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REVISION HISTORY		
Revision	Date	Description
C	2018/02/21	Added correct and incorrect cage mating bezel picture in 6.3 Checking Assembly Added refer to product specification PS-74754-0001 instead of TBD in 6.2 Seating Added revision table on sheet 2

1.0 SCOPE

This specification covers the requirements for the application of the SFP+ Cage Assemblies to interconnect with SFP+ fiber optic or copper transceiver modules to printed circuit (pc) boards. The cage assemblies are available in single port or ganged 1x2, 1x4 and 1x6 configurations. The configurations are available with or without optional light pipes.

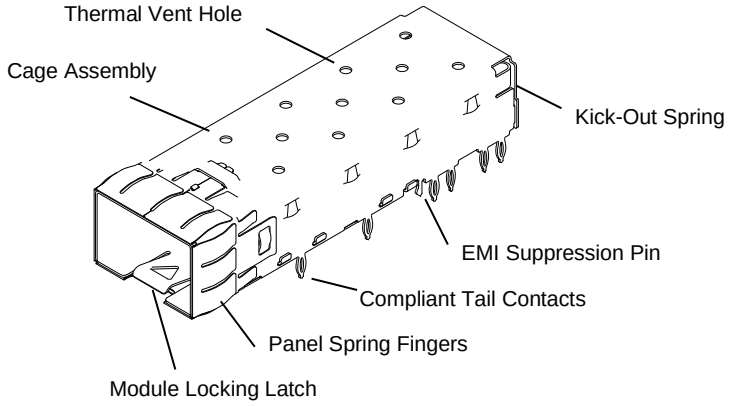
All Cage Assemblies provide electromagnetic interference (EMI) suppression, thermal vent holes, and panel ground fingers or a conductive gasket. The connector cage assemblies have a locking latch and the single port cage has a kick-out spring. The locking latch holds the module in place, and the kick-out spring to help in releasing the module for removal. The connector assembly is designed to be inserted into a bezel after being seated onto the pc board.

The SFP+ 1x ganged cages assemblies are available in two versions: elastomeric gasket and panel spring fingers. Single port cages are available in press-fit, solder post, and PCI (1°) versions; 1x ganged cages available in press-fit versions. The press fit tails accommodate belly-to-belly applications for both single and ganged cages.

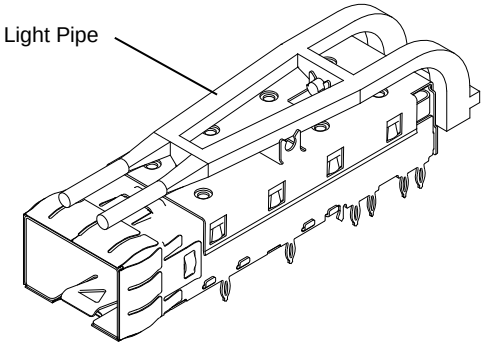
Basic terms and features of these products are provided in Figure 1.

SFP+ Single Port Cage Assembly

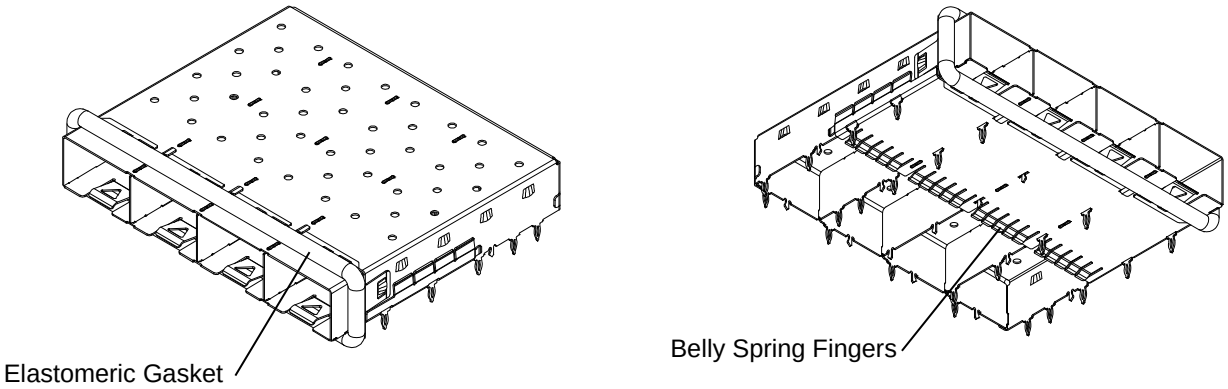
Without Light Pipe



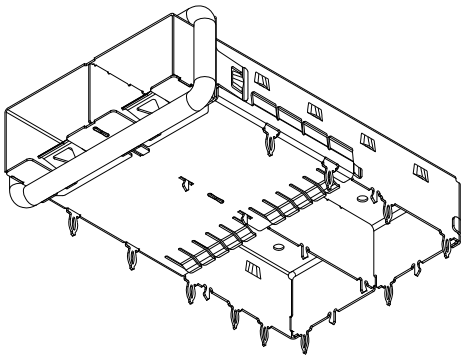
With Optional Light



SFP+ 1x4 Cage Assembly



SFP+ 1x2 Cage Assembly



SFP+ 1x6 Cage Assembly
Back View Shown

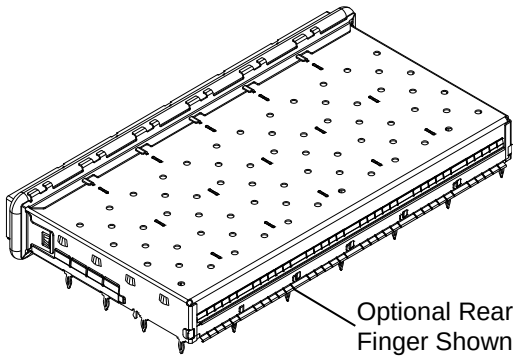


Figure 1

2.0 REFERENCE DOCUMENTS

Refer to the appropriate customer sales drawing for product part numbers.
Refer to PS-74754-001 for the SFP+ Cage assembly Product Spec.
Refer to Small Form-factor Pluggable (SFP+) Transceiver Multi Source Agreement (MSA)

3.0 PROCEDURE

3.1 GENERAL REQUIREMENTS

3.1.1 Limitations The connectors are designed to operate in a temperature range of –40° to 85°C [-40° to 185° F]. The bezel requirements given in this document are specifically configured for products used in the communications industry. It is strongly recommended that this bezel configuration NOT be used for peripheral component interconnect (PCI) applications.

3.1.2 Material The light pipes are made of polycarbonate, UL 94-V-0. The cage assembly is made of a Nickel plated Nickel Silver Alloy.

3.1.3 Shelf Life The cage assembly should remain in the shipping container until ready for use to prevent deformation to the contact leads, ground tails and mounting posts. The cage assemblies should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

3.1.4 Chemical Exposure Do not store connector assemblies near any chemicals listed below as they may cause stress corrosion cracking in the terminal contacts or mounting posts.

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

4.0 PC BOARD REQUIREMENTS

4.1 MATERIAL THICKNESS

The pc board material shall be glass epoxy (FR-4 or G-10). The minimum pc board thickness shall be 1.57mm (0.62”) for Single Sided and Belly-to-Belly 3.00 mm (0.118”).

4.2 TOLERANCE

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

4.3 HOLE DIMENSIONS

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

4.4 LAYOUT

The holes for the cage assembly must be precisely located to ensure proper placement and optimum performance of the connector assembly. Example of PCB layout is shown in figure 3a, 3b.

Recommended Hole Dimensions

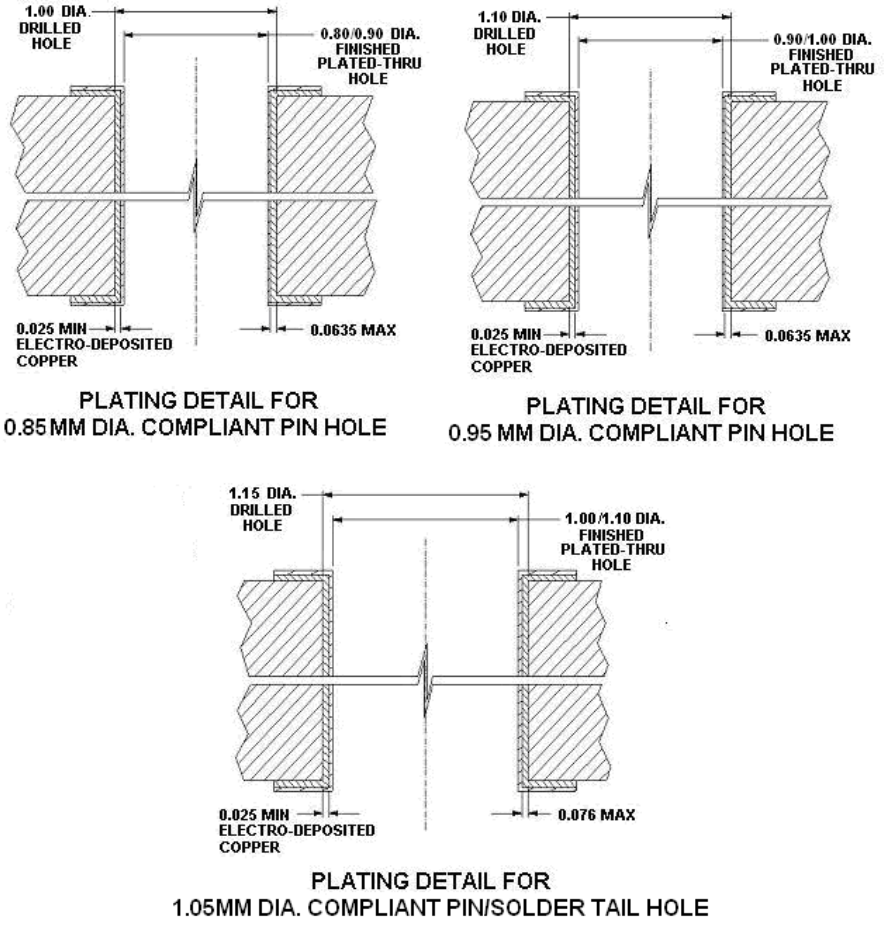
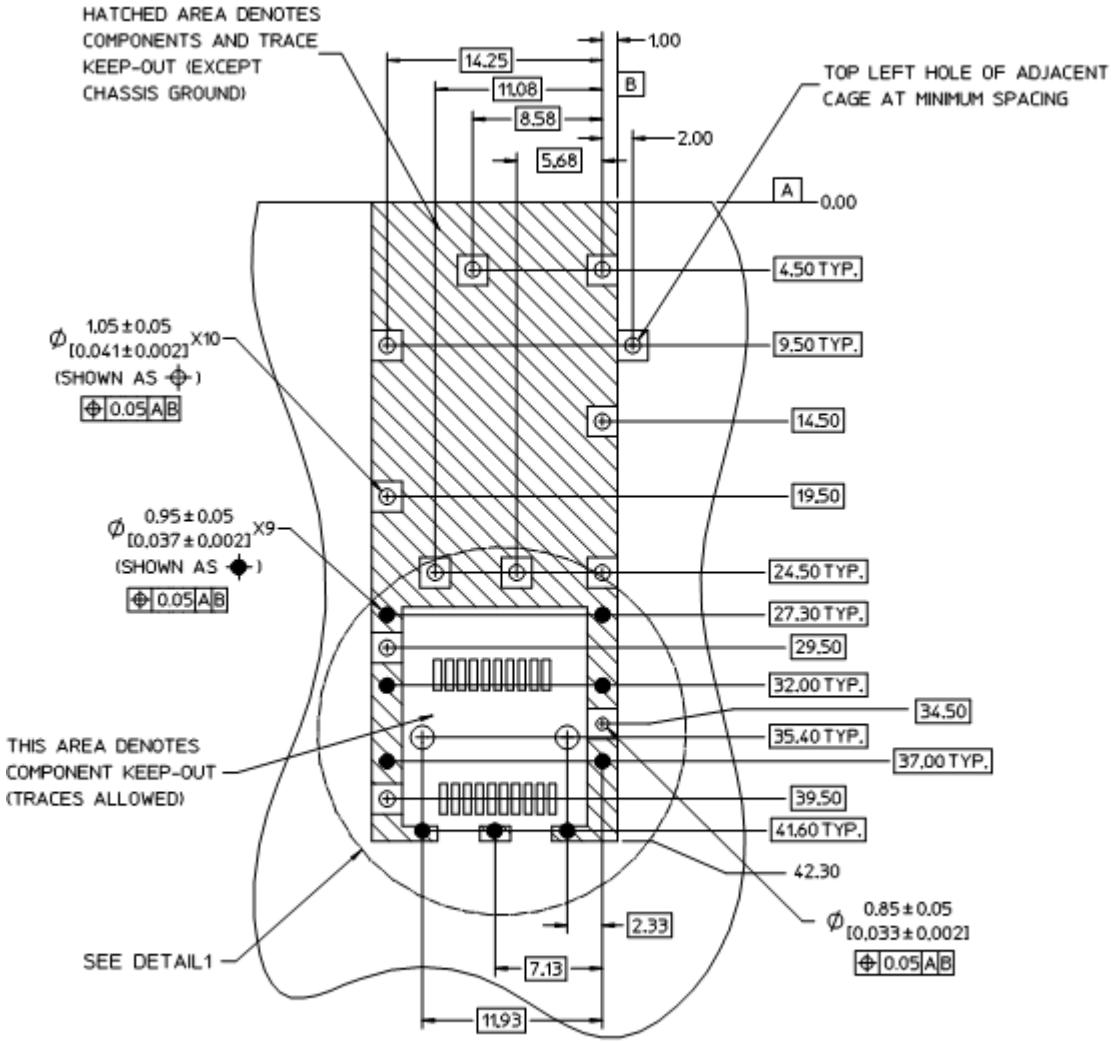


Figure 2

Note: Depending upon the plating finish and plating process, a larger drill diameter may be used to achieve the finished hole specification.

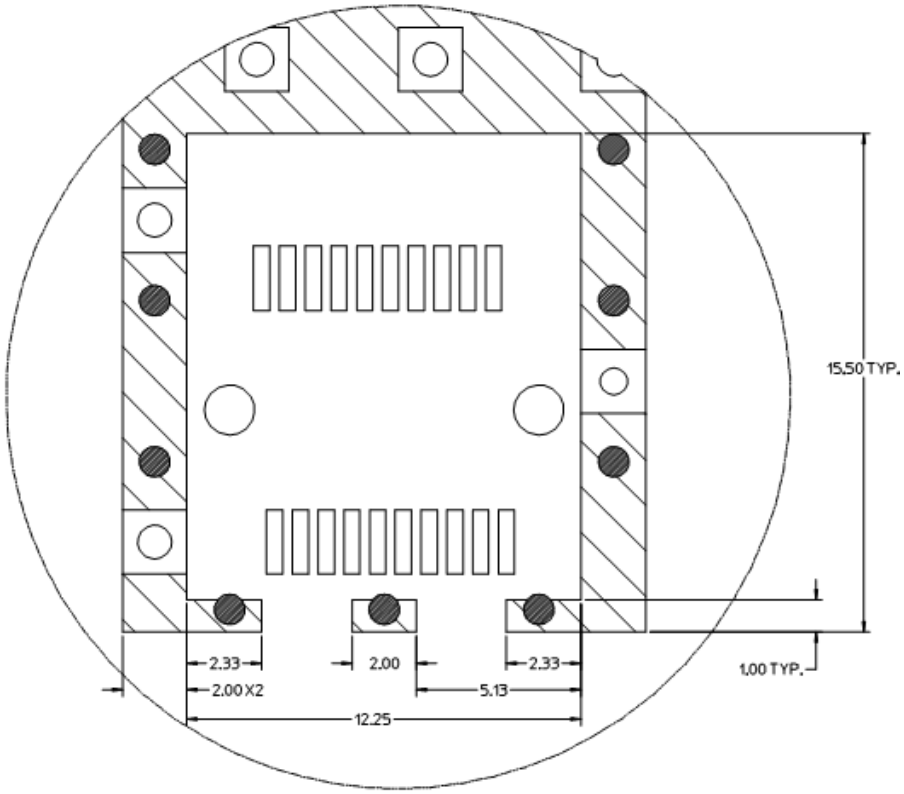
Example: PC Board Layout for Single Port Cage Assembly



Note: For a specific PCB layout, refer to Customer Sales Drawing

Figure 3a

Example: PC Board Layout for Single Port Cage Assembly Cont.



DETAIL1
SCALE 10:1
HOST CONNECTOR DETAIL

NOTES:
1. PADS AND VIAS CONNECT TO CHASSIS GROUND (RECOMMEND PADS TO BE 2.00mm SQUARE)
2. RECOMMENDED THRU HOLE PLATING INCLUDES HASL, OSP, OR IMMERSION (GOLD, SILVER, OR TIN).
3. CONNECTOR PAD LAYOUT PER SFP+ MSA WILL ACCOMMODATE MOLEX CONNECTOR SERIES 74441 OR EQUIVALENT.

Note: For a specific PCB layout, refer to Customer Sales Drawing

Figure 3b

5.0 BEZEL REQUIREMENTS

5.0.1 THICKNESS

The bezel thickness range shall be 0.8 mm thru 2.6 mm.

5.0.2 CUTOUT

The bezel must provide a cutout that allows proper mounting of the connector assembly. The cage assembly panel ground springs must be compressed by the bezel in order to provide an electrical ground between the connector assembly and bezel for EMI suppression. In a case where a gasket is used, the gasket should be compressed enough when the connector assembly is in its final seated position in the bezel cutout 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 assemblies must be considered to ensure proper assembly. Dimensions for bezel cutout and minimum allowable distance between cutouts are shown in Figure 4a and 4b.

5.1 PC BOARD AND BEZEL POSITION

The bezel and pc board must be positioned in relation to each other to avoid interference with the function of the cage assembly module locking latch and to ensure proper function of the panel ground springs or the gasket. This relationship must conform to the dimensions stated in Figure 4a and 4b.

Recommended Bezel Cutout and PC Board and Bezel Position

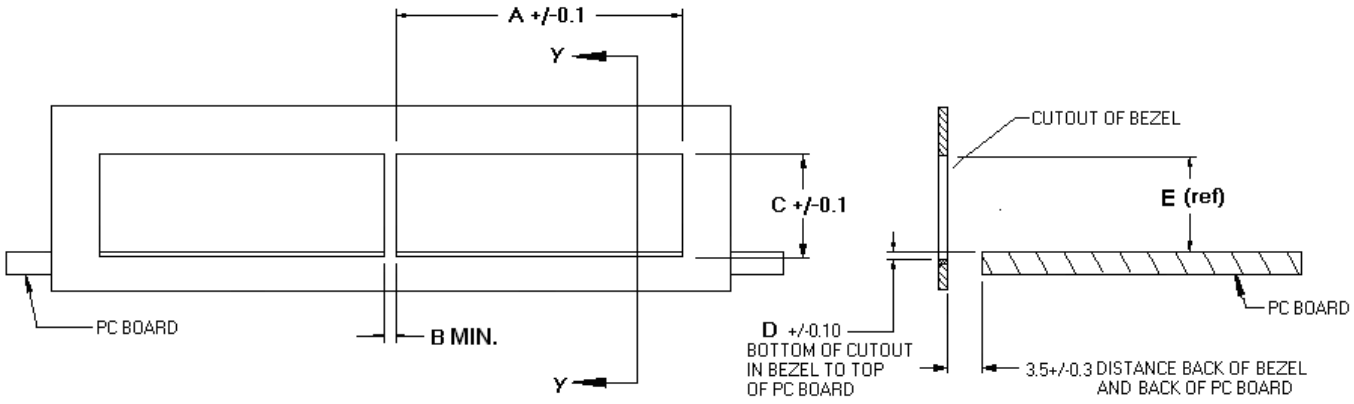
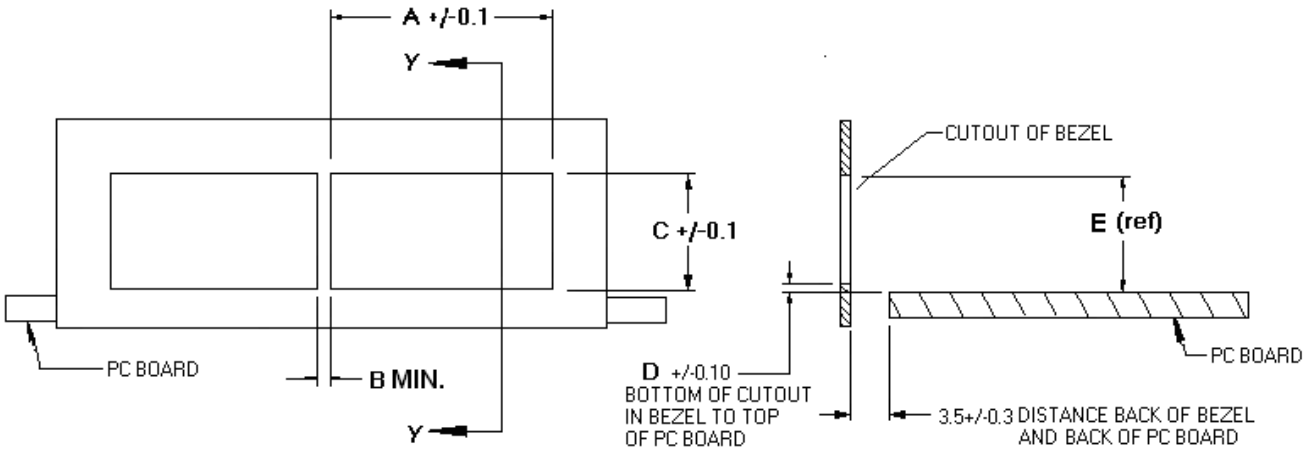


Figure 4a

Single Port w/Solder Post Application Shown Below
(747540106)

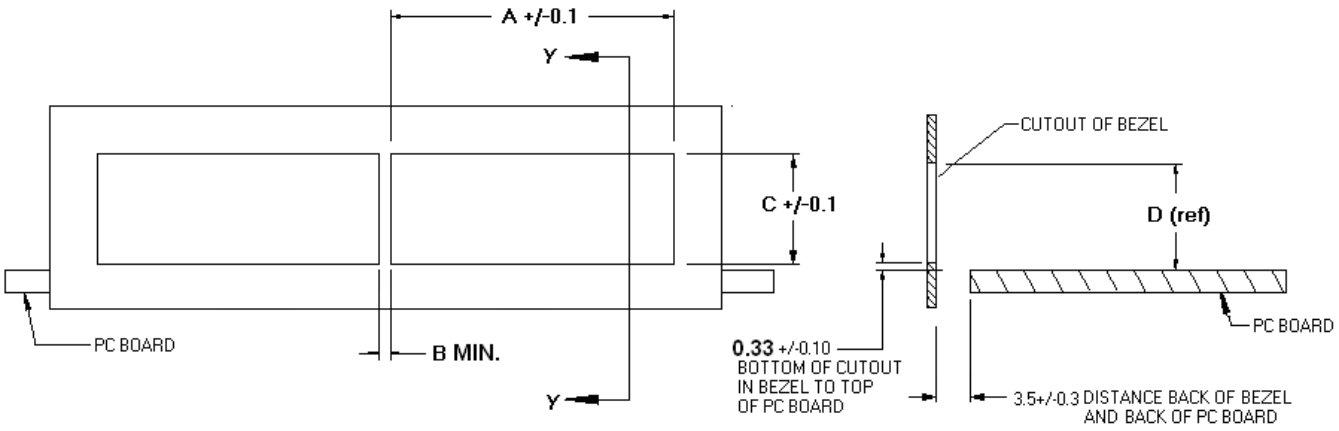


Recommended Bezel Cutout and PC Board and Bezel Position

NON- PCI APPLICATION		DIMENSIONS				
TYPE	**CONFIGURATION**	**A**	**B**	**C**	**D**	**E**
SFP+ Metal Gasket	Single Port	15.45	0.80	10.40	0.43	9.97
SFP+ Metal Gasket	Single Port(Solder Post) 747540106	15.40	0.80	10.40	0.33	10.73
SFP+ Metal Gasket	1x2	29.70	1.30	10.40	0.09	10.31
SFP+ Elastomeric Gasket	1x2	29.90	2.35	10.60	0.19	10.41
SFP+ Metal Gasket	1x4	58.20	1.30	10.40	0.09	10.31
SFP+ Elastomeric Gasket	1X4	58.40	2.35	10.60	0.19	10.41
SFP+ Metal Gasket	1X6	86.70	1.30	10.40	0.09	10.31
SFP+ Elastomeric Gasket	1X6	86.90	2.35	10.60	0.19	10.41

Figure 4a cont.

PCI Application Shown Below



PCI APPLICATION		DIMENSIONS			
TYPE	CONFIGURATION	A	B	C	D
SFP+ Metal Gasket	Single Port	15.45	0.80	10.40	10.73

Figure 4b

6.0 ASSEMBLY PLACEMENT INSTRUCTIONS

The following requirements also apply to the connector assemblies used for rework purposes.

6.1 Registration

The cage compliant pins must be aligned with matching holes in the pc board simultaneously to prevent any twisting or bending of the pin contacts.

6.2 Seating

Using proper seating force and seating height is essential to interconnection performance. The force used to seat the cage assembly must be applied evenly at an insertion rate of 50mm/min. to prevent deformation or other damage to the pin contacts. The force required to seat the cage assembly onto the pc board can be calculated by:

Seating Force: refer to product specification PS-74754-0001

CAUTION *Over-driving of the connector assembly will deform parts critical to the quality of the cage assembly. 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 cage assembly. The shut height can be calculated by:

Seating Height (Cage Assembly Seated) + Height of Seating Tool (loaded onto Cage Assembly) + 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 given in Figure 5.

The cage assembly must be seated on the pc board not exceeding the dimensions shown in Figure 5.

NOTE *The shut height may need to be adjusted to obtain the 0.10 mm [0.004 in.] maximum gap between the standoffs in the cage assembly and the pc board.*

SFP+ Cage Assemblies

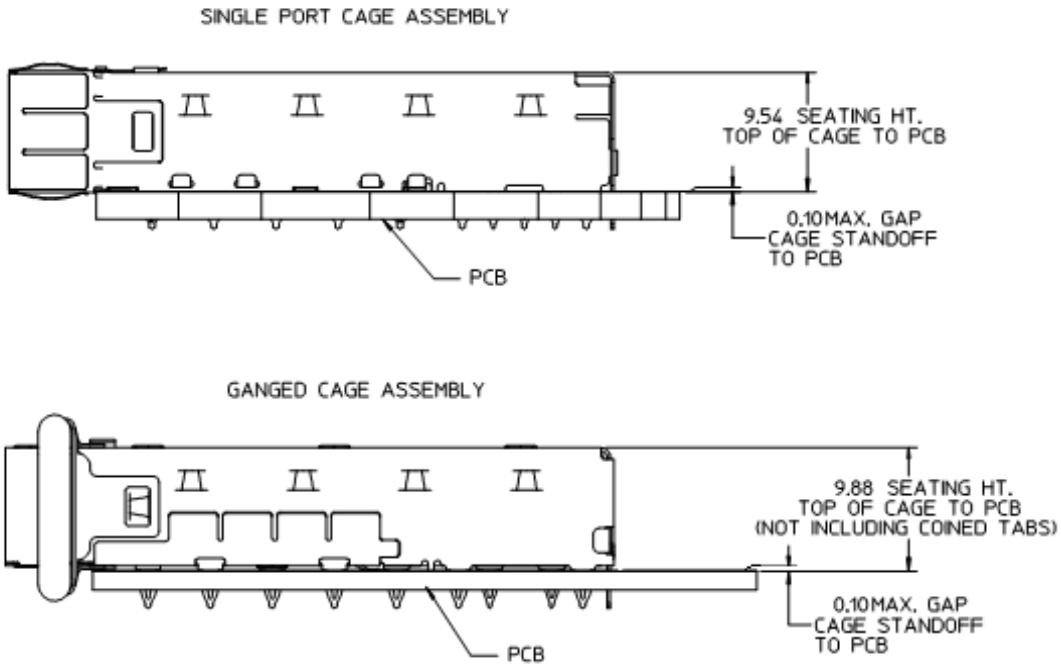
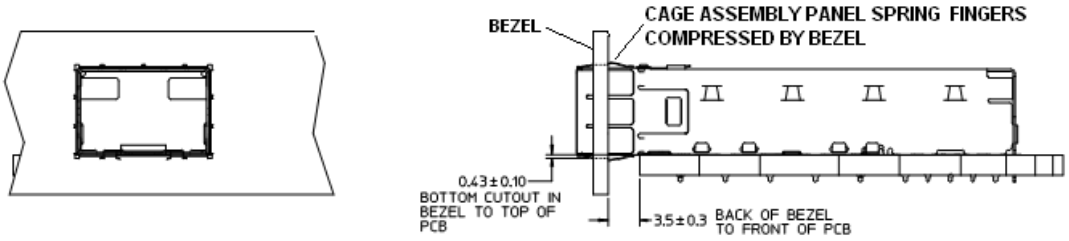


Figure 5

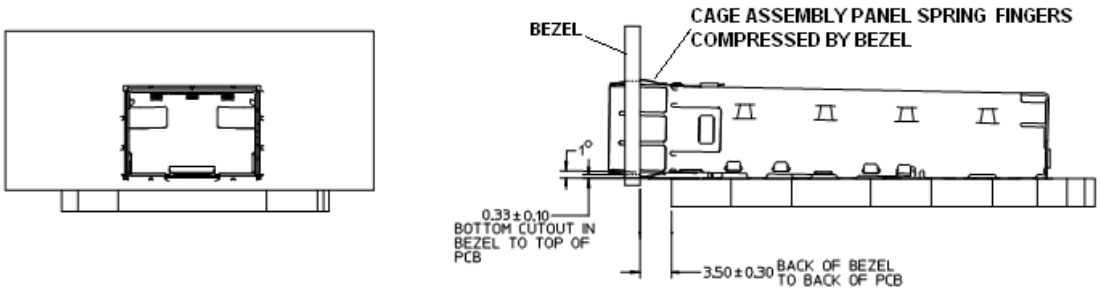
6.3 Checking Assembly

After assembly, the cage assembly panel ground springs must be compressed by the bezel. A slight bow in the cage connector assembly is permitted. On the elastomeric cage assembly, the gasket must compress up against the back face of the bezel and frame. The bezel must not interfere with the function of the module-locking latch. The bezel and pc board must be positioned according to the dimensions shown in Figure 6a and Figure 6b and Figure 6c

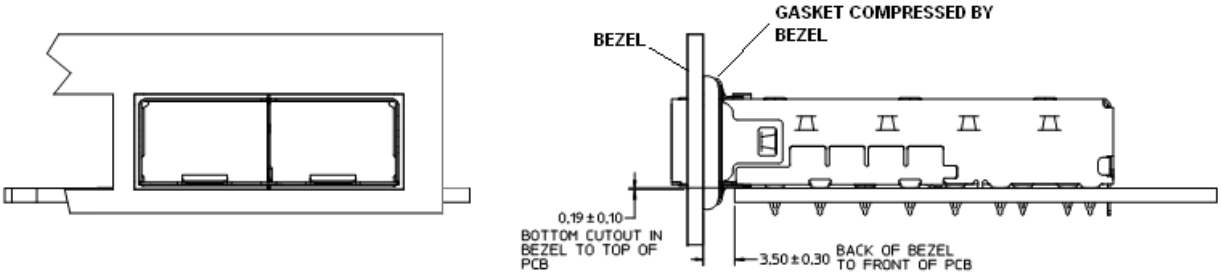
SINGLE PORT CAGE ASSEMBLY - NON PCI



SINGLE PORT CAGE ASSEMBLY - PCI



GANGED CAGE ASSEMBLY
W/ ELASTOMERIC GASKET



GANGED CAGE ASSEMBLY
W/ PANEL SPRING FINGERS

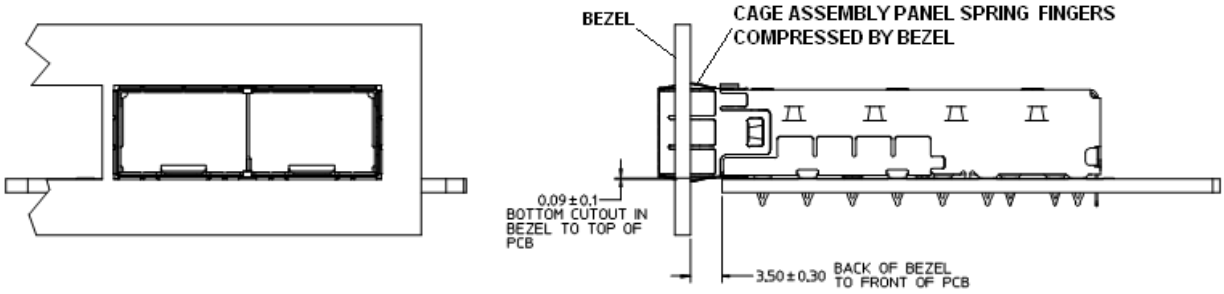


Figure 6a

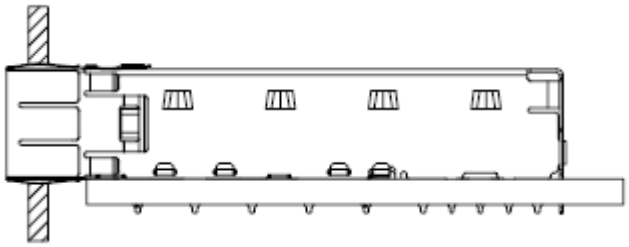
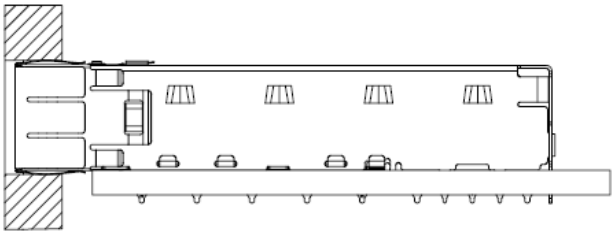
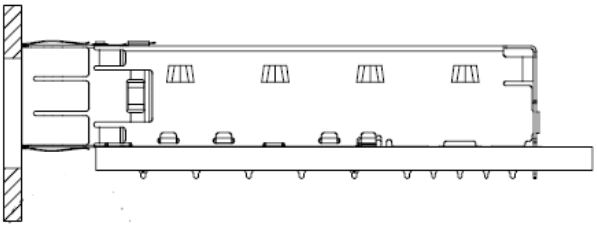
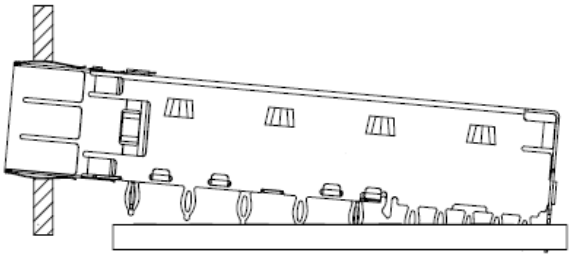
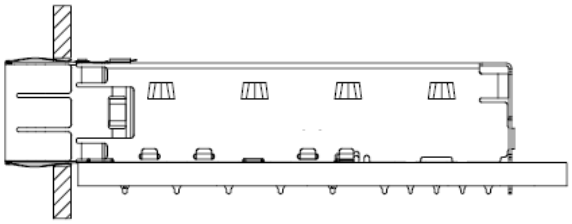
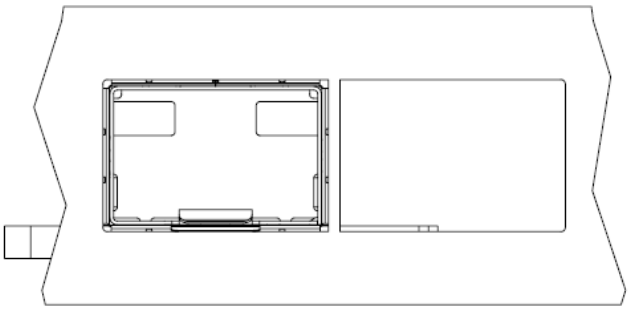
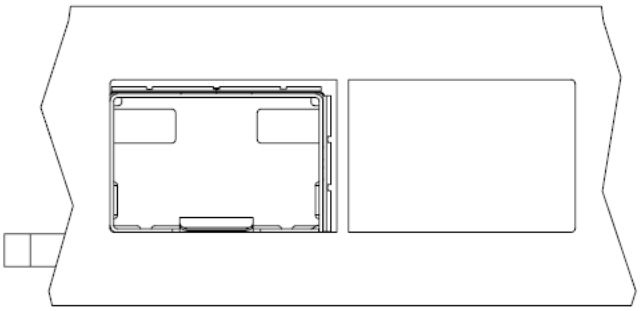
✓ **CORRECT**	
X INCORRECT Bezel extends past opening of cage assembly	
X INCORRECT Improper alignment of bezel and pc board causing stubbing of bezel	
X INCORRECT Improper alignment of bezel and pc board causing cage assembly to lift off of pc board	
X INCORRECT Over-insertion of cage through the bezel at any point during assembly can cause damage to spring fingers and/or spring finger attachment features	

Figure 6b



✓ **CORRECT**



X INCORRECT

Figure 6c

6.4 Repair and Rework

Damaged or defective cage assemblies must be removed and replaced. After the cage is removed, it must be replaced.

If repair or rework to the pc board requires soldering after the cage assembly w/tails has been soldered 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 the using a “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 manufacture. Refer to the manufacture’s Material Safety Data Sheet (MSDS) for characteristics and handling of cleaners. Trichloroethylene and Methylene Chloride is not recommended because of harmful occupational and environmental effects.*

Air-drying is recommended. Otherwise, make sure that temperature limitations are not exceeded: –55º to 85ºC [-67º to 185º F]. Excessive temperatures may cause connector housing and light pipe degradation.

See Table 7.0 in section 7.0 for a listing of extraction tools for these cages.

7.0 INSERTION AND REMOVAL TOOLING

7.1 See Table 7.0 for Molex custom seating and extraction tools.

Table 7.0

Size	Seating Tool	Extraction Tool
1x1 PCI	62202-9720	62202-9750
1x1	62202-9740	62202-9750
1x2	62202-9880	62202-9890
1x4	62202-9780	62202-9790
1x6	62202-9830	62202-9840

1X1 INSERTION TOOL SHOWN FOR REF.

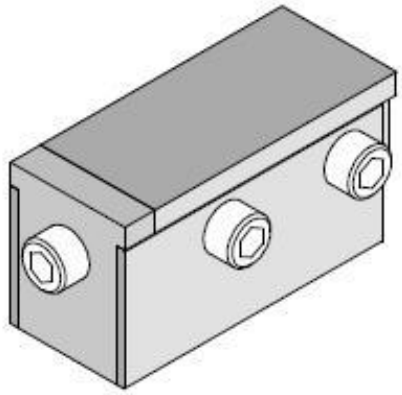


Figure 7a

1X1 EXTRACTION TOOL SHOWN FOR REF.

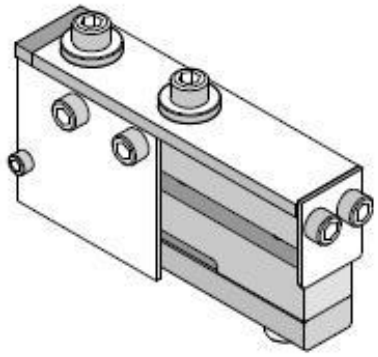


Figure 7b

8.0 VISUAL AIDS

The illustration shown in Fig. 8a and 8b the typical applications of the SFP+ cage assemblies with elastomeric gasket and grounding panel fingers. The illustrations 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.

Single Port Cage Assembly w/ Grounding Panel Fingers Shown
Requirements also apply to Ganged Cage Assembly

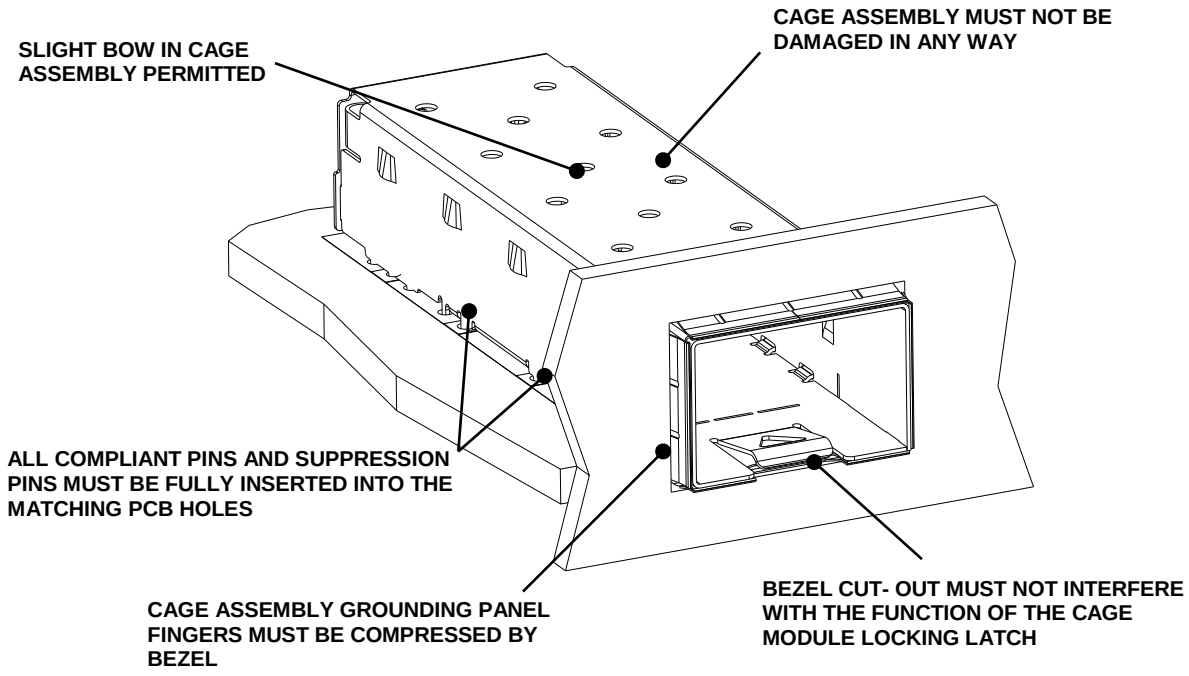


Figure 8a

Ganged Cage Assembly w/Elastomeric Gasket Shown

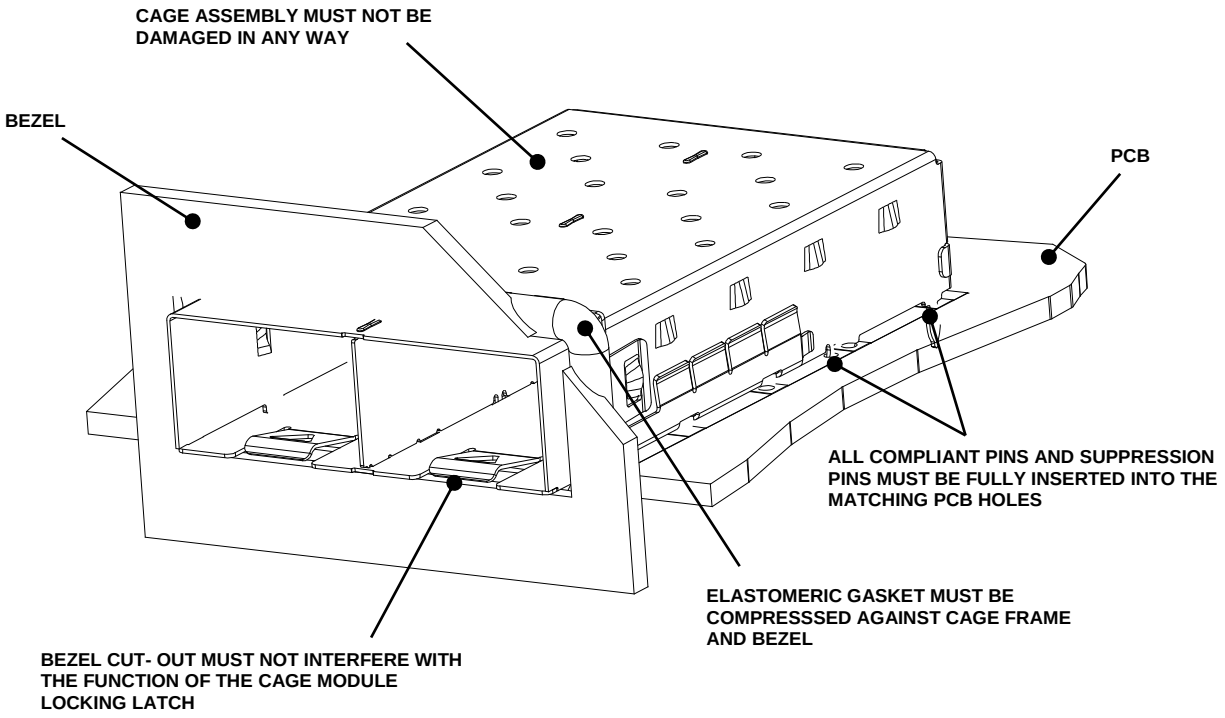


Figure 8b