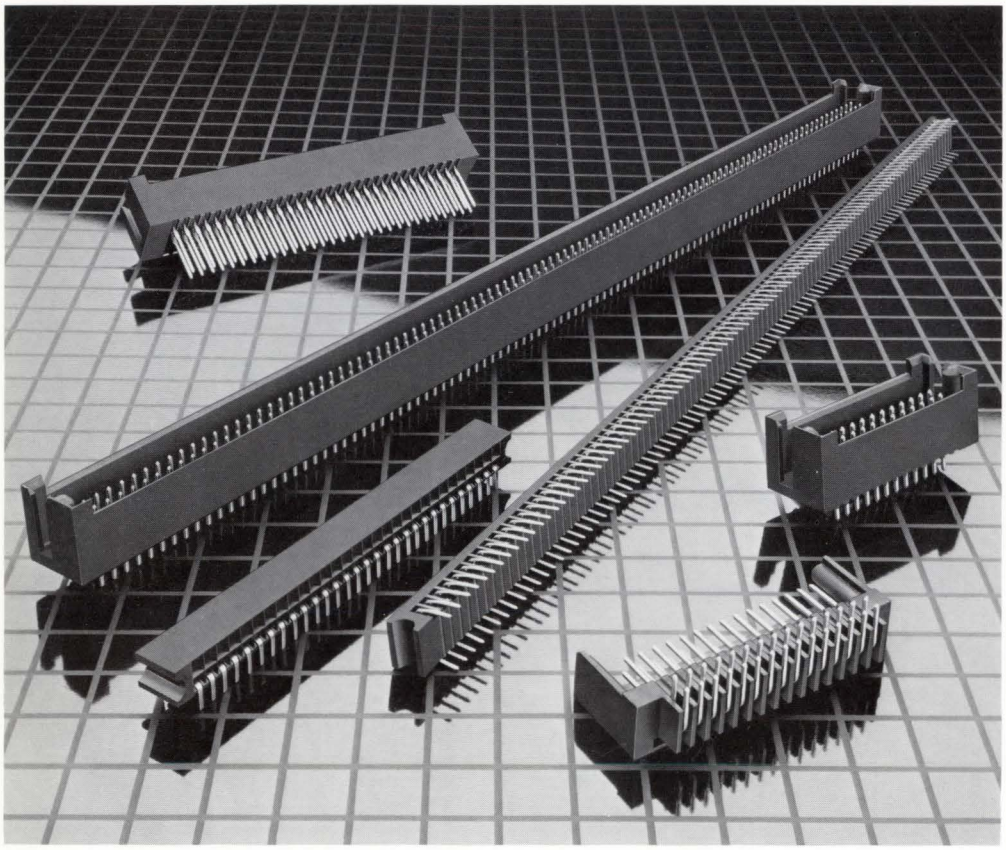
AMPMODU Two-Piece Printed Circuit Board Connectors

Catalog
80-583
Issued 10-85



AMPMODU Two-Piece Printed Circuit Board Connectors are designed to reliably and economically meet the packaging and interconnection requirements of today's sophisticated electronic equipment. This double row system is comprised of straight and right angle post header assemblies and mating horizontal receptacles to provide mother/daughter board connections.

Header assemblies employ .025 (0.64) square solder posts for conventional solder connections to PC board, or .025 (0.64) square ACTION PIN posts which allow header assemblies to be press fitted into PC boards without the need for soldering. Low insertion forces inherent in this system permit high pin counts, while less sensitivity to board thickness assures fewer board rejects due to thickness variations.

Header assemblies are available in a variety of popular sizes, with posts preloaded on .100 × .100 (2.54 × 2.54) centers. The ACTION PIN posts and solder posts are made of phosphor bronze and offer a choice of selective gold or duplex plating. Housings are made of glass-filled thermoplastic and are fully shrouded to protect the pins. They also have slotted ends for polarization and built-in guide pins which engage before the contacts for easy, accurate mating with the receptacle assemblies.

Receptacle assemblies feature preloaded AMPMODU horizontal board mounted receptacles. These time-proven contacts are made of phosphor bronze, and employ dual cantilever beams and built-in anti-overstress to provide highly reliable post to receptacle connections. Closed entry housings provide a lead-in ramp for positive mating of posts and receptacles, and incorporate slots which engage the header assembly guide pins before actual contact engagement. Receptacle assemblies are available with polyphenylene sulfide housings and duplex plated contacts.

Features

- Two-Piece reliability
- 12 thru 200 positions
- Available with press fit posts for backplane interconnections or with standard .025 (0.64) square solder posts
- Short signal path for VLSI applications
- Built-in guides assure accurate header and receptacle alignment before contact engagement
- Closed entry receptacle housings provide lead-in ramp for positive mating of contacts
- Shrouded header assemblies provide full pin protection
- Slotted ends of header assemblies provide polarization
- Post contacts are repairable
- Simple seating tooling for headers with ACTION PIN posts

Technical Documents

AMP Product Specification #108-25017

AMP Application Specification #114-9009

AMP Application Instruction Sheets:

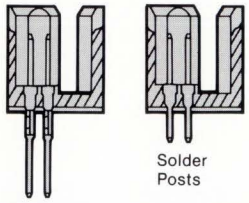
IS 9054 – Seating tools
IS 9185 – ACTION PIN Contact front extraction tool
IS 2636 – ACTION PIN Contact rear extraction and replacement tool

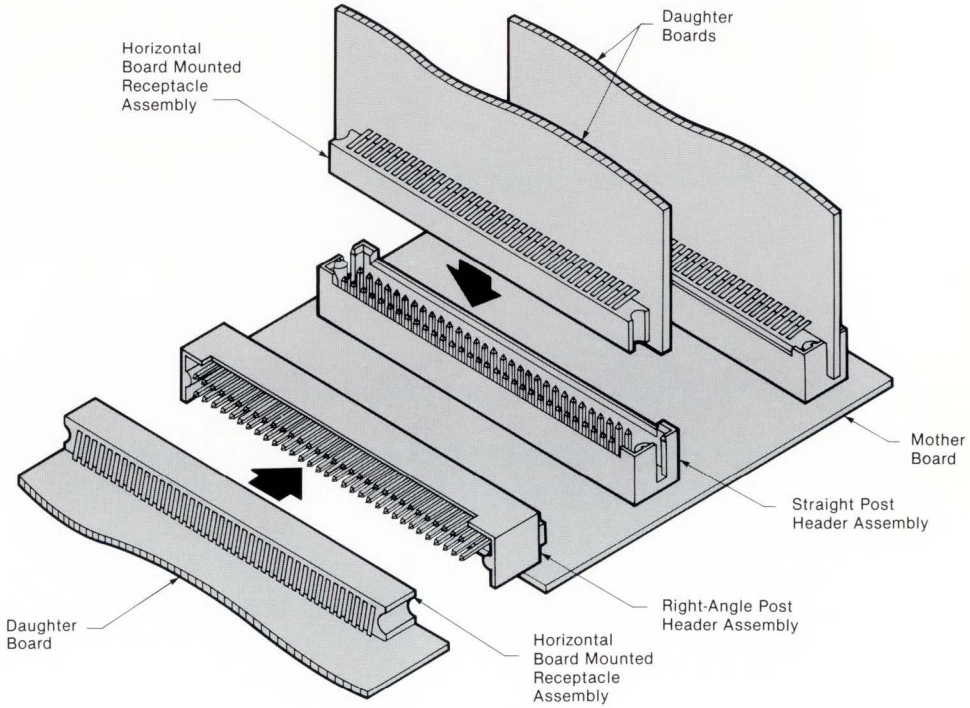
Dimensioning:
All dimensions in inches and millimetres. Values in brackets are metric equivalents.

Specifications subject to change. Consult AMP Incorporated for latest design specifications.

AMPMODU Two-Piece Interconnection System

Dimensioning:
All dimensions in inches and millimetres.
Values in brackets are metric equivalents.





Specifications

Current Rating:
3 amp max. for single contact; 2 amp max. per contact for fully energized connector

Voltage Rating:
250 VAC

Dielectric Rating:
750 VAC between contacts for one minute

Termination Resistance:
12 milliohm max. at 100 milliamps test current, and 50 millivolts open circuit voltage

Insulation Resistance:
10^3 megaohms after temperature/humidity cycling

Temperature Rating:
−65°C to +105°C (glass-filled thermoplastic housings)
−65°C to +125°C (polyphenelyne sulfide housings)

Durability:
200 cycles for 30 micro inch gold plating; 75 cycles for 15 micro inch gold plating

Mating Force:
4 oz. average per contact

Unmating Force:
.75 oz. minimum per contact after 3 mating cycles

Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476

CSA Certified, File No. LR 16455

AMP INCORPORATED, HARRISBURG, PA 17105 • PHONE: 717-564-0100 TWX: 510-657-4110

Specifications for ACTION PIN Contacts

Dimensioning:
Unless otherwise noted, dimensions are in inches and millimetres. Values in brackets are millimetres.

Chart contains dimensions in inches over millimetres.

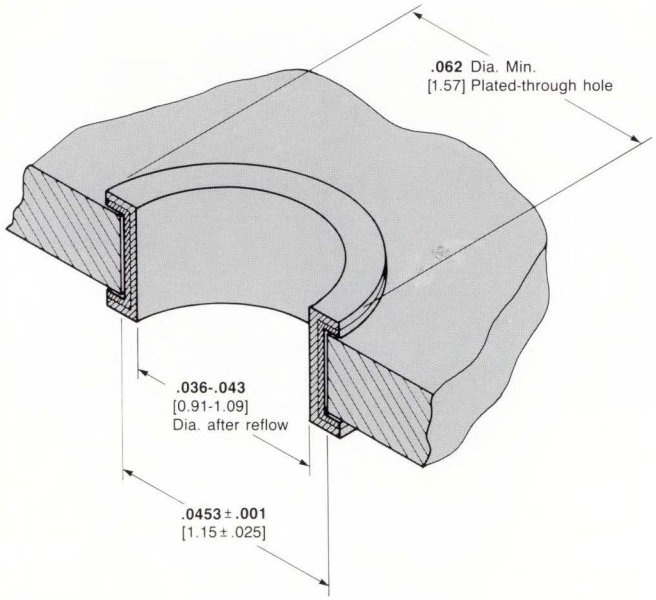
ACTION PIN posts make a gas-tight, press-fit connection when properly applied in plated-through holes. Proper hole diameters and plating thicknesses must be maintained to assure optimal performance.

No damage to plated-through holes

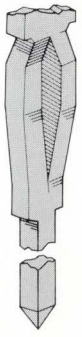
Rupturing just one layer of a pc board can render the board useless. The fact that there are frequently as many as 10,000 plated-through holes in a multilayer board underlies the importance of using a pin-joining method which is inherently rupture-free.

Relaxed tolerances

ACTION PIN contacts allow printed circuit panels to be processed more economically by permitting greater tolerance in hole size. Finished plated-through hole diameters ranging from .036 to .043 [0.91 to 1.09] for press fit are acceptable, as illustrated at right.



Plated-through hole dimensions



ACTION PIN Contact

Repairable

As the photo shows, there is no broaching of the walls of plated-through holes with ACTION PIN contacts. Damaged pins can be removed and replaced several times without sacrificing mechanical or electrical performance.

Gas-tight, stored-energy connection

The spring properties of the ACTION PIN contact assure a constant supply of stored energy to keep the pin securely in the hole and to keep the electrical contact between the pin and the hole wall gas tight.

Multiple insertion

Insertion forces significantly lower than interference-fit pins allows mass insertion of ACTION PIN contacts with a simple insertion tool. ACTION PIN contacts require an insertion force of less than 40 lb [177.9 N] per contact.

For more information on AMP ACTION PIN Contacts request specification 108-26003.

Hole Type	Drill Size	Drilled Hole Dia. ± .0010 [± 0.025]	Plating Thickness		Hole Diameter		Copper Hardness (Knoop)	Min. Pad Dia.
			Copper	Tin/Lead	After Plating	After Reflow		
Plated-Through	1.15 mm	**.0453** 1.15	**.001-.003** 0.03-0.08	**.0003** 0.008 Min.	**.037-.043** 0.94-1.09	**.036-.043** 0.91-1.09	150 Max.	**.062** 1.57
Non-Plated-Through	1.15 mm	**.0453** 1.15	–	–	–	–	–	**.065** 1.65

Header Assemblies
Straight Post

Dimensioning:
All dimensions in inches and millimetres. Value in brackets are metric equivalents.

Chart contains dimensions in inches over millimetres.

All dimensions shown for reference purposes only.

Solder Post and ACTION PIN contacts (with Pin Protection and Guide Pins)

Material:

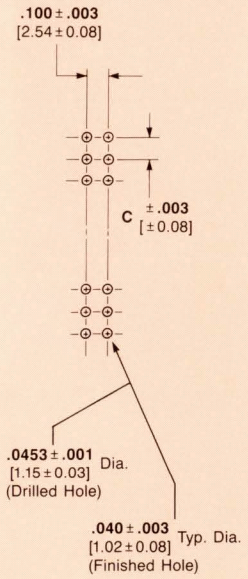
Housing—Glass Filled Thermoplastic, Flame Retardant

Contacts—Phosphor Bronze, plated as follows:

A—Duplex plated .000015 [0.00038] gold on mating end, .000100-.000200 [0.00254-0.00508] bright tin-lead on termination end, with entire contact underplated .000050 [0.00127] nickel.

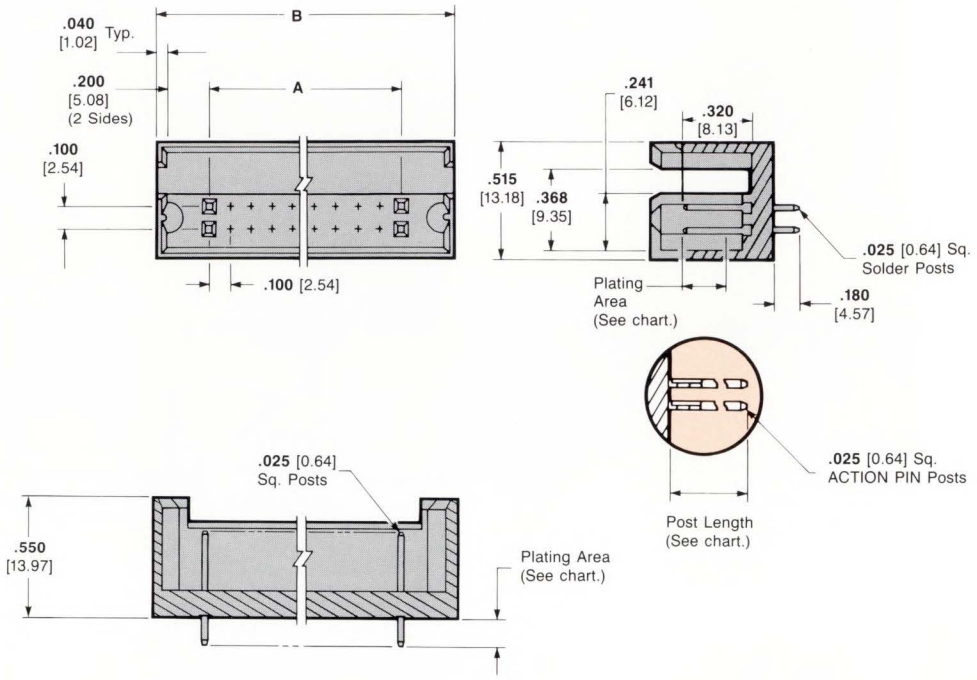
B—Duplex plated .000030 [0.00076] gold on mating end, .000100-.000200 [0.00254-0.00508] bright tin-lead on termination end, with entire contact underplated .000050 [0.00127] nickel.

C—Selectively plated gold flash over .000050 [0.00127] nickel on entire contact, with additional .000030 [0.00076] gold on mating end and .000015 [0.00038] gold on termination end.



Recommended Pc Board Hole Layout

C—Hole centerline to be **.100** [2.54]; **± .003** [± 0.08] tolerances not to accumulate within one connector pattern.



No. of Pos.	Dimensions A	Dimensions B	Header Assembly Part No. with .180 Solder Posts Plating A	with .180 Solder Posts Plating B	With ACTION PIN Posts Post Length	With ACTION PIN Posts Plating A	With ACTION PIN Posts Plating B	With ACTION PIN Posts Plating C
12	.500 12.7	.980 24.89	102567-1	102692-1	.250 6.35	103291-4	102690-1	–
			–	–	.480 12.19	533724-1	102691-1	102666-1
14	.600 15.24	1.080 27.43	2-102567-3	2-102692-5	.250 6.35	103291-3	2-102690-4	–
			–	–	.480 12.19	533724-2	2-102691-4	2-102666-2
16	.700 17.78	1.180 29.97	1-102567-8	1-102692-5	.250 6.35	103291-5	1-102690-4	–
			–	–	.480 12.19	533724-3	1-102691-2	1-102666-0
20	.900 22.86	1.380 35.03	1-102567-1	1-102692-6	.250 6.35	103291-6	1-102690-3	–
			–	–	.480 12.19	533724-4	1-102691-3	1-102666-2
24	1.100 27.94	1.580 40.13	102567-2	102692-2	.250 6.35	103291-7	102690-2	–
			–	–	.480 12.19	533724-5	102691-2	102666-2
30	1.400 35.56	1.880 47.75	1-102567-3	1-102692-7	.250 6.35	103291-8	1-102690-5	–
			–	–	.480 12.19	533724-6	1-102691-4	1-102666-3
36	1.700 43.18	2.180 55.37	102567-3	102692-3	.250 6.35	103291-9	102690-3	–
			–	–	.480 12.19	533724-7	102691-3	102666-3
40	1.900 48.26	2.380 60.45	1-102567-2	1-102692-3	.250 6.35	103291-2	1-102690-6	–
			–	–	.480 12.19	533724-8	1-102691-5	1-102666-4
44	2.100 53.34	2.580 65.53	2-102567-4	2-102692-6	.250 6.35	2-103291-5	2-102690-5	–
			–	–	.480 12.19	2-533724-5	2-102691-5	2-102666-5
50	2.400 60.96	2.880 73.15	102567-6	102692-4	.250 6.35	1-103291-0	102690-4	–
			–	–	.480 12.19	533724-9	102691-4	102666-4
60	2.900 73.66	3.380 85.85	102567-4	102692-5	.250 6.35	1-103291-1	102690-5	–
			–	–	.480 12.19	1-533724-0	102691-5	102666-5

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Header Assemblies
Straight Post

(continued)

Dimensioning:
All dimensions in inches and millimetres. Value in brackets are metric equivalents.

Chart contains dimensions in inches over millimetres.

All dimensions shown for reference purposes only.

ACTION PIN Replacement Contact Part Numbers

.250 [6.35] Post Length
Plating A 102824-9
Plating B 1-102824-0

.480 [12.19] Post Length
Plating A 102824-6
Plating B 102824-2
Plating C 102824-3

.680 [17.27] Post Length
Plating C 102824-7

No. of Pos.	Dimensions A	Dimensions B	Header Assembly Part No. with .180 Solder Posts Plating A	with .180 Solder Posts Plating B	With ACTION PIN Posts Post Length	With ACTION PIN Posts Plating A	With ACTION PIN Posts Plating B	With ACTION PIN Posts Plating C
70	**3.400** 86.36	**3.880** 98.55	1-102567-0	1-102692-4	**.250** 6.35	1-103291-2	1-102690-7	–
			–	–	**.480** 12.19	1-533724-1	1-102691-6	1-102666-5
72	**3.500** 88.9	**3.980** 101.09	1-102567-6	1-102692-8	**.250** 6.35	1-103291-3	1-102690-8	–
			–	–	**.480** 12.19	1-533724-2	1-102691-7	1-102666-6
80	**3.900** 99.06	**4.380** 111.25	102567-8	102692-6	**.250** 6.35	1-103291-4	102690-6	–
			–	–	**.480** 12.19	1-533724-3	102691-6	102666-6
86	**4.200** 106.68	**4.680** 118.87	1-102567-7	1-102692-9	**.250** 6.35	1-103291-5	1-102690-9	–
			–	–	**.480** 12.19	1-533724-4	1-102691-8	1-102666-7
90	**4.400** 111.76	**4.880** 123.95	1-102567-4	1-102692-2	**.250** 6.35	1-103291-6	1-102690-1	–
			–	–	**.480** 12.19	1-533724-5	1-102691-9	1-102666-8
94	**4.600** 116.84	**5.080** 129.03	2-102567-5	2-102692-7	**.250** 6.35	1-103291-7	2-102690-3	–
			–	–	**.480** 12.19	1-533724-6	2-102691-2	2-102666-3
96	**4.700** 119.38	**5.180** 131.57	102567-5	102692-7	**.250** 6.35	1-103291-8	102690-7	–
			–	–	**.480** 12.19	1-533724-7	102691-7	102666-7
100	**4.900** 124.46	**5.380** 136.55	102567-9	102692-8	**.250** 6.35	1-103291-9	102690-8	–
			–	–	**.480** 12.19	1-533724-8	102691-8	102666-8
			–	–	**.680** 17.27	–	–	102777-3
110	**5.400** 137.16	**5.880** 149.35	1-102567-5	1-102692-0	**.250** 6.35	2-103291-0	2-102690-0	–
			–	–	**.480** 12.19	1-533724-9	2-102691-0	1-102666-9
120	**5.900** 149.86	**6.380** 162.05	102567-7	102692-9	**.250** 6.35	2-103291-1	102690-9	–
			–	–	**.480** 12.19	2-533724-0	102691-9	1-102666-1
			–	–	**.680** 17.27	–	–	102777-1
128	**6.300** 160.02	**6.780** 172.21	2-102567-6	2-102692-2	**.250** 6.35	2-103291-6	2-102690-6	–
			–	–	**.480** 12.19	2-533724-6	2-102691-6	2-102666-6
130	**6.400** 162.56	**6.880** 174.75	1-102567-9	2-102692-0	**.250** 6.35	2-103291-2	1-102690-2	–
			–	–	**.480** 12.19	2-533724-1	1-102691-1	102666-9
			–	–	**.680** 17.27	–	–	102777-2
140	**6.900** 175.26	**7.380** 187.45	2-102567-0	2-102692-1	**.250** 6.35	2-103291-3	2-102690-1	–
			–	–	**.480** 12.19	2-533724-2	1-102691-0	2-102666-0
148	**7.300** 185.42	**7.780** 197.61	2-102567-7	2-102692-3	**.250** 6.35	2-103291-7	2-102690-7	–
			–	–	**.480** 12.19	2-533724-7	2-102691-7	2-102666-7
160	**7.900** 200.66	**8.380** 212.85	2-102567-2	2-102692-8	**.250** 6.35	2-103291-8	2-102690-8	–
			–	–	**.480** 12.19	2-533724-8	2-102691-8	2-102666-8
180	**8.900** 226.06	**9.380** 238.25	2-102567-8	2-102692-4	**.250** 6.35	2-103291-4	2-102690-2	–
			–	–	**.480** 12.19	2-533724-3	2-102691-3	2-102666-4
200	**9.900** 251.46	**10.380** 263.65	2-102567-1	1-102692-1	**.250** 6.35	103291-1	1-102690-0	–
			–	–	**.480** 12.19	2-533724-4	2-102691-1	2-102666-1

Notes: 1. Other header sizes can be made available upon request.
2. Headers with ACTION PIN posts are for use with **.093** (2.36) nominal or thicker PC boards. For headers compatible with **.062** (1.58) nominal or thicker boards, consult AMP Incorporated.
3. Application tooling for installing headers with ACTION PIN posts is shown on Page 8.
4. Headers with make first/break last contacts can be made available upon request.
5. Solder post assemblies with board retention legs can be made available upon request.

Header Assemblies, Right-Angle Post

Dimensioning:
All dimensions in inches and millimetres. Value in brackets are metric equivalents.

Chart contains dimensions in inches over millimetres.

All dimensions shown for reference purposes only.

Card Extender (with Pin Protection and Guide Pins)

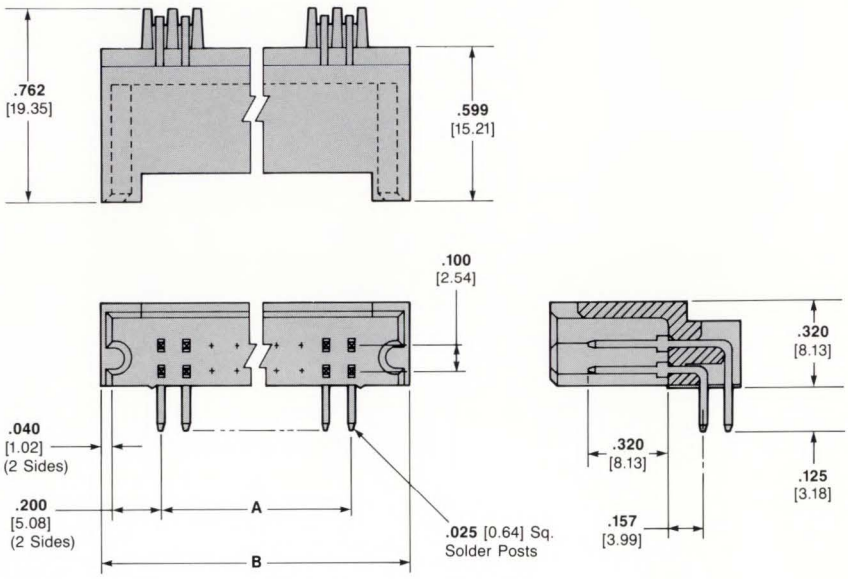
Material and Finish:

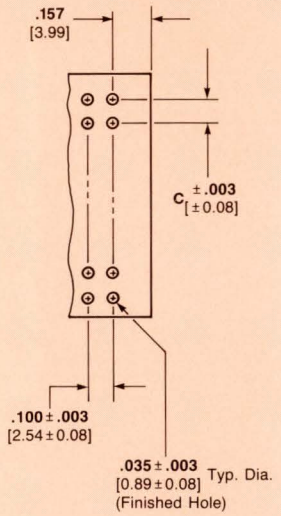
Housing—Glass Filled Thermoplastic, Flame Retardant

Contacts—Phosphor Bronze, duplex plated as follows:

A—.000015 [0.00038] gold on mating end, .000100-.000200 [0.00254-0.00508] bright tin-lead on solder tail, with entire contact underplated .000050 [0.00127] nickel.

B—.000030 [0.00076] gold on mating end, .000100-.000200 [0.00254-0.00508] bright tin-lead on solder tail, with entire contact underplated .000050 [0.00127] nickel.





Recommended Pc Board Hole Layout

C—Hole centerline to be **.100** [2.54]; **±.003** [±0.08] tolerances not to accumulate within one connector pattern.

No. of Pos.	Dimensions		Header Assembly Part No.	
	A	B	Plating A	Plating B
12	**.500** 12.7	**.980** 24.89	102589-8	1-102802-2
16	**.700** 17.78	**1.180** 29.97	1-102589-6	1-102802-4
20	**.900** 22.86	**1.380** 35.05	1-102589-2	1-102802-5
24	**1.100** 27.94	**1.580** 40.13	102589-6	1-102802-3
30	**1.400** 35.56	**1.880** 47.75	102589-4	1-102802-6
36	**1.700** 43.18	**2.180** 55.37	102589-2	102802-3
40	**1.900** 48.26	**2.380** 60.45	1-102589-3	102802-8
50	**2.400** 60.96	**2.880** 73.15	102589-5	102802-4
60	**2.900** 73.66	**3.380** 85.85	102589-7	102802-9
70	**3.400** 86.36	**3.880** 98.55	1-102589-0	102802-7
72	**3.500** 88.9	**3.980** 101.09	1-102589-7	1-102802-7
80	**3.900** 99.06	**4.380** 111.25	102589-1	102802-5
86	**4.200** 106.68	**4.680** 118.87	1-102589-8	1-102802-8
90	**4.400** 111.76	**4.880** 123.95	1-102589-4	1-102802-0
96	**4.700** 119.38	**5.180** 131.57	102589-9	1-102802-1
100	**4.900** 124.46	**5.380** 136.65	102589-3	102802-6
110	**5.400** 137.16	**5.880** 149.35	1-102589-5	102802-1
120	**5.900** 149.86	**6.380** 162.05	1-102589-1	102802-2
130	**6.400** 162.56	**6.880** 174.75	1-102589-9	1-102802-9
140	**6.900** 175.26	**7.380** 187.45	2-102589-0	2-102802-0

Note: Other header sizes can be made available upon request.

Closed Entry Receptacle Assemblies Board Mounted

Dimensioning:
All dimensions in inches and millimetres. Values in brackets are metric equivalents.

Chart contains dimensions in inches over millimetres.

All dimensions shown for reference purposes only.

Horizontal Mount (with Guide Pin Slots and Standoffs)

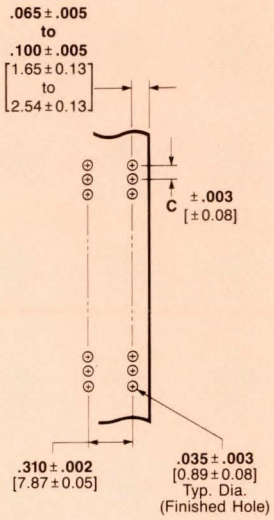
Material and Finish:

Housing—Polyphenylene Sulfide

Contacts—Phosphor Bronze, duplex plated as follows:

A—.000015 [0.00038] gold on mating area, .000050-.000100 [0.00127-0.00254] bright tin-lead on solder tail, with entire contact underplated .000050 [0.00127] nickel.

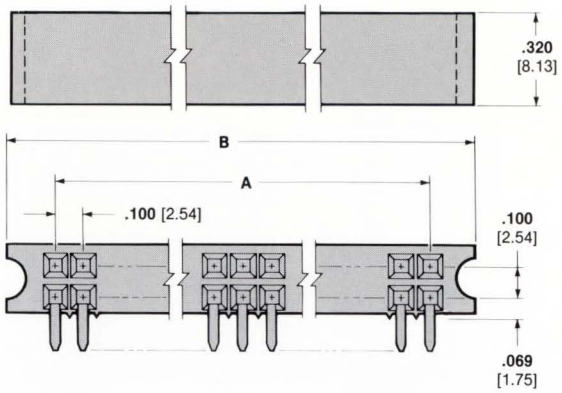
B—.000030 [0.00076] gold on mating area, .000050-.000100 [0.00127-0.00254] bright tin-lead on solder tail, with entire contact underplated .000050 [0.00127] nickel.

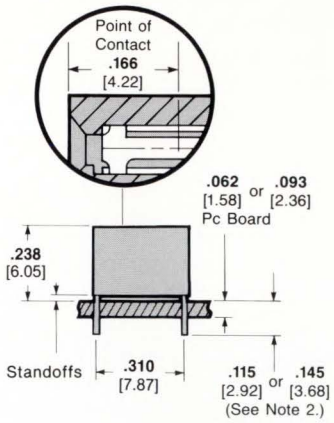


Recommended Pc Board Hole Layout

C—Hole centerline to be **.100** [2.54]; **± .003** [± 0.08] tolerances not to accumulate within one connector pattern.

Keying Plug
Material:
Natural Color Nylon
Part No. 86286-1





No. of Pos.	Dimensions		Receptacle Assembly Part No.			
			.115 Solder Tail		.145 Solder Tail	
	A	B	Plating A	Plating B	Plating A	Plating B
12	**.500** 12.7	**.858** 21.79	532955-1	532956-1	532993-4	533009-1
14	**.600** 15.24	**.958** 24.33	2-532955-5	2-532956-5	2-532993-4	2-533009-4
16	**.700** 17.78	**1.058** 26.87	532955-2	532956-2	532993-5	533009-2
20	**.900** 22.86	**1.258** 31.95	532955-3	532956-3	532993-6	533009-3
24	**1.100** 27.94	**1.458** 37.03	532955-4	532956-4	532993-7	533009-4
30	**1.400** 35.56	**1.758** 44.65	532955-5	532956-5	532993-1	533009-5
36	**1.700** 43.18	**2.058** 52.27	532955-6	532956-6	532993-8	533009-6
40	**1.900** 48.26	**2.258** 57.35	532955-7	532956-7	532993-9	533009-7
44	**2.100** 53.34	**2.458** 62.43	2-532955-4	2-532956-8	2-532993-7	2-533009-7
50	**2.400** 60.96	**2.758** 70.05	532955-8	532956-8	1-532993-0	533009-8
60	**2.900** 73.66	**3.258** 82.75	532955-9	532956-9	1-532993-1	533009-9
70	**3.400** 86.36	**3.758** 95.45	1-532955-0	1-532956-0	1-532993-2	1-533009-0
72	**3.500** 88.9	**3.858** 97.99	1-532955-1	1-532956-1	532993-2	1-533009-1
80	**3.900** 99.06	**4.258** 108.15	1-532955-2	1-532956-2	1-532993-3	1-533009-2
86	**4.200** 106.68	**4.558** 115.77	1-532955-3	1-532956-3	532993-3	1-533009-3
90	**4.400** 111.76	**4.758** 120.85	1-532955-4	1-532956-4	1-532993-4	1-533009-4
94	**4.600** 116.84	**4.958** 125.93	2-532955-6	2-532956-6	2-532993-5	2-533009-5
96	**4.700** 119.38	**5.058** 128.47	1-532955-5	1-532956-5	1-532993-5	1-533009-5
100	**4.900** 124.46	**5.258** 133.55	1-532955-6	1-532956-6	1-532993-6	1-533009-6
110	**5.400** 137.16	**5.758** 146.25	1-532955-7	1-532956-7	1-532993-7	1-533009-7
120	**5.900** 149.86	**6.258** 158.95	1-532955-8	1-532956-8	1-532993-8	1-533009-8
128	**6.300** 160.02	**6.658** 169.11	1-532955-9	1-532956-9	1-532993-9	1-533009-9
130	**6.400** 162.56	**6.758** 171.65	2-532955-0	2-532956-0	2-532993-0	2-533009-0
140	**6.900** 175.26	**7.258** 184.35	2-532955-1	2-532956-1	2-532993-1	2-533009-1
148	**7.300** 185.42	**7.658** 194.51	2-532955-2	2-532956-2	2-532993-2	2-533009-2
160	**7.900** 200.66	**8.258** 209.75	2-532955-7	2-532956-7	2-532993-6	2-533009-6
180	**8.900** 226.06	**9.258** 235.15	2-532955-8	2-532956-4	2-532993-8	2-533009-8
200	**9.900** 251.46	**10.258** 260.55	2-532955-3	2-532956-3	2-532993-3	2-533009-3

Notes: 1. Other receptacle sizes and solder tail lengths can be made available upon request.

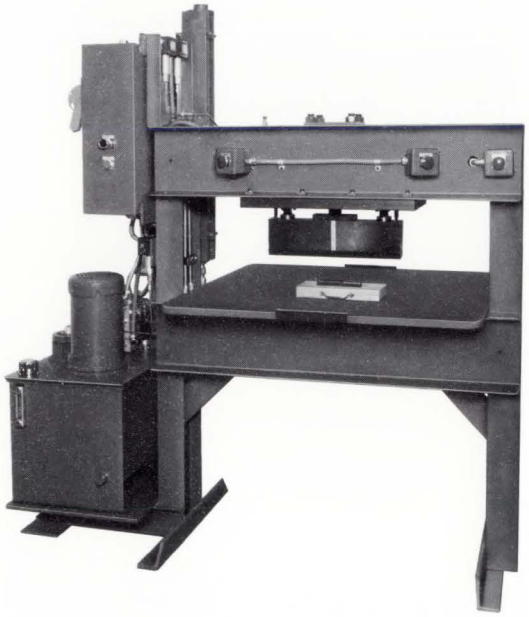
2. **.115** (2.92) tail length is for use with **.062** (1.58) PC boards; **.145** (3.68) tail length is for use with **.093** (2.36) PC boards.

3. Solder tail assemblies with board retention legs can be made available upon request.

Application Tooling for ACTION PIN Contact Header Assemblies

AMP Seating Machine (SM-10/20)

This machine consists of a selectable 10/20 ton hydraulically operated power unit. A header with ACTION PIN posts is inserted into a PC board using a connector seating tool and a template positioned under the board. Headers in sizes up to 200 positions may be inserted in a 15 second cycle. A board sensing option is available to compensate for thickness variations. Consult AMP Incorporated for recommendations regarding your specific requirements.



AMP Seating Machine (SM 10/20), part number 803880-6.
Connector Seating Tools, part number series 91170.

AMP Seating Machine (SM-3)

This machine is a pneumatically operated bench top unit for installing AMPMODU connectors with ACTION PIN posts into printed circuit boards. This unit provides a maximum of 6,000 lbs. of force at 75 PSIG and board or pressure sensing for seating verification, and to compensate for thickness variations. Seating pressure is adjustable. A variety of seating tools are available for handling connector sizes up to 120 positions. Maximum board size capability is 20 inches by 24 inches, and a traversing ram for lateral positioning is incorported for ease of use.

AMP Seating Machine (SM-3), part number 814700-1.
Connector Seating Tools, part number series 91170.

Connector Seating Tools	
Position	**Tool Assembly**
12	91170-5
14	91170-6
16	91170-7
20	91170-9
24	1-91170-1
30	1-91170-4
36	1-91170-7
40	1-91170-9
44	2-91170-1
50	2-91170-4
60	2-91170-9
70	3-91170-0
72	3-91170-1
80	3-91170-2
86	3-91170-3
90	3-91170-4
94	4-91170-4
96	3-91170-5
100	3-91170-6
110	3-91170-7
120	3-91170-8
128	4-91170-5
130	3-91170-9
140	4-91170-0
148	4-91170-6
160	4-91170-7
180	4-91170-3
200	4-91170-2

ACTION PIN Contact Repair Tooling

Front extraction tool; part number 58209-1
Rear extraction tool; part number 265871-7
Replacement tool; part number 265871-7

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