



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  $\pm 0.13$  [ $\pm .005$ ] 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 Z1 power connectors designed for ATCA onto printed circuit (pc) boards for use in high-end telecommunications equipment. The connectors are available in a front board right-angle plug and backplane straight vertical receptacle. These connectors are fully intermateable and interchangeable with existing power connectors defined by ATCA.

Each connector has a housing containing eye-of-needle precision formed press-fit (compliant pin) contacts: 22 Size 22 signal contacts and 8 Size 16 power contacts (positions 1 through 4 are not populated). The housing has individually-numbered position identification marked on the mating face. The housing features a lead-in edge to prevent stubbing of the signal contacts during mating. The housings are designed with a feature to ensure polarization when mating connectors.

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.

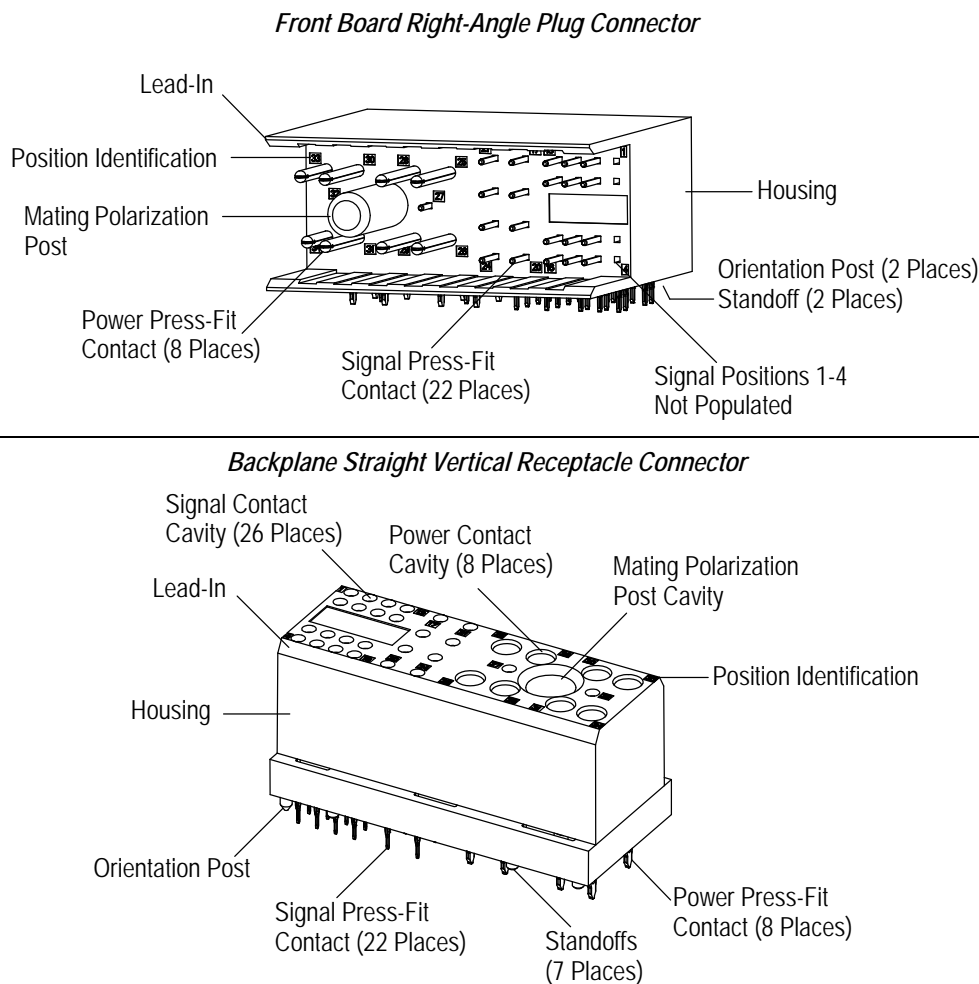


Figure 1

ATCA is a trademark.

The connectors feature standoffs and orientation posts to provide stability when placed on the pc board. The connectors can be placed on the pc board by hand.

The connectors offer four levels of sequencing, which includes a first-mate power/ground pin and a last-mate enable/signal pin. The backplane connector meets international safety standards for touch-safe applications.

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

- New logo

### 2.2. Customer Assistance

Reference Product Base Part Number 1766500 (front board connector) and 1766501 (backplane connector) and Product Code K587 are representative of Z1 power connectors designed for ATCA. 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 TE representative, by visiting our website at [www.te.com](http://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 product part numbers are available from the service network. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, call PRODUCT INFORMATION at the number at the bottom of page 1.

### 2.4. Specifications

Product Specification 108-2216 provides product performance and test information.

### 2.5. Industry Standards and Publications

Standards and publications developed by the PCI Industrial Computer Manufacturers Group, Inc. (PICMG) provide industry test and performance requirements. Documents available which pertain to this product are:

PICMG 3.0 (Core specification defining architecture mechanicals, power, system management, and fabric connectors)

## 3. REQUIREMENTS

### 3.1. Safety

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

### 3.2. Limitations

The connectors are designed to operate in a maximum temperature of 105°C [221°F].

### 3.3. Storage

#### A. Ultraviolet Light

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

#### B. Shelf Life

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

#### C. Chemical Exposure

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

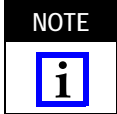
Alkalies	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur Nitrites		Tartrates

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### 3.4. PC Board

#### A. Material and Thickness

The pc board material shall be glass epoxy (FR-4 or G-10). The pc board thickness range shall be a minimum of 1.6 mm [.063 in.] for front board connectors and a minimum of 3.2 mm [.126 in.] for backplane connectors.



Contact **PRODUCT INFORMATION** at the number at the bottom of page 1 for suitability of other board materials and thicknesses.

#### B. Tolerance

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

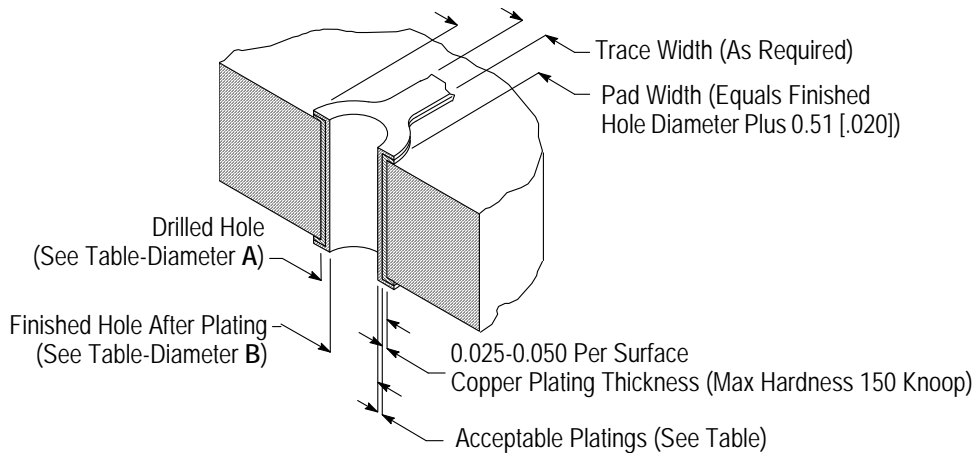
#### C. Holes

The pc board holes for the contacts must be drilled and plated through to specific dimensions to prevent stubbing during placement of the connector on the board and to ensure optimum continuity for circuits. The plating type and thickness and finished hole size must be as stated in Figure 2. All other holes must be drilled to the dimensions given on the pc board layout (refer to Figure 3).

#### D. Layout

The holes in the pc board must be precisely located to ensure proper placement and optimum performance of the connector. The pc board layout must be designed using the dimensions provided on the customer drawing for the specific connector. The recommended pc board layout is shown in Figure 3.

#### Contact Hole



CONNECTOR CONTACT TYPE	DIAMETER		SURFACE FINISH	THICKNESS RANGE
	"A"	"B"		
Signal (Size 22)	1.15+0.025 [.045+.001]	1.0+0.09/-0.06 [.039+.0035/-0.0024]	Hot Air Solder Leveling (HASL) Tin-Lead (SnPb)	0.004-0.010 [.00015-.00039]
Power (Size 16)	1.75+0.025 [.069+.001]	1.60+0.09/-0.06 [.063+.0035/-0.0024]	Immersion Tin (Sn)	0.0005-0.004 [.00002-.00015]
			Organic Solderability Preservative (OSP)	0.0002-0.0005 [.000008-.00002]
			Immersion Gold (Au) Over Nickel (Ni) (ENIG)	0.0001-0.0005 [.000004-.00002] Au 0.004-0.0051 Ni[.00015-.0002] Ni
			Immersion Silver (Ag)	0.0001-0.0005 [.000004-.00002]

Figure 2

**Recommended PC Board Layout  
(Viewed from Connector Side of PC Board)**

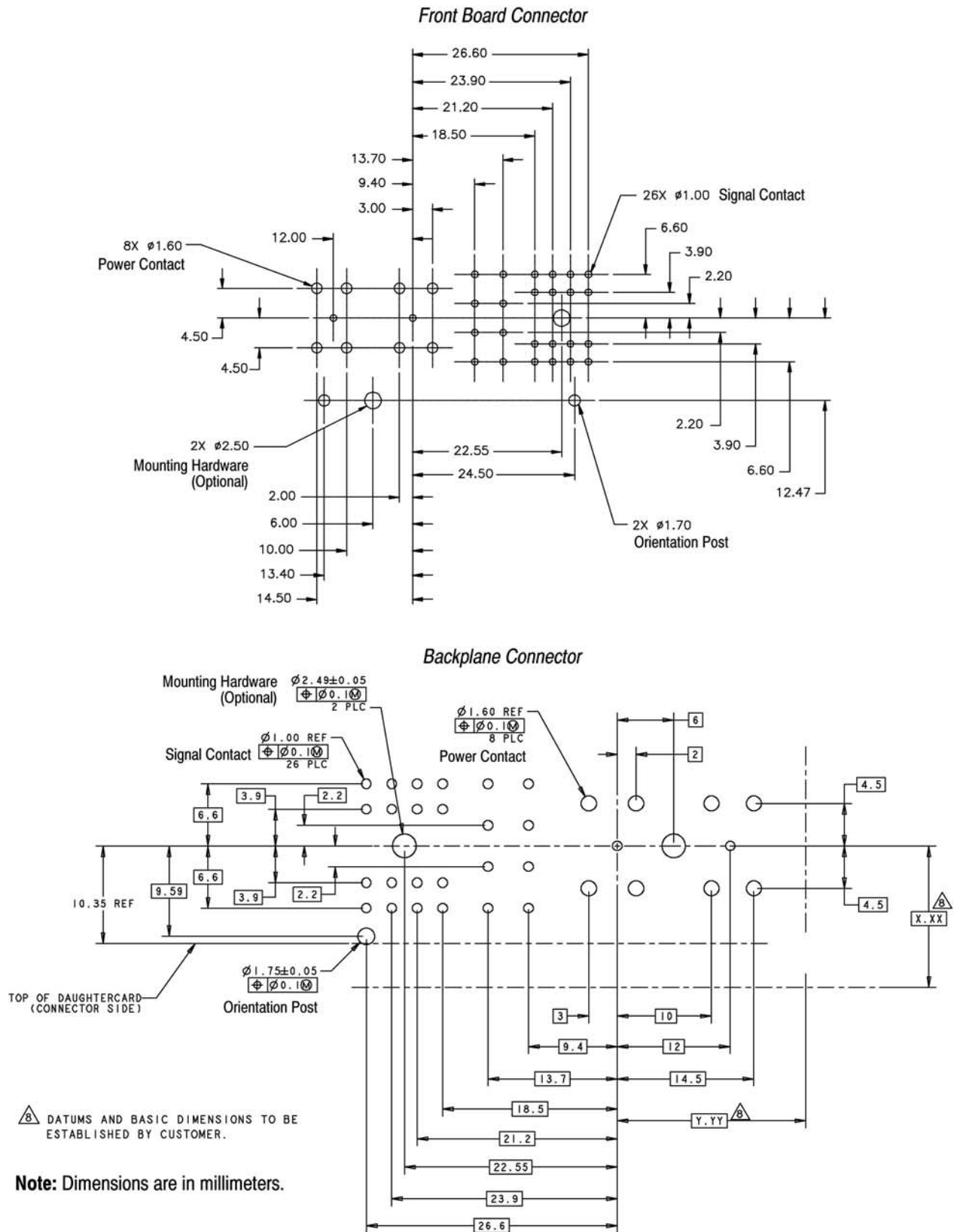


Figure 3

### 3.5. Connector Placement



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

#### A. Registration

When placing connectors on the pc board, contacts and any other protruding component must be aligned and started into the matching holes before seating the connector onto the board.

#### B. Insertion Force

The maximum force required to seat the connector onto the pc board is 2224 N [500 lb-force].

### 3.6. Checking Installed Connector

All standoffs must be seated on the pc board within the dimension provided in Figure 4.

Each orientation post and the entire “eye” of each contact must be within its pc board hole. Planarity of installed connectors is covered in PICMG 3.0.

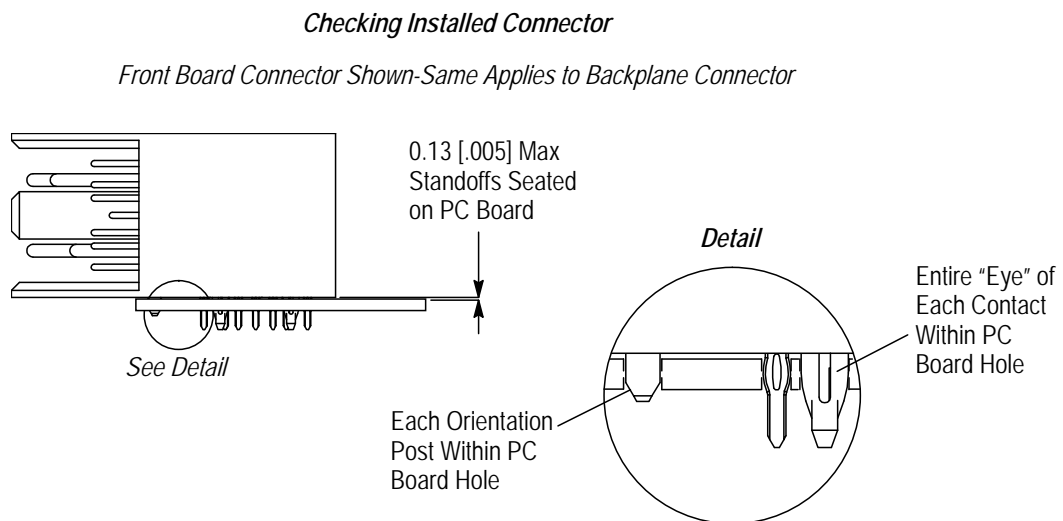


Figure 4

### 3.7. Connector Mating



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

#### A. Polarization

The mating polarization post of the front board must be aligned with the mating polarization cavity of the backplane before the connectors can be mated.

#### B. Mating Force

The maximum amount of mating force is 67 N [15 lb-force].

#### C. Dimensions

Mating depth, range of electrical engagement, and misalignment are covered in PICMG 3.0.

### 3.8. Testing

Probe testing and gauging for restricted entry are covered in PICMG 3.0.

### 3.9. Connector Unmating



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

The maximum amount of unmating force is 67 N [15 lb-force).

### 3.10. Connector Removal

Connectors must be removed from the pc board using a push bar (or flat rock) and pc board support.



For reparability, the tips of the contacts must extend below the surface of the pc board by at least 1.02 mm [.040 in.]; if not, the connector **MUST NOT** be removed from the pc board.

### 3.11. Repair

These connectors are not repairable. Damaged or defective connectors must not be used.

## 4. QUALIFICATION

Zone 1 power connectors designed for ATCA is Recognized by Underwriters Laboratories Inc. (UL) in File E28476 Vol. 39 Sec. 26.

## 5. TOOLING

### 5.1. Application Tooling

Application tooling (such as an arbor press) used to seat the connectors must provide sufficient amount of downward force to insert the contacts into the pc board holes.

### 5.2. PC Board Support

A pc board support must be used to prevent bowing of the pc board during the placement of the connectors on the board. The board support must have a flat surface with holes or a channel large enough and deep enough to receive any protruding components. The pc board must be secured to the board support to prevent movement of the board during seating. Refer to Figure 5. The board support must also be used when removing the connectors from the pc board.

### 5.3. Flat Rock Tooling

Commercially available bar stock (flat rock tooling) with a flat surface large enough to cover all contacts must be used with the application tooling to seat the connectors. For removing the connectors from the pc board, it is suggested that the pc board be supported from the connector side and that the connector be removed using flat rock tooling.

*Seating Connectors*

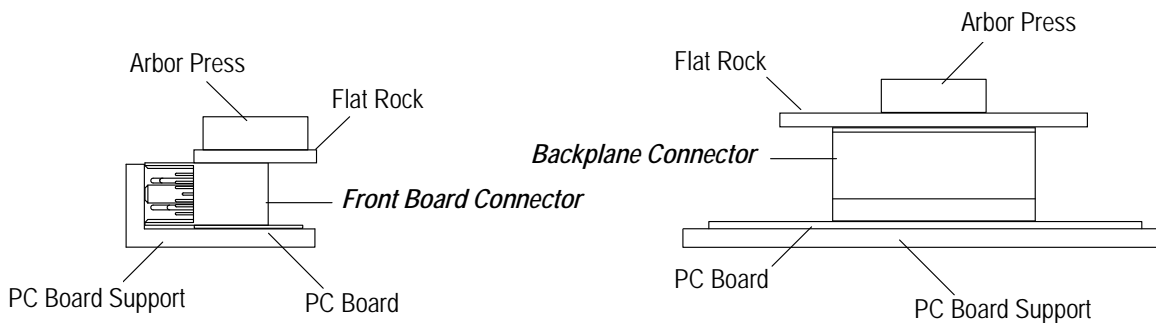
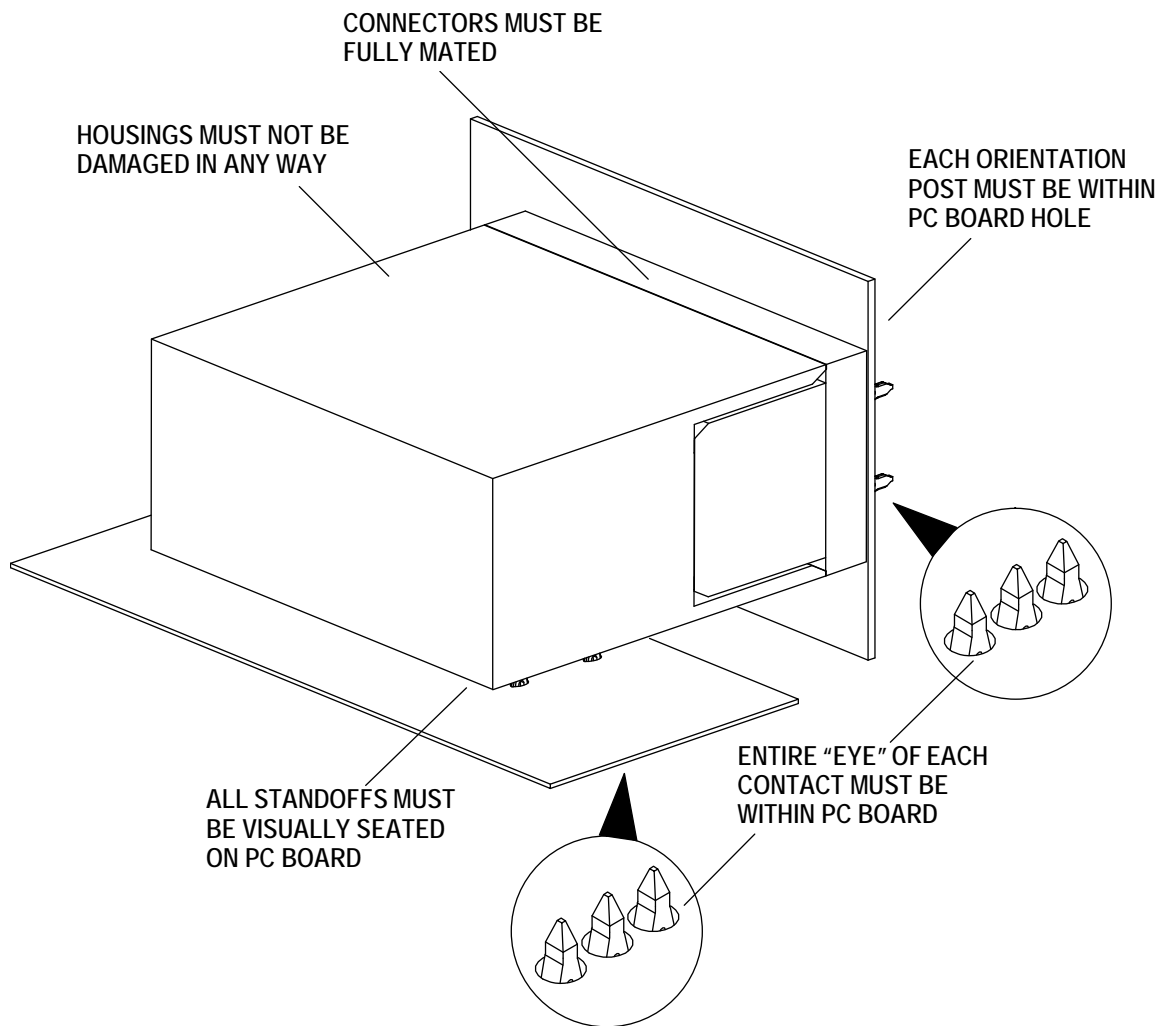


Figure 5

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## 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 6. VISUAL AID**