



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 CFP Host Board Assembly. The CFP connector assembly is a 74-position, 0.8 mm pitch, right-angle surface mount connector. A connector cover assembly, that also provides a positive stop for the CFP transceiver and EMI isolation for the connector assembly, protects this assembly. Threaded holes in the connector cover assembly hold the installed CFP transceiver in place once installed. CFP guide rails roughly align the transceiver with the connector as it is inserted. The CFP external bracket and backer plates roughly align the CFP transceiver to the guide rails as it is inserted through the bezel or front panel, and block EMI emissions from escaping the cabinet when the CFP port is in use. The optional heat sink will help dissipate heat in high performance applications.

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.

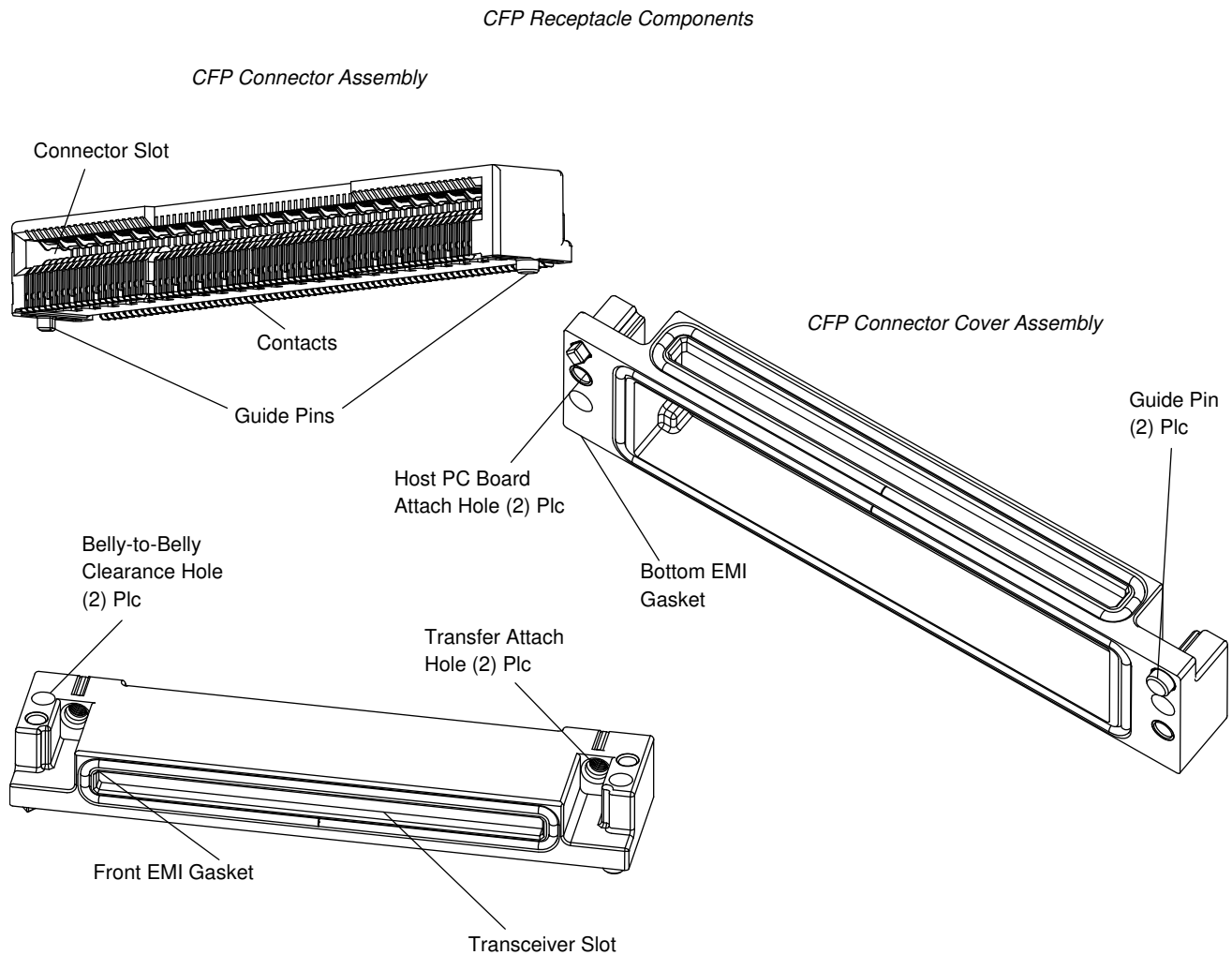
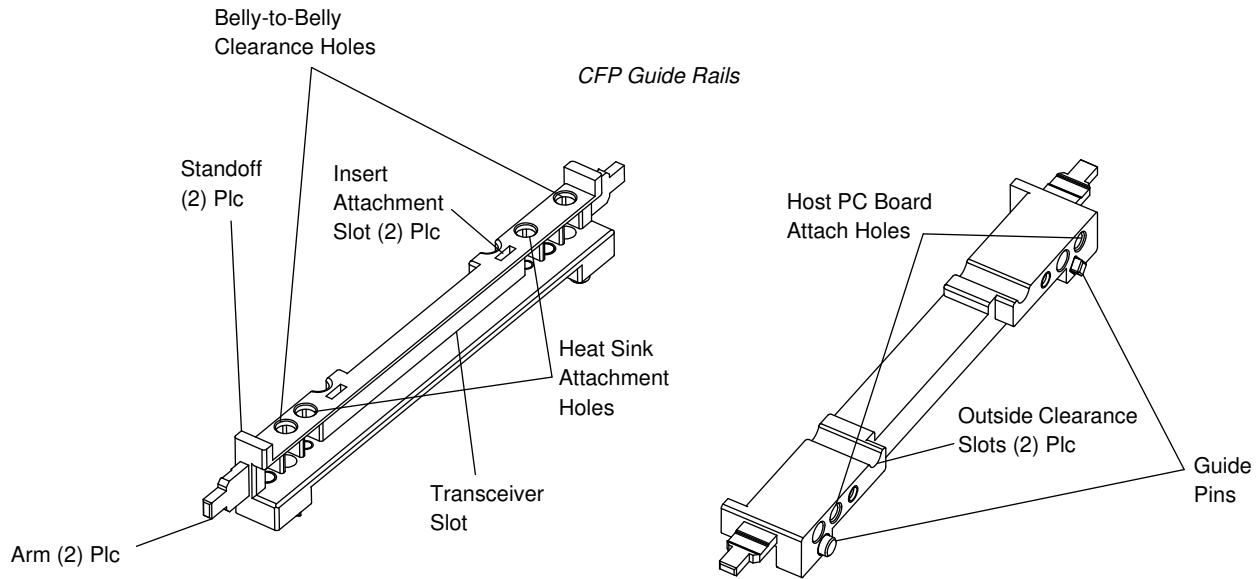
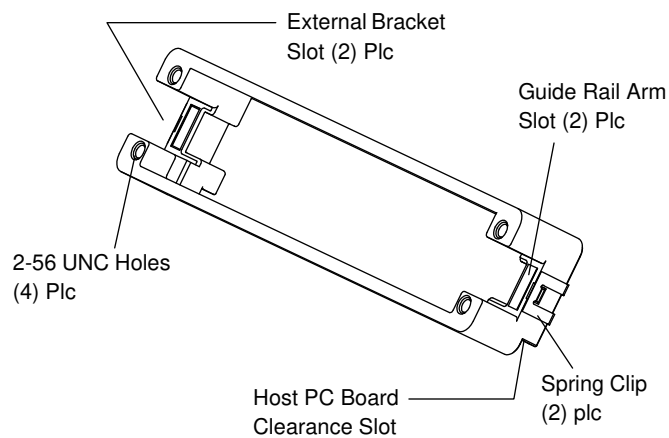


Figure 1 (Cont'd)



CFP Backer Plate



CFP External Bracket

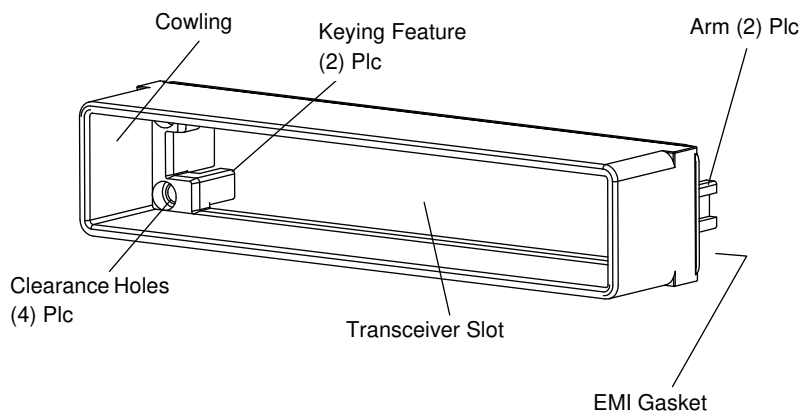


Figure 1 (Cont'd)

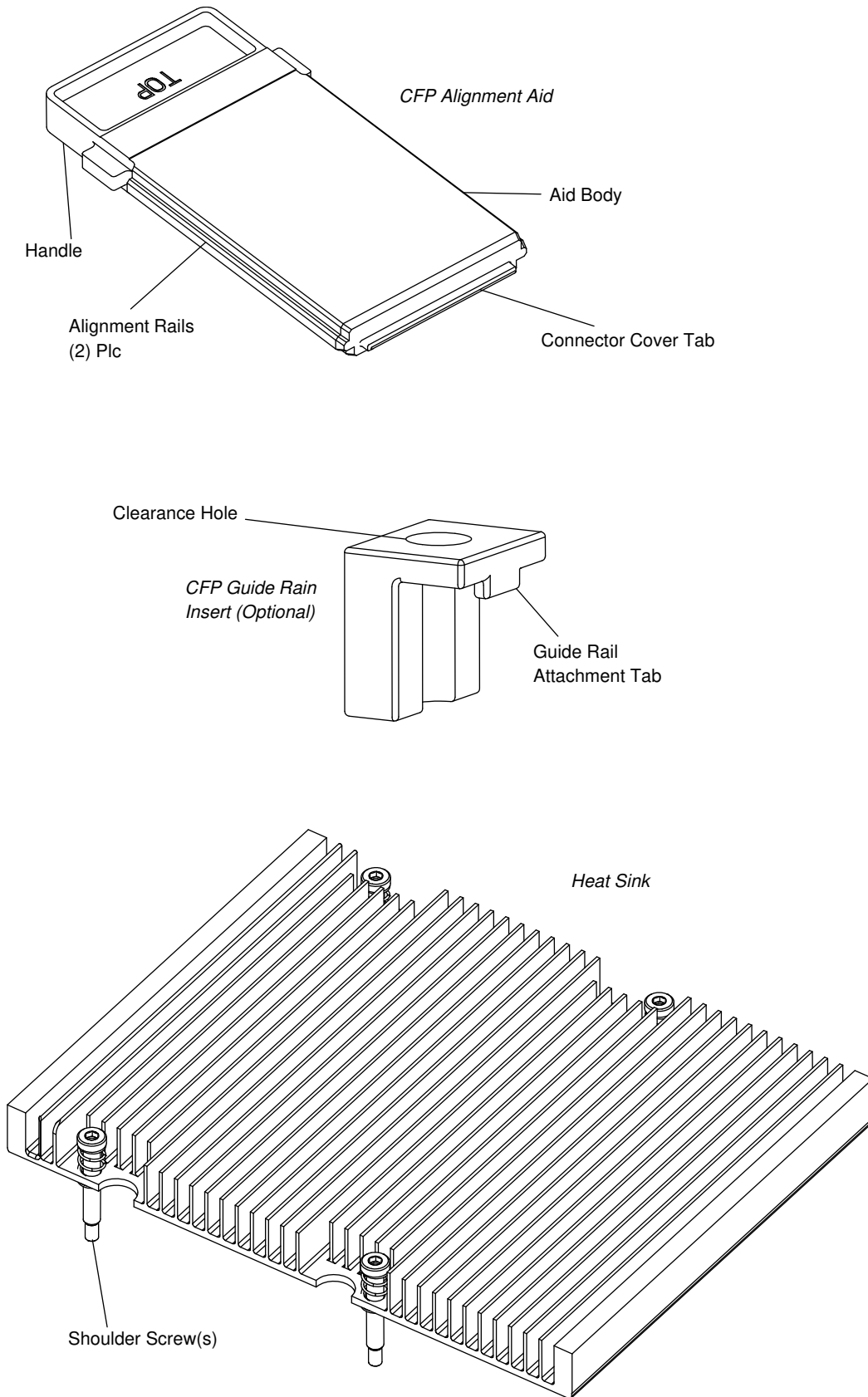


Figure 1 (End)

2. REFERENCE MATERIAL

2.1. Revision Summary

Revisions to this application specification include:

- Updated document to incorporate requirements and changed text in Paragraph 2.2.

2.2. Customer Assistance

Reference Product Base Part Number 2057630 and Product Code L622 are representative of the CFP Receptacle Connector. 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, 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 by TE, the information contained in the customer drawings takes priority.

2.4. Specifications

Product Specification 108-2399 provides product performance and test information. EIA (Electronic Industries Alliance)-364-52 provides solderability requirements and evaluation methods, and Workmanship Specification 101-21 provides solder fillet requirements for the connector.

2.5. Instructional Material

Instruction sheets (408-Series) provide assembly instructions. Documents available which pertain to this product are:

<u>Document Number</u>	<u>Document Title</u>
408-9816	Handling Reeled Products
408-10302	CFP Receptacle Connector

2.6. Manuals

Manual 402-40 can be used as a guide to soldering. This manual provides information on various flux types and characteristics with the commercial designation and flux removal procedures. A checklist is included in the manual as a guide for information on soldering problems.

3. REQUIREMENTS

3.1. Safety

Do not stack product component 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 connector material.

B. Shelf Life

The products 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 CFP components near any chemical listed below as they may cause stress corrosion cracking in the contacts or compliant pins.

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 105°C [-67 to 221°F].

3.4. Material

The connector cover, guide rail, backer plate, and external bracket are made of zinc alloy plated with nickel over copper. EMI gaskets are made of conductive elastomer. The connector housing is made of polyester LCP, UL 94-V-0. The contacts are made of copper alloy plated with gold.

3.5. Host PC Board

A. Material and Thickness

The host pc board material shall be glass epoxy (FR-4 or G-10). The pc board thickness shall be a minimum of 2 mm for mounting CFP receptacles to one side of the pc board, and 3 mm minimum for mounting CFP receptacles on both sides of the pc board.



NOTE

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

B. Tolerance

Maximum allowable bow of the pc board shall be 0.08 mm over the length of the cage assembly. The coplanarity of the pc board circuit pads must be 0.03 mm.

C. Circuit Pads

The circuit pads must be solderable in accordance with EIA-364-52.

D. Layout

All holes and circuit pads must be precisely located on the pc board to ensure proper placement and optimum performance of the connector and cage assembly. Recommended circuit pad pattern, keep out zones, dimensions, and tolerances for a single CFP receptacle are provided in Customer Drawings. Contact the Product Information number at the bottom of page 1 for specific drawings.

3.6. Solder Paste Characteristics

- Alloy type for tin-lead solder shall be 63 Sn/37 Pb, 60 Sn/40 Pb, or 62 Sn/36 Pb/2 Ag
- Alloy type for lead-free solder shall be compatible with pure tin or gold; for example, SAC305 (96.5 Sn/3 Ag/0.5 Cu) or SAC405 (95.5 Sn/4 Ag/0.5 Cu)
- Flux incorporated in the paste shall be rosin, mildly active (RMA) type
- Paste will be at least 80% solids by volume
- Mesh designation -200 to +325 (74 to 44 square micron openings, respectively)
- Minimum viscosity of screen print shall be 5x10% cp (centipoise)
- Minimum viscosity of stencil print shall be 7.5x10% cp (centipoise)

3.7. Solder Volume

Minimum solder volume (V) (before curing) for each circuit pad is calculated by multiplying the pad length (L) by the pad width (W) by the stencil thickness (T): $1.4 \text{ mm (L)} \times 0.35 \text{ mm (W)} \times 0.15 \text{ mm (T)} = 0.074 \text{ mm}^3 \text{ (V)}$. Solder volume for each connector must be 0.074 mm³ per contact solder tine.



NOTE

Solder volume may vary depending on solder paste composition.

3.8. Solder Paste Thickness

Solder paste thickness for the connector contact solder tines must be at least 0.15 mm.

3.9. Stencil

The stencil aperture is determined by the circuit pad size and stencil thickness. It may be any shape as long as it prevents solder bridging from one pad to another. Generally, a thinner stencil will need a larger aperture to maintain the given volume of solder paste. The stencil should be 0.15 mm thick.

3.10. Solder Mask

When soldering, a solder mask is recommended between all circuit pads to minimize solder bridging between pads. The mask must not exceed the height of the pad. If a trace is run between adjacent pads on the pc board, a solder mask must be applied over the trace to prevent bridging and wicking of solder away from the connector contact solder tines. The mask most suitable is Liquid Photo Imageable.



CAUTION

All traces must be covered by solder mask in the solder deposit area. Exposed traces could cause bridging and create a short, or wick solder away from the solder tines, producing a weak solder joint.

3.11. Connector Assembly Placement



CAUTION

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



CAUTION

The connector must be soldered to the host pc board before seating the connector cover assembly. The soldering process will cause damage to the connector cover assembly.

A. Registration

The connector contact solder tines must be aligned with matching circuit pads and alignment posts aligned with matching holes before placing the connector on the host pc board.

B. Position

Optimally, the contact solder tines should be centered on the host pc board circuit pads. However, a slight misalignment is permissible as shown in Figure 2.

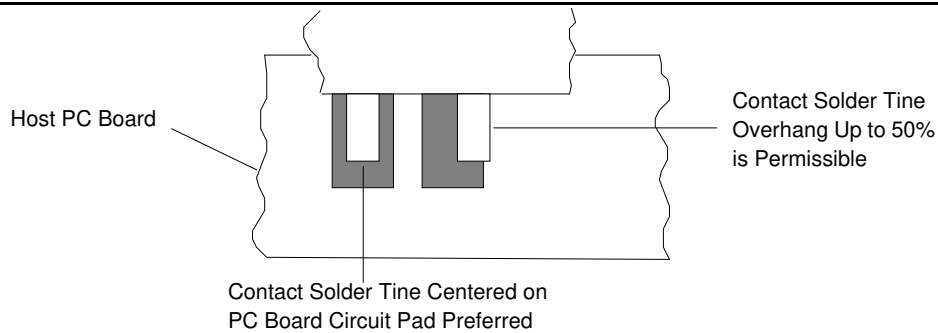


Figure 2

C. Seating

Because the connector alignment posts are for clearance and fit only, the force required to seat the connector is minimal. Apply only that force necessary to seat the contact solder tines into the top surface of the solder paste. The alignment posts must be inserted into the host pc board holes. See Figure 3.

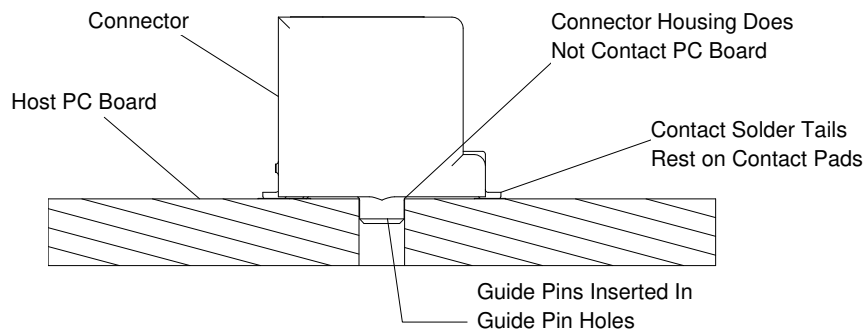


Figure 3

D. Placement by Vacuum Pickup

In order to facilitate use of a vacuum pick and place tool, tape has been placed over the centroid of the connector. The location of the centroid of the connector based on number of contacts is shown in Figure 4.

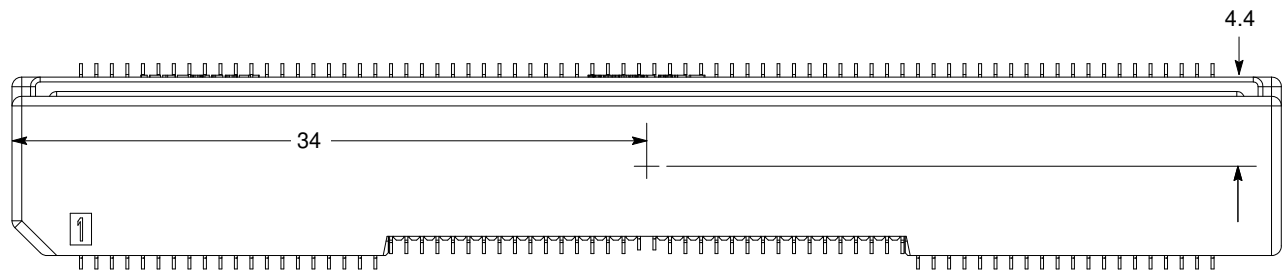


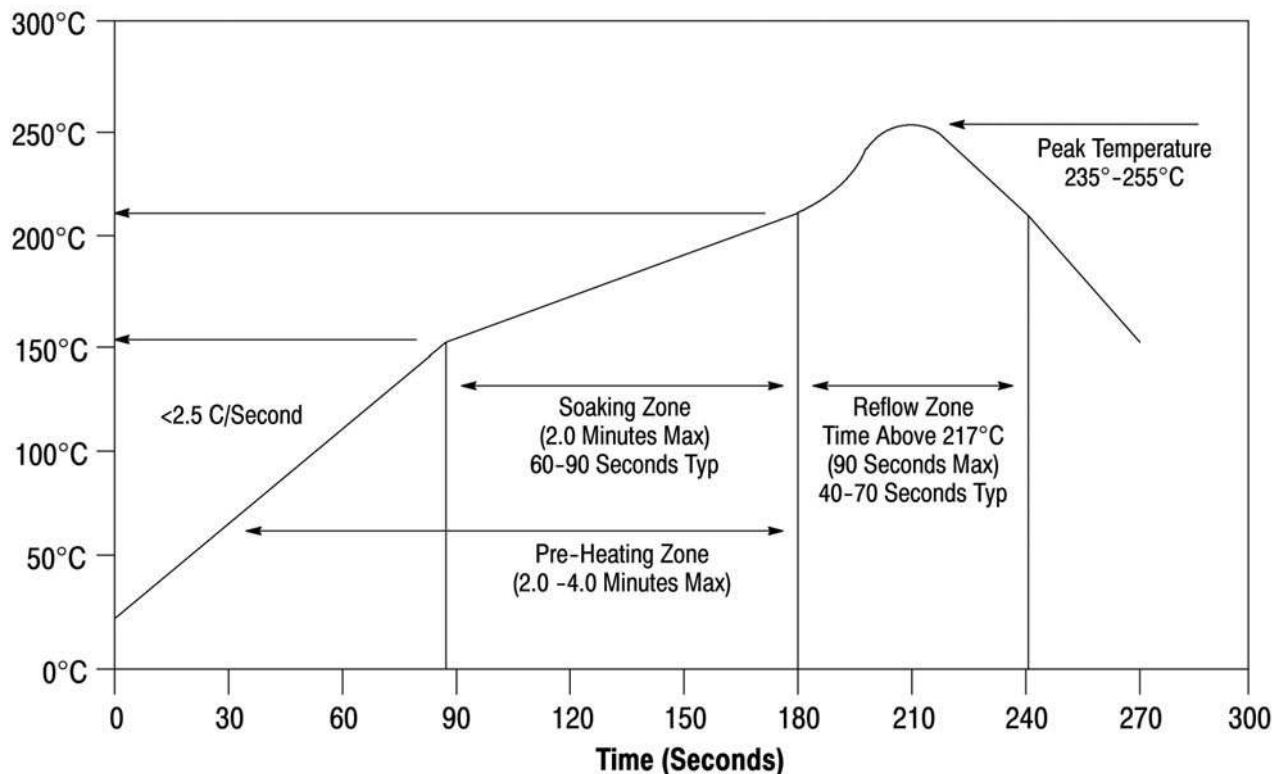
Figure 4

3.12. Soldering

A. Process

The connector must be soldered using non-focused infrared (IR) reflow or equivalent soldering technique. When mounting to both sides of the host pc board, the surface tension of the solder when it is in the liquidus state will hold the connector on the pc board. Reflow temperature and time may vary depending on the size of the host pc board and placement of other components. The reflow temperature and approximate time to which the connector can be subjected is specified in Figure 5.

Kester Lead-Free Reflow Profile
Alloys: Sn96.5/Ag3.0/Cu0.5 and Sn96.5/Ag3.5



Kester is a trademark.

Figure 5 (Cont'd)

Reflow Soldering Process Cycle

Tin-Lead Solder
(Maximum 230°C [446°F] for 20 Seconds)

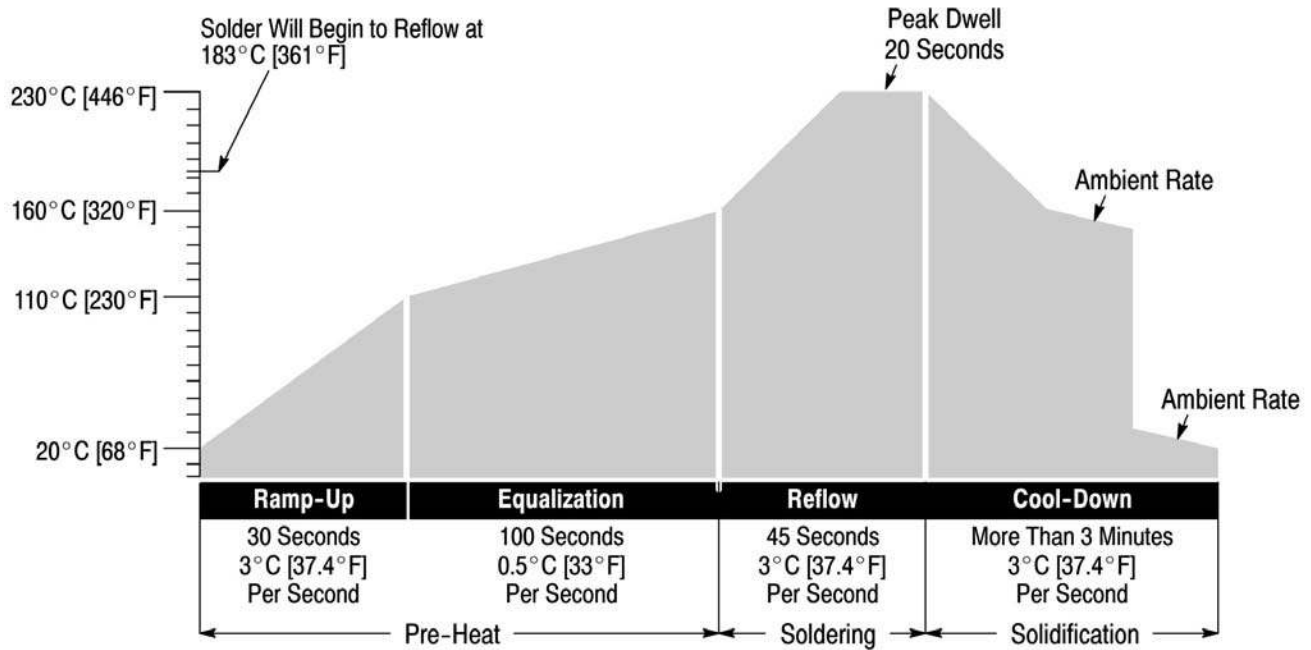


Figure 5 (End)



CAUTION

Excessive temperature may cause connector housing degradation or plating deterioration. It is recommended that component temperatures not exceed 230°C [446°F] when using tin-lead solder and 260°C [500°F] when using lead-free solder.

B. Cleaning

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. It is recommended cleaning the host pc board on its edge. If using aqueous cleaner, standard equipment such as a soak-tank or an automatic in-line machine should be used. Common cleaning solvents that will not affect the connector for the time and temperature specified are listed in Figure 6.

CLEANER		TIME (Minutes)	TEMPERATURE (Maximum)
NAME	TYPE		
ALPHA 2110	Aqueous	1	132°C [270°F]
BIOACT EC-7	Solvent	5	100°C [212°F]
Butyl CARBITOL	Solvent	1	Ambient Room
Isopropyl Alcohol	Solvent	5	100°C [212°F]
KESTER 5778	Aqueous		
KESTER 5779	Aqueous		
LONCOTERGE 520	Aqueous		
LONCOTERGE 530	Aqueous		
Terpene	Solvent		

ALPHA, BIOACT, CARBITOL, LONCOTERGE, and KESTER are trademarks of their respective owners.

Figure 6



DANGER

Consideration must be given to toxicity and other safety requirements recommended by the solvent manufacturer. Refer to the manufacturer'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. Both are carcinogenic (cancer-causing).



NOTE

If you have a particular solvent that is not listed, contact Product Information at the number on the bottom of page 1 for recommendations

C. Drying

When drying cleaned assemblies and host pc boards, make certain that temperatures do not exceed 85°C [185°F]. Excessive temperatures may cause connector housing degradation.

3.13. Checking Installed Connector

All solder joints must conform to those specified in Workmanship Specification 101-21 and all other requirements specified in this document. The installed connector must have solder fillets evenly formed around each contact solder tine. Solder must have 95% minimum coverage over the circuit pad. See Figure 7.

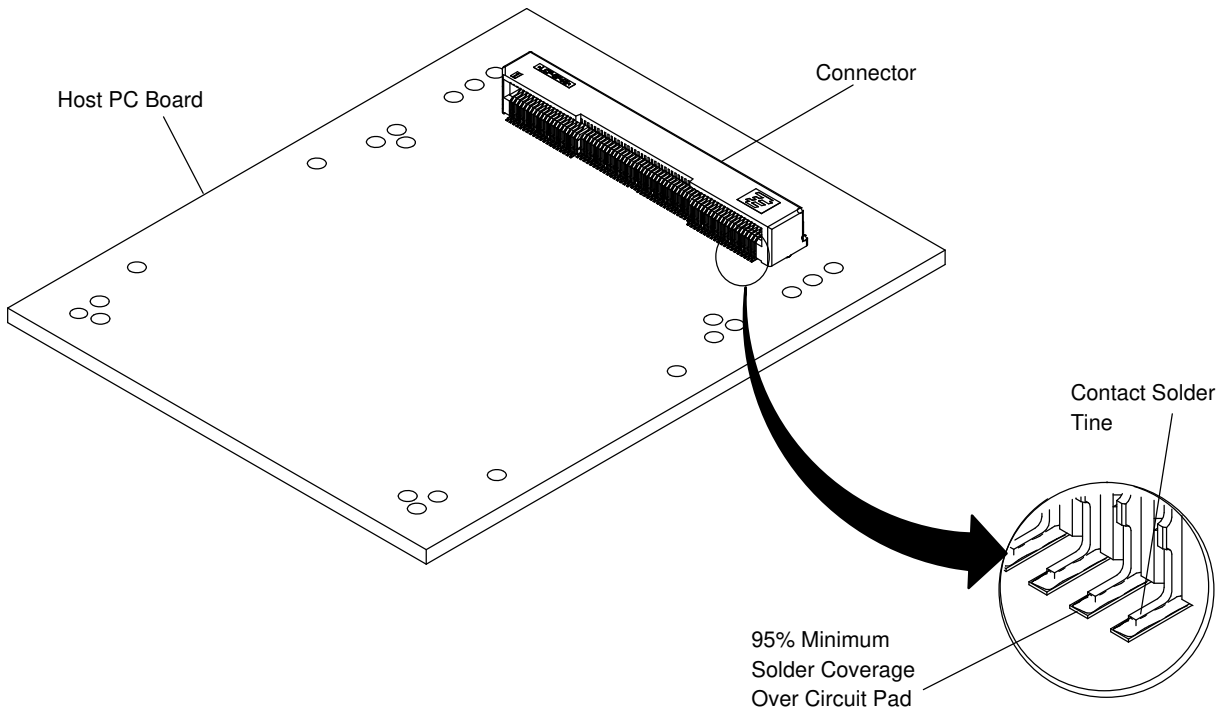


Figure 7

3.14. Connector Cover Assembly

The Connector Cover Assembly, displayed in Figure 1, must be positioned so the guide pins are aligned with the guide pin holes on the host pc board. Care must be taken to avoid damage to the contacts and connector assembly. The connector cover assembly must be fastened to the host pc board tightly enough to ensure full compression of the bottom EMI gasket, using two M3 x 0.5 mm screws. The bottom of the metal frame of the assembly must rest flush against the plated surface on the pc board. See Section 6, VISUAL AID.

3.15. Bezel

A. Thickness

The bezel thickness range shall be 1 mm through 3 mm.

B. Cutout

The bezel must provide a cutout that allows proper mounting of the external bracket assembly. Care must be used to avoid interference between adjacent receptacles and other components. The minimum allowable distance between components must be considered to ensure proper assembly. Dimensions for bezel cutout and minimum allowable distance between cutouts are shown in Figure 8.

C. Position

The bezel and host pc board must be positioned in relation to each other to avoid interference with the insertion and extraction of the transceiver. This relationship must conform to dimensions given in Figure 8.

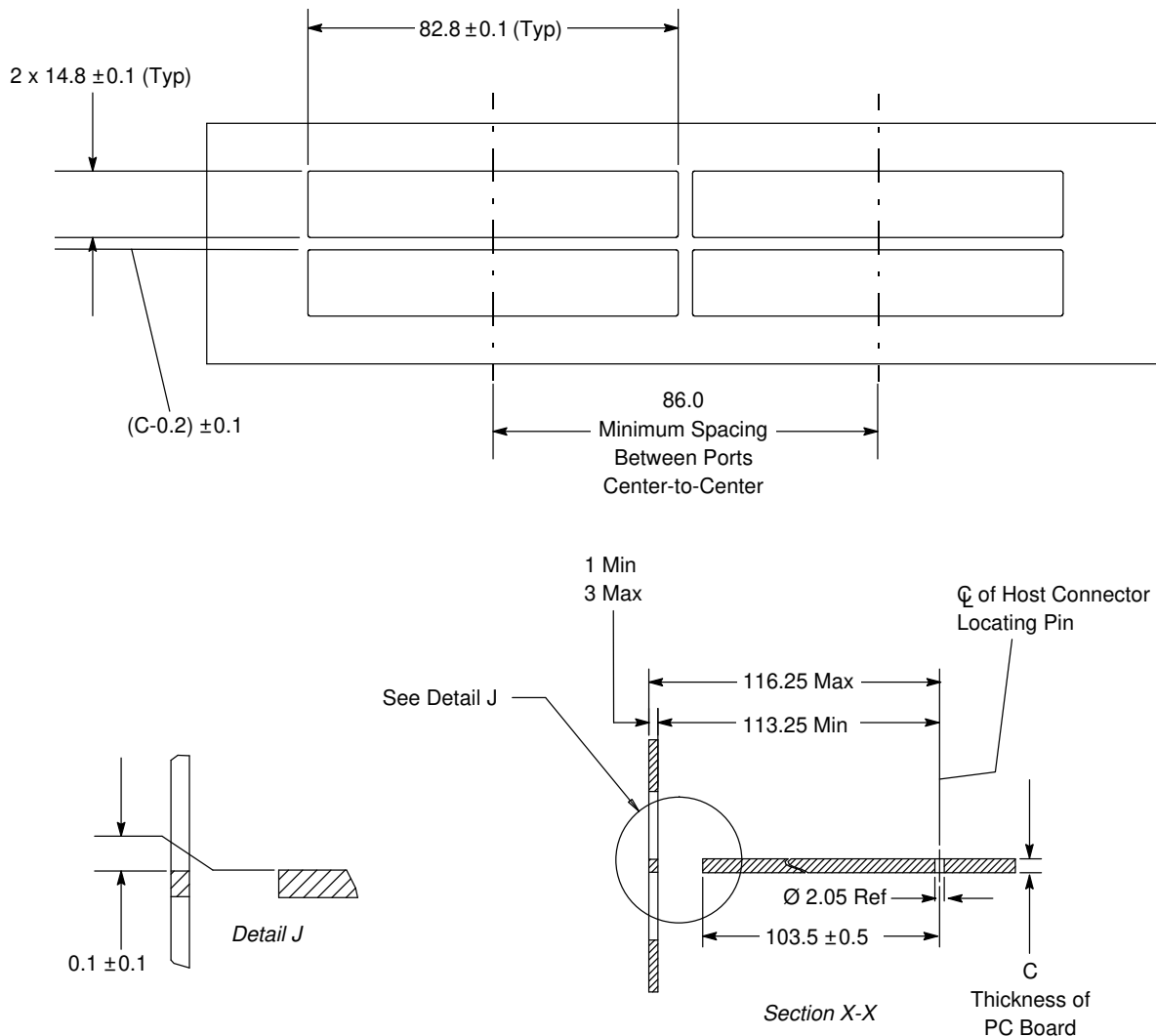


Figure 8

3.16. Guide Rail Placement



NOTE

The connector must be soldered to the pc board BEFORE seating the guide rails.

The guide pins and threaded attachment holes of the guide rails, shown in Figure 1, must be aligned with matching holes in the pc board, shown in Figure 2, then inserted into the pc board. The guide rail must be firmly attached to the host pc board with the bottom surface of the guide rail seated on the plated surface of the pc board, using two M3 x 0.5 mm screws. See Section 6, VISUAL AID.

3.17. External Bracket Assembly and Backer Plate Assembly

The two assemblies, shown in Figure 1, should be assembled around the opening in the bezel, shown in Figure 8. The external bracket shall be secured by four 2-56 UNC hex socket head cap screws and should fit securely on the bezel with the EMI gasket fully compressed and the metal frame in contact with the bezel surface. The arms of the external bracket should be inserted in the external bracket slot of the backer plate. The rail arms should be inserted through the guide rail arm slot and the slot in the arm of the external bracket. The board clearance slot on the backer plate must be facing the host pc board. See Section 6, VISUAL AID.

3.18. Guide Rail Insert

The Guide Rail Insert, shown in Figure 1, is optional. Two inserts may be installed on each guide rail, resting on the top of the rail with the tab of the insert placed into the slots on the top of the guide rail. The clearance hole in the insert will be aligned to the outside clearance slots on the rails allowing a fastener to be fed through the insert, clearance slot, and optional hole on the host pc board. The insert provides additional surface area for the head of a fastener, wherever it is not provided by a combination of two rails seated back-to-back to each other. See Section 6, VISUAL AID.

3.19. Mounting Heat Sink (Figure 9)

The heat sink must be placed on the host board assembly and secured to the guide rails using the shoulder screws. After the heat sink is installed and screws are tightened, the following requirements must apply.

- The perimeter of the heat sink must be flush with the top of the guide rails of the cage assembly

Any heat sink used must be flush with and securely attached to the guide rails of the host board assembly.

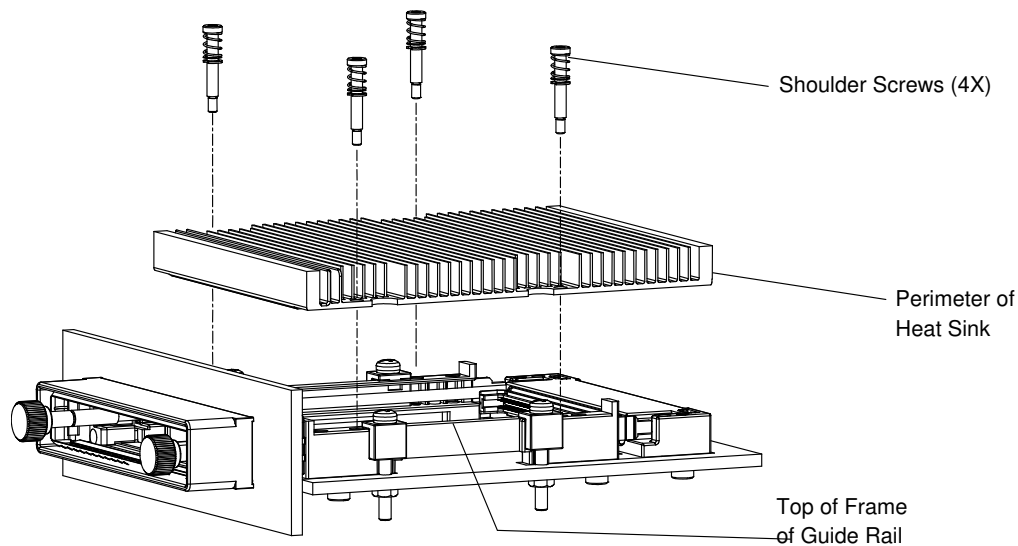


Figure 9

3.20. Removal and Repair

The optional rail inserts can be removed by unscrewing them and lifting them straight off the guide rails.

The guide rails must be detached from the slots of the rear of the backer plate and external bracket assemblies prior to removing the backer plate and external bracket assemblies. Unscrew the assemblies from each other, while supporting both assemblies to prevent them from falling. Then pull the assemblies apart.

The guide rails must be detached from the slots of the rear of the backer plate and external bracket assemblies prior to removal. To remove the guide rails, unscrew the rails from the host board or any other structures as they are attached to and lift them from the host pc board. If guide rails are mounted on both sides of the host pc board, both sets of rails must be unscrewed from the board to remove either set.

The guide rails on the same side of the host pc board must both be removed before removing the connector cover assembly. To remove the connector cover assembly, unscrew the assembly and lift the assembly from the pc board. If an assembly is mounted on both sides on the host pc board, both assemblies must be unscrewed from the pc board to remove either assembly.

The connector cover assembly must be removed from the host pc board before removing the connector. Standard de-soldering methods must be used to remove the connector from the host pc board. The connector must NOT be re-used after removal. The connector is not repairable. Any defective or damaged product must NOT be used.

3.21. Reel Dimensions

Reel dimensions are provided in Figure 10.

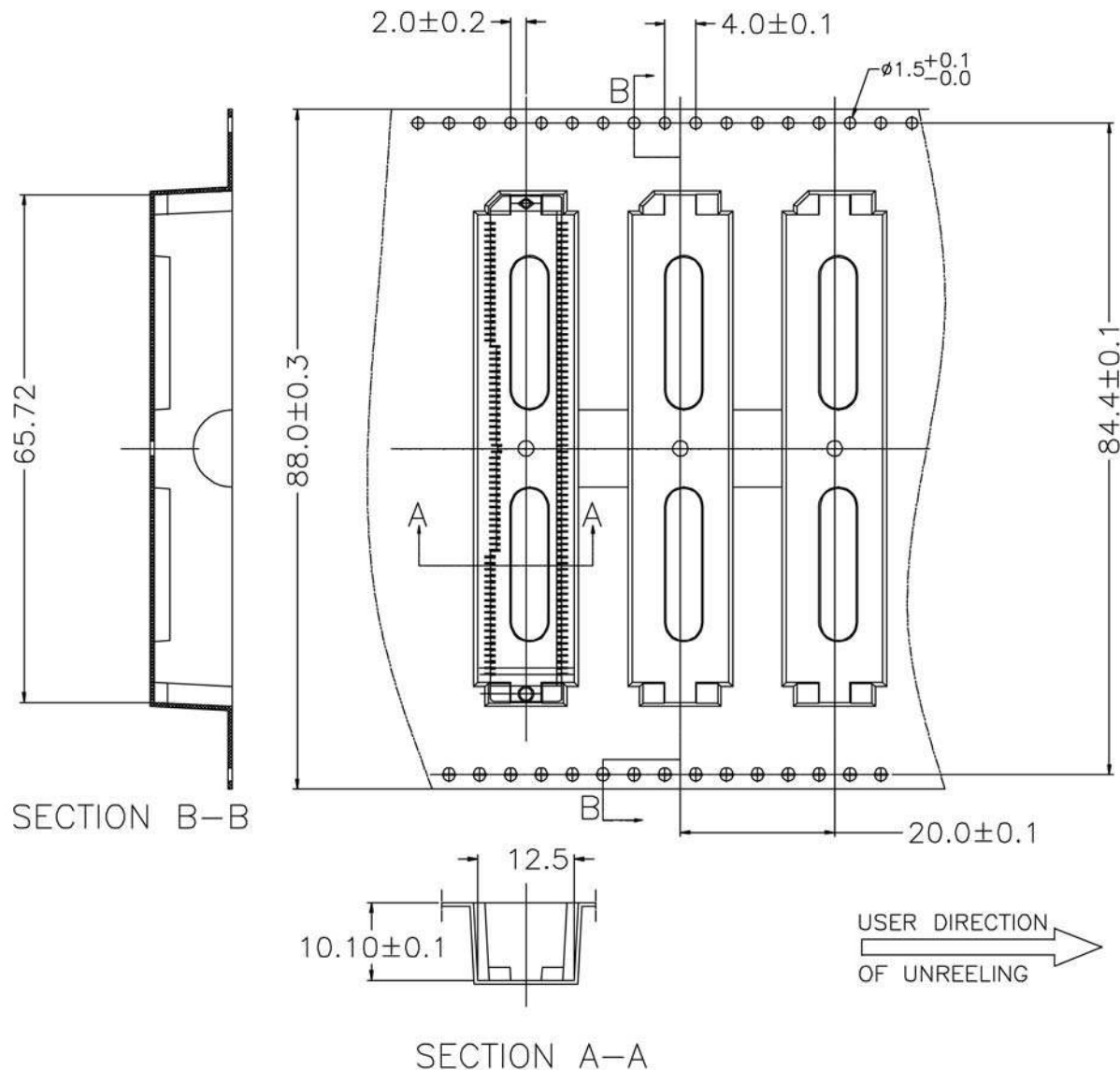


Figure 10

4. QUALIFICATIONS

CFP Connectors are Recognized by Underwriters Laboratories Inc. (UL) in File E28476.

5. TOOLING

The connector assembly can be installed without special tooling. However, for automatic machine placement, the robotic equipment must have a true position accuracy tolerance sufficient to properly locate the connector and bottom cage. This includes gripper and fixture tolerances as well as equipment repeatability.

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.

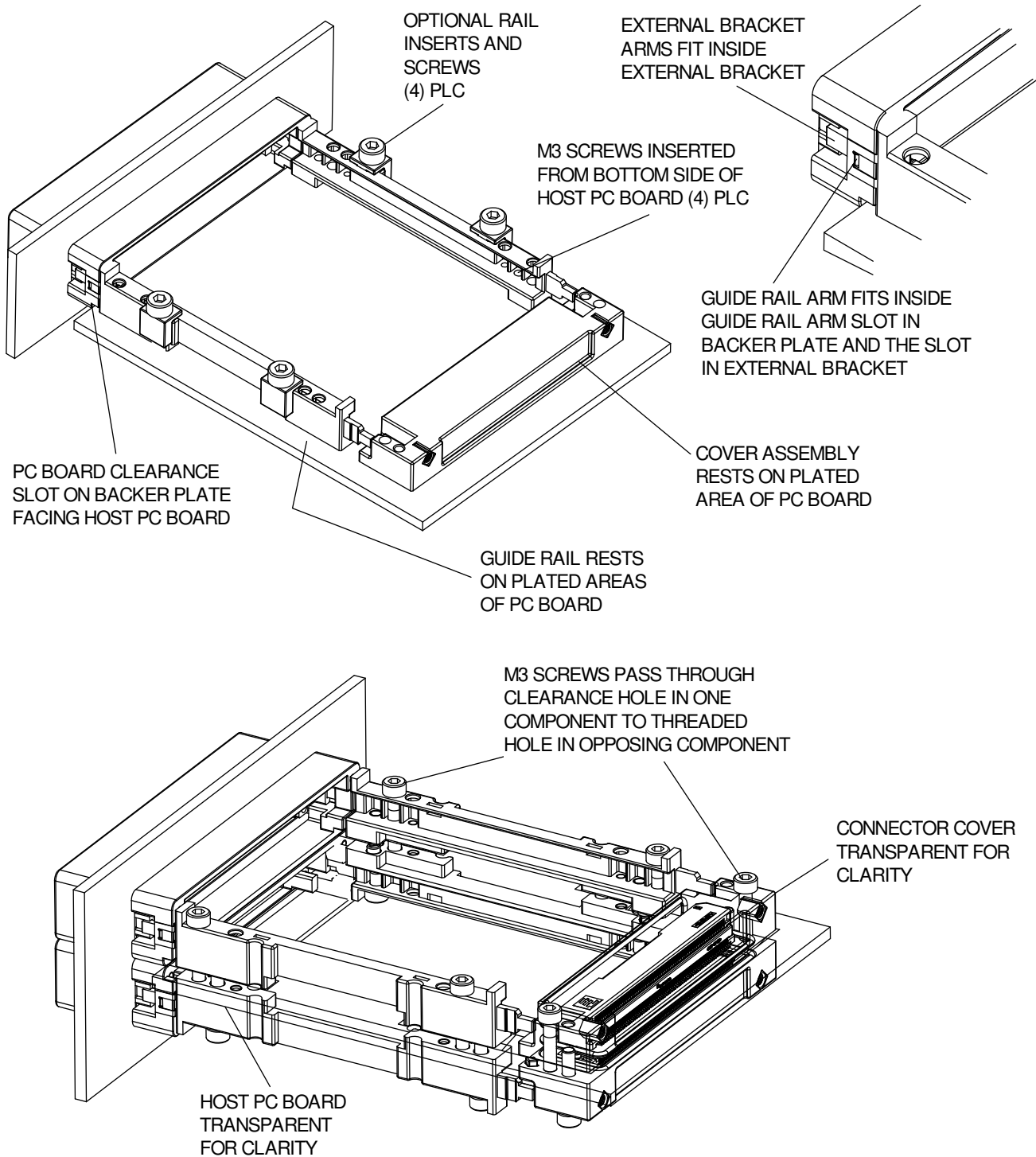


FIGURE 10. VISUAL AID (CONT'D)

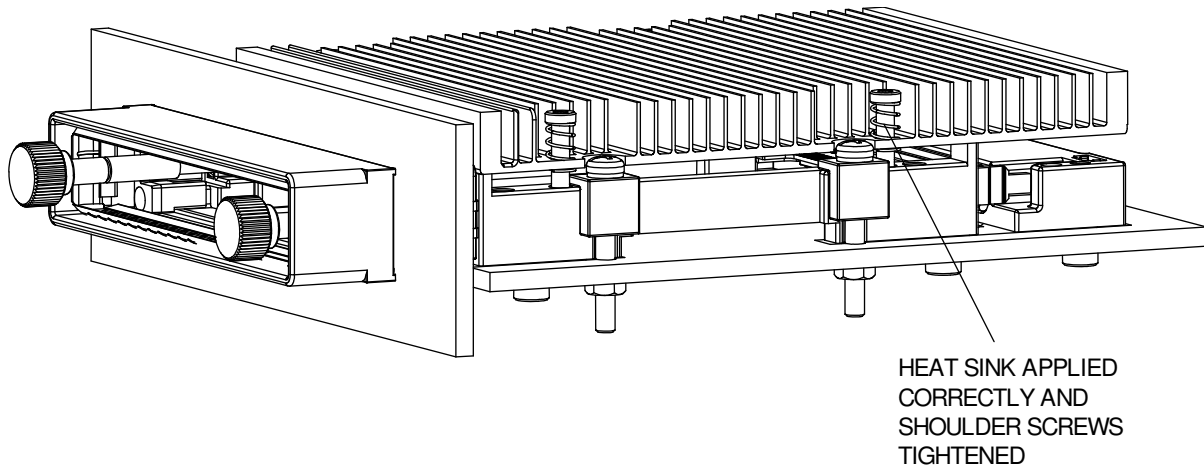


FIGURE 10. VISUAL AID (END)