

# PCI Express® 4.0 U.2/U.3 Interposer



## Key Features

- Quick and simple set-up
- Allows Capturing and decoding of all PCIe traffic between host and device
- Decodes PCIe host interfaces such as NVMe, SOP/PQI, AHCI/PCIe in addition to native PCIe protocols
- Supports 2.5" drives and drive bays using carrier extensions
- Supports data rates of 2.5 GT/s, 5.0 GT/s, 8.0 GT/s and 16.0 GT/s
- Supports two x2 ports
- Supports SRIS Clocking
- Supports CLKREQ# for testing low power L1 Substates
- Supports SMBus
- Supports both U.2 and U.3 devices
- Can be licensed to support Dual Port devices
- Environmental:
  - Operating: 0° to 55°C (32° to 131°F)
  - Non-Operating: -20° to 80°C (-4° to 176° F)
  - Humidity: 10% to 90% RH (non-condensing)
- Dimensions:
  - 522.22 mm x 156.97 mm (20.56" x 6.18")

## Teledyne LeCroy's PCIe® 4.0 x4 U.2/U.3 Single/Dual Port Interposers provide quick and simple means for protocol analysis of Solid State Drives (SSDs) based on PCI Express (PCIe) protocols.

Teledyne LeCroy's U.2/U.3 (previously known as SFF-8639) Interposers provide quick and simple means for protocol analysis of Solid State Drives (SSDs) based on PCI Express (PCIe) protocols.

The U.2/U.3 Interposer cards, used with a PCIe 4.0 Summit protocol analyzer, enable PCIe bus traffic between a host backplane and SSD device to be monitored, captured, and recorded for protocol analysis. The U.2/U.3 Interposers support PCIe host interfaces such as NVM Express (NVMe), SCSI Express (SOP/ PQI), SATA Express (AHCI/PCIe) and native PCI Express protocols at link widths up to x2 per port and at data rates from 2.5 GT/s up to 16.0 GT/s. The PCIe 4.0 U.2/U.3 Interposer supports both single and dual port protocol analysis using a PCIe 4.0 protocol analyzer.

Now with the MultiPort option on the Gen4 analyzers it is possible to monitor and analyze multiple PCIe links. This means that multiple U.2/U.3 Interposers can be used with a single Summit T4 protocol analyzer to do multilink protocol analysis. This provide a lower

cost debugging solution for more complicated configurations.

The U.2/U.3 Interposers provide connectivity and monitoring capability for the U.2/U.3 connector targeted at enterprise storage devices. This U.2/U.3 connector provides flexible drive connectivity for NVM Express, SCSI Express, SATA Express, SAS, SATA, and native PCIe 4.0 host interface devices in a serviceable and hot-pluggable drive bay.

U.2/U.3 Interposers can be used with 2-1/2" drives depending on the specific card. To use these interposers, the drive is inserted into a drive tray on the interposer that supports a mechanical and electrical connection to a U.2/U.3 connector. The interposer taps all PCIe protocol traffic between the host and the storage device and records it on the PCIe protocol analyzer, where protocol issues and performance metrics can be further analyzed and debugged.

## U.2/U.3 Interposer Connection Overview



Summit T48 Analyzer

Test Point Number	Test Point Name
TP3	GND
TP9	GND
TP10	4V from 12V DC Jack
TP11	3.3V IO
TP13	1.2V CORE
TP26	3V3_AUX_HOST
TP28	12V_HOST

Y cable: PE021UCA-X

12V DC from adapter supplied

Activity per lane

DUT Power Status LEDs

External Clock Inputs MMCX (Optional Connection)

Clock Selection

Device Under Test (DUT)  
Compatible with 2.5" drives

U.2/U.3 Host Slot

Optional Carrier Extension (may be fit to either side)

The optional carrier extension(s) can be used to help fit the interposer to a specific manufacturer's drive carrier. This may involve custom modifications to a carrier to allow the interposer to extend out from the end of the carrier. Guidance is provided and an example modification is described in the Quick Start Guide provided with the interposer.

### Connecting the U.2/U.3 Interposer (refer to Quick Start Guide for more details)

**Note:** The sequence of operations shown here is for "hot plug" operations where the host system powering the U.2/U.3 host slot remains powered on. For test applications where this is not required, assemble the components as indicated (including plugging the interposer into the host slot), then power on all components (interposer, analyzers, and host machine for PCIe Protocol Analysis software) before powering on the U.2/U.3 host slot.

1. Set the SW1 DIP switches to the desired clock selection.
2. Install the U.2 device under test (DUT) into the connector on the interposer as shown (fits 2.5" drives).
3. Connect the Summit T48 Analyzer (or other compatible Teledyne LeCroy analyzer) to the interposer using the system cables. One analyzer should be connected to the port marked "SCSI Express / NVMe Port A" and the second analyzer should be connected to the port marked "SCSI Express / NVMe Port B." If using MultiPort, use the x4-to-x8 straight cable (PE020UCA-X). If not using MultiPort then the iPass Y-Cable (PE021UCA-X) should be used.
4. Connect the analyzers to a host computer system using the USB ports on the Summit analyzers.
5. If not already done, install the PCIe Protocol Analysis application on the host machine.
6. Connect 12V DC using the AC adapter supplied with the interposer. (Make sure the AC adapter is powered on.)
7. Power on the analyzers.
8. Power on the host machine.
9. Launch the Teledyne LeCroy software application to monitor, record and view PCI Express traffic passing through the U.2/U.3 Interposer.
10. Install the Interposer into the host system connector.

#### System Compatibility

Summit T48	✓
Summit T416	✓

## Ordering Information

### Product Description

PCI Express Gen4 U.2/U.3 Standard 12 Inch Interposer  
Summit T48 MultiPort Analysis Option  
G4x8 MultiPort Capable Interposer (includes G4x8 Interposer Card)

### Product Code

PE188UIA-X  
PE259SUA-A  
PE182UIA-X



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