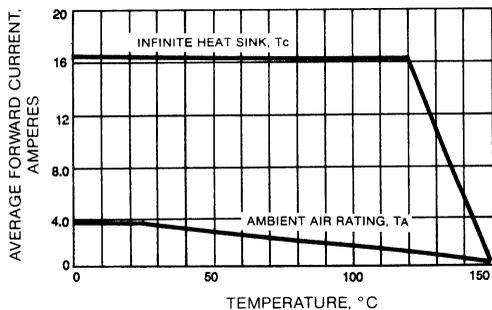


Fig. 3 — TYPICAL REVERSE CHARACTERISTICS PER LEG

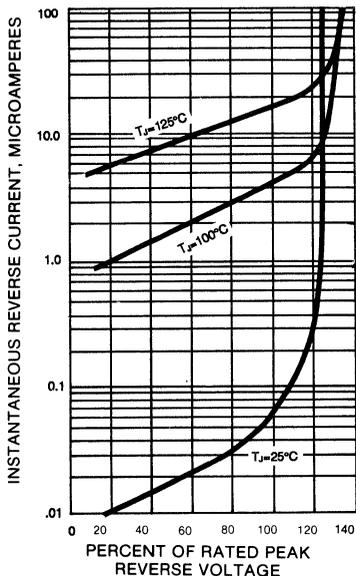


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

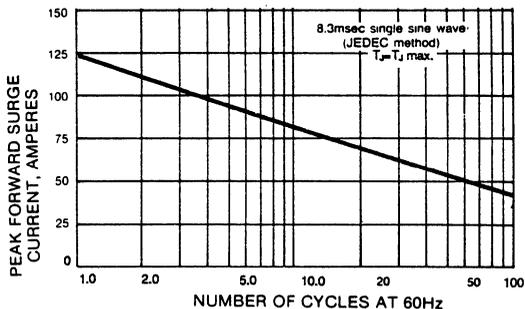


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

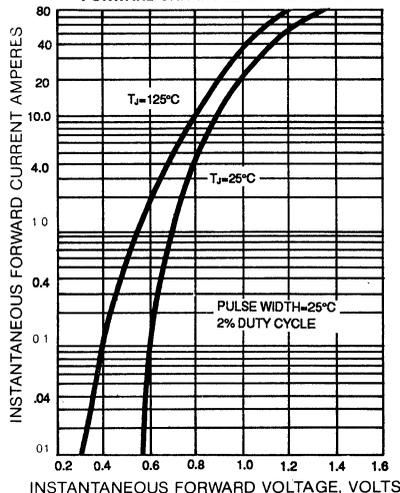
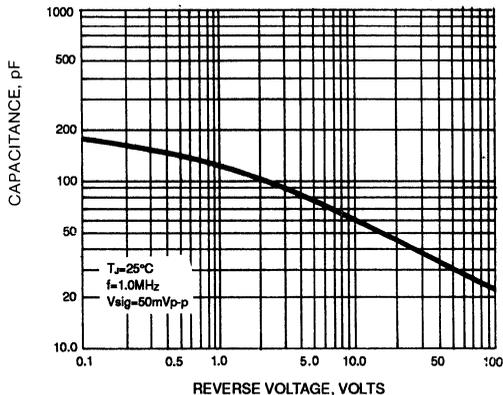


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG

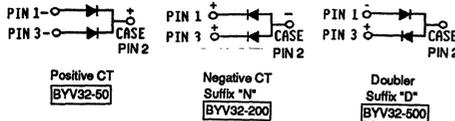
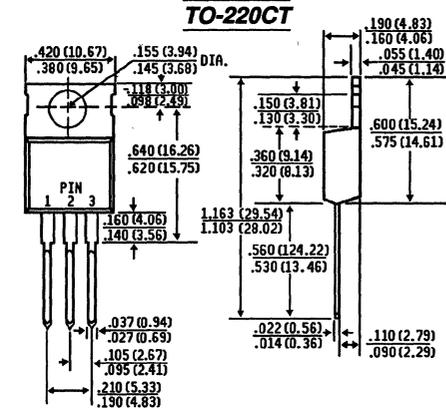
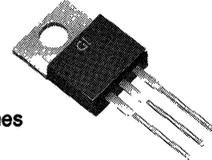


BYV32-50 THRU BYV32-200

FAST EFFICIENT GLASS PASSIVATED RECTIFIER
Voltage - 50 to 150 Volts Current - 18.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive centertap
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junctions
- ◆ Low power loss
- ◆ Low forward voltage, high current capability
- ◆ High surge capability
- ◆ Superfast recovery times for high efficiency
- ◆ High temperature soldering guaranteed: 250°C, .25" (6.35mm) from case for 10 seconds



Dimensions in inches and millimeters

MECHANICAL DATA

Case: JEDEC TO-220 molded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.08 ounce, 2.24 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	BYV32-50	BYV32-100	BYV32-150	BYV32-200	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V_{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current at $T_C=120^\circ\text{C}$	$I_{(AV)}$	18.0				Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed $T_J=150^\circ\text{C}$	I_{FSM}	150.0				Amps
Maximum Instantaneous Forward Voltage per leg at $I_F=20\text{A}$, $I_F=5.0\text{A}$, $T_J=100^\circ\text{C}$	V_F	1.15 0.85				Volts
Maximum DC Reverse Current $T_C=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_C=100^\circ\text{C}$	I_R	10.0 600.0				μA
Maximum Reverse Recovery Time per leg (NOTE 2) $T_J=25^\circ\text{C}$	T_{RR}	25.0				nS
Typical Junction Capacitance (NOTE 1)	C_J	45.0				pf
Maximum Thermal Resistance per leg (NOTE 3)	$R_{\theta JC}$	3.0				$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150				$^\circ\text{C}$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: $I_F=1\text{A}$ to $V_R=30\text{V}$, with $di/dt=100\text{A}/\mu\text{s}$.
3. Thermal Resistance from Junction to Case per leg.

RATINGS AND CHARACTERISTIC CURVES BYV32-50 THRU BYV32-200

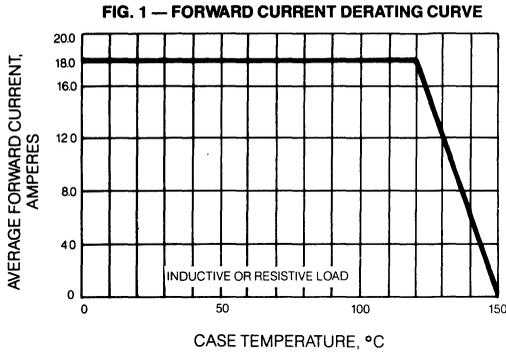


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

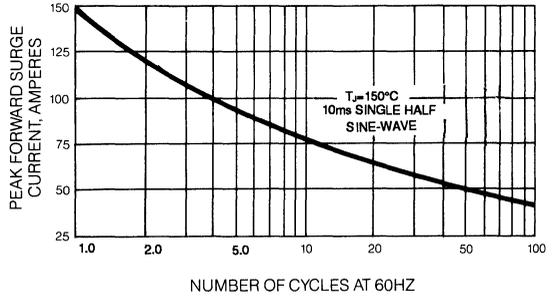


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

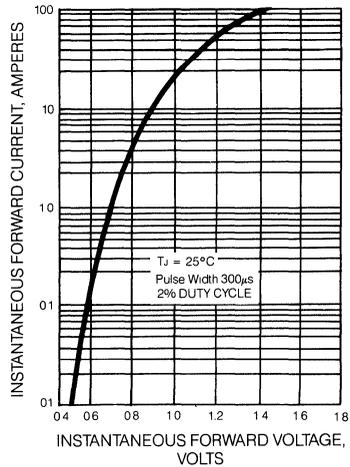


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS PER LEG

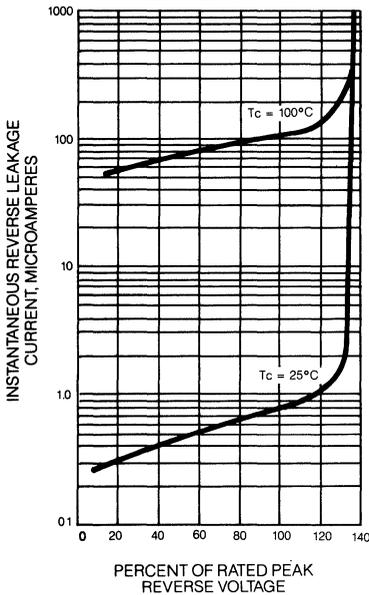
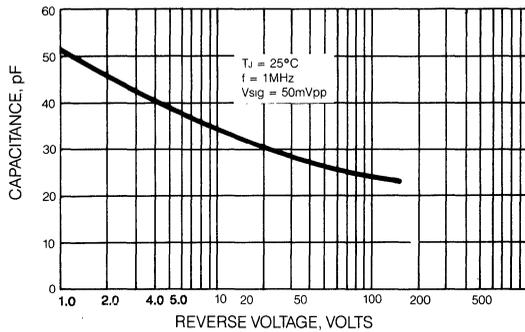


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER LEG

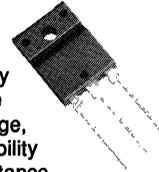


FEPF30AP THRU FEPF30JP

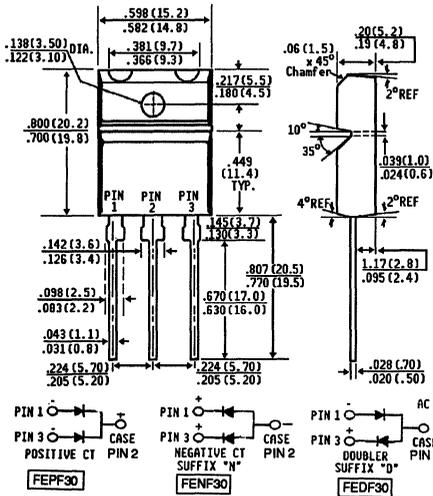
FAST EFFICIENT GLASS PASSIVATED RECTIFIER
Voltage - 50 to 600 Volts Current - 30.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive centertap
- ◆ Isolated Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junctions
- ◆ Superfast recovery times, high voltage
- ◆ Low forward voltage, high current capability
- ◆ Low thermal resistance
- ◆ Low power loss, high efficiency
- ◆ High temperature soldering guaranteed: 250°C, .17", (4.3mm) from case for 10 seconds
- ◆ Internal Insulation: 1.5k VRMS



ITO-3P



MECHANICAL DATA

Case: ITO-3P Fully overmolded plastic
Terminals: Plated Lead solderable per MIL-STD-202, Method 208
Polarity: As marked
Mounting Position: Any
Mounting Torque: 5 in.-lb. max.
Weight: 0.47 ounce, 13.2 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

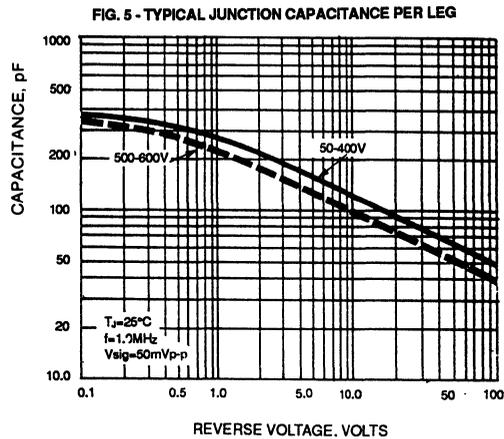
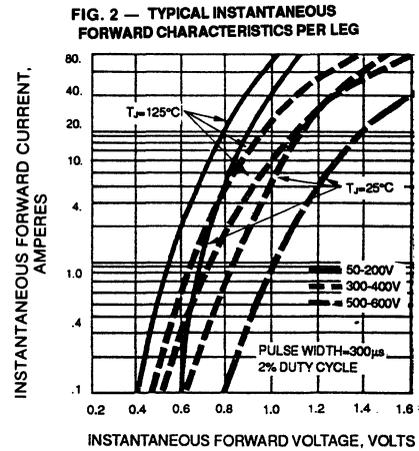
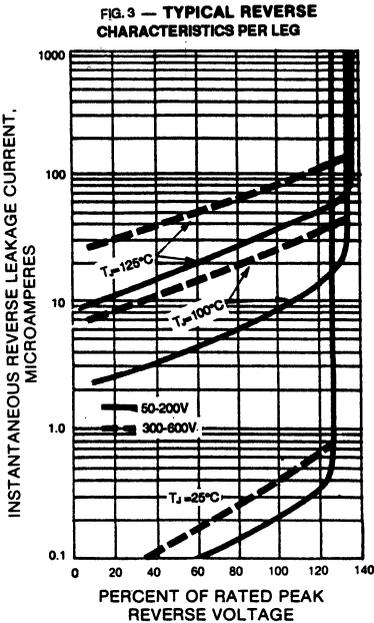
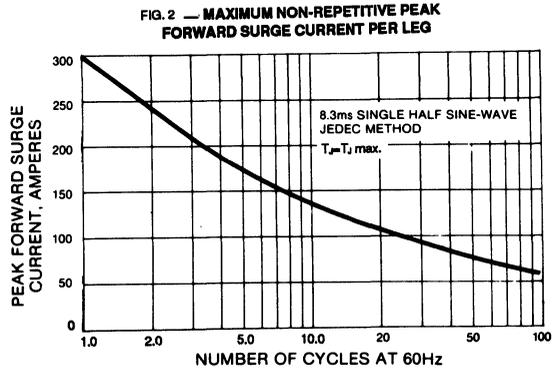
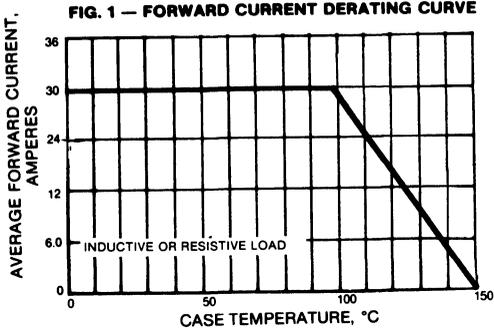
Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

		FEPF 30AP	FEPF 30BP	FEPF 30CP	FEPF 30DP	FEPF 30FP	FEPF 30GP	FEPF 30HP	FEPF 30JP	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	500	600	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	350	420	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	500	600	Volts
Maximum Average Forward Rectified Current at T _C =100°C	I _(AV)	30.0								Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	300.0								Amps
Maximum Instantaneous Forward Voltage at 15.0A per leg	V _F	0.95		1.3		1.5				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _C =25°C T _C =100°C	I _R	10.0				500.0				µA
Maximum Reverse Recovery Time (NOTE 2) per leg T _J =25°C	T _{RR}	35.0			50.0					nS
Typical Junction Capacitance per leg (NOTE 1)	C _J	175.0					145.0			pf
Thermal Resistance (NOTE 3)	R _{θJC}	2.0								°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150								°C

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.
3. Thermal Resistance from Junction to Case per leg.

RATINGS AND CHARACTERISTIC CURVES FEFP30AP THRU FEFP30JP SERIES

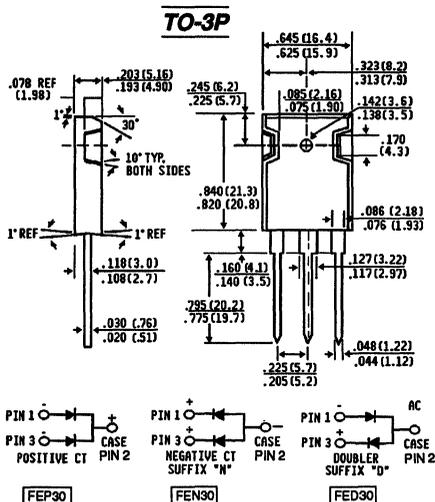
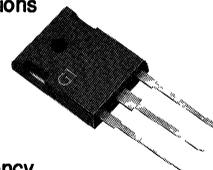


FEP30AP THRU FEP30JP

FAST EFFICIENT GLASS PASSIVATED RECTIFIER
Voltage - 50 to 600 Volts Current - 30.0 Amperes

FEATURES

- ◆ Dual rectifier construction, positive centertap
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junctions
- ◆ Superfast recovery times, high voltage
- ◆ Low forward voltage, high current capability
- ◆ Low thermal resistance
- ◆ Low power loss, high efficiency
- ◆ High temperature soldering guaranteed: 250°C, .17", (4.3mm) from case for 10 seconds



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-3P molded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Mounting Position: Any

Weight: 0.2 ounce, 5.6 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	FEP	FEP	FEP	FEP	FEP	FEP	FEP	FEP		
	SYMBOLS	30AP	30BP	30CP	30DP	30FP	30GP	30HP	30JP	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	500	600	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	350	420	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	500	600	Volts
Maximum Average Forward Rectified Current at T _C =100°C	I _(AV)	30.0								Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	300.0								Amps
Maximum Instantaneous Forward Voltage per leg at 15.0A	V _F	0.95					1.3	1.5		Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _C =25°C T _C = 100°C	I _R	10.0				500.0				µA
Maximum Reverse Recovery Time (NOTE 2) per leg T _J =25°C	T _{RR}	35.0				50.0				nS
Typical Junction Capacitance per leg (NOTE 1)	C _J	175.0				145.0				pf
Typical Thermal Resistance (NOTE 3)	R _{θJC}	1.0								°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150								°C

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, recover to 0.25A.
3. Thermal Resistance from Junction to Case per leg.

RATINGS AND CHARACTERISTIC CURVES FEP30AP THRU FEP30JP

FIG. 1 — FORWARD CURRENT DERATING CURVE

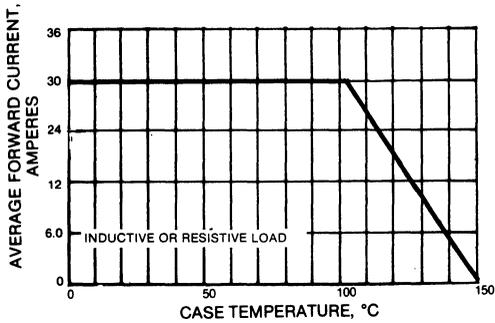


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER LEG

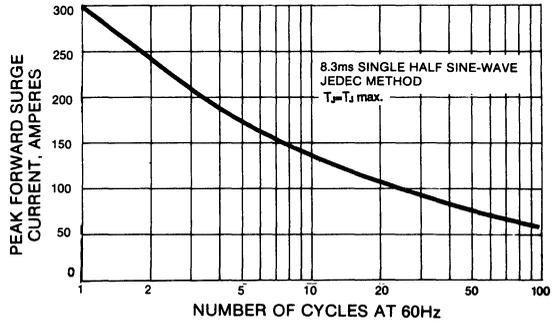


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS PER LEG

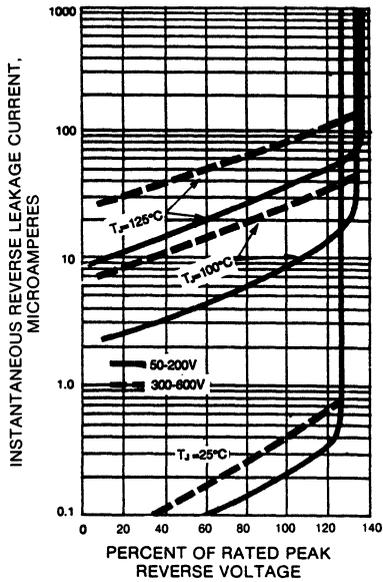


FIG. 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER LEG

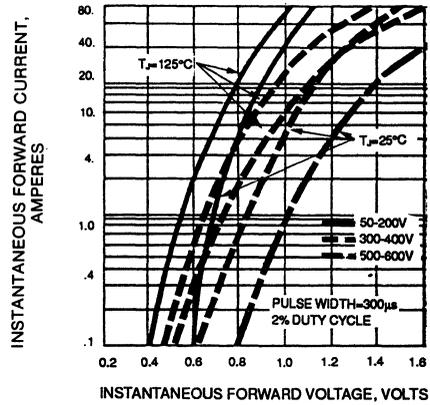
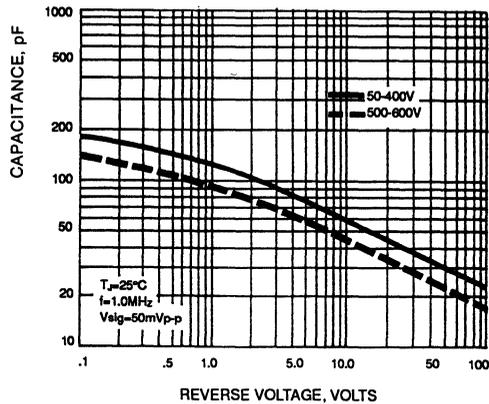


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER LEG



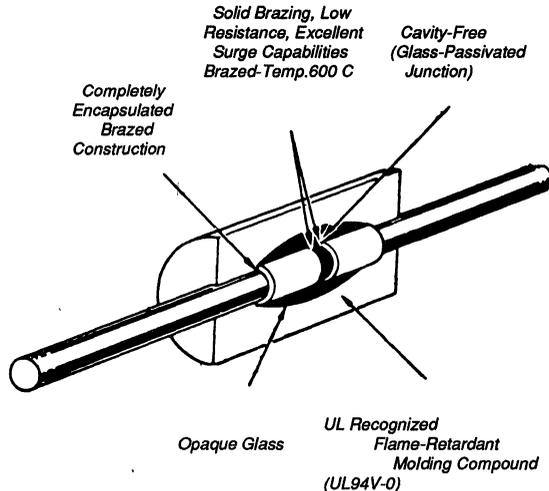
SUPERECTIFIERS

***0.25 TO 3.0 AMPERES
50 VOLTS TO 4000 VOLTS***

**GENERAL
INSTRUMENT**

SUPERECTIFIER

.25 to 3.0 Amperes 50 Volts to 4000 Volts



Introduction

No other .25 to 3.0 Ampere rectifiers of any kind - plastic, glass, or metal - can match (or even approach) **SUPERECTIFIER**'s combination of features...the result of General Instrument's unique glass-plastic construction:

- ◆ *Brazed at greater than 600°C at both leads and die-eliminates all soft solders*
- ◆ *Exclusive UL recognized flame-retardant epoxy molding compound rated 94V-0, the highest available*
- ◆ *Patented glass passivation*
- ◆ *Reliability proved equal to military requirements*
- ◆ *Hermetically sealed construction*
- ◆ *Cost effective construction at plastic prices*

General Instrument's **SUPERECTIFIER** is exactly that...a super rectifier. There is nothing else in the world like it.

In cell construction, most other rectifiers rated up to 3.0 Amperes are soft soldered or are only pressure contacted and silastic passivated. **SUPERECTIFIER** uses a patented brazed construction and glass passivation to seal its junction hermetically.

In device encapsulation, again **SUPERECTIFIER** is the only one that won't go up in flames. It is one of the few rectifiers using an exclusive flame-RETARDANT molding compound, rated UL94V-0, the highest rating available. Other plastic rectifiers use flame-ENHANCING compounds. Here again, **SUPERECTIFIER**'s superiority is manifest. With this construction it exceeds environmental standards of MIL-S-19500.

In summary, **SUPERECTIFIER** is the world's only rectifier with totally brazed construction, with a patented glass passivated junction, and with flame-retardant molding encapsulation.

FAMILIES OF GENERAL INSTRUMENT SUPERECTIFIER

Glass Passivated Junction Plastic Rectifiers 0.25 to 1.5 AMPERES

Types:

1N3611GP thru 1N3614GP
1N4001GP thru 1N4007GP
1N4245PG thru 1N4249GP
1N5059GP thru 1N5062GP
1N5391GP thru 1N5399GP
GI250-1 thru GI250-2
GP02-20 thru GP02-40
GP08A thru GP08J
GP10A thru GP10Y
GP15A thru GP15M

Features:

- ◆ High Temperature Metallurgically Bonded
- ◆ Plastic Package has Underwriters Laboratory Classification 94V-0
- ◆ Glass Passivated Junction overmolded in epoxy packages for easy handling
- ◆ Is rated current operation at 55 °C Ambient Temperature with no Thermal Runaway
- ◆ Capable of meeting Environmental Standards of MIL-S-19500
- ◆ High Temperature Soldering Guaranteed 350°C/10 Second/.375", 9.5mm Lead Length at 5lbs. 2.25kg Tension
- ◆ Tin Plated Axial Leads, Solderable per MIL-STD-202 Method 208

Glass Passivated Junction Plastic Rectifiers 2.0 to 3.0 AMPERES

Types:

1N5624GP thru 1N5627GP
GP20A thru GP20J
GP25A thru GP25M
GP30A thru GP30M

Features:

- ◆ High Temperature Metallurgically Bonded
- ◆ Plastic Package has Underwriters Laboratory Classification 94V-0
- ◆ Glass Passivated Junction overmolded in epoxy packages for easy handling
- ◆ Is rated current operation at 55 C Ambient Temperature with no Thermal Runaway
- ◆ Typical less than 0.1 μ A
- ◆ Capable of meeting Environmental Standards of MIL-S-19500
- ◆ Tin Plated Axial Leads, Solderable per MIL-STD-202 Method 208
- ◆ High Temperature Soldering Guaranteed 350 °C/10 Second/.375", (9.5mm) Lead Length at 5 lbs (2.25kg) Tension

Fast Recovery Glass Passivated Junction Plastic Rectifiers 0.50 to 3.0 AMPERES

Types:

1N4942GP thru 1N4948GP
RGP02-12E thru RGP02-20E
RGP10A thru RGP10M
RGP15A thru RGP15M
RGP20A thru RGP20J
RGP25A thru RGP25M
RGP30A thru RGP30M
BA157GP thru BA159GP

Features:

- ◆ High Temperature Metallurgically Bonded
- ◆ Fast switching for High Rectification Efficiency to 100kHz
- ◆ Plastic Package has Underwriters Laboratory Classification 94V-0
- ◆ Capable of meeting Environmental Standards of MIL-S-19500
- ◆ Includes all Advantages of the SUPERECTIFIER Design
- ◆ Tin Plated Axial Leads, Solderable per MIL-STD-202 Method 208
- ◆ High Temperature Soldering Guaranteed: 350 °C/10 Second/.375", (9.5mm) Lead Length at 5 lbs. (2.25kg) Tension

QUICK GUIDE TO SUPERRECTIFIERS

TYPE	RGP02* -12E thru -20E	GP02 -20 thru -40	GP1250 -1 thru -4	TYPE	BA157GP* thru BY159GP*	GP08A thru GP08J	GP10A thru GP10M	1N3611GP thru 1N3614GP& 1N3957GP	1N4001GP thru 1N4007GP	1N4245GP thru 1N4248GP	1N4933GP* thru 1N4937GP*
CASE	DO41	DO41	DO41	CASE	DO41	DO41	DO41	DO41	DO41	DO41	DO41
Io(A)	0.5	0.25	0.25	Io(A)	0.5	0.8	1.0	1.0	1.0	1.0	1.0
@TA(C°)	55	55	75	@TA(C°)	55	55	55	100	75	55	75
VR=100Q(V)			G1250-1	VR=50(V)		GP08A	GP10A		1N4001GP		1N4933GP
VR=120Q(V)	RG02-12E			VR=100(V)		GP08B	GP10B		1N4002GP		1N4934GP
VR=140Q(V)	RG02-14E			VR=200(V)		GP08D	GP10D	1N3611GP	1N4003GP	1N4245GP	1N4935GP
VR=160Q(V)	RG02-16E			VR=300(V)		GP08G					
VR=180Q(V)	RG02-18E			VR=400(V)	BA157GP		GP10G	1N3612GP	1N4004GP	1N4246GP	1N4936GP
VR=200Q(V)	RG02-20E	GP02-20	G1250-2	VR=500(V)		GP08J					
VR=250Q(V)		GP02-25		VR=600(V)	BA158GP		GP10J	1N3613GP	1N4005GP	1N4247GP	1N4937GP
VR=300Q(V)		GP02-30	G1250-3	VR=800(V)	BA159DGP		GP10K	1N3614GP	1N4006GP	1N4248GP	
VR=350Q(V)		GP02-35		VR=100Q(V)	BA159GP		GP10M	1N3957GP	1N4007GP	1N4249GP	
VR=400Q(V)		GP02-40	G1250-4								
SURGE(A)	20	15	15		20	25	30	30	30	25	30
VF(V)	1.8	3.0	3.5		1.3	1.3	1.1	1.1	1.1	1.2	1.2

*FAST RECOVERY

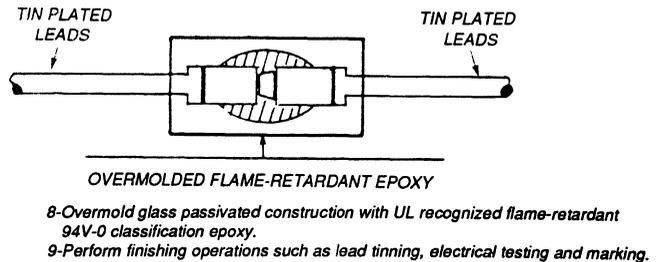
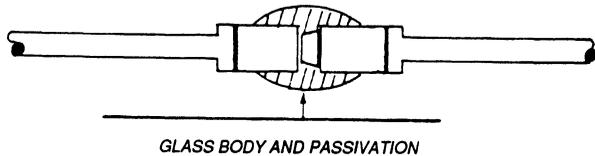
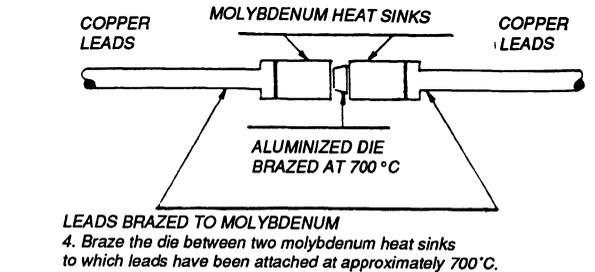
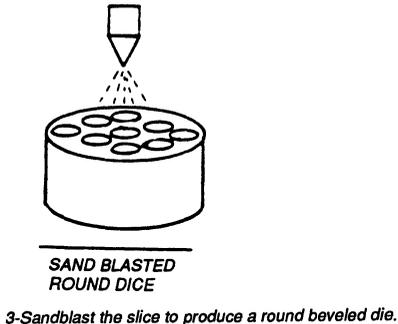
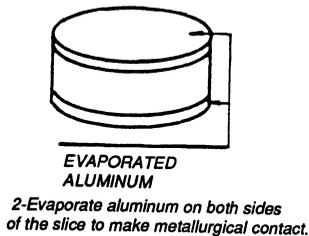
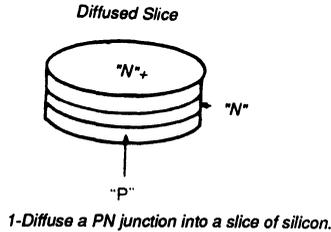
QUICK GUIDE TO SUPERRECTIFIERS

TYPE	1N4383GP thru 1N4586GP	1N5059GP thru 1N5062GP	AGP15-200 thru AGP15-800	GP15A thru GP15M	1N5391GP thru 1N5399GP	RGP15A thru RGP15M*	GP20A thru GP20J	RGP20A thru RGP20J*	RGP25A thru RGP25M*	1N5624GP thru 1N5627GP	GP30A thru GP30M	RGP30A* thru RGP30*
*CASE	DO15	DO15	DO15	DO15	DO15	DO15	GP20	DO201AD	DO201AD	DO201AD	DO201AD	DO201AD
Io(A)	1.0	1.0	1.5	1.5	1.5	1.5	2.0	2.0	2.5	3.0	3.0	3.0
@TA(C°)	55	55	55	55	55	55	55	55	55	70	55	55
VR=50(V)				GP15A	1N5391GP	RGP15A	GP20A	RGP20A	RGP25A		GP30A	RGP30A
VR=100(V)				GP15B	1N5392GP	RGP15B	GP20B	RGP20B	RGP25B		GP30B	RGP30B
VR=200(V)	1N4383GP	1N5059GP	AGP15-200	GP15D	1N5393GP	RGP15D	GP20D	RGP20D	RGP25D	1N5624GP	GP30D	RGP30D
VR=300(V)					1N5394GP							
VR=400(V)	1N4384GP	1N5060GP	AGP15-400	GP15G	1N5395GP	RGP15G	GP20G	RGP20G	RGP25G	1N5625GP	GP30G	RGP30G
VR=500(V)					1N5396GP							
VR=600(V)	1N4385GP	1N5061GP	AGP15-600	GP15J	1N5397GP	RGP15J	GP20J	RGP20J	RGP25J	1N5626GP	GP30J	RGP30J
VR=800(V)	1N4585GP	1N5062GP	AGP15-800	GP15K	1N5398GP	RGP15K			RGP25K	1N5627GP	GP30K	RGP30K
VR=100Q(V)	1N4586GP	1N5399GP		GP15M		RGP15M	GP30M		RGP25M		GP30M	RGP30M
=												
SURGE(A)	50	50	50	50	50	50	65	65	65	100	125	125
VF(V)	1.2	1.2	1.2	1.1	1.4	1.3	1.1	1.3	1.3	1.3	1.0	1.1

*FAST RECOVERY



GLASS RECTIFIER PROCESS



Package Design

The small size of the superectifier with its capability up to 3 Amperes permits packing densities in electronic assemblies and equipment, while increasing reliability. Only high temperature brazing operations are used to withstand the 600°C required to melt and fuse the glass. This technique eliminates solder construction and tremendously enhances mechanical strength and temperature cycling capability, increasing operating and storage temperature range while reducing thermal resistance.

Reliability

Specified reliability data on Superectifier devices are available from the General Instrument Semiconductor Components Reliability Department. The basic design of the superectifier devices and the strict positive controls over materials and manufacturing processes provide assurance of failure-free performance under the most severe conditions. Processing facilities have been geared to follow the procedural requirements of Military Standard 750 and are capable of withstanding environmental extremes in excess of MIL-S-19500. Assurance of production uniformity and reliability is provided by a test technique called "Operational Load Line Testing", which has proven product reliability with over 1 Billion Superectifiers now in use.

GENERAL
INSTRUMENT

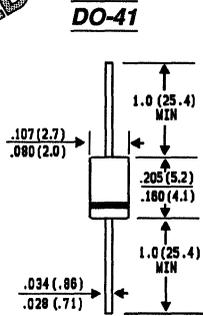
GP02-20 THRU GP02-40

MINIATURE HIGH VOLTAGE GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 2000 to 4000 Volts Current - 0.25 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly to Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-41 package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension



MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, .3 gram



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

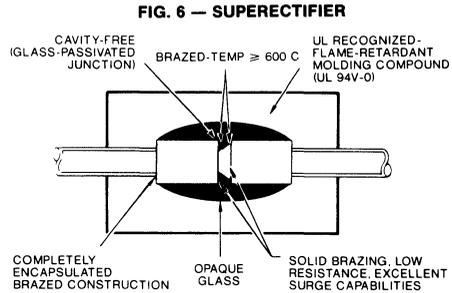
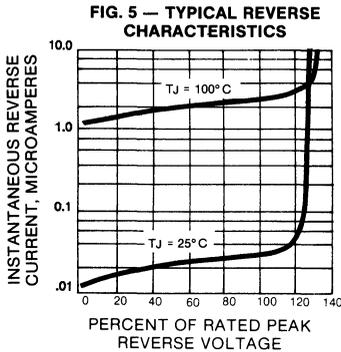
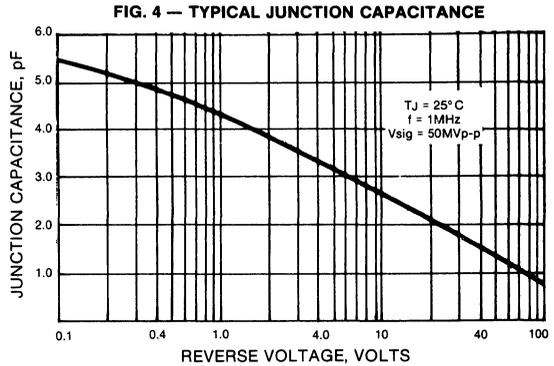
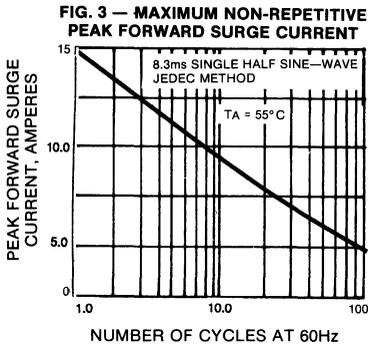
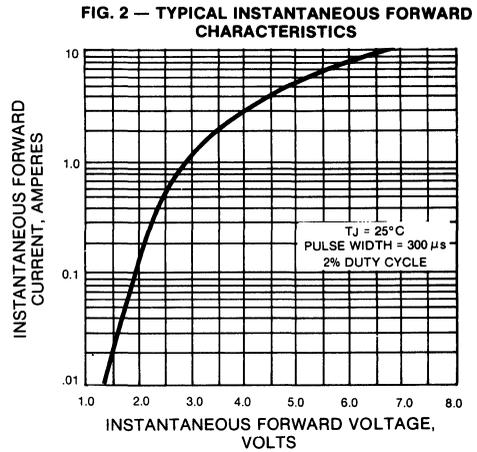
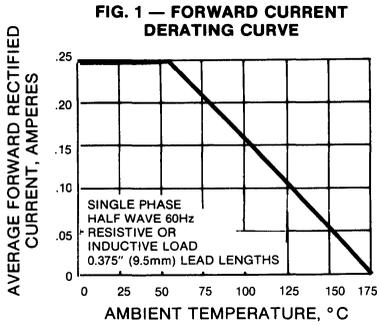
Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	GP02 -20	GP02 -25	GP02 -30	GP02 -35	GP02 -40	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	2000	2500	3000	3500	4000	Volts
Maximum RMS Voltage	V _{RMS}	1400	1750	2100	2450	2800	Volts
Maximum DC Blocking Voltage	V _{DC}	2000	2500	3000	3500	4000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _A =55°C	I _(AV)	0.25					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at T _A =55°C	I _{FSM}	15.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A	V _F	3.0					Volts
Maximum DC Reverse Current T _A = 25°C at Rated DC Blocking Voltage T _A =100°C	I _R	50.0					μA
Typical Reverse Recovery Time (NOTE 2)	T _{RR}	2.0					μs
Typical Junction Capacitance (NOTE 1)	C _J	3.0					pf
Typical Thermal Resistance (NOTE 3)	ReJA	130.0					°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175					°C

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: I_F=0.5A, I_R= 1.0A, I_{rr}= .25A.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES GP02-20 THRU GP02-40



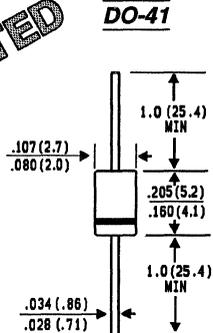
GI250-1 THRU GI250-4

MINIATURE HIGH VOLTAGE GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 1000 to 4000 Volts Current - 0.25 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly to Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-41 package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375" (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, .3 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.

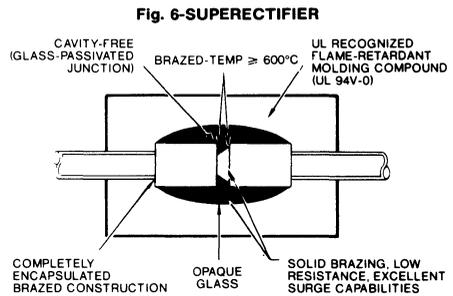
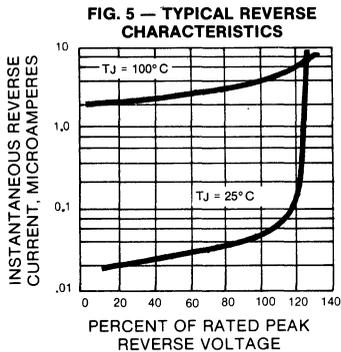
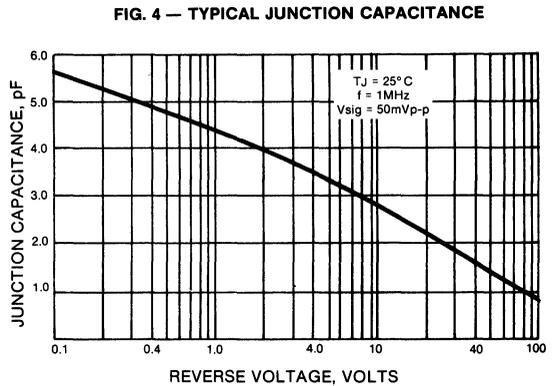
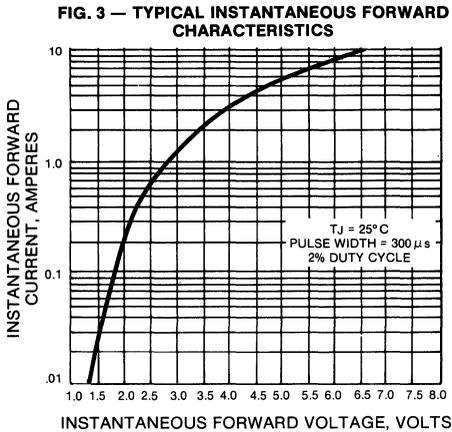
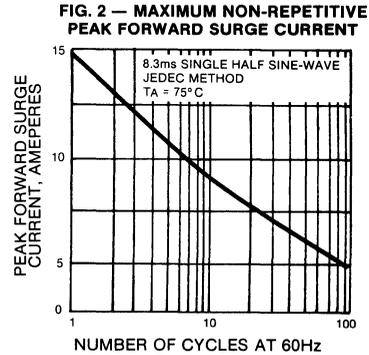
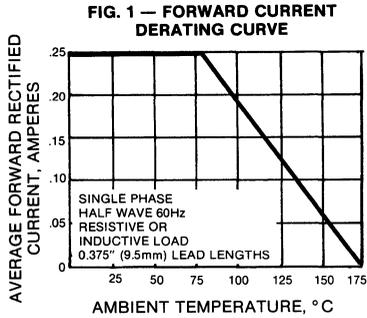
For capacitive load, derate current by 20%.

	SYMBOLS	GI250-1	GI250-2	GI250-3	GI250-4	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	1000	2000	3000	4000	Volts
Maximum RMS Voltage	V _{RMS}	700	1400	2100	2800	Volts
Maximum DC Blocking Voltage	V _{DC}	1000	2000	3000	4000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _A = 75°C	I _(AV)	0.25				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load at T _A = 75°C(JEDEC Method)	I _{FSM}	15.0				Amps
Maximum Instantaneous Forward Voltage at 0.25A	V _F	3.5				Volts
Maximum DC Reverse Current T _A = 25°C	I _R	5.0				μA
at Rated DC Blocking Voltage T _A = 100°C	I _R	50.0				μA
Typical Reverse Recovery Time (NOTE 2)	T _{RR}	2.0				μs
Typical Junction Capacitance (NOTE 1)	C _J	3.0				pf
Typical Thermal Resistance (NOTE 3)	R _{θJC}	130.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175				°C

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: I_F = 0.5A, I_R = 1.0A, I_{rr} = 0.25A.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES GI250-1 THRU GI250-4



GP08A THRU GP08J

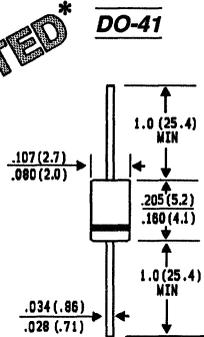
MINIATURE GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 50 to 600 Volts Current - 0.8 Amperes

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in D0-41 package
- ◆ 0.8 Ampere operation at $T_A = 55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1\mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly to Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

MECHANICAL DATA

Case: Molded plastic over glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.012 ounce, .3 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	GP08A	GP08B	GP08D	GP08G	GP08J	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A = 55^\circ\text{C}$	$I_{(AV)}$	0.8					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A = 55^\circ\text{C}$	I_{FSM}	25.0					Amps
Maximum Instantaneous Forward Voltage at 0.8A	V_F	1.3					Volts
Maximum Full Load Reverse Current Full Cycle Average 375" (9.5mm) Lead Lengths at $T_A = 55^\circ\text{C}$	$I_{R(AV)}$	30.0					μA
Maximum DC Reverse Current $T_A = 25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A = 125^\circ\text{C}$	I_R	50.0					μA
Typical Reverse Recovery Time (NOTE 1)	T_{RR}	1.0					μs
Typical Junction Capacitance (NOTE 2)	C_J	8.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	45.0					$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

1. Measure on $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, $I_{rr} = 25\text{A}$.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES GP08A THRU GP08J

FIG. 1 — FORWARD CURRENT DERATING CURVE

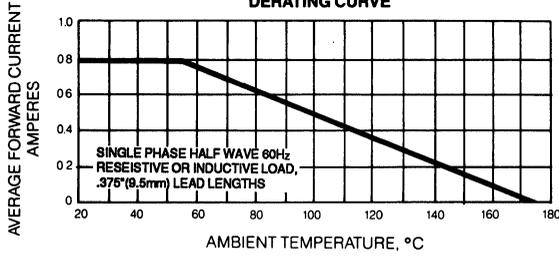


FIG. 2 TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

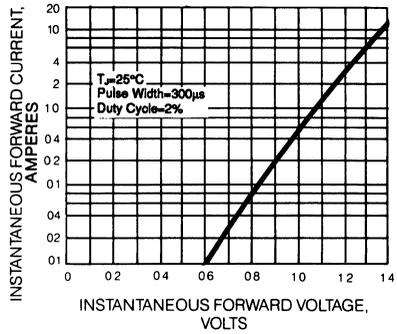


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

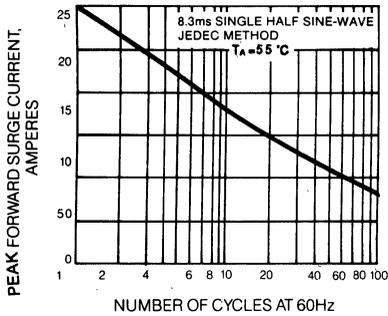


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

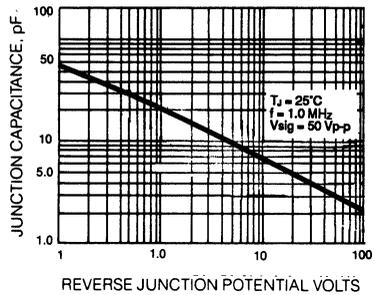


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

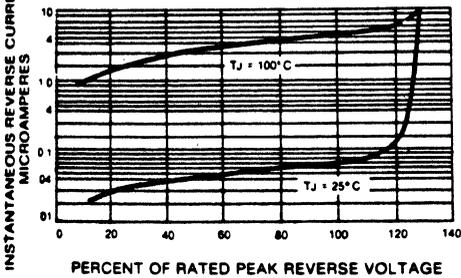
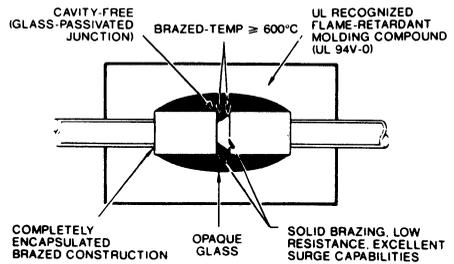


FIG. 6 — SUPERRECTIFIER



1N3611GP THRU 1N3614GP AND 1N3957GP

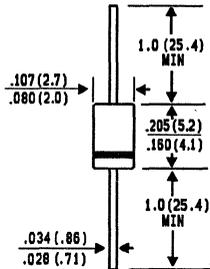
MINIATURE GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 200 to 1000 Volts Current - 1.0 Ampere

FEATURES

PATENTED*

DO-41



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly to Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-41 package
- ◆ 1.0 Ampere operation at $T_A=75^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than 0.1 μA
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, .3 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	1N	1N	1N	1N	1N	UNITS
		3611GP	3612GP	3613GP	3614GP	3957GP	
* Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
* Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Amps
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=75^\circ\text{C}$	$I(AV)$	1.0					Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.0					Volts
* Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	300.0					μA
Typical Reverse Recovery Time (NOTE 1)	T_{RR}	2.0					μs
Typical Junction Capacitance (NOTE 2)	C_J	10.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	45.0					$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions : $I_F=0.5\text{A}$, $I_R = 1.0\text{A}$, $I_{rr} = .25\text{A}$.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

* JEDEC Registered Values

RATINGS AND CHARACTERISTIC CURVES 1N3611GP THRU 1N3614GP AND 1N3957GP

FIG. 1 — FORWARD CURRENT DERATING CURVE

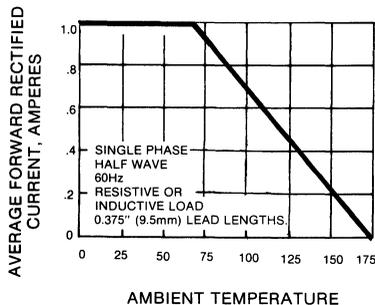


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

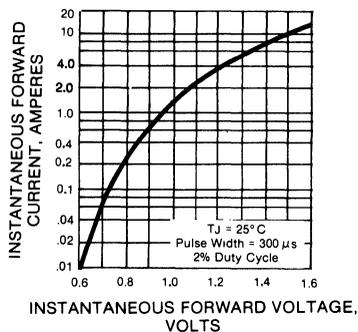


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

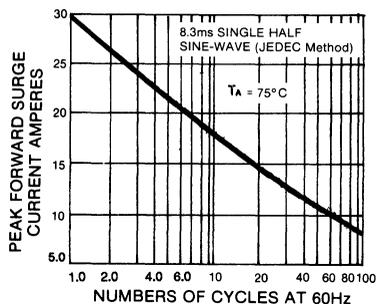


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

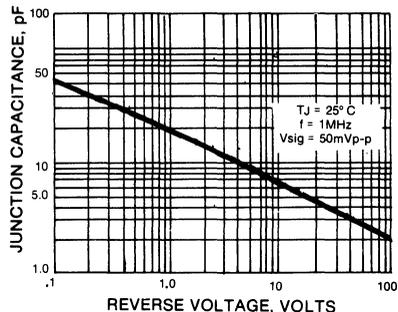


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

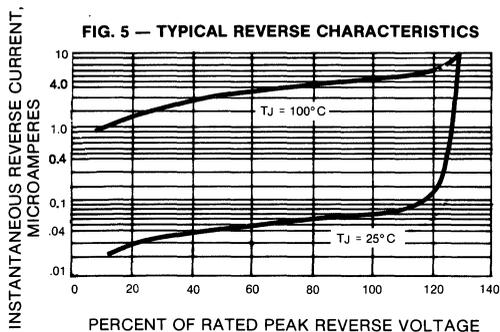
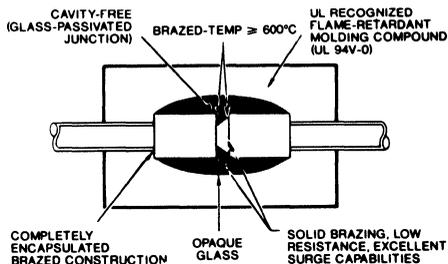


FIG. 6 — SUPERRECTIFIER



1N4001GP THRU 1N4007GP

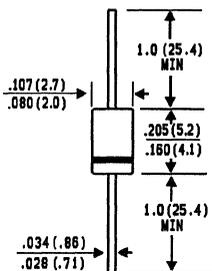
MINIATURE GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 50 to 1000 Volts Current - 1.0 Ampere

FEATURES

PATENTED*

DO-41



Dimensions in inches and (millimeters)

*Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly to Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-41 package
- ◆ 1.0 Ampere operation at $T_A = 75^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, 0.3 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
For capacitive load, derate current by 20%.

		1N	1N	1N	1N	1N	1N	1N	UNITS
	SYMBOLS	4001GP	4002GP	4003GP	4004GP	4005GP	4006GP	4007GP	
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
*Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
*Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A = 75^\circ\text{C}$	$I_{(AV)}$	1.0							Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0							Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.1							Volts
*Maximum Full Load Reverse Current, Full Cycle Average .375", (9.5mm) Lead Length $T_A = 75^\circ\text{C}$	$I_{R(AV)}$	30.0							μA
*Maximum DC Reverse Current $T_A = 25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A = 125^\circ\text{C}$	I_R	5.0							μA
Typical Reverse Recovery Time (NOTE 1)	T_{RR}	2.0							μS
Typical Junction Capacitance (NOTE 2)	C_J	8.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	45.0							$^\circ\text{C}/\text{W}$
*Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

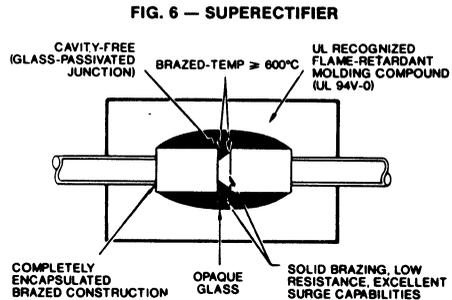
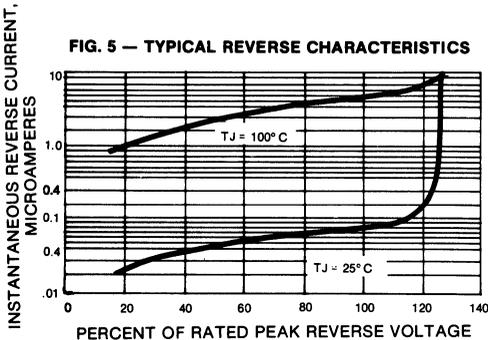
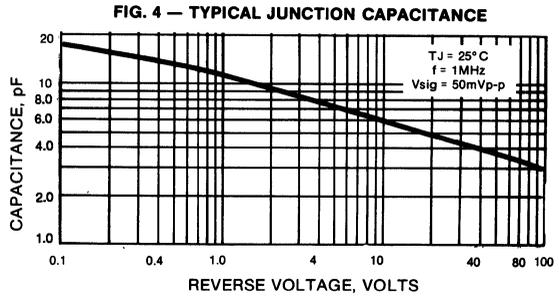
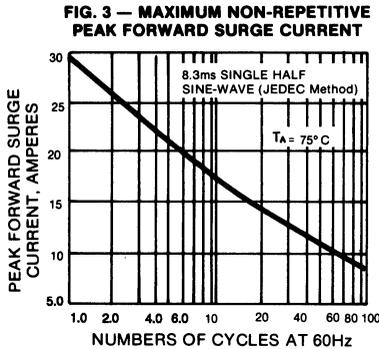
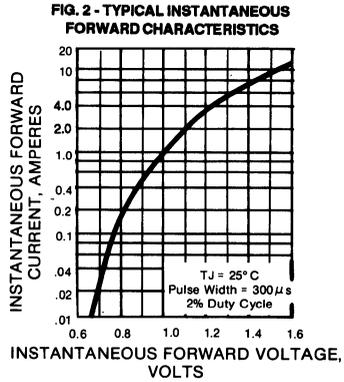
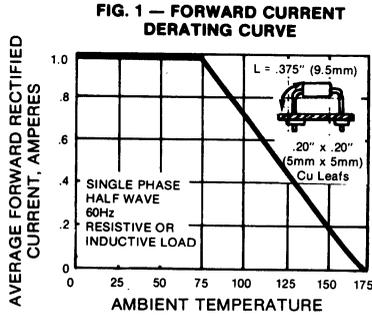
NOTES: 1. Reverse Recovery Test Conditions: $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, $I_{rr} = 0.25\text{A}$.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 V_{DC} .

3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

* JEDEC Registered Values

RATINGS AND CHARACTERISTIC CURVES 1N4001GP THRU 1N4007GP



1N4245GP THRU 1N4249GP

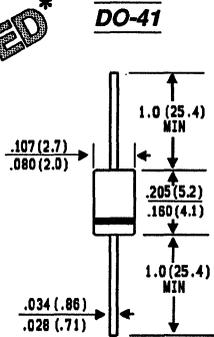
MINIATURE GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 200 to 1000 Volts Current - 1.0 Ampere

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction version of 1N4249 in DO-41 package
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*



Dimensions in inches and (millimeters)

*Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.012 ounce, .3 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N	1N	1N	1N	1N	UNITS
		4245GP	4246GP	4247GP	4248GP	4249GP	
* Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
* Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
* Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
* Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
* Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	25.0					Amps
* Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.2					Volts
* Maximum Full Load Reverse Current Full Cycle Average .375" (9.5mm) Lead Length $T_A=55^\circ\text{C}$	$I_{R(AV)}$	50.0					μA
* Maximum Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$	I_R	25.0					μA
Typical Junction Capacitance (NOTE 1)	C_J	8.0					pf
Typical Thermal Resistance (NOTE 2)	$R_{\theta JA}$	45.0					$^\circ\text{C}/\text{W}$
* Operating Temperature Range	T_J	-65 to +160					$^\circ\text{C}$
* Storage Temperature Range	T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
 2. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
- * JEDEC registered values

RATINGS AND CHARACTERISTIC CURVES 1N4245GP THRU 1N4249GP

FIG. 1 — FORWARD CURRENT DERATING CURVE

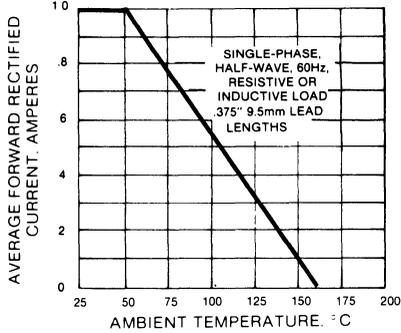


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

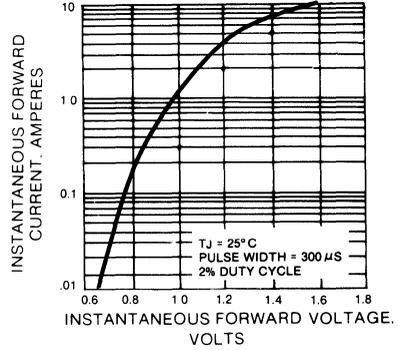


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

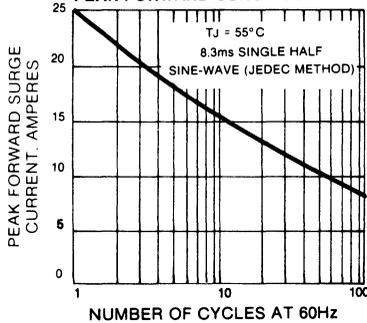
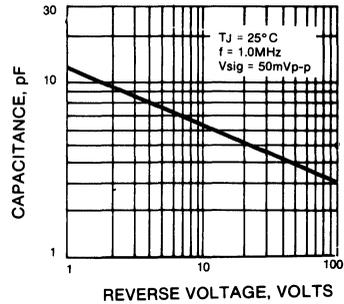


FIG. 4 — TYPICAL JUNCTION CAPACITANCE



INSTANTANEOUS REVERSE CURRENT, MICROAMPERES

FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

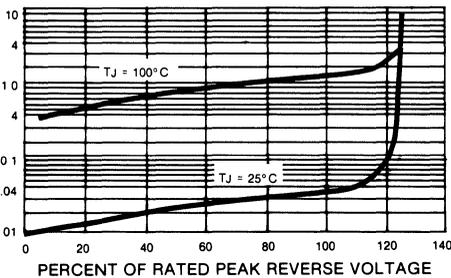
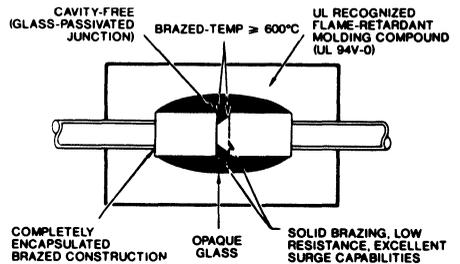


FIG. 6 — SUPERECTIFIER



GP10A THRU GP10Y

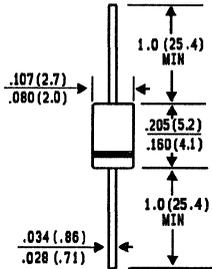
MINIATURE GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 50 to 1600 Volts Current - 1.0 Ampere

FEATURES

PATENTED*

DO-41



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-41 package
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, .3 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

SYMBOLS	A B D G J K M N Q T V W Y											UNITS
	Maximum Recurrent Peak Reverse Voltage	50 to 1600 Volts, See Fig 5.											Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	1.0											Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	30.0					25.0					Amps	
Maximum Instantaneous Forward Voltage at 1.0A	1.1			1.2			1.3			Volts		
Maximum Full Load Reverse Current, Full Cycle Average, .375", (9.5mm) Lead Lengths at $T_A=75^\circ\text{C}$	30.0											μA
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=125^\circ\text{C}$	50.0											μA
Typical Reverse Recovery Time (NOTE 1)	2.0											μS
Typical Junction Capacitance (NOTE 2)	8.0			7.0			5.0			pf		
Typical Thermal Resistance (NOTE 3)	45.0											$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	-65 to +175											$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Condition: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES GP10A THRU GP10Y

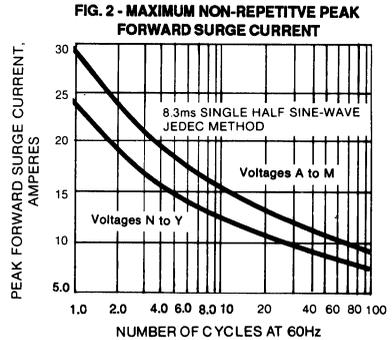
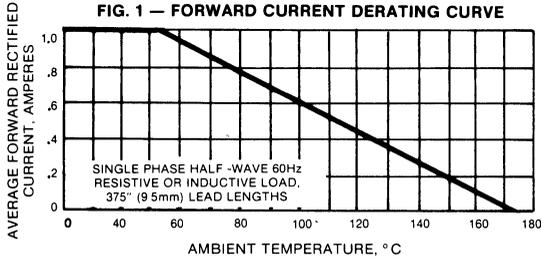


FIG. 3 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

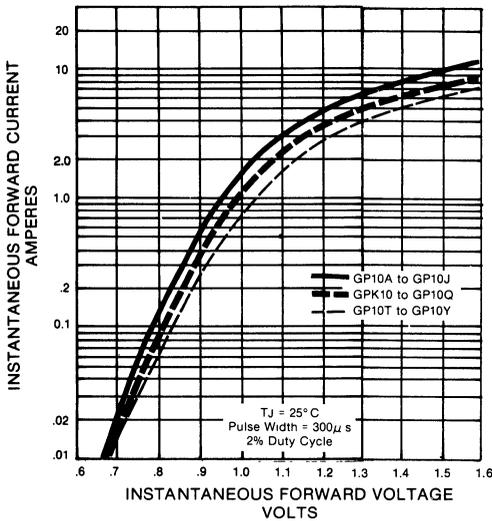


FIG. 4 - TYPICAL REVERSE CHARACTERISTICS

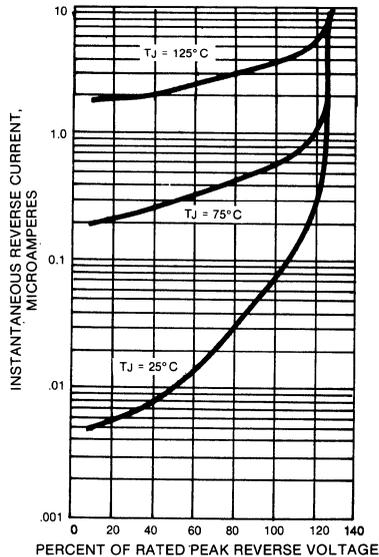
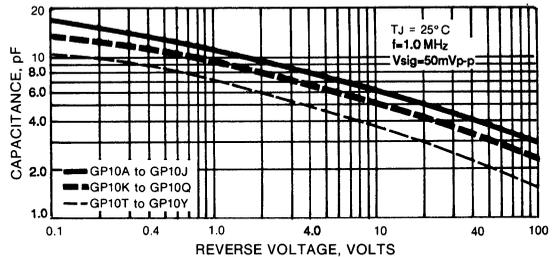


Fig. 5 - MAXIMUM RECURRENT PEAK REVERSE VOLTAGE

- GP10A - 50V
- GP10B - 100V
- GP10D - 200V
- GP10G - 400V
- GP10J - 600V
- GP10K - 800V
- GP10M - 1000V
- GP10N - 1100V
- GP10Q - 1200V
- GP10T - 1300V
- GP10V - 1400V
- GP10W - 1500V
- GP10Y - 1600V

FIG. 6 - TYPICAL JUNCTION CAPACITANCE



1N4383GP THRU 1N4385GP 1N4585GP AND 1N4586GP

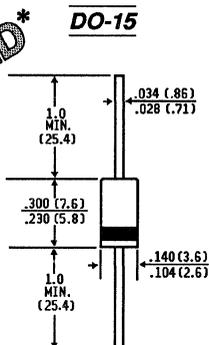
MINIATURE GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 200 to 1000 Volts Current - 1.0 Ampere

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-15 package
- ◆ 1.0 Ampere operation at $T_A=100^\circ\text{C}$ with no thermal runaway
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed lead assembly by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-15 Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.015 ounce, 0.4 gram

SUPERRECTIFIER®

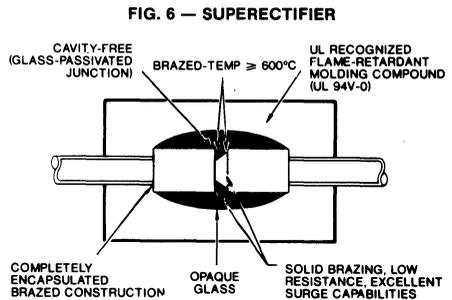
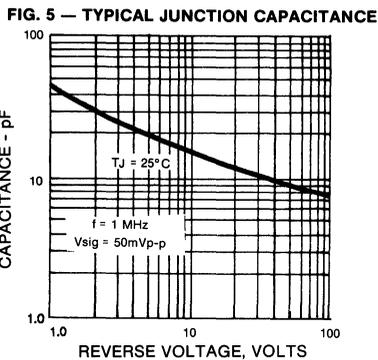
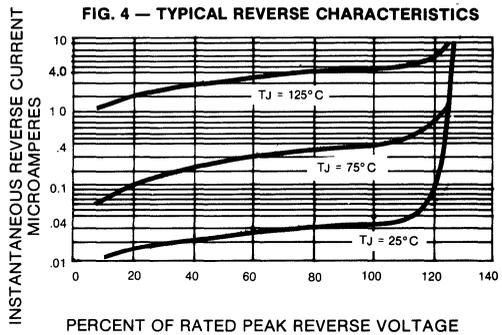
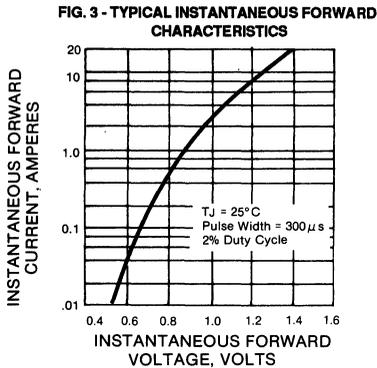
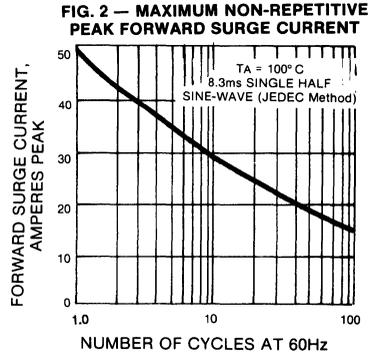
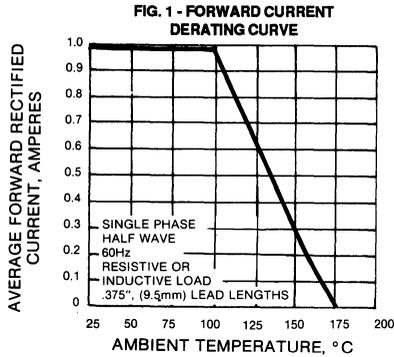
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Single half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

SYMBOLS	1N	1N	1N	1N	1N	UNITS	
	4383GP	4384GP	4385GP	4585GP	4586GP		
* Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
* Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
* Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
* Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=100^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
* Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A=100^\circ\text{C}$	I_{FSM}	50.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.0					Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	5.0 250.0					μA
* Typical Reverse Recovery Time (NOTE 2)	T_{RR}	2.0					μS
Maximum Full Load Reverse Current Full Cycle Average at .375" (9.5mm) Lead Lengths $T_A=100^\circ\text{C}$	$I_{R(AV)}$	275	250	225	200	200	μA
Typical Junction Capacitance (NOTE 1)	C_J	15.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	25.0					$^\circ\text{C}/\text{W}$
* Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES: 1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=0.25\text{A}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
* JEDEC registered values

**RATINGS AND CHARACTERISTIC CURVES 1N4383GP THRU 1N4385GP
1N4585GP AND 1N4586GP**



1N5059GP THRU 1N5062GP

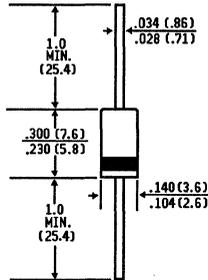
MINIATURE GLASS PASSIVATED JUNCTION/PLASTIC RECTIFIER

Voltage - 200 to 800 Volts Current - 1.0 Ampere

FEATURES

PATENTED*

DO-15



Dimensions in inches and (millimeters)

*Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

SUPER RECTIFIER®

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction version of 1N5059 thru 1N5062 in DO-15 package
- ◆ 1.0 Ampere operation at $T_A=75^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-15 Molded plastic over glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.015 ounce, 0.4 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

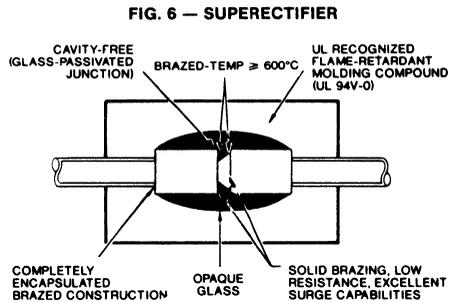
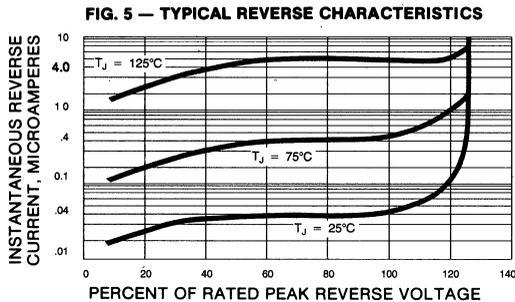
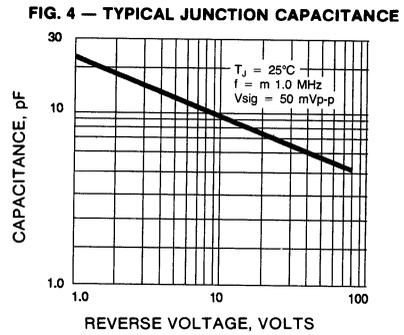
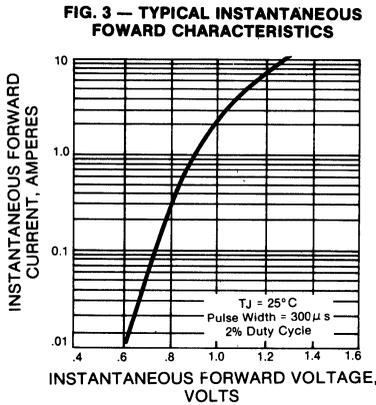
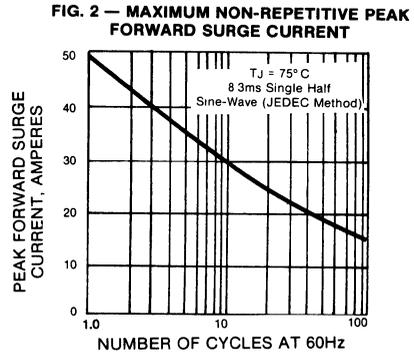
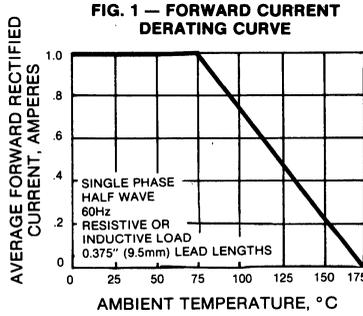
Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	1N5059GP	1N5060GP	1N5061GP	1N5062GP	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	Volts
*Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=75^\circ\text{C}$	$I_{(AV)}$	1.0				Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0				Amps
*Maximum Instantaneous Forward Voltage at 1.0A $T_A=75^\circ\text{C}$	V_F	1.2				Volts
*Maximum Full Load Reverse Current, Full Cycle Average, .375" (9.5mm) Lead Lengths at $T_A=25^\circ\text{C}$ $T_A=75^\circ\text{C}$	$I_{R(AV)}$	5.0 150.0				μA
*Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$ $T_A=175^\circ\text{C}$	I_R	5.0 300.0				μA
Typical Reverse Recovery Time (NOTE 1)	T_{RR}	2.0				μs
Typical Junction Capacitance (NOTE 2)	C_J	15.0				pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	25.0				$^\circ\text{C}/\text{W}$
*Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175				$^\circ\text{C}$

NOTES:

- Reverse Recovery Test Conditions : $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, recover to 0.25A.
- Measured at 1.0 MHz and applied reverse voltage of 4.0 Vdc.
- Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
 * JEDEC Registered Value

RATINGS AND CHARACTERISTIC CURVES 1N5059GP THRU 1N5062GP



1N5391GP THRU 1N5399GP

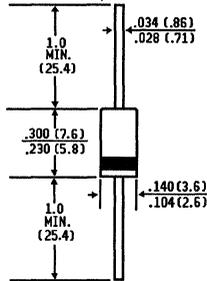
MINIATURE GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 50 to 1000 Volts Current - 1.5 Amperes

FEATURES

PATENTED*

DO-15



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction
- ◆ 1.5 Ampere operation at $T_A=70^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-15 Molded plastic over glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.015 ounce, 0.4 gram

SUPERRECTIFIER®

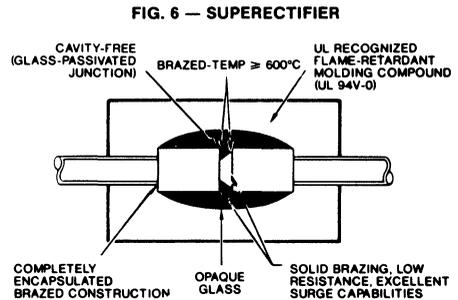
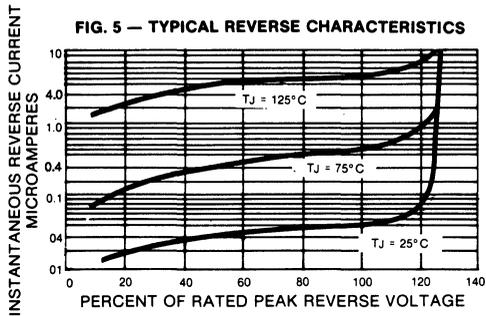
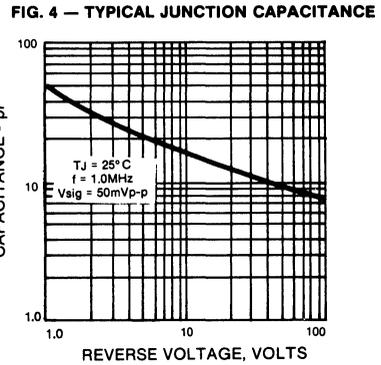
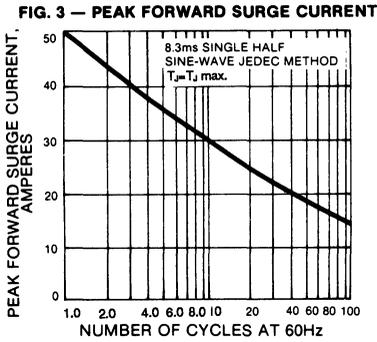
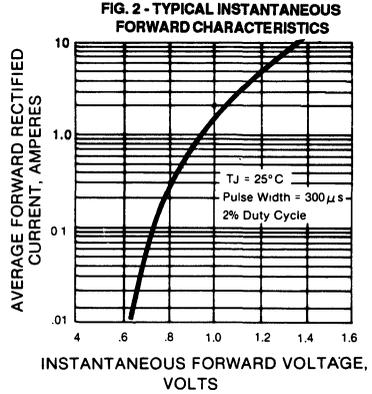
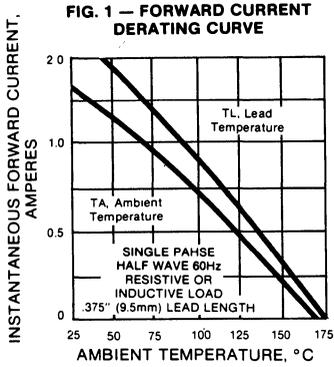
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Single phase, half wave 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N53 91GP	1N53 92GP	1N53 93GP	1N53 94GP	1N53 95GP	1N53 96GP	1N53 97GP	1N53 98GP	1N53 99GP	UNITS
* Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	300	400	500	600	800	1000	Volts
* Maximum RMS Voltage	V_{RMS}	35	70	140	210	280	350	420	560	700	Volts
* Maximum DC Blocking Voltage	V_{DC}	50	100	200	300	400	500	600	800	1000	Volts
* Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=70^\circ\text{C}$	$I_{(AV)}$	1.5									Amps
* Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0									Amps
* Maximum Instantaneous Forward Voltage at 1.5A, $T_A=70^\circ\text{C}$	V_F	1.4									Volts
* Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	300.0									μA
* Maximum Full Load Reverse Current Full Cycle Average, .375", (9.5mm) Lead Length at $T_A=70^\circ\text{C}$	$I_{R(AV)}$	300.0									μA
Typical Reverse Recovery Time (NOTE 2)	T_{RR}	2.0									μs
Typical Junction Capacitance (NOTE 1)	C_J	15.0									pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	30.0									$^\circ\text{C}/\text{W}$
* Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175									$^\circ\text{C}$

NOTES: 1. Measured at 1.0 MHz and applied reverse voltage of $4.0 V_{DC}$.
 2. Reverse Recovery Test Condition: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=0.25\text{A}$.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
 * JEDEC registered values

RATINGS AND CHARACTERISTIC CURVES 1N5391GP THRU 1N5399GP



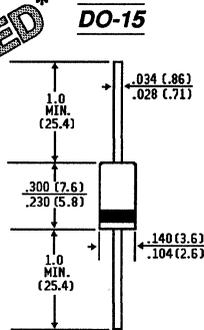
GP15A THRU GP15M

MINIATURE GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 50 to 1000 Volts Current - 1.5 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-15 package
- ◆ 1.5 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-15 Molded plastic over glass

Terminals: Plated Axial leads, solderable per

MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.015 ounce, 0.4 gram



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	GP 15A	GP 15B	GP 15D	GP 15G	GP 15J	GP 15K	GP 15M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.5							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0							Amps
Maximum Instantaneous Forward Voltage at 1.5A	V_F	1.1							Volts
Maximum Full Load Reverse Current, Full Cycle Average .375", (9.5mm) Lead Length $T_A=55^\circ\text{C}$	$I_{R(AV)}$	100.0							μA
Maximum Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	5.0 200.0							μA
Typical Reverse Recovery Time (NOTE 2)	T_{RR}	2.0							μS
Typical Junction Capacitance (NOTE 1)	C_J	15.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	25.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 V_{DC}.
2. Reverse Recovery Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, recover to 0.25A.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES GP15A THRU GP15M

FIG. 1 — FORWARD CURRENT DERATING CURVE

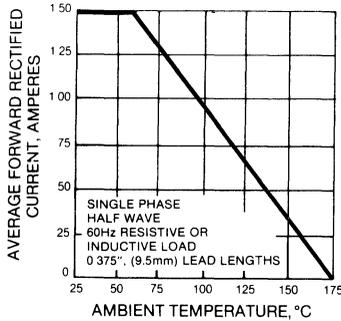


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

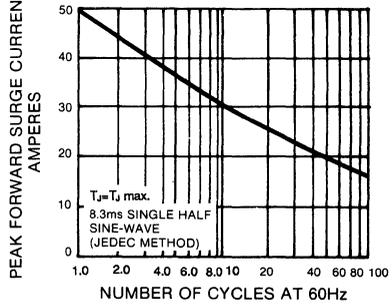


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

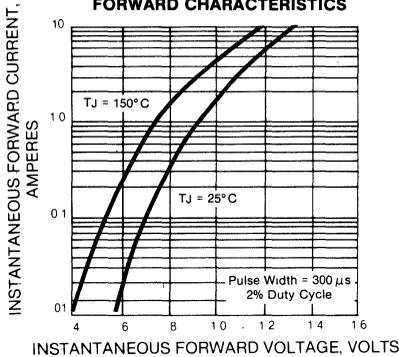


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

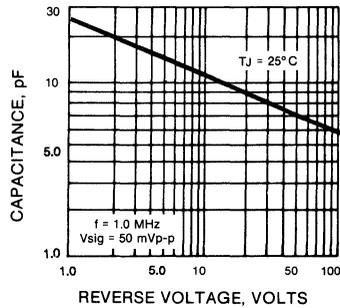


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

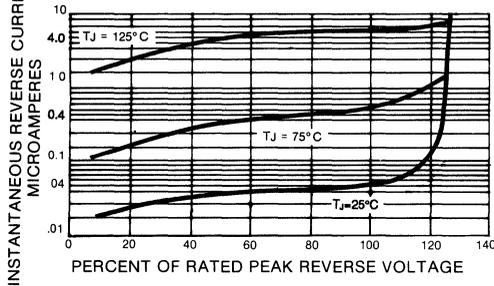
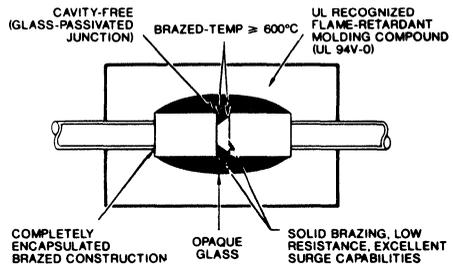


FIG. 6 — SUPERRECTIFIER



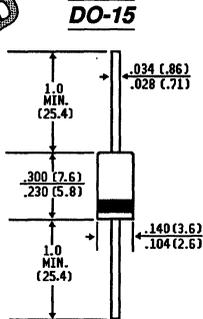
AGP15-200 THRU AGP15-800

MINIATURE GLASS PASSIVATED JUNCTION PLASTIC CONTROLLED AVALANCHE RECTIFIER

Voltage - 200 to 800 Volts Current - 1.5 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Controlled Avalanche characteristic combined with the ability to dissipate reverse power
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-15 package
- ◆ 1.5 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-15 Molded plastic over glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any **Weight:** 0.0154 ounce, .4 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	AGP15-200	AGP15-400	AGP15-600	AGP15-800	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	Volts
Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	Volts
Minimum Avalanche Breakdown Voltage at $100 \mu\text{A}$	V_{BR}	240	450	675	880	Volts
Maximum Avalanche Breakdown Voltage at $100 \mu\text{A}$	V_{BR}	500	750	1000	1200	Volts
Maximum Peak Power Dissipation in the Avalanche Region 20 μs Pulse	P_{RM}	500.0				Watts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.5				Amps
Peak Forward Surge Current, 8.3ms single half sine wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0				Amps
Maximum Instantaneous Forward Voltage at 1.5A	V_F	1.1				Volts
Maximum Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	5.0 200.0				μA
Maximum Full Load Reverse Current, Full Cycle Average, .375", (9.5mm) Lead Length at $T_A=55^\circ\text{C}$	$I_{R(AV)}$	100.0				μA
Typical Reverse Recovery Time (NOTE 2)	T_{RR}	2.0				μs
Typical Junction Capacitance (NOTE 1)	C_J	15.0				pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	25.0				$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175				$^\circ\text{C}$

- NOTES: 1. Measured at 1 MHz and applied reverse voltage of 4.0 Volts.
 2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, recover to 0.25A.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES AGP15-200 THRU AGP15-800

FIG. 1 — FORWARD CURRENT DERATING CURVE

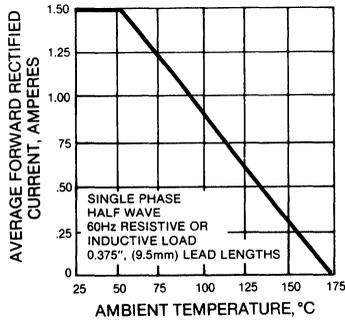


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

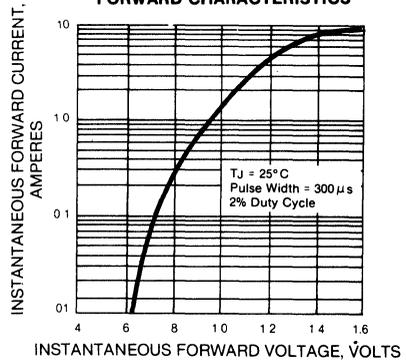


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

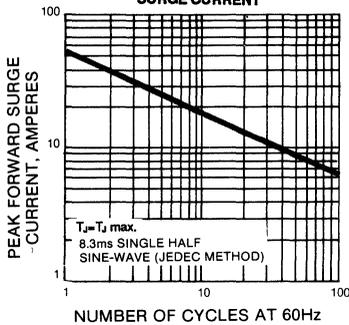


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

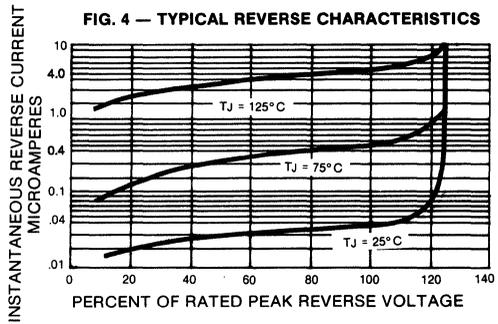


FIG. 5 — MAXIMUM NON-REPETITIVE REVERSE AVALANCHE POWER DISSIPATION

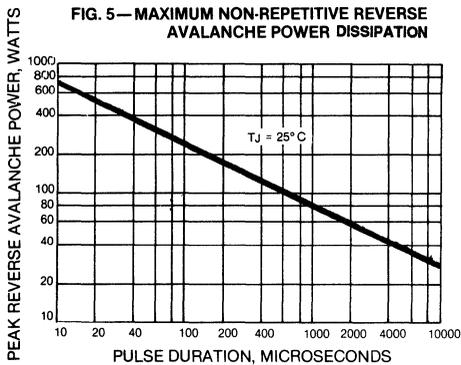
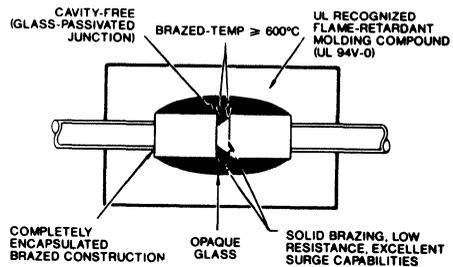


FIG. 6 — SUPERRECTIFIER



GP20A THRU GP20J

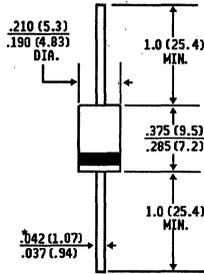
GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 50 to 600 Volts Current - 2.0 Amperes

FEATURES

PATENTED*

DO-201*



Dimensions in inches and (millimeters)

*Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

- ♦ High temperature metallurgically bonded constructed rectifiers
- ♦ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ♦ Glass passivated cavity-free junction
- ♦ 2.0 Ampere operation at $T_A = 55^\circ\text{C}$ with no thermal runaway
- ♦ Typical I_R less than $0.1 \mu\text{A}$
- ♦ Capable of meeting environmental standards of MIL-S-19500
- ♦ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-201* Molded plastic over glass

Terminals: Plated Axial leads, solderable per

MIL-STD-202, Method 208

Polarity: Band denotes cathode

Mounting Position: Any

Weight: 0.03 ounce, 0.8 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified 60 Hz

Resistive or inductive load.

For capacitive load, derate current by 20%.

	SYMBOLS	GP 20A	GP 20B	GP 20D	GP 20G	GP 20J	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A = 55^\circ\text{C}$	$I_{(AV)}$	2.0					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	65.0					Amps
Maximum Instantaneous Forward Voltage at 2.0A	V_F	1.2		1.1			Volts
Maximum Reverse Current at Rated DC Blocking Voltage $T_A = 25^\circ\text{C}$	I_R	5.0					μA
Maximum Full Load Reverse Current, Full Cycle Average, .375" (9.5mm) Lead Length $T_A = 55^\circ\text{C}$	$I_{R(AV)}$	100.0					μA
Typical Reverse Recovery Time (NOTE 1)	T_{RR}	2.5					μs
Typical Junction Capacitance (NOTE 2)	C_J	40.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	16.0					$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.

2. Reverse Recovery Test Conditions: $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, $I_{rr} = 0.25\text{A}$.

3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES GP20A THRU GP20J

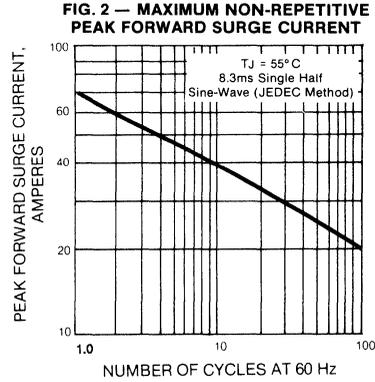
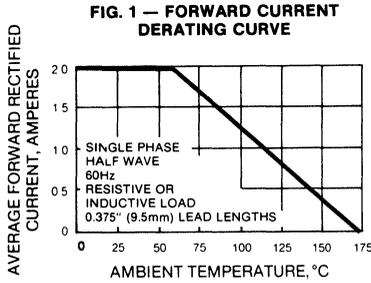


FIG. 3 — TYPICAL JUNCTION CAPACITANCE

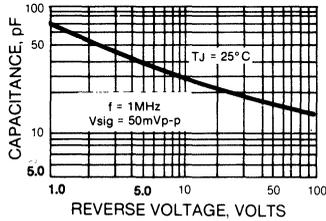


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

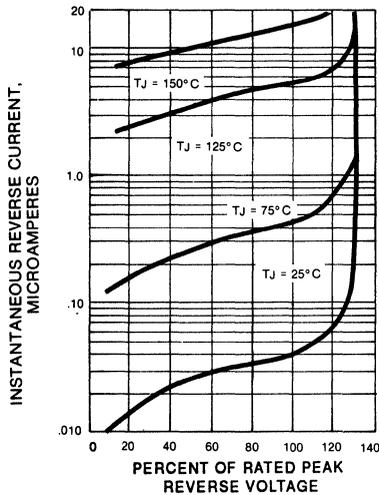


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

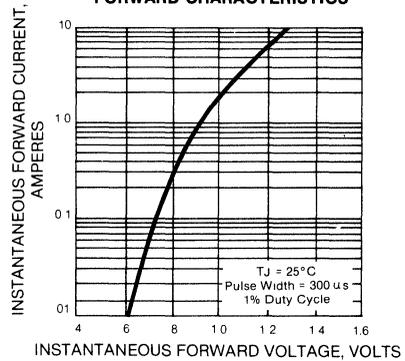
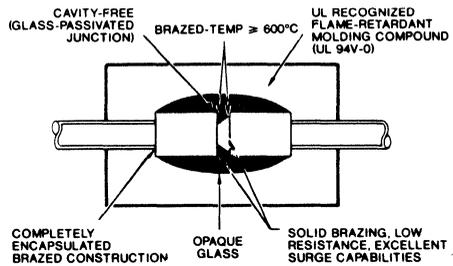


FIG. 6 — SUPERRECTIFIER



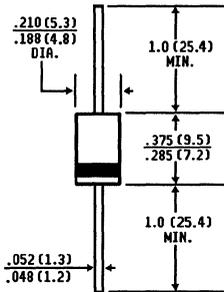
1N5624GP THRU 1N5627GP

GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 200 to 800 Volts Current - 3.0 Amperes

FEATURES

PATENTED* DO-201AD



Dimensions in inches and (millimeters)

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-201AD package
- ◆ 3.0 Ampere operation at $T_A = 70^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension



*Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-201AD Molded plastic over glass

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.04 ounce, 1.12 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

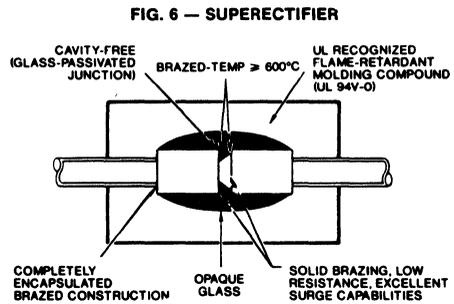
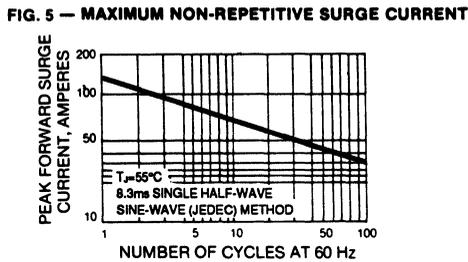
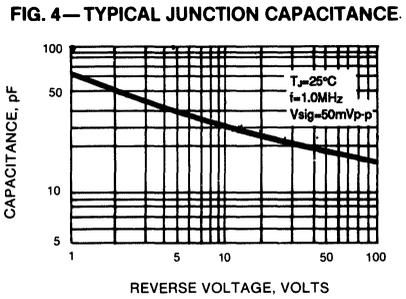
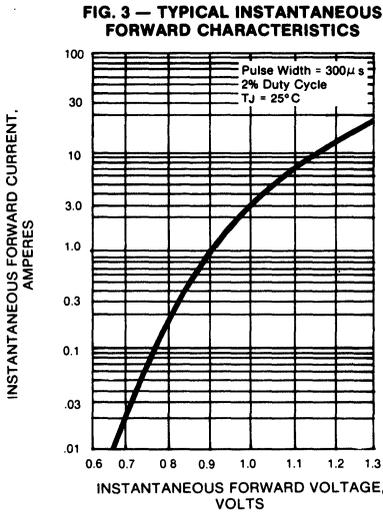
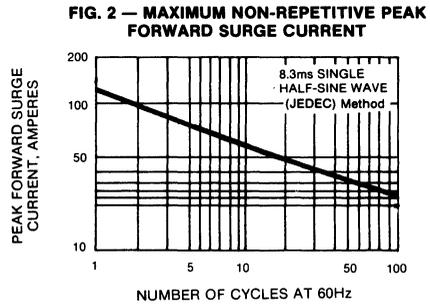
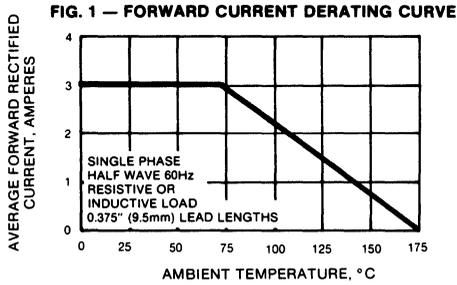
Ratings at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N5624GP	1N5625GP	1N5626GP	1N5627GP	UNITS
* Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	Volts
* Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	Volts
* Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A = 70^\circ\text{C}$	$I_{(AV)}$	3.0				Amps
* Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	125.0				Amps
* Maximum Instantaneous Forward Voltage at 3.0A	V_F	$T_A = 25^\circ\text{C}$ 1.0				Volts
		$T_A = 70^\circ\text{C}$ 0.95				
Maximum Reverse Current at Rated DC Blocking Voltage	I_R	$T_A = 25^\circ\text{C}$ 300.0		$T_A = 150^\circ\text{C}$ 200.0		μA
Maximum Full Load Reverse Current, Full Cycle Average, .375" (9.5mm) Lead Length at $T_A = 70^\circ\text{C}$		$I_{R(AV)}$	200.0				$\mu\text{A}$
Typical Reverse Recovery Time (NOTE 2)	T_{RR}	3.0				μS
Typical Junction Capacitance (NOTE 1)	C_J	40.0				pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	15.0				$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175				$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Vdc.
 2. Reverse Recovery Test Conditions: $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, recover to 0.25A.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
- * JEDEC Registered Value

RATINGS AND CHARACTERISTIC CURVES 1N5624GP THRU 1N5627GP



GP30A THRU GP30M

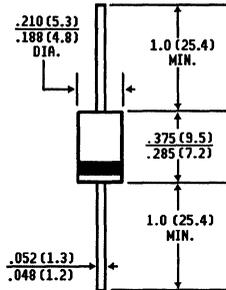
GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 50 to 1000 Volts Current - 3.0 Amperes

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-201AD package
- ◆ 3.0 Ampere operation at $T_A = 55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED* DO-201AD



Dimensions in inches and (millimeters)

*Glass-epoxy encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

MECHANICAL DATA

Case: JEDEC DO-201AD Molded plastic over glass
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.04 ounce, 1.12 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	GP 30A	GP 30B	GP 30D	GP 30G	GP 30J	GP 30K	GP 30M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	3.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	125.0							Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.2		1.1					Volts
Maximum Reverse Current at Rated DC Blocking Voltage	I_R	5.0							μA
Maximum Full Load Reverse Current, Full Cycle Average .375", (9.5mm) Lead Length $T_A=55^\circ\text{C}$	$I_{R(AV)}$	100.0							μA
Maximum Reverse Recovery Time (NOTE 2) $T_J=25^\circ\text{C}$	T_{RR}	3.0							μS
Typical Junction Capacitance (NOTE 1)	C_J	40.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	15.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES GP30A THRU GP30M

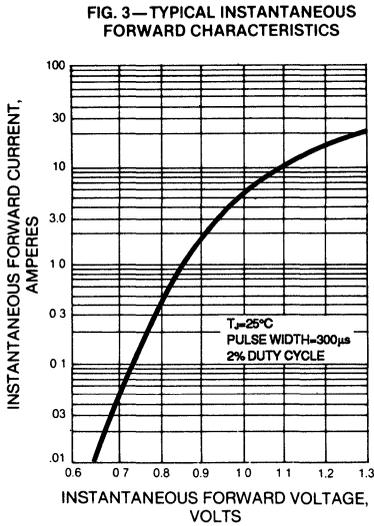
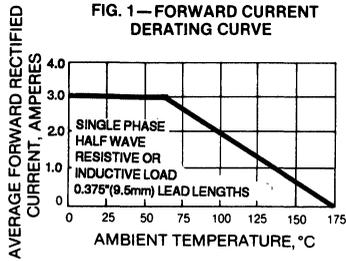


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

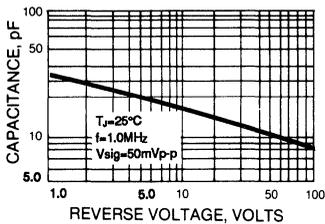


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

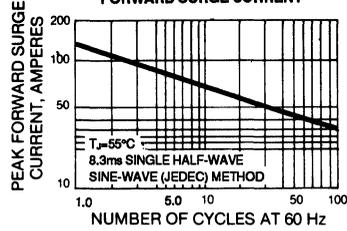


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

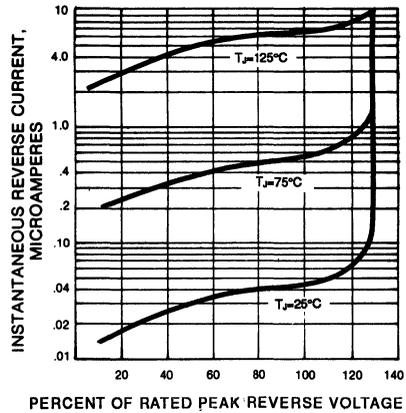
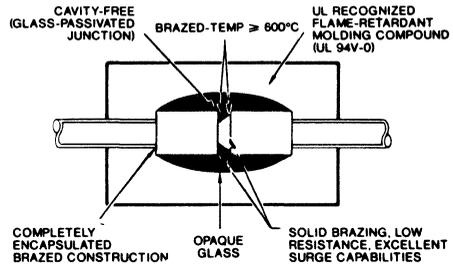


FIG. 6 — SUPERRECTIFIER



**SUPERECTIFIER ZENER
REGULATOR DIODE**

***1.5 WATT
100 VOLTS TO 200 VOLTS***

**GENERAL
INSTRUMENT**

ZGP10-100 THRU ZGP10-200

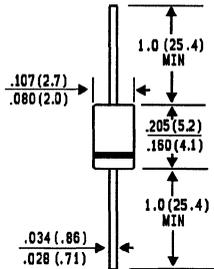
MINIATURE GLASS PASSIVATED JUNCTION PLASTIC ZENER REGULATOR DIODE

Voltage - 100 to 200 Volts Power Rating - 1.5 Watts

FEATURES

PATENTED*

DO-41



Dimensions in inches and (millimeters)

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Low zener impedance
- ◆ Excellent clamping capability
- ◆ Glass passivated cavity-free junction in DO-41 package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

*Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, .3 gram



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

OPERATING AND STORAGE TEMPERATURE T_J, T_{STG} -65°C to +175°C

TYPE	Zener Breakdown Voltage at 5mA		Maximum Zener Dynamic Impedance				Maximum Reverse Current at Measurement Voltage, V _R			Maximum Forward Voltage at .50A	Maximum Continuous Regulator Current*
	MIN	MAX	I _{ZT}	Z _{ZT}	I _{ZK}	Z _{ZK}	V _R	25°C	100°C	V _F	I _{ZM}
	Volts	Volts	mA	Ohms	mA	Ohms	Volts	µA	µA	Volts	mA
ZGP10-100	80	120	5	500	.25	5000	60	0.5	100	1.0	10.0
ZGP10-110	88	132	5	600	.25	5000	70	0.5	100	1.0	9.1
ZGP10-120	96	144	5	700	.25	5000	80	0.5	100	1.0	8.3
ZGP10-130	104	156	5	800	.25	5000	90	0.5	100	1.0	7.7
ZGP10-140	112	168	5	900	.25	5500	100	0.5	100	1.0	7.1
ZGP10-150	120	180	5	1000	.25	6000	110	0.5	100	1.0	6.6
ZGP10-160	140	170	5	1100	.25	6500	120	0.5	100	1.0	6.3
ZGP10-170	136	204	5	1200	.25	7000	130	0.5	100	1.0	5.9
ZGP10-180	144	216	5	1300	.25	7000	140	0.5	100	1.0	5.6
ZGP10-190	152	228	5	1400	.25	7500	150	0.5	100	1.0	5.3
ZGP10-200	160	240	5	1500	.25	8000	160	0.5	100	1.0	5.0

Standard +/- 20%, Suffix A= +/- 10%, Suffix B= +/- 5%.

*Temperature rating at specified regulator current is T_L=30°C.

**Maximum continuous power dissipation at T_L=75°C lead length .375", 9.5mm is 1.5 Watts.

RATINGS AND CHARACTERISTIC CURVES ZGP10-100 THRU ZGP10-200

FIG. 1 — MAXIMUM CONTINUOUS POWER DISSIPATION

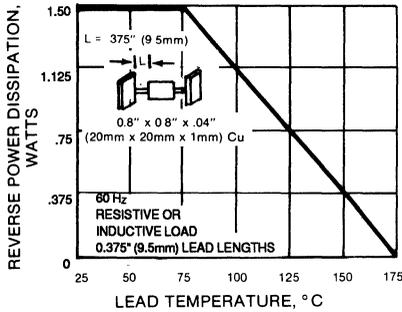


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

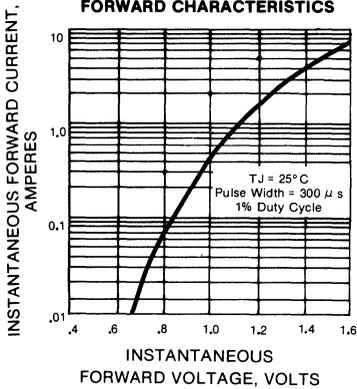


FIG. 5 — TYPICAL TEMPERATURE COEFFICIENTS

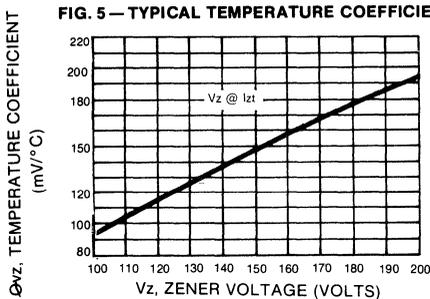


FIG. 2 — TYPICAL ZENER IMPEDANCE

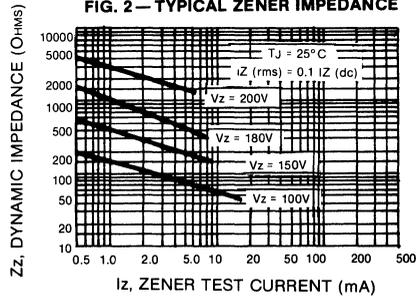


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

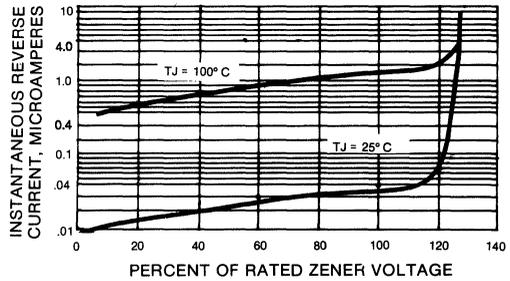
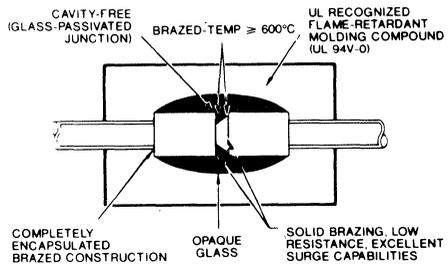


FIG. 6 — SUPERRECTIFIER



**FAST-RECOVERY
SUPERECTIFIERS**

***0.5 AMPERES THRU 3.0 AMPERES
50 VOLTS TO 2000 VOLTS***

**GENERAL
INSTRUMENT**

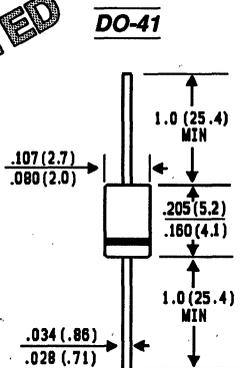
RGP02-12E THRU RGP02-20E

MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING PLASTIC RECTIFIER

Voltage - 1200 to 2000 Volts Current - 0.5 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ For use in high frequency rectifier circuits
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Fast switching for high efficiency
- ◆ Glass passivated cavity-free junction in DO-41 package
- ◆ 0.5 Ampere operation at $T_A = 55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375" (9.5mm) lead length at 5 lbs. (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.012 ounce, .3 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

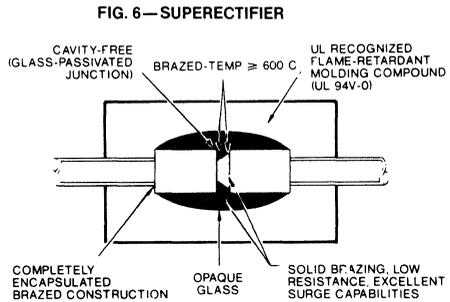
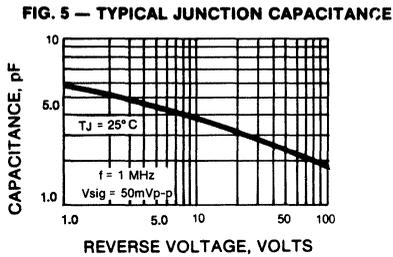
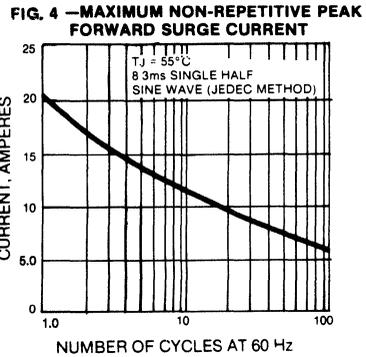
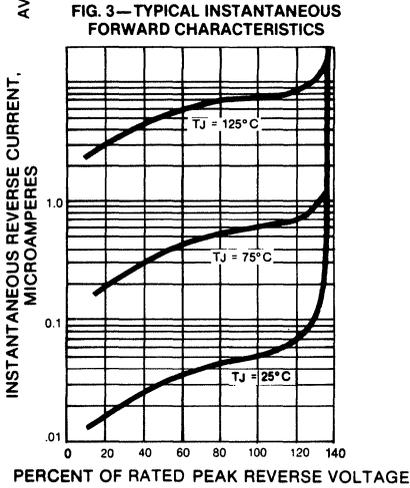
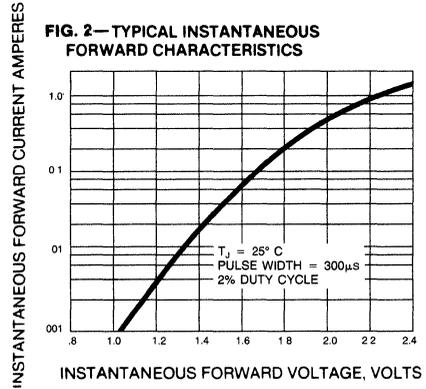
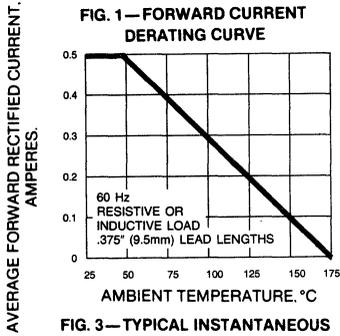
Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	RGP02 -12E	RGP02 -14E	RGP02 -16E	RGP02 -18E	RGP02 -20E	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	1200	1400	1600	1800	2000	Volts
Maximum RMS Voltage	V_{RMS}	840	980	1120	1260	1400	Volts
Maximum DC Blocking Voltage	V_{DC}	1200	1400	1600	1800	2000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A = 55^\circ\text{C}$	$I_{(AV)}$	0.5					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	20.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.8					Volts
Maximum DC Reverse Current $T_A = 25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A = 125^\circ\text{C}$	I_R	50.0					μA
Maximum Reverse Recovery Time (NOTE 1) $T_J = 25^\circ\text{C}$	T_{RR}	300.0					nS
Typical Junction Capacitance (NOTE 2)	C_J	5.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0					$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, $I_{rr} = 25\text{A}$.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES RGPO2-12E THRU RGP02-20E



BA157GP THRU BA159GP

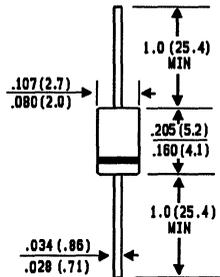
MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING PLASTIC RECTIFIER

Voltage - 400 to 1000 Volts Current - 0.5 Ampere

FEATURES

PATENTED*

DO-41



Dimensions in inches and (millimeters)

*Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ For use in high frequency rectifier circuits
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Fast switching for high efficiency
- ◆ Glass passivated cavity-free junction in D0-41 package
- ◆ 0.5 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, 0.3 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	BA157GP	BA158GP	BA159DGP	BA159GP	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	0.5				Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed on rated load at $T_A=25^\circ\text{C}$	I_{FSM}	20.0				Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.5				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage	I_R	5.0				μA
Maximum Reverse Recovery Time (NOTE 1)	T_{RR}	150	250	500	500	nS
Typical Junction Capacitance (NOTE 2)	C_J	15.0				pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0				$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175				$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions : $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, recover to 0.25A.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 V_{DC} .
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES BA157GP THRU BA159GP

FIG. 1 — FORWARD CURRENT DERATING CURVE

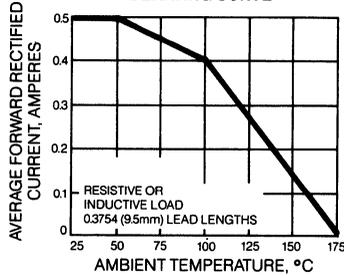


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

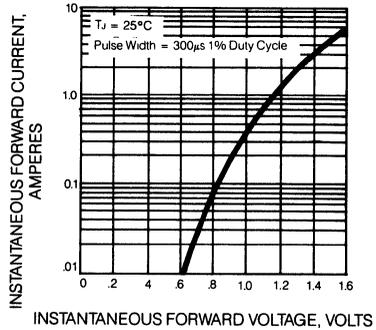


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

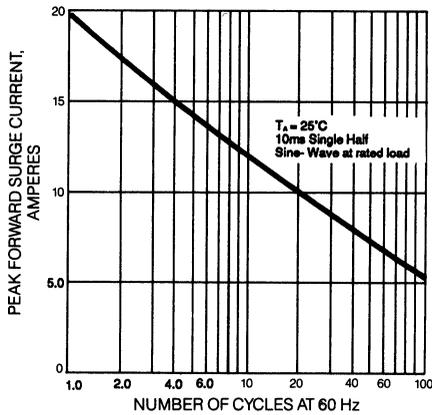


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

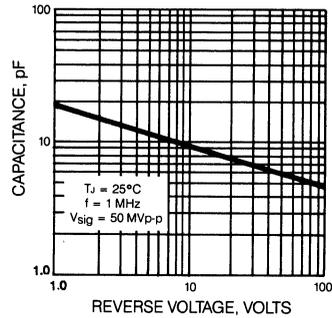


FIG. 5 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

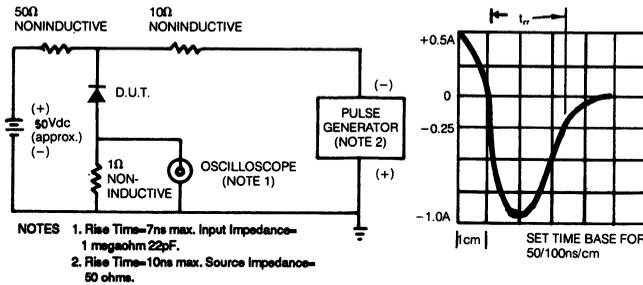
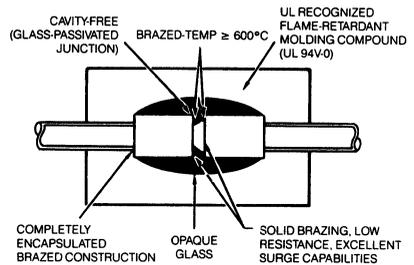


FIG. 6 — SUPERCTIFIER



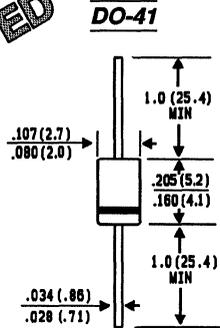
1N4933GP THRU 1N4937GP

MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING PLASTIC RECTIFIER

Voltage - 50 to 600 Volts Current - 1.0 Ampere

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ For use in high frequency rectifier circuits
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Fast switching for high efficiency
- ◆ Glass passivated cavity-free junction in D0-41 package
- ◆ 1.0 Ampere operation at $T_A=75^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.012 ounce, 0.34 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load. For capacitive load, derate current by 20%.

SYMBOLS	1N	1N	1N	1N	1N	UNITS	
	4933GP	4934GP	4935GP	4936GP	4937GP		
* Maximum Recurrent Peak Reverse Voltage	VRRM	50	100	200	400	600	Volts
* Maximum RMS Voltage	VRMS	35	70	140	280	420	Volts
* Maximum DC Blocking Voltage	VDC	50	100	200	400	600	Volts
* Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=75^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
* Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0					Amps
* Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.2					Volts
* Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=125^\circ\text{C}$	I_R	100.0					μA
* Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	200.0					nS
Typical Junction Capacitance (NOTE 2)	C_J	15.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0					$^\circ\text{C}/\text{W}$
* Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

- Reverse Recovery Test Conditions: $I_F=1.0\text{A}$, $V_R=30$ Volts.
 - Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
 - Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
- * JEDEC Registered Values

RATINGS AND CHARACTERISTIC CURVES 1N4933GP THRU 1N4937GP

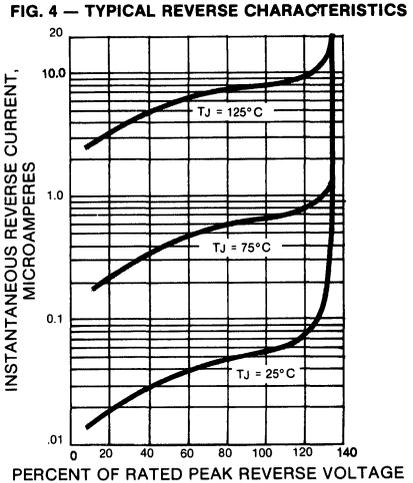
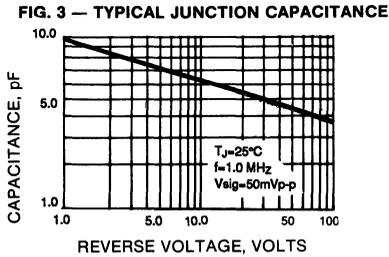
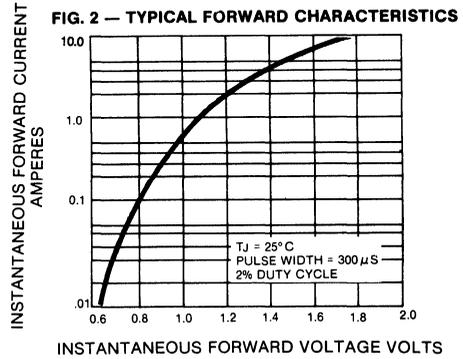
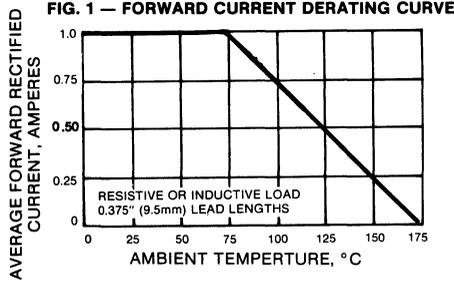
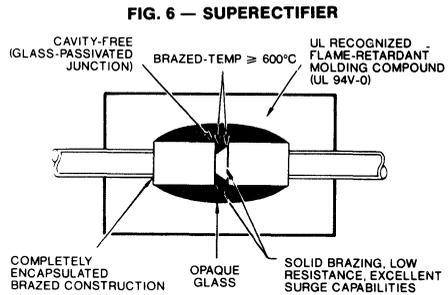
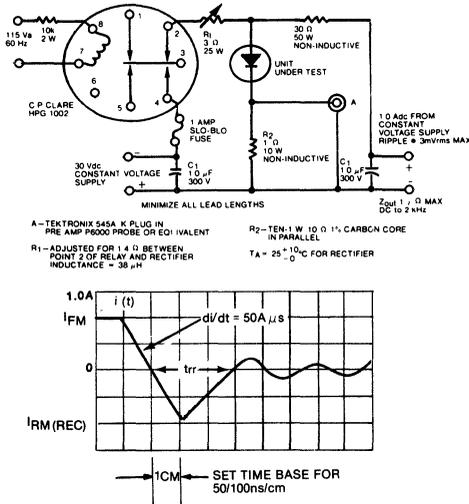


FIG. 5 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



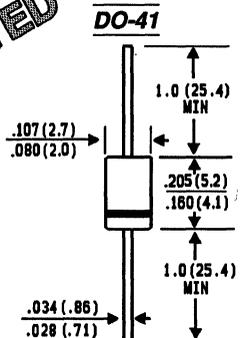
1N4942GP THRU 1N4948GP

MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING PLASTIC RECTIFIER

Voltage - 200 to 1000 Volts Current - 1.0 Ampere

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ For use in high frequency rectifier circuits
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Fast switching for high efficiency
- ◆ Glass passivated cavity-free junction in D0-41 package
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, 0.3 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

SYMBOLS	1N	1N	1N	1N	1N	UNITS	
	4942GP	4944GP	4946GP	4947GP	4948GP		
* Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
* Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
* Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
* Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
* Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	25.0					Amps
* Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.3					Volts
* Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	200.0					μA
* Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	150	150	250	250	500	nS
Typical Junction Capacitance (NOTE 2)	C_J	15.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0					$^\circ\text{C}/\text{W}$
* Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=0.25\text{A}$.

2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

* JEDEC registered values

RATINGS AND CHARACTERISTIC CURVES 1N4942GP THRU 1N4948GP

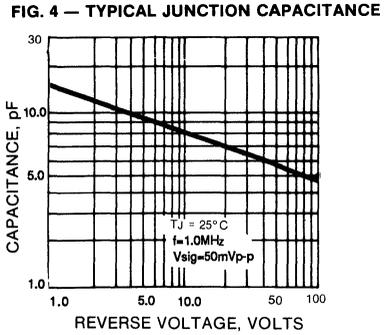
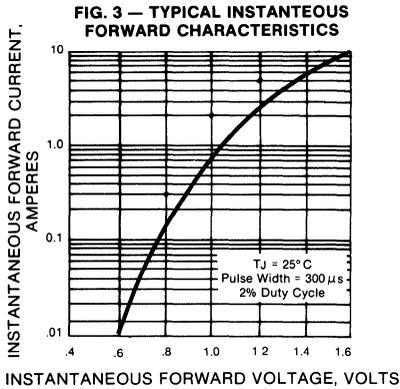
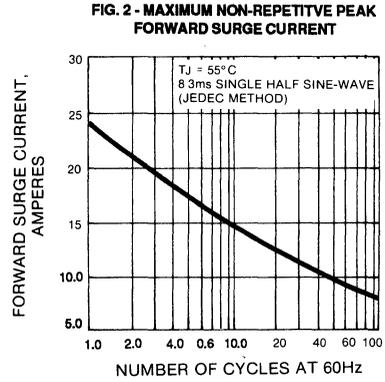
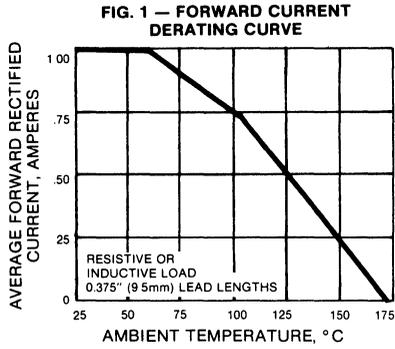
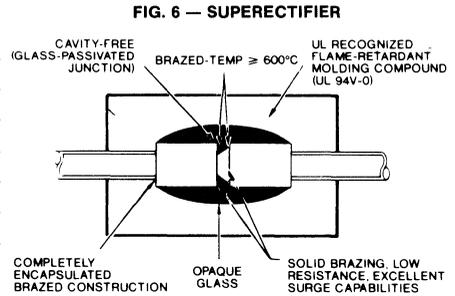
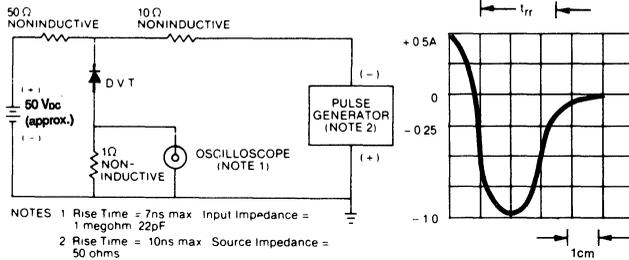


FIG. 5 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



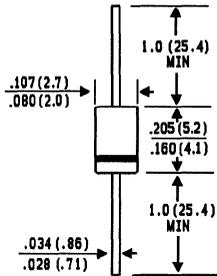
RGP10A THRU RGP10M

**MINIATURE GLASS PASSIVATED JUNCTION
FAST SWITCHING PLASTIC RECTIFIER**
Voltage - 50 to 1000 Volts Current - 1.0 Ampere

FEATURES

PATENTED*

DO-41



Dimensions in inches and (millimeters)

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ For use in high frequency rectifier circuits
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Fast switching for high efficiency
- ◆ Glass passivated cavity-free junction in DO-41 package
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than 0.1 μA
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375" (9.5mm) lead length at 5 lbs., (2.3kg) tension

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic over glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.012 ounce, 0.3 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load. For capacitive load, derate current by 20%.

		RGP SYMBOLS	RGP 10A	RGP 10B	RGP 10D	RGP 10G	RGP 10J	RGP 10K	RGP 10M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000		Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700		Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	100		Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$					1.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}				30.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F				1.3					Volts
Maximum Full Load Reverse Current, Full Cycle Average .375", (9.5mm) Lead Length $T_A=55^\circ\text{C}$	I_R				100.0					μA
Maximum DC Reverse Current $T_A=25^\circ\text{C}$					5.0					μA
at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R				200.0					μA
Maximum Reverse Recovery Time $T_J=25^\circ\text{C}$ (NOTE 1)	T_{RR}		150			250	500			nS
Typical Junction Capacitance (NOTE 2)	C_J				15.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$				50.0					$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}				-65 to +175					$^\circ\text{C}$

NOTES: 1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, recover to 0.25A.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES RGP10A THRU RGP10M

FIG. 5 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

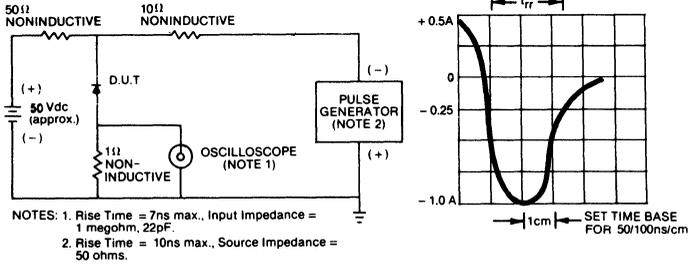


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

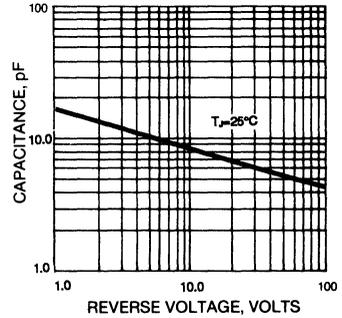


FIG. 1 — FORWARD CURRENT DERATING CURVE

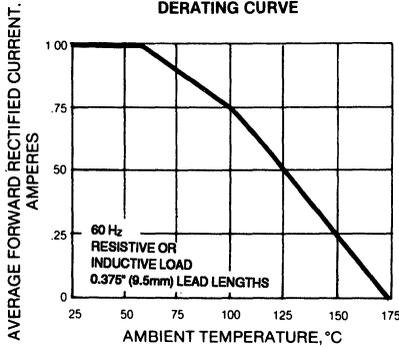


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

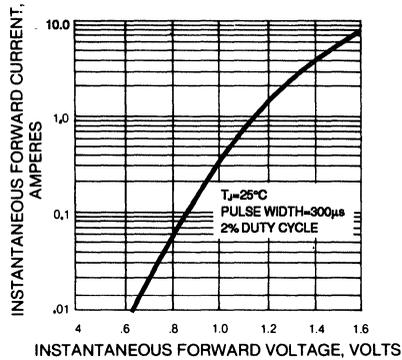


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

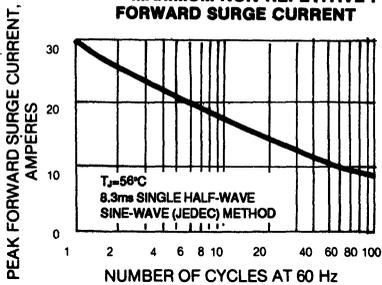
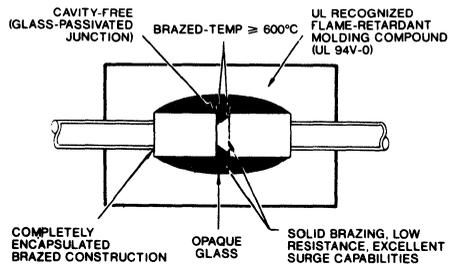


FIG. 6 — SUPERRECTIFIER

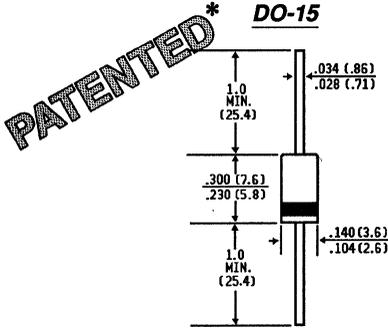


1N5615GP THRU 1N5623GP

GLASS PASSIVATED JUNCTION FAST SWITCHING PLASTIC RECTIFIER

Voltage - 200 to 1000 Volts Current - 1.0 Ampere

FEATURES



Dimensions in inches and (millimeters)

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Fast switching for high efficiency
- ◆ Glass passivated cavity-free junction
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

MECHANICAL DATA

- Case:** JEDEC DO-15 Molded plastic over glass
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.015 ounce, .4 gram



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	1N 5615GP	1N 5617GP	1N 5619GP	1N 5621GP	1N 5623GP	UNITS
* Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
* Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
* Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Amps
* Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
* Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.2					Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	0.5 25.0					μA
* Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	150	150	250	300	500	ns
Typical Junction Capacitance (NOTE 2)	C_J	25.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	30.0					$^\circ\text{C}/\text{W}$
* Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=0.25\text{A}$.
 2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
- * JEDEC registered values

RATINGS AND CHARACTERISTIC CURVES 1N5615GP THRU 1N5623GP

FIG. 1—REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

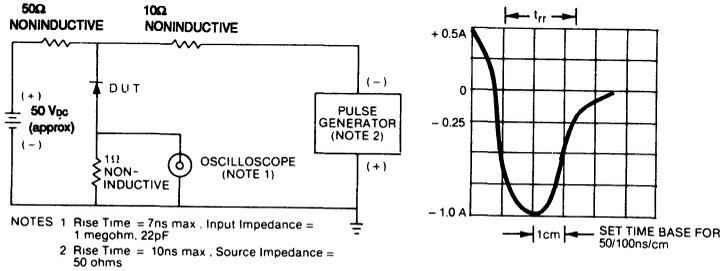


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

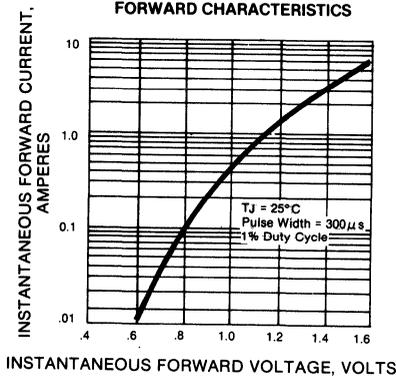


FIG. 1—FORWARD CURRENT DERATING CURVE

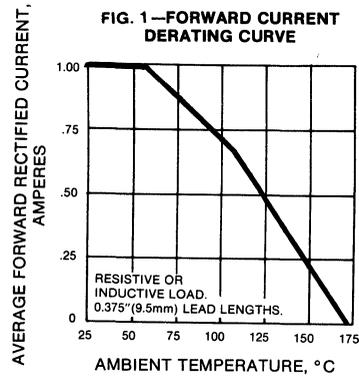


FIG. 4—TYPICAL JUNCTION CAPACITANCE

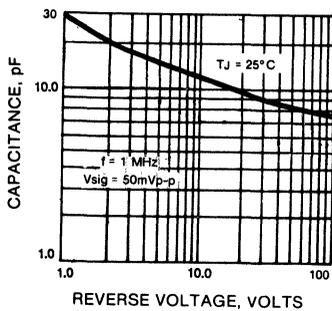
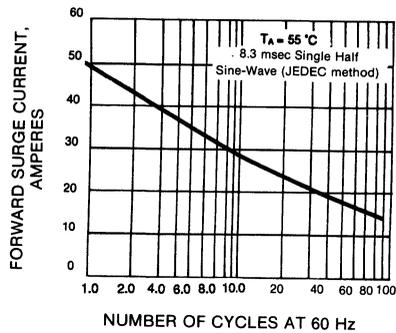


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT



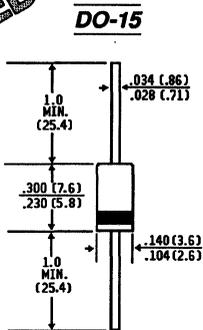
GI810 THRU GI818

GLASS PASSIVATED JUNCTION FAST SWITCHING PLASTIC RECTIFIER

Voltage - 50 to 1000 Volts Current - 1.0 Ampere

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976



- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Fast switching for high efficiency
- ◆ Glass passivated cavity-free junction in DO-15 package
- ◆ 1.0 Ampere operation at $T_A=75^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_{RQ} less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-15 Molded plastic over glass
Terminals: Plastic Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.015 ounce, 0.4 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	GI SYMBOLS	GI 810	GI 811	GI 812	GI 814	GI 816	GI 817	GI 818	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=75^\circ\text{C}$	$I_{(AV)}$	1.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) $T_A=75^\circ\text{C}$	I_{FSM}	30.0							Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.2							Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	10.0 / 100.0							μA
Maximum Reverse Recovery Time (NOTE 1)	T_{RR}	75.0							nS
Typical Junction Capacitance (NOTE 2)	C_J	25.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	30.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES:

- Reverse Recovery Test Conditions: $I_F=1.0\text{A}$, $V_R=30\text{V}$.
- Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
- Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES GI810 THRU GI818

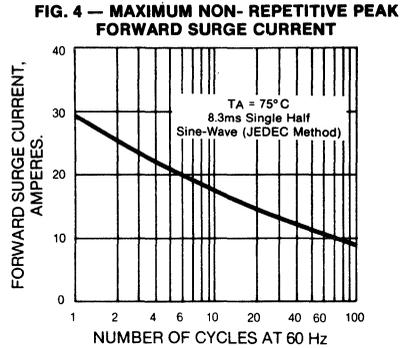
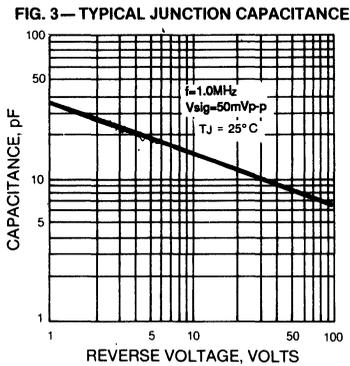
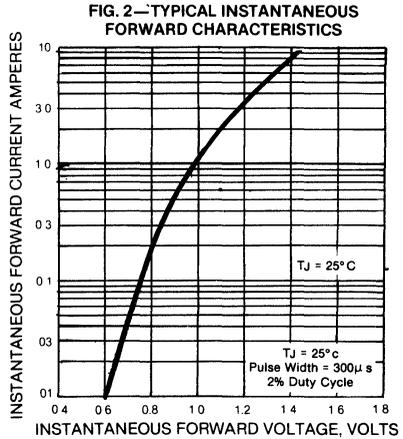
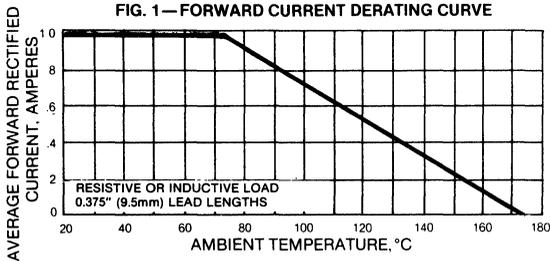
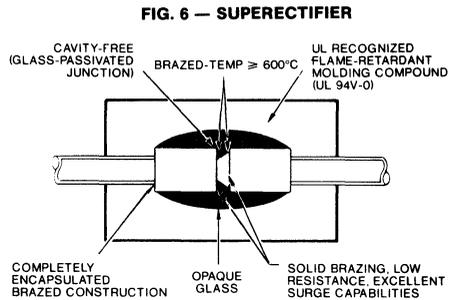
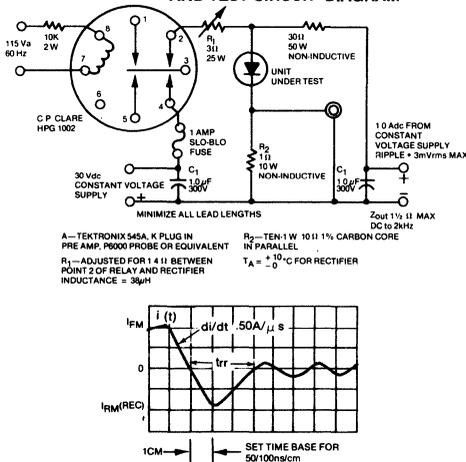


FIG. 5— REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



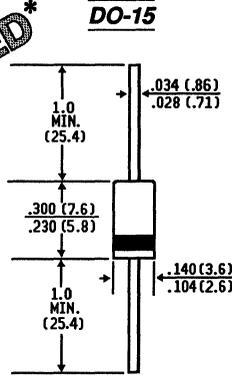
RGP15A THRU RGP15M

GLASS PASSIVATED JUNCTION FAST SWITCHING PLASTIC RECTIFIER

Voltage - 50 to 1000 Volts Current - 1.5 Ampere

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,936,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-15 package
- ◆ 1.5 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than 0.1 μA
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension



MECHANICAL DATA

Case: JEDEC DO-15 Molded plastic over glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.015 ounce, 0.4 gram

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

		RGP 15A	RGP 15B	RGHP 15D	RGP 15G	RGP 15J	RGP 15K	RGP 15M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.5							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0							Amps
Maximum Instantaneous Forward Voltage at 1.5A	V_F	1.3							Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$ $T_A=150^\circ\text{C}$	I_R	5.0 200.0							μA
Maximum Full Load Reverse Current, Full Cycle Average .375", (9.5mm) Lead Length $T_A=55^\circ\text{C}$	$I_{R(AV)}$	100.0							μA
Maximum Reverse Recovery Time (NOTE 2) $T_J=25^\circ\text{C}$	T_{RR}	150		250		500			nS
Typical Junction Capacitance (NOTE 2)	C_J	25.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	30.0							$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES: 1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
 2. Reverse Recovery Test Conditions: $I_F=5A$, $I_R=1A$, $I_{RT}=25A$.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES RGP15A THRU RGP15M

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

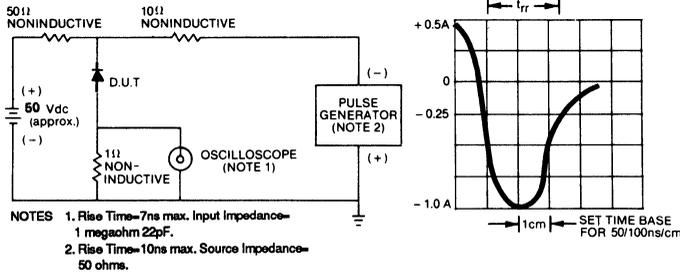


FIG. 2 — FORWARD CURRENT DERATING CURVE

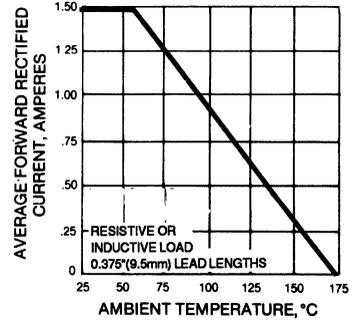


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

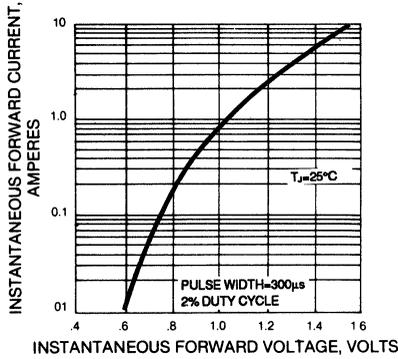


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

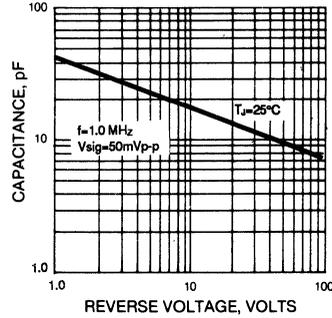


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

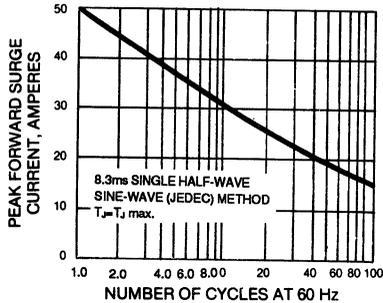
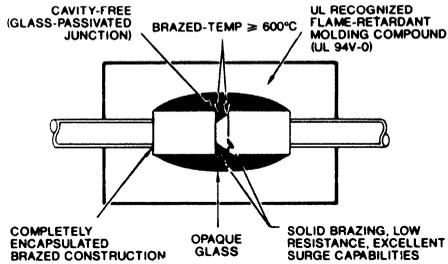


FIG. 6 — SUPERRECTIFIER



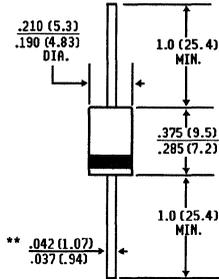
RGP20A THRU RGP20J

**GLASS PASSIVATED JUNCTION
FAST SWITCHING PLASTIC RECTIFIER**
Voltage - 50 to 600 Volts Current - 2.0 Amperes

FEATURES

PATENTED

* DO-201AA**



Dimensions in inches and (millimeters)
(** NOT TO JEDEC DIMENSIONS)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Fast switching for high efficiency
- ◆ Glass passivated cavity-free junction
- ◆ 2.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-201AA** Molded plastic over glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Band denotes cathode
Mounting Position: Any
Weight: 0.03 ounce, 0.8 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	RGP 20A	RGP 20B	RGP 20D	RGP 20G	RGP 20J	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	2.0					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	80.0					Amps
Maximum Instantaneous Forward Voltage at 2.0A	V_F	1.3					Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=125^\circ\text{C}$	I_R	5.0 100.0					μA
Maximum Full Load Reverse Current, Full Cycle Average, .375" (9.5mm) Lead Length $T_A=55^\circ\text{C}$	$I_{R(AV)}$	100.0					μA
Maximum Reverse Recovery Time (NOTE 2) $T_J=25^\circ\text{C}$	T_{RR}	150				250	nS
Typical Junction Capacitance (NOTE 1)	C_J	35.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	22.0					$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES: 1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=0.25\text{A}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES RGP20A THRU RGP20J

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

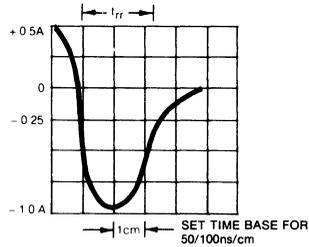
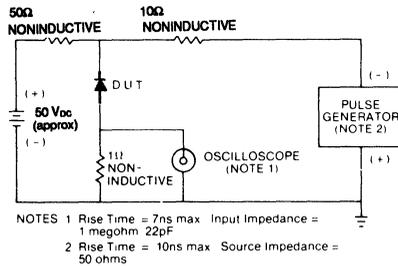


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

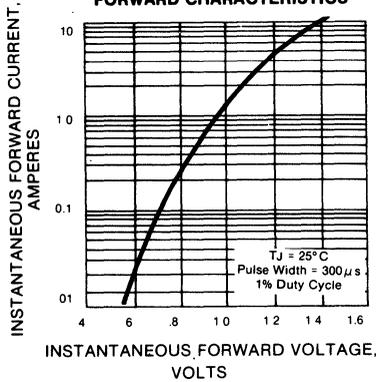


FIG. 2 — FORWARD CURRENT DERATING CURVE

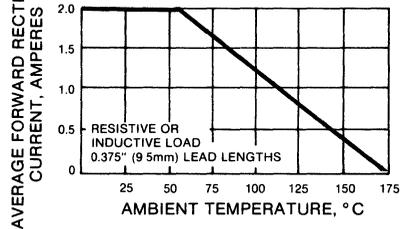


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

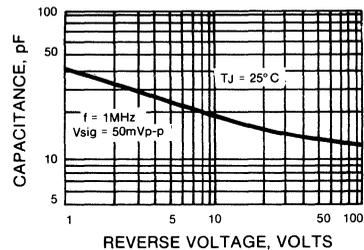


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

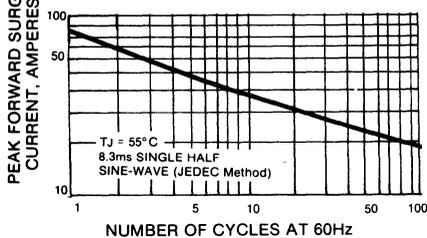
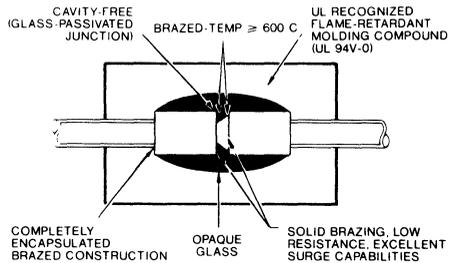


FIG. 6 — SUPERRECTIFIER



RGP25A THRU RGP25M

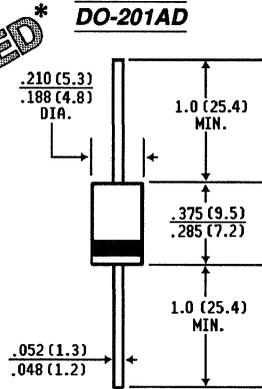
GLASS PASSIVATED JUNCTION FAST SWITCHING PLASTIC RECTIFIER

Voltage - 50 to 1000 Volts Current - 2.5 Amperes

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction in DO-201AD package
- ◆ 2.5 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/ $.375"$, (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*

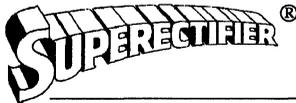


Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-201AD Molded plastic over glass
Terminals: Plastic Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: 0.04 ounce, 1.12 gram



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	RGP 25A	RGP 25B	RGP 25D	RGP 25G	RGP 25J	RGP 25K	RGP 25M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	2.5							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	100.0							Amps
Maximum Instantaneous Forward Voltage at 2.5A	V_F	1.3							Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=125^\circ\text{C}$	I_R	200.0							μA
Maximum Full Load Reverse Current, Full Cycle Average .375", (9.5mm) Lead Length $T_A=55^\circ\text{C}$	I_R	100.0							μA
Maximum Reverse Recovery Time (NOTE 2) $T_J=25^\circ\text{C}$	T_{RR}	150				250	500		nS
Typical Junction Capacitance (NOTE 1)	C_J	60.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	16.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES: 1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
 2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=.25\text{A}$.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES RGP25A THRU RGP25M

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

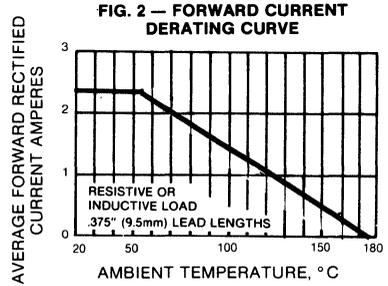
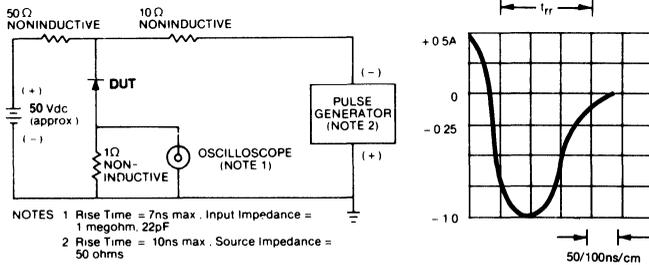


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

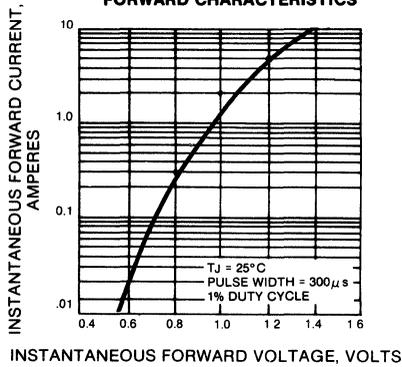


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

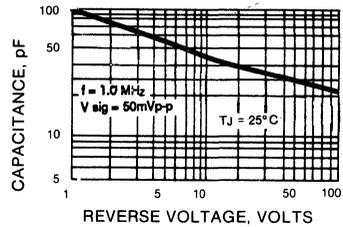


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

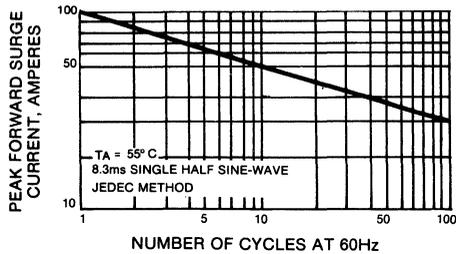
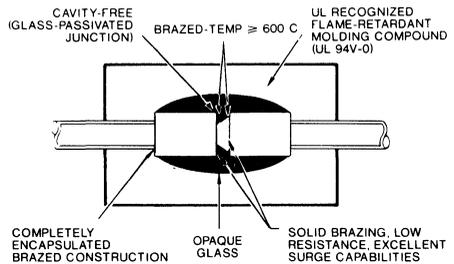


FIG. 6 — SUPERRECTIFIER



RGP30A THRU RGP30M

GLASS PASSIVATED JUNCTION FAST SWITCHING PLASTIC RECTIFIER

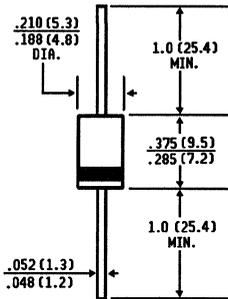
Voltage - 50 to 1000 Volts Current - 3.0 Amperes

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated cavity-free junction
- ◆ 3.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*

DO-201AD



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976 and brazed-lead assembly by Patent No. 3,930,306 of 1976



MECHANICAL DATA

Case: JEDEC DO-201AD Molded plastic over glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.04 ounce, 1.12 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
For capacitive load, derate current by 20%.

		RGP 30A	RGP 30B	RGP 30D	RGP 30G	RGP 30J	RGP 30K	RGP 30M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	3.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	125.0							Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.3							Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=125^\circ\text{C}$	I_R	100.0							μA
Maximum Full Load Reverse Current, Full Cycle Average .375", (9.5mm) Lead Length $T_A=55^\circ\text{C}$	$I_{R(AV)}$	100.0							μA
Maximum Reverse Recovery Time (NOTE 2) $T_J=25^\circ\text{C}$	T_{RR}	150			250		500		nS
Typical Junction Capacitance (NOTE 1)	C_J	60.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	16.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=.25\text{A}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES RGP30A THRU RGP30M

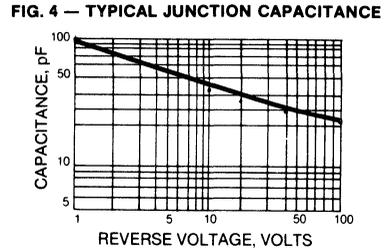
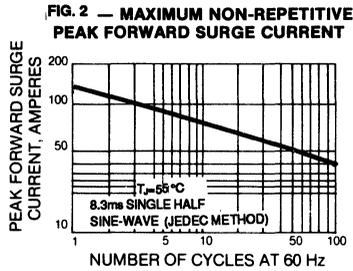
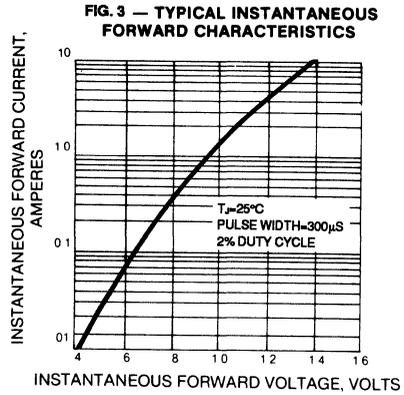
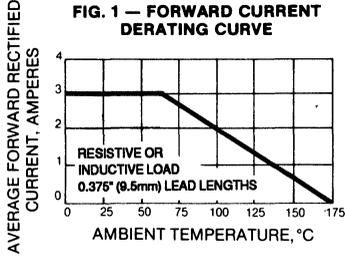
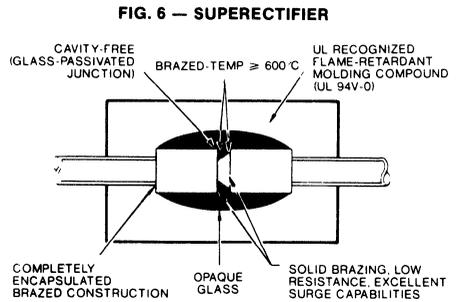
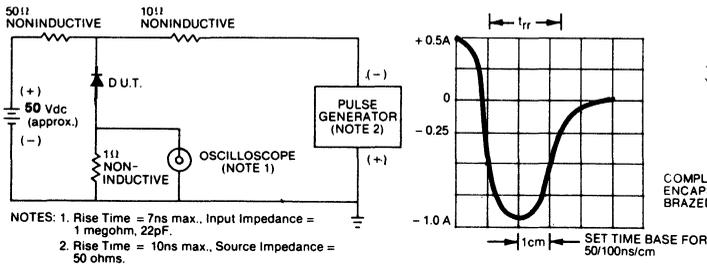


FIG. 5 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



**MINIATURE GLASS
PASSIVATED CHIP
PLASTIC RECTIFIER**

***1.0 AMPERE
50 VOLTS TO 1000 VOLTS***

**GENERAL
INSTRUMENT**

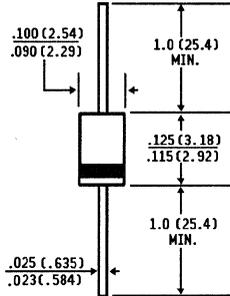
MPG06A THRU MPG06M

MINIATURE GLASS PASSIVATED JUNCTION PLASTIC RECTIFIER

Voltage - 50 to 1000 Volts Current - 1.0 Ampere

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94 V-O
- ◆ Low forward voltage, high current capability
- ◆ Glass passivated chip junctions
- ◆ High Surge Capability
- ◆ 1.0 Ampere operation at $T_A=25^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic over glass passivated chip

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.0064 ounce, .181 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

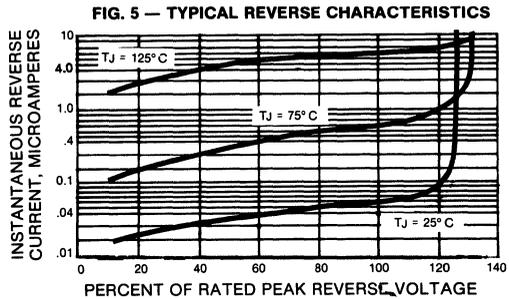
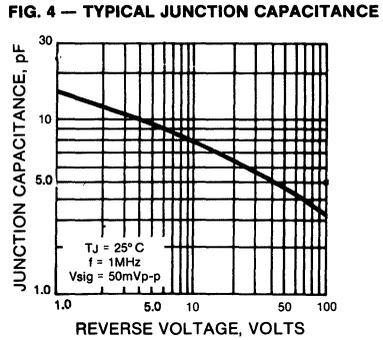
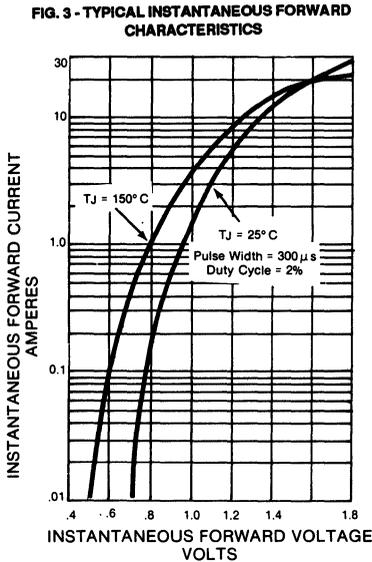
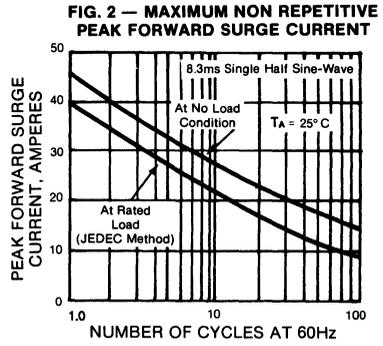
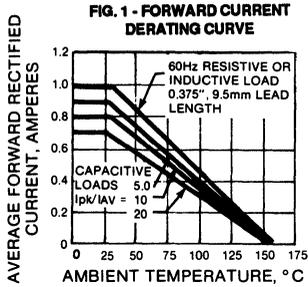
Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60Hz, resistive or inductive load.

	SYMBOLS	MPG	MPG	MPG	MPG	MPG	MPG	UNITS	
		06A	06B	06D	06G	06J	06K		06M
Maximum Recurrent Peak Reverse Voltage	VRRM	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	VRMS	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	VDC	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current, .375" (9.5mm) Lead Length at $T_A=25^\circ\text{C}$	$I_{(AV)}$	1.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) $T_A=25^\circ\text{C}$	I_{FSM}	40.0							Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.1							Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=125^\circ\text{C}$	I_R	5.0							μA
Typical Junction Capacitance (NOTE 1)	C_J	10.0							pf
Typical Reverse Recovery Time (NOTE 2)	T_{RR}	0.6							μS
Thermal Resistance Typical		65.0							$^\circ\text{C}/\text{W}$
Maximum (NOTE 3)	$R_{\theta JA}$	85.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-50 to +150							$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, 1.0A, $I_{RR} = 0.25\text{A}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATING AND CHARACTERISTIC CURVES MPG06A THRU MPG06M



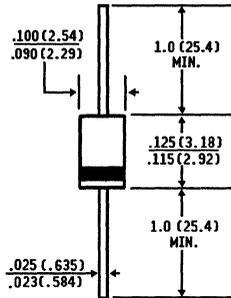
RMPG06A THRU RMPG06J

MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING PLASTIC RECTIFIER

Voltage - 50 to 600 Volts Current - 1.0 Ampere

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94 V-O
- ◆ Low forward voltage drops, high current capability
- ◆ Glass passivated chip junctions
- ◆ High Surge Capability
- ◆ 1.0 Ampere operation at $T_A=25^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds/ $.375''$, (9.5mm) lead length at 5 lbs., (2.3kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic over glass passivated chip

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.0064 ounce, .181 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

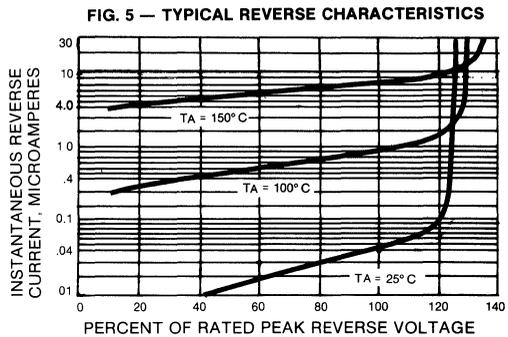
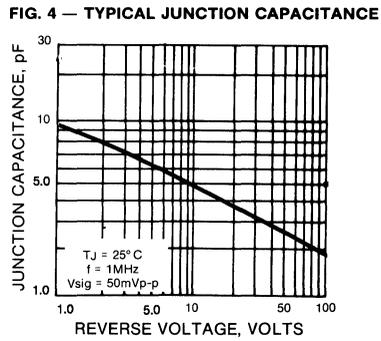
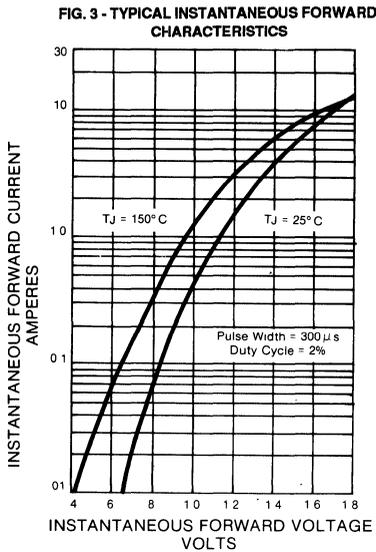
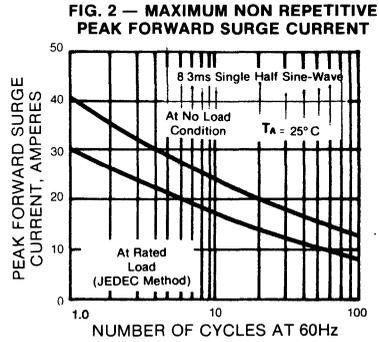
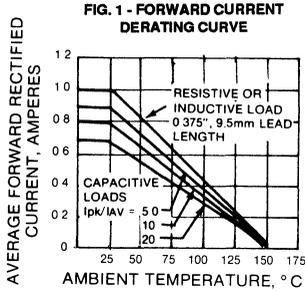
Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.

	SYMBOLS	RMPG 06A	RMPG 06B	RMPG 06D	RMPG 06G	RMPG 06J	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	Volts
Maximum DC Blocking Voltage	V_{DC}	50	70	200	400	600	Volts
Maximum Average Forward Rectified Current, $.375''$ (9.5mm) Lead Length at $T_A=25^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) $T_A=25^\circ\text{C}$	I_{FSM}	40.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.3					Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=125^\circ\text{C}$	I_R	5.0 50.0					μA
Typical Junction Capacitance (NOTE 1)	C_J	6.6					pf
Typical Reverse Recovery Time (NOTE 2) $T_J=25^\circ\text{C}$	T_{RR}	150				200	nS
Thermal Resistance Typical Maximum (NOTE 3)	$R_{\theta JA}$	67.0 85.0					$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-50 to +150					$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=0.25\text{A}$.
3. Thermal Resistance from Junction to Ambient at $.375''$ (9.5mm) Lead Lengths, P.C. Board Mounted.

RATING AND CHARACTERISTIC CURVES RMPG06A THRU RMPG06J



**GLASS PASSIVATED
RECTIFIERS**

***0.2 AMPERE TO 3.0 AMPERES
50 VOLTS TO 1600 VOLTS***

**GENERAL
INSTRUMENT**

GLASS PASSIVATED RECTIFIER

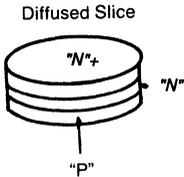
0.2 to 0.3 Amperes 50 Volts to 1600 Volts

Device Design

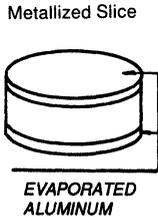
The Glass Passivated Rectifier is a hermetically sealed, cavityfree, diffused junction rectifier with unsurpassed operating and surge characteristics at high temperature.

Cavityfree construction with a specially developed extremely pure glass in direct contact with the silicon junction plus durable heat sink design obviate the need for solder joints and compression contact parts. The carefully matched expansion characteristics of the glass and metal parts in combination with the direct contact of the glass and silicon junction make the active rectifying elements impervious to surface contamination, moisture or other external chemical agents. Further, the long term degradation associated with organic junction protection is avoided.

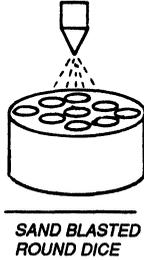
There are many steps necessary to produce such a device:



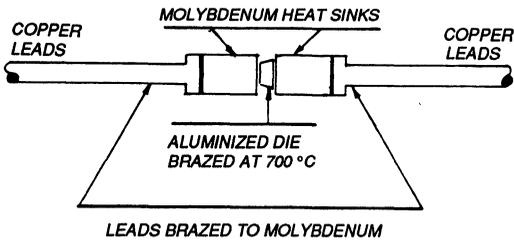
1-Diffuse a PN junction into a slice of silicon.



2-Evaporate aluminum on both sides of the slice to make metallurgical contact.



3-Sandblast the slice to produce a round beveled die.



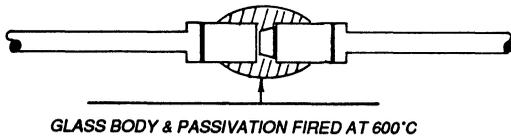
LEADS BRAZED TO MOLYBDENUM

4. Braze the die between two molybdenum heat sinks to which leads have been attached at approximately 700°C.

5. Clean the assembly by chemically etching, washing and drying.

6. Apply glass in the form of a frit to the die and molybdenum assembly.

GLASS PASSIVATED RECTIFIER



7. Melt the glass by heating in an oven to approximately 600 °C.

8. Overmold glass passivated construction with UL recognized flame-retardant 94V-0 classification epoxy.

Package Design

The small size of the glass package with its capability up to 3 Ampere permits greater packing densities in electronic assemblies and equipment, while increasing reliability. Furthermore, only high temperature brazing operations are used to withstand the 600 C required to melt and fuse the glass. This technique eliminates solder construction and tremendously enhances mechanical strength and temperature cycling capability, increasing operating and storage temperature range while reducing thermal resistance.

Reliability

Specified reliability data on Glass Passivated Rectifier devices are available from the General Instrument Semiconductor Components Division Reliability Department. The basic design of the Glass Passivated rectifier and the strict positive controls over materials and manufacturing processes provide assurance of failure free performance under the most severe conditions. Processing facilities have been geared to follow the procedural requirements of Military Standard 750. Glass Passivated rectifiers are capable of withstanding environmental extremes in excess of MIL-S-19500E and of meeting requirements of MIL-STD-883, MIL-Q-9858 and MIL-I-45208. Assurance of production uniformity and reliability is provided by a test technique called "Operational Load Line Testing," which has proven product reliability with over 1 Billion Glass Passivated rectifiers now in use.

FAMILIES OF GENERAL INSTRUMENT GLASS PASSIVATED RECTIFIERS

Glass Passivated Junction Diodes 0.2 to 0.4 AMPERES

Types:
1N483B thru 1N486B
1N645 thru 1N649

Features:

- ◆ High Temperature Metallurgically Bonded
- ◆ High Efficiency and Rectification Ratio
- ◆ Ideally Suited for Miniaturized Equipment
- ◆ Case: One Piece Glass, Hermetically Sealed
- ◆ Tin Plated Axial Leads, Solderable per MIL-STD-202/208
- ◆ Operating from $-65^{\circ}\text{C} + 175$
- ◆ Low Leakage
- ◆ Glass Passivated Silicon Rectifiers 1.0 to 3.0 AMPERES

Glass Passivated Junction Rectifiers 1.0 to 3.0 AMPERES

Types:
1N4245 thru 1N4249
1N5059 thru 1N5062
1N5614 thru 1N5622
1N5550 thru 1N5554
1N5624 thru 1N5627
G1A thru G1M
G2A thru G2M
G3A thru G3M
G4A thru G4M

Features:

- ◆ Glass Passivated Junction
- ◆ High Mechanical Strength
- ◆ Storage up to 200°C
- ◆ Voidless Construction
- ◆ Hermetically Sealed
- ◆ Avalanche Operation
- ◆ Low Leakage
- ◆ High Conductance
- ◆ Tin Plated Axial Leads, Solderable per MIL-STD-202/208

Glass Passivated Fast Recovery Junction Rectifiers 1.0 to 3.0 AMPERES

Types:
1N4942 thru 1N4948
1N5615 thru 1N5623
1N5415 thru 1N5420
RG1A thru RG1M
RG2A thru RG2M
RG3A thru RG3M
RG4A thru RG4M
BYV95 thru BYV96
BYW32 thru BYW36
BYW72 thru BYW76

Features:

- ◆ Glass Passivated Junction
- ◆ Fast Switching for High Rectification Efficiency to 100 kHz
- ◆ High Mechanical Strength
- ◆ Low Leakage
- ◆ Hermetically Sealed
- ◆ Storage up to 200°C
- ◆ Tin Plated Axial Leads, Solderable per MIL-STD-202/208

High Voltage Glass Passivated Junction Rectifiers 1.0 to 3.0 Amperes

Types:
CG1, DG1
CG2, DG2
CG3, DG3
G11-1200 thru G11-1600

Features:

- ◆ All Advantages of a Hermetically Sealed Glass Passivated Junction
- ◆ Specially designed for Clamper/Damper Applications in Television/CRT circuitry
- ◆ Low Leakage, VR ratings of 1400 volts to 1600 volts
- ◆ High Mechanical Strength
- ◆ Tin Plated Axial Leads, Solderable per MIL-STD-202/208

QUICK GUIDE TO GLASS PASSIVATED RECTIFIERS

TYPE	1N483B thru 1N486B	1N645 thru 1N649	1N4245 thru 1N4249	1N4942* thru 1N4948*	1N5059 thru 1N5062	1N5614 thru 1N5622	1N5615* thru 1N5623*	G1A thru G1M	RG1A* thru RG1M*
CASE	DO204MB	DO204MB	DO204AP	DO204AP	DO204AP	DO204AP	DO204AP	DO204AP	DO204AP
Io(A)	0.2	0.4	1.0	1.0	1.0	1.0	1.0	1.0	1.0
θTA(C)	25	25	55	55	55	55	55	100	55
VR-50(V)	1N483B							G1A	RG1A
VR-100(V)	1N485B							G1B	RG1B
VR-200(V)	1N486B	1N645	1N4245	1N4942	1N5059	1N5614	1N5615	G1D	RG1D
VR-300(V)		1N646							
VR-400(V)		1N647	1N4246	1N4944	1N5060	1N5616	1N5617	G1G	RG1G
VR-500(V)		1N648							
VR-600(V)		1N649	1N4247	1N4946	1N5061	1N5618	1N5619	G1J	RG1J
VR-800(V)			1N4248	1N4947	1N5062	1N5620	1N5621	G1K	RG1K
VR-1000(V)			1N4249	1N4948		1N5622	1N5623	G1M	RG1M
SURGE(A)	2.0	15	25	30	50	50	50	50	30
VF(V)	1.0	1.0	1.2	1.3	1.2	1.2	1.2	1.1	1.3

*Fast Recovery

QUICK GUIDE TO GLASS PASSIVATED RECTIFIERS

TYPE	CG1 and DG1	G2A thru G2M	RG2A* thru RG2M*	CG2 and DG2	1N5624 thru 1N5627	1N5550 thru 1N5559	1N5415* thru 1N5420*	G3A thru G3M	G4A thru G4M	RG3A* thru RG3M*	RG4A thru RG4M	CG3 and DG3
CASE	DO204AP	DO204AP	DO204AP	DO204AP	GPR3	GPR4	GPR4	GPR3	GPR4	GPR3	GPR4	GPR3
Io(A)	1.5	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
TA(C)	55	70	55	50	70	55	55	70	70	55	50	50
VR-50(V)		G2A	RG2A				1N5415	G3A	G4A	RG3A	RG4A	
VR-100(V)		G2B	RG2B				1N5416	G3B	G4B	RG3B	RG4B	
VR-200(V)		G2D	RG2D		1N5624	1N5550	1N5417	G3D	G4D	RG3D	RG4D	
VR-300(V)												
VR-400(V)		G2G	RG2G		1N5625	1N5551	1N5418	G3G	G4G	RG3G	RG4G	
VR-500(V)							1N5419					
VR-600(V)		G2J	RG2J		1N5626	1N5552	1N5420	G3J	G4J	RG3J	RG4J	
VR-800(V)		G2K	RG2K		1N5627	1N5553		G3K	G4K	RG3K	RG4K	
VR-1000(V)		G2M	RG2M			1N5554		G3M	G4M	RG3M	RG4M	
VR-1000(V)	CG1/DG1			CG2/DG2								CG3/DG3
SURGE(A)	40	50	50	40	125	100	80	125	125	100	100	100
VF(V)	1.0	1.2	1.3	1.1	1.0	1.2/1.3	1.1	1.1	1.1	1.3	1.3	1.2

*Fast Recovery

1N483B THRU 1N486B

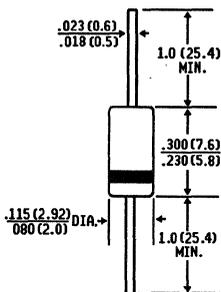
LOW POWER MINIATURE GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 70 to 225 Volts Current - 200 Milliampes

FEATURES

PATENTED*

DO-204MB



Dimension in inches
and
(millimeters)

*Braze-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ 0.2 Ampere operation at $T_A = 25^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than 0.1 μA
- ◆ Hermetically sealed package
- ◆ Glass passivated cavity-free junction
- ◆ Ideally suited for miniaturized equipment
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204MB One piece glass sleeve

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .02 ounce, .56 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	1N483B	1N485B	1N486B	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	70	180	225	Volts
Maximum RMS Voltage	V_{RMS}	50	127	159	Volts
*Maximum DC Blocking Voltage	V_{DC}	70	180	225	Volts
*Minimum Reverse Breakdown Voltage at 100 μA	V_{BR}	80	200	250	Volts
*Maximum Average Forward Rectified Current $T_A = 25^\circ\text{C}$.375", (9.5mm) Lead Lengths at $T_A = 150^\circ\text{C}$	$I_{(AV)}$		200.0 50.0		Mili Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}		2.0		Amps
*Maximum Instantaneous Forward Voltage at 100mA	V_F		1.0		Volts
*Maximum DC Reverse Current $T_A = 25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A = 150^\circ\text{C}$	I_R		25.0 5.0		nA μA
Typical Reverse Recovery Time (NOTE 4)	T_{RR}		2.0		μs
Typical Junction Capacitance (NOTE 1)	C_J		15.0		pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$		81.0		$^\circ\text{C}/\text{W}$
*Operating and Storage Temperature Range	T_J, T_{STG}		-65 to +200		$^\circ\text{C}$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 Vpc.
2. Available to JAN and JANTX Military Specifications MIL-S-19500/118C.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
4. Reverse Recovery Test Conditions: $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, $I_{rr} = 25\text{A}$

*JEDEC Registered Values

RATING AND CHARACTERISTIC CURVES 1N483B THRU 1N486B

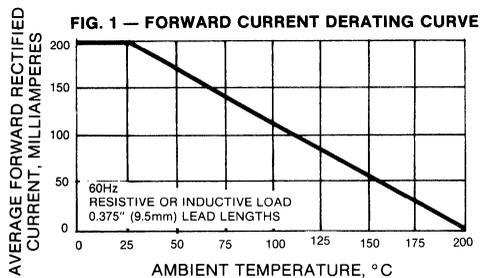


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

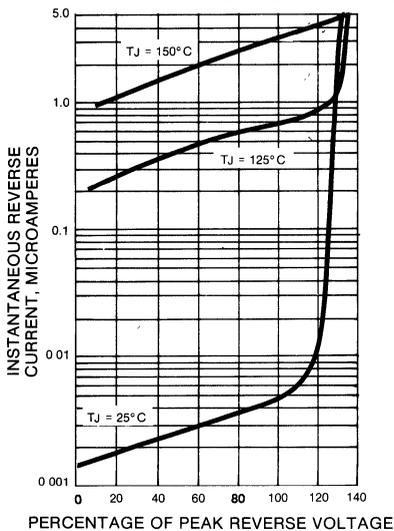


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

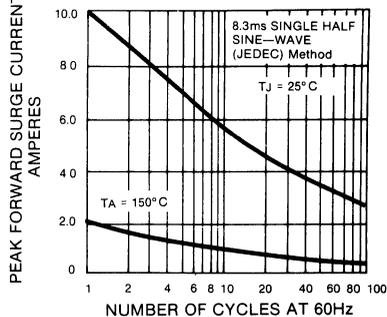


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

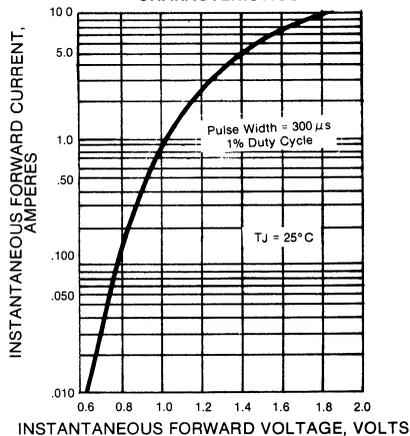
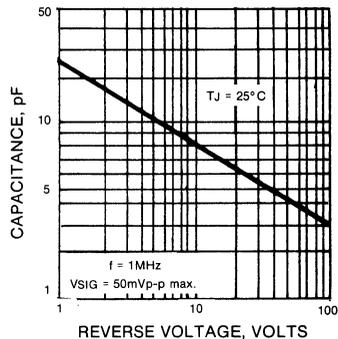


FIG. 5 — TYPICAL JUNCTION CAPACITANCE



1N645 THRU 1N649

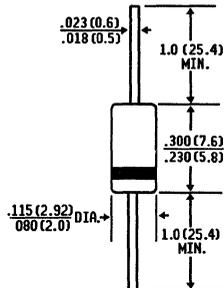
MINIATURE GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 225 to 600 Volts Current- 400 Milliampes

FEATURES

PATENTED*

DO-204MB



Dimension in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ 0.4 Ampere operation at $T_A=25^\circ\text{C}$ with no thermal runaway
- ◆ Hermetically sealed package
- ◆ Glass passivated cavity-free junction
- ◆ Ideally suited for miniaturized equipment
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204MB One piece glass sleeve

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .02 ounce, .56 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	1N645	1N646	1N647	1N648	1N649	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	225	300	400	500	600	Volts
Maximum RMS Voltage	V_{RMS}	156	210	280	350	420	Volts
Maximum DC Blocking Voltage	V_{DC}	225	300	400	500	600	Volts
*Minimum Reverse Breakdown Voltage at $100\mu\text{A}$ $T_A=100^\circ\text{C}$	V_{BR}	275	360	480	600	720	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=25^\circ\text{C}$ $T_A=150^\circ\text{C}$	$I_{(AV)}$			400.0 150.0			Mili-Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}			15.0			Amps
*Maximum Instantaneous Forward Voltage at 400mA	V_F			1.0			Volts
*Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R		15.0	20.0	25.0		nA μA
Typical Junction Capacitance (NOTE 1)	C_J			15.0			pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$			81.0			$^\circ\text{C}/\text{W}$
Operating Temperature Range	T_J			-65 to +175			$^\circ\text{C}$
Storage Temperature Range	T_{STG}			-65 to +200			$^\circ\text{C}$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 Vpc.
 2. Available to Jan and Jan TX Military Specifications MIL-STD-19500/240.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
- * JEDEC Registered Values

RATING AND CHARACTERISTIC CURVES 1N645 THRU 1N649

FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

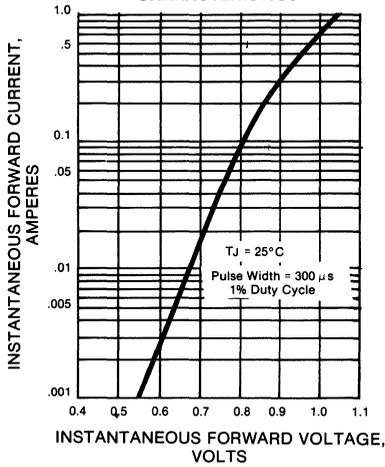


FIG. 1 — FORWARD CURRENT DERATING CURVE

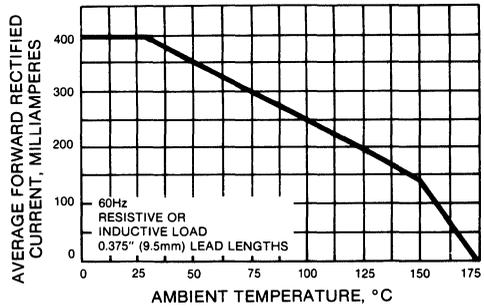


FIG. 2 — MAXIMUM NON-REPTITIVE PEAK FORWARD SURGE CURRENT

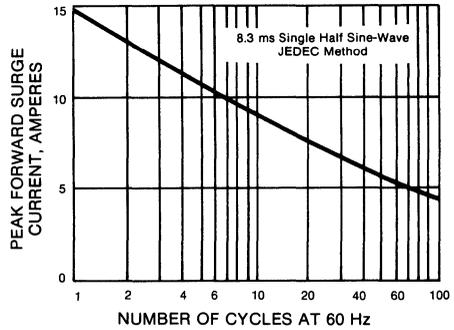


FIG. 5 — TYPICAL REVERSE LEAKAGE CHARACTERISTICS

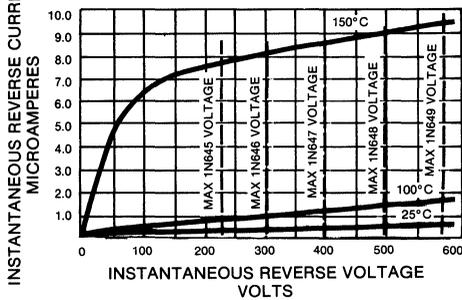
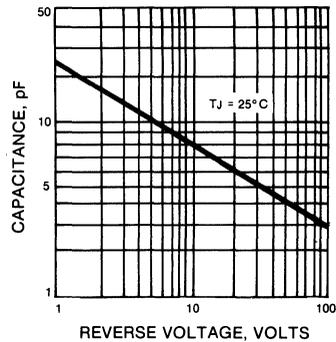


FIG. 4 — TYPICAL JUNCTION CAPACITANCE



1N4245 THRU 1N4249

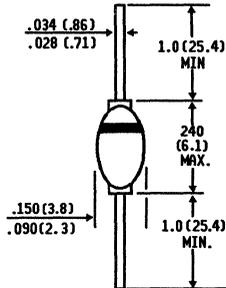
MINIATURE GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 200 to 1000 Volts Current - 1.0 Ampere

FEATURES

PATENTED*

DO-204AP



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Hermetically sealed package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .02 ounce, .56 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

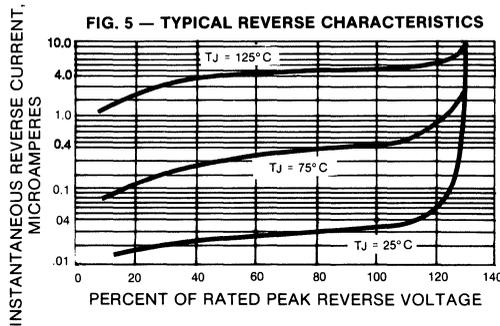
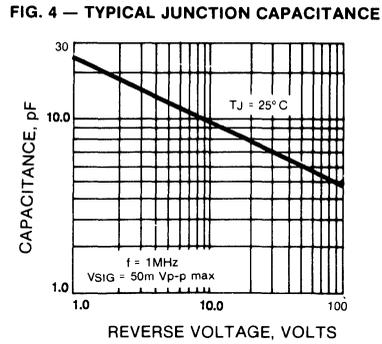
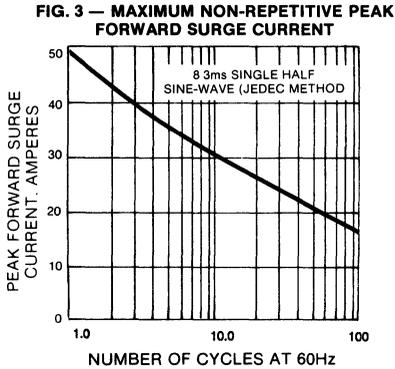
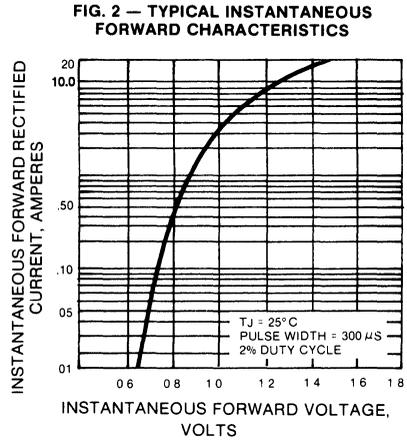
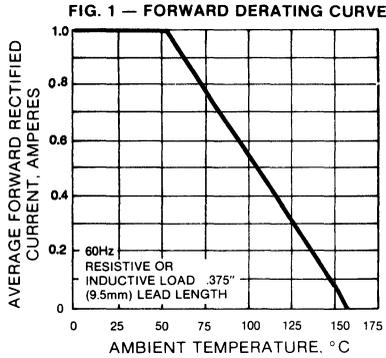
Ratings at 25C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N4245	1N4246	1N4247	1N4248	1N4249	UNITS
*Maximum Recurrent Peak Reverse Voltage	V _{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	140	280	420	560	700	Volts
*Maximum DC Blocking Voltage	V _{DC}	200	400	600	800	1000	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	I _(AV)	1.0					Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	50.0					Amps
*Maximum Instantaneous Forward Voltage at 1.0A	V _F	1.2					Volts
*Maximum Full Load Reverse Current, Full Cycle Average .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	I _{R(AV)}	50.0					μA
*Maximum Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=125^\circ\text{C}$	I _R	1.0 25.0					μA
Typical Junction Capacitance (NOTE 2)	C _J	15.0					pf
Typical Thermal Resistance (NOTE 3)	R _{θJA}	40.0					$^\circ\text{C}/\text{W}$
*Operating Temperature Range	T _J	-65 to +160					$^\circ\text{C}$
*Storage Temperature Range	T _{STG}	-65 to +200					$^\circ\text{C}$

NOTES:

1. Available to JAN and JAN TX Military Specifications MIL-S-19500 / 286C.
 2. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
- *JEDEC Registered Values

RATING AND CHARACTERISTIC CURVES 1N4245 THRU 1N4249



1N5059 THRU 1N5062

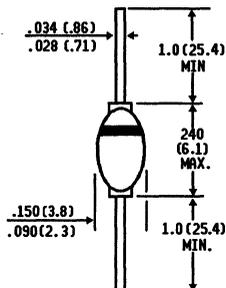
MINIATURE GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 200 to 800 Volts Current - 1.0 Ampere

FEATURES

PATENTED*

DO-204AP



Dimensions in inches
and
(millimeters)

*Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ 1.0 Ampere operation at $T_A=75^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Hermetically sealed package
- ◆ Glass passivated cavity-free junction DO-204AP package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375" (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .02 ounce, .56 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N5059	1N5060	1N5061	1N5062	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	Volts
*Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=75^\circ\text{C}$	$I_{(AV)}$	1.0				Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0				Amps
*Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.2				Volts
*Maximum Full Load Reverse Current, Full Cycle Average .375", (9.5mm) $T_A=25^\circ\text{C}$ Lead Lengths at $T_A=75^\circ\text{C}$	$I_{R(AV)}$	150	5.0		100	μA
*Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=175^\circ\text{C}$	I_R	300	5.0		200	μA
Typical Reverse Recovery Time (NOTE 1)	T_{RR}	2.0				μs
Typical Junction Capacitance (NOTE 2)	C_J	15.0				pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	40.0				$^\circ\text{C}/\text{W}$
*Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175				$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=-25\text{A}$.

2. Measured at 1 MHz and applied reverse voltage of 4.0 volts.

3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

*JEDEC Registered Values

RATING AND CHARACTERISTIC CURVES 1N5059 THRU 1N5062

FIG. 1 — FORWARD CURRENT DERATING CURVE

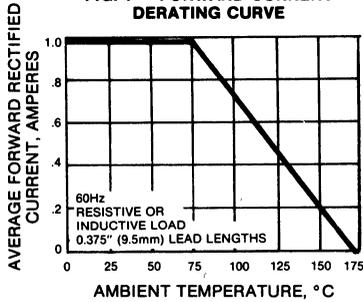


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

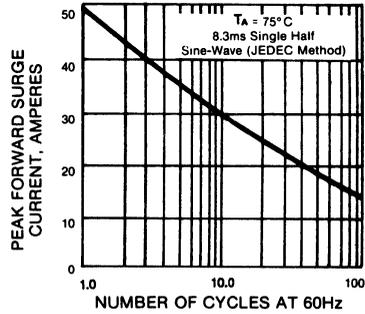


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

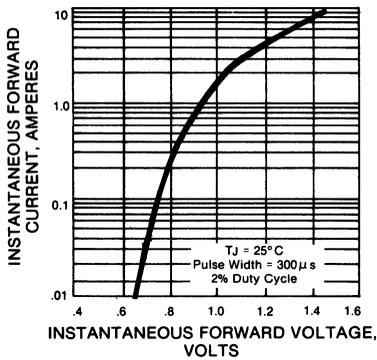


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

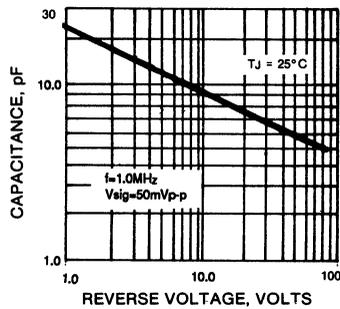


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

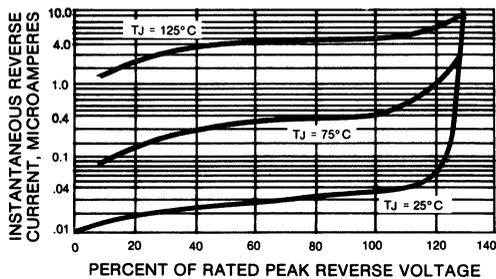
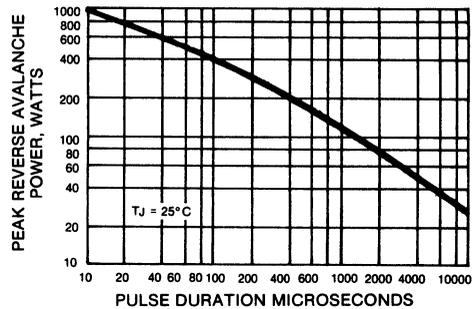


FIG. 6 — MAXIMUM NON-REPETITIVE REVERSE AVALANCHE POWER DISSIPATION



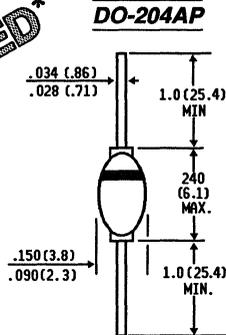
1N5614 THRU 1N5622

MINIATURE GLASS PASSIVATED MEDIUM-SWITCHING JUNCTION RECTIFIER

Voltage - 200 to 1000 Volts Current - 1.0 Ampere

FEATURES

PATENTED*



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ 1.0 Ampere operation at $T_A = 55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Hermetically sealed package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

- Case:** JEDEC DO-204AP One piece glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 grams

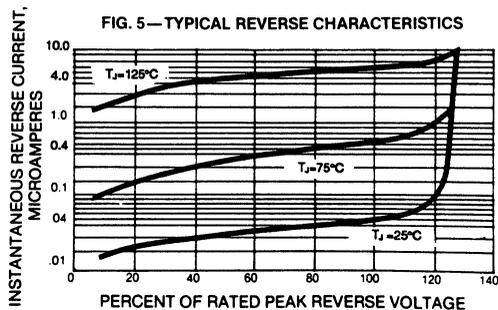
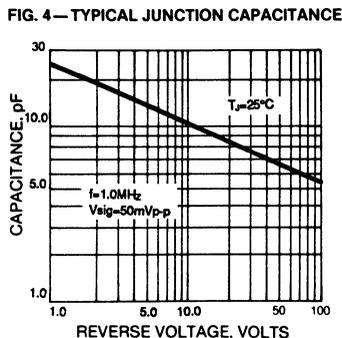
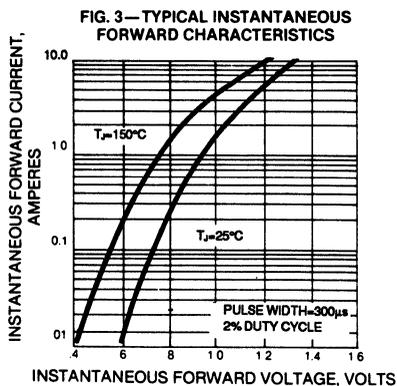
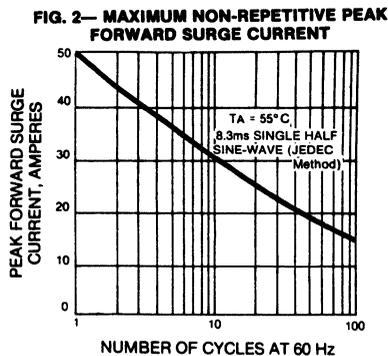
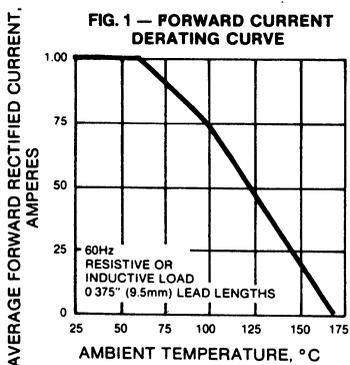
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N5614	1N5616	1N5618	1N5620	1N5622	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
*Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
*Minimum Reverse Breakdown Voltage at $50 \mu\text{A}$	V_{BR}	220	440	660	880	1100	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0					Amps
*Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.2					Volts
*Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$ $T_A=200^\circ\text{C}$	I_R	0.5 25.0 1500					μA
*Maximum Reverse Recovery Time (NOTE 1)	T_{RR}	2.0					μs
Typical Junction Capacitance (NOTE 2)	C_J	45	35	25	20	15	pf
Typical Thermal Resistance (NOTE 4)	$R_{\theta JA}$	40.0					$^\circ\text{C/W}$
*Operating Temperature Range	T_J	-65 to +175					$^\circ\text{C}$
*Storage Temperature Range	T_{STG}	-65 to +200					$^\circ\text{C}$

- NOTES:** 1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
 2. Measured at 1 MHz and applied reverse voltage of 12 volts.
 3. Available to Jan and Jan TX Military Specifications MIL-S-19500/427.
 4. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
 *JEDEC Registered Values

RATING AND CHARACTERISTIC CURVES 1N5614 THRU 1N5622



G1A THRU G1M

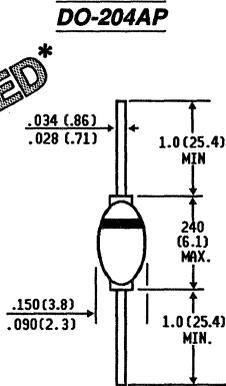
MINIATURE GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 50 to 1000 Volts Current- 1.0 Ampere

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction in DO-204AP package
- ◆ Hermetically sealed case
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

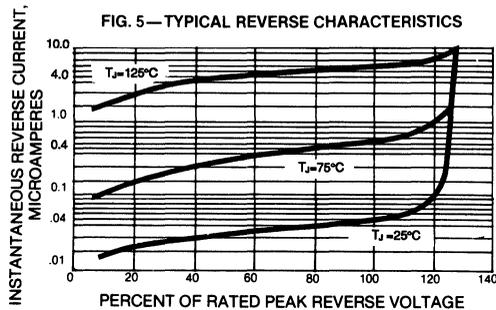
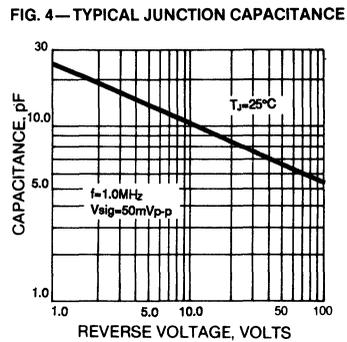
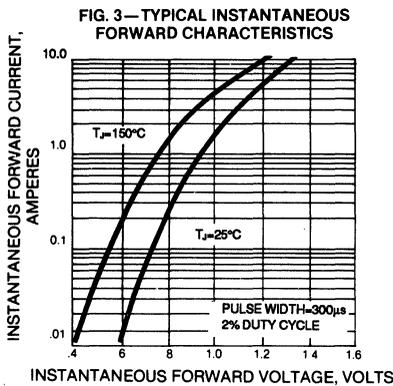
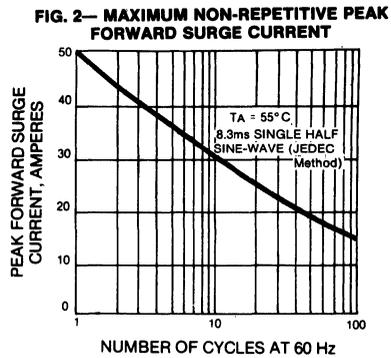
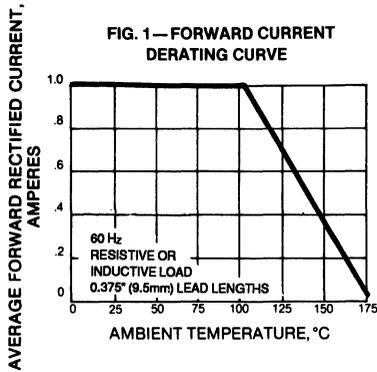
Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%

	SYMBOLS	G1A	G1B	G1D	G1G	G1J	G1K	G1M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	70	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current, .375" (9.5mm) Lead Length at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0							Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.2		1.1					Volts
Maximum Full Load Reverse Current, Full Cycle Average, .375", (9.5mm) Lead Length at $T_A=100^\circ\text{C}$	$I_{R(AV)}$	200.0							μA
Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$	I_R	2.0							μA
$T_A=150^\circ\text{C}$		100.0							
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	2.0							μs
Typical Junction Capacitance (NOTE 2)	C_J	15.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	40.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES:

1. Measured with $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Vdc.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES G1A THRU G1M



G2A THRU G2M

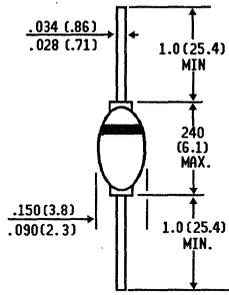
MINIATURE GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 50 to 1000 Volts Current- 2.0 Amperes

FEATURES

PATENTED*

DO-204AP



Dimensions in inches and (millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction in DO-204AP package
- ◆ Hermetically sealed case
- ◆ 2.0 Ampere operation at $T_A=75^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 grams

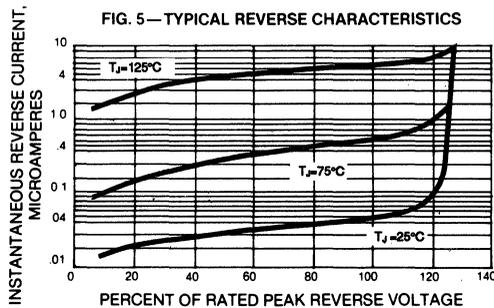
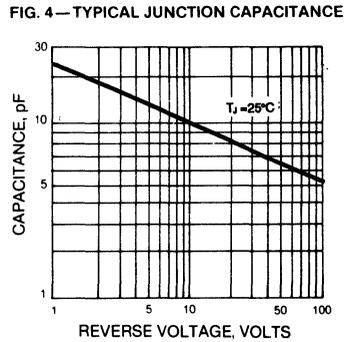
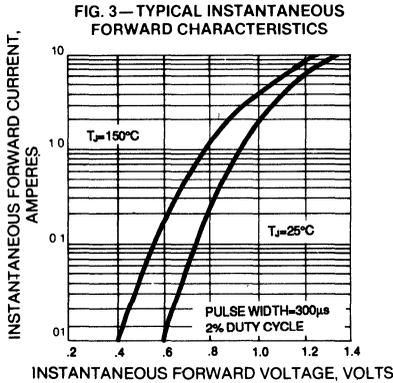
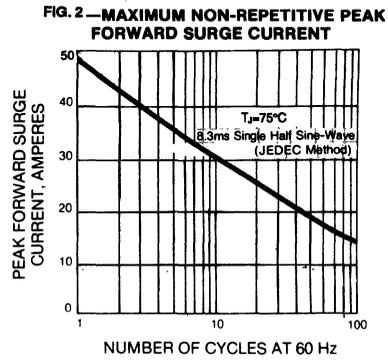
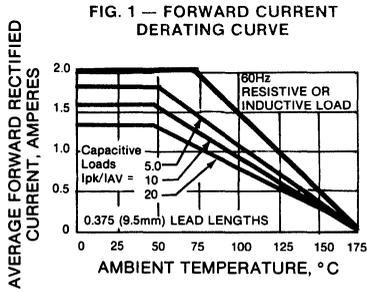
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%

	SYMBOLS	G2A	G2B	G2D	G2G	G2J	G2K	G2M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current, .375" (9.5mm) Lead Length at $T_A=75^\circ\text{C}$	$I_{(AV)}$	2.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0							Amps
Maximum Instantaneous Forward Voltage at 2.0A	V_F	1.2		1.1					Volts
Maximum Full Load Reverse Current, Full Cycle Average, .375", (9.5mm) Lead Length at $T_A=100^\circ\text{C}$	$I_{R(AV)}$	100.0							μA
Maximum DC Reverse Current at Rated DC Blocking Voltage	I_R	1.0							μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	2.0							μs
Typical Junction Capacitance (NOTE 2)	C_J	15.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	40.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

- NOTES:**
1. Measured with $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{TR}=25\text{A}$.
 2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Vpc.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES G2A THRU G2M

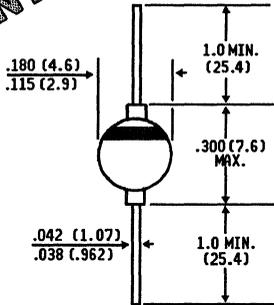


1N5550 THRU 1N5554

GLASS PASSIVATED JUNCTION RECTIFIER
Voltage - 200 to 1000 Volts Current - 3.0 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

*Braze-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ Glass passivated cavity-free junction
- ◆ High temperature metallurgically bonded
- ◆ Hermetically sealed package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Medium switching for good efficiency
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .037 ounce, 1.04 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

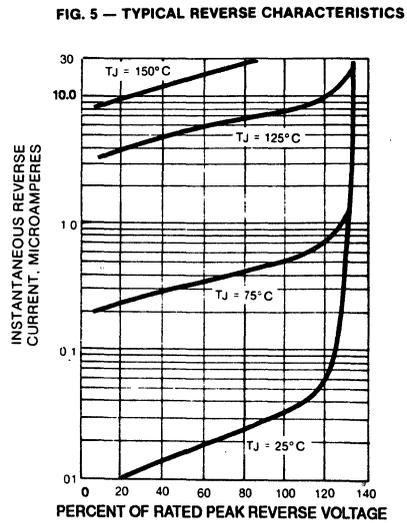
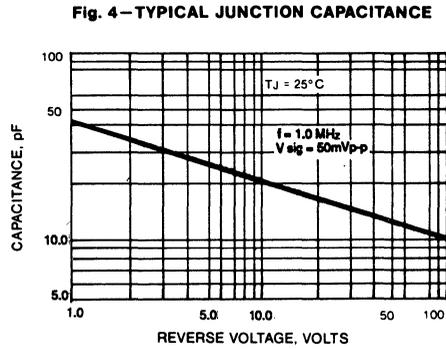
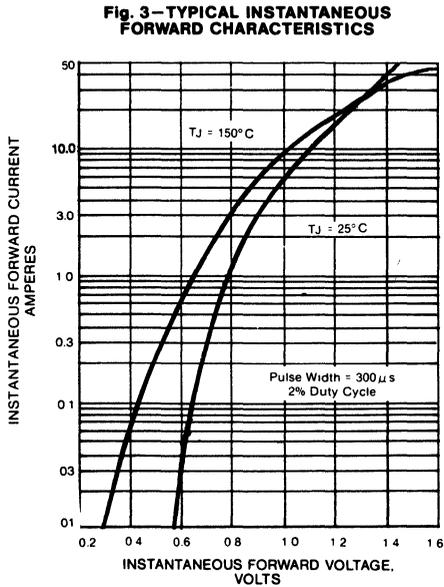
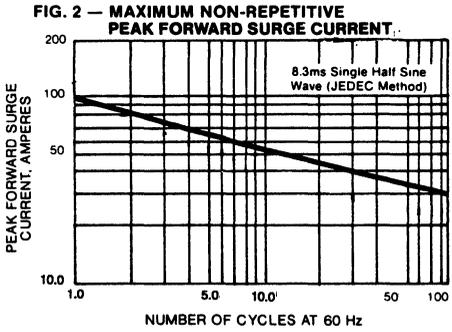
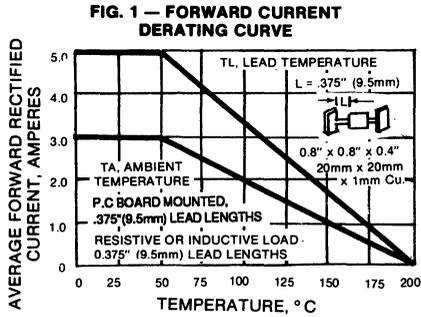
Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	1N5550	1N5551	1N5552	1N5553	1N5554	UNITS
*Maximum Recurrent Peak Reverse Voltage	V _{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	140	280	420	560	700	Volts
*Maximum DC Blocking Voltage	V _{DC}	200	400	600	800	1000	Volts
*Minimum Reverse Breakdown Voltage at 50 μ A	V _{BR}	240	460	660	880	1100	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at T _A =55°C	I _(AV)	3.0					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	100.0					Amps
* Maximum Instantaneous Forward Voltage at 3.0A	V _F	1.0			1.1		Volts
*Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =100°C T _A =200°C	I _R	1.0 25.0 1500.0					μA
*Maximum Junction Capacitance (NOTE 2)	C _J	150	120	100	90	85	pf
*Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	2.0			4.0		μs
Typical Thermal Resistance (NOTE 4)	θ _{JA}	15.0					°C/W
*Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +200					°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{rr}=25A.
 2. Measured at 1 MHz and applied reverse voltage of 12.0 volts.
 3. Available to JAN and JAN TX Military Specifications MIL-ST-19500/420A.
 4. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, with both leads mounted between heat sinks.
- *JEDEC Registered Values

RATINGS AND CHARACTERISTIC CURVES 1N5550 THRU 1N5554

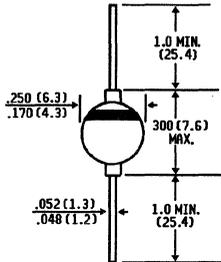


1N5624 THRU 1N5627

GLASS PASSIVATED JUNCTION RECTIFIER
Voltage - 200 to 800 Volts Current - 3.0 Amperes

FEATURES

PATENTED*



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ Glass passivated cavity-free junction
- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Hermetically sealed package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Typical I_R less than $0.1 \mu A$
- ◆ 3.0 Ampere operation at $T_A=70^\circ C$ with no thermal runaway
- ◆ High temperature soldering guaranteed: $350^\circ C/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .04 ounce, 1.1 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

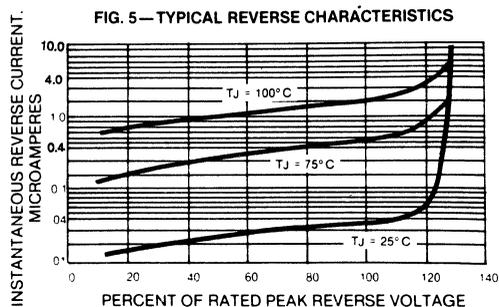
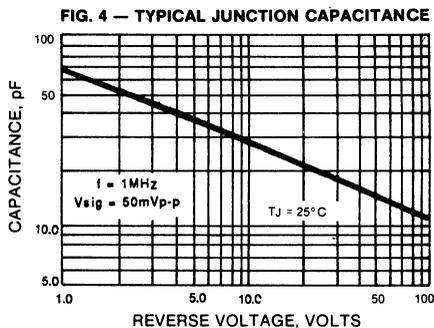
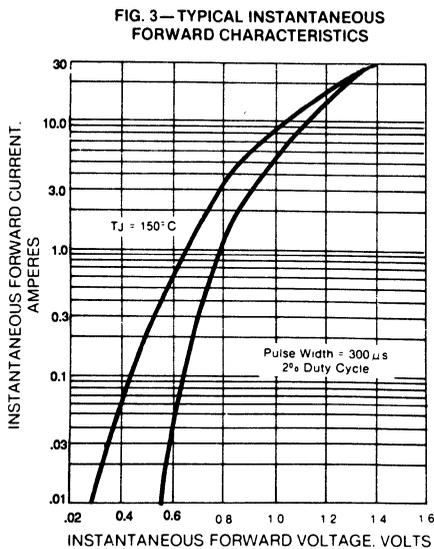
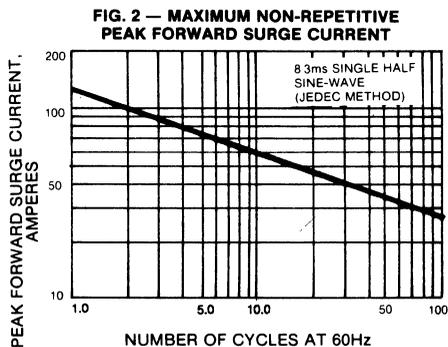
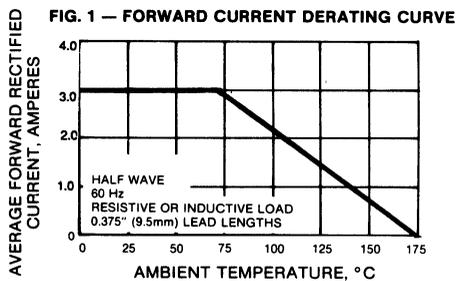
Ratings at $25^\circ C$ ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	1N5624	1N5625	1N5626	1N5627	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	Volts
*Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=70^\circ C$	$I_{(AV)}$	3.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	125				Amps
*Maximum Instantaneous Forward Voltage at 3.0A $T_A=25^\circ C$ $T_A=70^\circ C$	V_F	1.0 0.95				Volts
*Maximum Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ C$ $T_A=175^\circ C$	I_R	300.0		200.0		μA
*Maximum Full Load Reverse Current, Full cycle Average, .375", (9.5mm) lead length at $T_A=70^\circ C$	$I_{R(AV)}$	150.0		100.0		μA
Typical Junction Capacitance (NOTE 1)	C_J	40.0				pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	15.0				$^\circ C/W$
*Operating Temperature Range	T_J	-65 to +175				$^\circ C$
*Storage Temperature Range	T_{STG}	-65 to +200				$^\circ C$

NOTES: 1. Measured at 1.0 MHz and applied reverse voltage of $4.0 V_{DC}$.
 2. Available to JAN and JAN TX Military Specifications MIL-S-19500/432.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, with both leads attached between heatsinks.

*JEDEC Registered Values

RATINGS AND CHARACTERISTIC CURVES 1N5624 THRU 1N5627

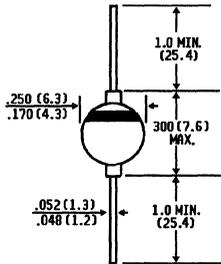


G3A THRU G3M

GLASS PASSIVATED JUNCTION RECTIFIER
Voltage - 50 to 1000 Volts Current- 3.0 Amperes

FEATURES

PATENTED*



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction
- ◆ Hermetically sealed package
- ◆ 3.0 Ampere operation at $T_A=70^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .04 ounce, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	G3A	G3B	G3D	G3G	G3J	G3K	G3M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current, .375" (9.5mm) Lead Length at $T_A=70^\circ\text{C}$	$I_{(AV)}$	3.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	125.0							Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.2		1.1					Volts
Maximum Full Load Reverse Current, Full Cycle Average, .375", (9.5mm) Lead Length at $T_A=70^\circ\text{C}$	$I_{R(AV)}$	200.0							μA
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	5.0							μA
Typical Reverse Recovery Time (NOTE 1)	T_{RR}	3.0							μs
Typical Junction Capacitance (NOTE 2)	C_J	40.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	15.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES:

1. Measured with $I_F=0.5\text{A}$, $I_R=1\text{A}$, $I_{RR}=25\text{A}$.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 V_{DC} .
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, with both leads mounted between heatsinks.

RATINGS AND CHARACTERISTIC CURVES G3A THRU G3M

FIG. 1 — FORWARD CURRENT DERATING CURVE

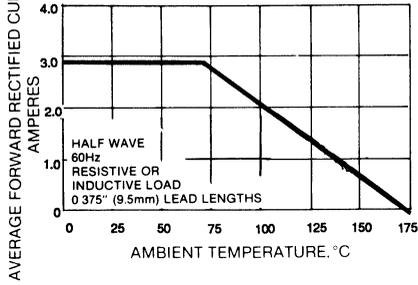


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

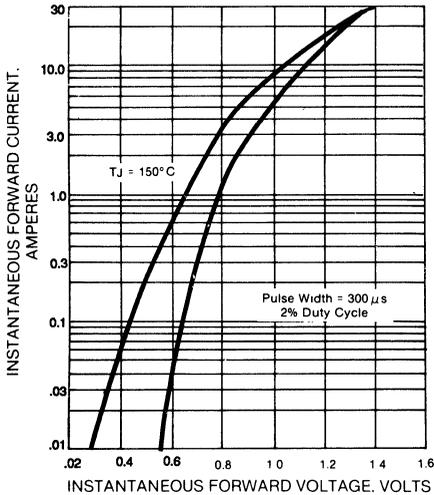


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

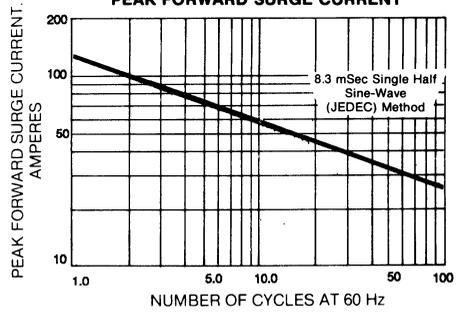


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

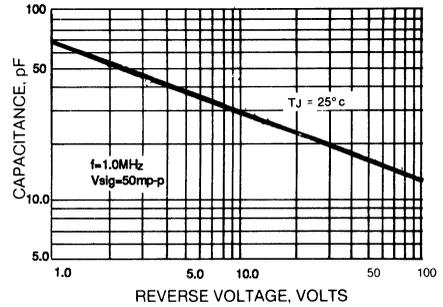
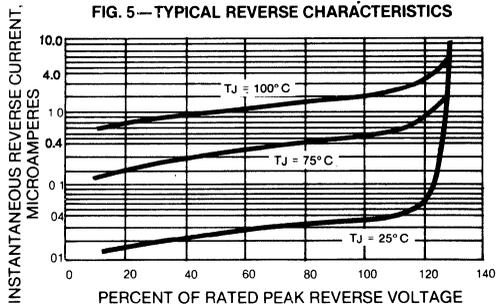


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

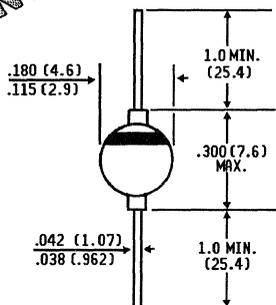


G4A THRU G4M

GLASS PASSIVATED JUNCTION RECTIFIER
Voltage - 50 to 1000 Volts Current - 3.0 Amperes

FEATURES

PATENTED*



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction
- ◆ Hermetically Sealed package
- ◆ 3.0 Ampere operation at $T_A=75^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/ $.375"$, (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .037 ounce, 1.04 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.
 For capacitive load, derate current by 20%

	SYMBOLS	G4A	G4B	G4D	G4G	G4J	G4K	G4M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current, $.375"$ (9.5mm) Lead Length at $T_A=70^\circ\text{C}$	$I_{(AV)}$	3.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	100.0							Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.1							Volts
Maximum Full Load Reverse Current Full Cycle Average, $.375"$, (9.5mm) Lead Length at $T_A=70^\circ\text{C}$	$I_{R(AV)}$	200.0							μA
Maximum Average Reverse Current at Peak $T_A=25^\circ\text{C}$ Reverse Voltage $T_A=100^\circ\text{C}$	$I_{R(AV)}$	100.0							μA
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	1.0							μA
Typical Reverse Recovery Time (NOTE 2) $T_J=25^\circ\text{C}$	T_{RR}	3.0							μs
Typical Junction Capacitance (NOTE 1)	C_J	40.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	15.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
3. Thermal Resistance from Junction to Ambient at $.375"$ (9.5mm) Lead Lengths with both leads mounted between heatsinks.

RATINGS AND CHARACTERISTIC CURVES G4A THRU G4M

Fig. 1—FORWARD CURRENT DERATING CURVE

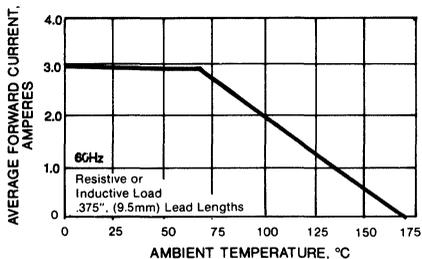


Fig. 3—TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

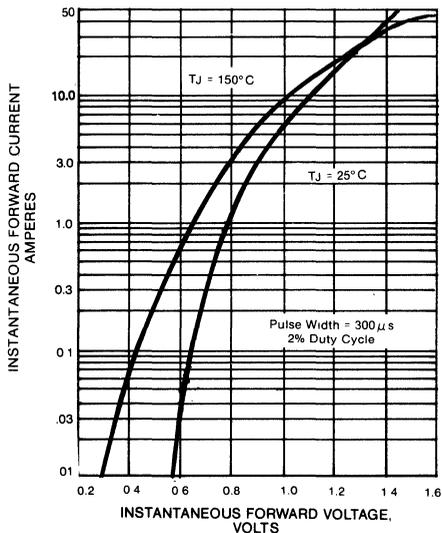


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

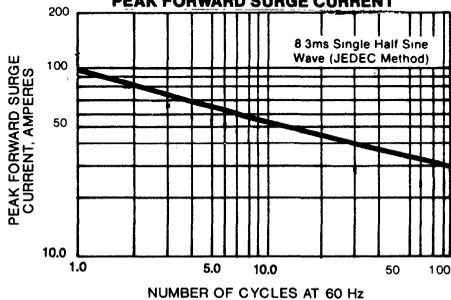


Fig. 4—TYPICAL JUNCTION CAPACITANCE

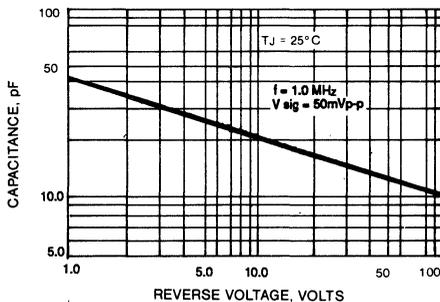
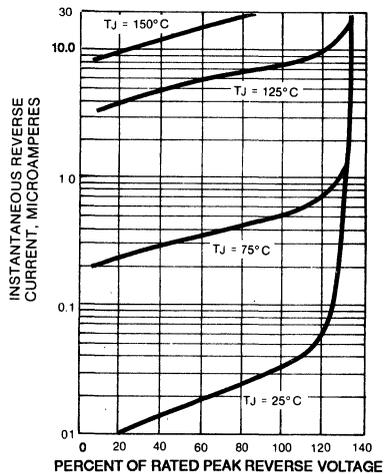


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS



**HIGH VOLTAGE GLASS
PASSIVATED RECTIFIERS**

***1.0 AMPERE TO 3.0 AMPERES
1200 VOLTS TO 1600 VOLTS***

**GENERAL
INSTRUMENT**

CG1 AND DG1

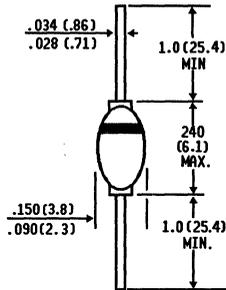
MINIATURE CLAMPER / DAMPER GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 1400 to 1500 Volts Current - 1.5 Amperes

FEATURES

PATENTED*

DO-204AP



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ Specially designed for clamping circuits horizontal deflection systems and damper applications
- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction in DO-204AP package
- ◆ 1.5 Ampere operation at $T_A=50^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Hermetically sealed package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .02 ounce, .56 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	CG1	DG1	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	1400	1500	Volts
Maximum RMS Voltage	V_{RMS}	980	1050	Volts
Maximum DC Blocking Voltage	V_{DC}	1400	1500	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=50^\circ\text{C}$	$I_{(AV)}$	1.5		Amps
Peak Forward Surge Current 8.3ms single half sine -wave superimposed on rated load (JEDEC Method)	I_{FSM}	40.0		Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.1		Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	5.0 100		μA
Maximum Full Load Reverse Current Full Cycle Average, .375", (9.5mm) Lead Length $T_A=100^\circ\text{C}$	$I_{R(AV)}$	50.0		μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	15.0	20.0	μs
Typical Junction Capacitance (NOTE 2)	C_J	15.0		pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	40.0		$^\circ\text{C}/\text{W}$
Operating Storage Temperature Range	T_J, T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=50\text{ma}$.
2. Measured at 1 MHz and applied reverse voltage of 4.0 Vdc.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES CG1 AND DG1

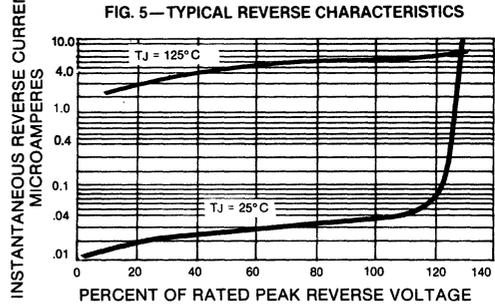
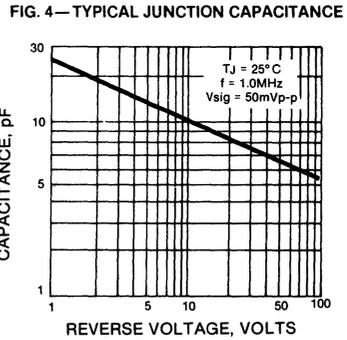
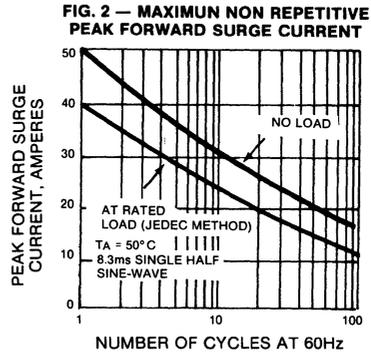
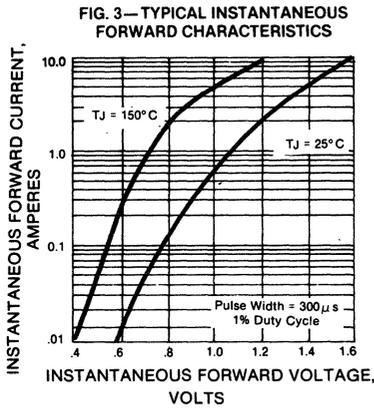
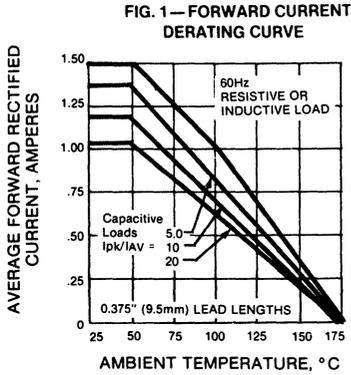
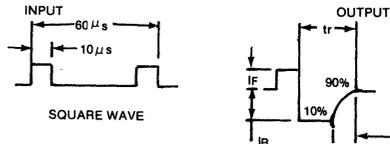
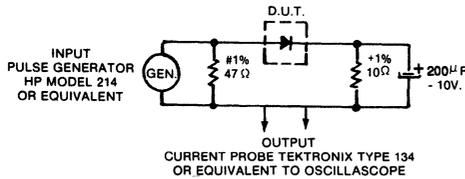


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM



GI1-1200 THRU GI1-1600

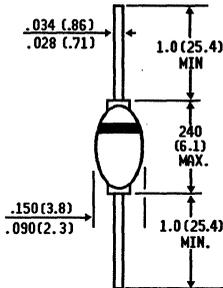
MINIATURE HIGH VOLTAGE GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 1200 to 1600 Volts Current - 1.0 Ampere

FEATURES

PATENTED*

DO-204AP



Dimensions in inches and (millimeters)

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction in DO-204AP package
- ◆ 1.0 Ampere operation at $T_A=75^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Hermetically sealed package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .02 ounce, .56 grams

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	GI1-1200	GI1-1400	GI1-1600	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	1200	1400	1600	Volts
Maximum RMS Voltage	V_{RMS}	840	980	1120	Volts
Maximum DC Blocking Voltage	V_{DC}	1200	1400	1600	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=75^\circ\text{C}$	$I_{(AV)}$	1.0			Amps
Peak Forward Surge Current 8.3ms single half sine -wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0			Amps
Maximum Instantaneous Forward Voltage at 1.0A 3.14A	V_F	1.1 1.3			Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	10.0 100.0			μA
Maximum Reverse Recovery Time (NOTE 1)	T_{RR}	25.0			μs
Maximum Forward Recovery Time (NOTE 2)	T_{FR}	1.0			μs
Typical Junction Capacitance (NOTE 3)	C_J	15.0			pf
Typical Thermal Resistance (NOTE 4)	$R_{\theta JA}$	40.0			$^\circ\text{C}/\text{W}$
Operating Storage Temperature Range	T_J, T_{STG}	-65 to +175			$^\circ\text{C}$

NOTES:

1. Measured on Tektronix Type "S" recovery plug-in Tektronix 545 Scope or equivalent IFM=20 mA, IRM= 2mA.
2. Measured on Tektronix Type "S" recovery plug-in, Tektronix 545 or equivalent, IFM = 20mA.
3. Measured at 1 MHz and applied reverse voltage of 4.0 V_{DC}.
4. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES GI1-1200 THRU GI1-1600

FIG. 1 — FORWARD CURRENT DERATING CURVE

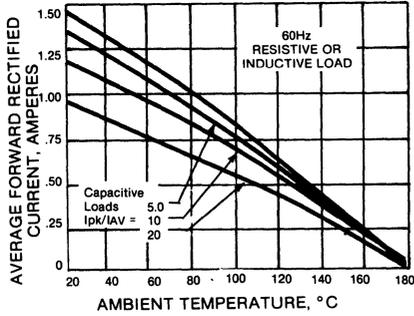


FIG. 2 — MAXIMUM NON REPETITIVE PEAK FORWARD SURGE CURRENT

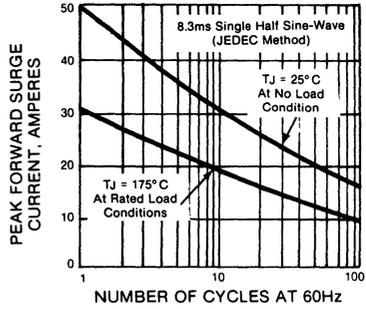


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

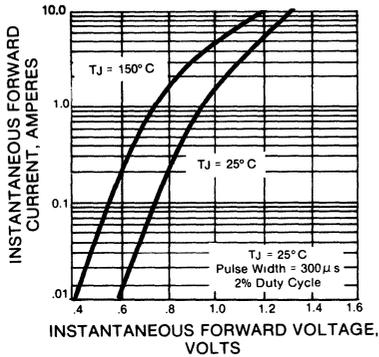


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

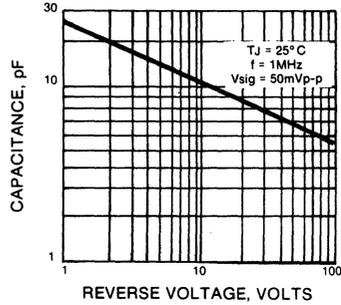
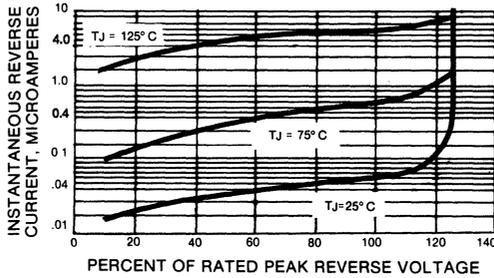


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS



CG2 AND DG2

MINIATURE CLAMPER / DAMPER GLASS PASSIVATED JUNCTION RECTIFIER

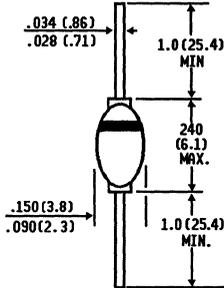
Voltage - 1400 to 1500 Volts Current - 2.0 Amperes

FEATURES

- ◆ Specially designed for clamping circuits in horizontal deflection systems and damper applications
- ◆ High temperature metallurgically bonded
- ◆ Glass passivated cavity-free junction in a DO-204AP package
- ◆ 2.0 Ampere operation at $T_A=50^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Hermetically sealed package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*

DO-204AP



*Dimensions in inches
and
(millimeters)*

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .02 ounce, .56 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	CG2	DG2	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	1400	1500	Volts
Maximum RMS Voltage	V_{RMS}	980	1050	Volts
Maximum DC Blocking Voltage	V_{DC}	1400	1500	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=50^\circ\text{C}$	$I_{(AV)}$	2.0		Amps
Peak Forward Surge Current 8.3ms single half sine -wave superimposed on rated load (JEDEC Method)	I_{FSM}	40.0		Amps
Maximum Instantaneous Forward Voltage at 2.0A	V_F	1.1		Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	100.0		μA
Maximum Full Load Reverse Current Full Cycle Average, .375", (9.5mm) Lead Length $T_A=100^\circ\text{C}$	$I_{R(AV)}$	200.0		μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	15.0	20.0	μs
Typical Junction Capacitance (NOTE 2)	C_J	15.0		pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	40.0		$^\circ\text{C/W}$
Operating Storage Temperature Range	T_J, T_{STG}	-65 to +175		$^\circ\text{C}$

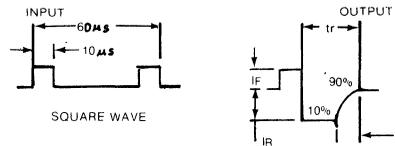
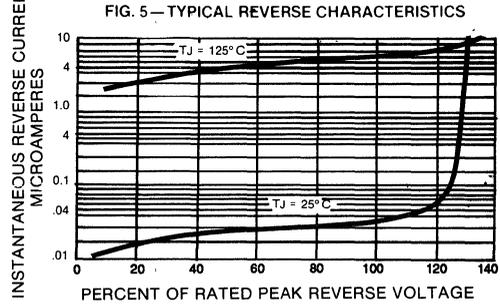
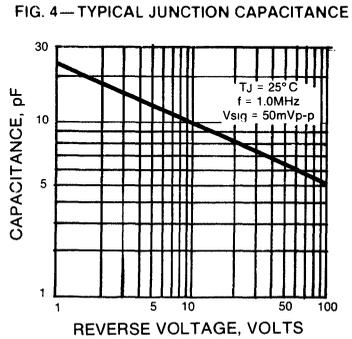
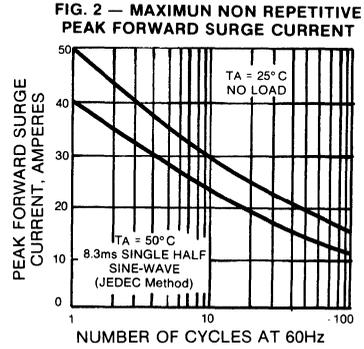
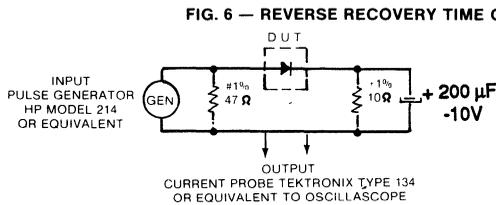
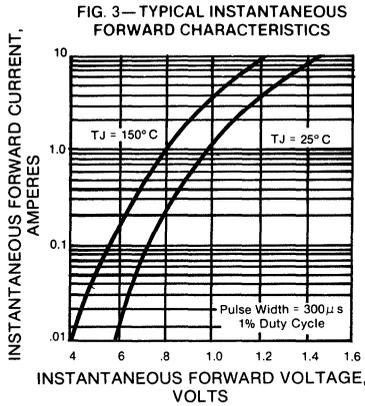
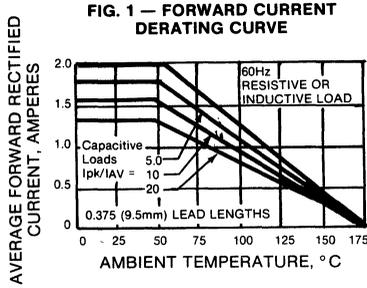
NOTES:

1. Measured with $I_F=0.5\text{A}$, $I_R=50\text{mA}$.

2. Measured at 1 MHz and applied reverse voltage of 4.0 V_{DC}.

3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES CG2 AND DG2



BY228 SERIES

CLAMPER / DAMPER GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 1500 Volts Current - 2.5 Amperes

GENERAL DESCRIPTION

These silicon Glass Passivated Clamper / Damper Rectifiers are designed for TV Applications, such as clamping circuits in horizontal deflection systems and damper

applications. The glass passivated construction and Dual Heat-Sink design assures reliable and stable operation.

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction
- ◆ 2.5 Ampere operation at $T_A=50^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Hermetically sealed package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

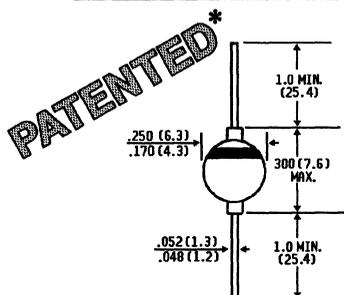
MECHANICAL DATA

Case: One piece glass, hermetically sealed

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any **Weight:** .04 ounce, 1.1 gram



Dimensions in inches and (millimeters)

* Braze-lead assembly is covered by Patent No. 3,830,306 of 1976

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 50 - 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	BY228	UNITS
Maximum Non Repetitive Peak Reverse Voltage	V_{RSM}	1650	Volts
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	1500	Volts
Maximum RMS Voltage	V_{RMS}	1050	Volts
Maximum DC Blocking Voltage	V_{DC}	1500	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=50^\circ\text{C}$	$I_{(AV)}$	2.5	Amps
Peak Forward Surge Current 10ms single half sine -wave superimposed on rated load	I_{FSM}	50.0	Amps
Maximum Instantaneous Forward Voltage at 5.0A	V_F	1.6	Volts
Working Peak Forward Current at $T_A=75^\circ\text{C}$	I_{FWM}	5.0	Amps
Peak Repetitive Forward Surge Current at $T_A=75^\circ\text{C}$	I_{FRM}	10.0	Amps
Maximum Peak Reverse Current $T_A=25^\circ\text{C}$ at Rated Peak Reverse Voltage $T_J=140^\circ\text{C}$	I_R	5.0 200	μA
Maximum Reverse Recovery Time (NOTE 1)	T_{RR}	20.0	μS
Maximum Forward Recovery Time (NOTE 3)	T_{FR}	1.0	μS
Typical Junction Capacitance (NOTE 2)	C_J	40.0	pf
Typical Thermal Resistance (NOTE 4)	$R_{\theta JA}$	20.0	$^\circ\text{C}/\text{W}$
Operating Temperature Range	T_J	-65 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +200	$^\circ\text{C}$

NOTES: 1. Measured with $I_F = 1.0\text{A}$, $I_R = 50\text{mA}$, $di/dt = 50\text{mA}/\mu\text{s}$.

2. Measured at 1 MHz and applied reverse voltage of 4.0 V_{dc}.

3. Measured with $I_F = 5.0\text{A}$ with $t_r = 0.1 \mu\text{s}$

4. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATING AND CHARACTERISTIC CURVES BY228 SERIES

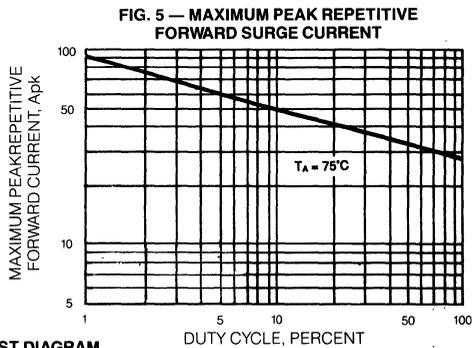
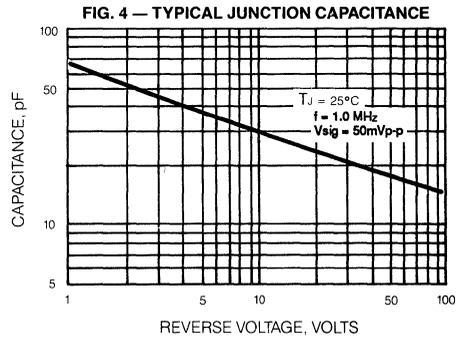
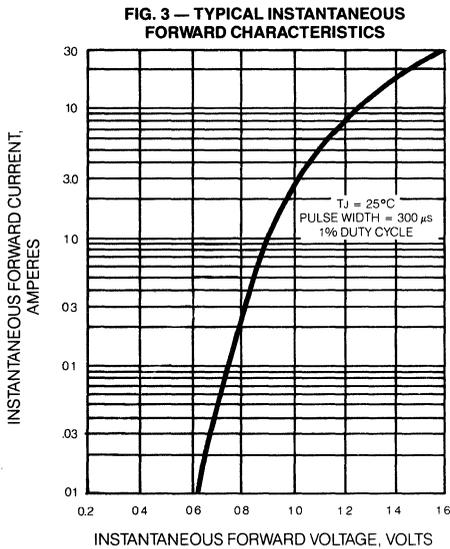
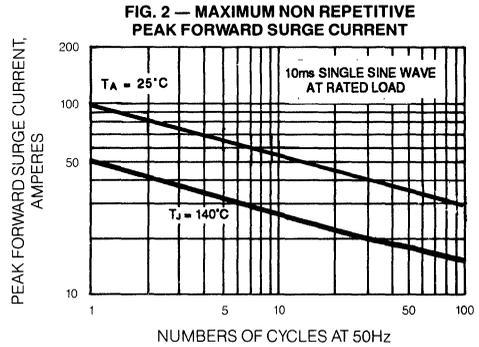
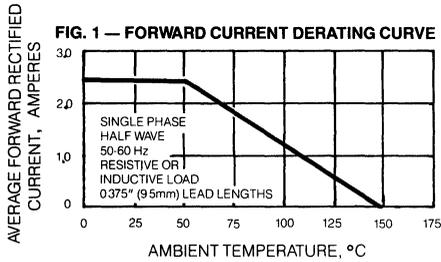
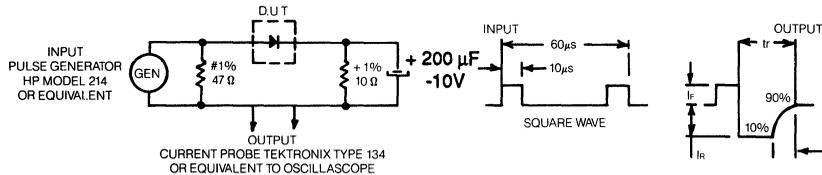


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM



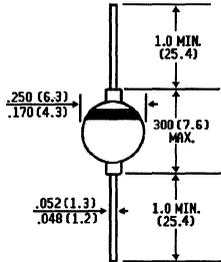
CG3 AND DG3

CLAMPER / DAMPER GLASS PASSIVATED JUNCTION RECTIFIER

Voltage - 1400 to 1500 Volts Current - 3.0 Amperes

FEATURES

PATENTED*



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ Specially designed for clamping circuits horizontal deflection systems and damper applications
- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction
- ◆ 3.0 Ampere operation at $T_A=50^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Hermetically sealed package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .04 ounce, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	CG3	DG3	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	1400	1500	Volts
Maximum RMS Voltage	V_{RMS}	980	1050	Volts
Maximum DC Blocking Voltage	V_{DC}	1400	1500	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=50^\circ\text{C}$	$I_{(AV)}$	3.0		Amps
Peak Forward Surge Current 8.3ms single half sine -wave superimposed on rated load (JEDEC Method)	I_{FSM}	100.0		Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.2		Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	5.0 100.0		μA
Maximum Full Load Reverse Current Full Cycle Average, .375", (9.5mm) Lead Length $T_A=70^\circ\text{C}$	$I_{R(AV)}$	200.0		μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	15.0	20.0	μs
Typical Junction Capacitance (NOTE 2)	C_J	40.0		pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	20.0		$^\circ\text{C/W}$
Operating Storage Temperature Range	T_J, T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES:

1. Measured with $I_F=0.5\text{A}$, $I_R=50\text{mA}$.
2. Measured at 1 MHz and applied reverse voltage of $4.0 V_{DC}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES CG3 AND DG3

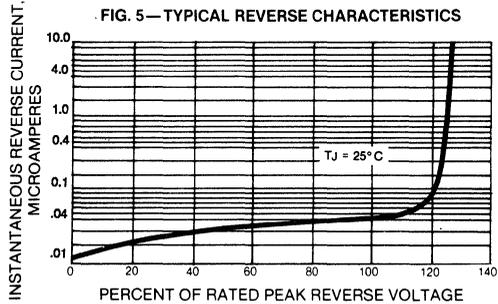
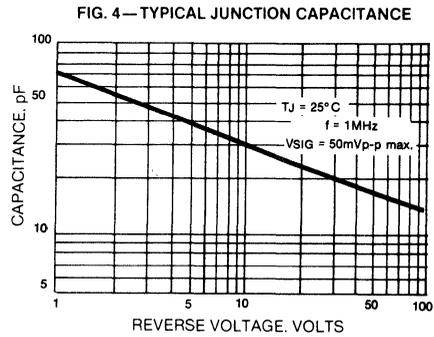
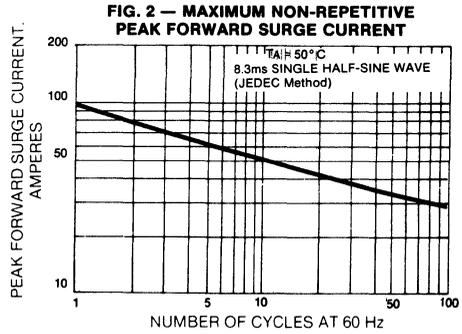
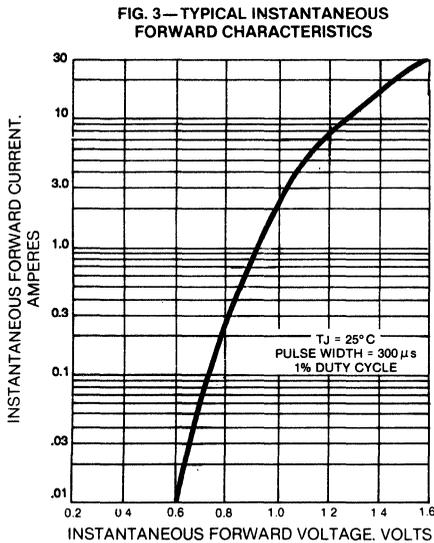
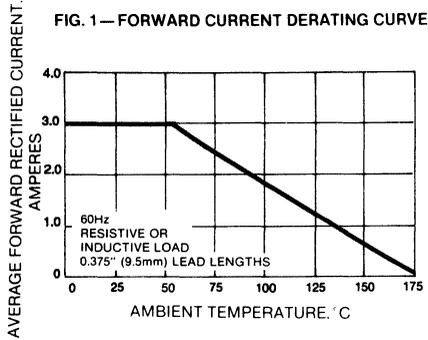
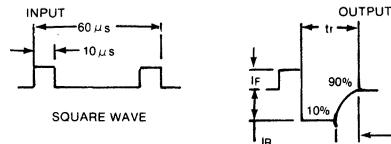
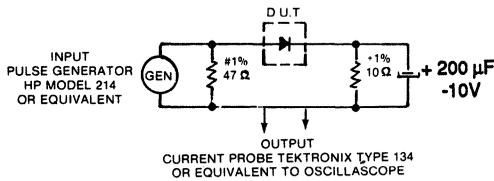


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM



**FAST RECOVERY GLASS
PASSIVATED RECTIFIERS**

***1.0 AMPERE TO 3.0 AMPERES
50 VOLTS TO 1000 VOLTS***

**GENERAL
INSTRUMENT**

1N4942 THRU 1N4948

MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER

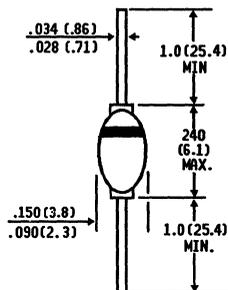
Voltage - 200 to 1000 Volts Current - 1.0 Ampere

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Hermetically sealed case
- ◆ Glass passivated cavity-free junction in DO-204AP package
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*

DO-204AP



Dimensions in inches and (millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .02 ounce, .56 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N4942	1N4944	1N4946	1N4947	1N4948	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
*Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
*Minimum Reverse Breakdown Voltage at $50 \mu\text{A}$	V_{BR}	220	440	660	880	1100	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	25.0					Amps
*Maximum Instantaneous Forward Voltage at 1.0A at 2.0A, $T_A=-40^\circ\text{C}$	V_F	1.3					Volts
	V_F	2.5					Volts
*Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=175^\circ\text{C}$	I_R	1.0					μA
	I_R	500.0					μA
*Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	150	150	250	250	500	nS
Typical Junction Capacitance (NOTE 2)	C_J	15.0					pf
Typical Thermal Resistance (NOTE 4)	$R_{\theta JA}$	50.0					$^\circ\text{C}/\text{W}$
*Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
 2. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
 3. Available to JAN and JAN TX Military Specifications MIL-ST-19500/359
 4. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
- *JEDEC Registered Values

RATINGS AND CHARACTERISTIC CURVES 1N4942 THRU 1N4948

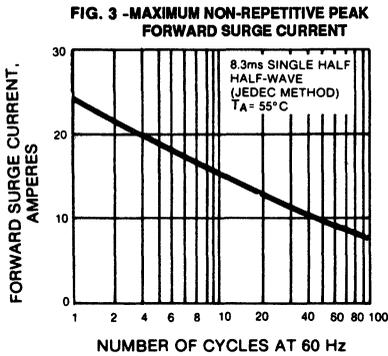
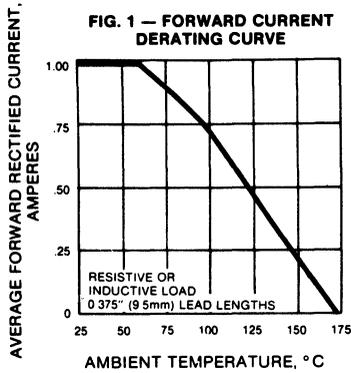


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

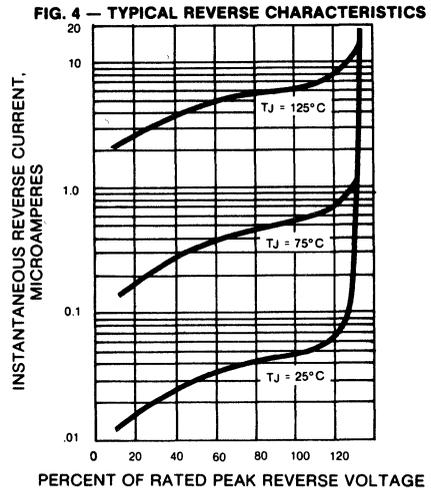
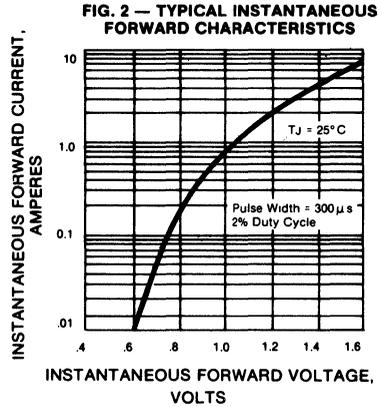
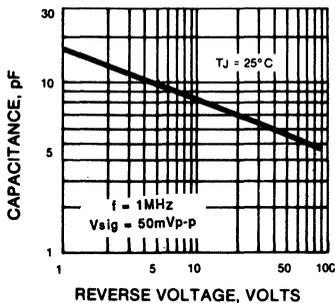
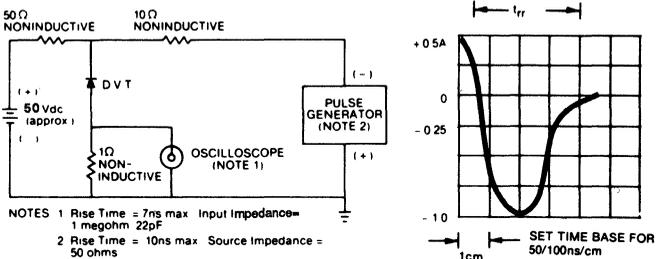


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



1N5615 THRU 1N5623

MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER

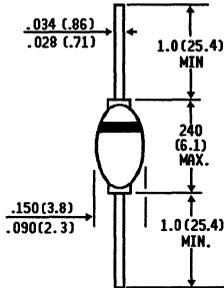
Voltage - 200 to 1000 Volts Current - 1.0 Ampere

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Hermetically sealed case
- ◆ Glass passivated cavity-free junction in a DO-204AP package
- ◆ 1.0 Ampere operation at $T_A = 55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*

DO-204AP



Dimensions in inches and millimeters

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N5615	1N5617	1N5619	1N5621	1N5623	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
*Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
*Minimum Reverse Breakdown Voltage at $50 \mu\text{A}$	V_{BR}	220	440	660	880	1100	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A = 55^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0					Amps
*Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.2					Volts
*Maximum DC Reverse Current $T_A = 25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A = 100^\circ\text{C}$ $T_A = 200^\circ\text{C}$	I_R	0.5 25.0 1500.0					μA
*Maximum Reverse Recovery Time (NOTE 1) $T_J = 25^\circ\text{C}$	T_{RR}	150	150	250	300	500	nS
*Maximum Junction Capacitance (NOTE 2)	C_J	45	35	25	20	15	pf
Typical Thermal Resistance (NOTE 4)	$R_{\theta JA}$	50.0					$^\circ\text{C}/\text{W}$
*Operating Temperature Range	T_J	-65 to +175					$^\circ\text{C}$
*Storage Temperature Range	T_{STG}	-65 to +200					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions : $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, $I_{rr} = 25\text{A}$.
 2. Measured at 1 MHz and applied reverse voltage of 12 volts.
 3. Available to JAN and JAN TX Military Specifications MIL-S-19500/429.
 4. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.
- *JEDEC Registered Values

RATINGS AND CHARACTERISTIC CURVES 1N5615 THRU 1N5623

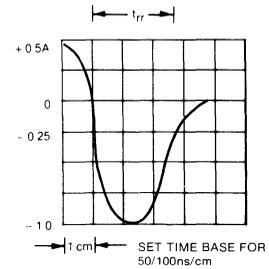
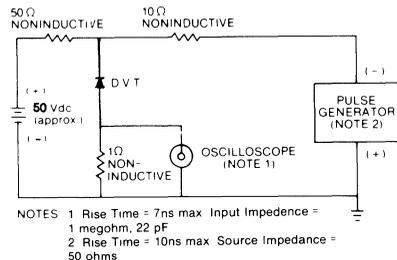
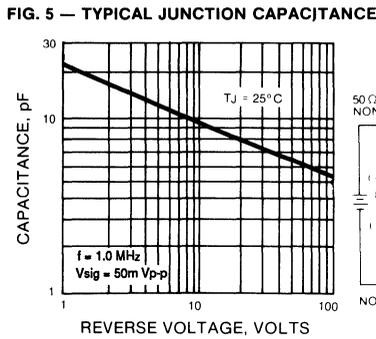
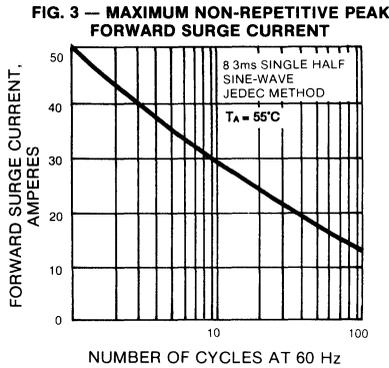
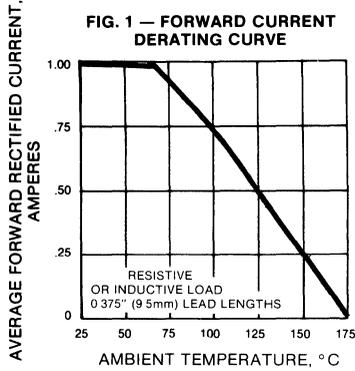


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

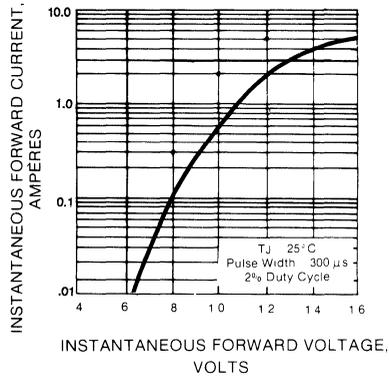
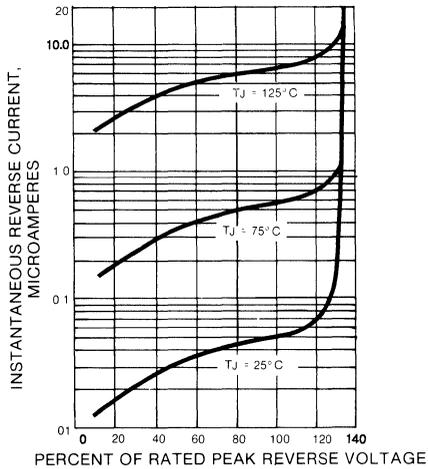


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS



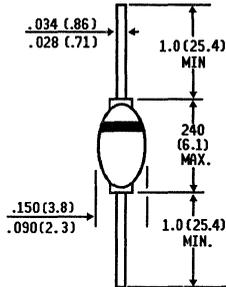
RG1A THRU RG1M

MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER

Voltage - 50 to 1000 Volts Current - 1.0 Ampere

FEATURES

PATENTED*
DO-204AP



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Hermetically sealed case
- ◆ Glass passivated cavity-free junction in a DO-204AP package
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO204AP One piece glass
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	RG1A	RG1B	RG1D	RG1G	RG1J	RG1K	RG1M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current, .375" (9.5mm) Lead Length at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0							Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.3							Volts
Maximum Full Load Reverse Current, Full Cycle Average, .375", (9.5mm) Lead Length at $T_A=25^\circ\text{C}$ and $T_A=100^\circ\text{C}$	$I_{R(AV)}$	1.0 100.0							μA
Maximum DC Reverse Current at Rated DC Blocking Voltage	I_R	2.0							μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	150			200		250	500	nS
Typical Junction Capacitance (NOTE 2)	C_J	15.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Vdc.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES RG1A THRU RG1M

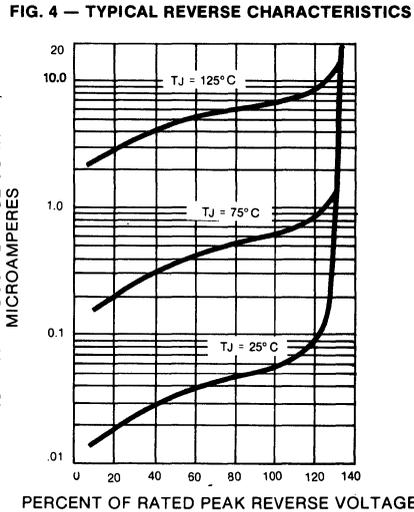
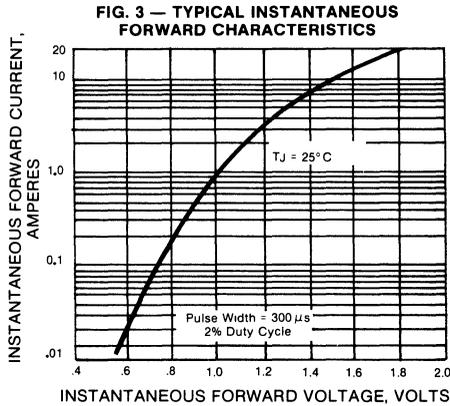
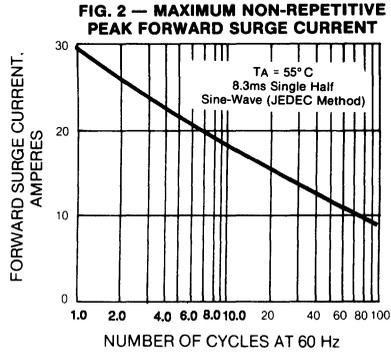
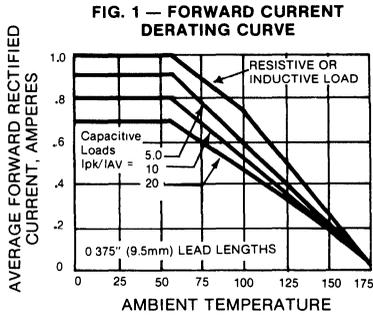


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

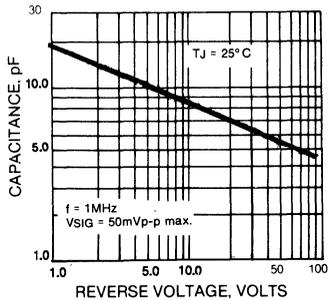
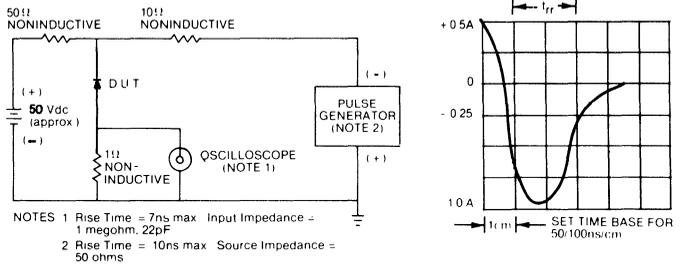


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



BYV95 AND BYV96 SERIES

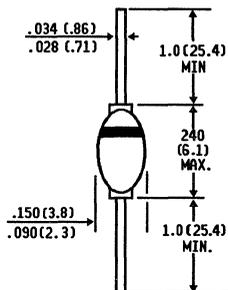
MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER

Voltage - 200 to 1000 Volts Current - 1.5 Amperes

FEATURES

PATENTED*

DO-204AP



Dimensions in inches
and
(millimeters)

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Hermetically sealed case
- ◆ Glass passivated cavity-free junction in a DO-204AP package
- ◆ 1.5 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for high efficiency up to 100 KHz
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .02 ounce, .56 grams

* Braze-lead assembly is covered by Patent No. 3,930,306 of 1976

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	BYV95A	BYV95B	BYV95C	BYV96D	BYV96E	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	200	400	600	800	1000	Volts
Minimum Avalanche Breakdown Voltage at $100 \mu\text{A}$	V_{BR}	300	500	800	900	1100	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.5					Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed on rated load	I_{FSM}	35.0					Amps
Maximum Instantaneous Forward Voltage at 3.0A $T_A=25^\circ\text{C}$ $T_J=165^\circ\text{C}$	V_F	1.6 1.35					Volts
Maximum Full Load Reverse Current, Full Cycle Average, .375", (9.5mm) Lead Length at $T_J=25^\circ\text{C}$ $T_J=165^\circ\text{C}$	$I_{R(AV)}$	1.0 150.0					μA
Maximum DC Reverse Current at rated DC Blocking Voltage	I_R	2.0					μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	250			300		nS
Typical Junction Capacitance (NOTE 2)	C_J	10.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0					$^\circ\text{C/W}$
Operating Temperature Range	T_J	-65 to +175					$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +200					$^\circ\text{C}$

- NOTES: 1. Measured with $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr} = .25\text{A}$.
2. Measured at 1 MHz and applied reverse voltage of $4.0 V_{DC}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATING AND CHARACTERISTIC CURVES BYV95 AND BYV96 SERIES

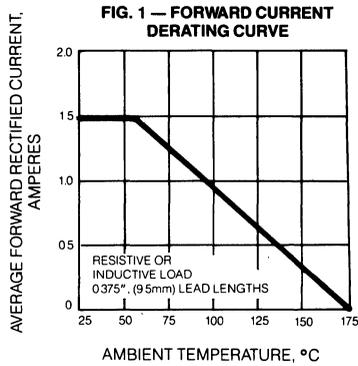


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

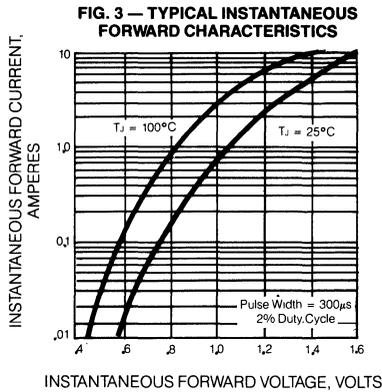
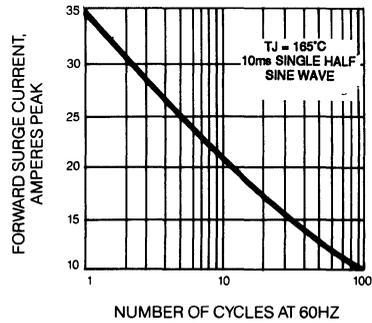


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

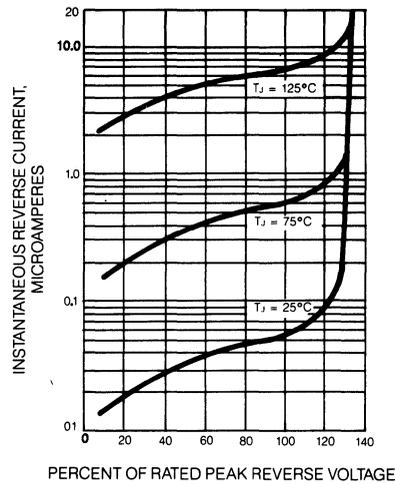


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

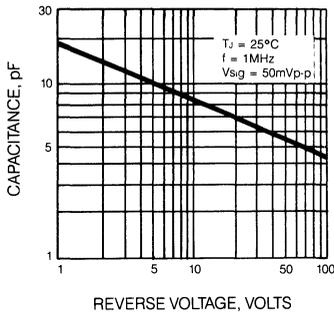
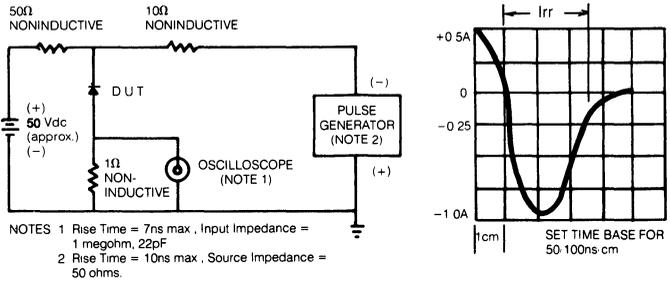


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



RG2A THRU RG2M

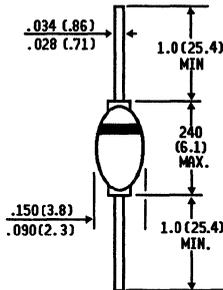
MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER

Voltage - 50 to 1000 Volts Current - 2.0 Amperes

FEATURES

PATENTED*

DO-204AP



Dimensions in inches
and
(millimeters)

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Hermetically sealed case
- ◆ Glass passivated cavity-free junction in a DO-204AP package
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 grams

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60Hz, resistive or inductive load.

	SYMBOLS	RG2A	RG2B	RG2D	RG2G	RG2J	RG2K	RG2M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	2.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0							Amps
Maximum Instantaneous Forward Voltage at 2.0A	V_F	1.3							Volts
Maximum Full Load Reverse Current, Full Cycle Average, .375", (9.5mm) Lead Lengths at $T_A=25^\circ\text{C}$ $T_A=100^\circ\text{C}$	$I_{R(AV)}$	1.0 100.0							μA
Maximum DC Reverse Current at Rated DC Blocking Voltage	I_R	5.0							μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	150			200	250	500		nS
Typical Junction Capacitance (NOTE 2)	C_J	15.0							pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES:

1. Measured with $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
2. Measured at 1 MHz and applied reverse voltage of 4.0 Vdc.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATINGS AND CHARACTERISTIC CURVES RG2A THRU RG2M

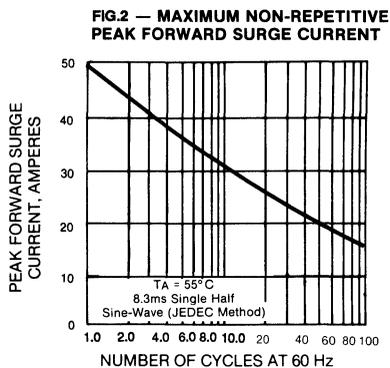
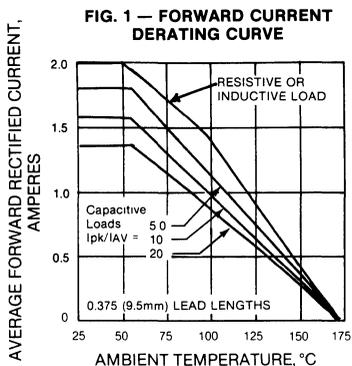


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

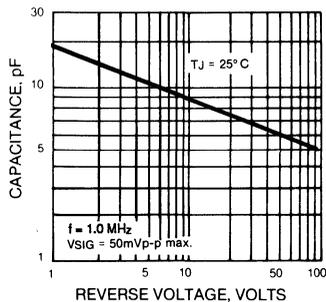


FIG. 5— REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

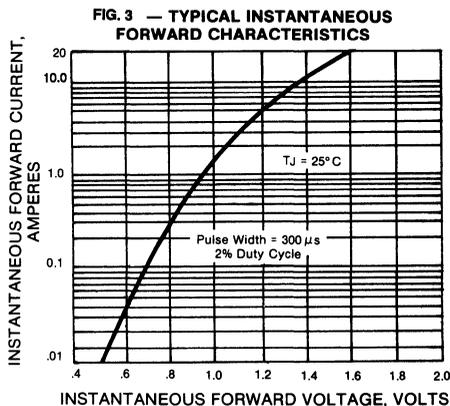
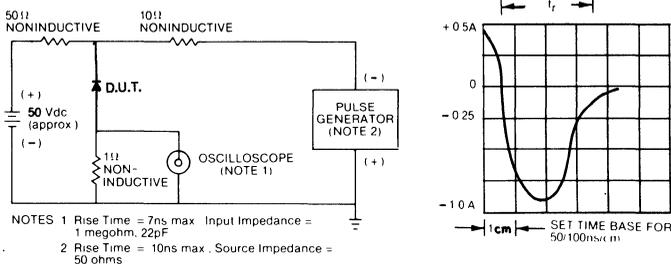
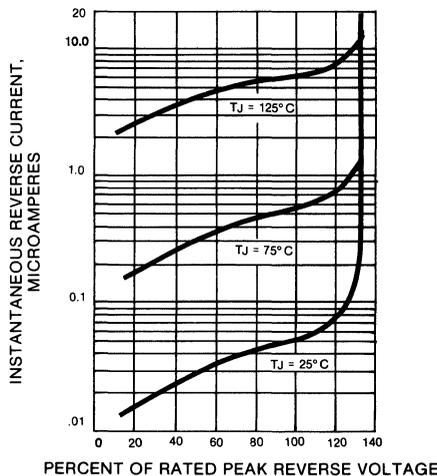


FIG. 4 — TYPICAL REVERSE CHARACTERISTIC



BYW32 THRU BYW36 SERIES

MINIATURE GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER

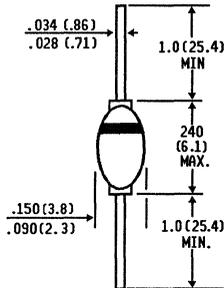
Voltage - 200 to 600 Volts Current - 2.0 Amperes

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Hermetically sealed case
- ◆ Glass passivated cavity-free junction in a DO-204AP package
- ◆ 2.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED

*DO-204AP



Dimensions in inches
and
(millimeters)

* Braze-lead assembly is covered by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: JEDEC DO-204AP One piece glass
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .02 ounce, .56 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	BYW32	BYW33	BYW34	BYW35	BYW36	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	300	400	500	600	Volts
Maximum RMS Voltage	V_{RMS}	140	210	280	350	420	Volts
Maximum DC Blocking Voltage	V_{DC}	200	300	400	500	600	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	2.0					Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed on rated load at $T_A=25^\circ\text{C}$	I_{FSM}	40.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.2					Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage	I_R	5.0					μA
Maximum Full Load Reverse Current Full Cycle Average, .375", (9.5mm) Lead Length $T_A=25^\circ\text{C}$ $T_A=100^\circ\text{C}$	$I_{R(AV)}$	5.0 50.0					μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	200					nS
Typical Junction Capacitance (NOTE 2)	C_J	15.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	50.0					$^\circ\text{C/W}$
Operating Temperature Range	T_J	-65 to +175					$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +200					$^\circ\text{C}$

NOTES:

1. Measured with $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
2. Measured at 1 MHz and applied reverse voltage of 4.0 Vdc.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, P.C. Board Mounted.

RATING AND CHARACTERISTIC CURVES BYW32 THRU BYW36

FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

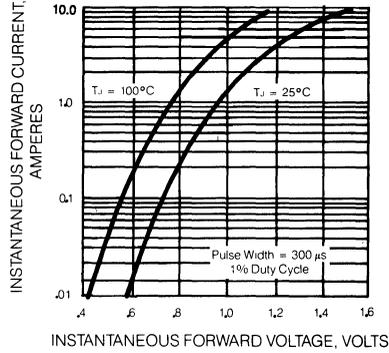


FIG. 1 — FORWARD CURRENT DERATING CURVE

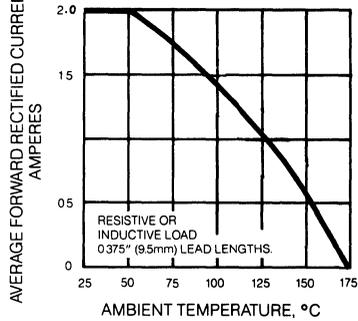


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

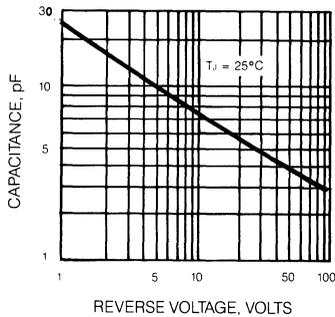


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

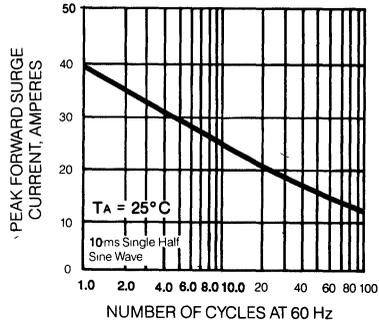


FIG. 5 — TYPICAL RECTIFICATION EFFICIENCY

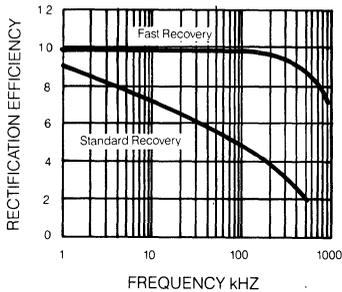
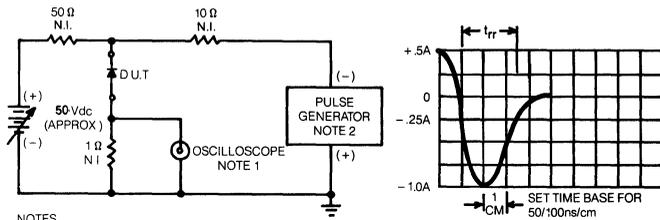


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM



- NOTES
 1. RISE TIME = 7nSEC MAX., INPUT IMPEDANCE = 1 MEGOHM, 22pF.
 2. RISE TIME = 10nSEC MAX., SOURCE IMPEDANCE = 50 OHM

1N5415 THRU 1N5420

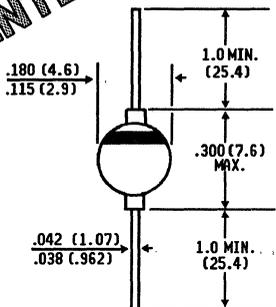
GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER

Voltage - 50 to 600 Volts Current - 3.0 Amperes

FEATURES

- ◆ Glass passivated cavity-free junction
- ◆ High temperature metallurgically bonded
- ◆ Hermetically sealed package
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: 350°C/10 seconds/.375" (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*



Dimensions in inches and (millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: One piece glass, hermetically sealed
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .037 ounce, 1.04 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N5415	1N5416	1N5417	1N5418	1N5419	1N5420	UNITS		
*Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	500	600	Volts		
Maximum RMS Voltage	V _{RMS}	35	70	140	280	350	420	Volts		
*Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	500	600	Volts		
*Minimum Reverse Breakdown Voltage at 50 μA	V _{BR}	55	110	220	440	550	660	Volts		
*Maximum Average Forward Rectified Current .375" (9.5mm) Lead Lengths at T _A =55°C	I _(AV)	3.0						Amps		
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at T _A =100°C	I _{FSM}	80.0						Amps		
Maximum Instantaneous Forward Voltage at 3.0A* at 9.0A	V _F	1.10 1.50						Volts		
Maximum DC Reverse Current at Rated DC Blocking Voltage	I _R	1.0 20.0 2.0						μA μA mA		
*T _A =25°C *T _A =100°C *T _A =175°C										
*Maximum Junction Capacitance (NOTE 2)	C _J	200	175	150	120	110	100	pf		
*Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	150						250	400	nS
Typical Thermal Resistance (NOTE 4)	RθJA	22.0							°C/W	
*Operating and Storage Temperature Range	T _J , T _{STG}	-65 to 175							°C	

NOTES:

- Reverse Recovery Test Conditions: I_F=0.5A, I_R= 1.0A, I_{rr}=25A.
 - Measured at 1 MHz and applied reverse voltage of 12.0 volts.
 - Available to JAN and JAN TX Military Specifications MIL-S-19500/411D.
 - Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, with both leads to heat sink.
- *JEDEC Registered Values

RATINGS AND CHARACTERISTIC CURVES 1N5415 THRU 1N5420

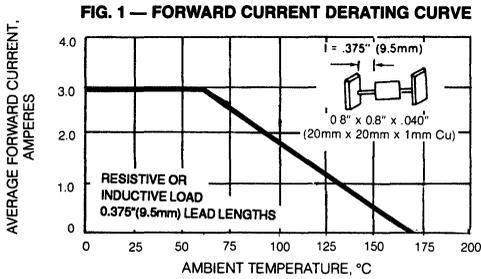


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

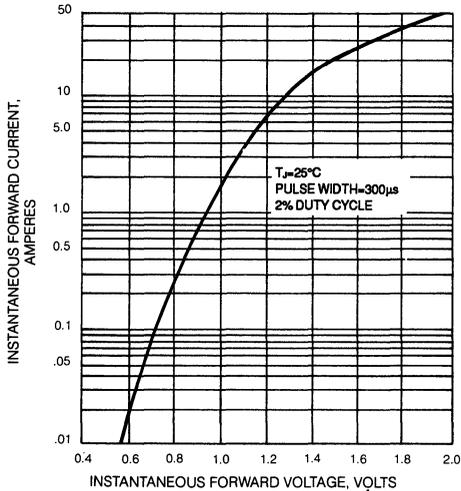


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

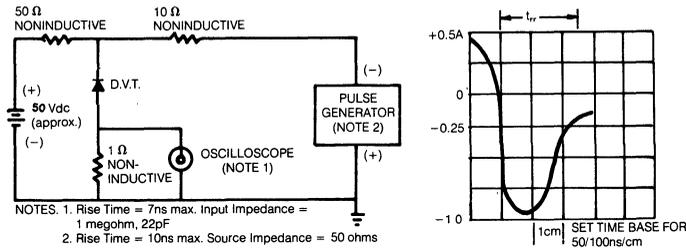


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

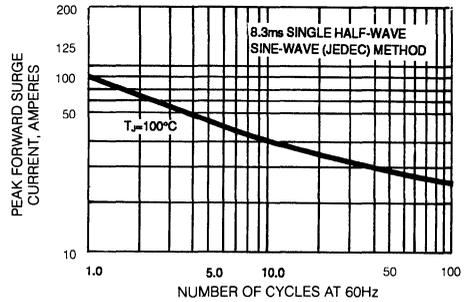


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

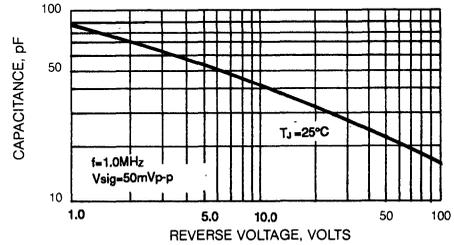
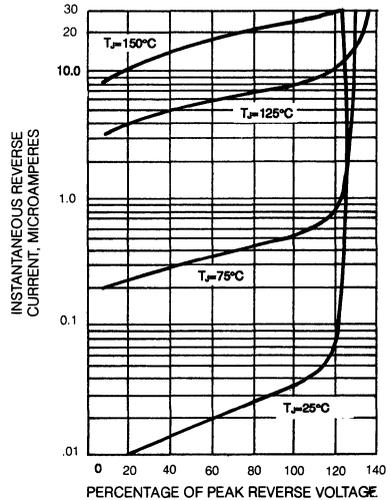


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS



RG3A THRU RG3M

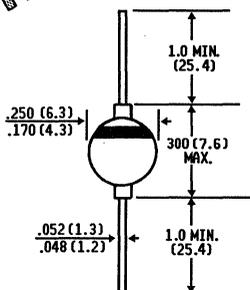
GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER

Voltage - 50 to 1000 Volts Current - 3.0 Amperes

FEATURES

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction
- ◆ Hermetically sealed package
- ◆ 3.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

PATENTED*



Dimension in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

MECHANICAL DATA

Case: One piece glass
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .04 ounce, 1.1 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	RG3A	RG3B	RG3D	RG3G	RG3J	RG3K	RG3M	UNITS	
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	220	400	600	800	1000	Volts	
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts	
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts	
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	3.0							Amps	
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	100.0							Amps	
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.3							Volts	
Maximum Average Reverse Current at Rated Peak Reverse Voltage $T_A=25^\circ\text{C}$ $T_A=100^\circ\text{C}$	$I_{R(AV)}$	2.0 100.0							μA	
Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$	I_R	5.0							μA	
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	150			250			400	500	nS
Typical Junction Capacitance (NOTE 2)	C_J	40.0							pf	
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	22.0							$^\circ\text{C}/\text{W}$	
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$	

NOTES:

- Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_r=.25\text{A}$.
- Measured at 1 MHz and applied reverse voltage of 4.0 Vdc.
- Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, with both leads attached to heat sink.

RATINGS AND CHARACTERISTIC CURVES RG3A THRU RG3M

FIG. 1 — FORWARD RECTIFIED CURRENT DERATING CURVE

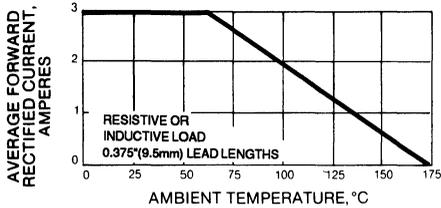


FIG. 3 — TYPICAL JUNCTION CAPACITANCE

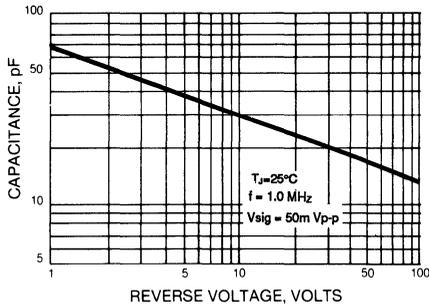


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

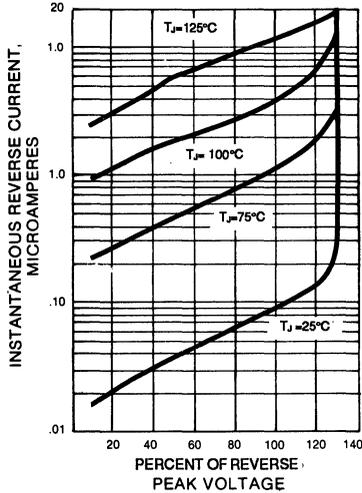


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

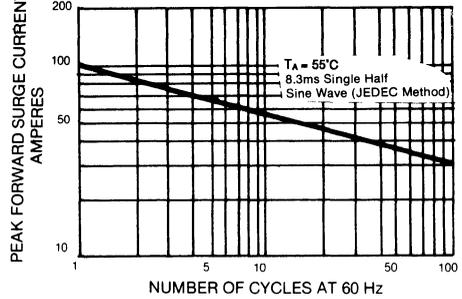


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

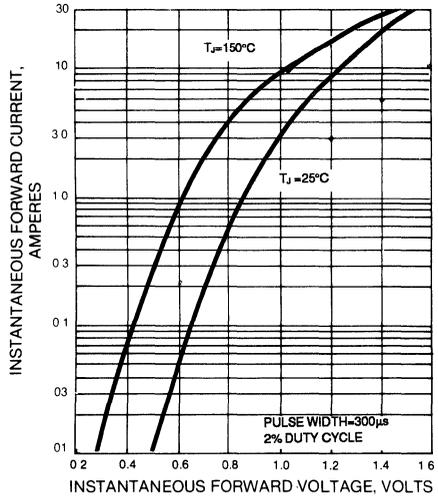
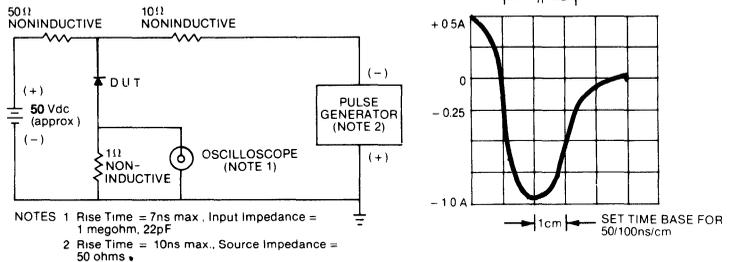


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



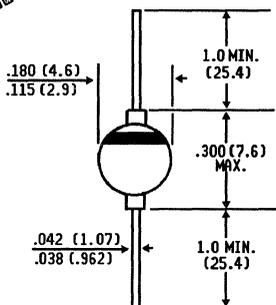
RG4A THRU RG4M

GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER

Voltage - 50 to 1000 Volts Current - 3.0 Amperes

FEATURES

PATENTED*



Dimensions in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ Fast switching for fast efficiency
- ◆ 3.0 Ampere operation at $T_A=50^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Hermetically sealed package
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .037 ounce, 1.04 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	RG4A	RG4B	RG4D	RG4G	RG4J	RG4K	RG4M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=50^\circ\text{C}$	$I_{(AV)}$	3.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	100.0							Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.3							Volts
Maximum Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$	I_R	5.0							μA
Maximum Average Reverse Current at Peak Reverse Voltage $T_A=25^\circ\text{C}$	$I_{R(AV)}$	2.0							μA
$T_A=100^\circ\text{C}$		100.0							
Typical Junction Capacitance (NOTE 2)	C_J	50.0							pf
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	150			250	500	500		nS
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	22.0							$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
2. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, with both leads to heat sink.

RATINGS AND CHARACTERISTIC CURVES RG4A THRU RG4M

Fig. 1 — FORWARD CURRENT DERATING CURVE

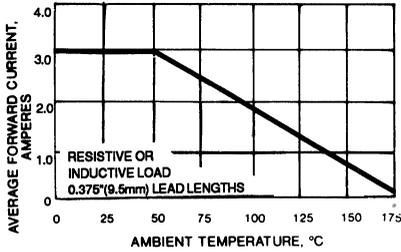


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

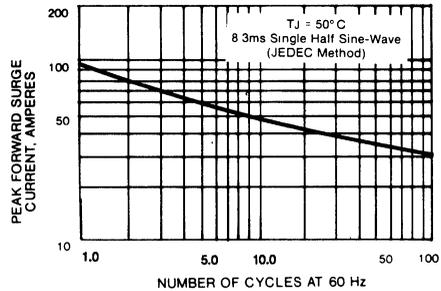


Fig. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

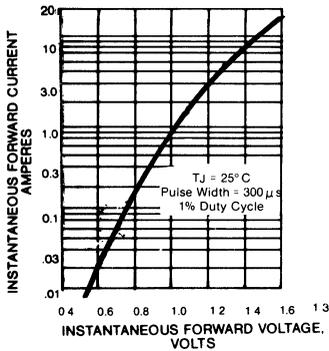


Fig. 4 — TYPICAL JUNCTION CAPACITANCE

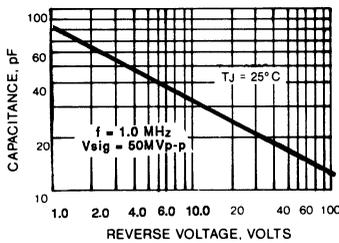


Fig. 5 — TYPICAL REVERSE CHARACTERISTICS

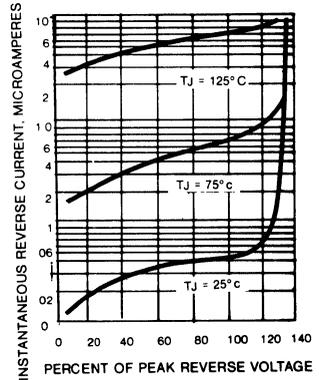
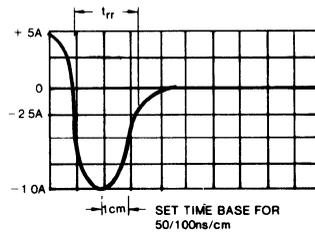
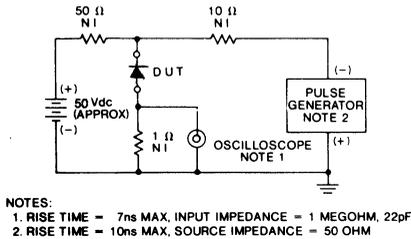


Fig. 6 — TEST CIRCUIT DIAGRAM AND REVERSE RECOVERY TIME CHARACTERISTICS



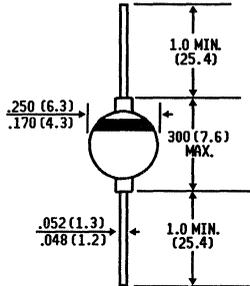
BYW72 THRU BYW76 SERIES

GLASS PASSIVATED JUNCTION FAST SWITCHING RECTIFIER

Voltage - 200 to 600 Volts Current - 3.0 Amperes

FEATURES

PATENTED*



Dimension in inches
and
(millimeters)

* Brazed-lead assembly is covered by Patent No. 3,930,306 of 1976

- ◆ High temperature metallurgically bonded constructed rectifiers
- ◆ Glass passivated cavity-free junction
- ◆ Hermetically sealed package
- ◆ 3.0 Ampere operation at $T_A=45^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1 \mu\text{A}$
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: $350^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: One piece glass

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: .04 ounce, 1.1gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	BYW72	BYW73	BYW74	BYW75	BYW76	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	200	300	400	500	600	Volts
Maximum RMS Voltage	V_{RMS}	140	210	280	350	420	Volts
Maximum DC Blocking Voltage	V_{DC}	200	300	400	500	600	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) Lead Lengths at $T_A=45^\circ\text{C}$	$I_{(AV)}$	3.0					Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed on rated load	I_{FSM}	60.0					Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.1					Volts
Maximum Average Reverse Current at Rated Peak Reverse Voltage $T_A=100^\circ\text{C}$	$I_{R(AV)}$	50.0					μA
Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$	I_R	5.0					μA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	200.0					nS
Typical Junction Capacitance (NOTE 2)	C_J	40.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	22.0					$^\circ\text{C}/\text{W}$
Operating Temperature Range	T_J	-65 to +175					$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +300					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr} = 25\text{A}$.
2. Measured at 1 MHz and applied reverse voltage of 4.0 V_{DC} .
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) Lead Lengths, with both leads attached to heat sink.

RATING AND CHARACTERISTIC CURVES BYW72 THRU BYW76

FIG. 1 — FORWARD RECTIFIED CURRENT DERATING CURVE

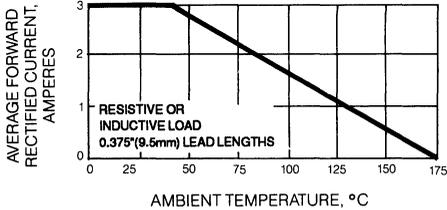


FIG. 3 — TYPICAL JUNCTION CAPACITANCE

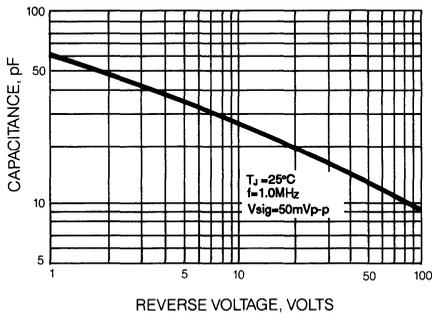


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

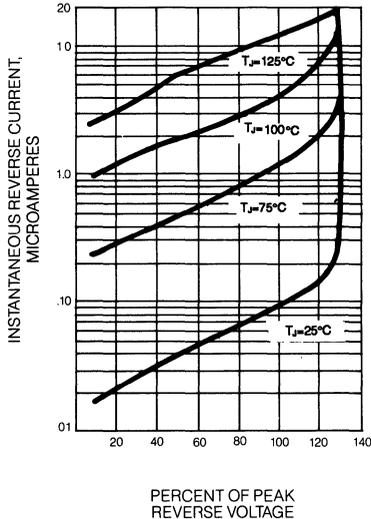


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

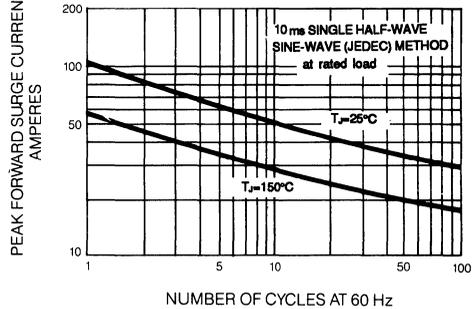


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

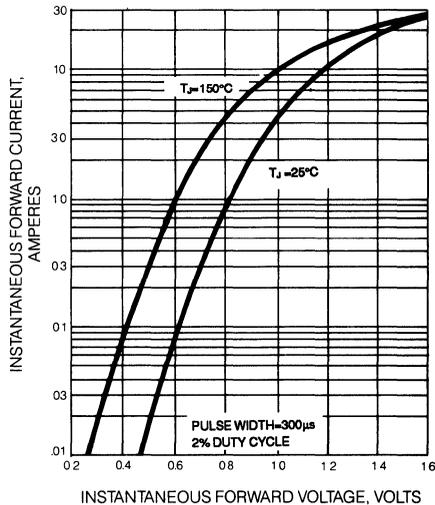
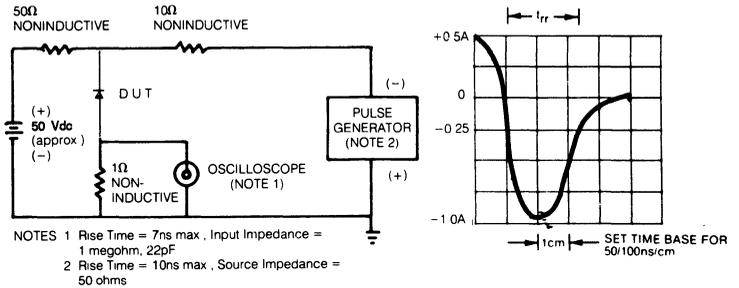


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



PLASTIC RECTIFIERS

***1.0 AMPERE TO 8.0 AMPERES
50 VOLTS TO 1000 VOLTS***

**GENERAL
INSTRUMENT**

PLASTIC RECTIFIERS

1.0 Ampere to 8.0 Amperes 50 to 1000 Volts

Principle of Construction

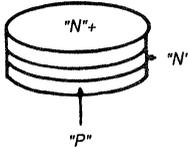
General Instrument has produced Plastic Rectifiers successfully for many years. The key factor in the production of our Plastic Rectifiers is the cell concept.

The small size allows many cells to be processed simultaneously in batch form.

This method ensures accurate pretesting of the cells before final assembly, and allows General Instrument to produce high volumes of rectifiers economically.

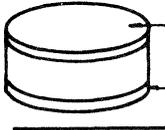
The cell construction consists of the following steps:

Diffused Slice



1 - Diffusing a PN junction into a slice of silicon.

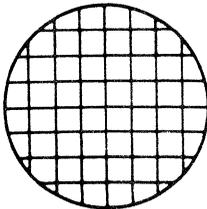
Metallized Slice



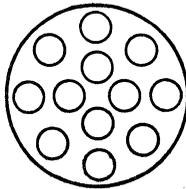
2 - Metallizing the slice of silicon.

Gold and Nickel Plating

Scribed Wafer

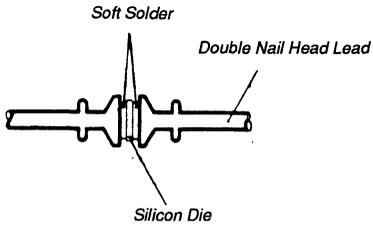


Sandblasted Round Dice



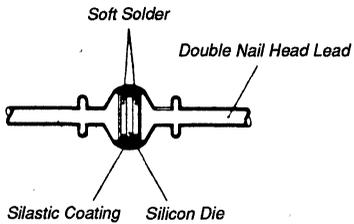
3 - Scribing and breaking the slice into individual dies, for the 1.0 Ampere devices we use a sandblast technology for the 3.0 thru 25.0 Ampere devices we use a saw technology.

PLASTIC RECTIFIERS



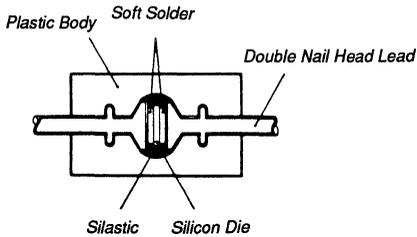
4 - Soldering the die between two Double Nail Head Leads.

Soldering between Double Head Lead



5 - Cleaning the assembly by chemical etching, washing and drying.

6 - Passivating the finished rectifier with silastic.



7 - Overmolding by General Instrument proprietary 4B flame retardant molding compound.

8 - Lead tinning, electrical testing, marking and packing.

Double Nail Head Plastic Rectifier

FAMILIES OF GENERAL INSTRUMENT PLASTIC RECTIFIERS

Miniature Plastic Rectifiers 1.0 to 1.5 AMPERES

Types:

1N4001 thru 1N4007
1N4001P thru 1N4007P
M100A thru M100M
1N5391 thru 1N5399

Features:

- ◆ Low Cost
- ◆ Diffused Junction
- ◆ Low Leakage
- ◆ High Current Capability
- ◆ Easily Cleaned with Freon, Alcohol, Chloroethene and similar Solvents
- ◆ Tin Plated Axial Leads, Solderable per MIL-STD-202/208
- ◆ Case: Jedec DO41
- ◆ High Temperature Soldering Guaranteed 265°C/10 Seconds/.375" (10mm) Lead Length at 5 lbs (2.25 kg) Tension

Plastic Power Rectifiers 3.0 to 8.0 AMPERES

Types:

1N5400 thru 1N5408
P300A thru P300M
G1500 thru G1510
G1750 thru G1758
P600A thru P600M
NS8AT thru NS8MT*

Features:

- ◆ High Surge Current Capability
- ◆ Void-Free Plastic Packages
- ◆ High Current Operation
- ◆ Typical I_r less than .1 μ A
- ◆ High Temperature Soldering Guaranteed 265°C/10 Seconds/.375" (10mm) Lead Length at 5 lbs (2.25 kg) Tension

* This series uses glass passivated chip junctions.

Fast Recovery Plastic Rectifiers 1.0 to 6.0 AMPERES

Types:

BY396P thru BY399
PIN4933 thru 1N4937
BY500-100 thru BY500-800
SRP100A thru SRP100K
G1820 thru G1825
SRP300A thru SRP300K
G1850 thru G1855
SRP600A thru SRP600K
G1910 thru G1917

Features:

- ◆ High Surge Current Capability
- ◆ Void-Free Plastic Packages
- ◆ High Current Operation
- ◆ Typical I_r less than 1.0 μ A
- ◆ High Temperature Soldering Guaranteed 265°C/10 Seconds/.375" (10mm) Lead Length at 5 lbs (2.25 kg) Tension
- ◆ Controlled Soft Recovery Guarantees on SRP100A thru SRP100K, SRP300A thru SRP300K, BY500-100 thru BY500-800 and SRP600A thru SRP600K series
- ◆ Tin Plated Axial Leads, Solderable per MIL-STD-202/208

QUICK GUIDE TO PLASTIC RECTIFIERS

TYPE	1N4001 thru 1N4007	M100A thru M100M	1N4933* thru 1N4937*	SRP100A* thru SRP100K*	1N5391 thru 1N5399	1N5400 thru 1N5406	P300A thru P300M	GI500 thru GI510	GI910* thru GI917*	GI850* thru GI856*	SRP300A* thru SRP300K	BY396P* thru BY399P*
CASE	DO41	DO41	DO41	DO41	DO41	DO201AD	DO201AD	DO201AD	DO201AD	DO201AD	DO201AD	DO201AD
I _o (A)	1.0	1.0	1.0	1.0	1.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0
@TA(*C)	75	100	75	55	75 at TL	55	55	95	90	90	55	50
VR= 50(V)	1N4001	M100A	1N4933	SRP100A	1N5391	1N5400	P300A	GI500	GI910	GI850	SRP300A	
VR= 100(V)	1N4002	M100B	1N4934	SRP100B	1N5392	1N5401	P300B	GI501	GI911	GI851	SRP300B	BY396P
VR= 200(V)	1N4003	M100D	1N4935	SRP100D	1N5393	1N5402	P300D	GI502	GI912	GI852	SRP300D	BY397P
VR= 300(V)					1N5394	1N5403						
VR= 400(V)	1N4004	M100G	1N4936	SRP100G	1N5395	1N5404	P300G	GI504	GI914	GI854	SRP300G	BY398P
VR= 500(V)					1N5396	1N5405						
VR= 600(V)	1N4005	M100J	1N4937	SRP100J	1N5397	1N5406	P300J	GI506	GI916	GI856	SRP300J	
VR= 800(V)	1N4006	M100K		SRP100K	1N5398	1N5407	P300K	GI508	GI917		SRP300K	BY399P
VR=1000(V)	1N4007	M100M			1N5399	1N5408	P300M	GI510				
SURGE(A)	30	50	30	30	50	200	100	100	100	150	100	100
VF(V)	1.1	1.0,1.1	1.2	1.3	1.4	1.2	1.1	.1.1	1.25	1.25	1.3	1.25

*Fast Recovery

QUICK GUIDE TO PLASTIC RECTIFIERS

TYPE	BY500-100* thru BY500-800*	GI750 thru GI758	P600A thru P600M	GI820* thru GI826*	SRP600A* thru SRP600K*	NS8AT thru NS8MT
CASE	DO201AD	P600	P600	P600	P600	TO220
I _o (A)	5.0	6.0	6.0	5.0	6.0	8.0
@TA(*C)	45	60	60	55	55	100Tc
VR= 50(V)		GI750	P600A	GI820	SRP600A	NS8AT
VR= 100(V)	BY500-100	GI751	P600B	GI821	SRP600B	NS8BT
VR= 200(V)	BY500-200	GI752	P600D	GI822	SRP600D	NS8DT
VR= 400(V)	BY500-400	GI754	P600G	GI824	SRP600G	NS8GT
VR= 600(V)	BY500-600	GI756	P600J	GI826	SRP600J	NS8JT
VR= 800(V)	BY500-800	GI758	P600K		SRP600K	NS8KT
VR=1000(V)			P600M			NS8MT
SURGE(A)	200	400	400	300	300	175
VF(V)	1.35	.9/.95	.9/1.0	1.0	1.3	1.1

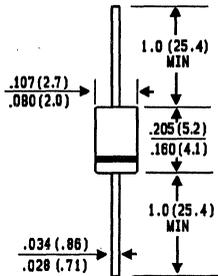
*Fast Recovery

1N4001 THRU 1N4007

MINIATURE PLASTIC RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 1.0 Ampere

FEATURES

DO-41



Dimension in inches
and
(millimeters)

- ◆ The plastic package carries Underwriters Laboratory Flammability Classification 94V-O
- ◆ Low cost construction utilizing void-free molded plastic technique
- ◆ Double Diffused junction
- ◆ Low leakage
- ◆ High current capability
- ◆ Easily cleaned with Freon, Alcohol, Chlorothene and similar solvents
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375", (9.5mm) lead lengths at 5 lbs., (2.3kg) tension

MECHANICAL DATA

Case: JEDEC DO-41, molded plastic

Terminals: Plated axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode end

Weight: 0.012 ounce, 0.3 gram

Mounting Position: Any

Handling Precautions: None

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	1N 4001	1N 4002	1N 4003	1N 4004	1N 4005	1N 4006	1N 4007	UNITS
*Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
*Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
*Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at T _A =75°C	I(AV)	1.0							Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	30.0							Amps
*Maximum Instantaneous Forward Voltage at 1.0A	V _F	1.1							Volts
*Maximum Full Load Reverse Current Full Cycle Average .375", (9.5mm) lead lengths at T _L =75°C	I _{R(AV)}	30.0							μA
*Maximum DC Reverse Current T _A = 25°C at Rated DC Blocking Voltage T _A =100°C	I _R	5.0 50.0							μA
Typical Reverse Recovery Time (NOTE 1) T _A =25°C	T _{RR}	30.0							μs
Typical Junction Capacitance (NOTE 2) T _J =25°C	C _J	15.0							pf
Typical Thermal Resistance (NOTE 3)	RθJA	26.0							°C/W
Maximum DC Blocking Voltage Temperature	T _A	+150							°C
*Operating and Storage Temperature Range	T _J , T _{STG}	-50 to +175							°C

NOTES:

1. Measured on Tektronix Type "S" recovery plug-in. Tedtronix 545 Scope or equivalent, IFM = 20mA, IRM =1 mA.
 2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, P.C. Board mounted.
- *JEDEC Registered Value

RATINGS AND CHARACTERISTIC CURVES 1N4001 THRU 1N4007

FIG. 1 — FORWARD CURRENT DERATING CURVE

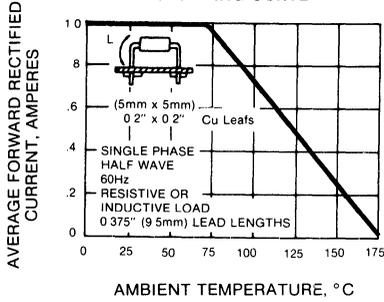


FIG. 2 — TYPICAL FORWARD CHARACTERISTICS

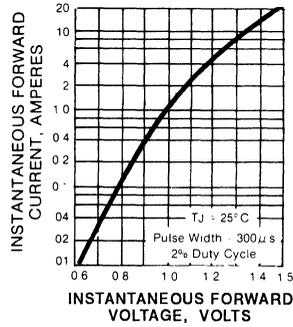


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

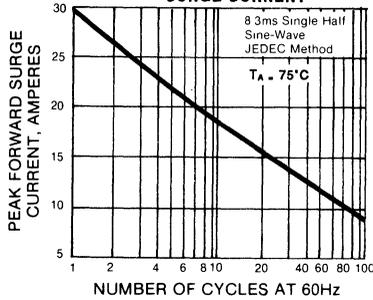


FIG. 4 — PEAK FORWARD SURGE CURRENT

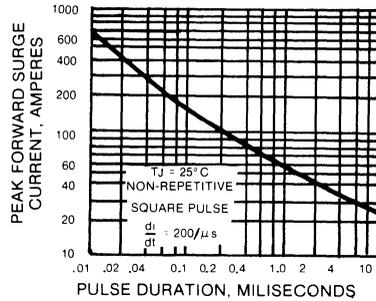


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

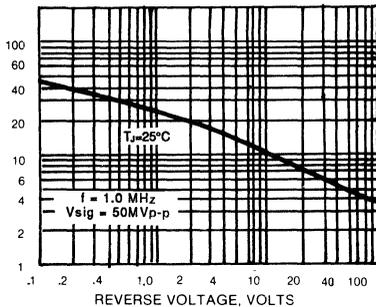
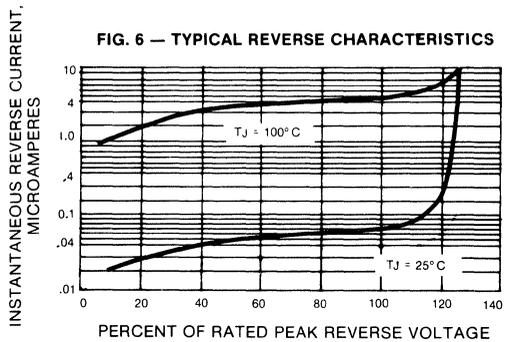


FIG. 6 — TYPICAL REVERSE CHARACTERISTICS



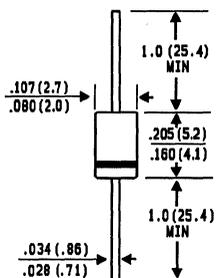
M100A THRU M100M

MINIATURE LOW CURRENT PLASTIC RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Low cost construction utilizing void-free molded plastic technique
- ◆ Diffused junction
- ◆ Low leakage
- ◆ High surge current capability
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375"(.95mm) lead lengths at 5 lbs., (2.3kg) tension

DO-41



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-41, molded plastic
Terminals: Plated axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode end
Weight: 0.012 ounce, 0.3 gram
Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	M100 M100 M100 M100 M100 M100						UNITS	
		A	B	D	G	J	K		M
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at T _A =100°C	I _(AV)	1.0						Amps	
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	50.0						Amps	
Maximum Instantaneous Forward Voltage at 1.0A	V _F	1.0			1.1			Volts	
Maximum Full Load Reverse Current Full Cycle Average .375", (9.5mm) lead lengths at T _A =55°C	I _R	100						μA	
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A = 100°C	I _R	1.0						μA	
Typical Reverse Recovery Time (NOTE 2)	T _{RR}	2.0						μS	
Typical Junction Capacitance (NOTE 1) T _J =25°C	C _J	30.0						pf	
Typical Thermal Resistance (NOTE 3)	R _{ΘJA}	26.0						°C/W	
Operating and Storage Temperature Range	T _J , T _{STG}	-50 to +150						°C	

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 V_{dc}.
2. Measured with I_F=0.5A, I_R=0.1A, I_T=25A
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, P.C. Board mounted.

RATINGS AND CHARACTERISTIC CURVES M100A THRU M100M

FIG. 1 — FORWARD CURRENT DERATING CURVE

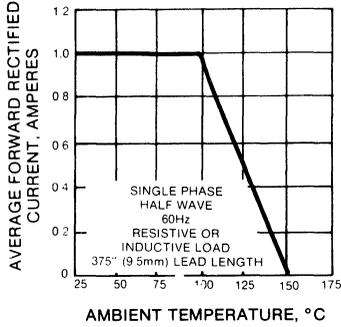


FIG. 2 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

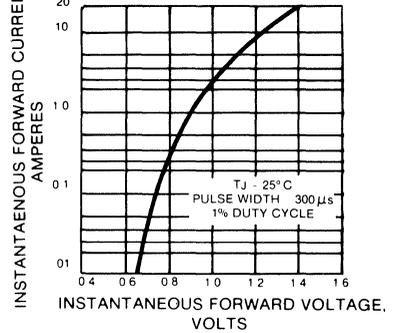


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

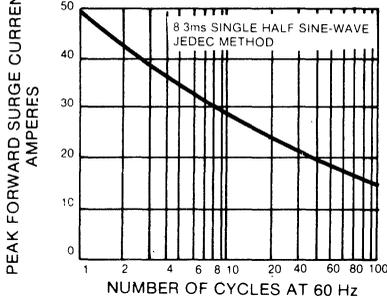
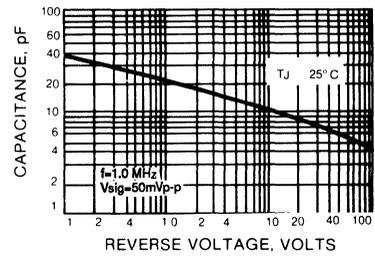


Fig. 4—TYPICAL JUNCTION CAPACITANCE



INSTANTANEOUS REVERSE CURRENT, MICROAMPERES

Fig. 5— TYPICAL REVERSE CHARACTERISTICS

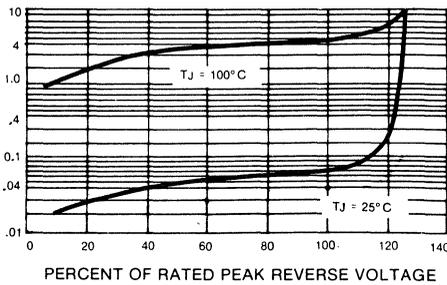
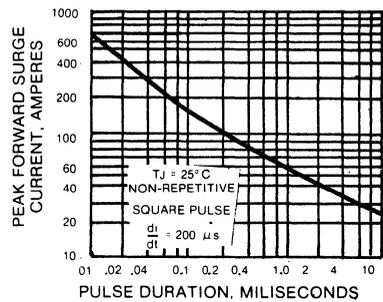


FIG. 6 — PEAK FORWARD SURGE CURRENT



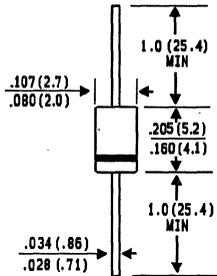
1N5391 THRU 1N5399

MINIATURE LOW CURRENT PLASTIC RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 1.5 Amperes

FEATURES

- ◆ High surge current capability
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ 1.5 Ampere operation at $T_L = 70^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1\mu\text{A}$
- ◆ Low cost construction utilizing void-free molded plastic technique
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension

DO-41



Dimensions in inches
and
(millimeters)



MECHANICAL DATA

- Case:** JEDEC DO-41, molded plastic case
Terminals: Plated axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode end
Weight: 0.012 ounce, 0.3 gram
Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	1N 5391	1N 5392	1N 5393	1N 5394	1N 5395	1N 5396	1N 5397	1N 5398	1N 5399	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	300	400	500	600	800	1000	Volts
*Maximum RMS Voltage	V_{RMS}	35	70	140	210	280	350	420	560	700	Volts
*Maximum DC Blocking Voltage	V_{DC}	50	100	200	300	400	500	600	800	1000	Volts
*Maximum Average Forward Rectified Current .500, (12.7mm) lead lengths at $T_L = 70^\circ\text{C}$	$I_{(AV)}$	1.5									Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0									Amps
*Maximum Instantaneous Forward Voltage at 1.5A, $T_A = 70^\circ\text{C}$	V_F	1.4									Volts
* Maximum DC Reverse Current $T_A = 25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A = 150^\circ\text{C}$	I_R	300.0									μA
*Maximum Full Load Reverse Current Full Cycle Average, .375", (9.5mm) Lead Length at $T_L = 70^\circ\text{C}$	I_R	300.0									μA
Typical Reverse Recovery Time (NOTE 2)	T_{RR}	2.0									μS
Typical Junction Capacitance (NOTE 1)	C_J	15.0									pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	26.0									$^\circ\text{C}/\text{W}$
*Maximum DC Blocking Voltage Temperature	T_A	+150									$^\circ\text{C}$
*Operating Junction Temperature Range	T_J	-50 to +170									$^\circ\text{C}$
*Storage Temperature Range	T_{STG}	-50 to +175									$^\circ\text{C}$

- NOTES: 1. Measured at 1.0 MHz and applied reverse voltage of 4.0 V_{DC}.
 2. Measured with $I_F = 0.5\text{A}$, $I_R = 0.1\text{A}$, $I_{rr} = .25\text{A}$.
 3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, P.C. Board mounted.
 *JEDEC Registered Value.

RATINGS AND CHARACTERISTIC CURVES 1N5391 THRU 1N5399

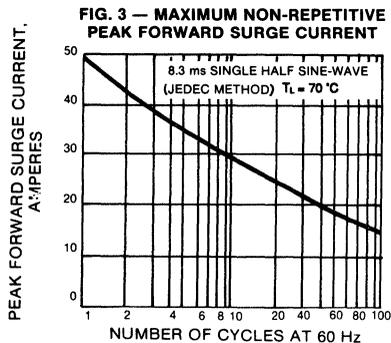
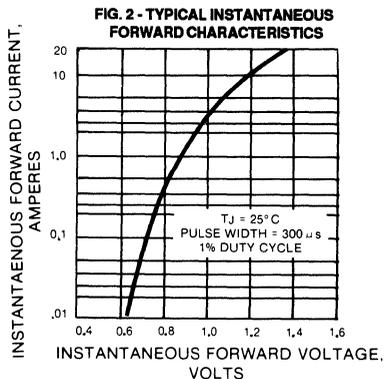
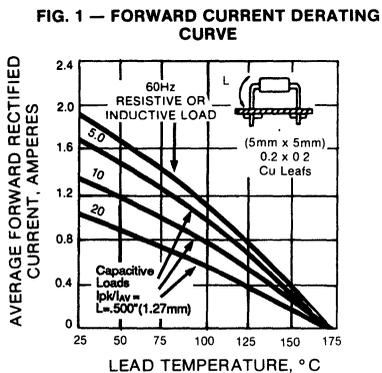
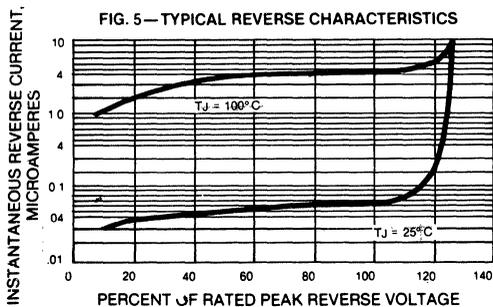
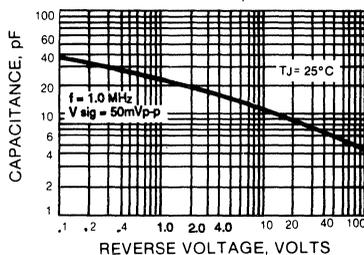


Fig. 4—TYPICAL JUNCTION CAPACITANCE

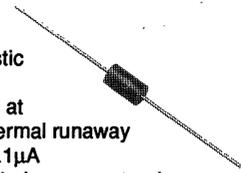


1N5400 THRU 1N5408

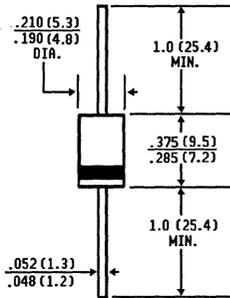
MEDIUM CURRENT PLASTIC RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ High surge current capability
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Void-free molded plastic package
- ◆ 3.0 Ampere operation at $T_L = 105^\circ\text{C}$ with no thermal runaway
- ◆ Typical I_R less than $0.1\ \mu\text{A}$
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds/ $.375"$ (9.5mm) lead length at 5 lbs., (2.3kg) tension



DO-201AD



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-201AD Molded plastic
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color Band denotes cathode
Weight: 0.04 ounce, 1.1 gram
Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	1N 5400	1N 5401	1N 5402	1N 5403	1N 5404	1N 5405	1N 5406	1N 5407	1N 5408	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	300	400	500	600	800	1000	Volts
*Maximum RMS Voltage	V_{RMS}	35	70	140	210	280	350	420	560	700	Volts
*Maximum DC Blocking Voltage to $T_A=150^\circ\text{C}$	V_{DC}	50	100	200	300	400	500	600	800	1000	Volts
*Maximum Average Forward Rectified Current .5", (12.5mm) lead lengths at $T_L=105^\circ\text{C}$	$I_{(AV)}$	3.0									Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	200.0									Amps
*Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.2									Volts
* Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=150^\circ\text{C}$	I_R	500.0									μA
*Maximum Full Load Reverse Current Full Cycle Average, .5", (12.5 mm) Lead Length at $T_L=105^\circ\text{C}$	$I_{R(AV)}$	500.0									μA
Typical Junction Capacitance (NOTE 1) $T_J=25^\circ\text{C}$	C_J	28.0									pf
*Typical Thermal Resistance (NOTE 2)	$R_{\theta JA}$	15.0									$^\circ\text{C}/\text{W}$
*Operating Junction Temperature Range	T_J	-50 to +170									$^\circ\text{C}$
Maximum DC Blocking Voltage Temperature	T_A	+150									$^\circ\text{C}$
*Storage Temperature Range	T_{STG}	-50 to +175									$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Thermal Resistance from Junction to Ambient at $.375"$ (9.5mm) lead lengths, P.C. Board mounted.
 *JEDEC Registered Value

RATINGS AND CHARACTERISTIC CURVES 1N5400 THRU 1N5408

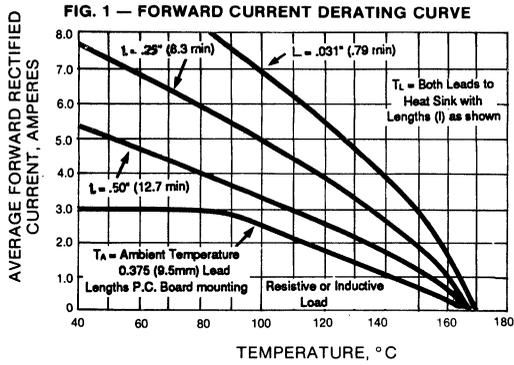


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

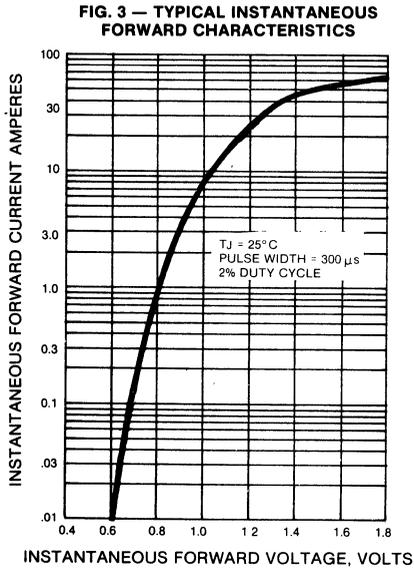
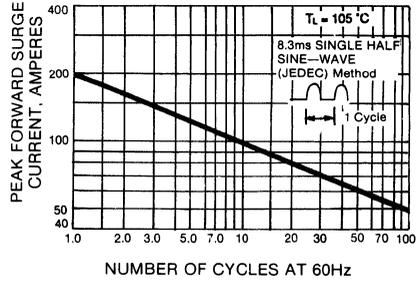


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

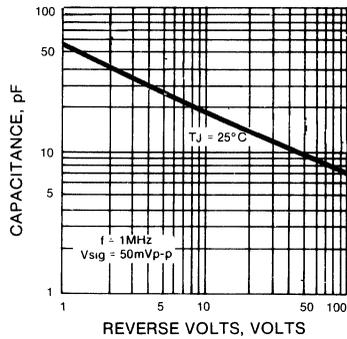
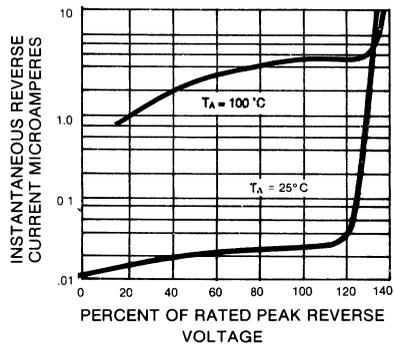


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

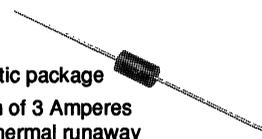


GI500 THRU GI510

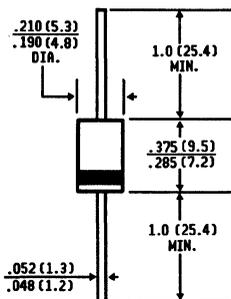
MEDIUM CURRENT PLASTIC RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ High surge current capability
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Typical I_R less than $0.1 \mu A$
- ◆ Void-free molded plastic package
- ◆ High current operation of 3 Amperes at $T_A = 95^\circ C$ with no thermal runaway
- ◆ High temperature soldering guaranteed: $250^\circ C/10$ seconds/.375", (9.5mm) lead lengths at 5 lbs., (2.3kg) tension



DO-201AD



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC D0-201AD Molded plastic

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color Band denotes cathode

Weight: 0.04 ounce, 1.1 gram

Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at $25^\circ C$ ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	GI 500	GI 501	GI 502	GI 504	GI 506	GI 508	GI 510	UNITS
Maximum Recurrent Peak Reverse Voltage	VRRM	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	VRMS	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	VDC	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at $T_A = 95^\circ C$	$I_{(AV)}$	3.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	100.0							Amps
Maximum Instantaneous Forward Voltage at 9.4A $T_J = 25^\circ C$ $T_J = 175^\circ C$	V_F	1.1 1.0							Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A = 25^\circ C$ $T_A = 100^\circ C$	I_R	5.0 50.0							μA
Typical Junction Capacitance (NOTE 2) $T_J = 25^\circ C$	C_J	28.0							pf
Typical Reverse Recovery Time (NOTE 3)	T_{RR}	2.5							μS
Typical Thermal Resistance (NOTE 1)	$R_{\theta JA}$	15.0							$^\circ C/W$
Operating Temperature Range	T_J	-50 to +150							$^\circ C$
Storage Temperature Range	T_{STG}	-50 to +175							$^\circ C$

NOTES:

1. Thermal Resistance from Junction to applied at ambient .375" (9.5mm) lead lengths, P.C. Board mounted.
2. Measured at 1MHz and applied reverse voltage of 4.0 volts.
3. Reverse Recovery Test Conditions: $I_F = 0.5A$, $I_R = 1.0A$, $I_{rr} = 0.25A$.

RATINGS AND CHARACTERISTIC CURVES GI500 THRU GI510

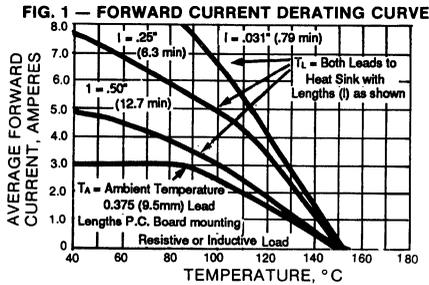


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

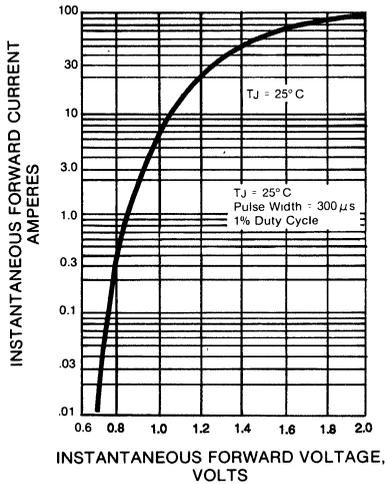


FIG. 2 — MAXIMUM PEAK FORWARD SURGE CURRENT

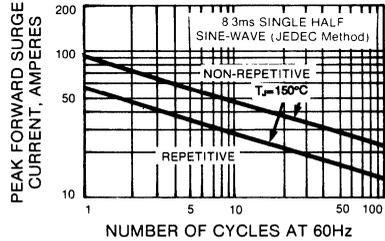


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

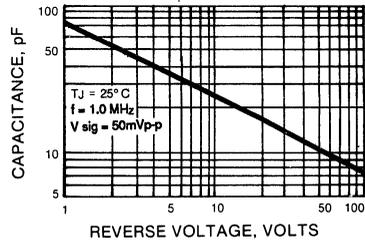
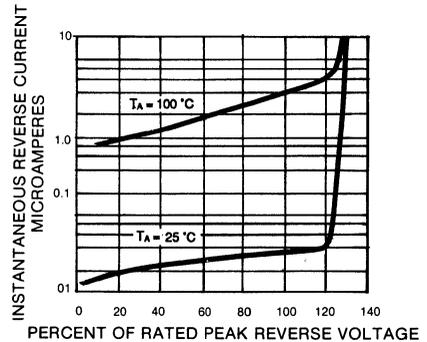


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS



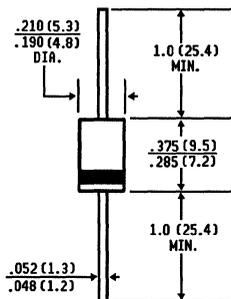
P300A THRU P300M

MEDIUM CURRENT PLASTIC RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ High surge current capability
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Typical I_R less than $0.1 \mu A$
- ◆ Void-free molded plastic package
- ◆ 3.0 Ampere operation at $T_A=90^\circ C$ with no thermal runaway
- ◆ High temperature soldering guaranteed: $250^\circ C/10$ seconds/.375"(.95mm) lead lengths at 5 lbs., (2.3kg) tension

DO-201AD



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-201AD Molded plastic

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color Band denotes cathode

Weight: 0.4 ounce, 1.1 gram

Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at $25^\circ C$ ambient temperature unless otherwise specified
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	P300 A	P300 B	P300 D	P300 G	P300 J	P300 K	P300 M	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at $T_A=55^\circ C$	$I_{(AV)}$	3.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	200.0							Amps
Maximum Instantaneous Forward Voltage at 3.0A $T_J=25^\circ C$	V_F	1.2							Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ C$	I_R	5.0							μA
Typical Junction Capacitance (NOTE 1) $T_J=25^\circ C$	C_J	28.0							pf
Typical Reverse Recovery Time (NOTE 2)	T_{RR}	2.5							μS
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	15.0							$^\circ C/W$
Operating and Storage Temperature Range	T_J, T_{STG}	-50 to +150							$^\circ C$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: $I_F=0.5A$, $I_R=1.0A$, $I_{rr}=25A$
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, P.C. Board mounted.

RATINGS AND CHARACTERISTIC CURVES P300A THRU P300M

FIG. 1 — FORWARD CURRENT DERATING CURVE

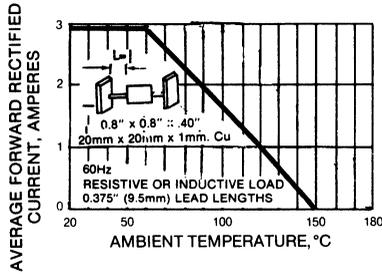


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

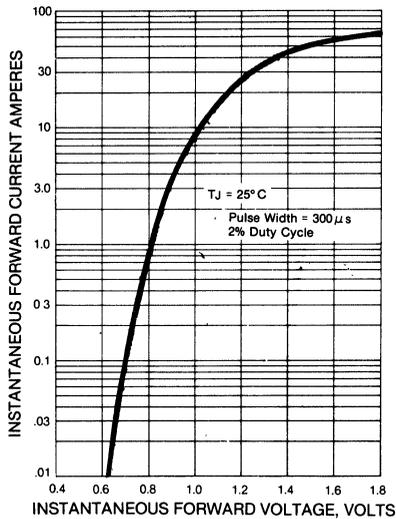


FIG. 2 — MAXIMUM PEAK FORWARD SURGE CURRENT

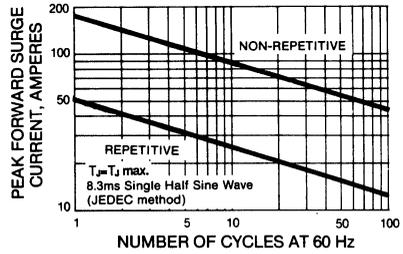


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

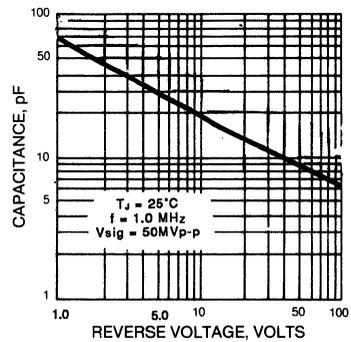
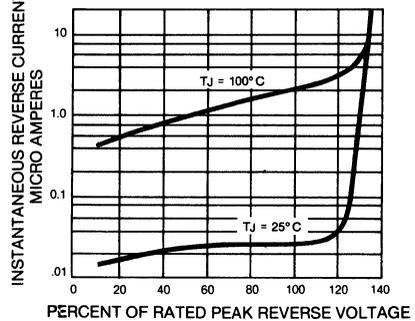


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

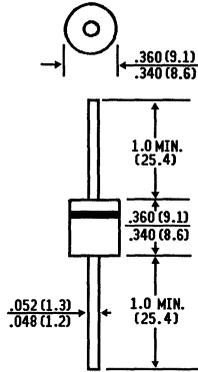
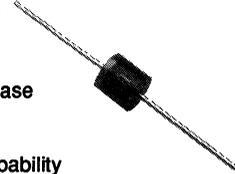


GI750 THRU GI758

HIGH CURRENT PLASTIC RECTIFIER
VOLTAGE - 50 to 800 Volts CURRENT - 6.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ High Current Capability
- ◆ Diffused Junction
- ◆ Completely Insulated Case
- ◆ Uniform Molded Body
- ◆ High Surge Current Capability
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375", (9.5mm) lead lengths at 5 lbs., (2.3kg) tension



Dimensions in inches
and
millimeters

MECHANICAL DATA

Case: Void-free Molded plastic

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color Band denotes cathode

Weight: 0.07 ounce, 2.1 grams

Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	GI750	GI751	GI752	GI754	GI756	GI758	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	Volts
Maximum Average Forward Rectified Current at $T_A=60^\circ\text{C}$ P.C. Board Mounting (FIG. 1) $T_L=60^\circ\text{C}$.125", (3.18mm) Lead Lengths (FIG. 2)	$I_{(AV)}$	6.0						Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	400.0						Amps
Maximum Instantaneous Forward Voltage at 6.0A 100A	V_F	0.90				0.95		Volts
		1.25				1.30		
Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$	I_R	5.0						μA
		1.0						mA
Typical Junction Capacitance (NOTE 2)	C_J	300.0						pf
Typical Thermal Resistance (NOTE 1)	$R_{\theta JL}$	10.0						$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-50 to +150						$^\circ\text{C}$

NOTES:

1. Thermal Resistance from Junction to Lead at .50" (12.7mm) lead lengths, with both leads attached to heat sinks.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES GI750 THRU GI758

FIG. 1 — MAXIMUM FORWARD CURRENT DERATING CURRENT

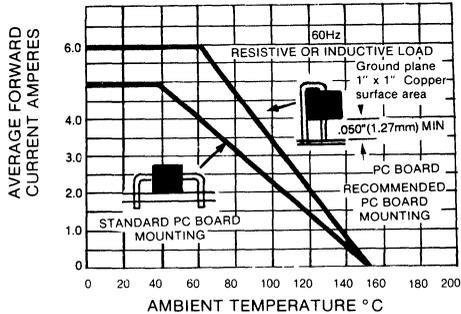


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

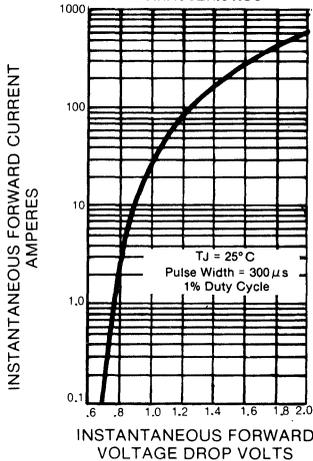


FIG. 5 — MAXIMUM PEAK FORWARD SURGE CURRENT

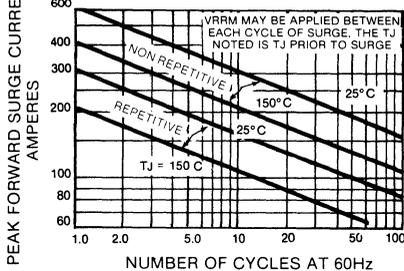


FIG. 2 — MAXIMUM FORWARD CURRENT DERATING CURVE

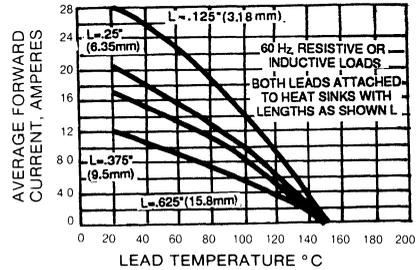


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

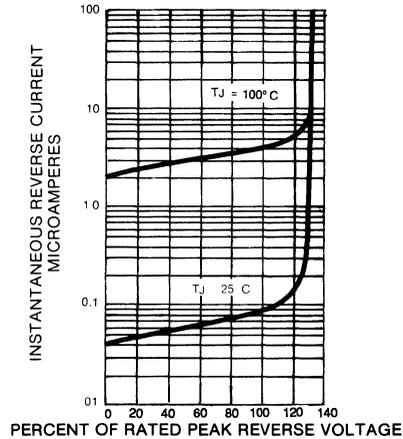
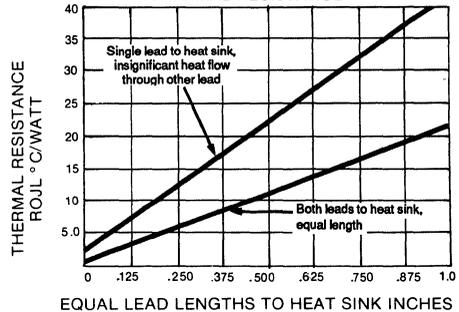


FIG. 6 — TYPICAL STEADY STATE THERMAL RESISTANCE

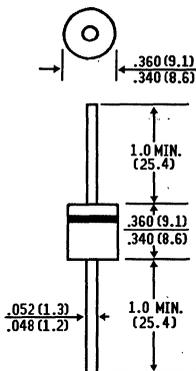


P600A THRU P600M

HIGH CURRENT PLASTIC RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 6.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ High Current Capability
- ◆ Diffused Junction
- ◆ Completely Insulated Case
- ◆ Uniform Molded Body
- ◆ High Surge Current Capability
- ◆ High temperature soldering guaranteed:
250°C/10 seconds/.375" (9.5mm) lead lengths at 5 lbs., (2.3kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Void-free Molded plastic

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color Band denotes cathode

Weight: 0.07 ounce, 2.1 grams

Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.

	SYMBOLS	P600A	P600B	P600D	P600G	P600J	P600K	P600M	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current at T _A =60°C .375" (9.5mm) Lead Lengths (FIG 1) T _L =60°C .125" (3.18mm) Lead Lengths (FIG 2)	I _(AV)	6.0 22.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	400.0							Amps
Maximum Instantaneous Forward Voltage at 6.0A 100A	V _F	0.90 1.30				1.0 1.4			Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _A =25°C T _A =100°C	I _R	5.0 1.0							μA mA
Typical Junction Capacitance (NOTE 2)	C _J	300.0							pf
Typical Thermal Resistance (NOTE 1)	R _{θJL}	10.0							°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-50 to +150							°C

NOTES:

1. Thermal Resistance from Junction to Lead at .50" (12.7mm) lead lengths, with both leads attached to heat sinks.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES P600A THRU P600M

FIG. 1 - FORWARD CURRENT DERATING CURVE

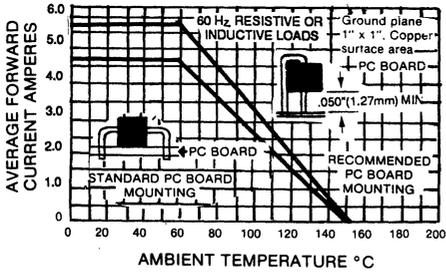


FIG. 2 - FORWARD CURRENT DERATING CURVE

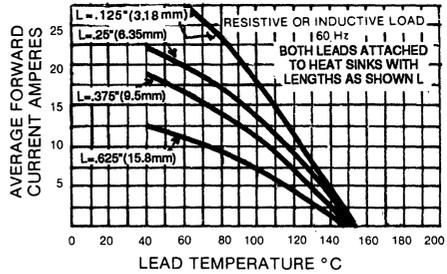


FIG. 3 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

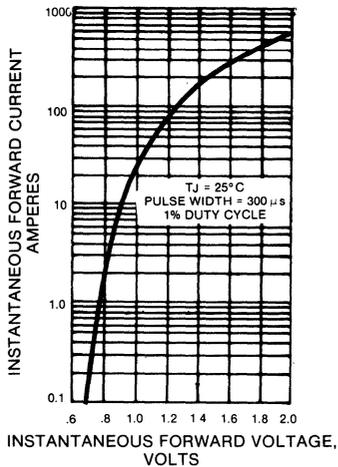


FIG. 4 - TYPICAL REVERSE CHARACTERISTICS

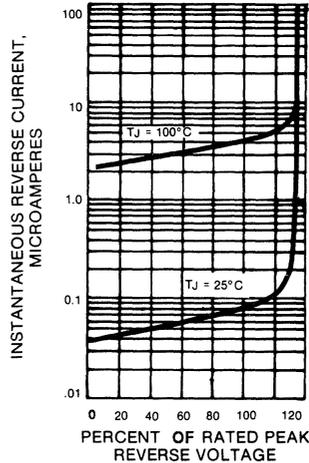


FIG. 5 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

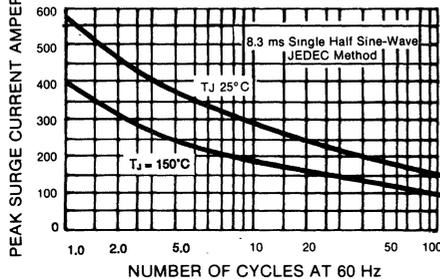
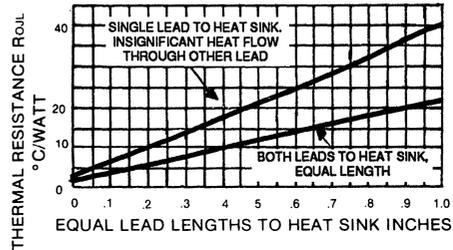


FIG. 6 - TYPICAL THERMAL RESISTANCE VS LEAD LENGTH



**GENERAL
INSTRUMENT**

NSF8AT THRU NSF8MT

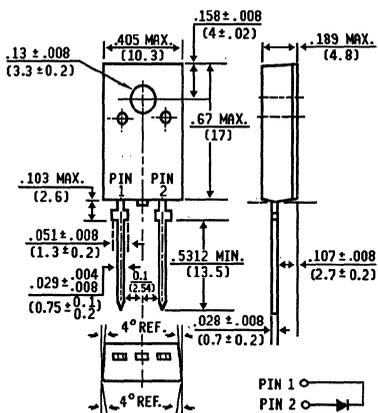
HIGH CURRENT GLASS PASSIVATED RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 8.0 Amperes

FEATURES

- ◆ Fully Isolated Overmolded Package
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ High surge current capability
- ◆ High current capability
- ◆ Low forward voltage
- ◆ Glass passivated drop chip junctions
- ◆ Internal Insulation: 1.5k VRMS
- ◆ High temperature soldering guaranteed: 265°C/10 seconds .160" (4.06 mm) lead lengths at 5 lbs/ (2.3 kg) tension



ITO-220



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: ITO-220 fully overmolded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: As marked

Weight: .08 ounces, 2.24 gram

Mounting Position: Any

Mounting Torque: 5 in. - lbs. max.

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

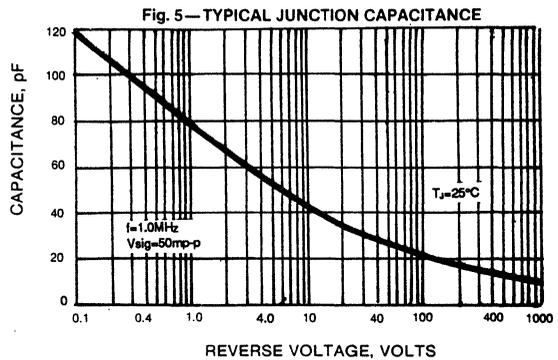
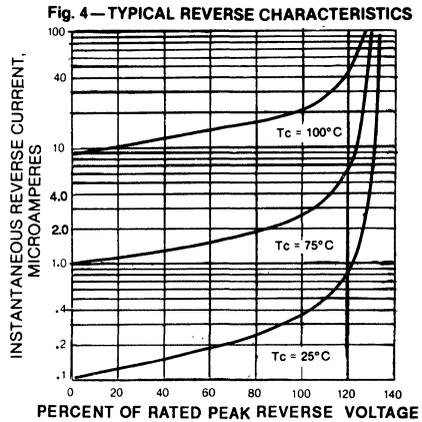
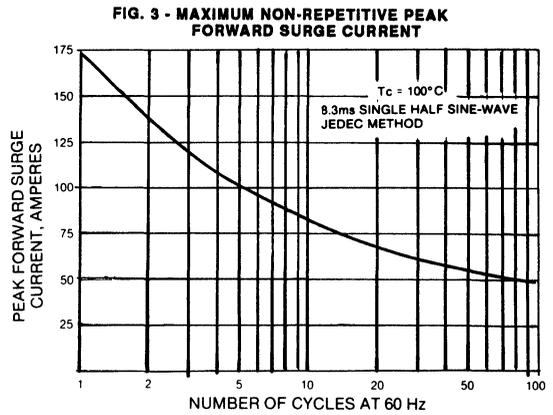
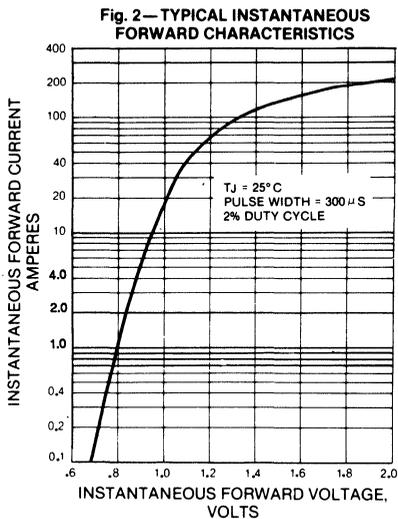
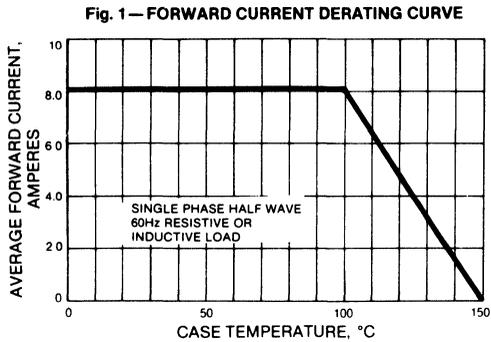
Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	NSF8 AT	NSF8 BT	NSF8 DT	NSF8 GT	NSF8 JT	NSF8 KT	NSF8 MT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current at T _C =100°C	I _(AV)	8.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	175.0							Amps
Maximum Instantaneous Forward Voltage at 8.0A	V _F	1.1							Volts
Maximum Reverse Current T _C =25°C at Rated DC Blocking Voltage T _C =100°C	I _R	100.0							µA
Typical Junction Capacitance (NOTE 2)	C _J	55.0							pf
Typical Thermal Resistance (NOTE 1)	R _{θJC}	3.0							°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150							°C

NOTES:

1. Thermal Resistance Junction to Case.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES NSF8AT THRU NSF8MT

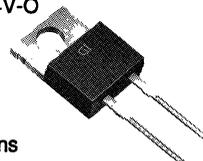


NS8AT THRU NS8MT

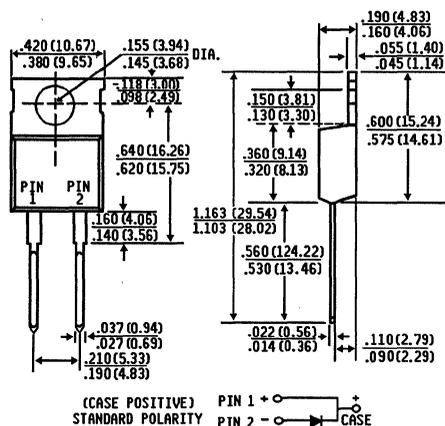
HIGH CURRENT GLASS PASSIVATED PLASTIC RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 8.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ High current capability
- ◆ High surge current capability
- ◆ Low forward voltage drop
- ◆ Glass passivated chip junctions
- ◆ High temperature soldering guaranteed:
265°C/10 seconds/.160" (4.06 mm) lead lengths at 5 lbs., (2.3kg) tension



TO-220



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC TO-220 molded plastic

Terminals: Plated Leads solderable per MIL-STD-202, Method 208

Polarity: As marked

Weight: 0.08 ounce, 2.24 gram

Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	NS8 AT	NS8 BT	NS8 DT	NS8 GT	NS8 JT	NS8 KT	NS8 MT	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current at T _C =100°C	I <sub(av)< sub=""></sub(av)<>	8.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	175.0							Amps
Maximum Instantaneous Forward Voltage at 8.0A	V _F	1.1							Volts
Maximum Reverse Current at Rated DC Blocking Voltage T _C =25°C T _C =100°C	I _R	10.0 100.0							µA
Typical Junction Capacitance (NOTE 2) T _J =25°C	C _J	55.0							pf
Typical Thermal Resistance (NOTE 1)	R _{θJC}	3.0							°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150							°C

NOTES:

1. Thermal Resistance from Junction to Case.
2. Measured at 1 MHz and applied reversed voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES NS8AT THRU NS8MT

Fig. 1 — FORWARD CURRENT DERATING CURVE

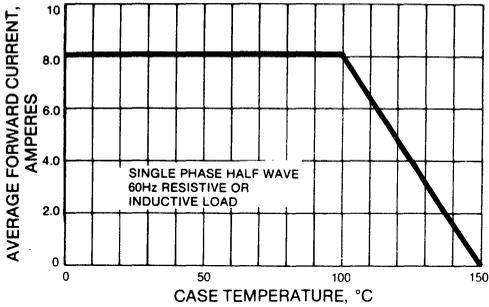


Fig. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

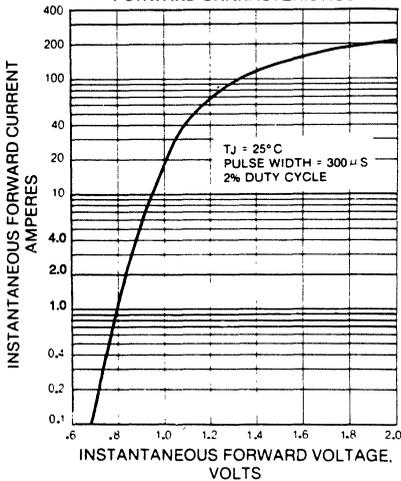


FIG. 3 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

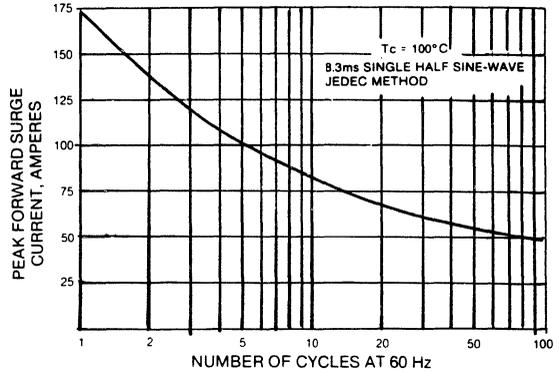


Fig. 4 — TYPICAL REVERSE CHARACTERISTICS

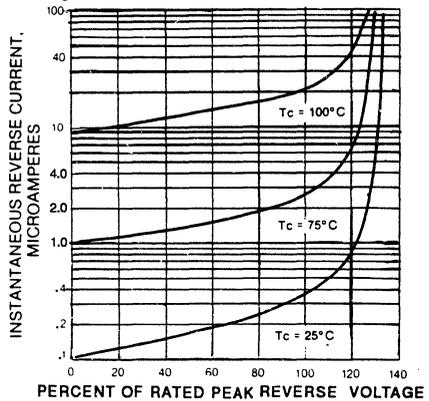
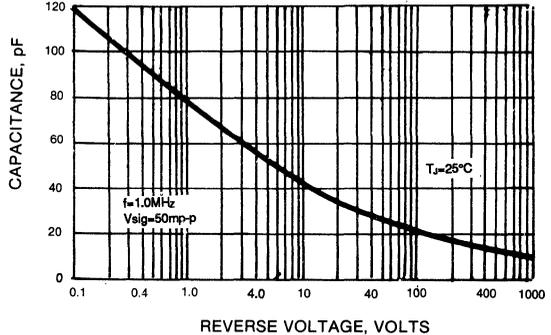


Fig. 5 — TYPICAL JUNCTION CAPACITANCE



**FAST RECOVERY
PLASTIC RECTIFIERS**

***1.0 AMPERE TO 6.0 AMPERES
50 VOLTS TO 800 VOLTS***

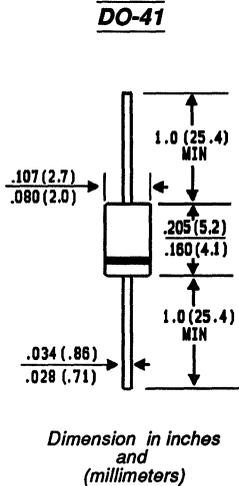
**GENERAL
INSTRUMENT**

1N4933 THRU 1N4937

MINIATURE FAST SWITCHING PLASTIC RECTIFIER
VOLTAGE - 50 to 600 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ Low cost
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Fast switching for high efficiency
- ◆ Void-free molded plastic package
- ◆ 1.0 Ampere operation at $T_A=75^\circ\text{C}$ with no thermal runaway
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds/.375", (9.5mm) lead lengths at 5 lbs., (2.3kg) tension



MECHANICAL DATA

Case: JEDEC DO-41, molded case

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, 0.34 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	1N4933	1N4934	1N4935	1N4936	1N4937	UNITS
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	Volts
*Maximum RMS Voltage	V_{RMS}	35	70	145	280	420	Volts
*Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	Volts
*Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at $T_A=75^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
*Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) at $T_A=75^\circ\text{C}$	I_{FSM}	30.0					Amps
*Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.2					Volts
*Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	100.0					μA
*Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	200.0					nS
*Maximum Reverse Recovery Current (NOTE 1)	$I_{RM(Rec)}$	2.0					Amps
Typical Junction Capacitance (NOTE 2)	C_J	15.0					pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	41.0					$^\circ\text{C}/\text{W}$
*Operating and Storage Temperature Range	T_J, T_{STG}	-50 to +150					$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=1.0\text{A}$, $V_R=30\text{V}$., $di/dt=50\text{A}/\mu\text{s}$.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 Vdc.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, P.C. Board mounted.
 *JEDEC registered values

RATINGS AND CHARACTERISTIC CURVES 1N4933 THRU 1N4937

FIG. 1 — FORWARD CURRENT DERATING CURVE

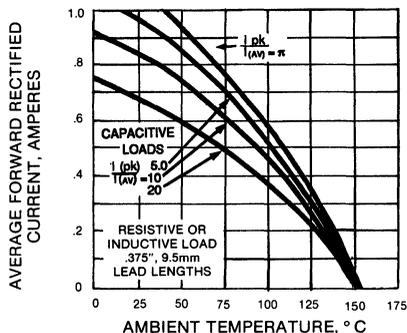


FIG. 3 — TYPICAL JUNCTION CAPACITANCE

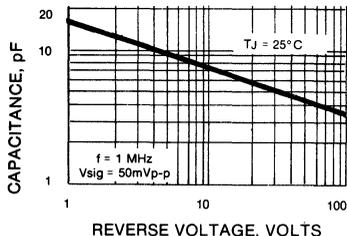


FIG. 5 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

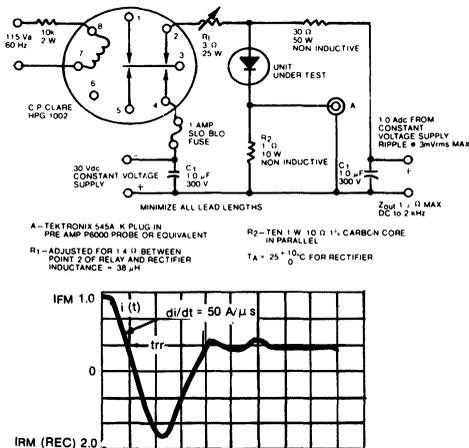


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

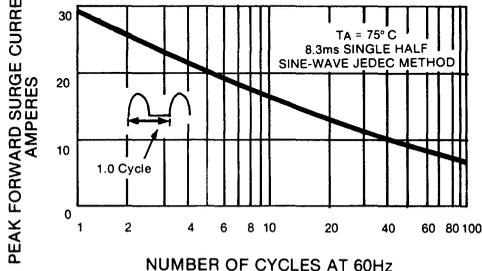


FIG. 4 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

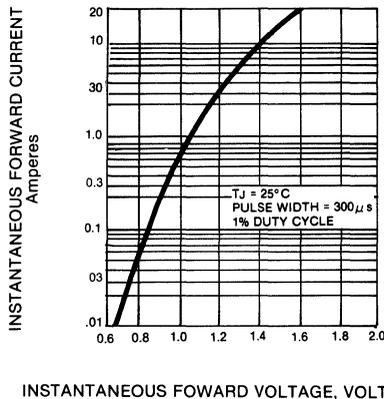
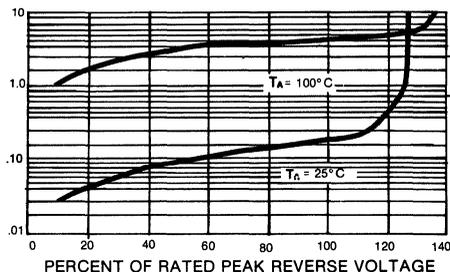


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS



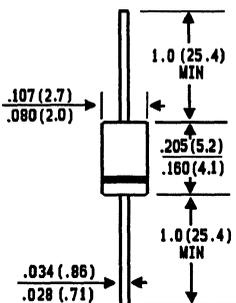
SRP100A THRU SRP100K

MINIATURE SOFT RECOVERY
FAST SWITCHING PLASTIC RECTIFIER
VOLTAGE - 50 to 800 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ High surge current capability
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Void-free molded plastic in DO-41 package
- ◆ 1.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds/.375", (9.5mm) lead lengths at 5 lbs., (2.3kg) tension

DO-41



Dimension in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-41 molded plastic

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Band denotes cathode

Mounting Position: Any

Weight: 0.012 ounce, 1.3 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	SRP 100A	SRP 100B	SRP 100D	SRP 100G	SRP 100J	SRP 100K	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	1.0						Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0						Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.3						Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	10.0 200.0						μA
Maximum Reverse Recovery Time (NOTE 2) $T_J=25^\circ\text{C}$	T_{RR}	100				200		nS
Typical Junction Capacitance (NOTE 1) $T_J=25^\circ\text{C}$	C_J	12.0						pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	41.0						$^\circ\text{C}/\text{W}$
Operating Temperature Range	T_J	-50 to +125						$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-50 to +150						$^\circ\text{C}$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, P.C. Board mounted.

RATINGS AND CHARACTERISTIC CURVES SRP100A THRU SRP100K

FIG. 1 — FORWARD CURRENT DERATING CURVE

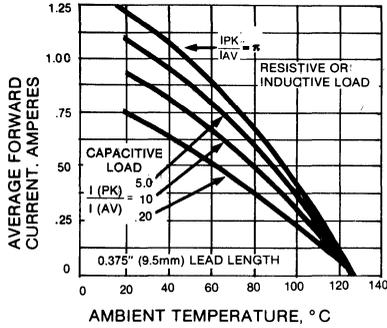


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

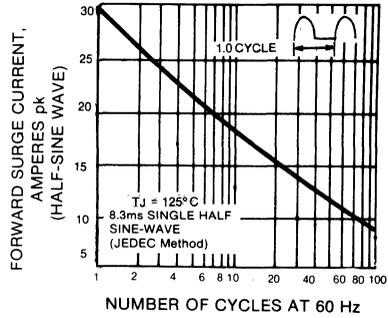


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

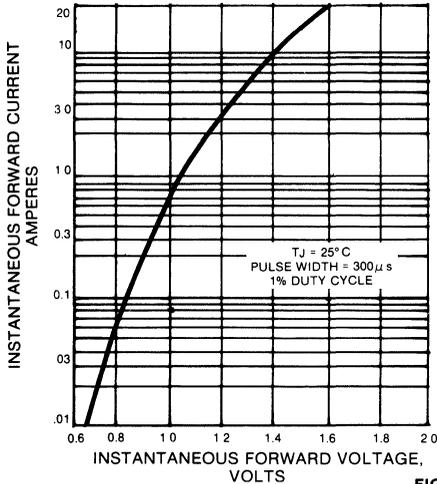


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

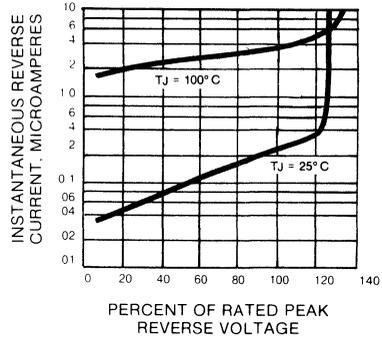


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

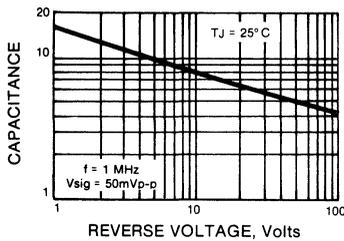
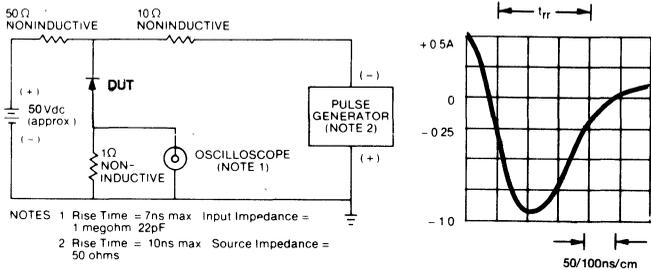


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

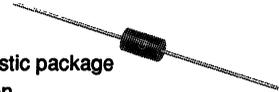


GI850 THRU GI856

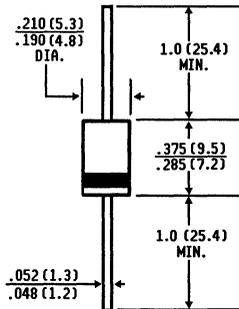
SOFT RECOVERY, FAST SWITCHING PLASTIC RECTIFIER
VOLTAGE - 50 to 600 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ High surge current capability
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Fast switching for high efficiency
- ◆ Void-free molded plastic package
- ◆ High current operation
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375"(.9.5mm) lead lengths at 5 lbs., (2.3kg) tension



DO-201AD



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: JEDEC DO-201AD molded plastic
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight: .04 ounce, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	GI850	GI851	GI852	GI854	GI856	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	Volts
Maximum Non-repetitive Peak Reverse Voltage	V _{RSM}	75	150	250	450	650	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at T _A =90°C	I _(AV)	3.0					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	100.0					Amps
Maximum Instantaneous Forward Voltage at 3A T _J =25°C 9.4A T _J =175°C	V _F	125 1.10					Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _A =25°C T _A =100°C	I _R	10.0 150 150 200 250 300					μA
Typical Junction Capacitance T _J =25°C (NOTE 1)	C _J	28.0					pf
Maximum Reverse Recovery Time (NOTE 2) T _J =25°C	T _{RR}	200.0					nS
Maximum Reverse Recovery Current (NOTE 2)	I _{RM(REC)}	2.0					Amps
Typical Thermal Resistance (NOTE 3)	R _{θJA}	15.0					°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-50 to +150					°C

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: I_F=1.0A, V_R=30V, di/dt=50A/μs.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, with both leads to heat sink.

RATINGS AND CHARACTERISTIC CURVES GI850 THRU GI856

FIG. 1 — FORWARD CURRENT DERATING CURVE

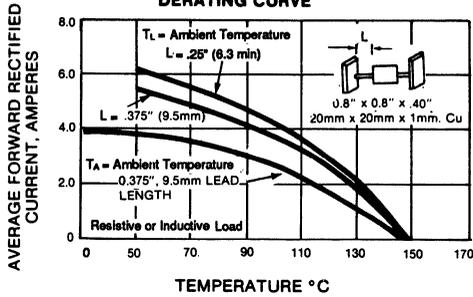


FIG. 2 — MAXIMUM PEAK FORWARD SURGE CURRENT

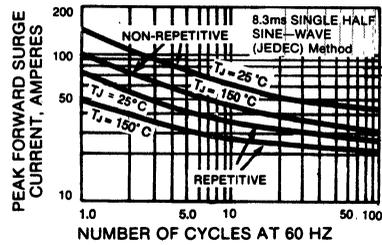


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

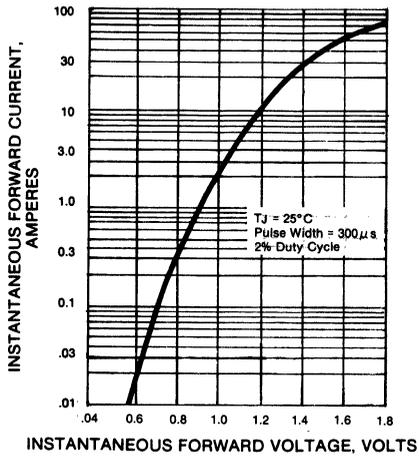


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

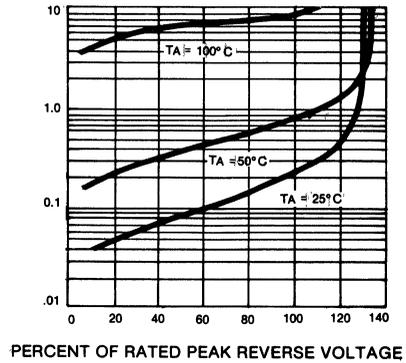
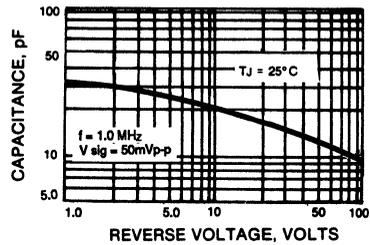


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

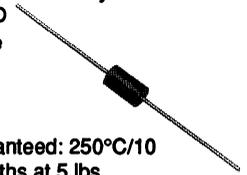


GI910 THRU GI917

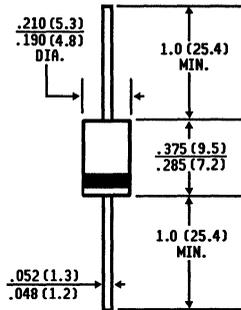
SOFT RECOVERY, MEDIUM-SWITCHING PLASTIC RECTIFIER VOLTAGE - 50 to 800 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ High surge current capability
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Void-free molded plastic package
- ◆ High current operation of 3.0 Amperes at $T_A=90^\circ\text{C}$
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds/.375" (9.5mm) lead lengths at 5 lbs., (2.3kg) tension



DO-201AD



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

- Case:** JEDEC DO-201AD molded plastic
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color Band denotes cathode
Mounting Position: Any
Weight: 0.04 ounce, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	GI910	GI911	GI912	GI914	GI916	GI917	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at $T_A=90^\circ\text{C}$	$I_{(AV)}$	3.0						Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	100.0						Amps
Maximum Instantaneous Forward Voltage at 3.0A $T_J=25^\circ\text{C}$ 9.4A $T_J=175^\circ\text{C}$	V_F	1.25 1.10						Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage $T_A=25^\circ\text{C}$ $T_A=100^\circ\text{C}$	I_R	10.0 300.0						μA
Typical Junction Capacitance (NOTE 1) $T_J=25^\circ\text{C}$	C_J	28.0						pf
Maximum Reverse Recovery Time $T_J=25^\circ\text{C}$ (NOTE 2)	T_{RR}	750						nS
Maximum Reverse Recovery Current	$I_{RM(REC)}$	2.0						Amps
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	15.0						$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-50 to +150						$^\circ\text{C}$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 Volts.
2. Reverse Recovery Test Conditions: $I_F=1.0\text{A}$, $V_R=30\text{V}$, $di/dt=50\text{A}/\mu\text{s}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, both leads to a heat sink.

RATINGS AND CHARACTERISTIC CURVES GI910 THRU GI917

FIG. 1 — FORWARD CURRENT DERATING CURVE

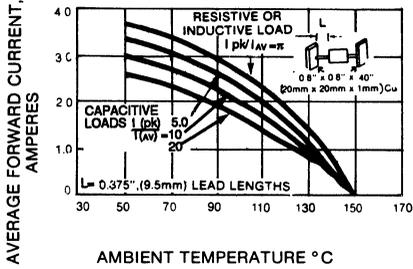


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

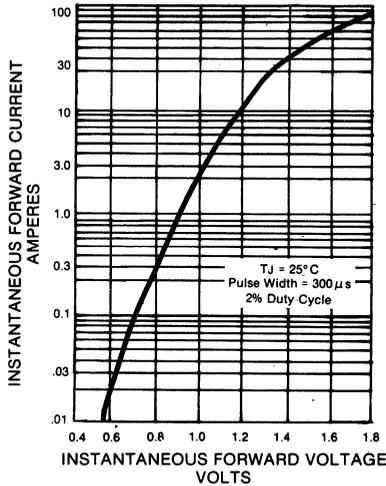


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

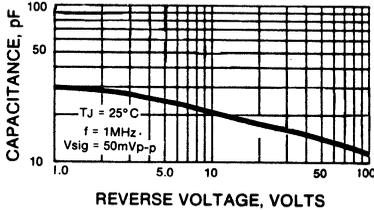


FIG. 2 — MAXIMUM FORWARD SURGE CURRENT

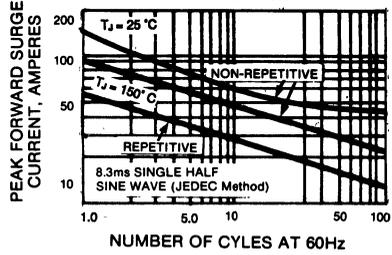


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

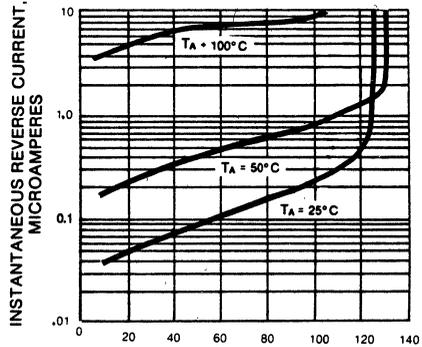
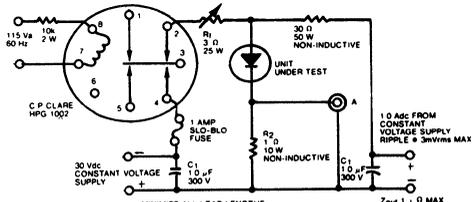
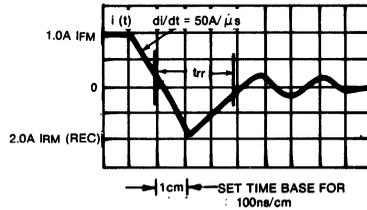


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



- A — TEKTRONIX 545A-K PLUG IN PINK AMP PROBE OR EQUIVALENT
- R₂ — TEN 1 W 10 Ω 1% CARBON CORE IN PARALLEL
- R₁ — ADJUSTED FOR 1.4 Ω BETWEEN POINT 2 OF RELAY AND RECTIFIER INDUCTANCE = 38 μH
- T_A = 25 \pm 10°C FOR RECTIFIER



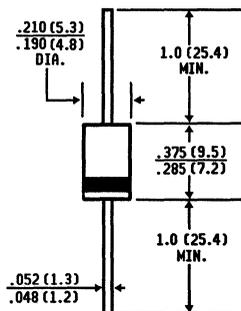
SRP300A THRU SRP300K

SOFT RECOVERY, FAST-SWITCHING PLASTIC RECTIFIER
VOLTAGE - 50 to 800 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ High surge current capability
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Void-free molded plastic package
- ◆ 3.0 Ampere operation at $T_A=55^\circ\text{C}$ with no thermal runaway
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds/.375", (9.5mm) lead lengths at 5 lbs., (2.3kg) tension

DO-201AD



Dimension in inches
and
(millimeters)



MECHANICAL DATA

Case: JEDEC DO-201AD molded plastic
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color Band denotes cathode
Mounting Position: Any
Weight: 0.04 ounce, 1.1 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SRP 300A	SRP 300B	SRP 300D	SRP 300G	SRP 300J	SRP 300K	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at $T_A=55^\circ\text{C}$	$I_{(AV)}$	3.0						Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	150.0						Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.3						Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage	I_R	10.0						μA
		200		300	400	500		
Maximum Reverse Recovery Time (NOTE 2) $T_J=25^\circ\text{C}$	T_{RR}	100	100	150	150	200	200	nS
Typical Junction Capacitance (NOTE 1) $T_J=25^\circ\text{C}$	C_J	28.0						pf
Typical Thermal Resistance (NOTE 3)	$R_{\theta JA}$	15.0						$^\circ\text{C}/\text{W}$
Operating Temperature Range	T_J	-50 to +125						$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-50 to +150						$^\circ\text{C}$

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
2. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths with both leads to heat sink.

RATINGS AND CHARACTERISTIC CURVES SRP300A THRU SRP300K

AVERAGE FORWARD RECTIFIED CURRENT, AMPERES.

FIG. 1 — FORWARD CURRENT DERATING CURVE

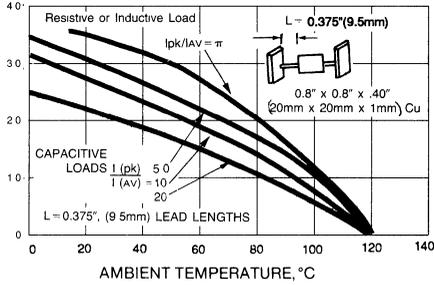


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

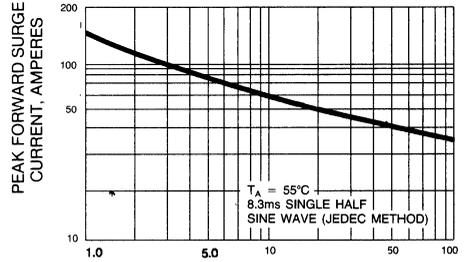


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

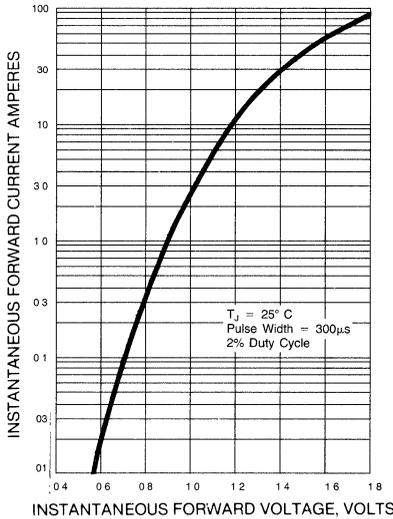


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

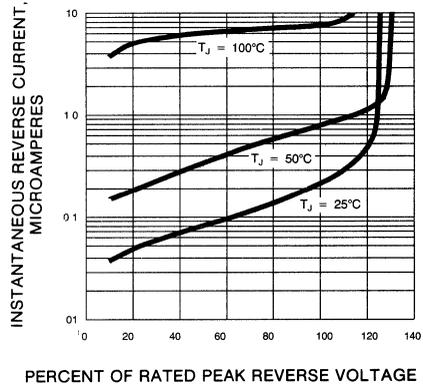


FIG. 5 — TYPICAL JUNCTION CAPACITANCE

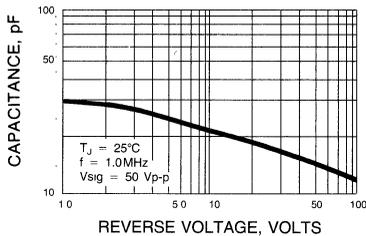
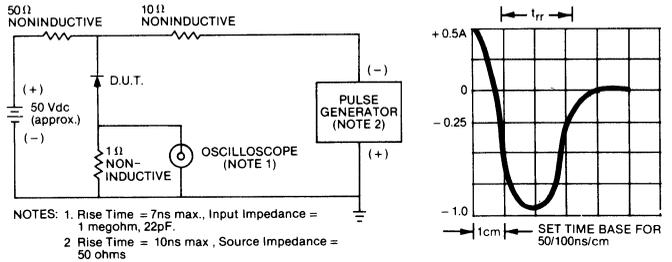


FIG. 6 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



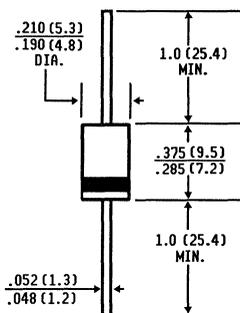
BY396P THRU BY399P

SOFT RECOVERY, FAST SWITCHING PLASTIC RECTIFIER
VOLTAGE - 100 to 800 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ High surge current capability
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Void-free molded plastic package
- ◆ 3.0 Ampere operation at $T_A=50^\circ\text{C}$ with no thermal runaway
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds/.375", (9.5mm) lead lengths at 5 lbs., (2.3kg) tension

DO-201AD



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-201AD molded plastic
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color Band denotes end
Mounting Position: Any
Weight: .04 ounce, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

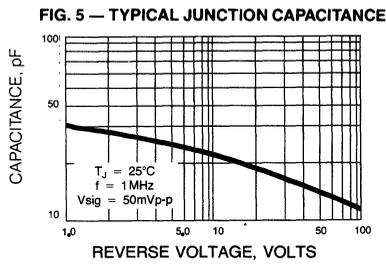
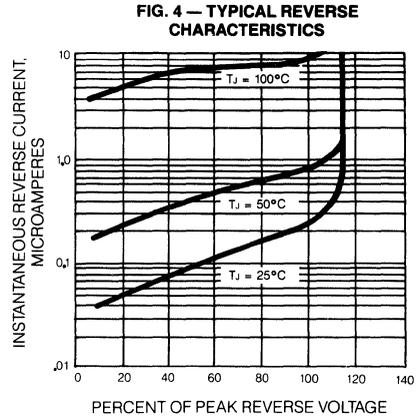
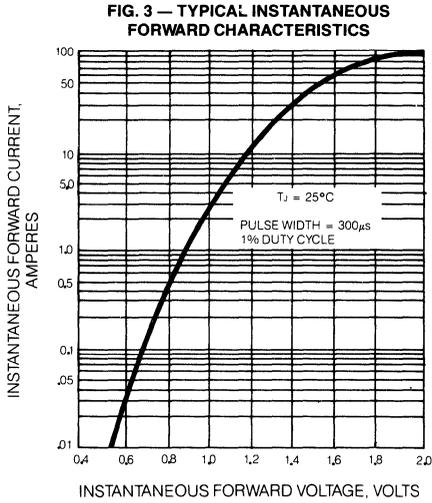
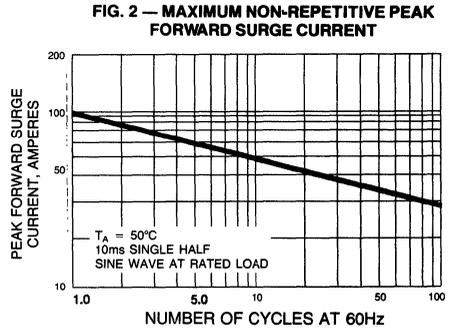
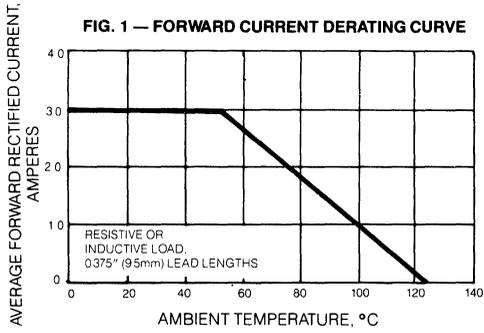
Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	BY396P	BY397P	BY398P	BY399P	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	100	200	400	800	Volts
Maximum RMS Voltage	V_{RMS}	70	140	280	560	Volts
Maximum DC Blocking Voltage	V_{DC}	100	200	400	800	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at $T_A=50^\circ\text{C}$	$I_{(AV)}$	3.0				Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed on rated load at $T_A=25^\circ\text{C}$	I_{FSM}	100.0				Amps
Maximum Repetitive Peak Forward Surge (NOTE 1)	I_{FRM}	10.0				Amps
Maximum Instantaneous Forward Voltage at 3.0A	V_F	1.25				Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	500.0				μA
Maximum Reverse Recovery Time (NOTE 3) $T_J=25^\circ\text{C}$	T_{RR}	500.0				nS
Maximum Forward Recovery Time 100mA $T_J=25^\circ\text{C}$	T_{FR}	1.0				μS
Typical Junction Capacitance (NOTE 2)	C_J	28.0				pf
Typical Thermal Resistance (NOTE 4)	$R_{\theta JA}$	15.0				$^\circ\text{C}/\text{W}$
Operating Temperature Range	T_J	-50 to +125				$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-50 to +150				$^\circ\text{C}$

NOTES:

1. Repetitive Peak Forward Surge Current at $f < 15\text{KHz}$.
2. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
3. Reverse Recovery Test Conditions: $I_F=10\text{mA}$, $I_R=10\text{mA}$, $I_{rr}=1.0\text{mA}$.
4. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths with both leads to heat sink.

RATINGS AND CHARACTERISTIC CURVES BY396P THRU BY399P



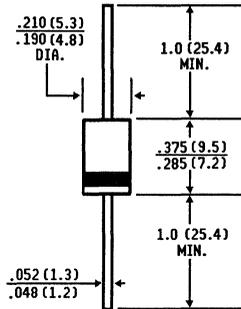
BY500-100 THRU BY500-800

SOFT RECOVERY, FAST SWITCHING PLASTIC RECTIFIER
VOLTAGE - 100 to 800 Volts CURRENT - 5.0 Amperes

FEATURES

- ◆ High surge current capability
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Fast switching for high efficiency
- ◆ High current operation at $T_L=45^\circ\text{C}$
- ◆ Void-free molded plastic package
- ◆ High temperature soldering guaranteed: $250^\circ\text{C}/10$ seconds $.375"$, (9.5mm) lead lengths at 5 lbs., (2.3kg) tension
- ◆ Especially designed for applications such as Switch Mode Power Supplies, Inverters, Converters, TV Scanning, Ultrasonic-Systems, Speed controlled DC Motors, Low RF Interference and Free Wheeling Rectifiers

DO-201AD



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-201AD molded plastic
Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color Band denotes end
Mounting Position: Any
Weight: .04 ounce, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

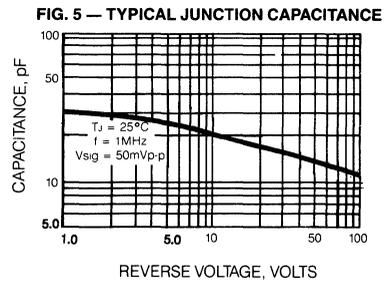
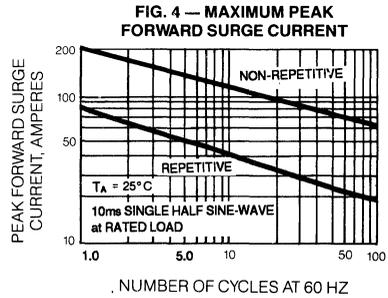
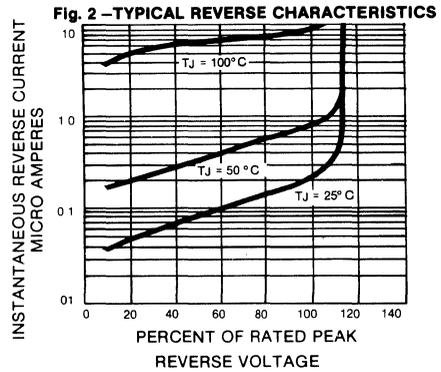
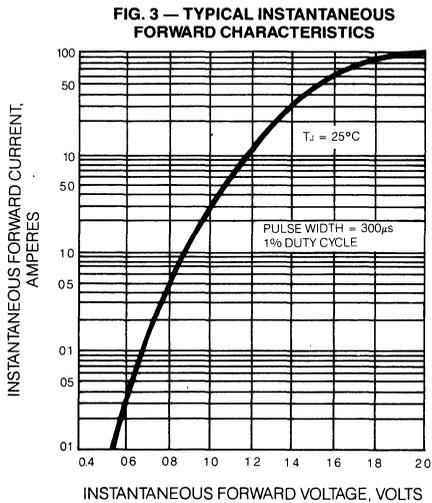
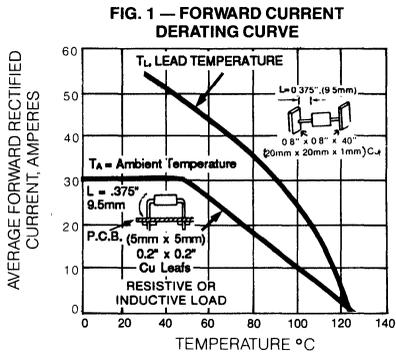
Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	BY500-100	BY500-200	BY500-400	BY500-600	BY500-800	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	100	200	400	600	800	Volts
Maximum RMS Voltage	V_{RMS}	70	140	280	420	560	Volts
Maximum DC Blocking Voltage	V_{DC}	100	200	400	600	800	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at $T_L=45^\circ\text{C}$	$I_{(AV)}$	5.0					Amps
Peak Forward Surge Current 10ms single half sine-wave superimposed on rated load at $T_A=25^\circ\text{C}$	I_{FSM}	200.0					Amps
Maximum Repetitive Peak Forward Surge	I_{FRM}	10.0					Amps
Maximum Instantaneous Forward Voltage at 5.0A	V_F	1.35					Volts
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	10.0 1.0					μA mA
Maximum Reverse Recovery Time (NOTE 3) $T_J=25^\circ\text{C}$	T_{RR}	200.0					nS
Maximum Reverse Recovery Current (NOTE 3)	$I_{RM(REC)}$	2.0					Apk
Typical Junction Capacitance $T_J=25^\circ\text{C}$ (NOTE 2)	C_J	28.0					pf
Typical Thermal Resistance (NOTE 1)	$R_{\theta JA}$	15.0					$^\circ\text{C}/\text{W}$
Operating Temperature Range	T_J	-50 to +125					$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-50 to +150					$^\circ\text{C}$

NOTES:

1. Thermal Resistance from Junction to Ambient at $375"$, (9.5mm) lead lengths with both leads to heat sink.
2. Measured at 1 MHz and applied reverse voltage of 4.0 volts.
3. Reverse Recovery Test Conditions: $I_F=1.0\text{A}$, $V_R=30\text{V}$, $di/dt=50\text{A}/\mu\text{s}$.

RATINGS AND CHARACTERISTIC CURVES BY500-100 THRU BY500-800

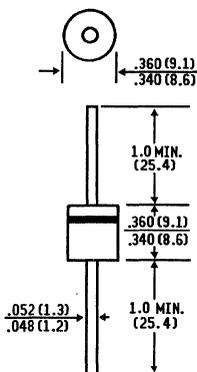


GI820 THRU GI826

HIGH CURRENT FAST SWITCHING PLASTIC RECTIFIER VOLTAGE - 50 to 600 Volts CURRENT - 5.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ High surge current capability
- ◆ High current operation
- ◆ Fast switching for high efficiency
- ◆ Diffused junction
- ◆ Completely insulated case
- ◆ Uniform molded body
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375", (9.5mm) lead lengths at 5 lbs., (2.3kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color Band denotes cathode

Mounting Position: Any

Weight: 0.07 ounce, 2.1grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

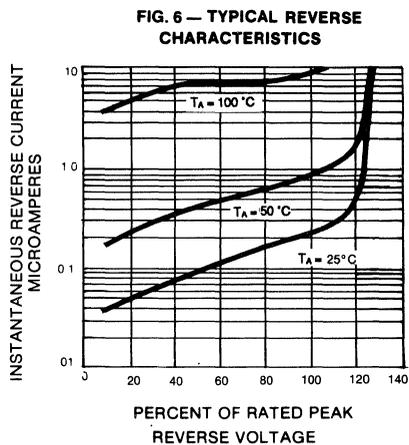
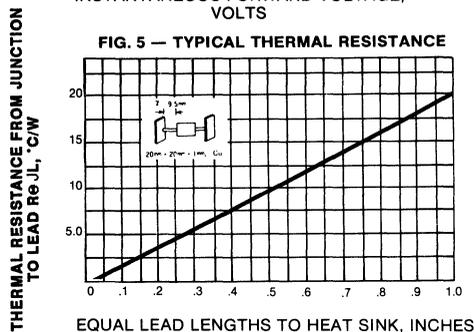
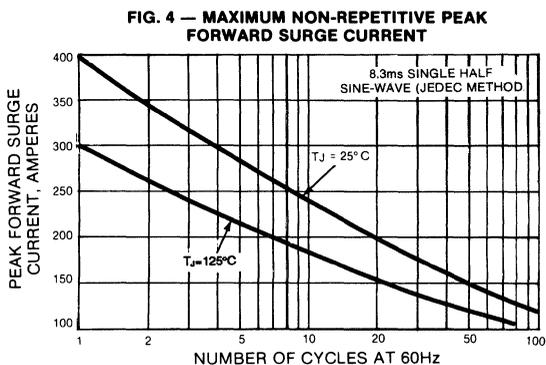
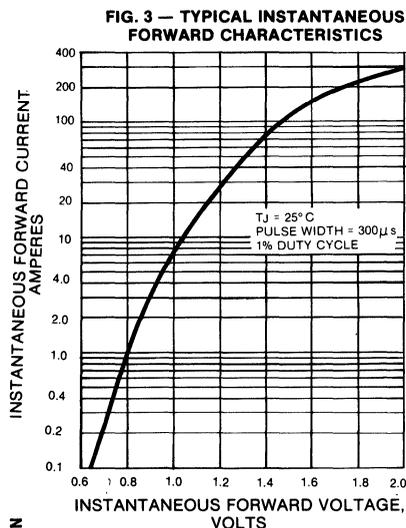
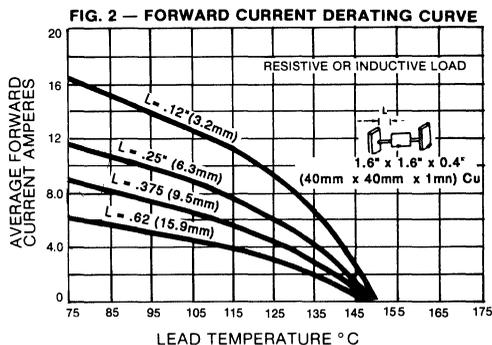
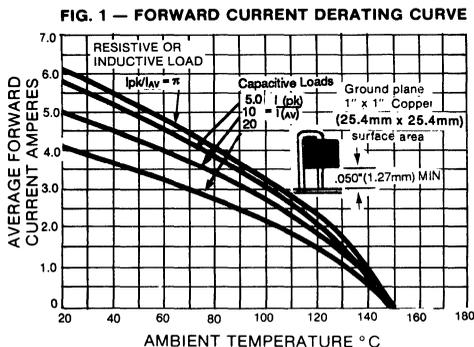
Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	GI820	GI821	GI822	GI824	GI826	UNITS
Maximum Recurrent Peak Reverse Voltage	VRRM	50	100	200	400	600	Volts
Maximum RMS Voltage	VRMS	35	70	140	280	420	Volts
Maximum DC Blocking Voltage	VDC	50	100	200	400	600	Volts
Maximum Non-repetitive Peak Reverse Voltage	VRSM	75	150	250	450	650	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at TA=55°C	I(AV)	5.0					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	IFSM	300.0					Amps
Maximum Instantaneous Forward Voltage at 5.0A at 15.7A TJ=150°C	VF	1.10 1.05					Volts
Maximum Reverse Current TA= 25°C at Rated DC Blocking Voltage TA=100°C	IR	10.0 1.0					µA mA
Typical Junction Capacitance TJ=25°C (NOTE 3)	CJ	300.0					pf
Maximum Reverse Recovery Time (NOTE 1) TJ=25°C	TRR	200.0					nS
Maximum Reverse Recovery Current (NOTE 1)	IRM(REC)	2.0					Amps
Typical Thermal Resistance (NOTE 2)	RθJA	10.0					°C/W
Operating and Storage Temperature Range	TJ, TSTG	-50 to +150					°C

NOTES:

1. Reverse Recovery Test Conditions: $I_F=1.0A$, $V_R=30V$, $di/dt=50A/\mu s$.
2. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, with both leads to heat sink.
3. Measured at 1 MHz and applied reverse voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES GI820 THRU GI826

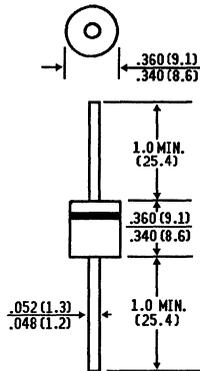


SRP600A THRU SRP600K

HIGH CURRENT SOFT RECOVERY FAST-SWITCHING PLASTIC RECTIFIER
VOLTAGE - 50 to 800 Volts CURRENT - 6.0 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ High surge current capability
- ◆ High Current Operation
- ◆ Void-free molded plastic package
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/.375", (9.5mm) lead lengths at 5 lbs., (2.3kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Void-free Molded plastic

Terminals: Plated Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denotes cathode

Mounting Position: Any

Weight: 0.07 ounce, 2.1grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

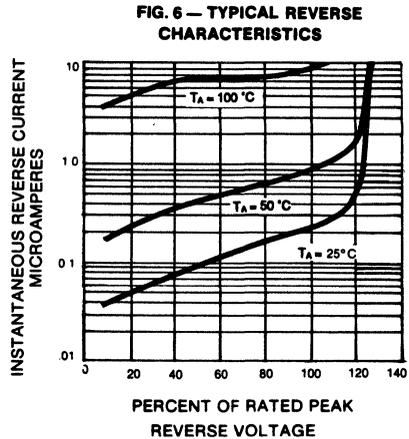
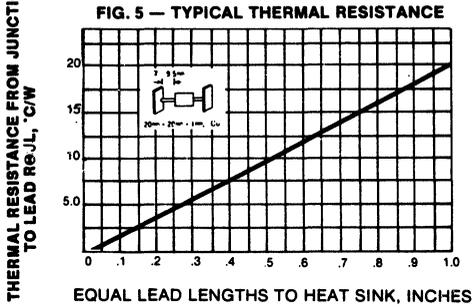
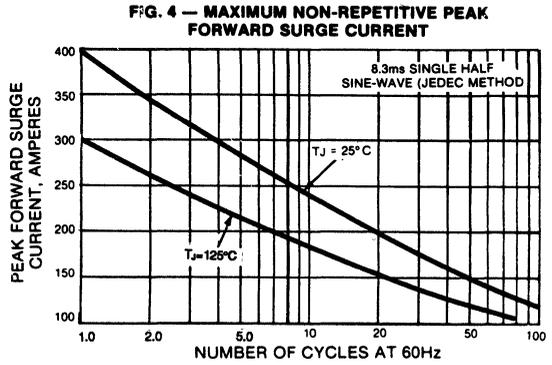
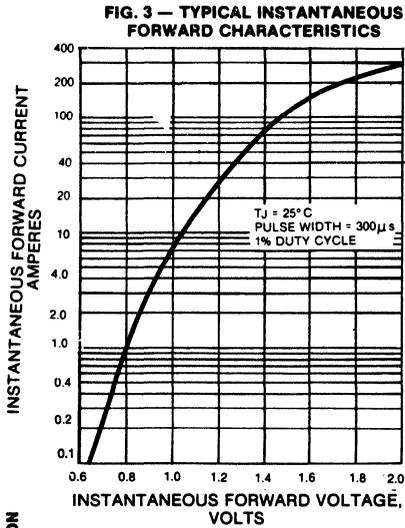
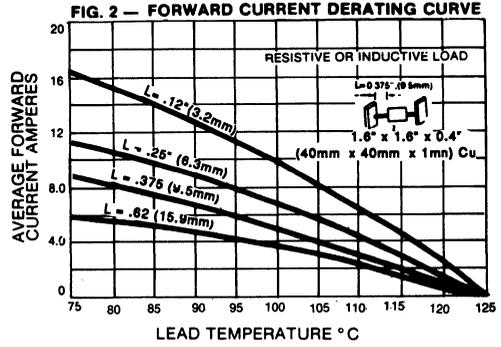
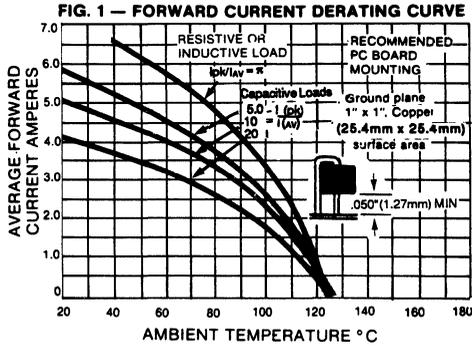
Ratings at 25°C ambient temperature unless otherwise specified.
Resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	SRP 600A	SRP 600B	SRP 600D	SRP 600G	SRP 600J	SRP 600K	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead lengths at T _A =55°C	I _(AV)	6.0						Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	300.0						Amps
Maximum Instantaneous Forward Voltage at 6.0A	V _F	1.3						Volts
Maximum DC Reverse Current T _A = 25°C at Rated DC Blocking Voltage T _A = 100°C	I _R	1.0						μA mA
Maximum Reverse Recovery Time (NOTE 1) T _J = 25°C	T _{RR}	100	100	150	150	200	200	nS
Typical Junction Capacitance (NOTE 2) T _J = 25°C	C _J	300.0						pf
Typical Thermal Resistance (NOTE 3)	R _{θJA}	10.0						°C/W
Operating Temperature Range	T _J	-50 to +125						°C
Storage Temperature Range	T _{STG}	-50 to +150						°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{rr}= .25A.
2. Measured at 1 MHz and applied reverse voltage of 4.0 Volts.
3. Thermal Resistance from Junction to Ambient at .375" (9.5mm) lead lengths, with both leads to heat sink.

RATINGS AND CHARACTERISTIC CURVES SRP600A THRU SRP600K



**FULL-WAVE
BRIDGE RECTIFIERS**

***0.9 AMPERE TO 35.0 AMPERES
50 VOLTS TO 1000 VOLTS***

**GENERAL
INSTRUMENT**

BRIDGE RECTIFIERS

0.9 to 35 Amperes 50 Volts to 1000 Volts

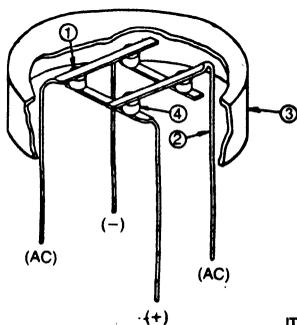


Fig. 1 Round Bridge

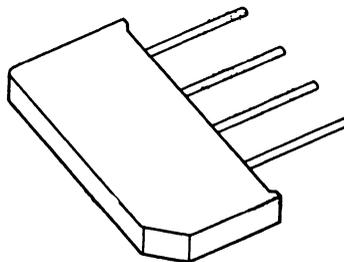


Fig. 2 IN-LINE Bridge

ITEM DESCRIPTION

1. Solder Preforms
2. Formed Copper Leads
3. Plastic Case
4. Glass Passivated Chip (GPP)

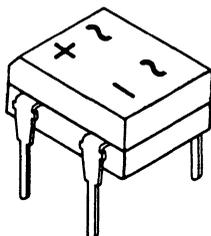


Fig. 3 DUAL-IN-LINE Bridge

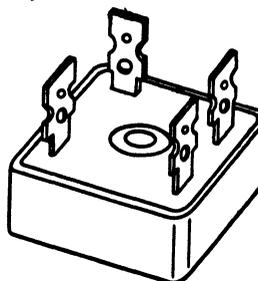


Fig. 4 Chassis Mounted Bridge

FAMILIES OF GENERAL INSTRUMENT BRIDGE RECTIFIERS

All types of rectifier cells, which are produced by General Instrument, are available in bridge configurations, molded in various plastic packages.

The basic types of packages are:

Round Plastic Package (Fig. 1)

IN-LINE Plastic Package (Fig. 2)

DUAL-IN-LINE Plastic Package (Fig. 3)

Square Plastic Package for Chassis Mounting (Fig. 4)

These bridge families are available with different terminals such as wire leads, FASTON or soldering lugs.

FAMILIES OF GENERAL INSTRUMENT BRIDGE RECTIFIERS

Dual-In-Line Single Phase Bridge Rectifiers 0.9 to 1.0 AMPERE

Types:
DF005M thru DF10M
EDF1AM thru EDF1DM
B40C80DM thru B380C800DM

Features:

- ◆ Surge Overload Rating 50 Amperes Peak
- ◆ Ideal for Printed Circuit Board
- ◆ Reliable Low Cost Construction
- ◆ Tinned Copper Leads Solderable to MIL-STD-202, Method 208
- ◆ Glass Passivated Chip Junctions
- ◆ Plastic Package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ All bridge series are UL recognized under component index, file number E54214

Miniature Single-Phase Bridge Rectifiers 1.5 to 2.0 AMPERES

Types:
W005G thru W10G
2W005G thru 2W10G
B40C800G thru B250C800G
B40C1000G thru B380C1000G
B40C1500G thru B380C1500G

Features:

- ◆ Surge Overload Rating 50 and 60 Amperes Peak
- ◆ Ideal for Printed Circuit Board
- ◆ Reliable Low Cost Construction
- ◆ Leads are Solderable to MIL-STD-202 Method 208
- ◆ Plastic Package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ All bridge series are UL recognized under component index, file number E54214
- ◆ All series have glass passivated chip junctions

In-Line Single Phase Bridge Rectifiers 1.0 to 8.0 AMPERES

Types:
KBP005M thru KBP10M
2KBP005M thru 2KBP10M
GBU4A thru GBU4M
GBL005 thru GBL10
GB6A thru GBU6M
GBU8A thru GBU8M
3N249 thru 3N252
3N253 thru 3N259

Features:

- ◆ Surge Overload Rating from 50 to 300 Amperes Peak
- ◆ Ideal for Printed Circuit Board
- ◆ Reliable Low Cost Construction utilizing molded Plastic Leads are Solderable to MIL-STD-202 Method 208
- ◆ Plastic Package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ All bridge series are UL recognized under component index file number E54214
- ◆ All series have glass passivated chip junctions

High Current Single Phase Bridge Rectifiers 3.0 to 35.0 AMPERES

Types:
GBPC1005 thru GBPC110
GBPC6005 thru GBPC610
GBPC8005 thru GBPC810
GBPC10-005 thru GBPC10-10
GBPC12005 thru GBPC1210
GBPC15005 thru GBPC1510
GBPC25005 thru GBPC2510
GBPC35005 thru GBPC3510

Features:

- ◆ High Capability of Surge Overload Rating
- ◆ Insulated Case for Maximum Heat Dissipation
- ◆ Low Forward Voltage Drop
- ◆ Copper Leads or Faston Terminals, versions for GBPC12, 15, 25 & 35 series only
- ◆ Simple Installation thru Screw hole for NBR6 Screw
- ◆ Leads are Solderable to MIL-STD-202 Method 208
- ◆ Plastic Package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ All bridge series are UL recognized under component index, file number E54214
- ◆ All bridges have glass passivated chip junctions

QUICK GUIDE TO BRIDGE RECTIFIERS

I _o (A)	1.0	1.5	1.5	1.0	2.0	2.0	2.0	4.0	4.0	6.0	8.0
@T _a (°C)	40	25	50	75	25	50	55	50	100 ^c	100 ^c	100 ^c
SURGE(A)	50	50	50	30	60	60	60	150	150	175	200
VR=50(V)	DF05M	W005G	KBP005M	3N246	2W005G	2KBP005M	3N253	GBL005	GBU4A	GBU6A	GBU8A
VR=100(V)	DF01M	W01G	KBP01M	3N247	2W01G	2KBP01M	3N254	GBL01	GBU4B	GBU6B	GBU8B
VR=200(V)	DF02M	W02G	KBP02M	3N248	2W02G	2KBP02M	3N255	GBL02	GBU4D	GBU6D	GBU8D
VR=400(V)	DF04M	W04G	KBP04M	3N249	2W04G	2KBP04M	3N256	GBL04	GBU4G	GBU6G	GBU8G
VR=600(V)	DF06M	W06G	KBP06M	3N250	2W06G	2KBP06M	3N257	GBL06	GBU4J	GBU6J	GBU8J
VR=800(V)	DF08M	W08G	KBP08M	3N251	2W08G	2KBP08M	3N258	GBL08	GBU4K	GBU6K	GBU8K
VR=1000(V)	DF10M	W10G	KBP10M	3N252	2W10G	2KBP10M	3N259	GBL10	GBU4M	GBU6M	GBU8M

QUICK GUIDE TO BRIDGE RECTIFIERS

I _o (A)	3.0	6.0	8.0	10	12	15	25	35	I _o (A)
@T _a (°C)	50	100	50	50	55	55	55	50	@T _a (°C)
SURGE(A)	60	175	200	200	200	300	300	400	SURGE(A)
VR= 50(V)	GBPC1005	GBPC6005	GBPC8005	GBPC10-005	GBPC12-005	GBPC15-005	GBPC25-005	GBPC35-005	VR= 50(V)
VR= 100(V)	GBPC101	GBPC601	GBPC801	GBPC10-01	GBPC12-01	GBPC15-01	GBPC25-01	GBPC35-01	VR=100(V)
VR= 200(V)	GBPC102	GBPC602	GBPC802	GBPC10-02	GBPC12-02	GBPC15-02	GBPC25-02	GBPC35-02	VR=200(V)
VR= 400(V)	GBPC104	GBPC604	GBPC804	GBPC10-04	GBPC12-04	GBPC15-04	GBPC25-04	GBPC35-04	VR=400(V)
VR= 600(V)	GBPC106	GBPC606	GBPC806	GBPC10-06	GBPC12-6	GBPC15-06	GBPC25-06	GBPC35-06	VR=600(V)
VR= 800(V)	GBPC108	GBPC608	GBPC808	GBPC10-08	GBPC12-8	GBPC15-08	GBPC25-08	GBPC35-08	VR=800(V)
VR=1000(V)	GBPC110	GBPC610	GBPC810	GBPC10-10	GBPC12-10	GBPC15-10	GBPC25-10	GBPC35-10	VR=1000(V)

QUICK GUIDE TO BRIDGE RECTIFIERS

I _o (A)	0.8	1.0	1.5	1.5
TA(°C)	45	45	45	45
SURGE(A)	45	45	45	90
VRMS= 40(V)	B40C800 ¹⁾²⁾	B40C1000 ¹⁾	B40C1500	B40C1500 C
VRMS= 80(V)	B80C800 ¹⁾²⁾	B80C1500 ¹⁾	B80C1500 C	VRMS= 80(V)
VRMS=125(V)	B125C800 ¹⁾²⁾	B125C1500 ¹⁾	B125C1500 C	VRMS=125(V)
VRMS=250(V)	B250C800 ¹⁾²⁾	B250C1000 ¹⁾	B250C1500	B250C1500 CV
VRMS=380(V)	B380C100010	B380C1500	B380C1500 C	VRMS=380(V)

- 1)G Indicates Glass Passivated Chip Junctions
 2) DM Indicates Dual-Inline Package (IC-Leads)

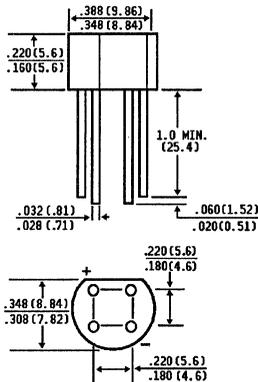


B40C / B80C / B125C / B250C / B380C 800G SERIES

MINIATURE GLASS PASSIVATED SINGLE - PHASE BRIDGE RECTIFIER
Voltage - 65 to 600 Volts Current - 0.9 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junctions
- ◆ High case dielectric strength
- ◆ Typical I_R less than $0.1 \mu A$
- ◆ High overload surge current
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed:
265°C/10 seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: Molded plastic
Terminals: Plated Leads solderable per MIL-STD-202, Method 208
Mounting Position: Any
Weight: 0.04 ounce, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 50 Hz or 60 Hz, resistive or inductive load.

	SYMBOLS	B40	B80	B125	B250	B380	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	65	125	200	400	600	Volts
Maximum RMS Input Voltage R + C-Load	V _{RMS}	40	80	125	250	380	Volts
Maximum Average Forward Output Current for free air operation at T _A =45°C R + L-Load C - Load	I _(AV)	0.9 0.8					Amps
Maximum DC Blocking Voltage	V _{DC}	65	125	200	400	600	Volts
Maximum Repetitive Peak Reverse Voltage	V _{RRM}	65	125	200	400	600	Volts
Maximum Peak Working Voltage	V _{RWM}	90	180	300	600	900	Volts
Maximum Non-Repetitive Peak Voltage	V _{RSM}	100	200	350	600	1000	Volts
Maximum Repetive Peak Forward Surge Current	I _{FRM}	10.0					Amps
Peak Forward Surge Current Single Sine wave on rated load at T _J =125°C	I _{FSM}	45.0					Amps
Rating for Fusing at T _J =125°C (t<100ms)	I ² t	10.0					A ² S
Minimum Series Resistor C-Load V _{RMS} = +10%	R _t	1.0	2.0	4.0	8.0	12.0	Ohms
Maximum Load Capacitance +50% -10%	C _L	5000	2500	1000	500	200	μF
Maximum Instantaneous Forward Voltage Drop per element at 0.9A	V _F	1.0					Volts
Maximum Reverse Current at rated Repetitive Peak Voltage per element T _A =25°C	I _R	10.0					μA
Typical Thermal Resistance (NOTE 1)	R _{θJA}	36.0					C/W
Operating Temperature Range	T _J	-40 to +125					°C
Storage Temperature Range	T _{STG}	-40 to +125					°C

NOTES:

1. Thermal Resistance from Junction to Ambient mounted on P.C Board at .375" (9.5mm) Lead Lengths with 0.2" x 0.2" (5.5mm x 5.5mm) Copper Pads.

RATINGS AND CHARACTERISTIC CURVES B40C THRU B380C 800G

FIG. 1 - DERATING CURVE FOR OUTPUT RECTIFIED CURRENT FOR B40C 800G...B12C 800G

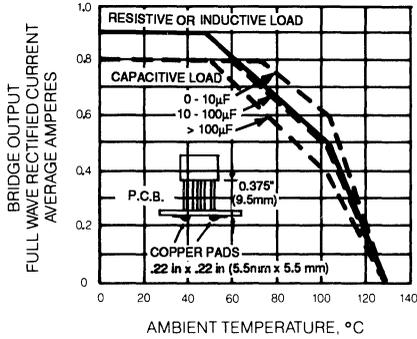


FIG. 2 - DERATING CURVES FOR OUTPUT RECTIFIED CURRENT B250C 800G...B380C 800G

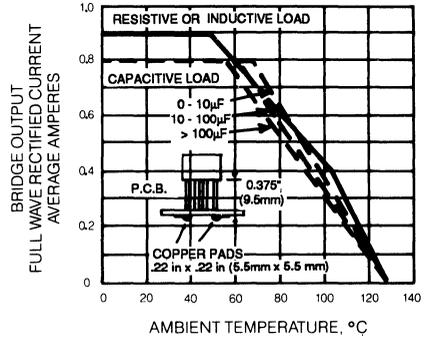


FIG. 4 - TYPICAL FORWARD CHARACTERISTICS PER BRIDGE ELEMENT

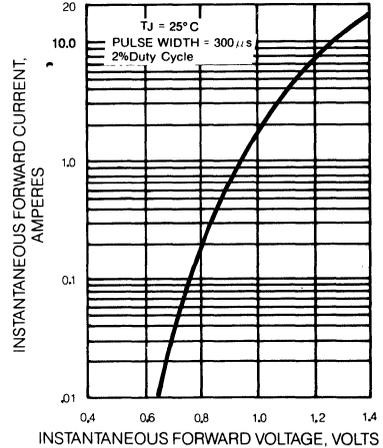


FIG. 3 - TYPICAL REVERSE CHARACTERISTICS PER BRIDGE ELEMENT

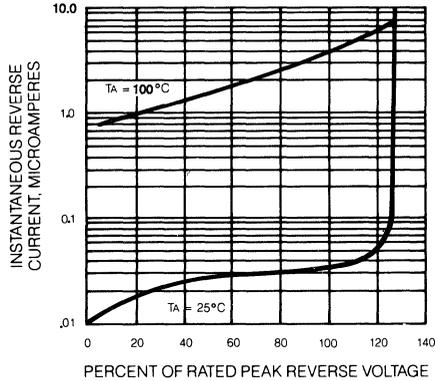


FIG. 5 - MAXIMUM NON-REPETITIVE PEAK FORWARD CURRENT PER BRIDGE ELEMENT

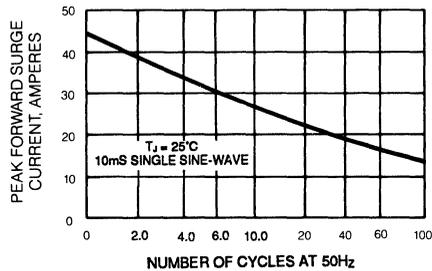
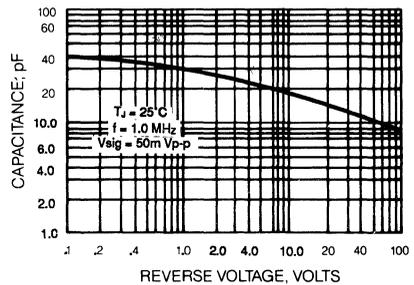


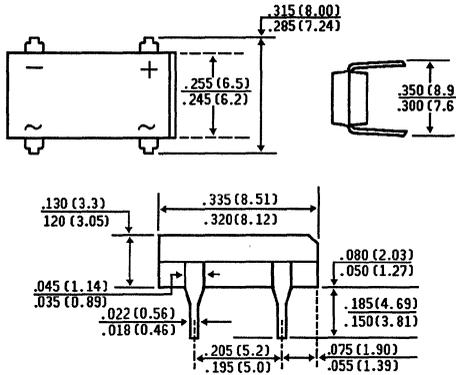
FIG. 6 - TYPICAL JUNCTION CAPACITANCE PER BRIDGE ELEMENT



B40C / B80C / B125C / B250C / B380C 800 DM

MINIATURE GLASS PASSIVATED SINGLE - PHASE BRIDGE RECTIFIER
Voltage - 65 to 600 Volts Current - 0.9 Amperes

FEATURES



- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junctions
- ◆ Surge overload rating of 45 Amperes peak
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed: 265°C / 10 seconds at 5 lbs., (2.3kg) tension



MECHANICAL DATA

- Case:** Molded plastic
Terminals: Plated Leads solderable per MIL-STD-202, Method 208
Polarity: Polarity symbols marked on body
Mounting Position: Any
Weight: 0.04 ounce, 1.0 gram

Dimensions in inches and (millimeters)

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
50 Hz or 60 Hz, resistive or inductive load.

	SYMBOLS	B40	B80	B125	B250	B380	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	65	125	200	400	600	Volts
Maximum RMS Input Voltage R + C-Load	V _{RMS}	40	80	125	250	380	Volts
Maximum Average Forward Output Current for free air operation at T _A =45°C R + L-Load C - Load	I _(AV)	0.9					Amps
		0.8					
Maximum DC Blocking Voltage	V _{DC}	65	125	200	400	600	Volts
Maximum Repetitive Peak Reverse Voltage	V _{RRM}	90	180	300	600	900	Volts
Maximum Peak Working Voltage	V _{RWM}	90	180	300	600	900	Volts
Maximum Non-Repetitive Peak Voltage	V _{RSM}	100	200	350	650	1000	Volts
Maximum Repetive Peak Forward Surge Current	I _{FRM}	10.0					Amps
Peak Forward Surge Current Single Sine wave on rated load at T _J =125°C	I _{FSM}	45.0					Amps
Rating for Fusing at T _J =125°C (t<100ms)	I ² t	10.0					A ² S
Minimum Series Resistor C-Load V _{RMS} = + 10%	R _t	1.0	2.0	4.0	8.0	12.0	Ohms
Maximum Load Capacitance +50% -10%	CL	5000	2500	1000	500	200	μF
Maximum Instantaneous Forward Voltage Drop per element at 0.9A	V _F	1.0					Volts
Maximum Reverse Current at rated Repetitive Peak Voltage per element T _A = 25°C	I _R	10.0					μA
Typical Thermal Resistance (NOTE 1)	R _{θJA}	40.0					°C/W
Operating Temperature Range	T _J	-40 to +125					°C
Storage Temperature Range	T _{STG}	-40 to +150					°C

NOTES:

1. Thermal Resistance from Junction to Ambient mounted on P.C Board 0.5" x 0.5" (13mm x 13mm) Copper pads.

RATINGS AND CHARACTERISTIC CURVES B40C THRU B380C 800 DM

FIG 1 - DERATING CURVE FOR OUTPUT RECTIFIED CURRENT B40C 800DM...B125C 800DM

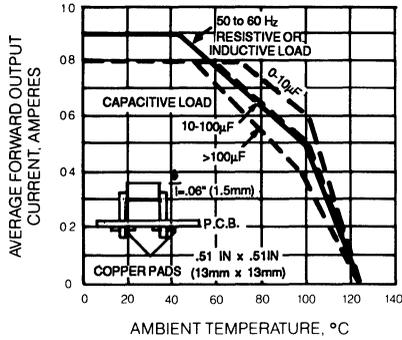


FIG. 2 - DERATING CURVE FOR OUTPUT RECTIFIED CURRENT B40C 800DM...B125C 800DM

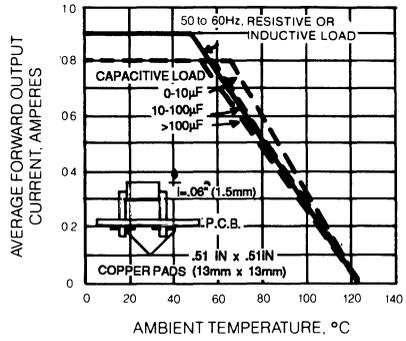


FIG. 3 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER BRIDGE ELEMENT

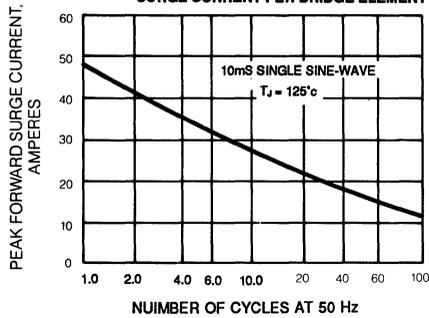


FIG. 4 — TYPICAL FORWARD CHARACTERISTICS PER BRIDGE ELEMENT

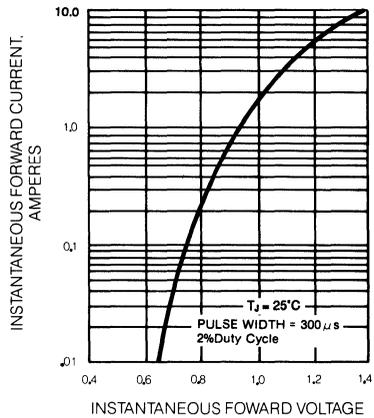


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER BRIDGE ELEMENT

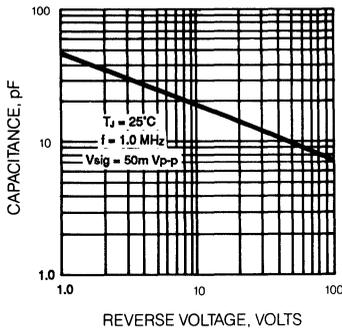
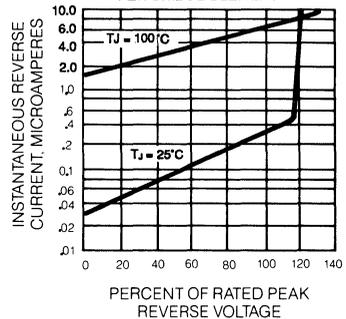


FIG. 6 — TYPICAL REVERSE CHARACTERISTICS PER BRIDGE ELEMENT

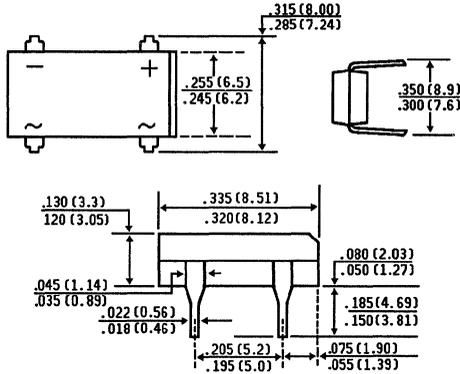


DF005M THRU DF10M

MINIATURE GLASS PASSIVATED SINGLE - PHASE BRIDGE RECTIFIER VOLTAGE - 50 to 1000 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic material used carries Underwriters Laboratory flammability recognition 94V-0
- ◆ Glass passivated chip junctions
- ◆ Surge overload rating of 50 Amperes peak
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed: 265°C /10 seconds at 5 lbs., (2.3kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: Polarity symbols marked on body

Weight: 0.04 ounce, 1.0 gram

Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

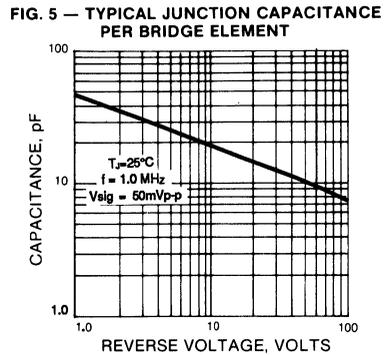
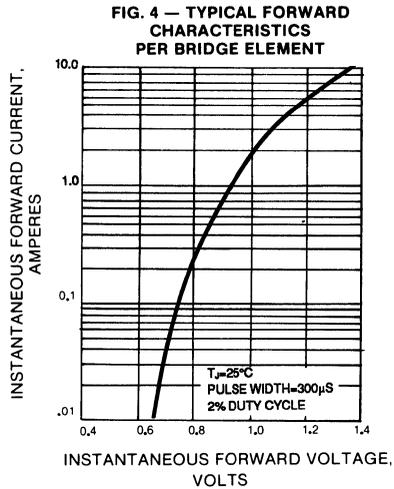
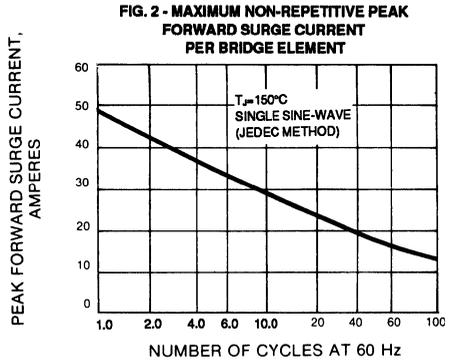
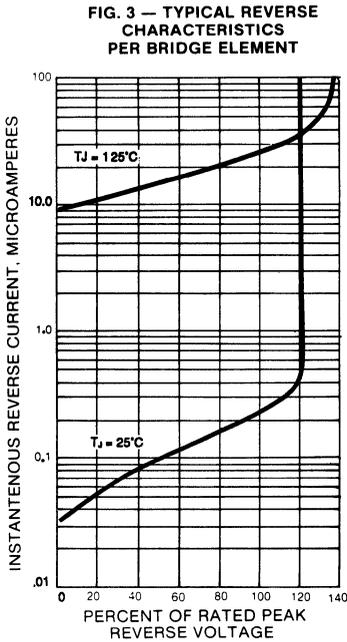
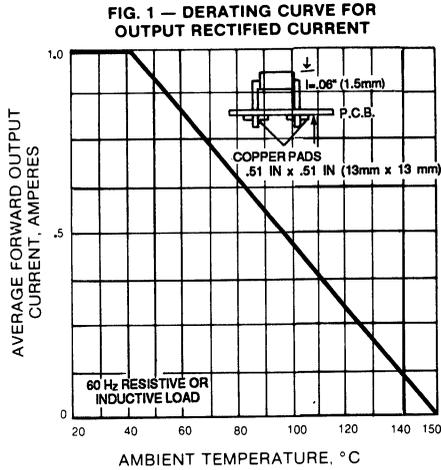
Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load.

	SYMBOLS	DF 005M	DF 01M	DF 02M	DF 04M	DF 06M	DF 08M	DF 10M	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Output Rectified Current at T _A =40°C	I _(AV)	1.0							Amps
Peak Forward Surge Current Single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	50.0							Amps
Rating for fusing (t<8.35ms)	I ² t	10.0							A ² s
Maximum Instantaneous Forward Voltage drop per element at 1.0A	V _F	1.1							Volts
Maximum Reverse Current at Rated DC Blocking Voltage per element	I _R	10.0							μA
Typical Junction Capacitance per element (NOTE 1)	C _J	25.0							pf
Typical Thermal Resistance (NOTE 2)	R _{θJA}	40.0							°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150							°C

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Thermal Resistance from Junction to Ambient mounted on P.C. Board with 0.5" x 0.5" (13mm x13mm) Copper Pads.

RATINGS AND CHARACTERISTIC CURVES DF005M THRU DF10M

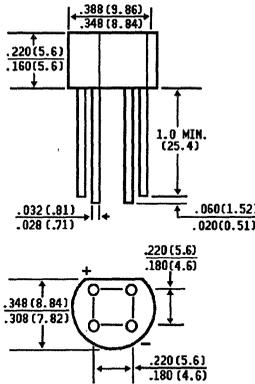


B40C / B80C / B125C / B250C / B380C 1000G

**MINIATURE GLASS PASSIVATED
SINGLE - PHASE BRIDGE RECTIFIER**
Voltage - 65 to 600 Volts Current - 1.0 Ampere

FEATURES

- ◆ Glass passivated chip junctions
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ High case dielectric strength
- ◆ Typical I_R less than $0.1 \mu A$
- ◆ High overload surge current
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed: $265^\circ C/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Plated Leads solderable per MIL-STD-202, Method 208

Mounting Position: Any

Weight: 0.05 ounce, 1.3 gram

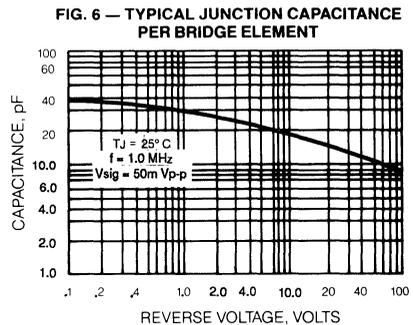
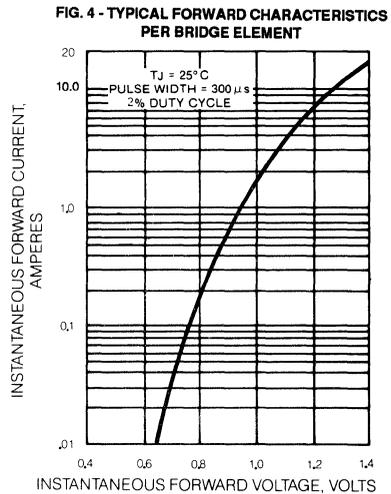
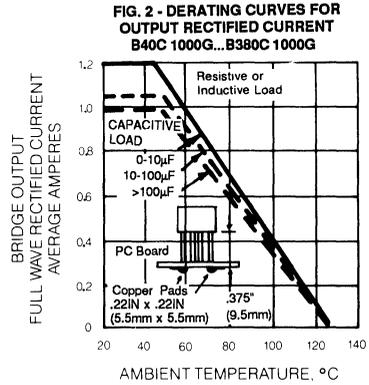
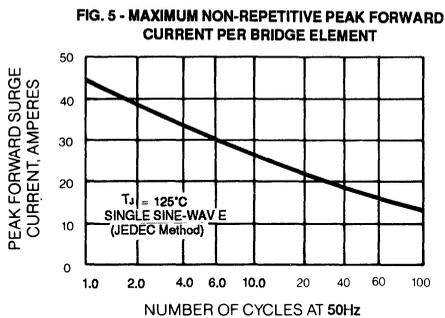
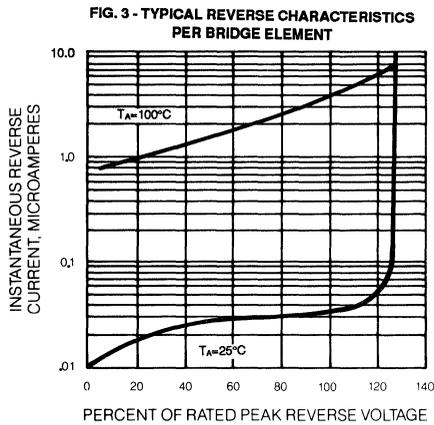
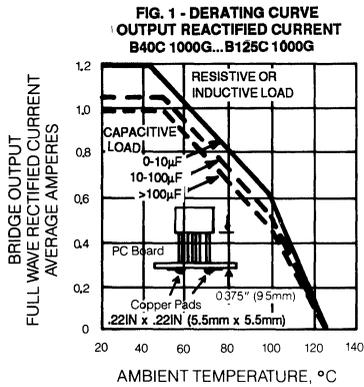
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at $25^\circ C$ ambient temperature unless otherwise specified. 50Hz or 60 Hz, resistive or inductive load.

	SYMBOLS	B40	B80	B125	B250	B380	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	65	125	200	400	600	Volts
Maximum RMS Input Voltage R + C-Load	V_{RMS}	40	80	125	250	380	Volts
Maximum Average Forward Output Current for free air operation at $T_A=45^\circ C$ R + L-Load C - Load	$I_{(AV)}$	1.2 1.0					Amps
Maximum DC Blocking Voltage	V_{DC}	65	125	200	400	600	Volts
Maximum Repetitive Peak Reverse Voltage	V_{RRM}	90	180	300	600	800	Volts
Maximum Peak Working Voltage	V_{RWM}	90	180	300	600	900	Volts
Maximum Non-Repetitive Peak Voltage	V_{RSM}	100	200	350	600	1000	Volts
Maximum Repetive Peak Forward Surge Current	I_{FRM}	10.0					Amps
Peak Forward Surge Current Single Sine wave on rated load (JEDEC) Method) at $T_J=125^\circ C$	I_{FSM}	45.0					Amps
Rating for Fusing at $T_J=125^\circ C$ ($t < 100ms$)	I^2t	10.0					A^2S
Minimum Series Resistor C-Load $V_{RMS} = -or+ 10\%$	R_t	1.0	2.0	4.0	8.0	12.0	Ohms
Maximum Load Capacitance +50% -10%	C_L	5000	2500	1000	500	200	μF
Maximum Instantaneous Forward Voltage Drop per element at 1.0A	V_F	1.0					Volts
Maximum Reverse Current at rated Repetitive Peak Voltage per element $T_A=25^\circ C$	I_R	10.0					μA
Typical Thermal Resistance (NOTE 1)	$R_{\theta JA}$	36.0					$^\circ C/W$
Operating Temperature Range	T_J	-40 to +125					$^\circ C$
Storage Temperature Range	T_{STG}	-40 to +150					$^\circ C$

NOTES: 1. Thermal Resistance from Junction to Ambient mounted on P.C Board at .375" (9.5mm) Lead Lengths with $0.2" \times 0.2"$ (5.5mm x 5.5mm) Copper Pads.

RATINGS AND CHARACTERISTIC CURVES B40C 1000G THRU B380C 1000G



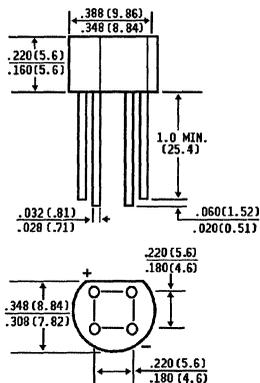
W005G THRU W10G

MINIATURE GLASS PASSIVATED SINGLE - PHASE BRIDGE RECTIFIER

VOLTAGE - 50 - 1000 Volts CURRENT - 1.5 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Glass passivated chip junctions
- ◆ Plastic material used carries Underwriters Laboratory flammability recognition 94V-O
- ◆ High case dielectric strength
- ◆ 200 Watts Avalanche Power Dissipation for 100 μ s
- ◆ Typical I_R less than 0.1 μ A
- ◆ High overload surge capability
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed: 265°C/10 seconds/.375", (9.5mm) lead length /5lbs., (2.3 kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic
Terminals: Leads solderable per MIL-STD-202, Method 208
Mounting Position: Any
Weight: 0.04 ounce, 1.1 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load.

	SYMBOLS	W 005G	W 01G	W 02G	W 04G	W 06G	W 08G	W 10G	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current at .375", (9.5mm) lead length at $T_A=25^\circ\text{C}$	$I_{(AV)}$	1.5							Amps
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0							Amps
Rating for fusing ($t < 8.3\text{ms}$)	I^2t	10.0							A^2s
Maximum Instantaneous Forward Voltage Drop per element at 1.0 Ampere	V_F	1.0							Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage per Element	T_J	5.0							μA
		500.0							μA
Typical Junction Capacitance per element (NOTE 1)	C_J	14.0							pf
Typical Thermal Resistance (NOTE 2)	$R_{\theta JA}$	36.0							$^\circ\text{C}/\text{W}$
Operating Temperature Range	T_J	-55 to +150							$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150							$^\circ\text{C}$

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Thermal Resistance from Junction to Ambient at .375", 9.5mm lead length P.C. Board mounting.

RATINGS AND CHARACTERISTIC CURVES W005G THRU W10G

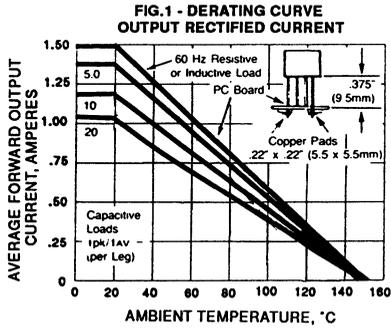


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER BRIDGE ELEMENT

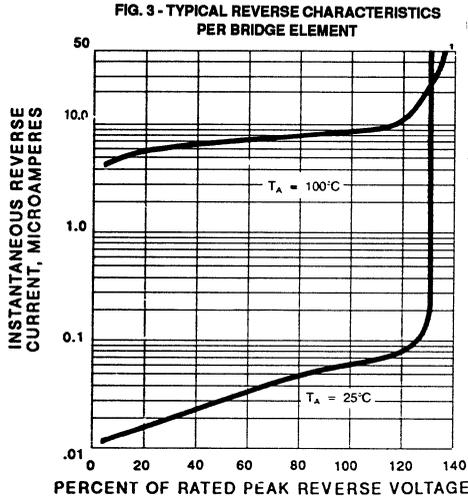
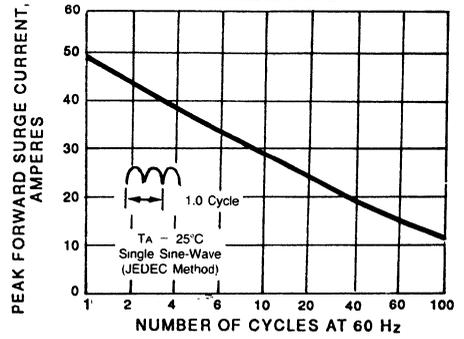


FIG. 4 - TYPICAL FORWARD CHARACTERISTICS PER BRIDGE ELEMENT

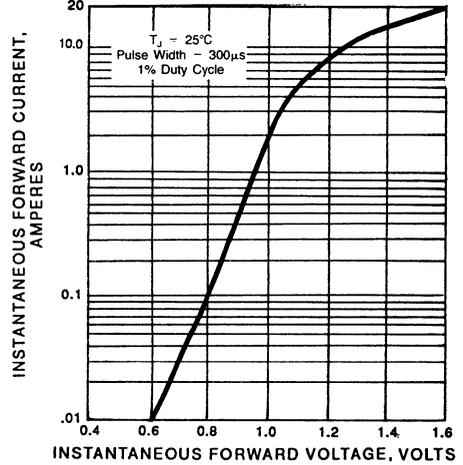


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER BRIDGE ELEMENT

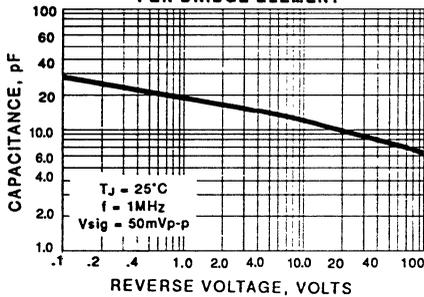
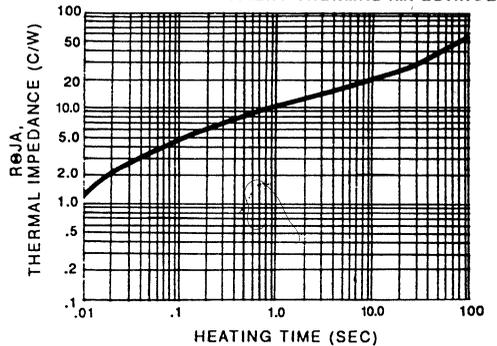


FIG. 6 - TYPICAL TRANSIENT THERMAL IMPEDANCE



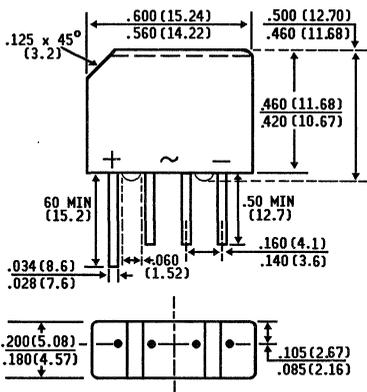
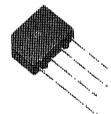
**GENERAL
INSTRUMENT**

KBP005M THRU KBP10M SERIES 3N246 THRU 3N252 SERIES

MINIATURE GLASS PASSIVATED
SINGLE - PHASE RECTIFIER BRIDGE
VOLTAGE - 50 to 1000 Volts CURRENT - 1.5 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic package has Underwriters Laboratory flammability recognition 94V-O
- ◆ Glass passivated chip junctions
- ◆ Surge overload rating - 30 Amperes peak
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed: 265°C /10 seconds at 5 lbs., (2.3kg) tension



Polarity shown on front side of case:
positive lead by beveled corner

Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Polarity: Polarity symbols marked on case

Mounting position: Any

Weight : 0.06 ounce, 1.70 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

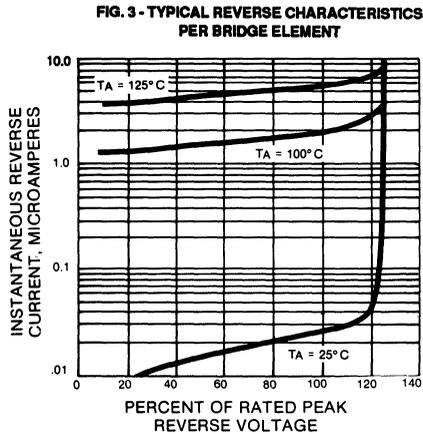
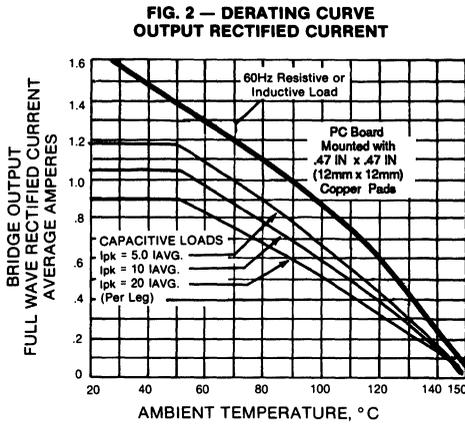
Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load.

	SYMBOLS	KBP005M 3N246	KBP010M 3N247	KBP020M 3N248	KBP040M 3N249	KBP060M 3N250	KBP080M 3N251	KBP100M 3N252	UNITS
* Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
* Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
* Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Output Rectified Current at T _A = 40°C	I _(AV)	1.5							Amps
* Peak Forward Surge Current Single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	30.0							Amps
Rating for fusing (t<8.35ms)	I ² t	10.0							A ² s
* Maximum Instantaneous Forward Voltage drop per element at 1.0A 1.57A	V _F	1.0 1.3							Volts
* Maximum DC Reverse Current at Rated DC Blocking Voltage per element T _A =25°C T _A =125°C	I _R	10.0 500.0							µA
Typical Junction Capacitance per element (NOTE 1)	C _J	15.0							pf
Typical Thermal Resistance (NOTE 2)	R _{θJA}	28.0							°C/W
*Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150							°C

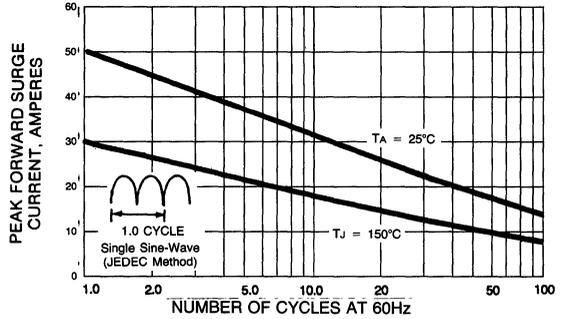
NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.
2. Thermal Resistance from Junction to Ambient mounted on P.C. Board with, .47" x .47" (12mm x12mm) Copper Pads.
* JEDEC Registered Values

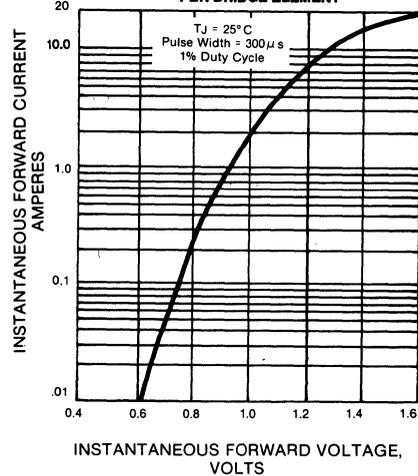
**RATINGS AND CHARACTERISTIC CURVES KBP005M THRU KBP10M /
3N246 THRU 3N252 SERIES**



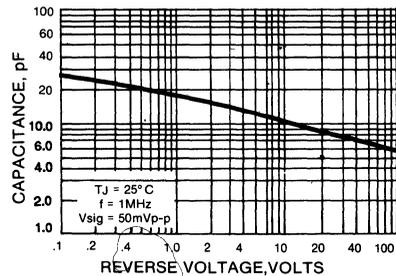
**FIG. 2 — MAXIMUM NON-REPETITIVE
PEAK FORWARD SURGE CURRENT**



**FIG. 4 - TYPICAL FORWARD CHARACTERISTICS
PER BRIDGE ELEMENT**



**FIG. 5 — TYPICAL JUNCTION CAPACITANCE
PER BRIDGE ELEMENT**

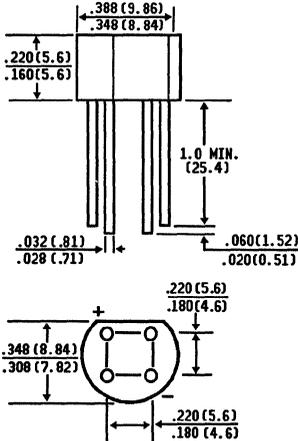


B40C/ B80C/ B125C/ B250C/ B380C 1500G SERIES

MINIATURE GLASS PASSIVATED SINGLE - PHASE BRIDGE RECTIFIER
Voltage - 65 to 600 Volts Current - 1.5 Amperes

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ High case dielectric strength
- ◆ Typical I_R less than $0.1 \mu A$
- ◆ High overload surge current
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed: $250^\circ C/10$ seconds/.375", (9.5mm) lead length at 5 lbs., (2.3kg) tension



Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Plated Leads solderable per MIL-STD-202, Method 208

Mounting Position: Any

Weight: 0.04 ounce, 1.1 gram

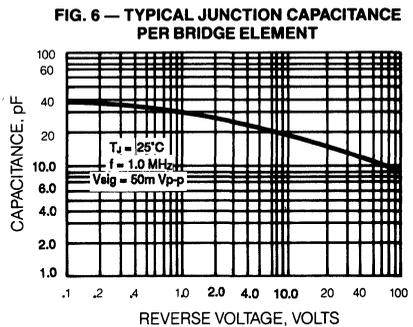
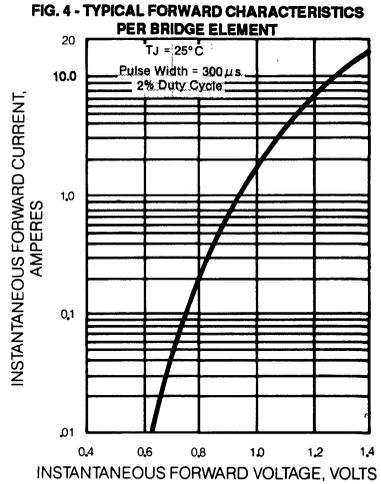
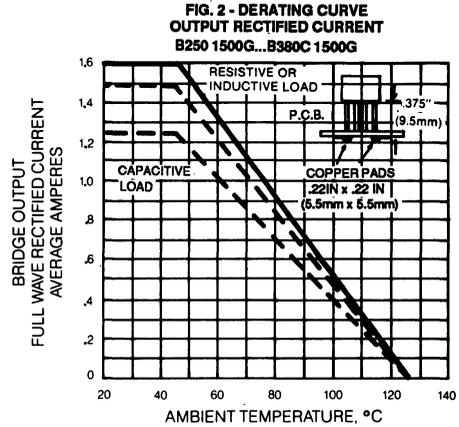
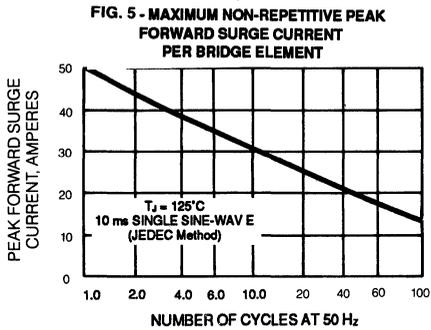
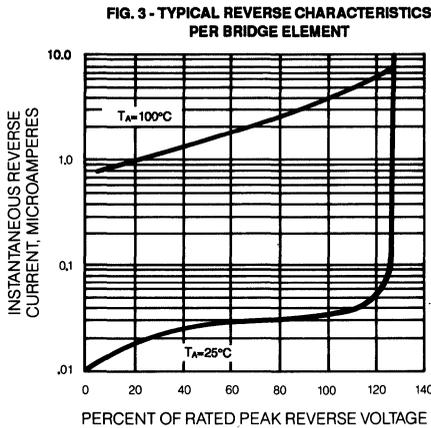
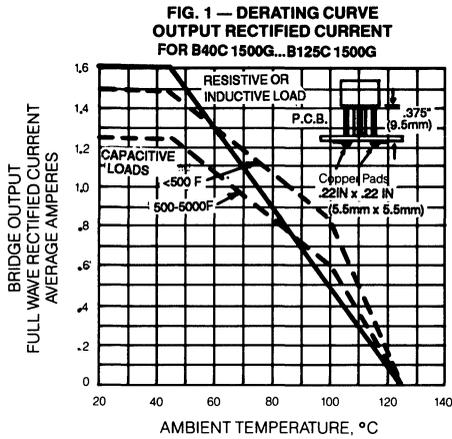
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at $25^\circ C$ ambient temperature unless otherwise specified. 50 Hz or 60 Hz, resistive or inductive load.

	SYMBOLS	B40	B80	B125	B250	B380	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	65	125	200	400	600	Volts
Maximum RMS Input Voltage R + C-Load	V_{RMS}	40	80	125	250	380	Volts
Maximum Average Forward Output Current for free air operation at $T_A = 45^\circ C$	$I_{(AV)}$	1.6					Amps
		1.5					Amps
Maximum DC Blocking Voltage	V_{DC}	65	125	200	400	600	Volts
Maximum Repetitive Peak Reverse Voltage	V_{RRM}	90	180	300	600	800	Volts
Maximum Peak Working Voltage	V_{RWM}	90	180	300	600	800	Volts
Maximum Non-Repetitive Peak Voltage	V_{RSM}	100	200	350	650	1000	Volts
Maximum Repetive Peak Forward Surge Current	I_{FRM}	10.0					Amps
Peak Forward Surge Current Single Sine wave on rated load at $T_J = 125^\circ C$	I_{FSM}	50.0					Amps
Rating for Fusing at $T_J = 125^\circ C$ ($t < 100ms$)	I^2t	12.5					A^2S
Min. Series Resistor C-Load $V_{RMS} = +$ or -10%	R_t	1.0	2.0	4.0	8.0	12.0	ohms
Maximum Load Capacitance +50% -10%	C_L	5000	2500	1000	500	200	μF
Maximum Instantaneous Forward Voltage Drop per element at 1.5A	V_F	1.0					Volts
Maximum Reverse Current at rated Repetitive Peak Voltage per element $T_A = 25^\circ C$	I_R	10.0					μA
Typical Thermal Resistance (NOTE 1)	$R_{\theta JA}$	36.0					$^\circ C/W$
Operating Temperature Range	T_J	-40 to +125					$^\circ C$
Storage Temperature Range	T_{STG}	-40 to +150					$^\circ C$

NOTES: 1. Thermal Resistance from Junction to Ambient mounted on P.C Board at .375" (9.5mm) Lead Lengths with $0.2" \times 0.2"$ (5.5mm x 5.5mm) Copper Pads.

RATINGS AND CHARACTERISTIC CURVES B40C 1500G THRU B380C 1500G

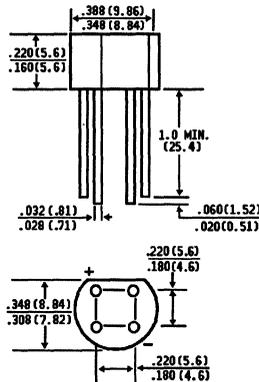


2W005G THRU 2W10G

MINIATURE GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER VOLTAGE - 50 to 1000 Volts CURRENT - 2.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Glass passivated chip junctions
- ◆ Plastic package has Underwriters Laboratory flammability recognition 94V-0
- ◆ High case dielectric strength
- ◆ Typical I_R less than $0.5 \mu A$
- ◆ High overload surge capability
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed: $265^\circ C$ for /10 seconds / .375" (9.5mm) lead lengths/5lbs., (2.3 kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Leads Solderable per MIL-STD-202, Method 208

Mounting Position: Any

Weight: 0.05 ounce, 1.3 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at $25^\circ C$ ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load.

SYMBOLS	2W 005G 2W 01G 2W 02G 2W 04G 2W 06G 2W 08G 2W 10G							UNITS	
	50	70	100	140	200	280	400		
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current .375", (9.5mm) lead length (SEE FIG. 1)	$I_{(AV)}$	2.0						Amps	
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	60.0						Amps	
Rating for fusing (t<8.3ms)	I^2t	15.0						A^2s	
Maximum Instantaneous Forward Voltage drop per element at 2.0 Amperes	V_F	1.1						Volts	
Maximum DC Reverse Current at Rated DC Blocking Voltage per element	I_R	5.0 500.0						μA μA	
Typical Junction Capacitance per element (NOTE 1)	C_J	40.0			20.0			pf	
Typical Thermal Resistance (NOTE 2)	$R_{\theta JA}$	40.0						$^\circ C/W$	
Operating Temperature Range	T_J	-55 to + 150						$^\circ C$	
Storage Temperature Range	T_{STG}	-55 to +150						$^\circ C$	

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 volts.
2. Thermal Resistance from Junction to Ambient at .375", 9.5mm lead length for P.C. Board mounting.

RATINGS AND CHARACTERISTIC CURVES 2W005G THRU 2W10G

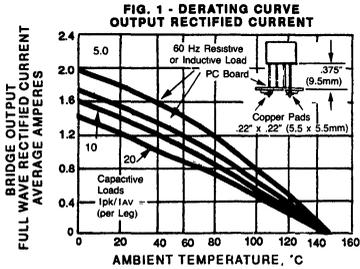


FIG. 3 - TYPICAL REVERSE CHARACTERISTICS PER BRIDGE ELEMENT

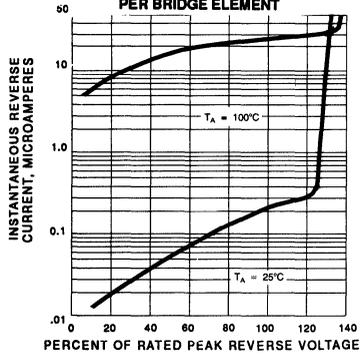


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER BRIDGE ELEMENT

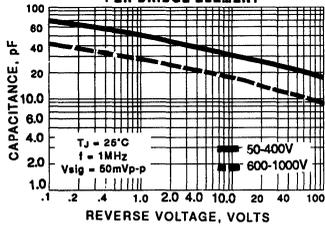


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER BRIDGE ELEMENT

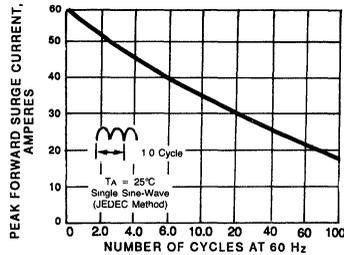


FIG. 4 - TYPICAL FORWARD CHARACTERISTICS PER BRIDGE ELEMENT

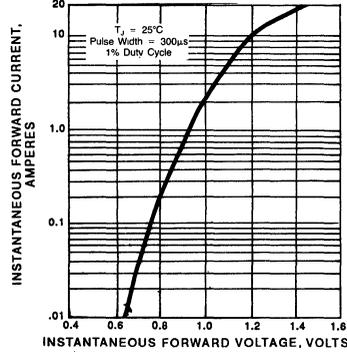
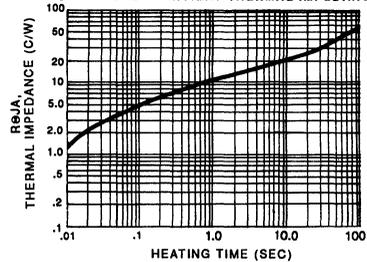


FIG. 6 - TYPICAL TRANSIENT THERMAL IMPEDANCE

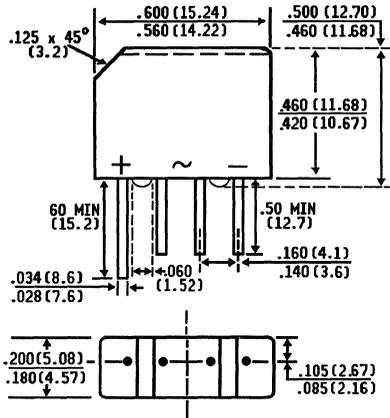


2KBP005M THRU 2KBP10M SERIES 3N253 THRU 3N259 SERIES

GLASS PASSIVATED SINGLE - PHASE BRIDGE RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 2.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic package has Underwriters Laboratory flammability recognition 94V-O
- ◆ Glass passivated chip junctions
- ◆ Typical I_R less than $0.1 \mu A$
- ◆ Built-in printed circuit board stand-offs
- ◆ High case dielectric strength
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed:
265°C / 10 seconds at 5 lbs., (2.3kg) tension



Polarity shown on front side of case:
positive lead by beveled corner

Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Plated lead solderable per MIL-STD-202, Method B08

Mounting position: Any

Weight: 0.06 ounce, 1.70 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz Resistive or inductive load.

	SYMBOLS	2KBP	2KBP	2KBP	2KBP	2KBP	2KBP	2KBP	UNITS
		005M 3N253	01M 3N254	02M 3N255	04M 3N256	06M 3N257	08M 3N258	10M 3N259	
*Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
*Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
*Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
* Maximum Average Forward Output Rectified Current at $T_A=55^\circ C$	$I_{(AV)}$	2.0							Amps
*Peak Forward Surge Current Single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	60.0							Amps
Rating for fusing ($t < 8.35ms$)	I^2t	15.0							A ² s
* Maximum Instantaneous Forward Voltage drop per element at 3.14A	V_F	1.1							Volts
* Maximum DC Reverse Current at Rated DC Blocking Voltage per element $T_A=25^\circ C$ $T_A=125^\circ C$	I_R	10.0 500.0							μA
Typical Junction Capacitance per element (NOTE 1)	C_J	25.0							pf
Typical Thermal Resistance (NOTE 2)	$R_{\theta JA}$	30.0							°C/W
*Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +165							°C

NOTES:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

2. Thermal Resistance from Junction to Ambient mounted on P.C. Board with, .47" x .47" (12mm x 12mm) Copper Pads.

* JEDEC Registered Values

RATINGS AND CHARACTERISTIC CURVES
3N253 THRU 3N259 / 2KBP005M THRU 2KBP10M

FIG. 1—DERATING CURVE FOR OUTPUT RECTIFIED CURRENT

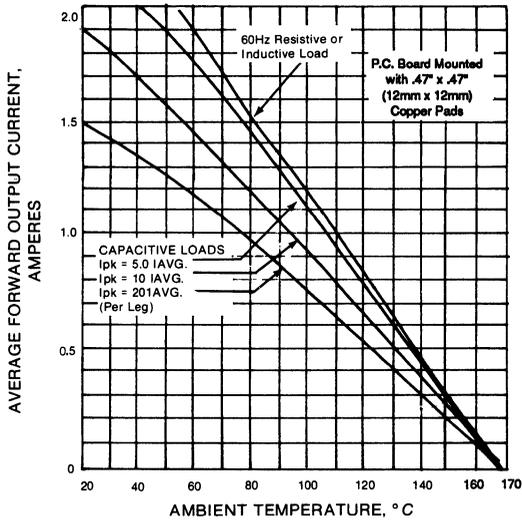


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER BRIDGE ELEMENT

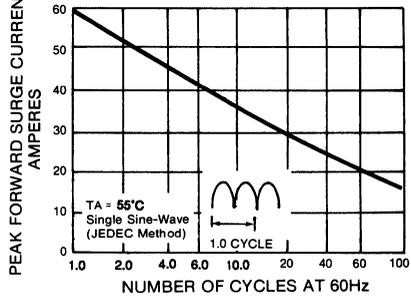


FIG. 4 - TYPICAL FORWARD CHARACTERISTICS PER BRIDGE ELEMENT

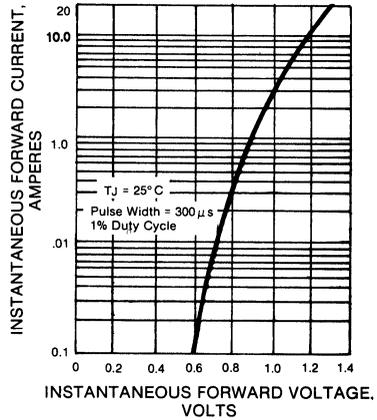


FIG. 3 - TYPICAL REVERSE CHARACTERISTICS PER BRIDGE ELEMENT

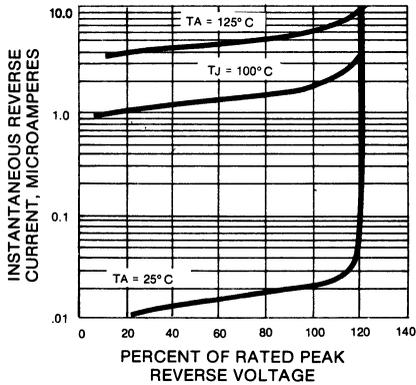
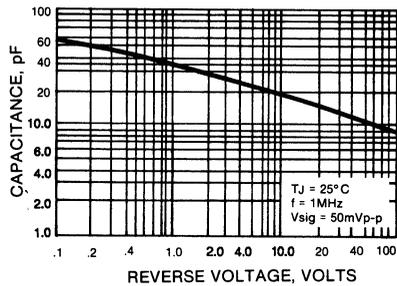


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER BRIDGE ELEMENT

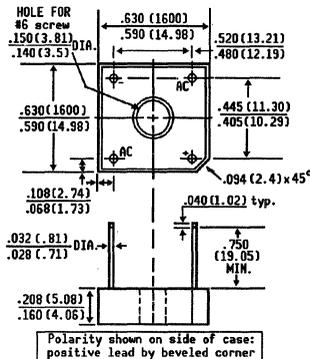
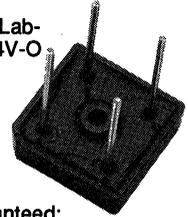


GBPC1005 THRU GBPC110

GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Glass passivated chip junctions
- ◆ Plastic package has underwriters Laboratory flammability recognition 94V-0
- ◆ High case dielectric strength of 1500 VRMS
- ◆ Typical I_T less than 0.1 μ A
- ◆ High surge current capability
- ◆ Ideal for printed circuit boards
- ◆ High temperature soldering guaranteed: 265°C /10 seconds/ .375" (9.5mm) lead lengths /5lbs., (2.3 kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Plated leads solderable per MIL-STD-202, Method 208

Mounting Position: Bolt down on heat-sink with silicone thermal compound between bridge and mounting surface for maximum heat transfer with number 6.0 screw

Mounting Torque: 5.0 in. - lb. max.

Weight: 0.1 ounces, 2.8 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

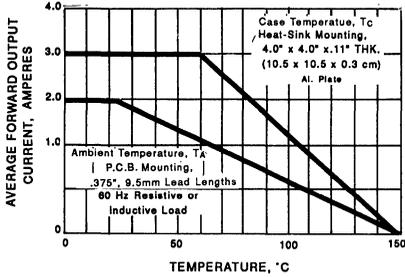
	SYMBOLS	GBPC 1005	GBPC 101	GBPC 102	GBPC 104	GBPC 106	GBPC 108	GBPC 110	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Bridge Input Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Output Current at T _C = 60°C (NOTE 1) T _A = 25°C (NOTE 2)	I <sub(av)< sub=""></sub(av)<>				3.0				Amps
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}				60.0				Amps
Rating for fusing (t<8.3ms)	I ² t				15.0				A ² s
Maximum Instantaneous Forward Voltage Drop per element at 1.5 Amperes	V _F				1.0				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage per Element T _A = 25°C T _A =125°C	I _R				5.0				μA
Typical Junction Capacitance per element (NOTE 3)	C _J				21.0				pf
Typical Thermal Resistance from Junction to Case (NOTE 1)	R _{θJC}				8.0				°C/W
Operating Temperature Range	T _J				-55 to +150				°C
Storage Temperature Range	T _{STG}				-55 to +150				°C

NOTES:

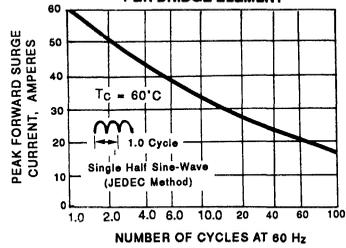
1. Unit mounted on 4.0" x 4.0" x .11" thick (10.5 x 10.5 x 0.3 cm) Al. plate.
2. Unit mounted on P.C. board at .375", 9.5mm lead lengths with .5"x.5" (12mmx12mm) Copper pads.
3. Measured at 1 MHz and applied reverse voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES GBPC1005 THRU GBPC110

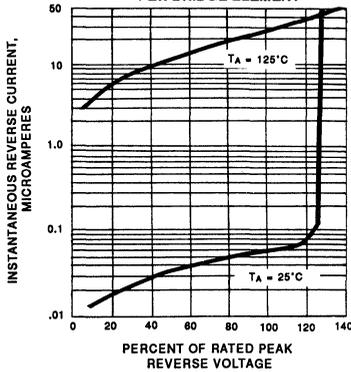
**FIG. 1 - DERATING CURVE
OUTPUT RECTIFIED CURRENT**



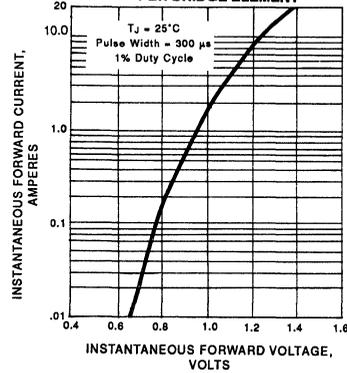
**FIG. 2 - MAXIMUM NON-REPETITIVE PEAK
FORWARD SURGE CURRENT
PER BRIDGE ELEMENT**



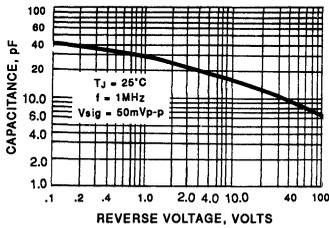
**FIG. 3 - TYPICAL REVERSE CHARACTERISTICS
PER BRIDGE ELEMENT**



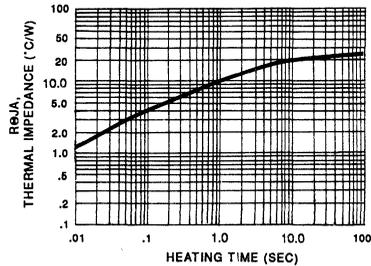
**FIG. 4 - TYPICAL FORWARD CHARACTERISTICS
PER BRIDGE ELEMENT**



**FIG. 5 - TYPICAL JUNCTION CAPACITANCE
PER BRIDGE ELEMENT**



**FIG. 6 - TYPICAL TRANSIENT
THERMAL IMPEDANCE**

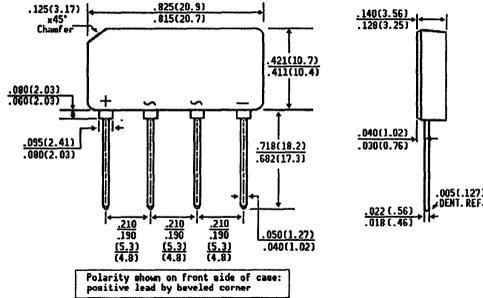


GBL005 THRU GBL10

GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER
VOLTAGE - 50 - 1000 Volts CURRENT - 4.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Glass passivated chip junctions
- ◆ Plastic package has Underwriters Laboratory flammability recognition 94V-0
- ◆ High case dielectric strength
- ◆ Typical I_R less than 0.1 μA
- ◆ High surge capability
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed:
265°C/10 seconds/.375"(9.5mm) lead lengths at 5 lbs., (2.3kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Reliable low cost construction utilizing molded plastic technique

Terminals: Plated leads solderable per MIL-STD-202, Method 208

Mounting Position: Any

Weight: .071 ounces, 2.0 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

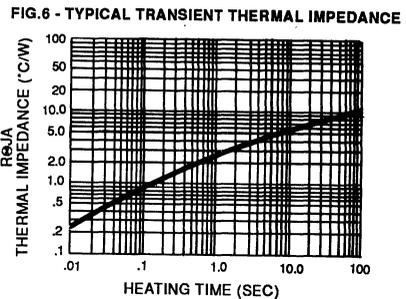
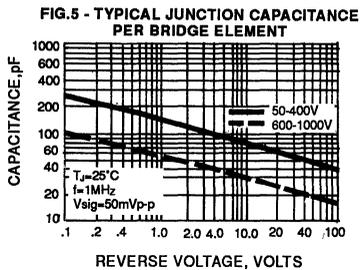
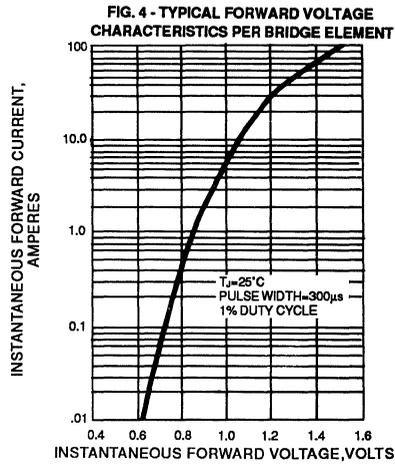
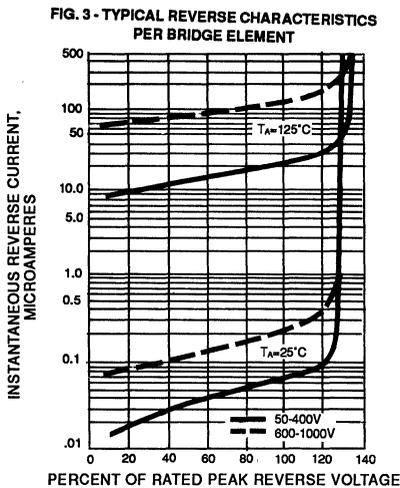
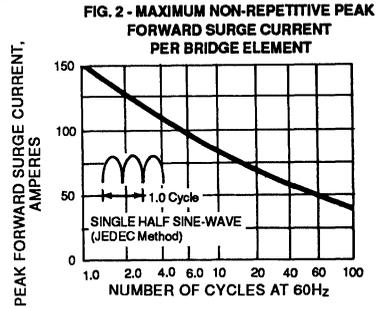
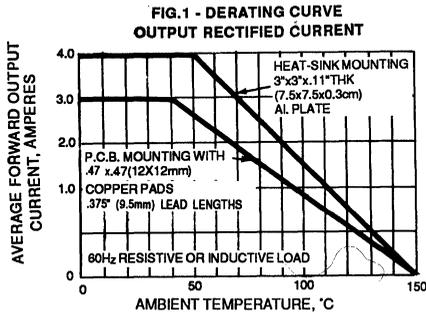
Ratings at 25°C ambient temperature unless otherwise specified.
60Hz resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	GBL	GBL	GBL	GBL	GBL	GBL	GBL	UNITS
		005	01	02	04	06	08	10	
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Output Current at $T_A=50^\circ C$ (NOTE 1)	$I_{(AV)}$	4.0							Amps
Peak Forward Surge Current, Single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	3.0							Amps
Rating for fusing ($t < 8.3ms$)	I^2t	150.0							A^2s
Maximum Instantaneous Forward Drop per element at 4.0 Amperes	V_F	93.0							Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage per element $T_A=25^\circ C$	I_R	5.0							μA
Typical Junction Capacitance per element (NOTE 3)	C_J	500.0					40.0		pf
Typical Thermal Resistance from Junction to Ambient (NOTE 1)	$R_{\theta JA}$	95.0							$^\circ C/W$
Operating Temperature Range	T_J	10.0							$^\circ C$
Storage Temperature Range	T_{STG}	-55 to +150							$^\circ C$

NOTES:

1. Unit mounted on 3.0"x3.0"x.11" thick (7.5x7.5x0.3 cm) Al. plate.
2. Unit mounted on P.C. Board at .375", 9.5mm lead lengths with .5"x.5" (12mmx12mm) copper pads.
3. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

RATINGS AND CHARACTERISTIC CURVES GBL005 THRU GBL10

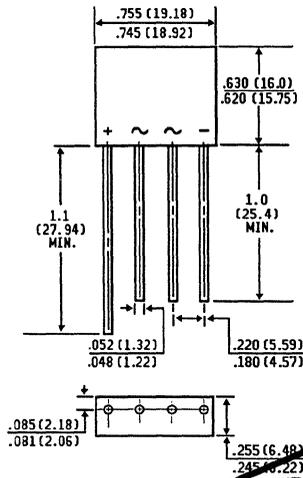


KBL005 THRU KBL10

GLASS PASSIVATED SINGLE -PHASE BRIDGE RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 4.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic material used carries Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass Passivated chip junctions
- ◆ Ideal for printed circuit board
- ◆ Reliable low cost construction utilizing molded plastic technique
- ◆ Surge overload rating of 200 Amperes peak
- ◆ High temperature soldering guaranteed at 250° C / 10 seconds, .375" (9.5mm) lead length / 5lbs., (2.3 kg) tension



Dimensions in inches
 and millimeters

REPLACED BY GBL

MECHANICAL DATA

Case: Reliable low cost construction utilizing molded plastic technique

Terminals: Plated Lead solderable per MIL-STD-202, Method 208

Mounting Position: Any

Weight: 0.2 ounce, 5.6 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at 25° C ambient temperature unless otherwise specified
 Resistive or inductive load, 60 Hz.
 For capacitive load, derate current by 20%

	SYMBOLS	KBL 005	KBL 01	KBL 02	KBL 04	KBL 06	KBL 08	KBL 10	UNITS	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts	
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts	
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts	
Maximum Average Forward Output Current at T _A = 50°C	I(AV)								4.0	Amps
Peak Forward Surge Current Single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}								200.0	Amps
Maximum Instantaneous Forward Voltage drop per element at 4.0A	V _F								1.1	Volts
Maximum DC Reverse Leakage at Rated DC Blocking Voltage per leg	I _R								5.0	µA
									1.0	mA
Typical Thermal Resistance per leg (NOTE 1)	R _{θJC}								16.0	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}								-50 to +150	°C

NOTES:

1. Thermal Resistance from Junction to Case with units mounted on a P.C. Board with .5"x.5" (12mmx12mm) and .375 (9.5mm) lead lengths

RATINGS AND CHARACTERISTIC CURVES KBL005 THRU KBL10

FIG. 1 — DERATING CURVE FOR OUTPUT RECTIFIED CURRENT

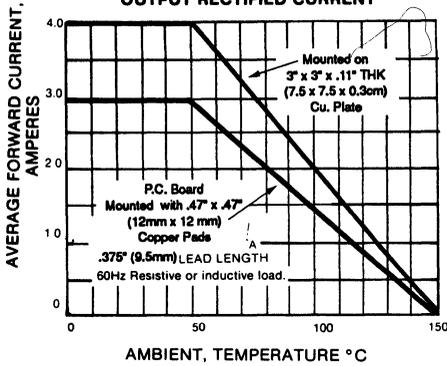


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER ELEMENT

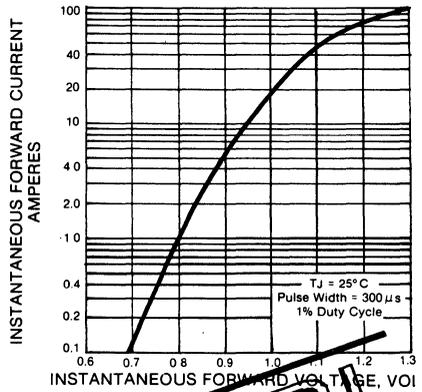


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

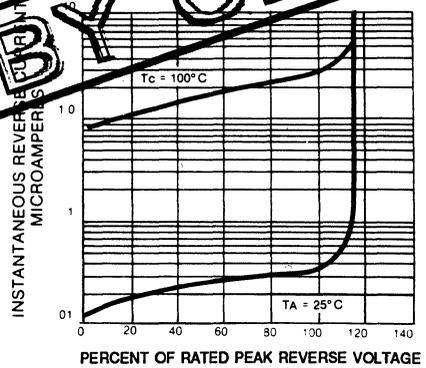


FIG. 3 — MAXIMUM NON-REPEITIVE PEAK FORWARD SURGE CURRENT

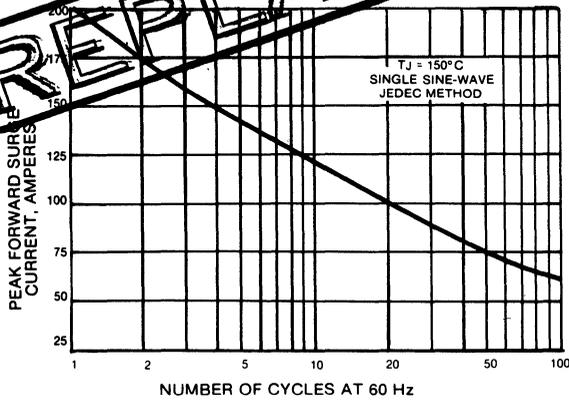
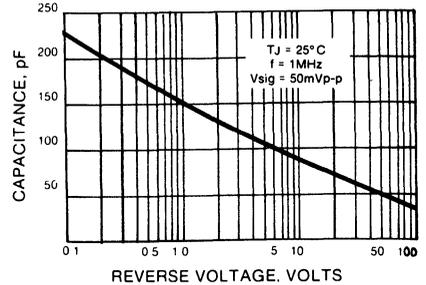


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER ELEMENT



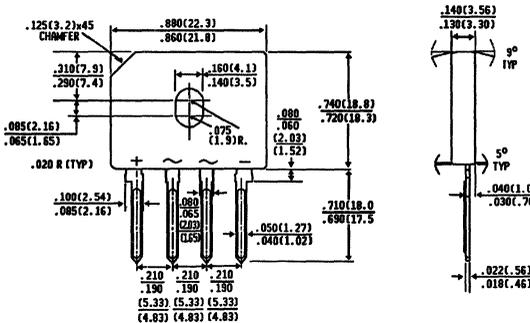
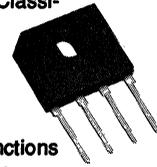
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GBU4A THRU GBU4M

GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 4.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ High case dielectric strength of 1500 VRMS
- ◆ Ideal for printed circuit board mounting
- ◆ Glass passivated chip junctions
- ◆ High surge overload rating
- ◆ High temperature soldering guaranteed: 265°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3kg) tension



Polarity shown on front side of case, positive lead by beveled corner

Dimensions in inches
and
(millimeters)

MECHANICAL DATA

- Case:** Reliable low cost construction utilizing molded plastic technique
Terminals: Plated leads solderable per MIL-STD-202, Method 208
Mounting Position: Any
Mounting Torque: 5 in. lb. max.
Weight: 0.015 ounce, 4.0 gram

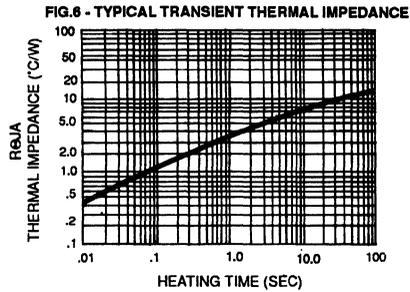
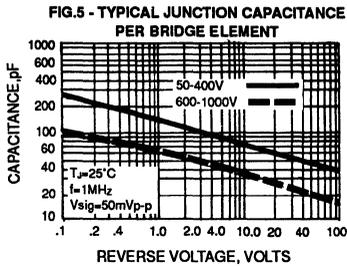
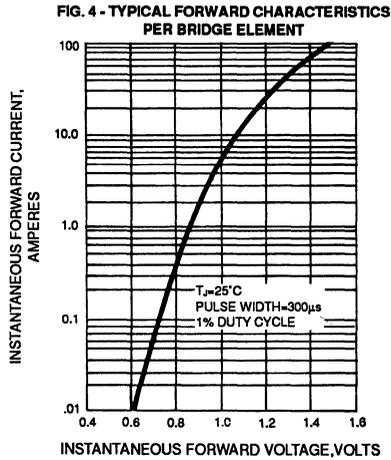
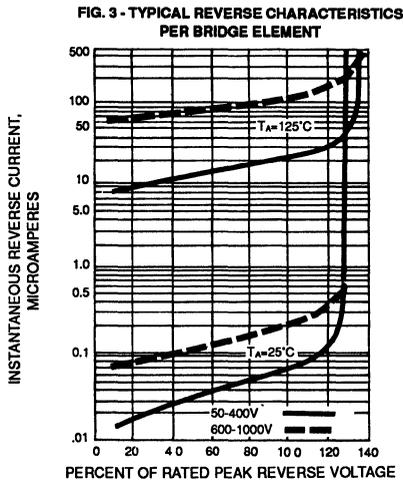
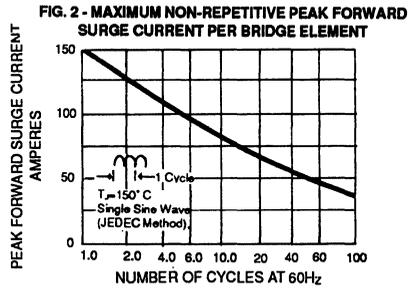
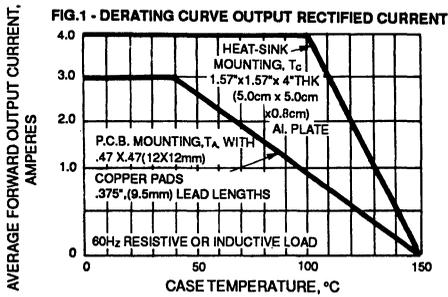
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load, 60 Hz. For capacitive load, derate current by 20%.

	SYMBOLS	GBU							UNITS
		4A	4B	4D	4G	4J	4K	4M	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Output Current at T _C =100°C (NOTE 1) T _A =40°C (NOTE 2)	I _(AV)	4.0							Amps
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	150.0							Amps
Rating for fusing (t<8.3ms)	I ² t	93.0							A ² s
Maximum Instantaneous Forward Voltage drop per element at 4.0A	V _F	1.0							Volts
Maximum DC Reverse Leakage Current at T _J =25°C	I _R	5.0							μA
Rated DC Blocking Voltage per element at T _J =125°C	I _R	500.0							μA
Typical Junction Capacitance per element (NOTE 3)	C _J	101.0					46.0		pf
Typical Thermal Resistance from Junction to Case (NOTE 1) (per element)	R _{θJC}	2.5							°C/W
Junction to Ambient (NOTE 2)	R _{θJA}	18.0							°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150							°C

- Notes:** 1. Unit case mounted on 1.6"x1.6"x0.06" THK (4.0 x 4.0 x 0.15 cm) Al. Plate.
 2. Units mounted on P.C. Board with .5"x.5" (12mm x 12mm) copper pads and .375"(9.5mm) lead lengths.
 3. Measured at 1.0 MHz and applied reverse voltage of 4.0 volts.
 4. Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with number 6.0 screw.

RATINGS AND CHARACTERISTIC CURVES GBU4A THRU GBU4M

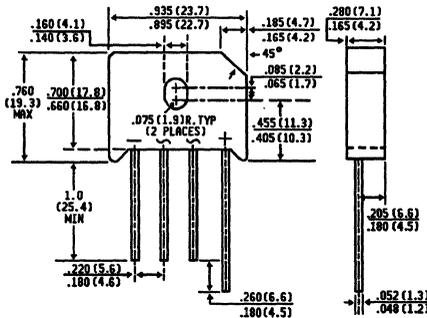
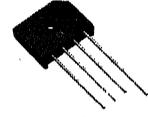


KBU4A THRU KBU4M

GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 4.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic material used carries Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junctions
- ◆ Ideal for printed circuit board
- ◆ Reliable low cost construction utilizing molded plastic technique
- ◆ Surge overload rating of 200 Amperes peak
- ◆ High temperature soldering guaranteed:
250°C /10 seconds / .375", (9.5mm) lead length / 5lbs., (2.3 kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Reliable low cost construction utilizing molded plastic technique
Terminals: Plated lead solderable per MIL-STD-202, Method 208
Mounting Position: Any
Mounting Torque: 5 in. lb. max.
Weight: 0.3 ounce, 8.0 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Reverse and inductive load, 60 Hz.
 For capacitive load, double current by 20%.

		KBU SYMBOLS	KBU 4A	KBU 4B	KBU 4D	KBU 4G	KBU 4J	KBU 4K	KBU 4M	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000		Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700		Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000		Volts
Maximum Average Forward Rectified Output Current at T _C =100°C (NOTE 1) T _A =65°C (NOTE 2)	I _(AV)				4.0	4.0				Amps
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}				200.0					Amps
Maximum Instantaneous Forward Voltage drop per element at 4.0A	V _F				1.0					Volts
Maximum DC Reverse Leakage at Rated DC Blocking Voltage per leg	I _R				5.0	1.0				μA mA
Typical Thermal Resistance per leg (NOTE 1)	R _{θJC}				3.3					°C/W
Operating and Storage Temperature Range	T _J , T _{STG}				-50 to +150					°C

NOTES:

1. Thermal Resistance from Junction to Case with units mounted on a 2.0" x 1.6" x 0.3" THK (5cm. x 4cm. x 0.8cm.) Al. Plate.
2. Units mounted on P.C. Board with .5"x.5" (12mmx12mm) copper pads and .375" (9.5mm) lead lengths.

RATINGS AND CHARACTERISTIC CURVES KBU4A THRU KBU4M

FIG. 1 — DERATING CURVE FOR OUTPUT RECTIFIED CURRENT

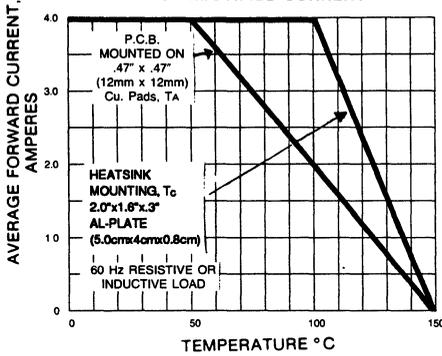


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER ELEMENT

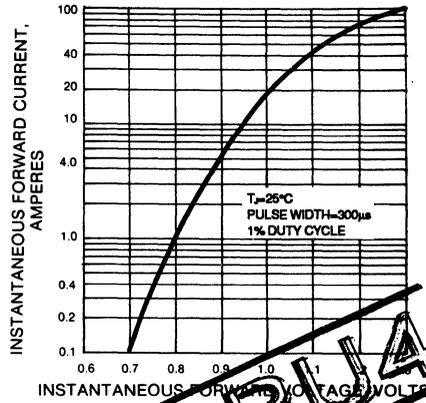


FIG. 3 — MAXIMUM NON-REPEATING PEAK FORWARD SURGE CURRENT

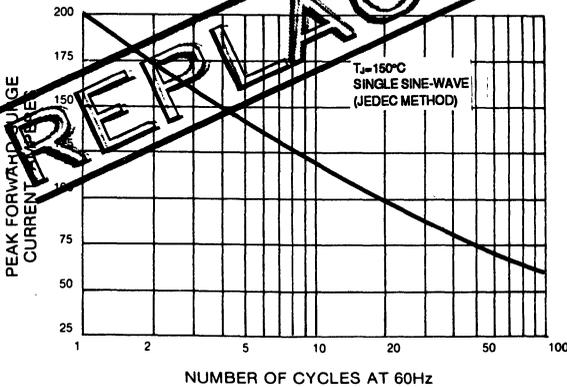


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

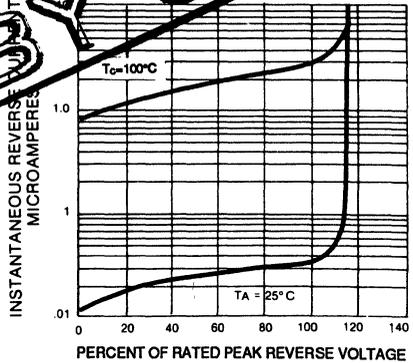
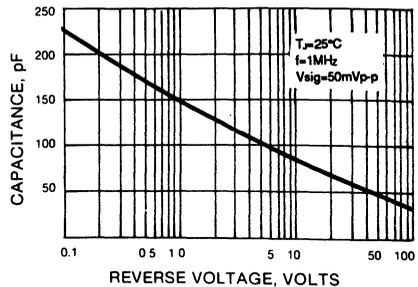


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER ELEMENT

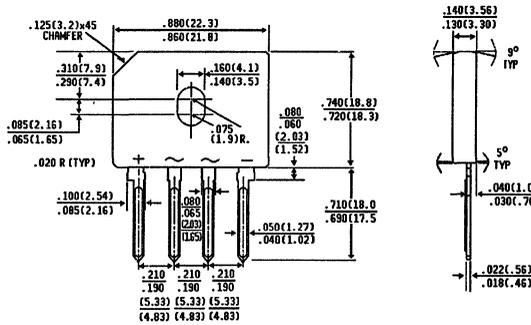


GENERAL INSTRUMENT

GBU6A THRU GBU6M

GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 6.0 Amperes

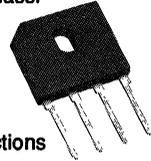
FEATURES



Polarity shown on front side of case, positive lead by beveled corner

Dimensions in inches
and
(millimeters)

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ High case dielectric strength of 1500 VRMS
- ◆ Ideal for printed circuit board mounting
- ◆ Glass passivated chip junctions
- ◆ High surge overload rating
- ◆ High temperature soldering guaranteed: 265°C/10 seconds/ .375", (9.5mm) lead length/5lbs., (2.3kg) tension



MECHANICAL DATA

Case: Molded plastic

Terminals: Plated leads solderable per MIL-STD- 202, Method 208

Mounting Position: Any (NOTE 3)

Mounting Torque: 5 in. lb. max.

Weight: 0.015 ounce, 4.0 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load, 60 Hz. For capacitive load, derate current by 20%.

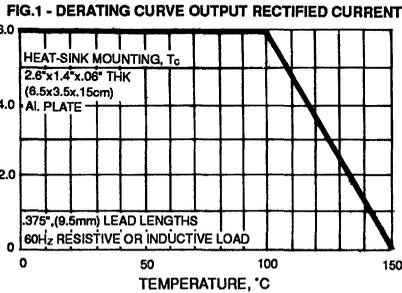
	SYMBOLS	GBU								UNITS
		6A	6B	6D	6G	6J	6K	6M		
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000		Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700		Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000		Volts
Maximum Average Forward Rectified Output Current at T _C =100°C (NOTE 1)	I <sub(av)< sub=""></sub(av)<>	6.0								Amps
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	175.0								Amps
Rating for fusing (t<8.3ms)	I ² t	127.0								A ² s
Maximum Instantaneous Forward Voltage drop per element at 6.0A	V _F	1.0								Volts
Maximum DC Reverse Leakage Current at T _J =25°C		5.0								µA
Rated DC Blocking Voltage per element T _J =125°C	I _R	500.0								µA
Typical Junction Capacitance per element (NOTE 2)	C _J	211.0				94.0				pf
Typical Thermal Resistance per element from Junction to Case (NOTE 1)	R _{θJC}	2.2								°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150								°C

Notes:

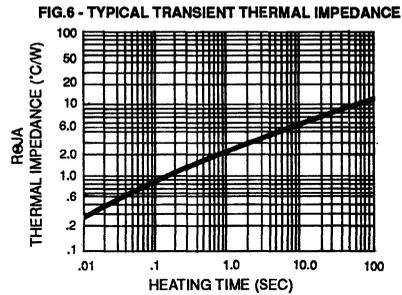
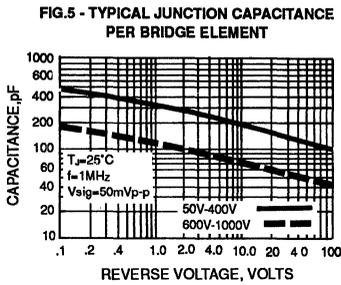
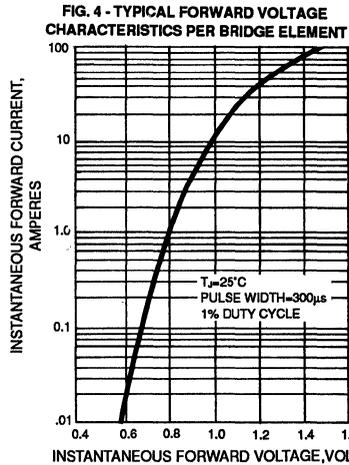
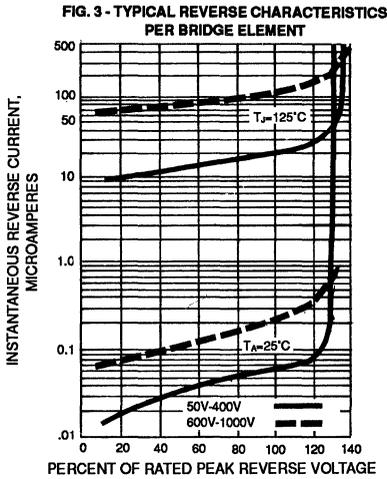
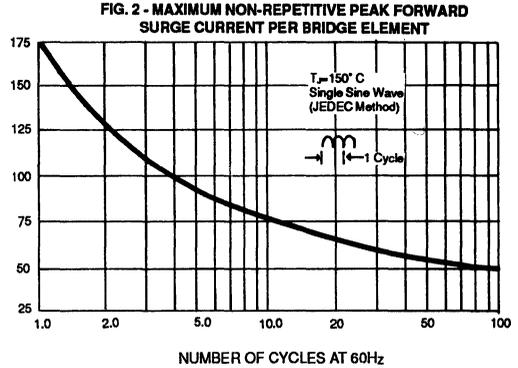
1. Units case mounted on 2.6"x1.4"x0.06" THK (6.5 x 3.5 x 0.15 cm) Al. Plate, heatsink.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 volts.
3. Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with number 6.0 screws.

RATINGS AND CHARACTERISTIC CURVES GBU6A THRU GBU6M

AVERAGE FORWARD OUTPUT CURRENT, AMPERES



PEAK FORWARD SURGE CURRENT, AMPERES



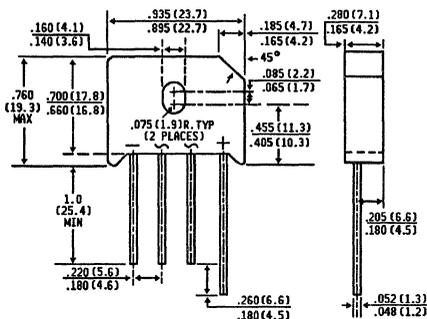
**GENERAL
INSTRUMENT**

KBU6A THRU KBU6M

GLASS PASSIVATED SINGLE - PHASE BRIDGE RECTIFIERS
VOLTAGE - 50 to 1000 Volts CURRENT - 6.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic material used carries Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junctions
- ◆ Ideal for printed circuit board
- ◆ Reliable low cost construction utilizing molded plastic technique
- ◆ Surge overload rating of 250 Amperes peak
- ◆ High temperature soldering guaranteed: 250°C / 10 seconds / .375", (9.5mm) lead length / 5lbs., (2.3 kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Reliable low cost construction utilizing molded plastic technique

Terminals: Plated Lead solderable per MIL-STD-202 Method 208

Mounting Position: Any

Mounting Torque: 5 in. lb. max.

Weight: 0.3 ounce, 8.0 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at 25°C ambient temperature unless otherwise specified.

60% resistive or inductive load.

For capacitive load, derate current by 20%.

		KBU 6A	KBU 6B	KBU 6D	KBU 6G	KBU 6J	KBU 6K	KBU 6M	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Output Current at	I _(AV)			6.0					Amps
				6.0					
Peak Forward Surge Current Single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}			250.0					Amps
Maximum Instantaneous Forward Voltage drop per element at 6.0A	V _F			1.0					Volts
Maximum DC Reverse Leakage at Rated DC Blocking Voltage per leg	I _R			5.0					µA
				1.0					mA
Typical Thermal Resistance per leg (NOTE 1)	R _{θJC}			4.7					°C/W
Operating and Storage Temperature Range	T _{J,TSTG}			-50 to +150					°C

NOTES:

1. Thermal Resistance from Junction to Case with units mounted on a 2.6" x 1.4" x .06" THK (6.5cm. x 3.5cm. x 1.5cm.) Al. Plate.

RATINGS AND CHARACTERISTIC CURVES KBU6A THRU KBU6M

FIG. 1 — DERATING CURVE FOR OUTPUT RECTIFIED CURRENT

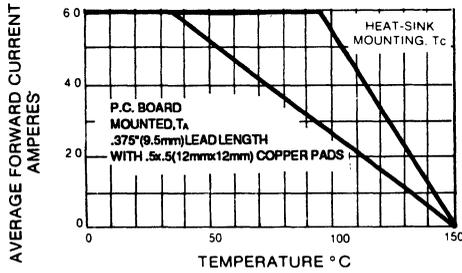


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER ELEMENT

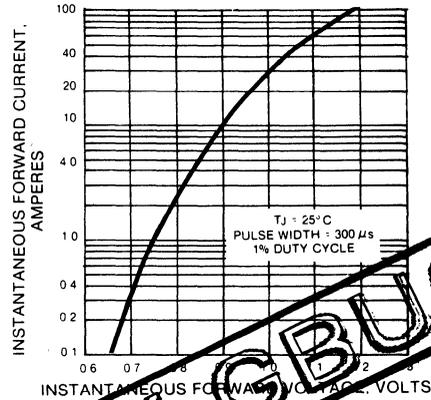


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS

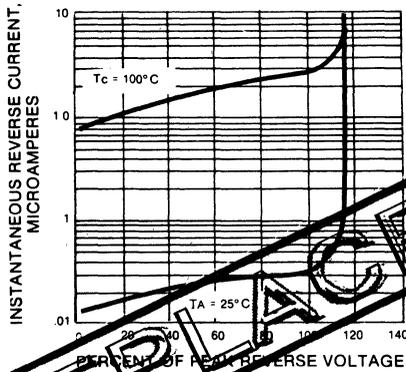


FIG. 4 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

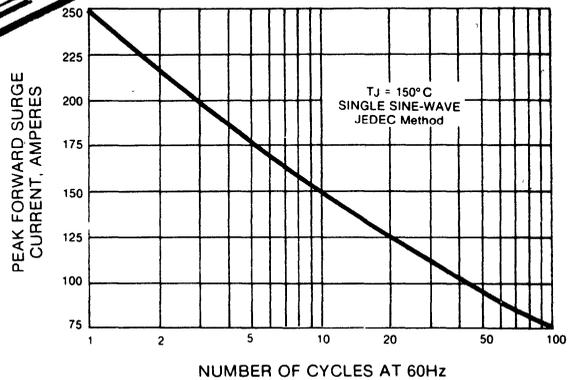
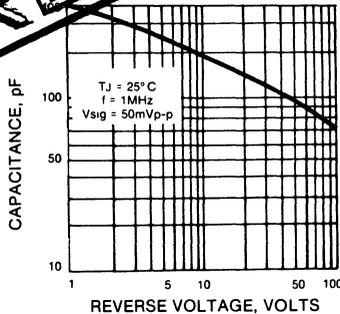


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER ELEMENT



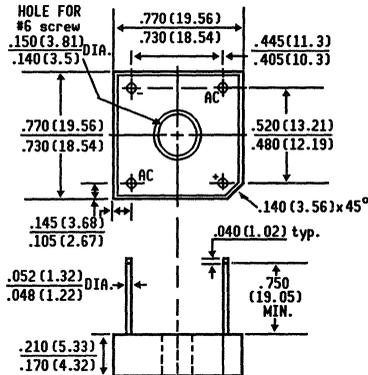
REPLACED BY GBU6

GBPC6005 THRU GBPC610

GLASS PASSIVATED SINGLE - PHASE BRIDGE RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 6.0 Amperes

FEATURES

- ◆ Glass passivated chip junctions
- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic package has carries Underwriters Laboratory flammability recognition 94V-O
- ◆ High case dielectric strength of 1500 VRMS
- ◆ Typical I_R less than $0.5 \mu A$
- ◆ High surge current capability
- ◆ Ideal for printed circuit boards
- ◆ High temperature soldering guaranteed: $265^\circ C / 10$ seconds at 5lbs., (2.3 kg) tension



Polarity shown on side of case:
 positive lead by beveled corner

Dimensions in inches
 and
 (millimeters)

MECHANICAL DATA

Case: Reliable construction utilizing molded plastic technique

Terminals: Plated leads solderable per MIL-STD-202, Method 208

Mounting Position: Bolt down on heat-sink with silicone thermal compound between bridge and mounting surface for maximum heat transfer with number 6.0 screw

Mounting Torque: 5.0 in. - lb. max.

Weight: 0.1 ounces, 2.8 grams

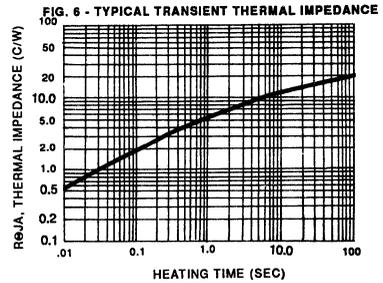
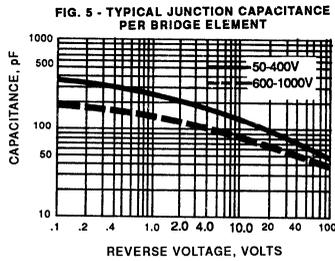
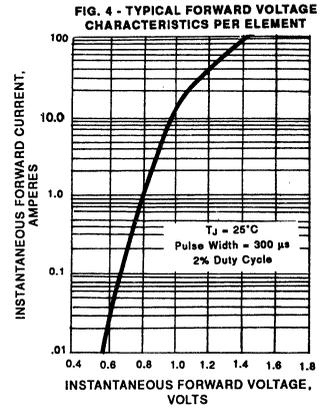
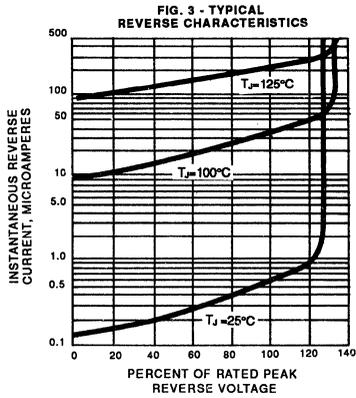
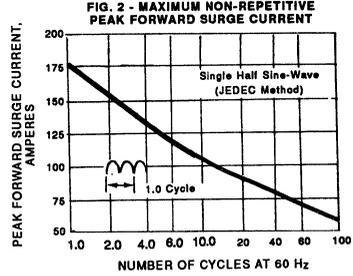
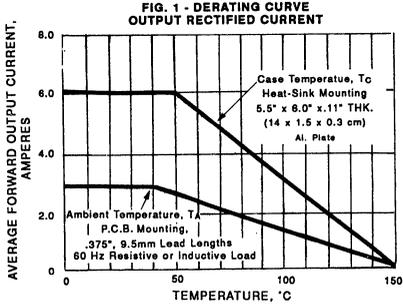
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at $25^\circ C$ ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	GBPC 6005	GBPC 601	GBPC 602	GBPC 604	GBPC 606	GBPC 608	GBPC 610	UNITS	
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts	
Maximum RMS Bridge Input Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts	
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts	
Maximum Average Forward Rectified Output Current at $T_C=50^\circ C$ (NOTE 1)	$I_{(AV)}$							6.0	Amps	
at $T_C=40^\circ C$ (NOTE 2)								3.0		
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}							175.0	Amps	
Rating for fusing ($t < 8.3ms$)	I^2t							127.0	A^2s	
Maximum Instantaneous Forward Voltage Drop per element at 3.0 Amperes	V_F							1.0	Volts	
Maximum DC Reverse Current at Rated DC Blocking Voltage per element $T_A=25^\circ C$	I_R							5.0	μA	
$T_A=125^\circ C$								500.0		
Typical Junction Capacitance per element (NOTE 3)	C_J							186.0	90.0	pf
Typical Thermal Resistance from Junction to Case (NOTE 1)	$R_{\theta JC}$							8.0	$^\circ C/W$	
Operating Temperature Range	T_J							-55 to +150	$^\circ C$	
Storage Temperature Range	T_{STG}							-55 to +150	$^\circ C$	

- NOTES: 1. Unit mounted on 5.5" x 6.0" x .11" thick (14 x 15 x 0.3 cm) Al. plate.
 2. Unit mounted on P.C. board at .375", 9.5mm lead lengths with .5"x.5"(12mmx12mm) Copper pads.
 3. Measured at 1 MHz and applied reverse voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES GBPC6005 THRU GBPC610

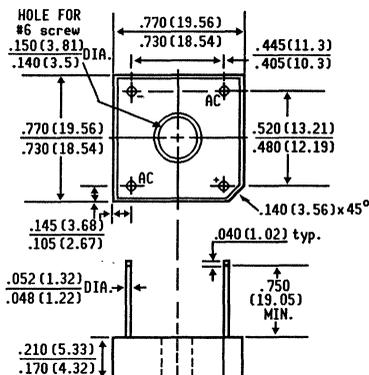


GBPC8005 THRU GBPC810

GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 8.0 Amperes

FEATURES

- ◆ Glass passivated chip junctions
- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic package has Underwriters Laboratory flammability recognition 94V-0
- ◆ High case dielectric strength of 1500 VRMS
- ◆ Typical I_F less than 0.5 μ A
- ◆ High surge current capability
- ◆ Ideal for printed circuit boards
- ◆ High temperature soldering guaranteed: 265°C /10 seconds/ .375" (9.5mm) lead lengths /5lbs., (2.3 kg) tension



Polarity shown on side of case:
positive lead by beveled corner

Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: molded plastic

Terminals: Plated leads solderable per MIL-STD-202, Method 208

Mounting Position: Bolt down on heat-sink with silicone thermal compound between bridge and mounting surface for maximum heat transfer with number 6.0 screw

Mounting Torque: 10.0 in. - lb. max.

Weight: 0.1 ounces, 2.8 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	GBPC 8005	GBPC 801	GBPC 802	GBPC 804	GBPC 806	GBPC 808	GBPC 810	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Bridge Input Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Output Current at $T_C=50^\circ\text{C}$ (NOTE 1) at $T_A=40^\circ\text{C}$ (NOTE 2)	$I_{(AV)}$				8.0				Amps
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}				200.0				Amps
Rating for fusing ($t < 8.3\text{ms}$)	I^2t				160.0				A^2s
Maximum Instantaneous Forward Voltage Drop per element at 4.0 Amperes	V_F				1.0				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage per element $T_A=25^\circ\text{C}$ $T_A=125^\circ\text{C}$	I_R				5.0				μA
Typical Junction Capacitance per element (NOTE 3)	C_J	200.0			100.0				pf
Typical Thermal Resistance from Junction Case (NOTE 1)	$R_{\theta JC}$				6.0				$^\circ\text{C}/\text{W}$
Operating Temperature Range	T_J				-55 to +150				$^\circ\text{C}$
Storage Temperature Range	T_{STG}				-55 to +150				$^\circ\text{C}$

NOTES: 1. Unit mounted on 8.6" sq. x .24" thick (22 x 22 x 0.6 cm) Al. plate.
2. Unit mounted on P.C. board at .375" ,9.5mm lead lengths with .5"x.5" (12mmx12mm) Copper pads.
3. Measured at 1 MHz and applied reverse voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES GBPC8005 THRU GBPC810

**FIG. 1 - DERATING CURVE
OUTPUT RECTIFIED CURRENT**

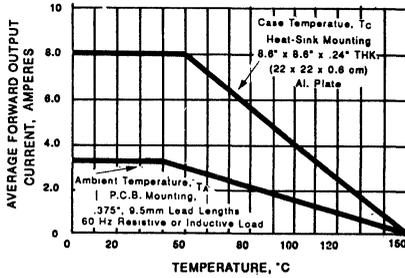
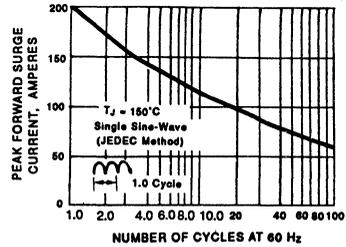
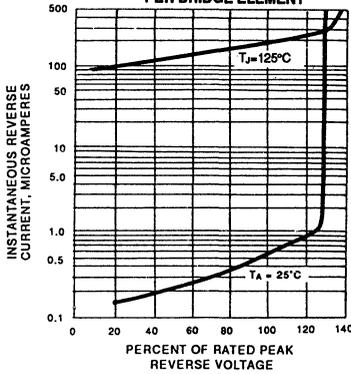


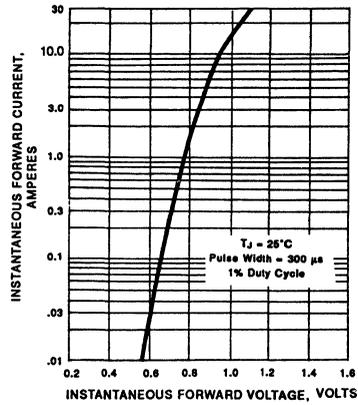
FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER BRIDGE ELEMENT



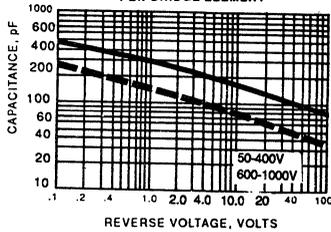
**FIG. 3 - TYPICAL REVERSE CHARACTERISTICS
PER BRIDGE ELEMENT**



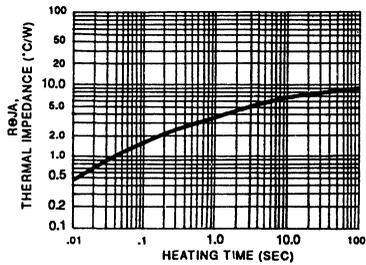
**FIG. 4 - TYPICAL FORWARD VOLTAGE
CHARACTERISTICS PER BRIDGE ELEMENT**



**FIG. 5 - TYPICAL JUNCTION CAPACITANCE
PER BRIDGE ELEMENT**



**FIG. 6 - TYPICAL TRANSIENT
THERMAL IMPEDANCE**

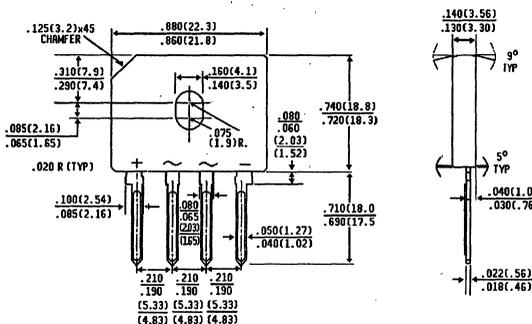
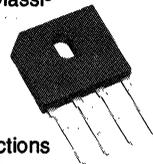


GBU8A THRU GBU8M

GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 8.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ High case dielectric strength of 1500 VRMS
- ◆ Ideal for printed circuit board mounting
- ◆ Glass passivated chip junctions
- ◆ High surge overload rating
- ◆ High temperature soldering guaranteed: 265°C/10 seconds/ .375", (9.5mm) lead length/5lbs., (2.3kg) tension



Polarity shown on front side of case, positive lead by beveled corner

Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic
Terminals: Plated leads solderable per MIL-STD-202, Method 208
Mounting Position: Any (NOTE 3)
Mounting Torque: 5 in. lb. max.
Weight: 0.015 ounce, 4.0 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

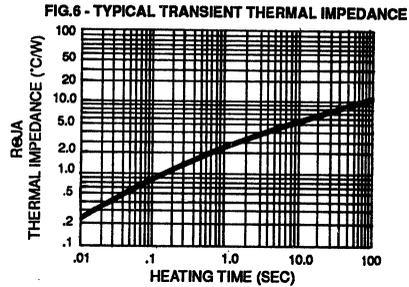
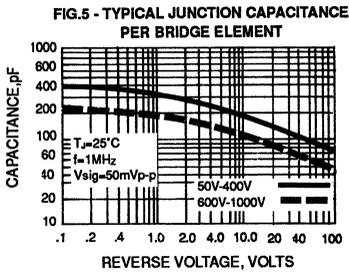
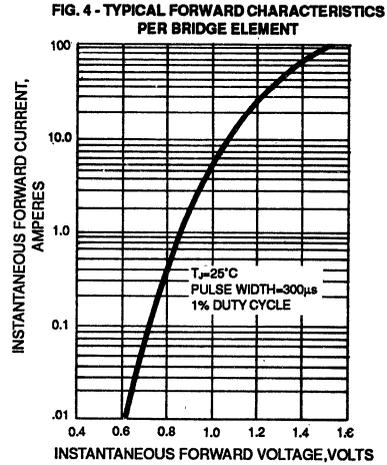
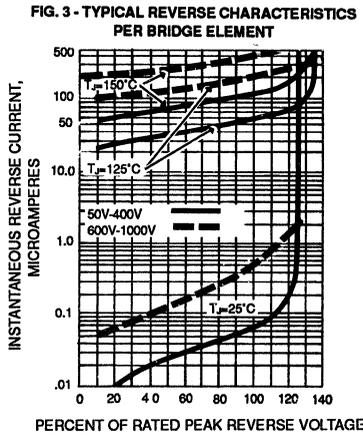
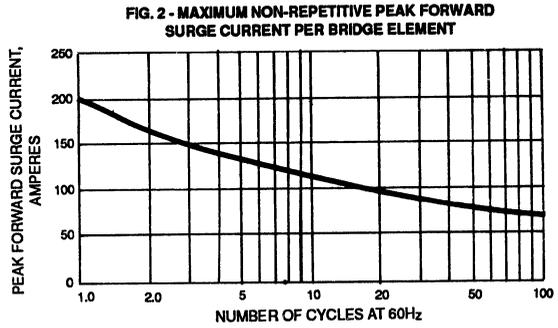
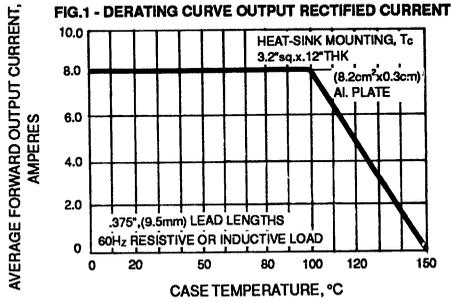
Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load, 60 Hz. For capacitive load, derate current by 20%.

	SYMBOLS	GBU							UNITS
		8A	8B	8D	8G	8J	8K	8M	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Output Current at T _C =100°C (NOTE 1)	I _(AV)				8.0				Amps
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}				200.0				Amps
Rating for fusing (t<8.3ms)	I ² t				166.0				A ² s
Maximum Instantaneous Forward Voltage drop per element at 8.0A	V _F				1.0				Volts
Maximum DC Reverse Leakage Current at T _J =25°C	I _R				5.0				μA
Rated DC Blocking Voltage per element at T _J =125°C	I _R				500.0				μA
Typical Junction Capacitance (NOTE 2)	C _J		211.0			94.0			pf
Typical Thermal Resistance per element from Junction to Case (NOTE 1)	R _{θJC}				2.2				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}				-55 to +150				°C

NOTES:

1. Units case mounted on 3.2"x3.2"x .12" THK (8.2 x8.2 x 0.3cm.) Al. Plate, heatsink.
2. Measured at 1.0 MHz and applied reverse voltage of 4.0 volts.
3. Recommended mounting position is to bolt down on heatsink with silicone thermal compound for maximum heat transfer with number 6.0 screws.

RATINGS AND CHARACTERISTIC CURVES GBU8A THRU GBU8M

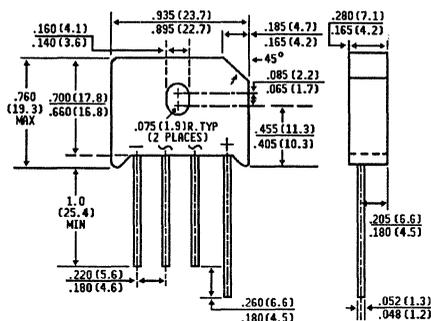


KBU8A THRU KBU8M

GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 8.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic material used carries Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junctions
- ◆ Ideal for printed circuit board
- ◆ Reliable low cost construction utilizing molded plastic technique
- ◆ Surge overload rating of 300 Amperes peak
- ◆ High temperature soldering capability: 250°C / 10 seconds / .375" (9.5mm) lead length / 5lbs. (2.3 kg) tension



Dimensions in inches
and
millimeters

REPLACED BY GBU8

MECHANICAL DATA

Case: Reliable low cost construction utilizing molded plastic technique

Terminals: Plated Leads solderable per MIL-STD-202, Method 208

Mounting Position: Any

Mounting Torque: 5 in. lb. max.

Weight: 0.3 ounce, 8.0 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

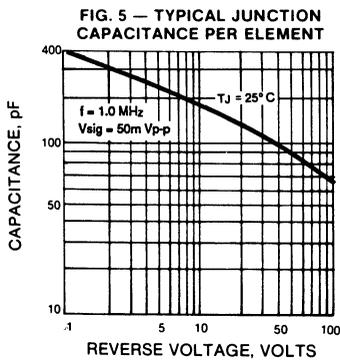
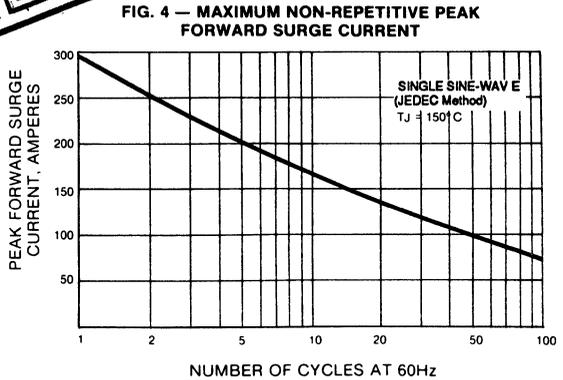
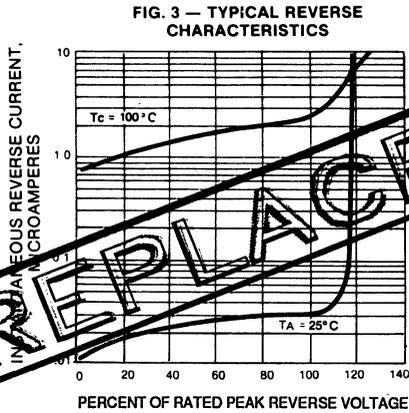
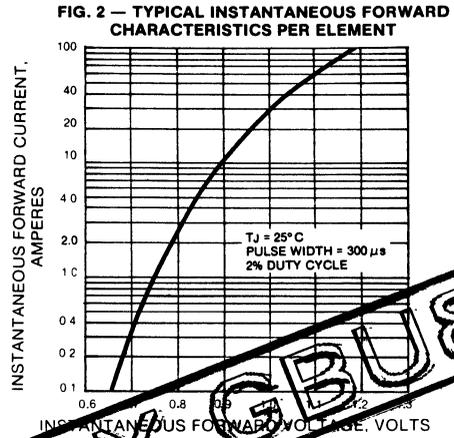
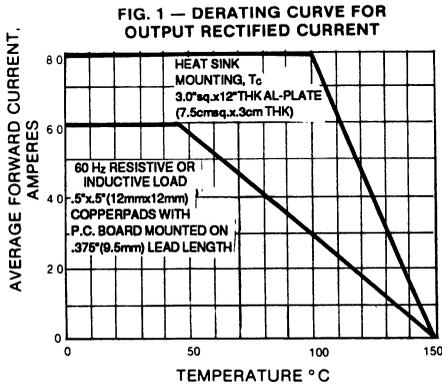
Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load, 60 Hz.
 For capacitive load, derate current by 20%.

		KBU 8A	KBU 8B	KBU 8D	KBU 8G	KBU 8J	KBU 8K	KBU 8M	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Output Current at	I _(AV)				8.0				Amps
					6.0				
Peak Forward Surge Current Single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}				300.0				Amps
Maximum Instantaneous Forward Voltage drop per element at 8.0A	V _F				1.0				Volts
Maximum DC Reverse Leakage at Rated DC Blocking Voltage per leg	I _R				10.0				µA mA
					1.0				
Typical Thermal Resistance per leg (NOTE 1)	R _{θJC}				5.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}				-50 to +150				°C

NOTES:

1. Thermal Resistance from Junction to Case with units mounted on a 3" Sq. x .11" THK (7.5cm. sq. x 0.3 cm.) Al. Plate.

RATINGS AND CHARACTERISTIC CURVES KBU8A THRU KBU8M



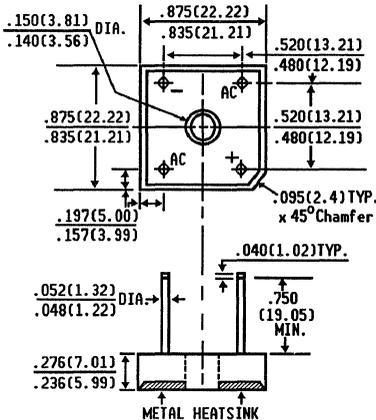
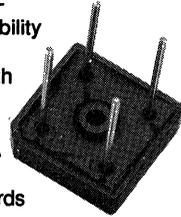
REPLACED BY GBU8

GBPC10-005 THRU GBPC10-10

GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER
VOLTAGE - 50 - 1000 Volts CURRENT - 10.0 Amperes

FEATURES

- ◆ This series is UL recognized under component index file number E54214
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ High case dielectric strength of 1500 VRMS
- ◆ Glass passivated junctions
- ◆ Typical I_R less than 0.5 μ A
- ◆ High surge capability
- ◆ Ideal for printed circuit boards
- ◆ High temperature soldering: 265°C/10 seconds at 5lbs.,(2.3kg) tension



Polarity shown on side of case:
positive lead by beveled corner

Dimensions in inches and (millimeters)

MECHANICAL DATA

Case: Molded plastic with heatsink integrally mounted in the bridge encapsulation

Terminals: Leads solderable per MIL-STD-202, Method 208

Mounting Position: Bolt down on heat-sink with silicon thermal compound between bridge and mounting surface for maximum heat transfer efficiency with number 6.0 screw

Mounting Torque: 10.0 in. lb. max.

Weight: 0.28 ounces, 8.0 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	GBPC10-							UNITS
		005	01	02	04	06	08	10	
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Bridge Input Voltage	V_{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Output Current at $T_C=50^\circ\text{C}$ (NOTE 1)	$I_{(AV)}$	10.0							Amps
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	200.0							Amps
Rating for fusing ($t < 8.3\text{ms}$)	I^2T	160.0							A ² S
Maximum Instantaneous Forward Voltage Drop per element at 5.0 Amperes	V_F	1.0							Volts
Maximum DC Reverse Current at Rated $T_A=25^\circ\text{C}$	I_R	5.0							μ A
DC Blocking Voltage per element $T_A=125^\circ\text{C}$	I_R	500.0							μ A
Typical Junction Capacitance per element (NOTE 2)	C_J	220.0				110.0			pf
Typical Thermal Resistance from Junction to Case (NOTE 1)	$R_{\theta JC}$	4.30							°C/W
Operating Temperature Range	T_J	-55 to +150							°C
Storage Temperature Range	T_{STG}	-55 to +150							°C

NOTES: 1. Unit mounted on 6.0"x2.2"x2.2" (15x5.7 mx5.5cm) Al. Plate.

2. Measured at 1 MHz and applied reverse voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES GBPC10-005 THRU GBPC10-10

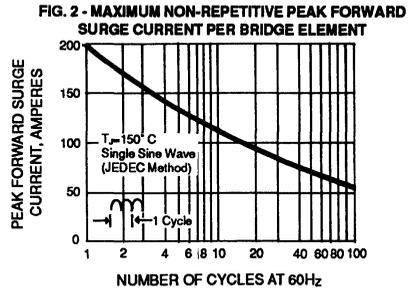
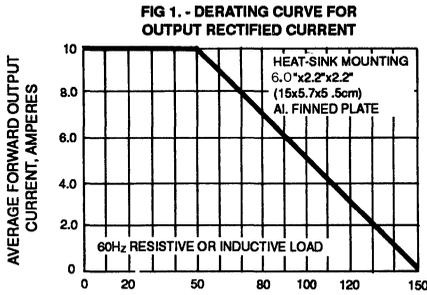


FIG. 3 - TYPICAL REVERSE CHARACTERISTICS PER BRIDGE ELEMENT

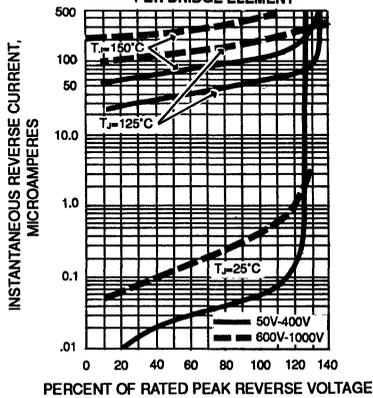


FIG. 4 - TYPICAL FORWARD VOLTAGE CHARACTERISTICS PER BRIDGE ELEMENT

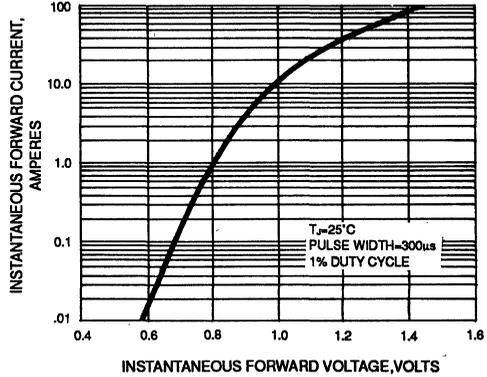


FIG. 5 - TYPICAL JUNCTION CAPACITANCE PER BRIDGE ELEMENT

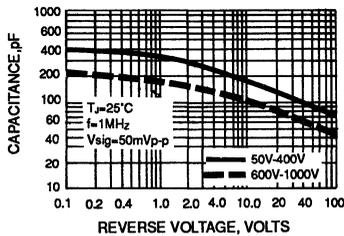
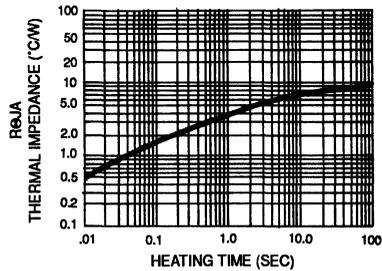


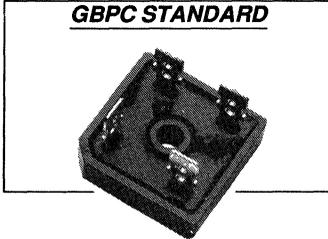
FIG. 6 - TYPICAL TRANSIENT THERMAL IMPEDANCE



GBPC12,15,25 SERIES

HIGH CURRENT GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER

FEATURES



- ◆ This series is UL recognized under component index, file number E54212
- ◆ The plastic package has Underwriters Laboratory flammability recognition 94V-O
- ◆ Integrally molded heatsink provide very low thermal resistance for maximum heat dissipation
- ◆ Universal 3-way terminals; snap-on, wire wrap-around, or P.C. board mounting
- ◆ Surge overload ratings to 300 Amperes
- ◆ Glass passivated chip junctions
- ◆ Typical I_R less than 0.3 μ A
- ◆ High temperature soldering guaranteed: 260°C /10 seconds at 5lbs., (2.3 kg) tension



MECHANICAL DATA

Case: Molded plastic with heatsink integrally mounted in the bridge encapsulation

Terminals: Either plated .25" (6.35mm). Faston or plated copper leads .040" (1.02mm) diameter. Suffix letter "W" added to indicate leads.(ex. GBPC12005W)

Mounting Position: Bolt down on heat-sink with silicone thermal compound between bridge and mounting surface for maximum heat transfer efficiency with number 10 screw

Polarity: Polarity symbols molded on body

Mounting Torque: 20 in. lb. max. **Weight:** .53 ounce 15 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

		GBPC12,15,25								
		SYMBOLS	005	01	02	04	06	08	10	UNITS
Maximum Recurrent Peak Reverse Voltage		V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage		V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage		V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Output Current (SEE FIG.1)	GBPC12 GBPC15 GBPC25	I _(AV)				12.0 15.0 25.0				Amps
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	GBPC12 GBPC15 GBPC25	I _{FSM}				200.0 300.0 300.0				Amps
Rating (non-repetitive, for t greater than 1 ms and less than 8.3 ms) for fusing	GBPC12 GBPC15 GBPC25	I ² _t				160.0 375.0 375.0				Amps ² sec
Maximum Instantaneous Forward Voltage drop per element at	GBPC12 I _F = 6.0A GBPC15 I _F =7.5A GBPC25 I _F =12.5A	V _F				1.1				Volts
Maximum Reverse DC Current at Rated DC Blocking Voltage per element	T _A =25°C T _A =125°C	I _R				5.0 500.0				μ A
RMS Isolation Voltage from case to leads		V _{ISO}				2500.0				Volts
Typical Junction Capacitance per element (NOTE 2)		C _J				300.0				pf
Typical Thermal Resistance per element (NOTE 1)		R θ _{JC}				1.9				°C/W
Operating Temperature Range		T _J				-55 to +150				°C
Storage Temperature Range		T _{STG}				-55 to +150				°C

NOTES: 1. Thermal Resistance from Junction to Case per element.
2. Measured at 1 MHz and applied reverse voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES GBPC12,15,25 SERIES

FIG. 1 - MAXIMUM OUTPUT RECTIFIED CURRENT

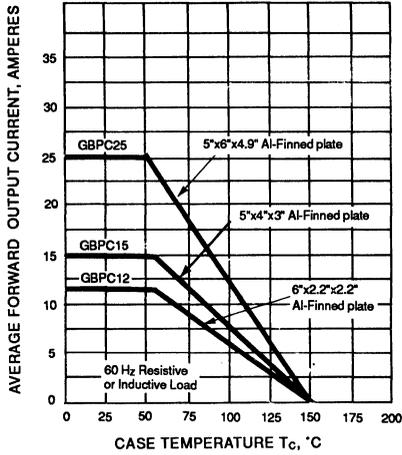


FIG 2 - MAXIMUM OUTPUT RECTIFIED CURRENT

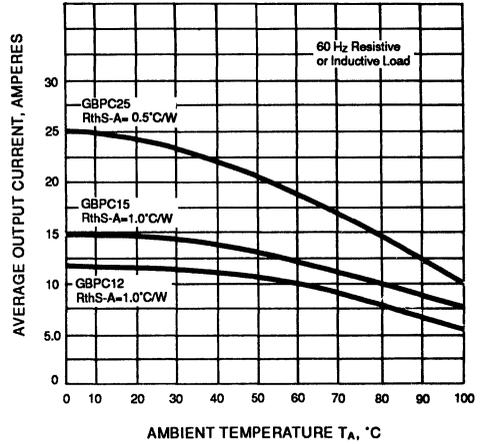


FIG 3 - MAXIMUM POWER DISSIPATION

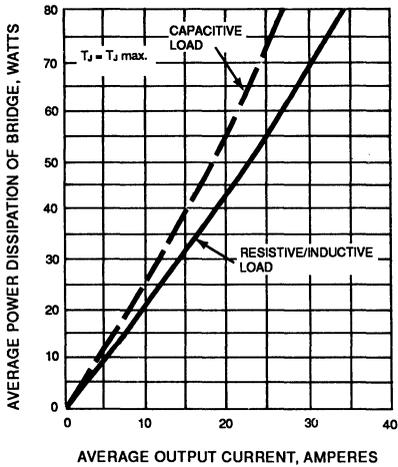
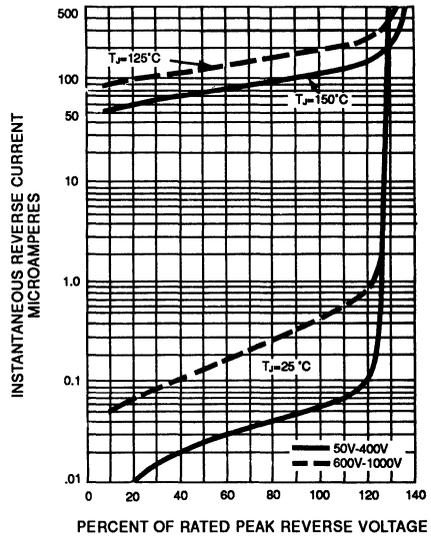


FIG 4 - TYPICAL REVERSE CHARACTERISTICS



RATINGS AND CHARACTERISTIC CURVES GBPC12,15,25 SERIES

FIG. 5-TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS PER BRIDGE ELEMENT

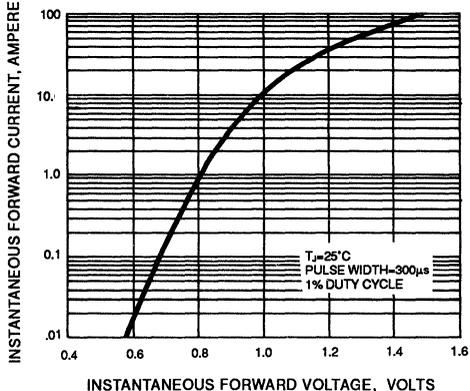


FIG. 6-TYPICAL TRANSIENT THERMAL IMPEDANCE

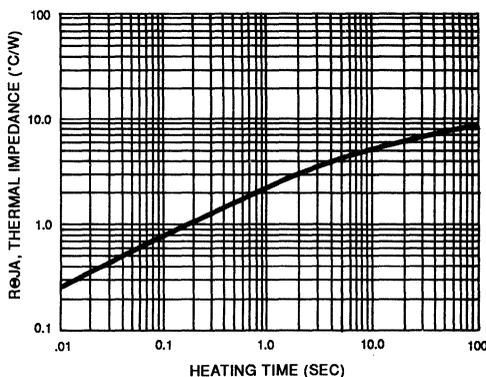


FIG. 7-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

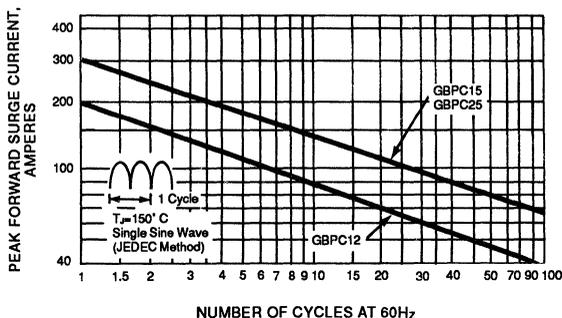


FIG. 8-TYPICAL JUNCTION CAPACITANCE PER BRIDGE ELEMENT

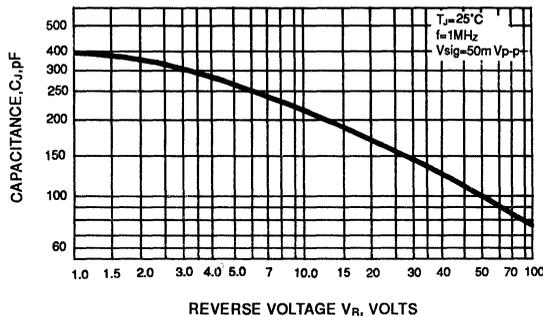
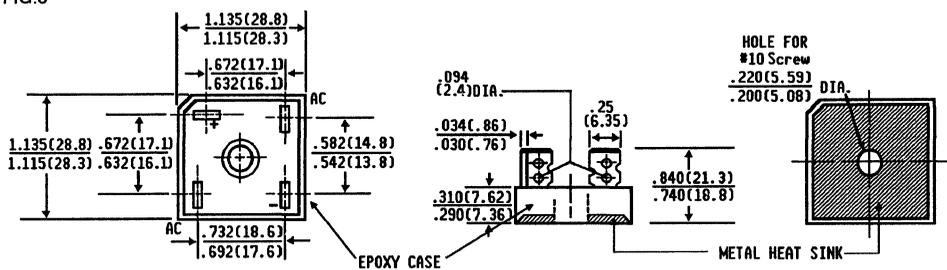
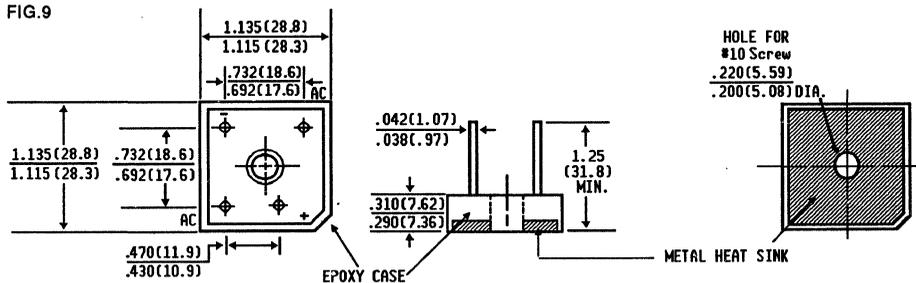


FIG. 8



GBPC-W

FIG. 9



Dimensions in inches and (millimeters)

Notes:

1. Corrosion resistant terminals designed with .250 female quick connectors for wrap around or snap-on.
2. A thin film of silicone thermal compound is recommended between the bridge case and mounting surface for improved thermal conduction.
3. Higher dielectric strengths available. Consult factory.

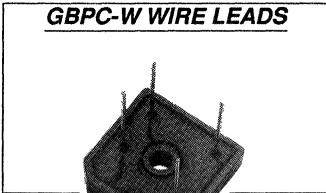
GBPC35005 THRU GBPC3510

HIGH CURRENT GLASS PASSIVATED SINGLE-PHASE BRIDGE RECTIFIER

FEATURES



- ◆ This series is UL recognized under component index, file number E54214
- ◆ The plastic package has Underwriters Laboratory flammability recognition 94V-O
- ◆ Integrally molded heatsink provide very low thermal resistance for maximum heat dissipation
- ◆ Universal 3-way terminals; snap-on, wire wrap -around, or P.C. board mounting
- ◆ Surge overload ratings to 400 Amperes
- ◆ Glass passivated chip junctions
- ◆ Typical I_R less than $0.3 \mu A$
- ◆ High temperature soldering guaranteed: $260^\circ C / 10$ seconds at 5lbs., (2.3 kg) tension



MECHANICAL DATA

Case: Molded plastic with heatsink integrally mounted in the bridge encapsulation

Terminals: Either nickel plated .25" (6.35mm) Faston terminals or plated copper leads .040" (1.02mm) diameter. Suffix letter "W" added to indicate leads.(ex. GBPC3510W)

Mounting Position: Bolt down on heat-sink with silicone thermal compound between bridge and mounting surface for maximum heat transfer efficiency with number 10 screw

Polarity: Polarity symbols molded on body

Mounting Torque: 20 in.- lb. max. **Weight:** .53 ounce, 15 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at $25^\circ C$ ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	GBPC35								UNITS
		005	01	02	04	06	08	10		
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800	1000		Volts
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560	700		Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800	1000		Volts
Maximum Average Forward Rectified Output Current at $T_C=50^\circ C$ (NOTE 1)	$I_{(AV)}$	35.0								Amps
Peak Forward Surge Current Single sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	400.0								Amps
Rating (non-repetitive, for t greater than 1 ms and less than 8.3 ms) for fusing	I^2t	660.0								Amps ² Sec
Maximum Instantaneous Forward Voltage drop per element at 17.5 Amps	V_F	1.1								Volts
Maximum DC Reverse Leakage Current $T_A=25^\circ C$ at Rated DC Blocking Voltage per element $T_A=125^\circ C$	I_R	5.0								μA
RMS Isolation Voltage from case to leads	V_{ISO}	2500.0								Volts
Typical Junction Capacitance per element (NOTE 2)	C_J	300.0								pf
Typical Thermal Resistance from Junction to Case per element (NOTE 1)	$R_{\theta JC}$	1.4								$^\circ C/W$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150								$^\circ C$

NOTES: 1. Bridge mounted on a 9"x3.5"x4.6" (22.9x8.9x11.7cm) Al-Finned Heatsink.

2. Measured at 1 MHz and applied reverse voltage of 4.0 volts.

RATINGS AND CHARACTERISTIC CURVES GBPC35005 THRU GBPC3510

FIG 1 - MAXIMUM OUTPUT RECTIFIED CURRENT

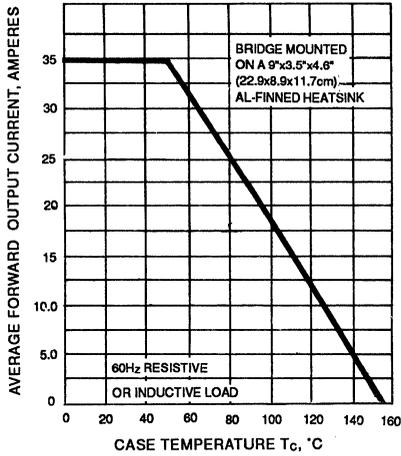


FIG 2 - MAXIMUM OUTPUT RECTIFIED CURRENT

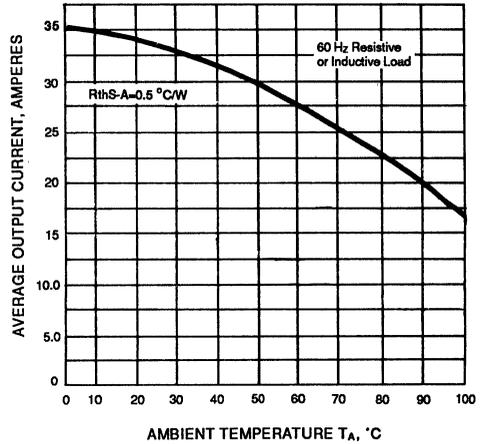


FIG 3 - MAXIMUM POWER DISSIPATION

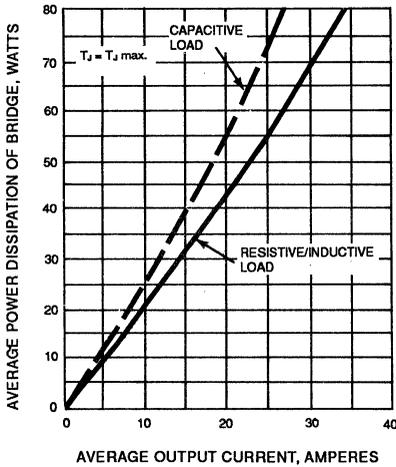
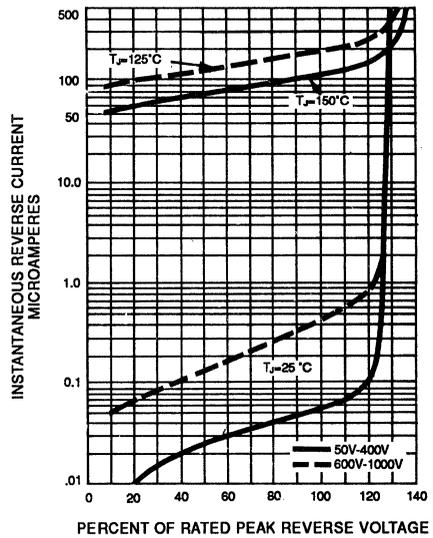
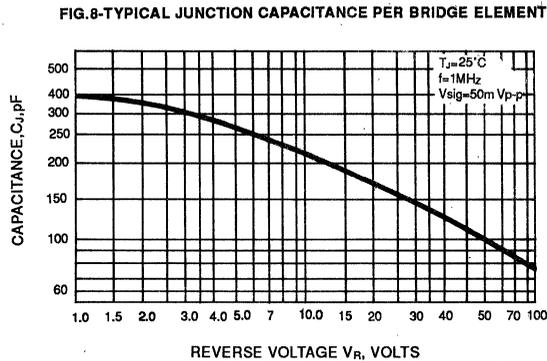
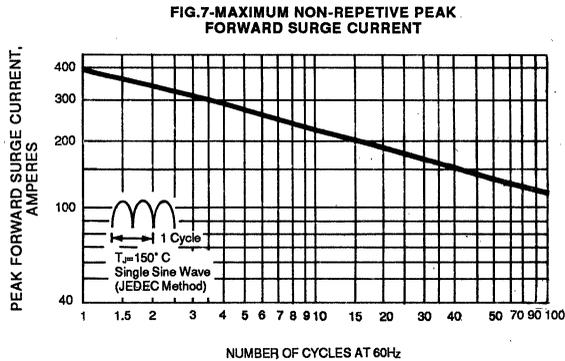
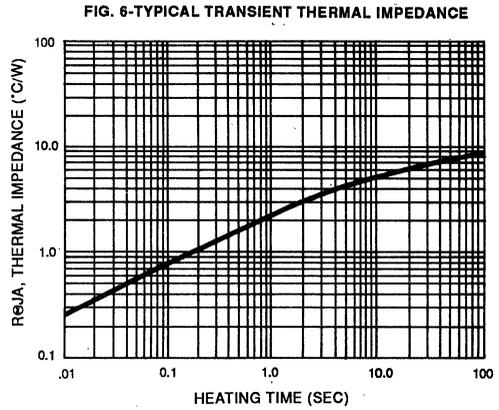
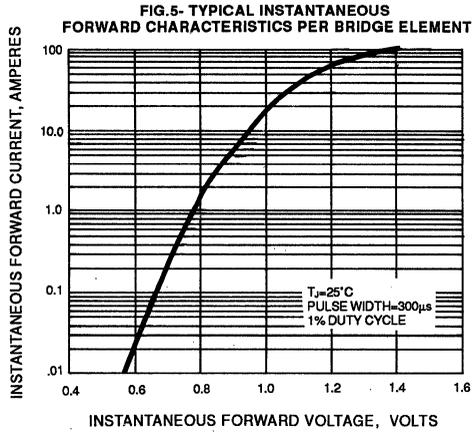


FIG 4 - TYPICAL REVERSE CHARACTERISTICS



GENERAL INSTRUMENT

RATINGS AND CHARACTERISTIC CURVES GBPC35005 THRU GBPC3510



**GENERAL
INSTRUMENT**

FIG.8

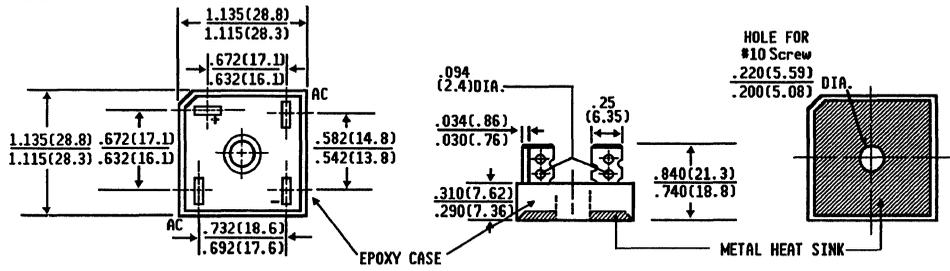
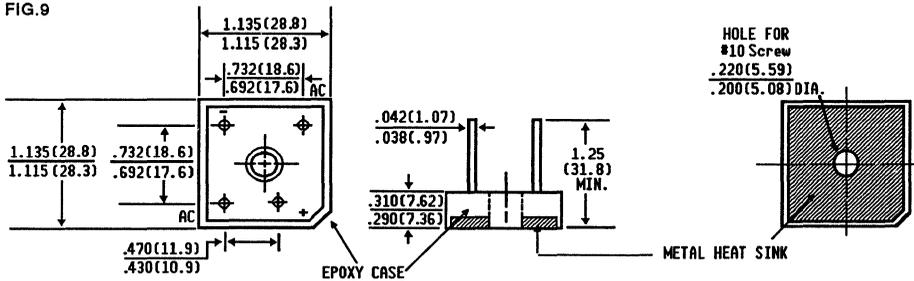


FIG.9



Dimensions in inches and (millimeters)

Notes:

1. Corrosion resistant terminals designed with .250 female quick connectors for wrap around or snap-on.
2. A thin film of silicone thermal compound is recommended between the bridge case and mounting surface for improved thermal conduction.
3. Higher dielectric strengths available. Consult factory.

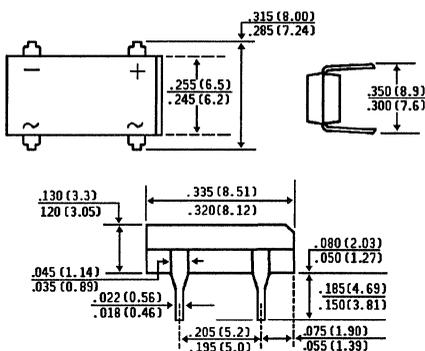
EDF1AM THRU EDF1DM

MINIATURE GLASS PASSIVATED FAST EFFICIENT BRIDGE RECTIFIER

VOLTAGE - 50 to 200 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic package has Underwriters Laboratory flammability recognition 94V-0
- ◆ Glass passivated chip junctions
- ◆ High Surge overload rating - 50 amperes peak
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed: 265°C / 10 seconds at 5 lbs., (2.3kg) tension
- ◆ Superfast recovery times for high efficiency



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Leads solderable per MIL-STD-202, Method 208

Polarity: Polarity symbols marked on body

Weight: 0.04 ounce, 1.0 gram

Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

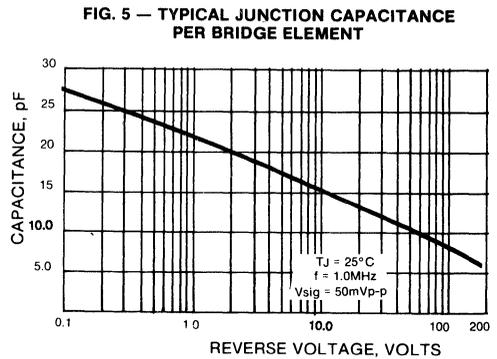
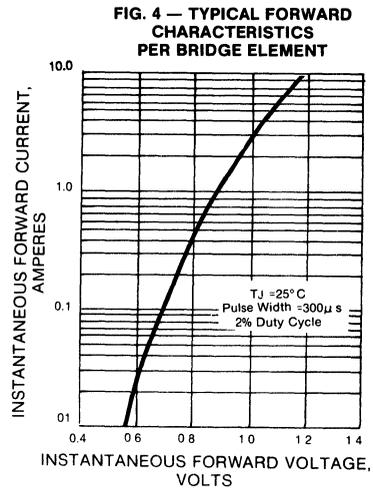
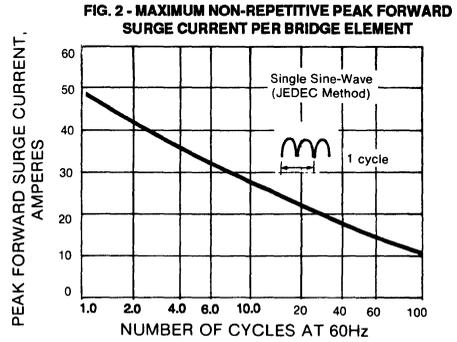
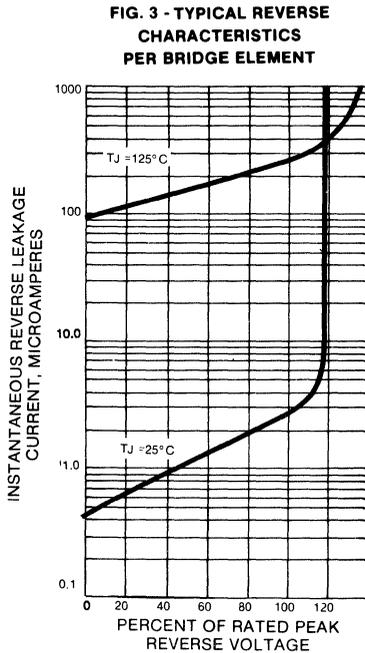
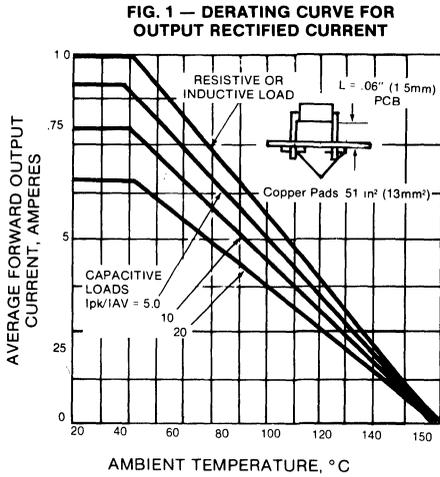
	SYMBOLS	EDF1AM	EDF1BM	EDF1CM	EDF1DM	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V_{RMS}	35	70	150	200	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	150	200	Volts
Maximum Average Forward Output Rectified Current at $T_A=40^\circ\text{C}$	$I_{(AV)}$	1.0				Amps
Peak Forward Surge Current (Single half sine-wave superimposed on rated load (JEDEC Method))	I_{FSM}	50.0				Amps
Rating for fusing ($t < 8.35\text{ms}$)	I^2t	10.0				A^2s
Maximum Instantaneous Forward Voltage drop per element at 1.0A	V_F	1.05				Volts
Maximum Reverse Current at Rated DC Blocking Voltage	I_R	5.0				μA
		1.0				mA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	50.0				nS
Typical Thermal Resistance (NOTE 2)	$R_{\theta JA}$	40.0				$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150				$^\circ\text{C}$

NOTES:

1. Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=25\text{A}$.

2. Thermal Resistance from Junction to Ambient mounted on P.C. Board with .51"sq. (13mm sq.) Copper Pads.

RATINGS AND CHARACTERISTIC CURVES EDF1AM THRU EDF1DM



**SURFACE MOUNT
BRIDGE RECTIFIER**

***1.0 AMPERE
50 VOLTS TO 1000 VOLTS***

**GENERAL
INSTRUMENT**

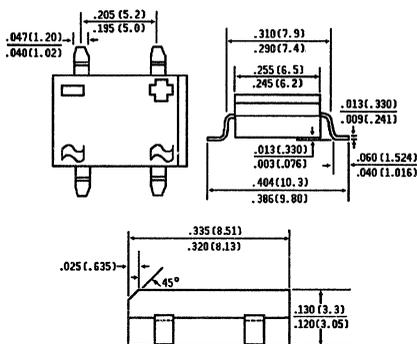
DF005S THRU DF10S

MINIATURE GLASS PASSIVATED SINGLE - PHASE SURFACE MOUNT BRIDGE RECTIFIER

VOLTAGE - 50 to 1000 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic package has Underwriters Laboratory flammability recognition 94V-0
- ◆ Glass passivated chip junctions
- ◆ High Surge overload rating - 50 amperes peak
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed: 300°C /10 seconds at 5 lbs., (2.3kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded Plastic

Terminals: Lead solderable per MIL-STD-202, Method 208

Polarity: Polarity symbols marked on body

Weight: 0.04 ounce, 1.0 gram

Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
60 Hz, resistive or inductive load.

	SYMBOLS	DF0 05S	DF 01S	DF 02S	DF 04S	DF 06S	DF 08S	DF 10S	UNITS
Maximum Recurrent Peak Reverse Voltage	VRRM	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	VRMS	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	VDC	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Output Rectified Current at TA=40°C	IAV				1.0				Amp
Peak Forward Surge Current Single half sine-wave superimposed on rated load (JEDEC Method)	IFSM				50.0				Amps
Rating for fusing (t<8.35ms)	I²t				10.0				A²s
Maximum Instantaneous Forward Voltage drop per element at 1.0A	VF				1.1				Volts
Maximum Reverse Current at Rated DC Blocking Voltage per element	IR				10.0 0.5				µA mA
Typical Junction Capacitance per element (NOTE 1)	CJ				25.0				pf
Operating Temperature Range	TJ				-55 to +150				°C
Storage Temperature Range	TSTG				-55 to +150				°C

NOTE:

1. Measured at 1.0 MHz and applied reverse voltage of 4.0 Volts.

RATINGS AND CHARACTERISTIC CURVES DF005S THRU DF10S

FIG. 1 — DERATING CURVE FOR OUTPUT RECTIFIED CURRENT

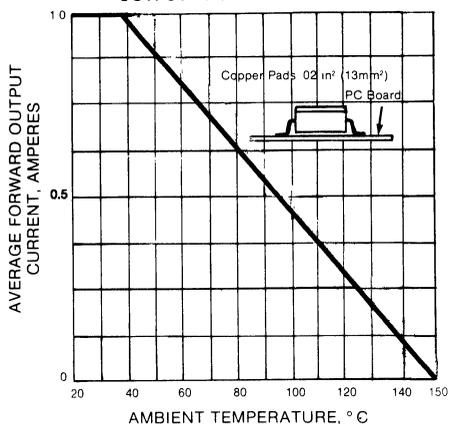


FIG. 3 — TYPICAL REVERSE CHARACTERISTICS PER BRIDGE ELEMENT

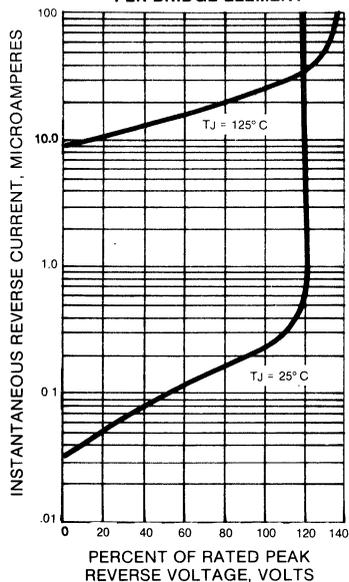


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER BRIDGE ELEMENT

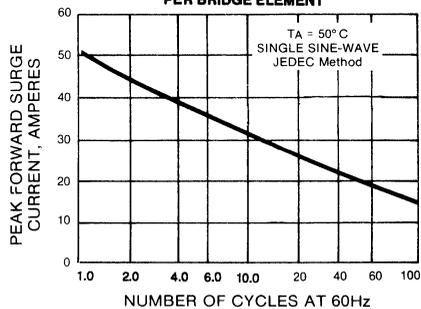


FIG. 4 — TYPICAL FORWARD CHARACTERISTICS PER BRIDGE ELEMENT

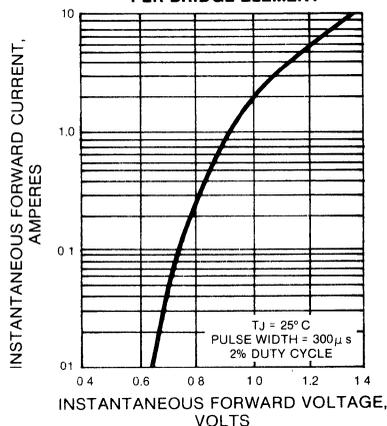
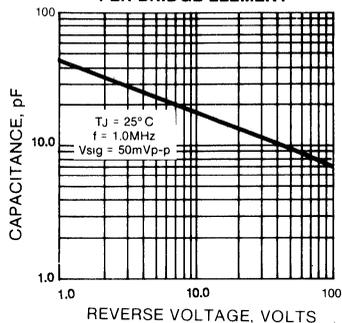


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER BRIDGE ELEMENT

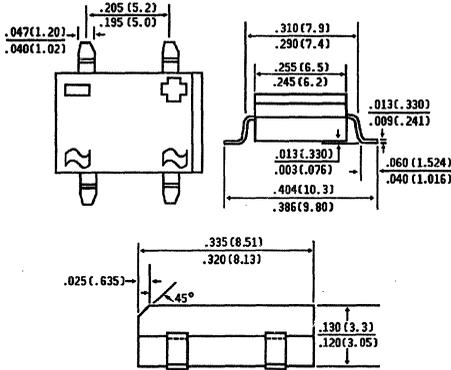


EDF1AS THRU EDF1DS

MINIATURE GLASS PASSIVATED FAST EFFICIENT SURFACE MOUNT BRIDGE RECTIFIER VOLTAGE - 50 to 200 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ This series is UL recognized under component index, file number E54214
- ◆ Plastic package has Underwriters Laboratory flammability recognition 94V-O
- ◆ Glass passivated chip junctions
- ◆ High surge overload rating- 50 amperes peak
- ◆ Ideal for printed circuit board
- ◆ High temperature soldering guaranteed: 300°C /10 seconds at 5 lbs., (2.3kg) tension
- ◆ Superfast recovery times for high efficiency



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

- Case:** Molded plastic
Terminals: Leads solderable per MIL-STD-202, Method 208
Polarity: Polarity symbols marked on body
Weight: 0.04 ounce, 1.0 gram
Mounting Position: Any

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	EDF1AS	EDF1BS	EDF1CS	EDF1DS	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V_{RMS}	35	70	150	200	Volts
Maximum DC Blocking Voltage	V_{DC}	50	100	150	200	Volts
Maximum Average Forward Output Rectified Current at $T_A=40^\circ\text{C}$	$I_{(AV)}$	1.0				Amps
Peak Forward Surge Current Single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0				Amps
Rating for fusing ($t < 8.35\text{ms}$)	I^2t	10.0				A^2s
Maximum Instantaneous Forward Voltage drop per element at 1.0A	V_F	1.05				Volts
Maximum Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=125^\circ\text{C}$	I_R	5.0 1.0				μA mA
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	50.0				nS
Typical Thermal Resistance (NOTE 2)	$R_{\theta JA}$	40.0				$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150				$^\circ\text{C}$

NOTES:

- Reverse Recovery Test Conditions: $I_F=0.5\text{A}$, $I_R=1.0\text{A}$, $I_{rr}=.25\text{A}$.
- Thermal Resistance from Junction to Ambient mounted on P.C. Board with, .51"sq. (13mm sq.) Copper Pads.

RATINGS AND CHARACTERISTIC CURVES EDF1AS THRU EDF1DS

FIG. 1 — DERATING CURVE FOR OUTPUT RECTIFIED CURRENT

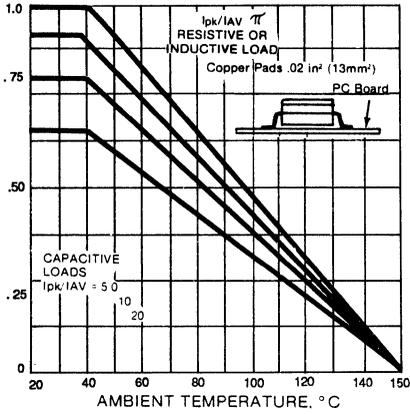


FIG. 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT PER BRIDGE ELEMENT

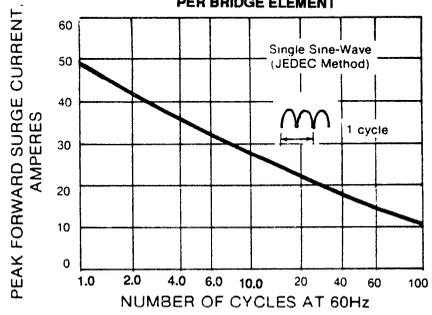


FIG. 4 — TYPICAL FORWARD CHARACTERISTICS PER BRIDGE ELEMENT

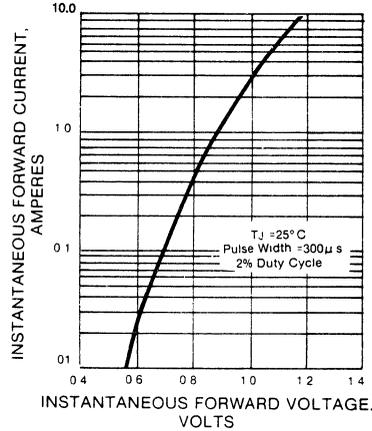


FIG. 3 - TYPICAL REVERSE CHARACTERISTICS PER BRIDGE ELEMENT

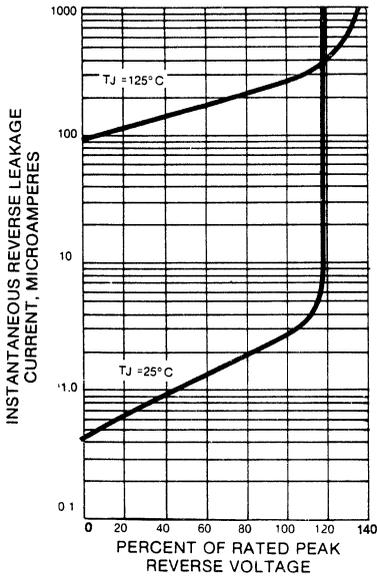
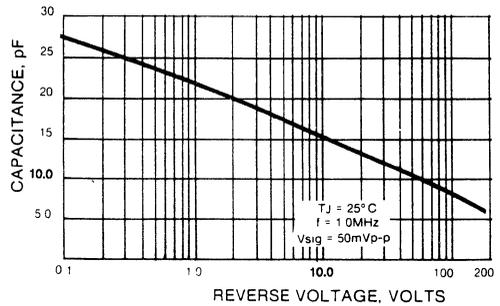


FIG. 5 — TYPICAL JUNCTION CAPACITANCE PER BRIDGE ELEMENT





SURFACE MOUNT SUPERECTIFIERS

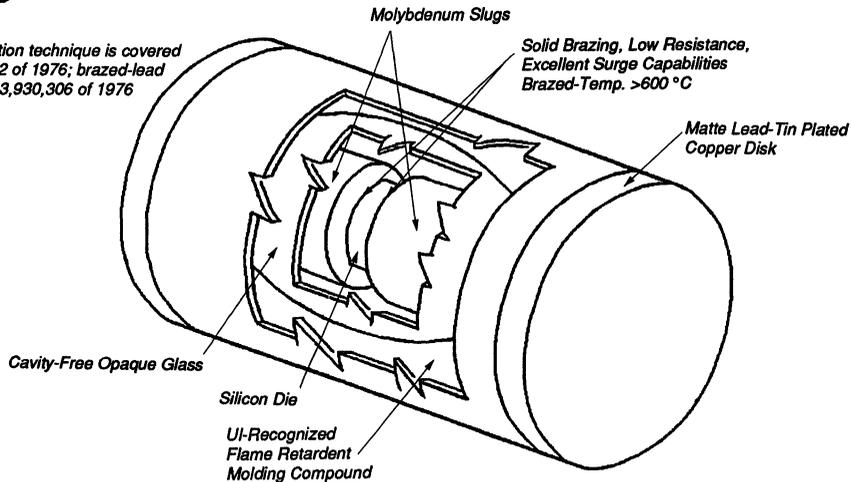
GENERAL
INSTRUMENT

SUPERECTIFIER®

SURFACEMOUNT®

PATENTED*

Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,930,306 of 1976



Our surface mount SUPERECTIFIER has redefined the concept of time and space. Passivated silicon SUPERECTIFIERS (1N6478-1N6484 and GL41A-GL41T) are 1.0 Amp, 50-1000 PRV leadless, surface mounted devices that provide new space options, from increased surface density to reduced board size. Component placement speeds can be an order of magnitude higher. Our surface mount SUPERECTIFIERS Feature:

Brazing at greater than 600 Deg C at both terminal and die-eliminates all soft solders.

Exclusive UL recognized flame-retardant epoxy molding compound rated 94V-0, the highest available rating. (hermetically sealed construction.)

No other 1.0 Ampere rectifier of any kind - plastic, glass or metal - can match our surface mount SUPERECTIFIER features.

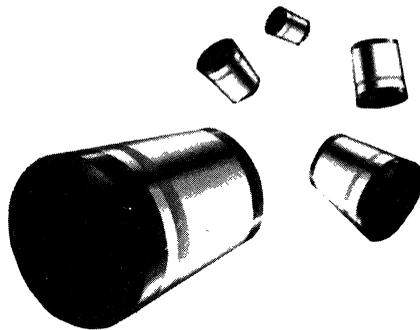
The way we make our surface mount SUPERECTIFIER is what makes them the best.

In eall construction, most other rectifiers rated up to 1.0 ampere are soldered or are only pressure contacted. Our surface mounted SUPERECTIFIER is made into an entirely solid unit with leads and cell brazed at temperatures greater than 600 Deg C. All other rectifiers fail at half that temperature!

Conventional plastic rectifiers use either varnish, silicon rubber or a thin film of silicon oxide to protect the junction. Our surface mount SUPERECTIFIER uses a patented glass passivation to seal its junction hermetically.

In device encapsulation, our surface mount SUPERECTIFIER uses a flame-RETARDANT molding compound, rated UL94V-0, the highest rating available. In fact, it is the only plastic rectifier that exceeds environmental standards of MIL-S-19500.

In summary, the General Instrument surface mount SUPERECTIFIER is the world's only rectifier with totally brazed construction, with a patented glass passivated junction, and with flame-retardant molding encapsulation.



GENERAL
INSTRUMENT

SURFACE MOUNT SUPERECTIFIERS

Surface Mount Superectifiers

Features:

- ◆ High Temperature Metallurgically Bonded
- ◆ Plastic Package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass Passivated Junction
- ◆ Capable of meeting Environmental Standards of MIL-S-19500
- ◆ High Temperature Soldering guaranteed for all present methods, including wave and vapor reflow soldering

Types:

1N6478-1N6484	1.0 Amp Standard Recovery Times
GL41A-GL41T	1.0 Amp. Standard Recovery Times
RGL41A-RGL41M	1.0 Amp. Fast Recovery Times
EGL41A-EGL41G	1.0 Amp. Ultrafast Recovery Times
GL34A-GL34J	0.5 Amp. Standard Recovery Times
RGL34A-RGL34J	0.5 Amp. Fast Recovery Times
EGL34A-EGL34G	0.5 Amp. Ultrafast Recovery Times

QUICK GUIDE TO SURFACE MOUNT SUPERECTIFIERS

TYPE	1N6478 thru 1N6484	GL41A thru GL41M	RGL41A* thru RGL41M*	EGL41+ thru EGL41G+	GL34A thru GL34J	RGL34A* thru RGL34J*	EGL34A+ thru EGL34G+
CASE	GL41	GL41	GL41	GL41	GL34	GL34	GL34
Io (A)	1.0	1.0	1.0	1.0	0.5	0.5	0.5
@T _A (°C)	75	75	55	75	75	55	75
V = 50(V)	1N6478	GL41A	RGL41A	EGL41A	GL34A	RGL34A	EGL34A
V = 100(V)	1N6479	GL41B	RGL41B	EGL41B	GL34B	RGL34B	EGL34B
V = 150(V)				EGL41C			EGL34C
V = 200(V)	1N6480	GL41D	RGL41D	EGL41D	GL34D	RGL34D	EGL34D
V = 300(V)				EGL41F			EGL34F
V = 400(V)	1N6481	GL41G	RGL41G	EGL41G	GL34G	RGL34G	EGL34G
V = 600(V)	1N6482	GL41J	RGL41J		GL34J	RGL34J	
V = 800(V)	1N6483	GL41K	RGL41K				
V = 1000(V)	1N6484	GL41M	RGL41M				
VR=1300(V)		GL41Y					
VR=1600(V)		GL41T					
SURGE (A)	30	30	30	30	10	10	10
V (V)	1.0	1.1/1.2	1.3	1.0/1.25	1.1	1.3	1.25

* Fast Recovery + Ultrafast Recovery

SMD Selector Guide

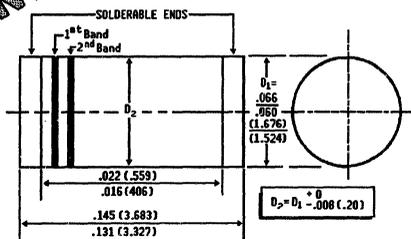
<i>Series</i>	<i>Type</i>	<i>Voltage (V)</i>	<i>Current/Power</i>	<i>TRR (nS)</i>	<i>Package</i>
<i>GL34</i>	<i>Rectifier</i>	<i>50-600</i>	<i>0.5A</i>	<i>---</i>	<i>DO-213AA</i>
<i>RGL34</i>	<i>Rectifier</i>	<i>50-600</i>	<i>0.5A</i>	<i>150/250</i>	<i>DO-213AA</i>
<i>EGL34</i>	<i>Rectifier</i>	<i>50-400</i>	<i>0.5A</i>	<i>50</i>	<i>DO-213AA</i>
<i>IN6478</i>	<i>Rectifier</i>	<i>50-1000</i>	<i>1.0A</i>	<i>---</i>	<i>DO-213AB</i>
<i>GL41</i>	<i>Rectifier</i>	<i>50-1600</i>	<i>1.0A</i>	<i>---</i>	<i>DO-213AB</i>
<i>RGL41</i>	<i>Rectifier</i>	<i>50-1000</i>	<i>1.0A</i>	<i>150-500</i>	<i>DO-213AB</i>
<i>EGL41</i>	<i>Rectifier</i>	<i>50-400</i>	<i>1.0A</i>	<i>50</i>	<i>DO-213AB</i>
<i>GLL4735</i>	<i>Zener (1W)</i>	<i>6.2-91</i>	<i>1.0 Watt</i>	<i>---</i>	<i>DO-213AB</i>
<i>ZGL41</i>	<i>Zener (1W)</i>	<i>100-200</i>	<i>1.0 Watt</i>	<i>---</i>	<i>DO-213AB</i>
<i>TGL41</i>	<i>TVS (400W)</i>	<i>6.8-200</i>	<i>400 Watt Peak</i>	<i>---</i>	<i>DO-213AB</i>
<i>SGL41</i>	<i>Schottky</i>	<i>20-60</i>	<i>1.0A</i>	<i>---</i>	<i>DO-213AB</i>
<i>ES1</i>	<i>Rectifier</i>	<i>20-600</i>	<i>0.6A</i>	<i>15</i>	<i>SMA/DO-214AC</i>
<i>SS12</i>	<i>Schottky</i>	<i>20-60</i>	<i>1.0A</i>	<i>---</i>	<i>SMA/DO-214AC</i>
<i>SS19</i>	<i>Schottky</i>	<i>90/100</i>	<i>1.0A</i>	<i>---</i>	<i>SMA/DO-214AC</i>
<i>S2</i>	<i>Rectifier</i>	<i>50-1000</i>	<i>1.5A</i>	<i>---</i>	<i>SMB/DO214AA</i>
<i>RS2</i>	<i>Rectifier</i>	<i>50-800</i>	<i>1.5A</i>	<i>150-500</i>	<i>SMB/DO214AA</i>
<i>ES2</i>	<i>Rectifier</i>	<i>50-200</i>	<i>2.0A</i>	<i>20</i>	<i>SMB/DO-214AA</i>
<i>SS22</i>	<i>Schottky</i>	<i>20-60</i>	<i>2.0A</i>	<i>---</i>	<i>SMB/DO-214AA</i>
<i>SS29</i>	<i>Schottky</i>	<i>90/100</i>	<i>2.0A</i>	<i>---</i>	<i>SMB/DO-214AA</i>
<i>SMB</i>	<i>TVS (600W)</i>	<i>5.0-170</i>	<i>600 Watt Peak</i>	<i>---</i>	<i>SMB/DO-214AA</i>
<i>S3</i>	<i>Rectifier</i>	<i>50-1000</i>	<i>2.5A</i>	<i>---</i>	<i>SMC/DO-214AB</i>
<i>RS3</i>	<i>Rectifier</i>	<i>50-800</i>	<i>2.5A</i>	<i>150-500</i>	<i>SMC/DO-214AB</i>
<i>ES3</i>	<i>Rectifier</i>	<i>50-200</i>	<i>3.0A</i>	<i>20</i>	<i>SMC/DO-214AB</i>
<i>SS32</i>	<i>Schottky</i>	<i>20-60</i>	<i>3.0A</i>	<i>---</i>	<i>SMC/DO-214AB</i>
<i>SS39</i>	<i>Schottky</i>	<i>90/100</i>	<i>3.0A</i>	<i>---</i>	<i>SMC/DO-214AB</i>
<i>SMC</i>	<i>TVS (1500W)</i>	<i>5.0-170</i>	<i>1500 Watt Peak</i>	<i>---</i>	<i>SMC/DO-214AB</i>
<i>GF1</i>	<i>Rectifier</i>	<i>50-1000</i>	<i>1.0A</i>	<i>---</i>	<i>GF1/DO-214BA</i>

BYM05-50 THRU BYM05-600 GL34A THRU GL34J

SURFACE MOUNT GLASS PASSIVATED SILICON RECTIFIER
Voltage - 50 to 600 Volts Current - 0.5 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

* Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,930,306 of 1976

SUPERRECTIFIER®

- ◆ For surface mounted applications
- ◆ High temperature metallurgically bonded- no compression contacts as found in diode-constructed rectifiers
- ◆ Glass passivated junction
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: 450°C/5 seconds at terminals. Complete device submersible temperature of 260°C for 10 seconds in solder bath

MECHANICAL DATA

Case: Molded plastic over glass

Terminals: Plated Terminals, solderable per MIL-STD-202, Method 208

Polarity: Two bands indicate cathode

1st band denotes device type 2nd band denotes voltage type

Mounting Position: Any **Handling Precautions:** None

Weight: 0.036 gram, 0.0014 ounce

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	BYM05					UNITS
		-50	-100	-200	-400	-600	
Standard recovery time device: 1 st band is white		GL34A	GL34B	GL34D	GL34G	GL34J	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	Volts
Maximum Average Forward Rectified Current at T _T =75°C	I _(AV)	0.5					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	10.0					Amps
Maximum Instantaneous Forward Voltage at 0.5A	V _F	1.1					Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =125°C	I _R	5.0 50.0					μA
Maximum Full Load Reverse Current, Full Cycle Average, at T _A =75°C	I _{R(AV)}	20					μA
Typical Junction Capacitance (NOTE 1)	C _J	7.0					pf
Maximum Thermal Resistance R _{thJL} (NOTE 2) R _{thJA} (NOTE 3)	R _{θJL} R _{θJA}	70.0 150.0					°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175					°C
Polarity Color Bands (2 nd Band)		Gray	Red	Orange	Yellow	Green	

NOTES: 1. Measured at 1 MHz and applied reverse voltage of 4.0 V_{DC}.
2. Thermal resistance junction to terminal, 5.0mm² copper pads to each terminal.
3. Thermal resistance junction to ambient, 5.0mm² copper pads to each terminal.

**RATINGS AND CHARACTERISTIC CURVES BYM05-50 THRU BYM05-600
GL34A THRU GL34J**

FIG. 1 — FORWARD CURRENT DERATING CURVE

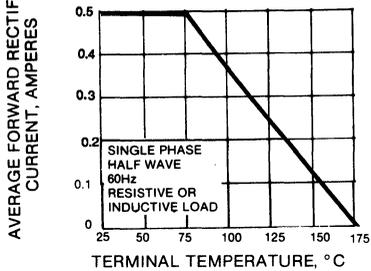


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

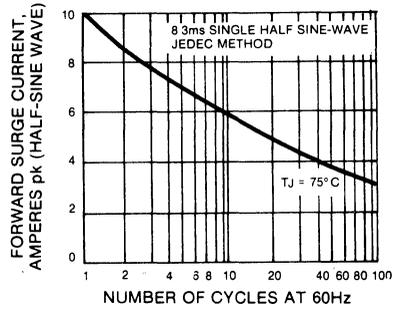


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

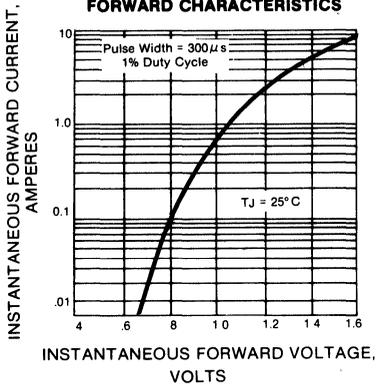


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

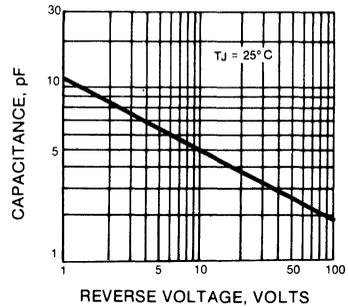
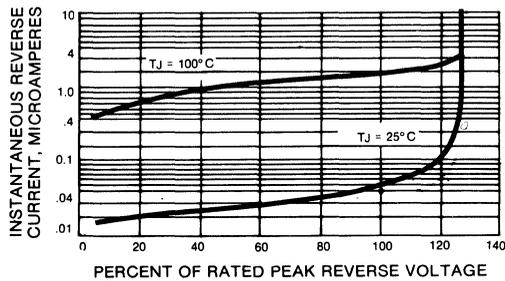


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS



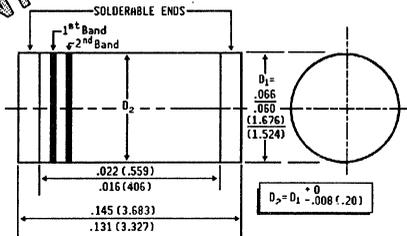
BYM06-50 THRU BYM06-600 RGL34A THRU RGL34J

SURFACE MOUNT GLASS PASSIVATED FAST SWITCHING SILICON RECTIFIER

Voltage - 50 to 600 Volts Current - 0.5 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

*Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,930,306 of 1976

- ◆ For surface mounted applications
- ◆ High temperature metallurgically bonded-no compression contacts as found in diode-constructed rectifiers
- ◆ Glass passivated junction
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: 450°C/5 seconds at terminals. Complete device submersible temperature of 260°C for 10 seconds in solder bath



MECHANICAL DATA

Case: Molded plastic over glass

Terminals: Plated terminals, solderable per MIL-STD-202, Method 208

Polarity: Two bands indicate cathode

1st band denotes device type 2nd band denotes voltage type

Mounting Position: Any **Handling Precautions:** None

Weight: 0.036 gram, 0.0014 ounce

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25° C ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	BYM06					UNITS
		-50	-100	-200	-400	-600	
Fast switching device: 1 st band is Red		RGL34A	RGL34B	RGL34D	RGL34G	RGL34J	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	Volts
Maximum Average Forward Rectified Current at T _r =55°C	I _(AV)	0.5					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	10.0					Amps
Maximum Instantaneous Forward Voltage at 0.5A	V _F	1.3					Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =125°C	I _R	5.0 50.0					μA
Maximum Full Load Reverse Current, Full Cycle Average, at T _A =55°C	I _{R(AV)}	30.0					μA
Maximum Reverse Recovery Time (Note 1) T _A =25°C	T _{RR}	150			250		ns
Typical Junction Capacitance (Note 2)	C _J	4.0					pf
Maximum Thermal Resistance (Note 3) (Note 4)	R _{θJL} R _{θJA}	70 150.0					°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175					°C
Polarity Color Bands (2 nd Band)		Gray	Red	Orange	Yellow	Green	

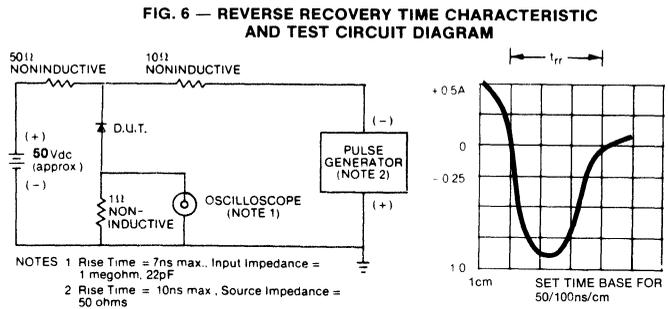
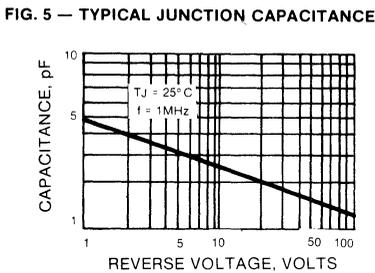
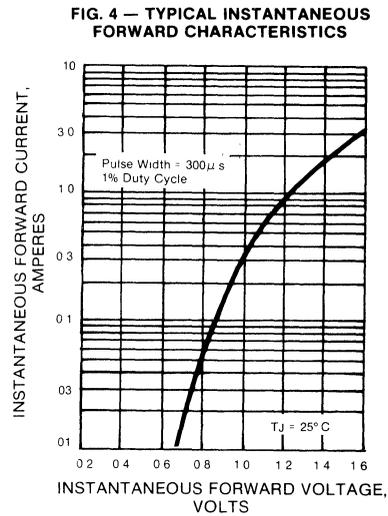
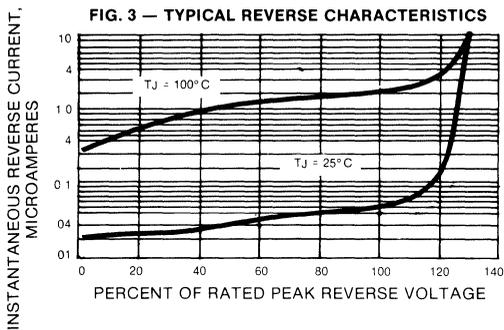
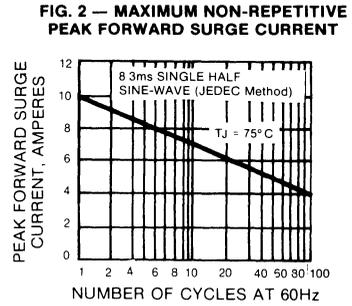
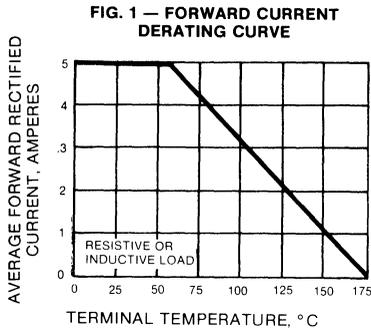
NOTES: 1. Reverse Recovery Test Conditions I_F=0.5A, I_R=1.0A, I_{rr}= .25A.

2. Measured at 1 MHz and applied reverse voltage of 4.0 Volts.

3. Thermal resistance from junction to terminal, 5mm² copper pads to each terminal

4. Thermal resistance from junction to ambient, 5mm² copper pads to each terminal.

**RATINGS AND CHARACTERISTIC CURVES BYM06-50 THRU BYM06-600
RGL34A THRU RGL34J**



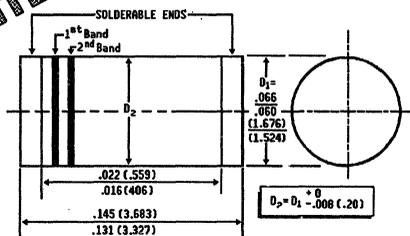
**GENERAL
INSTRUMENT**

BYM07-50 THRU BYM07-400 EGL34A THRU EGL34G

SURFACE MOUNT GLASS PASSIVATED FAST EFFICIENT SILICON RECTIFIER
Voltage - 50 to 400 Volts Current - 0.5 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

*Braze-load assembly is covered by Patent No. 3,930,306 of 1976 and glass composition by Patent No. 3,752,701 of 1973

- ◆ For surface mounted applications
- ◆ High temperature metallurgically bonded no compression contacts as found in diode-constructed rectifiers
- ◆ Glass passivated junction
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering guaranteed: 450°C/5 seconds at terminals. Complete device submersible temperature of 260°C for 10 seconds in solder bath



MECHANICAL DATA

Case: Molded plastic over glass

Terminals: Plated terminals, solderable per MIL-STD-202, Method 208

Polarity: Two bands indicate cathode

1st band denotes device type 2nd band denotes voltage type

Mounting Position: Any **Handling Precautions:** None

Weight: 0.036 gram, 0.0014 ounce

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	BYM07						UNITS	
	SYMBOLS	-50	-100	-150	-200	-300		-400
Fast Efficient device: 1 st band is Green		EGL34A	EGL34B	EGL34C	EGL34D	EGL34F	EGL34G	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	Volts
Maximum Average Forward Rectified Current at T _T =75°C	I _(AV)	0.5						Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	10.0						Amps
Maximum Instantaneous Forward Voltage at 0.5A	V _F					1.25	1.35	Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =125°C	I _R					5.0	50.0	µA
Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	50.0						nS
Typical Junction Capacitance (NOTE 2)	C _J	4.0						pf
Maximum Thermal Resistance (NOTE 3) (NOTE4)	R _{θJL} R _{θJA}					70.0	150.0	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175						°C
Polarity Color Bands (2 nd Band)		Gray	Red	Pink	Orange	Brown	Yellow	

NOTES: 1. Reverse Recovery Test Conditions: I_F= 0.5A, I_R= 1.0A, I_{rr} = .25A

2. Measured at 1 MHz and applied reverse voltage of 4.0 Volts.

3. Thermal resistance from junction to terminal, 5.0mm² copper pads to each terminal.

4. Thermal resistance from junction to ambient, 5.0mm² copper pads to each terminal.

**RATINGS AND CHARACTERISTIC CURVES BYM07-50 THRU BYM07-400
EGL34A THRU EGL34G**

FIG. 1 — FORWARD CURRENT DERATING CURVE

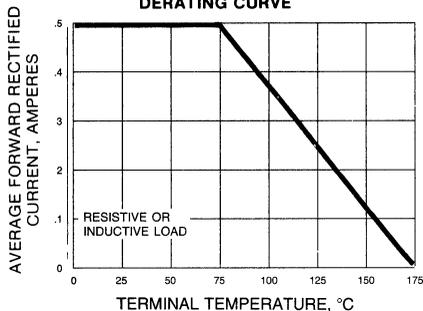


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

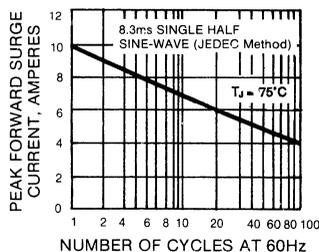


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

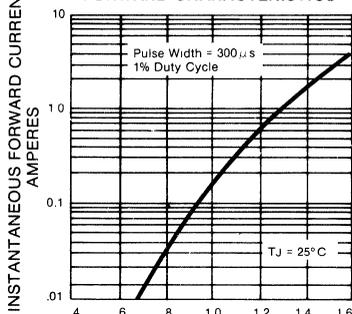


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

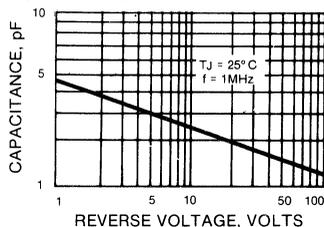
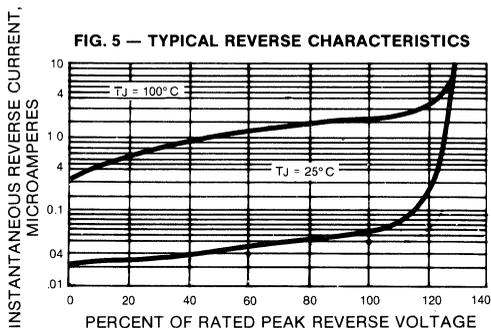


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS



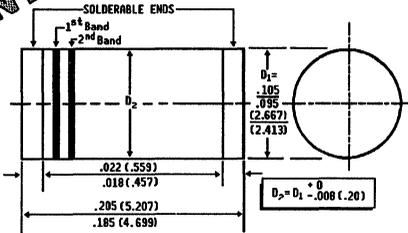
1N6478 THRU 1N6484

SURFACE MOUNT GLASS PASSIVATED SILICON RECTIFIER

Voltage - 50 to 1000 Volts Current - 1.0 Ampere

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

*Glass-plastic encapsulation technique is covered by Patent 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,930,306 of 1976

- ◆ For surface mounted applications
- ◆ High temperature metallurgically bonded- no compression contacts as found in diode-constructed rectifiers
- ◆ Glass passivated junction
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: 450°C/5 seconds at terminals. Complete device submersible temperature of 265°C for 10 seconds in solder bath



MECHANICAL DATA

Case: Molded plastic over glass

Terminals: Plated terminals, solderable per MIL-STD-202, Method 208

Polarity: Two bands indicate cathode

1st band denotes device type 2nd band denotes voltage type

Mounting Position: Any **Handling Precautions:** None

Weight: 0.116 gram, 0.0046 ounce



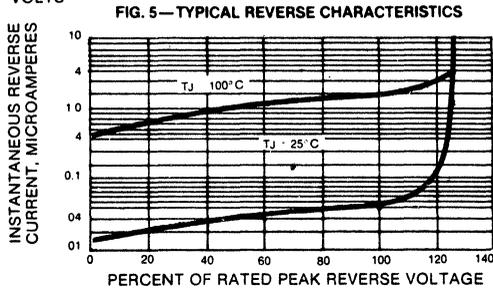
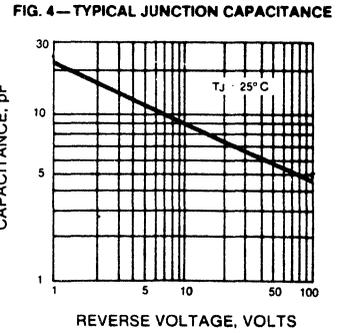
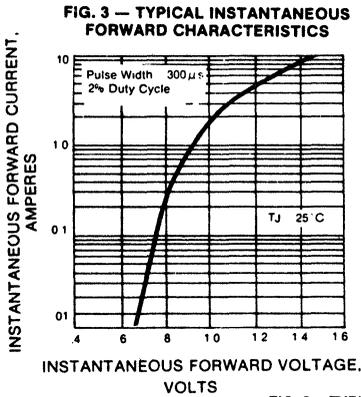
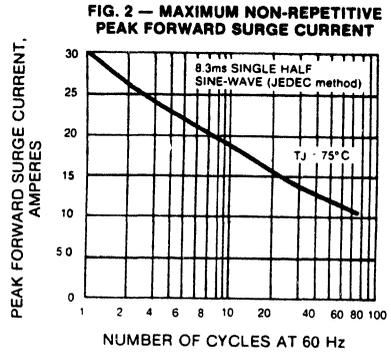
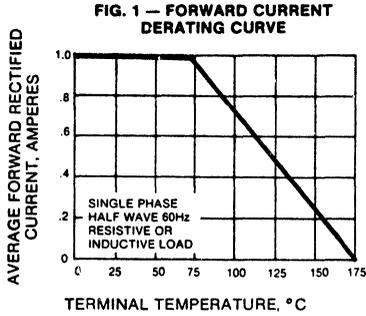
MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

Standard recovery time device: 1 st band is White	SYMBOLS	1N	1N	1N	1N	1N	1N	1N	UNITS
		6478	6479	6480	6481	6482	6483	6484	
* Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
* Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
* Maximum Average Forward Rectified Current at T _T =75°C	I _(AV)	1.0							Amps
* Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) T _A =75°C	I _{FSM}	30.0							Amps
* Maximum Instantaneous Forward Voltage at 1.0A T _A =75°C T _A =25°C	V _F	1.0 1.1							Volts
* Maximum DC Reverse Current at Rated DC Blocking Voltage T _A =25°C T _A =125°C	I _R	10.0 200							μA
* Maximum Full Load Reverse Current, Full Cycle Average at T _A =75°C	I _{R(AV)}	100							μA
Typical Junction Capacitance (NOTE 1)	C _J	15							pf
* Maximum Thermal Resistance (NOTE 2) (NOTE 3)	R _{θJL} R _{θJA}	20.0 50.0							°C/W
* Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175							°C
Polarity Color Bands (2 nd Band)		Gray	Red	Orange	Yellow	Green	Blue	Violet	

NOTES: 1. Measured at 1 MHz and applied reverse voltage of 4.0 V_{DC}.
2. Thermal resistance from junction to terminal, 6.0mm² copper pads to each terminal.
3. Thermal resistance from junction to ambient, 6.0mm² copper pads to each terminal.
* JEDEC Registered Values

RATINGS AND CHARACTERISTIC CURVES 1N6478 THRU 1N6484

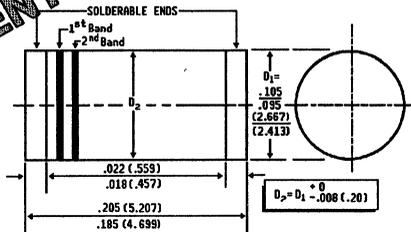


BYM10-50 THRU BYM10-1000 GL41A THRU GL41M

SURFACE MOUNT GLASS PASSIVATED SILICON RECTIFIER
Voltage - 50 to 1600 Volts Current - 1.0 Ampere

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

*Glass plastic encapsulation technique is covered by Patent 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,930,306 of 1976

- ◆ For surface mounted applications
- ◆ High temperature metallurgically bonded-no compression contacts as found in diode-constructed rectifiers
- ◆ Glass passivated junction
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: 450°C/5 seconds at terminals. Complete device submersible temperature of 265°C for 10 seconds in solder bath

MECHANICAL DATA

Case: Molded plastic over glass

Terminals: Plated Terminals, solderable per MIL-STD-202, Method 208

Polarity: Two bands indicate cathode

1st band denotes device type 2nd band denotes voltage type

Mounting Position: Any **Handling Precautions:** None

Weight: 0.116 gram, 0.0046 ounce

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

SYMBOLS	BYM10						BYM10A		UNITS		
	-50	-100	-200	-400	-600	-800-1000	-800-1000				
Standard recovery device: 1 st band is White	GL41A	GL41B	GL41D	GL41G	GL41J	GL41K	GL41M	GL41T	GL41Y		
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	1300	1600	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	910	1120	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	1300	1600	Volts
Maximum Average Forward Rectified Current T _T =75°C	I _(AV)	1.0									Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	30.0									Amps
Maximum Instantaneous Forward Voltage at 1.0A	V _F					1.1	1.2				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _A =25°C T _A =125°C	I _R					10.0	50.0				µA
Maximum Full Load Reverse Current Full Cycle Average at T _A =75°C	I _{R(AV)}					30.0					µA
Typical Junction Capacitance (NOTE 1)	C _J					15.0					pf
Maximum Thermal Resistance (NOTE 2) (NOTE 3)	R _{ΘJL} R _{ΘJA}					30.0	75.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175									°C
Polarity Color Bands (2 nd Band)		Gray	Red	Orange	Yellow	Green	Blue	Violet	White	Brown	

- NOTES: 1. Measured at 1 MHz and applied reverse voltage of 4.0 V_{DC}.
2. Thermal resistance from junction to terminal, 6.0mm² copper pads to each terminal.
3. Thermal resistance from junction to ambient, 6.0mm² copper pads to each terminal.

**RATINGS AND CHARACTERISTIC CURVES BYM10-50 THRU BYM10-1000
GL41A THRU GL41M**

FIG. 1 — FORWARD CURRENT DERATING CURVE

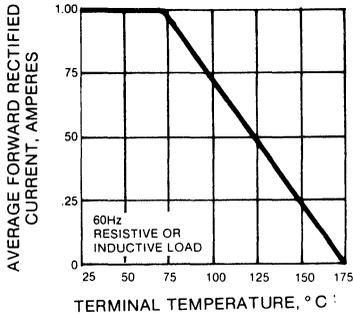


FIG. 2 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

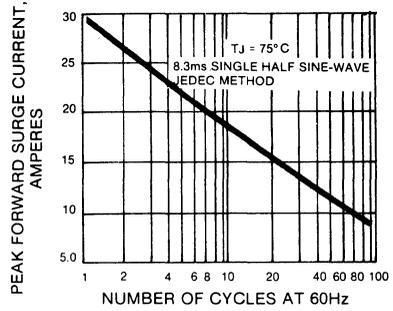


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

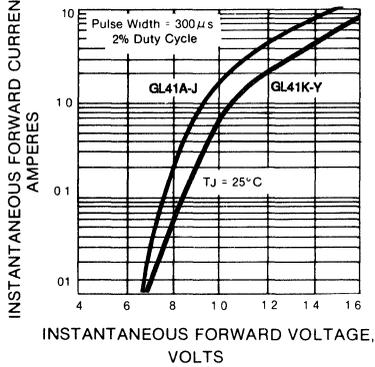


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

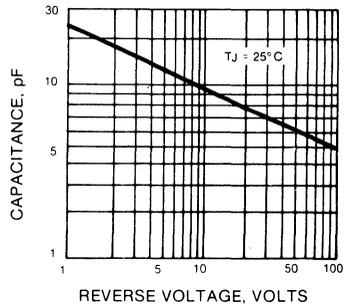
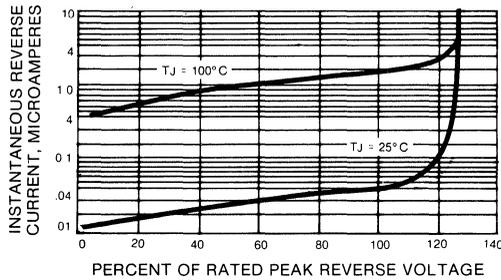


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

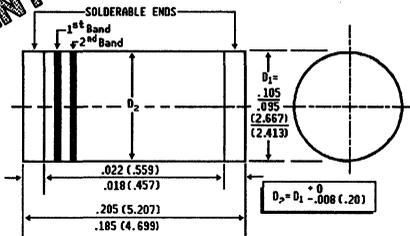


BYM11-50 THRU BYM11-1000 RGL41A THRU RGL41M

SURFACE MOUNT GLASS PASSIVATED FAST SWITCHING SILICON RECTIFIER
Voltage - 50 to 1000 Volts Current - 1.0 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

*Glass-plastic encapsulation technique is covered by Patent No. 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,530,306 of 1976

- ◆ For surface mounted applications
- ◆ High temperature metallurgically bonded - no compression contacts as found in diode-constructed rectifiers
- ◆ Glass passivated junction
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: 450°C/5 seconds at terminals. Complete device submersible temperature of 260°C for 10 seconds in solder bath



MECHANICAL DATA

Case: Molded plastic over glass

Terminals: Plated Terminals, solderable per MIL-STD-202, Method 208

Polarity: Two bands indicate cathode

1st band denotes device type 2nd band denotes voltage type

Mounting Position: Any **Handling Precautions:** None

Weight: 0.116 gram, 0.0046 ounce

SUPER RECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	BYM11							UNITS	
	SYMBOLS	- 50	-100	-200	-400	-600	-800-1000		
Fast switching time device: 1 st band is Red		RGL 41A	RGL 41B	RGL 41D	RGL 41G	RGL 41J	RGL 41K 41M		
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	50	100	200	400	600	800 1000	Volts	
Maximum RMS Voltage	V_{RMS}	35	70	140	280	420	560 700	Volts	
Maximum DC Blocking Voltage	V_{DC}	50	100	200	400	600	800 1000	Volts	
Maximum Average Forward Rectified Current $T_T=55^\circ\text{C}$	$I_{(AV)}$	1.0						Amps	
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0						Amps	
Maximum Instantaneous Forward Voltage at 1.0A	V_F	1.3						Volts	
Maximum DC Reverse Current $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=125^\circ\text{C}$	I_R	5.0 50.0						μA	
Maximum Full Load Reverse Current, Full Cycle Average, at $T_A = 55^\circ\text{C}$	$I_{R(AV)}$	50.0						μA	
Maximum Reverse Recovery Time (NOTE 1) $T_J=25^\circ\text{C}$	T_{RR}	150			250	500	500	ns	
Typical Junction Capacitance (NOTE 4)	C_J	15.0						pf	
Maximum Thermal Resistance (NOTE 2) (NOTE 3)	$R_{\theta JL}$ $R_{\theta JA}$	30.0 75.0						$^\circ\text{C/W}$	
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175							$^\circ\text{C}$
Polarity Color Bands (2 nd Band)		Gray	Red	Orange	Yellow	Green	Blue	Violet	

NOTES: 1. Reverse Recovery Test Conditions: $I_F=0.5A$, $I_R=1.0A$, $I_{rr}=.25A$.

2. Thermal resistance from junction to terminal, 6.0mm² copper pads to each terminals.

3. Thermal Resistance from junction to ambient 6.0mm² copper pads to each terminal.

4. Measured at 1 MHz and applied reverse voltage of 4.0 V_{DC}.

RATINGS AND CHARACTERISTIC CURVES BYM11-50 THRU BYM11-1000 RGL41A THRU RGL41M

FIG. 1 — REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

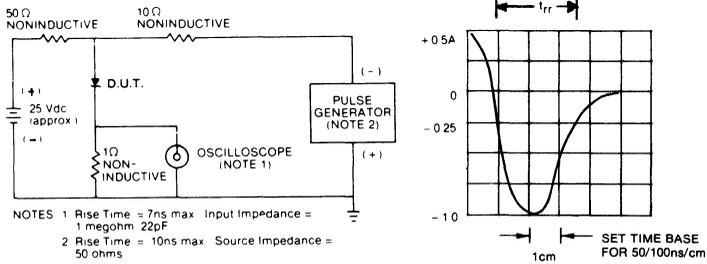


FIG. 2 — FORWARD CURRENT DERATING CURVE

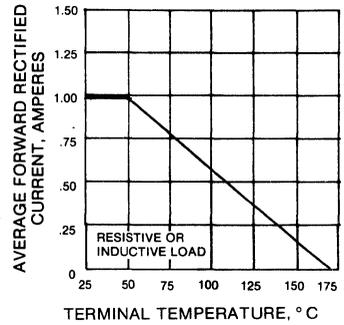


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

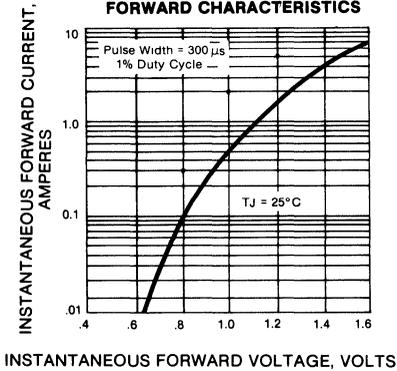


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

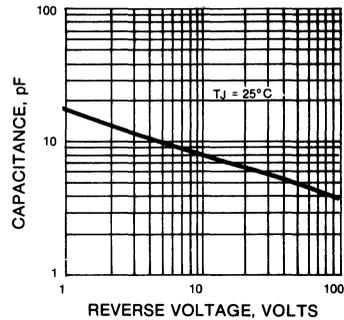


FIG. 5 — MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

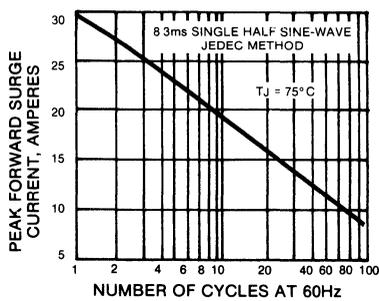
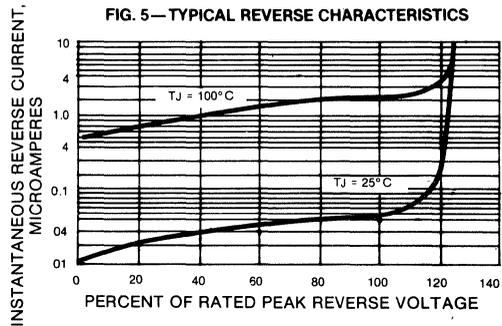


FIG. 5 — TYPICAL REVERSE CHARACTERISTICS

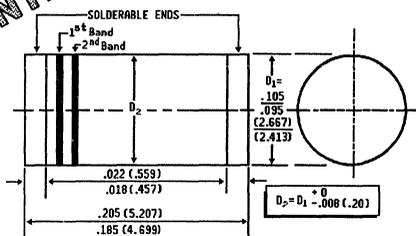


BYM12-50 THRU BYM12-400 EGL41A THRU EGL41G

SURFACE MOUNT GLASS PASSIVATED FAST EFFICIENT SILICON RECTIFIER
Voltage - 50 to 400 Volts Current - 1.0 Amperes

FEATURES

PATENTED*



Dimensions in inches and (millimeters)

*Glass-plastic encapsulation technique is covered by Patent 3,996,602 of 1976; brazed-lead assembly to Patent No. 3,930,306 of 1976

- ◆ For surface mounted applications
- ◆ High temperature metallurgically bonded - no compression contacts as found in diode-constructed rectifiers
- ◆ Glass passivated junction
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Superfast recovery times for high efficiency
- ◆ Capable of meeting environmental standards of MIL-S-19500
- ◆ High temperature soldering guaranteed: 450°C/ 5 seconds at terminals. Complete device submersible temperature of 265°C for 10 seconds in solder bath



MECHANICAL DATA

Case: Molded plastic over glass
Terminals: Solderable per MIL-STD-202, Method 208
Polarity: Two bands indicate cathode
1st band denoted device type 2nd band denotes voltage type
Mounting Position: Any **Handling Precautions:** None
Weight: 0.116 gram, 0.0046 ounce

SUPERRECTIFIER®

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

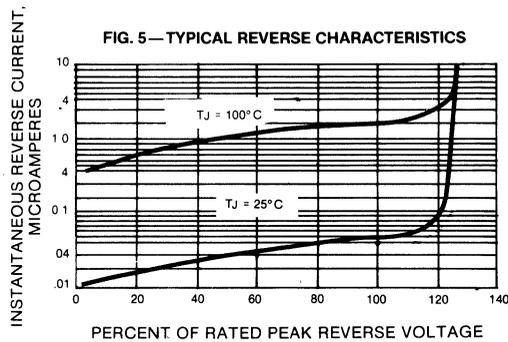
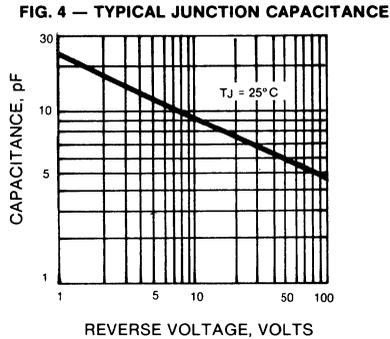
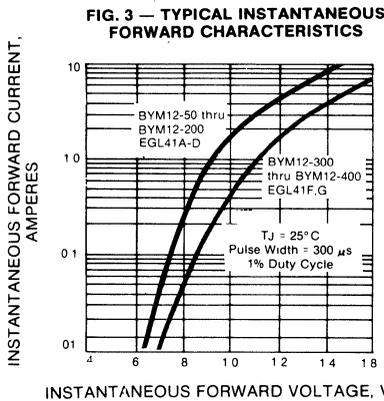
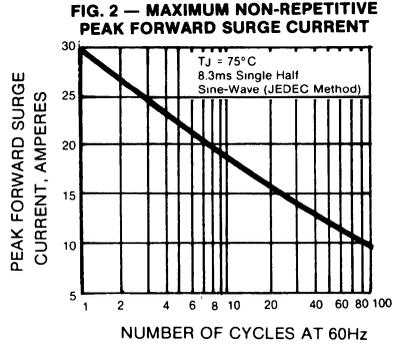
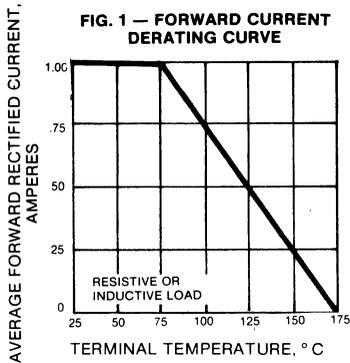
Ratings at 25°C ambient temperature unless otherwise specified. 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	BYM12						UNITS
		-50	-100	-150	-200	300	-400	
Fast efficient devices: 1 st band is green		EGL 41A	EGL 41B	EGL 41C	EGL 41D	EGL 41F	EGL 41G	
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	300	400	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	210	280	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	300	400	Volts
Maximum Average Forward Rectified Current at T _t =75°C	I _(AV)	1.0						Amps
Peak Forward Surge Current, 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	30.0						Amps
Maximum Instantaneous Forward Voltage at 1.0A	V _F	1.0			1.25			Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =125°C	I _R	5.0			50.0			μA
Maximum Reverse Recovery Time (NOTE 1) T _J =25°C	T _{RR}	50						ns
Typical Junction Capacitance (NOTE 2)	C _J	15.0						pf
Maximum Thermal Resistance R _{thJL} (NOTE 3) R _{thJA} (NOTE 4)	R _{θJL} R _{θJA}	30				60		°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175						°C
Polarity Color Bands (2 nd Band)		Gray	Red	Pink	Orange	Brown	Yellow	

NOTES:

- Reverse Recovery test Conditions I_F = .5A, I_R = 1.0A, I_{rr} = .25A.
- Measured at 1 MHz and applied reverse voltage of 4.0 Volts.
- Thermal resistance junction to terminal, 6.0mm² copper pads to each terminal.
- Thermal resistance junction to ambient, 6.0mm² copper pads to each terminal.

**RATINGS AND CHARACTERISTIC CURVES BYM12-50 THRU BYM12-400
EGL41A THRU EGL41G**

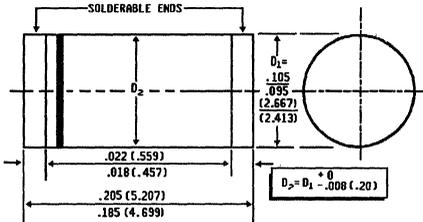


GLL4735 THRU GLL4763

1.0 WATT SURFACE MOUNT GLASS PASSIVATED ZENER
Voltage- 6.2-91.0 Volts Power Rating - 1.0 Watt

FEATURES

- ◆ For surface mounted applications
- ◆ Plastic package has Underwriter Laboratory Flammability Classification 94 V-0
- ◆ Glass passivated junction
- ◆ Low zener impedance
- ◆ Excellent clamping capability
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/ at terminals



MECHANICAL DATA

Case: Molded plastic

Terminals: Solderable per MIL-STD-202, Method 208

Polarity: Red band denotes cathode

Mounting Position: Any

Handling Precautions: None

Weight: 0.116 grams, 0.0046 ounce

The plastic material covering the glass passivated junction carries U/L recognition 94V-0

OPERATING AND STORAGE TEMPERATURE RANGE -65°C to +175°C

Type	*Nominal Zener Voltage @I _{ZT} V _Z Volts	Maximum DC Power Dissipation @T _T = 75°C P _D Watts	Test Current I _{ZT} mA	Maximum Dynamic Impedance			Maximum Reverse Leakage Current @T _A = 25°C		Maximum Surge Current @T _A = 25°C (Note 1) I _R mApk	Maximum Forward Voltage @200mA @T _A = 25°C Volts
				Z _{TT} OHMs	Z _{ZK} @ OHMs	I _{ZT} MA	I _R µA	V _R Volts		
GLL4735	6.2	1.0	41.0	2.0	700	1.0	10.0	3.0	730.0	1.2
GLL4736	6.8	1.0	37.0	3.5	700	1.0	10.0	4.0	660.0	1.2
GLL4737	7.5	1.0	34.0	4.0	700	0.5	10.0	5.0	605.0	1.2
GLL4738	8.2	1.0	31.0	4.5	700	0.5	10.0	6.0	550.0	1.2
GLL4739	9.1	1.0	28.0	5.0	700	0.5	10.0	7.0	500.0	1.2
GLL4740	10	1.0	25.0	7.0	700	0.25	10.0	7.6	454.0	1.2
GLL4741	11	1.0	23.0	8.0	700	0.25	5.0	8.4	414.0	1.2
GLL4742	12	1.0	21.0	9.0	700	0.25	5.0	9.1	380.0	1.2
GLL4743	13	1.0	19.0	10.0	700	0.25	5.0	9.9	344.0	1.2
GLL4744	15	1.0	17.0	14.0	700	0.25	5.0	11.4	305.0	1.2
GLL4745	16	1.0	15.5	16.0	700	0.25	5.0	12.2	285.0	1.2
GLL4746	18	1.0	14.0	20.0	750	0.25	5.0	13.7	250.0	1.2
GLL4747	20	1.0	12.5	22.0	750	0.25	5.0	15.2	225.0	1.2
GLL4748	22	1.0	11.5	23.0	750	0.25	5.0	16.7	205.0	1.2
GLL4749	24	1.0	10.5	25.0	750	0.25	5.0	18.2	190.0	1.2
GLL4750	27	1.0	9.5	35.0	750	0.25	5.0	20.6	170.0	1.2
GLL4751	30	1.0	8.5	40.0	1000	0.25	5.0	22.8	150.0	1.2
GLL4752	33	1.0	7.5	45.0	1000	0.25	5.0	25.1	135.0	1.2
GLL4753	36	1.0	7.0	50.0	1000	0.25	5.0	27.4	125.0	1.2
GLL4754	39	1.0	6.5	60.0	1000	0.25	5.0	29.7	115.0	1.2
GLL4755	43	1.0	6.0	70.0	1500	0.25	5.0	32.7	110.0	1.2
GLL4756	47	1.0	5.5	80.0	1500	0.25	5.0	35.8	95.0	1.2
GLL4757	51	1.0	5.0	95.0	1500	0.25	5.0	38.8	90.0	1.2
GLL4758	56	1.0	4.5	110.0	2000	0.25	5.0	42.6	80.0	1.2
GLL4759	62	1.0	4.0	125.0	2000	0.25	5.0	47.1	70.0	1.2
GLL4760	68	1.0	3.7	150.0	2000	0.25	5.0	51.7	65.0	1.2
GLL4761	75	1.0	3.3	175.0	2000	0.25	5.0	56.0	60.0	1.2
GLL4762	82	1.0	3.0	200.0	3000	0.25	5.0	62.2	55.0	1.2
GLL4763	91	1.0	2.0	250.0	3000	0.25	5.0	69.2	50.0	1.2

*Standard Voltage Tolerance ±10%, Suffix A ±5% Note 1: Surge Current is non-repetitive, 8.3 ms pulse width square wave or equivalent sine-wave superimposed on I_{ZT} per JEDEC method.

RATINGS AND CHARACTERISTIC CURVES GLL4735 THRU GLL4763

FIG. 1 — MAXIMUM CONTINUOUS POWER DISSIPATION

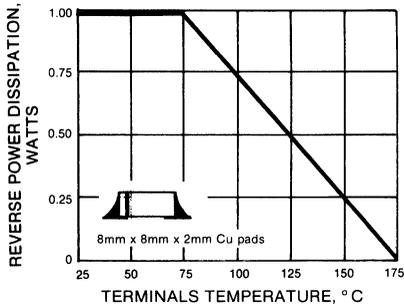


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

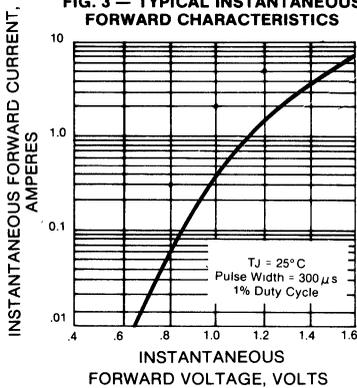


FIGURE 2 — TYPICAL ZENER IMPEDANCE

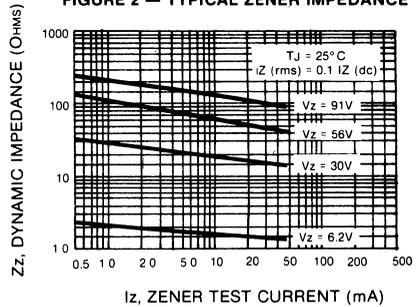


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

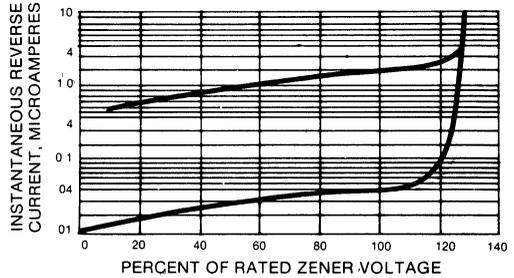
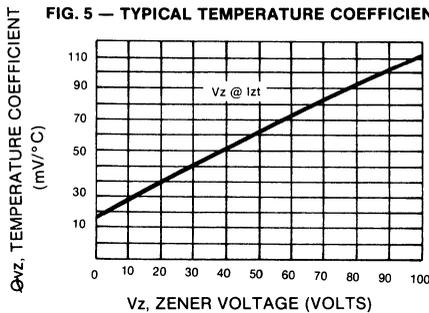


FIG. 5 — TYPICAL TEMPERATURE COEFFICIENTS

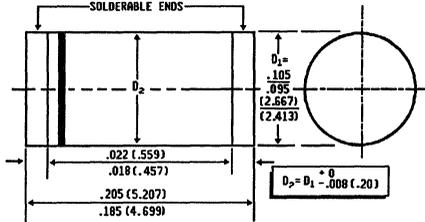


ZGL41-100 THRU ZGL41-200

1.0 WATT SURFACE MOUNT GLASS PASSIVATED ZENER
Voltage- 100 - 200 Volts Power Rating - 1.0 Watt

FEATURES

- ◆ For surface mounted applications
- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94 V-O
- ◆ Glass passivated junction
- ◆ Low zener impedance
- ◆ Excellent clamping capability
- ◆ High temperature soldering guaranteed: 250°C/10 seconds/ at terminals



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Solderable per MIL-STD-202, Method 202

Polarity: Red band denotes cathode

Mounting Position: Any

Handling Precautions: None

Weight: 0.116 grams, 0.0046 ounce

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

The plastic material covering the glass passivated junction carries U/L recognition 94V-O
OPERATING AND STORAGE TEMPERATURE RANGE -65°C to +175°C

TYPE	NOMINAL ZENER VOLTAGE @ I _{ZT} VZ	MAXIMUM DC POWER DISSIPATION @ T _J =75°C PD	TEST CURRENT I _{ZT} mA	MAXIMUM DYNAMIC IMPEDANCE			MAXIMUM REVERSE LEAKAGE CURRENT @ T _A =25 °C		MAXIMUM SURGE CURRENT @ T _A =25 °C (NOTE 1) I _{FSM} mA	MAXIMUM FORWARD VOLTAGE @ I _F =25 mA @ T _A =25 °C V _F
				Z _{ZT} OHMS	Z _{ZK} OHMS	I _{ZK} 1 _H mA	I _R μA	I _{RM} VOLTS		
ZGL41-100	100	1.0	3.7	250	3100	0.25	1.0	76.0	10.0	1.5
ZGL41-110	110	1.0	3.4	300	4000	0.25	1.0	83.6	9.1	1.5
ZGL41-120	120	1.0	3.1	380	4500	0.25	1.0	91.2	8.3	1.5
ZGL41-130	130	1.0	2.9	450	5000	0.25	1.0	98.8	7.7	1.5
ZGL41-140	140	1.0	2.7	525	5500	0.25	1.0	106.4	7.1	1.5
ZGL41-150	150	1.0	2.5	600	6000	0.25	1.0	114	6.7	1.5
ZGL41-160	160	1.0	2.3	700	6500	0.25	1.0	121.6	6.3	1.5
ZGL41-170	170	1.0	2.2	800	6750	0.25	1.0	129.2	5.9	1.5
ZGL41-180	180	1.0	2.1	900	7000	0.25	1.0	136.98	5.6	1.5
ZGL41-190	190	1.0	2.0	1050	7500	0.25	1.0	144.4	5.3	1.5
ZGL41-200	200	1.0	1.9	1200	8000	0.25	1.0	152	5.0	1.5

* Standard Voltage Tolerance ±10%, Suffix A ±5%.

RATINGS AND CHARACTERISTIC CURVES ZGL41-100 THRU ZGL41-200

FIG. 1 — MAXIMUM CONTINUOUS POWER DISSIPATION

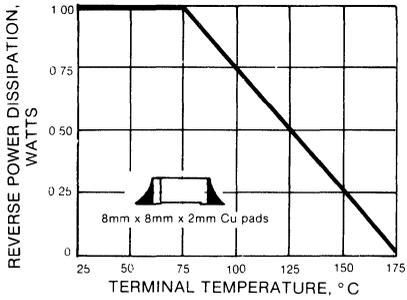


FIG. 3 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

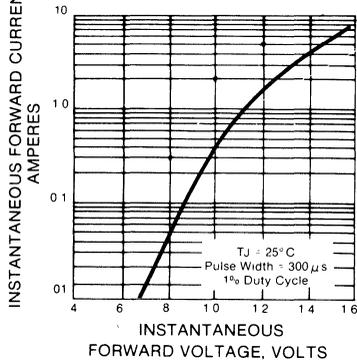


FIG. 2 — TYPICAL ZENER IMPEDANCE

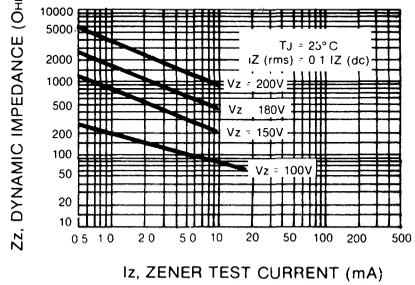


FIG. 4 — TYPICAL REVERSE CHARACTERISTICS

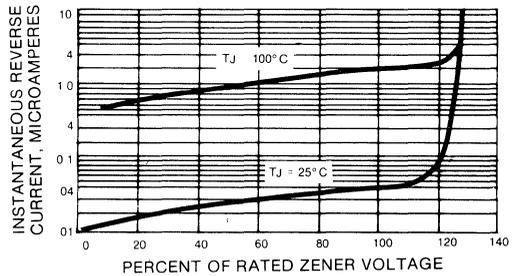
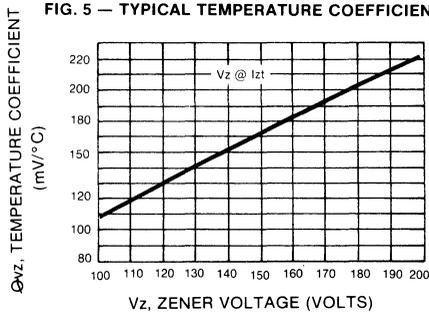


FIG. 5 — TYPICAL TEMPERATURE COEFFICIENTS

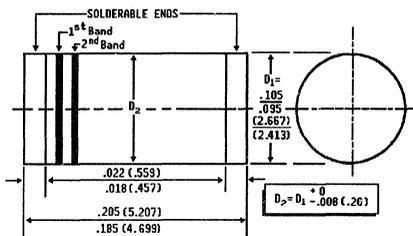


BYM13-20 THRU BYM13-60 SGL41-20 THRU SGL41-60

SURFACE MOUNT SCHOTTKY RECTIFIER
Voltage - 20 to 60 Volts Current - 1.0 Ampere

FEATURES

- ◆ For surface mounted applications
- ◆ Plastic material used carries Underwriters Laboratory Flammability Classifications 94V-0
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ For use in low voltage, high frequency inverters, free wheeling and polarity protection applications
- ◆ High temperature soldering guaranteed: 250°C/10 seconds at terminals



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic
Terminals: Solderable per MIL-STD-202, Method 208
Polarity: Two bands indicate cathode
1st band denotes device type 2nd band denotes voltage type
Mounting Position: Any
Handling Precautions: None
Weight: 0.116 gram, 0.0046 ounce

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz resistive or inductive load.
For capacitive load, derate current by 20%.

	SYMBOLS	BYM13					UNITS
		-20	-30	-40	-50	-60	
Schottky devices: 1st band is orange		SGL41-20	SGL41-30	SGL41-40	SGL41-50	SGL41-60	
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	20	30	40	50	60	Volts
Maximum RMS Voltage	V_{RMS}	14	21	28	35	42	Volts
Maximum DC Blocking Voltage	V_{DC}	20	30	40	50	60	Volts
Maximum Average Forward Rectified Current at $T_T = 75^\circ\text{C}$	$I_{(AV)}$	1.0					Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A	V_F	.50		.70			Volts
Maximum Reverse Current at Rated DC Blocking Voltage $T_J = 25^\circ\text{C}$ $T_J = 100^\circ\text{C}$	I_R	0.5 10					mA
Typical Junction Capacitance (NOTE 1)	C_J	110.0			80.0		pf
Maximum Thermal Resistance R_{thJL} (NOTE 2) R_{thJA} (NOTE 3)	$R_{\theta JL}$ $R_{\theta JA}$	30 75					$^\circ\text{C/W}$
Operating Temperature Range	T_J	-65 to +125					$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +175					$^\circ\text{C}$
Polarity Color Bands (2 nd Band)		Gray	Red	Orange	Yellow	Green	

NOTES:

1. Measured at 1 MHz and applied reverse voltage of 4.0 Vdc.
2. Thermal resistance junction to terminal, 6.0mm² copper pads to each terminal.
3. Thermal resistance junction to ambient, 6.0mm² copper pads to each terminal.

**RATINGS AND CHARACTERISTIC CURVES BYM13-20 THRU BYM13-60
SGL41-20 THRU SGL41-60**

FIG. 1 — FORWARD CURRENT DERATING CURVE

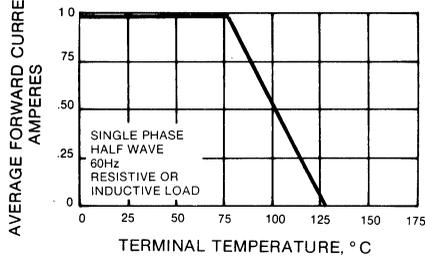


FIG. 2 — TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

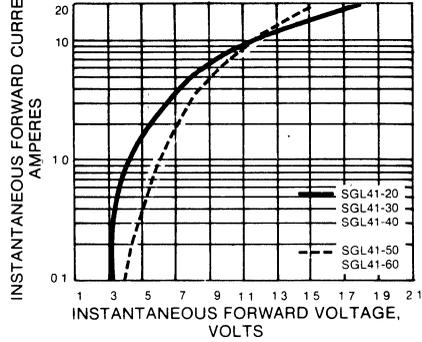


FIG. 3A — TYPICAL REVERSE CHARACTERISTICS

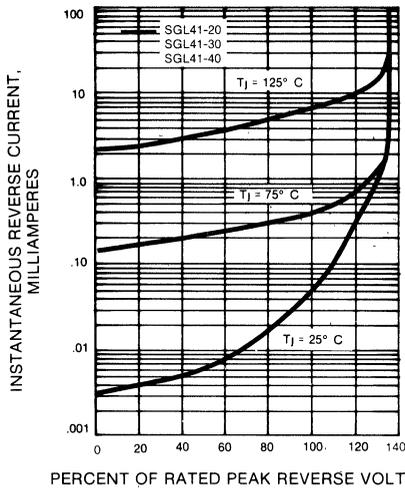


FIG. 3B — TYPICAL REVERSE CHARACTERISTICS

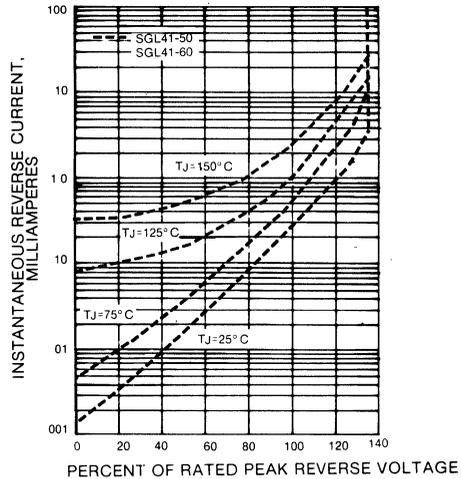


FIG. 4 — TYPICAL JUNCTION CAPACITANCE

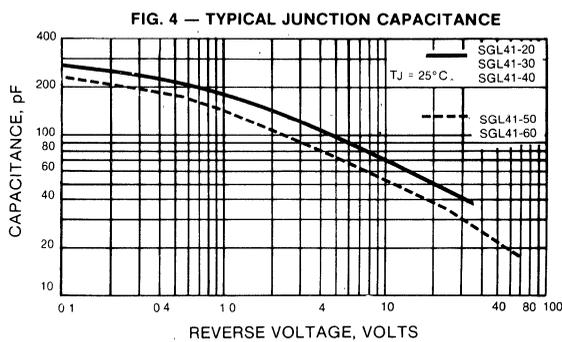
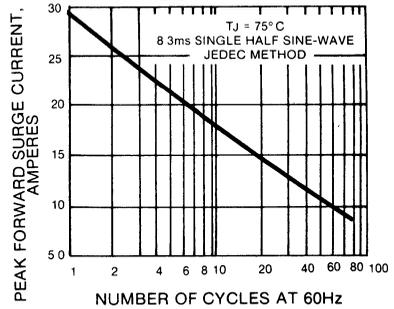


FIG. 5 — MAXIMUM NON-REPETITIVE SURGE CURRENT



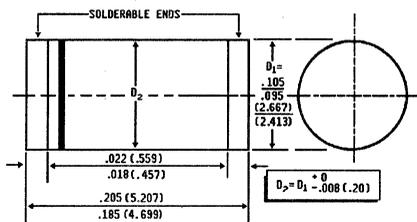
TGL41 SERIES

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

Voltage - 6.8 to 200 Volts

FEATURES

- ◆ For surface mounted applications
- ◆ Plastic material used carries Underwriters Laboratory Flammability Classifications 94V-O
- ◆ Glass passivated junction
- ◆ Excellent clamping capability
- ◆ Fast response time typically less than 1.0ps from 0 volts to BV min.
- ◆ Typical I_R less than 1 μ A above 10V
- ◆ High temperature soldering guaranteed: 250°C/10 seconds at terminals



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Solderable per MIL-STD-202, Method 208

Polarity: Blue bands denotes cathode

Mounting Position: Any

Handling Precautions: None

Weight: 0.116 gram, 0.0046 ounce

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

RATINGS	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ\text{C}$, $T_p = 1\text{ms}$ (NOTE 1)	Ppk	Minimum 400	Watts
Steady State Power Dissipation at $T_T=75^\circ\text{C}$ (NOTE 2)	P_D	1.0	Watt
Peak Forward Surge Current, 8.3ms single half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	I_{FSM}	40.0	Amps
Operating and Storage Temperature Range	T_J , T_{STG}	-65 to +175	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2.
2. Mounted on 8.0 mm² copper pads to each terminal.
3. 8.3ms single half sine-wave duty cycle = 4 pulses per minutes maximum.

RATINGS AND CHARACTERISTIC CURVES TGL41 SERIES

FIGURE 1 — PULSE RATING CURVE

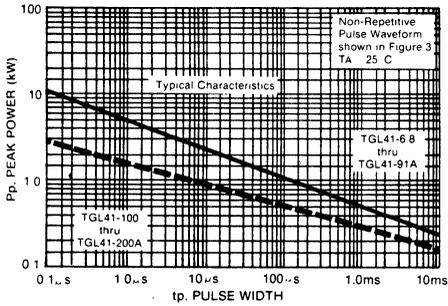


FIGURE 2 — PULSE DERATING CURVE

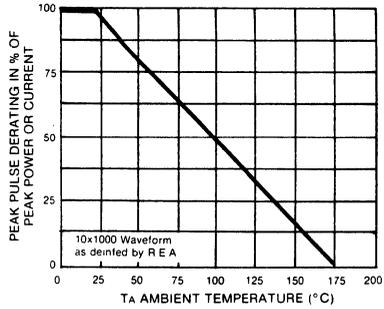


FIGURE 3 — PULSE WAVEFORM

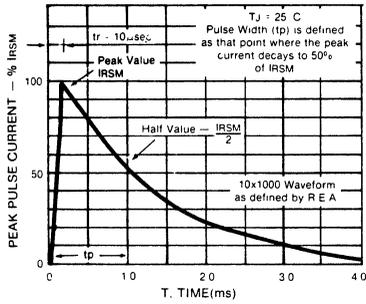


FIGURE 4 — TYPICAL JUNCTION CAPACITANCE

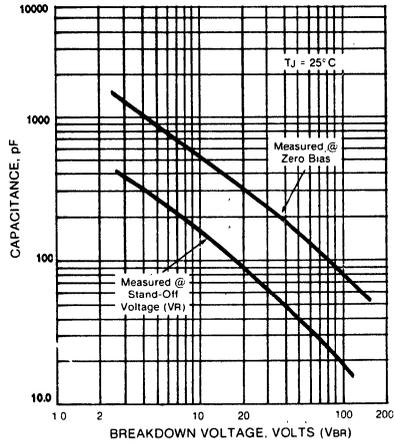


FIGURE 5 — STEADY STATE POWER DERATING

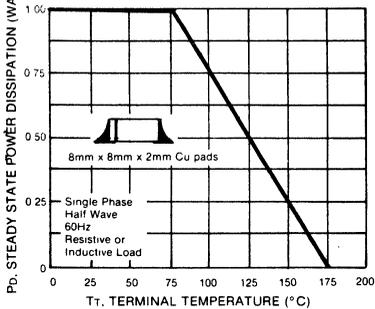
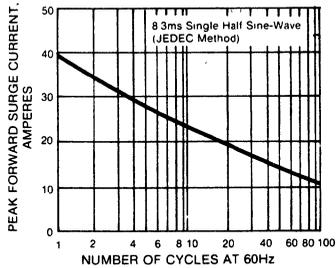


FIGURE 6 — MAXIMUM NON-REPETITIVE SURGE CURRENT



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

DEVICE	Breakdown Voltage V_{BR} @ I_T		Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} I_R (μA)	Maximum Reverse Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Coefficient of V_{BR} (% / $^\circ\text{C}$)	
	Volts (NOTE 1)							
	MIN	MAX						
TGL41-6.8	6.12	7.48	10	5.50	1000	37	10.8	0.060
TGL41-6.8A	6.45	7.14	10	5.80	1000	38	10.5	0.060
TGL41-7.5	6.75	8.25	10	6.05	500	34	11.7	0.064
TGL41-7.5A	7.13	7.88	10	6.40	500	35	11.3	0.064
TGL41-8.2	7.38	9.02	10	6.63	200	32	12.5	0.068
TGL41-8.2A	7.79	8.61	10	7.02	200	33	12.1	0.068
TGL41-9.1	8.19	10.0	1.0	7.37	50	29	13.8	0.071
TGL41-9.1A	8.65	9.55	1.0	7.78	50	30	13.4	0.071
TGL41-10	9.00	11.0	1.0	8.10	10	27	15.0	0.076
TGL41-10A	9.50	10.5	1.0	8.55	10	28	14.5	0.076
TGL41-11	9.90	12.1	1.0	8.92	5.0	25	16.2	0.078
TGL41-11A	10.5	11.6	1.0	9.40	5.0	26	15.6	0.078
TGL41-12	10.8	13.2	1.0	9.72	5.0	23	17.3	0.081
TGL41-12A	11.4	12.6	1.0	10.2	5.0	24	16.7	0.081
TGL41-13	11.7	14.3	1.0	10.5	5.0	21	19.0	0.084
TGL41-13A	12.4	13.7	1.0	11.1	5.0	22	18.2	0.084
TGL41-15	13.5	16.5	1.0	12.1	5.0	18.20	22.0	0.087
TGL41-15A	14.3	15.8	1.0	12.8	5.0	18.90	21.2	0.087
TGL41-16	14.4	17.6	1.0	12.9	5.0	17.00	23.5	0.089
TGL41-16A	15.2	16.8	1.0	13.6	5.0	17.80	22.5	0.089
TGL41-18	16.2	19.8	1.0	14.5	5.0	15.10	26.5	0.091
TGL41-18A	17.1	18.9	1.0	15.3	5.0	15.90	25.2	0.091
TGL41-20	18.0	22.0	1.0	16.2	5.0	13.70	29.1	0.093
TGL41-20A	19.0	21.0	1.0	17.1	5.0	14.40	27.7	0.093
TGL41-22	19.8	24.2	1.0	17.8	5.0	12.50	31.9	0.095
TGL41-22A	20.9	23.1	1.0	18.8	5.0	13.10	30.6	0.095
TGL41-24	21.6	26.4	1.0	19.4	5.0	11.50	34.7	0.097
TGL41-24A	22.8	25.2	1.0	20.5	5.0	12.00	33.2	0.097
TGL41-27	24.3	29.7	1.0	21.8	5.0	10.20	39.1	0.099
TGL41-27A	25.7	28.4	1.0	23.1	5.0	10.70	37.5	0.099
TGL41-30	27.0	33.0	1.0	24.3	5.0	9.20	43.5	0.100
TGL41-30A	28.5	31.5	1.0	25.6	5.0	9.70	41.4	0.100
TGL41-33	29.7	36.3	1.0	26.8	5.0	8.40	47.7	0.101
TGL41-33A	31.4	34.7	1.0	28.2	5.0	8.80	45.7	0.101
TGL41-36	32.4	39.6	1.0	29.1	5.0	7.70	52.0	0.102
TGL41-36A	34.2	37.8	1.0	30.8	5.0	8.00	49.9	0.102
TGL41-39	35.1	42.9	1.0	31.6	5.0	7.10	56.4	0.103
TGL41-39A	37.1	41.0	1.0	33.3	5.0	7.40	53.9	0.103
TGL41-43	38.7	47.3	1.0	34.8	5.0	6.50	61.9	0.104
TGL41-43A	40.9	45.2	1.0	36.8	5.0	6.70	59.3	0.104
TGL41-47	42.3	51.7	1.0	38.1	5.0	5.90	67.8	0.104
TGL41-47A	44.7	49.4	1.0	40.2	5.0	6.20	64.8	0.104
TGL41-51	45.9	56.1	1.0	41.3	5.0	5.40	73.5	0.105

ELECTRICAL CHARACTERISTICS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

DEVICE	Breakdown Voltage Peak V_{BR} Volts (NOTE 1)			Working Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} I_R (μA)	Maximum Reverse Current I_{RSM} (NOTE 2) (Ampe)	Maximum Maximum Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Temperature Coefficient of V_{BR} (% / $^{\circ}\text{C}$)
			@IT (mA)					
	MIN	MAX						
TGL41-51A	48.5	53.6	1.0	43.6	5.0	5.70	70.1	0.105
TGL41-56	50.4	61.6	1.0	45.4	5.0	5.00	80.5	0.106
TGL41-56A	53.2	58.8	1.0	47.8	5.0	5.20	77.0	0.106
TGL41-62	55.8	68.2	1.0	50.2	5.0	4.50	89.0	0.107
TGL41-62A	58.9	65.1	1.0	53.0	5.0	4.70	85.0	0.107
TGL41-68	61.2	74.8	1.0	55.1	5.0	4.10	98.0	0.107
TGL41-68A	64.6	71.4	1.0	58.1	5.0	4.30	92.0	0.107
TGL41-75	67.5	82.5	1.0	60.7	5.0	3.70	108.0	0.108
TGL41-75A	71.3	78.8	1.0	64.1	5.0	3.90	103.0	0.108
TGL41-82	73.8	90.2	1.0	66.4	5.0	3.40	118.0	0.108
TGL41-82A	77.9	86.1	1.0	70.1	5.0	3.50	113.0	0.108
TGL41-91	81.9	100.0	1.0	73.7	5.0	3.00	131.8	0.109
TGL41-91A	86.5	95.50	1.0	77.8	5.0	3.20	125.0	0.109
TGL41-100	90.0	110.0	1.0	81.0	5.0	1.39	144.0	0.109
TGL41-100A	95.0	105.0	1.0	85.5	5.0	1.46	137.0	0.109
TGL41-110	99.0	121.0	1.0	89.2	5.0	1.27	158.0	0.110
TGL41-110A	105.0	116.0	1.0	94.0	5.0	1.32	152.0	0.110
TGL41-120	108.0	132.0	1.0	97.2	5.0	1.16	173.0	0.110
TGL41-120A	114.0	126.0	1.0	102.0	5.0	1.21	165.0	0.110
TGL41-130	117.0	143.0	1.0	105.0	5.0	1.07	187.0	0.110
TGL41-130A	124.0	137.0	1.0	111.0	5.0	1.12	179.0	0.110
TGL41-150	135.0	165.0	1.0	121.0	5.0	.93	215.0	0.111
TGL41-150A	143.0	158.0	1.0	128.0	5.0	.97	207.0	0.111
TGL41-160	144.0	176.0	1.0	130.0	5.0	.87	230.0	0.111
TGL41-160A	152.0	168.0	1.0	136.0	5.0	.91	219.0	0.111
TGL41-170	153.0	187.0	1.0	138.0	5.0	.82	244.0	0.111
TGL41-170A	162.0	179.0	1.0	145.0	5.0	.85	234.0	0.111
TGL41-180	162.0	198.0	1.0	146.0	5.0	.78	258.0	0.111
TGL41-180A	171.0	189.0	1.0	154.0	5.0	.81	246.0	0.111
TGL41-200	180.0	220.0	1.0	162.0	5.0	.70	287.0	0.111
TGL41-200A	190.0	210.0	1.0	171.0	5.0	.73	274.0	0.111

NOTES:

- V_{BR} measured after IT applies for 300 μs IT = Square Wave Pulse or equivalent.
- Surge Current Waveform per Figure 3 and Derate per Figure 2.



GF1A THRU GF1M

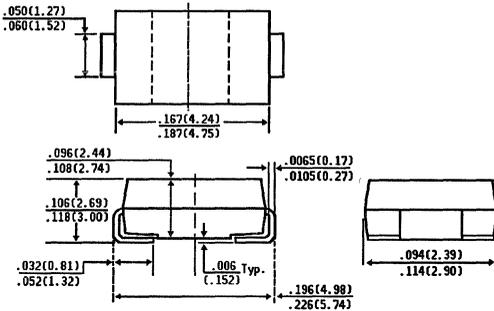
SURFACE MOUNT RECTIFIER
VOLTAGE - 50 to 1000 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ For surface mounted applications
- ◆ High temperature metallurgically bonded-no compression contacts as found in other diode-constructed rectifiers
- ◆ Glass passivated junction
- ◆ Built-in strain relief
- ◆ Easy pick and place
- ◆ Plastic material used carries Underwriters Laboratory Classification 94 V-O
- ◆ High temperature soldering guaranteed: 450°C/5 seconds at terminals
- ◆ Complete device submersible temperature of 265°C for 10 seconds in solder bath



GF1/DO-214BA



Dimensions in inches and (millimeters)

MECHANICAL DATA

- Case:** Molded plastic over glass
- Terminals:** Solder plated
- Polarity:** Indicated by cathode band
- Standard Packaging:** 12mm tape (EIA STD RS-481)
- Weight:** 0.0048 ounces, 0.120 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	GF1A	GF1B	GF1D	GF1G	GF1J	GF1K	GF1M	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current at T _L =125°C	I _(AV)	1.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	30.0							Amps
Maximum Instantaneous Forward Voltage at 1.0A	V _F	1.10							Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _A =25°C T _A =125°C	I _R	5.0 50							μA
Typical Reverse Recovery Time (NOTE 1)	T _{RR}	2.5							μS
Typical Junction Capacitance (NOTE 2)	C _J	15.0							pf
Maximum Thermal Resistance (NOTE 3)	R _{θJL}	30.0							°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175							°C

NOTES:

1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{rr}=0.25A.
2. Measured at 1.0 MHz and Applied Vr=4.0 volts.
3. 5.0mm² (.013mm thick) land areas.

RATINGS AND CHARACTERISTIC CURVES GF1A THRU GF1M

FIG 1 - FORWARD CURRENT DERATING CURVE

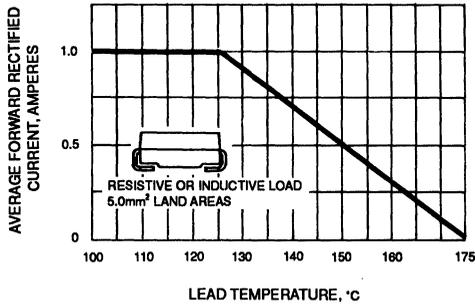


FIG 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

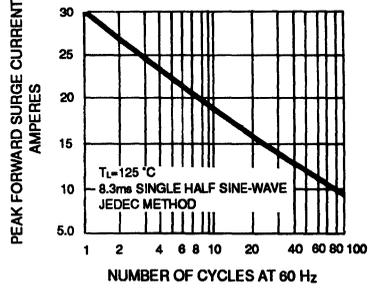


FIG 3 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

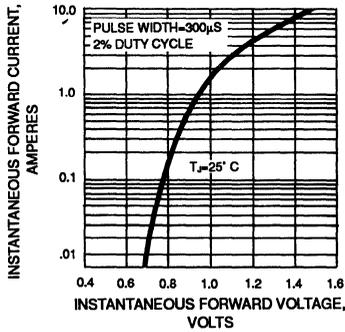


FIG 4 - TYPICAL JUNCTION CAPACITANCE

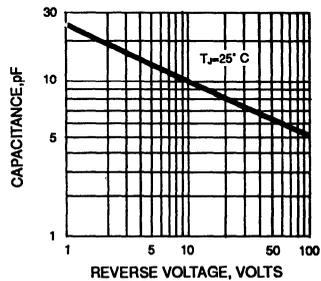


FIG 5 - TYPICAL REVERSE CHARACTERISTICS

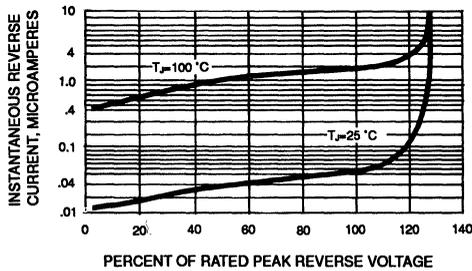
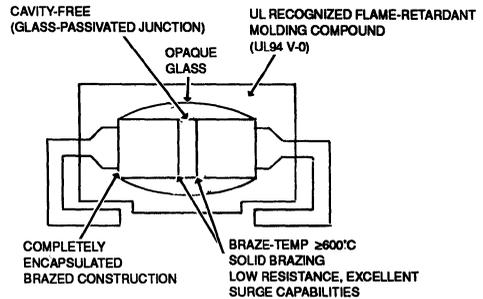


FIG 6 - SUPERRECTIFIER GF1 PACKAGE





RF1A THRU RF1M

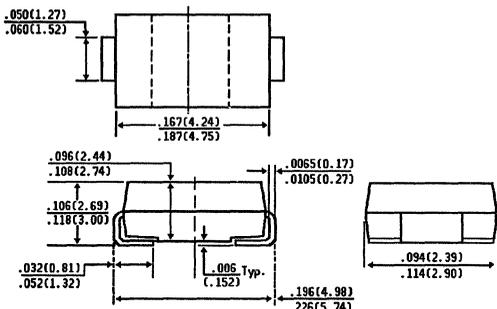
**SURFACE MOUNT GLASS PASSIVATED
FAST SWITCHING SILICON RECTIFIER**
VOLTAGE - 50 to 1000 Volts CURRENT - 1.0 Ampere

FEATURES

- ◆ For surface mounted applications
- ◆ High temperature metallurgically bonded-no compression contacts as found in other diode-constructed rectifiers
- ◆ Glass passivated junction
- ◆ Built-in strain relief
- ◆ Easy pick and place
- ◆ Fast switching for high efficiency
- ◆ Plastic material used carries Underwriters Laboratory Flammability Classification 94 V-O
- ◆ High temperature soldering guaranteed: 450°C/5 seconds at terminals
- ◆ Complete device submersible temperature of 265°C for 10 seconds in solder bath



GF1/DO-214BA



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

- Case:** Molded plastic over glass
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 12mm tape (EIA STD RS-481)
Weight: 0.0048 ounces, 0.120 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	RF1A	RF1B	RF1D	RF1G	RF1J	RF1K	RF1M	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current at T _L =120°C	I _(AV)	1.0							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC method)	I _{FSM}	30.0							Amps
Maximum Instantaneous Forward Voltage at 1.0A	V _F	1.30							Volts
Maximum Full Load Reverse Current, Full Cycle Average, T _A =55°C	I _{R(AV)}	50.0							µA
Maximum DC Reverse Current at T _A =25°C	I _R	5.0							µA
Maximum DC Blocking Voltage at T _A =125°C	I _R	100							µA
Maximum Reverse Recovery Time (NOTE 1)	T _{RR}	150				250	500		nS
Typical Junction Capacitance (NOTE 2)	C _J	15.0							pf
Maximum Thermal Resistance (NOTE 3)	R _{θJL}	30.0							°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175							°C

Notes:

- Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{rr}=0.25A.
- Measured at 1.0 MHz and Applied V_r=4.0 volts.
- 5.0mm² (.013mm thick) land areas.

RATINGS AND CHARACTERISTIC CURVES RF1A THRU RF1M

FIG 1-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM

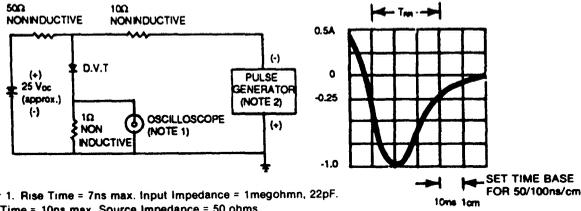


FIG 2- FORWARD CURRENT DERATING CURVE

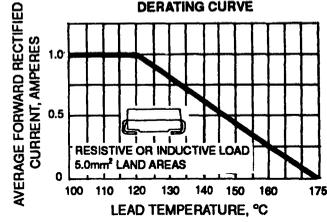


FIG 4 - TYPICAL JUNCTION CAPACITANCE

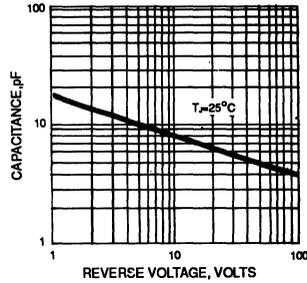


FIG 3 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

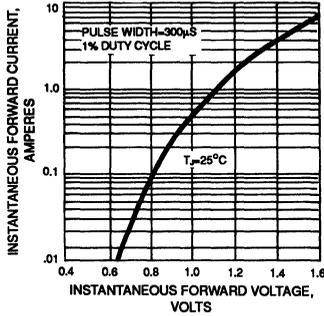


FIG 6 - TYPICAL REVERSE CHARACTERISTICS

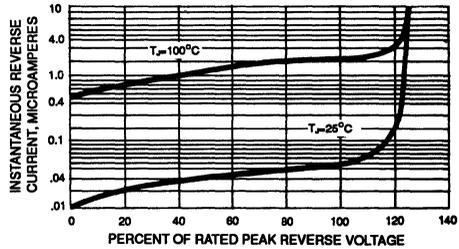


FIG 5 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

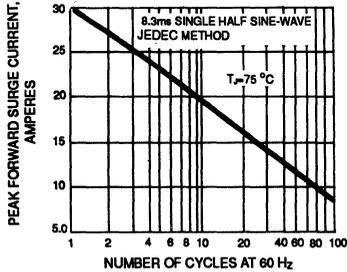
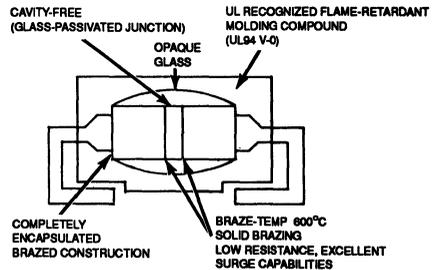


FIG 7 - SUPERRECTIFIER RF1 PACKAGE



ES1A THRU ES1D

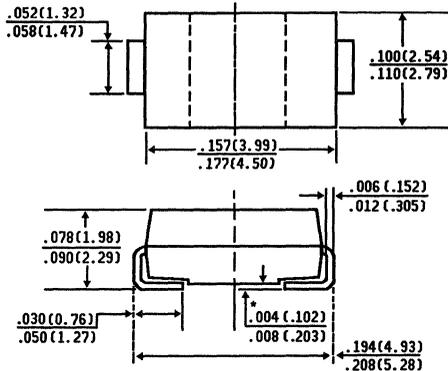
SURFACE MOUNT ULTRAFAST RECTIFIER
VOLTAGE - 50 - 200 Volts CURRENT - 0.6 Amperes

FEATURES

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Ideally suited for use in very high frequency switching power supplies, inverters and as free wheeling diodes
- ◆ Ultrafast 15 nanosecond recovery times
- ◆ Low forward voltage
- ◆ Low leakage current
- ◆ Glass passivated junction
- ◆ High temperature soldering: 250°C/10 seconds at terminals



SMA/DO-214AC



Dimensions in inches and (millimeters)

*Typical Range

MECHANICAL DATA

Case: Molded plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 12mm tape (EIA STD RS-481)
Weight: 0.002 ounces, .064 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

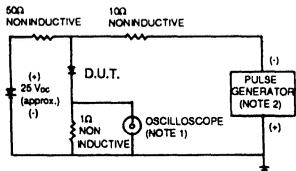
Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	ES1A	ES1B	ES1C	ES1D	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current at T _L =120°C	I _(AV)	0.6				Amps
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	30.0				Amps
Maximum Instantaneous Forward Voltage at 0.6A	V _F	0.90				Volts
Maximum DC Reverse Current T _A =25°C at Rated DC Blocking Voltage T _A =100°C	I _R	2.0 100				μA
Maximum Reverse Recovery Time (NOTE 1)	T _{RR}	15.0				Ns
Maximum Reverse Recovery Time (NOTE 2)	T _{RR}	25.0 35.0				Ns
Maximum Stored Charge (NOTE 2)	Q _{RR}	5.0 15.0				Nc
Typical Junction Capacitance (NOTE 3)	C _J	10.0				pf
Maximum Thermal Resistance (NOTE 4)	R _{ΘJL}	25.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150				°C

NOTES: 1. Reverse Recovery Test conditions: I_F=0.5A, I_R=1.0A, I_{rr}=0.25A.
 2. T_{RR} and Q_{RR} measured on LEM tester: V_R=30V, di/dt=50 A/μs, I_F=0.6A.
 3. Measured at 1.0 MHz and applied reverse voltage of 4.0 volts.
 4. 5.0mm² (.013mm thick) land areas.

RATINGS AND CHARACTERISTIC CURVES ES1A THRU ES1D

FIG 1 - REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM



NOTES: 1 Rise Time = 7ns max. Input Impedance = 1megohm, 22pF
 2 Rise Time = 10ns max. Source Impedance = 50 ohms.

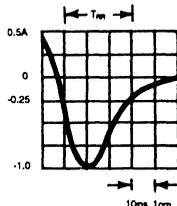


FIG 2 - MAXIMUM AVERAGE FORWARD CURRENT RATING

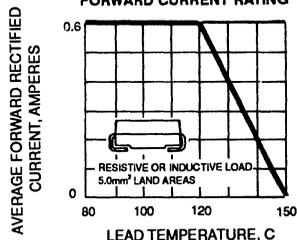


FIG 3 - TYPICAL REVERSE CHARACTERISTICS

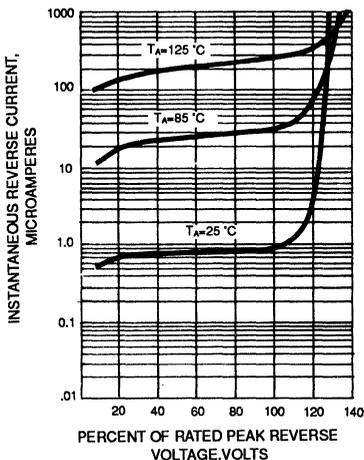


FIG 4 - TYPICAL FORWARD CHARACTERISTICS

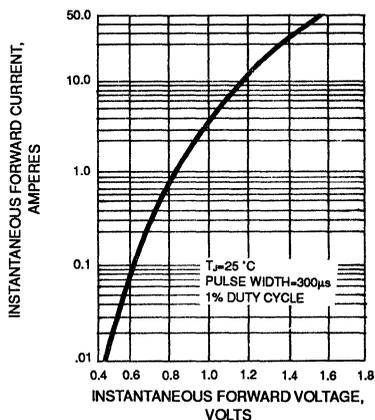


FIG 5 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

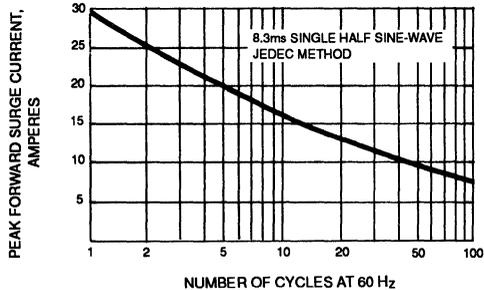
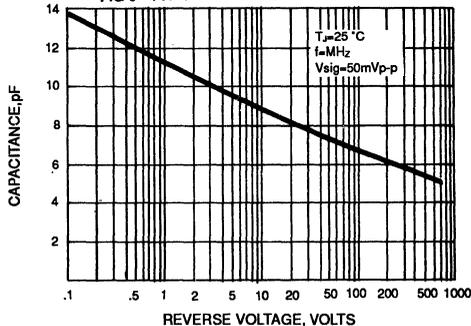


FIG 6 - TYPICAL JUNCTION CAPACITANCE

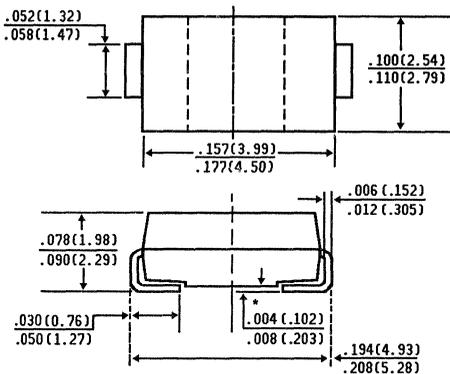


SS12 THRU SS16

SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER
VOLTAGE - 20 TO 60 Volts CURRENT - 1.0 Amperes

FEATURES

SMA/DO-214AC



Dimensions in inches and (millimeters)

*Typical Range

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection



MECHANICAL DATA

Case: Molded plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 12mm tape (EIA STD RS-481)
Weight: 0.002 ounces 0.064 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

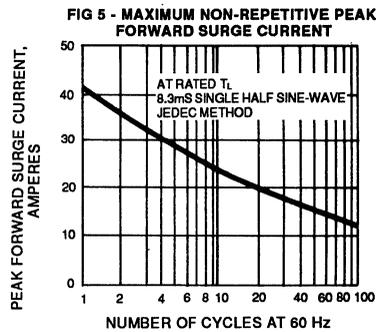
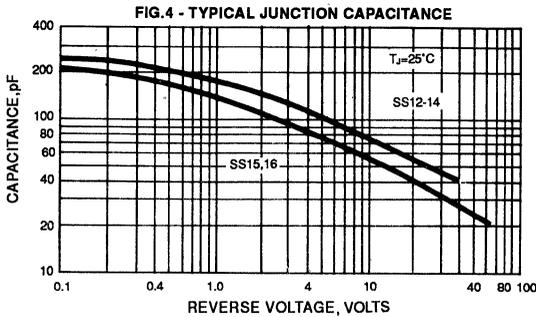
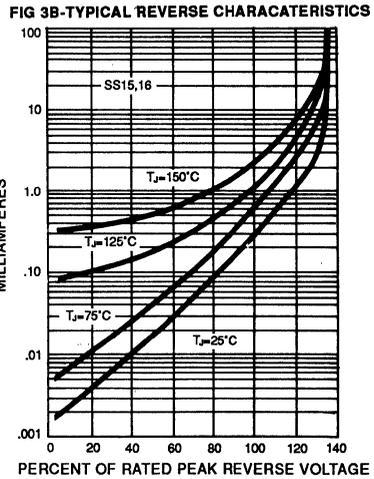
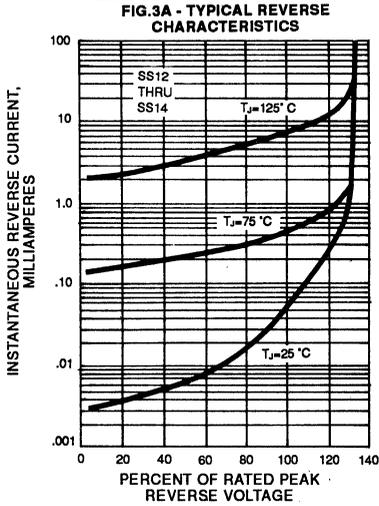
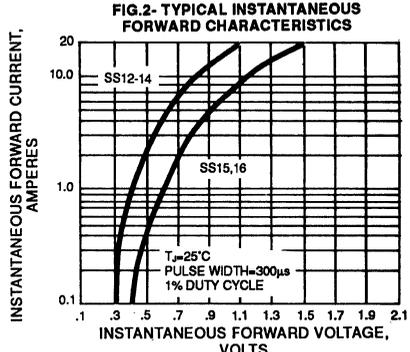
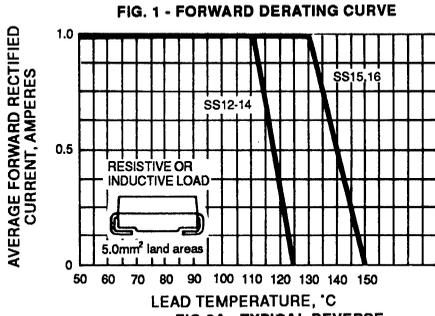
Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SS12	SS13	SS14	SS15	SS16	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	20	30	40	50	60	Volts
Maximum RMS voltage	V_{RMS}	14	21	28	35	42	Volts
Maximum DC Blocking Voltage	V_{DC}	20	30	40	50	60	Volts
Maximum Average Forward Rectified Current at T_L (See Figure 1)	$I_{(AV)}$	1.0					Amps
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0					Amps
Maximum Instantaneous Forward Voltage at 1.0A (NOTE 1)	V_F	0.50			0.75		Volts
Maximum DC Reverse Current (NOTE 1) $T_A=25^\circ\text{C}$ at Rated DC Blocking Voltage $T_A=100^\circ\text{C}$	I_R	10.0			5.0		mA
Maximum Thermal resistance (NOTE 2)	$R_{\theta JL}$	25					°C/W
Operating Temperature Range	T_J	-65 to +125			-65 to +150		°C
Storage Temperature Range	T_{STG}	-65 to +150					°C

NOTES:

1. Pulse Test with $PW=300 \mu\text{sec}$, 2% Duty Cycle.
2. Measured on P.C. Board with 5.0mm^2 (.013mm thick) land areas.

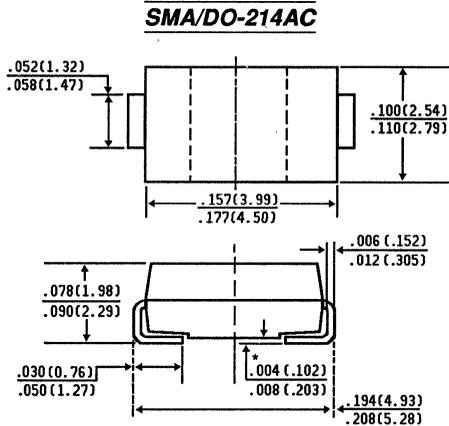
MAXIMUM RATINGS AND CHARACTERISTIC CURVES SS12 THRU SS16



SS19 AND SS1B

SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER
VOLTAGE - 90 and 100 Volts CURRENT - 1.0 Ampere

FEATURES



Dimensions in inches and (millimeters)

*Typical Range

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in high frequency inverters, free wheeling, and polarity protection application
- ◆ Guardring for transient protection



MECHANICAL DATA

Case: Molded plastic

Terminals: Solder plated

Polarity: Indicated by cathode band

Standard Packaging: 12mm tape
(EIA STD RS-481)

Weight: 0.002 ounces 0.064 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SS19	SS1B	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	90	100	Volts
Working Peak Reverse Voltage	V_{RWM}	64	71	Volts
DC Blocking Voltage	V_{DC}	90	100	Volts
Maximum Average Forward Rectified Current at T_L (SEE FIG.1)	$I_{(AV)}$	1.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	30.0		Amps
Peak Repetitive Reverse Surge Current (2.0μs, 1KHz)	I_{RSM}	1.0		Amps
Voltage Rate of Change, dv/dt (rated V_R)	$V/\mu s$	1000		$V/\mu s$
Maximum Forward voltage (Note 1) $I_F=1A, T_L=25^\circ C$ $I_F=1A, T_L=100^\circ C$	V_F	0.79 0.69		Volts
Maximum reverse current at Peak reverse Voltage $T_L=100^\circ C$ (NOTE 1) Peak reverse Voltage $T_L=25^\circ C$	I_R I_R	5.0 0.5		mA mA
Maximum thermal Resistance, Junction to Lead (NOTE 2)	$R_{\theta JL}$	25.0		$^\circ C/W$
Maximum Operating Junction Temperature	T_J	-65 to +150		$^\circ C$
Maximum Storage Temperature	T_{STG}	-65 to +175		$^\circ C$

NOTES:

1. Pulse Test Pulse Width 300μs, Duty Cycle 2%.
2. 5.0mm² (.013mm thick) land areas.

RATINGS AND CHARACTERISTIC CURVES SS19 AND SS1B

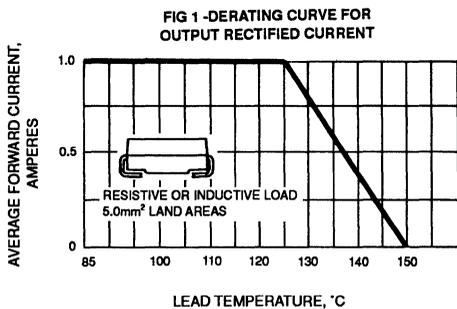


FIG 3 - TYPICAL REVERSE CHARACTERISTICS

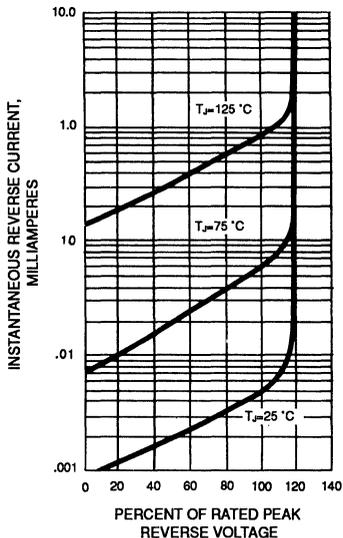


FIG 2 - MAXIMUM NON-REPETITIVE SURGE CURRENT

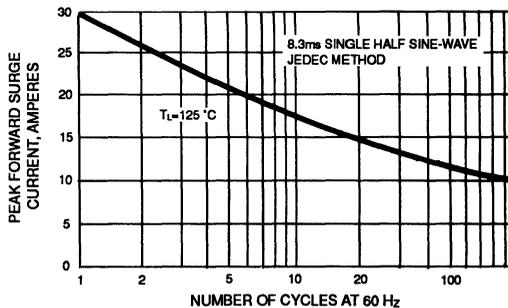


FIG 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

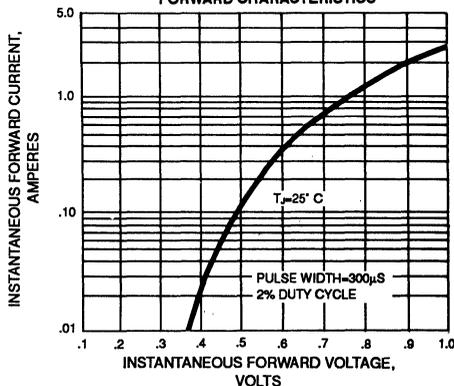
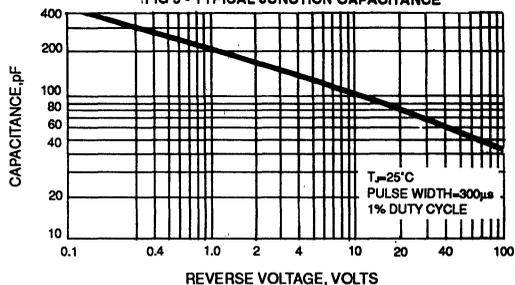


FIG 5 - TYPICAL JUNCTION CAPACITANCE



T SMA SERIES

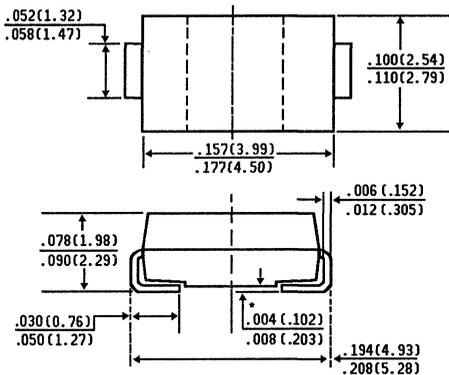
SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE - 6.8 - 200 Volts

FEATURES

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Glass passivated junction
- ◆ Excellent clamping capability
- ◆ Fast response time: typically less than 1.0ps from 0 volts to BV min.
- ◆ Typical I_R less than 1μA above 10V
- ◆ High temperature soldering: 250°C/10 seconds at terminals



SMA/DO-214AC



* Typical Range

Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: Molded plastic

Terminals: Solder plated

Polarity: Indicated by cathode band

Standard Packaging: 12mm Tape
(E1A STD RS-481)

Weight: .002 ounces, .064 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

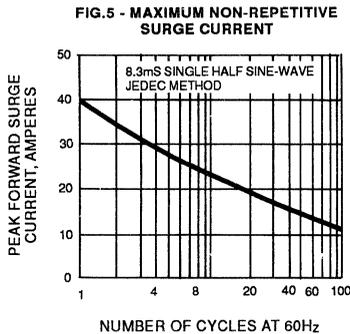
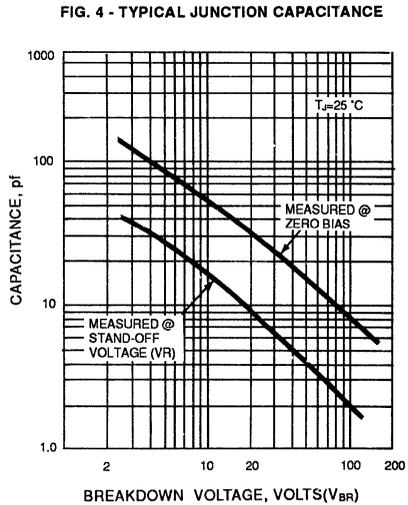
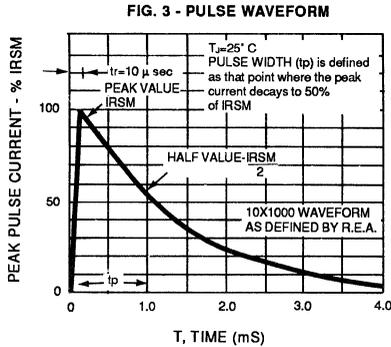
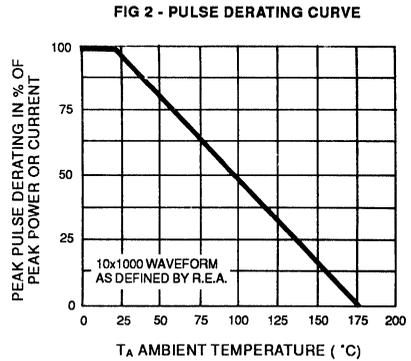
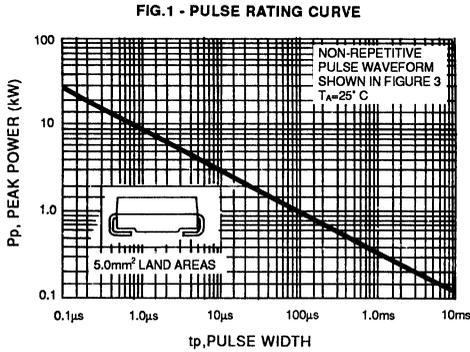
Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOLS	VALUE	UNITS
Peak Power Dissipation at T _A =25°C, T _p =1ms (NOTE 1,2)	P _{pk}	Minimum 400	Watts
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) (NOTE 3)	I _{FSM}	40.0	Amps
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to 175	°C

NOTES:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25°C per Fig. 2.
2. Mounted on 5.0mm² copper pads to each terminal.
3. 8.3ms single half sine-wave duty cycle=4 pulses per minutes maximum.

MAXIMUM RATINGS AND CHARACTERISTIC CURVES T5MA SERIES



**GENERAL
INSTRUMENT**

ELECTRICAL CHARACTERISTICS@25° C

Device	Device Marking Code	Breakdown Voltage V _{BR} Volts (NOTE 1)		@ IT mA	Working Peak Reverse Voltage V _{PRM} (Volts)	Maximum Reverse Leakage at V _{PRM} I _{R(LA)}	Maximum Reverse Surge Current I _{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I _{RSM} (Clamping Voltage) V _{RSU} (Volts)
		Min.	Max.					
T SMA6.8	AD	6.12	7.48	10	5.50	1000	38	10.8
T SMA6.8A	AE	6.45	7.14	10	5.80	1000	40	10.5
T SMA7.5	AF	6.75	8.25	10	6.05	500	36	11.7
T SMA7.5A	AG	7.13	7.88	10	6.40	500	37	11.3
T SMA8.2	AH	7.38	9.02	10	6.63	200	33	12.5
T SMA8.2A	AK	7.79	8.61	10	7.02	200	35	12.1
T SMA9.1	AL	8.19	10.0	1.0	7.37	50	30	13.8
T SMA9.1A	AM	8.65	9.55	1.0	7.78	50	31	13.4
T SMA10	AN	9.00	11.0	1.0	8.10	10	28	15.0
T SMA10A	AP	9.50	10.5	1.0	8.55	10	29	14.5
T SMA11	AQ	9.90	12.1	1.0	8.92	5.0	26	16.2
T SMA11A	AR	10.5	11.6	1.0	9.40	5.0	27	15.6
T SMA12	AS	10.8	13.2	1.0	9.72	5.0	24	17.3
T SMA12A	AT	11.4	12.6	1.0	10.2	5.0	25	16.7
T SMA13	AU	11.7	14.3	1.0	10.5	5.0	22	19.0
T SMA13A	AV	12.4	13.7	1.0	11.1	5.0	23	18.2
T SMA15	AW	13.5	16.3	1.0	12.1	5.0	19	22.0
T SMA15A	AX	14.3	15.8	1.0	12.8	5.0	20	21.2
T SMA16	AY	14.4	17.6	1.0	12.9	5.0	18	23.5
T SMA16A	AZ	15.2	16.8	1.0	13.6	5.0	19	22.5
T SMA18	BD	16.2	19.8	1.0	14.5	5.0	16	26.5
T SMA18A	BE	17.1	18.9	1.0	15.3	5.0	17	25.5
T SMA20	BF	18.0	22.0	1.0	16.2	5.0	14	29.1
T SMA20A	BG	19.0	21.0	1.0	17.1	5.0	15	27.7
T SMA22	BH	19.8	24.2	1.0	17.8	5.0	13	31.9
T SMA22A	BK	20.9	23.1	1.0	18.8	5.0	14	30.6
T SMA24	BL	21.6	26.4	1.0	19.4	5.0	12	34.7
T SMA24A	BM	22.8	25.2	1.0	20.5	5.0	13	33.2
T SMA27	BN	24.3	29.7	1.0	21.8	5.0	11	39.1
T SMA27A	BP	25.7	28.4	1.0	23.1	5.0	11.2	37.5
T SMA30	BQ	27.0	33.0	1.0	24.3	5.0	10	43.5
T SMA30A	BR	28.5	31.5	1.0	25.6	5.0	10	41.4
T SMA33	BS	29.7	36.3	1.0	26.8	5.0	9	47.7
T SMA33A	BT	31.4	34.7	1.0	28.2	5.0	9	45.7
T SMA36	BU	32.4	39.6	1.0	29.1	5.0	8	52.0
T SMA36A	BV	34.2	37.8	1.0	30.8	5.0	8.4	49.9
T SMA39	BW	35.1	42.9	1.0	31.6	5.0	7.4	56.4
T SMA39A	BX	37.1	41.0	1.0	33.3	5.0	7.8	53.9
T SMA43	BY	38.7	47.3	1.0	34.8	5.0	6.8	61.9
T SMA43A	BZ	40.9	45.2	1.0	36.8	5.0	7.1	59.3
T SMA47	CD	42.3	51.7	1.0	38.1	5.0	6.2	67.8
T SMA47A	CE	44.7	49.4	1.0	40.2	5.0	5.0	64.8
T SMA51	CF	45.9	56.1	1.0	41.3	5.0	5.7	73.5
T SMA51A	CG	48.5	53.6	1.0	43.6	5.0	5.0	70.1
T SMA56	CH	50.4	61.6	1.0	45.4	5.0	5.2	80.5
T SMA56A	CK	53.2	58.8	1.0	47.8	5.0	5.5	77.0
T SMA62	CL	55.8	68.2	1.0	50.2	5.0	4.7	89.0
T SMA62A	CM	58.9	65.1	1.0	53.0	5.0	5.0	85.0
T SMA68	CN	61.2	74.8	1.0	55.1	5.0	4.3	98.0
T SMA68A	CP	64.6	71.4	1.0	58.1	5.0	4.6	92.0
T SMA75	CQ	67.5	82.5	1.0	60.7	5.0	3.9	108
T SMA75A	CR	71.3	78.8	1.0	64.1	5.0	4.1	103
T SMA82	CS	73.8	90.2	1.0	66.4	5.0	3.6	118
T SMA82A	CT	77.9	86.1	1.0	70.1	5.0	3.7	113
T SMA91	CU	81.9	100	1.0	73.7	5.0	3.2	131
T SMA91A	CV	86.5	95.5	1.0	77.8	5.0	3.4	125
T SMA100	CW	90.0	110	1.0	81.0	5.0	2.9	144
T SMA100A	CX	95.0	105	1.0	85.5	5.0	3.1	137
T SMA110	CY	99.0	121	1.0	89.2	5.0	2.7	158
T SMA110A	CZ	105	116	1.0	94.0	5.0	2.8	152
T SMA120	RD	108	132	1.0	97.2	5.0	2.4	173

**GENERAL
INSTRUMENT**

ELECTRICAL CHARACTERISTICS @25°C

Device	Device Marking Code	Breakdown Voltage V_{BR} Volts (NOTE 1)		@ I_T mA	Working Peak Reverse Voltage V_{RPM} (Volts)	Maximum Reverse Leakage at V_{RPM} I_{RP} (A)	Maximum Reverse Surge Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)
		Min.	Max.					
TSMA 120A	RE	114	126	1.0	102	5.0	2.5	165
TSMA 130	RF	117	143	1.0	105	5.0	2.2	187
TSMA 130A	RG	124	137	1.0	111	5.0	2.3	179
TSMA 150	RH	135	165	1.0	121	5.0	2.0	215
TSMA 150A	RK	143	158	1.0	128	5.0	2.0	207
TSMA 160	RL	144	176	1.0	130	5.0	1.8	230
TSMA 160A	RM	152	168	1.0	136	5.0	1.9	219
TSMA 170	RN	153	187	1.0	138	5.0	1.7	244
TSMA 170A	RP	162	179	1.0	145	5.0	1.8	234
TSMA 180	RQ	162	198	1.0	146	5.0	1.6	258
TSMA 180A	RR	171	189	1.0	154	5.0	1.7	246
TSMA 200	RS	180	220	1.0	162	5.0	1.5	287
TSMA 200A	RT	190	210	1.0	171	5.0	1.53	274

NOTES:

- V_{BR} measured after I_T applied for 300 μ s I_T = Square Wave Pulse or equivalent.
- Surge Current Waveform per Figure 3 and Derate per Figure 2.
- V_F = 3.5V at I_F = 50A (TSMA6.8 thru TSMA91A)
 V_F = 5.0V at I_F = 50A (TSMA100 thru TSMA200A) on 1/2 Square or equivalent Sine Wave.
 PW = 8.3ms, Duty Cycle = 4 Pulses per minute maximum.
- For bipolar types having V_R of 10 volts and under, the I_R limit is doubled.

APPLICATION NOTES:

Transient Voltage Suppressors may be used at various points in a circuit to provide various degrees of protection. The following is a typical linear power supply with transient voltage suppressor units placed at different points. All provide protection of the load.

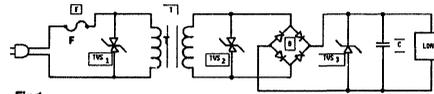


Fig.1

Transient Voltage Suppressor 1 provides maximum protection. However, the system will probably require replacement of the line fuse (F) since it provides a dominant portion of the series impedance when a surge is encountered.

Any combination of these three, or any one of these applications, will prevent damage to the load. This would require varying trade-offs in power supply protection versus maintenance (time changing the fuse).

Transient Voltage Suppressor 2 provides excellent protection of circuitry excluding the transformer (T). However, since the transformer is a large part of the series impedance, the chance of the line fuse opening during the surge condition is reduced.

An additional method is to utilize the Transient Voltage Suppressor units as a controlled avalanche bridge. This reduces the parts count and incorporates the protection within the bridge rectifier.

Transient Voltage Suppressor 3 provides the load with complete protection. It uses a unidirectional Transient Voltage Suppressor, which is a cost advantage. The series impedance now includes the line fuse, transformer, and bridge rectifier (B) so failure of the line fuse is further reduced. If only Transient Voltage Suppressor 3 is in use, then the bridge rectifier is unprotected and would require a higher voltage and current rating to prevent failure by transients.

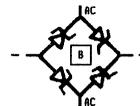


Fig.2

Higher wattage devices are available in the TSMB series of 600 W and TSMC series of 1500 W surface mount suppressors.

S2A THRU S2M

SURFACE MOUNT RECTIFIER

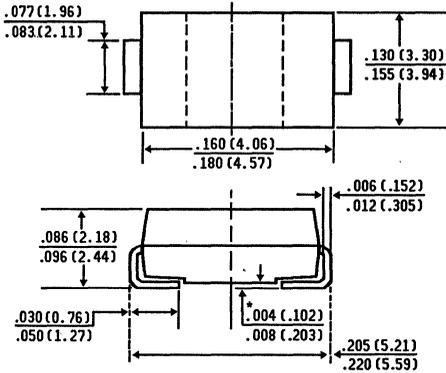
VOLTAGE - 50 - 1000 Volts CURRENT - 1.5 Amperes

FEATURES

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Easy pick and place
- ◆ Plastic material used carries Underwriters Laboratory Classification 94 V-0
- ◆ Glass passivated junction
- ◆ High temperature soldering: 250°C/10 seconds at terminals



SMB/DO-214AA



Dimensions in inches and (millimeters)

*Typical Range

MECHANICAL DATA

Case: Molded plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 12mm tape (EIA STD RS-481)
Weight: 0.003 ounces, 0.093 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	S2A	S2B	S2D	S2G	S2J	S2K	S2M	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current at T _L =100°C	I _(AV)	1.5							Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	50.0							Amps
Maximum Instantaneous Forward Voltage at 1.5A	V _F	1.15							Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage	I _R	1.0 125.0							μA
Typical Reverse Recovery Time (NOTE 1)	T _{RR}	2.0							μS
Typical Junction Capacitance (NOTE 2)	C _J	30.0							pf
Maximum Thermal Resistance (NOTE 3)	R _{θJL} R _{θJA}	20.0 100.0							°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to 150							°C

NOTES:

1. Reverse Recovery Test conditions: I_F=0.5A, I_R=1.0A, I_{rr}=0.25A.
2. Measured at 1.0 MHz and applied Vr=4.0 volts.
3. 5.0mm² (0.13mm thick) land areas.

RATING AND CHARACTERISTIC CURVES S2A THRU S2M

FIG 1 - FORWARD CURRENT DERATING CURVE

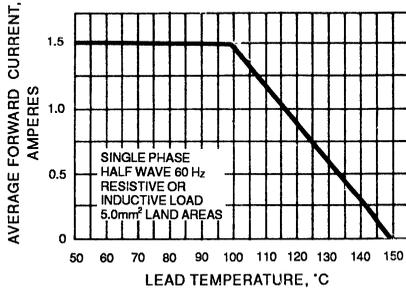


FIG 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

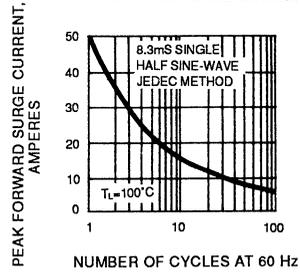


FIG 3 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

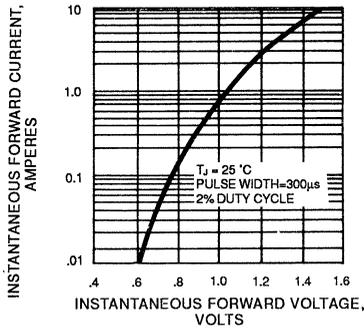


FIG 4 - TYPICAL JUNCTION CHARACTERISTICS

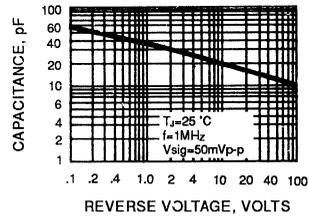
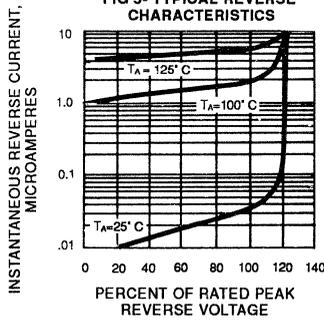


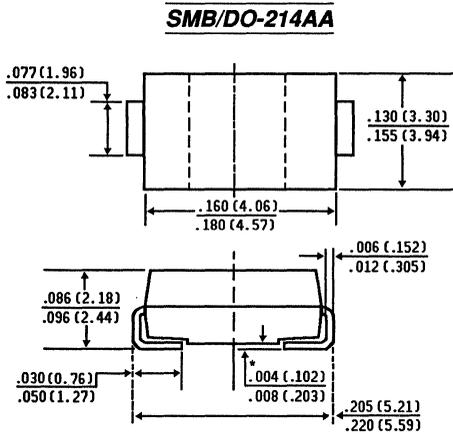
FIG 5 - TYPICAL REVERSE CHARACTERISTICS



RS2A THRU RS2K

FAST SWITCHING SURFACE MOUNT RECTIFIER
VOLTAGE - 50 - 800 Volts CURRENT - 1.5 Amperes

FEATURES



Dimensions in inches and (millimeters)

*Typical Range

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Easy pick and place
- ◆ Plastic material used carries Underwriters Laboratory Classification 94 V-0
- ◆ Glass passivated junction
- ◆ Fast switching for high efficiency
- ◆ High temperature soldering: 250°C/10 seconds at terminals



MECHANICAL DATA

Case: Molded plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 12mm tape (EIA STD RS-481)
Weight: 0.003 ounces, 0.093 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	RS2A	RS2B	RS2D	RS2G	RS2J	RS2K	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	Volts
Maximum Average Forward Rectified Current at T _L =100°C	I <sub(av)< sub=""></sub(av)<>	1.5						Amps
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	50.0						Amps
Maximum Instantaneous Forward Voltage at 1.5A	V _F	1.30						Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage	I _R	5.0 200.0						μA
Maximum Reverse Recovery Time (NOTE 1)	T _{RR}	150				250	500	nS
Typical Junction Capacitance (NOTE 2)	C _J	50.0						pf
Maximum Thermal Resistance (NOTE 3)	R _{θJL} R _{θJA}	20.0 100.0						°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to 150						°C

NOTES:

1. Reverse Recovery Test conditions: I_F=0.5A, I_R=1.0A, I_{rr}=0.25A.
2. Measured at 1.0 MHz and applied V_r=4.0 volts.
3. 5.0mm² (.013mm thick) land areas.

RATING AND CHARACTERISTIC CURVES RS2A THRU RS2K

FIG 1 - FORWARD CURRENT DERATING CURVE

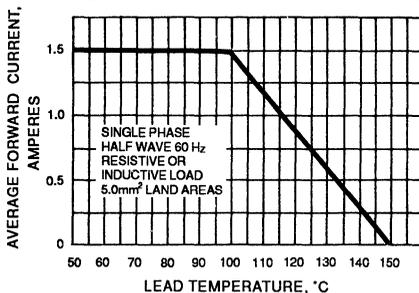


FIG 2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

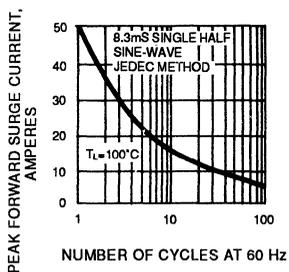


FIG 3 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

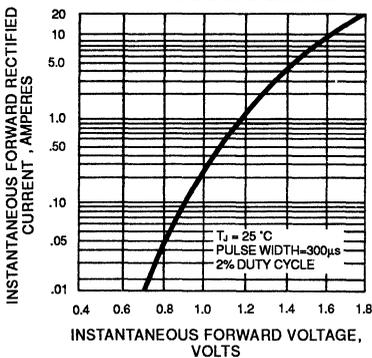


FIG 4 - TYPICAL JUNCTION CHARACTERISTICS

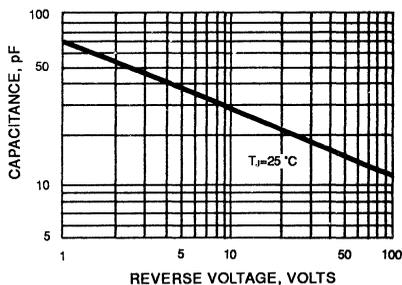


FIG 5 - TYPICAL REVERSE CHARACTERISTICS

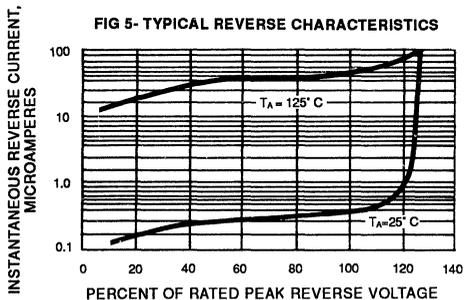
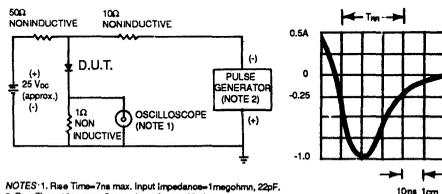


FIG 6 - REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT DIAGRAM



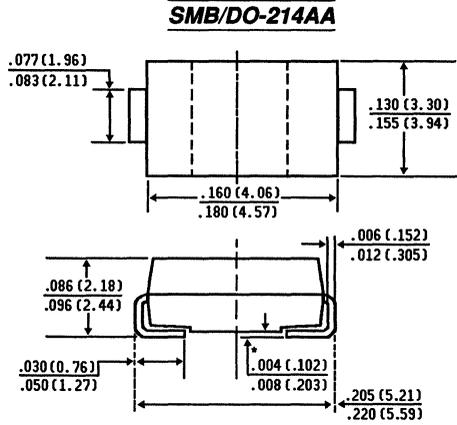
NOTES: 1. Rise Time = 7ns max. Input Impedance = 1megohm, 22pF.
2. Rise Time = 10ns max. Source Impedance = 50 ohms.

ES2A THRU ES2D

FAST EFFICIENT SURFACE MOUNT RECTIFIER
VOLTAGE - 50 - 200 Volts CURRENT - 2.0 Amperes

FEATURES

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Easy pick and place
- ◆ Plastic material used carries Underwriters Laboratory Classification 94 V-0
- ◆ Glass passivated junction
- ◆ Superfast recovery times for high efficiency
- ◆ Low power loss, high efficiency
- ◆ High temperature soldering: 250°C/10 seconds at terminals



MECHANICAL DATA

Case: Molded plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 12mm tape (EIA STD RS-481)
Weight: 0.003 ounces, 0.093 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

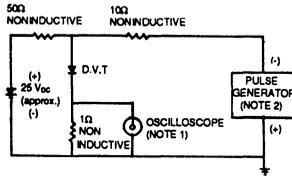
Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	ES2A	ES2B	ES2C	ES2D	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current at T _L =110°C	I _(AV)	2.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	50.0				Amps
Maximum Instantaneous Forward Voltage at 2 .0A	V _F	0.90				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _A =25°C T _A =100°C	I _R	5.0 350				μA
Maximum Reverse Recovery Time (Note 1)	T _{RR}	20.0				Ns
Maximum Reverse Recovery Time (Note 2) T _A =25°C T _A =100°C	T _{RR}	30.0 50.0				Ns
Maximum Stored Charge (Note 2) T _A =25°C T _A =100°C	Q _{RR}	8.0 25.0				Nc
Typical Junction Capacitance (Note 3)	C _J	25.0				pf
Maximum Thermal Resistance (Note 4)	R _{θJL}	20.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150				°C

- Notes:**
1. Reverse Recovery Test conditions: I_F=0.5A, I_R=1.0A, I_{rr}=0.25A.
 2. T_{RR} and Q_{RR} measured on LEM tester: V_R=30V, di/dt=50 A/μs I_F=2.0A.
 3. Measured at 1.0 MHz and applied reverse voltage of 4.0 volts.
 4. 5.0mm² (.013mm thick) land areas.

RATING AND CHARACTERISTIC CURVES ES2A THRU ES2D

FIG 1 - REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM



NOTES: 1. Rise Time = 7ns max. Input Impedance = 1megohm, 22pF.
2. Rise Time = 10ns max. Source Impedance = 50 ohms

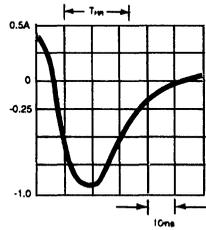


FIG 2 - MAXIMUM AVERAGE FORWARD CURRENT RATING

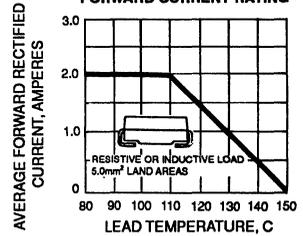


FIG 3 - TYPICAL REVERSE CHARACTERISTICS

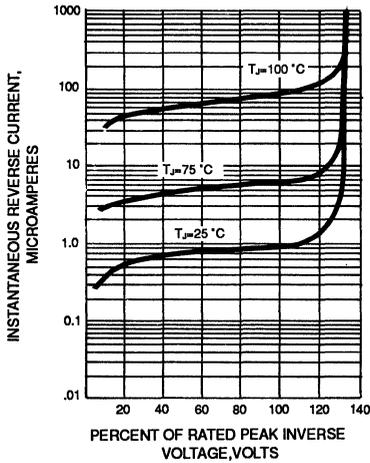


FIG 4 - TYPICAL FORWARD CHARACTERISTICS

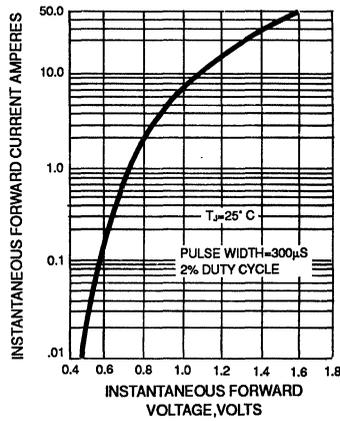


FIG 5 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

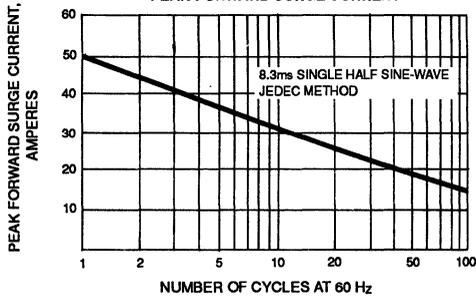
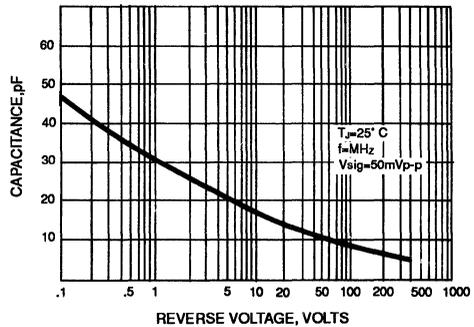


FIG 6 - TYPICAL JUNCTION CAPACITANCE



SS22 THRU SS26

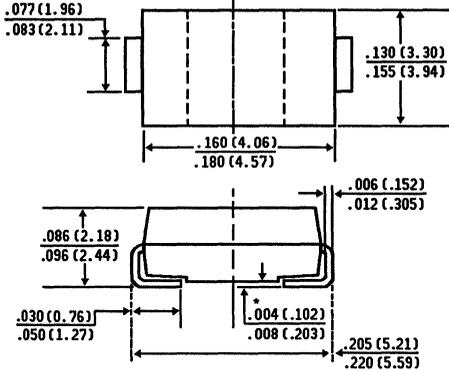
SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER
VOLTAGE - 20 - 60 Volts CURRENT - 2.0 Amperes

FEATURES

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in low voltage high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection



SMB/DO-214AA



Dimensions in inches and (millimeters)

*Typical Range

MECHANICAL DATA

Case: Molded plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 12mm tape (EIA STD RS-481)
Weight: 0.003 ounces 0.093 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

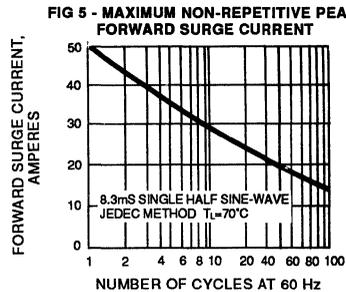
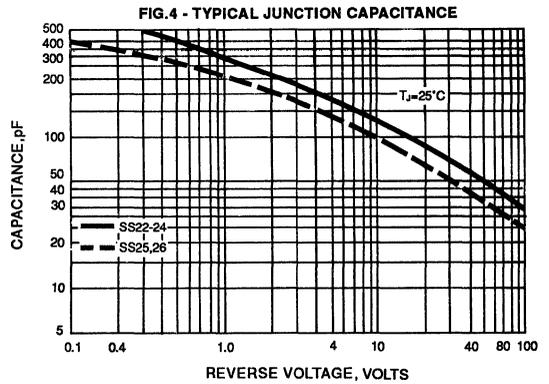
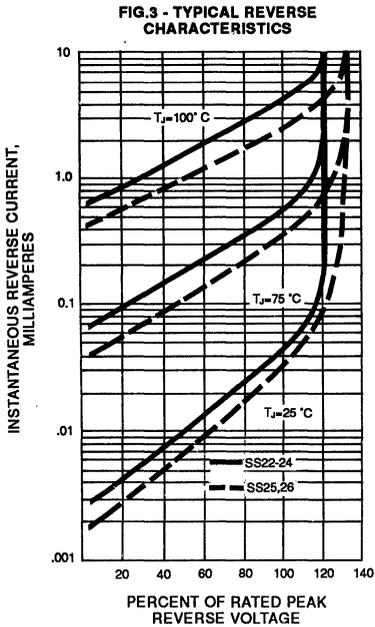
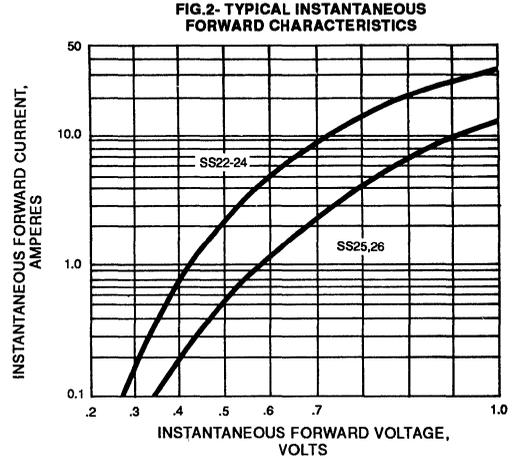
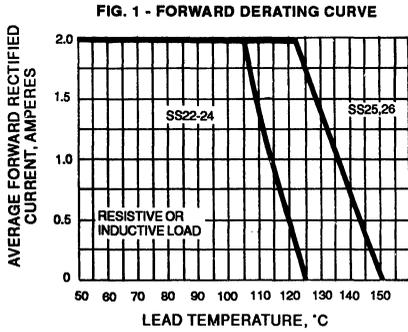
Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SS22	SS23	SS24	SS25	SS26	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	20	30	40	50	60	Volts
Maximum RMS voltage	V _{RMS}	14	21	28	35	42	Volts
Maximum DC Blocking Voltage	V _{DC}	20	30	40	50	60	Volts
Maximum Average Forward Rectified Current at T _L (See Figure 1)	I _(AV)	2.0					Amps
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	50.0					Amps
Maximum Instantaneous Forward Voltage at 2.0A (NOTE 1)	V _F	0.50		0.70		Volts	
Maximum DC Reverse Current (NOTE 1) T _A =25°C at Rated DC Blocking Voltage T _A =100°C	I _R	0.5		10.0		mA	
Maximum Thermal resistance (NOTE 2)	θ _{JL}	20.0					°C/W
	θ _{JA}	100.0					
Operating Temperature Range	T _J	-65 to +125		-65 to +150		°C	
Storage Temperature Range	T _{STG}	-65 to +150					°C

NOTES:

1. Pulse Test with PW=300 μsec, 2% Duty Cycle.
2. 5.0mm² (.013mm thick) land areas.

MAXIMUM RATINGS AND CHARACTERISTIC CURVES SS22 THRU SS26



SS29 AND SS2B

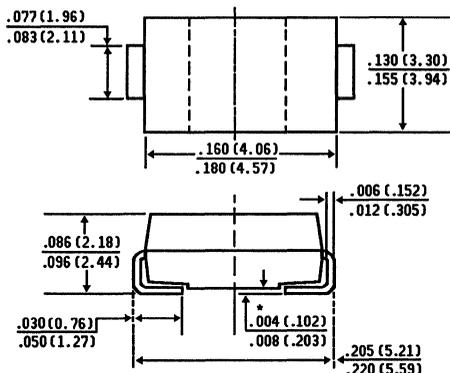
SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER
VOLTAGE - 90 and 100 Volts CURRENT - 2.0 Amperes

FEATURES

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_f
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection



SMB/DO-214AA



Dimensions in inches and (millimeters)

*Typical Range

MECHANICAL DATA

Case: Molded plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 12mm tape (EIA STD RS-481)
Weight: 0.003 ounces 0.093 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%

	SYMBOLS	SS29	SS2B	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	90	100	Volts
Working Peak Reverse Voltage	V_{RWM}	64	71	Volts
DC Blocking Voltage	V_{DC}	90	100	Volts
Maximum Average Forward Rectified Current at T_L (SEE FIG.1)	$I_{(AV)}$	2.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	50.0		Amps
Peak Repetitive Reverse Surge Current (2.0μs, 1KHz)	I_{RSM}	1.0		Amps
Voltage Rate of Change, dv/dt (rated V_R)	$V/\mu s$	1000		$V/\mu s$
Maximum Forward Voltage (NOTE 1) $I_F = 2A, T_L = 25^\circ C$ $I_F = 2A, T_L = 100^\circ C$	V_F	0.79 0.69		Volts
Maximum Reverse Current at Peak Reverse Voltage $T_L = 100^\circ C$ (NOTE 1) Peak Reverse Voltage $T_L = 25^\circ C$	I_R	10.0 0.1		mA
Maximum Thermal Resistance, Junction to Lead (NOTE 2)	$R_{\theta JL}$	20.0		$^\circ C/W$
Maximum Operating Junction Temperature	T_J	-65 to +150		$^\circ C$
Maximum Storage Temperature	T_{STG}	-65 to +175		$^\circ C$

NOTES:

1. Pulse test pulse width 300μs, Duty Cycle 2%.
2. 5.0mm² (.013mm thick) land areas.

RATING AND CHARACTERISTIC CURVES SS29 AND SS2B

FIG 1 - FORWARD CURRENT DERATING CURVE

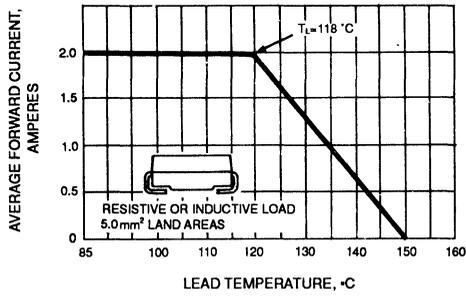


FIG 2 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

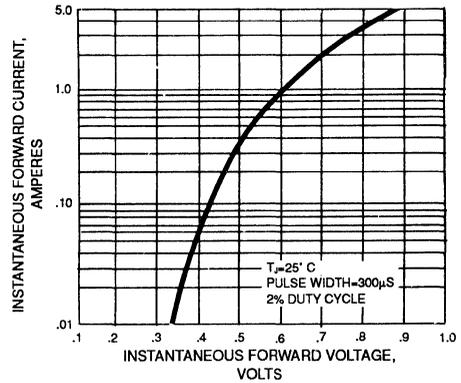


FIG 3 - TYPICAL REVERSE CHARACTERISTICS

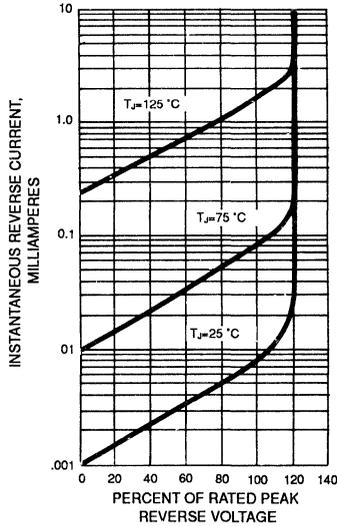


FIG 4 - TYPICAL JUNCTION CAPACITANCE

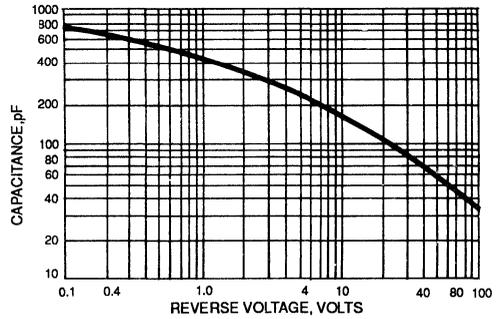
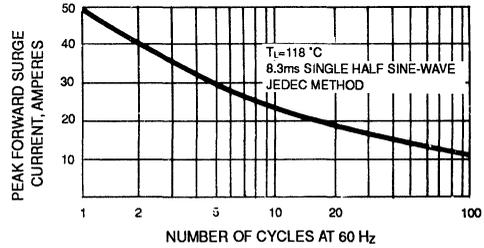


FIG 5 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

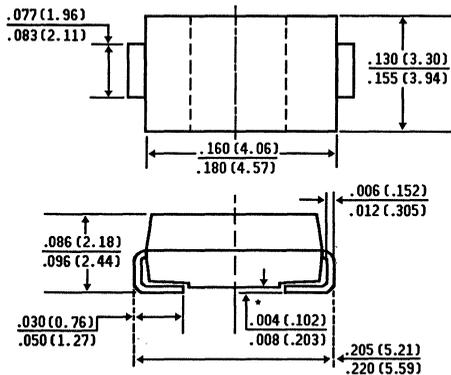


TSMB SERIES

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE - 6.8 - 200 Volts

FEATURES

SMB/DO-214AA



* TYPICAL RANGE

Dimensions in inches
and
(millimeters)



- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Glass passivated junction
- ◆ Excellent clamping capability
- ◆ Fast response time: typically less than 1.0ps from 0 volts to BV min.
- ◆ Typical I_R less than 1μA above 10V
- ◆ High temperature soldering: 250°C/10 seconds at terminals
- ◆ Plastic material used carries Underwriters Laboratory Flammability Classification 94V-0

MECHANICAL DATA

Case: Molded plastic

Terminals: Solder plated

Polarity: Indicated by cathode band

Standard Packaging: 12mm tape
(EIA STD RS-481)

Weight: 0.003 ounces, 0.093 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOLS	VALUE	UNITS
Peak Power Dissipation at T _A =25°C, T _p =1ms (NOTES 1,2)	P _{pk}	Minimum 600	Watts
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method) (NOTES 2,3)	I _{FSM}	100.0	Amps
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175	°C

NOTES:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25°C per Fig. 2.
2. Mounted on 5.0mm² (.013mm thick) land areas.
3. 8.3ms single half sine-wave duty cycle=4 pulses per minute maximum.

MAXIMUM RATINGS AND CHARACTERISTIC CURVES TSMB SERIES

FIG. 1 - PULSE RATING CURVE

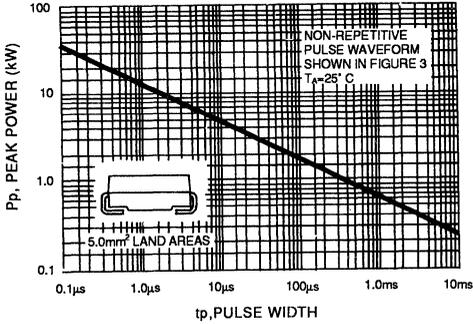


FIG 2 - PULSE DERATING CURVE

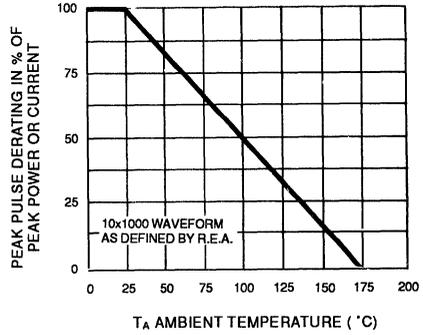


FIG. 3 - PULSE WAVEFORM

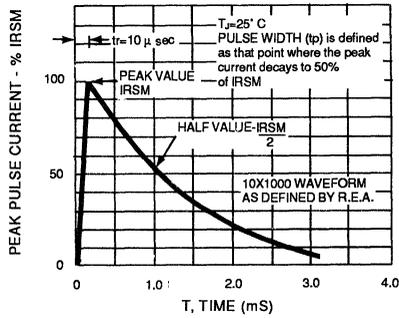


FIG. 4 - TYPICAL JUNCTION CAPACITANCE

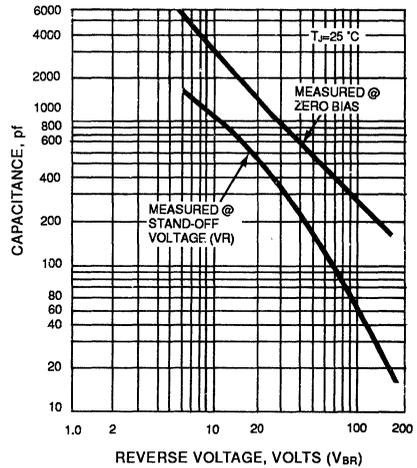
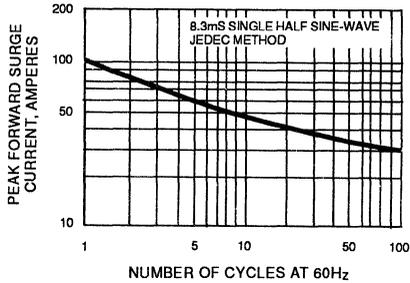


FIG. 5 - MAXIMUM NON-REPETITIVE SURGE CURRENT



ELECTRICAL CHARACTERISTICS @25°C

Device	Device Marking Code	Breakdown Voltage V _{BR} Volts(NOTE 1)		@ I _T mA	Working Peak Reverse Voltage V _{RM} (Volts)	Maximum Reverse Leakage at V _{RM} /I _{RM} I _{RM} (μA)	Maximum Reverse Surge Current I _{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I _{RSM} (Clamping Voltage) V _{RSM} (Volts)
		Min.	Max.					
TSMB6.8	KD	6.12	7.48	10	5.50	1000	56	10.8
TSMB6.8A	KE	6.45	7.14	10	5.80	1000	57	10.5
TSMB7.5	KF	6.75	8.25	10	6.05	500	51	11.7
TSMB7.5A	KG	7.13	7.88	10	6.40	500	53	11.3
TSMB8.2	KH	7.38	9.02	10	6.63	200	48	12.5
TSMB8.2A	KK	7.79	8.61	10	7.02	200	50	12.1
TSMB9.1	KL	8.19	10.0	1.0	7.37	50	44	13.8
TSMB9.1A	KM	8.65	9.55	1.0	7.78	50	45	13.4
TSMB10	KN	9.00	11.0	1.0	8.10	10	40	15.0
TSMB10A	KP	9.50	10.5	1.0	8.55	10	41	14.5
TSMB11	KQ	9.90	12.1	1.0	8.92	5.0	37	16.2
TSMB11A	KR	10.5	11.6	1.0	9.40	5.0	38	15.6
TSMB12	KS	10.8	13.2	1.0	9.72	5.0	35	17.3
TSMB12A	KT	11.4	12.6	1.0	10.2	5.0	36	16.7
TSMB13	KU	11.7	14.3	1.0	10.5	5.0	32	19.0
TSMB13A	KV	12.4	13.7	1.0	11.1	5.0	33	18.2
TSMB15	KW	13.5	16.5	1.0	12.1	5.0	27	22.0
TSMB15A	KX	14.3	15.8	1.0	12.8	5.0	28	21.2
TSMB16	KY	14.4	17.6	1.0	12.9	5.0	26	23.5
TSMB16A	KZ	15.2	16.8	1.0	13.6	5.0	27	22.5
TSMB18	LD	16.2	19.8	1.0	14.5	5.0	23	26.5
TSMB18A	LE	17.1	18.9	1.0	15.3	5.0	24	25.2
TSMB20	LF	18.0	22.0	1.0	16.2	5.0	21	29.1
TSMB20A	LG	19.0	21.0	1.0	17.1	5.0	22	27.7
TSMB22	LH	19.8	24.2	1.0	17.8	5.0	19	31.9
TSMB22A	LK	20.9	23.1	1.0	18.8	5.0	20	30.6
TSMB24	LL	21.6	26.4	1.0	19.4	5.0	17	34.7
TSMB24A	LM	22.8	25.2	1.0	20.5	5.0	18	33.2
TSMB27	LN	24.3	29.7	1.0	21.8	5.0	15	39.1
TSMB27A	LP	25.7	28.4	1.0	23.1	5.0	16	37.5
TSMB30	LQ	27.0	33.0	1.0	24.3	5.0	14	43.5
TSMB30A	LR	28.5	31.5	1.0	25.6	5.0	14.4	41.4
TSMB33	LS	29.7	36.3	1.0	26.8	5.0	12.6	47.7
TSMB33A	LT	31.4	34.7	1.0	28.2	5.0	13.2	45.7
TSMB36	LU	32.4	39.6	1.0	29.1	5.0	11.6	52.0
TSMB36A	LV	34.2	37.8	1.0	30.8	5.0	12.0	49.9
TSMB39	LW	35.1	42.9	1.0	31.6	5.0	10.6	56.4
TSMB39A	LX	37.1	41.0	1.0	33.3	5.0	11.2	53.9
TSMB43	LY	38.7	47.3	1.0	34.8	5.0	9.6	61.9
TSMB43A	LZ	40.9	45.2	1.0	36.8	5.0	10.1	59.3
TSMB47	MD	42.3	51.7	1.0	38.1	5.0	8.9	67.8
TSMB47A	ME	44.7	49.4	1.0	40.2	5.0	9.3	64.8
TSMB51	MF	45.9	56.1	1.0	41.3	5.0	8.2	73.5
TSMB51A	MG	48.5	53.6	1.0	43.6	5.0	8.6	70.1
TSMB56	MH	50.4	61.6	1.0	45.4	5.0	7.4	80.5
TSMB56A	MK	53.2	58.8	1.0	47.8	5.0	7.8	77.0
TSMB62	ML	55.8	68.2	1.0	50.2	5.0	6.8	89.0
TSMB62A	MM	58.9	65.1	1.0	53.0	5.0	7.1	85.0
TSMB68	MN	61.2	74.8	1.0	55.1	5.0	6.1	98.0
TSMB68A	MP	64.6	71.4	1.0	58.1	5.0	6.5	92.0
TSMB75	MQ	67.5	82.5	1.0	60.7	5.0	5.5	108
TSMB75A	MR	71.3	78.8	1.0	64.1	5.0	5.8	103
TSMB82	MS	73.8	90.2	1.0	66.4	5.0	5.1	118
TSMB82A	MT	77.9	86.1	1.0	70.1	5.0	5.3	113
TSMB91	MU	81.9	100	1.0	73.7	5.0	4.5	131
TSMB91A	MV	86.5	95.5	1.0	77.8	5.0	4.8	125
TSMB100	MW	90.0	110	1.0	81.0	5.0	4.2	144
TSMB100A	MX	95.0	105	1.0	85.5	5.0	4.4	137
TSMB110	MY	99.0	121	1.0	89.2	5.0	3.8	158
TSMB110A	MZ	105	116	1.0	94.0	5.0	4.0	152
TSMB120	ND	108	132	1.0	97.2	5.0	3.5	173
TSMB120A	NE	114	126	1.0	102	5.0	3.6	165

ELECTRICAL CHARACTERISTICS @25°C

Device	Device Marking Code	Breakdown Voltage V_{BR} (NOTE 1)		Working Peak Reverse Voltage V_{RWM} (Volts) @ IT mA	Maximum Reverse Leakage at V_{RWM} $I_{R(A)}$	Maximum Reverse Surge Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	
		Min.	Max.					
TSMB130	NF	117	143	1.0	105	5.0	3.2	187
TSMB130A	NG	124	137	1.0	111	5.0	3.3	179
TSMB150	NH	135	165	1.0	121	5.0	2.8	215
TSMB150A	NK	143	158	1.0	128	5.0	2.9	207
TSMB160	NL	144	176	1.0	130	5.0	2.6	230
TSMB160A	NM	152	168	1.0	136	5.0	2.7	219
TSMB170	NN	153	187	1.0	138	5.0	2.5	244
TSMB170A	NP	162	179	1.0	145	5.0	2.6	234
TSMB180	NQ	162	198	1.0	146	5.0	2.3	258
TSMB180A	NR	171	189	1.0	154	5.0	2.4	246
TSMB200	NS	180	220	1.0	162	5.0	2.1	287
TSMB200A	NT	190	210	1.0	171	5.0	2.2	274

NOTES:

- V_{BR} measured after I_T applied for 300 μ s I_T = Square Wave Pulse or equivalent.
- Surge Current Waveform per Figure 3 and Derate per Figure 2.
- $V_F = 3.5V$ at $I_F = 50A$ (TSMB6.8 thru TSMB91A)
 $V_F = 5.0V$ at $I_F = 50A$ (TSMB100 thru TSMB200A) on 1/2 Square or equivalent Sine Wave.
 PW = 8.3ms, Duty Cycle = 4 Pulses per minute maximum.
- For bipolar types having V_R of 10 volts and under, the I_R limit is doubled.

APPLICATION NOTES:

Transient Voltage Suppressors may be used at various points in a circuit to provide various degrees of protection. The following is a typical linear power supply with transient voltage suppressor units placed at different points. All provide protection of the load.

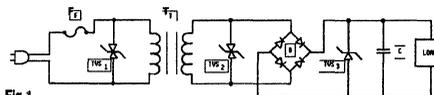


Fig.1

Transient Voltage Suppressor 1 provides maximum protection. However, the system will probably require replacement of the line fuse (F) since it provides a dominant portion of the series impedance when a surge is encountered.

Transient Voltage Suppressor 2 provides excellent protection of circuitry excluding the transformer (T). However, since the transformer is a large part of the series impedance, the chance of the line fuse opening during the surge condition is reduced.

Transient Voltage Suppressor 3 provides the load with complete protection. It uses a unidirectional Transient Voltage Suppressor, which is a cost advantage. The series impedance now includes the line fuse, transformer, and bridge rectifier (B) so failure of the line fuse is further reduced. If only Transient Voltage Suppressor 3 is in use, then the bridge rectifier is unprotected and would require a higher voltage and current rating to prevent failure by transients.

Any combination of these three, or any one of these applications, will prevent damage to the load. This would require varying trade-offs in power supply protection versus maintenance (time changing the fuse).

An additional method is to utilize the Transient Voltage Suppressor units as a controlled avalanche bridge. This reduces the parts count and incorporates the protection within the bridge rectifier.

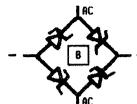


Fig.2

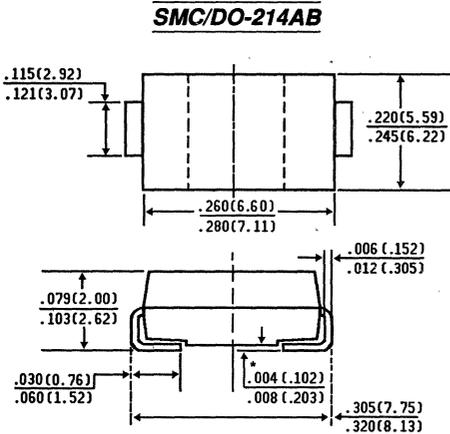
Higher and lower wattage devices are available in the TSMA (400W) and the TSMC series (1500W) series of surface mount suppressors.

S3A THRU S3M

SURFACE MOUNT RECTIFIER
VOLTAGE - 50 - 1000 Volts CURRENT - 2.5 Amperes

FEATURES

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Easy pick and place
- ◆ Plastic material used carries Underwriters Laboratory Classification 94 V-O
- ◆ Glass passivated junction
- ◆ High temperature soldering: 260°C/10 seconds at terminals



Dimensions in inches and (millimeters)
 *Typical Range

MECHANICAL DATA

Case: Molded plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 16mm tape (EIA STD RS-481)
Weight: 0.007 ounces, 0.21 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	S3A	S3B	S3D	S3G	S3J	S3K	S3M	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	1000	Volts
Maximum RMS voltage	V _{RMS}	35	70	140	280	420	560	700	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	1000	Volts
Maximum Average Forward Rectified Current at T _L =95°C	I _(AV)	2.5							Amps
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	100.0							Amps
Maximum Instantaneous Forward Voltage at 2.5A	V _F	1.15							Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _A =25°C T _A =125°C	I _R	10.0 250.0							μA
Typical Reverse Recovery Time (NOTE 1)	T _{RR}	2.5							μs
Typical Junction Capacitance (NOTE 2)	C _J	60.0							pf
Maximum Thermal Resistance (NOTE 3)	R _{θJL} R _{θJA}	10.0 60.0							°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150							°C

NOTES:
 1. Reverse Recovery Test conditions: I_F=0.5A, I_R=1.0A, I_{rr}=0.25A.
 2. Measured at 1.0 MHz and applied V_r=4.0 volts.
 3. 8.0mm² (.013mm thick) land areas.

RATINGS AND CHARACTERISTIC CURVES S3A THRU S3M

FIG 1 - FORWARD CURRENT DERATING CURVE

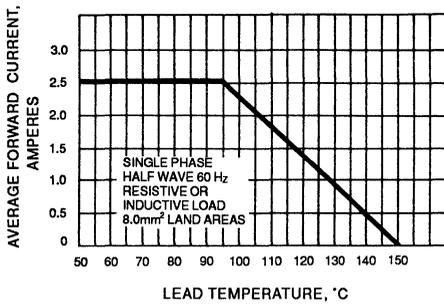


FIG 2 - MAXIMUM NON-REPETITIVE SURGE CURRENT

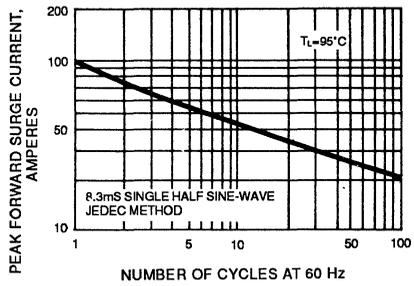


FIG 3 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

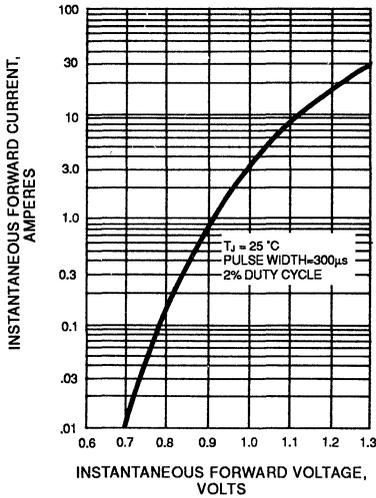


FIG 4 - TYPICAL JUNCTION CHARACTERISTICS

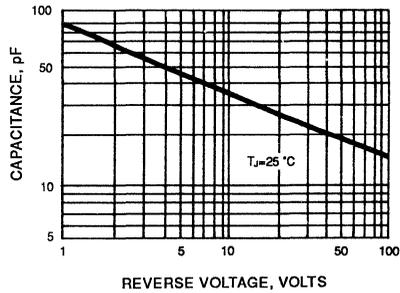
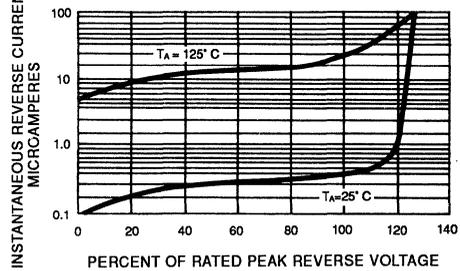


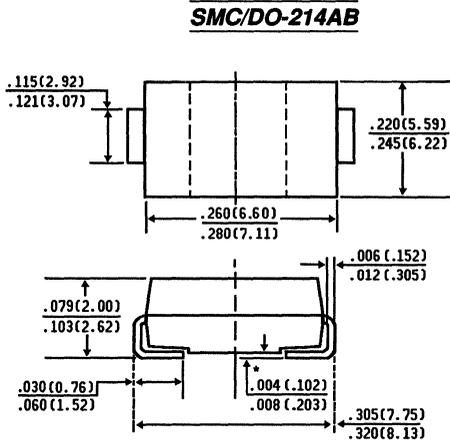
FIG 5 - TYPICAL REVERSE CHARACTERISTICS



RS3A THRU RS3K

FAST SWITCHING SURFACE MOUNT RECTIFIER
VOLTAGE - 50 - 800 Volts CURRENT - 2.5 Amperes

FEATURES



Dimensions in inches and (millimeters)

*Typical Range

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Easy pick and place
- ◆ Plastic material used carries Underwriters Laboratory Classification 94 V-O
- ◆ Glass passivated junction
- ◆ High temperature soldering: 250°C/10 seconds at terminals



MECHANICAL DATA

Case: Molded plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 16mm tape (EIA STD RS-481)
Weight: 0.007 ounces, 0.21 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	RS3A	RS3B	RS3D	RS3G	RS3J	RS3K	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	200	400	600	800	Volts
Maximum RMS Voltage	V _{RMS}	35	70	140	280	420	560	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	200	400	600	800	Volts
Maximum Average Forward Rectified Current at T _L =95°C	I <sub(av)< sub=""></sub(av)<>	2.5						Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	100						Amps
Maximum Instantaneous Forward Voltage at 2.5A	V _F	1.3						Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage	I _R	10.0						μA
Maximum Reverse Recovery Time (NOTE 1)	T _{RR}	150				250	500	nS
Typical Junction Capacitance (NOTE 2)	C _J	60.0						pf
Maximum Thermal Resistance (NOTE 3)	R _{θJL} R _{θJA}	10.0						°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150						°C

NOTES:

1. Reverse Recovery Test conditions: I_F=0.5A, I_R=1.0A, I_{rr}=0.25A.
2. Measured at 1.0 MHz and applied V_r=4.0 volts.
3. 8.0mm² (.013mm thick) land areas.

RATING AND CHARACTERISTIC CURVES RS3A THRU RS3K

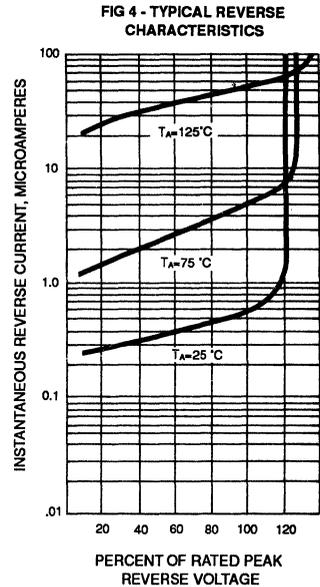
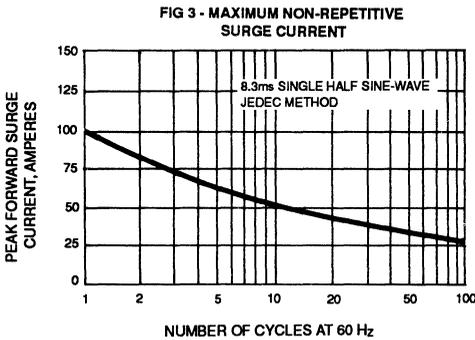
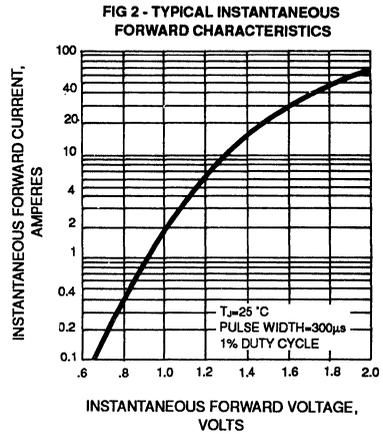
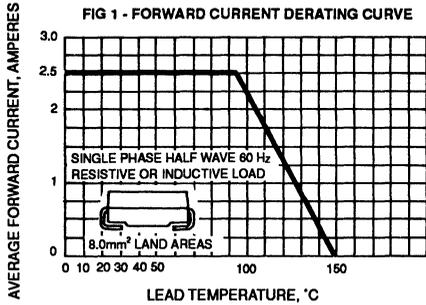
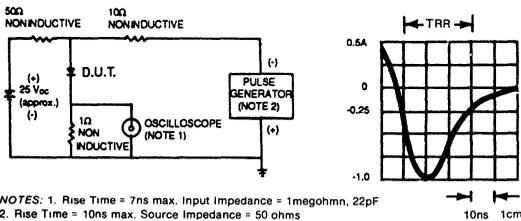


FIG 5 - REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM



NOTES: 1. Rise Time = 7ns max. Input Impedance = 1megohm, 22pF
2. Rise Time = 10ns max. Source Impedance = 50 ohms

ES3A THRU ES3D

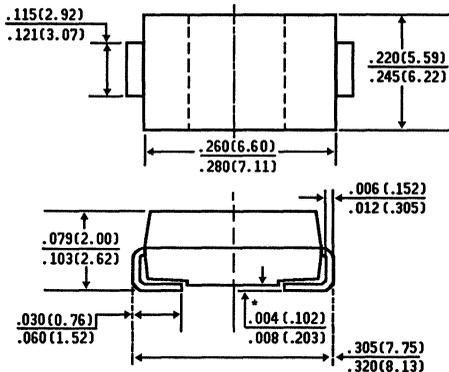
SURFACE MOUNT ULTRAFAST RECTIFIER
VOLTAGE - 50 - 200 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Easy pick and place
- ◆ Superfast recovery times for high efficiency
- ◆ Plastic material used carries
Underwriters Laboratory Classification 94 V-O
- ◆ Glass passivated junction
- ◆ High temperature soldering:
250°C/10 seconds at terminals



SMC/DO-214AB



Dimensions in inches and (millimeters)

*Typical Range

MECHANICAL DATA

- Case:** Molded plastic
- Terminals:** Solder plated
- Polarity:** Indicated by cathode band
- Standard Packaging:** 16mm tape
(EIA STD RS-481)
- Weight:** 0.007 ounces, 0.21 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

	SYMBOLS	ES3A	ES3B	ES3C	ES3D	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	50	100	150	200	Volts
Maximum RMS Voltage	V _{RMS}	35	70	105	140	Volts
Maximum DC Blocking Voltage	V _{DC}	50	100	150	200	Volts
Maximum Average Forward Rectified Current at T _L =120°C	I _(AV)	3.0				Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	100				Amps
Maximum Instantaneous Forward Voltage at 3.0A	V _F	0.90				Volts
Maximum DC Reverse Current at Rated DC Blocking Voltage T _A =25°C	I _R	5.0				μA
T _A =100°C		500				
Maximum Reverse Recovery Time (NOTE 1)	T _{RR}	20.0				Ns
Maximum Reverse Recovery Time (NOTE 2)	T _{RR}	30.0				Ns
		50.0				
Maximum Stored Charge (NOTE 2)	Q _{RR}	10.0				Nc
		30.0				
Typical Junction Capacitance (NOTE 3)	C _J	45.0				pf
Typical Thermal Resistance (NOTE 4)	R _{θJL}	10.0				°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150				°C

NOTES: 1. Reverse Recovery Test Conditions: I_F=0.5A, I_R=1.0A, I_{rr}=0.25A.
 2. T_{RR} and Q_{RR} measured on LEM tester: V_R=30V, di/dt=50 A/μs I_F=3.0A.
 3. Measured at 1.0 MHz and applied reverse voltage of 4.0 volts.
 4. 8.0mm² (.013mm thick) land areas.

RATING AND CHARACTERISTIC CURVES ES3A THRU ES3D

FIG 1 - REVERSE RECOVERY TIME CHARACTERISTIC AND TEST DIAGRAM

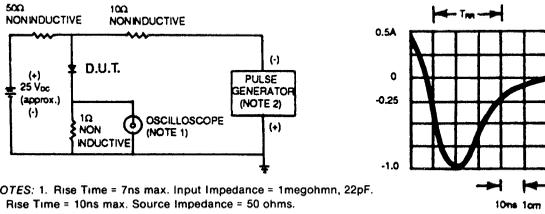


FIG 2 - MAXIMUM AVERAGE FORWARD CURRENT RATING

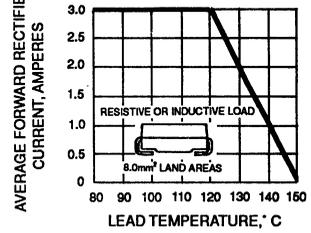


FIG 3 - TYPICAL REVERSE CHARACTERISTICS

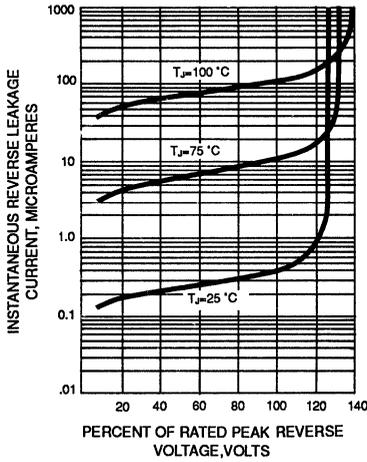


FIG 4 - TYPICAL FORWARD CHARACTERISTICS

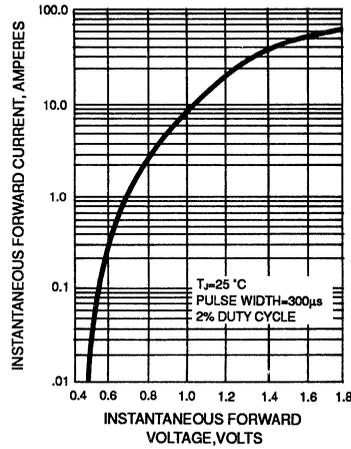


FIG 5 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

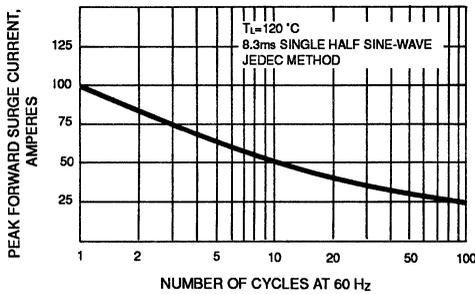
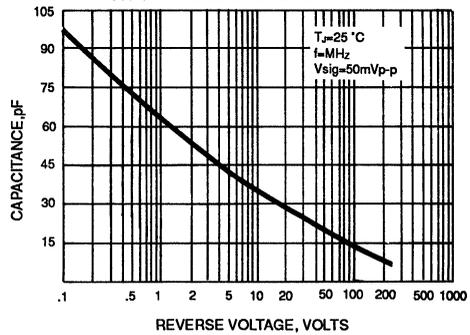


FIG 6 - TYPICAL JUNCTION CAPACITANCE

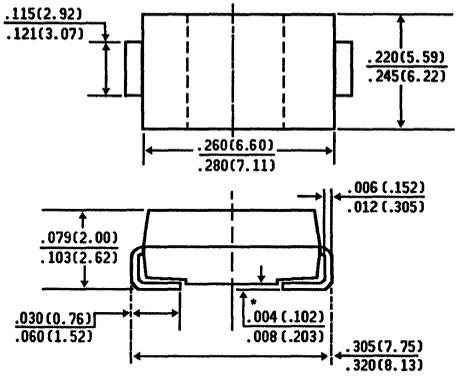


SS32 THRU SS36

SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER
VOLTAGE - 20 to 60 Volts CURRENT - 3.0 Amperes

FEATURES

SMC/DO-214AB



Dimensions in inches and (millimeters)
 *Typical Range

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Easy pick and place
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ For use in low voltage, high frequency inverters, free wheeling, and polarity protection applications
- ◆ High temperature soldering: 260°C/10 seconds at terminal



MECHANICAL DATA

Case: Molded plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 16mm tape (EIA STD RS-481)
Weight: 0.007 ounces 0.21 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SS32	SS33	SS34	SS35	SS36	UNITS
Maximum Recurrent Peak Reverse Voltage	V _{RRM}	20	30	40	50	60	Volts
Maximum RMS voltage	V _{RMS}	14	21	28	35	42	Volts
Maximum DC Blocking Voltage	V _{DC}	20	30	40	50	60	Volts
Maximum Average Forward Rectified Current at T _L (SEE FIGURE 1)	I _(AV)	3.0					Amps
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I _{FSM}	100					Amps
Maximum Instantaneous Forward Voltage at 3.0A (NOTE 1)	V _F	0.50		0.75			Volts
Maximum DC Reverse Current (NOTE 1) T _A =25°C at Rated DC Blocking Voltage T _A =100°C	I _R	0.5			20.0		mA
Maximum Thermal Resistance (NOTE 2)	R _{θJL} R _{θJA}	10.0			60.0		°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +125					°C

NOTES:
 1. Pulse Test Pulse Width 300 μs, Duty Cycle 2%.
 2. 8.0mm² (.013mm thick) land areas.

RATING AND CHARACTERISTIC CURVES SS32 THRU SS36

FIG 1 - FORWARD CURRENT DERATING CURVE

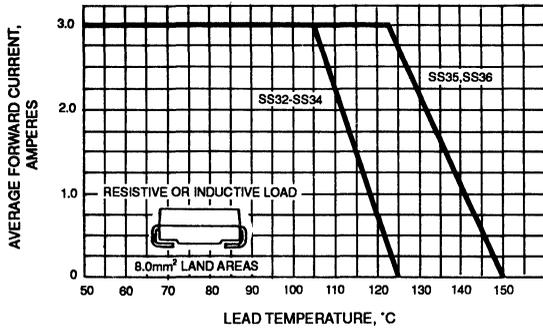


FIG 2 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

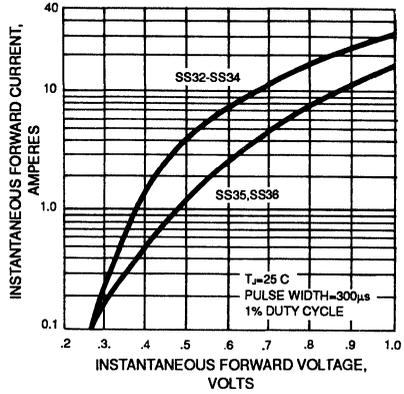


FIG 3 - TYPICAL REVERSE CHARACTERISTICS

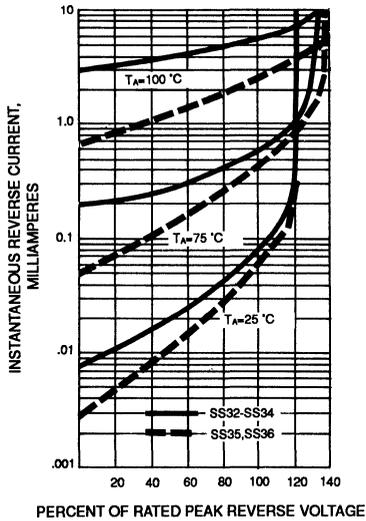


FIG 4 - TYPICAL JUNCTION CAPACITANCE

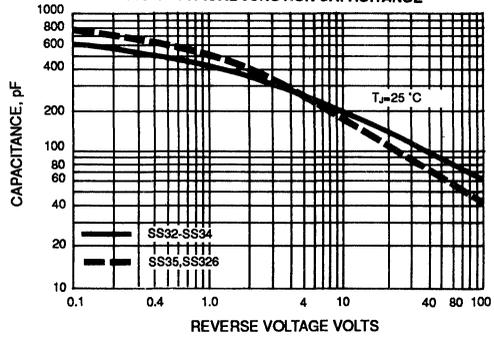
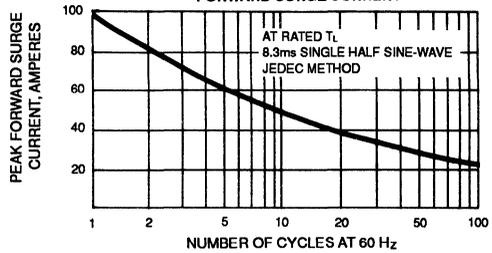


FIG 5 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT



SS39 AND SS3B

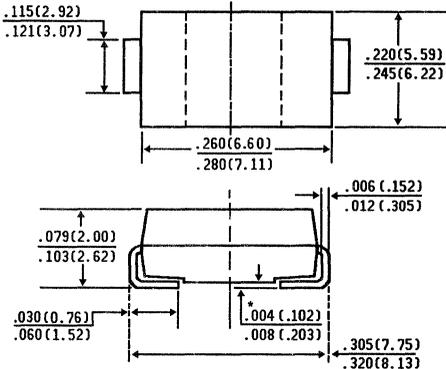
SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER
VOLTAGE - 90 and 100 Volts CURRENT - 3.0 Amperes

FEATURES

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Metal to silicon rectifier, majority carrier conduction
- ◆ Low power loss, high efficiency
- ◆ High current capability, low V_F
- ◆ High surge capacity
- ◆ Epitaxial construction
- ◆ For use in high frequency inverters, free wheeling, and polarity protection applications
- ◆ Guardring for transient protection



SMC/DO-214AB



*Typical Range

MECHANICAL DATA

Case: Moided plastic
Terminals: Solder plated
Polarity: Indicated by cathode band
Standard Packaging: 16mm tape
 (EIA STD RS-481)
Weight: 0.007 ounces 0.21 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Resistive or inductive load.
 For capacitive load, derate current by 20%.

	SYMBOLS	SS39	SS3B	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	90	100	Volts
Working Peak Reverse Voltage	V_{RWM}	64	71	Volts
DC Blocking Voltage	V_{DC}	90	100	Volts
Maximum Average Forward Rectified Current at $T_L=125^\circ\text{C}$ (SEE FIG.1)	$I_{(AV)}$	3.0		Amps
Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)	I_{FSM}	100		Amps
Peak Repetitive Reverse Surge Current (2.0ms, 1KHZ)	I_{RSM}	1.0		Amps
Voltage Rate of Change, dv/dt(rated Vr)	$V/\mu\text{s}$	1000		$V/\mu\text{s}$
Maximum Forward Voltage (NOTE 1) $I_F = 3A, T_L = 25^\circ\text{C}$ $I_F = 3A, T_L = 100^\circ\text{C}$	V_F	0.79	0.69	Volts
Maximum Reverse Current at Peak Reverse Voltage $T_L=100^\circ\text{C}$ (NOTE 1) Peak Reverse Voltage $T_L=25^\circ\text{C}$	I_R	20.0	0.6	mA
Maximum Thermal Resistance, Junction to Lead (NOTE 2)	$R_{\theta JL}$	10.0		$^\circ\text{C/W}$
Maximum Operating Junction Temperature	T_J	-65 to +150		$^\circ\text{C}$
Maximum Storage Temperature	T_{STG}	-65 to +175		$^\circ\text{C}$

NOTES:
 1. Pulse test pulse width 300 μs , Duty Cycle 2%.
 2. 8.0mm² (.013mm thick) land areas.

RATING AND CHARACTERISTIC CURVES SS39 AND SS3B

FIG 1 - FORWARD CURRENT DERATING CURVE

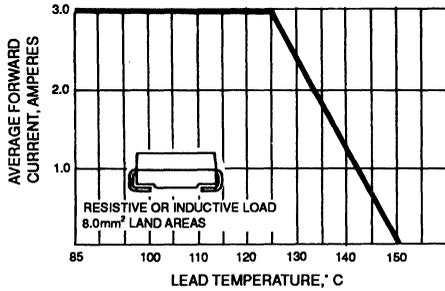


FIG 2 - TYPICAL REVERSE CHARACTERISTICS

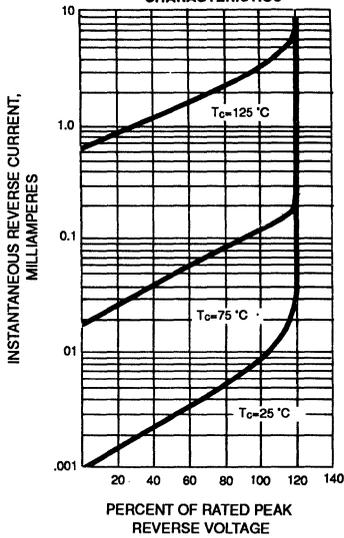


FIG 3 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

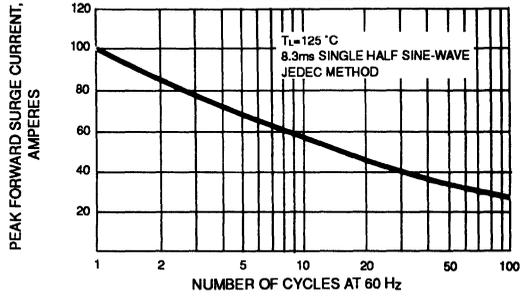


FIG 4 - TYPICAL INSTANTANEOUS FORWARD CHARACTERISTICS

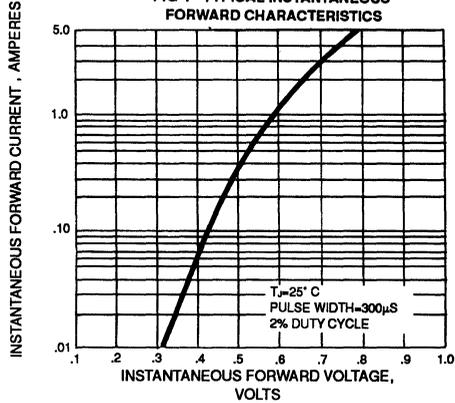
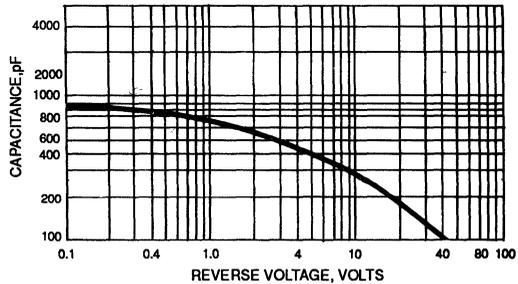


FIG 5 - TYPICAL JUNCTION CAPACITANCE

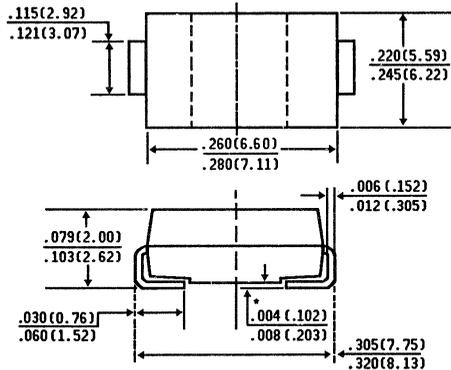


TSMC SERIES

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE - 6.8 - 200 Volts

FEATURES

SMC/DO-214AB



* TYPICAL RANGE

Dimensions in inches
and
millimeters

- ◆ For surface mounted applications
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Glass passivated junction
- ◆ Excellent clamping capability
- ◆ Fast response time: typically less than 1.0ps from 0 volts to BV min.
- ◆ Typical I_R less than 1mA above 10V
- ◆ High temperature soldering: 250°C/10 seconds at terminals



MECHANICAL DATA

Case: Molded plastic

Terminals: Solder plated

Polarity: Indicated by cathode band

Standard Packaging: 16mm tape
(E1A STD RS-481)

Weight: .007 ounces, 0.21 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

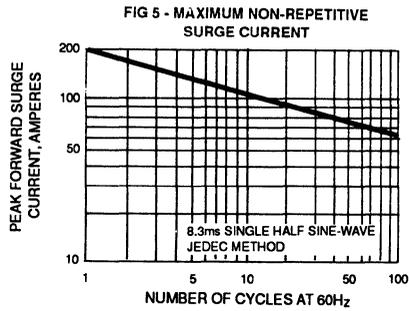
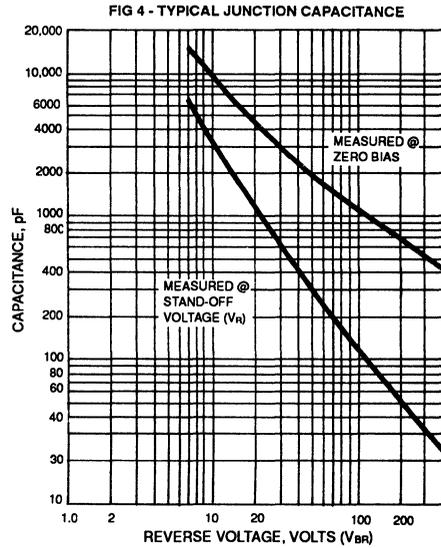
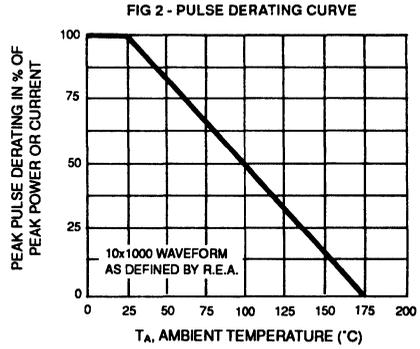
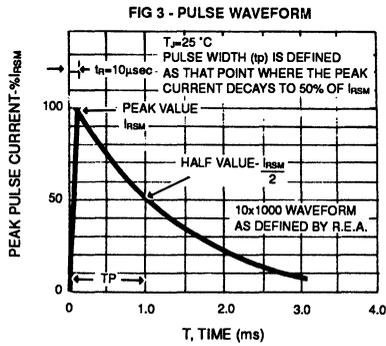
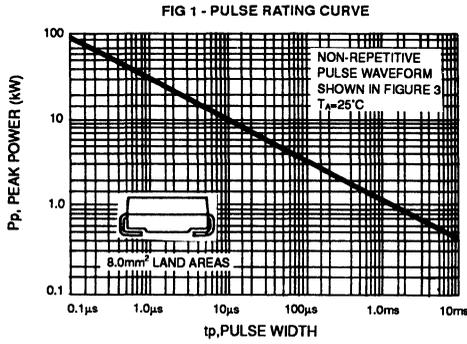
Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOLS	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ\text{C}$, $T_p=1\text{ms}$ (NOTES 1,2)	Ppk	Minimum 1500	Watts
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)(NOTES 2,3)	I _{FSM}	200.0	Amps
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +175	°C

NOTES:

1. Non-repetitive current pulse, per Fig.3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2.
2. Mounted on 8.0mm² copper pads to each terminal.
3. 8.3ms single half sine-wave duty cycle=4 pulses per minutes maximum.

MAXIMUM RATINGS AND CHARACTERISTIC CURVES TSMC SERIES



ELECTRICAL CHARACTERISTICS @25°C

Device	Device Marking Code	Breakdown Voltage V_{BR} Volts(NOTE 1)		@ IT mA	Working Peak Reverse Voltage V_{RPM} (Volts)	Maximum Reverse Leakage at V_{RPM} I_{RPM} (µA)	Maximum Reverse Surge Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)
		Min.	Max.					
TSMC6.8	DD	6.12	7.48	10	5.50	1000	139	10.8
TSMC6.8A	DE	6.45	7.14	10	5.80	1000	143	10.5
TSMC7.5	DF	6.75	8.25	10	6.05	500	128	11.7
TSMC7.5A	DG	7.13	7.88	10	6.40	500	132	11.3
TSMC8.2	DH	7.38	9.02	10	6.63	200	120	12.5
TSMC8.2A	DK	7.79	8.0	10	7.02	200	124	12.1
TSMC9.1	DL	8.19	10.0	1.0	7.37	50	109	13.8
TSMC9.1A	DM	8.65	9.55	1.0	7.78	50	112	13.4
TSMC10	DN	9.00	11.0	1.0	8.10	10	100	15.0
TSMC10A	DP	9.50	10.5	1.0	8.55	10	103	14.5
TSMC11	DQ	9.90	12.1	1.0	8.92	5.0	93.0	16.2
TSMC11A	DR	10.5	11.6	1.0	9.40	5.0	96.0	15.6
TSMC12	DS	10.8	13.2	1.0	9.72	5.0	87.0	17.3
TSMC12A	DT	11.4	12.6	1.0	10.2	5.0	90.0	16.7
TSMC13	DU	11.7	14.3	1.0	10.5	5.0	78.0	19.0
TSMC13A	DV	12.4	13.7	1.0	11.1	5.0	82.0	18.2
TSMC15	DW	13.5	16.5	1.0	12.1	5.0	68.0	22.0
TSMC15A	DX	14.3	15.8	1.0	12.8	5.0	71.0	21.2
TSMC16	DY	14.4	17.6	1.0	12.9	5.0	64.0	23.5
TSMC16A	DZ	15.2	16.8	1.0	13.6	5.0	67.0	22.5
TSMC18	ED	16.2	19.8	1.0	14.5	5.0	56.5	26.5
TSMC18A	EE	17.1	18.9	1.0	15.3	5.0	59.5	26.2
TSMC20	EF	18.0	22.0	1.0	16.2	5.0	51.5	29.1
TSMC20A	EG	19.0	21.0	1.0	17.1	5.0	54.0	27.7
TSMC22	EH	19.8	24.2	1.0	17.8	5.0	47.0	31.9
TSMC22A	EK	20.9	23.1	1.0	18.8	5.0	49.0	30.6
TSMC24	EL	21.6	26.4	1.0	19.4	5.0	43.0	34.7
TSMC24A	EM	22.8	25.2	1.0	20.5	5.0	45.0	33.2
TSMC27	EN	24.3	29.7	1.0	21.8	5.0	38.5	39.1
TSMC27A	EP	25.7	28.4	1.0	23.1	5.0	40.0	37.5
TSMC30	EQ	27.0	33.0	1.0	24.3	5.0	34.5	43.5
TSMC30A	ER	28.5	31.5	1.0	25.6	5.0	36.0	41.4
TSMC33	ES	29.7	36.3	1.0	26.8	5.0	31.5	47.7
TSMC33A	ET	31.4	34.7	1.0	28.2	5.0	33.0	45.7
TSMC36	EU	32.4	39.6	1.0	29.1	5.0	29.0	52.0
TSMC36A	EV	34.2	37.8	1.0	30.8	5.0	30.0	49.9
TSMC39	EW	35.1	42.9	1.0	31.6	5.0	26.5	56.4
TSMC39A	EX	37.1	41.0	1.0	33.3	5.0	28.0	53.9
TSMC43	EY	38.7	47.3	1.0	34.8	5.0	24.0	61.9
TSMC43A	EZ	40.9	45.2	1.0	36.8	5.0	25.3	59.3
TSMC47	FD	42.3	51.7	1.0	36.1	5.0	22.2	67.8
TSMC47A	FE	44.7	49.4	1.0	40.2	5.0	23.2	64.8
TSMC51	FF	45.9	56.1	1.0	41.3	5.0	20.4	73.5
TSMC51A	FG	48.5	53.6	1.0	43.6	5.0	21.4	70.1
TSMC56	FH	50.4	61.8	1.0	45.4	5.0	18.6	80.5
TSMC56A	FK	53.2	58.8	1.0	47.8	5.0	19.5	77.0
TSMC62	FL	55.8	68.2	1.0	50.2	5.0	16.9	89.0
TSMC62A	FM	58.9	65.1	1.0	53.0	5.0	17.7	85.0
TSMC68	FN	61.2	74.8	1.0	55.1	5.0	15.3	98.0
TSMC68A	FP	64.6	71.4	1.0	58.1	5.0	16.3	92.0
TSMC75	FQ	67.5	82.5	1.0	60.7	5.0	13.9	109
TSMC75A	FR	71.3	78.8	1.0	64.1	5.0	14.6	104
TSMC82	FS	73.8	90.2	1.0	66.4	5.0	12.7	118
TSMC82A	FT	77.9	86.1	1.0	70.1	5.0	13.3	113
TSMC91	FU	81.9	100.0	1.0	73.7	5.0	11.4	131
TSMC91A	FV	86.5	95.5	1.0	77.8	5.0	12.0	125
TSMC100	FW	90.0	110	1.0	81.0	5.0	10.4	144
TSMC100A	FX	95.0	105	1.0	85.5	5.0	11.0	137
TSMC110	FY	99.0	121	1.0	89.2	5.0	9.5	158
TSMC110A	FZ	106	116	1.0	94.0	5.0	9.9	152
TSMC120	GD	108	132	1.0	97.2	5.0	8.7	173
TSMC120A	GE	114	126	1.0	102	5.0	9.1	165

ELECTRICAL CHARACTERISTICS @25°C

Device	Device Marking Code	Breakdown Voltage V_{BR} Volts(NOTE 1)		Working Peak Reverse Voltage V_{RPM} (Volts)	Maximum Reverse Leakage at V_{RWM} (I_{RPM} -A)	Maximum Reverse Surge Current I_{RSM} (NOTE 2) (Ampe)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	
		Min.	Max.					
TSMC130	GF	117	143	1.0	106	5.0	8.0	187
TSMC130A	GG	124	137	1.0	111	5.0	8.4	179
TSMC150	GH	136	165	1.0	121	5.0	7.0	215
TSMC150A	GK	143	158	1.0	128	5.0	7.2	207
TSMC160	GL	144	176	1.0	130	5.0	6.5	230
TSMC160A	GM	152	168	1.0	136	5.0	6.8	219
TSMC170	GN	153	167	1.0	138	5.0	6.2	244
TSMC170A	GP	162	179.	1.0	145	5.0	6.4	234
TSMC180	GQ	162	198	1.0	146	5.0	5.8	258
TSMC180A	GR	171	189	1.0	154	5.0	6.1	246
TSMC200	GS	180	220	1.0	162	5.0	5.2	287
TSMC200A	GT	190	210	1.0	171	5.0	5.5	274

NOTES:

- V_{BR} measured after I_T applied for 300 us. I_T = Square Wave Pulse or equivalent.
- Surge current Waverform per Figure 3 and Derate per Figure 2.
- V_F - 3.5V max, I_F =100A (TSMC6.8 thru TSMC91A)
 V_F =5.0 V max., I_F =100A (TSMC100 thru TSMC400A) per 1/2 Square or equivalent Sine Wave.
 PW - 8.3ms, Duty Cycle - 4 Pulses per minute maximum.

APPLICATION NOTES:

Transient Voltage Suppressors may be used at various points in a circuit to provide various degrees of protection. The following is a typical linear power supply with transient voltage suppressor units placed at different points. All provide protection of the load.

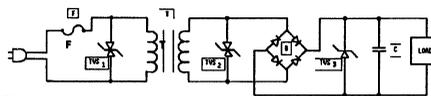


Fig.1

Transient Voltage Suppressor 1 provides maximum protection. However, the system will probably require replacement of the line fuse (F) since it provides a dominant portion of the series impedance when a surge is encountered.

Transient Voltage Suppressor 2 provides excellent protection of circuitry excluding the transformer (T). However, since the transformer is a large part of the series impedance, the chance of the line fuse opening during the surge condition is reduced.

Transient Voltage Suppressor 3 provides the load with complete protection. It uses a unidirectional Transient Voltage Suppressor, which is a cost advantage. The series impedance now includes the line fuse, transformer, and bridge rectifier (B) so failure of the line fuse is further reduced. If only Transient Voltage Suppressor 3 is in use, then the bridge rectifier is unprotected and would require a higher voltage and current rating to prevent failure by transients.

Any combination of these three, or any one of these applications, will prevent damage to the load. This would require varying trade-offs in power supply protection versus maintenance (time changing the fuse).

An additional method is to utilize the Transient Voltage Suppressor units as a controlled avalanche bridge. This reduces the parts count and incorporates the protection within the bridge rectifier.

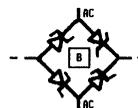


Fig.2

Lower wattage devices are available in the TSMA series of 400 W and TSMB series of 600 W surface mount suppressors.

TRANSIENT VOLTAGE SUPPRESSORS

General Instrument Transient Voltage Suppressors are the state-of-the-art in semiconductor surge protection for modern electronic equipment.

Because TVS devices are semiconductors, there is no inherent wear out mechanism. When overstressed, they short circuit at the changing voltage and protect the associated equip-

ment. The clamping voltage is close to the operating voltage enabling a high degree of protection while assuring the devices are off until their operation is required.

General Instrument TVS units are available in four power ranges: 400, 600, 1500, and 5,000 watts with a wide variety of voltages.

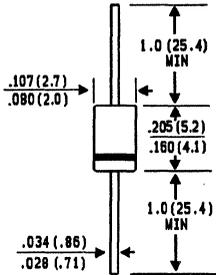
**GENERAL
INSTRUMENT**

TMPG06

TRANSIENT VOLTAGE SUPPRESSOR
VOLTAGE- 6.8 to 43 Volts
400 Watt Peak Power 1.0 Watt Steady State

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junction
- ◆ Exclusive G.I. PAR construction
- ◆ 400W surge capability at 1 ms
- ◆ Excellent clamping capability
- ◆ Low zener impedance
- ◆ Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- ◆ Typical I_R less than 10 μ A above 10V at 175°C
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3 kg) tension
- ◆ Designed to handle under the hood applications



*Dimensions in inches
and
(millimeters)*

MECHANICAL DATA

Case: Molded plastic over a passivated junction
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denotes cathode
Mounting Position: Any
Weight : 0.0064 ounce, .181 gram

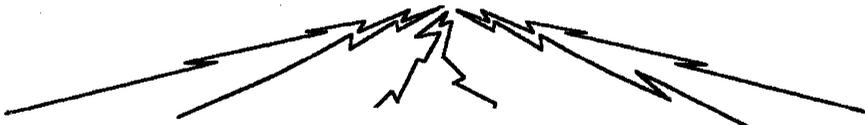
MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A = 25^\circ\text{C}$, $T_p = 1\text{ms}$ (NOTE 1)	Ppk	Minimum 400	Watts
Steady State Power Dissipation at $T_L = 75^\circ\text{C}$ Lead Lengths .25", (6.33mm) (NOTE 2)	PD	1.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	I_{FSM}	40.0	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +185	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25^\circ\text{C}$ per Fig. 2.
2. Mounted on Copper Leaf area of 1.57 in² (40mm²).
3. 8.3ms single half sine-wave, duty cycle = 4 pulses per minute maximum.



RATINGS AND CHARACTERISTIC CURVES TMPG06 SERIES

FIGURE 1 — PULSE RATING CURVE

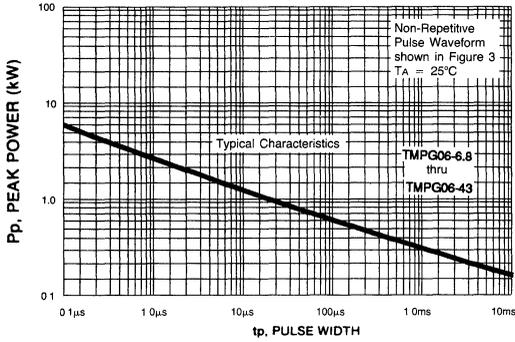


FIGURE 3 — PULSE WAVEFORM

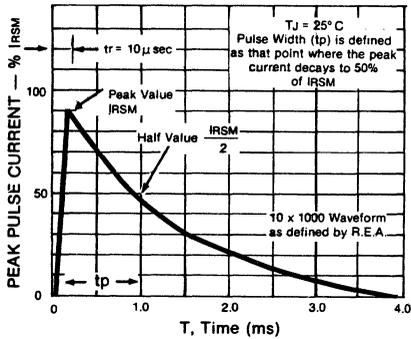


FIGURE 5 — STEADY STATE POWER DERATING

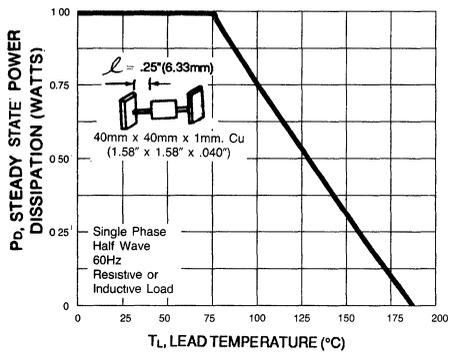


FIGURE 2 — PULSE DERATING CURVE

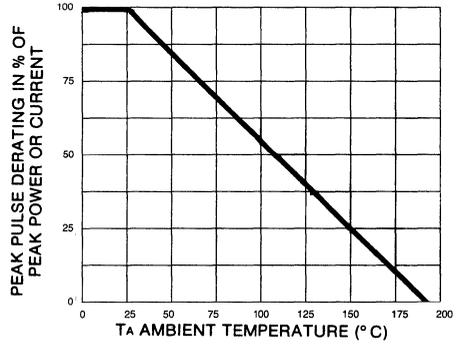


FIGURE 4 — TYPICAL JUNCTION CAPACITANCE

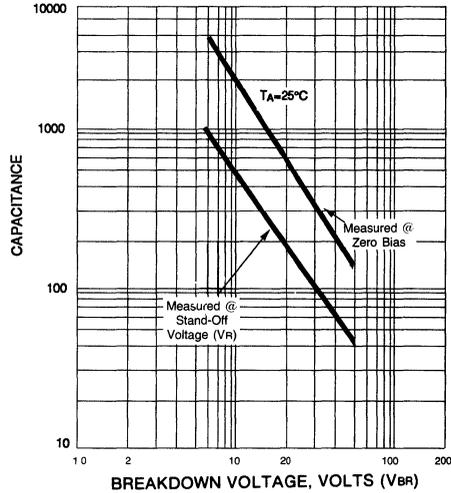
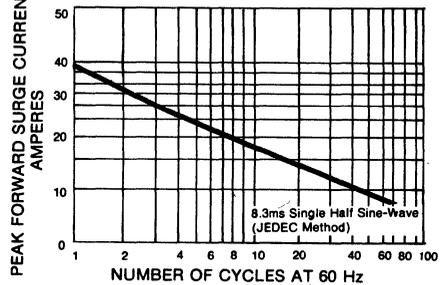


FIGURE 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

DEVICE	Breakdown Voltage V_{BR} Volts (NOTE 1)		@ I_T (mA)	Working Peak Reverse Voltage V_{RPM} (Volts)	Maximum Reverse Leakage at V_{RPM} I_R (μA)	$T_C=150^\circ\text{C}$ Maximum Reverse Leakage at V_{RPM} I_R (μA)	Maximum Reverse Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Coefficient of V_{BR} (%/°C)
	MIN	MAX							
TMPG06-6.8	6.12	7.48	10.0	5.50	300	1000	39.8	10.8	0.057
TMPG06-6.8A	6.45	7.14	10.0	5.80	300	1000	41.0	10.5	0.057
TMPG06-7.5	6.75	8.25	10.0	6.05	150	500	36.8	11.7	0.060
TMPG06-7.5A	7.13	7.88	10.0	6.40	150	500	38.1	11.3	0.061
TMPG06-8.2	7.38	9.02	10.0	6.63	50.0	200	34.4	12.5	0.065
TMPG06-8.2A	7.79	8.61	10.0	7.02	50.0	200	35.5	12.1	0.065
TMPG06-9.1	8.19	10.0	1.0	7.37	10.0	50.0	32.2	13.8	0.068
TMPG06-9.1A	8.65	9.55	1.0	7.78	1.0	50.0	32.1	13.4	0.068
TMPG06-10	9.00	11.0	1.0	8.10	1.0	10.0	28.7	15.0	0.073
TMPG06-10A	9.50	10.5	1.0	8.55	1.0	5.0	29.7	14.5	0.073
TMPG06-11	9.90	12.1	1.0	8.92	1.0	5.0	26.5	16.2	0.075
TMPG06-11A	10.5	11.6	1.0	9.40	1.0	5.0	27.6	15.6	0.075
TMPG06-12	10.8	13.2	1.0	9.72	1.0	5.0	24.9	17.3	0.076
TMPG06-12A	11.4	12.6	1.0	10.2	1.0	5.0	25.8	16.7	0.078
TMPG06-13	11.7	14.3	1.0	10.5	1.0	5.0	22.6	19.0	0.081
TMPG06-13A	12.4	13.7	1.0	11.1	1.0	5.0	23.6	18.2	0.081
TMPG06-15	13.5	16.3	1.0	12.1	1.0	5.0	19.6	22.0	0.084
TMPG06-15A	14.3	15.8	1.0	12.8	1.0	5.0	20.3	21.2	0.084
TMPG06-16	14.4	17.6	1.0	12.9	1.0	5.0	18.3	23.5	0.086
TMPG06-16A	15.2	16.8	1.0	13.6	1.0	5.0	19.1	22.5	0.086
TMPG06-18	16.2	19.8	1.0	14.5	1.0	5.0	16.2	26.5	0.088
TMPG06-18A	17.1	18.9	1.0	15.3	1.0	5.0	16.9	25.5	0.088
TMPG06-20	18.0	22.0	1.0	16.2	1.0	5.0	14.8	29.1	0.090
TMPG06-20A	19.0	21.0	1.0	17.0	1.0	5.0	15.5	27.7	0.090

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Device	Breakdown Voltage V_{BR} Volts (NOTE 1)		@IT (mA)	Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} I_R (μA)	$T_C=150^\circ\text{C}$ Maximum Reverse Leakage at V_{RWM} I_R (μA)	Maximum Reverse Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Coefficient of V_{BR} (%/°C)
	MIN	MAX							
TMPG06-22	19.8	24.2	1.0	17.8	1.0	5.0	13.5	31.9	0.092
TMPG06-22A	20.9	23.1	1.0	18.8	1.0	5.0	14.1	30.6	0.092
TMPG06-24	21.6	26.4	1.0	19.4	1.0	5.0	12.4	34.2	0.094
TMPG06-24A	22.8	25.2	1.0	20.5	1.0	5.0	13.0	33.2	0.094
TMPG06-27	24.3	29.7	1.0	21.8	1.0	5.0	11.0	39.1	0.096
TMPG06-27A	25.7	28.4	1.0	23.1	1.0	5.0	11.5	37.5	0.096
TMPG06-30	27.0	33.0	1.0	24.3	1.0	5.0	9.9	43.5	0.097
TMPG06-30A	28.5	31.5	1.0	25.6	1.0	5.0	10.4	41.4	0.097
TMPG06-33	29.7	36.3	1.0	26.8	1.0	5.0	9.0	47.7	0.098
TMPG06-33A	31.4	34.7	1.0	28.2	1.0	5.0	9.4	45.7	0.098
TMPG06-36	32.4	39.6	1.0	29.1	1.0	5.0	8.3	52.0	0.099
TMPG06-36A	34.2	37.8	1.0	30.8	1.0	5.0	8.6	49.9	0.099
TMPG06-39	35.1	42.9	1.0	31.6	1.0	5.0	7.6	56.4	0.100
TMPG06-39A	37.1	41.0	1.0	33.3	1.0	5.0	8.0	53.9	0.100
TMPG06-43	38.7	47.3	1.0	34.8	1.0	5.0	7.0	61.9	0.101
TMPG06-43A	40.9	45.2	1.0	36.8	1.0	5.0	7.3	59.3	0.101

NOTES:

1. V_{BR} measured after IT applied for 300 μs , IT = Square Wave Pulse or equivalent.
2. Surge Current Waveform per Figure 3 and Derated per Figure 2.
3. $V_F = 3.5\text{ V max.}$, $I_F = 25\text{A}$ for all types on 1/2 Square or equivalent Sine Wave
PW= 8.33 ms, Duty Cycle= 4 Pulses per minute maximum

P4KA SERIES

AUTOMOTIVE TRANSIENT VOLTAGE SUPPRESSOR

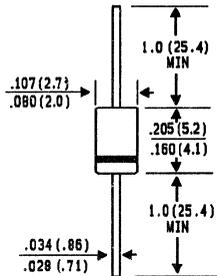
VOLTAGE- 6.8 to 43 Volts

400 Watt Peak Power 1.0 Watt Steady State

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated junction
- ◆ Exclusive G.I. PAR construction
- ◆ 400W surge capability at 1 ms
- ◆ Excellent clamping capability
- ◆ Low zener impedance
- ◆ Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- ◆ Typical I_R less than 10 μ A above 10V at 175°C
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3 kg) tension
- ◆ Designed to handle under the hood applications

DO-41



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denoted cathode except Bipolar

Mounting Position: Any

Weight: 0.012 ounce, 0.3 gram

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types P4KA6.8 thru types P4KA43.
Electrical characteristics apply in both directions.

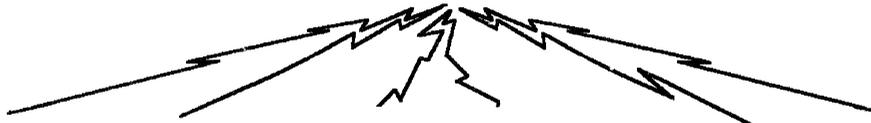
MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ\text{C}$, $T_p=1\text{ms}$ (NOTE 1)	Ppk	Minimum 400	Watts
Steady State Power Dissipation at $T_L=75^\circ\text{C}$ Lead Lengths .375", (9.5mm) (NOTE 2)	PD	1.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	IFSM	40.0	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +185	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2.
2. Mounted on Copper Leaf area of 1.57 in² (40mm²).
3. 8.3ms single half sine-wave, duty cycle=4 pulses per minutes maximum.



RATINGS AND CHARACTERISTIC CURVES P4KA SERIES

FIGURE 1 — PULSE RATING CURVE

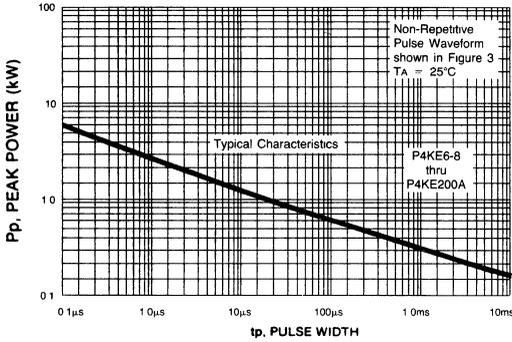


FIGURE 2 — PULSE DERATING CURVE

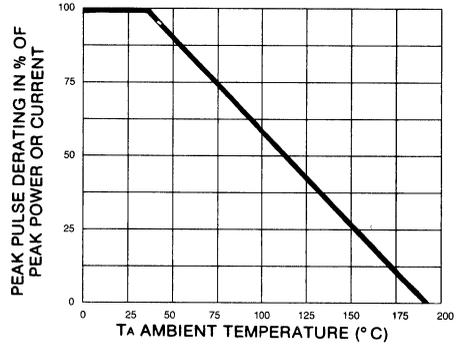


FIGURE 3 — PULSE WAVEFORM

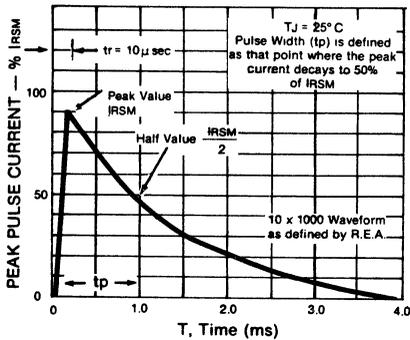


FIGURE 4 — TYPICAL JUNCTION CAPACITANCE

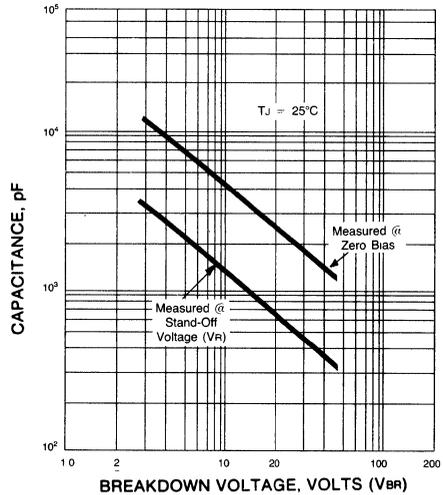


FIGURE 5 — STEADY STATE POWER DERATING

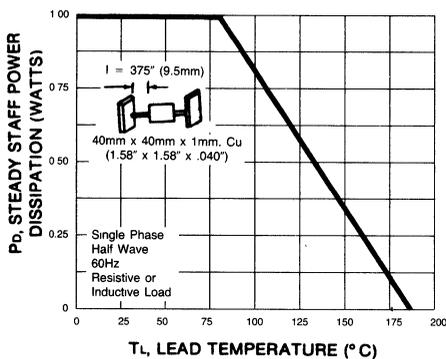
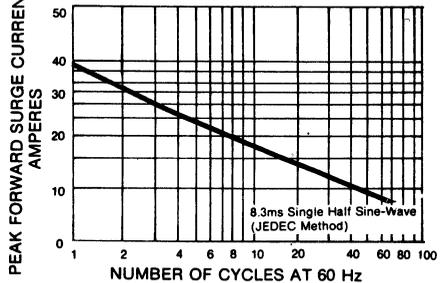


FIGURE 6 — MAXIMUM NON-REPETITIVE SURGE CURRENT



DEVICE	Breakdown Voltage		@IT (mA)	Working Peak Reverse Voltage V _{RRM} (Volts)	Maximum Reverse Leakage at V _{RRM} I _R (μ A)	T _C =150°C Maximum Reverse Leakage at V _{RRM} I _R (μ A)	Maximum Reverse Current I _{RSU} (note 2) (Amps)	Maximum Reverse Voltage at I _{RSU} (Clamping Voltage) V _{RSU} (Volts)	Maximum Temperature Coefficient of V _{RRM} (%/°C)
	V _{BR} Volts (note 1)								
	MIN	MAX							
P4KA6.8	6.12	7.48	10.0	5.50	300	1000	39.8	10.8	0.057
P4KA6.8A	6.45	7.14	10.0	5.80	300	1000	41.0	10.5	0.057
P4KA7.5	6.75	8.25	10.0	6.05	150	500	36.8	11.7	0.060
P4KA7.5A	7.13	7.88	10.0	6.40	150	500	38.1	11.3	0.061
P4KA8.2	7.38	9.02	10.0	6.63	50.0	200	34.4	12.5	0.065
P4KA8.2A	7.79	8.61	10.0	7.02	50.0	200	35.5	12.1	0.065
P4KA9.1	8.19	10.0	1.0	7.37	10.0	50.0	32.2	13.8	0.068
P4KA9.1A	8.65	9.55	1.0	7.78	1.0	50.0	32.1	13.4	0.068
P4KA10	9.00	11.0	1.0	8.10	1.0	10.0	28.7	15.0	0.073
P4KA10A	9.50	10.5	1.0	8.55	1.0	5.0	29.7	14.5	0.073
P4KA11	9.90	12.1	1.0	8.92	1.0	5.0	26.5	16.2	0.075
P4KA11A	10.5	11.6	1.0	9.40	1.0	5.0	27.6	15.6	0.075
P4KA12	10.8	13.2	1.0	9.72	1.0	5.0	24.9	17.3	0.076
P4KA12A	11.4	12.6	1.0	10.2	1.0	5.0	25.8	16.7	0.078
P4KA13	11.7	14.3	1.0	10.5	1.0	5.0	22.6	19.0	0.081
P4KA13A	12.4	13.7	1.0	11.1	1.0	5.0	23.6	18.2	0.081
P4KA15	13.5	16.3	1.0	12.1	1.0	5.0	19.6	22.0	0.084
P4KA15A	14.3	15.8	1.0	12.8	1.0	5.0	20.3	21.2	0.084
P4KA16	14.4	17.6	1.0	12.9	1.0	5.0	18.3	23.5	0.086
P4KA16A	15.2	16.8	1.0	13.6	1.0	5.0	19.1	22.5	0.086
P4KA18	16.2	19.8	1.0	14.5	1.0	5.0	16.2	26.5	0.088
P4KA18A	17.1	18.9	1.0	15.3	1.0	5.0	16.9	25.5	0.088
P4KA20	18.0	22.0	1.0	16.2	1.0	5.0	14.8	29.1	0.090
P4KA20A	19.0	21.0	1.0	17.0	1.0	5.0	15.5	27.7	0.090
P4KA22	19.8	24.2	1.0	17.8	1.0	5.0	13.5	31.9	0.092
P4KA22A	20.9	23.1	1.0	18.8	1.0	5.0	14.1	30.6	0.092
P4KA24	21.6	26.4	1.0	19.4	1.0	5.0	12.4	34.2	0.094
P4KA24A	22.8	25.2	1.0	20.5	1.0	5.0	13.0	33.2	0.094
P4KA27	24.3	29.7	1.0	21.8	1.0	5.0	11.0	39.1	0.096
P4KA27A	25.7	28.4	1.0	23.1	1.0	5.0	11.5	37.5	0.096
P4KA30	27.0	33.0	1.0	24.3	1.0	5.0	9.9	43.5	0.097
P4KA30A	28.5	31.5	1.0	25.6	1.0	5.0	10.4	41.4	0.097
P4KA33	29.7	36.3	1.0	26.8	1.0	5.0	9.0	47.7	0.098
P4KA33A	31.4	34.7	1.0	28.2	1.0	5.0	9.4	45.7	0.098
P4KA36	32.4	39.6	1.0	29.1	1.0	5.0	8.3	52.0	0.099
P4KA36A	34.2	37.8	1.0	30.8	1.0	5.0	8.6	49.9	0.099
P4KA39	35.1	42.9	1.0	31.6	1.0	5.0	7.6	56.4	0.100
P4KA39A	37.1	41.0	1.0	33.3	1.0	5.0	8.0	53.9	0.100
P4KA43	38.7	47.3	1.0	34.8	1.0	5.0	7.0	61.9	0.101
P4KA43A	40.9	45.2	1.0	36.8	1.0	5.0	7.3	59.3	0.101

NOTES:

1. V_{BR} measured after IT applied for 300 μ s, IT = Square Wave Pulse or equivalent.
2. Surge Current Waveform per Figure 3 and Derated per Figure 2.
3. V_F = 3.5 V max., I_F = 25A for all types on 1/2 Square or equivalent Sine Wave.
PW = 8.33 ms, Duty Cycle = 4 Pulses per minute maximum.

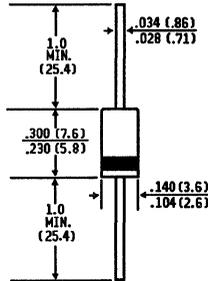


P6KA SERIES

AUTOMOTIVE TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE - 6.8 to 43 Volts 600 Watt Peak Power 5.0 Watt Steady State

FEATURES

DO-15



Dimensions in inches
and
(millimeters)

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated junction
- ◆ Exclusive G.I. PAR construction
- ◆ 600W surge capability at 1 ms
- ◆ Excellent clamping capability
- ◆ Low zener impedance
- ◆ Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- ◆ Typical I_R less than 10 μ A above 10V at 175°C
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3 kg) tension
- ◆ Designed to handle under the hood applications

MECHANICAL DATA

Case: JEDEC DO-15 Molded plastic

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denoted cathode except Bipolar

Mounting Position: Any

Weight: 0.015 ounce, 0.4 gram

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types P6KA6.8 through types P6KA43.
Electrical characteristics apply in both directions.

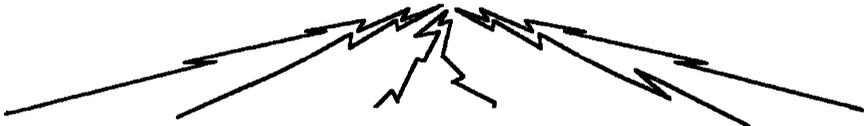
MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ\text{C}$, $T_p=1\text{ms}$ (NOTE 1)	Ppk	Minimum 600	Watts
Steady State Power Dissipation at $T_L=75^\circ\text{C}$ Lead Lengths .375", (9.5mm) (NOTE 2)	PD	5.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	I_{FSM}	100	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +185	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2.
2. Mounted on Copper Leaf area of 1.57 in² (40mm²).
3. 8.3ms single half sine-wave, duty cycle = 4 pulses per minutes maximum.



RATING AND CHARACTERISTIC CURVES P6KA SERIES

FIGURE 1 — PULSE RATING CURVE

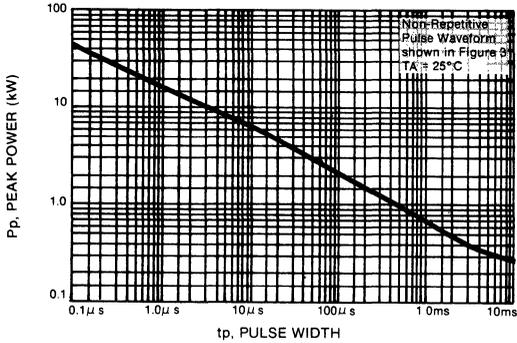


FIGURE 2 — PULSE DERATING CURVE

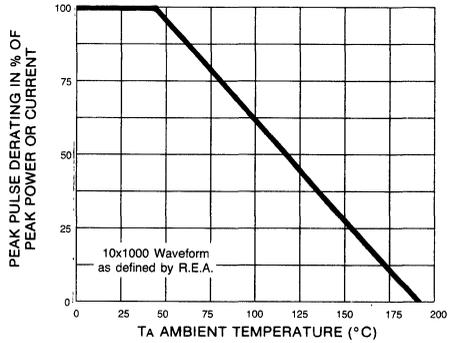


FIGURE 3 — PULSE WAVEFORM

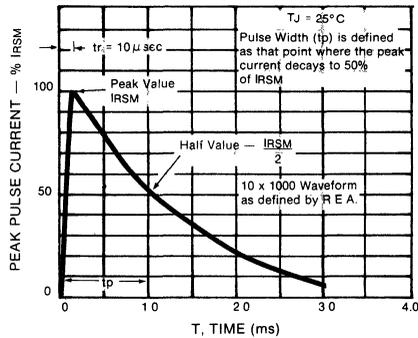


FIGURE 4 — TYPICAL JUNCTION CAPACITANCE

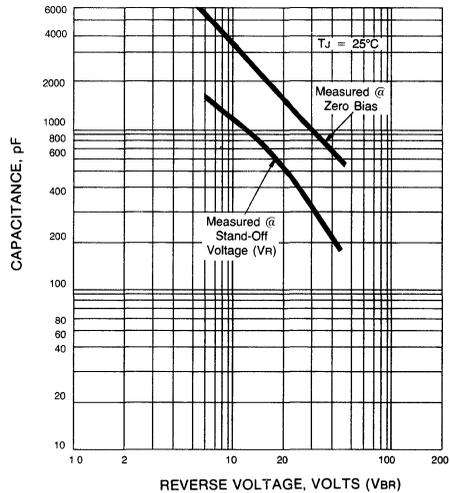


FIGURE 5 — STEADY STATE POWER DERATING

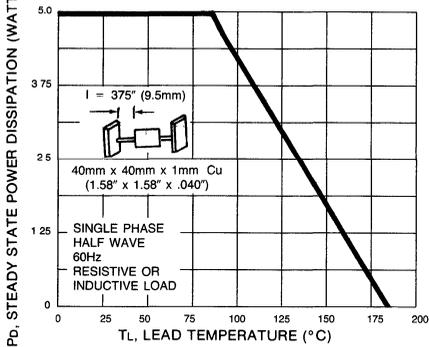
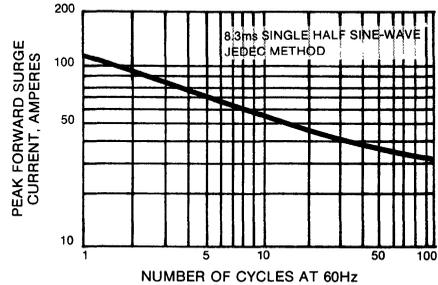


FIGURE 6 — MAXIMUM NON-REPETITIVE SURGE CURRENT



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

DEVICE	Breakdown Voltage		@IT (mA)	Working Peak Reverse Voltage (Volts)	Maximum Reverse Leakage at V_{RM} $I_R(\mu\text{A})$	$T_C=150^\circ\text{C}$ Maximum Reverse Leakage at V_{RM} $I_R(\mu\text{A})$	Maximum Reverse Current I_{RM} (note 2) (Amps)	Maximum Reverse Voltage at I_{RM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Coefficient of V_{BR} (%/°C)
	V_{BR} Volts (note 1)								
	MIN	MAX							
P6KA6.8	6.12	7.48	10	5.50	500	1000	59.7	10.8	0.057
P6KA6.8A	6.45	7.14	10	5.80	500	1000	61.4	10.5	0.057
P6KA7.5	6.75	8.25	10	6.05	250	500	58.1	11.7	0.061
P6KA7.5A	7.13	7.88	10	6.40	250	500	57.1	11.3	0.061
P6KA8.2	7.38	9.02	10	6.63	100	200	51.6	12.5	0.065
P6KA8.2A	7.79	8.61	10	7.02	100	200	53.3	12.1	0.065
P6KA9.1	8.19	10.0	1.0	7.37	25	50	46.7	13.8	0.068
P6KA9.1A	8.65	9.55	1.0	7.78	25	50	48.1	13.4	0.068
P6KA10	9.00	11.0	1.0	8.10	5.0	10	43.0	15.0	0.073
P6KA10A	9.50	10.5	1.0	8.55	5.0	10	44.5	14.5	0.073
P6KA11	9.90	12.1	1.0	8.92	2.0	5.0	39.8	16.2	0.075
P6KA11A	10.5	11.6	1.0	9.40	2.0	5.0	41.3	15.6	0.076
P6KA12	10.8	13.2	1.0	9.72	2.0	5.0	37.3	17.3	0.076
P6KA12A	11.4	12.6	1.0	10.2	2.0	5.0	38.6	16.7	0.078
P6KA13	11.7	14.3	1.0	10.5	2.0	5.0	35.9	19.0	0.081
P6KA13A	12.4	13.7	1.0	11.1	2.0	5.0	35.4	18.2	0.081
P6KA15	13.5	16.3	1.0	12.1	2.0	5.0	29.3	22.0	0.084
P6KA15A	14.3	15.8	1.0	12.8	2.0	5.0	30.4	21.2	0.084
P6KA16	14.4	17.6	1.0	12.9	2.0	5.0	27.4	23.5	0.086
P6KA16A	15.2	16.8	1.0	13.6	2.0	5.0	28.7	22.5	0.086
P6KA18	16.2	19.8	1.0	14.5	2.0	5.0	24.3	26.5	0.088
P6KA18A	17.1	18.9	1.0	15.3	2.0	5.0	25.6	25.2	0.088
P6KA20	18.0	22.0	1.0	16.2	2.0	5.0	22.2	29.1	0.090
P6KA20A	19.0	21.0	1.0	17.1	2.0	5.0	23.3	27.7	0.090
P6KA22	19.8	24.2	1.0	17.8	2.0	5.0	20.2	31.9	0.092
P6KA22A	20.9	23.1	1.0	18.8	2.0	5.0	21.1	30.6	0.092
P6KA24	21.6	26.4	1.0	19.4	2.0	5.0	18.6	34.7	0.094
P6KA24A	22.8	25.2	1.0	20.5	2.0	5.0	19.4	33.6	0.094
P6KA27	24.3	29.7	1.0	21.8	2.0	5.0	16.5	39.1	0.096
P6KA27A	25.7	28.4	1.0	23.1	2.0	5.0	17.2	37.5	0.096
P6KA30	27.0	33.0	1.0	24.3	2.0	5.0	14.8	43.5	0.097
P6KA30A	28.5	31.5	1.0	25.6	2.0	5.0	15.6	41.4	0.097
P6KA33	29.7	36.3	1.0	26.8	2.0	5.0	13.5	47.7	0.098
P6KA33A	31.4	34.7	1.0	28.2	2.0	5.0	14.1	45.7	0.098
P6KA36	32.4	39.6	1.0	29.1	2.0	5.0	12.4	52.0	0.099
P6KA36A	34.2	37.8	1.0	30.8	2.0	5.0	12.9	49.9	0.099
P6KA39	35.1	42.9	1.0	31.6	2.0	5.0	11.4	56.4	0.100
P6KA39A	37.1	41.0	1.0	33.3	2.0	5.0	12.0	53.9	0.100
P6KA43	38.7	47.3	1.0	34.8	2.0	5.0	10.4	61.9	0.101
P6KA43A	40.9	45.2	1.0	36.8	2.0	5.0	10.9	59.3	0.101

NOTES:

1. V_{BR} measured after IT applied for 300 μs . IT = Square Wave Pulse or equivalent.
2. Surge Current Waveform per Figure 3 and Derate per Figure 2.
3. $V_F = 3.5\text{ V max.}$, $I_F = 50\text{A}$ for all types on 1/2 Square or equivalent Sine Wave.
PW = 8.3ms, Duty Cycle = 4 Pulses per minute maximum.



1.5KA SERIES

AUTOMOTIVE TRANSIENT VOLTAGE SUPPRESSOR

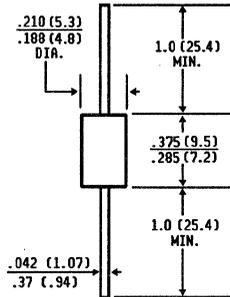
VOLTAGE- 6.8 to 43 Volts

1500 Watt Peak Power 5.0 Watt Steady State

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated junction
- ◆ Exclusive G.I. PAR construction
- ◆ 1500W surge capability at 1 ms
- ◆ Excellent clamping capability
- ◆ Low zener impedance
- ◆ Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- ◆ Typical I_R less than 20 μ A above 10V at 175°C
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3 kg) tension
- ◆ Designed to handle under the hood applications

DO-201



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-201 Molded plastic
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denoted cathode except Bipolar
Mounting Position: Any
Weight: 0.045 ounce, 1.2 grams

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types 1.5KA6.8 thru types 1.5KA43.
 Electrical characteristics apply in both directions.

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ\text{C}$, $T_p=1$ ms (NOTE 1)	Ppk	Minimum 1500	Watts
Steady State Power Dissipation at $T_L=75^\circ\text{C}$ Lead Lengths .375", (9.5mm) (NOTE 2)	PD	5.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	I_{FSM}	200	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +185	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2.
2. Mounted on Copper Leaf area of 0.79 in² (20mm²).
3. 8.3ms single half sine-wave, duty cycle = 4 pulses per minutes maximum.



RATINGS AND CHARACTERISTIC CURVES 1.5KA SERIES

FIGURE 1 — PULSE RATING CURVE

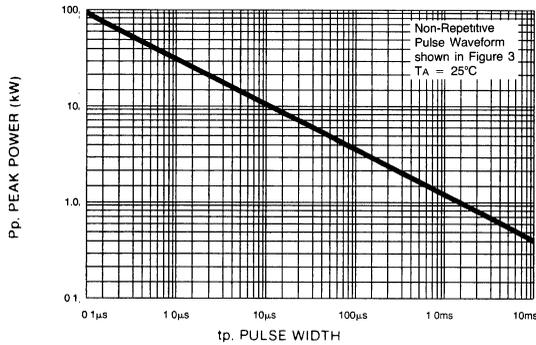


FIGURE 2 — PULSE DERATING CURVE

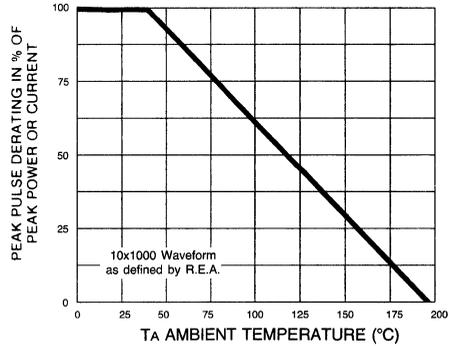


FIGURE 3 — PULSE WAVEFORM

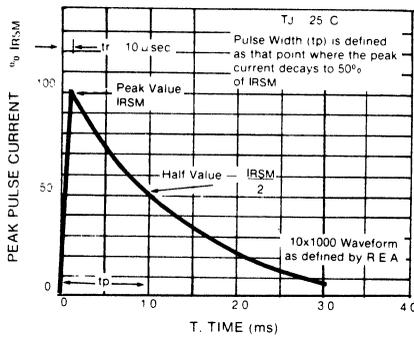


FIGURE 4 — TYPICAL JUNCTION CAPACITANCE

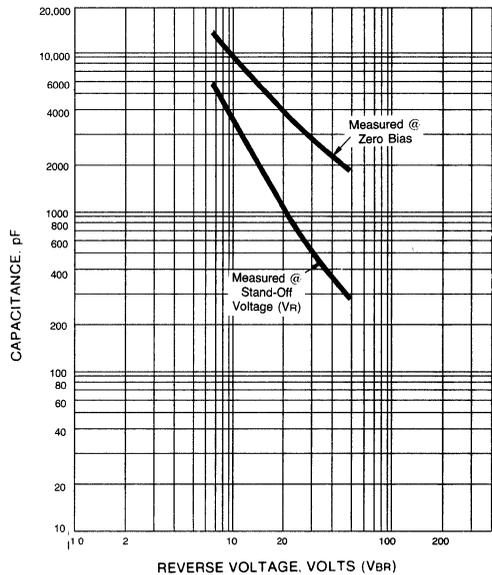


FIGURE 5 — STEADY STATE POWER DERATING

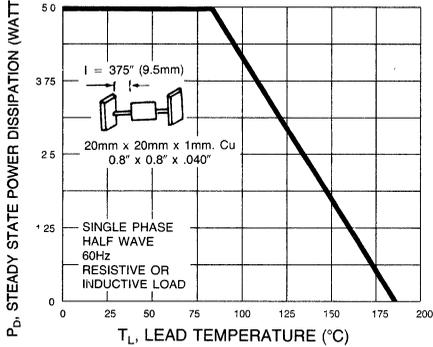
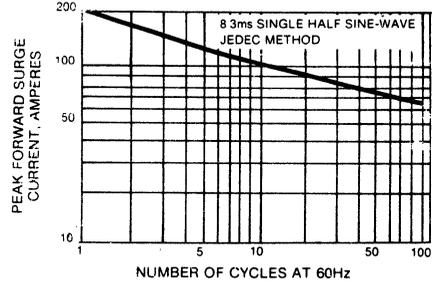


FIGURE 6 — MAXIMUM NON-REPETITIVE SURGE CURRENT



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

DEVICE	Breakdown Voltage		@IT (mA)	Working Peak Reverse Voltage at V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} $I_R(\mu\text{A})$	$T_C=150^\circ\text{C}$ Maximum Reverse Leakage at V_{RWM} $I_R(\mu\text{A})$	Maximum Reverse Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Coefficient of V_{BR} (%/°C)
	V_{BR} Volts (NOTE 1)								
	MIN	MAX							
1.5KA6.8	6.12	7.48	10	5.50	500	2000	149	10.8	0.057
1.5KA6.8A	6.45	7.14	10	5.80	500	2000	153	10.5	0.057
1.5KA7.5	6.75	8.25	10	6.05	250	1000	137	11.7	0.061
1.5KA7.5A	7.13	7.88	10	6.40	250	1000	143	11.3	0.061
1.5KA8.2	7.38	9.02	10	6.63	100	400	129	12.5	0.065
1.5KA8.2A	7.79	8.61	10	7.02	100	400	133	12.1	0.065
1.5KA9.1	8.19	10.0	1.0	7.37	25	100	117	13.8	0.068
1.5KA9.1A	8.65	9.55	1.0	7.78	25	100	120	13.4	0.068
1.5KA10	9.00	11.0	1.0	8.10	5	20	107	15.0	0.073
1.5KA10A	9.50	10.5	1.0	8.55	5	20	111	14.5	0.073
1.5KA11	9.90	12.1	1.0	8.92	2	10	99.5	16.2	0.075
1.5KA11A	10.5	11.6	1.0	9.40	2	10	103	15.6	0.076
1.5KA12	10.8	13.2	1.0	9.72	2	10	93.2	17.3	0.076
1.5KA12A	11.4	12.6	1.0	10.2	2	10	96.5	19.0	0.078
1.5KA13	11.7	14.3	1.0	10.5	2	10	84.8	18.2	0.081
1.5KA13A	12.4	13.7	1.0	11.1	2	10	88.6	22.0	0.081
1.5KA15	13.5	16.3	1.0	12.1	2	10	73.3	21.2	0.084
1.5KA15A	14.3	15.8	1.0	12.8	2	10	76.0	23.5	0.084
1.5KA16	14.4	17.6	1.0	12.9	2	10	68.6	23.5	0.086
1.5KA16A	15.2	16.8	1.0	13.6	2	10	71.6	22.5	0.086
1.5KA18	16.2	19.8	1.0	14.5	2	10	60.8	26.5	0.088
1.5KA18A	17.1	18.9	1.0	15.3	2	10	64.0	25.2	0.088
1.5KA20	18.0	22.0	1.0	16.2	2	10	55.4	29.1	0.090
1.5KA20A	19.0	21.0	1.0	17.1	2	10	58.2	27.7	0.090
1.5KA22	19.8	24.2	1.0	17.8	2	10	50.5	31.9	0.092
1.5KA22A	20.9	23.1	1.0	18.8	2	10	52.7	30.6	0.092
1.5KA24	21.6	26.4	1.0	19.4	2	10	46.5	34.7	0.094
1.5KA24A	22.8	25.2	1.0	20.5	2	10	48.6	33.2	0.094
1.5KA27	24.3	29.7	1.0	21.8	2	10	41.2	39.1	0.096
1.5KA27A	25.7	28.4	1.0	23.1	2	10	43.4	37.5	0.096
1.5KA30	27.0	33.0	1.0	24.3	2	10	37.0	43.5	0.097
1.5KA30A	28.5	31.5	1.0	25.6	2	10	38.9	41.4	0.097
1.5KA33	29.7	36.3	1.0	26.8	2	10	33.8	47.7	0.098
1.5KA33A	31.4	34.7	1.0	28.2	2	10	35.3	45.7	0.098
1.5KA36	32.4	39.6	1.0	29.1	2	10	31.0	52.0	0.099
1.5KA36A	34.2	37.8	1.0	30.8	2	10	32.3	49.9	0.099
1.5KA39	35.1	42.9	1.0	31.6	2	10	28.6	56.4	0.100
1.5KA39A	37.1	41.0	1.0	33.3	2	10	29.9	53.9	0.100
1.5KA43	38.7	47.3	1.0	34.8	2	10	26.0	61.9	0.101
1.5KA43A	40.9	45.2	1.0	36.8	2	10	27.2	59.3	0.101

NOTES:

- V_{BR} measured after IT applied for 300 μs . IT = Square Wave Pulse or equivalent.
- Surge current Waveform per Figure 3 and Derate per Figure 2.
- $V_F = 3.5\text{V mas.}$, $I_F = 100\text{A}$ for all types per 1/2 Square or equivalent Sine Wave.
PW = 8.3 ms, Duty Cycle = 4 Pulses per minute maximum.



P4KE SERIES

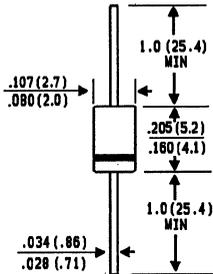
GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

VOLTAGE- 6.8 to 400 Volts
400 Watt Peak Power 1.0 Watt Steady State

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junction in DO-41 package
- ◆ 400W surge capability at 1 ms
- ◆ Excellent clamping capability
- ◆ Low zener impedance
- ◆ Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- ◆ Typical I_R less than $1\mu A$ above 10V
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3 kg) tension

DO-41



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denoted cathode except Bipolar
Mounting Position: Any
Weight: 0.012 ounce, 0.3 gram

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types P4KE7.5 thru types P4KE400.
 Electrical characteristics apply in both directions.

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
 Single phase, half wave, 60 Hz, resistive or inductive load.
 For capacitive load, derate current by 20%.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A = 25^\circ C$, $T_p = 1$ ms (NOTE 1)	Ppk	Minimum 400	Watts
Steady State Power Dissipation at $T_L = 75^\circ C$ Lead Lengths .375", (9.5mm) (NOTE 2)	PD	1.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	I_{FSM}	40.0	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25^\circ C$ per Fig. 2.
2. Mounted on Copper Leaf area of 1.57 in² (40 mm²).
3. 8.3ms single half sine-wave, duty cycle=4 pulses per minutes maximum.



RATINGS AND CHARACTERISTIC CURVES P4KE SERIES

FIGURE 1 — PULSE RATING CURVE

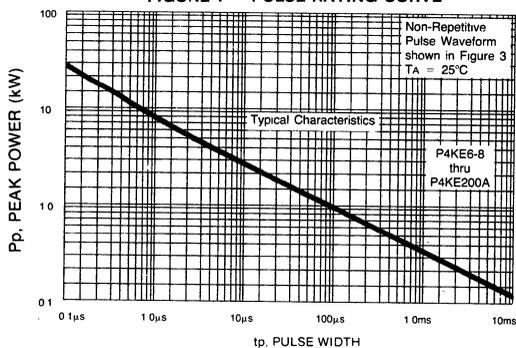


FIGURE 2 — PULSE DERATING CURVE

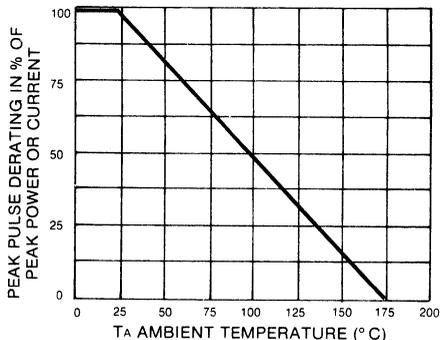


FIGURE 3 — PULSE WAVEFORM

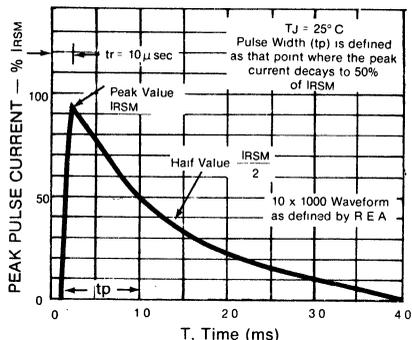


FIGURE 4 — TYPICAL JUNCTION CAPACITANCE

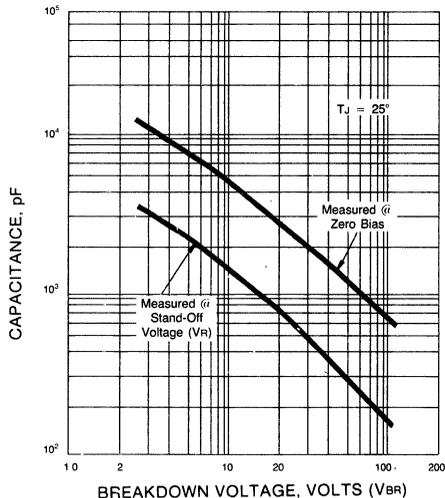


FIGURE 5 — STEADY STATE POWER DERATING

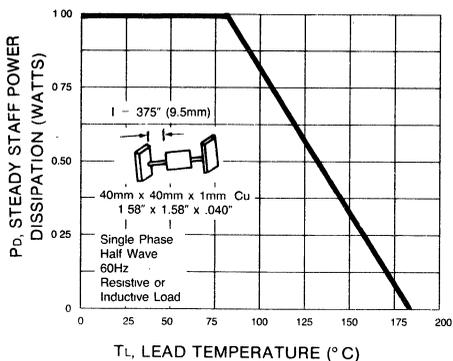
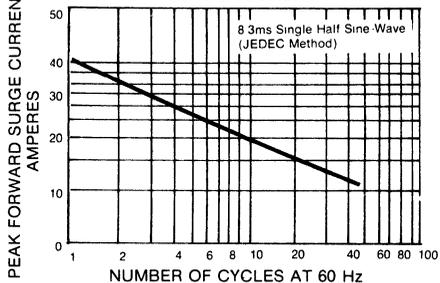


FIGURE 6 — MAXIMUM NON-REPETITIVE SURGE CURRENT



Device	Breakdown Voltage		IGT (mA)	Working Peak Reverse Voltage V _{RWM} (Volts)	Maximum Reverse Leakage at V _{RWM} I _s (μ A)	Maximum Reverse Current I _{RSU} (NOTE 2) (Amps)	Maximum Reverse Voltage at I _{RSU} (Clamping Voltage) V _{RSU} (Volts)	Maximum Temperature Coefficient of V _{BR} (%C)
	V _{BR} Volts (NOTE 1)							
	MIN	MAX						
P4KE6.8	6.12	7.48	10	5.50	1000	38	10.8	0.057
P4KE6.8A	6.45	7.14	10	5.80	1000	40	10.5	0.057
P4KE7.5	6.75	8.25	10	6.05	500	36	11.7	0.061
P4KE7.5A	7.13	7.88	10	6.40	500	37	11.3	0.061
P4KE8.2	7.38	9.02	10	6.63	200	33	12.5	0.065
P4KE8.2A	7.79	8.61	10	7.02	200	35	12.1	0.065
P4KE9.1	8.19	10.0	1.0	7.37	50	30	13.8	0.068
P4KE9.1A	8.65	9.55	1.0	7.78	50	31	13.4	0.068
P4KE10	9.00	11.0	1.0	8.10	10	28	15.0	0.073
P4KE10A	9.50	10.5	1.0	8.55	10	29	14.5	0.073
P4KE11	9.90	12.1	1.0	8.92	5.0	26	16.2	0.075
P4KE11A	10.5	11.6	1.0	9.40	5.0	27	15.6	0.075
P4KE12	10.8	13.2	1.0	9.72	5.0	24	17.3	0.076
P4KE12A	11.4	12.6	1.0	10.2	5.0	25	16.7	0.078
P4KE13	11.7	14.3	1.0	10.5	5.0	22	19.0	0.081
P4KE13A	12.4	13.7	1.0	11.1	5.0	23	18.2	0.081
P4KE15	13.5	16.3	1.0	12.1	5.0	19	22.0	0.084
P4KE15A	14.3	15.8	1.0	12.8	5.0	20	21.2	0.084
P4KE16	14.4	17.6	1.0	12.9	5.0	18	23.5	0.086
P4KE16A	15.2	16.8	1.0	13.6	5.0	19	22.5	0.086
P4KE18	16.2	19.8	1.0	14.5	5.0	16	26.5	0.088
P4KE18A	17.1	18.9	1.0	15.3	5.0	17	25.5	0.088
P4KE20	18.0	22.0	1.0	16.2	5.0	14	29.1	0.090
P4KE20A	19.0	21.0	1.0	17.1	5.0	15	27.7	0.090
P4KE22	19.8	24.2	1.0	17.8	5.0	13	31.9	0.092
P4KE22A	20.9	23.1	1.0	18.8	5.0	14	30.6	0.092
P4KE24	21.6	26.4	1.0	19.4	5.0	12	34.7	0.094
P4KE24A	22.8	25.2	1.0	20.5	5.0	13	33.2	0.094
P4KE27	24.3	29.7	1.0	21.8	5.0	11	39.1	0.096
P4KE27A	25.7	28.4	1.0	23.1	5.0	11.2	37.5	0.096
P4KE30	27.0	33.0	1.0	24.3	5.0	10	43.5	0.097
P4KE30A	28.5	31.5	1.0	25.6	5.0	10	41.4	0.097
P4KE33	29.7	36.3	1.0	26.8	5.0	9	47.7	0.098
P4KE33A	31.4	34.7	1.0	28.2	5.0	9	45.7	0.098
P4KE36	32.4	39.6	1.0	29.1	5.0	8	52.0	0.099
P4KE36A	34.2	37.8	1.0	30.8	5.0	8.4	49.9	0.099
P4KE39	35.1	42.9	1.0	31.6	5.0	7.4	56.4	0.100
P4KE39A	37.1	41.0	1.0	33.3	5.0	7.8	53.9	0.100
P4KE43	38.7	47.3	1.0	34.8	5.0	6.8	61.9	0.101
P4KE43A	40.9	45.2	1.0	36.8	5.0	7.1	59.3	0.101
P4KE47	42.3	51.7	1.0	38.1	5.0	6.2	67.8	0.101
P4KE47A	44.7	49.4	1.0	40.2	5.0	5.0	64.8	0.101
P4KE51	45.9	56.1	1.0	41.3	5.0	5.7	73.5	0.102
P4KE51A	48.5	53.6	1.0	43.6	5.0	6.0	70.1	0.102
P4KE56	50.4	61.6	1.0	45.4	5.0	5.2	80.5	0.103
P4KE56A	53.2	58.8	1.0	47.8	5.0	5.5	77.0	0.103
P4KE62	55.8	68.2	1.0	50.2	5.0	4.7	89.0	0.104
P4KE62A	58.9	65.1	1.0	53.0	5.0	5.0	85.0	0.104
P4KE68	61.2	74.8	1.0	55.1	5.0	4.3	98.0	0.104
P4KE68A	64.6	71.4	1.0	58.1	5.0	4.6	92.0	0.104
P4KE75	67.5	82.5	1.0	60.7	5.0	3.9	108	0.105
P4KE75A	71.3	78.8	1.0	64.1	5.0	4.1	103	0.105

Device	Breakdown Voltage		@ I _T (mA)	Working Peak Reverse Voltage V _{PRM} (Volts)	Maximum Reverse Leakage at V _{PRM} I _R (μ A)	Maximm Reverse Current I _{RSU} NOTE 2 (Amps)	Maximum Reverse Voltage at I _{RSU} (Clamping Voltage) V _{RSK} (Volts)	Maximum Temperature Coefficient of V _{BR} (%C)
	V _{BR} Volts (NOTE 1)							
	MIN	MAX						
P4KE82	73.8	90.2	1.0	66.4	5.0	3.6	118	0.105
P4KE82A	77.9	86.1	1.0	70.1	5.0	3.7	113.0	0.105
P4KE91	81.9	100	1.0	73.7	5.0	3.2	131	0.106
P4KE91A	86.5	95.5	1.0	77.8	5.0	3.4	125	0.106
P4KE100	90.0	110	1.0	81.0	5.0	2.9	144	0.106
P4KE100A	95.0	105	1.0	85.5	5.0	3.1	137	0.106
P4KE110	99.0	121	1.0	89.2	5.0	2.7	158	0.107
P4KE110A	105	116	1.0	94.0	5.0	2.8	152	0.107
P4KE120	108	132	1.0	97.2	5.0	2.4	173	0.107
P4KE120A	114	126	1.0	102	5.0	2.5	165	0.107
P4KE130	117	143	1.0	105	5.0	2.2	187	0.107
P4KE130A	124	137	1.0	111	5.0	2.3	179	0.107
P4KE150	135	165	1.0	121	5.0	2.0	215	0.108
P4KE150A	143	158	1.0	128	5.0	2.0	207	0.108
P4KE160	144	176	1.0	130	5.0	1.8	230	0.108
P4KE160A	152	168	1.0	136	5.0	1.9	219	0.108
P4KE170	153	187	1.0	138	5.0	1.7	244	0.108
P4KE170A	162	179	1.0	145	5.0	1.8	234	0.108
P4KE180	162	198	1.0	146	5.0	1.6	258	0.108
P4KE180A	171	189	1.0	154	5.0	1.7	246	0.108
P4KE200	180	220	1.0	162	5.0	1.5	287	0.108
P4KE200A	190	210	1.0	171	5.0	1.53	274	0.108
P4KE220	198	242	1.0	175	5.0	1.16	344	0.108
P4KE220A	209	231	1.0	185	5.0	1.22	328	0.108
P4KE250	225	275	1.0	202	5.0	1.11	360	0.110
P4KE250A	237	267	1.0	214	5.0	1.16	344	0.110
P4KE300	270	330	1.0	243	5.0	0.93	430	0.110
P4KE300A	285	315	1.0	256	5.0	0.97	414	0.110
P4KE350	315	385	1.0	284	5.0	0.79	504	0.110
P4KE350A	332	368	1.0	300	5.0	0.83	482	0.110
P4KE400	360	440	1.0	324	5.0	0.70	574	0.110
P4KE400A	380	420	1.0	342	5.0	0.73	548	0.110

NOTES:

1. V_{BR} measured after I_T applied for 300 μ s. I_T = Square Wave Pulse or equivalent.
2. Surge Current Waveform per Figure 3 and Derated per Figure 2.
3. V_F = 3.5 V max., I_F = 50 A for all types on 1/2 Square or equivalent Sine Wave.
PW = 8.3 ms, Duty Cycle = 4 Pulses per minute maximum.
4. For Bipolar types having V_R of 10 volts and under, the I_R limit is doubled.

BZW04 SERIES

GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

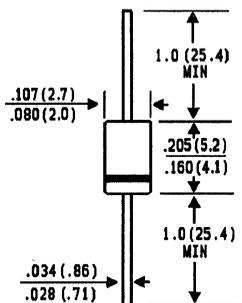
VOLTAGE - 6.8 to 440 Volts
400 Watt Peak Power 1.0 Watt Steady State

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junction in DO-41 package
- ◆ 400W surge capability at 1 ms
- ◆ Excellent clamping capability
- ◆ Low zener impedance
- ◆ Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- ◆ Typical I_R less than 1 μ A above 10V
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3 kg) tension



DO-41



Dimensions in inches and millimeters

MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denoted cathode except Bipolar
Mounting Position: Any
Weight: 0.012 ounce, 0.3 gram

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use B.
Electrical characteristics apply in both directions.

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

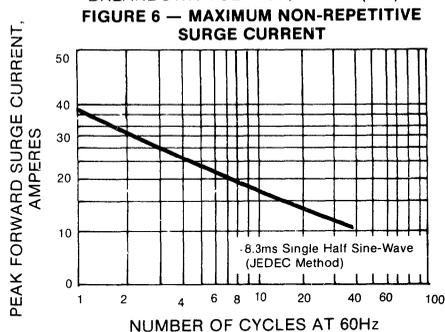
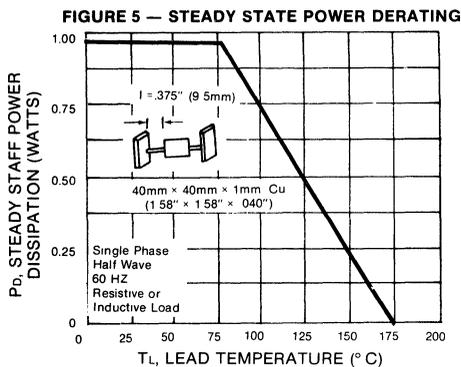
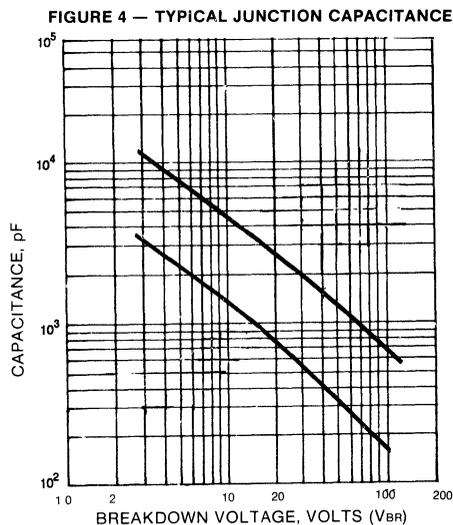
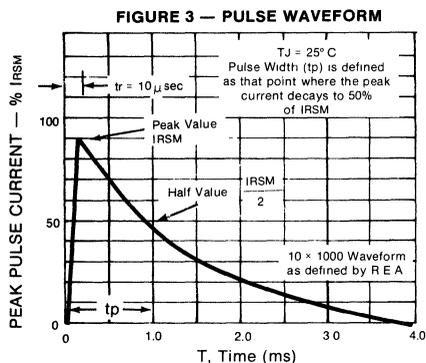
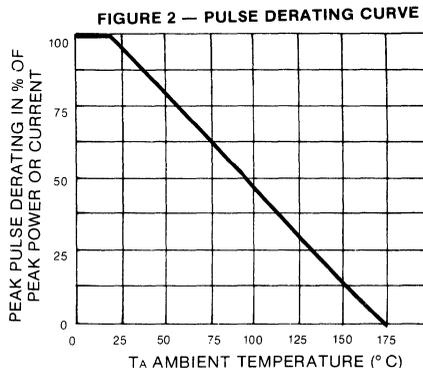
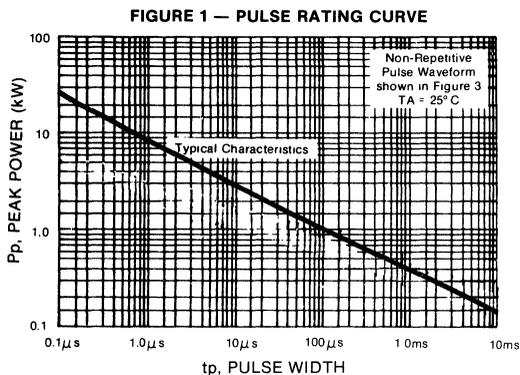
RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ\text{C}$, $T_p = 1\text{ms}$ (NOTE 1)	Ppk	Minimum 400	Watts
Steady State Power Dissipation at $T_L=75^\circ\text{C}$ Lead Lengths .375", (9.5mm) (NOTE 2)	PD	1.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	I_{FSM}	40.0	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2.
2. Mounted on Copper Leaf area of 1.57 in² (40mm²).
3. 8.3ms single half sine-wave, duty cycle =4 pulses per minutes maximum



RATINGS AND CHARACTERISTIC CURVES BZW04 SERIES



**GENERAL
INSTRUMENT**

Device	Breakdown Voltage			Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} $I_{R(LA)}$	Maximum Reverse Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Coefficient of v_{BR} (%/°C)
	V_{BR} (NOTE 1)		$@I_T$ (mA)					
	MIN	MAX						
BZW04P5V8	6.45	7.48	10	5.80	1000	38.0	10.5	.057
BZW04-5V8	6.45	7.14	10	5.90	1000	38.0	10.5	.057
BZW04P6V4	7.13	8.25	10	6.40	500	35.4	11.3	.061
BZW04-6V4	7.13	7.88	10	6.40	500	35.4	11.3	.061
BZW04P7V0	7.79	9.02	10	7.02	200	33.0	12.1	.065
BZW04-7V0	7.79	8.61	10	7.02	200	33.0	12.1	.065
BZW04P7V8	8.65	10.0	1	7.78	50	30.0	13.4	.068
BZW04-7V8	8.65	9.55	1	7.78	50	30.0	13.4	.073
BZW04P8V5	9.50	11.0	1	8.55	10	27.6	14.5	.073
BZW04-8V5	9.50	10.5	1	8.55	10	27.6	14.5	.075
BZW04P9V4	10.5	12.1	1	9.4	5	25.7	15.6	.075
BZW04P10	11.4	13.2	1	10.2	5	24.0	16.7	.078
BZW04-10	11.4	12.6	1	10.2	5	24.0	16.7	.078
BZW04P11	12.4	14.3	1	10.2	5	22.0	18.2	.081
BZW04-11	12.4	13.7	1	11.1	5	22.0	18.2	.081
BZW04P13	14.3	16.5	1	12.8	5	19.0	21.2	.084
BZW04-13	14.3	15.8	1	12.8	5	19.0	21.2	.084
BZW04P14	15.2	17.6	1	13.6	5	17.8	22.5	.086
BZW04-14	15.2	16.8	1	13.6	5	17.8	22.5	.086
BZW04P15	17.1	19.8	1	15.3	5	16.0	25.2	.088
BZW04-15	17.1	18.9	1	15.3	5	16.0	25.2	.088
BZW04P17	19.0	22.0	1	17.1	5	14.5	27.7	.090
BZW04-17	19.0	21.0	1	17.1	5	14.5	27.7	.090
BZW04P19	20.9	24.2	1	18.8	5	13.0	30.6	.092
BZW04-19	20.9	23.1	1	18.8	5	13.0	30.6	.092
BZW04P20	22.8	26.4	1	20.5	5	12.0	33.2	.094
BZW04-20	22.8	25.2	1	20.5	5	12.0	33.2	.094
BZW04P23	25.7	29.7	1	23.1	5	10.7	37.5	.096
BZW04-23	25.7	28.4	1	23.1	5	10.7	37.5	.096
BZW04P26	28.5	33.0	1	25.6	5	9.60	41.5	.097
BZW04-26	28.5	31.5	1	25.6	5	9.60	41.5	.097
BZW04P28	31.4	36.3	1	28.2	5	8.80	45.7	.098
BZW04-28	31.4	34.7	1	28.2	5	8.80	45.7	.098
BZW04P31	34.2	39.6	1	30.8	5	8.00	49.9	.099
BZW04-31	34.2	37.8	1	30.8	5	8.00	49.9	.099
BZW04P33	37.1	42.9	1	33.3	5	7.40	53.9	.100
BZW04-33	37.1	41.0	1	33.3	5	7.40	53.9	.100
BZW04P37	40.9	41.0	1	36.8	5	6.70	59.3	.101
BZW04-37	40.9	45.2	1	36.8	5	6.70	59.3	.101
BZW04P40	44.7	51.7	1	40.2	5	6.20	64.8	.101
BZW04-40	44.7	49.4	1	40.2	5	6.20	64.8	.101
BZW04P44	48.5	56.1	1	43.6	5	5.70	70.1	.102
BZW04-44	48.5	53.6	1	43.6	5	5.70	70.1	.102
BZW04P48	53.2	61.6	1	47.8	5	5.20	77.0	.103
BZW04-48	53.2	58.8	1	47.8	5	5.20	77.0	.103
BZW04P53	58.9	68.2	1	53.0	5	4.70	85.0	.104
BZW04-53	58.9	65.1	1	53.0	5	4.70	85.0	.104
BZW04P58	64.6	74.8	1	58.1	5	4.30	92.0	.104
BZW04-58	64.6	71.4	1	58.1	5	4.30	92.0	.104
BZW04P64	71.3	82.5	1	64.1	5	3.90	103	.105
BZW04-64	71.3	78.8	1	64.1	5	3.90	103	.105
BZW04P70	77.9	90.2	1	70.1	5	3.50	113	.105
BZW04-70	77.9	86.1	1	70.1	5	3.50	113	.105
BZW04P78	86.5	100	1	77.8	5	3.20	125	.106
BZW04-78	86.5	95.5	1	77.8	5	3.20	125	.106

Device	Breakdown Voltage		Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} I_R (μ A)	Maximum Reverse Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Coefficient of V_{BR} (%/C)	
	V_{BR} Volts (NOTE 1)							@ T (mA)
	MIN	MAX						
BZW04P85	95.0	110	1	85.5	5	2.90	137	.106
BZW04-85	95.0	105	1	85.5	5	2.90	137	.106
BZW04P94	105	121	1	94.0	5	2.60	152	.107
BZW04-94	105	116	1	94.0	5	2.60	152	.107
BZW04P102	114	132	1	102	5	2.40	165	.107
BZW04-102	114	126	1	102	5	2.40	165	.107
BZW04P110	124	143	1	1110	5	2.20	179	.107
BZW04-110	124	137	1	111	5	2.20	179	.107
BZW04P128	143	165	1	128	5	2.00	207	.108
BZW04-128	143	158	1	128	5	2.00	207	.108
BZW04P136	152	176	1	136	5	1.80	219	.108
BZW04-136	152	168	1	136	5	1.80	219	.108
BZW04P145	161	187	1	145	5	1.70	234	.108
BZW04-145	161	179	1	145	5	1.70	234	.108
BZW04P154	171	198	1	154	5	1.60	246	.108
BZW04-154	171	189	1	154	5	1.60	246	.108
BZW04P171	190	220	1	171	5	1.50	274	.108
BZW04-171	190	210	1	171	5	1.50	274	.108
BZW04P188	209	242	1	188	5	1.40	301	.108
BZW04-188	209	231	1	188	5	1.40	301	.108
BZW04P213	237	275	1	213	5	1.50	344	.110
BZW04-213	237	263	1	213	5	1.50	344	.110
BZW04P239	266	308	1	239	5	1.50	384	.110
BZW04-239	266	294	1	239	5	1.50	384	.110
BZW04P256	285	330	1	256	5	1.20	414	.110
BZW04-256	285	315	1	256	5	1.20	414	.110
BZW04P273	304	352	1	273	5	1.20	438	.110
BZW04-273	304	336	1	299	5	1.20	438	.110
BZW04P299	332	385	1	299	5	0.90	482	.110
BZW04-299	332	368	1	299	5	0.90	482	.110
BZW04P342	380	440	1	342	5	0.90	548	.110
BZW04-342	380	420	1	342	5	0.90	548	.110
BZW04P376	418	484	1	376	5	0.80	603	.110
BZW04-376	418	462	1	376	5	0.80	603	.110

NOTES:

1. V_{BR} measured after I_T applied for 300 μ s. I_T = Square Wave Pulse or equivalent.
2. Surge Current Waveform per Figure 3 and Derated per Figure 2.
3. V_F = 3.5 V Max., I_F = 5- A for all types on 1/2 Square or equivalent Sine Wave.
PW = 8.3 ms, Duty Cycle = 4 Pulses per minute maximum.

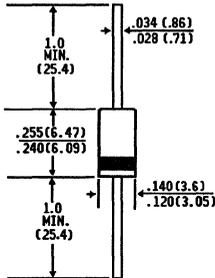
SA SERIES

GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

VOLTAGE- 5.0 to 170 Volts
500 Watt Peak Power 3.0 Watt Steady State

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junction
- ◆ 500W surge capability at 1 ms
- ◆ Excellent clamping capability
- ◆ Low zener impedance
- ◆ Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- ◆ Typical I_R less than 1 μ A above 10V
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3 kg) tension



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

- Case:** Molded plastic over glass passivated chip junction
Terminals: Axial leads, solderable per MIL-STD-202, Method 208
Polarity: Color band denoted cathode except Bipolar
Mounting Position: Any
Weight: 0.015 ounce, .4 gram

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types SA5.0 thru types SA170.
 Electrical characteristics apply in both directions.

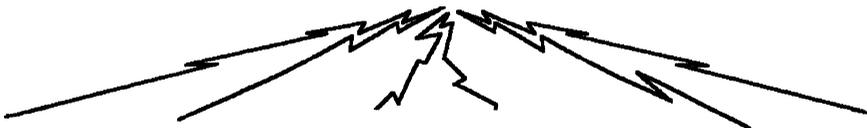
MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ\text{C}$, $T_p=1\text{ms}$ (NOTE 1)	Ppk	Minimum 500	Watts
Steady State Power Dissipation at $T_L=75^\circ\text{C}$ Lead Lengths .375", (9.5mm) (NOTE 2)	PD	3.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	I_{FSM}	70	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2.
2. Mounted on Copper Leaf area of 1.57 in^2 (40 mm^2).
3. 8.3ms single half sine-wave, Duty Cycle = 4 pulses per minute maximum.



RATINGS AND CHARACTERISTIC CURVES SA SERIES

FIGURE 1 - PULSE RATING CURVE

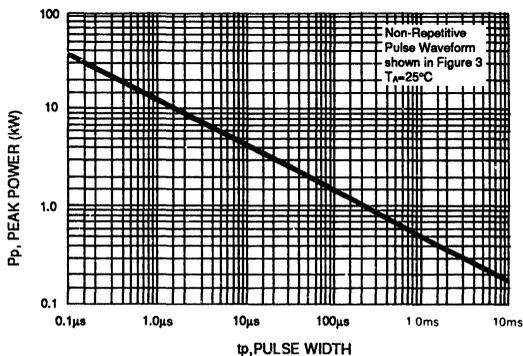


FIGURE 2 -- PULSE DERATING CURVE

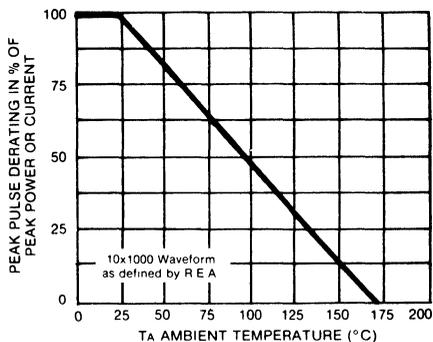


FIGURE 3 - PULSE WAVEFORM

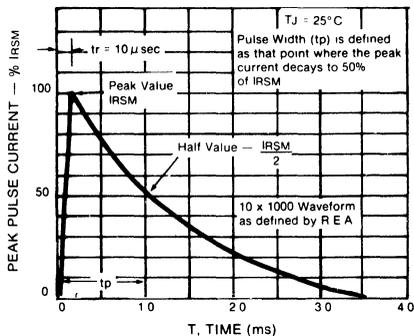


FIGURE 4 - TYPICAL JUNCTION CAPACITANCE

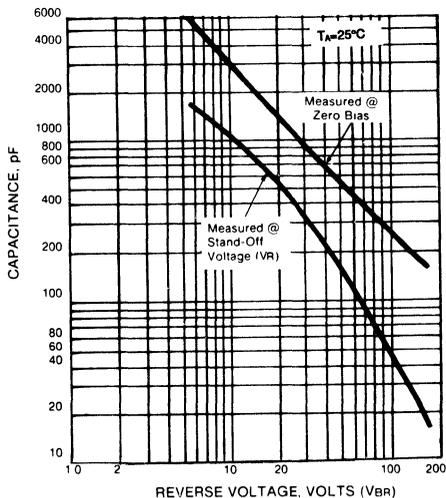


FIGURE 5 - STEADY STATE POWER DERATING

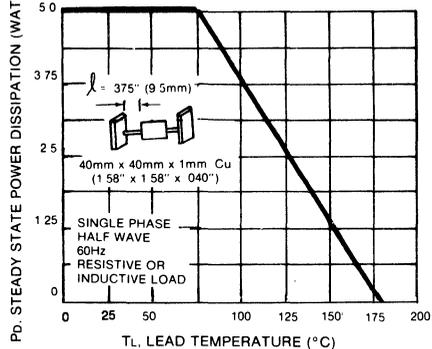
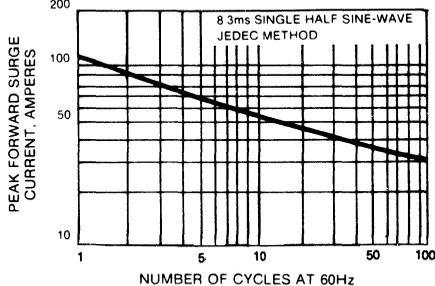


FIGURE 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Device	Breakdown Voltage V_{BR} Volts (NOTE 1)		I_{RT} (mA)	Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} I_{RWM} (μA)	Maximum Reverse Current I_{RSM} (NOTE 2) (Ampe)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Voltage Variation V_{TR} mV/°C
	MIN	MAX						
SA5.0	6.40	7.30	10	5.0	600	52.0	9.60	5.0
SA5.0A	6.40	7.00	10	5.0	600	54.3	9.20	5.0
SA6.0	6.67	8.15	10	6.0	600	43.9	11.4	5.0
SA6.0A	6.67	7.37	10	6.0	600	48.5	10.3	5.0
SA6.5	7.22	8.82	10	6.5	400	40.7	12.3	5.0
SA6.5A	7.22	7.98	10	6.5	400	44.7	11.2	5.0
SA7.0	7.78	9.51	10	7.0	150	37.8	13.3	6.0
SA7.0A	7.78	8.60	10	7.0	150	41.7	12.0	6.0
SA7.5	8.33	10.2	1.0	7.5	50	35.0	14.3	7.0
SA7.5A	8.33	9.21	1.0	7.5	50	38.8	12.9	7.0
SA8.0	8.89	10.9	1.0	8.0	25	33.3	15.0	7.0
SA8.0A	8.89	9.83	1.0	8.0	25	36.7	13.6	7.0
SA8.5	9.44	11.5	1.0	8.5	10	31.4	15.9	8.0
SA8.5A	9.44	10.4	1.0	8.5	10	34.7	14.4	8.0
SA9.0	10.0	12.2	1.0	9.0	5.0	29.5	16.9	9.0
SA9.0A	10.0	11.1	1.0	9.0	5.0	32.5	15.4	9.0
SA10	11.1	13.6	1.0	10.0	1.0	26.6	18.8	10.0
SA10A	11.1	12.3	1.0	10.0	1.0	29.4	17.0	10.0
SA11	12.2	14.9	1.0	11.0	1.0	24.9	20.1	11.0
SA11A	12.2	13.5	1.0	11.0	1.0	27.4	18.2	11.0
SA12	13.3	16.3	1.0	12.0	1.0	22.7	22.0	12.0
SA12A	13.3	14.7	1.0	12.0	1.0	25.1	19.9	12.0
SA13	14.4	17.6	1.0	13.0	1.0	21.0	23.8	13.0
SA13A	14.4	15.9	1.0	13.0	1.0	23.2	21.5	13.0
SA14	15.6	19.1	1.0	14.0	1.0	19.4	25.8	14.0
SA14A	15.6	17.2	1.0	14.0	1.0	21.5	23.2	14.0
SA15	16.7	20.4	1.0	15.0	1.0	18.8	26.9	16.0
SA15A	16.7	18.5	1.0	15.0	1.0	20.6	24.4	16.0
SA16	17.8	21.8	1.0	16.0	1.0	17.6	28.8	19.0
SA16A	17.8	19.7	1.0	16.0	1.0	17.6	28.8	17.0
SA17	18.9	23.1	1.0	17.0	1.0	16.4	30.5	20.0
SA17A	18.9	20.9	1.0	17.0	1.0	16.1	27.6	19.0
SA18	20.0	24.4	1.0	18.0	1.0	15.5	32.2	21.0
SA18A	20.0	22.1	1.0	18.0	1.0	17.2	29.2	20.0
SA20	22.2	27.1	1.0	20.0	1.0	13.9	35.8	25.0
SA20A	22.2	24.5	1.0	20.0	1.0	15.4	32.4	23.0
SA22	24.4	29.8	1.0	22.0	1.0	12.7	39.4	28.0
SA22A	24.4	26.9	1.0	22.0	1.0	14.1	35.5	25.0
SA24	26.7	32.6	1.0	24.0	1.0	11.6	43.0	31.0
SA24A	26.7	29.5	1.0	24.0	1.0	12.8	38.9	28.0
SA26	28.9	35.3	1.0	26.0	1.0	10.7	46.6	31.0
SA26A	28.9	31.9	1.0	26.0	1.0	11.9	42.1	30.0
SA28	31.1	38.0	1.0	28.0	1.0	9.9	50.1	35.0
SA28A	31.1	34.4	1.0	28.0	1.0	11.0	45.4	31.0
SA30	33.3	40.7	1.0	30.0	1.0	9.3	53.5	39.0
SA30A	33.3	36.8	1.0	30.0	1.0	10.3	48.4	36.0
SA33	36.7	44.9	1.0	33.0	1.0	8.5	59.0	42.0
SA33A	36.7	40.6	1.0	33.0	1.0	9.4	53.3	39.0
SA36	40.0	48.9	1.0	36.0	1.0	7.8	64.3	46.0
SA36A	40.0	44.2	1.0	36.0	1.0	8.5	58.1	41.0
SA40	44.4	54.3	1.0	40.0	1.0	7.0	71.4	51.0
SA40A	44.4	49.1	1.0	40.0	1.0	7.8	64.5	46.0
SA43	47.8	58.4	1.0	43.0	1.0	6.5	76.7	55.0
SA43A	47.8	52.8	1.0	43.0	1.0	7.2	69.4	50.0

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Device	Breakdown Voltage V_{BR} Volts (NOTE 1)		$@I_T$ (mA)	Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} I_{RSM} (μA)	Maximum Reverse Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Voltage Variation V_{BR} $mV/^\circ\text{C}$
	MIN	MAX						
SA45	50.0	61.1	1.0	45.0	1.0	6.2	80.3	58.0
SA45A	50.0	55.3	1.0	45.0	1.0	6.9	72.7	52.0
SA48	53.3	65.2	1.0	48.0	1.0	5.8	85.5	63.0
SA48A	53.3	58.9	1.0	48.0	1.0	6.5	77.4	56.0
SA51	56.1	69.3	1.0	51.0	1.0	5.5	91.1	66.0
SA51A	56.7	62.7	1.0	51.0	1.0	6.1	82.4	61.0
SA54	60.0	73.3	1.0	54.0	1.0	5.2	96.3	71.0
SA54A	60.0	66.3	1.0	54.0	1.0	5.7	87.1	65.0
SA58	64.4	78.7	1.0	58.0	1.0	4.9	103	78.0
SA58A	64.4	71.2	1.0	58.0	1.0	5.3	93.6	70.0
SA60	66.7	81.5	1.0	60.0	1.0	4.7	107	80.0
SA60A	66.7	73.7	1.0	60.0	1.0	5.2	96.8	71.0
SA64	71.1	96.9	1.0	64.0	1.0	4.4	114	86.0
SA64A	71.1	78.6	1.0	64.0	1.0	4.9	103	76.0
SA70	77.6	95.1	1.0	70.0	1.0	4.0	125	94.0
SA70A	77.8	86.0	1.0	70.0	1.0	4.4	113	85.0
SA75	83.3	102	1.0	75.0	1.0	3.7	134	101
SA75A	83.3	92.1	1.0	75.0	1.0	4.1	121	91.0
SA78	86.7	106	1.0	78.0	1.0	3.6	126	105
SA78A	86.7	95.8	1.0	78.0	1.0	4.0	126	95.0
SA85	94.9	115	1.0	85.0	1.0	3.3	151	114
SA85A	94.4	104	1.0	85.0	1.0	3.6	137	103
SA90	100	122	1.0	90.0	1.0	3.1	160	121
SA90A	100	111	1.0	90.0	1.0	3.4	146	110
SA100	111	136	1.0	100	1.0	2.8	179	135
SA100A	111	123	1.0	100	1.0	3.1	162	123
SA110	122	149	1.0	110	1.0	2.6	196	148
SA110A	122	135	1.0	110	1.0	2.8	177	133
SA120	133	163	1.0	120	1.0	2.3	214	162
SA120A	133	147	1.0	120	1.0	2.0	193	146
SA130	144	176	1.0	130	1.0	2.2	230	175
SA130A	144	159	1.0	130	1.0	2.4	209	158
SA150	167	204	1.0	150	1.0	1.9	268	203
SA150A	167	185	1.0	150	1.0	2.1	243	184
SA160	178	218	1.0	160	1.0	1.7	257	217
SA160A	178	197	1.0	160	1.0	1.9	259	196
SA170	189	231	1.0	170	1.0	1.6	3.04	230
SA170A	189	206	1.0	170	1.0	1.8	275	208

- NOTES: 1. V_{BR} measured after I_T applied for 300ms. I_T = Square Wave Pulse or equivalent.
 2. Surge Current waveform per Figure 3 and Derate per Figure 2.
 3. $V_F = 3.5$ Volts max $I_F = 35\text{A}$ for all types on 1/2 square or equivalent Sine Wave. PW = 8.3ms.
 Duty Cycle = 4 Pulse per Minute maximum.
 4. For bipolar types with V_R 10 Volts and under, the I_R limit is doubled.

P6KE SERIES

GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

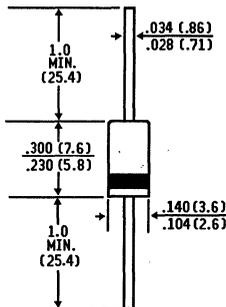
VOLTAGE- 6.8 to 400 Volts

600 Watt Peak Power 5.0 Watt Steady State

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Glass passivated chip junction in DO-15 package
- ◆ 600W surge capability at 1 ms
- ◆ Excellent clamping capability
- ◆ Low zener impedance
- ◆ Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- ◆ Typical I_R less than 1 μ A above 10V
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3 kg) tension

DO-15



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-15 Molded plastic

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denoted cathode except Bipolar

Mounting Position: Any

Weight : 0.015 ounce, .4 gram

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types P6KE6.8 thru types P6KE400.
Electrical characteristics apply in both directions.

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.
Single phase, half wave, 60 Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ\text{C}$, $T_p = 1\text{ms}$ (NOTE 1)	Ppk	Minimum 600	Watts
Steady State Power Dissipation at $T_L=75^\circ\text{C}$ Lead Lengths .375", (9.5mm) (NOTE 2)	PD	5.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	I_{FSM}	100	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175	$^\circ\text{C}$

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2.
2. Mounted on Copper Leaf area of 1.57 in² (40mm²).
3. 8.3ms single half sine-wave, duty cycle = 4 pulses per minutes maximum.



RATINGS AND CHARACTERISTIC CURVES P6KE SERIES

FIGURE 1 — PULSE RATING CURVE

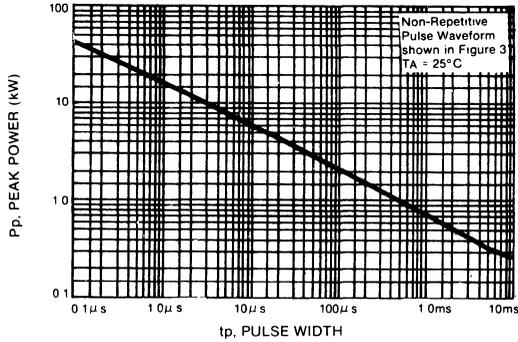


FIGURE 2 — PULSE DERATING CURVE

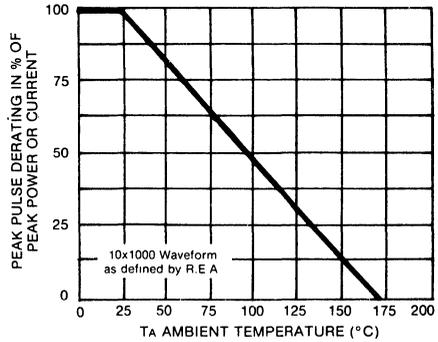


FIGURE 3 — PULSE WAVEFORM

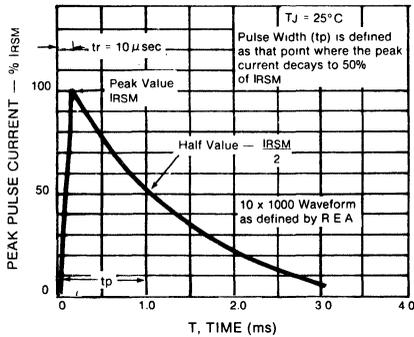


FIGURE 4 — TYPICAL JUNCTION CAPACITANCE

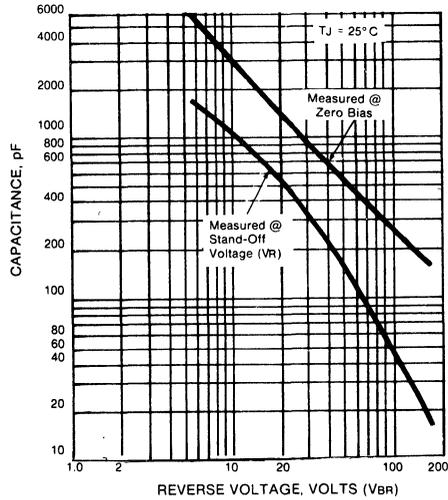


FIGURE 5 — STEADY STATE POWER DERATING

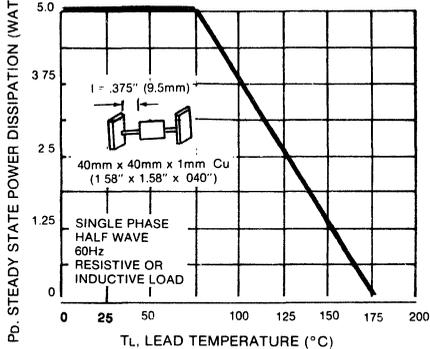
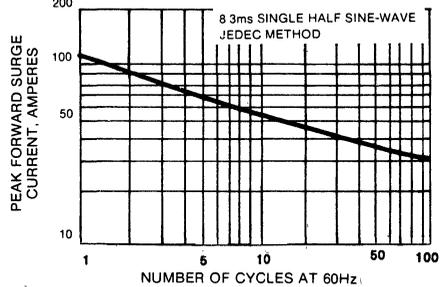


FIGURE 6 — MAXIMUM NON-REPETITIVE SURGE CURRENT



Device	Breakdown Voltage			Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} I_{R1} (μ A)	Maximum Reverse Current I_{RM} (Amps)	Maximum Reverse Voltage at I_{RM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Coefficient of V_{BR} (%)
	Ver		@IT (mA)					
	MIN	MAX						
P6KE6.8A	6.45	7.14	10	5.80	1000	57	10.5	0.057
P6KE7.5	6.75	8.25	10	6.05	500	51	11.7	0.061
P6KE7.5A	7.13	7.88	10	6.40	500	53	11.3	0.061
P6KE8.2	7.38	9.02	10	6.63	200	48	12.5	0.065
P6KE8.2A	7.79	8.61	10	7.02	200	50	12.1	0.065
P6KE9.1	8.19	10.0	1.0	7.37	50	44	13.8	0.068
P6KE9.1A	8.65	9.55	1.0	7.78	50	45	13.4	0.068
P6KE10	9.00	11.0	1.0	8.10	10	40	15.0	0.073
P6KE10A	9.50	10.5	1.0	8.55	10	41	14.5	0.073
P6KE11	9.90	12.1	1.0	8.92	5.0	37	16.2	0.075
P6KE11A	10.5	11.6	1.0	9.40	5.0	38	15.6	0.075
P5KE12	10.8	13.2	1.0	9.72	5.0	35	17.3	0.078
P6KE12A	11.4	12.6	1.0	10.2	5.0	36	16.7	0.078
P6KE13	11.7	14.3	1.0	10.5	5.0	32	19.0	0.061
P6KE13A	12.4	13.7	1.0	11.1	5.0	33	18.2	0.081
P6KE15	13.5	16.5	1.0	12.1	5.0	27	22.0	0.084
P6KE15A	14.3	15.8	1.0	12.8	5.0	28	21.2	0.084
P6KE16	14.4	17.6	1.0	12.9	5.0	26	23.5	0.086
P6KE16A	15.2	16.8	1.0	13.6	5.0	27	22.5	0.086
P6KE18	16.2	19.8	1.0	14.5	5.0	23	26.5	0.088
P6KE18A	17.1	18.9	1.0	15.3	5.0	24	25.2	0.088
P6KE20	18.0	22.0	1.0	16.2	5.0	21	29.1	0.090
P6KE20A	19.0	21.0	1.0	17.1	5.0	22	27.7	0.090
P6KE22	19.8	24.2	1.0	17.8	5.0	19	31.9	0.092
P6KE22A	20.9	23.1	1.0	18.8	5.0	20	30.6	0.092
P6KE24	21.6	26.4	1.0	19.4	5.0	17	34.7	0.094
P6KE24A	22.8	25.2	1.0	20.5	5.0	18	33.2	0.094
P6KE27	24.3	29.7	1.0	21.8	5.0	15	39.1	0.096
P6KE27A	25.7	28.4	1.0	23.1	5.0	16	37.5	0.096
P6KE30	27.0	33.0	1.0	24.3	5.0	14	43.5	0.097
P6KE30A	28.5	31.5	1.0	25.6	5.0	14.4	41.4	0.097
P6KE33	29.7	36.3	1.0	26.8	5.0	12.6	47.7	0.098
P6KE33A	31.4	34.7	1.0	28.2	5.0	13.2	45.7	0.098
P6KE36	32.4	39.6	1.0	29.1	5.0	11.6	52.0	0.099
P6KE36A	34.2	37.8	1.0	30.8	5.0	12.0	49.9	0.099
P6KE39	35.1	42.9	1.0	31.6	5.0	10.6	56.4	0.100
P6KE39A	37.1	41.0	1.0	33.3	5.0	11.2	53.9	0.100
P6KE43	38.7	47.3	1.0	34.8	5.0	9.6	61.9	0.101
P6KE43A	40.9	45.2	1.0	36.8	5.0	10.1	59.3	0.101
P6KE47	42.3	51.7	1.0	38.1	5.0	8.9	67.8	0.101
P6KE47A	44.7	49.4	1.0	40.2	5.0	9.3	64.8	0.101
P6KE51	45.9	56.1	1.0	41.3	5.0	8.2	73.5	0.102
P6KE51A	48.5	53.6	1.0	43.6	5.0	8.6	70.1	0.102
P6KE56	50.4	61.6	1.0	45.4	5.0	7.4	80.5	0.103
P6KE56A	53.2	58.8	1.0	47.8	5.0	7.8	77.0	0.103
P6KE62	55.8	68.2	1.0	50.2	5.0	6.8	89.0	0.104
P6KE62A	58.9	65.1	1.0	53.0	5.0	7.1	85.0	0.104
P6KE68	61.2	74.8	1.0	55.1	5.0	6.1	98.0	0.104
P6KE68A	64.6	71.4	1.0	58.1	5.0	6.5	92.0	0.104
P6KE75	67.5	82.5	1.0	60.7	5.0	5.5	108	0.105
P6KE75A	71.3	78.8	1.0	64.1	5.0	5.8	103	0.105
P6KE82	73.8	90.2	1.0	66.4	5.0	5.1	118	0.105
P6KE82A	77.9	86.1	1.0	70.1	5.0	5.3	113	0.105
P6KE91	81.9	100	1.0	73.7	5.0	4.5	131	0.106
P6KE91A	86.5	95.5	1.0	77.8	5.0	4.8	125	0.106

Device	Breakdown Voltage		@IT (mA)	Working Peak Reverse Voltage V _{RWM} (Volts)	Maximum Reverse Leakage at V _{RWM} I _R (μ A)	Maximum Reverse Current I _{RM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I _{RM} (Clamping Voltage) V _{RSW} (Volts)	Maximum Temperature Coefficient of V _{BR} (%C)
	V _{BR} Volts (NOTE 1)							
	MIN	MAX						
P6KE100	90.0	110	1.0	81.0	5.0	4.2	144	0.106
P6KE100A	95.0	105	1.0	85.5	5.0	4.4	137	0.106
P6KE110	99.0	121	1.0	89.2	5.0	3.8	158	0.107
P6KE110A	105	116	1.0	94.0	5.0	4.0	152	0.107
P6KE120	108	132	1.0	97.2	5.0	3.5	173	0.107
P6KE120A	114	126	1.0	102	5.0	3.6	165	0.107
P6KE130	117	143	1.0	105	5.0	3.2	187	0.107
P6KE130A	124	137	1.0	111	5.0	3.3	179	0.107
P6KE150	135	165	1.0	121	5.0	2.8	215	0.108
P6KE150A	143	158	1.0	128	5.0	2.9	207	0.108
P6KE160	144	176	1.0	130	5.0	2.6	230	0.108
P6KE160A	152	168	1.0	136	5.0	2.7	219	0.108
P6KE170	153	187	1.0	138	5.0	2.5	244	0.108
P6KE170A	162	179	1.0	145	5.0	2.6	234	0.108
P6KE180	162	198	1.0	146	5.0	2.3	258	0.108
P6KE180A	171	189	1.0	154	5.0	2.4	246	0.108
P6KE200	180	220	1.0	162	5.0	2.1	287	0.108
P6KE200A	190	210	1.0	171	5.0	2.2	274	0.108
P6KE220	198	242	1.0	175	5.0	1.75	344	0.108
P6KE220A	209	231	1.0	185	5.0	1.83	328	0.108
P6KE250	225	275	1.0	202	5.0	1.67	360	0.110
P6KE250A	237	263	1.0	214	5.0	1.75	344	0.110
P6KE300	270	330	1.0	243	5.0	1.40	430	0.110
P6KE300A	285	315	1.0	256	5.0	1.45	414	0.110
P6KE350	315	385	1.0	284	5.0	1.20	504	0.110
P6KE350A	332	368	1.0	300	5.0	1.25	482	0.110
P6KE400	360	440	1.0	324	5.0	1.05	574	0.110
P6KE400A	380	420	1.0	342	5.0	1.10	548	0.110

NOTES:

1. V_{BR} measured after I_T applied for 300 μ s I_T = Square Wave Pulse or equivalent.
2. Surge Current Waveform per Figure 3 and Derate per Figure 2.
3. V_F = 3.5V at I_F = 50A (P6KE6.8 thru P6KE91A)
V_F = 5.0V at I_F = 50A (P6KE100 thru P6KE400A) on 1/2 Square or equivalent Sine Wave.
PW = 8.3ms, Duty Cycle = 4 Pulses per minute maximum.
4. For bipolar types moving V_R of 10 volts and under, the I_R limit is doubled.

1.5KE SERIES

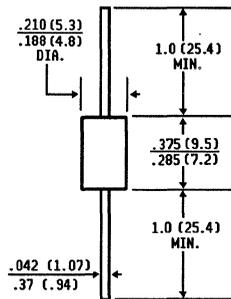
GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

VOLTAGE - 6.8 to 400 Volts
1500 Watt Peak Power 5.0 Watt Steady State

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Glass passivated chip junction in Molded Plastic package
- ◆ 1500W surge capability at 1 ms
- ◆ Excellent clamping capability
- ◆ Low zener impedance
- ◆ Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- ◆ Typical I_R less than $1\mu A$ above 10V
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3 kg) tension

DO-201



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

Case: JEDEC DO-201 Molded plastic

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denoted cathode except Bipolar

Mounting Position: Any

Weight : 0.045 ounce, 1.2 grams

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types 1.5KE6.8 thru types 1.5KE400.
Electrical characteristics apply in both directions.

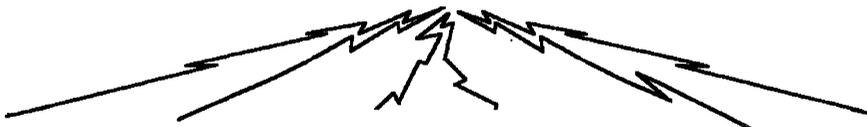
MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ C$, $T_p=1ms$ (NOTE 1)	Ppk	Minimum 1500	Watts
Steady State Power Dissipation at $T_L=75^\circ C$ Lead Lengths .375", (9.5mm) (NOTE 2)	PD	5.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	I_{FSM}	200	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ C$ per Fig. 2.
2. Mounted on Copper Leaf area of 0.79 in² (20mm²).
3. 8.3ms single half sine-wave, duty cycle =4 pulses per minutes maximum.



RATINGS AND CHARACTERISTIC CURVES 1.5KE SERIES

FIGURE 1 — PULSE RATING CURVE

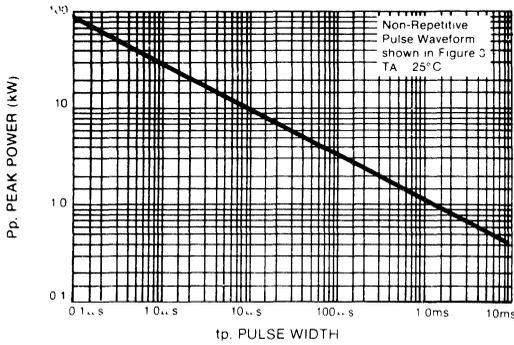


FIGURE 2 — PULSE DERATING CURVE

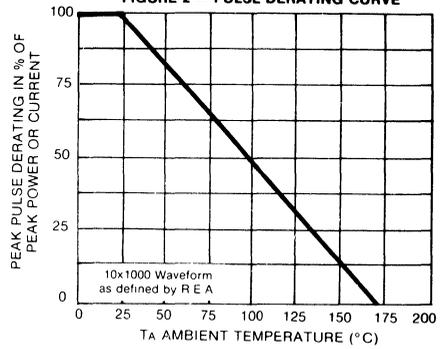


FIGURE 3 — PULSE WAVEFORM

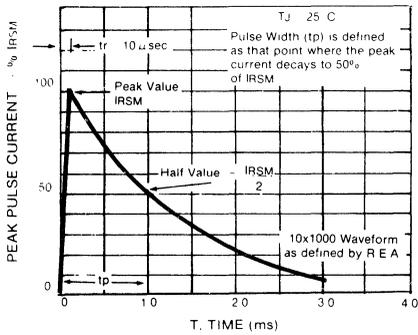


FIGURE 4 — TYPICAL JUNCTION CAPACITANCE

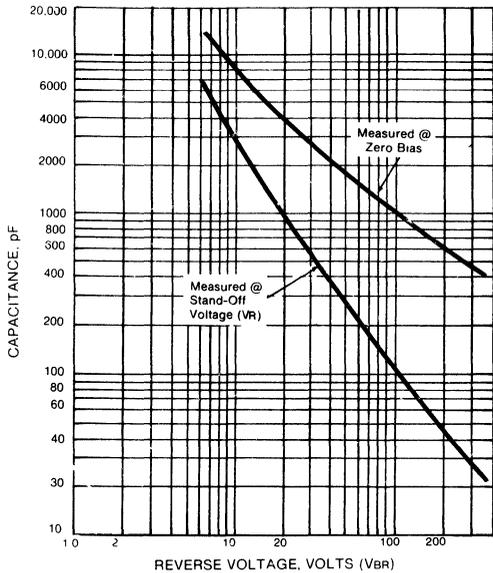


FIGURE 5 — STEADY STATE POWER DERATING

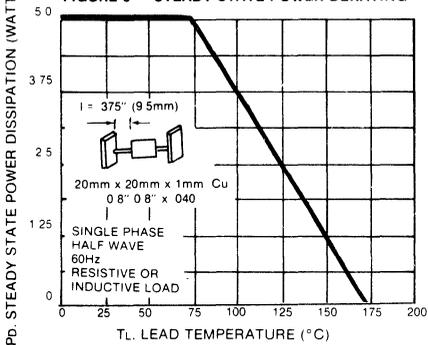
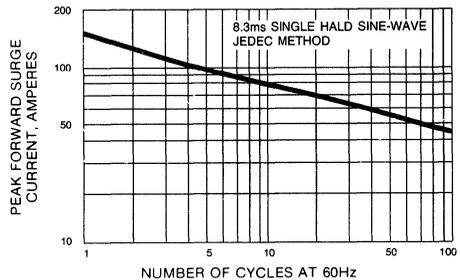


FIG. 6 — MAXIMUM NON-REPETITIVE SURGE CURRENT



JEDEC TYPE NUMBER	GENERAL PART NUMBER	Breakdown Voltage* V _{BR}		@IT (mA)	Working Peak Reverse Voltage V _{RRM} (Volts)	Maximum Reverse Leakage at V _{RRM} I _R (μA)	Maximum Reverse Surge Current I _{RSM} puls 2 (Amps)	Maximum Reverse Voltage at I _{RSM} (Clamping Voltage) V _{RRM} (Volts)	Maximum Temperature Coefficient of V _{BR} (%/°C)V _{BR} (Volts)
		(NOTE 1)							
		Min	Max						
1N6267	1.5KE6.8	6.12	7.48	10	5.50	1000	139	10.8	0.057
1N6267A	1.5KE6.8A	6.45	7.14	10	5.80	1000	143	10.5	0.057
1N6268	1.5KE7.5	6.75	8.25	10	6.05	500	128	11.7	0.061
1N6268A	1.5KE7.5A	7.13	7.88	10	6.40	500	132	11.3	0.061
1N6269	1.5KE8.2	7.38	9.02	10	6.63	200	120	12.5	0.065
1N6269A	1.5KE8.2A	7.79	8.0	10	7.02	200	124	12.1	0.065
1N6270	1.5KE9.1	8.19	10.0	1.0	7.37	50	109	13.8	0.068
1N6270A	1.5KE9.1A	8.65	9.55	1.0	7.78	50	112	13.4	0.068
1N6271	1.5KE10	9.00	11.0	1.0	8.10	10	100	15.0	0.073
1N6271A	1.5KE10A	9.50	10.5	1.0	8.55	10	103	14.5	0.073
1N6272	1.5KE11	9.90	12.1	1.0	8.92	5.0	93.0	16.2	0.075
1N6272A	1.5KE11A	10.5	11.6	1.0	9.40	5.0	96.0	15.6	0.075
1N6273	1.5KE12	10.8	13.2	1.0	9.72	5.0	87.0	17.3	0.076
1N6273A	1.5KE12A	11.4	12.6	1.0	10.2	5.0	90.0	16.7	0.078
1N6274	1.5KE13	11.7	14.3	1.0	10.5	5.0	79.0	19.0	0.081
1N6274A	1.5KE13A	12.4	13.7	1.0	11.1	5.0	82.0	18.2	0.081
1N6275	1.5KE15	13.5	16.5	1.0	12.1	5.0	68.0	22.0	0.084
1N6275A	1.5KE15A	14.3	15.8	1.0	12.8	5.0	71.0	21.2	0.084
1N6276	1.5KE16	14.4	17.6	1.0	12.9	5.0	64.0	23.5	0.086
1N6276A	1.5KE16A	15.2	16.8	1.0	13.6	5.0	67.0	22.5	0.086
1N6277	1.5KE18	16.2	19.8	1.0	14.5	5.0	56.5	26.5	0.088
1N6277A	1.5KE18A	17.1	18.9	1.0	15.3	5.0	59.5	26.2	0.089
1N6278	1.5KE20	18.0	22.0	1.0	16.2	5.0	51.5	29.1	0.090
1N6278A	1.5KE20A	19.0	21.0	1.0	17.1	5.0	54.0	27.7	0.090
1N6279	1.5KE22	19.8	24.2	1.0	17.8	5.0	47.0	31.9	0.092
1N6279A	1.5KE22A	20.9	23.1	1.0	18.8	5.0	49.0	30.6	0.092
1N6280	1.5KE24	21.6	26.4	1.0	19.4	5.0	43.0	34.7	0.094
1N6280A	1.5KE24A	22.8	25.2	1.0	20.5	5.0	45.0	33.2	0.094
1N6281	1.5KE27	24.3	29.7	1.0	21.8	5.0	38.5	39.1	0.096
1N6281A	1.5KE27A	25.7	28.4	1.0	23.1	5.0	40.0	37.5	0.096
1N6282	1.5KE30	27.0	33.0	1.0	24.3	5.0	34.5	43.5	0.097
1N6282A	1.5KE30A	28.5	31.5	1.0	25.6	5.0	36.0	41.4	0.097
1N6283	1.5KE33	29.7	36.3	1.0	26.8	5.0	31.5	47.7	0.098
1N6283A	1.5KE33A	31.4	34.7	1.0	28.2	5.0	33.0	45.7	0.098
1N6284	1.5KE38	32.4	39.6	1.0	29.1	5.0	29.0	52.0	0.099
1N6284A	1.5KE36A	34.2	37.8	1.0	30.8	5.0	30.0	49.9	0.099
1N6285	1.5KE39	35.1	42.9	1.0	31.6	5.0	26.5	56.4	0.100
1N6285A	1.5KE39A	37.1	41.0	1.0	33.3	5.0	28.0	53.9	0.100
1N6286	1.5KE43	38.7	47.3	1.0	34.8	5.0	24.0	61.9	0.101
1N6286A	1.5KE43A	40.9	45.2	1.0	36.8	5.0	25.3	59.3	0.101
1N6287	1.5KE47	42.3	51.7	1.0	36.1	5.0	22.2	67.8	0.101
1N6287A	1.5KE47A	44.7	49.4	1.0	40.2	5.0	23.2	64.8	0.101
1N6288	1.5KE51	45.9	56.1	1.0	41.3	5.0	20.4	73.5	0.102
1N6288A	1.5KE51A	48.5	53.6	1.0	43.6	5.0	21.4	70.1	0.102
1N6289	1.5KE56	50.4	61.8	1.0	45.4	5.0	18.6	80.5	0.103
1N6289A	1.5KE56A	53.2	58.8	1.0	47.8	5.0	19.5	77.0	0.103
1N6290	1.5KE62	55.8	68.2	1.0	50.2	5.0	16.9	89.0	0.104
1N6290A	1.5KE62A	58.9	65.1	1.0	53.0	5.0	17.7	85.0	0.104
1N6291	1.5KE68	61.2	74.8	1.0	55.1	5.0	15.3	98.0	0.104
1N6291A	1.5KE68A	64.6	71.4	1.0	58.1	5.0	16.3	92.0	0.104
1N6292	1.5KE75	67.5	82.5	1.0	60.7	5.0	13.9	109	0.105
1N6292A	1.5KE75A	71.3	78.8	1.0	64.1	5.0	14.6	104	0.105
1N6293	1.5KE82	73.8	90.2	1.0	66.4	5.0	12.7	118	0.105
1N6293A	1.5KE82A	77.9	86.1	1.0	70.1	5.0	13.3	113	0.105
1N6294	1.5KE91	81.9	100.0	1.0	73.7	5.0	11.4	131	0.106
1N6294A	1.5KE91A	86.5	95.5	1.0	77.8	5.0	12.0	125	0.106
1N6295	1.5KE100	90.0	110	1.0	81.0	5.0	10.4	144	0.106

JEDEC TYPE NUMBER	GENERAL PART NUMBER	Breakdown Voltage* V _{BR} (Volts) (NOTE 1)		@I _T (mA)	Working Peak Reverse Voltage V _{RRM} (Volts)	Maximum Reverse Leakage at V _{RRM} I _R (μA)	Maximum Reverse Surge Current I _{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I _{RSM} (Clamping Voltage) V _{RSM} (Volts)	Maximum Temperature Coefficient of V _{BR} (%/°C)V _{RSM} (Volts)
		Min	Max						
1N6295A	1.5KE100A	95.0	105	1.0	85.5	5.0	11.0	137	0.106
1N6296	1.5KE110	99.0	121	1.0	89.2	5.0	9.5	158	0.107
1N6296A	1.5KE110A	106	116	1.0	94.0	5.0	9.9	152	0.107
1N6297	1.5KE120	108	132	1.0	97.2	5.0	8.7	173	0.107
1N6297A	1.5KE120A	114	126	1.0	102	5.0	9.1	165	0.107
1N6298	1.5KE130	117	143	1.0	106	5.0	8.0	187	0.107
1N6298A	1.5KE130A	124	137	1.0	111	5.0	8.4	179	0.107
1N6299	1.5KE150	136	165	1.0	121	5.0	7.0	215	0.108
1N6299A	1.5KE150A	143	158	1.0	128	5.0	7.2	207	0.106
1N6300	1.5KE160	144	176	1.0	130	5.0	6.5	230	0.106
1N6300A	1.5KE160A	152	168	1.0	136	5.0	6.8	219	0.108
1N6301	1.5KE170	153	167	1.0	138	5.0	6.2	244	0.108
1N6301A	1.5KE170A	162	179	1.0	145	5.0	6.4	234	0.108
1N6302	1.5KE180	162	198	1.0	146	5.0	5.8	258	0.108
1N6302A	1.5KE180A	171	189	1.0	154	5.0	6.1	246	0.108
1N6303	1.5KE200	180	220	1.0	162	5.0	5.2	287	0.108
1N6303A	1.5KE200A*	190	210	1.0	171	5.0	5.5	274	0.108
	1.5KE220	196	242	1.0	175	5.0	4.3	344	0.108
	1.5KE220A*	209	231	1.0	185	5.0	4.6	328	0.108
	1.5KE250	225	275	1.0	202	5.0	5.0	360	0.110
	1.5KE250A	237	263	1.0	214	5.0	5.0	344	0.110
	1.5KE300	270	330	1.0	243	5.0	5.0	430	0.110
	1.5KE300A	285	315	1.0	256	5.0	5.0	414	0.110
	1.5KE350	315	385	1.0	284	5.0	4.0	504	0.110
	1.5KE350A	333	368	1.0	300	5.0	4.0	482	0.110
	1.5KE400	360	440	1.0	324	5.0	4.0	574	0.110
	1.5KE400A	380	420	1.0	342	5.0	4.0	548	0.110

NOTES:

- V_{BR} measured after I_T applied for 300 us. I_T = Square Wave Pulse or equivalent.
- Surge current Waverform per Figure 3 and Derate per Figure 2.
- V_F - 3.5V max., I_F=100A (1.5KE6.8 thru 1.5KE91A)
V_F=5.0 V max., I_F=100A (1.5KE100 thru 1.5KE400A) per 1/2 Square or equivalent Sine Wave.
PW - 8.3ms, Duty Cycle - 4 Pulses per minute maximum.
* Bidirectional versions are UL approved.

5KP SERIES

GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

VOLTAGE- 5.0 to 110 Volts

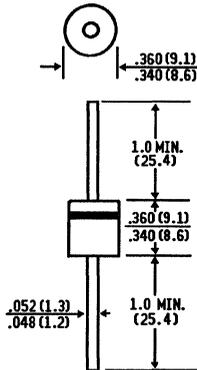
5000 Watt Peak Power 5.0 Watt Steady State

FEATURES

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- ◆ Exceeds environmental standards MIL-STD-19500
- ◆ Glass passivated junction chip in Molded Plastic package
- ◆ 5000W surge capability at 1 ms
- ◆ Excellent clamping capability
- ◆ Low zener impedance
- ◆ Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- ◆ Typical I_R less than 1 μ A above 10V
- ◆ High temperature soldering guaranteed: 300°C/10 seconds/.375", (9.5mm) lead length/5lbs., (2.3 kg) tension



P600



Dimensions in inches
and
(millimeters)

MECHANICAL DATA

- Case:** Molded plastic over glass passivated junction
- Terminals:** Axial leads, solderable per MIL-STD-202, Method 208
- Polarity:** Color band denoted cathode except Bipolar
- Mounting Position:** Any
- Weight :** 0.007 ounce, 2.1 gram

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

RATING	SYMBOL	VALUE	UNITS
Peak Power Dissipation at $T_A=25^\circ\text{C}$, $T_p = 1\text{ ms}$ (NOTE 1)	Ppk	Minimum 5000	Watts
Steady State Power Dissipation at $T_L=75^\circ\text{C}$ Lead Lengths .375", (9.5mm) (NOTE 2)	PD	5.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (NOTE 3)	I_{FSM}	400	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +175	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2.
2. Mounted on Copper Leaf area of 0.79 in² (20mm²).
3. 8.3ms single half sine-wave, duty cycle= 4 pulses per minutes maximum.



RATINGS AND CHARACTERISTIC CURVES 5KP SERIES

FIGURE 1 — PULSE RATING CURVE

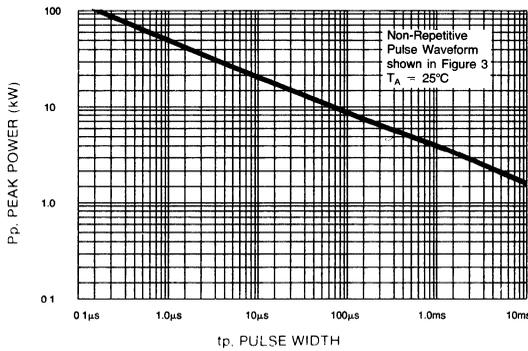


FIGURE 2 — PULSE DERATING CURVE

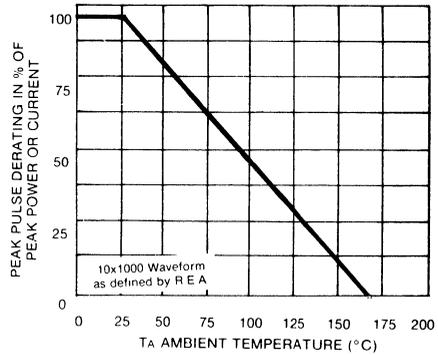


FIGURE 3 — PULSE WAVEFORM

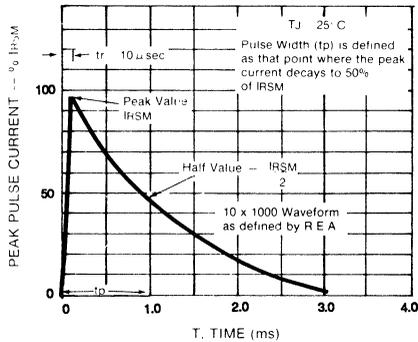


FIGURE 4 — TYPICAL JUNCTION CAPACITANCE

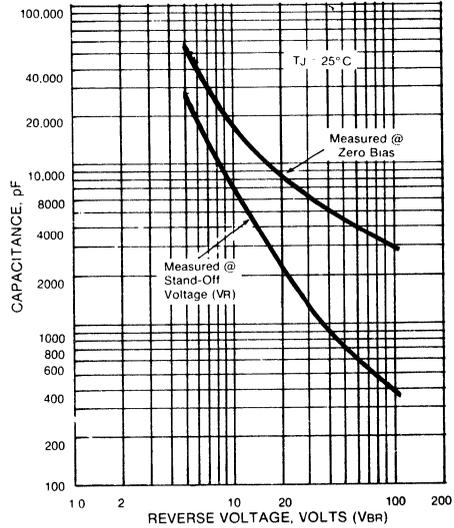


FIGURE 5 — STEADY STATE POWER DERATING

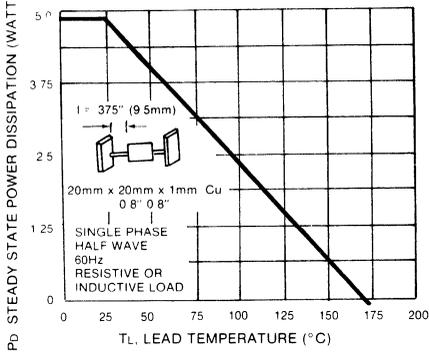
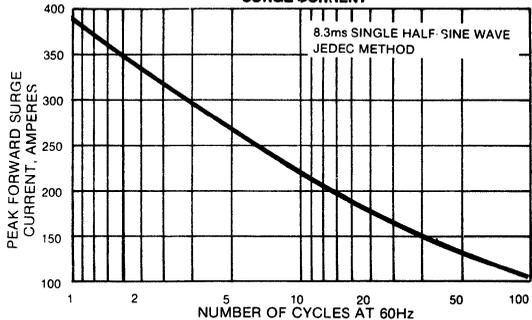


FIGURE 6 — MAXIMUM NON-REPETITIVE SURGE CURRENT



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Device	Breakdown Voltage V_{BR} Volts (NOTE 1)		@IT (mA)	Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} I_{RWM} (μA)	Maximum Reverse Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (clamping Voltage) V_{RSM} (Volts)	Maximum Temperature Coefficient of V_{BR} (% $^\circ\text{C}$)
	MIN	MAX						
5KP5.0	6.40	7.30	50	5.0	2000	520	9.6	0.057
5KP5.0A	6.40	7.00	50	5.0	2000	543	9.2	0.057
5KP6.0	6.67	8.15	50	6.0	5000	439	11.4	0.061
5KP6.0A	6.67	7.37	50	6.0	5000	485	10.3	0.061
5KP6.5	7.22	8.82	50	6.5	2000	407	12.3	0.065
5KP6.5A	7.22	7.98	50	6.5	2000	447	11.2	0.065
5KP7.0	7.78	9.51	50	7.0	1000	378	13.3	0.068
5KP7.0A	7.78	8.60	50	7.0	1000	417	12.0	0.068
5KP7.5	8.33	10.2	5.0	7.5	250	350	14.3	0.073
5KP7.5A	8.33	9.21	5.0	7.5	250	388	12.9	0.073
5KP8.0	8.89	10.9	5.0	8.0	150	333	15.0	0.075
5KP8.0A	8.89	9.83	5.0	8.0	150	367	13.6	0.075
5KP8.5	9.44	11.5	5.0	8.5	50	314	15.9	0.078
5KP8.5A	9.44	10.4	5.0	8.5	50	347	14.4	0.078
5KP9.0	10.0	12.2	5.0	9.0	20	295	16.9	0.081
5KP9.0A	10.0	11.1	5.0	9.0	20	325	15.4	0.081
5KP10	11.1	13.6	5.0	10.0	15	266	18.8	0.084
5KP10A	11.1	12.3	5.0	10.0	15	294	17.0	0.084
5KP11	12.2	14.9	5.0	11.0	10	249	20.1	0.086
5KP11A	12.2	13.5	5.0	11.0	10	274	18.2	0.086
5KP12	13.3	16.3	5.0	12.0	10	227	22.0	0.088
5KP12A	13.3	14.7	5.0	12.0	10	251	19.9	0.088
5KP13	14.4	17.6	5.0	13.0	10	210	23.8	0.090
5KP13A	14.4	15.9	5.0	13.0	10	232	21.5	0.090
5KP14	15.6	19.1	5.0	14.0	10	194	25.8	0.092
5KP14A	15.6	17.2	5.0	14.0	10	215	23.2	0.092
5KP15	16.7	20.4	5.0	15.0	10	188	26.9	0.094
5KP15A	16.7	18.5	5.0	15.0	10	206	24.4	0.094
5KP16	17.8	21.8	5.0	16.0	10	176	28.8	0.096
5KP16A	17.8	19.7	5.0	16.0	10	176	28.8	0.096
5KP17	18.9	23.1	5.0	17.0	10	164	30.5	0.097
5KP17A	18.9	20.9	5.0	17.0	10	161	27.6	0.097
5KP18	20.0	24.4	5.0	18.0	10	155	32.2	0.098
5KP18A	20.0	22.1	5.0	18.0	10	172	29.2	0.098
5KP20	22.2	27.1	5.0	20.0	10	139	35.8	0.099
5KP20A	22.2	24.5	5.0	20.0	10	154	32.4	0.099
5KP22	24.4	29.8	5.0	22.0	10	127	39.4	0.100
5KP22A	24.4	26.9	5.0	22.0	10	141	35.5	0.100
5KP24	26.7	32.6	5.0	24.0	10	116	43.0	0.101
5KP24A	26.7	29.5	5.0	24.0	10	128	38.9	0.101
5KP26	28.9	35.3	5.0	26.0	10	107	46.6	0.101
5KP26A	28.9	31.9	5.0	26.0	10	119	42.1	0.101
5KP28	31.1	38.0	5.0	28.0	10	99	50.1	0.102
5KP28A	31.1	34.4	5.0	28.0	10	110	45.4	0.102
5KP30	33.3	40.7	5.0	30.0	10	93	53.5	0.103
5KP30A	33.3	36.8	5.0	30.0	10	103	48.4	0.103
5KP33	36.7	44.9	5.0	33.0	10	85	59.0	0.104
5KP33A	36.7	40.6	5.0	33.0	10	94	53.3	0.104
5KP36	40.0	48.9	5.0	36.0	10	78	64.3	0.104
5KP36A	40.0	44.2	5.0	36.0	10	85	58.1	0.104
5KP40	44.4	54.3	5.0	40.0	10	70	71.4	0.105
5KP40A	44.4	49.1	5.0	40.0	10	78	64.5	0.105
5KP43	47.8	58.4	5.0	43.0	10	65	76.7	0.105

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

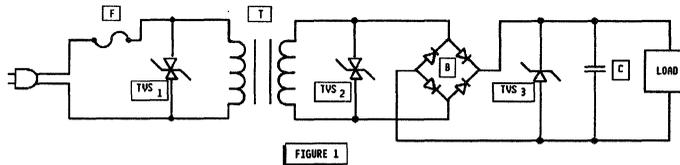
Device	Breakdown Voltage V_{BR} Volts (NOTE 1)		@ T (mA)	Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} I_R (μA)	Maximum Reverse Current I_{RM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RM} (Clamping Voltage) V_{RSM} (Volts)	Maximum Temperatur Coefficient of V_{BR} (% $^{\circ}\text{C}$)
	MIN	MAX						
5KP43A	47.8	52.8	5.0	43.0	10	72	69.4	0.105
5KP45	50.0	61.1	5.0	45.0	10	62	80.3	0.106
5KP45A	50.0	55.3	5.0	45.0	10	69	72.7	0.106
5KP48	53.3	65.2	5.0	48.0	10	58	85.5	0.106
5KP48A	53.3	58.9	5.0	48.0	10	65	77.4	0.106
5KP51	56.1	69.3	5.0	51.0	10	55	91.1	0.107
5KP51A	56.7	62.7	5.0	51.0	10	61	82.4	0.107
5KP54	60.0	73.3	5.0	54.0	10	52	96.3	0.107
5KP54A	60.0	66.3	5.0	54.0	10	57	87.1	0.107
5KP58	64.4	78.7	5.0	58.0	10	49	103	0.107
5KP58A	64.4	71.2	5.0	58.0	10	53	94	0.107
5KP60	66.7	81.5	5.0	60.0	10	47	107	0.108
5KP60A	66.7	73.7	5.0	60.0	10	52	97	0.108
5KP64	71.1	96.9	5.0	64.0	10	44	114	0.108
5KP64A	71.1	78.6	5.0	64.0	10	49	103	0.108
5KP70	77.6	95.1	5.0	70.0	10	40	125	0.108
5KP70A	77.8	86.0	5.0	70.0	10	44	113	0.108
5KP75	83.3	102	5.0	75.0	10	37	134	0.108
5KP75A	83.3	92.1	5.0	75.0	10	41	121	0.108
5KP78	86.7	106.0	5.0	78.0	10	36	126	0.108
5KP78A	86.7	95.8	5.0	78.0	10	40	126	0.108
5KP85	94.9	115	5.0	85.0	10	33	151	0.108
5KP85A	94.4	104	5.0	85.0	10	36	137	0.110
5KP90	100	122	5.0	90.0	10	31	160.	0.110
5KP90A	100	111	5.0	90.0	10	34	146	0.110
5KP100	111	136	5.0	100	10	28	179	0.110
5KP100A	111	123	5.0	100	10	31	162	0.110
5KP110	122	149	5.0	110	10	26	196	0.112
5KP110A	122	135	5.0	110	10	28	177	0.112

NOTES:

- V_{BR} measured after I_T applied for 300 ms. I_T = Square Wave Pulse or equivalent.
- Surge Current waveform per Figure 3 and Derate per Figure 2.
- $V_F = 3.5$ Volts max $I_F = 100\text{A}$ for all types on 1/2 square or equivalent Sine Wave.
PW = 8.3ms. Duty Cycle = 4 Pulse per minute maximum.

APPLICATIONS NOTE:

Transient Voltage Suppressors may be used at various points in a circuit to provide various degrees of protection. The following is a typical linear power supply with transient voltage suppressor units placed at different points. All provide protection of the load.



Transient Voltage Suppressor 1 provides maximum protection. However, the system will probably require replacement of the line fuse (F) since it provides a dominant portion of the series impedance when a surge is encountered.

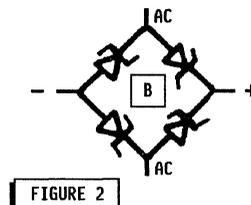
Transient Voltage Suppressor 2 provides excellent protection of circuitry excluding the transformer (T). However, since the transformer is a large part of the series impedance, the chance of the line fuse opening during the surge condition is reduced.

Transient Voltage Suppressor 3 provides the load with complete protection. It uses a unidirectional Transient Voltage Suppressor, which is a cost advantage. The series impedance now includes the line fuse, transformer, and bridge rectifier (B) so failure of the line fuse is further reduced. If only Transient Voltage Suppressor 3 is in use, then the bridge rectifier is unprotected and would require a higher voltage and current rating to prevent failure by transients.

Any combination of these three, or any one of these applications, will prevent damage to the load. This would require varying trade-offs in power supply protection versus maintenance (time changing the fuse).

An additional method is to utilize the Transient Voltage Suppressor units as a controlled avalanche bridge. This reduces the parts count and incorporates the protection within the bridge rectifier.

The wattage ratings are available in
400 watts (P4KE, BZW04)
500 watts (SA series),
600 watts (P6KE),
1500 watts (1.5KE Series) and
5000 watts (5KP Series).



For voltage ranges not seen on specification sheet, please consult factory or the nearest sales office.

APPLICATION NOTES

GENERAL
INSTRUMENT

DESIGN GUIDELINES FOR SCHOTTKY RECTIFIERS

Known limitations of Schottky rectifiers -- including limited high temperature operation, high leakage and limited voltage range -- can be measured and controlled, allowing wide application on switch mode power supplies.

Jon R. Schleisner
Senior Marketing Engineer
General Instrument Corp.,
Power Semiconductor Division
Hicksville, New York

Schottky rectifiers have been used in the power supply industry for approximately 15 years. During this time, significant fiction as well as fact has been associated with this type of rectifier. The primary assets of Schottky devices are switching speeds approaching zero-time and very low forward voltage drop (V_f). This combination makes Schottky barrier rectifiers ideal for the output stages of switching power supplies. On the negative side, Schottky devices are also known for limited high-temperature operation, high leakage and limited voltage range (BVR). Though these limitations exist, they are quantifiable and controllable, allowing wide application of these devices in switch mode power supplies.

High leakage, when associated with standard P-N junction rectifiers, usually indicates "badness," implying poor reliability. In a Schottky device, leakage at high temperature (75 °C and greater) is often on the order to several milliamps, depending on chip size. In the case of Schottky barrier rectifiers, high-temperature leakage and forward voltage drop are controlled by two primary factors: the size of the chip's active area and the barrier height (ϕB).

Design of a Schottky rectifier can be viewed as a tradeoff. A high barrier height device exhibits low leakage at high temperature, however, the forward voltage drop increases. These parameters are also controlled by the die size and resistivity of the starting material. A larger die will lower the V_f but raise the leakage if all other parameters are held constant. The resistivity of the starting material must be chosen in a range where the breakdown voltage (BVR) is not degraded at the low end and the forward end of the resistivity range. Since a larger chip size is

obviously more expensive, this is not the primary method for controlling these parameters. Chip size is usually set to a dimension where the current density through the die is kept at a safe level.

Barrier Height (ϕB), A Factor

General Instrument produces two product lines of Schottky barrier rectifiers. One line is referred to as the "MBR" series, a high-temperature, low-leakage, relatively high V_f type of Schottky device with a high barrier height (ϕB). The second line is the "SBL" series, designed to operate at lower temperature (125°C or less); however, while leakage current is higher, forward voltage drop (V_f) is significantly lower and they are designed with

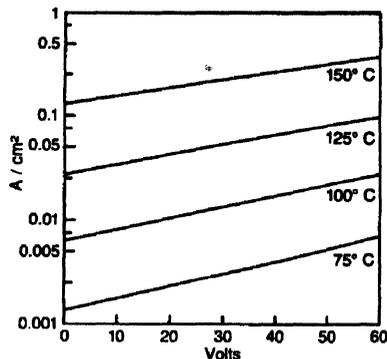


Figure 1

Voltage versus die area leakage barrier height = 0.71 volts

a low- ϕB barrier height. The low- ϕB -line SBL series uses a nichrome barrier metal with a barrier height of $\phi B = 0.64$ eV. The high- ϕB MBR series uses a nichrome-platinum barrier metal to achieve barrier height ($\phi B = 0.71$ eV). Both series are guard-ring protected against excessive transient voltages.

Both the low- and high-barrier-height Schottky devices are valuable in a variety

of applications. When the true operating temperature of the Schottky rectifier exceeds 125°C, the high-barrier-height series must be used to avoid thermal runaway. This occurs when excessive self-heating of the rectifier causes large leakage currents, resulting in additional self-heating. The process becomes a form of positive thermal feedback and may lead to damage in the rectifier or inappropriate functioning of the circuit utilizing the device.

Using a high-barrier-height (MBR) component prevents this anomaly, but sacrifices higher forward voltage. Operating the low barrier height (SBL) series at a junction temperature of 125° C or less prevents thermal runaway from occurring. If the junction temperature (Tj) in the application can be kept below 125° C, a decision on the use of a low- or high-barrier-height Schottky device must be made.

The following procedure has been developed to provide an analytical method of selecting the most efficient Schottky barrier device for a given application.

Calculating The Barrier Height (ϕB) of Schottky Rectifiers

Calculating the barrier height of a Schottky rectifier where ϕB is not given is a straightforward process. The following two equations will yield an excellent engineering approximation of the barrier height, ϕB :

$$\phi B = (-KT/q) \text{LN} (J / R^*T) \quad (1)$$

$$\begin{aligned} J_o &= I_o / \text{ACTIVE AREA} (cm^2) \\ \phi B &= \text{barrier height} (eV) \\ K &= \text{Boltsman's constant} = \\ &8.62 \times 10^5 \text{ eV} / ^\circ K \end{aligned} \quad (2)$$

T = ambient temperature in degrees Kelvin
 J_o = current density at zero volts
 R^* = Richardson's constant = $112 \text{ / cm}^2 \text{ k}^2$
 I_o = forward current at zero volts

To solve Equation One, the current density J_o (Equation Two) must be found first:

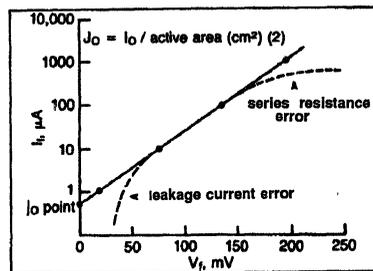
$$J_o = I_o / \text{ACTIVE AREA} (cm^2) \quad (2)$$

General Instrument provides the active area of its Schottky die in its product literature. If a manufacturer does not supply this information, decapsulating the device under question and measuring it with a precision caliper can provide an approximation of the active Schottky area,

assuming 90% of the total chip area is active.

$$\text{Total die area} \times 0.9 = \text{active area} \quad (3)$$

The calculation of J_o is done graphically (Graph 1). A minimum of three low-current room-temperature forward voltage drop V_f measurements are needed. This data is graphed on semi-log paper (Graph 1) where the vertical axis (log scales) is the current and the horizontal axis (linear scale) is the measured V_f . When these points are graphed, the result should be a true straight line. If the graph curves downward (see the dotted line on the left side of Graph 1), it indicates that the lowest measurement current is being affected by the rectifier's room temperature leakage. In this case, the current level at which the V_f measurements are taken should be increased to "swamp" out the contribution of low level leakage on the measurement. If the current levels are raised excessively, the series resistance of the device in question will influence the measurements. This causes a downward curve as represented by the dotted line on the right side of Graph 1. Again, the results should yield a true straight line.



Graph 1

Calculation of J_o (current density at zero volts)

The point where the line intercepts the vertical axis is the current at zero volts (J_o). J_o is then calculated:

$$J_o = I_o / \text{ACTIVE AREA} (cm^2) \quad (2)$$

This result is then placed into the first equation:

$$\phi B = (-KT/q) \text{LN} (J_o / R^*T^2) \quad (1)$$

The results of the calculation are usually in the range of 0.6 eV to 0.8 eV. Results

well outside this range indicate either a defective rectifier, measurement, or calculation error.

Selecting Efficient Schottky Devices

Normalized graphs of the low (SBL) and high (MBR) barrier height processes are provided. The vertical axis on all graphs is in amperes per square centimeter (A/cm^2). The horizontal axis provides forward voltage drop for the low and high barrier parts. Two additional graphs have the horizontal axis labeled for reverse voltage (V_r) for both the low and high barrier series. The graphs for the low barrier (SBL) series parts have curves for operation at 75 °C, 100 °C and 125 °C.

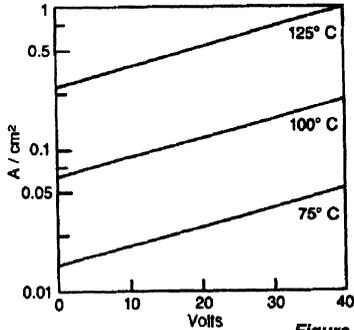


Figure 2
Voltage versus die area leakage barrier height = 0.64 volts

These curves may be used in two ways. If the die size, barrier height, temperature and forward current (I_f) are known, V_f can be graphically calculated. Using the leakage curves, and knowing the reverse voltage (V_r) to which the device will be subjected, it is possible to find the leakage current. Conversely, if the circuit parameters are set, the curves will provide the die size in A/cm^2 equations, making it possible to analytically select either a low- or high-barrier-height rectifier for maximum circuit efficiency. Most Schottky rectifiers are used in switch mode power supplies.

To select a Schottky rectifier that yields maximum efficiency, it is necessary to determine the "duty cycle equilibrium point," or the duty cycle point at which both a low- and high-barrier-height part will dissipate precisely the same amount of power:

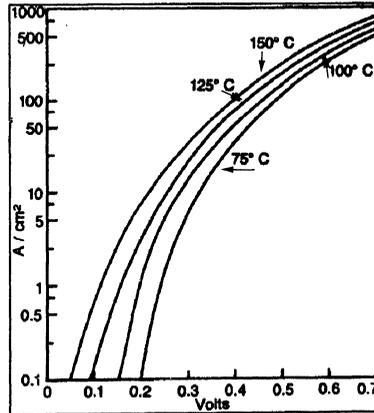


Figure 3
Die area current versus forward voltage drop barrier height = 0.71

$$D (P_{df\phi BL}) + (1-D)(P_{dr\phi BL}) =$$

$$D (P_{dr\phi BH}) + (1-D)(P_{df\phi BH}) \quad (1)$$

$$P_{dt} = P_{df} + P_{dr} \quad (2)$$

$$P_{df} = I_f \times V_f \quad (3)$$

$$P_{dr} = I_r \times V_r \quad (4)$$

D = duty cycle forward conduction

$1-D$ = duty cycle reverse blocking

I_f = forward current

I_r = reverse current

P_{df} = power dissipation in forward

P_{dr} = power dissipation in reverse

P_{dt} = total power dissipation

V_f = forward voltage drop

V_r = reverse voltage

ϕBL = low barrier height

ϕBH = high barrier height

The following is an example of the use of this equation:

Given the need for a 30-volt Schottky capable of operating at 10 amperes, the choice is between a SBL1040 ($\phi_{BL} = 0.64$) or a MBR1045 ($\phi_{BH} = 0.71$). These two devices were chosen for convenience in this example because of their equal die size (0.0477cm^2 active area).

The equilibrium point must be calculated for 75°C , 100°C and 125°C . For demonstration purposes, only the 75°C equilibrium point will be calculated in detail; the other two points are calculated in the same manner. The reverse leakage (I_r) and forward voltage drop (V_f) are derived from **Graphs 1** through **4** using the temperature, die size and ϕ_B given above.

For the low-barrier-height SBL1040:

$$P_{dr} = V_r \times I_r = \text{watts} \quad (4)$$

$$30 \text{ V} \times (1.9 \times 10^{-3} \text{ A}) = 0.057 \text{ W}$$

$$P_{df} = I_f \times V_f = \text{watts} \quad (3) \quad (3)$$

$$10 \text{ A} \times 0.46 \text{ V} = 4.6 \text{ W}$$

For the high-barrier-height MBR1045:

$$P_{dr} = V_r \times I_r = \text{watts} \quad (4) \text{--} 30$$

$$V_r \times (1.43 \times 10^{-4} \text{ A}) = 4.29 \times 10^{-3} \text{ W}$$

$$P_{df} = I_f \times V_f = \text{watts} \quad (3)$$

$$10 \text{ A} \times 0.565 \text{ V} = 5.65 \text{ W}$$

Solving for the equilibrium point at 75°C :

LOW BARRIER **HIGH BARRIER**

$$(D \times P_{df\phi_{BL}}) + [(1-D) \times P_{dr\phi_{BL}}] =$$

$$(D \times P_{df\phi_{BH}}) + [(1-D) \times P_{dr\phi_{BH}}]$$

$$(D \times 4.6 \text{ W}) + [(1-D) \times 0.057 \text{ W}] =$$

$$(D \times 5.65 \text{ W}) + [(1-D) \times 0.00429 \text{ W}]$$

$$0.05271 = 1.1027 D$$

$$D = 0.0478$$

$$D\% = 0.0478 \times 100$$

duty cycle equilibrium point, $D = 4.78\%$

Switching loss is assumed to be equal on both sides of the equation and thus is ignored. This procedure is then repeated for 100°C and 125°C . After calculating the equilibrium point for 100°C and 125°C , the results are:

TEMP	DUTY CYCLE EQUILIBRIUM POINT %
75°C	4.78%
100°C	15.93%
125°C	52.42%

The results of these calculations are graphed in Figure 5. To the left of the equilibrium curve, the high-barrier-height

MBR1045 is most efficient; to the right of the equilibrium curve, the low-barrier-height SBL1040 is more efficient. This is easy to understand because the high-bar-

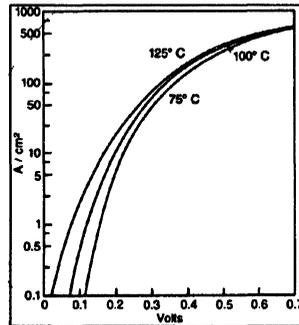


Figure 4
Die area current versus forward voltage drop barrier height = 0.64

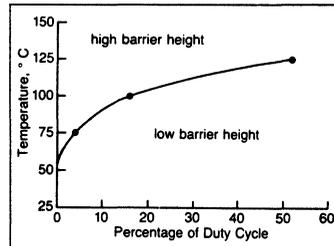


Figure 5
Duty cycle equilibrium point MBR1045 versus SBL1040

rier-height part exhibits lower reverse power loss and at a low duty cycle more time is spent in the reverse mode.

With the duty cycle higher than the equilibrium point, the part spends a larger percentage of time in the forward mode, and the low-barrier-height type part has a lower V_f and the forward power losses are reduced.

With knowledge of the application, including expected duty cycle and temperature, it is possible to choose the most efficient Schottky barrier rectifier, constructing a graph similar to Figure 1.

It is thus easy to graph the duty cycle versus temperature, as in Figure 5, and by knowing the application (expected duty cycle and temperature), make the intelligent choice of the most efficient Schottky rectifier for the application in question.

This analysis technique enables the design engineer to make an efficient and cost-effective choice of Schottky rectifier in duty-cycle-based systems. In addition, light has hopefully been shed on the difference in design philosophies between the low- and high- ϕ_B style of Schottky rectifiers.

SELECTING THE OPTIMUM VOLTAGE TRANSIENT SUPPRESSOR

Although the published data for several transient suppressors may appear similar enough to make the devices seem interchangeable, careful analysis can rule out nearly identical parts whose use could prove disastrous.

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Transient voltage suppressors (TVS) are specialized zener diodes intended to clamp the voltage appearing across a line, thereby preventing transient spikes from damaging sensitive components. They accomplish this conducting when the voltage across the line exceeds the zener-avalanche rating. Because transient voltages can be quite high, suppressors must be able to handle large avalanche currents. This means that care must be taken in the construction of the package and assembly process to ensure that the suppressor can tolerate high energy levels for short periods.

Typical transient voltage suppressors carry peak ratings of 400, 600, 1500 or 5000 watts. These wattages translate to 0.55, 0.80, 2.10 or 7.00 joules of energy during a 1-millisecond period. Avalanche ratings generally range from a few volts to several hundred volts. Key operating parameters include:

◆ **Breakdown voltage (V_{BR})**, the voltage at which a given device breaks down in its avalanche mode. This voltage is usually characterized at a test current (I_T) of 1 milliamp and is often specified as a range with minimum ($V_{BR \text{ min}}$) and maximum ($V_{BR \text{ max}}$) voltages listed.

◆ **Working peak reverse voltage (V_{RWM})**, the voltage at which the device's leakage current is measured. This voltage is always at least 10 percent lower than the minimum breakdown voltage. Suppressors with a breakdown-voltage rating of less than 10 volts can exhibit leakage currents as high as 1 milliamp, but suppressors with higher breakdown ratings typically exhibit leakage currents of 5 microamps or less.

◆ **Maximum reverse surge current (I_{RSM})**, the maximum current that the suppressor is guaranteed to withstand without incurring damage. This parameter is usually characterized with a 1-millisecond exponential waveform.

◆ **Maximum reverse voltage (V_{RSM})**, also called the maximum clamping voltage, the maximum voltage that can appear across the suppressor when the maximum rated surge current is flowing through it.

◆ **Maximum breakdown-voltage temperature coefficient ($\%V_{BR} / ^\circ C$)**, the maximum allowable change in the breakdown voltage as a function of the temperature.

Design Criteria

The best way to demonstrate the selection process is through a hypothetical example. In this example, the device to be protected is an integrated circuit, IC_x , which is designed to operate on a nominal rail voltage of 15 volts, and which has an absolute maximum voltage rating of 22 volts. The first step in the selection process is to determine the energy (joules) or power (watts) contained in the surge against which the device is to be protected, and the duration of that surge.

Transients are by definition nonrepetitive, with energy levels that are difficult to ascertain. Moreover, they generally result from an unexpected failure elsewhere in the system or from natural phenomenon such as lightning. Because of this, determining energy content and duration of the surge is the most difficult step in the transient-suppressor selection process.

Some surges, however, are predictable. The surge produced by a solenoid driver is a good example. If the inductance of the coil is known and the load on the solenoid is defined, it is possible to calculate or measure the duration and magnitude of the surge. Whenever possible, a "hands

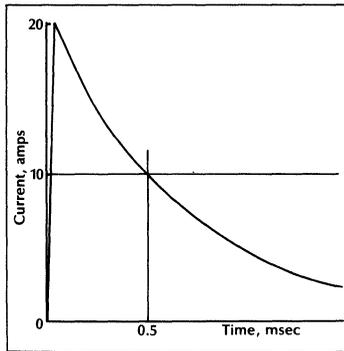


Figure 1

Waveform of an exponential-decay transient pulse with a peak current and a 0.5-millisecond pulse width at the half-peak-current point

on" measurement of the worst-case transient condition should be made. For the sake of discussion, assume that the transient being presented to IC_x has a peak current of 20 amps with a classic exponential decay, as shown in Figure 1, and a duration of 0.5 milliseconds, measured at 50 percent of the peak current.

With this data in hand, the next step is to examine manufacturer's data sheets to find a transient suppressor able to handle the anticipated surge. The breakdown voltage and maximum reverse surge current ratings published in the data sheets are key selection criteria. Since IC_x has a nominal 15-volt operating voltage, the minimum breakdown voltage must be greater than 15 volts. However, since it carries a 22-volt absolute maximum voltage rating, the suppressor's maximum breakdown voltage must be less than 22 volts. The foregoing assumes a relatively stable ambient temperature, such as that usually experienced in an office environment. If the product in which IC_x is used is expected to see wider temperature

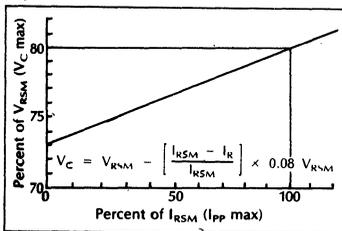
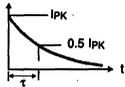
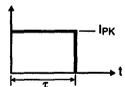
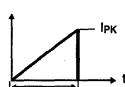
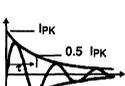
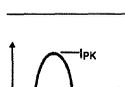


Figure 2

The clamping characteristic of a typical transient suppressor

fluctuations, the minimum breakdown voltage would have to be based on the lowest expected temperature. The resulting voltage would be determined by multiplying the difference between the expected temperature and room temperature by the temperature coefficient.

WAVESHAPE	EQUATION	K FACTOR
	$I_{PK} e^{-1/1.44\tau}$	1.4
	I_{PK}	1.0
	$I_{PK} (t/\tau)$	0.5
	$I_{PK} \sin(\pi t) e^{-t/\tau}$	0.86
	$I_{PK} \sin([\pi t / \tau])$	0.637

$$\text{Energy} = \int_0^{\tau} V_C(t) I(t) dt = K V_C I \tau$$

Figure 3

The energy contained in a transient pulse depends on its wave shape

With the minimum and maximum permissible breakdown voltages in hand, examine the clamping-voltage ratings published in the manufacturer's data sheets to identify suppressors falling within the required range. It is possible that there is no device that falls well within the upper and lower limits. If the device with the closest voltage rating falls about the upper voltage limit, a very close examination of its parameters must be made. Most reputable semiconductor manufacturers apply a one-percent guardband around voltage ratings as a safety margin. In this example, the guardband raises the absolute maximum rail voltage from 22 volts to 22.22 volts.

This small increase may not seem like much, but can make the difference in selecting a transient suppressor.

Selecting the Best Transient Suppressor

Consider a situation in which the only suppressor that comes close to meeting the protection need of IC carries a maximum clamping-voltage rating of 22.5 volts. The actual voltage at which the suppressor will clamp depends on the actual current flowing through it, as shown in Figure 2, and can be predicted using the following equation:

$$V_{RSM} - [(I_{RSM} - I_R) / (I_{RSM})] \times (0.08)V = V_C$$

For the sake of discussion, consider the General Instrument type P6KE16A transient suppressor, which carries a 22.5-volt maximum clamping-voltage rating.

$$22.5 - [(27 - 20) / 27] \times 0.08 (22.5) = 22.03 \text{ volts}$$

Although the resulting clamping voltage is still greater than the 22-volt absolute maximum voltage rating carried by IC x, it is well within the 22.22-volt rating provided by the one-percent guardband. Thus, although carrying a maximum clamping-voltage rating 0.5 volt higher than the maximum voltage rating carried by ICx, this suppressor can be safely used in this application.

The same, however, cannot be said of all 22.5-volt suppressors. Another device in the same family, the P4KE16A, has slightly different current ratings and yields considerably different results:

$$22.5 - [(19 - 20) / 19] \times 0.08 (22.5) = 22.59 \text{ volts}$$

Clearly, with a 22.59-volt clamping voltage, this device cannot be used because it exceeds the maximum clamping-voltage rating plus guardband of ICx.

The next step in the selection process is to verify the transient suppressor's power rating. There are two approaches that can be taken:

1. Since the waveform of the transient is a classic exponential decay with a 0.5-millisecond duration at the half-peak current point, a graphic plot of peak power versus time can be used. This graph is often published in manufacturer's data sheets and if it is available for the device under consideration, one need only compare the anticipated current against the current shown in the graph. Using the peak-power versus time graph published for the P6KE series suppressors, it can be seen that with a 0.5-millisecond time-constant decay, a P6KE device can handle a peak power of 792 watts.

Using Ohm's law and a 22-volt clamping voltage, this translates to:

$$I = P/V = 792/22 = 36 \text{ amps}$$

Since the anticipated peak reverse current with a 0.5-millisecond time constant is 20 amps, it is clear that a P6KE device can easily withstand the anticipated peak power of the surge.

2. Calculate the energy in joules contained in the transient and compare it to the maximum energy rating of the transient suppressor. The energy in the transient, of course, depends on its wave shape, as shown in Figure 3. The amount of energy a given transient suppressor can handle, on the other hand, depends on its energy rating and the duration of the pulse, as shown in Figure 4. In this example, the waveform has an exponential shape with a 20-amp peak current and a 0.5-millisecond half-peak-power point. Using these data, the energy calculations are as follows:

$$E = V_C(t) \times I(t) \times A(t) - KV_C \times I \times \tau$$

where, in this example,

$$V_C = 2V$$

$$I = 20A$$

$$\tau = 0.5 \text{ msec}$$

$$K = 1.4 \text{ (from Figure 3)}$$

$$\text{Thus } E = 1.4 \times 22 \times 20 \times (0.5 \times 10^{-3}) = 0.308J$$

The maximum single-pulse energy rating for a P6KE series is 0.83 joules for a pulse of 1 millisecond duration. Referring to Equation 4, the energy rating for a 0.5-millisecond pulse becomes $0.7 \times 0.83 \text{ J}$, or 0.581 joules. Clearly, then, a P6KE device can easily handle the 0.308-joule energy contained in the anticipated transient pulse.

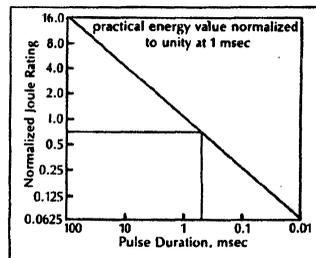


Figure 4

Energy-handling capacity of a transient voltage suppressor as a function of the transient's duration

Conclusion

The above example assumes a non-repetitive transient, or, if repetitive, each pulse is separated from the others by an interval of at least 20 seconds. Under these conditions, however, the procedures outlined provide a straightforward and reliable method of selecting the best transient voltage suppressor for a given application.

SUPERECTIFIER DESIGN BRINGS NEW LEVEL OF RELIABILITY TO SURFACE MOUNT COMPONENTS

by, Joseph M. Beck,
Sr. Applications Engineer

Surface Mount technology is here to stay. After years of plodding through cautious experimentation, many manufacturers now have fully automated production lines in place.

These production lines place circuit components at speeds that until recently would have been unthinkable. Finally being realized are the benefits of what was once considered a "Voo Doo" manufacturing technology.

Component manufacturers have learned a great deal over the past several years as well. Initially most surface mount components were nothing more than retrofit, lead formed versions of their conventional leaded, through-hole counterparts. For most manufacturers this was the quickest and least costly method of "developing" a line of surface mountable components.

It was soon discovered, however, that this approach to component assembly would be unacceptable. Surface mount technology placed new demands upon circuit components. Electrically, the same power was being required from smaller and smaller packages. Package geometries and dimensions became critical in relation to pick and place equipment and circuit board mounting. In addition, the construction of these devices needed to be such that they would suffer no ill effects when subjected to the rigors of the new assembly environment that surface mount technology presented. Encountered in this environment was extremely high-speed pick and place equipment, component adhesive attachment, immersion in molten solder and rapid temperature changes associated with reflow soldering processes. All this meant that component manufac-

turers would have to re-think their approach to device fabrication. Yes, components needed to be smaller; but they also needed to be more reliable.

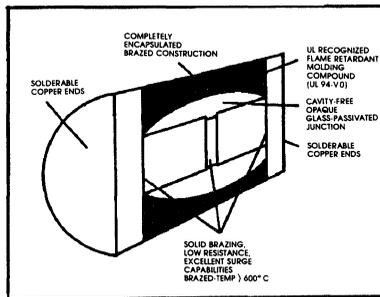


Figure 1 - SUPERECTIFIER construction

At General Instrument, the development of new surface mount components is not something that is taken lightly. It is realized that in order to produce a truly reliable surface mount product one must first consider all relevant aspects of the technology. Only when this process has been completed can a product be developed which is surface

mountable, and inherently reliable.

Surface Mount Superectifier®

General Instrument manufactures surface mount rectifiers in the popular MELF (metalized electro face) package style. These devices, denoted as SUPERECTIFIERS, are available with a wide variety of electrical characteristics. The main difference, however, between these rectifiers and other MELF style devices lies in the area of device construction. Figure 1 shows the unique construction employed in the manufacture of the SUPERECTIFIER.

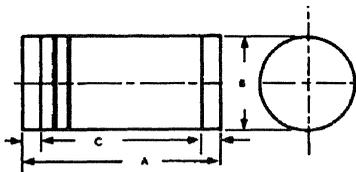
The construction of the SUPERECTIFIER does not internally utilize any soft solders. All interconnects are accomplished by the use of a high temperature brazing process (600°C). Hence, any chances of solder void occurrence or internal solder reflow during circuit board processing are eliminated. In addition, the silicon rectifier junction is completely encapsulated by a cavity-free glass. This glass encapsulation ensures that the rectifier junction is hermetically isolated from humidity and other harmful environmental intrusions.

The resultant sub-assembly could be considered to be a fully functional surface

mount rectifier. In fact, many component manufacturers offer MELF devices which have this appearance; namely, an oblong glass bead with two protruding metal end terminations. However, in order that the device have a uniform shape, the General Instrument sub-assembly is over molded with epoxy. The result is a smooth, perfectly cylindrical package.

Two Sizes

Two different size SUPERECTIFIER MELF packages are available. General Instrument designation GL34 and GL41 are for 0.5 ampere and 1.0 ampere rectifier types, respectively. JEDEC mechanical specifications DO-213AA and DO213AB detail the dimensions of the GL34 and GL41, respectively. Figure 2 gives these package dimensions.



DIM.	GL34 DO-213AA		GL41 DO-213AB	
	MIN	MAX	MIN	MAX
A	.130	.146	.189	.205
B	.063	.067	.094	.105
C	.016	.022	.016	.022

NOTE: ALL DIMENSIONS IN INCHES

Figure 2

Dimensional outline

MANUFACTURING CONSIDERATIONS

Pick and Place--Surface mount SUPERECTIFIERS are supplied on tape and reel in accordance with JEDEC standard RS-481A. Removal of the devices from the embossed carrier tape is easily accomplished by all vacuum pick-up mechanisms which utilize a compliant tip. The compliant tip will form a tight seal around the cylindrical MELF design once contact with the device has been made. This is not always the case, however, when MELF devices with a non-uniform package outline are used. Figure 3 shows two such MELF outlines. Figure 3A is a device with a concave package outline. This type of package is difficult to consistently remove from the carrier tape as the exact position of pick-up on the component body is critical. Figure 3B is that of the most common form of MELF pack-

aging. This type of construction utilizes a non-transparent glass body which is

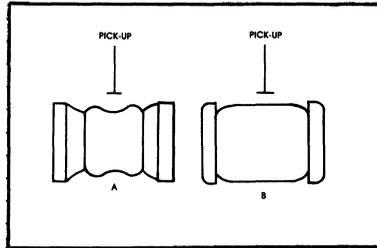


Figure 3.

Non-uniform MELF outlines

often characterized by pitting and surface irregularities. The irregularities make it difficult for a vacuum pick-up to form a tight seal around the device body. The result is that components are often dropped onto the production room floor instead of being placed on the targeted circuit board. General Instrument solves these problems with a smooth surface and perfectly cylindrical package outline.

Bonding Pads --The geometries and dimensions of bonding pads are critical to the proper mounting, soldering and overall performance of all surface mount components. Figure 4 gives the recommended pad layouts for GL34 and GL41 MELF outlines. Use of these pad layouts will be primary assistance in the following three areas:

- ◆ Surface mount technology by nature dictates that smaller component packages dissipate the same power as their larger through-hole counterparts. Hence, adequate bonding pad land area is required in order to aid the component package in the dissipation of this power. The recommended pad layouts provide the needed land area for GL34 and GL41 devices to operate safely at their maximum ratings.

- ◆ Component adhesive attachment allows the package to shift slightly from its original placement position prior to adhesive curing. In addition, most adhesives tend to spread during the curing process which also may allow package misalignment. The geometry of the recommended pad layouts will tend to minimize such movements. This assumes, of course, that the package was originally positioned correctly.

- ◆ During reflow soldering, solder surface tension can have a significant effect on the movement and final position of com-

ponents in relation to their bonding pads. The recommended pad layouts will actually make use of the solder surface tensions to bring MELF devices into alignment with the two bonding pad land areas. This means that MELF devices which are initially placed in slight misalignment on their bonding pads will reposition themselves during solder reflow until a position of alignment is reached.

Soldering—Surface mount SUPERECTIFIERS are capable of withstanding all present forms of wave and reflow soldering. The following guidelines should be followed, however, in order to ensure overall package integrity:

- ◆ GL34--Maximum temperature at device and terminations not to exceed 400°C for 5 seconds. Complete device submersible temperature not to exceed 260°C for 10 seconds in solder bath.

- ◆ GL41--Maximum temperature at device end terminations not to exceed 450°C for 5 seconds. Complete device submersible temperature not to exceed 265°C for 10 seconds in solder bath.

General Instrument's surface mount SUPERECTIFIERS combine superb electrical performance with unmatched levels of reliability. The construction of the SUPERECTIFIER virtually eliminates all problems associated with high-speed pick and place of MELF components. In addition, SUPERECTIFIER construction ensures that performance and reliability are never compromised when the device is subjected to the demands of surface mount assembly techniques or when other seemingly harmful environments are encountered. Quite simply, no other surface mount rectifier comes close to offering all the advantages of the SUPERECTIFIER MELF.

performance and reliability are never compromised when the device is subjected to the demands of surface mount assembly techniques or when other seemingly harmful environments are encountered. Quite simply, no other surface mount rectifier comes close to offering all the advantages of the SUPERECTIFIER MELF.

All surface mount components are small and save space. However, performance and reliability should never be considered necessary trade-offs in order to utilize surface mount technology. Use of General Instrument surface mount SUPERECTIFIERS requires no such sacrifices; no trade-offs.

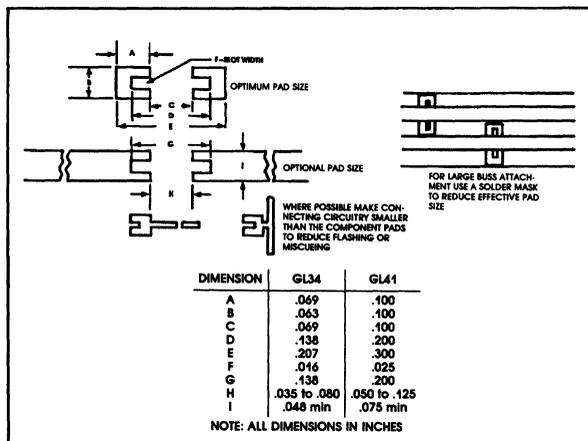


Figure 4

Recommended pad layout

SURFACE MOUNT SUPERECTIFIER AVAILABILITY:

PART NUMBER	CURRENT(A)	VOLTAGE(V)	TRR(ns)	PACKAGE
GENERAL PURPOSE				
GL34A-M	0.5	50-1000	—	GL34
1N6478-84	1.0	50-1000	—	GL41
GL41A-M	1.0	50-1000	—	GL41
FAST RECOVERY				
RGL34A-M	0.5	50-1000	150-500	GL34
RGL41A-M	1.0	50-1000	150-500	GL41
ULTRA FAST RECOVERY				
EGL41A-G	1.0	50-400	50	GL41
EGL34A-G	0.5	50-400	50	GL34

Protection of Power Supply and Data Lines Via Thyristor Surge Suppressor and TVS Devices

by Jon Schleisner

The Power Semiconductor Division of General Instrument (PSD), a mainstay in the arena of axial rectifiers, Schottky diodes, TVS, and surface mount technology, has extended its product line. PSD has entered the exciting and growing market of solid state "crowbar" type protection products.

Protection of power supply and data lines against transients is an art still in evolution. The advent of microprocessor-driven telephone systems based on sensitive electronics (instead of charcoal compressive microphones) has changed the criteria for protection. MOVs, gas tubes, and carbon blocks have been the staple components for protection schemes for decades.

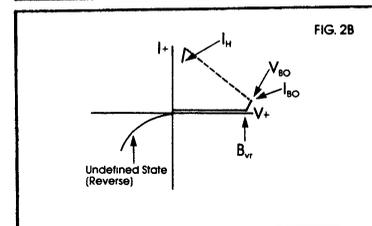
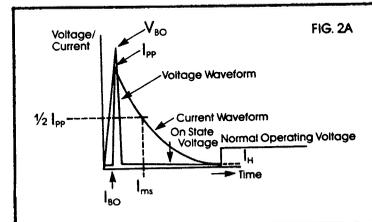
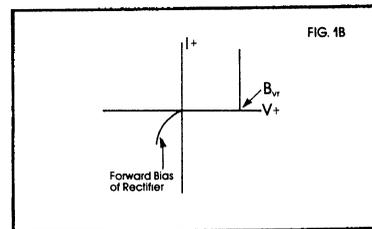
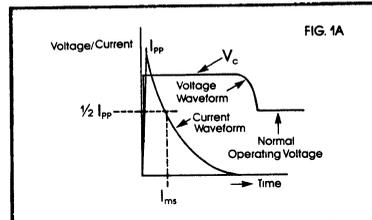
These older protection devices have several advantages and disadvantages versus their solid state counterparts. The common advantages are low cost and the ability to absorb tremendous amounts of energy. The disadvantages include slow turn-on times, lack of totally controllable breakover (gas tube) and avalanche (MOV, carbon block) voltages, and an inherent wear-out mechanism (use them and you lose them).

The advantages of the General Instrument's TVS and Thyristor Surge Suppressor devices are speed of response (pico- and nanoseconds), control of avalanche (Zener) voltage, and breakover voltage. Solid state protectors do not shift in parametric value unless stressed beyond their rated limits and driven to destruction. The disadvantage of solid state protection are generally lower power handling capacity and higher costs.

The cost factor is rendered moot if the slow protection device (MOV or gas tube) acts too slowly to protect the system to which it is dedicated.

The power limitations can be overcome, to a great degree, with some imaginative engineering. Thyristor Surge Suppressors and TVS devices are specified differently. Table 1 lists all the pertinent

TVS and Thyristor Surge Suppressor device parameters for comparison. While both devices are used for transient protection, their electrical behavior is quite different.



TVS BVR - The voltage at which the part goes into reverse breakdown at a specified test current, usually 1 or 10 milliamps.

Thyristor Surge Suppressor V_{BR} - The voltage at which the Thyristor Surge Suppressor device begins to conduct current, equivalent to the TVS BVR.

Thyristor Surge Suppressor V_{BO} - The voltage at which, when reaching the specified IBO, causes the device to "fire" or "fold back" in the low-voltage forward mode.

Thyristor Surge Suppressor I_{BO} - The required current at V_{BO} that causes the devices to "break over or fold back".

TVS V_{RSM} - The maximum specified voltage at I_{pp} , the TVS max clamping voltage.

TVS I_{RSM} - The max rated current to test the VC parameter.

Thyristor Surge Suppressor V_t - The voltage drop across the device at the specified I_t , after the device folds back.

I_t - The specified current at which V_t is tested.

I_R - This is a leakage spec with V_R set to less than BVR or V_{BR} on TVS or Thyristor Surge Suppressor devices.

Thyristor Surge Suppressor I_H - This is a spec. that is unique to "Thyristor Surge Suppressor" technology. After the device has been "fired," when the current starts to decay and passes below a critical value (usually several hundred milliamps), the device turns off and resumes its normal high impedance state

There is no TVS equivalent to I_H (holding current). This function is important; it places certain critical limitations on application of the Thyristor Surge Suppressor device. Consider a power supply output with a 1-amp current limit. If this line is protected with a Thyristor Surge Suppressor device with an $I_H=500mA$, problems will arise. If the is fired, it will never shut off. The available current from the power supply is greater than I_H , hence the part will stay turned on until power is momentarily removed. This classic condition requires attention whenever designing in a Thyristor Surge Suppressor device in a protection system.

This aspect of Thyristor Surge Suppressor device performance makes it ideal for protection of data lines from lightning and other true transient voltage conditions. Typical data lines have current limiting set rather low. The telephone system in North America has a current limit of 250mA, so maintaining $I_H < 250mA$ will ensure device turn-off after the passage of the transient.

Fig. 1 & 2 highlight differences in TVS and Thyristor Surge Suppressor device performance:

The following figures provide an explanation of circuit applications:

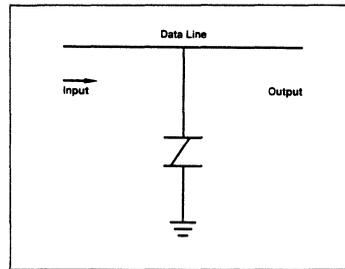


FIGURE 1.

The simplest and most direct application of a Thyristor Surge Suppressor device across a medium to slow data line. If a positive transient strike exceeds V_{BO} with sufficient I_{BO} , the Thyristor Surge Suppressor device will fire, absorbing the transient.

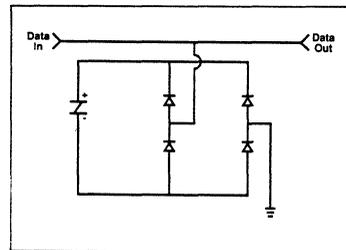


Figure 2

The same approach as Figure 1 with the addition of steering diodes to absorb bidirectional transients. Most transients are bidirectional in nature.

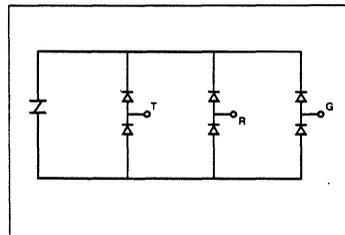


Figure 3

This is a further extension of Figure 2. With the terminals marked T (Tip), R (Ring), and G (Ground), this becomes the classic telephone line protection scheme.

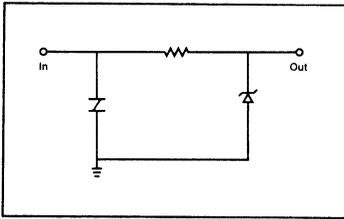


Figure 4

This is data line protection where the turn on transient approaching VBO (225 - 260V) cannot be tolerated. The resistor limits the current through the TVS to $VBO - VC/R$, the duration of this pulse is typically less than 1 usec, so a small TVS can be used.

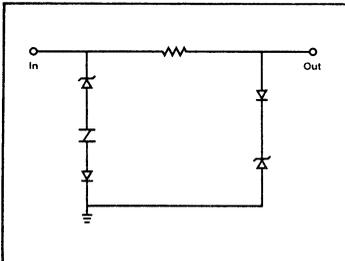


Figure 5

Similar to Figure 4, but designed to have reduced parasitic capacitance across the data line.

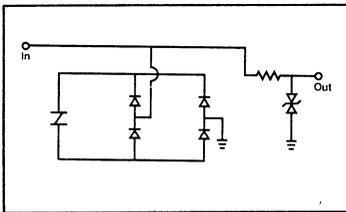


Figure 6

This circuit is a bidirectional version of Figure 4 with the low capacitance benefits of Figure 5.

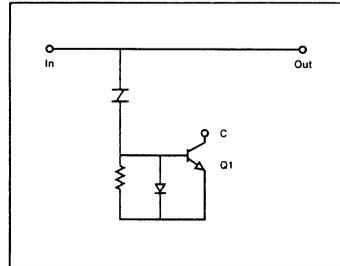


Figure 7

This is a power supply protection circuit. The open collector of Q1 is connected to the power source at the input and should be used to shut off the power supply output for a few milliseconds. This permits the current through the Thyristor Surge Suppressor device to fall below I_H before restart begins.

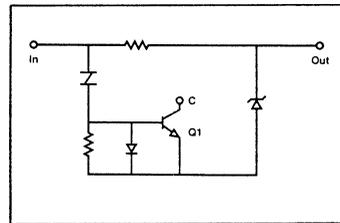


Figure 8

This circuit is equivalent to Figure 7 with the addition of TVS clamp at the output. This prevents VBO from appearing at the protection circuit's output.

General Instrument's Power Semiconductor Division will support your design efforts and assist in applying these new solid state protection devices. More protection performance for your dollar—that is our goal.

Using Rectifiers In Voltage Multiplier Circuits

By Joseph M. Beck
Sr. Applications Engineer

Systems designs frequently call for a high voltage, low current power source that needs only minimal regulation. A few familiar examples are CRT circuits, electrostatic copiers, and photoflash applications. Required voltages typically range from 10 to 30KV and the current demand rarely exceeds 5 milliamperes.

When your design requires this type of power source, you may want to consider a voltage multiplier circuit. They are inexpensive, easy to design, versatile, and can provide virtually any output voltage that is an odd or even multiple of the input voltage.

This article explores the basic operation of multiplier circuits and discusses guidelines for electronic component selection. Since General Instrument Corporation is the industry's leading manufacturer of rectifier products, we will place special emphasis on selecting rectifier diodes for multiplier circuits.

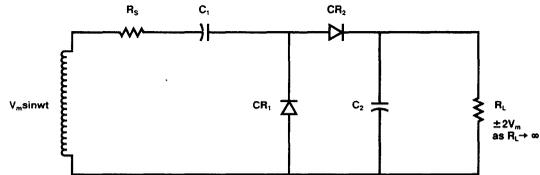


Figure 1A

Basic multiplier circuits. Half-wave Voltage Doubler

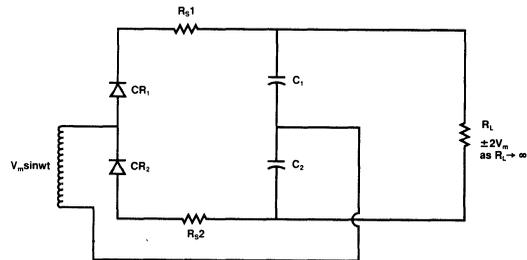


Figure 1B

Basic multiplier circuits. Full-wave Voltage Doubler

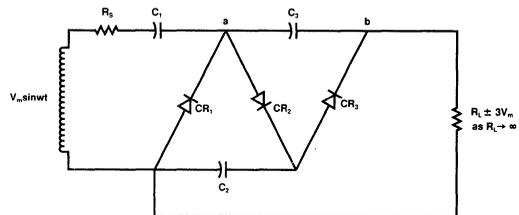


Figure 1C

Basic multiplier circuits. Half-wave Voltage Tripler

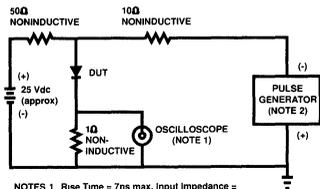
BASIC OPERATING PRINCIPLES

Most voltage multiplier circuits, regardless of their topology, consist chiefly of rectifiers and capacitors. Figure 1 shows three basic multiplier circuits.

The operating principle of all three circuits is essentially the same. Capacitors connected in series are charged and discharged on alternate half-cycles of the supply voltage. Rectifiers and additional capacitors are used to force equal voltage increments across each of these series capacitors. The multiplier circuit's output voltage is simply the sum of these series capacitor voltages.

A wide variety of alternating signal inputs are used with multiplier circuits. The most popular are sine and square wave inputs. For simplicity, this discussion will be limited to sine wave inputs; the calculations become somewhat more involved with asymmetrical signals.

Voltage Doublers - Figure 1A shows a half-wave voltage doubler circuit. It functions as follows. On the negative half-cycle of the input voltage, capacitor C₁ charges, through rectifier CR₁, to a voltage of V_m. On the positive half-cycle, the input voltage, in series with the voltage of C₁ (V_{c1}=V_m), charges capacitor C₂



NOTES 1 Rise Time = 7ns max. Input Impedance = 1 megohm 22pF
 2 Rise Time = 10ns max. Source Impedance = 50 ohms.

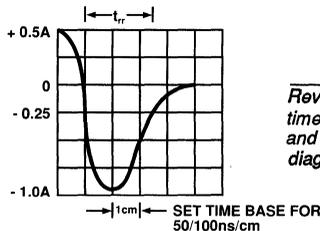


Figure 2
 Reverse recovery time characteristic and test circuit diagram

through rectifier CR2 to the desired output voltage of $2V_m$. Capacitor C1, which aids in the charging of capacitor C2, sees alternating current ("AC Cap") while C2 sees only direct current ("DC cap"). In this circuit, the output voltage and the input signal have the same ripple frequency.

The same operating principle extends to the full-wave voltage doubler circuit of figure 1B. On the negative half-cycle of the input voltage, capacitor C2 is charged through rectifier CR2 to a voltage of V_m . On the positive half-cycle, capacitor C1 is also charged to a voltage of V_m , through rectifier CR1. The series voltages of capacitors C1 and C2 ($V_{c1}=V_{c2}=V_m$) yield the desired output voltage: $2V_m$. In this case, capacitors C1 and C2 are "DC capacitors"; they see no alternating current. The output ripple frequency of the full-wave doubler is twice that of the input signal.

Voltage Tripler - Higher output voltages are possible through the use of a half-wave voltage tripler circuit, shown in figure 1C. This circuit operates as follows. On the negative half-cycle of the input voltage, capacitor C1 charges through rectifier CR1 to a voltage of V_m . On the positive half-cycle, the input voltage, in series with the stored voltage on C1 ($V_{c1}=V_m$), charges capacitor C2 through rectifier CR2 to a voltage of $2V_m$. On the next negative half-cycle, the charge on C1 is replenished. At the same time, the input voltage, in series with the stored voltage on C2 ($V_{c2}=2V_m$), charges capacitor C3 through rectifier CR3 to a voltage of $2V_m$ ($V_{c3}=V_b-V_a=(V_m+V_{c2})-V_{c1}=2V_m$). V_{c1} and V_{c3} , in series, provide the output voltage of $3V_m$. In this case, the output ripple frequency is equal to that of the input signal.

Although half-wave and full-wave multiplier circuits can provide equivalent output voltages, there are some fundamental differences that should be considered. First, the full-wave circuit has the advantage of higher output ripple frequency (twice that of the half-wave circuit). In addition, the full-wave circuit provides better voltage regulation than the half-wave circuit, since the latter relies upon one capacitor (C1 in figure 1A) to provide the charging energy to a single DC load capacitor (C2 in figure 1A). The full-wave circuit, however, requires that the secondary side of the transformer be capable of withstanding high voltages (approximately 1/2 of the output voltage). For this reason, the half-wave multiplier is usually the preferred circuit when high voltage outputs (V_o =kilovolts) are required.

DESIGN GUIDELINES

Capacitor selection - The size of capacitors used in multiplier circuits is directly proportional to the frequency of the input signal. Capacitors used in off-line, 60Hz applications are usually in the range of 1.0 to 20 μ F while those used in higher frequency applications, say 10KHz, are typically in the range of .02 to .06 μ F. In practice, it is usually easier, and less costly, to use the same large capacitance value for all capacitors, both "AC" and "DC" type. The overall capacitive reactance of the circuit must be considered, however, to determine the largest permissible value.

The voltage rating of capacitors is determined solely by the type of multiplier circuit. In the half-wave doubler circuit of figure 1A, C1 must be capable of withstanding a maximum voltage of V_m , while C2 must withstand a voltage of $2V_m$. In the full-wave doubler circuit of figure 1B, both C1 and C2 must withstand voltages of V_m . The half-wave voltage tripler of figure 1C requires C1 to withstand a voltage of V_m , and both C2 and C3 to withstand voltages of $2V_m$. A good rule of thumb is to select capacitors whose voltage rating is approximately twice that of the actual peak applied voltage. For example, a capacitor which will see a peak voltage of $2V_m$ should have a voltage rating of approximately $4V_m$.

Rectifier Diode Selection

Several basic device parameters should be considered:

Repetitive Peak Reverse Voltage (V_{rrm}) - Repetitive peak reverse voltage is the maximum allowable instantaneous value of reverse voltage across the rectifier diode. Applied reverse voltages below this maximum value will produce only negligible leakage cur-

rents through the device. Voltages in excess of this maximum value, however, can cause circuit malfunction --- and even permanent component damage --- because significant reverse currents will flow through the device. For example, General Instrument's GP02-40 rectifier diode has a peak reverse voltage rating (V_{rrm}) of 4,000 volts, maximum. Applied reverse voltages of 4KV or less will produce a maximum reverse leakage current, I_R , of 5 microamperes through the device when operated at room temperature (25 °C). In most cases, this leakage current is considered negligible, and the device is said to be completely blocking ($I_R=0$).

In the case of the three circuits of figure 1, the maximum reverse voltage seen by each rectifier diode is 2Vm. So devices must be selected with reverse voltage (V_{rrm}) ratings of at least 2Vm.

Reverse Recovery Time (t_{rr}) - In general terms, reverse recovery time is a measure of the time needed for a rectifier diode to reach a state of complete blocking ($I_R=0$) upon the application of a reverse bias. Ideally, this time should be zero. In reality, however, there's a finite period of time in which a stored charge at the diode junction must be "swept away" before the device can enter its blocking mode. This stored charge is directly related to the amount of forward current flowing through the device just prior to the application of the reverse bias. Fortunately, since operating currents are very low in multiplier circuits, reverse recovery times are kept to a minimum. Nevertheless, t_{rr} plays an important role in multiplier design.

When selecting rectifier diodes, the frequency of the input signal to the multiplier network must be considered. For symmetrical signal inputs, the device chosen must be capable of switching at speeds faster than the rise and fall times of the input. If the reverse recovery time of the rectifier is too long, the efficiency and regulation of the circuit will suffer. In the worst case, insufficient recovery speeds will result in excessive device heating, as reverse power losses in the rectifier become significant. Continued operation in this mode usually results in permanent damage to the device.

The reverse recovery time (t_{rr}) specification is very dependent upon the circuit and the conditions being used to make the measurement. Several industry standard t_{rr} test circuits exist (figure 2 is the test circuit used for the GP02-40). Therefore, it's very important to note which test circuit is being referenced, as the same device may measure differently on different test circuits. Furthermore, the t_{rr} specification should be used for qualitative, not quantitative purposes, since conditions specified for t_{rr} measurement rarely reflect those found in actual "real life" circuit operation. The t_{rr} specification is most valuable when comparing two or more devices that are measured on the same circuit, under the same conditions.

Figure 3 shows the relationship between forward current and t_{rr} in the GP02-40. As you can see, decreasing current flow in the multiplier circuit makes it possible to use higher input frequencies. An increase in current flow has the opposite effect. Ideally, the multiplier network load should draw no current.

Peak Forward Surge Current (I_{fsm}) - A peak forward surge current rating is given for most rectifier diodes. Most often, this rating corresponds to the maximum peak value of a single half-sine wave (50 or 60Hz) which, when superimposed upon the devices rated load current (JEDEC method), can be conducted, without damage by the rectifier. This rating becomes important when considering the large capacitance associated with multiplier circuitry.

Surge currents can develop in multiplier circuits, due to capacitive loading effects. The large step-up turns ratio between primary and secondary of most high voltage transformers causes the first multiplier capacitor (C_1 , secondary side) to be reflected as a much larger capacitance into the primary. For example, a transformer with a turns ratio of 25 will cause a 1.0 μ F capacitance to be reflected into the primary circuitry as a capacitance of $(1.0)(25)$ μ F, or 625 μ F. At circuit turn-on, large currents will be developed in the primary side as this effective capacitance begins charging.

On the secondary side, significant surge currents can flow through the rectifiers during initial capacitor charging at turn-on. The addition of a series resistance (R_s in figure 1) can greatly reduce these current surges, as well

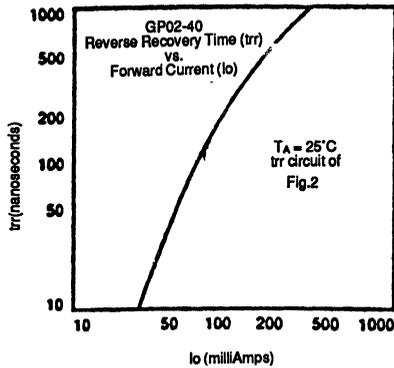


Figure 3

Trr as a function of forward current

as those in the primary circuitry. For example, the GP02-40 has a forward surge rating, I_{fsm} , of 15 amperes. Considering a maximum secondary voltage of 260 Vrms, 60Hz, the calculation of R_s is as follows:

$$R_s \geq V_{peak} I_{fsm} \quad \text{eq.1}$$

$$R_s \geq (1.41)(260)/15$$

$$R_s \geq 24.4 \text{ ohm}$$

Other Parameters - Of lesser significance are the forward current rating, I_o , and maximum forward voltage, V_f .

Forward current, I_o - As stated earlier, in the ideal multiplier configuration the load will draw no current. Ideally, the only significant current flow through the rectifiers occurs during capacitor charging. Therefore, devices with very low current ratings (hundreds of milliamperes) can be used. It must be noted, however, that the forward current and forward surge current ratings are related, since both are a function of silicon die area. Generally speaking, devices with a high surge current rating, I_{fsm} , will also have a high forward current, I_o , rating, and vice versa.

Forward Voltage, V_f - In practice, the forward voltage drop, V_f , of the rectifiers does not have a significant effect on the multiplier network's overall efficiency. For instance, the GP02-40 has a typical forward drop of 2.0 volts when measured at a current of 100 milliamperes. A half wave doubler with an 8KV output will have less than .05 percent ($2 \times 2V/8KV$) loss in efficiency due to the forward voltage drops.

HIGHER ORDER CASCADE MULTIPLIER

Still higher voltages are possible by using the cascade multiplier circuit shown in figure 4. The output voltage is calculated as:

$$V_o = (n)(V_m), \text{ as } I_L \rightarrow 0 \quad \text{eq.2}$$

where n = number of capacitors or diodes, assuming equal value capacitors, ideal diodes and symmetrical signal input.

In theory, one can obtain any incremental output voltage increasing the value of n . In practice, however, voltage regulation and efficiency become increasingly poor as n increases. The potential for voltage arcing must also be considered as the value of n increases, and when higher output voltages are required. Careful mechanical design can minimize arcing, to a large extent.

From a pure circuits standpoint, voltage multipliers are relatively easy to design. The selection of circuit components, however, is one facet of the "overall design" that should not be taken for granted or trivialized. Careful consideration of all component parameters is the only way to ensure both reliable and predictable circuit performance. Put another way, ideal circuits require ideal circuit components.

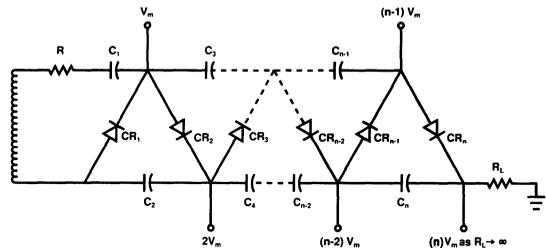


Figure 4

Cascade multiplier

To find the ideal rectifier for your voltage multiplier, consult the **General Instrument Power Semiconductor Division Data Book**. You can obtain a copy by phoning 516-933-3165, or by writing to General Instrument Corp., Power Semiconductor Division, 600 West John Street, Hicksville, NY 11802.

Transient Voltage Suppressors Ideally Suited for Automotive Applications or Harsh Environments

Gloria M.Luna
Automotive Applications Engineer

The combination of durability and high temperature performance has come together in the form of General Instrument's new, patented PAR (Passivated Anisotropic Rectifier)* process. Transient voltage suppressors produced by this process exhibit high temperature reverse bias stability, excellent transient energy capability, and low dynamic impedance, and are ideally suited for the harsh environments of automotive applications. In a standard diffused junction process, there are several conditions present that could affect the integrity of a device. These conditions become critical to the performance of the device as the junction temperature is increased and the device is stressed to the limits of its operation. They include the presence of a high field at the surface of the junction when a voltage is applied. The electric field (V/cm) that occurs over the depletion layer of a device determines the voltage capability of the device:

$$E(x) = \frac{dV(x)}{dx}$$

This field is not only present in the bulk of the device but also at the surface. When this electric field sees ionic contaminants on top of the surface and along the edge of the die, the contaminants will ionize and the resulting charge will distort the original field. This distortion can increase local leakage current and cause localized breakdown as well as thermal runaway. By growing an oxide directly on the surface of the junction layer, these contaminants can be eliminated. In addition, by employing a positive bevel angle construction, the field at the surface would be diminished to a point where it could not contribute to device degradation. General Instrument engineers have combined these features in a process that provides reliable devices under the high temperature conditions of the automotive environment as well as one that lends itself to state-of-the-art semiconductor manufacturing processes. Thus came the development of the PAR process.

*patented by General Instrument

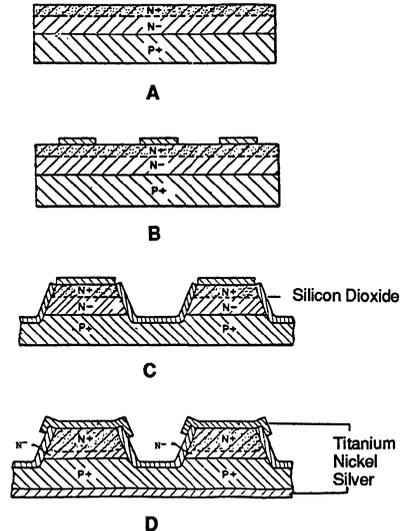


Figure 1

PROCESS TECHNOLOGY

As illustrated in Figure 1(A), we begin with a P+ device and an N- surface layer. We then diffuse in a shallow N+ layer, deposit and subsequently etch a silicon nitride layer that functions as a mask as shown in Figure 1(B). The resulting pattern is then anisotropically etched to form a mesa structure on the top side of the wafer. By utilizing this anisotropic process we are able to achieve a uniform 45 degree angle all around each die. We oxidize the silicon surface where there is no nitride, which results in a grown silicon dioxide layer that is ten times as thick as the silicon nitride. This oxide layer forms around the mesas but not on the original nitride as shown in Figure 1(C). As the N+ layer is driven deeper into the junction, a phenomenon occurs which results in a curvature between the N+ and the N- surface layers as illustrated by Figure 1(D). This curvature is essential in achieving higher breakdown voltages. The final step includes the removal of the top silicon nitride layer and the sintering of a metalization layer

composed of titanium, nickel, and silver deposited on the top and bottom surfaces. This is also illustrated in Figure 1(D).

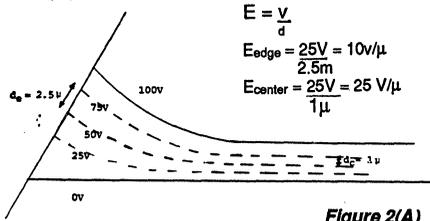


Figure 2(A)

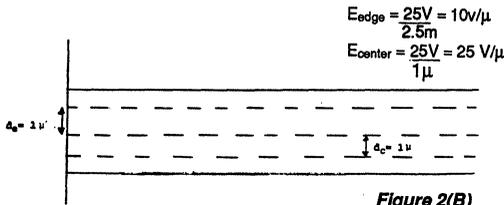


Figure 2(B)

This process is notable for the following reasons:

1. Reverse current measurements remain stable and uniform.
2. Complete stability during high temperature reverse bias and thermal cycling
3. Low electrical contact resistance.

This process results in several important features unique to the PAR construction. First, particle contamination is virtually eliminated by the use of a grown oxide to passivate the junction. Second, by utilizing a positive bevel angle construction, we are able to lower the field at the surface. Due to the fact that the reverse breakdown voltage of a device is determined by the width of the high ohmic region, the curvature of the N+/N- junction becomes an important design criteria in obtaining higher breakdown voltages at the surface of the silicon. This promotes a breakdown along the bulk of the junction rather than at the edge. As illustrated in Figure 2(A), the curvature of the junction results in an increase in the distances of the equipotential lines at the surface. By calculation, all of the breakdown occurs at the bulk of the device rather than at the edge because the field at the edge does not exceed the critical value of the layers of material outside of the silicon near the

junction (greater than $10V/\mu$). In contrast, the equipotential lines for a standard diffused junction device are illustrated in Figure 2(B). With the breakdown occurring at the edge of the junction, the incidence of high leakage and localized breakdown associated with field distortion is increased, particularly when the device is exposed to extreme environmental and operating conditions. In addition, this tailored junction affords the following advantages:

1. By having the breakdown occur over the large bulk area of the device, large energy surges can be safely handled without damage or deterioration to the device.
2. By modifying the edge of the device, the results under high temperature reverse bias are excellent.

AUTOMOTIVE TRANSIENTS

Electronic devices that operate in the automotive environment are subjected to very extreme conditions. Temperature, humidity, exposure to various liquids, vibration, voltage changes, and surge voltages are just some of the factors to be considered in the automotive environment. Temperatures can rise to as high as 200 degrees C in the engine compartment and as low as -20 degrees C. As a result, it is necessary that any electronic device be able to withstand these conditions and operate within reasonable limits so as not to degrade the performance of any system it may be operating in. Transients in the automotive environment cover a wide range of energy levels and time durations, as illustrated in Figure 3. These transients are distributed throughout the electrical system of an automobile and can occur at any time.

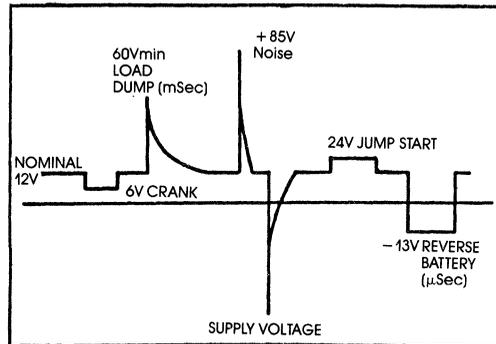


Figure 3

Possible automotive supply voltage variations

Some of the most serious types of transients are:

1. A load dump transient occurs when the alternator load is suddenly dropped due to battery disconnection. Voltages can range from 30 to 125V for up to 400 ms. This is considered the worst of all types of transients and was made a test requirement for all electrical systems and modules designed for the automotive industry back in the 1970's. See Figure 4

2. Transient voltages generated when the inductive loads (relays, solenoids, and switches) are turned off. See Figure 5.

3. Transient voltages generated when the ignition switch is turned off. 4. Transient voltages generated by inductive or capacitive coupling when electrical equipment (such as the ignition system) is turned on.

By connecting a transient voltage suppressor across the output of a circuit or connecting them within the circuit, you can protect delicate components and systems by clamping these transient voltages. Because the failure threshold level of a system is determined by its weakest component, it is wise to insure that a TVS would be able to withstand all of these conditions.

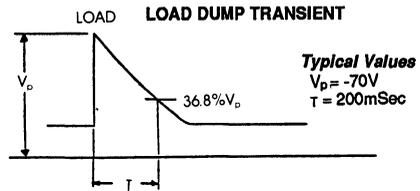


Figure 4

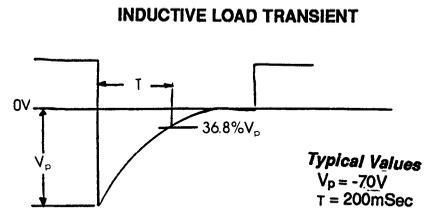


Figure 5

RELIABILITY

Due to this increased focus on reliability under harsh environmental conditions, the ability to quantify reliability has become an important criteria in selecting components. Failure modes fall into two broad categories--those related to defects in the silicon die, and those related to packaging of the die. Die defects relate to field distortion, oxide defects, surface charge or microcracking. By using devices manufactured with the PAR process, the incidence of these types of failures is greatly reduced. These failures can be provoked by high temperature reverse bias testing. In this test, the devices are reverse biased by applying 80% of the rated reverse voltage to the device and heating the device to at least 150 degrees C. This test can run anywhere from 250 to 1000 hours to insure device durability. Shown in Figure 6 are the results of HTRB testing on PAR produced transient voltage suppressors

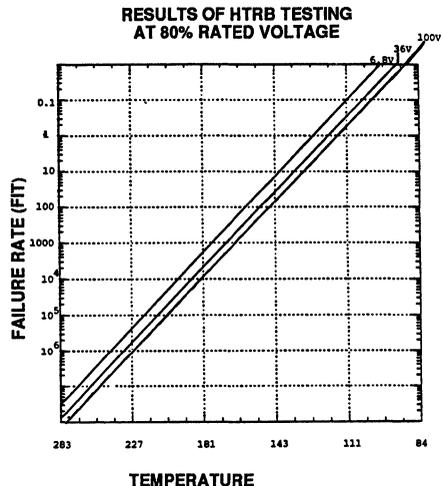


Figure 6

Definition: Failures > 5µA I_R at 25°C
Failure Rate = - fails / 10⁹h

rated at 6.8V, 36V, and 100V. In addition, reverse leakage remains within a very tight distribution and very little drift is observed in values before and after test. Packaging defects can occur from fatiguing of the bond or the presence of atmospheric vapor onto the die surface. Particularly in the automotive environment, semiconductor devices can be subject to thermal and electrical stress causing cracking, separation or voiding of the bond between the die and the lead. These conditions can lead to degrading operation and eventually, thermal runaway. By thermally cycling the device from low (typically -65 degrees C) to elevated temperatures (typically 150 degrees to 170 degrees C) with a dwell time of 5 minutes at each temperature, the bond can be stressed to the point of failure to insure the integrity of the device. The results of temperature cycling for PAR devices is shown in Figure 7.

RESULTS OF TEMPERATURE CYCLING TESTING

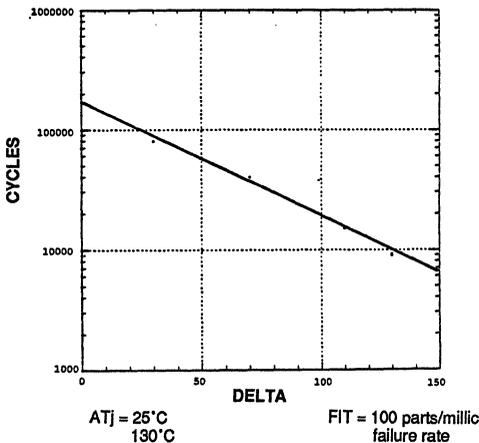


Figure 7

PART NUMBERS

The devices are available in three different power ranges utilizing the following part numbers:

- P4KA** (400 Watts) **P6KA** (600 Watts)
6.8V to 43V 6.8V to 43V
- 1.5KA** (1500 Watts)
6.8V to 43V
- TAGL41** (400 Watts Surface Mount)
6.8V to 43V

PACKAGING BULK-TAPE AND REEL

**GENERAL
INSTRUMENT**

PACKAGING CODES

PACKAGE CODE	PACKAGING DESCRIPTION
1 . . . . .	. Bulk
2 . . . . .	. SMB, 12MM Tape, 7" Diameter Plastic Reel
3 . . . . .	. 26MM Horizontal Taping and Ammo Packing
4 . . . . .	. 52.4MM Horizontal Tape, 13" Diameter Paper Reel Class I
5 . . . . .	. SMB, 12MM Tape, 7" Diameter Paper Reel
6 . . . . .	. Avisert, Cathode Up, Cathode First Off Reel
7 . . . . .	. SMC, 16MM Tape, 7" Diameter Plastic Reel
8 . . . . .	. Avisert, Cathode Up, Cathode First Off Ammo Pack
9 . . . . .	. SMC, 16MM Tape, 13" Diameter Paper Reel
10 . . . . .	. Avisert, Cathode Down, Anode First Off Reel
11 . . . . .	. SMA, 12MM Tape, 7" Diameter Plastic Reel
12 . . . . .	. Avisert, Cathode Down, Anode First Off Ammo Pack
13 . . . . .	. SMA, 12MM Tape, 13" Diameter Paper Reel
14 . . . . .	. Panasert, Cathode Up, Cathode First Off Reel
15 . . . . .	. Panasert, Cathode Up, Anode Off First, Ammo Pack
16 . . . . .	. Panasert, Cathode Up, Cathode First Off Ammo Pack
17 . . . . .	. GF1, 12MM Tape, 7" Diameter Plastic Reel
18 . . . . .	. Panasert, Cathode Down, Anode First Off Reel
19 . . . . .	. GF1, 12MM Tape, 13" Diameter Paper Reel
20 . . . . .	. Panasert, Cathode Down, Anode First Off Ammo Pack
22 . . . . .	. Bulk Pack for Special Axial-Leaded Formed Devices
23 . . . . .	. 52.4MM Horizontal Tape Ammo Pack, Class I
26 . . . . .	. GL41 SMD 12MM Tape, 13" Diameter Paper Reel
27 . . . . .	. DFS Bridge, 16MM Tape, 13" Diameter Paper Reel
28 . . . . .	. Special Carton Packing method for Tube Packaging Products
32 . . . . .	. GL34 SMD, 8MM Tape, 7" Diameter Paper Reel
34 . . . . .	. Tab Mounted EFR8 Chip, 16MM, 13" Diameter Reel
35 . . . . .	. Bulk, Axial-Leaded Conductive Packaging
36 . . . . .	. Standard Horizontal Reel, Class I (Metric 52.4MM) Conductive Packaging
37 . . . . .	. Bulk, TO220, TO3P Conductive Tubes
38 . . . . .	. Bulk, Conductive Packaging for Bridge Rectifier
39 . . . . .	. Miscellaneous Non-Standard T&R Packaging
40 . . . . .	. Euroform, Reel, Cathode First Off Reel, Lead Coated
41 . . . . .	. Euroform, Ammo Pack, Cathode First Out of Box, Lead Coated
42 . . . . .	. Euroform, Reel, Cathode Last Off Reel, Lead Coated
43 . . . . .	. Euroform, Ammo Pack, Cathode Last Out of Box, Lead Coated
44 . . . . .	. 52.4MM Horizontal Tape, 13" Diameter Paper Reel, 5MM Component Spacing for DO201 Packages
45 . . . . .	. Anti-Static Tube Packaging for TO220, TO3P and DFM
46 . . . . .	. GL41 SMD 12MM Tape, 7" Diameter Plastic Reels
48 . . . . .	. GL34 SMD 8MM Tape, 7 " Diameter Plastic Reels
50 . . . . .	. MPG06 Pseudo Radial Tape, 13" Diameter Paper Reels

Also available for all packaging Electro-Static-Protection by adding the number "50" to the existing codes. For example, "51" would be Bulk, Electro-Static Packaging. "54" would be T/R, Electro-Static Packaging.

TABLE 3

NEW BULK PACKAGING

DEVICE TYPE	PACKAGING	BOX SIZE		QUANTITY		GROSS WEIGHT
		INCHES	CM	EA.	LBS.		KG
GL34 SURFACE MOUNT	PAPER BOX	8.0 x 3.5 x 1.0	20.3 x 8.8 x 2.54	8000	0.55	0.25
GL41 SURFACE MOUNT	PAPER BOX	8.0 x 3.5 x 1.0	20.3 x 8.8 x 2.54	4000	1.03	0.47
GF1 SURFACE MOUNT	PAPER BOX	8.0 x 3.3 x .87	20.3 x 8.4 x 2.2	2000	0.76	1.67
SMA SURFACE MOUNT	PAPER BOX	8.0 x 3.3 x .87	20.3 x 8.4 x 2.2	2000	0.77	1.69
SMB SURFACE MOUNT	PAPER BOX	8.0 x 3.3 x .87	20.3 x 8.4 x 2.2	2000	0.77	1.69
SMC SURFACE MOUNT	PAPER BOX	8.0 x 3.3 x .87	20.3 x 8.4 x 2.2	1000	0.87	1.92
DO15	PAPER BOX	11.75 x 5.125 x 2.5	29.8 x 13.0 x 6.3	4000	3.85	1.75
DO201AD	PAPER BOX	11.75 x 5.125 x 2.5	29.8 x 13.0 x 6.3	1500	4.41	2.0
DO204AP	PAPER BOX	11.75 x 5.125 x 2.5	29.8 x 13.0 x 6.3	4000	3.75	1.7
DO204MB	PAPER BOX	11.75 x 5.125 x 2.5	29.8 x 13.0 x 6.3	5000	3.15	1.43
DO41/MPG06	PAPER BOX	11.75 x 5.125 x 2.5	29.8 x 13.0 x 6.3	5000	2.38/2.20	1.08/1.0
G4/G3	PAPER BOX	11.75 x 5.125 x 2.5	29.8 x 13.0 x 6.3	3000/2000	5.07 / 5.29	2.3/2.4
GP20	PAPER BOX	11.75 x 5.125 x 2.5	29.8 x 13.0 x 6.3	1500	3.75	1.7
J,JTX1N483B, 1N645, 1N645-1	PAPER BOX	8.0 x 3.5 x 1.0	20.3 x 8.8 x 2.54	1000	0.77	0.35
J, JTX1N3611, 1N4245, 1N5614	PAPER BOX	8.0 x 3.5 x 1.0	20.3 x 8.8 x 2.54	500	0.55	0.25
J, JTX1N4942, 1N5615	PAPER BOX	8.0 x 3.5 x 1.0	20.3 x 8.8 x 2.54	500	0.55	0.25
J, JTX1N5415, 1N5550, 1N5624, 1N5807	PAPER BOX	12.0 x 3.6 x 2.5	30.4 x 9.1 x 6.3	1000	2.50	1.1
P600	PAPER BOX	11.75 x 5.125 x 2.5	29.8 x 13.0 x 6.3	750	3.72	1.69
P6KE	PAPER BOX	11.75 x 3.5 x 1.0	29.8 x 8.8 x 2.54	2000	1.93	0.87
DF-MDF-S	ANTI-STATIC PLASTIC TUBES	19.0 LENGTH	48.2 LENGTH	50	0.12	0.05
TO-220, CT	ANTI-STATIC PLASTIC TUBES	20.5 LENGTH	52.0 LENGTH	50	0.306	0.14
TO3P	ANTI-STATIC PLASTIC TUBES	20.5 LENGTH	52.0 LENGTH	30	0.572	0.26
WG	PLASTIC BAGS			100	0.37	0.17
BC	PAPER BOX	9.2 x 5.0 x 2.5	5.1 x 5.1 x 0.9	100	0.042	1.4
KBPM/2KBPM	ANTI-STATIC PVC TRAY	12.5 x 6.5 x 1.25	31.7 x 16.5 x 3.17	120	0.53	0.24
GBU4,6,8	ANTI-STATIC PVC TRAY	12.5 x 6.1 x 1.0	30.9 x 15.5 x 2.5	250	2.42	1.1
GBL	ANTI-STATIC PVC TRAY	12.5 x 6.1 x 1.0	30.9 x 15.5 x 2.5	400	2.20	1.0
GBPC12-35W	ANTI-STATIC PVC TRAY	12.5 x 12.5 x 1.25	31.7 x 31.7 x 3.17	100	3.20	1.45
GBPC8	ANTI-STATIC PVC TRAY	12.5 x 12.5 x 8.7	31.7 x 31.7 x .87	200	2.42	1.1
GBPC10	ANTI-STATIC PVC TRAY	12.5 x 12.5 x 1.0	31.7 x 31.7 x 2.5	150	2.64	1.2
GBPC1, GBPC6	ANTI-STATIC PVC TRAY	12.5 x 12.5 x .75	31.7 x 31.7 x .75	250	1.6/1.9	.72/1.88
KBL	ANTI-STATIC PVC TRAY	12.2 x 6.1 x 1.5	30.9 x 15.5 x 3.8	300	4.19	1.9
GBPC12-35	ANTI-STATIC PVC TRAY	12.5 x 12.5 x 1.25	31.7 x 31.7 x 3.17	100	3.53	1.6
KBU4,6,8	ANTI-STATIC PVC TRAY	12.2 x 6.1 x 1.5	30.9 x 15.5 x 3.8	250	3.53	2.1

AMMO BOX PACKAGING

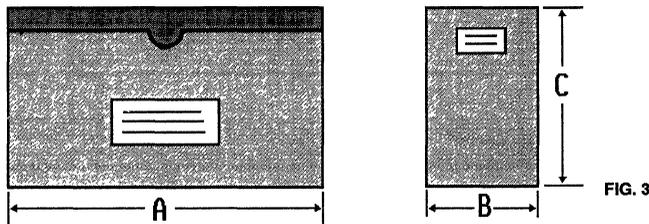


TABLE 4

Packaging	Available Product Outlines	Packaging Codes	Dimension "A"	Dimension "B"	Dimension "C"	Quantity Box
26MM Horizontal Tape, Ammo Pack	DO-41, MPG06	Pkg 3	9.7" (247MM)	1.7 (44MM)	"3.7" (95MM)	3.0K
	DO204AP, DO-15					1.5K
52MM Horizontal Tape, Ammo Pack	DO204AP, DO-41	Pkg 23	10.0" (254MM)	3.1" (79MM)	4.3" (110MM)	3.0K
	DO15					2.0K
	DO201AD, G3, G4, GP20					1.0K
	P600					0.3K
Radial (Avisert, Panasert, Euroform) Tape, Ammo Pack	GP10-E, RGP10-E 0.25" (0.65MM) Lead Diameter Only	Pkg 8,9 12, 13, 16,17, 20, 21,41,43	13.4" (340MM)	1.8" (47MM)	7.9" (200MM)	2.5K

HORIZONTAL TAPE-REEL PACKAGING

Axial leaded devices are packed in accordance with EIA Standard RS-296-E and the diagrams given below which refer to these specifications.

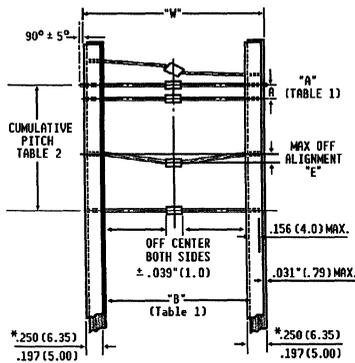
TABLE 1

COMPONENT CASE TYPE	UNITS PER REEL ea.	COMPONENT SPACING "A" FIG. 1		TAPE SPACING "B" FIG. 1		REEL DIMENSION "D" FIG. 2		MAX. OFF ALIGNMENT "E" FIG. 1		GROSS WEIGHT PER REEL	
		in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg.
1.5KA (PAR)	2000	.200	5.0	2.06	52.4	13.0	330	.047	1.2	7.1	3.2
DO15	4000	.200	5.0	2.06	52.4	13.0	330	.047	1.2	5.00	2.29
DO201AD	1400	.395	10.0	2.06	52.4	13.0	330	.047	1.2	4.9	2.22
DO204AP	4500	.200	5.0	2.06	52.4	13.0	330	.047	1.2	5.4	2.44
DO204MB	5000	.200	5.0	2.06	52.4	13.0	330	.047	1.2	4.6	2.07
DO41	5500	.200	5.0	2.06	52.4	13.0	330	.047	1.2	5.5	2.51
DFS Surface Mount	1500	.472	12.0	-	-	13.0	330	See Fig. 11		1.95	.885
G3/G4	1600/2000	.395	10.0	2.06	52.4	13.0	330	.047	1.2	5.2/4.4	2.36/2.02
GF1 Surface Mount	750/3200	.472	12.0	-	-	7/13.0	178/330	See Fig. 11		2.9/7.5	1.31/3.40
GL34 Surface Mount	2500	.157	4.0	—	—	7/13.0	178/330	See Fig. 11		.471	.214
GL41 Surface Mount	1500/5000	.157	4.0	—	—	7/13.0	178/330	See Fig. 11		.471/1.49	.214/68
GP10E Vertical	2500	.500	12.7	—	—	13.0	330	.079	2.0	3.0	1.34
GP10E Horizontal	5500	.200	5.0	2.06	52.4	13.0	330	.047	1.2	4.4	1.99
GP20	1400	.395	10.0	2.06	52.4	13.0	330	.047	1.2	4.9	2.22
MPG06	5500	.200	5.0	2.06	52.4	13.0	330	.047	1.2	3.8	1.71
P600	800	.395	10.0	2.06	52.4	13.0	330	.047	1.2	5.3	2.39
SMA Surface Mount	850/3500	.157	4.0	-	-	7.0/13.0	178/330	See Fig. 11		.11/1.47	.05/21
SMB Surface Mount	750/3200	.157	4.0	-	-	7.0/13.0	178/330	See Fig. 11		.31/1.46	.14/66
SMB Surface Mount	850/3500	.472	12.0	-	-	7.0/330	178/13.0	See Fig. 11		.40/2.42	.18/1.10

TABLE 2

Component Body Diameter	Components Spacing "A"(Lead to Lead)	Inside Tape Spacing "B"	Cumulative Pitch Tolerance
0mm to 5mm (0" to .197")	5.0mm+0.5mm (.197"+.020")	26mm+0.75mm (1.024" + .030)	Not to Exceed 1.5mm (.059") over 6 Consecutive Components
0mm to 5mm (0" to .197")	5.0mm + 0.5mm (.197" + .020")	52.4mm+1.5mm (2.062" + .059")	
5.01mm to 10mm (.197" to .394")	10mm + 0.5mm (.394" + .020")	52.4mm + 1.5mm (2.062" + .059")	

METRIC SPEC



*These are nominal values and have a ± .0157" (.40) tolerance range at each value **FIG. 1**

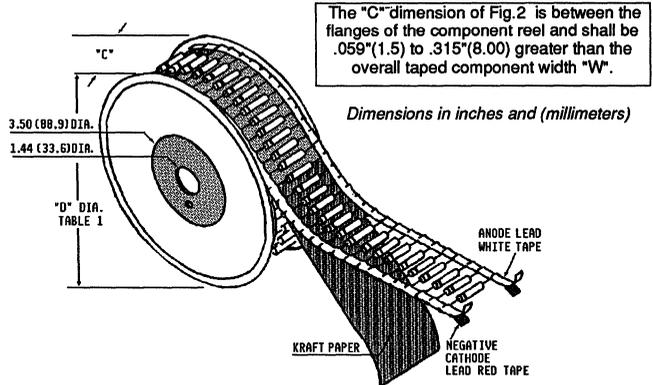


FIG. 2

GENERAL INSTRUMENT

PACKAGING FOR RADIAL TAPING

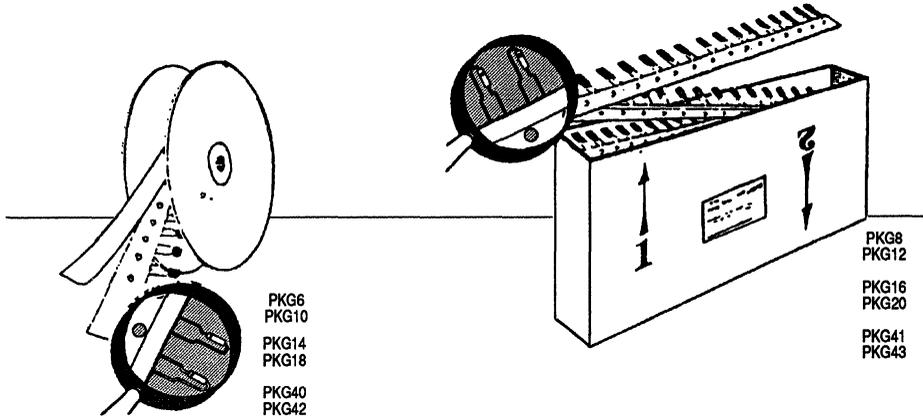


FIG.4

REEL PACKAGING

AMMO BOX PACKAGING

AVISERT

- PKG6
- PKG8
- PKG10
- PKG12

PANASERT

- PKG14
- PKG16
- PKG18
- PKG20

EUROFORM

- PKG40
- PKG41
- PKG42
- PKG43

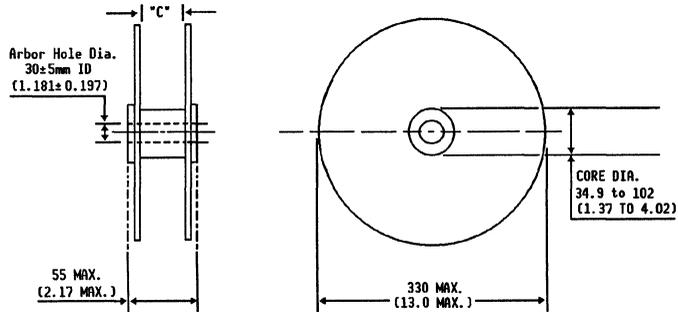


FIG. 5 - REEL DIMENSIONS

"C" Dimension between the reel flanges shall be governed by the overall width of the taped components and shall be 1.5mm(0.057) to 8.0mm(0.315") greater than the overall width

Package per EIA Standard RS-468-A. Available on reels or fan fold box (ammo pack).

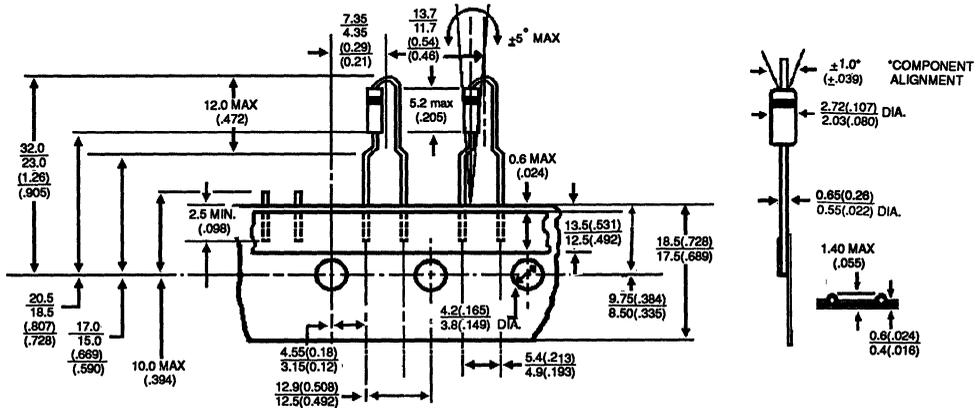
All dimensions in millimeters and (inches)

**GENERAL
INSTRUMENT**

RADIAL TAPE-REEL PACKAGING

All dimensions in millimeters and (inches)

FIG.6 - EUROFORM



Available for GP10 products only utilizing 0.65mm (0.25") diameter leads for Euroform Tape and Reeling by adding suffix "E" (GP10GE, 1N4004GPE). Lead coating is standard.

FIGURE 7 - PANASERT

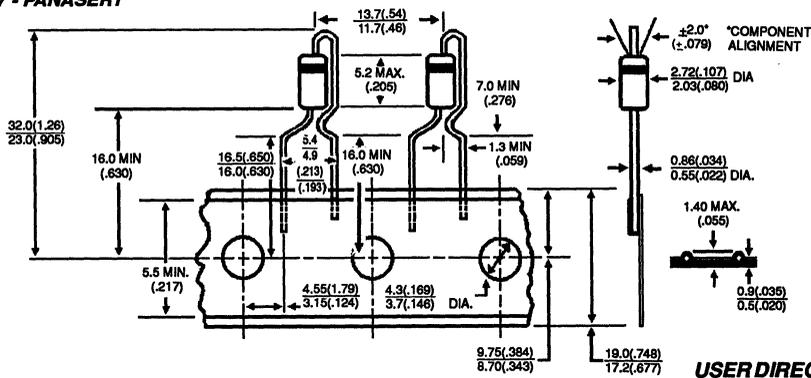
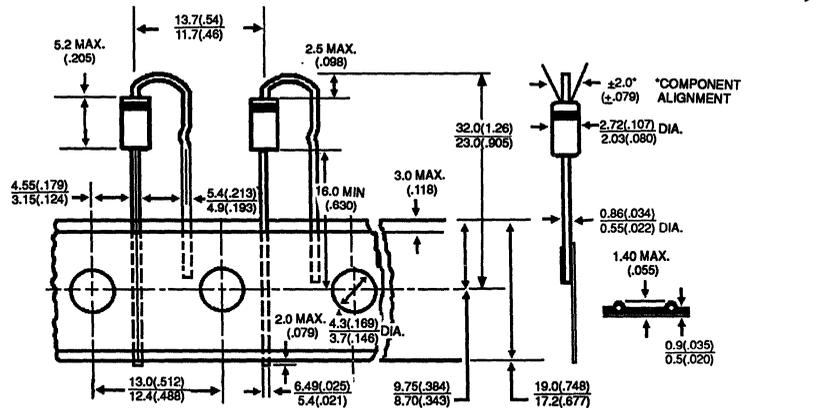


FIGURE 5 - AVISERT



Available only for DO-41 case style products utilizing 0.65mm (0.25") or 0.76 (.030) diameter leads for Panasert and Avisert Tape and Reeling. Lead coating is not available.

Standard polarity cathode oriented away from sprocket holes (Optional polarity cathode oriented toward sprocket holes)

SURFACE MOUNT TAPE / REEL PACKAGING

Packaged per E1A Standard 481-1 & -2

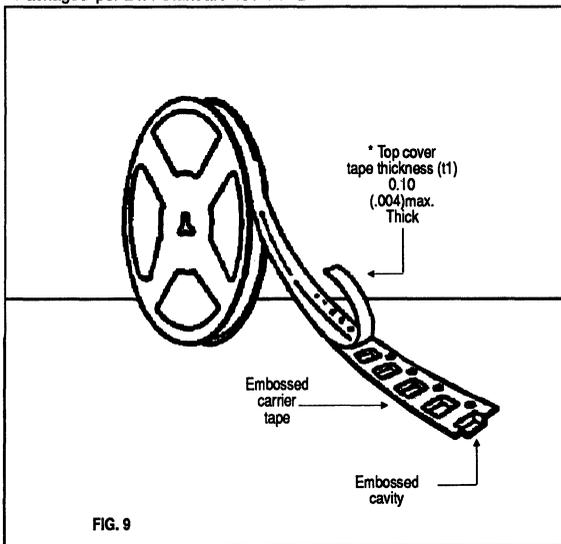


FIG. 9

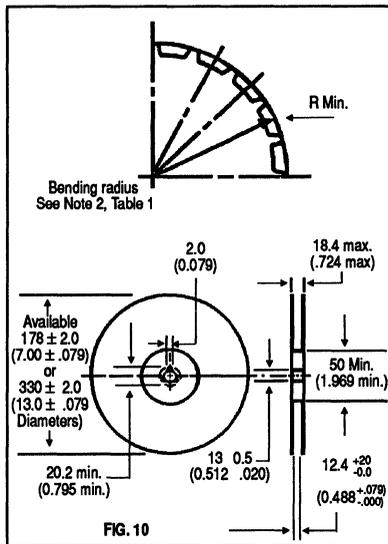


FIG. 10

8,12,16 MM Embossed Tape

TABLE 5

All Dimensions in Millimeters and (Inches)

	Tape Size	D	E	P ₀	t	Ao Bo Ko				Constant Dimensions	
	8,12,16 MM	1.5 ± .07 (.059)	1.75 ± 0.10 (.069 ± .004)	4.0 ± 1.0 (.157 ± .004)	0.40 (.016)	See Note 1 Table 2					
Product Type	Tape Size	Max. B ¹	Min. D ¹	F	Max. K	P2	Min. R	W	P	Variable Dimensions	
GL34	8MM	4.2 (.165)	1.0 (.39)	3.5 ± 0.051 (.138 ± .002)	2.4 (.094)	2.0 ± 0.051 (.079 ± .002)	25 (.984)	8.0 ± .30 (.315 ± .012)	4.0 ± 0.10 (1.57 ± .004)		
GL41	12MM	8.2 (.323)	1.5 (.059)	5.5 ± 0.051 (.217 ± .002)	4.5 (.177)			30 (1.81)	12.0 ± .30 (.472 ± .012)		8.0 ± .10 (.315 ± .004)
GF1					3.15 ± .10 (.124 ± .004)						
SMA					2.54 ± .10 (.100 ± .004)						
SMB					2.67 ± .10 (.105 ± .004)						
SMC	16MM	12.1 (.476)		7.5 ± 0.051 (.295 ± .002)	3.8 ± 0.07 (.150 ± .003)	4.0 ± 0.10 (.57 ± .004)		16.0 ± 0.2 (.630 ± .008)	12.0 ± 0.10 (.472 ± .004)		
DFS											

NOTES: 1. Ao Bo Ko are determined by component size. The clearance between the component and the cavity must be within 0.05 min. to 0.5 max. for 8MM tape and 0.05 min. to 0.650 max. for 12MM tape. In addition, the components cannot rotate more than 20 within the determined cavity.
2. Tape and components will pass around radius "R" without damage.

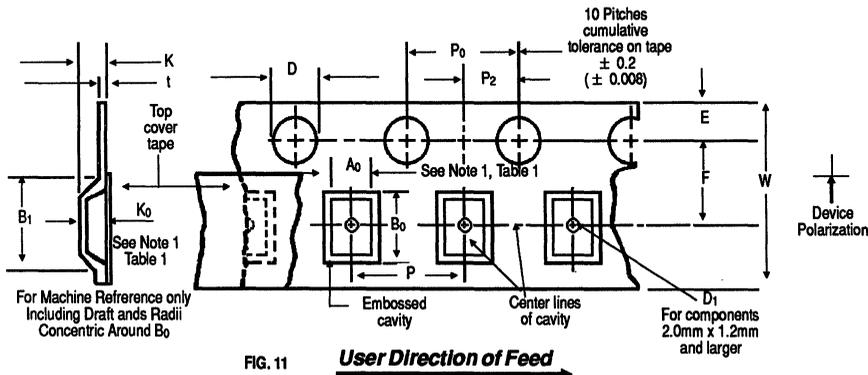


FIG. 11

User Direction of Feed →

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