

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 the Stacked Modular Jack with LED's, Category 5e Connectors to a printed circuit (pc) board. The modular jacks consist of a housing and a shield. The housing features standoffs to ensure proper seating on the pc board. The connector assembly features compliant pin contacts for mechanical retention to the pc board, and to provide Electromagnetic Interference (EMI) suppression and panel ground springs. The modular jack is available with or without integrated LED's. The modular jacks must be pressed onto the pc board by press tooling. The connector is designed to be inserted into a panel after being seated onto the pc board. 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.

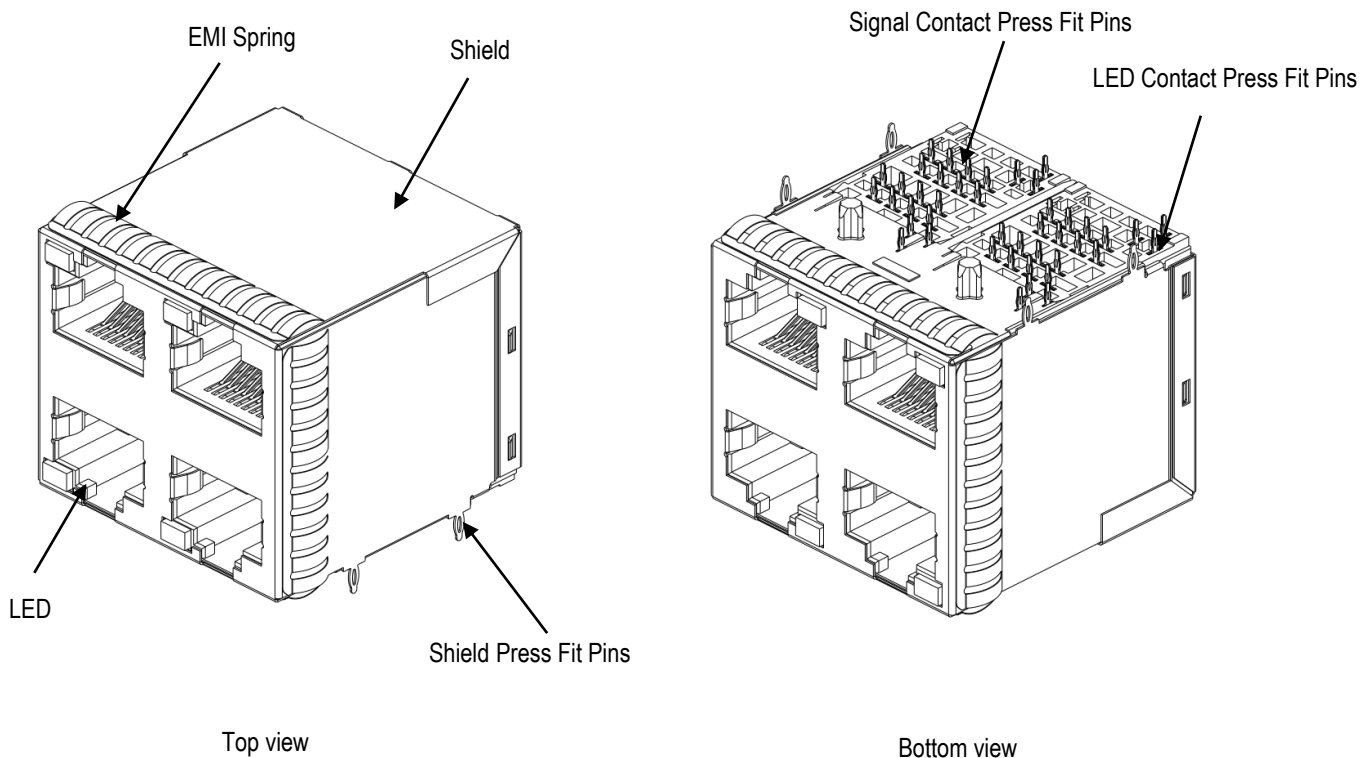


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

- Initial release.

2.2. Customer Service

Reference product base part numbers 2295251, and product code 2287 are representative of the High Performance Stacked Mod Jacks 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 a local TE Representative or, after purchase, by calling Product Information at the number 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 the Product Information number at the bottom of page 1.

2.4. Specifications

Product Specification 108-60109 provides product performance and test information for the Stacked Modular Jack with LED's, Category 5e Connectors.

3. REQUIREMENTS

3.1. Safety

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

3.2. Limitations

These connectors are designed to operate in a temperature range of -40° to 85°C [-40° to 185°F]. The panel requirements given in this document are specifically configured for products used in the communications industry.

3.3. Materials

The front housing and contact array housing are made from molded thermoplastic, UL 94-V-0. All compliant pin contacts are made from copper alloy under-plated with nickel, plated with tin at the interface area. All jack interface contacts are made from phosphor bronze under-plated with nickel, plated with gold and Palladium Nickel at the interface area. The shells are made from copper alloy plated with nickel.

3.4. Storage

A. Ultraviolet Light

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

B. Shelf Life

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

C. Chemical Exposure

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

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

3.5. LED Operation

The LED operation requirements for these modular jacks are provided in Figures 2.

STACKED MODULAR JACK

DESCRIPTION (Test Condition)	ABSOLUTE MAXIMUM RATING		
	RED	GREEN	UNIT
Luminance Intensity, I_v @ 20mA	210~460	460~1000	[lv(mcd)]
Viewing Angle	130	130	
Lens	White Diffused	White Diffused	--
With Resistor (250 Ohm)	No	No	--
Forward Voltage, $V_f = 20mA$	2.2	3.2	V
Reverse Voltage	5	5	V
Peak Forward Current	100	100	mA
DC Forward Current	30	30	mA
Reverse Current, $V_R = 5V$	10	10	mA
Operating/Storage Temperature	--40 TO 85 C [-40 to 185 F]	--40 TO 85 C [-40 to 185 F]	C [F]

Figure 2

3.6. PC Board Requirements

A. Material and Thickness

The pc board material shall be glass epoxy (FR-4 or G-10). The minimum pc board thickness shall be

1.50 mm. Contact the Product Information number at the bottom of page 1 for suitability of other pc board materials.

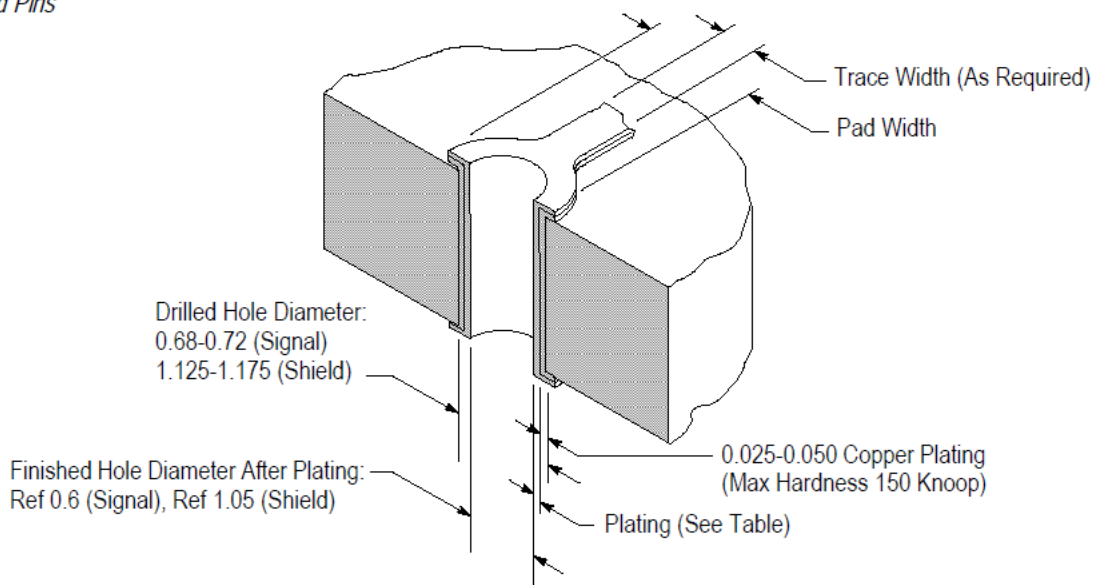
B. Tolerance

Maximum allow bow of the pc board shall be 0.08 mm over the length of the connector.

C. Hole Dimensions

The holes for the connector must be drilled and plated through to the dimensions specified in Figure 3.

*Illustration Represents
Holes for Both Signal and
Shield Pins*



PLATING	THICKNESS
Hot Air Solder Leveling (HASL) Tin-Lead (Sn-Pb)	0.004-0.010
Immersion Tin (Sn)	0.0005-0.001
Organic Solderability Preservative (OSP)	0.0002-0.0005
Immersion Gold (Au)	0.0001-0.0005 Au
Over Nickel (Ni) (ENIG)	0.004-0.0076 Ni
Tin-Lead Plating (Sn Pb)	0.010-0.025
Immersion Silver (Ag)	0.0001-0.00015

Figure 3

D. PC Board Layout

The holes for the connector must be precisely located to ensure proper placement and optimum performance of the connector. Recommended hole patterns, dimensions, and tolerances are provided in Figure 4.

Recommended Stacked Modular Jack with LED's, Category 5e Connector PC Board Layout

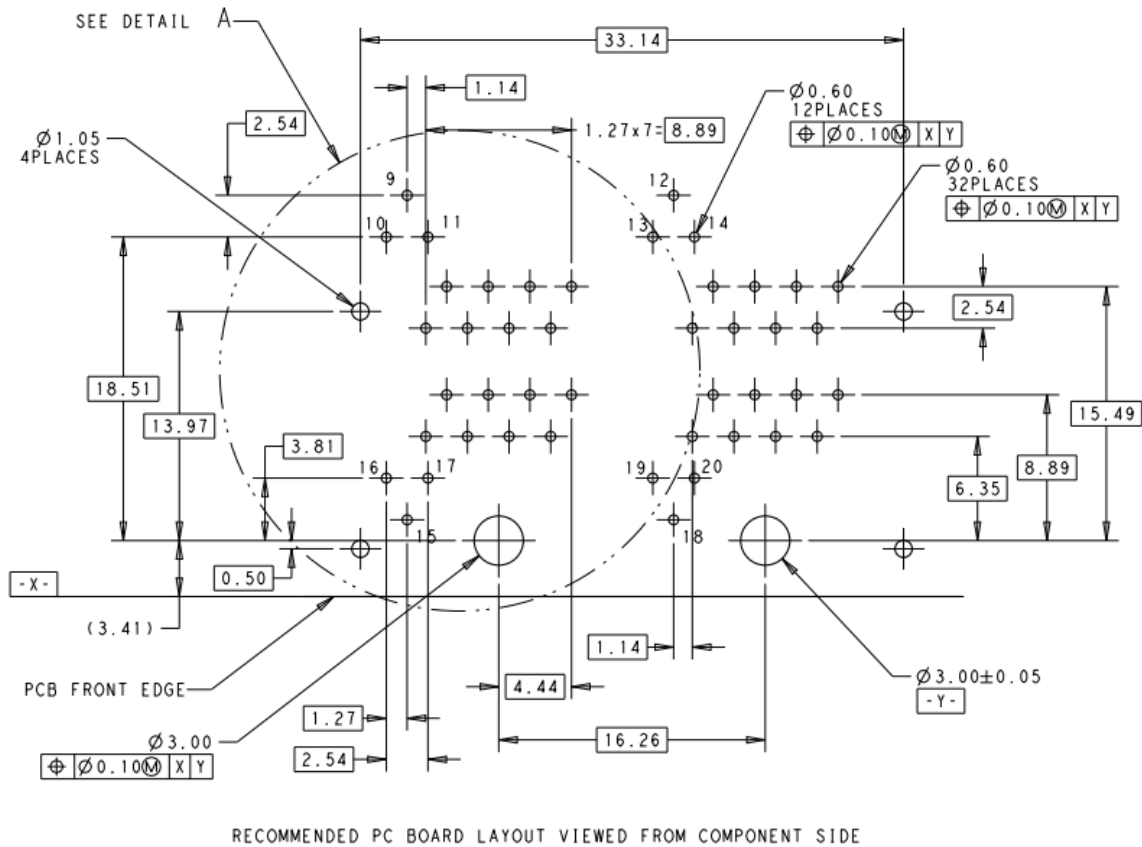


Figure 4

3.7. Panel Requirements

The following requirements are intended to be used in the communications industry only. The panel must be cut using the dimensions provided on the customer drawing for the specific modular jack. The panel thickness shall be approximately 0.10mm.

A. Cutout

The panel must provide a cutout that allows proper mounting of the connector. Care must be used to avoid interference between adjacent connectors and between connectors and other components. Recommended dimensions for panel cutout and minimum allowable distance between adjacent connectors are provided in Figure 5.

B. Location

Refer to Figure 5 for proper location of panel with respect to the connector.

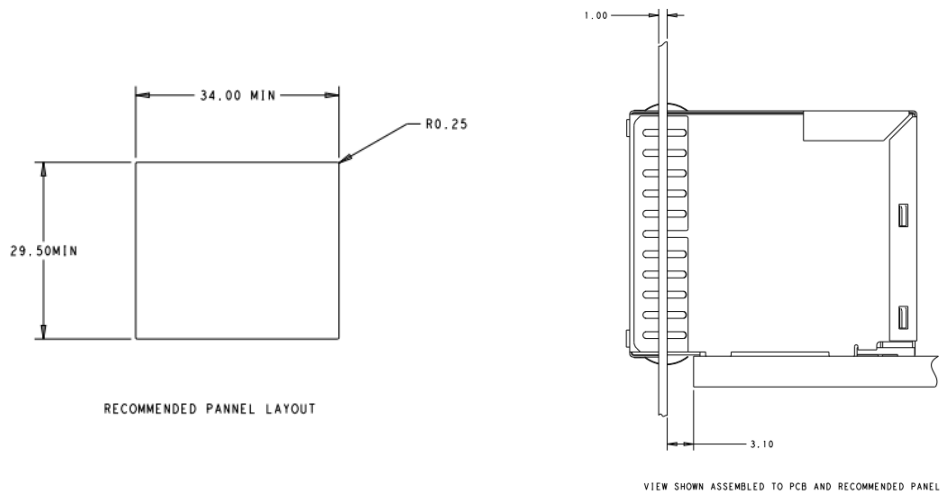


Figure 4

3.8. Placement of the Connector

The following requirements also apply to connectors used for rework purposes.



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

Placement of the connector on the pc board is accomplished by using the proper seating tool Refer to Section 5, TOOLING; and Figure 6 for proper seating tool selection and related instructional material for proper usage of the tool.

A. Registration of the Connector

The compliant pin contacts must be aligned with matching holes in the pc board. The compliant pin contacts are then inserted into the pc board simultaneously to prevent twisting or bending of the pins.

B. Seating the Connector

Using the proper seating force and seating height is essential to interconnection performance. The force used to seat the connector must be applied evenly to prevent deformation or damage to the compliant pin contacts. The maximum force required to seat the connector onto the pc board can be calculated by:

Number of compliant pins x 44.5N [10 lbs] (force per compliant pin) = seating force

Example: Stacked Modular Jack with LED's, Category 5e Connectors 2295251 (RJ45 2X2)

$(4 \times 8 + 4 + 12) \times 44.5 \text{ N [10 lbs]} = 2136 \text{ N [480 lbs]}$



Over-driving of the connector will deform parts critical to the quality of the connector to the pc board Maximum force occurs prior to the connector assembly bottoming on the pc board.

The shut height of the application tool must be specifically set for proper seating of the connector. The shut height can be calculated by: Seat height (connector seated) + height of tool + pc board thickness +

pc board support base = shut height of ram The maximum seating height, measured from the top of the connector assembly to the top of the pc board is given in Figure 5. The connector assembly must be seated on the pc board not exceeding the dimensions shown in Figure 5.

NOTE *The shut height may be adjusted to obtain the 0.10mm maximum gap between the standoffs of the connector assembly and the pc board.*

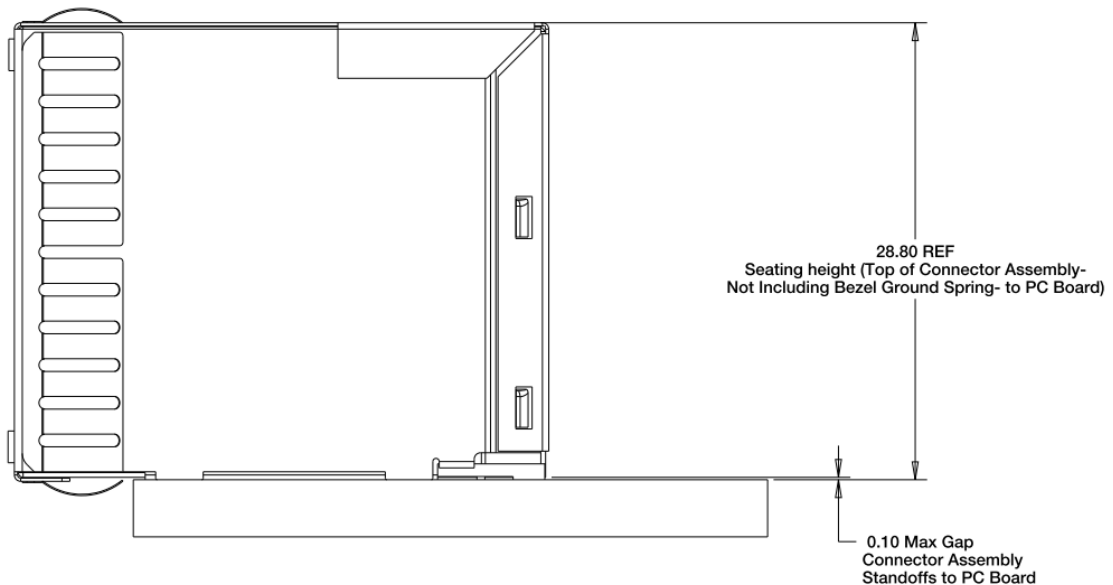


Figure 5

3.9. Repair/Rework

CAUTION *Damaged or defective connector assemblies should not be used and must be removed and replaced with new ones. Damaged connectors must not be reused or reinserted into the pc board.*

Removal of the connector from the pc board is accomplished by using the proper extraction tool. Refer to Section 5, TOOLING, for proper extraction tool selection.

4. QUALIFICATIONS

No qualification documentation is available at the time of publication of this document.

5. TOOLING

5.1. PC Board Support

A pc board support must be used with the seating tool. The support fixture provides proper support for the pc board and protects the pc board and the connector assembly from damage. The support fixture

must be customer designed. It is recommended that the support fixture be at least 25.4 mm longer and wider than the pc board and have flat surfaces with holes or a channel large enough and deep enough to receive any protruding components of the connector assembly or customer pc board. See Figure 6.

5.2. Seating Tool

Seating tool 2215100 -1 is used to seat (Type 2 x 4) connectors onto the pc board to the required depth.

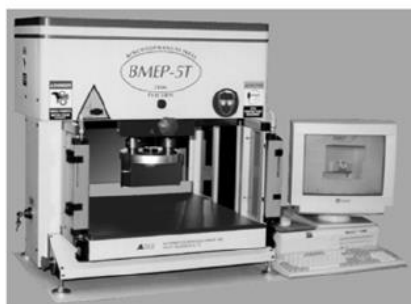
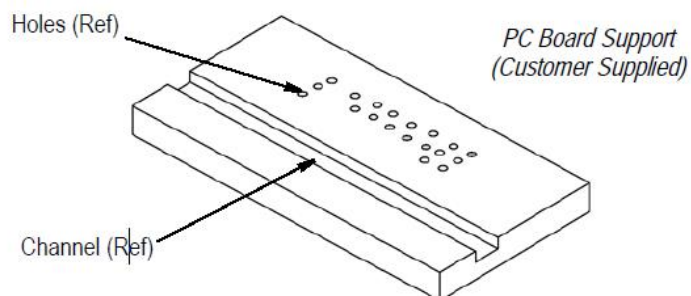
5.3. Extraction Tool

Extraction tool 2215115 -1 is used to remove the connector from the pc board by pushing the contacts through the pc board.

5.4. Power Unit

TE flat-rock tooling shown in Figure 6 or commercial power units are available for use with the seating tool and extraction tool. These power units must provide enough power with a ram capable of supplying a downward force of 44.5 N [10 lbs] per contact. For information on these available machines, contact the Tooling Assistance Center number at the bottom of page 1.

NOTE: The customer designed pc board support should be designed using the pc board layout from the specific customer print.



**BMEP-5T Benchtop
Manual Press 1585696-1
(No Document Available)**



**MEP-6T Manual Press
1585699-1
(No Document Available)**



**AP3 Main Assembly
1585280-1
(No Document Available)**

Figure 6

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.

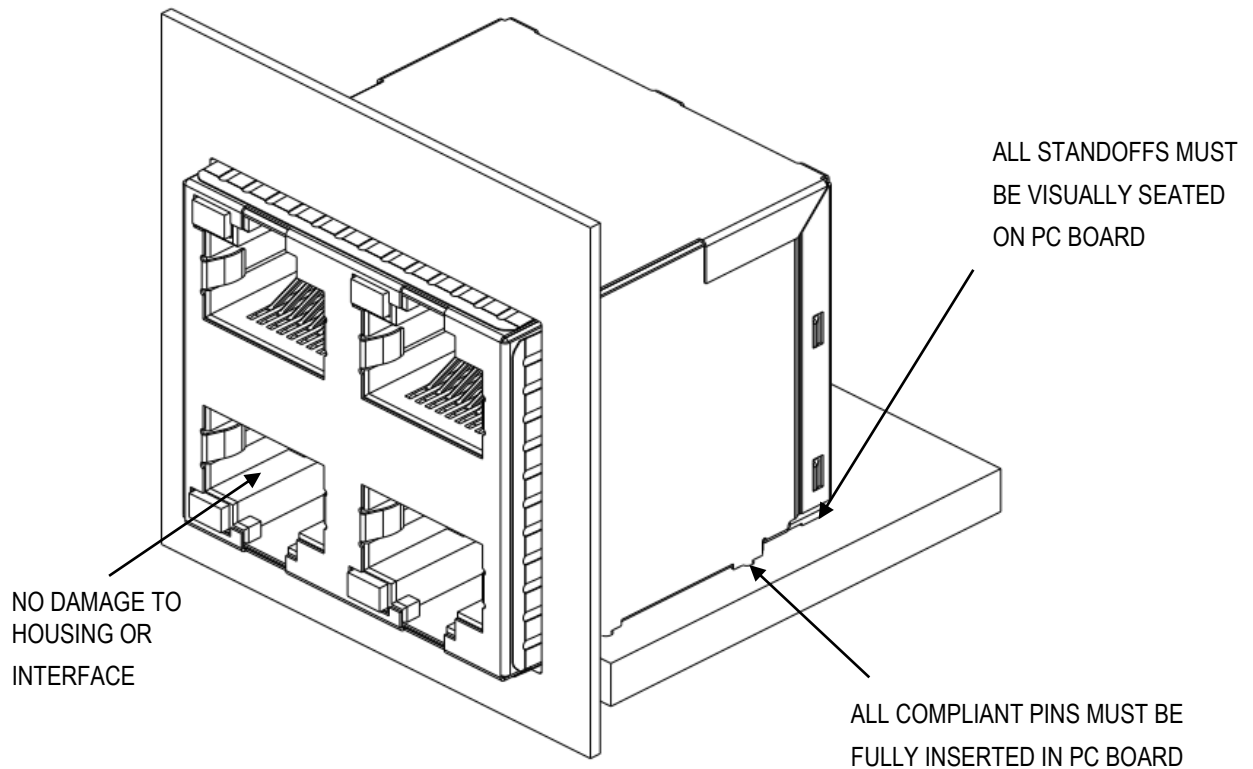


Figure 7