

Technical Details

Interposer Design

Introduction

This document contains all the information required for a user to start designing a custom interposer.

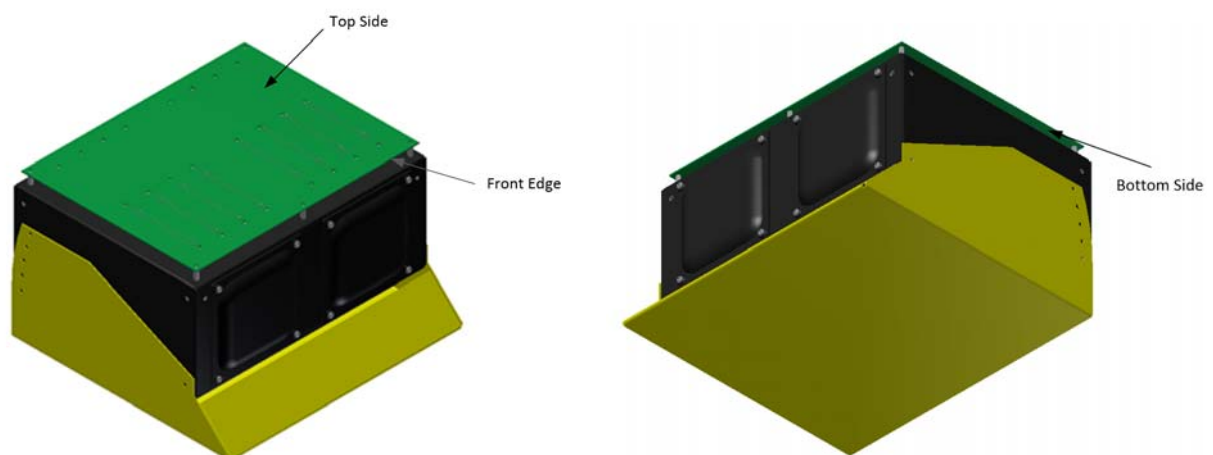
The Interposer card is the connection between the J-Testr and the unit under test. All power and test stimulation signals are directly connected to the interposer via the peripheral connectors eliminating the need for cabling.

Technical drawings

The below technical drawing are available to assist the designer.

- | | |
|---|--|
| 5304-1010-1010_RevA_Interposer_Card.pdf | - Full dimensioned Interposer drawing |
| 5304-1010-1010_RevA_Interposer_Card.dxf | - Outline/Route Keep-out/Connector Keep-in (importing into ECAD) |

Interposer location/Position



Interposer outline / route keep-out

The interposer DXF data provides both the card outline, including holes, and the 'route' keep-out borders.

The 'route' keep-out is required for both the top and bottom tracking layers to avoid traces being routed under the mounting pillars (bottom) and the mounting screw (Top). Inner layers do not required this but as with all normal PCB design practises traces should not be placed closer than 0.5mm from any edge.

Figure 1 shows the outline and route keep-outs

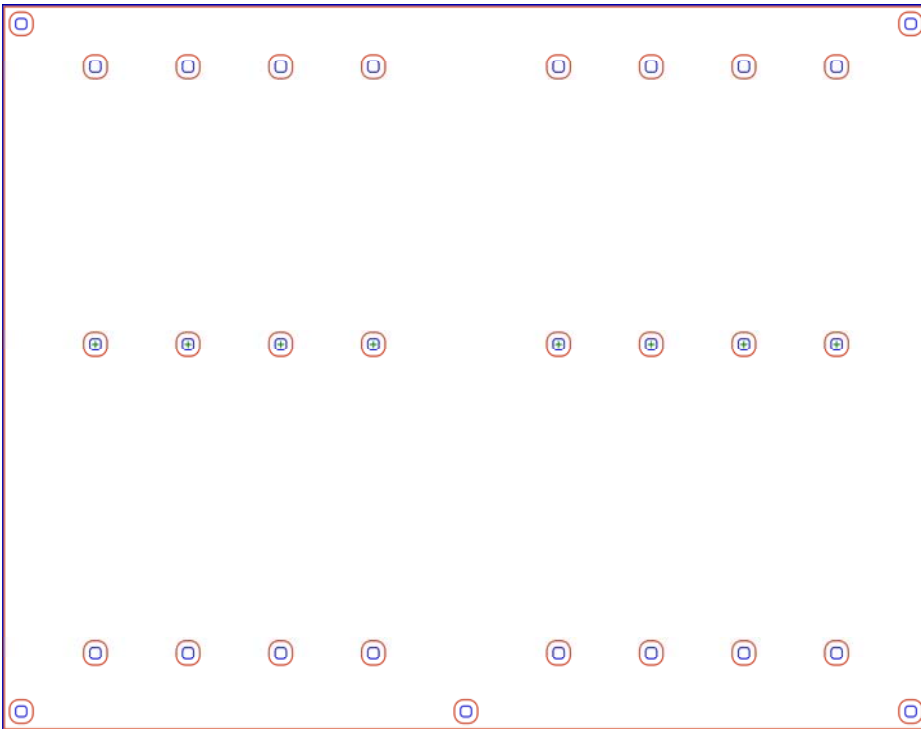


Figure 1 - Interposer Outline

Interposer mounting holes

The mounting holes on the interposer card have been designed to allow the interposer card to ‘float’ in the X and Y directions when inserting the peripheral cards*. This ‘float’ enables all the mechanical tolerances to be eliminated hence allowing easy mounting of the interposer.

The mounting holes have been designed to be manufactured using a standard 2mm routing drill bit used by most PCB vendors.

Details are shown in Figure 2

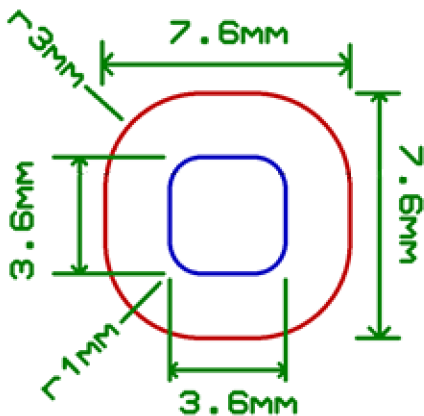


Figure 2 - Hole outline and Hole Keep-out detail

* The interposer card should not be fully tightened when mounting peripheral cards to allow the system to self-locate using the available float.

Peripheral Slot/Bank locations

The peripheral slot/bank positions are from right to left are shown in Figure 3

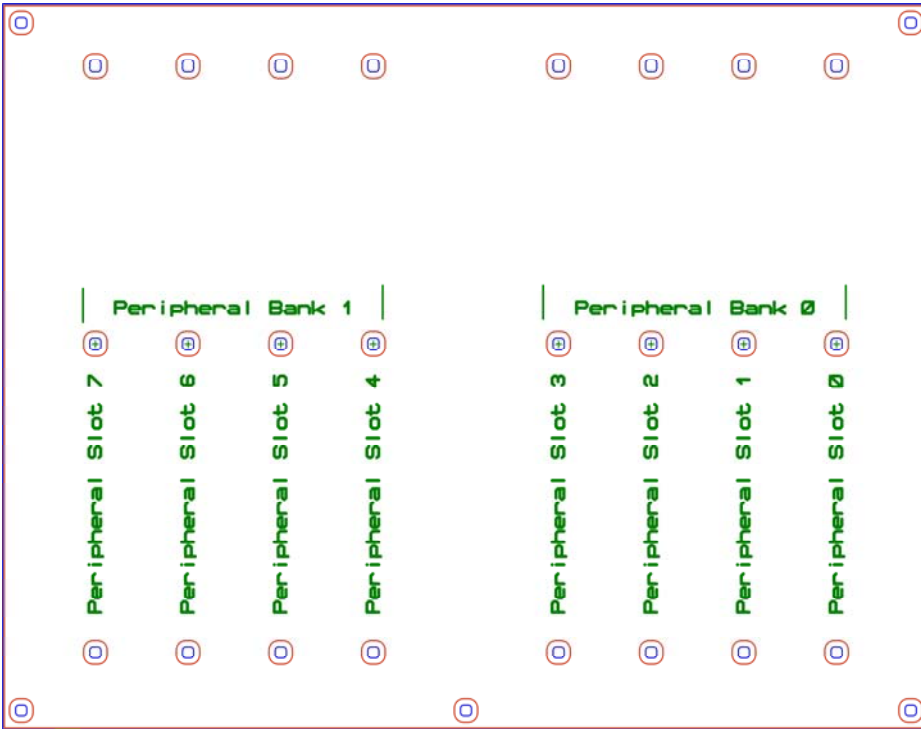


Figure 3 - Peripheral Slot/Bank Locations (top side view)

If not all peripheral slots are being used then holes either side of free slots can be removed to allow easier PCB routing into used slots.

The holes shown in Figure 4 must always be used

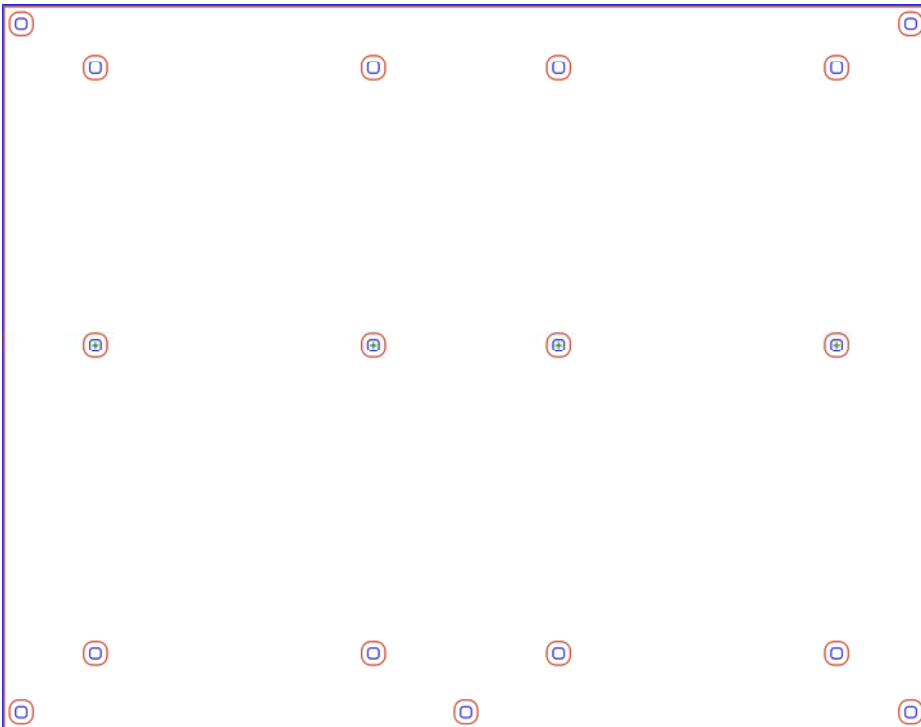


Figure 4 - Must use connection holes

Figure 5 shows an example where slots 1, 3, 5 and 7 are used

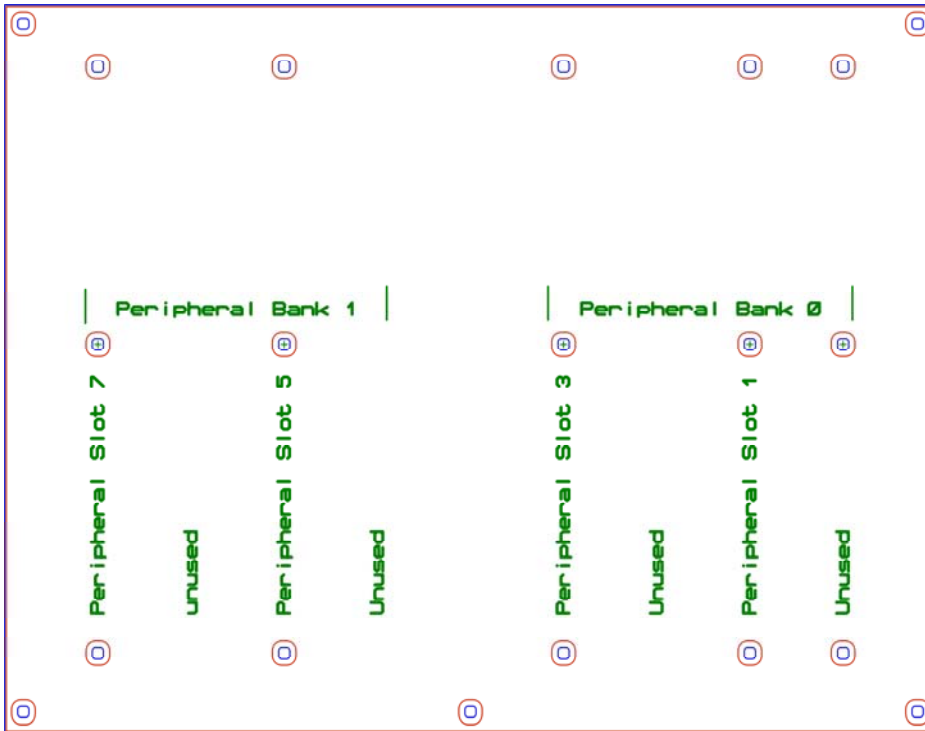


Figure 5

Warning – Plugging peripheral cards into slots without mounting holes can damage both the motherboard and the interposer

Peripheral Connectors

All peripheral connectors are standard PCI express (PCIe) edge connectors with a custom pin-out per card type*.

PCIe connectors are extremely cost effective plus have a well proven reliability record due to their heavy usage in PC systems. These connectors offer electrical signal speeds in excess of 3GHz, allowing high speed signals to the interposer, and have a current ratings of 1.1A per pin.

In the J-Testr system both 98way or 164way PCIe connectors are used for the peripheral cards, the 164way connectors have one fixed 'offset' position where as the 98way connectors can have several 'offset' positions* for keying purposes.

It is highly recommended to use high quality PCIe connectors with 30u" of gold plating; recommended part numbers are shown below:

164way	FCi	10018783-10003XXX	Mouser	649-1001878310003TLF
98way	FCi	10018783-10002XXX	Mouser	649-1001878310002MLF

IMPORTANT

To assist alignment it is highly recommended to make the alignment hole size, for the PCIe footprint, to be 2.2mm instead of the normal recommended 2.35mm**. PCB 'holes to hole' drill accuracy should be specified as +/- 0.05mm which is common for most modern PCB vendor drill machines.

* See peripheral card instructions for pin-outs and connector locations

** Having a 2.2mm sized hole will make the connector insertion slightly tight however as the interposer is not a volume product it is better to have the accuracy verses speed of assembly.

Peripheral Connector Reference points

All peripheral connector locations are referenced to the centre point of the middle interposer holes.

Placement accuracy is extremely important hence care must be taken when locating the peripheral connectors, this task has been simplified by all interposer holes being placed on a grid of integer multiples of 1mm as shown in Figure 6

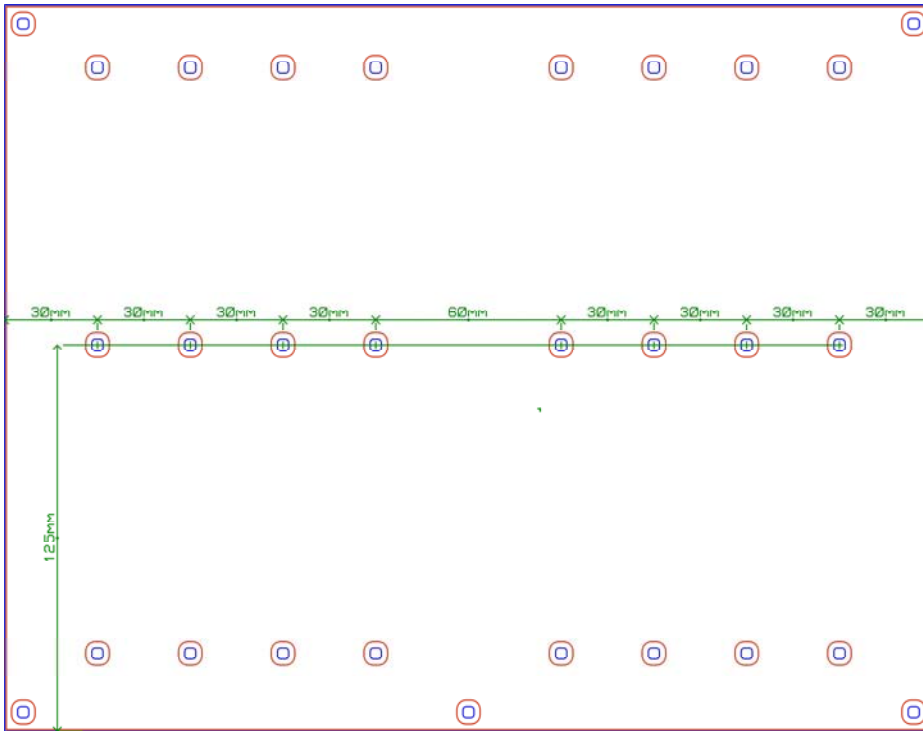


Figure 6 - Peripheral Connection Reference Positions

Peripheral Connector locating

The peripheral connectors are located in specific locations for each peripheral type to avoid operators plugging a wrong peripheral in the wrong slot.

The connectors can have either 0 degree or 180 degree of rotation with the PCIe alignment holes biased either to the rear edge (0 degrees) or to the front edge (180 degrees) of the interposer.

Figure 7 shows two 164way peripheral mounted at opposite rotations.

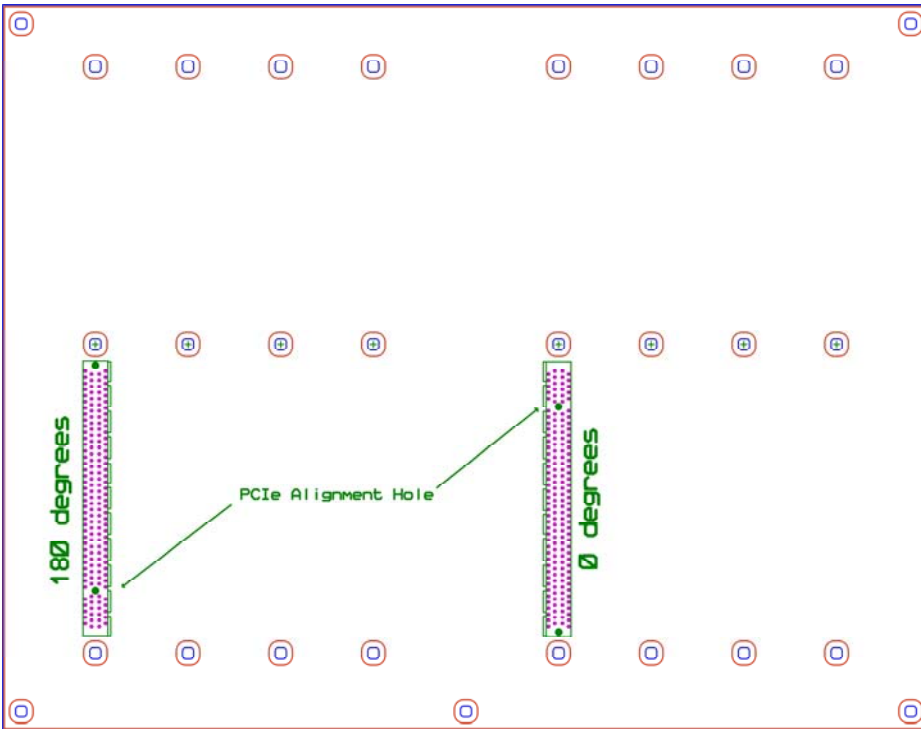


Figure 7 - Peripheral Connector Rotations (bottom side view)

The offset locations are detailed in the peripheral card instruction for each card type. Figure 8 shows an example of different offset location referenced to the connector reference points.

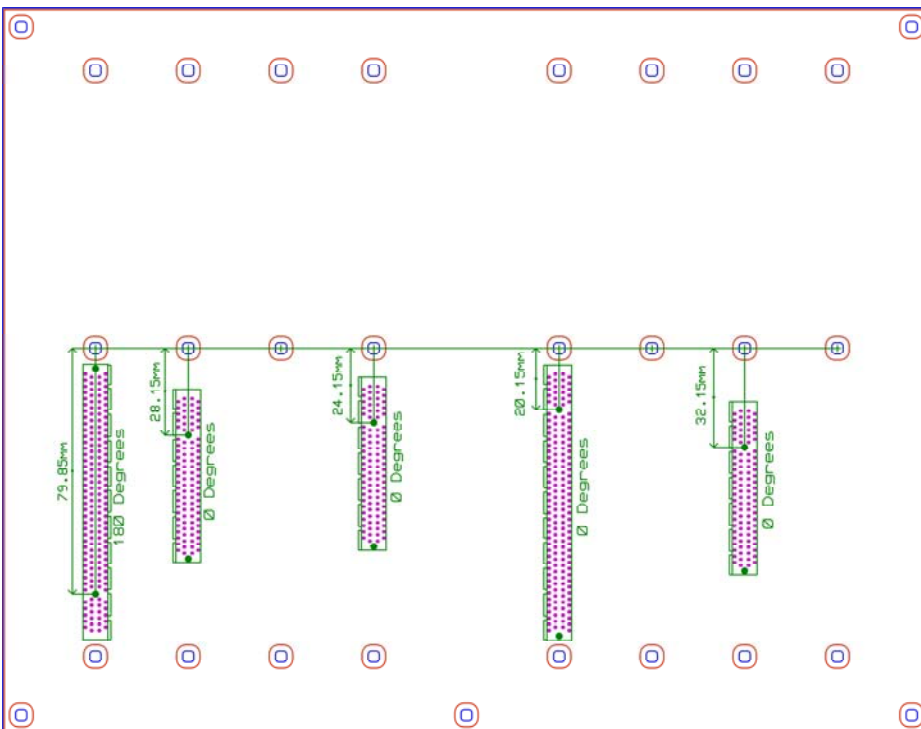


Figure 8 - Example connector offsets (bottom Side view)

External Connectors locations

The interposer has been designed such that right angled connectors are able to be fitted to the bottom side all around card edge. With a maximum height of 13.5mm this allows the use of most connector types including connectors as large as standard Sub-D.

These connectors give access to a device under test mounted on the Top DUT mounting plate*, if required, or to other external test equipment.

The provided DXF mechanical data includes a layer for the 'connector keep in' to clearly show where these connectors can be fitted, a space in the centre of the rear edge of the card has been reserved for JTAG connection as shown in Figure 9.

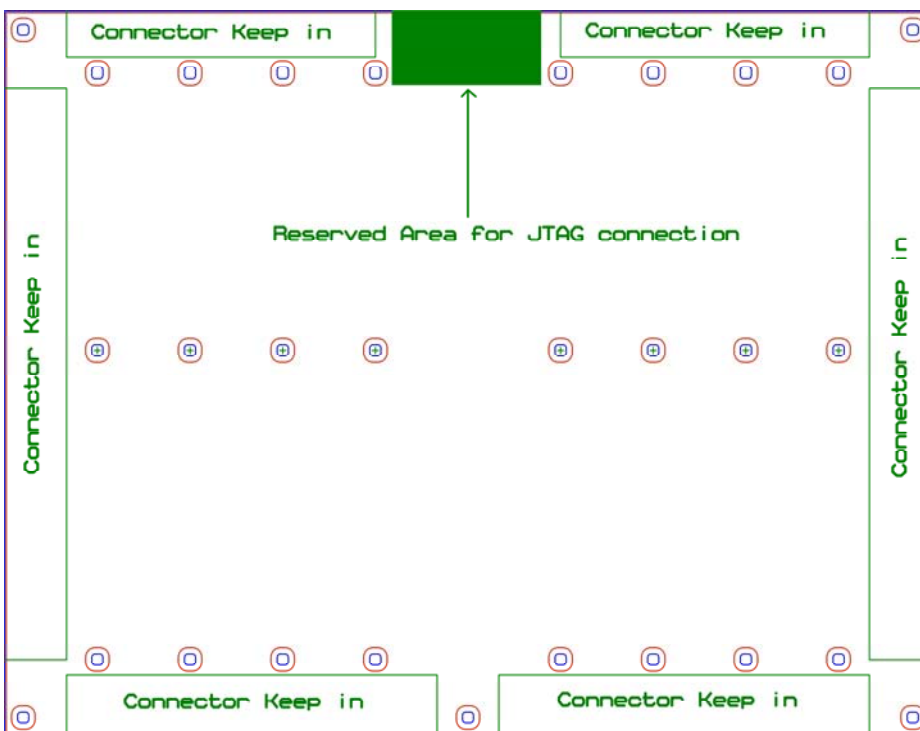


Figure 9 - Reserved Space for JTAG connection

Figure 9, Figure 10 and Figure 11 show the connector keep in areas and how they are easily accessed with the DUT top mounting plate fitted.

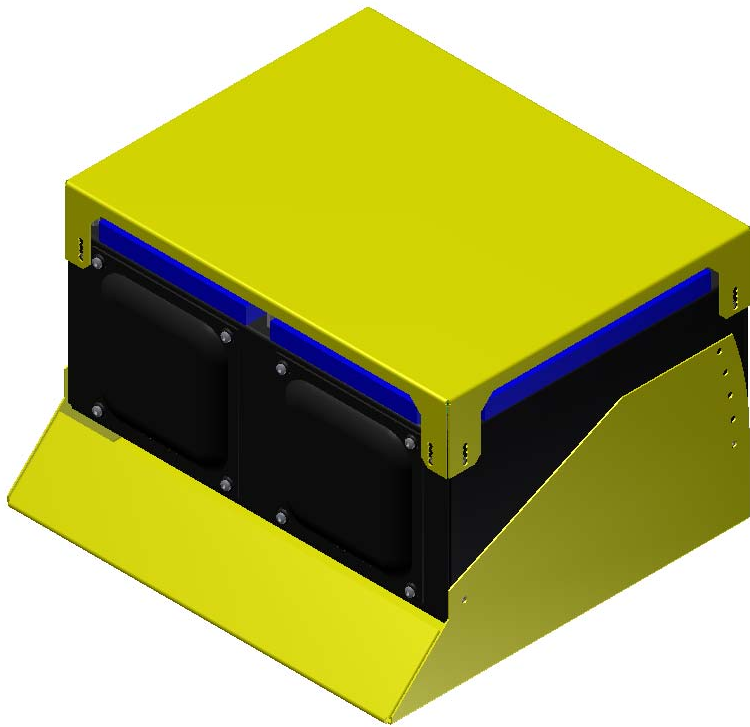


Figure 10 - Front and Right Side Connector Areas

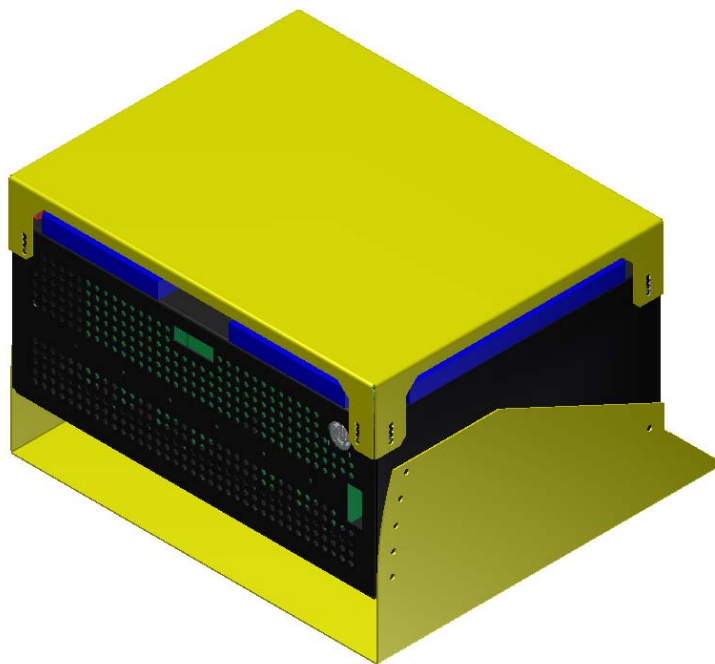


Figure 11 - Rear and Left Side Connector Areas

* DUT's can be mounted directly to the interposer or to a bed of Nails test rig.