



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 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 MicroQSFP Connector and Cage Assemblies utilized to interconnect MicroQSFP fiber optic or copper transceiver modules to host printed circuit boards. The MicroQSFP Connector and Cage assembly is a pre-assembled unit available in a 2X1 thru 2X4 configurations. Product styles include iterations that contain bezel EMI springs or gaskets. In addition, light pipe kits for each configuration are available.

Both the connector and cage assembly feature compliant pin contacts for mechanical retention to the pc board and to provide EMI suppression, thermal vent holes, and panel ground springs. In addition, the cage assembly ports contain latch plate slots used to retain the transceiver modules during operation. A dust cover for each port may be used when a module is not mated to the cage assembly to prevent contaminants from entering the chassis. The connector and cage assembly is designed to be inserted thru a bezel after being seated on the pc board.

The connector consists of a housing with dual 38-position receptacle ports and compliant pin contacts on a .6mm centerline spacing. The housings contain alignment posts that provide stability for placement on the pc board. Each receptacle port has a card entry slot that accepts a 1.0 +/- .1 mm thick integrated circuit card housed in the mating transceiver module.

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.

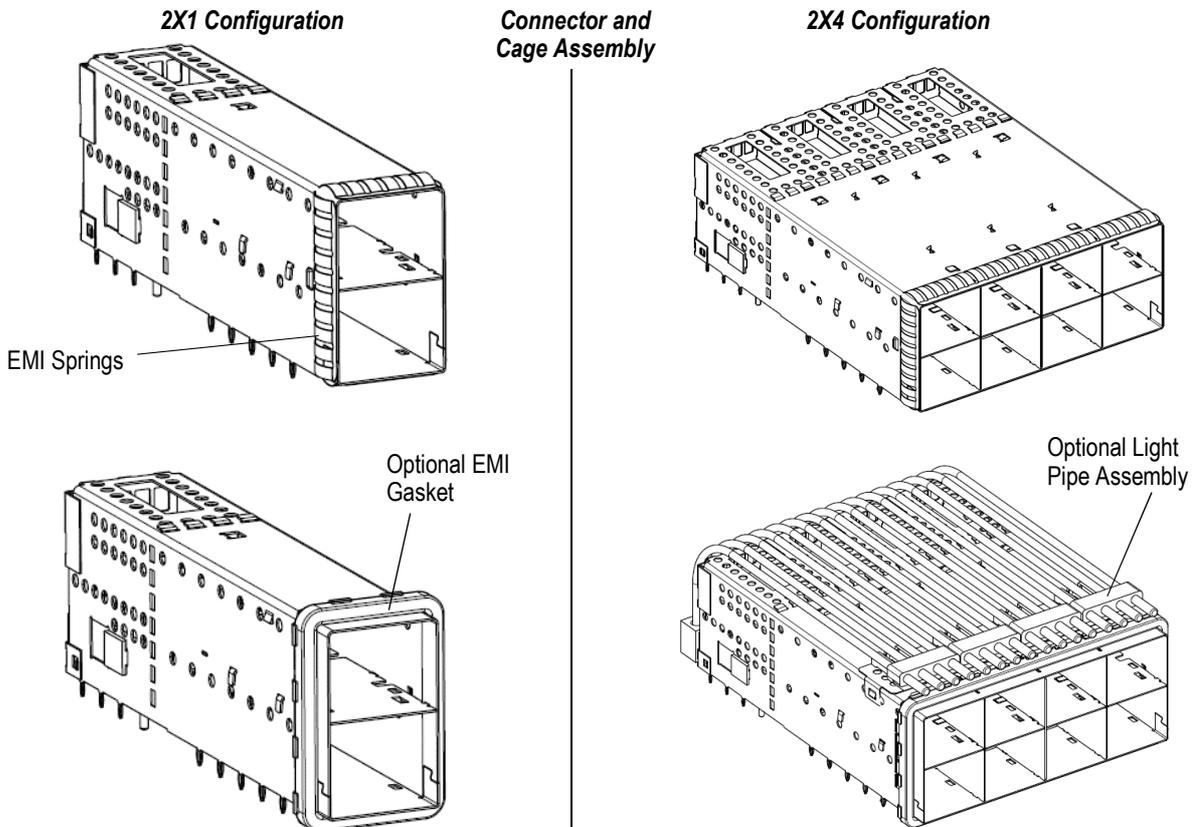


Figure 1 (cont'd)

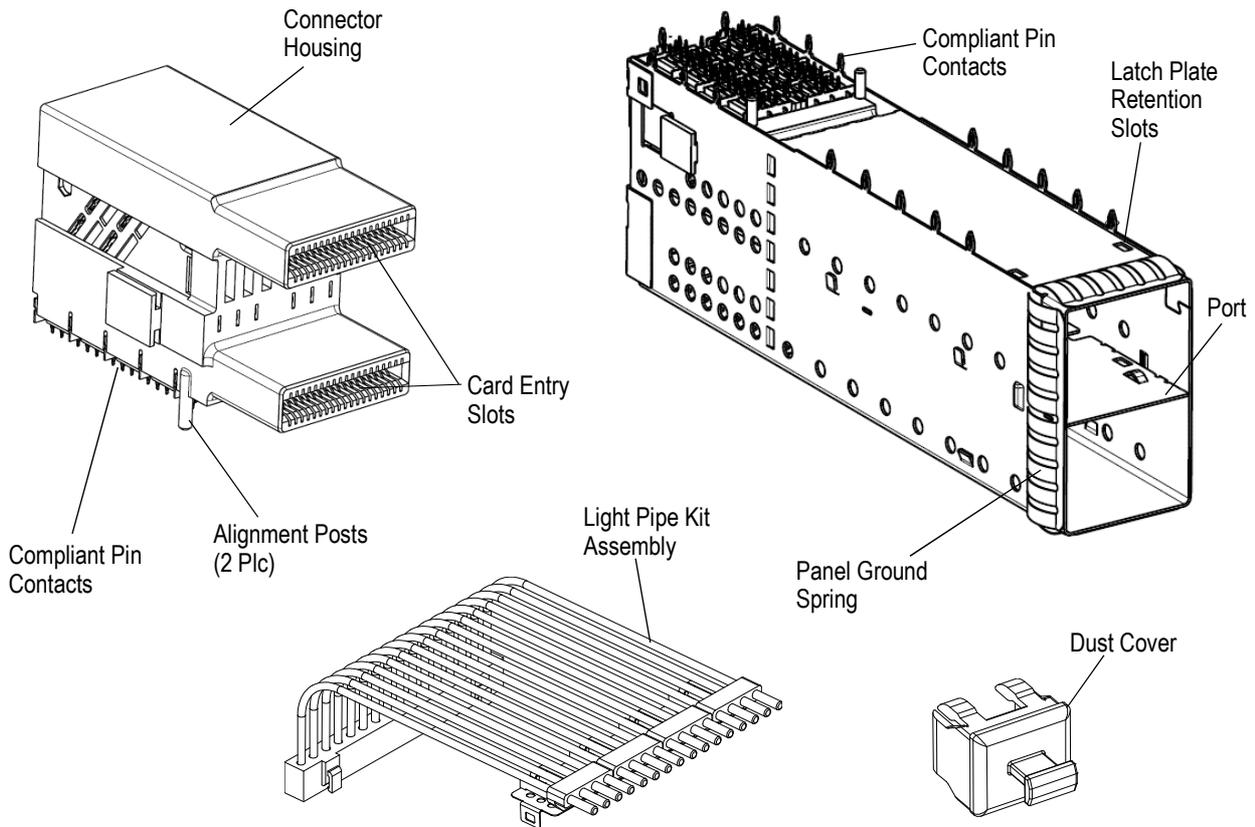


Figure 1 (end)

2. REFERENCE MATERIAL

2.1. Revision Summary

Initial release of application specification

2.2. Customer Assistance

Reference Product Base Part Numbers 2296273 (2X1), 2291332 (2X2), 2293143 (2X3), 2296070 (2X4), and Product Code X408 are representative of the MicroQSFP Stacked Connector and Cage Assemblies. Use of these numbers will identify the product line and help you to obtain product and tooling information when visiting www.te.com or calling the number at the bottom of page 1.

2.3. Drawings

Customer drawings for product part numbers are available from www.te.com. Information contained in the customer drawing takes priority.

2.4. Specifications

Product Specification 108-32126 provides product performance and test results.

2.5. Instructional Material

Instruction sheets (408-series) provide product assembly instructions or tooling setup and operation procedures. Instructional material that pertains to this product are:

- 408-32247 MicroQSFP Stacked Connector and Cage Assembly Seating Tool Kits
- 408-32252 MicroQSFP Stacked Connector and Cage Assembly Extraction Tools

3. REQUIREMENTS

3.1. Safety

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

3.2. Storage

A. Ultraviolet Light

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

B. Shelf Life

The product should remain in the shipping containers until ready for use to prevent deformation to components. The product 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 product near any chemical listed below as they may cause stress corrosion cracking in the material.

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

3.3. Limitations

The connectors are designed to operate in a temperature range of -55 to 85°C [-67 to 185°F].

The bezel requirements given in this document are specifically configured for products used in the communications industry, and peripheral component interconnect (PCI) applications.

3.4. Material

The connector housing and chicklets (parts that hold the compliant pins) are made of molded thermoplastic, UL 94-V-O rated. All compliant pin contacts in the connector are made of a copper based alloy under-plated with Nickel, plated with tin at the compliant pin area and gold at the interface. The cage components are made from a stainless steel alloy and the light pipe kits are made from molded polycarbonate material.

3.5. PC Board

A. Material and Thickness

The pc board material shall be glassed epoxy (FR-4 or G10). The minimum pc board thickness shall be 1.45mm for single sided applications and 2.2mm for dual sided. These minimum thickness values include the board thicknesses tolerance.

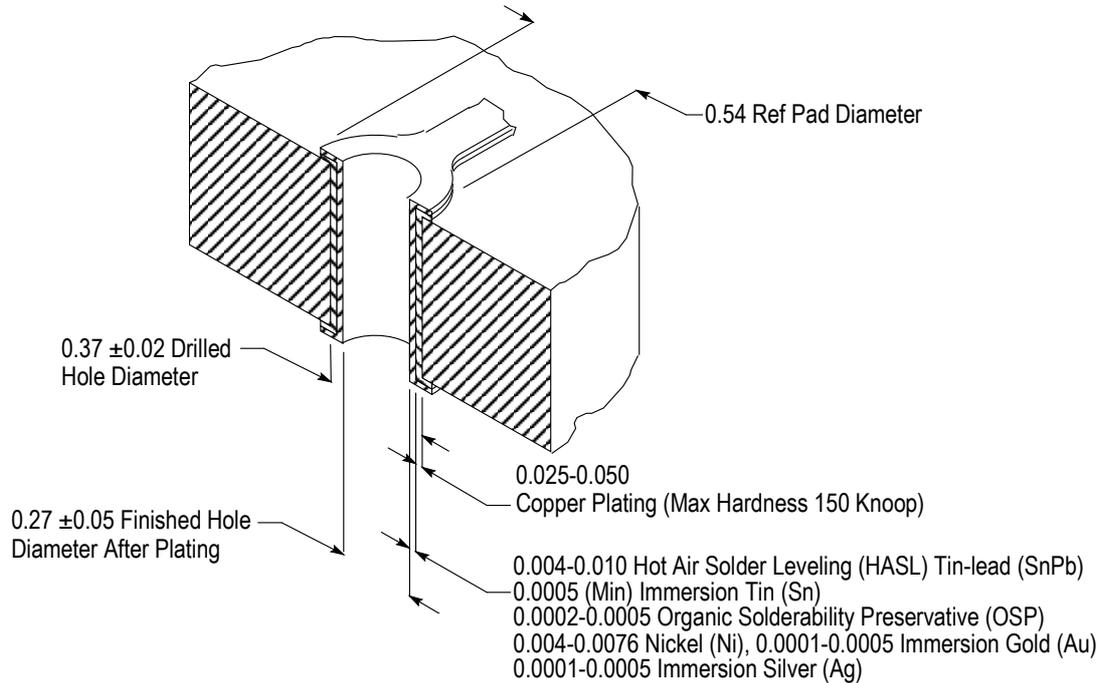
B. Tolerance

Maximum allowable bow of the pc board shall be 0.08 mm over the length of the connector and cage assembly.

C. Hole Dimensions

The holes for the connector signal contacts and cage assembly must be drilled and plated through to dimensions specified in Figure 2.

Recommended Hole Dimensions for Connector



Recommended Hole Dimensions for Cage Assembly

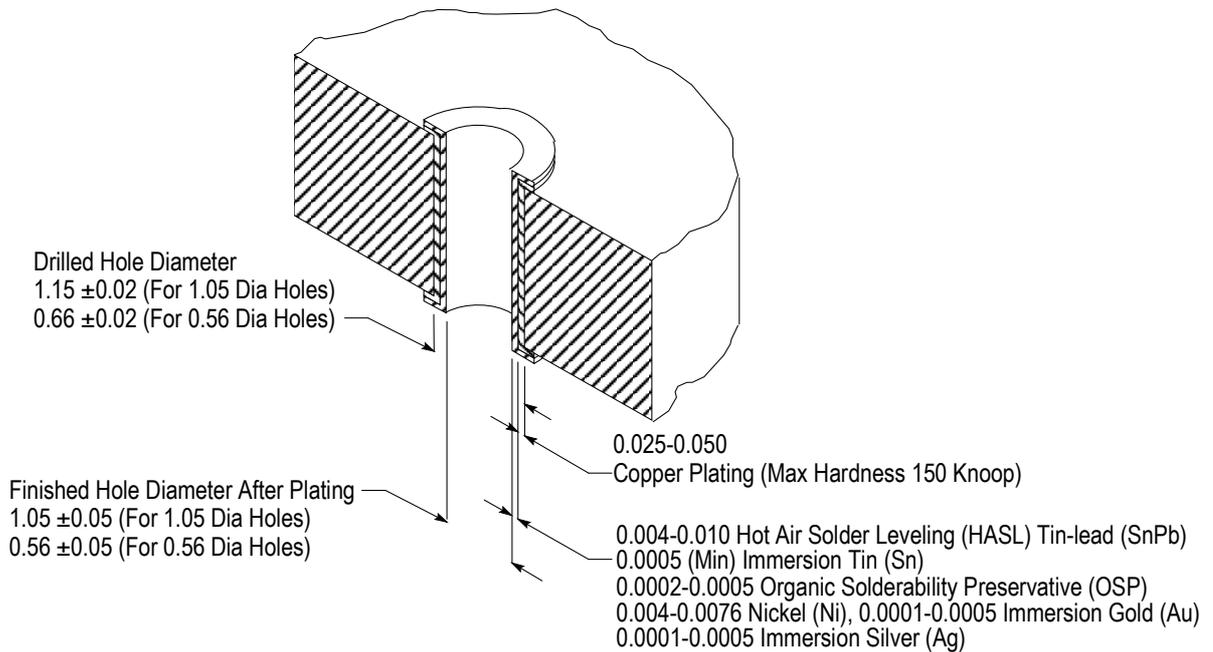
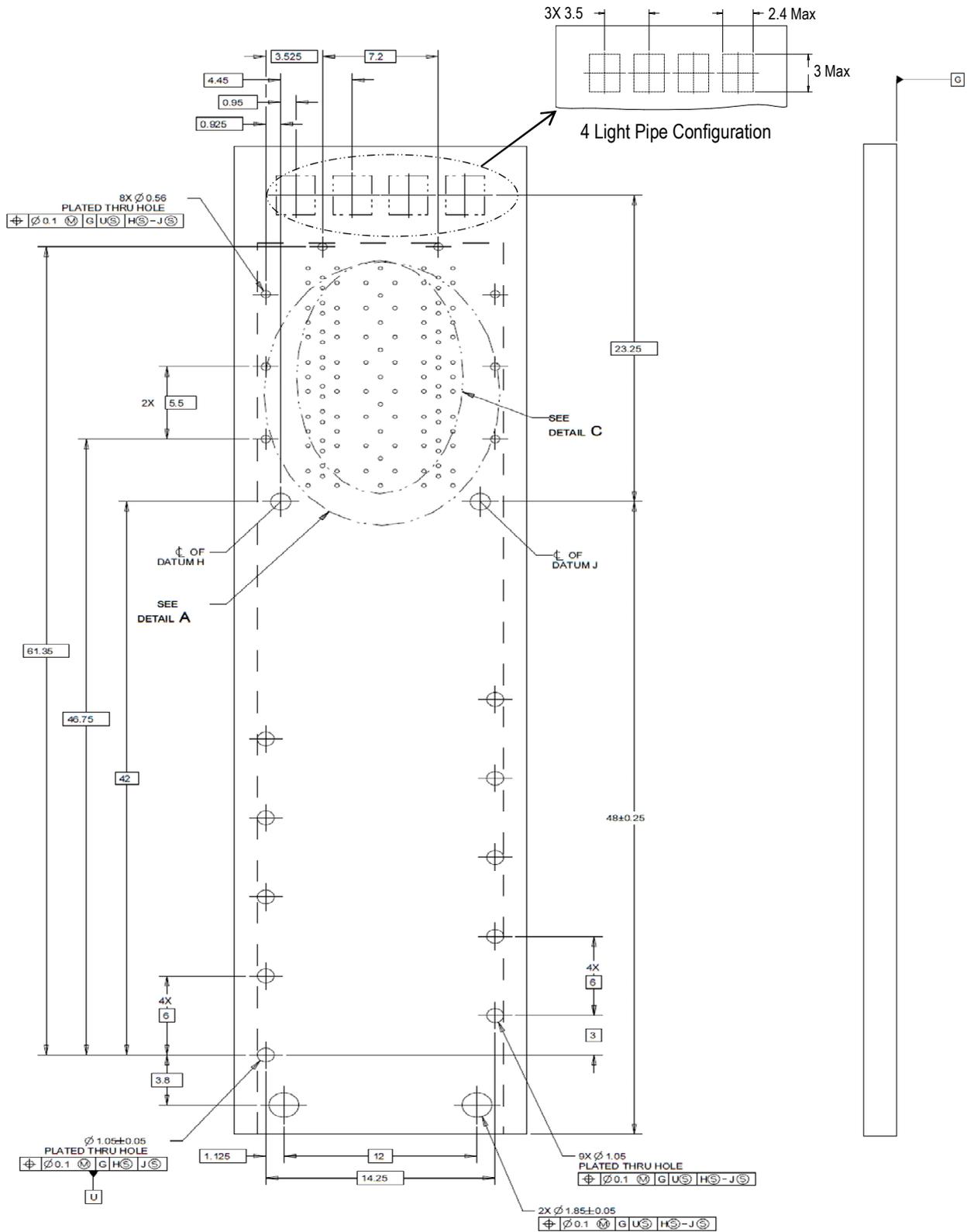


Figure 2

D. Layout

The holes for the connector and cage assembly must be precisely located to ensure proper placement and optimum performance of the connector and cage assembly. Recommended hole pattern, dimensions, and tolerances are provided on the customer prints. Sample layouts are provided in Figure 3.

Recommended PC Board Layout
(2x1 Cage and Connector Assembly Configuration)



(Connector and Cage Assembly 2X4 Configuration)

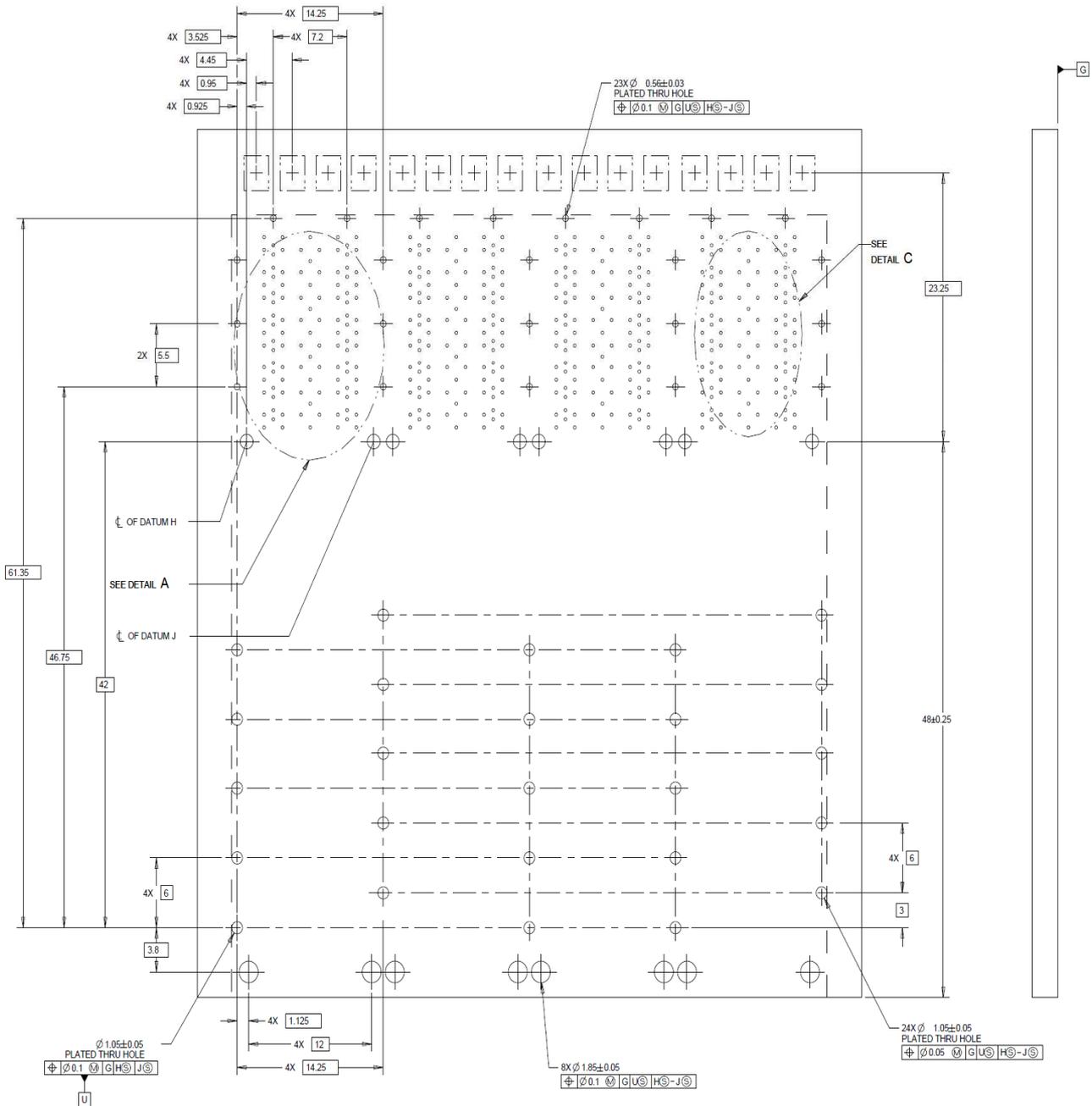


Figure 3 (end)

3.6. Transceiver Modules

The mating transceiver module packing size must conform to the mechanical requirements specified in the [MicroQSFP MSA specification TBD](#) to insure there are no module interference issues when transceivers are installed in adjacent ports.

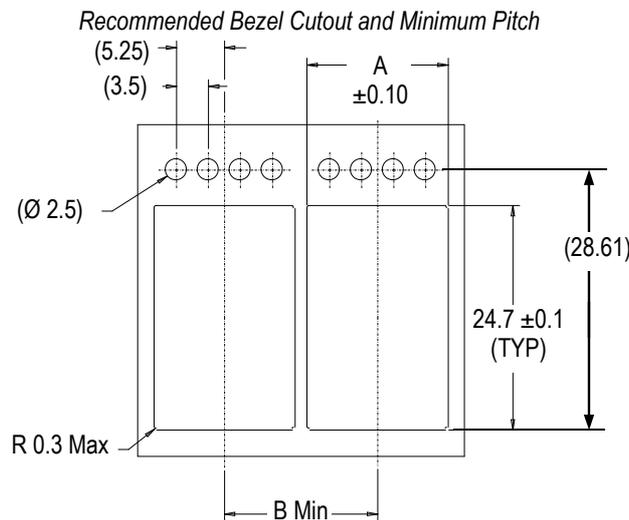
3.7. Bezel

A. Thickness

The bezel thickness range shall be 0.8 through 2.6 mm.

B. Cutout

The bezel must provide a cutout that allows proper mounting of the connector and cage assembly. The cage assembly panel ground springs or gasket must be compressed by the bezel in order to provide an electrical ground between the connector and cage assembly and bezel for EMI suppression. Care must be used to avoid interference between adjacent connector and cage assemblies and other components. The minimum allowable distance between connector and cage assemblies must be considered to ensure proper assembly. Dimensions for bezel cutout and minimum allowable distance between cutouts are shown in Figure 4.



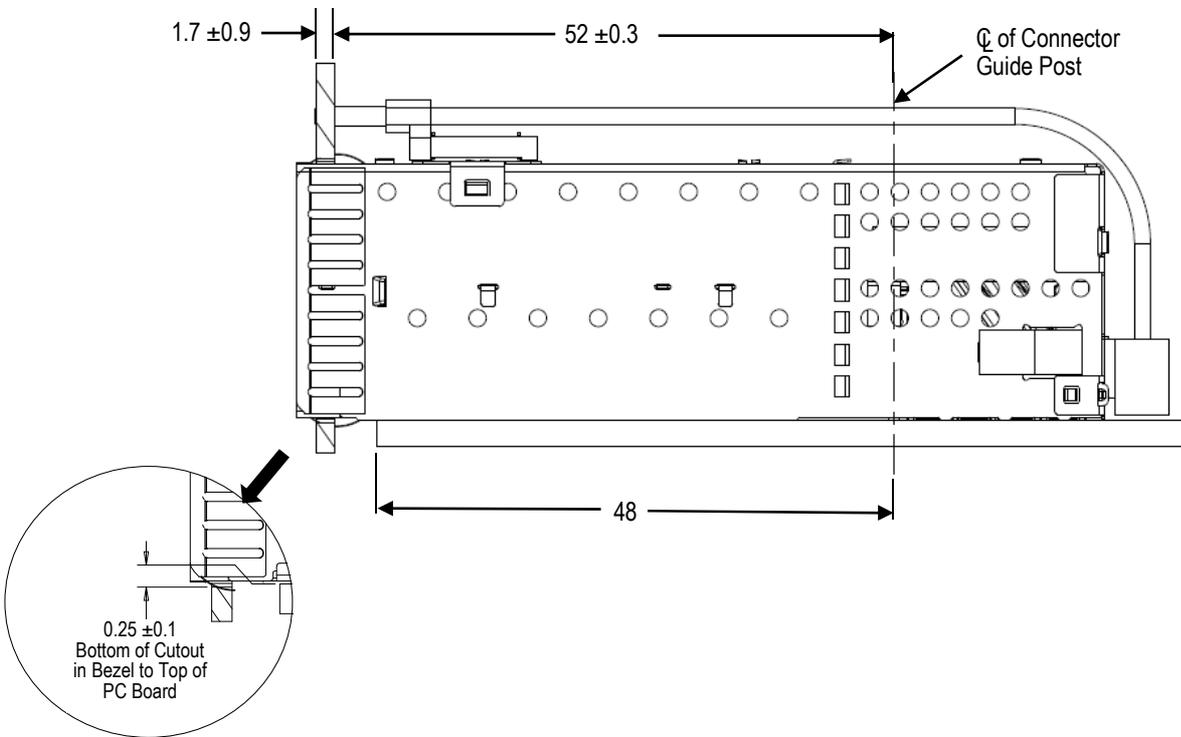
CONNECTOR AND CAGE ASSEMBLY CONFIGURATION	DIMENSION "A"	DIMENSION "B"
2X1	15.45	20.0
2X2	29.7	34.25
2X3	43.95	48.5
2X4	58.2	62.75

Figure 4

3.8. PC Board and Bezel Position

The bezel and pc board must be positioned in relation to each other to avoid interference with the insertion and extraction of the transceiver. The relationship must conform to the dimensions given in Figure 5.

*Recommended Bezel and PC Board Position
(EMI Spring Configuration)*



(EMI Gasket Configuration)

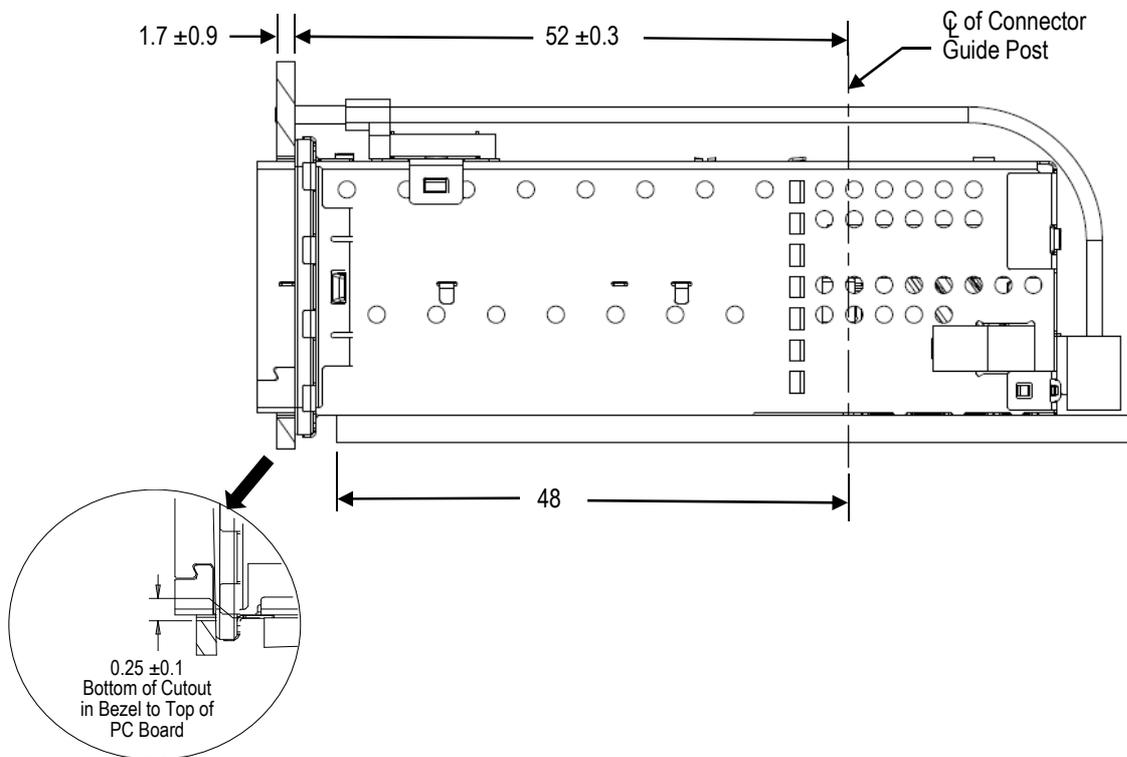


Figure 5

3.9. Placement

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

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

A. Registration

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

B. Seating

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

Amount of Compliant Pin Contacts X 44.5N (10 lbs) Force per Compliant Pin =

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

The shut height of the application tool must be specifically set for proper seating of the connector and cage assembly. The shut height can be calculated by:

Seating Height (Connector and Cage Seated) + Height of Seating Tool + Combined Thickness of PC Board and PC Board Support Fixture = Shut Height (Ram Down)

The seating height, measured from the top of the cage assembly (not including the panel ground springs) to the top of the PC board is shown in Figure 6.

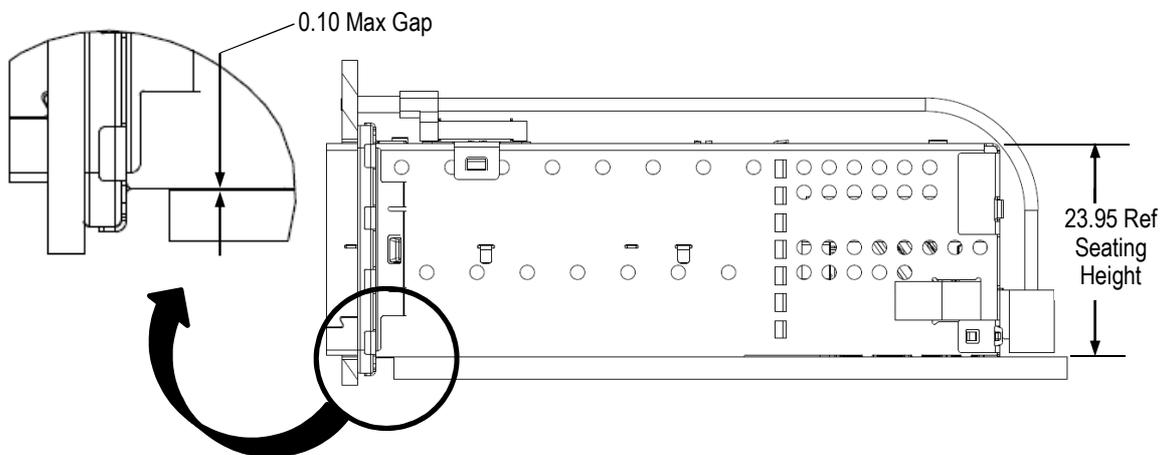


Figure 6

3.10. Checking the Assembly

After assembly, the cage assembly ground springs or EMI gaskets must be compressed by the bezel. A slight bow in the cage assembly is permitted. The bezel and PC board must be positioned according to the dimensions shown in Figure 5.

3.11. Dust Cover

A dust cover must be installed into the port when a transceiver module is not mated with the cage assembly.

3.12. Light Pipe Kits

A light pipe kit may be installed on the MicroQSFP Stacked Connector and Cage Assemblies. The Bezel must have additional cutouts as shown in Figure 4 for the light pipe kits. The number of bezel holes required is dependent on the number of light pipe openings desired. The appropriate location of the LED's on the host PC board is provided in Figure 3.

When a light pipe kit is installed, the rear organizer must be latched into the mounting slots on the rear of the cage assembly. The light pipe bracket must also be latched onto the latch tabs on the main cage body. See Figure 7.

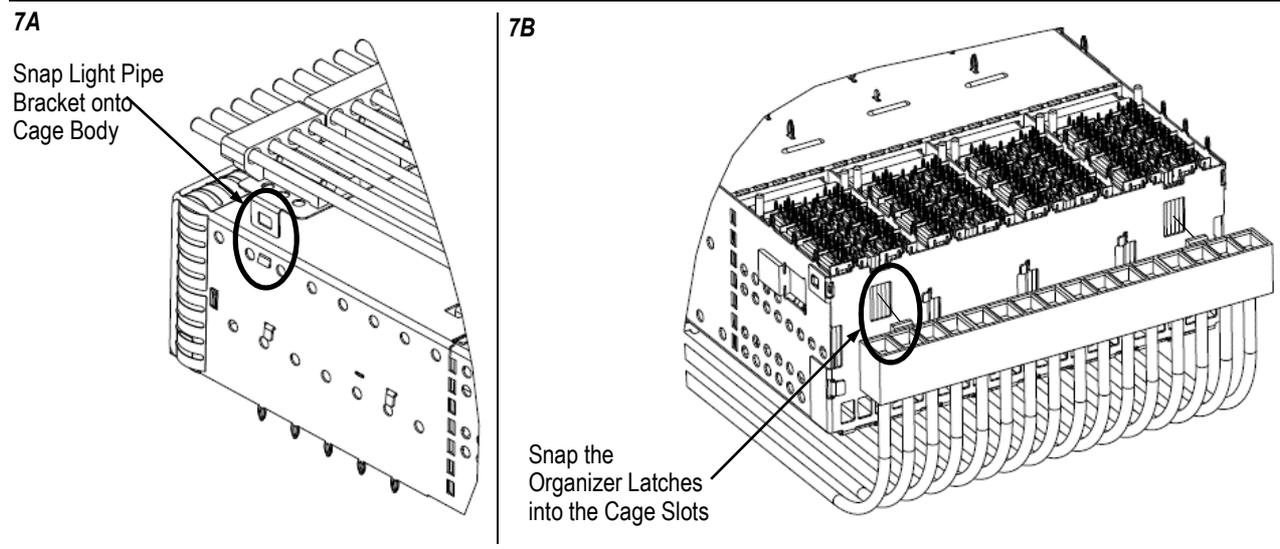


Figure 7

3.13. Repair and Rework

Damaged or defective connector and cage assemblies must be removed and replaced.

If repair or rework to the pc board requires soldering after the connector and cage assembly has been seated onto the pc board, the following must apply:

After soldering, removal of fluxes, residues, and activators is necessary. Consult with the supplier of the solder and flux for recommended cleaning solvents. Cleaners must be free of dissolved flux and other contaminants. Even when using “no clean” solder paste, it is imperative that the contact interface be kept clean of flux and residue.

Air drying is recommended. Otherwise, make sure that temperature limitations are not exceeded (-55 to 85°C). Excessive temperatures may cause housing degradation.

4. QUALIFICATION

No qualifying support for MicroQSFP Stacked Connectors and Cage Assemblies was defined at the time of publication of this document.

5. TOOLING

Tooling Part Numbers and instructional material packaged with the tooling are given in Figure 8.

5.1. Seating Tool Kits

TE designed seating tool kits (each consisting of a seating tool and wall support) must be used to accurately insert the connector and cage assembly onto the PC board. The seating tool and wall support are also available separately.

5.2. Extraction Tool

The extraction tool is used to remove the connector and cage assembly from the pc board. The connector and cage assembly cannot be reused.

5.3. Application Tool

Power for the seating tools and extraction tools must be provided by an application tool (with a ram) capable of supplying a downward force of 44.5N (10 lbs) per contact. For available application tools, call Product Information at the number on the bottom of page 1.

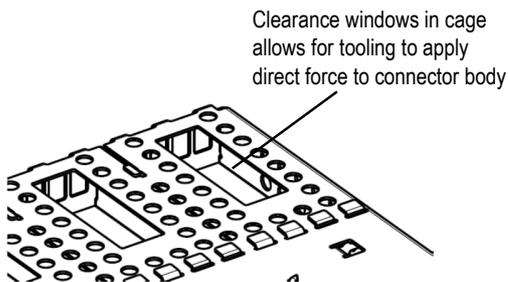
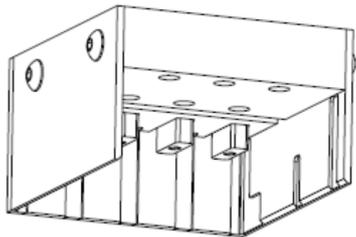
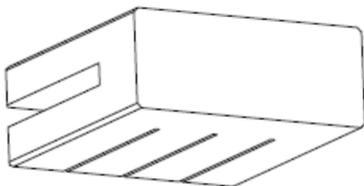
5.4. PC Board Support Fixture

A PC board support must be used with the seating tool and extraction tool. The support fixture provides proper support for the PC board and protects the board and the connector and cage 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 and cage assembly.

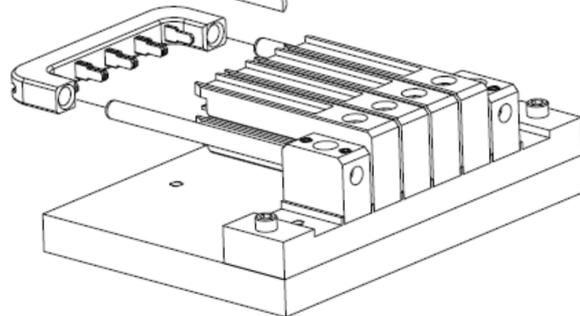
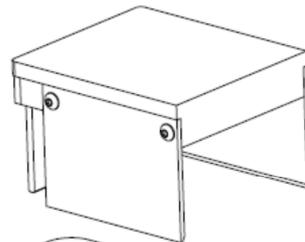
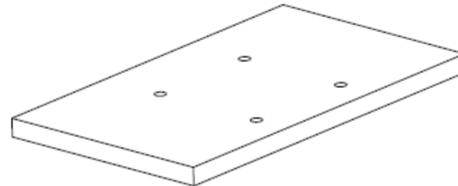
CONNECTOR AND CAGE CONFIGURATION	SEATING TOOL KIT	CONNECTOR AND CAGE EXTRACTION TOOL
2X1	2185206-1	2185208-1
2X2	2185206-2	2185208-2
2X3	2185206-3	2185208-3
2X4	2185206-4	2185208-4

Figure 8

Typical Seating Tool Kit
(Refer to Table)



Typical Extraction Tool Kit
(Refer to Table)



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.

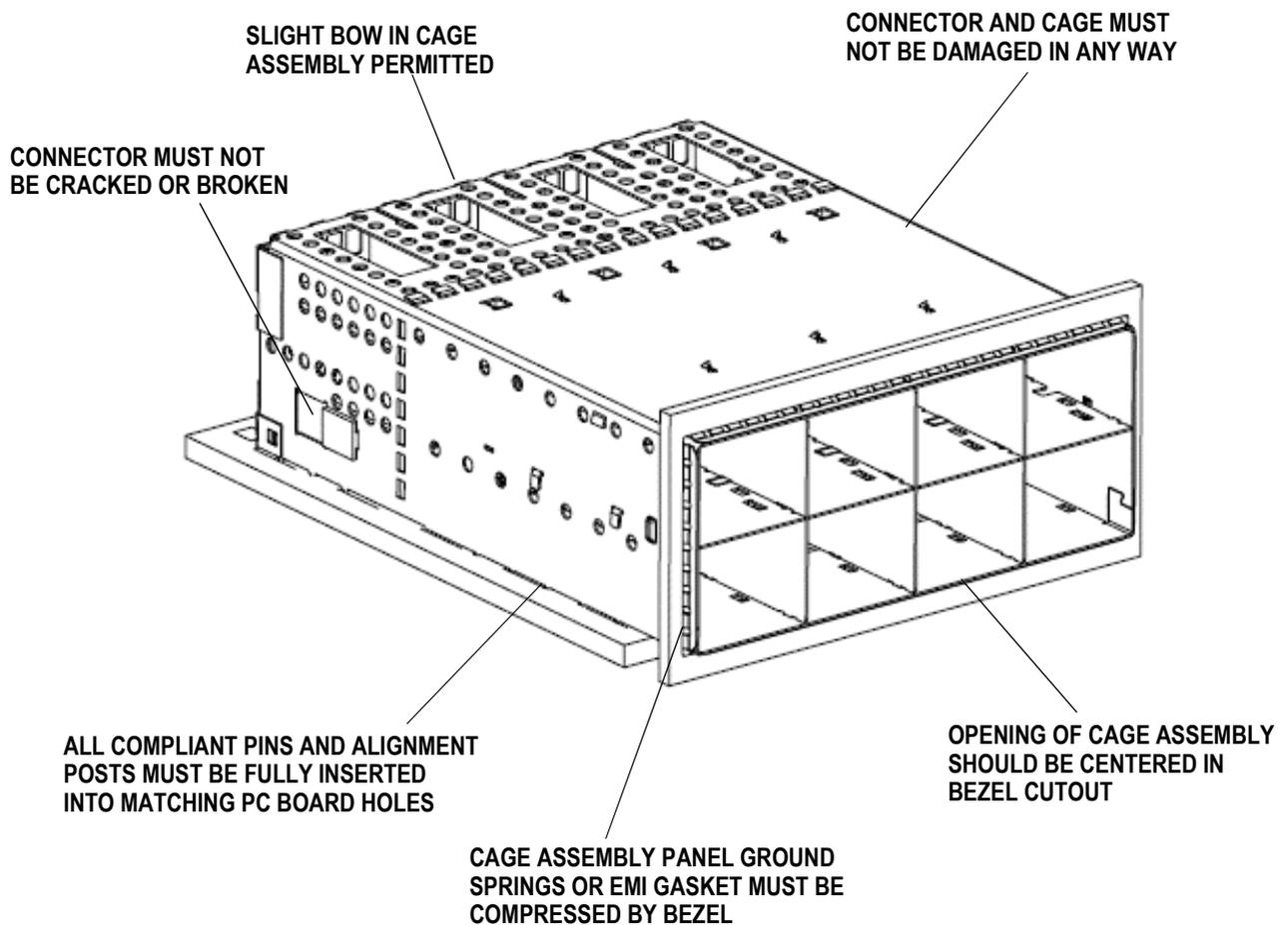


FIGURE 9. VISUAL AID