



# Xgig1000 PCIe Interposers Hardware Guide

## For X8 Gen3 CEM, 90° Left Angle/90° Right Angle X8 CEM, SFF-8639 Backplane, and M.2 Interposers

This document provides hardware information and installation instructions for the Xgig1000 PCIe Interposers. Topics covered in this document include the following:

- “X8 PCIe Gen3 Card Electromechanical (CEM) Interposer” on page 2
  - “Installing and Cabling the X8 PCIe Gen3 CEM Interposer Card” on page 3
- “90° Left Angle/90° Right Angle X8 PCIe Server Interposer” on page 5
  - “Installing and Cabling the Left Angle/Right Angle Interposer” on page 5
- “SFF-8639 Backplane Interposer” on page 9
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### CAUTION

CXP cables are used to connect the Xgig1000 PCIe chassis to the interposers. When connecting these cables, do not force these cables into the connectors if you encounter significant resistance.

## X8 PCIe Gen3 Card Electromechanical (CEM) Interposer

With the PCIe Gen3 CEM Interposer (model number XGIG1K-PCIE3-X8-AI), you should receive the following:

- PCIe Gen3 CEM Interposer card
- 12V power supply
- Power supply AC cable
- 2 CXP cables

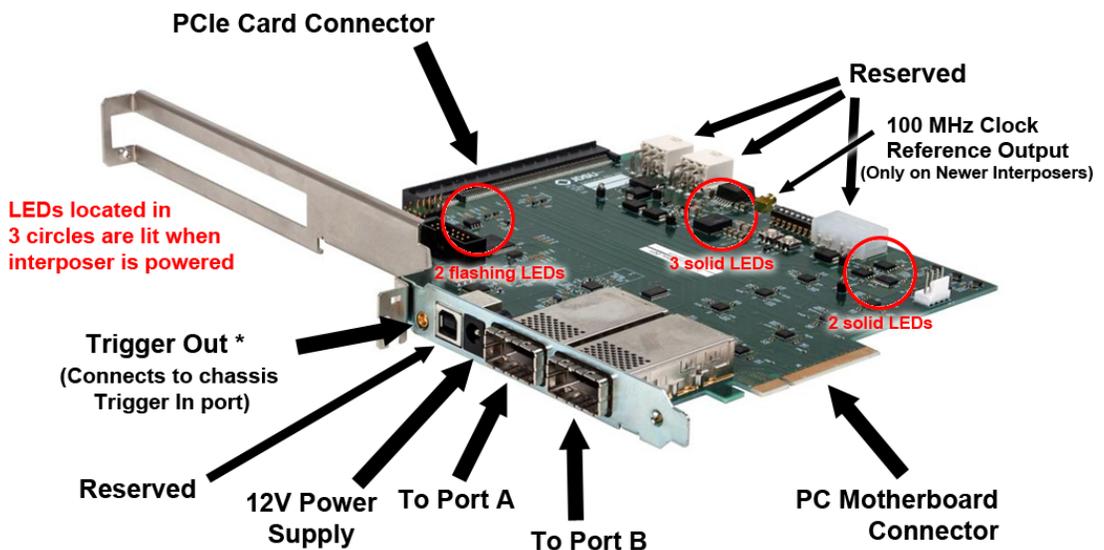
The following two illustrations show the PCIe Gen3 CEM Interposer card. [Figure 1](#) shows the interposer card as it is delivered to you.

**Figure 1** X8 PCIe Gen3 CEM Interposer Card



[Figure 2](#) shows the interposer card with the metal cage removed so that you can see all of the interposer card's connectors.

**Figure 2** X8 PCIe Gen3 CEM Interposer Card Connectors (with Metal Cage Removed)



\* This connector was 100 MHz Clock Output on older versions of this interposer.

## Installing and Cabling the X8 PCIe Gen3 CEM Interposer Card

In order to use the Xgig1000 PCIe chassis as a test system, you must connect it to an interposer card installed in the PC connected to the system.

### Installing the Interposer Card in a PC



#### CAUTION

Make sure the PC is turned off before installing the interposer to avoid damaging the interposer or the PC motherboard.

To install the interposer in a PC, follow these steps:

- 1 Refer to the user manual for your PC for instructions on opening the cover of the PC.
- 2 Locate the PCIe slot on the motherboard of the PC.
- 3 Plug the interposer into an available PCIe connector on the PC motherboard. The interposer will support up to 8 PCIe lanes (x8), but if the connector is smaller than x8, and the interposer is installed using an adapter for the smaller connector, the connector will determine the number of available lanes. For example, if the interposer is plugged into an x1 connector, only 1 lane will be supported.

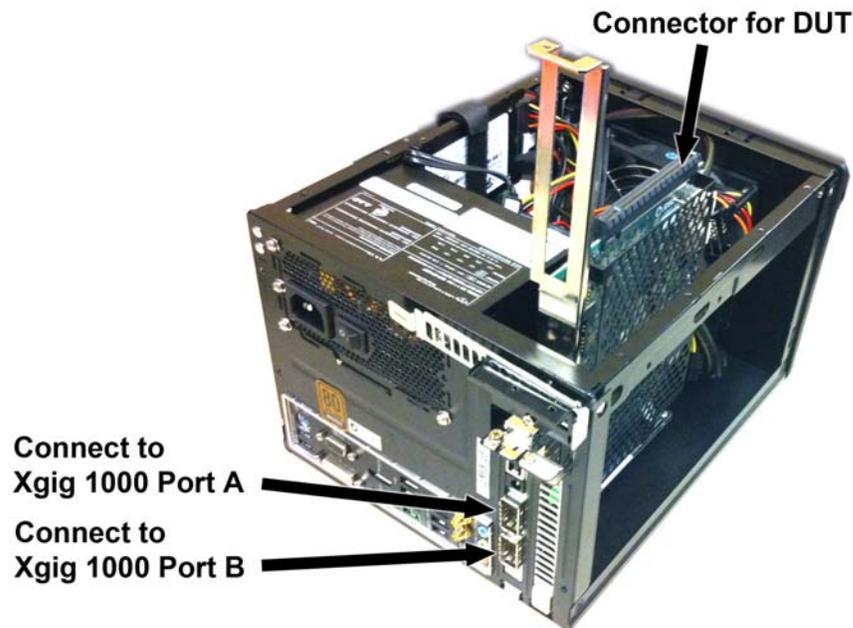


#### CAUTION

Hold the interposer card by the brackets, and avoid touching the electronic components to prevent ESD damage.

- 4 Secure the interposer by screwing down its end bracket to the PC chassis.

**Figure 3** Interposer Card Installed in a PC



## Cabling the Interposer Card to the Xgig1000 PCIe Chassis

To cable the XGIG1K-PCIE3-X8-AI interposer card to the Xgig1000 PCIe chassis using the power supply and cables provided with the interposer, follow these steps:

- 5 First referencing [Figure 3](#) to note the interposer card connectors, connect the two CXP cables supplied to the Xgig1000 PCIe chassis. Connect the Port A interposer connector to Port A on the chassis, and the Port B interposer connector to Port B on the chassis shown in [Figure 4](#).

**Figure 4** Xgig 1000 PCIe Chassis Front Panel Ports



- 6 Plug the PCIe card to be tested into the PCIe card edge connector on the top of the interposer. Secure the PCIe card by screwing down its end bracket to the interposer bracket. Take care not to over-tighten the retention screws.



### CAUTION

You may not be able to close the PC cover with the interposer card installed. Use caution in moving the PC to avoid damaging the interposer card or the PC motherboard.

- 7 To trigger the setup from the #PERST or #CLKREQ signals, connect a MCX cable (thin coaxial only) from the interposer's Trigger Out connector to the Trigger In connector on the Xgig1000 PCIe chassis. Refer to [Figure 2](#) for the Trigger Out connector location.

When you set up the Xgig Analyzer Capture Options, you will select which of these signals you will trigger on. Refer to the *Xgig Analyzer User's Guide*.

## Powering Up the Interposer Card and the Xgig1000 PCIe Chassis



### CAUTION

To avoid damaging the Interposer circuitry, you must first connect the 12V power supply to the Interposer before you connect it to the AC power source.

- 7 Connect the 12V power supply by inserting the plug into the Interposer's 12V power supply connector.
- 8 Plug the power supply into an AC power source. Verify the interposer is powered by locating the LEDs shown in [Figure 2](#) and making sure they are lit.
- 9 Power on the PC.

## 90° Left Angle/90° Right Angle X8 PCIe Server Interposer

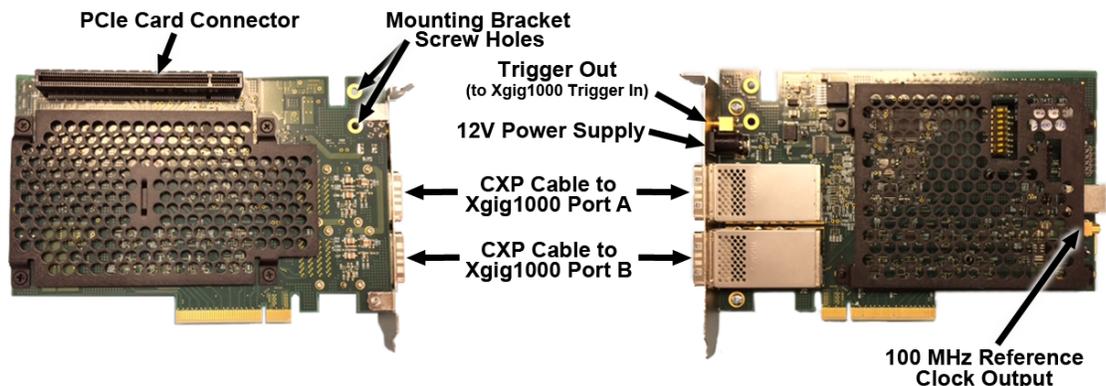
The 90° Left Angle X8 Server Interposer (model number XGIG1K-PCIE3-X8-S-L) and the 90° Right Angle X8 Server Interposer (model number XGIG1K-PCIE3-X8-S-R) are half-height interposer cards for PCIe devices that can be used with server or chassis motherboards with X8 Server PCIe slots. The interposer is inserted into the motherboard PCIe card slot and the PCIe board is mounted onto the interposer at a 90-degree angle. These interposers are referred to as the Left Angle Interposer and the Right Angle Interposer for the remainder of this section.

These server interposers are shipped with the following:

- Left Angle Interposer card or Right Angle Interposer card
- 12V power supply
- Power supply AC cable
- 2 CXP cables
- Mounting bracket with 2 screws

Figure 5 shows the Right Angle Interposer card with the interposer card's connectors identified. The Left Angle Interposer card has a similar layout.

**Figure 5** Right Angle Interposer Card and Connectors



## Installing and Cabling the Left Angle/Right Angle Interposer

In order to use the Xgig1000 PCIe chassis as a test system, you must connect it to either a Left Angle Interposer Card or a Right Angle Interposer Card installed in the computer motherboard connected to the system.

### Installing the Mounting Bracket to the Interposer Card

A mounting bracket is shipped with each interposer. The mounting bracket is secured to the interposer with two screws which are also included with the shipment. When the PCIe

card is inserted into the PCIe card connector, it will be held in place between the arms of the mounting bracket. See [Figure 6](#).

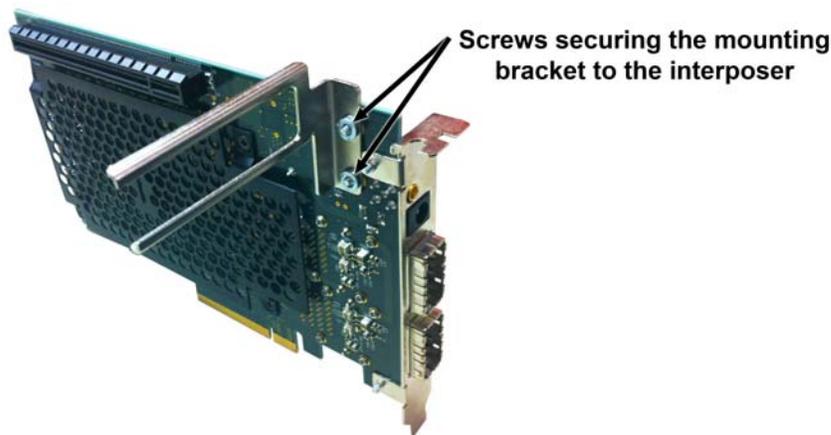
**Figure 6** Left and Right Mounting Brackets



To install the mounting bracket to the interposer card:

- 1 Secure the mounting bracket to your interposer card. Slide each screw through the interposer card and screw into the bracket (using 5 to 5.5 inch-pounds of torque) so that the mounting bracket is mounted on the same side of the interposer as the PCIe card connector. Refer to [Figure 7](#) for the location of the two mounting bracket screw holes on the interposer card.

**Figure 7** Right Interposer with Mounting Bracket Installed



## Installing the Interposer Card in a Motherboard



**CAUTION**

Make sure the computer is turned off before installing the interposer to avoid damaging the interposer or the computer motherboard.

To install the interposer card into a computer motherboard, follow these steps:

- 2 Refer to the user manual for your computer for instructions on opening the cover.
- 3 Locate the PCIe slot on the motherboard of the computer.

- 4 Plug the interposer into an available PCIe connector on the motherboard. The interposer will support up to 8 PCIe lanes (x8). If the connector is smaller than x8, and the interposer is installed using an adapter for the smaller connector, the connector will determine the number of available lanes. For example, if the interposer is plugged into an x1 connector, only 1 lane will be supported.



**CAUTION**

Hold the interposer card by the bracket, and avoid touching the electronic components to prevent ESD damage.

- 5 Secure the interposer by screwing down its end bracket to the computer chassis.

## Cabling the Interposer Card to the Xgig1000 PCIe Chassis

To cable the left angle/right angle interposer card to the Xgig1000 PCIe chassis using the power supply and cables provided with the interposer, follow these steps:

- 6 First referencing [Figure 5](#) to note the interposer card connectors, connect the two CXP cables supplied to the Xgig1000 PCIe chassis. Connect the Port A interposer connector to Port A on the chassis, and the Port B interposer connector to Port B on the chassis shown in [Figure 8](#).

**Figure 8** Xgig 1000 PCIe Chassis Front Panel Ports



- 7 Plug the PCIe card to be tested into the PCIe card connector near the top of the interposer. Ensure the PCIe card is cradled between the arms of the mounting bracket.



**CAUTION**

You may not be able to close the PC cover with the interposer card installed. Use caution in moving the PC to avoid damaging the interposer card or the PC motherboard.

- 8 To trigger the setup from the #PERST or #CLKREQ signals, connect a MCX cable (thin coaxial only) from the interposer's Trigger Out connector to the Trigger In connector on the Xgig1000 PCIe chassis. Refer to [Figure 5](#) for the Trigger Out connector location.

When you set up the Xgig Analyzer Capture Options, you will select which of these signals you will trigger on. Refer to the *Xgig Analyzer User's Guide*.

## Powering Up the Interposer Card and the Xgig1000 PCIe Chassis



### CAUTION

To avoid damaging the Interposer circuitry, you must first connect the 12V power supply to the Interposer before you connect it to the AC power source.

- 8 Connect the 12V power supply by inserting the plug into the Interposer's 12V power supply connector.
- 9 Plug the power supply into an AC power source.
- 10 Power on the PC.

## SFF-8639 Backplane Interposer

The SFF-8639 Backplane Interposer provides an interface between a server backplane's SFF-8639 connector and a server drive (DUT) that allows Viavi's Xgig 1K Chassis/ Analyzer solution to transparently capture PCI Express (PCIe) and SATA Express (SATAe) traffic between the backplane and the DUT.

The interposer is available as the SFF-8639 Single Interposer (XGIG1K-PCIE3-X4-8639S) and as the SFF-8639 Dual Interposer (XGIG1K-PCIE3-X4-8639D). The Dual Interposer provides cabling which allows you to connect the interposer to two Xgig chassis. This allows support of Dual Port Mode, where the 4 PCIe lanes are split into 2 links with 2 lanes each so the drive acts as two drives.

**Figure 9** SFF-8639 Backplane Interposer



With the SFF-8639 interposer, you receive:

- SFF-8639 Interposer card
- 12V power supply
- Power supply AC cable
- 2 CXP cables (For SFF-8639 Dual Interposer, splitter cables. See [Figure 12.](#))
- SFF-8639 Interposer Shim kit (refer to “[SFF-8639 Interposer Shims](#)”)

## SFF-8639 Interposer Shims

Use the following reference information to identify which shims you will need to install on the SFF-8639 Backplane Interposer during the installation process.

The Interposer is shipped with a package of shims of varying thicknesses and widths.

- Shims of 10mm width include thicknesses of 2mm, 3mm, 4mm, and 5mm; there are 2 of each thickness.
- Shims of 15mm width include thicknesses of 1mm, 1.5mm, 2mm, (3mm shipped installed on Interposer), and 4mm; there are 2 of each thickness.

- There is also a set of shims specifically for use with the Cisco UCS C240 M3 Rack Server.

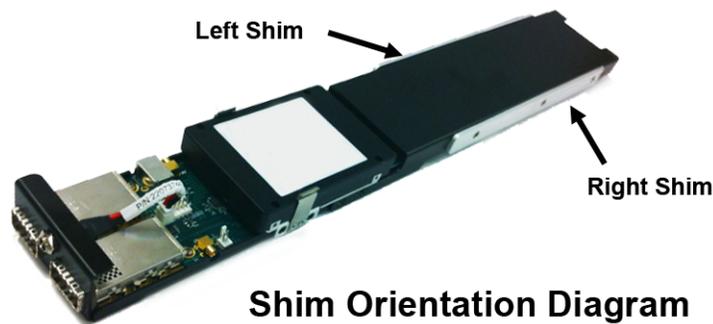
**Table 1** SFF-8639 Interposer Shim Reference Table

Server Board	Server Chassis	Slot Size (inches)	Drive Axis	Installed Interposer Orientation (see Note 1)	Shim Size (mm) (see Note 2)	
					L	R
Intel Wildcat Pass	2U	2.5	Vertical	Right	3	2
Intel Wildcat Pass		2.5	Horizontal		3	1.5
Intel Cottonwood Pass (see Note 3)	4U	?	?	Upwards	3	0 or 1
Supermicro X10DDW-i	3U	3.5	Horizontal	Upwards	NA	2
Supermicro X10DDW-i	1U	2.5	Horizontal	Upwards	0	2
Dell R620	2U	2.5	Vertical	Right	3	2
Dell R720	2U	2.5	Vertical	Right	3	2
Quanta S2Sp (see Note 4)	2U	2.5 – 3.5	Vertical	Left	?	?
HP DL380 Gen9	2U	2.5	Vertical	Right	1 or 2	2
AIC	1U	2.5	Horizontal	Upwards	1	2
Oracle X5	2U	2.5	Vertical	Right	None	1.5
	2U	2.5	Horizontal	Upwards		

**Notes:**

- 1 Installed Interposer orientation: This is the direction that the component side of the Interposer faces when it is installed in the Server.
- 2 Interposer orientation for shim sizes: L=Left Shim and R=Right Shim
- 3 Could be 3.5 and 5.25 bays
- 4 Only left facing server so far

**Orient the Interposer in this position when determining shim thicknesses for your server.**



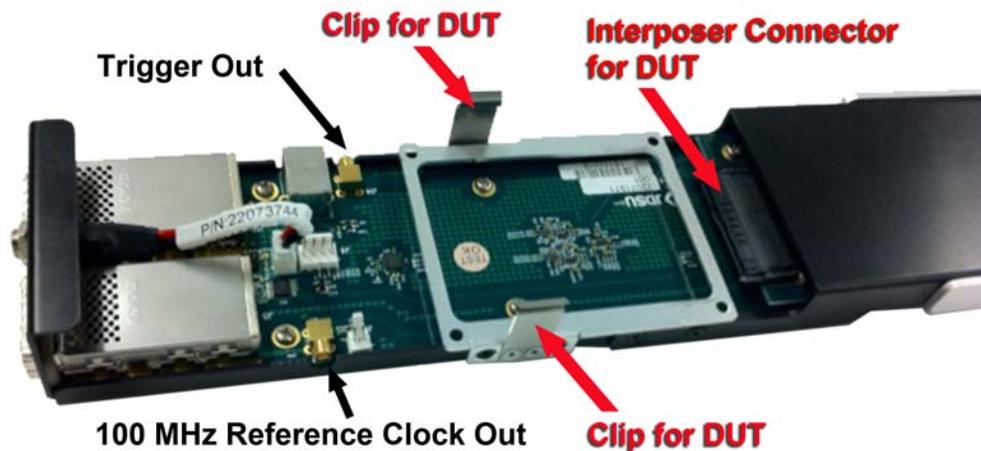
**Shim Orientation Diagram**

## Installing and Cabling the SFF-8639 Backplane Interposer

Perform the following steps to install the Interposer.

- 1 Install appropriate shims on the Backplane Interposer. Refer to [Table 1 on page 10](#).  
The Interposer is shipped with 15mmX3mm shims installed on the top and bottom. The shims are secured to the Interposer with 3 screws. Remove the shims and install shims of the appropriate thickness (and widths) as determined by the server that is being used. Contact the technical assistance team if you need assistance.
- 2 Power off server and remove the hard drive (DUT).
- 3 Connect the DUT to the Backplane Interposer by setting the DUT onto the Interposer between the two clips and sliding the DUT to connect it with the connector. Refer to [Figure 10](#).

**Figure 10** Connecting the DUT to the Interposer



The two clips and the connector will hold the DUT in place.

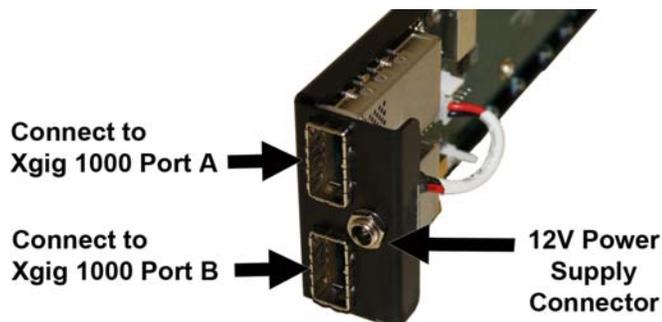
- 4 Connect the Interposer's 12V power adapter to the power connector on the Interposer. See [Figure 11](#).



### CAUTION

To avoid damaging the Interposer circuitry, you must first connect the 12V power supply to the Interposer before you connect it to the AC power source.

**Figure 11** SFF-8639 Backplane Interposer Power Adapter and CXP Cable Connectors



- 5 Connect the CXP cables supplied to the two Interposer connectors. See [Figure 11](#).
- 6 Insert the Interposer into the server slot and into the backplane's SFF-8639 connector.
  - For horizontally mounted backplane connectors, it is usually easier to mate the connector by applying slight upward pressure to the Interposer.
  - For vertically mounted backplane connectors, it is usually easier to mate the connector by applying slight pressure toward the right side of the Interposer.
- 7 Connect the two CXP cables to the Xgig 1K chassis connectors.
  - The top (or left, if mounted horizontally) Interposer connector to Port A on the chassis.
  - The bottom (or right, if mounted horizontally) Interposer connector to Port B on the chassis.
- 8 To trigger the setup from the #PERST or #CLKREQ signals, connect a MCX cable (thin coaxial only) from the interposer's Trigger Out connector to the Trigger In connector on the Xgig1000 PCIe chassis. Refer to [Figure 10](#) for the Trigger Out connector location.

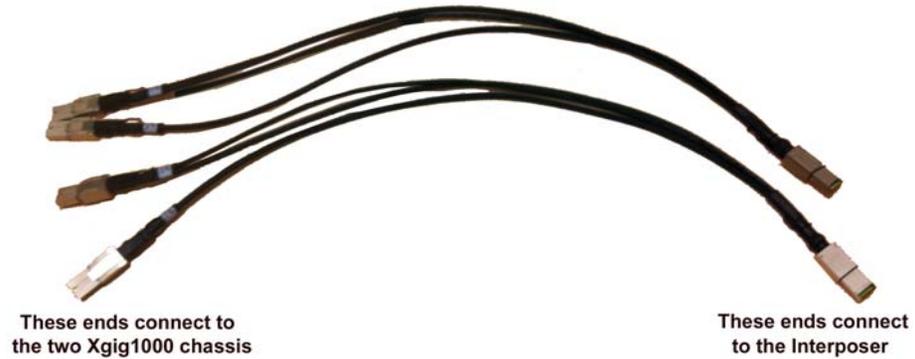
When you set up the Xgig Analyzer Capture Options, you will select which of these signals you will trigger on. Refer to the *Xgig Analyzer User's Guide*.
- 9 Connect the 12V power supply to the AC power source.
- 10 Power on the server.

## SFF-8639 Backplane Interposer Dual Port Connections

Several SFF-8639 NVMe drives support the Dual Port Mode. The Dual Port Mode is enabled on the drive by the host server when the DualPortEn# pin is grounded on the backplane. In this mode, the 4 PCIe lanes are split into 2 links with 2 lanes each so the drive acts as two drives.

Using a pair of special CXP split cables designed for the SFF-8639 dual backplane interposer, you may connect the interposer to two Xgig 1K chassis. This cabling design allows you to capture both traffic streams in the dual port configuration.

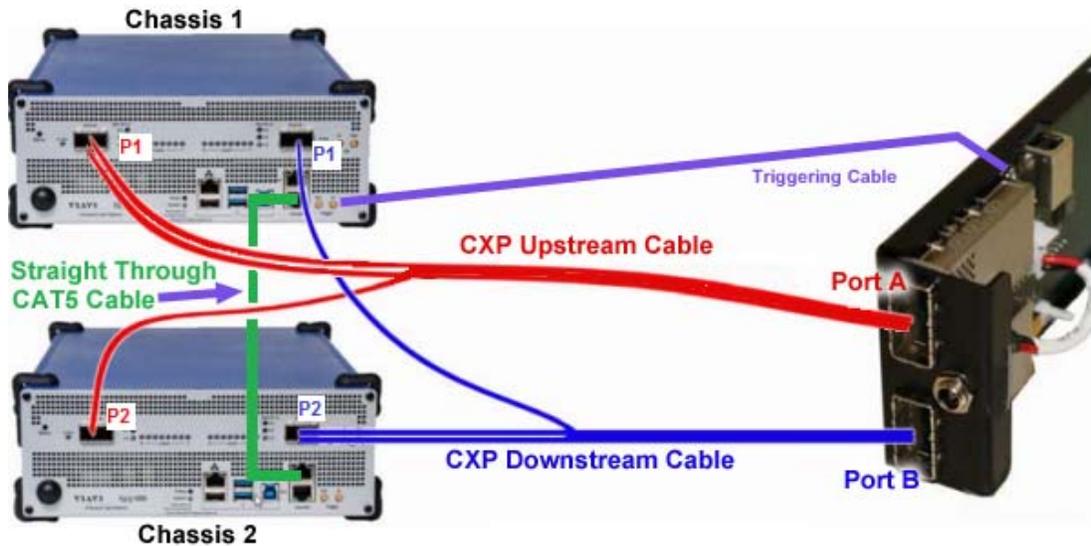
**Figure 12** CXP Split Cables



## Making the Dual Connections

- 1 Perform steps 1 through 4 described in the “[Installing and Cabling the SFF-8639 Backplane Interposer](#)” procedure starting on [page 11](#) before continuing with the following steps.
- 2 Connect the two CXP split cables to the Interposer ports as shown in [Figure 13](#).

**Figure 13** SFF-8639 Dual Backplane Interposer Connection Diagram



- 3 Insert the Interposer into the server slot and into the backplane's SFF-8639 connector.
  - For horizontally mounted backplane connectors, it is usually easier to mate the connector by applying slight upward pressure to the Interposer.
  - For horizontally mounted backplane connectors, it is usually easier to mate the connector by applying slight pressure toward the right side of the Interposer.

- 4 Connect the CXP cables to the connectors of the two Xgig 1K chassis. Refer to [Figure 13](#):
  - a Connect both connectors on the split ends of the cable for Port A to the Port A connectors on both of the Xgig1000 chassis.
  - b Connect both split ends of the cable for Port B to the Port B connectors on both of the Xgig1000 chassis.
- 5 Connect the Cascade Out port from Chassis 1 to the Cascade In port of Chassis 2 using a straight through CAT5 cable this is 3 feet or less in length. Refer to the green cable shown in [Figure 13](#).
- 6 To trigger the setup from the #PERST or #CLKREQ signals, connect a MCX cable (thin coaxial only) from the interposer's Trigger Out connector to the Trigger In connector on the Xgig1000 PCIe Chassis 1. Refer to [Figure 13](#).

When you set up the Xgig Analyzer Capture Options, you will select which of these signals you will trigger on. Refer to the *Xgig Analyzer User's Guide*.
- 7 Connect the 12V power supply to the AC power source.  
Power on the server.



**NOTE**

Both chassis must be connected to the LAN and they must have the same Appkit installed on them. Both chassis and the interposer must have power. When rebooting both chassis, the Cascade In/Out leds will flash for a couple minutes until they settle with Cascade Out ON on the upper chassis, and Cascade In ON on the lower chassis (if not, unplug/re-plug the LAN cables on both chassis, or reboot again).

## M.2 Interposer

The M.2 Interposer provides the capability of monitoring and capturing bus signals between an M.2 connector and its Solid State Drive (SSD). The M.2 Interposer supports M.2 connection formats using a connector rather than formats that are soldered to the motherboard.

### Required Equipment

The M.2 Interposer kit includes:

- M.2 Interposer Pod
- M.2 SSD Support Bracket with Standoff and Screw (phillips #1, panhead)
- Power Supply and Power Cable
- Four M.2 Adapter Cables

You will use one of the M.2 adapter cables to connect the interposer to the M.2 connector on the computer motherboard. These cables have specifications:

- Socket 3 connectors
- Connector Key M
- Module Key M, B+M
- Types: 2242, 2260, 2280, and 22110
- Module Height Options: S2, D2, S3, D3, D5

The following Viavi equipment and software is also required:

- Xgig1000 PCIe Gen3 Chassis
- Xgig Analyzer Software

You must supply the following equipment:

- Computer with M.2 Connector
- M.2 SSD Card

### M.2 Interposer Pod Description

**Figure 14** M.2 Interposer Pod



The M.2 Interposer pod has the following front panel features:

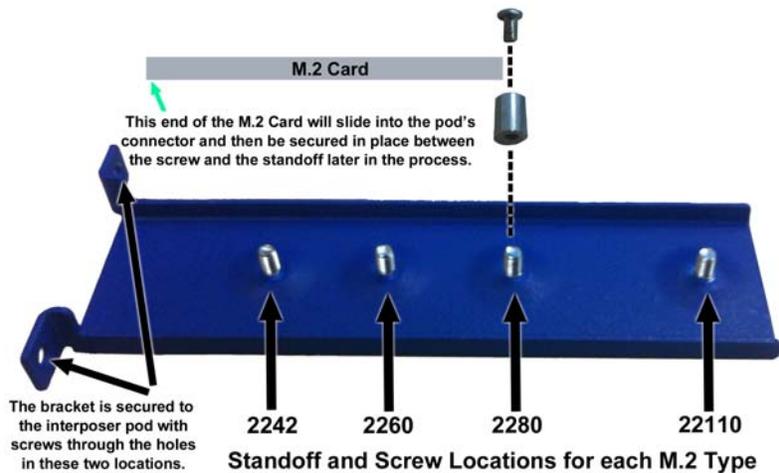
<b>Connectors</b>	
POWER	Connect the power supply provided to power to the Interposer Pod.
TRIGGER OUT	Use an MCX cable to connect the Trigger In port on the Xgig1000 PCIe chassis.
REFCLK OUT	Use an MCX cable to connect to the Clk In port on the Xgig1000 PCIe chassis.
CXP CONNECTOR	Use an CXP cable to connect to Port A on the Xgig1000 PCIe chassis.
<b>LEDs</b>	
REFCLK	<b>Amber</b> - Indicates Xgig1000 chassis is synchronized with Interposer Pod's 100 MHz Clock Reference signal. <b>Off</b> - No 100 MHz Clock Reference signal.
SUSCLK	32.768 kHz clock supply input that is provided by the Interposer pod's chipset to reduce power and cost for the module. <b>Amber</b> - SUSCLK signal is clocking. <b>Off</b> - No SUSCLK signal is present.
PERST#	Card Functional Reset – PCIe Reset <b>Green</b> - No errors since LED reset <b>Red</b> - Error has been detected within the last 1 second <b>Amber</b> - Error has been detected since LED reset but not within the last 1 second
STATUS	<b>Blinking Red</b> - Indicates the that Interposer application is being updated. <b>Green</b> - Indicates that the Interposer has application installed.
PEDET#	Host I/F Indication; To be grounded for SATA, No connect for PCIe <b>Green</b> - Indicates that PCIe/SATAe drive type is detected. <b>Amber</b> - Indicates that SATA drive type is detected.
PEWAKE#	Wake from a Power Saving Mode <b>Green</b> - No change since LED reset <b>Red</b> - Changed since LED reset (in the last 1 second) <b>Amber</b> - Changed since LED reset (Not in the last 1 second)
CLKREQ#	Reference clock request – ASPM L1.x enable <b>Green</b> - No change since LED reset <b>Red</b> - Changed since LED reset (in the last 1 second) <b>Amber</b> - Changed since LED reset (Not in the last 1 second)
POWER	<b>Green</b> - 12V external power supply connected <b>Amber</b> - 12V external and 3.3V via the M.2 adapter cable <b>Off</b> - No power at all

## Setting Up and Cabling the M.2 Interposer

Use the following steps to set up the M.2 connector test.

- 1 Remove the M.2 SSD card from the computer's M.2 connector.
- 2 Use your fingers to screw the standoff snugly onto the appropriate post of the SSD support bracket. There are four posts on the support bracket; use the post that matches your M.2 SSD card type. The card types are shown in [Figure 15](#).

**Figure 15** SSD Support Bracket



- 3 Secure the SSD support bracket to the rear of the M.2 Interposer Pod using the two screws on the back of the pod. Torque to 1.7 to 1.9 inch-pounds. Remove the screws from the pod. Insert them through the holes at the end of the support bracket before reattaching them to the pod. See [Figure 15](#).
- 4 Select the appropriate M.2 adapter cable and carefully connect the circuit board end of the adapter cable to the M.2 connector on the computer. See [Figure 16](#). There are four M.2 adapter cables that were shipped with the M.2 Interposer. Use the adapter cable that has a circuit board matching the size of the M.2 SSD card that was removed.

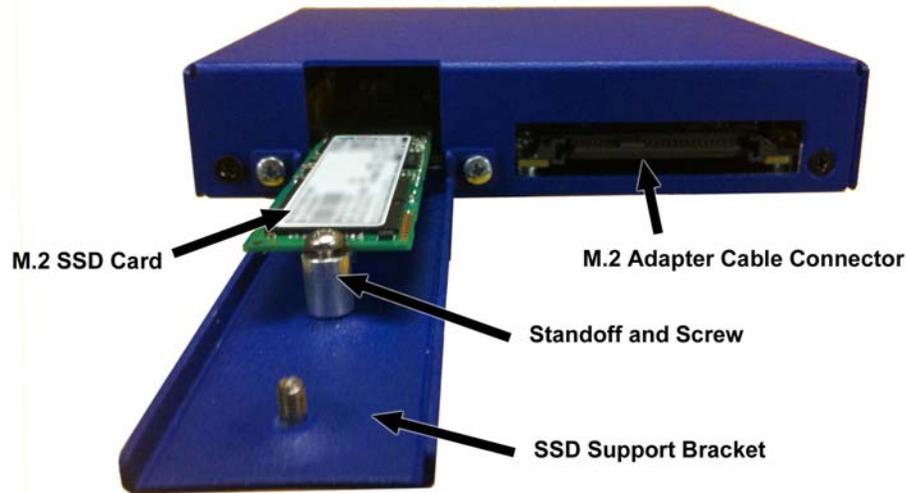
**Figure 16** M.2 Adapter Cable



The M.2 adapter cable types are:	2242	(22mm X 42mm)
	2260	(22mm X 60mm)
	2280	(22mm X 80mm)
	22110	(22mm X 110mm)

- 5 Connect the other end of the M.2 adapter cable to the connector on the rear of the M.2 interposer pod. The pod's connector is shown in [Figure 17](#).
- 6 Place the M.2 SSD card on the M.2 SSD support bracket and into the interposer pod's rear panel connector. Secure the card to the bracket with the screw that was provided. Torque to 1.7 to 1.9 inch-pounds.

**Figure 17** M.2 Interposer Pod with SSD Support Bracket (M.2 SSD Card also shown)



- 7 Connect the CXP cable from the M.2 interposer pod's front panel CXP port to the Xgig1000 PCIe chassis Port A.
- 8 To trigger the setup from the #PERST, #CLKREQ, or #PEWAKE signals, connect a MCX cable (thin coaxial only) from the interposer pod's Trigger Out connector to the Trigger In connector on the Xgig1000 PCIe chassis.  
When you set up the Xgig Analyzer Capture Options, you will select which of these signals you will trigger on. Refer to the *Xgig Analyzer User's Guide*.
- 9 Connect the Interposer power supply ac power source and then connect it to the M.2 Interposer pod's front panel Power connector.

## Related Information

This document provides general information to install and set up the PCIe interposers. The PCIe interposers are used in conjunction with other Viavi products. Refer to the following documents:

*Xgig 1000 Hardware Guide* — This document provides a general description of the Xgig1000 PCIe Gen3 chassis used with these interposers.

*Xgig Analyzer User's Guide* — This document describes the Xgig Analyzer software that can monitor, capture, and analyze the PCIe signals.

## Technical Assistance

If you require technical assistance, call 1-844-GO-VIAVI (1-844-468-4284) or e-mail [Techsupport-snt@viavisolutions.com](mailto:Techsupport-snt@viavisolutions.com).

For the latest TAC information, go to <http://www.viavisolutions.com/en/services-and-support/support/technical-assistance>.



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