QSFP-DD Test Adapters

User Manual

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Introduction

This user's guide documents the QSFP-DD Host (Plug) and QSFP-DD Module (Receptacle) Test Adapters. There are 5 versions of the QSFP-DD Plug TPAs. The first version is the 8 Channel TPA with all ports assigned to pinouts. The remaining four (Legacy, DD, Rx and Tx) have half of the required channels needed for compliance testing. The model numbers for the QSFP-DD TPAs are as follows:

Model Numbers:

HCB 8 Channel:

QSFPDD-TPA2.92-HCB-P	8 Channel HCB with 2.92mm Female Connectors
QSFPDD-TPA2.4-HCB-P	8 Channel HCB with 2.4mm Female Connectors
QSFPDD-TPA1.85-HCB-P	8 Channel HCB with 1.85mm Female Connectors

HCB Half Channel:

QSFPDD-TPA2.92-HCB-LGCY-P	Legacy channels HCB with 2.92mm Female Connectors
QSFPDD-TPA2.92-HCB-DD-P	DD channels HCB with 2.92mm Female Connectors
QSFPDD-TPA2.92-HCB-RX-P	Rx channels HCB with 2.92mm Female Connectors
QSFPDD-TPA2.92-HCB-TX-P	Tx channels HCB with 2.92mm Female Connectors
QSFPDD-TPA2.4-HCB-LGCY-P	Legacy channels HCB with 2.4mm Female Connectors
QSFPDD-TPA2.4-HCB-DD-P	DD channels HCB with 2.4mm Female Connectors
QSFPDD-TPA2.4-HCB-RX-P	Rx channels HCB with 2.4mm Female Connectors
QSFPDD-TPA2.4-HCB-TX-P	Tx channels HCB with 2.4mm Female Connectors
QSFPDD-TPA1.85-HCB-LGCY-P	Legacy channels HCB with 1.85mm Female Connectors
QSFPDD-TPA1.85-HCB-DD-P	DD channels HCB with 1.85mm Female Connectors
QSFPDD-TPA1.85-HCB-RX-P	Rx channels HCB with 1.85mm Female Connectors
QSFPDD-TPA1.85-HCB-TX-P	Tx channels HCB with 1.85mm Female Connectors

MCB:

QSFPDD-TPA2.92-MCB-R	MCB with 2.92mm Female Connectors
QSFPDD-TPA2.4-MCB-R	MCB with 2.4mm Female Connectors
QSFPDD-TPA1.85-MCB-R	MCB with 1.85mm Female Connectors

The test adapters, shown in Figures 1, 2 and 3 on the following pages, test QSFP-DD interface cables, hosts, and modules to the requirements of the QSFP-DD MSA and IEEE 802.3ck Standards.

The QSFPDD-HCB-P and QSFPDD-MCB-R test adapter assemblies allow access, via 2.92mm, 2.4mm or 1.85mm coaxial (High-Speed) connections, to measure or inject data signals.

NOTE: To avoid damaging the cables, use the handling techniques described in the Care and Handling section before making any connections or configuring a test setup.

Always use a static-safe workstation when performing tests, as explained in the "Electrostatic Discharge Information" section.

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QSFPDD-TPAxxx-HCB-P (8-Channel)

The QSFP-DD Host Compliance Test Adapter can be used for testing the compliance of QSFP-DD Host Devices to MSA and IEEE 802.3ck standards.

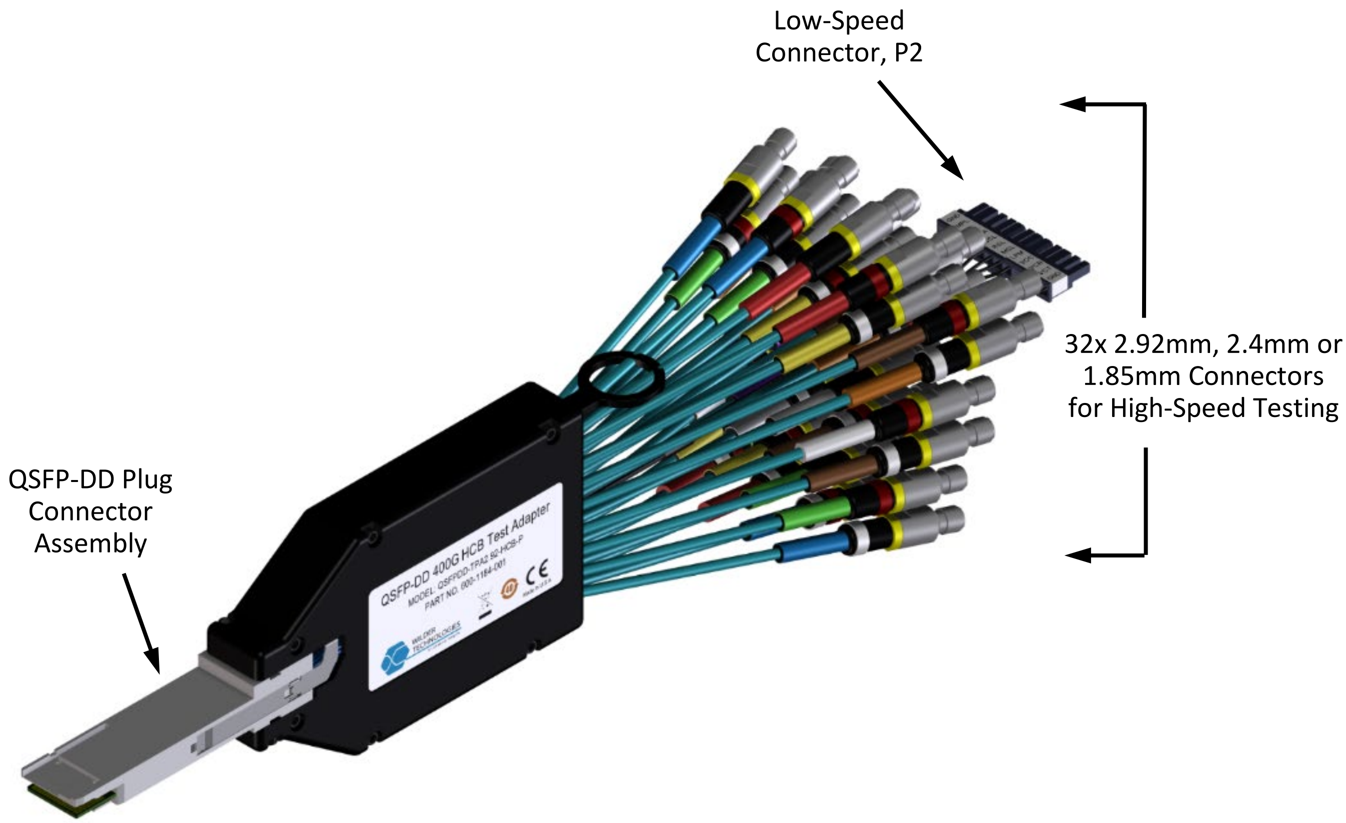

Figure 1. The QSFP-DD HCB (Plug) Test Adapter (Note: The coaxial cables are configuration dependent and may be terminated with different connectors and have different color-coding than what is shown.)

Included with the QSFPDD-TPAxxx-HCB-P is a spare Molex plug connector, provided for users to interface with the Low-Speed connection on the HCB. The Molex part numbers for the included plug, and contact pins are as follows. Part numbers for the receptacle and it's contact pins, which make up the low speed connector (P2) are also listed. These part numbers are the same for the Legacy, DD, Rx, and Tx TPAs.

12-position MicroFit Receptacle Housing (P2)	Molex PN 43645-1200
Receptacle Female Terminal Pins (P2)	Molex PN 43030-0011
12-position MicroFit Plug Header (Spare)	Molex PN 43640-1201
Plug Male Contact Pins (Spare)	Molex PN 43031-0011

QSFPDD-TPAxxx-HCB-P (Legacy, DD, Rx, Tx)

The Legacy, DD, Rx, and Tx versions of the QSFP-DD HCB TPA provide half of the required channels for testing.

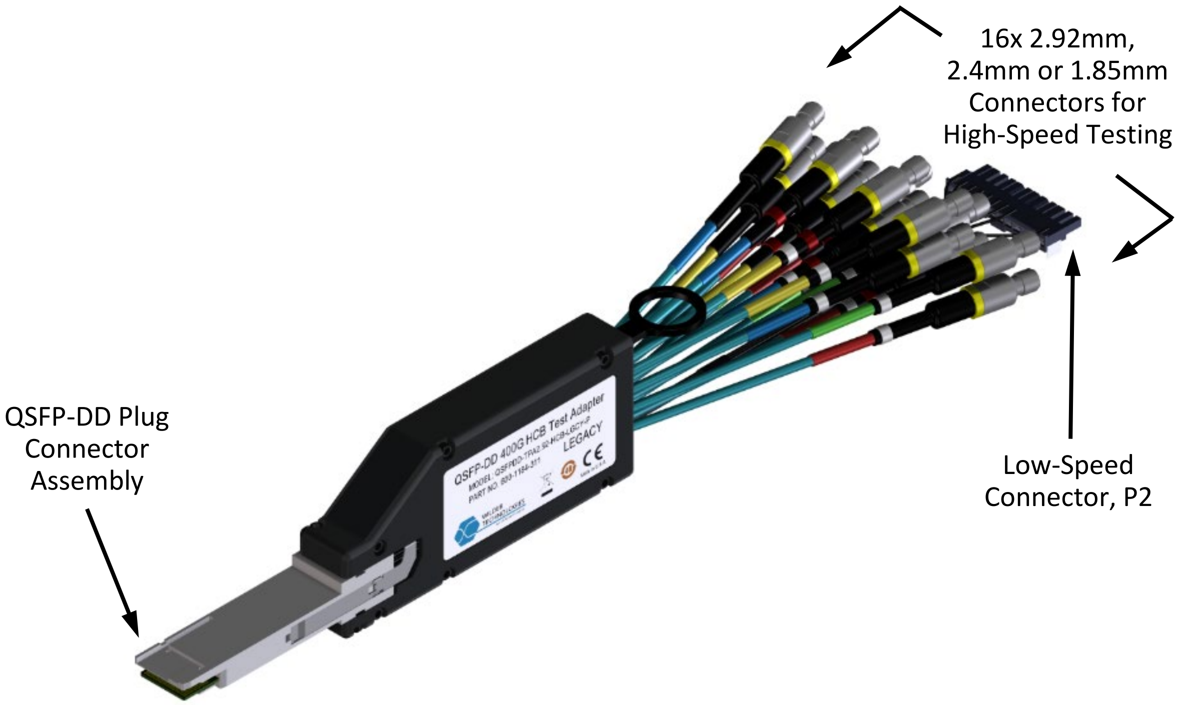

Figure 2. The QSFP-DD HCB (Legacy, DD, Rx, Tx) Test Adapter

HCB Version	Description	Channels
Legacy	Only provides pinouts to ports found in QSFP	Ports 1 through 4
DD	Only provides pinouts to the new ports in QSFP-DD	Ports 5 through 8
Rx	Only provides pinouts to Rx channels	All Rx Channels
Tx	Only provides pinouts to Tx channels	All Tx Channels

Note: Pinouts for Legacy, DD, Rx and Tx TPAs are further documented in the pin assignment tables in the Mechanical and Environmental Specifications section.

QSFPDD-TPAxxx-MCB-R

The QSFP-DD Module Compliance Test Adapter can be used for testing the compliance of QSFP-DD Module devices to MSA and IEEE 802.3ck standards.

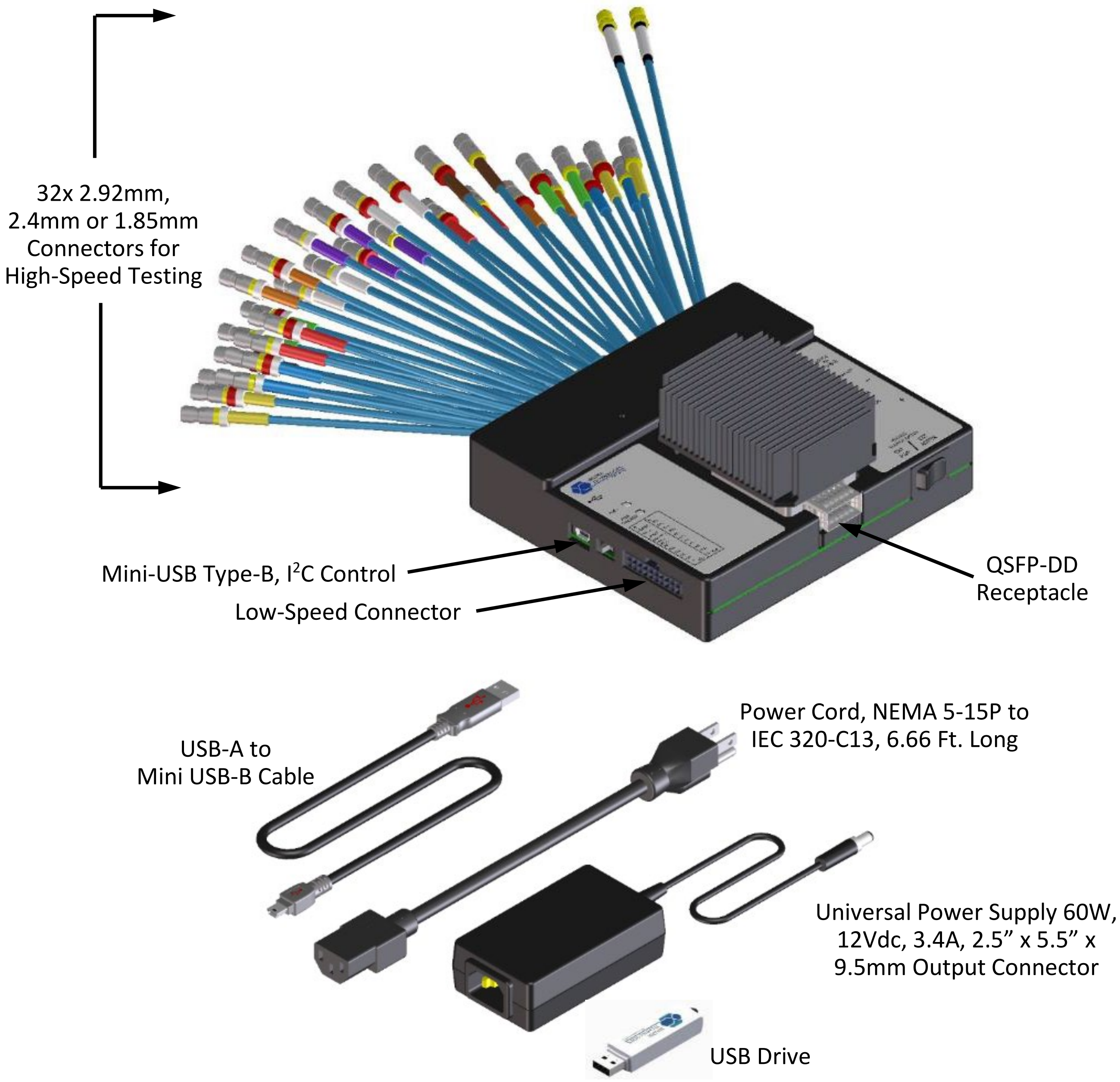

Figure 3. The QSFP-DD MCB (Receptacle) Test Adapter and its included cabling (Note: The coaxial cables are configuration dependent and may be terminated with different connectors than what is shown.)

Included with the QSFPDD-TPAxxx-MCB-R is a spare Molex receptacle connector, provided for users to interface with the Low-Speed connection on the MCB. The Molex part numbers for the included receptacle, and contact pins are as follows.

20-position 2 row MicroFit Receptacle Housing (Spare)	Molex PN 43025-2000
Receptacle Female Contact Terminal Pins (Spare)	Molex PN 43030-0011

Replacement parts for the MCB and HCB low-speed connections can be additionally purchased through Molex distributors.

NOTE: The receiver High-Speed connections for QSFP-DD are normally AC coupled. The QSFP-DD plug and receptacle TPAs do NOT have internal DC Blocks. This allows for parametric testing through the TPAs. Normal testing may require DC Blocks (Some DC blocks may be optionally ordered from Wilder Technologies or refer to the following table for purchasing options).

DC Block Specfications and Source Information				
Interface	**Frequency Range**	**VSWR**	**IL**	**Possible DC Block Sources**
1.85mm	≤10MHz - 67GHz	1.5:1	≤1.25	Centric RF Part Number C1067
2.4mm	≤10MHz - 50GHz	1.35:1	≤1.25	Centric RF Part Number C0150
2.92mm	≤10MHz - 40GHz	1.3:1	≤1.2	Centric RF Part Number C0140

NOTE: RF Terminators may be required to support specific user test configurations. (Some RF Terminators may be optionally ordered from Wilder Technologies or refer to the following table for purchasing options).

RF Terminator Specfications and Source Information				
Interface	**Frequency Range**	**VSWR**	**Power**	**Possible RF Terminator Sources**
1.85mm	0 - 67GHz	1.3:1	1W	Centric RF Part Number C673
2.4mm	0 - 50GHz	1.3:1	1W	Centric RF Part Number C505 Pasternack Part Number PE6TR1103
2.92mm	0 - 40GHz	1.2:1	1W	Centric RF Part Number C401 Pasternack Part Number PE6TR1106

NOTE: The metal shell of both the plug (QSFP-DD HCB) and receptacle (QSFP-DD MCB) connector housing or cage tie high-speed ground to chassis ground.

Cooling Module Accessory

The Cooling Module Accessory (Included with product or optional accessory) can be installed to the QSFP-DD MCB (Receptacle) Test Adapter. This will increase airflow through the TPA's heat sink and subsequently keep the device temperature within the standard operating range. The Cooling Module is recommended if the power class of the device to be tested is 6 or greater (See Table 1).

To install the Cooling Module, first mount the T-shaped rail guide to the MCB housing using the provided flat head screws. Then, slide the Cooling Module assembly onto the mounting rail guide until the assembly clicks in place.

A separate 12V AC-DC Power Adapter (not shown) is provided with the assembly and plugs into the Cooling Module's DC Jack, to power the fan.

NOTE: The Cooling Module is required while testing high power modules but is detachable for carrying purposes.

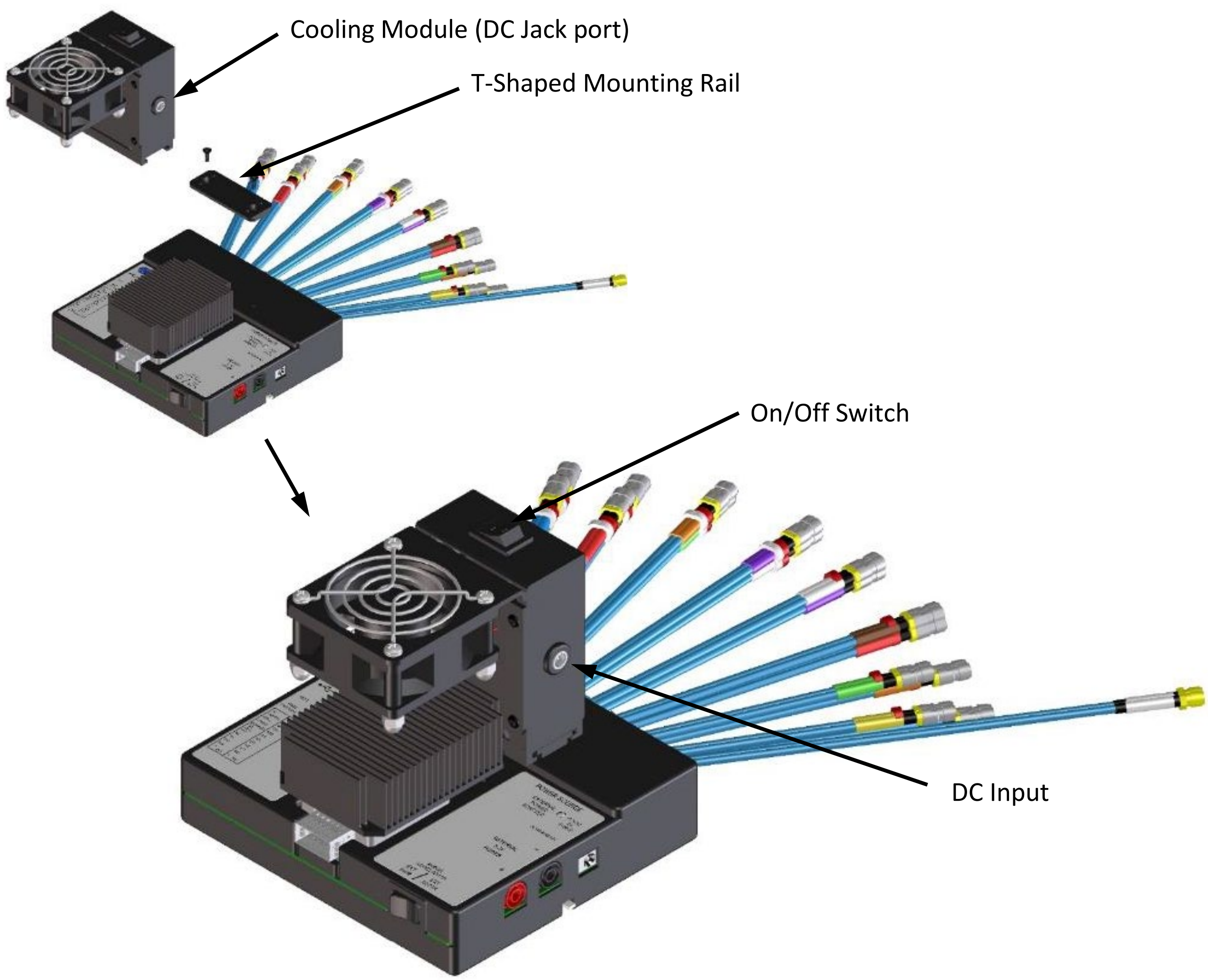

Figure 4. The QSFP-DD MCB (Receptacle) Test Adapter with Cooling Module

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Table 1. Cooling Module Recommended Use

This table lists the QSFP-DD module power classes and their effects on case temperature and MCB heatsink temperature. These temperatures were obtained through experimentation by Wilder Technologies. Case and heatsink temperatures with and without the Cooling Module are included in the table.

The Cooling Module is recommended at case temperatures greater than 70°C based on QSFP-DD MSA Standards[2]. The Cooling Module is also recommended at Heatsink temperatures greater than 60°C based on ASTM C1055 (*Standard Guide for Heated System Surface Conditions that Produce Contact Burn Injuries*)[3].

		Without Cooling Module		With Cooling Module		
Power Class	Max Power (W)	Case Temperature[1,2] (°C)	Heatsink Temperature[1,3] (°C)	Case Temperature[1,2] (°C)	Heatsink Temperature[1,3] (°C)	Cooling Module Recommended
1	1.5	29.72	28.11	N/A	N/A	No
2	3.5	37.96	34.56	N/A	N/A	No
3	7	52.38	45.84	N/A	N/A	Optional
4	8	56.5	49.07	N/A	N/A	Optional
5	10	64.74	55.51	N/A	N/A	Optional
6	12	72.98	61.96	34.55	25.62	Yes
7	14	81.22	68.41	45.57	25.92	Yes
8	>14	>81.22	>68.41	>45.57	>25.92	Yes
8	22.53	105.4	87.2	53.4	29.5	Yes

Based on measurements conducted by Wilder Technologies, the Cooling Module is recommended for use on the QSFP-DD MCB (Receptacle) when testing modules of Power Class 6 or greater. At these power classes, the case temperatures and heatsink temperatures of the QSFP-DD MCB exceed recommended limits (Per MSA and ASTM standards). Thus, the Cooling Module must be used to reduce temperatures to be within safe operating ranges.

[1] Temperatures interpolated from experimental data.
[2] "QSFP-DD/QSFP-DD800/QSFP112 Hardware Specification for QSFP Double Density 3X and QSFP 4X Pluggable Transceivers, Revision 6.01" QSFP-DD MSA.
[3] "Standard Guide for Heated System Surface Conditions that Produce Contact Burn Injuries (ASTM C1055-20)." American Society for Testing and Materials, Philadelphia, PA.

Product Inspection

Upon receiving QSFP-DD Test Adapters from Wilder Technologies, perform the following product inspection:

- Inspect the outer shipping container, foam-lined instrument case, and product for damage. Retain the outer cardboard shipping container until the contents of the shipment have been inspected for completeness and the product has been checked mechanically and electrically. Use the foam-lined instrument-case for secure storage of the Wilder Technologies QSFP-DD Test Adapter when not in use.

- Locate the shipping list and verify that all items ordered were received.

- In the unlikely event that the product is defective or incomplete, the “Limited Warranty” (see the Wilder web site) discusses how to contact Wilder Technologies for technical assistance and/or how to package the product for return.

The QSFP-DD Test Adapter Care and Handling Precautions

The QSFP-DD Test Adapters requires careful handling to avoid damage. Improper handling techniques, or using too small a cable bend radius, can damage the coaxial cable connections within the adapter housing or the cables themselves. This can occur at any point along the cable. To achieve optimum performance and to prolong the QSFP-DD TPA's life, observe the following handling precautions:

- **CAUTION 1: Avoid Torque Forces** (Twisting)
  Only the QSFP-DD MCB TPA has individual coaxial cables having some rotational freedom, twisting any QSFP-DD TPA as a unit, with one end held stationary, may damage, or severely degrade performance. Adherence to Caution 5 (below) helps to avoid twisting.

- **CAUTION 2: Avoid Sharp Cable Bends**
  Never bend coaxial cables into a radius of 26 mm (1-inch) or less. Never bend cables greater than 90°. Single or multiple cable bends must be kept within this limit. Bending the QSFP-DD TPA cables less than a 26mm (1-Inch) radius will permanently damage or severely degrade test adapter performance.

- **CAUTION 3: Avoid Cable Tension** (Pull Forces)
  Never apply tension (pull forces) to an individual coaxial cable that is greater than 2.3 kg (5 lbs.). To avoid applying tension, always place accessories and equipment on a surface that allows adjustment to eliminate tension on the QSFP-DD TPA and cables. Use adjustable elevation stands or apparatus to accurately place and support the QSFP-DD TPA.

- **CAUTION 4: Connect the QSFP-DD Test Adapter First**
  To prevent twisting, bending, or applying tension to the coaxial cables when connecting a QSFP-DD TPA, always attach the QSFP-DD TPA to the device under test (DUT) or cable under test before attaching any High-Speed connectors. Carefully align the QSFP-DD connectors and then gently push the connectors together until fully seated.

  If the QSFP-DD TPA must be turned or twisted to make connection to the DUT, avoid using the QSFP-DD TPA housing alone to make this occur. Try to distribute the torque forces along the length of the test setup and cabling. If this is not possible, it is recommended to first loosen or disconnect the High-Speed connections at the QSFP-DD TPA, make the connection to the DUT and then re-tighten or attach the test equipment leads.

NOTE: Only grip the test adapter housing when inserting or extracting the QSFP-DD TPA to or from the DUT. Pulling directly on the QSFP-DD TPA cables or using them to insert the QSFP-DD TPA may cause damage.

- **CAUTION 5: Carefully Make High-Speed (2.92mm, 2.4mm, 1.85mm) Connections**
  To connect the QSFP-DD TPA High-Speed connectors, follow these steps:

  1. Hold the cable stationary by grasping the cable at the black heat-shrink section near the connector.

  2. Insert the mating High-Speed connector barrel and hand-tighten the free-spinning nut onto the connector while avoiding pulling, bending, or twisting the QSFP-DD TPA coaxial cable.

  3. The QSFP-DD TPA High-Speed connectors have flats that accept an open-end 1/4-inch or 5/16-inch wrench, depending on configuration. When attaching instrument cables to the QSFP-DD TPA, it is recommended that the QSFP-DD TPA connectors be mechanically held and the test leads be tightened to the equipment manufacturer's torque recommendations, normally 5 in-lbs., using an open-end torque wrench.

     If the test set-up requires repositioning, first loosen, or disconnect the coax cable connections to avoid twisting, bending, or tension.

     NOTE: A drop in signal amplitude by half or 6dB during the testing of a channel may indicate that a cable has been mechanically pulled free of coaxial cable connections internal to the assembly. This could be determined by checking if the cable has any lateral play relative to the TPA. This would only occur when the TPA has exceeded the pull force as specified within the mechanical specification. If the cable cannot be re-seated or continues to fail, the test adapter will need to be sent back to the factory for service.

- **CAUTION 6: Independently Support Instrument Cables or Accessories**
  Excessive weight from instrument cables and/or accessories connected to the QSFP-DD TPA can cause damage or affect the test adapter performance. Be sure to provide appropriate means to support and stabilize all test set-up components.

- **CAUTION 7: ESD Sensitivity**
  The QSFP-DD test adapters are predominantly passive components and are not in themselves sensitive to electrostatic discharge. However, when an active DUT is installed, that device becomes susceptible to ESD. Observe proper ESD precautions, further discussed later in this document.

General Test Adapter, Cable, and Connector

Observing simple precautions can ensure accurate and reliable measurements.

Handling and Storage

Before each use of the QSFP-DD TPA, ensure that all connectors are clean. Handle all cables carefully and store the QSFP-DD TPA in the foam-lined instrument case when not in use, if possible. Do not set connectors contact end down. Install the coax connector protective end caps when the QSFP-DD TPA is not in use.

Visual Inspection

Be sure to inspect all cables carefully before making a connection. Inspect all cables for metal particles, scratches, deformed threads, dents, or bent, broken, or misaligned center conductors. Do not use damaged cables.

Cleaning

If necessary, clean the connectors using low-pressure (less than 60 PSI) compressed air or nitrogen with an effective oil-vapor filter and condensation trap. Clean the cable threads, if necessary, using a lint-free swab or cleaning cloth moistened with isopropyl alcohol. Always completely dry a connector before use. Do not use abrasives to clean the connectors. Re-inspect connectors, making sure no particles or residue remains.

Making Connections

Before making any connections, review the “Care and Handling Precautions**”** section. Follow these guidelines when making connections:

- Align cables carefully
- Make preliminary connection lightly
- To tighten, turn connector nut only
- Do not apply bending force to cable
- Do not over-tighten preliminary connections
- Do not twist or screw-in cables
- Use an appropriately sized torque wrench, and do not tighten past the “break” point of the torque wrench (normally 5-inch pounds)

Electrostatic Discharge Information

Protection against electrostatic discharge (ESD) is essential while connecting, inspecting, or cleaning the QSFP-DD TPA test adapter and connectors attached to a static-sensitive circuit (such as those found in test sets).

Electrostatic discharge can damage or destroy electronic components. Be sure to perform all work on electronic assemblies at a static-safe workstation, using two types of ESD protection:

- Conductive tablemat and wrist-strap combination
- Conductive floor-mat and heel-strap combination

When used together, both types provide a significant level of ESD protection. Used alone, the tablemat and wrist-strap combination provide adequate ESD protection. To ensure user safety, the static-safe accessories must provide at least 1 MΩ of isolation from ground. Acceptable ESD accessories may be purchased from a local supplier.

WARNING: These techniques for a static-safe workstation should not be used when working on circuitry with a voltage potential greater than 500 volts.

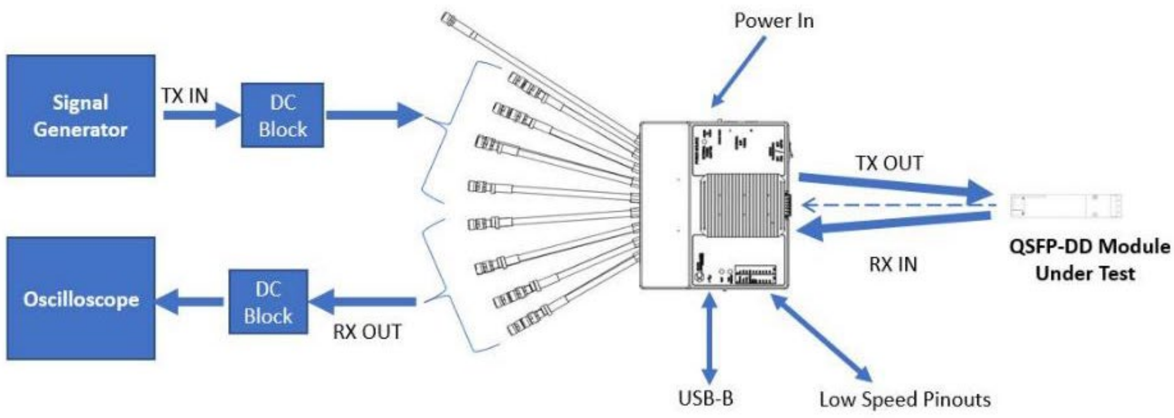
User Model

The QSFP-DD TPA's are capable of performing to the requirements of both MSA and IEEE 802.3ck standards, limited only by the specifications, environmental, care and handling of this document.

The two most common testing configurations are shown below.

QSFP-DD MCB

QSFPDD-TPAxxx-MCB-R is used to test a QSFP-DD Module:



*DC blocks are accessories and not provided with this product

Figure 5. QSFP-DD MCB User Model

In this configuration, the QSFPDD-MCB is used to test a QSFP-DD Module. The MCB must be powered by the 12V power supply provided.

The MCB receives input signals from a signal generator connected to its TX lines (indicated by TX IN). These signals are then transferred to the QSFP-DD module under test (indicated by TX OUT). The module responds with the RX IN signal, which is transferred through the MCB, and outputted to a connected oscilloscope through its RX lines.

*Note that between the Signal Generator and MCB and the MCB and Oscilloscope are DC Blocks which need to be separately obtained.

Closeup of MCB Interface and Functional Ports

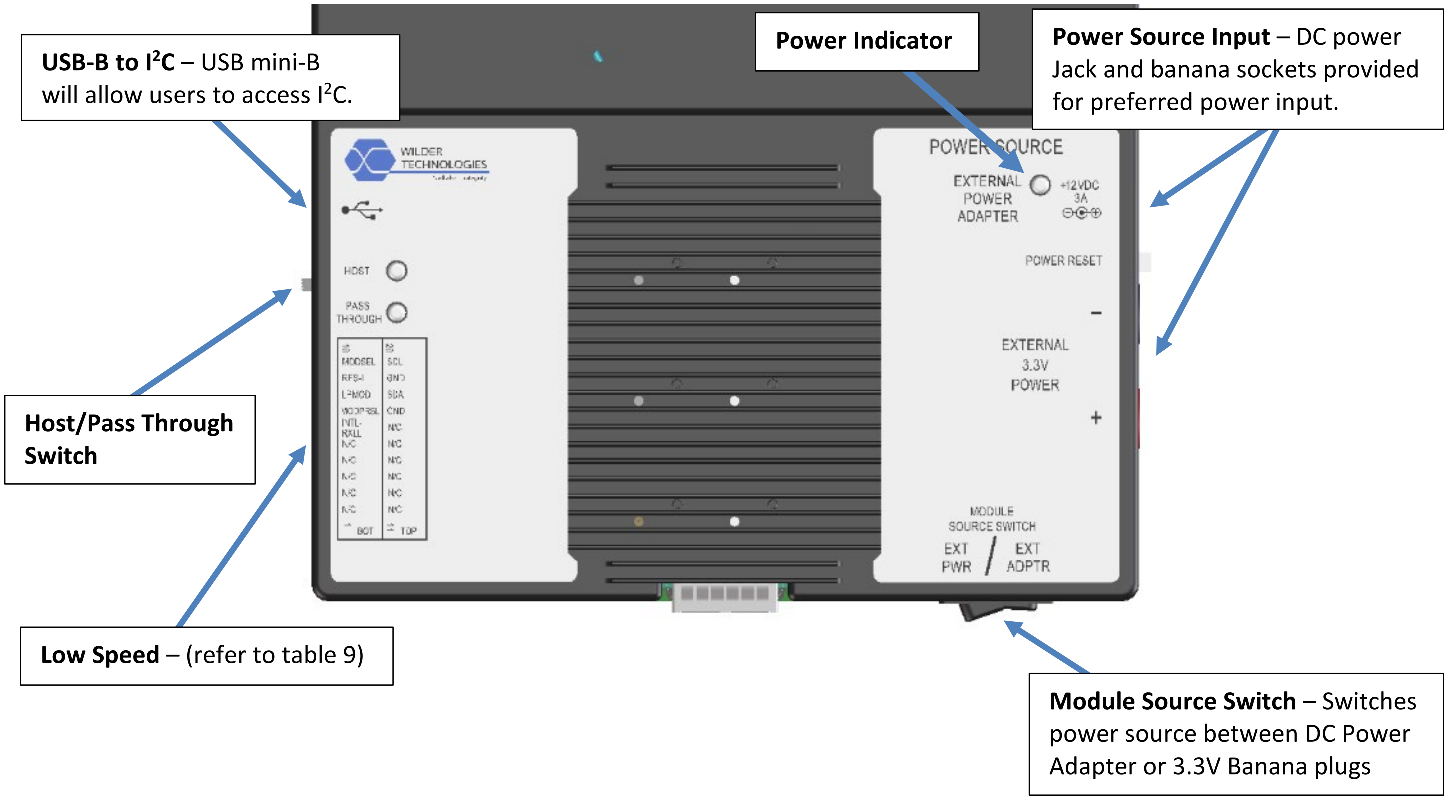


Figure 6. Closeup of QSFP-DD I/0's and External Functions

The **Module Source Switch** allows a user to select which power input supplies the 3.3V SFP-DD module VCC pins. With the switch in the **EXT PWR** position the module will take power from the **External 3.3V Power** connectors (banana jacks). With the switch in the **EXT ADPTR** position the module will take power from the **External Power Adapter** (+12VDC, 60-Watt Power Adapter). The 12V to 3.3V regulator can supply up to 8 amps to the module. Note: To run software applications, the external power adapter is required even when switched to **EXT PWR** mode.

The **Power Reset** circuit breaker will trip if power consumption exceeds 38W while in **EXT ADPTR** Mode. When tripped, a **Power Reset** button will pop out of the MCB casing. The **Power Reset** button must be pushed back into the MCB casing to allow power into the MCB once again.

Note: The user should provide an external current limiter, fuse, or breaker to prevent any possible short circuit damage while in **EXT PWR** mode. In EXT PWR mode, the MCB **Power Reset** circuit breaker will still trip if there is a short circuit within the MCB host emulation circuitry.

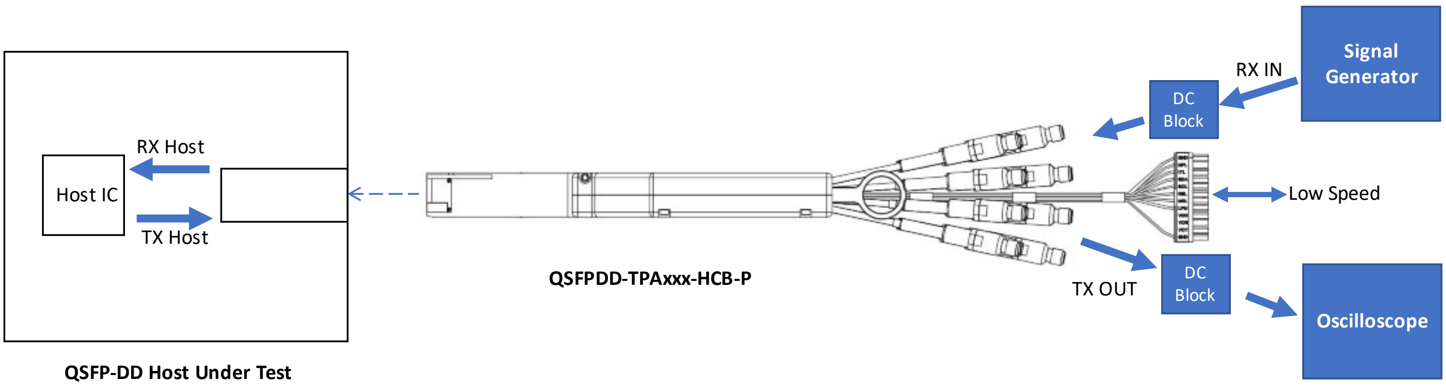
The **Host/Pass Through Switch** switches between a host emulation mode and a signal passthrough mode. In host emulation mode, the MCB can communicate with the Wilder Technologies CMIS GUI software that is running on an external PC. This allows the user to monitor and control the data registers of the system. In signal passthrough mode, the MCB will connect all low-speed signals to the low-speed header on the side of the MCB. This gives users access to all low-speed signals for their own monitoring and control. Note: CMIS GUI monitoring and control will be disabled in passthrough mode.

The **USB to I2C –** CMIS (Common Management Interface Specification) is a standardized way for manufacturers to define what data goes in registers based on Two Wire Interface. To access this information, use the Wilder Technologies CMIS GUI software. Installation and instructions are in the CMIS GUI user manual (970-0070-000). This manual is supplied with USB Flash Drive supplied with the QSFP-DD MCB product.

The **VCC Sense** SMA connectors (Cable interface at the rear of the unit) can be used to precisely monitor TX and RX supply voltages at QSFP-DD ECB located near the primary connector contact-lead pads.

QSFP-DD HCB

QSFPDD-TPAxxx-HCB-P is used to test a QSFP-DD Host:



*DC Blocks are accessories and are not provided with this product

Figure 7. QSFP-DD HCB User Model

In this configuration, the QSFP-DD HCB is used to test a QSFP-DD Host.

An RX signal, inputted from a connected Signal Generator, is transferred through the HCB RX lines into the QSFP-DD host under test. The Host responds by outputting TX signals which are transferred through the HCB, out through its TX lines into a connected Oscilloscope for measurement.

*Note that between the Signal Generator and MCB and the MCB and Oscilloscope are DC Blocks which need to be separately obtained.

Note: In the case where the laboratory source or load is not used in the test, each unused signal line must be replaced with RF Terminators. Not provided with this product.

Channel De-Embedding

The QSFP-DD TX and RX channels are fully passive. Therefore, calibration compensating for the losses must occur within the test instrumentation that drives the QSFP-DD Receivers or looks at the response of the QSFP-DD Transmitters.

The QSFP-DD TPA's have Touchstone S4P files for de-embedding the electrical length and losses within the TPA up to the QSFP-DD connector interface pads. (Contact Wilder Technologies, support@wilder-tech.com, to obtain a copy of the S4P files.) The Touchstone S4P files enable the test engineer to compensate for the last four of the following six repeatable, systematic errors that occur when moving the reference plane:

- Signal leakage effects: *Directivity errors*
- Signal leakage effects: *Crosstalk errors*
- Reflection effects: *Source Impedance Mismatching errors*
- Reflection effects: *Load Impedance Mismatching errors*
- Bandwidth effects: *Receiver Transmission in Test Equipment errors*
- Bandwidth effects: *Receiver Reflection-tracking in Test Equipment errors*

These errors are corrected on each port. Refer to the Instrument Manual for instructions on the instrument's specific de-embedding process.

NOTE: The reference plane is the boundary, both physically and electrically, between the calibrated and uncalibrated portions of the circuit. Everything outside the reference plane is considered part of the DUT. Any instrument that does not use calibration or de-embedding of the test fixture defines the DUT as the total of externally connected components. If the de-embedding file is not used, all of the QSFP-DD TPA and associated coaxial cables, as well as cables connecting the TPA assembly to the test instrument, would be a part of the DUT.

Non-repeatable errors, such as drift or random errors, can be reduced but not corrected. Drift errors aggregate over time or with environmental changes such as temperature shift. To eliminate drift errors, perform an instrumentation-level calibration.

A random error cannot be corrected through calibration since the error occurred randomly. Random errors are typically associated with either test instrument noise or test repeatability problems. Reduce test instrument noise by increasing source power, lowering the IF bandwidth, or averaging results over multiple sweeps. Reduce test repeatability problems through the use of a torque wrench or, again, by averaging over multiple sweeps.

Mechanical and Environmental Specifications

NOTE: All specifications in this manual are subject to change.

Table 2. General Specifications

ITEM	DESCRIPTION
Usage Environment	Controlled indoor environment
HCB (Plug) Test Adapter Length (w/2.92mm coax)	294.85 mm +/- 2 mm (11.61 inches +/- .08 inches) (Characteristic)m
MCB (Receptacle) Test Adapter Length (w/2.92mm coax)	289.56 mm +/- 2 mm (11.40 inches +/- .08 inches) (Characteristic)
Receptacle Test Adapter Housing Dimensions	134.62 x 151.13 x 67.56 (5.30 x 5.95 x 2.66 inches) (L, W, H)
Operating Temperature	0°C to +70°C (32°F to +158°F) (Characteristic)
Storage Temperature	-40°C to +70°C (-40°F to +158°F) (Characteristic)

QSFPDD-TPAxxx-HCB-P (8-Channel)

The QSFPDD-TPAxxx-HCB-P (Plug) test adapter provides thirty-two 2.92mm, 2.4mm or 1.85mm (High-Speed) connectors (eight lanes of primary differential signals). Color coded heat shrink labels mark each cable or connector. The following figure refers to the pin-description tables for the QSFPDD-TPAxxx-HCB-P (Plug) test adapter.

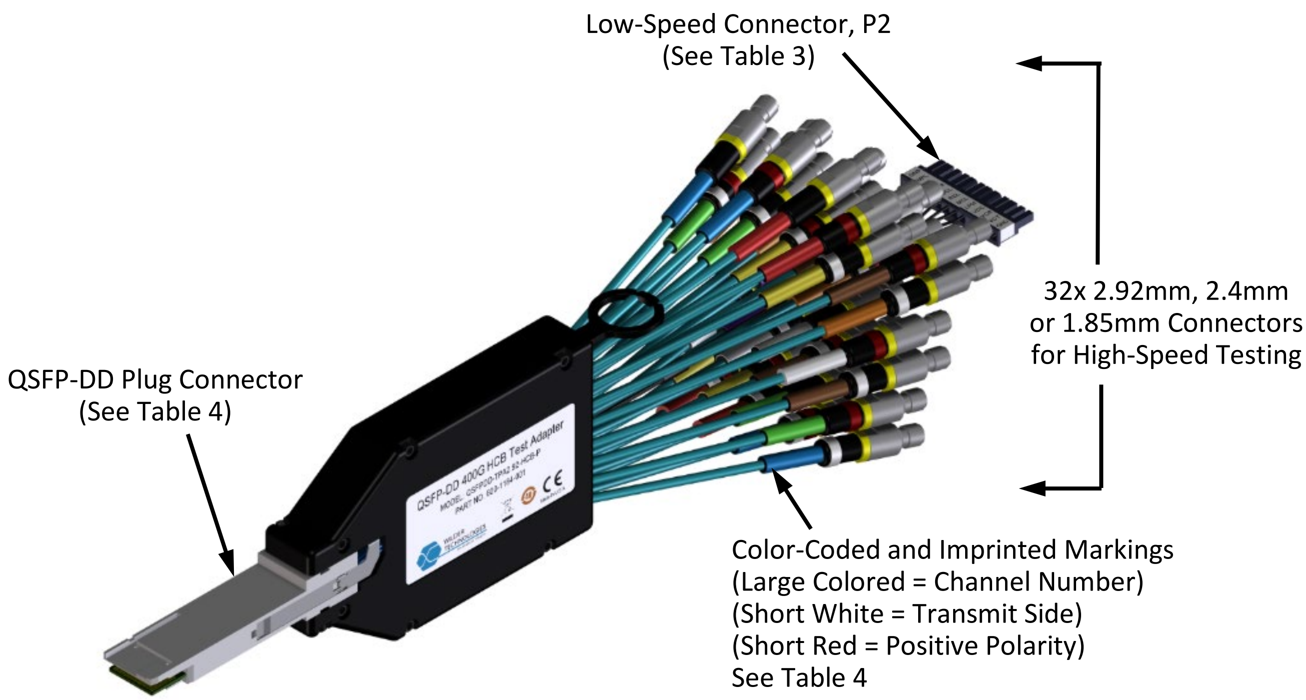


Figure 8. Cable Connectors (QSFPDD-TPA2.92-HCB-P shown). (Note: The coaxial cables are configuration dependent and may be terminated with different connectors and have different color-coding than what is shown.)

Table 3. QSFPDD-TPAxxx-HCB-P (Plug) 12-Position Cable Connector (Low-Speed).

LABEL	PIN NO.	COLOR ID FOR HCB	DESCRIPTION
GND	Pin 1	Black	Signal (RF Ground) and Supply (Power) Common
MPL	Pin 2	Black	Module Present
ITL	Pin 3	Black	Interrupt
SDA	Pin 4	Black	SDA, I^2C Data for DDC
SCL	Pin 5	Black	SCL, I^2C Clock for DDC
RSL	Pin 6	Black	Module Reset
MSL	Pin 7	Black	Module Select
LPM	Pin 8	Black	Low Power Mode
VCC	Pin 9	Not Present	Vcc1 module power supply (+3.3V)
VCR	Pin 10	Not Present	VccR, module receiver power supply (+3.3V)
VCT	Pin 11	Not Present	VccT, module transmitter power supply (+3.3V)
GND	Pin 12	Black	Signal (RF Ground) and Supply (Power) Common

Table 4. QSFPDD-TPAxxx-HCB -P (Plug) Pin Assignments

Pin Description	Connector Pin Number	Destination (HCB)	Color ID for Data Line Polarity	Color Identification (HCB)	
Ground	1	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx2n	2	Tx2-	Black	White/Blue	
Tx2p	3	Tx2+	Red	White/Blue	
Ground	4	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx4n	5	Tx4-	Black	White/Red	
Tx4p	6	Tx4+	Red	White/Red	
Ground	7	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
MSL	8	P2 Pin 7	N/A	Black Insulation	
RSL	9	P2 Pin 6	N/A	Black Insulation	
VccR	10	Not Presently/Connected	N/A	Not Presently/Connected	N/A
SCL	11	P2 Pin 5	N/A	Black Insulation	
SDA	12	P2 Pin 4	N/A	Black Insulation	
Ground	13	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx3p	14	Rx3+	Red	Green	
Rx3n	15	Rx3-	Black	Green	
Ground	16	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx1p	17	Rx1+	Red	Yellow	
Rx1n	18	Rx1-	Black	Yellow	
Ground	19	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Ground	20	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx2n	21	Rx2-	Black	Blue	
Rx2p	22	Rx2+	Red	Blue	
Ground	23	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx4n	24	Rx4-	Black	Red	
Rx4p	25	Rx4+	Red	Red	
Ground	26	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
MPL	27	P2 Pin 2	N/A	Black Insulation	

ITL	28	P2 Pin 3	N/A	Black Insulation	
VccT	29	Not Presently/Connected	N/A	Not Present/Connected	N/A
Vcc1	30	Not Presently/Connected	N/A	Not Presently/Connected	N/A
LPM	31	P2 Pin 8	N/A	Black Insulation	
Ground	32	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx3p	33	Tx3+	Red	White/Green	
Tx3n	34	Tx3-	Black	White/Green	
Ground	35	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx1p	36	Tx1+	Red	White/Yellow	
Tx1n	37	Tx1-	Black	White/Yellow	
Ground	38	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Ground	39	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx6n	40	Tx6-	Black	White/Brown	
Tx6p	41	Tx6+	Red	White/Brown	
Ground	42	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx8n	43	Tx8-	Black	White/White	
Tx8p	44	Tx8+	Red	White/White	
Ground	45	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Reserved	46	Not Present/Connected	N/A	Not Presently/Connected	N/A
VS1	47	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VccRx1	48	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS2	49	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS3	50	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Ground	51	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx7p	52	Rx7+	Red	Violet	
Rx7n	53	Rx7-	Black	Violet	
Ground	54	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	

Rx5p	55	Rx5+	Red	Orange	
Rx5n	56	Rx5-	Black	Orange	
Ground	57	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Ground	58	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx6n	59	Rx6-	Black	Brown	
Rx6p	60	Rx6+	Red	Brown	
Ground	61	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx8n	62	Rx8-	Black	White	
Rx8p	63	Rx8+	Red	White	
Ground	64	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
NC	65	Not Presently/Connected	N/A	Not Present/Connected	N/A
Reserved	66	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VccTx1	67	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Vcc2	68	Not Presently/Connected	N/A	Not Presently/Connected	N/A
ePPS	69	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Ground	70	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx7p	71	Tx7+	Red	White/Violet	
Tx7n	72	Tx7-	Black	White/Violet	
Ground	73	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx5p	74	Tx5+	Red	White/Orange	
Tx5n	75	Tx5-	Black	White/Orange	
Ground	76	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	

QSFPDD-TPAxxx-HCB-P (Half-Channel)

Each of the four configurations of Plug-Type QSFPDD-TPAxxx-HCB-P test adapters (Legacy, DD, Rx and Tx) provide sixteen high-speed (2.92mm, 2.4mm, 1.85mm) connectors (four lanes of primary differential signals). Color coded labels mark each cable or connector. The following figure refers to the pin-description tables for the QSFPDD-TPAxxx-HCB-P test adapters.

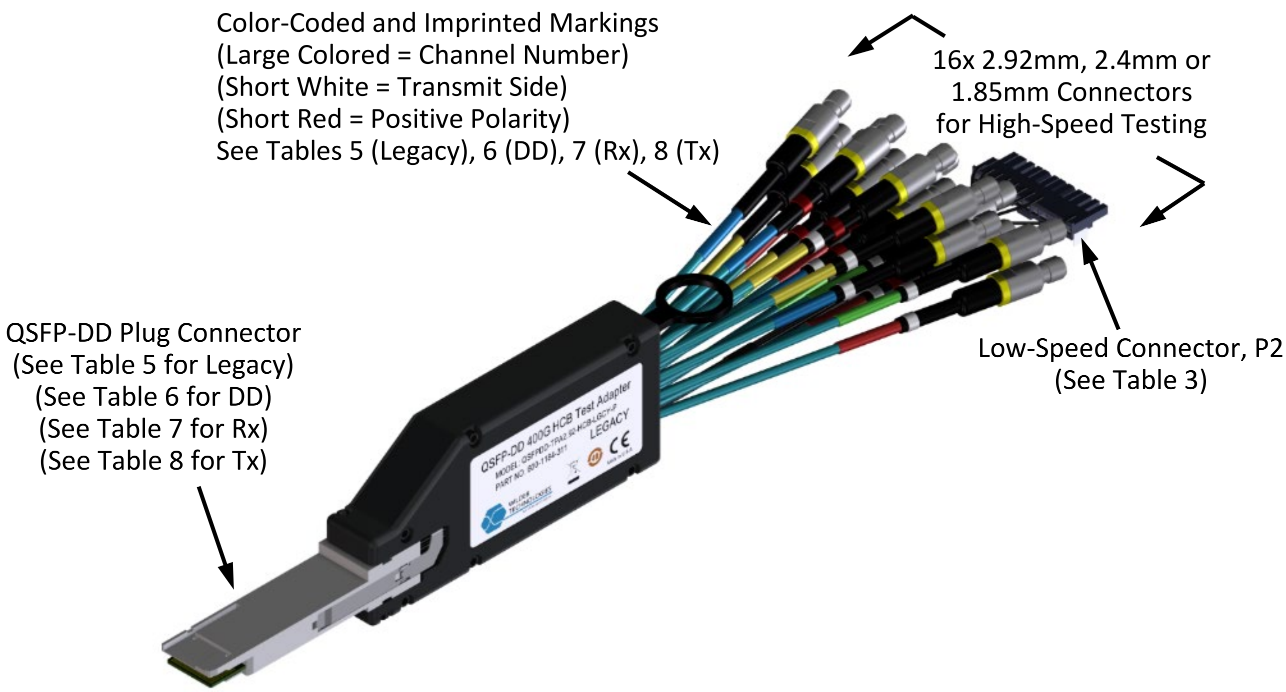


Figure 9. Cable Connectors (QSFPDD-TPA-HCB-P LEGACY shown). (Note: The coaxial cables are configuration dependent and may be terminated with different connectors and have different color-coding than what is shown.)

Table 5. QSFPDD-TPAxxx-HCB-LGCY-P (Legacy Plug) Pin Assignments

Pin Description	Connector Pin Number	Destination (HCB)	Color ID for Data Line Polarity	Color Identification (HCB)	
Ground	1	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx2n	2	Tx2-	Black	White/Blue	
Tx2p	3	Tx2+	Red	White/Blue	
Ground	4	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx4n	5	Tx4-	Black	White/Red	
Tx4p	6	Tx4+	Red	White/Red	
Ground	7	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
MSL	8	P2 Pin 7	N/A	Black Insulation	
RSL	9	P2 Pin 6	N/A	Black Insulation	
VccR	10	Not Presently/Connected	N/A	Not Presently/Connected	N/A
SCL	11	P2 Pin 5	N/A	Black Insulation	
SDA	12	P2 Pin 4	N/A	Black Insulation	
Ground	13	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx3p	14	Rx3+	Red	Green	
Rx3n	15	Rx3-	Black	Green	
Ground	16	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx1p	17	Rx1+	Red	Yellow	
Rx1n	18	Rx1-	Black	Yellow	
Ground	19	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Ground	20	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx2n	21	Rx2-	Black	Blue	
Rx2p	22	Rx2+	Red	Blue	
Ground	23	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx4n	24	Rx4-	Black	Red	
Rx4p	25	Rx4+	Red	Red	
Ground	26	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
MPL	27	P2 Pin 2	N/A	Black Insulation	

ITL	28	P2 Pin 3	N/A	Black Insulation	
VccT	29	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Vcc1	30	Not Presently/Connected	N/A	Not Presently/Connected	N/A
LPM	31	P2 Pin 8	N/A	Black Insulation	
Ground	32	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx3p	33	Tx3+	Red	White/Green	
Tx3n	34	Tx3-	Black	White/Green	
Ground	35	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx1p	36	Tx1+	Red	White/Yellow	
Tx1n	37	Tx1-	Black	White/Yellow	
Ground	38	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	

Table 6. QSFPDD-TPAxxx-HCB-DD-P (DD Plug) Pin Assignments

Pin Description	Connector Pin Number	Destination (HCB)	Color ID for Data Line Polarity	Color Identification (HCB)	
MSL	8	P2 Pin 7	N/A	Black Insulation	
RSL	9	P2 Pin 6	N/A	Black Insulation	
VccR	10	Not Presently/Connected	N/A	Not Presently/Connected	N/A
SCL	11	P2 Pin 5	N/A	Black Insulation	
SDA	12	P2 Pin 4	N/A	Black Insulation	
MPL	27	P2 Pin 2	N/A	Black Insulation	
ITL	28	P2 Pin 3	N/A	Black Insulation	
VccT	29	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Vcc1	30	Not Presently/Connected	N/A	Not Presently/Connected	N/A
LPM	31	P2 Pin 8	N/A	Black Insulation	
Ground	39	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx6n	40	Tx6-	Black	White/Brown	
Tx6p	41	Tx6+	Red	White/Brown	
Ground	42	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx8n	43	Tx8-	Black	White/White	
Tx8p	44	Tx8+	Red	White/White	
Ground	45	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Reserved	46	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS1	47	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VccRx1	48	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS2	49	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS3	50	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Ground	51	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx7p	52	Rx7+	Red	Violet	
Rx7n	53	Rx7-	Black	Violet	
Ground	54	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	

Rx5p	55	Rx5+	Red	Orange	
Rx5n	56	Rx5-	Black	Orange	
Ground	57	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Ground	58	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx6n	59	Rx6-	Black	Brown	
Rx6p	60	Rx6+	Red	Brown	
Ground	61	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx8n	62	Rx8-	Black	White	
Rx8p	63	Rx8+	Red	White	
Ground	64	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
NC	65	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Reserved	66	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VccTx1	67	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Vcc2	68	Not Presently/Connected	N/A	Not Presently/Connected	N/A
ePPS	69	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Ground	70	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx7p	71	Tx7+	Red	White/Violet	
Tx7n	72	Tx7-	Black	White/Violet	
Ground	73	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx5p	74	Tx5+	Red	White/Orange	
Tx5n	75	Tx5-	Black	White/Orange	
Ground	76	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	

Table 7. QSFPDD-TPAxxx-HCB-RX-P (Rx Plug) Pin Assignments

Pin Description	Connector Pin Number	Destination (HCB)	Color ID for Data Line Polarity	Color Identification (HCB)	
MSL	8	P2 Pin 7	N/A	Black Insulation	
RSL	9	P2 Pin 6	N/A	Black Insulation	
VccR	10	Not Presently/Connected	N/A	Not Presently/Connected	N/A
SCL	11	P2 Pin 5	N/A	Black Insulation	
SDA	12	P2 Pin 4	N/A	Black Insulation	
Ground	13	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx3p	14	Rx3+	Red	Green	
Rx3n	15	Rx3-	Black	Green	
Ground	16	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx1p	17	Rx1+	Red	Yellow	
Rx1n	18	Rx1-	Black	Yellow	
Ground	19	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Ground	20	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx2n	21	Rx2-	Black	Blue	
Rx2p	22	Rx2+	Red	Blue	
Ground	23	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx4n	24	Rx4-	Black	Red	
Rx4p	25	Rx4+	Red	Red	
Ground	26	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
MPL	27	P2 Pin 2	N/A	Black Insulation	
ITL	28	P2 Pin 3	N/A	Black Insulation	
VccT	29	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Vcc1	30	Not Presently/Connected	N/A	Not Presently/Connected	N/A
LPM	31	P2 Pin 8	N/A	Black Insulation	
Reserved	46	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS1	47	Not Presently/Connected	N/A	Not Presently/Connected	N/A

VccRx1	48	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS2	49	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS3	50	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Ground	51	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx7p	52	Rx7+	Red	Violet	
Rx7n	53	Rx7-	Black	Violet	
Ground	54	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx5p	55	Rx5+	Red	Orange	
Rx5n	56	Rx5-	Black	Orange	
Ground	57	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Ground	58	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx6n	59	Rx6-	Black	Brown	
Rx6p	60	Rx6+	Red	Brown	
Ground	61	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx8n	62	Rx8-	Black	White	
Rx8p	63	Rx8+	Red	White	
Ground	64	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
NC	65	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Reserved	66	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VccTx1	67	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Vcc2	68	Not Presently/Connected	N/A	Not Presently/Connected	N/A
ePPS	69	Not Presently/Connected	N/A	Not Presently/Connected	N/A

Table 8. QSFPDD-TPAxxx-HCB-TX-P (Tx Plug) Pin Assignments

Pin Description	Connector Pin Number	Destination (HCB)	Color ID for Data Line Polarity	Color Identification (HCB)	
Ground	1	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx2n	2	Tx2-	Black	White/Blue	
Tx2p	3	Tx2+	Red	White/Blue	
Ground	4	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx4n	5	Tx4-	Black	White/Red	
Tx4p	6	Tx4+	Red	White/Red	
Ground	7	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
MSL	8	P2 Pin 7	N/A	Black Insulation	
RSL	9	P2 Pin 6	N/A	Black Insulation	
VccR	10	Not Presently/Connected	N/A	Not Presently/Connected	N/A
SCL	11	P2 Pin 5	N/A	Black Insulation	
SDA	12	P2 Pin 4	N/A	Black Insulation	
MPL	27	P2 Pin 2	N/A	Black Insulation	
ITL	28	P2 Pin 3	N/A	Black Insulation	
VccT	29	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Vcc1	30	Not Presently/Connected	N/A	Not Presently/Connected	N/A
LPM	31	P2 Pin 8	N/A	Black Insulation	
Ground	32	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx3p	33	Tx3+	Red	White/Green	
Tx3n	34	Tx3-	Black	White/Green	
Ground	35	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx1p	36	Tx1+	Red	White/Yellow	
Tx1n	37	Tx1-	Black	White/Yellow	
Ground	38	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Ground	39	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	

Tx6n	40	Tx6-	Black	White/Brown	
Tx6p	41	Tx6+	Red	White/Brown	
Ground	42	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx8n	43	Tx8-	Black	White/White	
Tx8p	44	Tx8+	Red	White/White	
Ground	45	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Reserved	46	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS1	47	Not Present/Connected	N/A	Not Presently/Connected	N/A
VccRx1	48	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS2	49	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VS3	50	Not Presently/Connected	N/A	Not Presently/Connected	N/A
NC	65	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Reserved	66	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VccTx1	67	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Vcc2	68	Not Presently/Connected	N/A	Not Presently/Connected	N/A
ePPS	69	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Ground	70	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx7p	71	Tx7+	Red	White/Violet	
Tx7n	72	Tx7-	Black	White/Violet	
Ground	73	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Tx5p	74	Tx5+	Red	White/Orange	
Tx5n	75	Tx5-	Black	White/Orange	
Ground	76	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	

QSFPDD-TPAxxx-MCB-R (Receptacle) Cable Pin-out

The QSFPDD-TPAxxx-MCB-R test adapter (Legacy, DD, Rx and Tx) provides thirty-two 2.92mm, 2.4mm or 1.85mm (High-Speed) connectors (eight lanes of primary differential signals) to access all QSFP-DD high-speed signals (Legacy, DD, Rx and Tx). Color coded labels mark each cable or connector. The following figure refers to the pin-description tables for the QSFPDD-TPAxxx-MCB-R (Receptacle) test adapter.

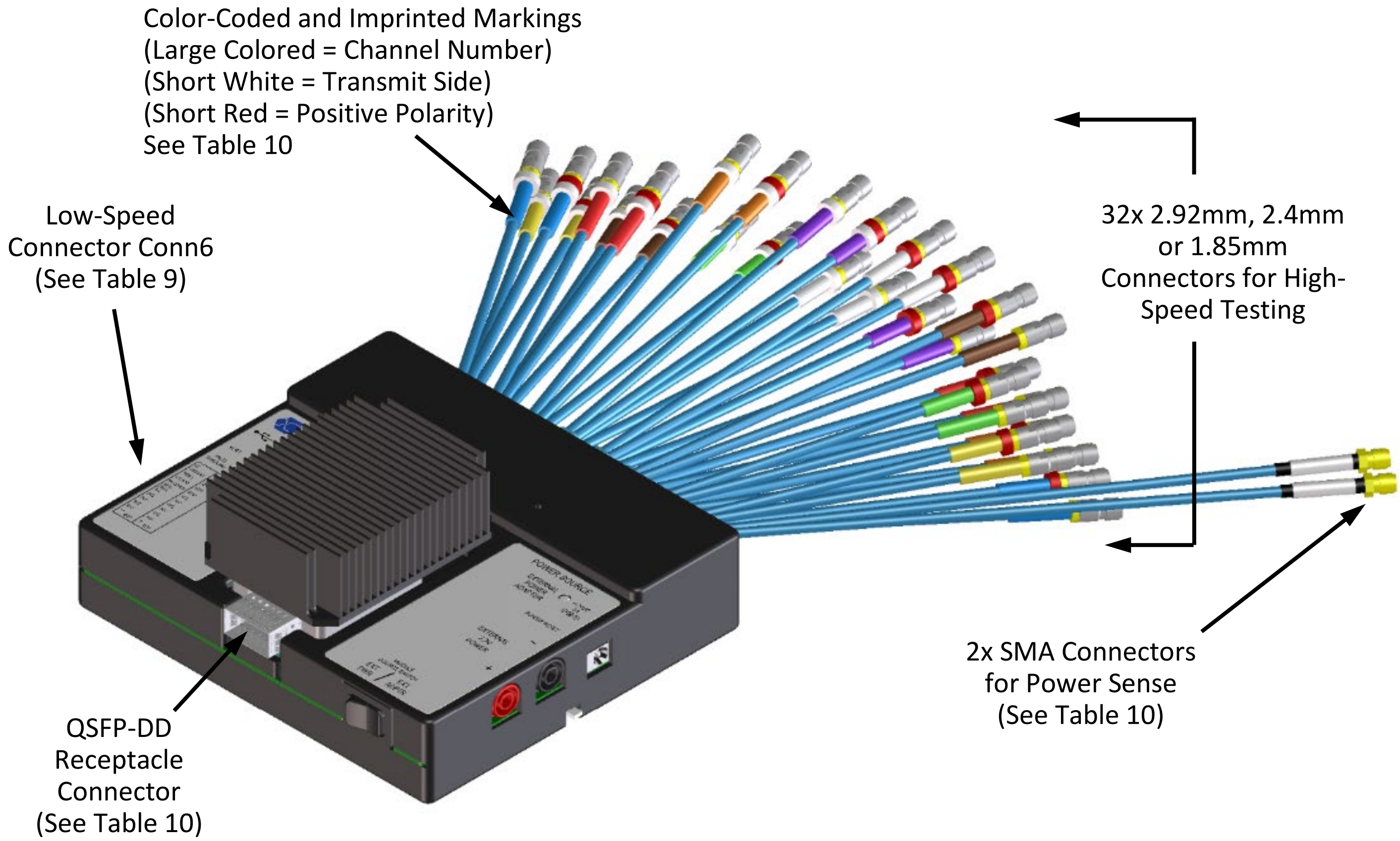


Figure 10. Cable Connectors (QSFPDD-TPA2.92-MCB-R shown). (Note: The coaxial cables are configuration dependent and may be terminated with different connectors than what is shown.)

Table 9. QSFPDD-TPAxxx-MCB-R Conn6 20-Position Fixture-Mounted Connector (Low-Speed)

LABEL	PIN NO.	DESCRIPTION
N/C	Pin 1	No Connection
N/C	Pin 2	No Connection
N/C	Pin 3	No Connection
N/C	Pin 4	No Connection
N/C	Pin 5	No Connection
INTL-RXLL	Pin 6	Interrupt
MODPRSL	Pin 7	Module Present
LPMOD/TxDis	Pin 8	Low Power Mode Optional TX Disable
RESET-L	Pin 9	Module Reset
MODSEL	Pin 10	Module Select
N/C	Pin 11	No Connection
N/C	Pin 12	No Connection
N/C	Pin 13	No Connection
N/C	Pin 14	No Connection
N/C	Pin 15	No Connection
N/C	Pin 16	No Connection
GND	Pin 17	Signal (RF Ground) and Supply (Power) Common
SDA	Pin 18	SDA, I^2C Data for DDC
GND	Pin 19	Signal (RF Ground) and Supply (Power) Common
SCL	Pin 20	SCL, I^2C Clock for DDC

Table 10. QSFPDD-TPAxxx-MCB-R (Receptacle) Pin Assignments

Pin Description	Connector Pin Number	Destination (MCB)	Color ID for Data Line Polarity	Color Identification (MCB)
Ground	1	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation
Tx2n	2	Tx2-	Black	White/Blue
Tx2p	3	Tx2+	Red	White/Blue
Ground	4	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation
Tx4n	5	Tx4-	Black	White/Red
Tx4p	6	Tx4+	Red	White/Red
Ground	7	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation
ModSelL	8	Low-Speed Conn6 Pin 8 (MODSEL)	N/A	Black Insulation
ResetL	9	Low-Speed Conn6 Pin 9 (RESETL)	N/A	Black Insulation
VccR	10	Int/Ext Supply SMA (VCCR Sense)	N/A	White
SCL	11	Low-Speed Conn6 Pin 20 (SCL)	N/A	Black Insulation
SDA	12	Low-Speed Conn6 Pin 18 (SDA)	N/A	Black Insulation
Ground	13	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation
Rx3p	14	Rx3+	Red	Green
Rx3n	15	Rx3-	Black	Green
Ground	16	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation
Rx1p	17	Rx1+	Red	Yellow
Rx1n	18	Rx1-	Black	Yellow
Ground	19	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation
Ground	20	Coax Shield and Conn 1 Pin 17,19	N/A	Black Insulation
Rx2n	21	Rx2-	Black	Blue
Rx2p	22	Rx2+	Red	Blue
Ground	23	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation
Rx4n	24	Rx4-	Black	Red
Rx4p	25	Rx4+	Red	Red
Ground	26	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation
ModPrsL	27	Low-Speed Conn6 Pin 7 (MODPRSL)	N/A	Black Insulation

IntL/RxLOS	28	Low-Speed Conn 6 Pin 6 (INTL)	N/A	Black Insulation	
VccT	29	Int/Ext Supply Fltr SMA (VCCT Sense)	N/A	White	
Vcc1	30	Int/Ext Supply (Filtered)	N/A	N/A	N/A
LPMode/TxDis	31	Low-Speed Conn6 Pin 8 (LPMODE)	N/A	Black Insulation	
Ground	32	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
Tx3p	33	Tx3+	Red	White/Green	
Tx3n	34	Tx3-	Black	White/Green	
Ground	35	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
Tx1p	36	Tx1+	Red	White/Yellow	
Tx1n	37	Tx1-	Black	White/Yellow	
Ground	38	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
Ground	39	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
Tx6n	40	Tx6-	Black	White/Brown	
Tx6p	41	Tx6+	Red	White/Brown	
Ground	42	Coax Shield and Conn 1 Pin 17,19	N/A	Black Insulation	
Tx8n	43	Tx8-	Black	White/White	
Tx8p	44	Tx8+	Red	White/White	
Ground	45	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
P/VS4	46	Not Presently/Connected	N/A	Not Presently/Connected	N/A
P/VS1	47	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VccRx1	48	Int/Ext Supply SMA (VCCR Sense)	N/A	White	
P/VS2	49	Not Presently/Connected	N/A	Not Presently/Connected	N/A
P/VS3	50	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Ground	51	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
Rx7p	52	Rx7+	Red	Violet	
Rx7n	53	Rx7-	Black	Violet	
Ground	54	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
Rx5p	55	Rx5+	Red	Orange	
Rx5n	56	Rx5-	Black	Orange	

Ground	57	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
Ground	58	Coax Shield and P2 Pin 1, 12	N/A	Black Insulation	
Rx6n	59	Rx6-	Black	Brown	
Rx6p	60	Rx6+	Red	Brown	
Ground	61	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
Rx8n	62	Rx8-	Black	White	
Rx8p	63	Rx8+	Red	White	
Ground	64	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
NC	65	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Reserved	66	Not Presently/Connected	N/A	Not Presently/Connected	N/A
VccTx1	67	Int/Ext Supply Filtr SMA (VCCT Sense)	N/A	White	
Vcc2	68	Int/Ext Supply (Filtered)	N/A	N/A	N/A
ePPS/Clock	69	Not Presently/Connected	N/A	Not Presently/Connected	N/A
Ground	70	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
Tx7p	71	Tx7+	Red	White/Violet	
Tx7n	72	Tx7-	Black	White/Violet	
Ground	73	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	
Tx5p	74	Tx5+	Red	White/Orange	
Tx5n	75	Tx5-	Black	White/Orange	
Ground	76	Coax Shield and Conn 6 Pin 17,19	N/A	Black Insulation	

Electrical Responses

Documented in the following pages are the electrical responses of the Wilder 800G QSFPDD TPAs. HCB loss, MCB loss, MTF response and ICN data is shown.

Wilder 800G QSFP-DD HCB Response

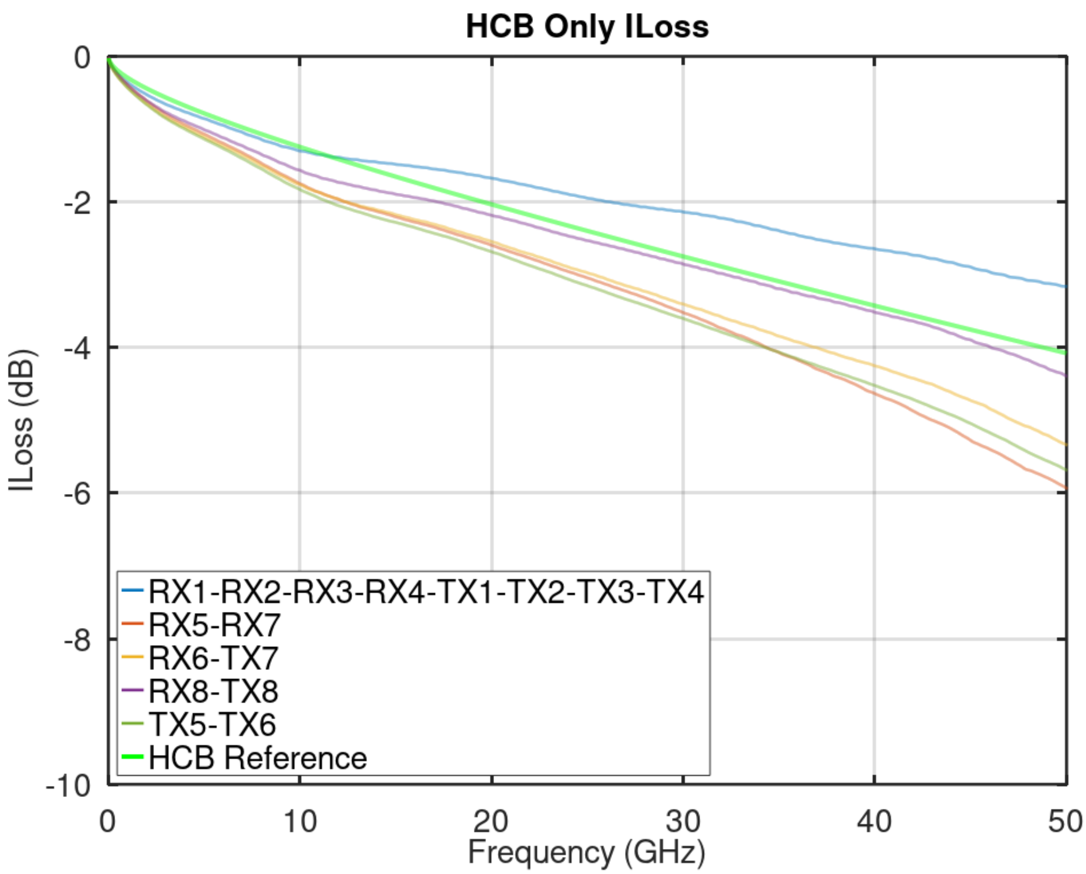


Figure 11. Plot of QSFP-DD HCB Insertion Loss

The loss of the HCB up to but excluding the connector and its associated PCB pads is plotted in Figure 11. The loss at 28GHz is in table below. Note that the IEEE 802.3ck specification states that the difference between reference and true HCB response should be accounted for in the measurement.

Table 11. HCB Insertion Loss @ 28GHz

Channel Group	ILoss at 28GHz (dB)
All Legacy	-2.07
RX5, RX7	-3.32
RX6, TX7	-3.23
RX8, TX8	-2.72
TX5, TX6	-3.42

Wilder 800G QSFP-DD MCB Response

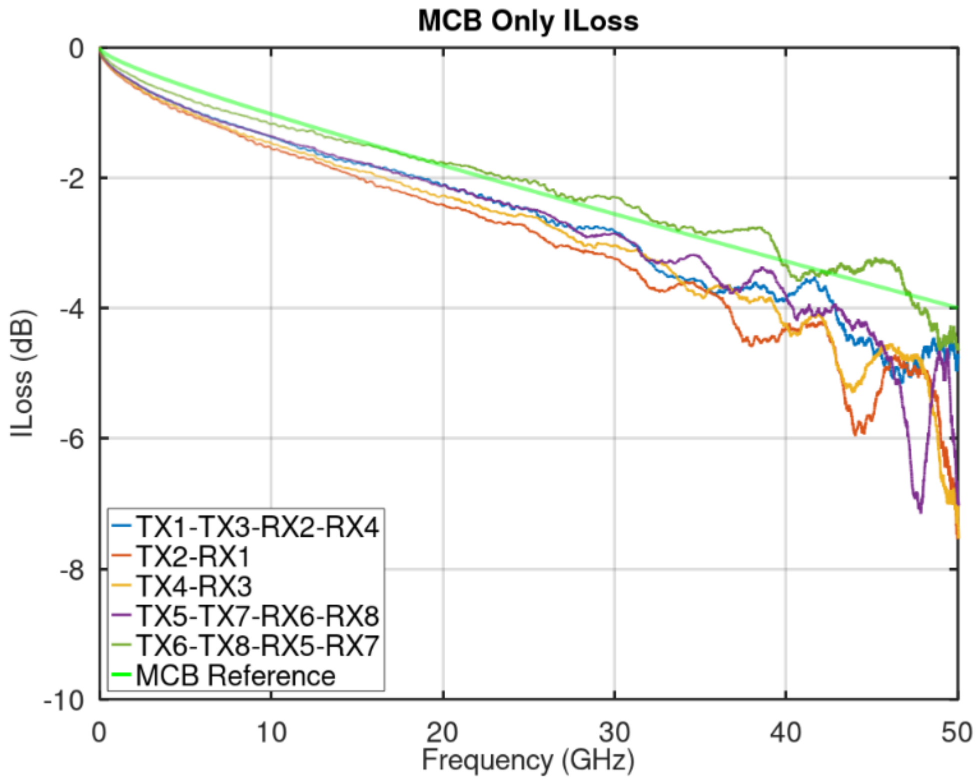


Figure 12. Plot of QSFP-DD MCB Insertion Loss

The loss of the MCB up to but excluding the connector and its associated PCB pads is plotted in Figure 12. The loss at 28GHz is in table below. Note that the IEEE 802.3ck specification states that the difference between reference and MCB response should be accounted for in the measurement.

Table 12. MCB Insertion Loss @ 28GHz

Channel Group	ILoss at 28GHz (dB)
TX1,TX3,RX2,RX4	-2.771033
TX2,RX1	-3.118171
TX4,RX3	-2.993397
TX5,TX7,RX6,RX8	-2.859757
TX6,TX8,RX5,RX7	-2.327752

Wilder 800G QSFP-DD Typical MTF Response

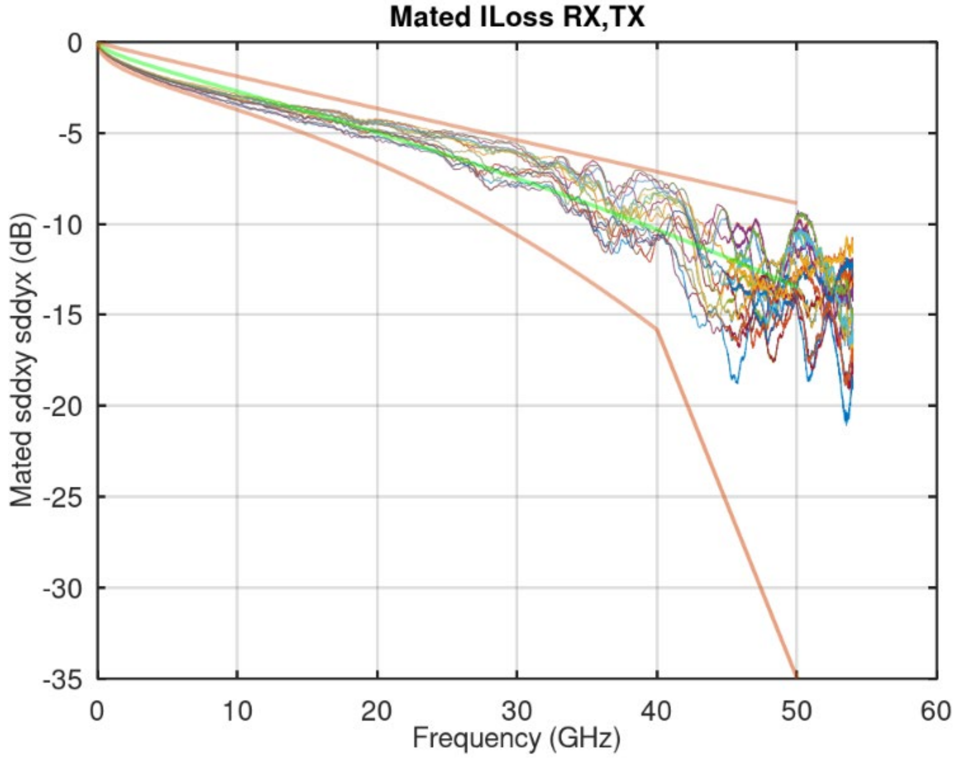


Figure 13. Plot of QSFP-DD Mated Test Fixture Response with 802.3ck limits

MTF ILoss is plotted with 802.3ck limits and ILoss at 28GHz is in table below.

Table 13. MTF Insertion Loss @ 28GHz

MTF Channel	SDD21 at 28GHz (dB)
RX1	-5.725035
RX2	-5.818253
RX3	-5.888065
RX4	-5.776094
RX5	-6.882945
RX6	-7.677087
RX7	-7.04049
RX8	-7.160534
TX1	-5.531484
TX2	-5.761923
TX3	-5.378554
TX4	-5.926252
TX5	-8.04507
TX6	-7.125358
TX7	-8.121569
TX8	-6.097685

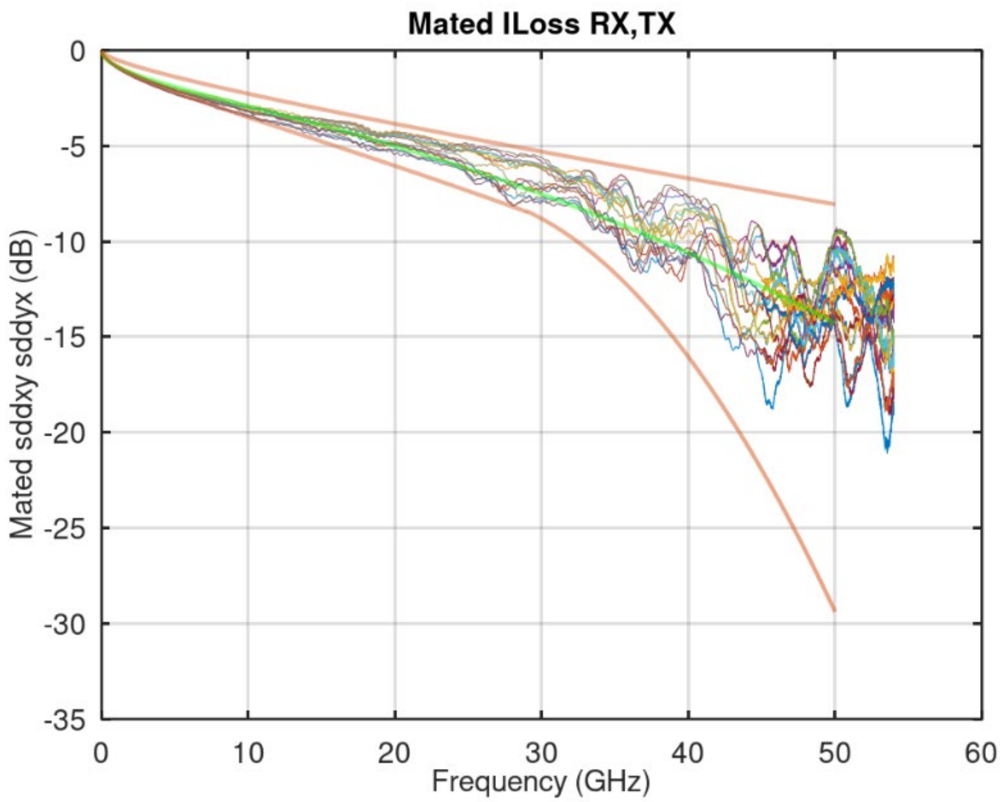


Figure 14. Plot of QSFP-DD Mated Test Fixture Response with CEI VSR Limits

MTF ILoss is plotted with OIF CEI VSR limits.

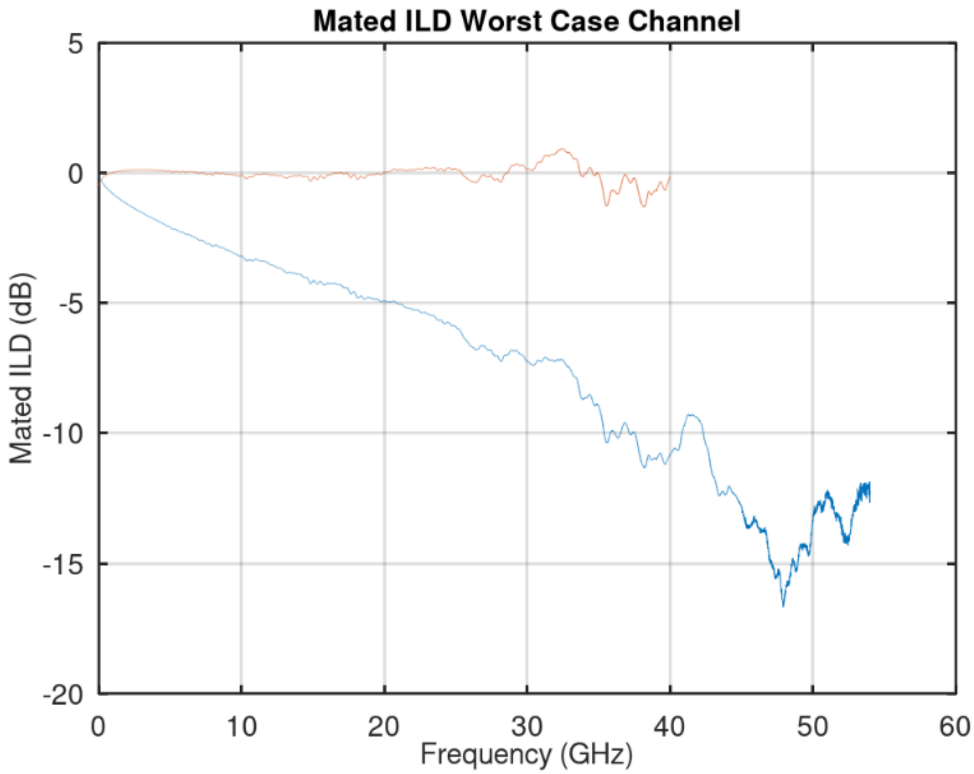


Figure 15. Plot of QSFP-DD Mated Test Fixture Worst Case Response

Worst case FOM_ild is plotted in Figure 15 and typical results for all 16 channels are shown in the table below. FOM_ild below is calculated using IEEE 802.3ck and CEI VSR parameters.

Table 14. MTF FOM_ild for CK and VSR

MTF Channel	FOM_ild CK Parameters (dB)	FOM_ild VSR Parameters (dB)
RX1	0.078596	0.085495
RX2	0.069467	0.075088
RX3	0.095899	0.102447
RX4	0.062766	0.068266
RX5	0.105622	0.115136
RX6	0.09125	0.099947
RX7	0.103171	0.112718
RX8	0.09023	0.100545
TX1	0.062005	0.067912
TX2	0.081399	0.087143
TX3	0.077674	0.085403
TX4	0.095253	0.101877
TX5	0.090031	0.098733
TX6	0.105732	0.114671
TX7	0.102471	0.113941
TX8	0.097319	0.104716

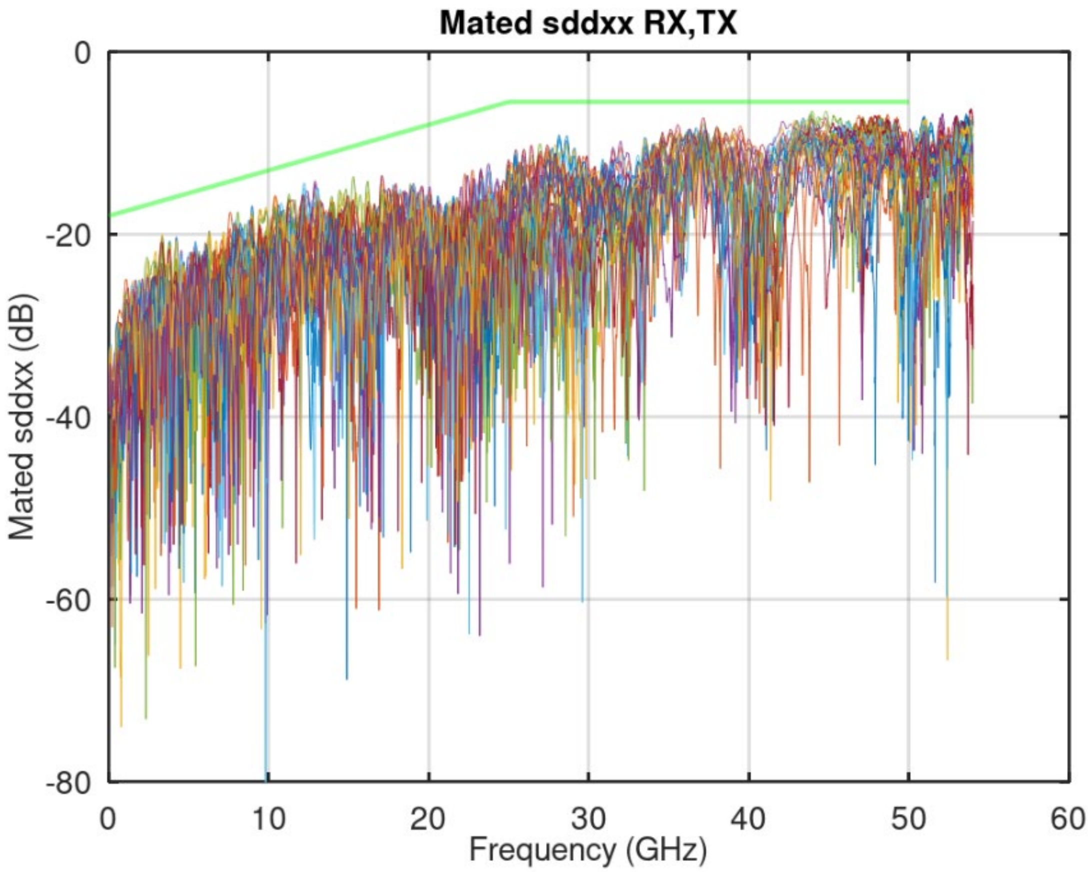


Figure 16. Plot of QSFP-DD Mated Test Fixture Return Loss with Original 802.3ck Limit (Informative)

MTF RLoss is shown for information only.

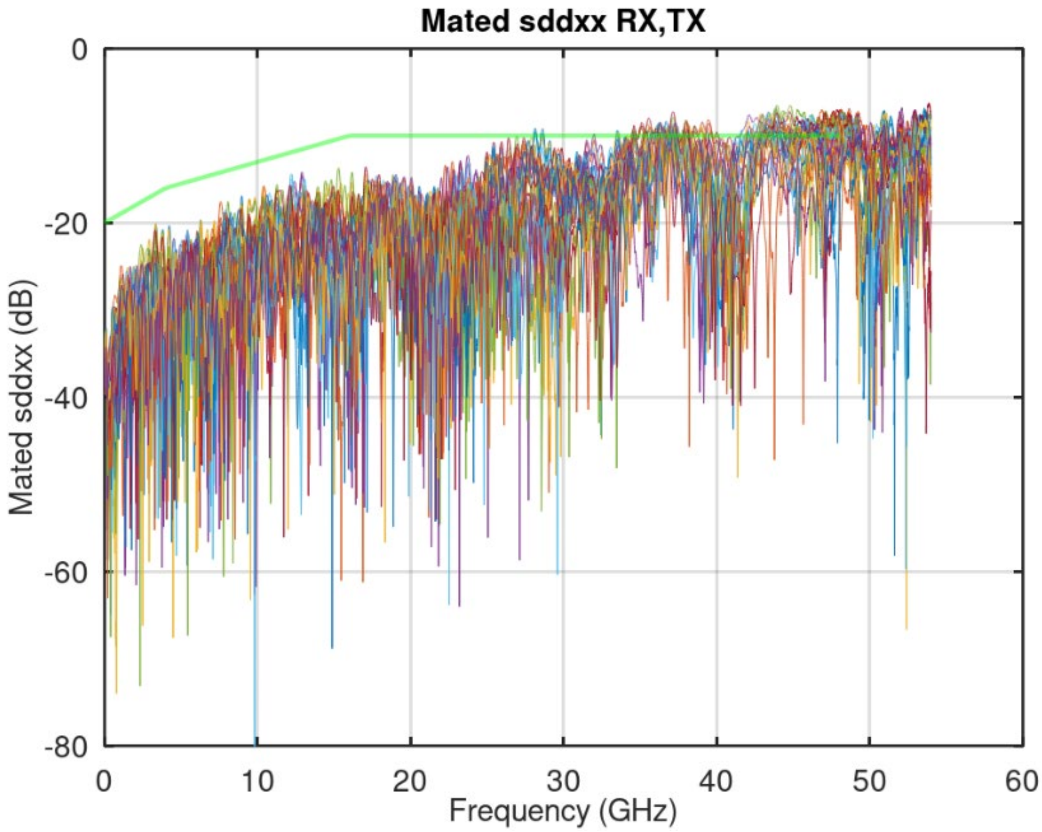


Figure 17. Plot of QSFP-DD Mated Test Fixture Return Loss with Original CEI VSR Limit (Informative)

MTF RLoss is shown for information only.

The ERL numbers below are for all 16 measured channels for a typical mated fixture set and are calculated with no gating. ERL11 is from the HCB side. ERL22 is from the MCB side.

Table 15. ERL Numbers

	ERL11 (dB)	ERL22 (dB)	ERL (dB)	ERL Limit (dB)
RX1	13.5391	14.0667	13.5391	10.3
RX2	14.1949	14.0099	14.0099	
RX3	13.9016	14.235	13.9016	
RX4	14.5725	13.9188	13.9188	
RX5	14.0099	13.622	13.622	
RX6	14.3069	13.3715	13.3715	
RX7	14.2709	13.7904	13.7904	
RX8	14.5771	13.7227	13.7227	
TX1	14.6425	14.3476	14.3476	
TX2	13.5473	14.3204	13.5473	
TX3	14.1949	13.8031	13.8031	
TX4	13.3351	14.1151	13.3351	
TX5	14.2395	13.2628	13.2628	
TX6	13.8074	13.1515	13.1515	
TX7	13.7776	13.3109	13.3109	
TX8	14.6989	13.3149	13.3149	

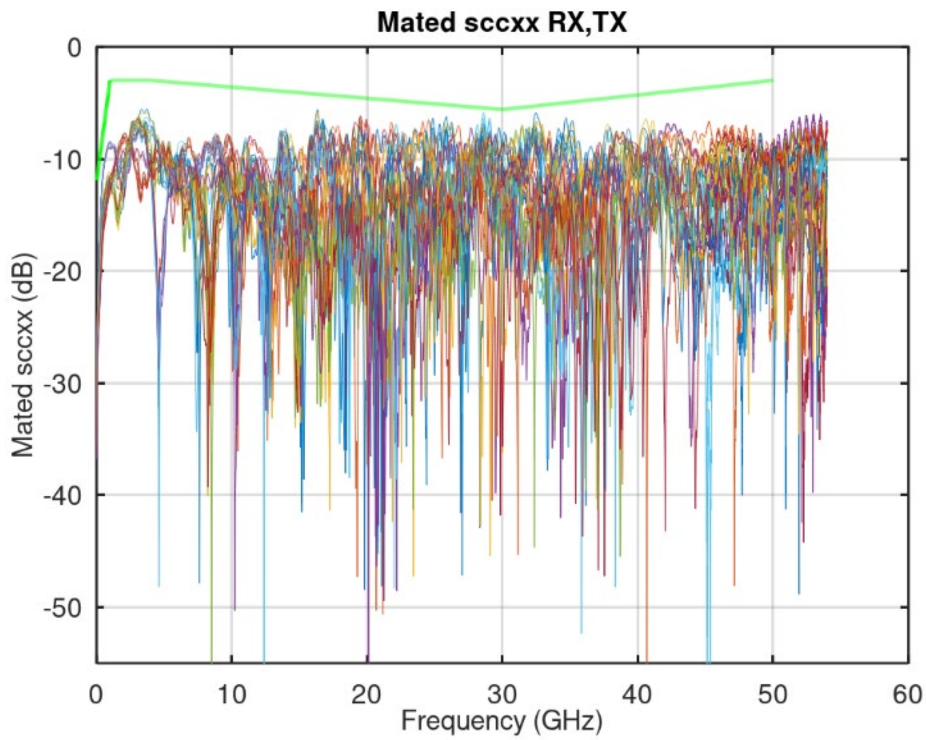


Figure 18. Plot of QSFP-DD MTF Common Mode Return Loss with 802.3ck Limit

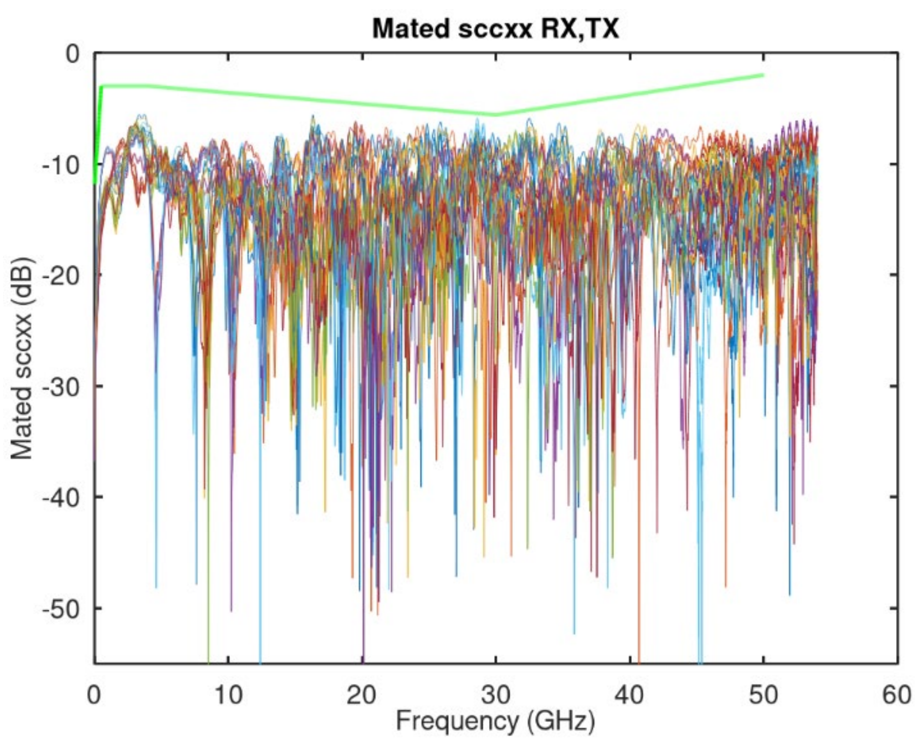


Figure 19. Plot of QSFP-DD MTF Common Mode Return Loss with CEI VSR Limit

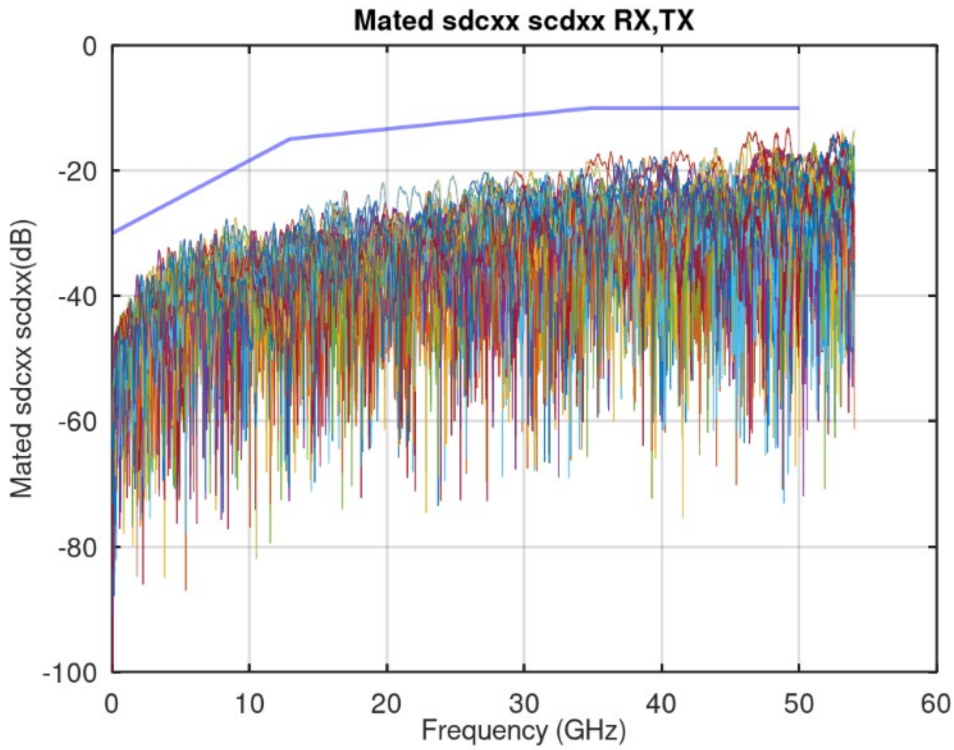


Figure 20. Plot of QSFP-DD MTF Conversion Return Loss with 802.3ck Limit

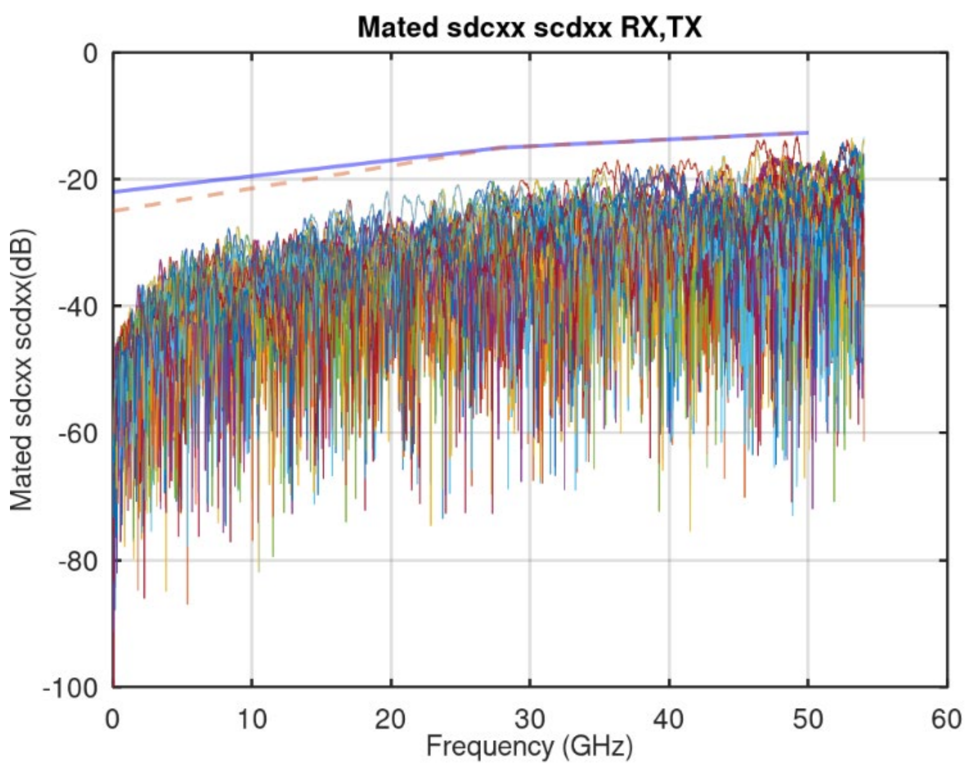


Figure 21. Plot of QSFP-DD MTF Conversion Return Loss with CEI VSR Limit

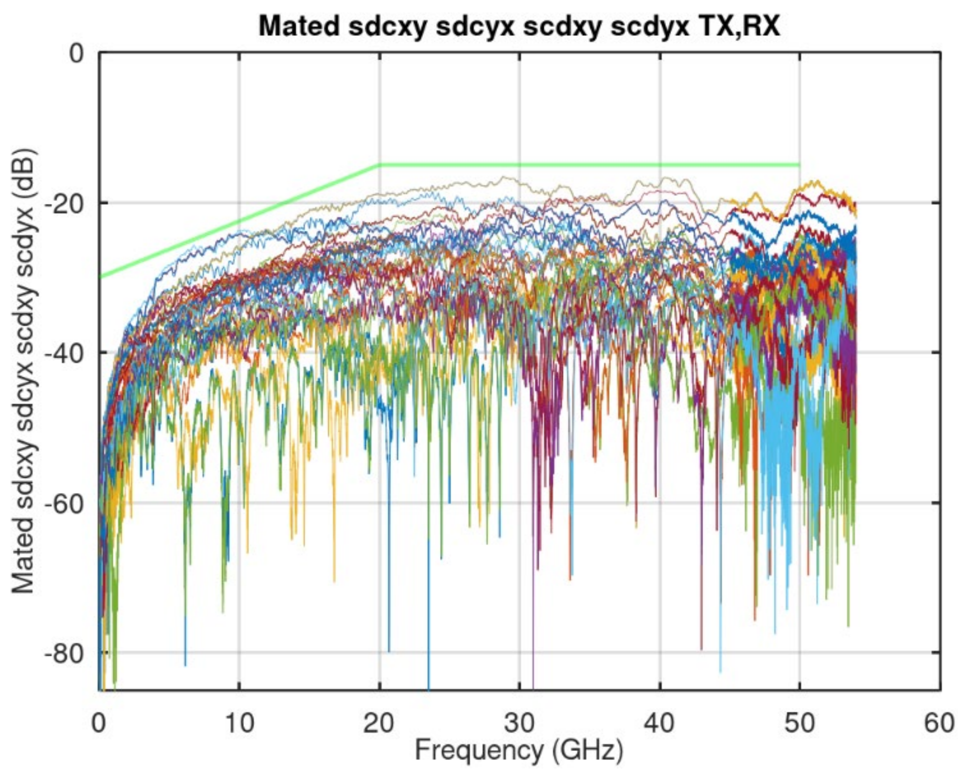


Figure 22. Plot of QSFP-DD MTF Conversion Insertion Loss with 802.3ck and CEI VSR Limit

Wilder 800G QSFP-DD ICN

TX victim is on HCB side and aggressors for TX victim are TX1in-TX[n]in on MCB (excluding thru channel) and TX1in-TX[n]in on MCB which make up the FEXT and NEXT responses, respectively.

RX victim is on MCB side and aggressors for RX victim are RX1in-RX[n]in on HCB (excluding thru channel) and TX1in-TX[n]in on MCB which make up the FEXT and NEXT responses, respectively.

For each victim, all FEXT aggressors are power summed, and all NEXT aggressors are power summed then each are integrated as outlined in the CK and OIF specification. Both single valued integrated noise levels are then added RSS to give the total ICN value.

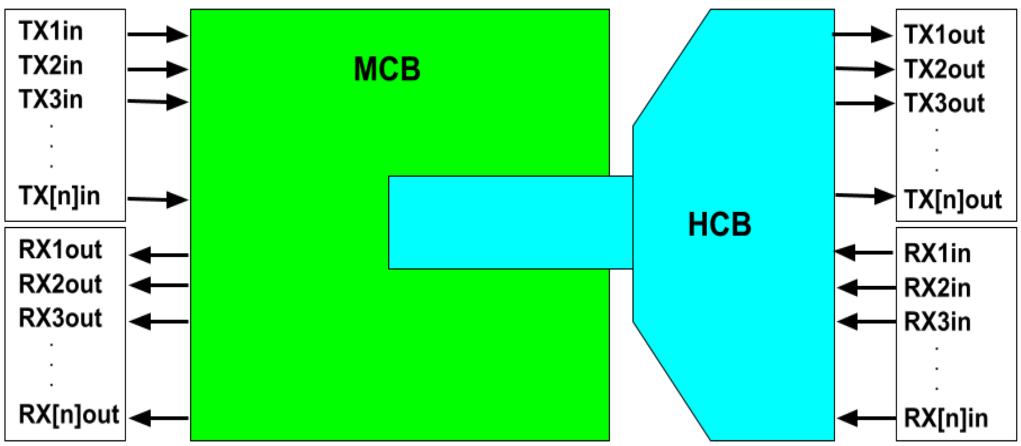


Table 16. TX ICN Data (802.3ck)

ICN (mV) from TX FEXT	Victim (HCB) p=port1, n=port2							
Aggressor (MCB) p=port3, n=port4	TX1 (mV)	TX2 (mV)	TX3 (mV)	TX4 (mV)	TX5 (mV)	TX6 (mV)	TX7 (mV)	TX8 (mV)
TX1	NA	0.1415	1.77206	0.15301	1.2955	0.212305	0.26829	0.11234
TX2	0.14464	NA	0.11791	1.35303	0.23257	1.25663	0.26844	0.45315
TX3	1.80677	0.51682	NA	0.11829	0.29028	0.156941	1.26976	0.15283
TX4	0.16697	1.10534	0.11121	NA	0.26691	0.271956	0.25507	1.22288
TX5	2.97309	0.46754	0.27279	0.16472	NA	1.193305	1.77503	0.43634
TX6	0.20391	0.92841	0.15256	0.2572	0.9863	NA	0.49414	1.61563
TX7	0.23445	0.13192	1.05082	0.12544	1.43348	0.405785	NA	0.92938
TX8	0.16793	0.40528	0.09635	1.05814	0.42942	1.485814	0.79156	NA
TX MDFEXT	3.50389	1.66466	2.09229	1.75977	2.25831	2.34927	2.4172	2.32404

ICN (mV) from TX NEXT	Victim (HCB) p=port1, n=port2							
Aggressor (HCB) p=port1, n=port2	TX1 (mV)	TX2 (mV)	TX3 (mV)	TX4 (mV)	TX5 (mV)	TX6 (mV)	TX7 (mV)	TX8 (mV)
RX1	0.19194	0.23731	0.17459	0.20331	0.17991	0.185174	0.14339	0.30447
RX2	0.26516	0.17258	0.24419	0.17165	0.19071	0.131462	0.14009	0.12757
RX3	0.11707	0.22813	0.11716	0.34047	0.17417	0.191541	0.13057	0.33317
RX4	0.27092	0.15085	0.349	0.13304	0.17207	0.137805	0.16508	0.10561
RX5	0.13611	0.16691	0.12689	0.21369	0.28741	0.302449	0.26244	0.30473
RX6	0.18187	0.12318	0.13877	0.1867	0.32621	0.24447	0.18902	0.24443
RX7	0.09042	0.13248	0.1093	0.20728	0.23891	0.274103	0.32283	0.49318
RX8	0.15925	0.15029	0.21998	0.13815	0.18729	0.224287	0.2684	0.35791
TX MDNEXT	0.52858	0.49404	0.56686	0.58905	0.64019	0.619619	0.60444	0.86894

TX ICN total (mV)	3.54354	1.73642	2.16772	1.85574	2.3473	2.429608	2.49163	2.48117

The table above is ICN data calculated as outlined in 802.3CK for the TX victim responses.

Note that each row represents an ICN value as each aggressor is added to the power sum.

The maximum required MDFEXT ICN is 4.2mV, maximum required MDNEXT ICN is 1.5mV, and the maximum required Total ICN is 4.4mV.

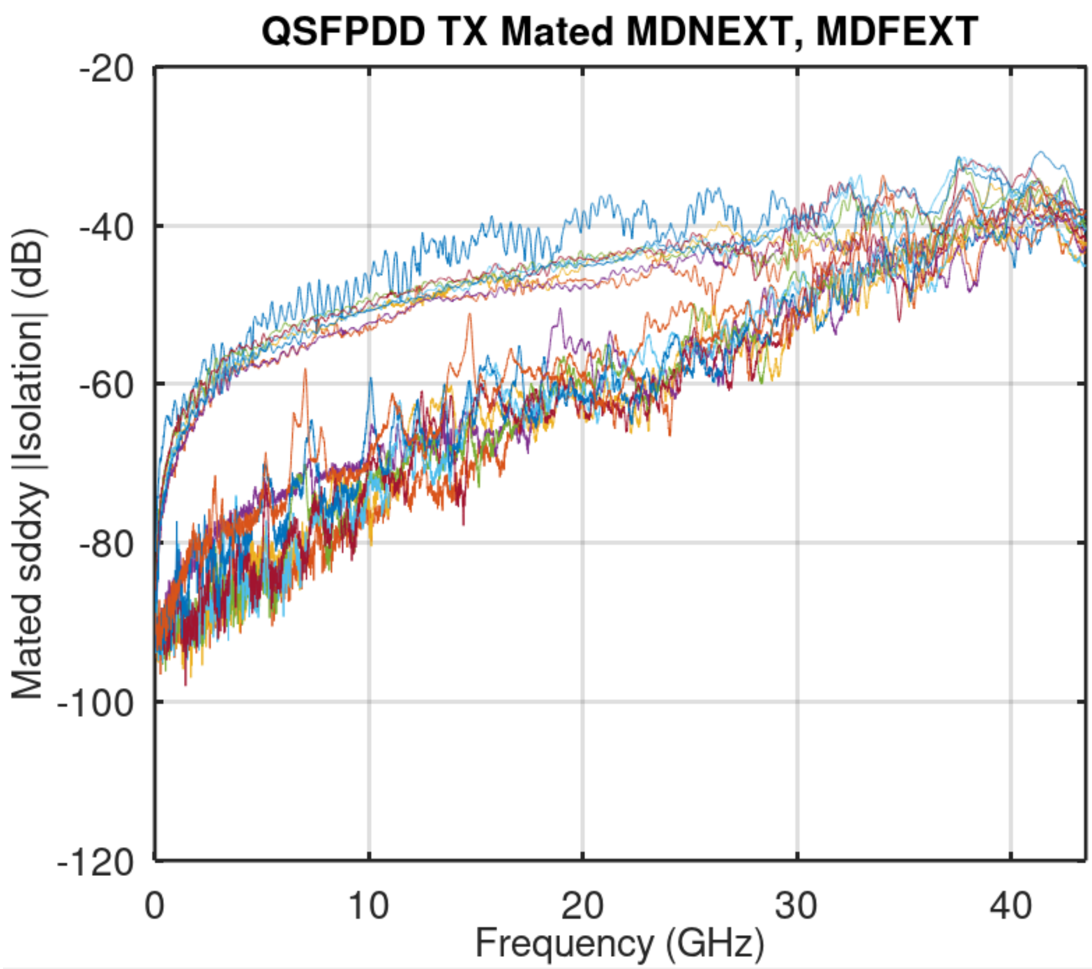


Figure 23. Plot of TX Victim Response to NEXT and FEXT

Table 17. RX ICN Data (802.3ck)

ICN (mV) from RX FEXT	Victim (MCB) p=port3, n=port4							
Aggressor (HCB) p=port1, n=port2	RX1 (mV)	RX2 (mV)	RX3 (mV)	RX4 (mV)	RX5 (mV)	RX6 (mV)	RX7 (mV)	RX8 (mV)
RX1	NA	0.16014	1.38857	0.1152	1.29972	0.296658	0.27178	0.21009
RX2	0.14192	NA	0.11097	1.95022	0.20614	1.27424	0.12554	0.2641
RX3	1.26486	0.1337	NA	0.09134	0.29052	0.270207	1.13144	0.22132
RX4	0.12967	1.76779	0.08727	NA	0.18436	1.046236	0.12206	1.30515
RX5	0.9661	0.16342	0.27446	0.10192	NA	0.877091	1.82467	0.50665
RX6	0.19883	1.05812	0.1717	0.26615	1.18041	NA	0.51391	1.53956
RX7	0.23124	0.09072	0.94151	0.08972	1.31312	0.537721	NA	0.72276
RX8	0.14565	0.21207	0.14522	1.10795	0.37093	1.19499	1.00213	NA
RX MDFEXT	1.63841	2.09001	1.72059	2.26756	2.25951	2.316408	2.44591	2.23956

ICN (mV) from RX NEXT	Victim (HCB) p=port1, n=port2							
Aggressor (HCB) p=port1, n=port2	RX1 (mV)	RX2 (mV)	RX3 (mV)	RX4 (mV)	RX5 (mV)	RX6 (mV)	RX7 (mV)	RX8 (mV)
TX1	0.14208	0.29061	0.10088	0.18372	0.16997	0.18155	0.11653	0.18308
TX2	0.20285	0.13857	0.15858	0.0777	0.23295	0.17103	0.15583	0.16134
TX3	0.08597	0.158	0.07615	0.22323	0.15008	0.153895	0.08709	0.16101
TX4	0.143	0.09731	0.2577	0.08618	0.19473	0.179298	0.17015	0.14602
TX5	0.16892	0.15869	0.14761	0.14987	0.29704	0.407319	0.2234	0.31278
TX6	0.27562	0.17569	0.18892	0.14539	0.43432	0.307954	0.25859	0.22494
TX7	0.14538	0.18945	0.1407	0.15015	0.22906	0.248157	0.26204	0.26685
TX8	0.19203	0.10858	0.24767	0.08971	0.27717	0.243972	0.38698	0.29843
RX MDNEXT	0.50168	0.49175	0.49613	0.41381	0.74146	0.70703	0.63999	0.64458

RX ICN total (mV)	1.7135	2.14708	1.79069	2.30501	2.37806	2.421908	2.52826	2.33047

The table above is ICN data calculated as outlined in 802.3CK for the RX victim responses.

Note that each row represents an ICN value as each aggressor is added to the power sum.

The maximum required MDFEXT ICN is 4.2mV, maximum required MDNEXT ICN is 1.5mV, and the maximum required Total ICN is 4.4mV.

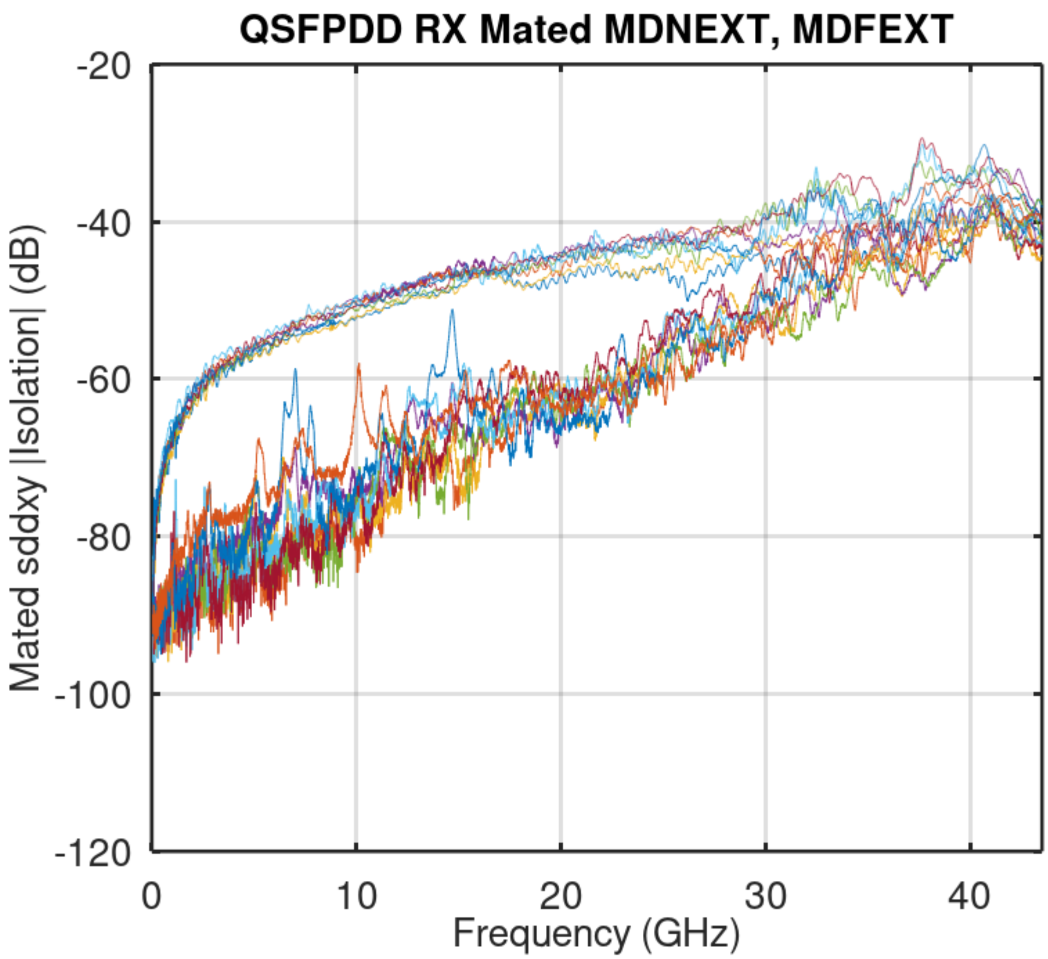


Figure 24. Plot of RX Victim Response to NEXT and FEXT

Table 18. TX ICN Data (CEI VSR)

ICN (mV) from TX FEXT	Victim (HCB) p=port1, n=port2							
Aggressor (MCB) p=port3, n=port4	TX1 (mV)	TX2 (mV)	TX3 (mV)	TX4 (mV)	TX5 (mV)	TX6 (mV)	TX7 (mV)	TX8 (mV)
TX1	NA	0.11877	1.37556	0.14585	0.99716	0.188277	0.22119	0.10743
TX2	0.12885	NA	0.12321	1.04771	0.26124	1.002851	0.29471	0.38759
TX3	1.3807	0.42003	NA	0.10914	0.22993	0.140067	0.97823	0.15214
TX4	0.15664	0.84253	0.10556	NA	0.25168	0.254525	0.27891	0.99256
TX5	2.25106	0.38101	0.21411	0.16361	NA	0.945376	1.38728	0.40162
TX6	0.17588	0.70495	0.13468	0.24634	0.77996	NA	0.46123	1.27413
TX7	0.18733	0.13764	0.7968	0.13627	1.08926	0.366607	NA	0.74981
TX8	0.14941	0.31416	0.09257	0.80684	0.38579	1.163445	0.61782	NA
TX MDFEXT	2.66516	1.28846	1.62047	1.374	1.76704	1.872779	1.9208	1.87537

ICN (mV) from TX NEXT	Victim (HCB) p=port1, n=port2							
Aggressor (HCB) p=port1, n=port2	TX1 (mV)	TX2 (mV)	TX3 (mV)	TX4 (mV)	TX5 (mV)	TX6 (mV)	TX7 (mV)	TX8 (mV)
RX1	0.17024	0.21453	0.15601	0.18662	0.1738	0.184505	0.16198	0.26093
RX2	0.2283	0.15422	0.22693	0.15221	0.16616	0.113943	0.12685	0.12339
RX3	0.10781	0.19663	0.12683	0.33496	0.16946	0.193465	0.14964	0.27335
RX4	0.24566	0.15756	0.29334	0.12745	0.1542	0.12563	0.1467	0.09545
RX5	0.12378	0.15544	0.12159	0.21639	0.25631	0.277119	0.24604	0.29259
RX6	0.1607	0.12124	0.1303	0.17409	0.29235	0.224058	0.17305	0.23239
RX7	0.08264	0.12733	0.11049	0.18513	0.23005	0.25363	0.29874	0.44038
RX8	0.1412	0.16598	0.18	0.16096	0.1708	0.214831	0.25163	0.33886
TX MDNEXT	0.47009	0.46467	0.50432	0.56899	0.58614	0.581131	0.57384	0.78455

TX ICN total (mV)	2.7063	1.36969	1.69714	1.48715	1.86172	1.960871	2.00469	2.03286

The table above is ICN data calculated as outlined in CEI VSR for the TX victim responses.

Note that each row represents an ICN value as each aggressor is added to the power sum.

The maximum required MDFEXT ICN is 3.6mV, maximum required MDNEXT ICN is 1.35mV, and the maximum required Total ICN is 3.85mV.

Table 19. RX ICN Data (CEI VSR)

ICN (mV) from RX FEXT	Victim (MCB) p=port3, n=port4							
Aggressor (HCB) p=port1, n=port2	RX1 (mV)	RX2 (mV)	RX3 (mV)	RX4 (mV)	RX5 (mV)	RX6 (mV)	RX7 (mV)	RX8 (mV)
RX1	NA	0.13313	1.05731	0.10933	1.0371	0.299787	0.25238	0.22233
RX2	0.12286	NA	0.11532	1.5031	0.18139	0.978009	0.12834	0.21243
RX3	0.96548	0.12703	NA	0.0881	0.26959	0.295404	0.91119	0.28176
RX4	0.11661	1.34862	0.08998	NA	0.16431	0.837251	0.12388	1.00424
RX5	0.73924	0.14436	0.24347	0.09016	NA	0.695428	1.4465	0.47226
RX6	0.17503	0.80364	0.17033	0.20831	0.94127	NA	0.46083	1.20109
RX7	0.19257	0.07976	0.7202	0.07774	1.0339	0.470373	NA	0.57149
RX8	0.14996	0.16748	0.15077	0.83732	0.34707	0.920513	0.80458	NA
RX MDFEXT	1.26393	1.59803	1.33004	1.7429	1.81206	1.840337	1.96922	1.78176

ICN (mV) from RX NEXT	Victim (HCB) p=port1, n=port2							
Aggressor (HCB) p=port1, n=port2	RX1 (mV)	RX2 (mV)	RX3 (mV)	RX4 (mV)	RX5 (mV)	RX6 (mV)	RX7 (mV)	RX8 (mV)
TX1	0.12885	0.24377	0.10359	0.15863	0.15355	0.157812	0.11488	0.17346
TX2	0.18299	0.12701	0.18276	0.07993	0.21364	0.1501	0.14418	0.1472
TX3	0.09087	0.16142	0.08713	0.22105	0.1366	0.134672	0.08732	0.13902
TX4	0.17138	0.08839	0.28021	0.08821	0.1797	0.159686	0.15544	0.16428
TX5	0.16126	0.15289	0.13474	0.13088	0.27399	0.375618	0.2049	0.30428
TX6	0.24246	0.16115	0.17847	0.13368	0.39923	0.28396	0.24026	0.20993
TX7	0.1355	0.16749	0.14329	0.14671	0.2338	0.239063	0.23737	0.27082
TX8	0.17788	0.11303	0.22676	0.08967	0.25689	0.227728	0.33803	0.26971
RX MDNEXT	0.47171	0.44677	0.5022	0.39085	0.68941	0.649464	0.57972	0.61711

RX ICN total (mV)	1.34908	1.65931	1.42169	1.78618	1.93878	1.951575	2.05278	1.8856

The table above is ICN data calculated as outlined in CEI VSR for the RX victim responses.

Note that each row represents an ICN value as each aggressor is added to the power sum.

The maximum required MDFEXT ICN is 3.6mV, maximum required MDNEXT ICN is 1.35mV, and the maximum required Total ICN is 3.85mV.

Compliance with Environmental Legislation

Wilder Technologies, LLC, is dedicated to complying with the requirements of all applicable environmental legislation and regulations, including appropriate recycling and/or disposal of our products.

WEEE Compliance Statement

The European Union adopted Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE), with requirements that went into effect August 13, 2005. WEEE is intended to reduce the disposal of waste from electrical and electronic equipment by establishing guidelines for prevention, reuse, recycling and recovery.

Wilder Technologies has practices and processes in place to conform to the requirements in this important Directive.

In support of our environmental goals, effective January 1st, 2009 Wilder Technologies, LLC has partnered with EG Metals Inc. – Metal and Electronics Recycling of Hillsboro, Oregon, www.egmetalrecycling.com, to recycle our obsolete and electronic waste in accordance with the European Union Directive 2002/96/EC on waste electrical and electronic equipment ("WEEE Directive").

As a service to our customers, Wilder Technologies is also available for managing the proper recycling and/or disposal of all Wilder Technologies products that have reached the end of their useful life. For further information and return instructions, contact support@wilder-tech.com.

Compliance To RoHS 2 Substance Restrictions

Wilder Technologies, LLC certifies that the parts described in this document are compliant to the substance restrictions of Directive 2011/65/EU and Amendment Directive (EU) 2015/863 of the European Parliament, and of the Council of 8 June, 2011 and 31 March, 2015 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2 Directive), prohibiting the use in homogeneous materials in excess of the listed maximum concentration value, except in cases where use is allowed by applicable exemptions listed in Annex III and Annex IV of the Directive.

Compliance with RoHS 2 has been verified through internal controls at design and production sites, including establishment of processes for specifying and controlling materials and segregation of non-compliant parts, receipt of supplier declarations of compliance and/or analytical test.

Glossary of Terms

TERMINOLOGY	DEFINITION
Aggressor	A signal imposed on a system (i.e., cable assembly) to measure response on other signal carriers.
Decibel (dB)	Ten times the common logarithm (i.e. log10) of the ratio of relative powers.
Far-end crosstalk or FEXT	Crosstalk that is propagated in a disturbed channel in the same direction as the propagation of a signal in the aggressor channel. The terminals of the aggressor channel and the victim channel are usually close to each other.
Informative	The designation of a test that is not required for compliance.
Insertion loss	The ratio, expressed in dB, of incident power to delivered power.
Near-end crosstalk or NEXT	Crosstalk that is propagated in a disturbed channel in the opposite direction as the propagation of a signal in the aggressor channel. The terminals of the aggressor channel and the victim channel are usually close to each other.
Normative	The designation of a test that is required for compliance.
Return Loss	The ratio, expressed in dB, of incident power to reflected power.
QSFP-DD	50 Gbps 8X Pluggable Transceiver (High-Density Quad Small Form Factor Pluggable)
QSFP-DD Host	The QSFP-DD Host is the fixed end of the connection supporting IEEE 802.3.
QSFP-DD Module	The QSFP-DD Module is the moveable end of the connection supporting IEEE 802.3.
QSFP-DD TPA	QSFP-DD Test Point Access. A specialized assembly that interfaces to a QSFP-DD host or module and enables access of signals for measurement or stimulation.
Victim	A signal carrier on a system that has a response imposed on it by other signals in the system.

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WILDER TECHNOLOGIES

It's all about integrity

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