Cisco QSFP-DD800 Transceiver Modules

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The Cisco family of QSFP-DD800 modules leverages the cornerstone of high-speed, high-density pluggable form factors, QSFP. The QSFP-DD800 provides the industry's highest bandwidth density of any transceiver module and backward compatibility to lower-speed QSFP pluggable modules and cables.

Product overview

The Cisco QSFP-DD800 modules introduce 800G and 2x400GBASE Quad Small Form-Factor Pluggable Double-Density (QSFP-DD) modules, offering customers super-high-density pluggable transceivers along with the flexibility of 400 Gigabit Ethernet and 100 Gigabit Ethernet connectivity options for data centers, high-performance computing networks, enterprise core and distribution layers, and service provider applications.

The QSFP-DD800 modules are Cisco's generation of 800G and 2x400G pluggable transceiver modules based on a QSFP-DD form factor providing 800G connectivity along with breakout options of 2x 400G, 4x 200G and 8x 100G.

Table 1. Feature and benefits of Cisco QSFP-DD800 modules

Feature	Benefit
Hot-swappable	Input/output device that plugs into 800G Ethernet Cisco QSFP-DD port
Interoperable	Interoperable with other IEEE-compliant 400GBASE and 100GBASE interfaces where applicable
Certified on Cisco platform	Certified and tested on Cisco QSFP-DD 800G ports for superior performance, quality, and reliability
Compatible with IEEE 802.3	High-speed electrical compliant to IEEE 802.3
Compatible with MSA	Optical and coding compliant to QSFP-DD MSA CMIS Rev 5.3, OIF 112G PAM4, and 100G Lambda MSA
Backward compatibility	QSFP-DD800 port is backward compatible with QSFP+, QSFP28, QSFP56, and QSFP-DD 400G modules
Breakout capability	The QSFP-DD modules have the capability to interface to multiple 100G, 200G and 400G modules, providing higher port density for 100G, 200G and 400G interfaces.

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Table 2. Cisco QSFP-DD800 portfolio

Product ID	Description	Max power consumption (W)	Optical connector
QDD-800G-VR8	QSFP-DD Transceiver, 800GBASE-VR8, Dual MPO-12 APC, 30/50m (OM3/OM4) parallel MMF	15	Dual MPO-12 APC
QDD-8X100G-FR	QSFP-DD Transceiver, 800G-DR8-2, Dual MPO-12, 2-km parallel SMF	17	Dual MPO-12 APC
QDD-2X400G-FR4	400G QSFP-DD Transceiver, 2x400G-FR4, 2-km Duplex SMF	17	Dual Duplex LC UPC

Note: Except for QDD-8X100G-FR, only connections with patch cords with PC or Ultra-Physical Contact (UPC) connectors are supported. QDD- 8X100G-FR requires patch cords with Angled Physical Contact (APC) MPO connectors. All cables and cable assemblies used must be compliant with the standards specified in the standards section of this data sheet. For more information and references on QSFP-DD cable guides, please click on the following link: Cisco Transceiver Modules - Brochures - Cisco

Cisco QSFP-DD800 transceiver prominent features and differentiators

QDD-800G-VR8



Figure 1.
QDD-800G-VR8

The Cisco QDD-800G-VR8 module (Figure 1) supports 800GBASE-VR8 as well as 2x 400GBASE-VR4, 4x 200GBASE-VR2, and 8x 100GBASE-VR1 breakouts for links up to 50m(OM4/5) in reach. The module has eight pairs of multi-mode fiber with dual MPO-12 APC connectors. It is compliant with IEEE 802.3 800GBASE-VR8 and QSFP-DD800 MSA module requirements. Optical signals are carried over eight pairs of parallel lanes, with one wavelength per lane. The optical interface can interoperate with any IEEE-compliant module regardless of the form factor. Forward Error Correction (FEC) is performed on the host platform. The QDD-800G-VR8 module is field firmware upgradeable, complying with CMIS 5.3 firmware upgradability process.

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QDD-8X100G-FR



Figure 2.
QDD-8X100G-FR

The Cisco QDD-8X100G-FR module (**Figure 2**) supports 800G and a variety of breakout options for link lengths of up to 2 km. The module has eight pairs of single-mode fiber with MPO-12 APC connectors. It is compliant to the IEEE 800GBASE-DR8-2, 400GBASE-DR4-2 and 100GBASE- FR1. Optical signals are carried over eight pairs of parallel lanes by one wavelength per lane. The QDD-8X100G-FR modules can be used to interface to other 800G compliant modules regardless of the form factor. It can also be used as 8x100G breakout to QSFP28 100G-DR (up to 500 m), 100G-FR (up to 2 km), and 100G-LR (up to 2 km). It may also be used as two independent 400GBASE-DR4 transceivers in a single port. FEC is performed on the host platform.

QDD-2X400G-FR4



Figure 3.
QDD-2X400G-FR4

The Cisco QDD-2X400G-FR4 module (**Figure 3**) supports link lengths of up to 2 km SMF with two duplex LC connectors. It is compliant to IEEE 802.3cu for 400GBASE-FR4 requirements and 100G Lambda MSA group. The 400 Gigabit Ethernet signal is carried over four CWDM grid optical wavelengths. Multiplexing and demultiplexing of the four wavelengths are managed within the device. FEC is performed on the host platform.

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Table 3. QSFP port and cabling specifications

Cisco 2X 400G QSFP-DD	Nominal wavelength (nm)	Cable type	Core size (microns)	Modal bandwidth	Cable distance	Pull tab color
QDD-800G-VR8	850	MMF	50	2000 (OM3) 4700 (OM4) 4700 (OM5)	30m (OM3) 50m (OM4/5)	Purple
QDD-8X100G-FR	1310	SMF	G.652		2 km	Green
QDD-2X400G-FR4	1270, 1290, 1310, 1330	SMF	G.652		2 km	Green

Platform support

Cisco QSFP-DD^{8}00 modules are supported on Cisco switches and routers. For more details, refer to the Cisco Transceiver Modules Compatibility Matrix.

Specifications

Table 4. Electrical specifications

Product	Description	Nominal data rate (Gbps)	High-speed electrical	Link meter
QDD-800G-VR8	QSFP-DD800 Transceiver, 800GBASE-VR8, Dual MPO-12, 30/50m (OM3/OM4) parallel MMF	800GE	800GAUI-8	30m (OM3) 50m(OM4/5)
QDD-8X100G-FR	QSFP-DD Transceiver, 8X100GBASE-FR1, Dual MPO-12, 2-km parallel SMF	800GE	800GAUI-8	2 km
QDD-2X400G-FR4	2X400G QSFP-DD Transceiver, 400G- FR4, Dual Duplex LC, 2-kmDuplex SMF	425	400GAUI-4 Annex 120G	2 km

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Table 5. Optical specifications

Product	Description	Average transmit power per lane (dBm) min	Average transmit power per lane (dBm) max	Average receive power per lane (dBm) min[1]	Average receive power per lane (dBm) max	Maximum supported insertion loss (IL) (dB)	Wavelength (nm)	Pre-FEC
QDD-800G-VR8	QSFP-DD800 Transceiver, 800G BASE-DR8, Dual MPO-12, 500m parallel MMF	-4.6	4	-6.3	4	1.6 (OM3) 1.7(OM4/5)	842-948	$2.4x10^{-4}$
QDD-8X100G-FR	QSFP-DD Transceiver, 4X100GBASE-FR1, MPO-12, 2-km parallel SMF	-2.9	4	-5.9	4	4	1310	$2.4x10^{-4}$
QDD-2X400G-FR4	2x400G QSFP-DD Transceiver, 2x400GBASE-FR4, Dual Duplex LC, 2-km Duplex SMF	-3.2	4.4	-7.2	4.4	4	1270, 1290, 1310, 1330	$2.4x10^{-4}$

Table 6. Mechanical specifications

Module dimension with pull tab	(H x W x D) 8.5 x 18.4 x 78.3/93.3 mm
Module weight (Max)	100 g
Module operation temperature	0 to 75° C
Storage temperature	-40 to 85° C

Table 7. Ordering information

Part ID	Product description
QDD-800G-VR8	QSFP-DD800 Transceiver, 800GBASE-DR8,2x MPO-12, 30m (OM3)/50m (OM4/5) parallel MMF
QDD-8X100G-FR	QSFP-DD Transceiver, 8x100GBASE-FR1, MPO-12, 2-km parallel SMF
QDD-2X400G-FR4	2x400G QSFP-D Transceiver, 2x400G-FR4, Dual Duplex LC, 2-km Duplex SMF

[1] Average receive power per lane (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance

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Regulatory and standards compliance

Standards

- QSFP-DD MSA hardware Rev 6.01, QSFP-DD800 hardware specification
- GR-20-CORE: Generic Requirements for Optical Fiber and Optical Fiber Cable
- GR-326-CORE: Generic Requirements for Single-Mode Optical Connectors and Jumper Assemblies
- GR-468-CORE: Generic Requirements for Optoelectronic Devices Used in Telecommunications Equipment
- GR-1435-CORE: Generic Requirements for Multifiber Optical Connectors
- Common Management Specification (CMIS) Rev 5.3
- IEEE Std 802.3-2018 IEEE Standard for Ethernet
- IEEE 802.3ba CL88
- IEEE 802.3bs 400GAUI-8 Annex 120E
- IEEE 802.3cd CL136
- IEEE 802.3cu CL140

Safety

- Laser Class 1 21CFR-1040 LN#50
- Laser Class 1 IEC60825-1
- Compliance with North American (FCC/ICES), European (CENELEC), Japanese (VCCI), and Telcordia NEBS standards
- GR-1089 EMC and Electrical Safety - Generic Criteria for Network Telecommunications Equipment
- EMI compliance on FCC Part 15 (30 MHz – 40 GHz) and CISPR32/CISPR22 (30-6000 MHz)
- RFI compliance on EN/IEC 61000-4-3 and GR-1089-CORE (10k to 10 GHz)
- ESD compliance on EN/IEC 61000-4-2 and GR-1089
- Certification to IEC/EN 60825-1 +A2
- RoHS 6 compliance

Table 8. Laser class for QSFP-DD modules

Part ID	Laser class
QDD-800G-VR8	1
QDD-8X100G-FR	1
QDD-2X400G-FR4	1

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Product sustainability

Information about Cisco's Environmental, Social and Governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability reporting.

Table 9. Cisco environmental sustainability information

Sustainability Topic		Reference
General	Information on product-material-content laws and regulations	Materials
	Information on electronic waste laws and regulations, including our products, batteries and packaging	WEEE Compliance
	Information on product takeback and reuse program	Cisco Takeback and Reuse Program
	Sustainability inquiries	Contact: csr_inquiries@cisco.com
Power	QSFP-DD port cabling specifications	Table 3
Material	Product packaging weight and materials	Contact: environment@cisco.com

Warranty

Standard warranty: 5 years Expedited replacement available via a Cisco SMARTnet service support contract

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation, and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services, and complementary third-party equipment in easy, predictable payments. Learn more.

Additional information

For more information about Cisco 400G QSFP-DD copper modules, contact your sales representative or visit www.cisco.com/en/US/products/hw/modules/ps5455/prod_module_series_home.html.

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Document history

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