

Cisco 400G QSFP Transceiver Modules

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Product overview

Cisco® 400G QSFP112 modules deliver high-performance, power-efficient connectivity optimized for AI/ML fabrics, high-performance computing, and modern data center networks. Built on 100G-per-lane PAM4 signaling, Quad Small Form-factor Pluggable (QSFP)112 enables 400 Gigabit Ethernet in a compact, thermally efficient form factor ideal for high-density AI and cloud deployments. QSFP112 is widely adopted across the ecosystem and supports flexible architectures, including breakout configurations for scalable leaf/spine and multi-plane AI fabric designs with connectivity into high-speed Network Interface Cards (NIC).

The Cisco QSFP-400G-DR4 module supports 400GBASE-DR4 links over parallel single-mode fiber using MPO-12 connectivity, with support for breakout connections up to 500 meters. The Cisco QSFP-400G-VR4 module delivers short-reach multimode connectivity optimized for high-density AI and cloud environments, using MPO-based multimode fiber infrastructure supporting reaches up to 50 meters. The Cisco QSFP-400G-FR4 module provides duplex single-mode fiber connectivity using LC connectors and wavelength multiplexing technology, supporting reaches up to 2 kilometers over Single Mode Fiber (SMF) while reducing fiber count and simplifying migration from existing duplex fiber infrastructure.

Together, these transceivers provide deployment flexibility across multimode and singlemode environments, supporting scalable AI back-end and front-end network architectures with high reliability, low power consumption, and standards-based interoperability.

Table 1. Features and benefits

Feature	Benefit
Hot-swappable	Input/output device that plugs into a 400G Cisco QSFP112-compatible port.
Interoperable	Interoperable with other IEEE-compliant 400G interfaces where applicable.
NIC certified	These modules and cables have been tested and qualified on Network Interface Card (NICs) from Cisco and other manufacturers for reliable performance.
Compliant with IEEE 802.3	High-speed electrical and optical interfaces compliant with IEEE 802.3.
Compliant with Multi-Source Agreement (MSA)	Compliant with QSFP112 MSA CMIS Rev 4.1.
Breakout capability	Some QSFP112 modules can be used for 200G and 100G interfaces by reducing the number of optical lanes used while maintaining the electrical lane speed at 100Gbps. A variety of cables are also available for 2x 400G and 4x 200G breakout applications from 800G ports.

Table 2. Cisco QSFP112 portfolio

Product ID	Description	Max power consumption (W)	Optical Connector
QSFP-400G-DR4	400G QSFP112 Transceiver, 400GBASE-DR4, MPO-12 parallel SMF, 500m	9	MPO-12 SMF APC
QSFP-400G-VR4	400G QSFP112 Transceiver, 400GBASE-VR4, MPO-12 parallel MMF, 50m	9	MPO-12 MMF APC
QSFP-400G-FR4	400G QSFP112 Transceiver, 400GBASE-FR4, Duplex LC SMF, 2km	9	Duplex LC SMF UPC

Note: For more information and references on Cisco transceiver cables, please visit [Cisco Transceiver Modules - Brochures - Cisco](#).



Figure 1.
QSFP-400G-DR4

The Cisco QSFP-400G-DR4 module (Figure 1) supports 400GBASE-DR4 links and up to four 100G DR1 or two 200G DR2 breakout link lengths of up to 500 m. The module has four pairs of single-mode fiber (SMF) with an MPO-12 connector. It is compliant with the IEEE 802.3 and 400GAUI-4 standards. The 400G signal is carried over four pairs of parallel fibers by one wavelength per fiber. It can be used 200G DR2 link for 200GE ports by using two pairs of fibers. Forward Error Correction (FEC) is performed on the host platform.



Figure 2.
QSFP-400G-VR4

The Cisco QSFP-400G-VR4 module (Figure 2) supports 400GBASE-VR4 links and up to four 100G VR1 or two 200G VR2 breakout links over multimode fiber (MMF). The module has four pairs of multi-mode fiber (MMF) with an MPO-12 connector. It is compliant with IEEE 802.3 and 400GAUI-4 standards. The 400G signal is transmitted over four parallel multimode fiber pairs using PAM4 signaling at 100Gbps per lane. The module can also operate in 200G breakout mode using two optical lanes for 200GE connectivity. Forward Error Correction (FEC) is performed on the host platform.

The Cisco QSFP-400G-FR4 module delivers 400 Gigabit Ethernet connectivity over duplex single-mode fiber (SMF) using LC connectors and wavelength-division multiplexing (WDM) technology. Designed for AI/ML fabrics, cloud networking, and high-density data centers, the module supports reaches up to 2 kilometers over standard G.652 SMF while reducing fiber complexity compared to parallel optics. QSFP-400G-FR4 uses four 100G PAM4 optical wavelengths multiplexed onto a duplex fiber pair, enabling efficient migration from existing duplex fiber infrastructure with lower cabling density and operational overhead. Compliant with IEEE 400GBASE-FR4 and 400GAUI-4 standards, the module provides low-power, standards-based interoperability for modern leaf/spine architectures and high-performance Ethernet fabrics.

Table 3. QSFP port and cabling specifications

Cisco 400G QSFP112	Nominal wavelength (nm)	Cable type	Core size (microns)	Modal bandwidth	Cable distance	Pull tab color
QSFP-400G-DR4	1310	SMF	G.652	N/A	500m	Orange
QSFP-400G-FR4	1310	SMF	G.652	N/A	2km	Green
QSFP-400G-VR4	850	MMF	OM3, OM4/OM5	OM3: 2000 MHz-km OM4: 4700 MHz-km OM5: 4700 MHz-km (at 850nm)	50m	Purple

Platform support

Cisco QSFP112 modules are primarily supported on NICs providing Ethernet connectivity to servers for a variety of applications. 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
QSFP-400G-DR4	400G QSFP112 Transceiver, 400GBASE-DR4, MPO-12, 500m parallel SMF Can be used for 2X 200G- DR2 and 4x 100G-DR1 breakout	425	400GAUI-4	500 m
QSFP-400G-FR4	400G QSFP112 Transceiver, 400GBASE-FR4, Duplex LC, 2km SMF	425	400GAUI-4	2 km
QSFP-400G-VR4	400G QSFP112 Transceiver, 400GBASE-VR4, MPO-12, 50m parallel MMF Can be used for 2X 200G- VR2 and 4x 100G-VR1 breakout	425	400GAUI-4	50 m

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
QSFP-400G-DR4	400G QSFP112 Transceiver, 400GBASE-DR4, MPO-12 APC, 500m parallel SMF.	-2.9	4	-5.9	4	3	1310	2.4x10 ⁻⁴
QSFP-400G-FR4	400G QSFP112 Transceiver, 400GBASE-FR4, LC Duplex UPC, 2km SMF.	-3.2	4.4	-4.6	4.4	4	1310	2.4x10 ⁻⁴
QSFP-400G-VR4	400G QSFP112 Transceiver, 400GBASE-VR4, MPO-12 APC, 50m parallel MMF.	-4.6	4	-6.4	4	1.9	850	2.4x10 ⁻⁴

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.

Table 6. Mechanical specifications

Module	Specification
Module dimension with pull tab	(H x W x D) 0.3 x 0.7 x 3.1/3.7 in. (8.5 x 18.4 x 78.3/93.3 mm)
Module weight (max)	Optical modules 3.5 oz (100 g)

Table 7. Temperature range

Module	Specification
QSFP-400G module operation temperature	32° to 158° F (0° to 70° C) ¹
Storage temperature	-40° to 185° F (-40° to 85° C)

¹ QSFP-400G-VR4: 59° to 158° F (15° to 70° C) (cold start 32° to 59° F [0° C to 15° C]).

Cisco Transceiver Qualification and Validation on Third-Party Network Interface Cards

Cisco performs extensive interoperability and qualification testing of its transceivers with a broad ecosystem of industry-standard NICs and AI infrastructure platforms. Cisco optics are validated not only on Cisco hosts, but also across leading third-party Ethernet adapters to help ensure reliable operation in heterogeneous AI and cloud-scale deployments. Qualification testing includes electrical, optical, thermal, firmware, and protocol validation under real-world traffic conditions, including breakout operation such as 400G to 2×200G and 4×100G, as well as 800G to 2×400G and 4×200G architectures used in modern AI fabrics. Cisco transceivers are designed to interoperate with Cisco as well as standards-compliant third-party transceivers and NICs that comply with the same IEEE and MSA specifications. Testing also includes FEC interoperability and stress validation across operating environments. This comprehensive validation methodology helps provide predictable interoperability, stable link performance, and reduced deployment risk in modern AI and high-performance computing networks.

For a comprehensive list of validated optics-to-NIC interoperability combinations, please refer to the Cisco Transceiver Module Group (TMG) Compatibility Matrix:

<https://tmgmatrix.cisco.com/?npf=2227&npf=2003&npf=901&npf=903&npf=902>.

Table 8. QSFP112 DR4 SMF PAM4 breakout interoperability and link reach

Standard (PAM4)	400G DR4	100G DR1	100G FR1	100G LR1	200G DR2
Product ID	QDD-400G-DR4-S QDD-8X100G-FR	QSFP-100G-DR-S	QDD-4X100G-FR-S QSFP-100G-FR-S CPAK-100G-FR QDD-8X100G-FR	QDD-4X100G-LR-S QSFP-100G-LR-S	QDD-400G-DR4-S QDD-8X100G-FR
QSFP-400G-DR4 (4x100G-DR1/FR1 and 2x 200G-DR2 breakout)	500m SMF (3dB)	500m SMF (3dB)	500m SMF (3dB)	500m SMF (3dB)	500m SMF (3dB)

Table 9. QSFP112 MMF PAM4 breakout interoperability and link reach

Standard (PAM4)	400G VR4	100G VR1
Product ID	QDD-400G-VR4-S	QSFP-100G-SR-S
QSFP-400G-VR4 (4x100G-VR1 breakout)	50m MMF	50m MMF

Table 10. QSFP112 FR4 SMF PAM4 interoperability and link reach

Standard (PAM4)	400G FR4	400G LR4
Product ID	QDD-400G-FR4-S	QDD-400G-LR4-S
QSFP-400G-FR4	2km SMF	2km SMF

A comprehensive list of optics to optics and optics to host interoperability: <https://tmgmatrix.cisco.com/>.

Table 11. Ordering information

Part ID	Product description
QSFP-400G-DR4	400G QSFP112 Transceiver, 400GBASE-DR4, MPO-12, 500m parallel SMF
QSFP-400G-FR4	400G QSFP112 Transceiver, 400GBASE-FR4, Duplex LC, 2 km over SMF
QSFP-400G-VR4	400G QSFP112 Transceiver, 400GBASE-VR4, MPO-12, 50m parallel MMF

Regulatory and standards compliance

Standards

- IEEE 802.3ck
- QSFP112 MSA
- IEEE 802.3 (400GBASE-DR4) Requirements
- IEEE 802.3 (400GBASE-VR4) Requirements
- IEEE 802.3 (400GBASE-FR4) Requirements
- 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 4.0
- IEEE Std 802.3 IEEE Standard for Ethernet
- IEEE 802.3ba CL88
- IEEE 802.3ck
- 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 to 40 GHz) and CISPR32/CISPR22 (30 to 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 12. Laser class for QSFP112 modules

Part ID	Laser class
QSFP-400G-DR4	1
QSFP-400G-FR4	1
QSFP-400G-VR4	1

Product sustainability

Table 13. 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
Material	QSFP112 port cabling specifications	Table 3
	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 QSFP112 or other transceiver modules and cables, contact your sales representative or

Visit https://www.cisco.com/en/US/products/hw/modules/ps5455/prod_module_series_home.html.

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