

DATA SHEET

BF992; BF992R Silicon N-channel dual-gate MOS-FETs

Product specification
Supersedes data of April 1991
File under Discrete Semiconductors, SC07

1996 Jul 30

Silicon N-channel dual-gate MOS-FETs

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APPLICATIONS

- VHF applications such as VHF television tuners and FM tuners with 12 V supply voltage. The device is also suitable for use in professional communications equipment.

DESCRIPTION

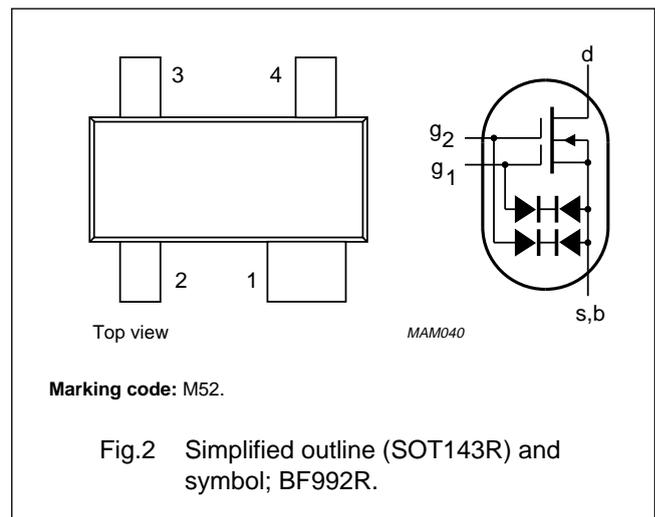
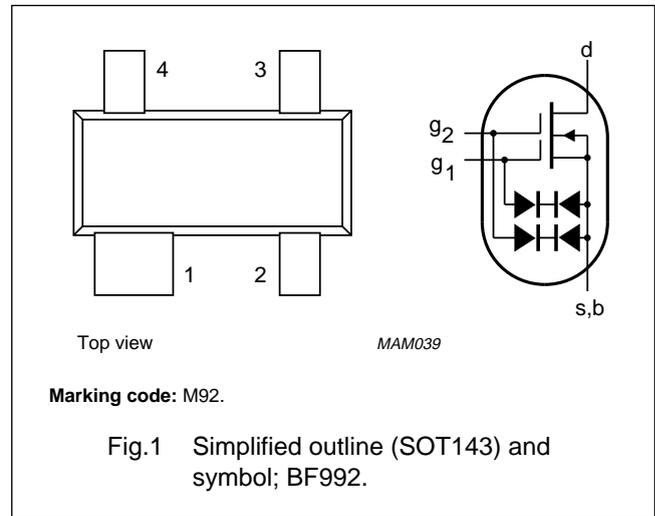
Depletion type field-effect transistor in a plastic micro-miniature SOT143 or SOT143R package with source and substrate interconnected.

The transistors are protected against excessive input voltage surges by integrated back-to-back diodes between gates and source.

CAUTION
The device is supplied in an antistatic package. The gate-source input must be protected against static discharge during transport or handling.

PINNING

PIN	SYMBOL	DESCRIPTION
1	s,b	source
2	d	drain
3	g ₂	gate 2
4	g ₁	gate 1



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{DS}	drain-source voltage (DC)		–	20	V
I_D	drain current (DC)		–	40	mA
P_{tot}	total power dissipation	$T_{amb} = 60\text{ °C}$	–	200	mW
$ Y_{fs} $	forward transfer admittance	$f = 1\text{ kHz}; I_D = 15\text{ mA}; V_{DS} = 10\text{ V}; V_{G2-S} = 4\text{ V}$	25	–	mS
C_{ig1-s}	input capacitance at gate 1	$f = 1\text{ MHz}; I_D = 15\text{ mA}; V_{DS} = 10\text{ V}; V_{G2-S} = 4\text{ V}$	4	–	pF
C_{rs}	reverse transfer capacitance	$f = 1\text{ MHz}; I_D = 15\text{ mA}; V_{DS} = 10\text{ V}; V_{G2-S} = 4\text{ V}$	30	–	fF
F	noise figure	$G_S = 2\text{ mS}; I_D = 15\text{ mA}; V_{DS} = 10\text{ V}; V_{G2-S} = 4\text{ V}; f = 200\text{ MHz}$	1.2	–	dB
T_j	operating junction temperature		–	150	°C

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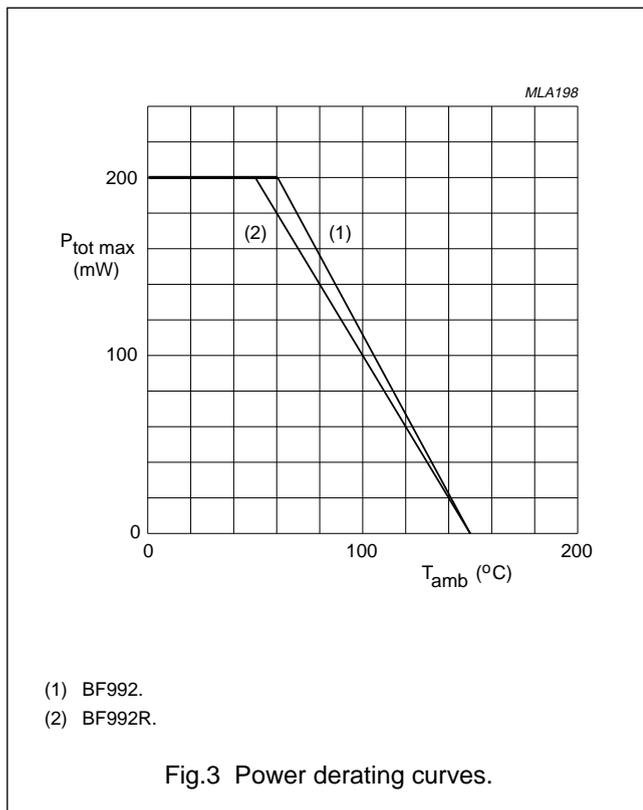
LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	drain-source voltage		–	20	V
I_D	drain current		–	40	mA
$\pm I_{G1}$	gate 1 current		–	10	mA
$\pm I_{G2}$	gate 2 current		–	10	mA
P_{tot}	total power dissipation	up to $T_{amb} = 60\text{ }^\circ\text{C}$; see Fig.3; note 1	–	200	mW
T_{stg}	storage temperature		–65	+150	$^\circ\text{C}$
T_j	operating junction temperature		–	150	$^\circ\text{C}$

Note

1. Device mounted on a ceramic substrate, 8 mm × 10 mm × 0.7 mm.



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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient in free air BF992 BF992R	note 1	460 500	K/W K/W

Note

1. Device mounted on a ceramic substrate, 8 mm × 10 mm × 0.7 mm.

STATIC CHARACTERISTICS

$T_j = 25\text{ °C}$; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$\pm V_{(BR)G1-SS}$	gate 1-source breakdown voltage	$V_{G2-S} = V_{DS} = 0$; $I_{G1-SS} = \pm 10\text{ mA}$	8	20	V
$\pm V_{(BR)G2-SS}$	gate 2-source breakdown voltage	$V_{G1-S} = V_{DS} = 0$; $I_{G2-SS} = \pm 10\text{ mA}$	8	20	V
$-V_{(P)G1-S}$	gate 1-source cut-off voltage	$V_{G2-S} = 4\text{ V}$; $V_{DS} = 10\text{ V}$; $I_D = 20\text{ }\mu\text{A}$	0.2	1.3	V
$-V_{(P)G2-S}$	gate 2-source cut-off voltage	$V_{G1-S} = 0$; $V_{DS} = 10\text{ V}$; $I_D = 20\text{ }\mu\text{A}$	0.2	1.1	V
$\pm I_{G1-SS}$	gate 1 cut-off current	$V_{G2-S} = V_{DS} = 0$; $V_{G1-S} = \pm 7\text{ V}$	–	25	nA
$\pm I_{G2-SS}$	gate 2 cut-off current	$V_{G1-S} = V_{DS} = 0$; $V_{G2-S} = \pm 7\text{ V}$	–	25	nA

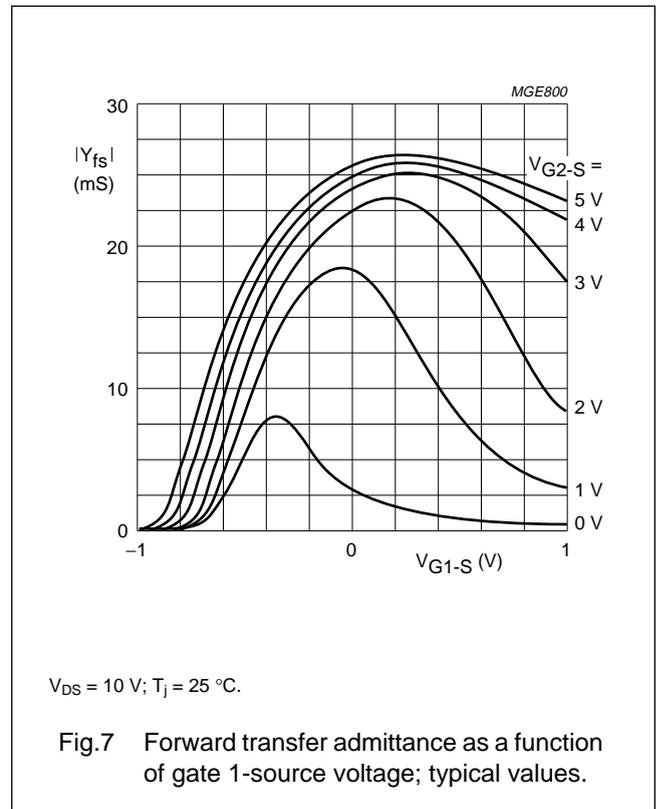
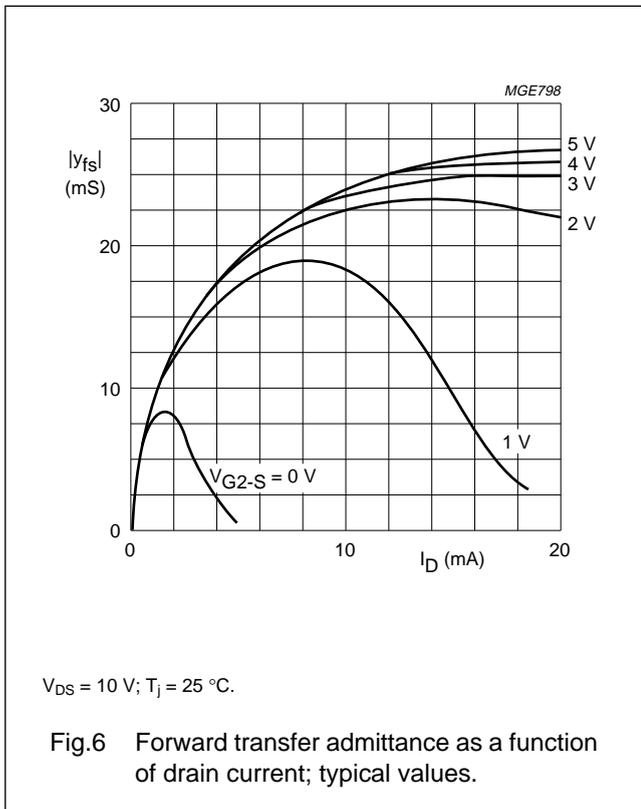
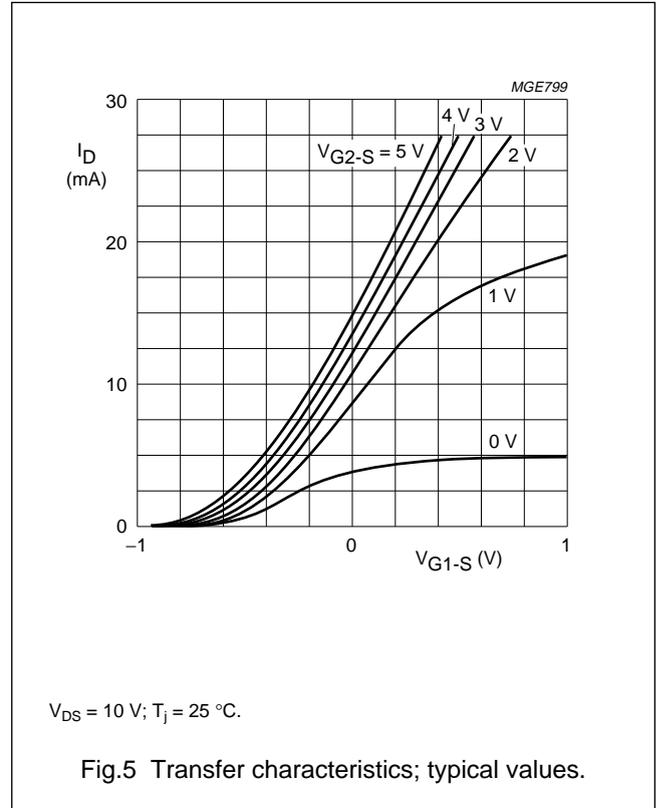
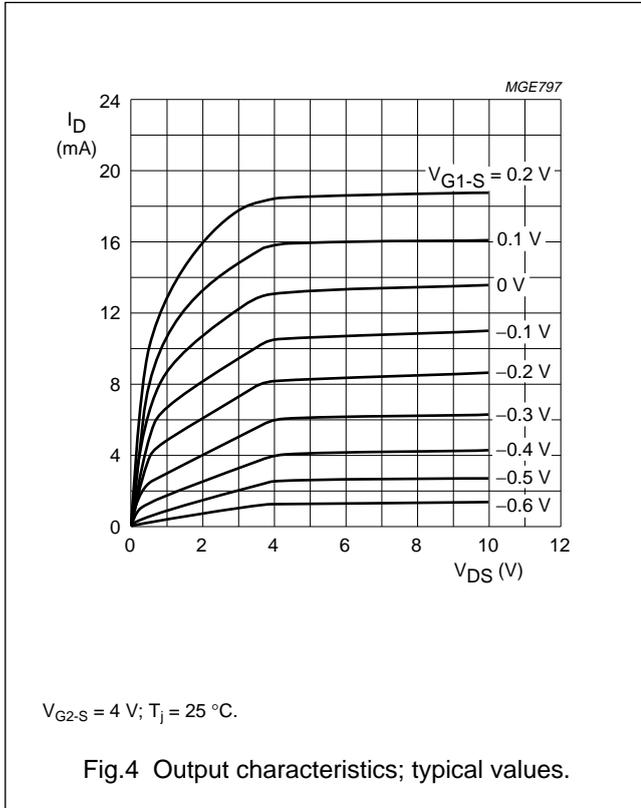
DYNAMIC CHARACTERISTICS

Common source; $T_{amb} = 25\text{ °C}$; $V_{DS} = 10\text{ V}$; $V_{G2-S} = 4\text{ V}$; $I_D = 15\text{ mA}$; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$ y_{fs} $	forward transfer admittance		20	25	–	mS
C_{ig1-s}	input capacitance at gate 1	$f = 1\text{ MHz}$	–	4	–	pF
C_{ig2-s}	input capacitance at gate 2	$f = 1\text{ MHz}$	–	1.7	–	pF
C_{os}	output capacitance	$f = 1\text{ MHz}$	–	2	–	pF
C_{rs}	reverse transfer capacitance	$f = 1\text{ MHz}$	–	30	40	fF
F	noise figure	$f = 200\text{ MHz}$; $G_S = 2\text{ mS}$	–	1.2	–	dB

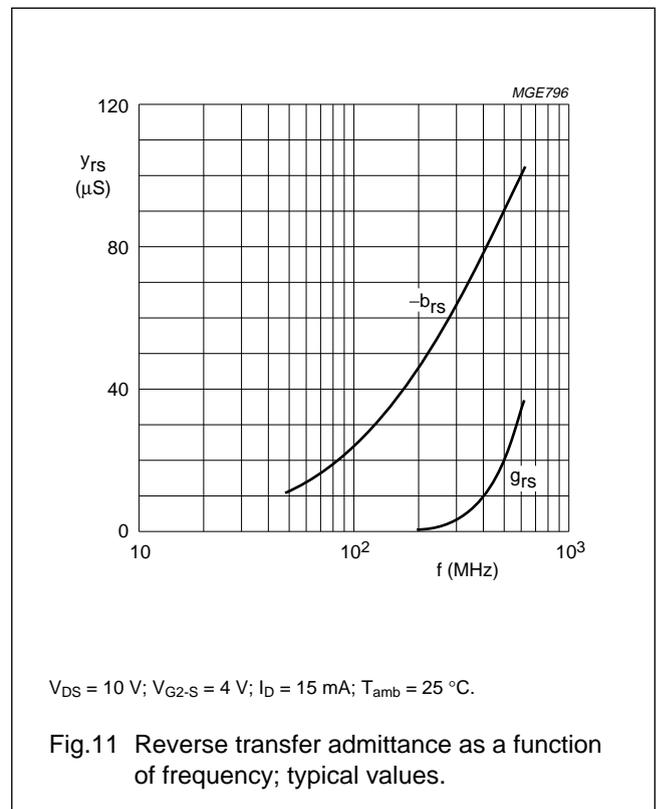
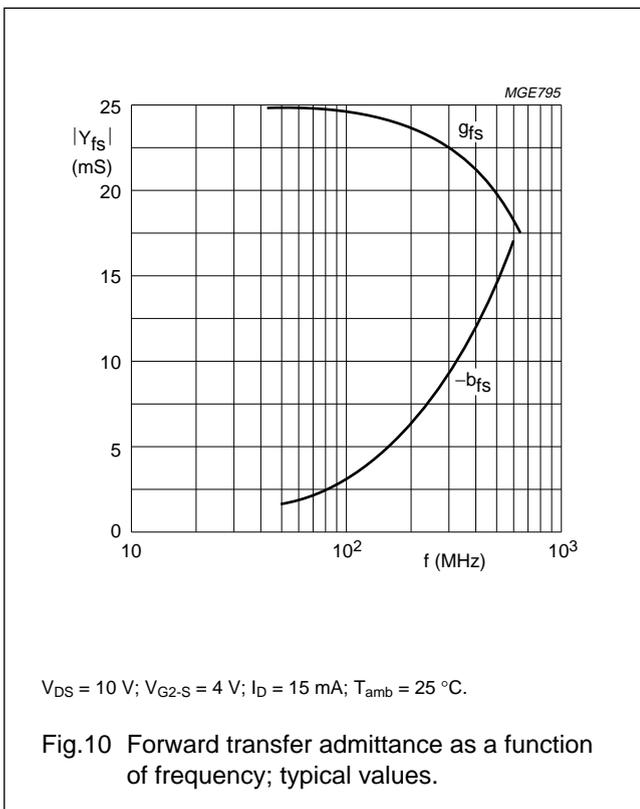
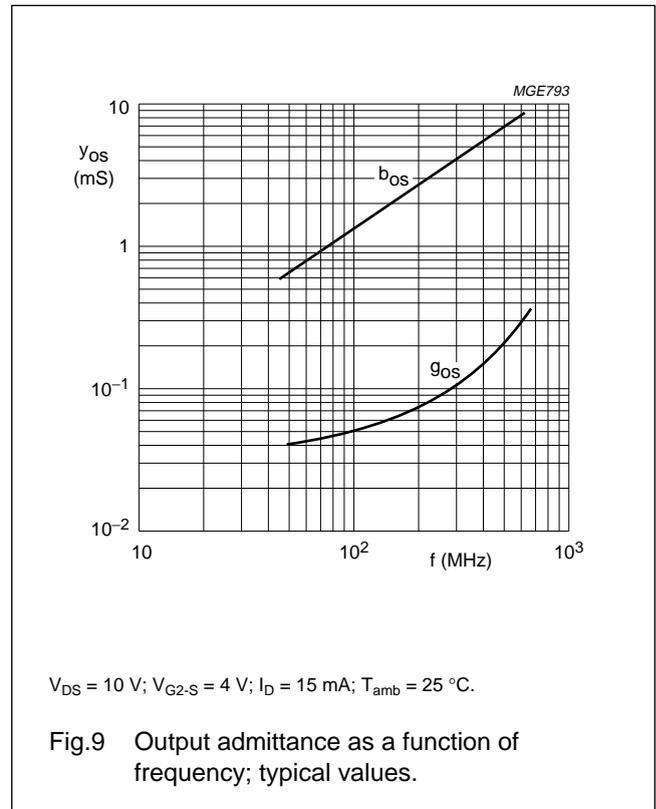
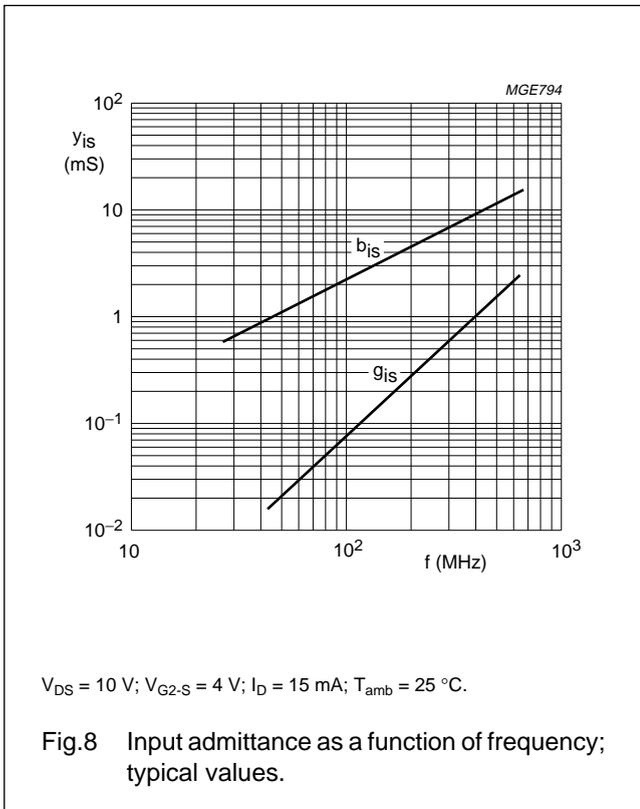
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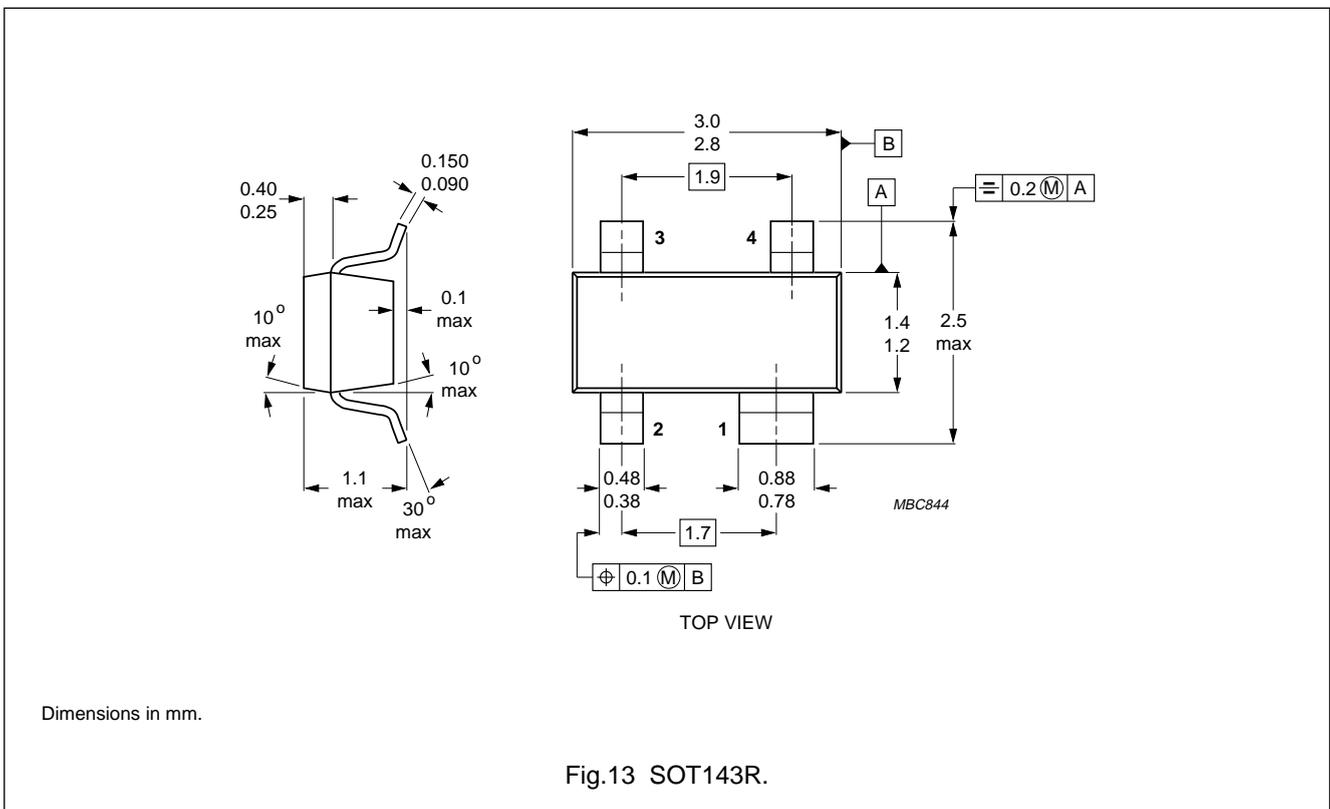
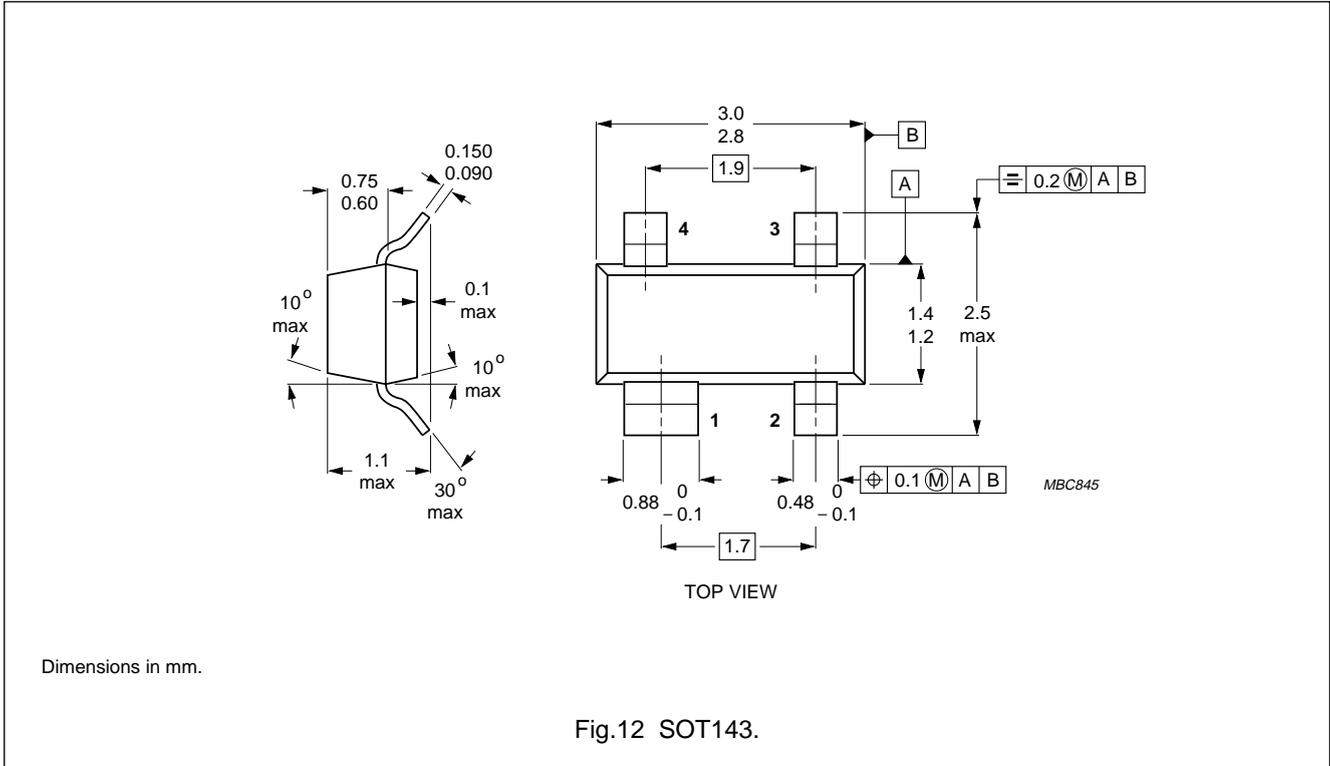
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PACKAGE OUTLINES



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DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.