

Mini-SAS HD Internal Receptacle Connectors


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 are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of Mini-SAS HD internal receptacle connectors. The receptacle is a pre-assembled unit available in 1x1, 1x2, and 1x4 configurations for both right-angle and vertical applications. The receptacle is designed to be inserted directly into a printed circuit (pc) board. The receptacle consists of a housing with 36-position receptacle ports and compliant pin contacts on 0.75 mm centerline spacing.

Each receptacle port has two card slots that accept a 1.0 ± 0.10 -mm thick integrated circuit cards housed in the mating cabled connector. Each port consists of 24 signal contacts along with 12 ground contacts. Auxiliary fasteners are applied to the seated receptacles to enhance mechanical retention to the pc board.

Basic terms and features of this product are provided in Figure 1.

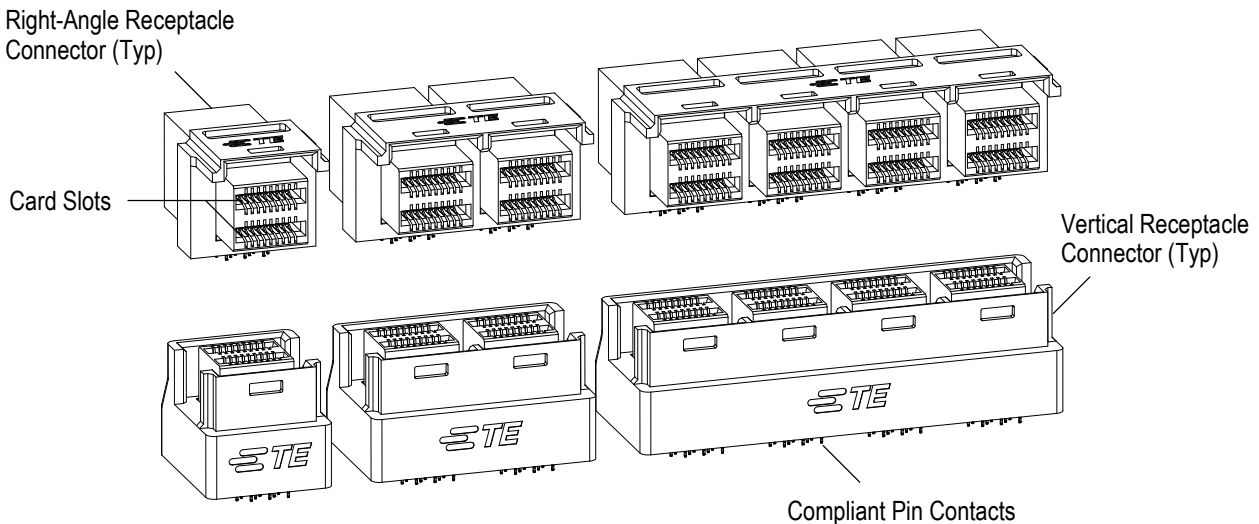


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Revision to this application specification include:

- Corrected arrows for plating in Figure 3
- Replaced seating tool, removal tool, and power unit with flat rock tooling and arbor frame in Section 5

2.2. Customer Assistance

Reference Product Base Part Number 2227582 and 2227642 and Product Code L817 are representative of Mini-SAS HD internal receptacle connectors. 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 this page.

2.3. Drawings

Customer drawings for product part numbers are available from www.te.com.

2.4. Specifications

Product Specification [108-32038](#) provides product performance and test results.

3. REQUIREMENTS

3.1. Safety

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

3.2. Operating Temperature

The receptacles are designed to operate in a temperature range of -40° to 85°C [-40° to 185°F].

3.3. Material

The receptacle housing and chicklets, which hold the compliant pin contacts, are made of molded thermoplastic, UL 94-V-0. All compliant pin contacts of the receptacle are made of copper alloy underplated with nickel plated with tin or tin-lead at the leads and plated with gold or gold equivalent at the interface area.

3.4. 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

3.5. 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 1.57 mm.

B. Tolerance

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

C. Layout

All holes and circuit pads must be precisely located on the pc board to ensure proper placement and optimum performance of the receptacle. Recommended circuit pad pattern, keep-out zones, dimensions, and tolerances for typical right-angle and vertical receptacles are provided in Figure 2.

D. Hole Dimensions

The pc board holes for the signal contacts must be drilled and plated through to dimensions specified in Figure 3.

Recommended Host PC Board Layout (Typ) for Right-Angle Connector

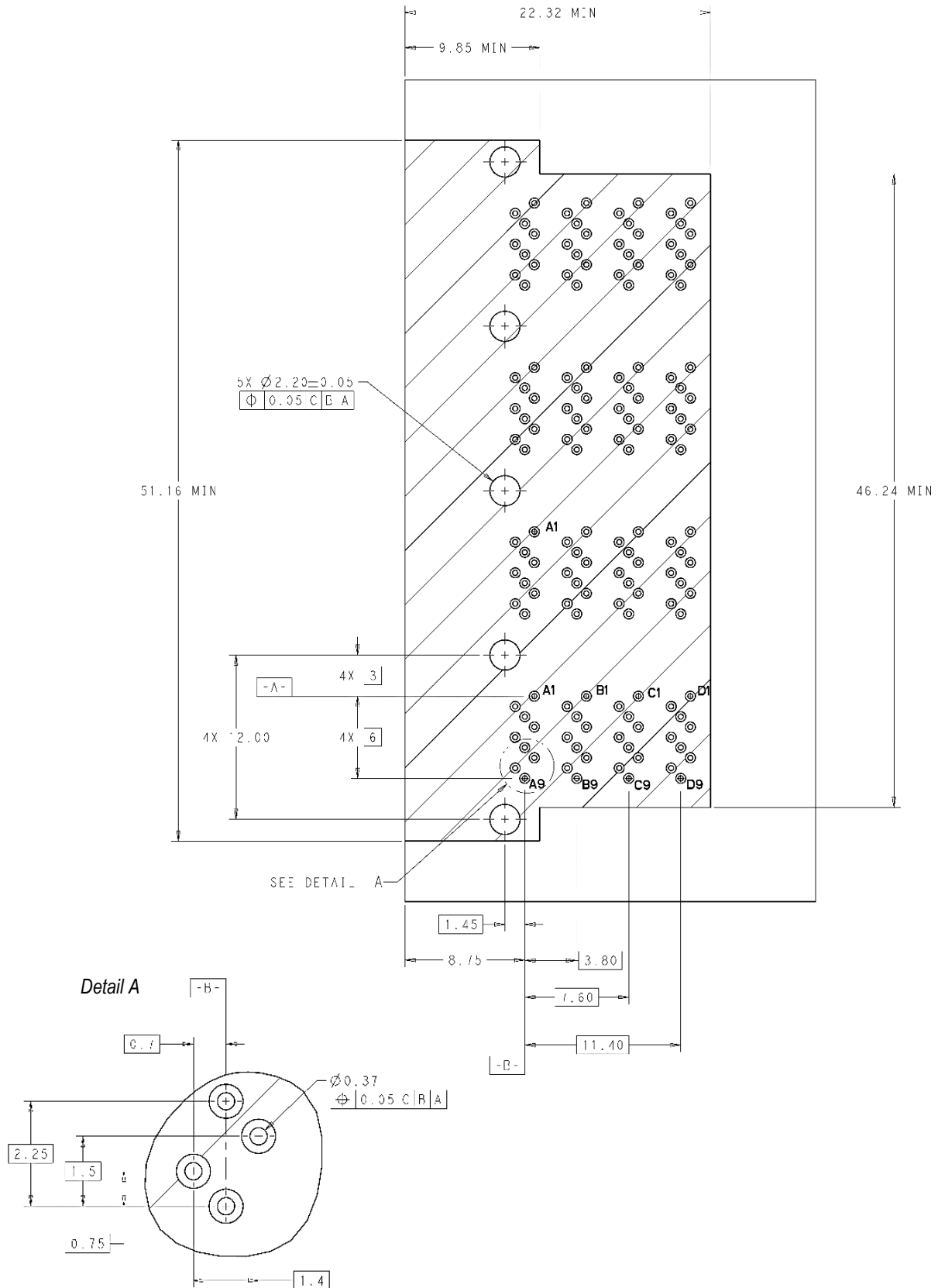


Figure 2 (Cont'd)

Recommended Host PC Board Layout (Typ) For Vertical Connector

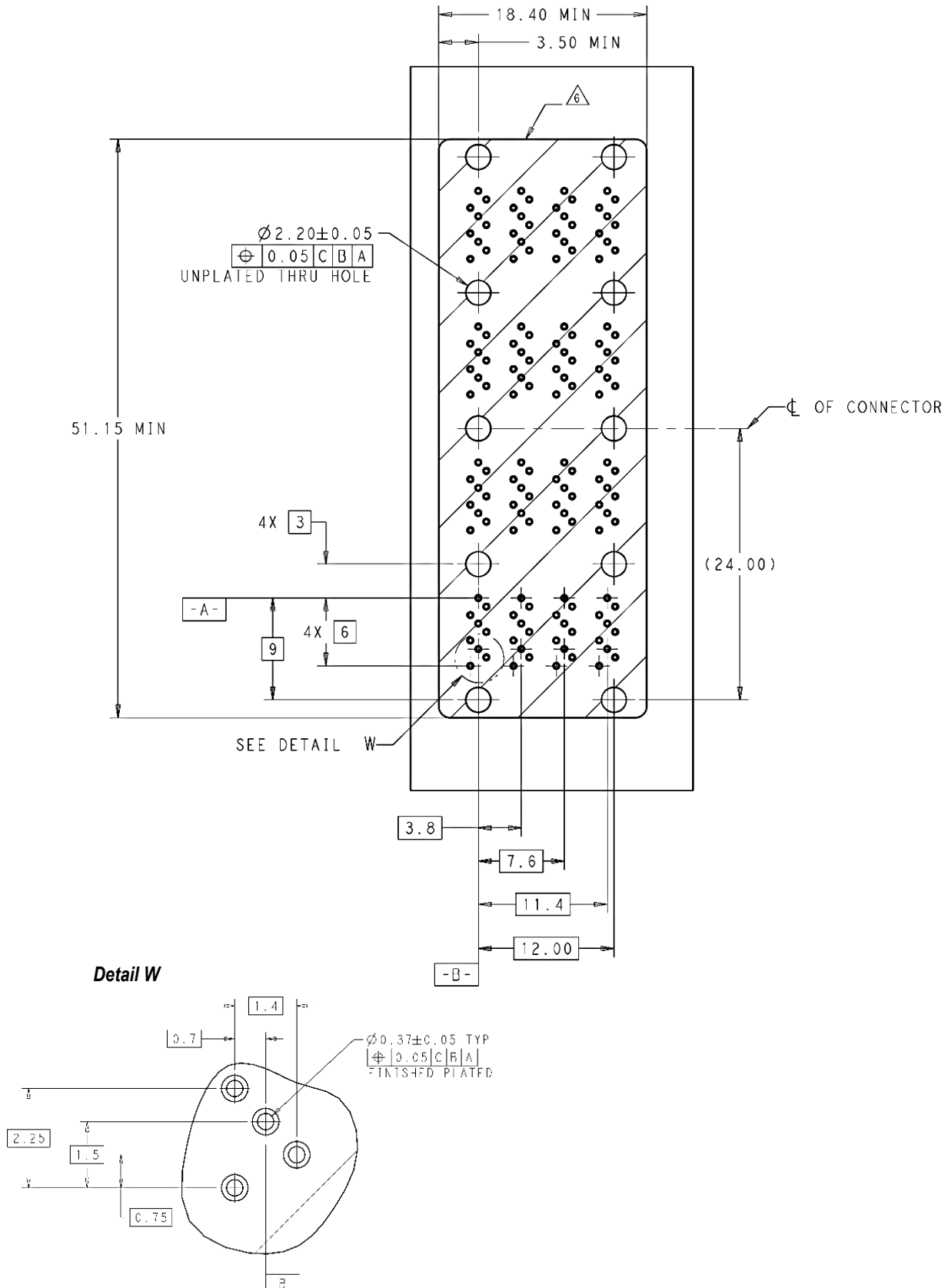


Figure 2 (End)

Recommended Hole Dimensions

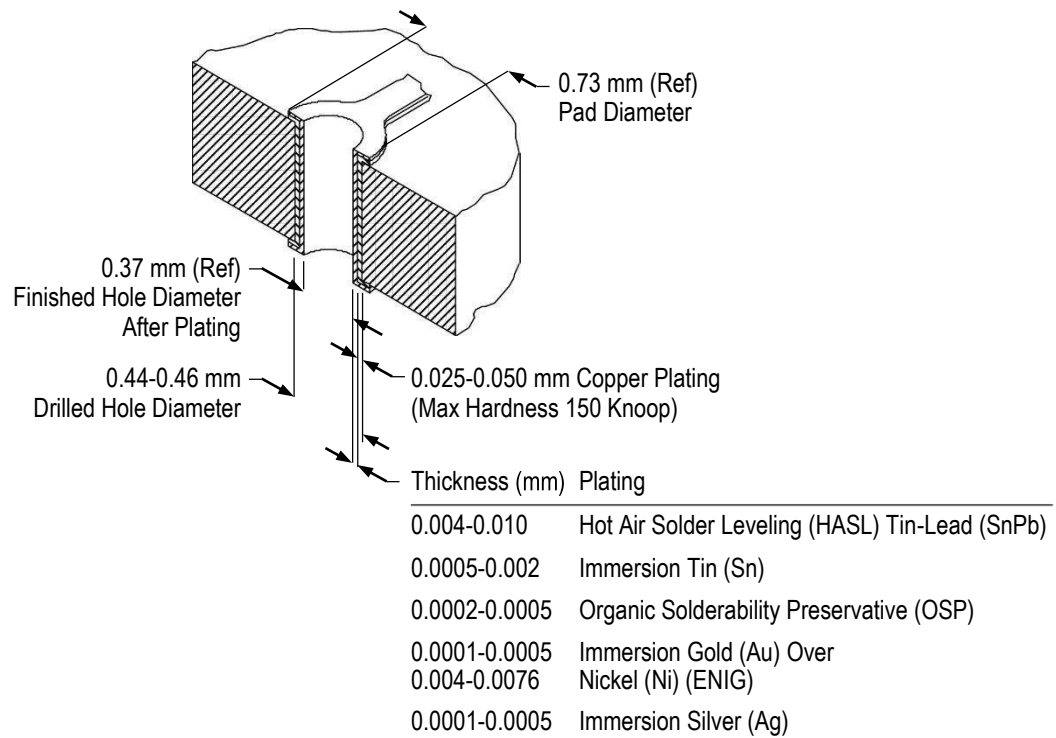


Figure 3

3.6. Placement and Seating

The following requirements apply to placement of receptacles and receptacles used for rework purposes.



CAUTION

The receptacles should be handled only by the cage assembly to avoid deformation, contamination, or damage to the compliant pin contacts.

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

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

$$\text{Amount of Compliant Pin Contacts} \times 31.15 \text{ N [7 lbs]} \text{ (Force per Compliant in Contact)} = \text{Seating Force}$$



CAUTION

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

The shut height of the application tool must be specifically set for proper seating of the receptacle. The shut height can be calculated by:

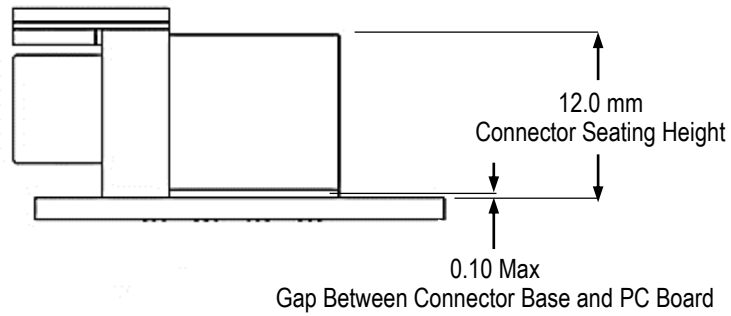
$$\text{Seating Height (Receptacle Seated)} + \text{Height of Seating Tool} + \text{Combined Thickness of PC Board and PC Board Support Fixture} = \text{Shut Height (Ram Down)}$$

The seating height, measured from the top of the receptacle to the top of the pc board is given in Figure 4.

The receptacle must be seated on the pc board not exceeding the dimensions given in Figure 4.

Seating Height

Right-Angle Connector



Vertical Connector

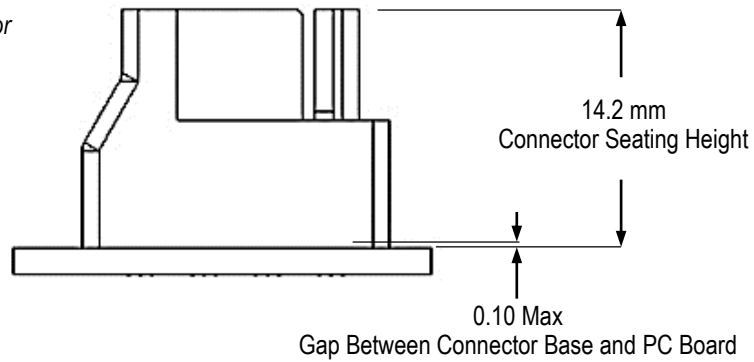


Figure 4

3.7. Assembly Fasteners

After seating, the receptacles must be fastened with M2 x 1.35 mm self-tapping screws from the bottom of the pc board. The screw (customer supplied) is application specific. The threaded length of the fastener must not exceed the maximum pc board thickness plus 3.0 mm. The torque applied to the screw should not exceed 0.16 Nm [1.500 in.-lb]; otherwise, damage may occur. See Figure 5.

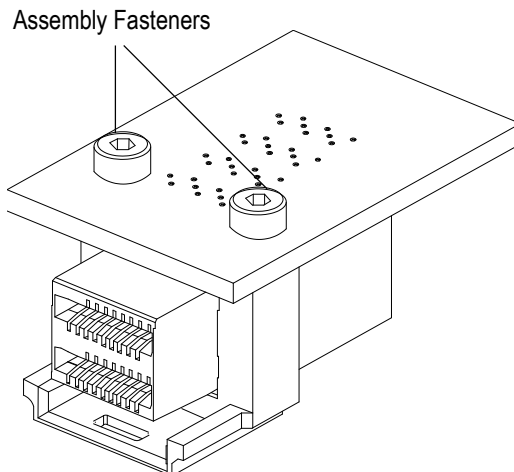


Figure 5

4. QUALIFICATIONS

Agency evaluation for Mini-SAS HD internal receptacle connectors was not defined at the time of publication of this application specification.

5. TOOLING

Tooling that can be used with this product is shown in Figure 6.

5.1. Flat Rock Tooling

Commercially available bar stock with a flat surface large enough to cover the top surface of the receptacle can be used as a flat rock to seat the receptacle onto the pc board by pressing evenly on the housing directly over the compliant pins. The flat rock can also be used to remove the receptacle from the pc board by pressing evenly on the ends of the compliant pins. The flat rock tooling may be used with a manual arbor frame assembly.

5.2. Manual Arbor Frame Assembly

The manual arbor frame assembly must be capable of supplying the required force need to seat or remove the receptacle using flat rock tooling.

5.3. PC Board Support Fixture

A pc board support (customer designed) must be used with the flat rock tooling. The support fixture provides support and protection for the pc board and receptacle from damage. 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.



Figure 6

6. VISUAL AID

The illustration below shows a typical application of Mini-SAS HD internal receptacle connectors. 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.

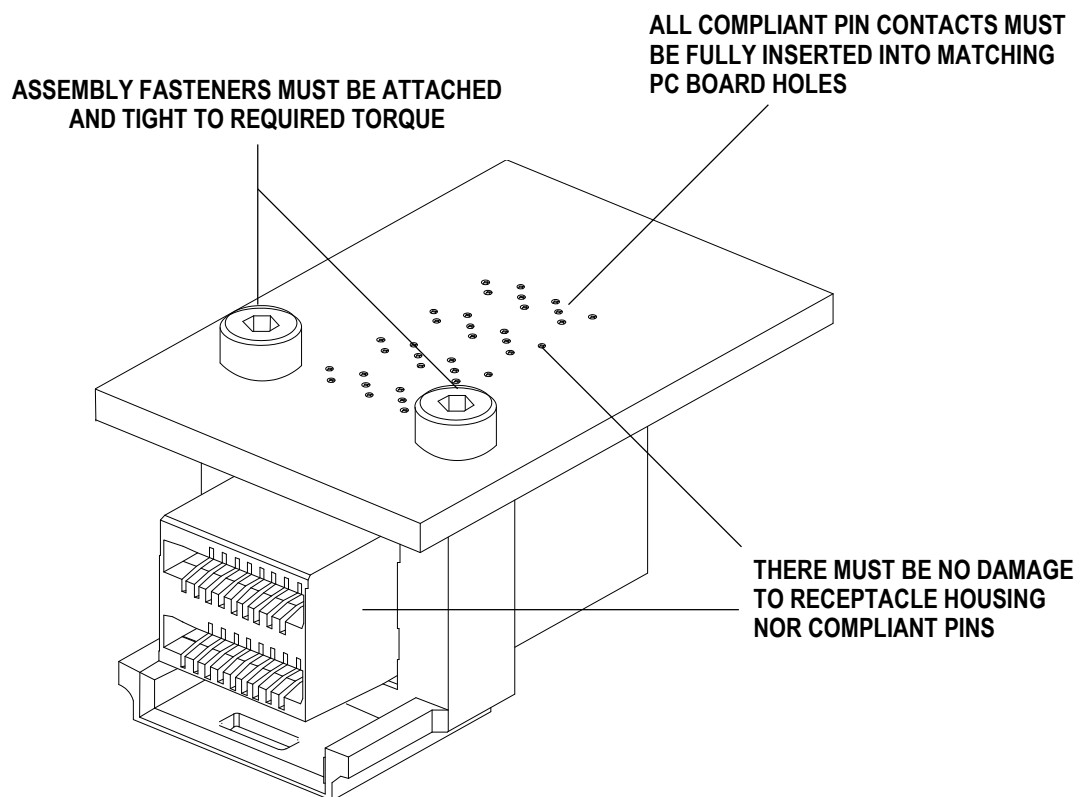


FIGURE 6. VISUAL AID