

NOTE

All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of ± 0.13 [.005] and angles have a tolerance of $\pm 2^\circ$. Figures and illustrations are for identification only and are not drawn to scale.

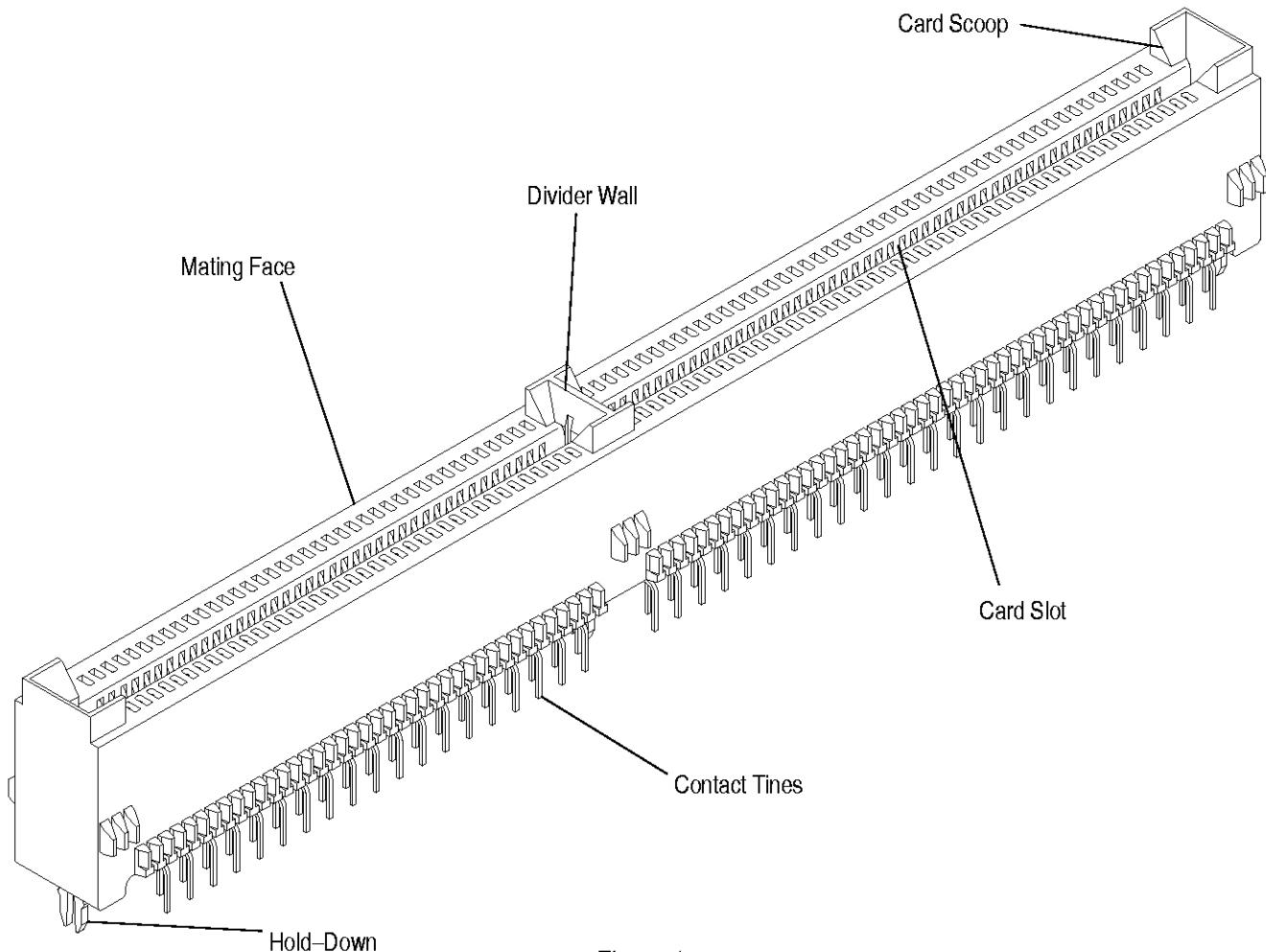
1. INTRODUCTION

This specification covers the requirements for application of AMP* High Speed Standard Edge (HSSE) through hole printed circuit (pc) board connectors. These connectors are a one-piece separable interconnect approach to high-speed signal transmission applications.

The connectors have an upper row of signal contacts on 1.27 [.050] centerline with a lower row of ground contacts within each circuit cavity. The positioning of signals and grounds achieves a 0.64 [.025] centerline density in a 1.27 [.050] centerline connector with 40 signal/ground pairs per linear inch and a 1:1 signal to ground ratio. The staggered contact interface height reduces the daughter card mating force. Housing positioning features align the connector assembly with holes positioned on the mother board and retain it for soldering processing.

HSSE Connectors are available in sizes: 50 dual positions (100 signal and 50 ground contacts, 150 total contacts and 200 virtual contacts) to 130 dual positions (260 signal and 130 ground contacts, 390 total contacts and 520 virtual contacts) in increments of 10 dual positions (20 signal contacts and 10 ground contacts, 30 total contacts and 40 virtual contacts).

When corresponding with AMP personnel, use the terminology provided on this specification to help facilitate your inquiry for information. Basic terms and features of components are provided in Figure 1.

*Figure 1*

2. REFERENCE MATERIAL**2.1. Revision Summary**

This paragraph is reserved for a revision summary of changes and additions made to this specification. Engineering Change EC 0990-0777-97 has been used to release this document as Rev O.

2.2. Customer Assistance

Reference Part Number 145090 and Product Code 7820 are representative numbers of AMP High Speed Standard Edge Connectors. Use of these numbers will identify the product line and expedite your inquiries through an AMP service network established to help you obtain product information. Such information can be obtained through a local AMP Representative (Field Sales Engineer, Field Applications Engineer, etc) or, after purchase, by calling the Tooling Assistance Center or the AMP FAX/Product Information Center number at the bottom of page 1.

2.3. Drawings

AMP Customer Drawings for each connector are available from the service network. The information contained in Customer Drawings takes priority if there is a conflict with this specification or with any technical documentation supplied by AMP Incorporated.

2.4. Bulletins

AMP Corporate Bulletin 401-52 is available upon request and can be used as a guide in soldering. This bulletin provides information on various flux types and characteristics along with the commercial designation and flux removal procedures. A checklist is attached to the bulletin as a guide for information on soldering problems.

2.5. Specifications

AMP Product Specification 108-1406 provide product performance requirements and test information.

2.6. Instructional Material

Instruction Sheet 408-6927 provides design recommendations for pc board support fixtures.

3. REQUIREMENTS**3.1. Storage****A. Ultraviolet Light**

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the connector housing material.

B. Shelf Life

The connectors should remain in the shipping containers until ready for use to prevent deformation of the contact solder tines or other damage to the connectors. The connectors should be used on a first in, first out basis to avoid storage contamination.

C. Chemical Exposure

Do not store connectors near any chemical listed below as they may cause stress corrosion cracks in the contacts.

Alkalies	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur Nitrites		Tartrates

3.2. Special Characteristics

AMP HSSE Connectors have an operating temperature range of -55° to 105°C [-67° to 221°F]. All connectors consist of a brown polyphenylene sulfide housing and phosphor bronze contacts. The contact plating is nickel all over with gold on the mating surface and bright tin-lead on the solder tines.

The card slots on the connector housing mating face have a triple card scoop feature at each end to facilitate mating with daughter boards. Metal hold-downs are incorporated into the bottom of the housing. These hold-downs stabilize the connector during the soldering process. However, they are not designed to control or counteract the effects of pc board warpage. See Figure 1.

3.3. PC Board Requirements

NOTE

PC Boards should conform with the standard industry requirements specified in IPC-J-001.

A. Mother Board Material and Thickness

The pc board material shall be glass epoxy (FR-4 or G-10). The connectors are designed to accommodate a pc board thickness range of 1.4 to 2.4 [.055 to .094]. Call the Product Information number listed at the bottom of page 1 for suitability of other board materials or other board thickness applications not specified on this specification.

B. Daughter Board Material and Thickness

The pc board material shall be glass epoxy (FR-4 or G-10) with a thickness range of 1.38 to 1.77 [.054 to .070].

C. PC Board Warpage

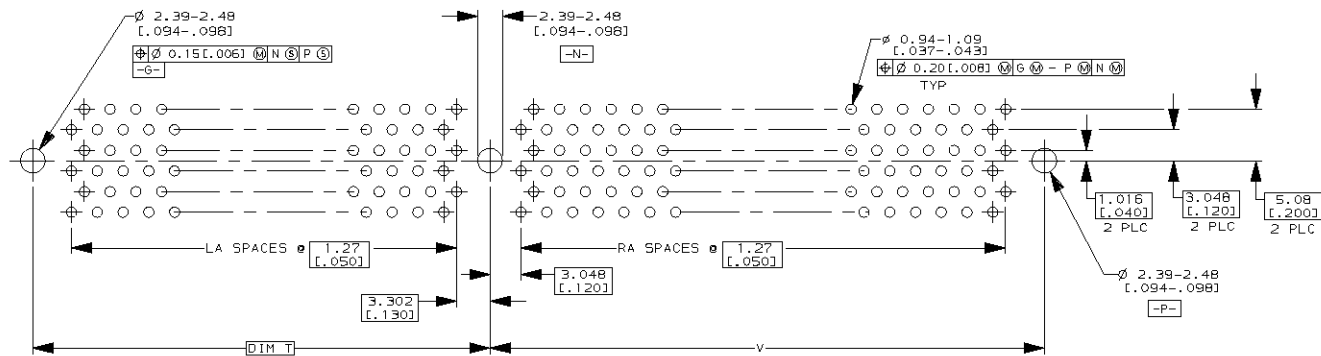
Maximum allowable bow of the pc board shall be 0.05 mm per 25.4 mm length [.002 in. per inch length] over the length of the connector assembly.

D. Mother PC Board Layout

The mounting and contact holes in the pc board must be precisely located to ensure proper placement and optimum performance of the socket assembly. The pc board layout dimensions and tolerances shown in Figure 2 must be observed when preparing pc boards for the various connector styles. The layout shows the top (component) side of the board.

CAUTION

AMP HSSE Connectors are not designed to function as board stiffeners when soldered to pc boards.



NUMBER OF DUAL POSN.	DIMENSION					
	LC	RC	LA	RA	T	V
50	34.62 [1.363]	41.99 [1.653]	21	27	33.78 [1.330]	41.07-41.22 [1.617-1.623]
60	39.7 [1.563]	49.51 [1.953]	25	33	38.86 [1.530]	48.59-48.84 [1.917-1.923]
70	44.78 [1.763]	57.23 [2.253]	28	39	43.94 [1.730]	56.31-56.46 [2.217-2.223]
73	47.32 [1.863]	58.5 [2.303]	31	40	46.48 [1.830]	57.58-57.73 [2.267-2.273]
80	52.4 [2.063]	62.31 [2.453]	35	43	51.56 [2.030]	61.39-61.54 [2.417-2.423]
90	57.48 [2.263]	69.93 [2.753]	39	49	56.64 [2.23]	69.01-69.16 [2.717-2.723]
100	62.56 [2.463]	77.55 [3.053]	43	55	61.72 [2.430]	76.63-76.78 [3.017-3.023]
110	67.64 [2.663]	85.17 [3.353]	47	61	66.80 [2.630]	84.25-84.40 [3.317-3.323]
120	72.72 [2.863]	92.79 [3.653]	51	67	71.88 [2.830]	91.87-92.02 [3.617-3.623]
130	80.34 [3.163]	97.87 [3.853]	57	71	79.50 [3.130]	96.95-97.10 [3.817-3.823]

Figure 2 (cont'd)

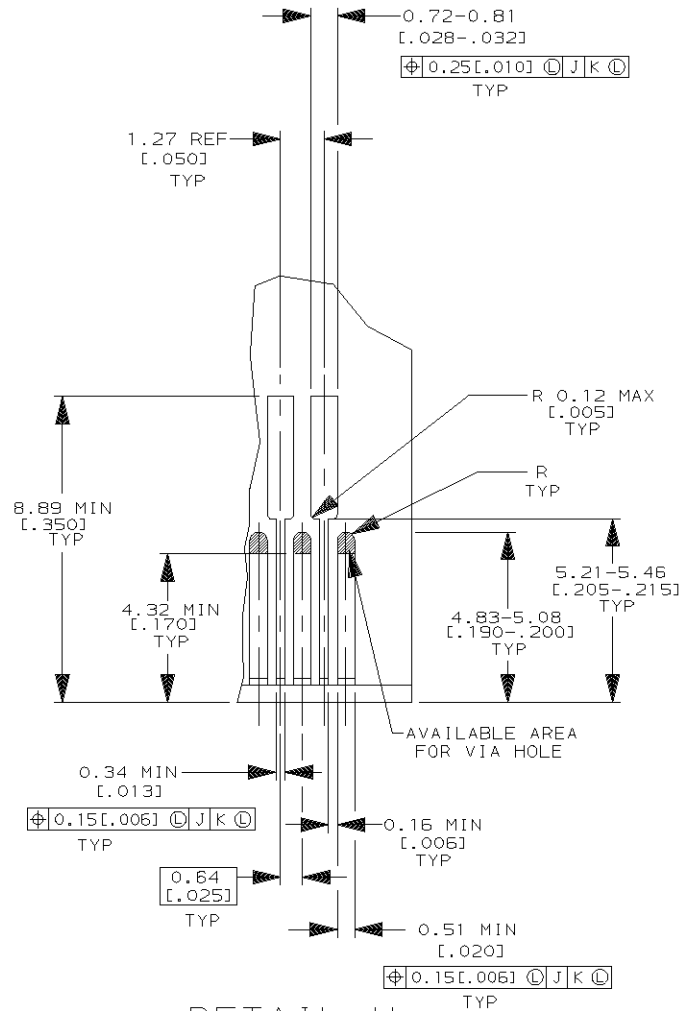
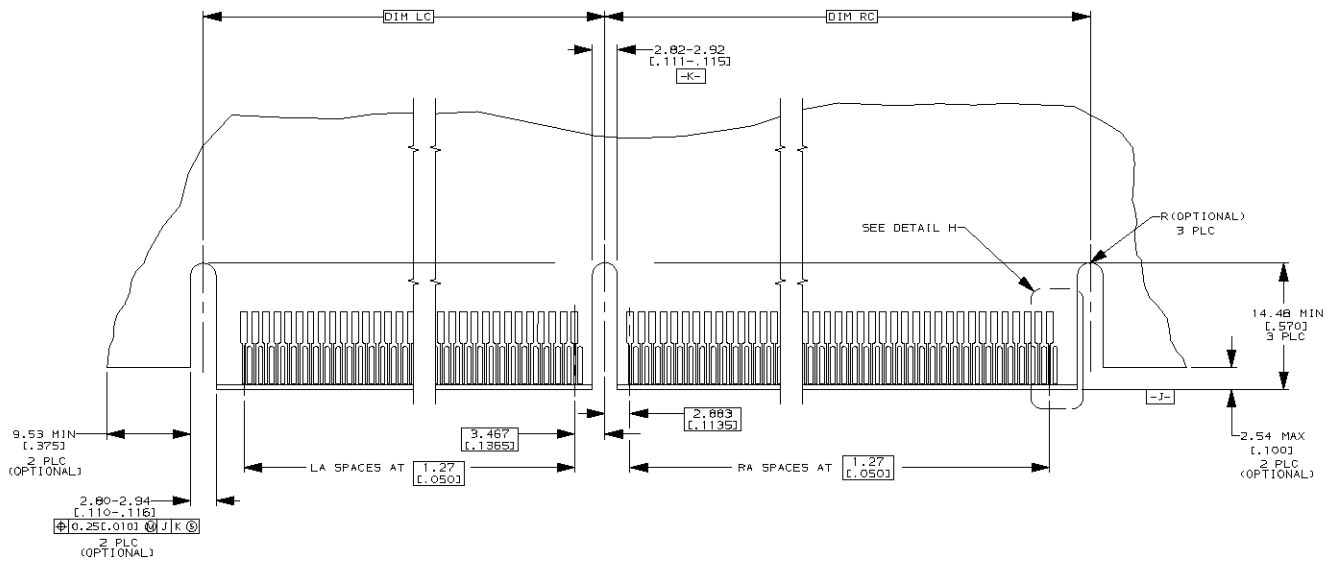


Figure 2 (end)

E. Daughter PC Board Layout

Several recommended alternative free pc board land and edge configurations are available for customer consideration as shown in Figure 3. Figure 3A is the base format from which all others are derived. The remaining configurations are variations of Figure 3A that are presented to allow customers a wide range of pc board design flexibility when using multilayer boards and alternate grounding patterns.

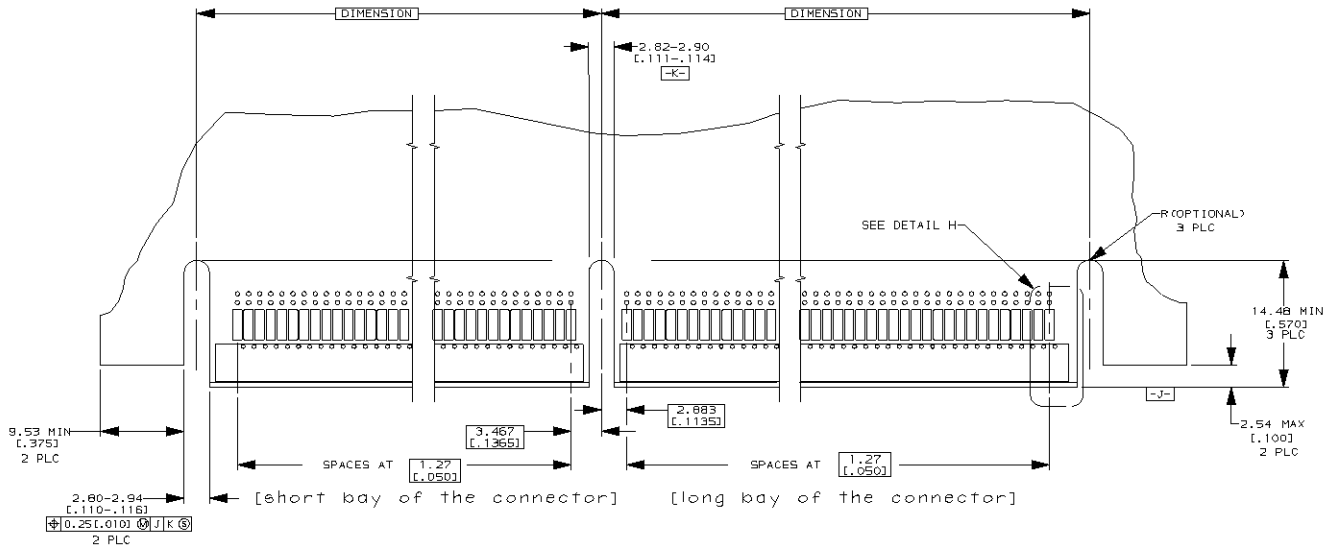


Figure 3A

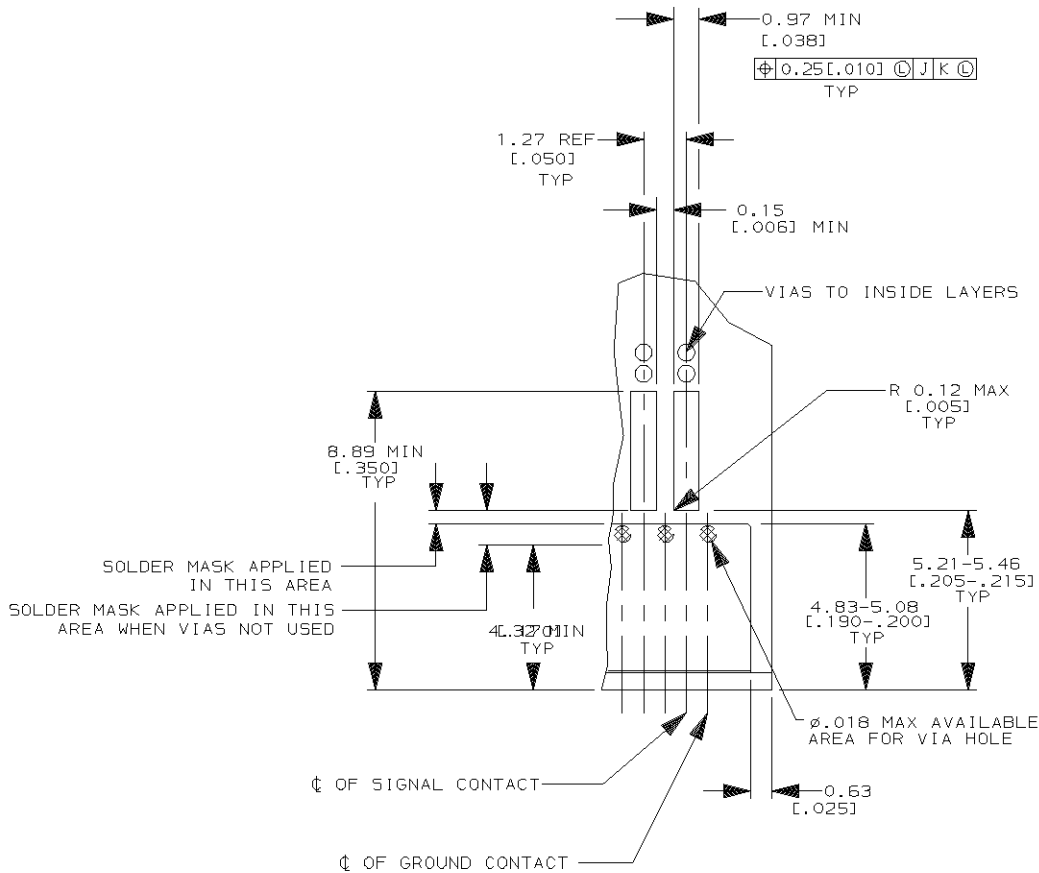


Figure 3B

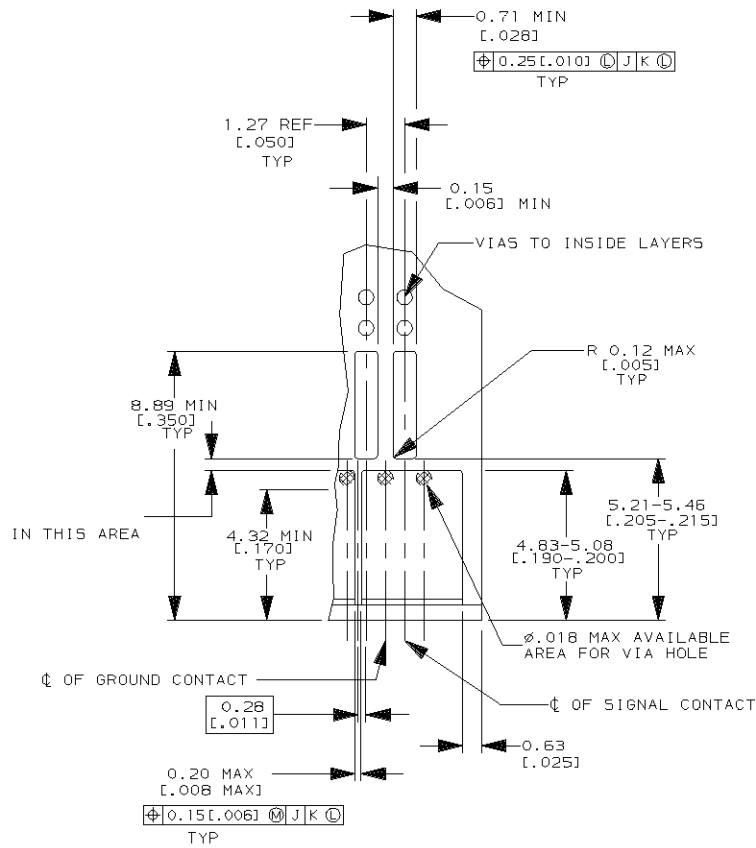


Figure 3C

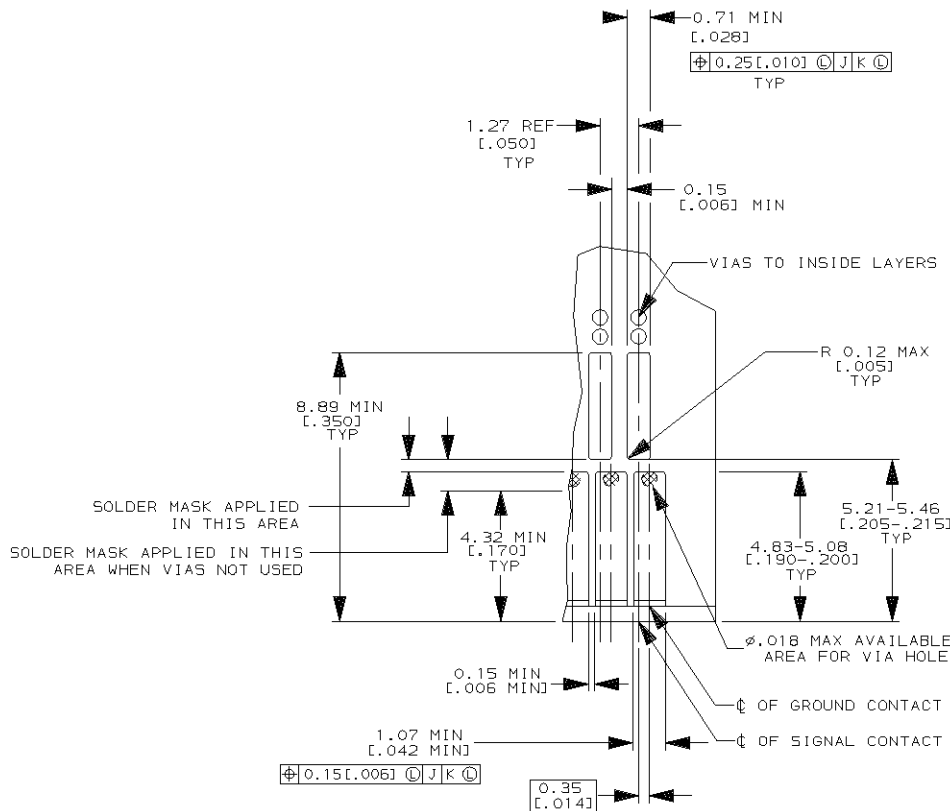


Figure 3D

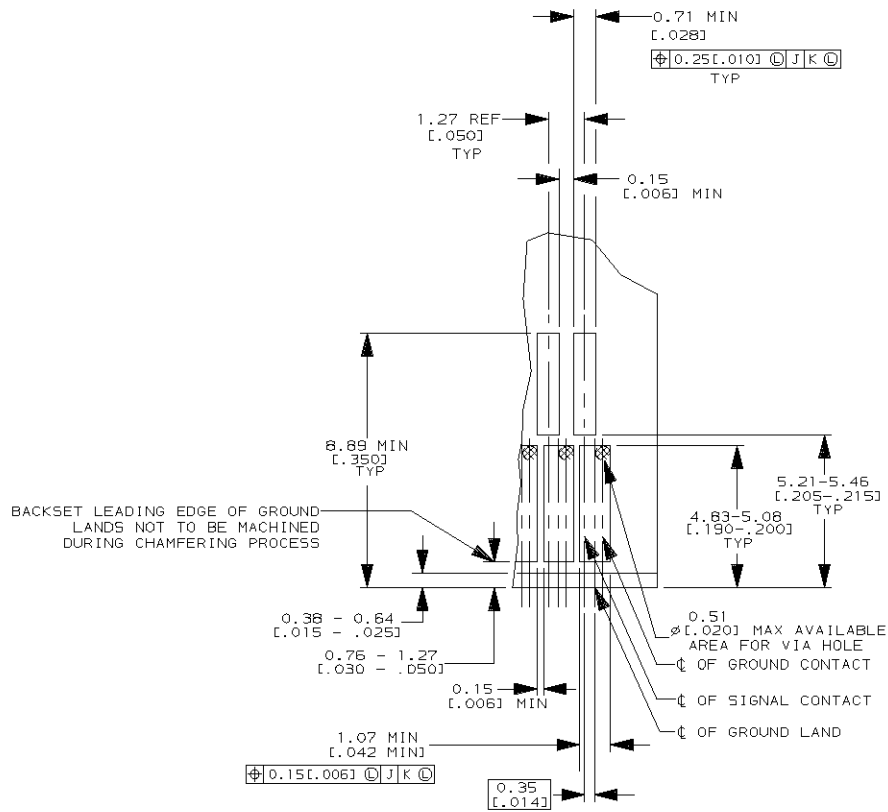


Figure 3E

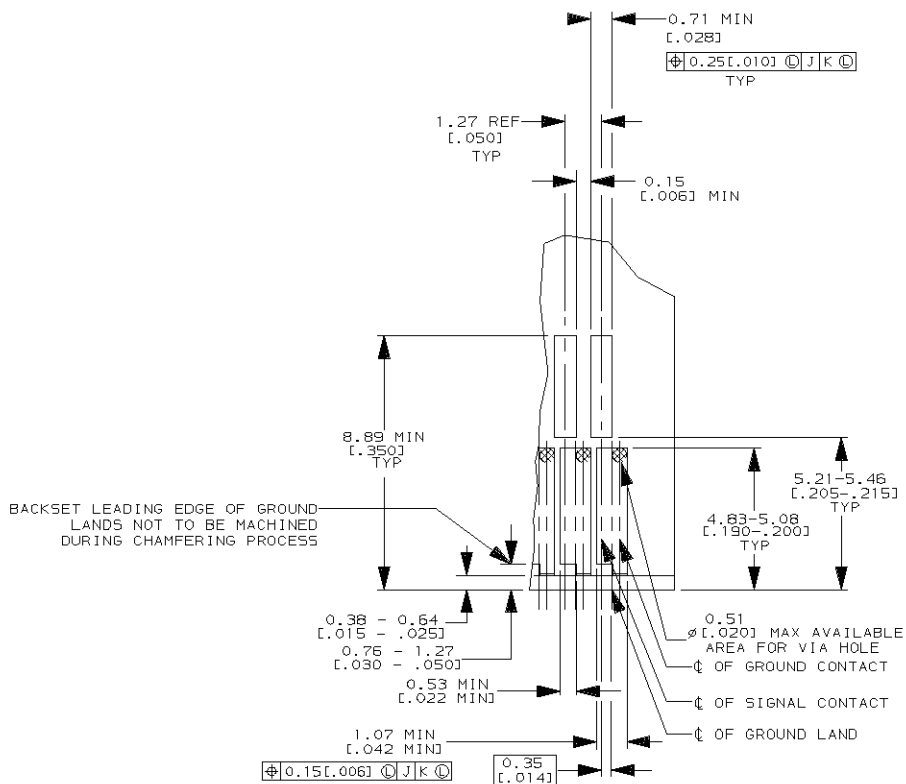


Figure 3F

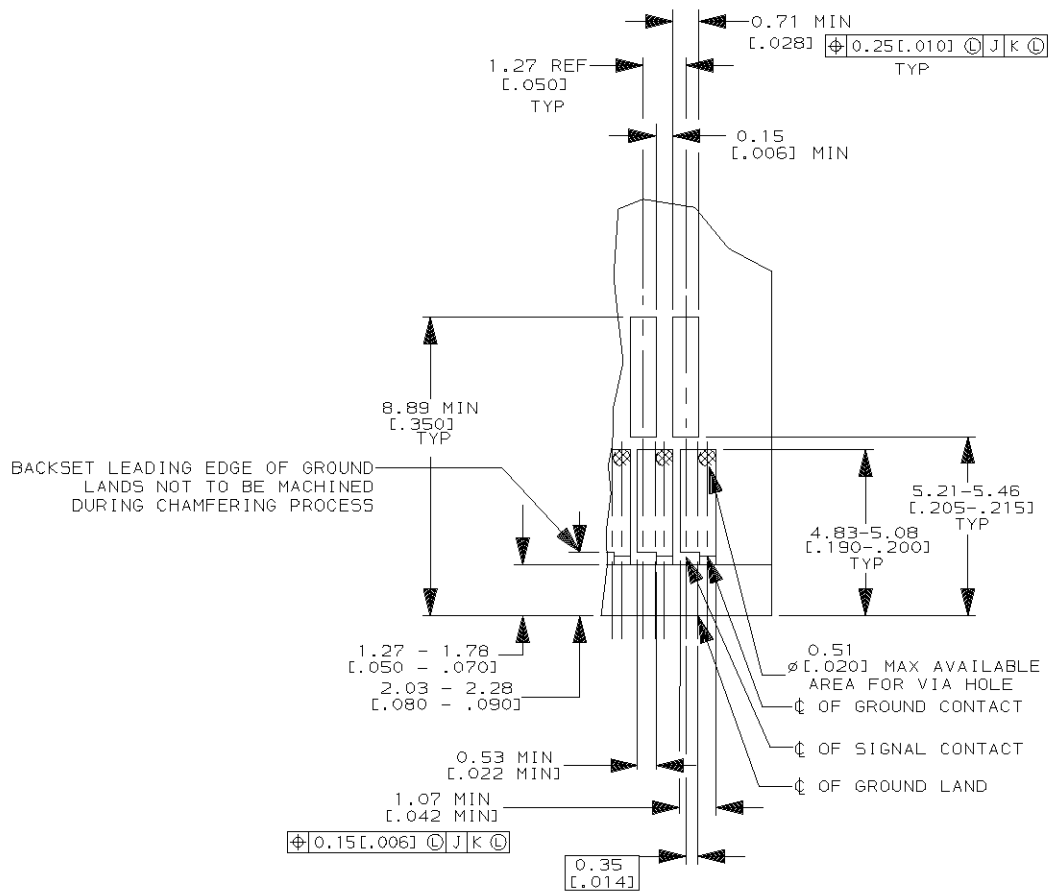


Figure 3I (end)

CAUTION Care should be taken when producing the daughter board edge chamfer. When daughter board chamfers are poorly cut, they may have the copper base metal ripped out from under the nickel underplate. This exposed nickel edge is hard and sharp. It may cut into the mating contact surfaces or may even catch on the contact mating surface and crush the contact. See Figure 4.

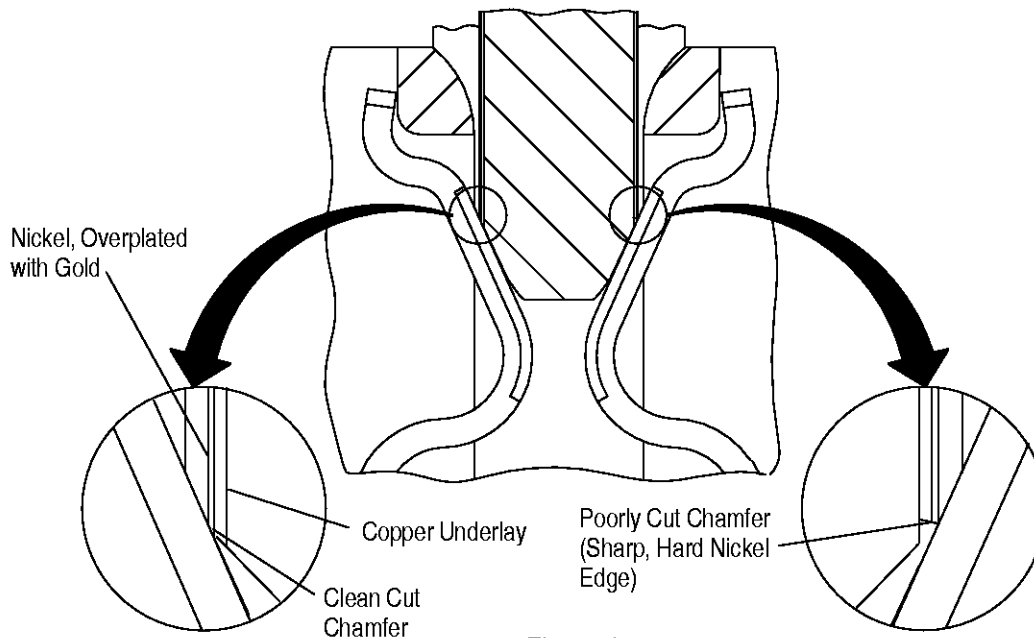


Figure 4

3.4. Through Hole Preparation

The holes in the pc board must be precisely located to ensure proper placement and optimum performance of the connector, and must be prepared to the requirements provided in Figure 5.

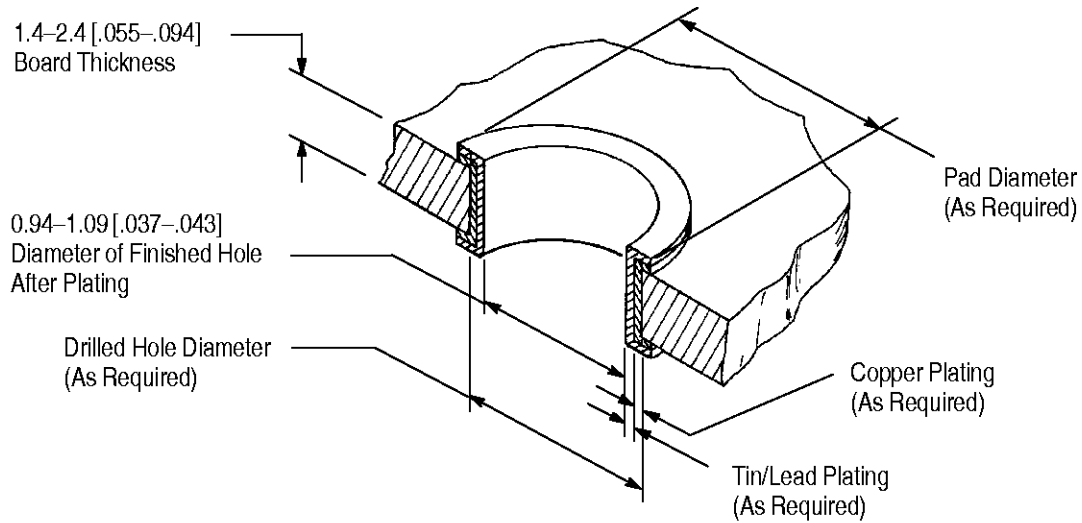


Figure 5

3.5. Connector Placement

CAUTION

Connectors should be handled only by the housing to avoid deformation, contamination, or damage to the contact tines.

When placing through hole connectors on the pc board, make sure the contact solder tines are aligned and started into the matching holes before seating the housing on the pc board. See Figure 6.

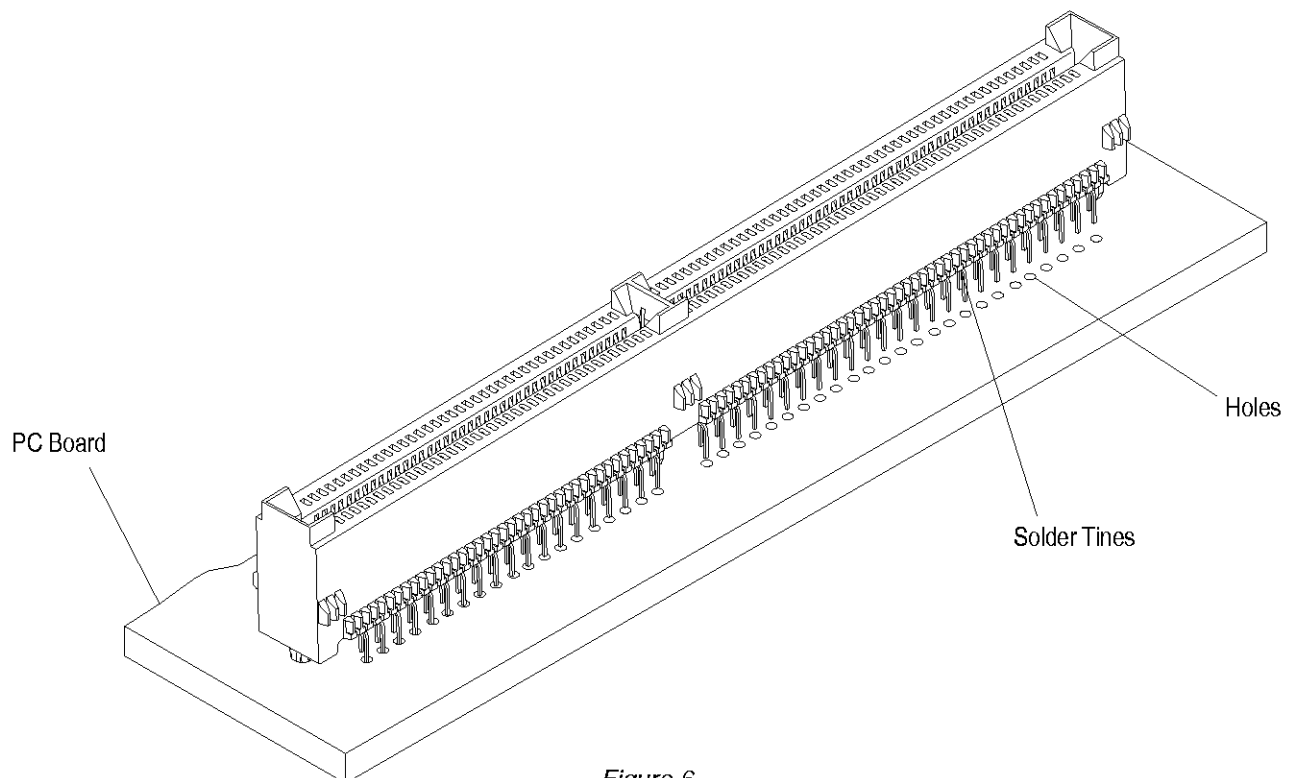


Figure 6

3.6. Soldering

A. Flux Selection

Contact solder tines must be fluxed prior to soldering with a mildly active, rosin base flux. Selection of the flux will depend on the type of pc board and other components mounted on the board. Additionally, the flux must be compatible with the wave solder line, manufacturing, health, and safety requirements. Call the Product Information phone number at the bottom of page 1 for consideration of other types of flux. Some fluxes that are compatible with these connectors are provided in Figure 7.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER ⁸⁸	ALPHA [■]
Type RMA (Mildly Activated)	Mild	Noncorrosive	186	611

⁸⁸ Product of Kester Solder Co. ■ Product of Alphametals Inc.

Figure 7

B. Cleaning

After soldering, removal of fluxes, residues, and activators is necessary. Consult with the supplier of the solder and flux for recommended cleaning solvents. The following is a listing of common cleaning solvents that will not affect the connectors for the time and temperature specified. See Figure 8.

DANGER Consideration must be given to toxicity and other safety requirements recommended by the solvent manufacturer. Refer to the manufacturer's Material Safety Data Sheet (MSDS) for characteristics and handling of cleaners. Trichloroethylene and Methylene Chloride can be used with no harmful affect to the connectors; however AMP does not recommend them because of the harmful occupational and environmental effects. Both are carcinogenic (cancer-causing) and Trichloroethylene is harmful to the earth's ozone layer.

NOTE If you have a particular solvent that is not listed, contact the Tooling Assistance Center or Product Information number at the bottom of page 1.

CLEANER		TIME (Minutes)	TEMPERATURES (Maximum)	
NAME	TYPE		CELSIUS	FAHRENHEIT
Alpha 2110 [■]	Aqueous	1	132	270
Bioact EC-7 [◆]	Solvent	5	100	212
Butyl Carbitol [●]	Solvent	1	Room Ambience	
Isopropyl Alcohol	Solvent	5	100	212
Kester 5778 ⁸⁸	Aqueous	5	100	212
Kester 5779 ⁸⁸	Aqueous	5	100	212
Loncoterge 520 [●]	Aqueous	5	100	212
Loncoterge 530 [●]	Aqueous	5	100	212
Terpene Solvent	Solvent	5	100	212

■ Product of Fry's Metals, Inc. ◆ Product of Petroferm, Inc. ● Product of Union Carbide Corp. 88 Product of Litton Systems, Inc.

Figure 8

C. Drying

When drying cleaned assemblies and printed circuit boards, make certain that temperature limitations are not exceeded: -55° to 105°C [-67° to 221°F] for standard temperature products. Excessive temperatures may cause connector degradation.

D. Soldering Guidelines

AMP High Speed Standard Edge Connectors can be soldered using wave or equivalent soldering techniques. The temperatures and exposure time shall be within the ranges specified in Figure 9. We recommend using SN60 or SN62 solder for these header assemblies.

NOTE

AMP Corporate Bulletin 401-52 provides some guidelines for establishing soldering practices. Refer to Paragraph 2.4, Bulletins.

SOLDERING PROCESS	TEMPERATURE		TIME (At Max Temperature)
	CELSIUS	FAHRENHEIT	
WAVE SOLDERING	260**	500**	5 Seconds

** Wave Temperature

Figure 9

3.7. Checking Installed Connector

All solder joints should conform to those specified in AMP Workmanship Specification 101-21 and all other requirements specified in this document. The connector must be seated on the pc board to the dimensions shown in Figure 10.

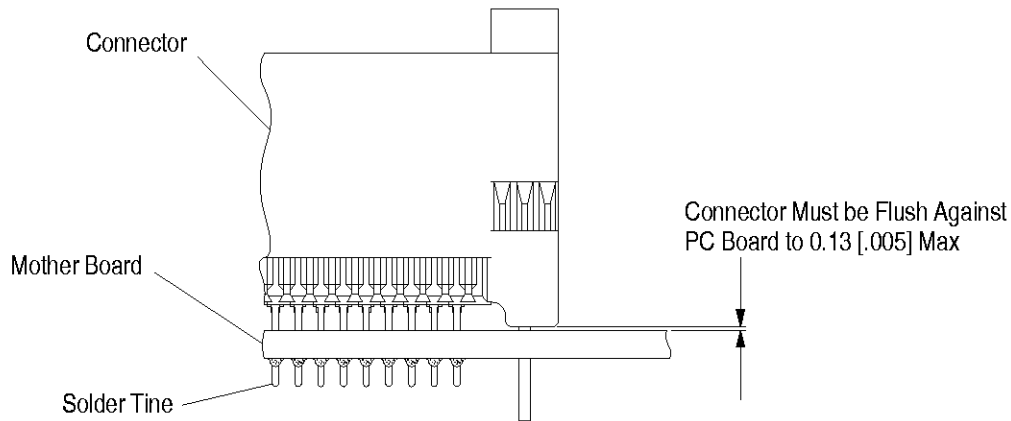


Figure 10

3.8. Daughter Board Usage Precautions

When mating or unmating daughter boards, caution should be taken to prevent the longitudinal rocking of the pc board in respect to the connector. See Figure 11. Angles greater than 5° can cause damage to the housing and misregistration of the contacts on the pc board lands.

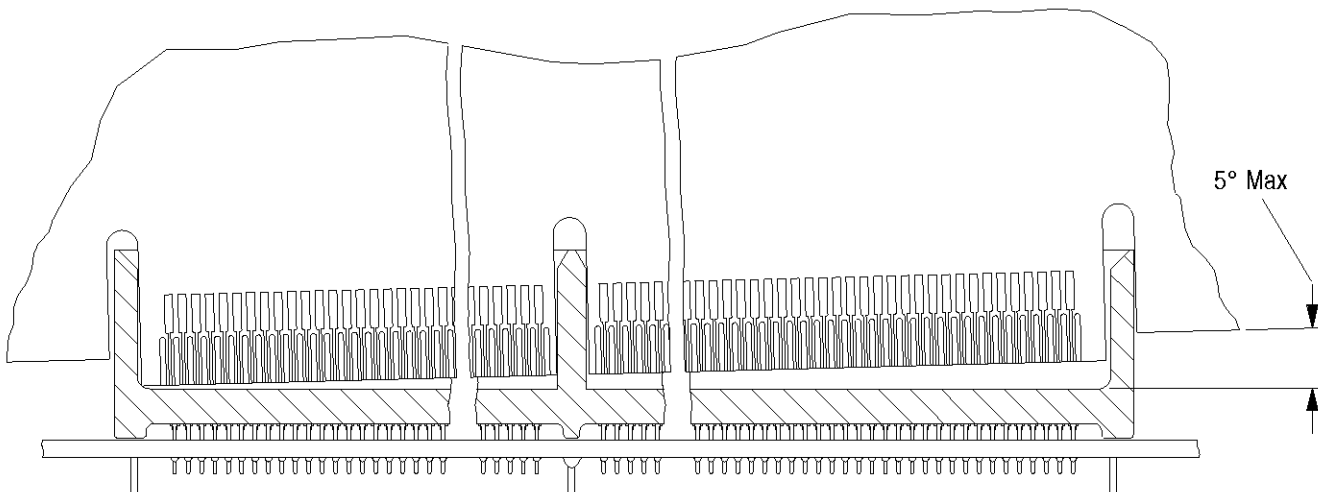


Figure 11

3.9. Repair /Removal

Connectors with damaged contacts cannot be repaired. The connector will require the desoldering of all contact solder tines, removing and discarding the damaged connector, and replacing it with a new one.

4. QUALIFICATION

The AMP High Speed Standard Edge Connectors are recognized by Underwriters Laboratories Inc. (UL) under File E28476, and investigated by UL to meet the Canadian Standard C22.2 No. 182.3-M1987.

5. TOOLING

No special tooling is required when handling connectors for manual placement; however, it is recommended that a support plate be used for application of the connector to the pc board. See Figure 12. The support should be used to prevent bowing of the pc board during the placement of a connector on the board, and it should allow the contact solder tines to go through the pc board without deforming the tines.

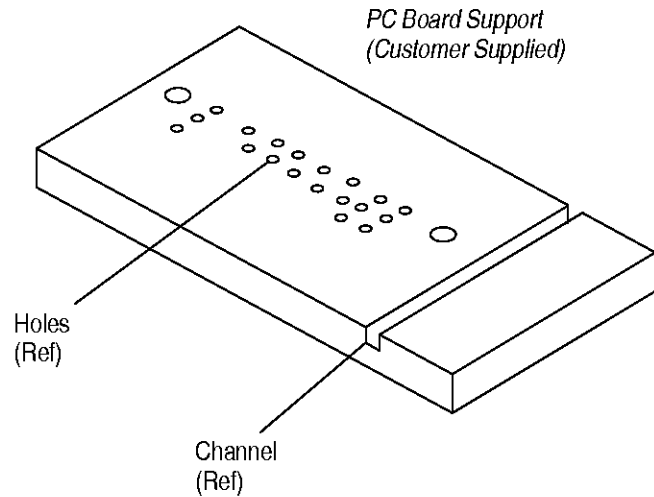


Figure 12

6. VISUAL AID

Figure 13 shows a typical application of AMP High Speed Standard Edge Connectors. This illustration should be used by production personnel to ensure a correctly applied product. Applications which **DO NOT** appear correct should be inspected using the information in the preceding pages of this specification and in the instructional material shipped with the product or tooling.

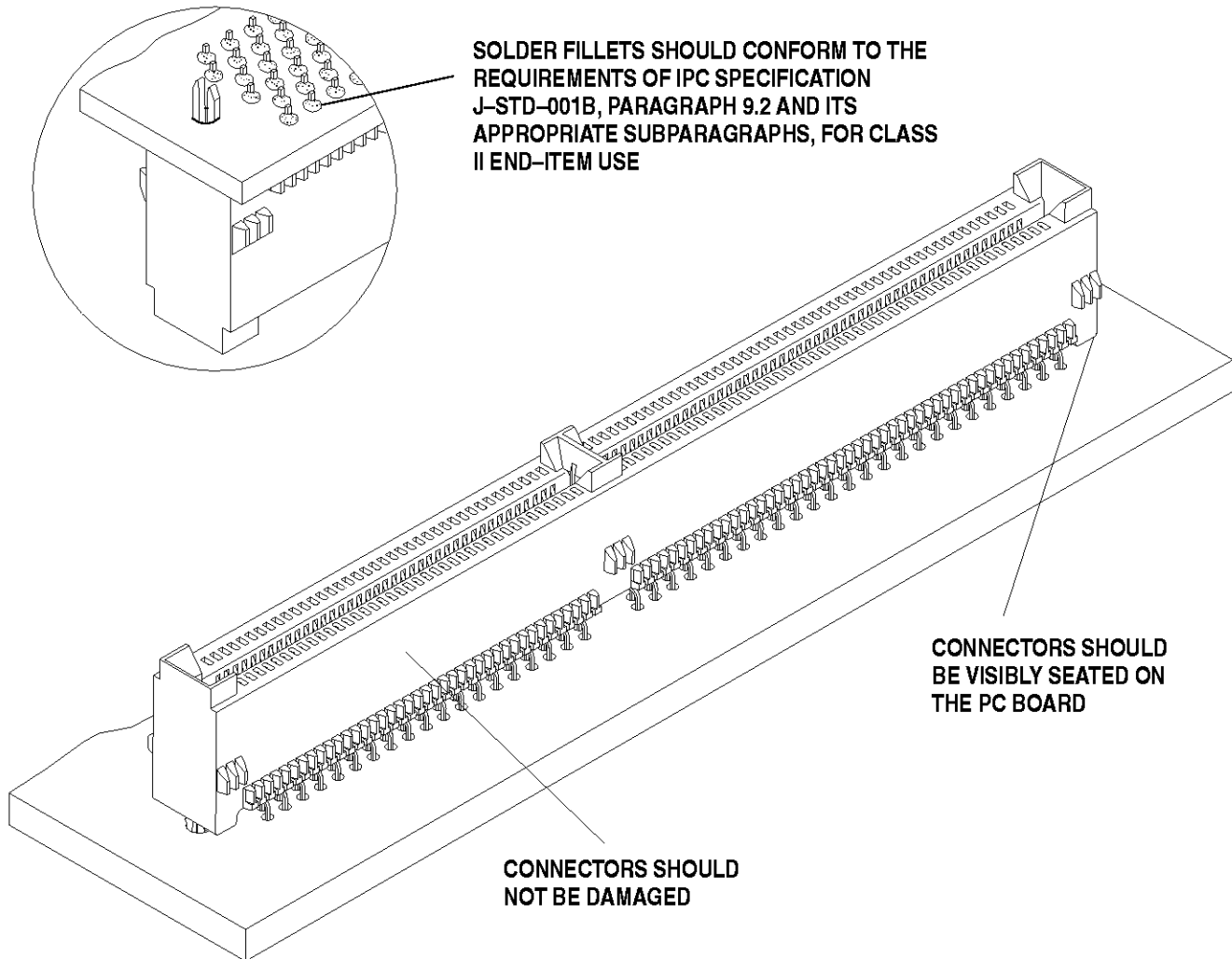


FIGURE 13. VISUAL AID