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 ±2°. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of the MULTIGIG RT 2 rigid flex stacking connectors, both daughtercard and backplane versions. These connectors have a modular and small form-factor design and can be used to attach a rigid flex cable to a printed circuit board (PCB) compatible with the VPX VITA 46 daughtercard and backplane footprints.

The daughtercard connector has 7 rows and 8 columns of eye-of-needle (EON) compliant pin contacts contained in a 4.0mm thick housing, while the backplane connector has 9 rows and 8 columns of EON compliant pin contacts contained in a 4.4mm thick housing. The housings both feature a notch used to aid in the orientation of the connector for installation onto the pc board or rigid flex cable. The connector can be applied to the pc board or rigid flex cable using manual tooling.

When corresponding with 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.

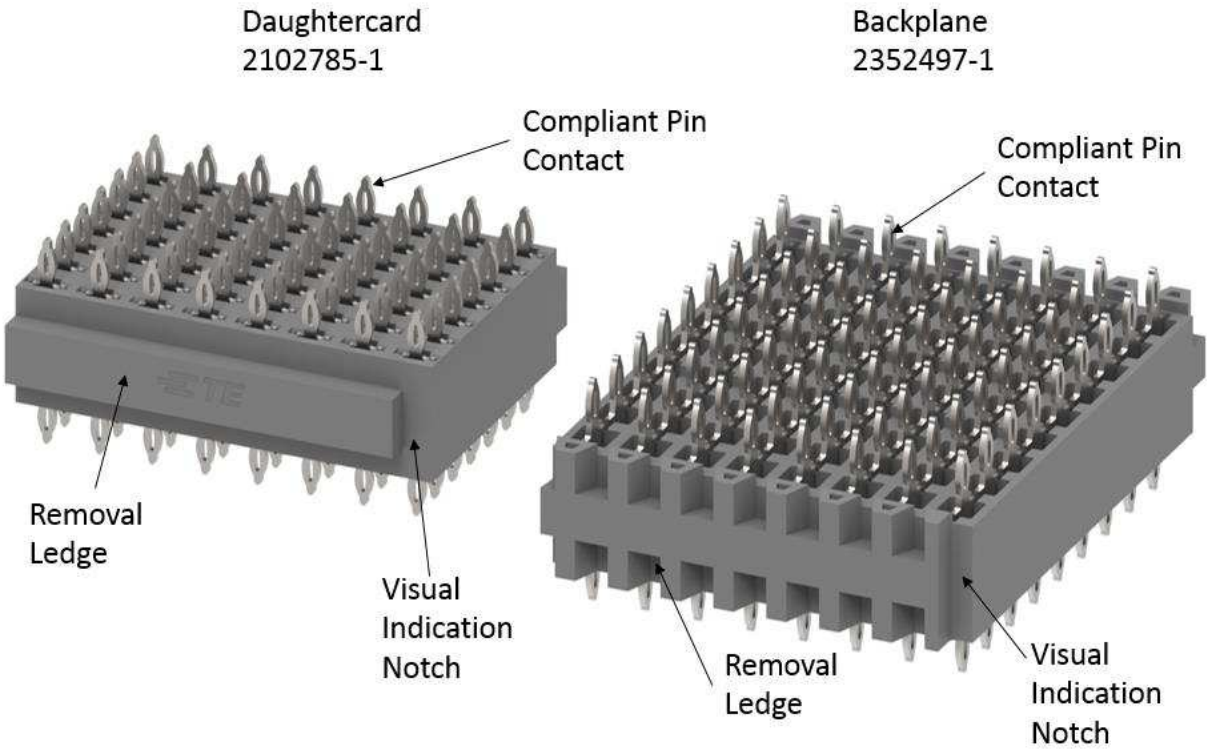


Figure 1: Connector Terminology

2. REFERENCE MATERIAL

2.1. Revision Summary

Addition of Backplane variant, associated figures, and data

2.2. Customer Assistance

Product Base Part Number 2102785-1 and Product Code J543 are representative of the MULTIGIG RT 2 DC rigid flex stacking connector. Product Base Part Number 2352497-1 and product code J974 are representative of the MULTIGIG RT 2 BP rigid flex stacking 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 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 and TE.com. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, call PRODUCT INFORMATION at the number at the bottom of page 1.

2.4. Specifications

Design Objective 108-32042 provides expected product performance and Qualification Test Report 501-134058 contains test results.

2.5. Instructional Material

Instruction Sheets (408-series) provide product assembly instructions or tool setup and operation procedures. There are no documents available that pertain to this product.

2.6. Standards and Publications

Standards and publications developed by the Institute for Interconnecting and Packaging Electronic Circuits (IPC) provide industry test and performance requirements. The standard that pertains to this product is:

IPC-6013, “Qualification and Performance Specification for Flexible Printed Boards”

3. REQUIREMENTS

3.1. Safety

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

The connector must be handled with care to avoid injury from the sharp ends of the contacts.

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

3.3. PC Board and Rigid Flex Cable

A. Material

The pc board and rigid part of the rigid flex cable can be made from FR-4 laminated glass epoxy. The rigid flex cable must be constructed to meet the requirements in IPC-6013, Type 4.

NOTE

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

B. Board Thickness

B.1. Daughtercard

The pc board and rigid part of the rigid flex cable (the board) must have a minimum thickness of 1.4 mm to ensure proper contact engagement; however, it is recommended that the board have a minimum thickness of 1.6 mm.

Boards thinner than 1.6 mm will require a board support to allow for the compliant pin tips to protrude from the far side of the PCB.

B.2. Backplane

The pc board and rigid part of the rigid flex cable (the board) must have a minimum thickness of 1.6 mm to ensure proper contact engagement; however, it is recommended that the board have a minimum thickness of 1.7 mm.

Boards thinner than 1.7 mm will require a board support to allow for the compliant pin tips to protrude from the far side of the PCB.

For RTM (Rear Transition Module per VPX VITA 46.10) application, the board minimum thickness shall be 3.7 mm.

C. Holes

Recommended drilled hole dimensions and plating types and thicknesses are given in Figure 2.

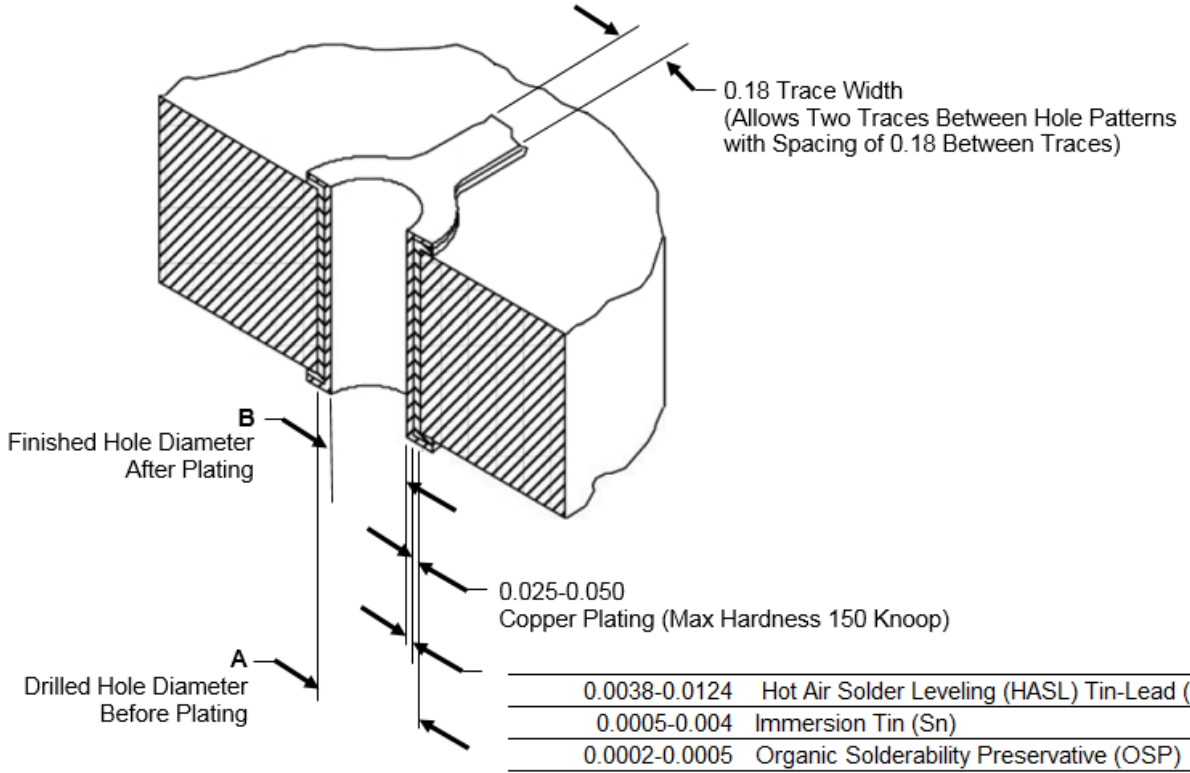
D. Layout

The pc board and rigid part of the rigid flex cable layout must be designed using the recommended dimensions provided on the customer drawing for the specific connector. The recommended dimensions are also given in Figure 3 for the Daughtercard Footprint and given in Figure 4 for the Backplane Footprint.

CAUTION

For applications that require specific electrical performance through the hardware footprint, good design practice should be followed on the metallization of the pc board hardware footprint to meet the grounding needs of the end application. For further help determining appropriate design requirements, call the number at the bottom of page 1.

PC Board Contact Hole Dimensions



0.0038-0.0124	Hot Air Solder Leveling (HASL) Tin-Lead (SnPb)
0.0005-0.004	Immersion Tin (Sn)
0.0002-0.0005	Organic Solderability Preservative (OSP)
0.0001-0.0005	Immersion Silver (Ag)
0.0001-0.0005 (Au) 0.00127-0.0076 (Ni)	Immersion Gold (Au) Over Nickel (Ni) (ENIG)

TIER	CONNECTOR	DIMENSION	
		A	B (Nominal)
RT 2 **RT 2-R** **RT 2-S**	Vertical Receptacle (Backplane)	0.63-0.67	0.56 (Ref)
	Right-Angle Plug (Daughtercard)	0.53-0.57	0.46 (Ref)

Figure 2: Plated Through-Hole Dimensions

Recommended PC Board Layout
(Connector Side)

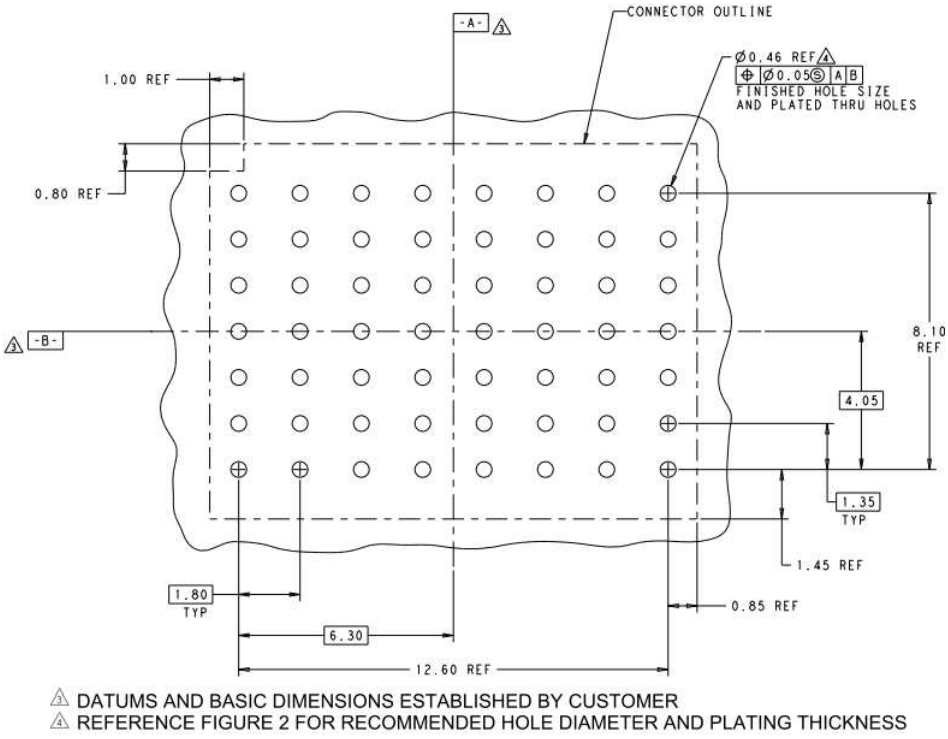


Figure 3: Daughtercard Footprint

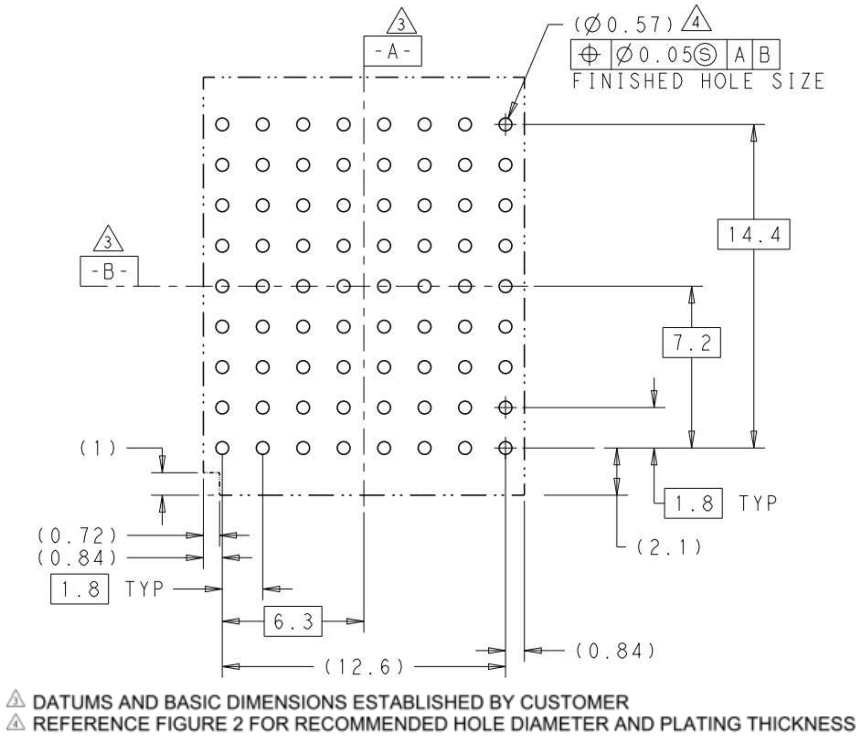


Figure 4: Backplane Footprint

3.4. Connector Installation

CAUTION

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

A. Sequencing

It is considered typical to install the connectors onto the rigid part of the rigid flex cable, then apply the rigid flex cable assembly to the pc board. This simplifies the construction process by first creating a subassembly of rigid flex cable and connectors.

B. Orientation

Although the connector can be oriented in any direction for application to the pc board or rigid part of the rigid flex cable, it is recommended that the connector be oriented in a consistent manner. To aid in orientation, a visual orientation notch is incorporated into the housing of the connectors. See Figure 5.

It is recommended to place the visual orientation notch in the top right or bottom left when facing the connector mounting side of the rigid flex cable. Using the visual orientation notch of the connector will allow efficient removal of the connector from the pc board, if required. In this case, the contacts will remain entrapped in the housing when extracting the connector. Orienting the connector with the visual orientation notch in the top left or bottom right may cause some contacts to be pulled from the connector and remain in the pc board. Those contacts will need to be removed individually.

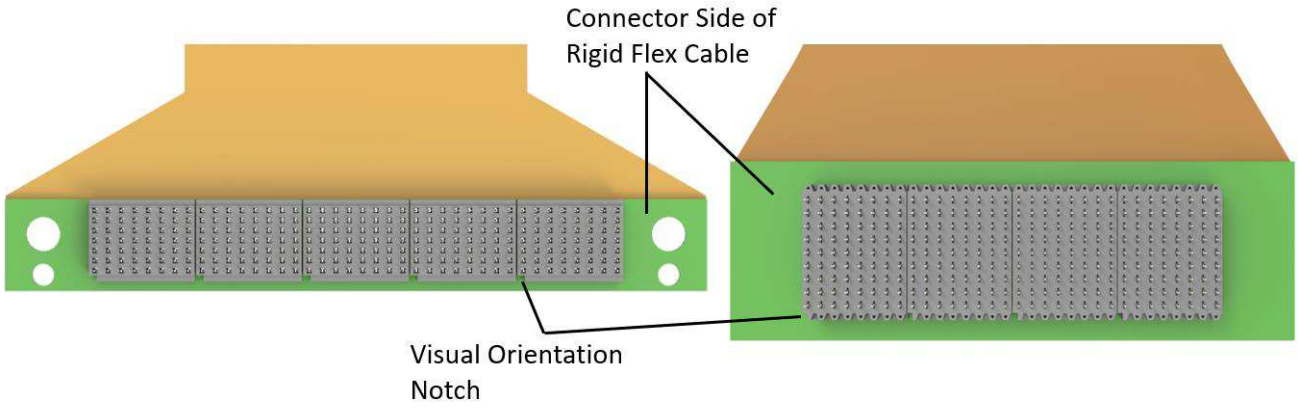


Figure 5: Connector Orientation (Daughtercard on Left and Backplane on Right)

C. Seating

The connectors must be installed onto the rigid part of the rigid flex cable one at a time or all at once, starting at one end of the contact hole pattern of the layout to ensure proper placement of the connectors. The seating tool, manual arbor frame, and support (for boards having a thickness less than 1.6-1.7 mm) described in Section 5.4 must be used.

The rigid flex cable assembly having a board thickness greater than 1.7 mm can be applied to the board using the flat bar and manual arbor frame described in Section 5. For boards having a thickness less than 1.6-1.7 mm, the seating tool and support must be used.

The connector maximum insertion force per contact is 31 N [7 lb-force]. The force required to seat the connector onto the board can be calculated by:

(Number of connector contacts) x (Maximum insertion force per contact) = Connector insertion force

3.5. Checking Installed Connector

All contacts must be straight with the widest section of the contact inside the hole of the pc board or rigid part of the rigid flex cable. The connector must be seated on the pc board or rigid part of the rigid flex cable not exceeding the dimension given in Figure 6.

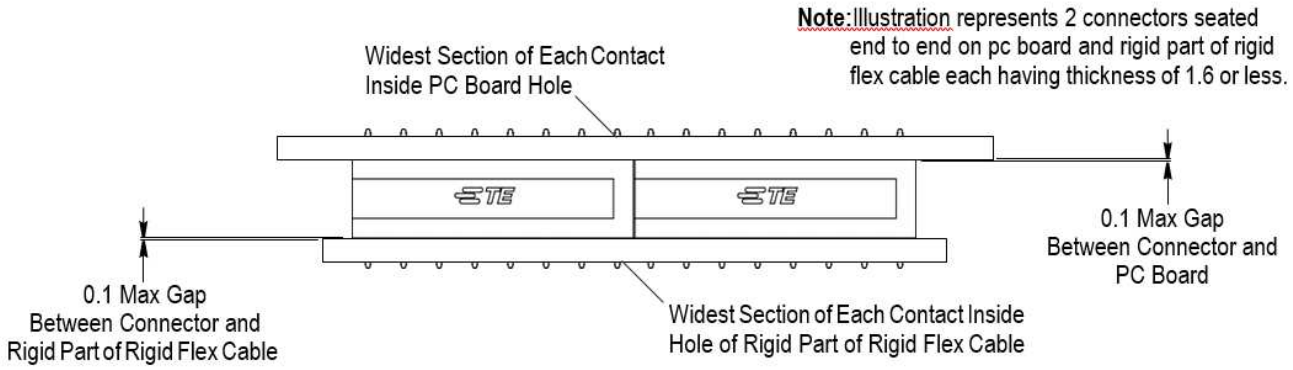


Figure 6: Installed Connectors

3.6. Removal

The connector can be removed using a custom-made removal tool that uses the ledges on the sides of the connector to pry to the connector from the pc board.

The minimum retention force for the connector is 4.45 N [1 lb-force] per contact. The minimum force required to remove a connector from the pc board can be calculated by:

(Number of connector contacts) x (Minimum retention force per contact) = Connector minimum removal force

3.7. Replacement and Repair

Damaged or defective connectors must not be used.

These connectors are designed for a one-time application and are not re-usable. If the connectors are removed from the pc board, a new rigid flex cable with new connectors must be applied.

The pc board accepts a total of 3 connector mating cycles (one initial application and 2 repair cycles).

4. QUALIFICATIONS

No outside agency approvals were defined at the time of publication of this application specification.

5. TOOLING

5.1. Seating Tool

These seating tools can be attached to a manual arbor frame to apply the connector module to the rigid flex cable or to the PCB.

These seating tools have a comb design. During seating, the teeth of the comb must fit between the contacts of the connector to prevent damage to the contacts.

These tools can be purchased from TE Connectivity or can be fabricated and customized from the prints provided on te.com.

5.2. Push Bar (Flat Rock)

Commercially-available bar stock with a flat surface sized to the width and length of the connector can be used to apply the rigid flex cable assembly having a board thickness of more than 1.7mm to the pc board. The push bar must be used with the manual arbor frame.

5.3. Manual Arbor Frame

A commercially available manual arbor frame capable of providing the force required to seat the connector must be used. The seating tool or push bar must be used with the manual arbor frame.

5.4. Support

When seating a connector onto the pc board or rigid part of the rigid flex cable having a thickness of less than 1.6-1.7 mm, a support must be used to allow clearance for contacts protruding from the board. The support must have a flat surface with holes or channels large enough and deep enough to receive protruding contacts. The support can also consist of an elastomeric material bonded to a metal block, which can support the board, while allowing for the protruding pins to pierce through the material.

5.5. Connector Removal

A removal tool must be custom made to accommodate the ledges on the sides of the connector so that the ledges can be used to pry the connector from the pc board.

Figure 7

6. VISUAL AID

The illustration below shows a typical application of MULTIGIG RT 2 rigid flex stacking 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.

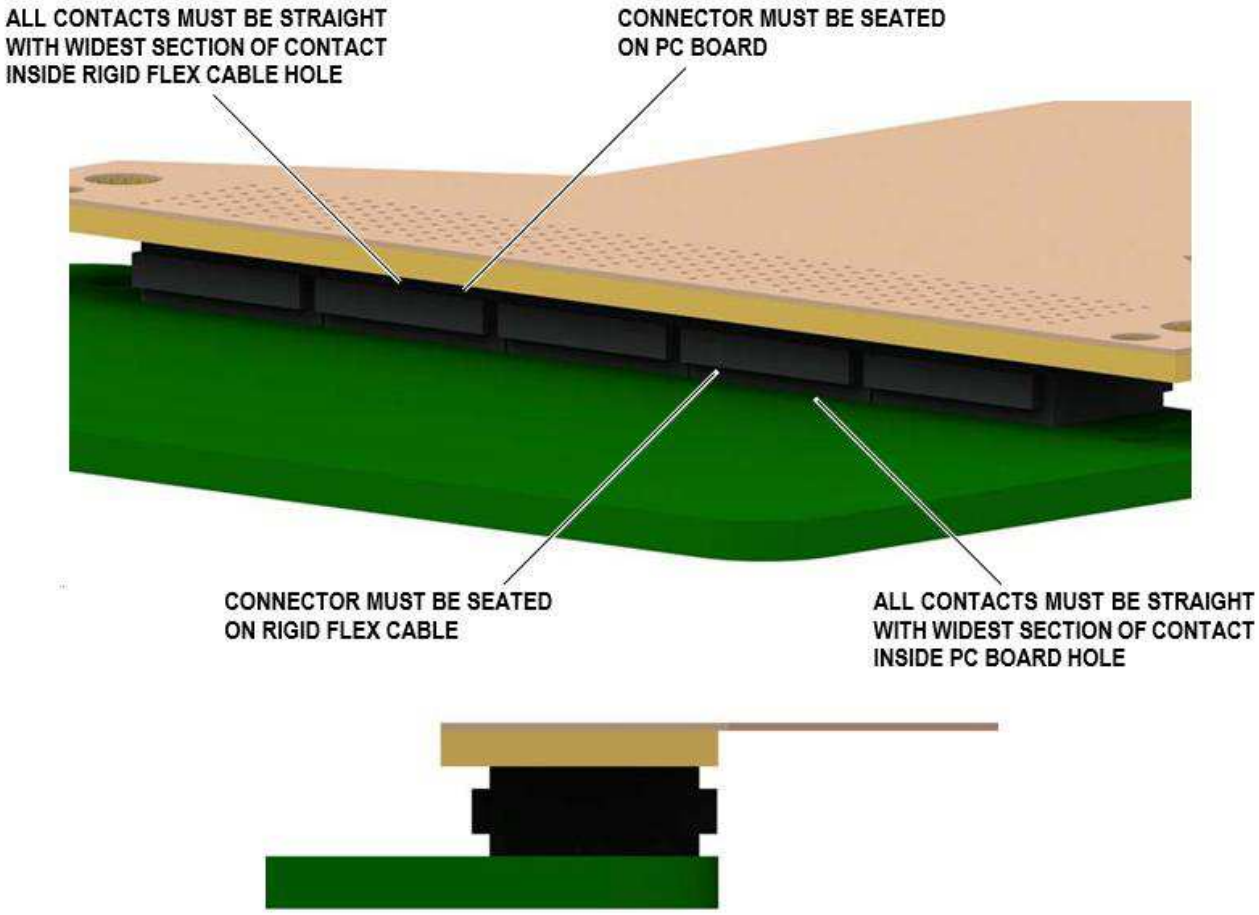


Figure 8