



NOTE

All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters. Unless otherwise specified, dimensions have a tolerance of ± 0.13 mm 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 MULTIGIG RT Power Modules, vertical receptacles, and right-angle plug headers. These modules may be used with MULTIGIG RT Signal Connectors, independently, or with other backplane/daughtercard product families. The connector blade-to-blade centerline spacing is 3.6 mm.

MULTIGIG RT Power Modules are available in vertical receptacles (backplane application), and right-angle plug headers (daughtercard application) as shown in Figure 1. Modules have 2 or 4 contact positions with 20.3 mm daughtercard spacing. Header contacts are available in 3 lengths for different levels of sequencing. All modules have ACTION PIN* press-fit contacts eliminating the need for soldering. Modules are polarized to ensure correct orientation on the printed circuit (pc) board, and for connector mating. Guide pins and modules should be used for primary alignment when needed. MULTIGIG RT Power Modules provide secondary alignment. Power Modules are placed on the pc board by manually operated or automatic machines.

When corresponding with TE Connectivity 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.

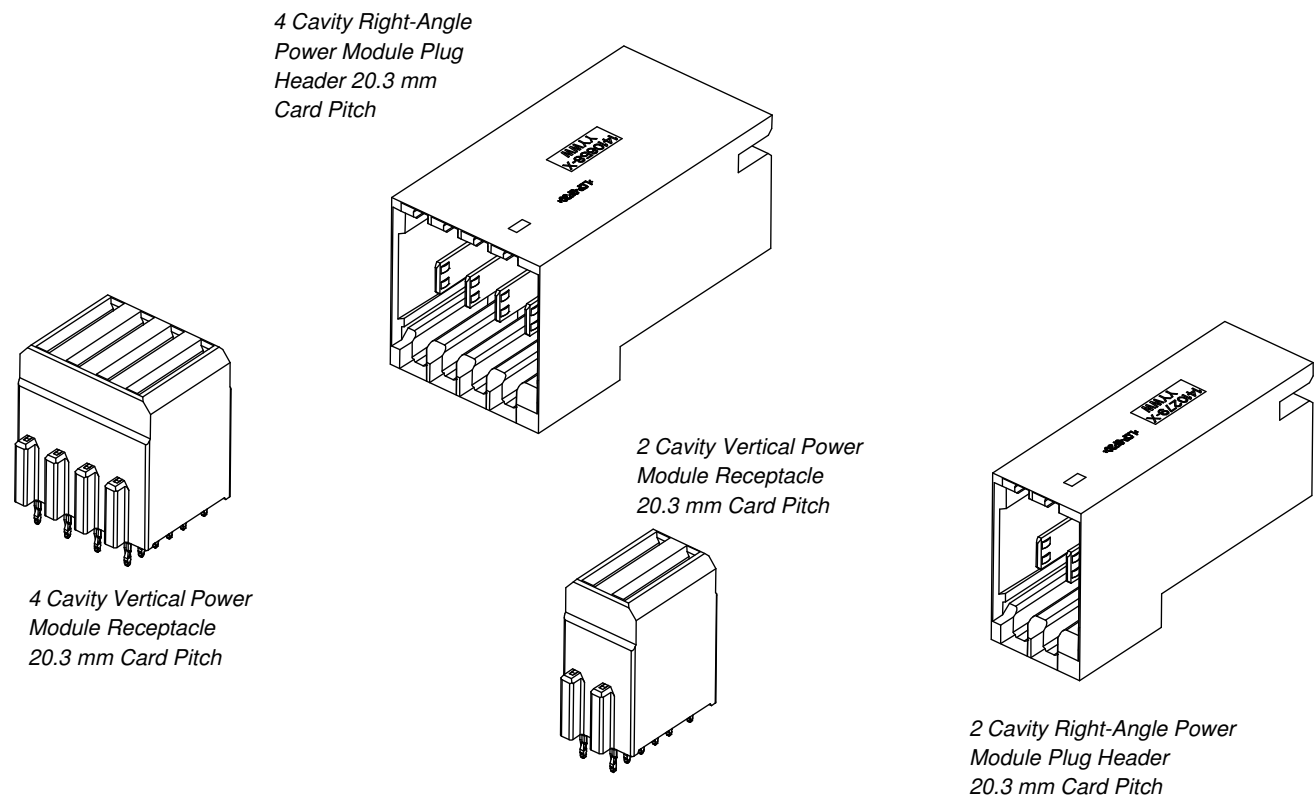


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Revisions to this instruction sheet include:

- Updated document to corporate requirements and changed company logo
- Deleted obsolete product artwork and related information in Figures 1 and 6
- Changed text in Paragraphs 3.3.A, 3.3.B and Section 4, QUALIFICATIONS
- Changed dimension text for hole diameter in Figure 6

2.2. Customer Assistance

Reference Product Base Part Number 1410270 and Product Code F349 are representative numbers of MULTIGIG RT Power Modules. Use of these numbers will identify the product line and help you to obtain product and tooling information. Such information can be obtained through a local Representative, by visiting our website at www.te.com, or by calling PRODUCT INFORMATION or the TOOLING ASSISTANCE CENTER at the numbers at the bottom of page 1.

2.3. Drawings

Customer Drawings for specific products 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 other technical documentation supplied by TE.

2.4. Specifications

Product Specification 108-2062 provides product performance and test information. Application Specification 114-13056 provides information for application of MULTIGIG RT Signal Connectors.

2.5. Instructional Material

The following list includes available instruction sheets (408- and 411-series) that provide assembly procedures for operation, maintenance and repair of tooling.

<u>Document Number</u>	<u>Document Title</u>
408-6923	Manual Arbor Frame Assembly 58024-1
408-7777	Manual Arbor Frame Assembly 91085-2
411-78056	Seating Tool 1596489-[] for MULTIGIG RT Power Module Vertical Receptacles

3. REQUIREMENTS

3.1. Storage

A. Ultraviolet Light

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

B. Shelf Life

The modules should remain in the shipping containers until ready for use to prevent deformation to the contacts. The modules 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 modules near any chemicals listed below, as stress corrosion cracking in the contacts may occur.

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

D. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

3.2. Temperature Limitations

The modules are designed to operate in a temperature range of -55° to 105° C [-67° to 221° F].

3.3. Material and Size Selection

A. Material

All MULTIGIG RT Power Modules Housings are molded of high temperature liquid crystal polymer (LCP) thermoplastic, UL94V-O rated. The contacts are phosphor bronze and plated at the contact interface with gold over nickel. The ACTION PIN contact area on both contacts is tin-lead over nickel or tin over nickel.



NOTE

The contact area of all contacts is covered with a lubricant to reduce friction, heat, and wear.

B. Size

These modules are available with either 2 or 4 contacts for 20.3 mm daughtercard spacing.

3.4. Sequencing Options

Three different levels of sequencing are available. It is recommended that Level 3 be used in conjunction with either a rack system or a guide pin/guide receptacle arrangement. See Figure 2.

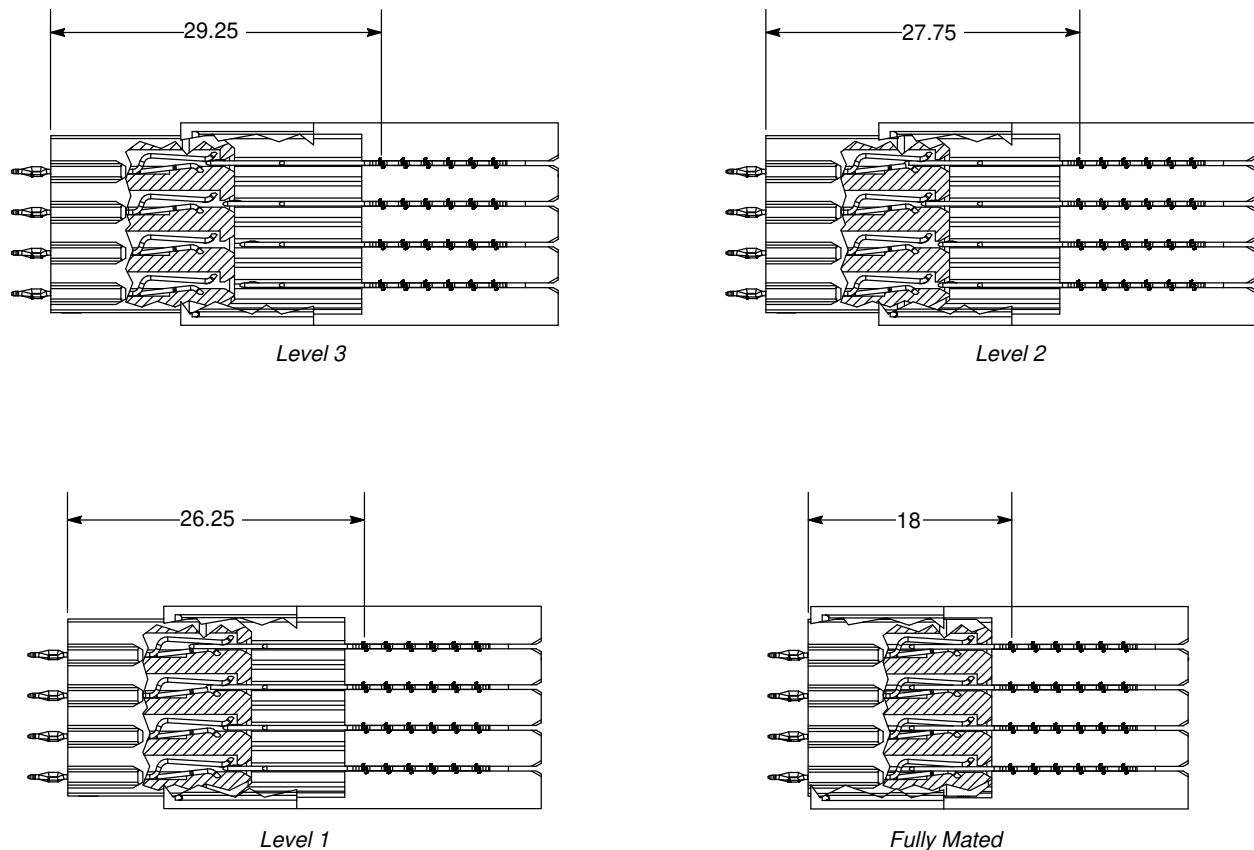


Figure 2

3.5. End-to-End Placement

For MULTIGIG RT Power Modules placed side-by-side, the centerline spacing is either 18.0 mm or 10.8 mm. This depends on whether 2 or 4 cavity power modules are being used. For placement next to another module, the ends of the right-angle housing are 3.6 mm maximum from the first and last blade in the module. Refer to Figure 3.

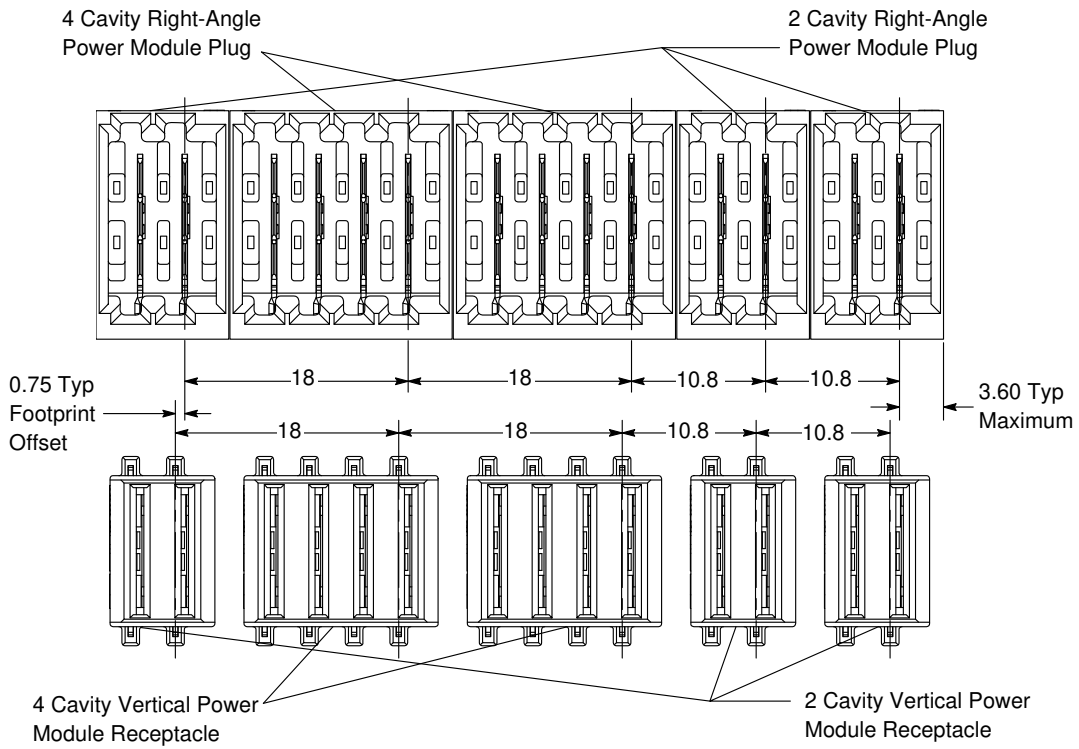


Figure 3

3.6. Alignment

Proper alignment is essential to ensure full engagement of mating modules, and to ensure that contacts are not bent or otherwise damaged during mating and unmating. For tolerance limitations, see Figure 4.

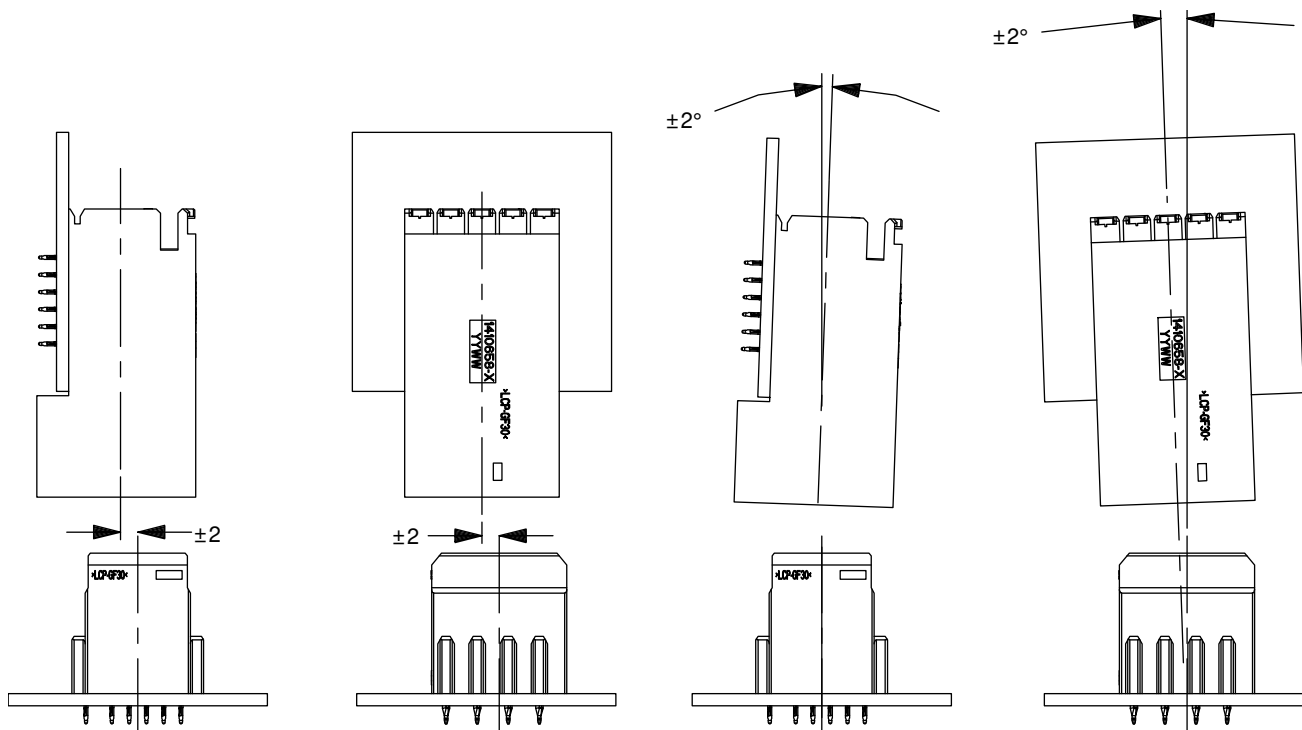


Figure 4

3.7. Mating Dimension

Full mating of modules is necessary to ensure a good connection. The dimension from the surface of the pc board to which the vertical receptacle is mounted to the first row of contacts in the right-angle plug should be as shown in Figure 5.

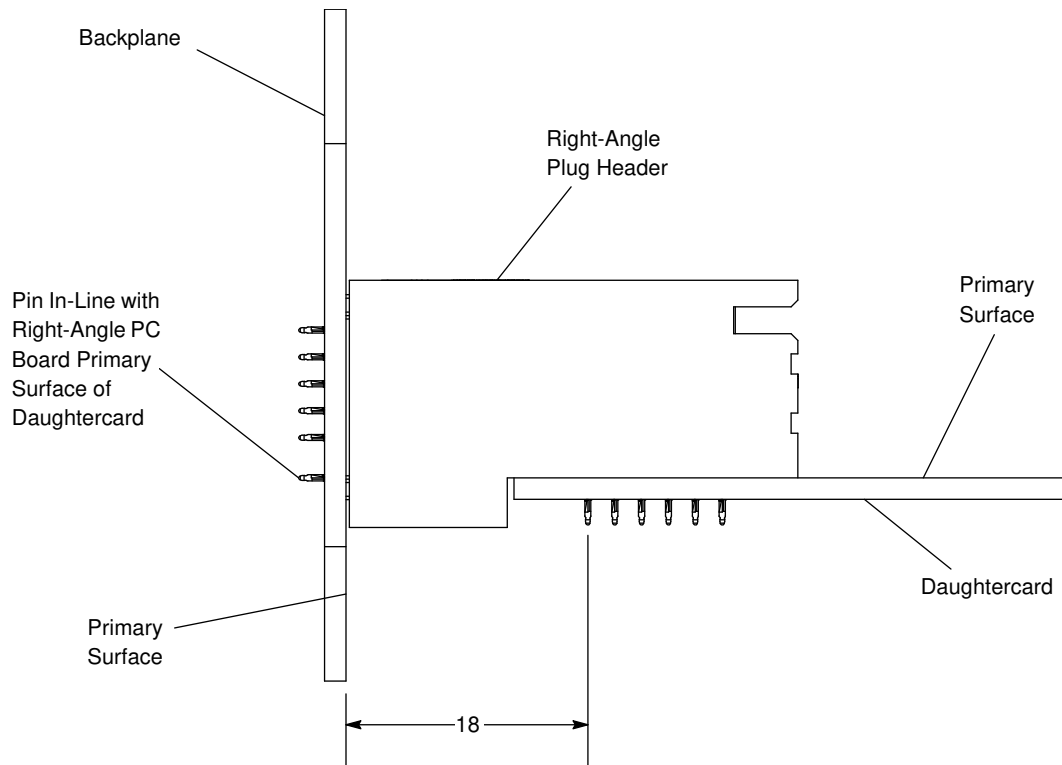


Figure 5

3.8. PC Board Requirements

A. PC Board Material and Thickness

The pc board material shall be glass epoxy (FR-4). Both right-angle plug header modules and vertical receptacle modules with compliant pins require a pc board with a minimum thickness of 1.4 mm.

B. PC Board Circuit Pattern Layout

The pc boards layout patterns for the placement of right-angle header modules and vertical receptacle modules are shown in Figure 6.



NOTE

For applications requiring the minimum installation force of the connector, the pc board through hole size should be in the high end of the allowable tolerance.



NOTE

Figure 6 represents a typical pc board layout for this product. For dimensions and hole pattern layout for specific part numbers, obtain the appropriate customer drawing through your TE Representative or refer to the telephone numbers at the bottom of page 1.

C. PC Board Circuit Pattern Layout Spacing for Adjacent Components

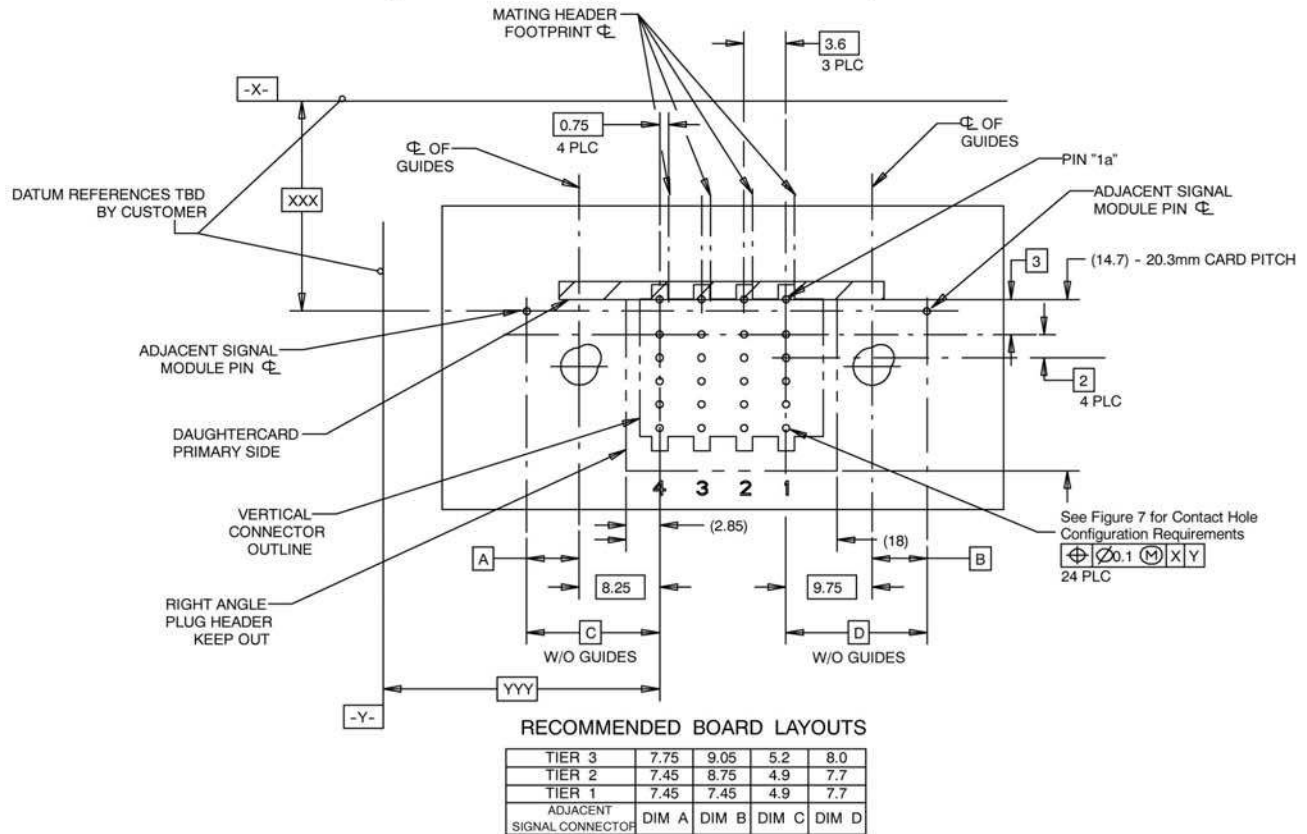
Care must be used to avoid interference between adjacent components. The allowable distance between power and guide or signal modules is provided in Figure 6.



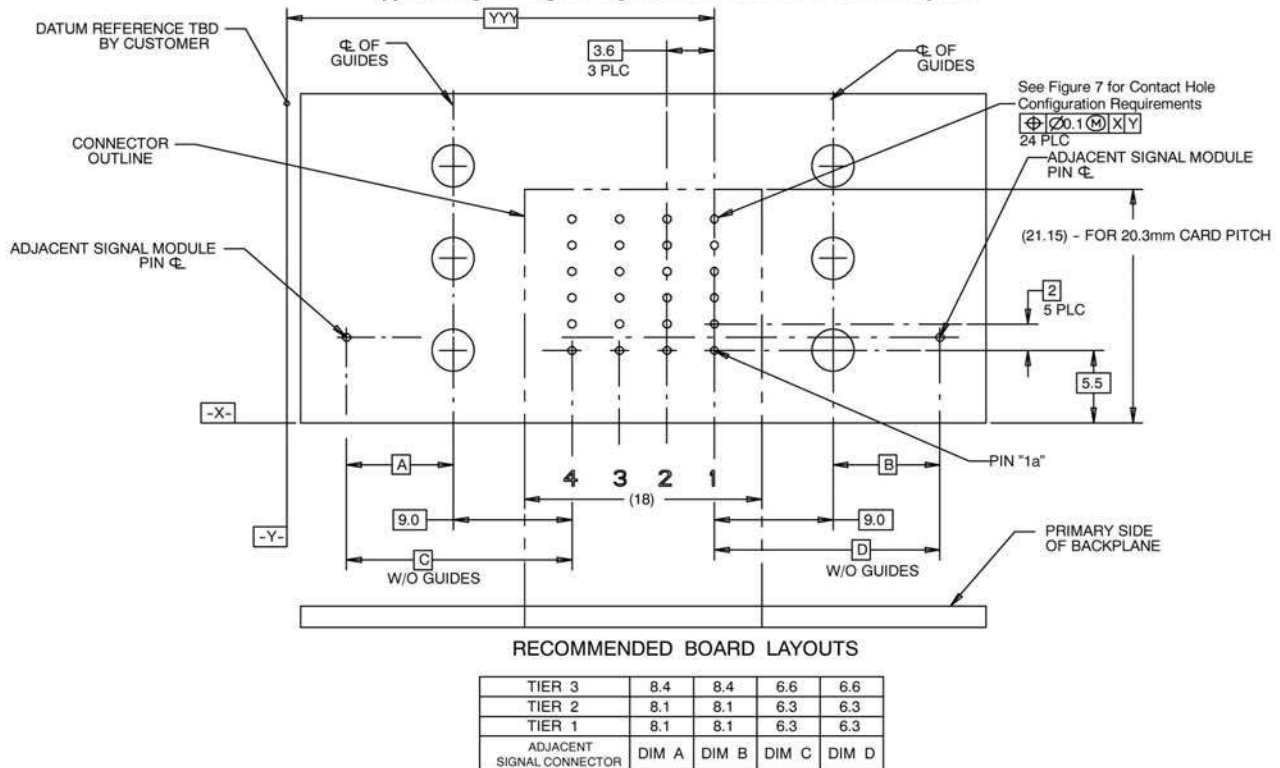
NOTE

Refer to Application Specification 114-13056 for details of recommended pc board layouts of signal and guide modules.

Typical Vertical Receptacle Module PC Board Layout



Typical Right-Angle Plug Header Module PC Board Layout



NOTE: Connector Side of PC Board

Figure 6

3.9. Contact Hole Configuration

The contact holes in the pc board for all contacts must be drilled and plated through to specific dimensions. See Figure 7.

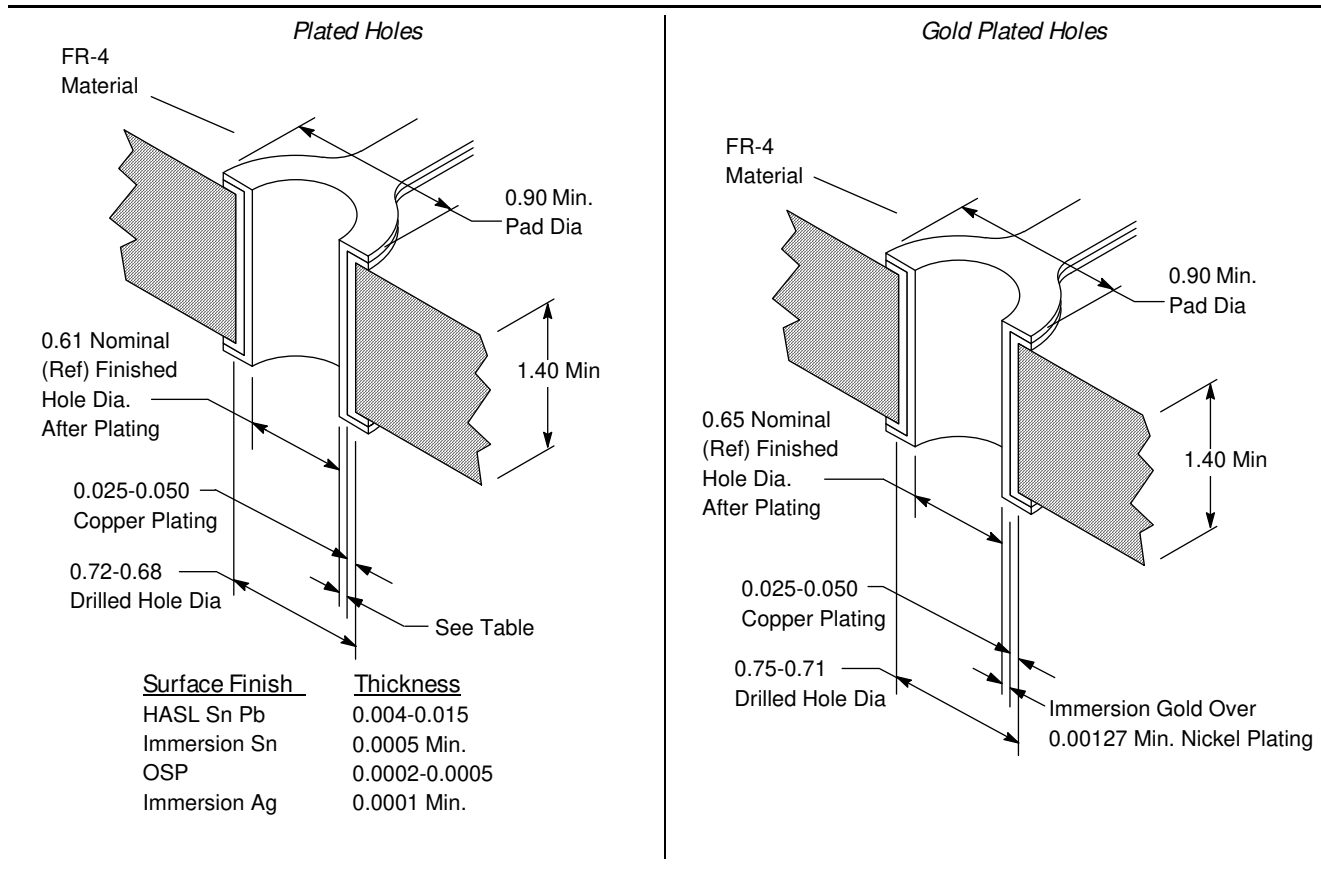


Figure 7

3.10. Module Seating

A. Polarization and Initial Positioning

Vertical receptacles can only be placed on the pc board in one orientation since the ACTION PIN contact tines are not symmetrical about the centerline of the housing. Right-angle headers can only be placed on the pc board in one orientation since a portion of the housing must extend below the edge of the pc board.



CAUTION

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

MULTIGIG RT Power Modules may be pre-applied to a pc board by hand or by robotic equipment. See Section 5, TOOLING. When placing modules onto a pc board, all contact tines should be aligned and started into the matching holes before seating the modules onto the pc board. The contacts must be inserted simultaneously to prevent twisting or bending of components.

B. Seating the Modules

Connectors with compliant pin contacts are seated to the pc board using pc board supports, seating tools (as required), and manual or powered units to provide insertion force. See Section 5, TOOLING.

Seating force must be applied evenly on the Power Modules to prevent deformation or other damage to the contacts and housings. When installing the vertical receptacles, the insertion force must be simultaneously applied to the shoulders of each contact. A seating tool is required for vertical receptacles. When installing right-angle plug headers, the insertion force per compliant pin tine is 53 N [12 lb-force]. Each contact has 6 tines and so maximum insertion force per contact is 318 N [72 lb-force]. The force required to seat the modules onto the pc board can be calculated by:

Number of contacts X maximum insertion force per contact = module insertion force. Correct seating is essential to interconnection performance. Over-driving product will deform parts critical to connection quality. Modules not fully seated to within 0.1 mm of pc board surface contribute to connector misalignment problems. See Figure 8.

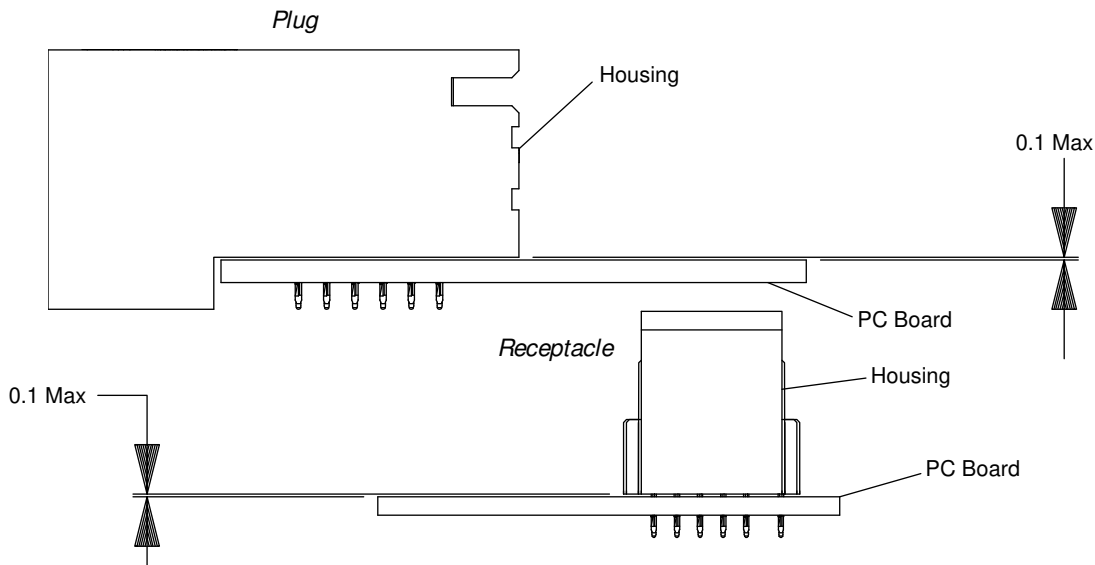


Figure 8

3.11. Soldering Process Considerations

Since the MULTIGIG RT Power Module is a press-in compliant pin type of design, it does not require solder. But, when pc board repair or rework requires soldering after the modules are already inserted in the pc board, the following applies.



CAUTION

Even when using "no clean" solder paste, it is imperative that the contact interface be kept clean of flux and residue, since it acts as an insulator.



DANGER

Consideration must be given to toxicity and other safety requirements recommended by the solvent manufacturer. Trichloroethylene and Methylene Chloride can be used with no harmful affect to the modules; 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.

Air drying of cleaned modules is recommended. Temperature for the modules should not exceed -55 to 105°C [-67 to 221°F]. Degradation of the housings could result from extreme temperatures. Gold surfaces of contact tines must be relubricated with a Telcordia approved lubricant if applications require it.



NOTE

Telcordia GR-1217, "Generic Requirements for Separable Electrical Connectors Used in Telecommunications Hardware" provides industry testing.

3.12. Repair/Replacement

Damaged contacts cannot be removed from modules. The entire module will have to be removed from the pc board and replaced with a new one.

A. Right-Angle Plug Repair

Place the pc board, connector side down, on a fixture that provides support all around the housing to be removed. Make sure the fixture will not interfere with or damage any other components on the pc board. Apply an even force to all contact pins with a push bar and machine capable of applying 800 N [180 lb-force]. See Figure 9.

Telcordia is a trademark.

B. Vertical Receptacle Repair

Place the pc board, connector side down, on a fixture that provides support all around the housing to be removed. Make sure the fixture will not interfere with or damage any other components on the pc board. Apply an even force to all contact pins with a push bar and machine capable of applying 800 N [180 lb-force]. See Figure 9.

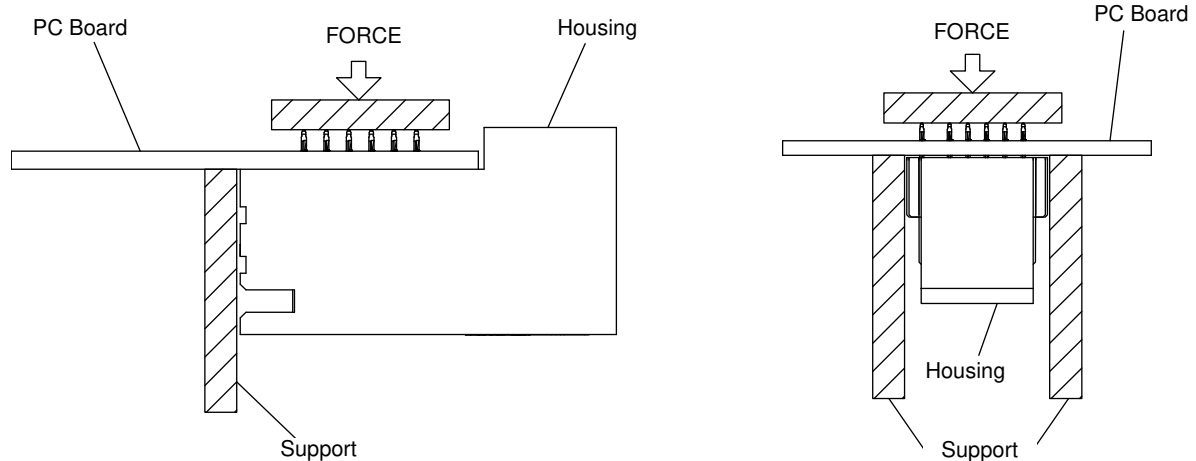


Figure 9

4. QUALIFICATIONS

The MULTIGIG RT Power Connectors are UL Recognized and CSA Certified by Underwriters Laboratories Inc. in File E28476.

5. TOOLING

Figure 10 provides tool part numbers and instructional material for the application of MULTIGIG RT Power Modules.



NOTE

TE Tool Engineers have designed machines for a variety of application requirements. For assistance in setting up prototype and production line equipment, contact TE Tool Engineering through your local TE Representative or call the Tooling Assistance Center number at the bottom of page 1.

• PC Board Support

A pc board support must be used to prevent bowing of the pc board during the insertion of a connector into the board. It should have flat surfaces with holes or a channel wide and deep enough to receive the contact compliant pins and other attaching hardware during installation of the connector on the pc board.

• Robotic Equipment

Robotic equipment for placement of connectors on a pc board must have a true position accuracy of 0.13 mm to ensure proper location and insertion of the contact pins. This includes gripper and fixture tolerances as well as equipment repeatability. It must use the connector datum surface to ensure reliable connector placement. If you need assistance in setting up prototype or production line equipment, contact TE Tooling Engineering through your local TE Representative or call the Tooling Assistance Center number at the bottom of page 1.

• Seating Tools

Seating tools have been designed to push on the contact and seat the connector on the pc board. The tool will prevent contacts from backing out of the housing and prevent damage to the housing. The seating tools may be used with the power units listed or arbor frame assembly.

• Extraction Tools

Extraction tools have been designed to push simultaneously on all the contacts without damage to the pc board holes to remove the modules with an even applied force.

• **Power Units**

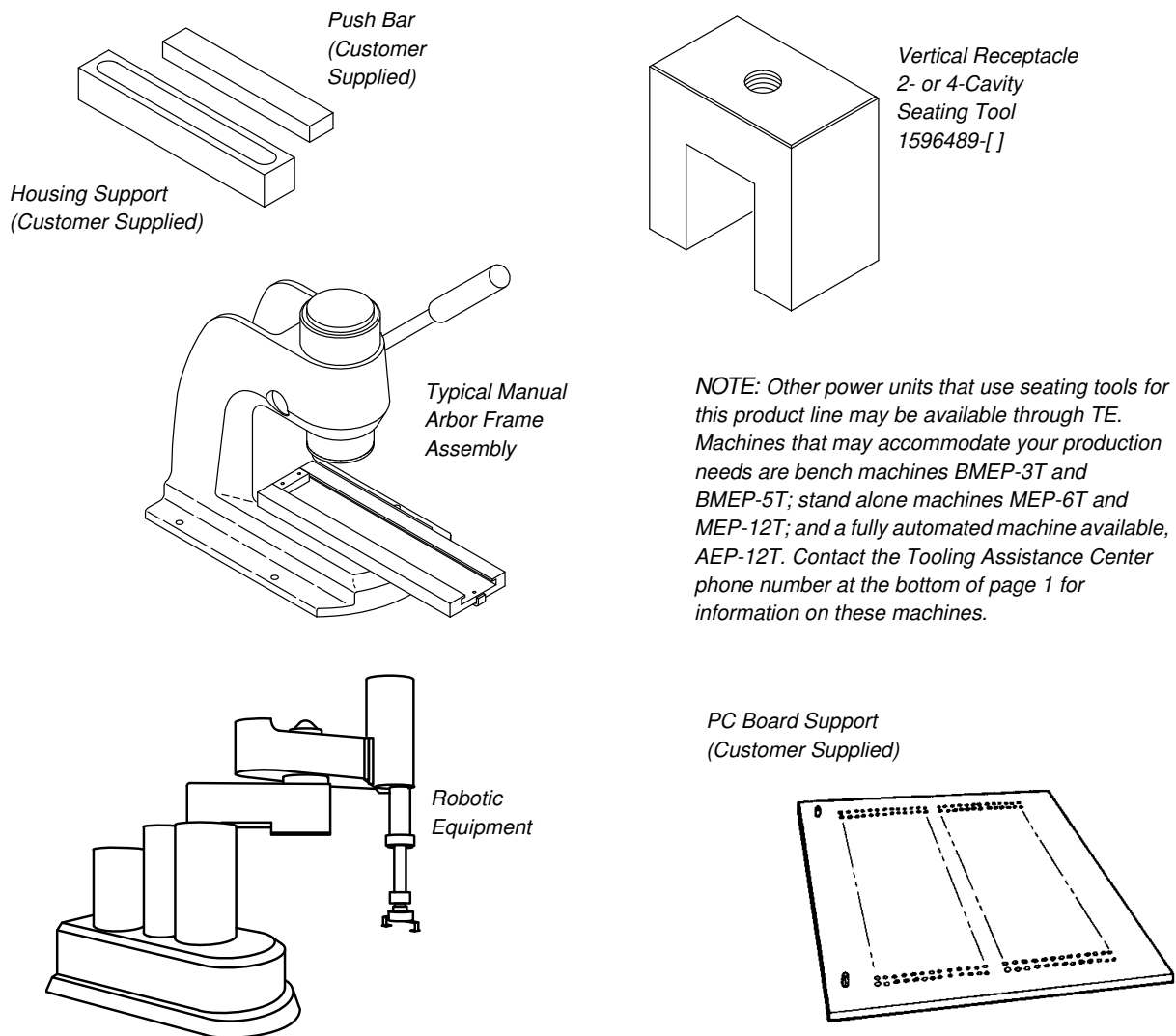
Power units are automatic or semi-automatic machines used to assist in the application of a product. A power unit supplies the force to seat the connector onto the pc board using seating tools.

• **Arbor Frame Assembly**

Manual arbor frame assemblies are used to exert a downward force used to apply connectors to a pc board using seating tools.

• **Push Bar (Flat Rock)**

Commercially available bar stock with a flat surface large enough to cover the top surface of the right-angle header and capable of transmitting 53 N [12 lb-force] per pin can be used as a push bar to insert the compliant pin contacts into the pc board holes. The same type tooling can be used to remove damaged right-angle headers from a pc board by pressing evenly on the tips of the compliant pin tines.



CONNECTOR	SEATING TOOL (DOCUMENT)	MACHINES (DOCUMENT)
VERTICAL RECEPTACLE	1596489-[] (411-78056)	58024-1 (408-6923)
		91085-2 (408-7777)

Figure 10

6. VISUAL AID

The illustration below shows a typical application of this product. 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.

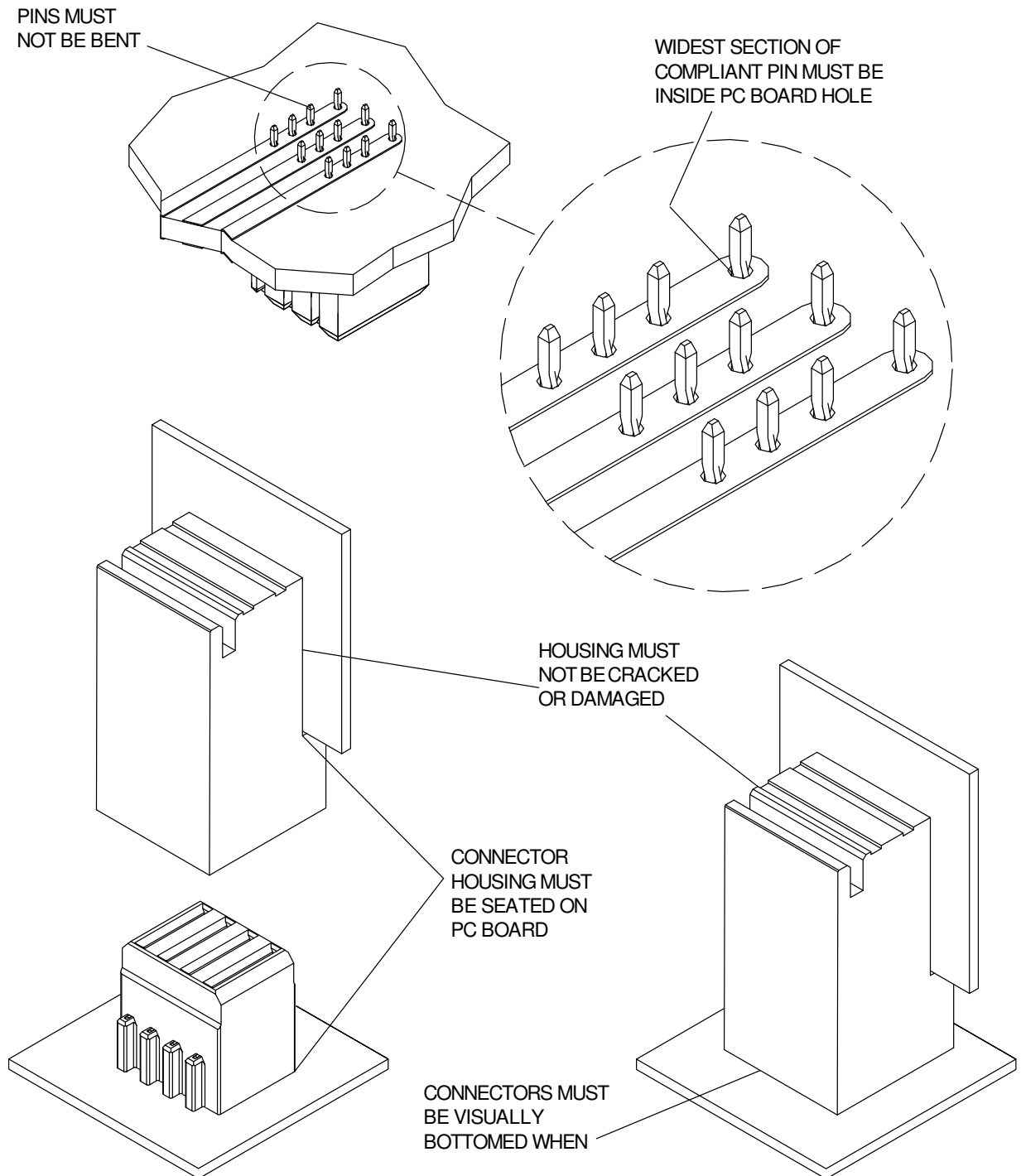


FIGURE 11. VISUAL AID