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LOC	DIST
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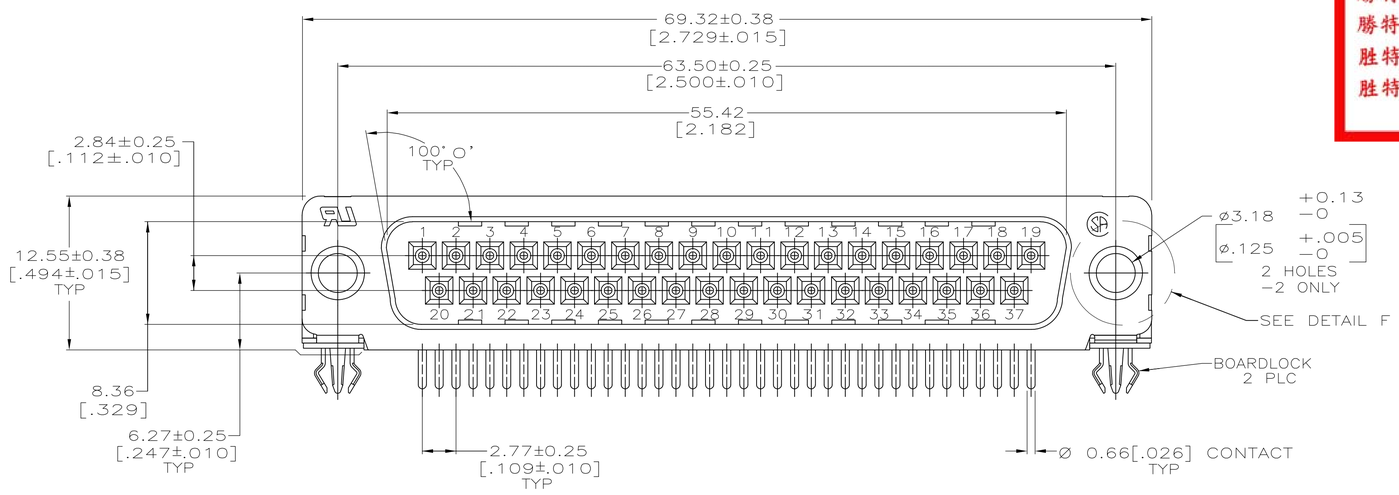
REVISIONS

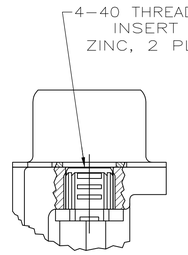
P	LTR	DESCRIPTION	DATE	DWN	APVD
	E	REVISED PER ECO-12-022391	02JAN2013	CJV	SLB

勝特力電材超市-龍山店 886-3-5773766
勝特力電材超市-光復店 886-3-5729570
胜特力电子(上海) 86-21-34970699
胜特力电子(深圳) 86-755-83298787
http://www.100y.com.tw

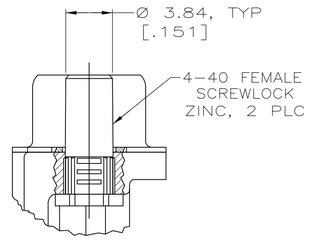


FOR -6 ONLY

DETAIL F
2 PLC



DETAIL D



DETAIL E

RECOMMENDED P.C. BOARD MOUNTING DIMENSIONS
P.C. BOARD THICKNESS: 1.57[.062]

1. HOUSING: NYLON OR POLYESTER, FLAME RETARDANT, UL 94V-0 RATED, GLASS FILLED, COLOR BLACK.
   CONTACTS: BRASS.
   SHELL: CARBON STEEL.
   EYELETS: BRASS.
   BOARDLOCKS: COPPER ALLOY.
   INSERTS: ZINC ALLOY.
   SCREWLOCKS: ZINC ALLOY.
2. CONTACTS: SEE TABLE.
   SHELL: 2.54µm [.000100] MIN TIN OVER 1.27µm [.000050] MIN COPPER.
   EYELETS: 5.08µm [.000200] MIN TIN OVER COPPER FLASH.
   BOARDLOCKS: 5.08µm[.000200] MIN TIN OVER 1.27µm[.000050] MIN NICKEL.
   INSERTS: CLEAR CHROMATE.
   SCREWLOCKS: CLEAR CHROMATE.
3. GOLD FLASH ON THE MATING SURFACES, 2.54µm[.000100] MIN TIN PLATE ON THE SOLDER END, 1.27µm[.000050] MIN NICKEL UNDERPLATE ON THE ENTIRE CONTACT.
4. 0.76µm[.000030] MIN GOLD PLATE ON THE MATING SURFACES, 2.54µm[.000100] MIN TIN PLATE ON THE SOLDER END, 1.27µm[.000050] MIN NICKEL UNDERPLATE ON THE ENTIRE CONTACT
   -OR-
   GOLD FLASH OVER PALLADIUM-NICKEL PLATE, 0.76µm[.000030] MIN TOTAL ON THE MATING SURFACES, 2.54µm[.000100] MIN TIN PLATE ON THE SOLDER END, 1.27µm[.000050] MIN NICKEL UNDERPLATE ON THE ENTIRE CONTACT.
5. DIMENSION APPLIES FROM CENTER OF CONTACTS.

MOUNTING HARDWARE	CONTACT FINISH	PART NUMBER
SEE DETAIL E	4	5747843-6
SEE DETAIL D	4	5747843-4
SEE DETAIL D	3	5747843-3
NONE	4	5747843-2

THIS DRAWING IS A CONTROLLED DOCUMENT.
DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009

DIMENSIONS: mm [INCHES]

TOLERANCES UNLESS OTHERWISE SPECIFIED:
0 PLC ± -
1 PLC ± -
2 PLC ± -
3 PLC ± 0.13[.005]
4 PLC ± -
ANGLES ± -

MATERIAL 1
FINISH 2

DWN 04-13-05 G. ATTADIA - DOCK5
CHK 04-13-05 G. BOLASH
APVD 04-13-05 M. WALMSLEY
PRODUCT SPEC 108-40025
APPLICATION SPEC 114-40010
WEIGHT -

TE Connectivity

NAME: PLUG ASSEMBLY, SIZE 4, 37 POSITION, RIGHT ANGLE, FRONT METAL SHELL, .318 SERIES, BOARDLOCKS, AMPLIMITE HD-20

SIZE	CAGE CODE	DRAWING NO	RESTRICTED TO
A1	00779	C-5747843	-

CUSTOMER DRAWING | SCALE 4:1 | SHEET 1 OF 1 | REV E

4805 (3/11)

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 ±2°. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of AMPLIMITE Right-Angle Front Metal Shell Series 318, 478, and 590 plug and receptacle connectors. The series designator is the dimension from the front of the mounting flange to the center of the first row of contacts. The connectors are available without mounting hardware, with 4-40 threaded inserts, screwlocks, or boardlocks. They can be placed on the printed circuit (pc) board by hand or robotic equipment or may be panel mounted if necessary.

The connectors are available in 9, 15, 25, and 37 positions, and will mate with AMPLIMITE HDE, HDF, or HDP plastic or metal shell connectors. Each connector is marked with position numbers on the mating faces for circuit identification. The connector plugs contain pin contacts and the receptacles contain socket contacts. These pre-installed right-angle contacts have precision formed solder tines.

When corresponding with personnel, use the terminology provided in this specification to facilitate your inquiries for information. Basic terms and features of this product are provided in Figure 1.

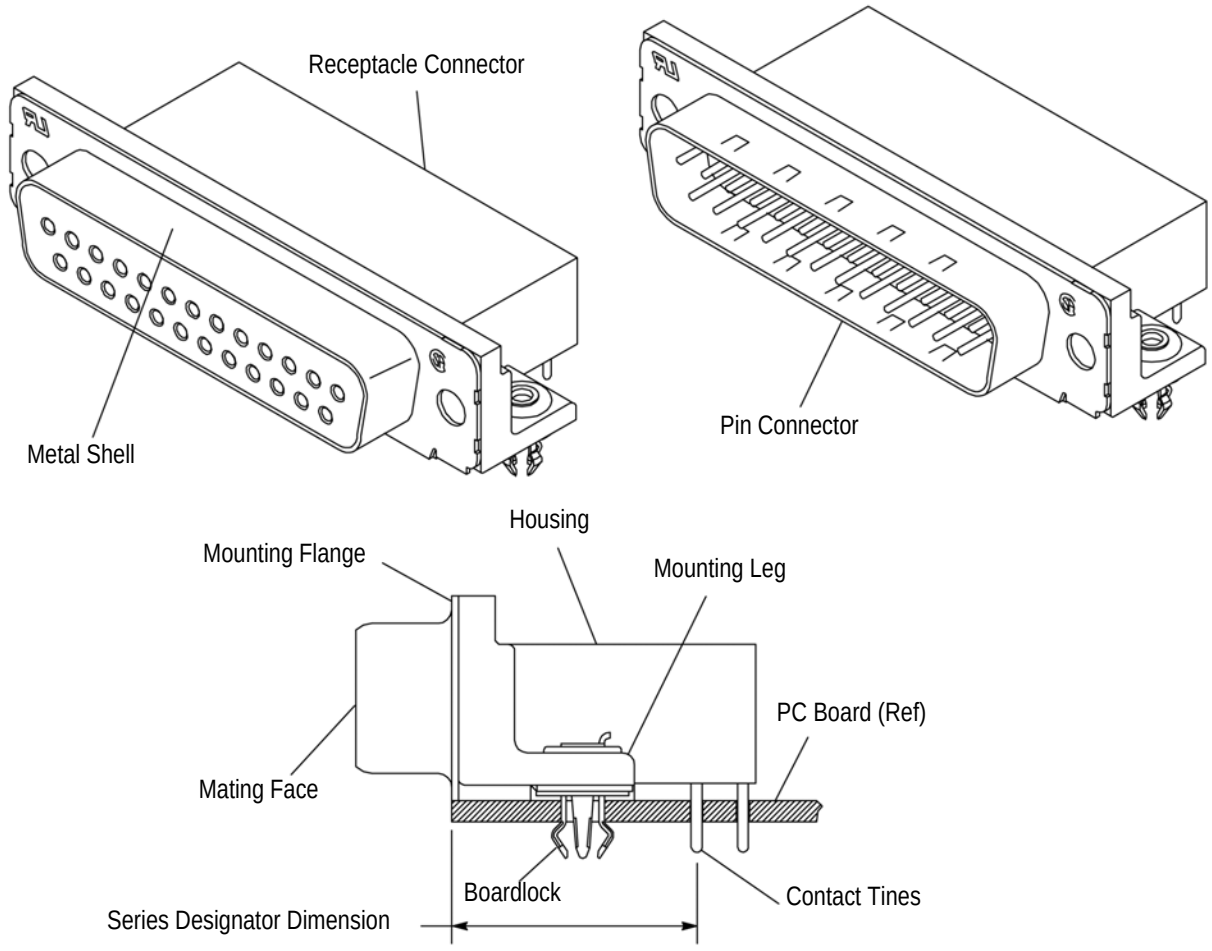


Figure 1

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2. REFERENCE MATERIAL

2.1. Revision Summary

This paragraph is reserved for a revision summary of the most recent additions and changes made to this specification. Since the previous release, the new company logo has been applied.

2.2. Customer Assistance

Reference Part Number 747844 and Product Code 7318 are representative numbers of AMPLIMITE Right-Angle Front Metal Shell Connectors. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product and tooling information. Such information can be obtained through your local company representative or, after purchase, by calling the Tooling Assistance Center or the Product Information Center number at the bottom of page 1.

2.3. Drawings

Customer drawings for each product part number 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 the company.

2.4. Manuals

Manual 402-40 is available upon request and can be used as a guide in soldering. This manual provides information on various flux types and characteristics along with the commercial designation and flux removal procedures. A checklist is included in the manual as a guide for information on soldering problems.

2.5. Specifications

Product Specification 108-40025 covers test and performance requirements.

3. REQUIREMENTS

3.1. Storage

NOTE

Due to the design of the connector, some corrosion may occur on the metal shell near the crimp tabs and on the ends of the shell. This condition does not affect the aesthetics, form, fit, or function of the connector or adjacent components and is considered acceptable.

A. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in connectors.

B. Shelf Life

The connectors should remain in the shipping containers until ready for use to prevent damage. The products should be used on a first in, first out basis to avoid storage contamination that could adversely affect signal transmissions.

C. Chemical Exposure

Do not store connectors near any chemicals listed below, as they may cause stress corrosion cracking in the components,

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

NOTE

Where the above environmental conditions exist, phosphor-bronze contacts are recommended instead of brass if available.

3.2. Connector Shell Size

The AMPLIMITE Metal Shell Connectors shell sizes conform to industry standard sizes. A composite of comparable plug configurations is provided in Figure 2.

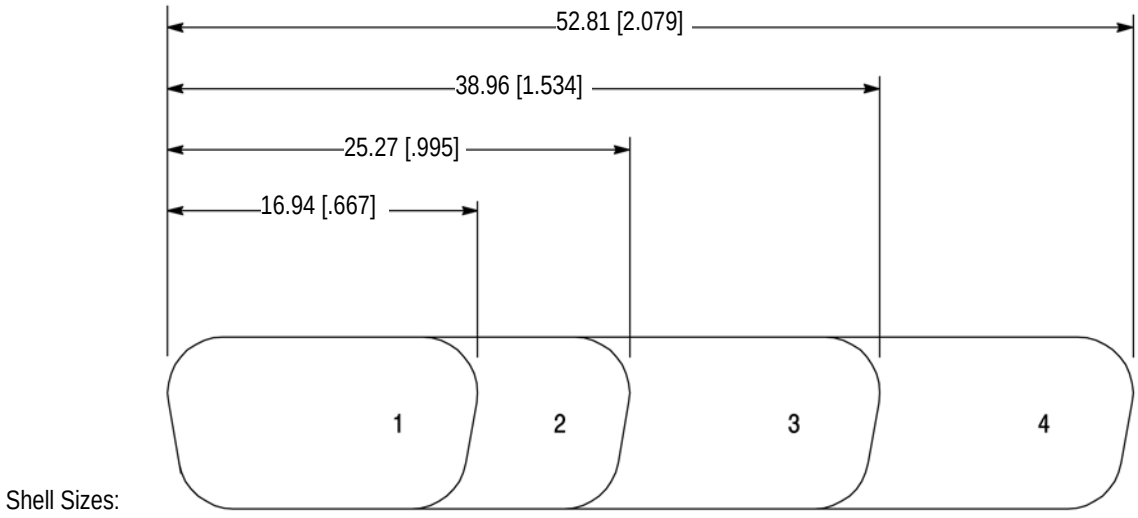


Figure 2

3.3. Mounting Panel Cutout

Panel mounting is optional for AMPLIMITE Right-Angle Front Metal Shell Connectors. For pc board receptacles, it will provide additional support for the solder joints during mating and unmating of connectors. pc board receptacles can ONLY be rear mounted. Either front or rear mounting is acceptable for the cable connector. The connector mounting flanges may have 4-40 internal threads that will accept screwlocks or panel mounting hardware. Hardware attached to the connector flange shall be tightened to 0.45 Nm (4 in-lb) maximum. See Figure 3 for panel cutout dimensions.

Screwlocks are designed to secure a connector to a panel 1.58 mm [.062 in.] thick. They can be used with thinner panels; however, washers are recommended to make up the thickness difference and provide a bottoming surface for the mating connector flange. Screwlocks should be tightened to a torque of 0.45 Nm (4 in.-lb) maximum. The 4-40 internal threads in the screwlocks will accept commercially available screws and jackscrews.

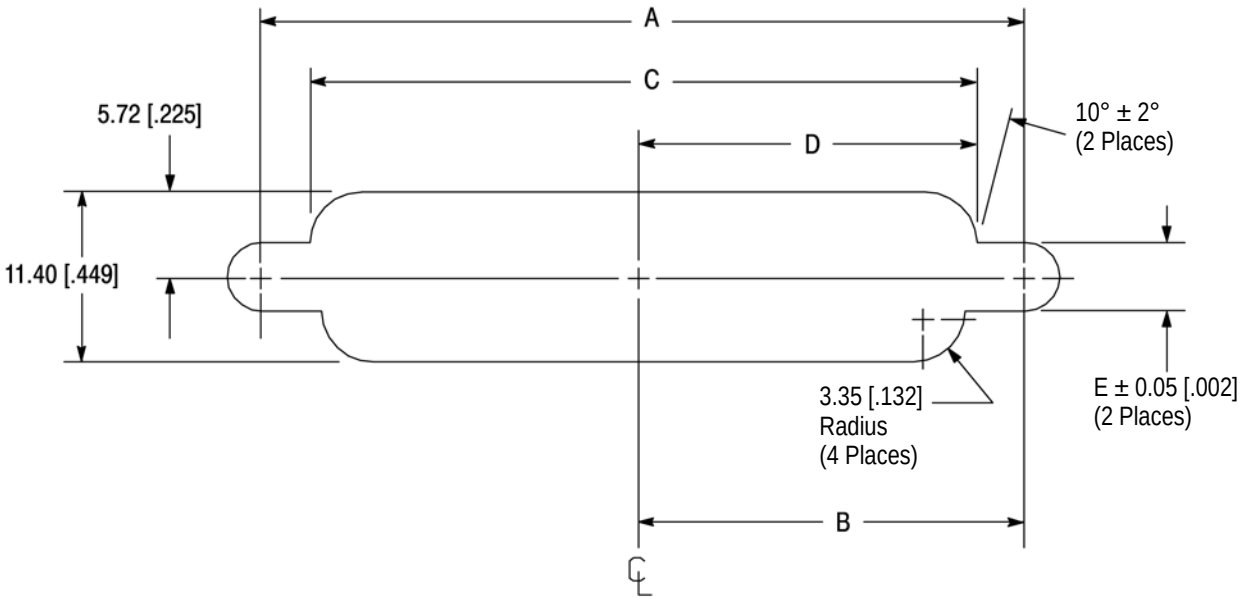


Figure 3 (Cont'd)

NUMBER OF CONTACT POSITIONS	A DIM	B DIM	C DIM	D DIM	E DIM	
					WITH SCREWLOCKS	W/O SCREWLOCKS
9	24.99 [.984]	12.50 [.492]	20.47 [.806]	10.24 [.403]	4.83 [.190]	3.05 [.120]
15	33.32 [1.312]	16.66 [.656]	28.80 [1.134]	14.40 [.567]		
25	47.04 [1.852]	23.52 [.926]	42.52 [1.674]	21.26 [837]		
37	63.50 [2.500]	31.75 [1.250]	59.08 [2.326]	29.54 [1.163]		

Figure 3 (End)

3.4. Mating Dimension

The dimension in Figure 4 is needed to ensure full mating of connectors. This dimension must be considered when determining location and panel considerations when mounting connectors.

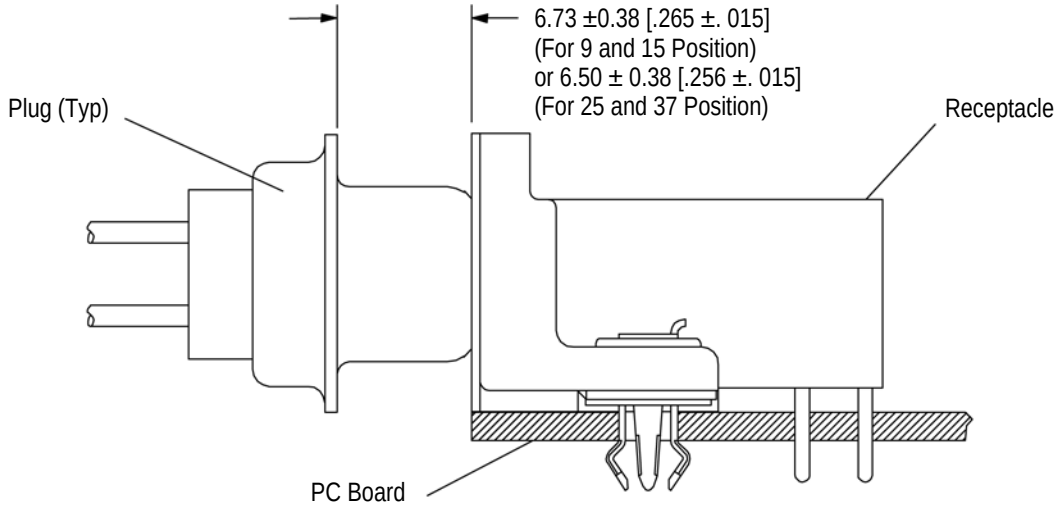


Figure 4

3.5. Connector Spacing

Care must be used to avoid interference between adjacent connectors and/or other components. The dimension is dependent on variable hardware used and the clearance required for mating connectors. The information provided in Figure 5 is to ensure proper mating for manual placement of connectors.

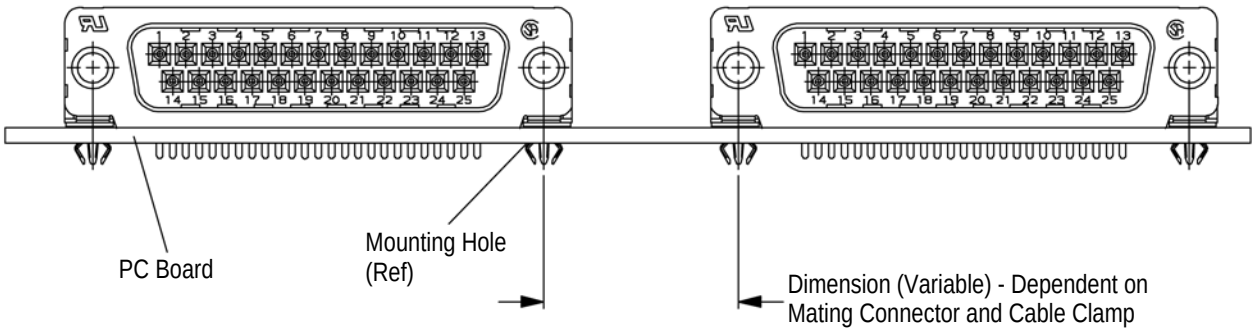


Figure 5

3.6. PC Boards

A. Material and Thickness

1) Board material will be glass epoxy (FR-4, G-10).

2) Board thickness will be 2.36 mm [.093 in.] for standard AMPLIMITE Right-Angle Front Metal Shell Connectors or 1.57 mm [.062 in.] for connectors with boardlocks.

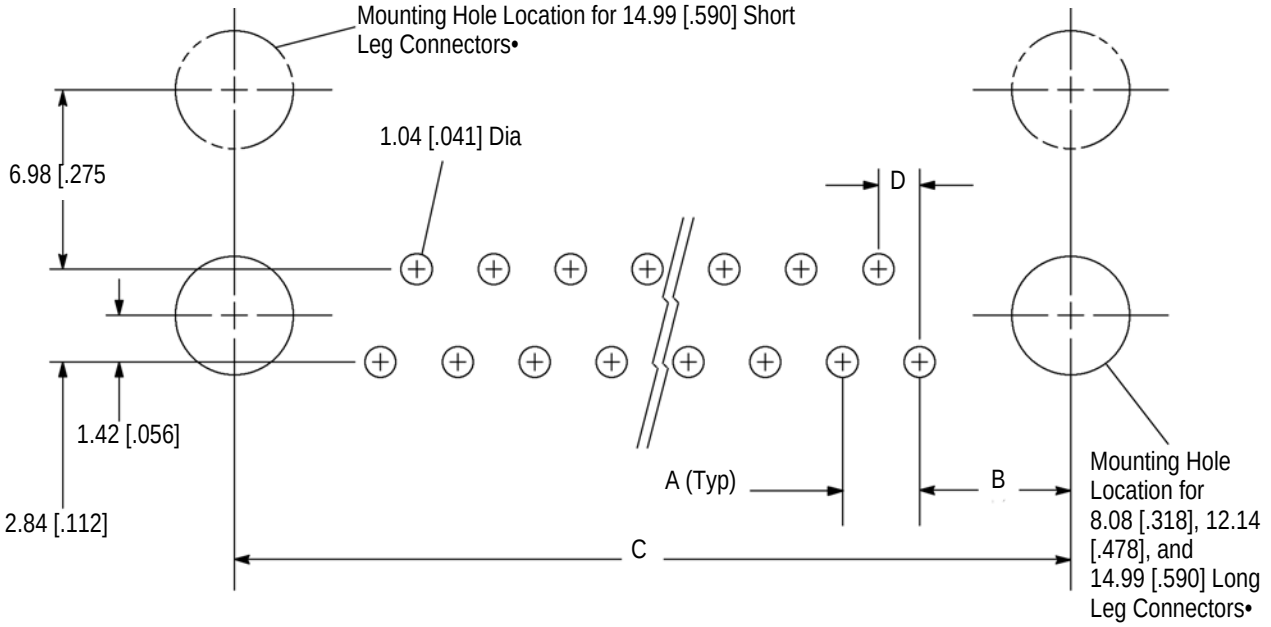
Contact the Product Information Center or the Tooling Assistance Center number listed at the bottom of page 1 for suitability of other board materials or thicknesses.

B. Tolerance

Maximum allowable bow of the pc board shall be 0.03 mm [.001 in.] over the length of the connector.

C. 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 connector. The connectors can be placed on the pc board manually or by machine. The following dimensions must be observed when preparing a pc board for AMPLIMITE Right-Angle Front Metal Shell Connectors. Design the pc board using the dimensions provided in Figure 6 for manual placement and Figure 7 for robotic placement. Both figure layouts show the connector mating face of the pc board.



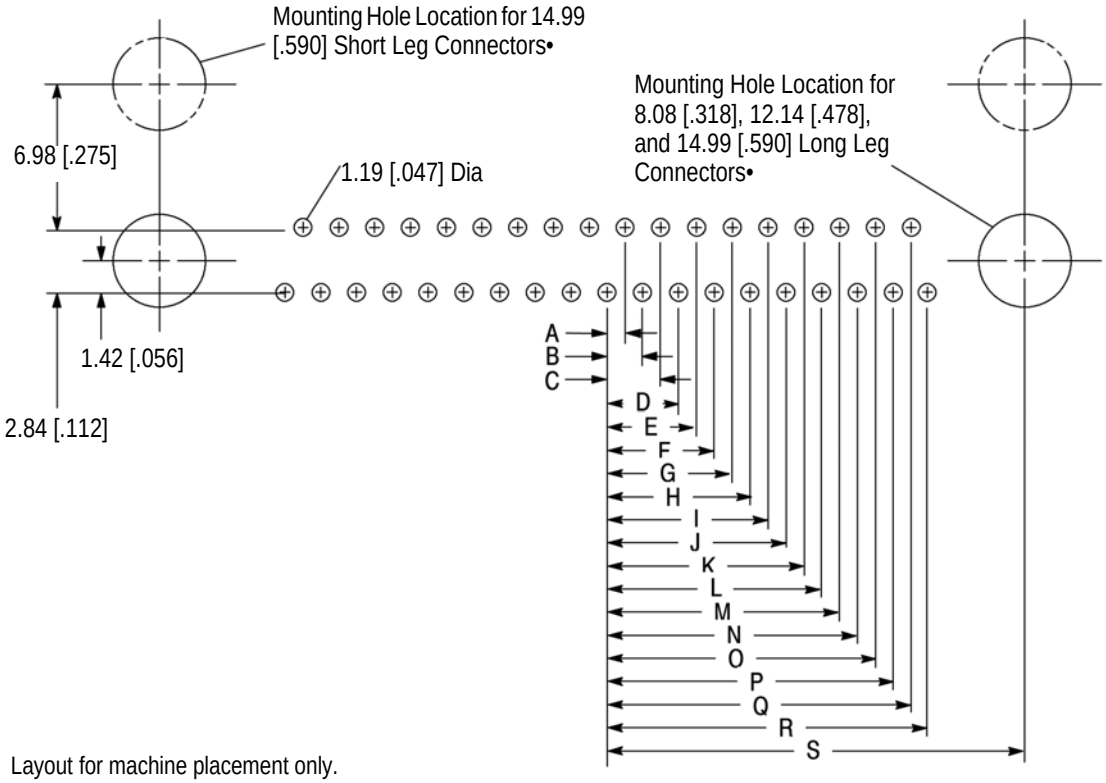
NOTE: Layout for manual placement only.

NUMBER OF CONTACTS	A† DIM	B DIM	C DIM	D DIM
9	2.74 [.108]	7.01 [.276]	24.99 [.984]	1.37 [.054]
15	2.74 [.108]	7.06 [.278]	33.32 [1.312]	1.37 [.054]
25	2.76 [.10867]	6.96 [.274]	47.04 [1.852]	1.379 [.05433]
37	2.76 [.10867]	6.96 [.274]	63.50 [2.500]	1.379 [.05433]

† This dimension is a noncumulative tolerance.

• Use 3.18 ±0.08 mm [.125 ±.003 in.] for connectors with boardlocks and 3.05 mm [.120 in.] for connectors with 3.18 mm [.125 in.] diameter holes.

Figure 6



NOTE: Layout for machine placement only.

NOTE: All dimensions for this layout have a tolerance of ±0.05 [±.002] unless otherwise stated.

CONNECTOR POSITION	DIMENSIONS									
	A	B	C	D	E	F	G	H	I	J
9	1.37 [.054]	2.74 [.108]	4.11 [.162]	5.49 [.216]	---	---	---	---	---	---
15	1.37 [.054]	2.74 [.108]	4.11 [.162]	5.49 [.216]	6.86 [.270]	8.23 [.324]	9.60 [.378]	---	---	---
25	1.40 [.055]	2.77 [.109]	4.14 [.163]	5.54 [.218]	6.91 [.272]	8.28 [.326]	9.68 [.381]	11.05 [.435]	12.42 [.489]	13.82 [.544]
25	1.40 [.055]	2.77 [.109]	4.14 [.163]	5.54 [.218]	6.91 [.272]	8.28 [.326]	9.68 [.381]	11.05 [.435]	12.42 [.489]	13.82 [.544]

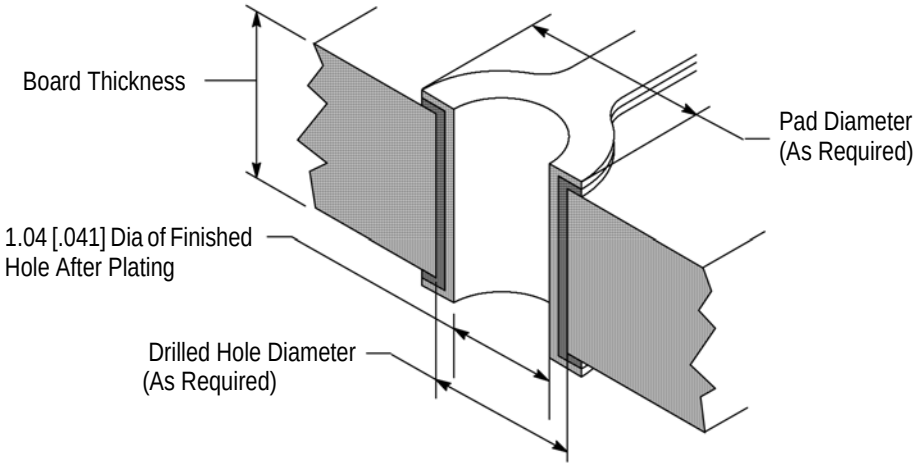
CONNECTOR POSITION	DIMENSIONS								
	K	L	M	N	O	P	Q	R	S
9	---	---	---	---	---	---	---	---	12.50 [.492]
15	---	---	---	---	---	---	---	---	16.66 [.656]
25	15.19 [.598]	16.56 [.652]	---	---	---	---	---	---	23.52 [.926]
37	15.19 [.598]	16.56 [.652]	17.96 [.707]	19.33 [.761]	20.70 [.815]	22.10 [.870]	23.47 [.924]	24.84 [.978]	31.75 [1.250]

• Use 3.18 ±0.08 mm [.125 ±.003 in.] for connectors with boardlocks and 3.05 mm [.120 in.] for connectors with 3.18 mm [.125 in.] diameter holes.

Figure 7

3.7. PC Board Contact Tine Holes

These connectors may be used with or without plated through holes. If plated, the drilled hole size plating types and plating thickness are dependent on your application requirements. The finished hole size must be as stated to provide unrestricted insertion and ensure adequate application of solder to the tines. See Figure 8.



NOTE: Board thickness shall be 2.36 mm [.093 in.] for standard connectors or 1.57 mm [.062 in.] for connectors with boardlocks.

Figure 8

3.8. Limitations

Use the product specification referenced in Paragraph 2.5 for test procedures regarding these connectors.

3.9. Polarizing and Keying

The keystone configuration of each connector mating face prohibits the accidental inversion of mating connectors. To further reduce the possibility of incorrect installation of mating plug connectors, a keying plug may be placed in the receptacle connector. See Figure 9.

NOTE

If a keying plug is used, the pin cavity in the mating plug connector must be empty.

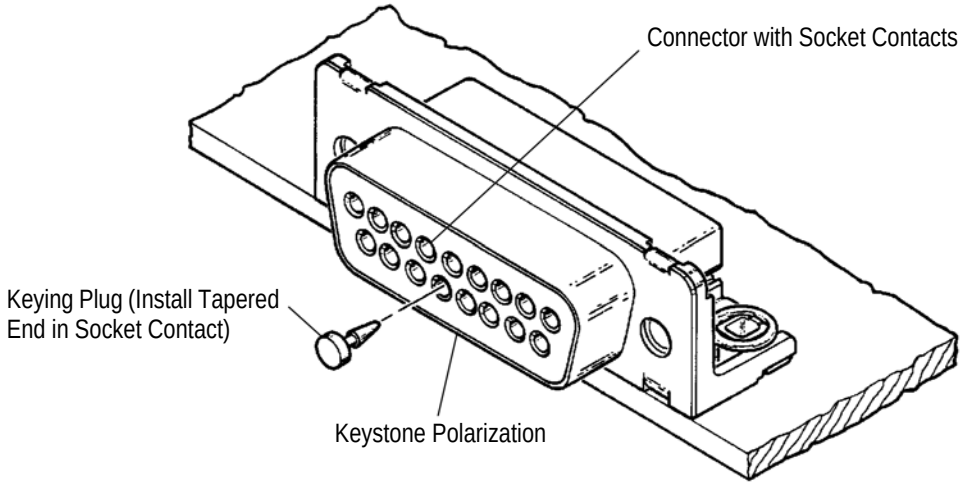


Figure 9

3.10. Hardware for PC Board Connectors

These connectors have been designed to be used with standard hardware. They will accept other types of commercially available mating hardware. If you are designing a connector for a system with some other type of hardware, contact the product information number on page 1 for design assistance. See Figure 10.

A. Standard Products

The connector may be affixed to the pc board by using commercially available hardware such as screws, washers and nuts: rivets or similar devices. These connectors must not be secured using incompatible, dissimilar metals without appropriate interface treatment.

B. Boardlocks

Boardlocks have gripping shoulders that pass through the pc board at the same time the contact tines are inserted through the board. They lock into position when the housing is seated on the board. The initial insertion and extraction forces are: 62 N [14 pounds] maximum for insertion and 13 N [3 pounds] minimum for extraction.

3.11. Ancillary Items

A. Screwlocks

Removable or non-removable screwlocks provide a means of securing mating connectors with commercially available 4-40 threaded hardware. The torque limit is 0.23 N•m [2 in-lb] applied from the mating face side. The maximum push out force is 89 N [20 lb-force] applied from the mating face side.

B. Inserts

Connectors with non-removable 4-40 threaded inserts in the mounting flange allow the connector to be mounted to a panel with commercially available 4-40 hardware. The torque limit is .45 N•m [4 inch-pounds] applied from the mating face side. The maximum push out force is 89 N [20 pounds], applied from the mating face side.

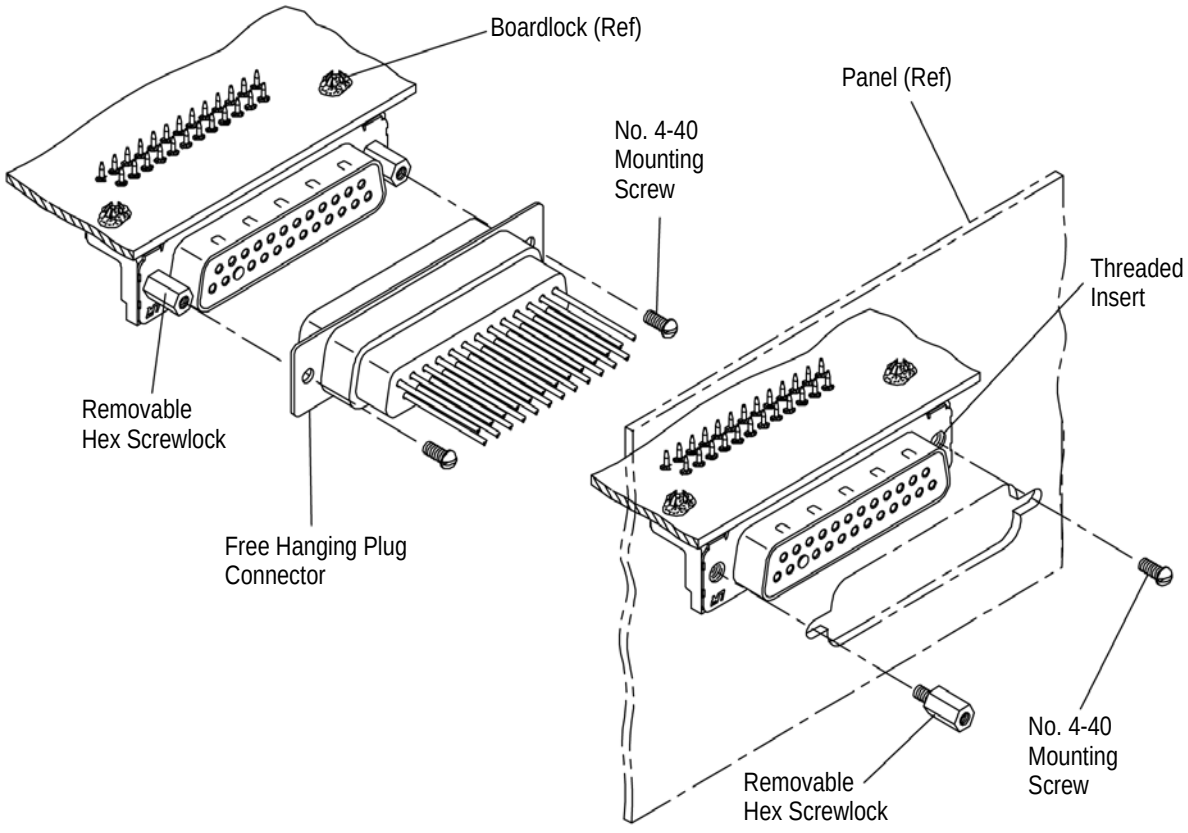


Figure 10

3.12. Shielding

These connectors feature tin-plated steel shells which provide continuity for EMC (Electromagnetic Compatibility) applications. When mated with corresponding metal shell connectors, shielding and grounding continuity are achieved. Use of boardlocks provides electrical continuity to any ground path on the pc board inclusive of hardware mounting holes.

3.13. Connector Placement

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

Determine which hole in the pc board is to receive the number one contact tine, then orient the connector so the number one solder tine is aligned with the hole. Start all solder tines into the board; then, when the boardlocks starts to engage the board, press the connector until it seats on the pc board.

After the connector is snapped into the pc board, the boardlocks are soldered with the connector solder tines during the soldering process.

3.14. 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. Some fluxes that are compatible with these connectors are provided in Figure 11.

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

KESTER and ALPHA are trademarks.

Figure 11

B. Soldering Guidelines

AMPLIMITE Right-Angle Front Metal Shell Connectors can be soldered using wave or equivalent soldering techniques. Refer to Manual 402-40 for soldering guidelines. The temperatures and exposure time shall be within the ranges specified in Figure 12. We recommend using SN60 or SN62 solder for these connectors.

A connector that is compatible with typical surface mount soldering techniques is also available. It can withstand a maximum temperature of 225°C [437°F] for a period of 90 seconds.

SOLDERING PROCESS	TIME (At Max Temp)	TEMPERATURE	
		CELSIUS	FAHRENHEIT
Wave Soldering	5 Seconds	260° (Wave Temperature)	500° (Wave Temperature)

Figure 12

C. Cleaning

After soldering, it is necessary to remove fluxes, residues, and activators. Consult with the supplier of the solder and flux for recommended cleaning solvents. Figure 13 contains a listing of common cleaning solvents that will not affect the connectors.

Cleaners must be free of dissolved flux and other contaminants. We recommend cleaning with the pc board on its edge. If using an aqueous cleaner, we recommend standard equipment such as a soak-tank or an automatic in-line machine.

CLEANER		TIME (Minutes)	TEMPERATURE (Maximum)
NAME	TYPE		
ALPHA 2110	Aqueous	1	132°C [270°F]
BIOACT EC-7	Solvent	5	100°C [212°F]
Butyl CARBITOL	Solvent	1	Ambient Room
Isopropyl Alcohol	Solvent	5	100°C [212°F]
KESTER 5778	Aqueous		
KESTER 5779	Aqueous		
LONCOTERGE 520	Aqueous		
LONCOTERGE 530	Aqueous		
Terpene	Solvent		

ALPHA, BIOACT, CARBITOL, LONCOTERGE, and KESTER are trademarks of their respective owners.

Figure 13

CAUTION

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 TE 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.

D. 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]. Excessive temperatures may cause housing degradation.

3.15. Checking Installed Connector

The AMPLIMITE Right-Angle Front Metal Shell Connector must be seated on the pc board to the dimensions shown in Figure 14.

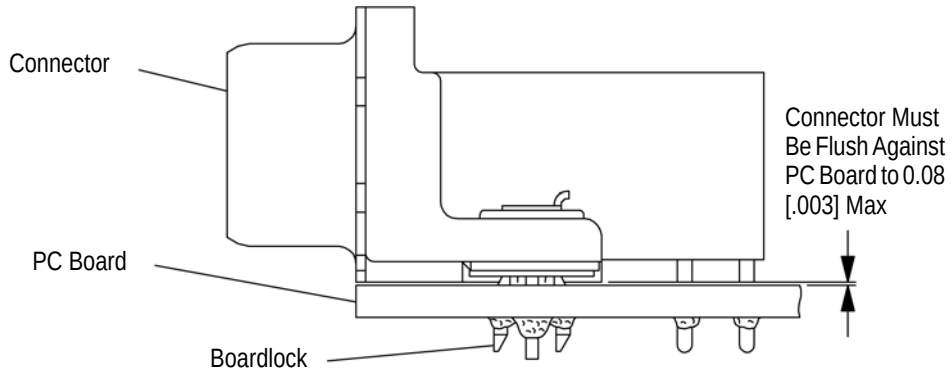


Figure 14

3.16. Repair/Removal

If the connector should become damaged, it must be replaced. The connector may be removed from the pc board by normal desoldering methods and replaced with a new connector.

When repairing or replacing AMPLIMITE Right-Angle Front Metal Shell Connectors, be careful not to damage other pc board components during the desoldering process.

4. QUALIFICATIONS

AMPLIMITE Right-Angle Front Metal Shell Connectors are Recognized by Underwriters Laboratories Inc. (UL) in File Number E-28476 and Certified by CSA International in File Number LR-16455.

5. TOOLING

No special tooling is required for the hand placement of AMPLIMITE Connectors on a pc board.

6. VISUAL AID

Figure 15 shows a typical application of AMPLIMITE Right-Angle Front Metal Shell 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.

NOTE

A typical installation will employ boardlocks, screwlocks, or other suitable hardware such as screws and nuts.

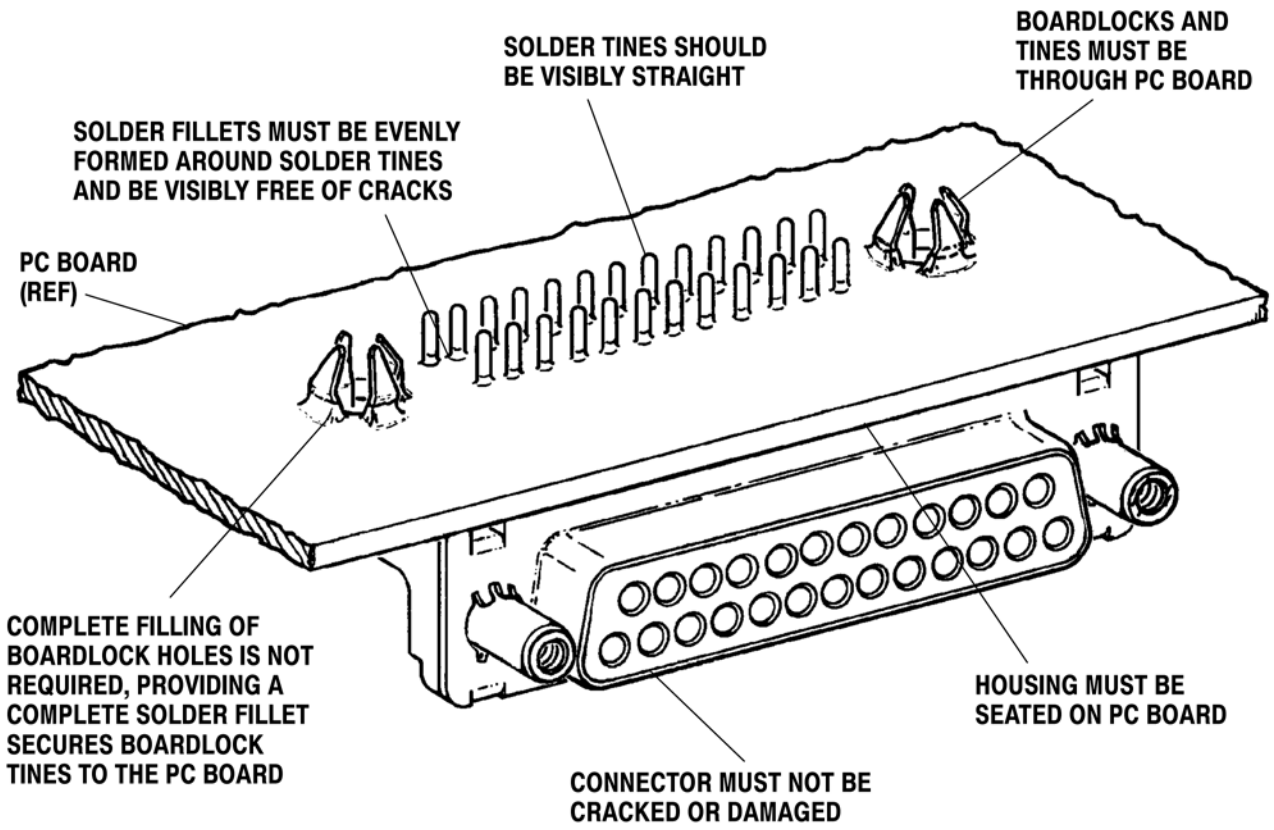


FIGURE 15. VISUAL AID

勝特力電材超市-龍山店 886-3-5773766
勝特力電材超市-光復店 886-3-5729570
胜特力电子(上海) 86-21-34970699
胜特力电子(深圳) 86-755-83298787
http://www.100y.com.tw