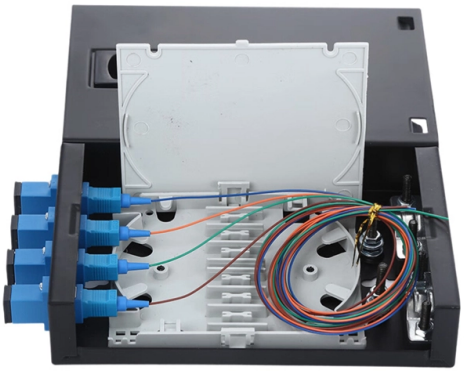
# 400G Product Optical Module



## Overview

Cisco 400G QSFP-DD High-Power (Bright) Optical ModuleProduct overview Cisco is now expanding the range of 400G Digital Coherent QSFP-DD transceivers, intro.

## Key Takeaways

A 400G optical module is a high-speed transceiver capable of 400 Gbps data transmission, using advanced modulation and multiple lanes to support modern data center and network applications.

## Overview

A 400G optical module is designed to handle data rates of 400 Gbps, forming the backbone of high-throughput networks, AI clusters, and modern data centers. These modules perform photoelectric conversion and use advanced modulation techniques like PAM4 (4-level Pulse Amplitude Modulation), which allows each symbol to carry two bits, effectively doubling the data rate per lane compared to traditional NRZ. Common Form Factors and StandardsQSFP-DD (Quad Small Form Factor – Double Density): Backward-compatible with QSFP/QSFP28, supports 8 lanes for 400G.

## OSF

P (Octal Small Formfactor Pluggable): New interface, not backward-compatible, designed for high-density deployments. CFP8, CWDM8, CDFP, COBO: Other 400G standards with varying channel counts, fiber types, and deployment scenarios. Types of 400G ModulesSR4/SR8: Short-range multimode fiber modules, ideal for intra-data center connections.

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SR4 typically supports 100 meters on OM4 fiber, while SR4. 2 extends up to 150 meters using wavelength division multiplexing. DR4: Popular for hyperscale data centers, using parallel single-mode fiber for medium-range links.

FR4: Uses CWDM over duplex single-mode fiber, reducing fiber count while maintaining 400G bandwidth. LR4: Long-range single-mode fiber modules for campus or metro networks.

## High-

Power Coherent Modules (e.g., Cisco QSFP-DD Bright): Support coherent DP-mQAM signaling in the C-band, with enhanced Tx power for long-distance DCI, metro, and cloud interconnects.

## Key Features

Transmission Distance: Varies by type; SR modules are short-range, DR/FR modules are medium-range, LR and coherent modules support long distances. Fiber Type: Multimode for SR, single-mode for DR, FR, LR, and coherent modules. Channels and Lanes: Typically 4–8 lanes, each carrying 50–100 Gbps, combined to achieve 400G.

Breakout Capability: Many 400G modules can be split into multiple lower-speed ports, e.g., 4x100G. Applications: Data center interconnects, cloud computing, high-performance computing, enterprise networks, and metro/long-haul networks.

## Choosing the Right Module

When selecting a 400G module, consider: Transmission Distance: Short-range (SR) vs. long-range (LR) requirements. Existing Fiber Infrastructure: Duplex vs. parallel fiber, multimode vs. single-mode. Power and Thermal Constraints: High-density environments may require low-power modules.

Application Needs: Ethernet, OTN, or coherent transport for long-haul links. In summary, 400G optical modules provide flexible, high-bandwidth solutions for modern networks, with multiple form factors, modulation techniques, and fiber compatibility options to meet diverse deployment scenarios.

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## Article Content

Cisco 400G QSFP-DD High-Power (Bright) Optical Module

Product overview Cisco is now expanding the range of 400G Digital Coherent QSFP-DD transceivers, introducing High Tx Power variants (+1dBm of Tx Power). Thanks to the miniaturization of the

How 400G Optical Modules Are Shaping Next-Gen Networks

Discover key factors driving the rapid adoption of 400G optical transceivers, including AI, 5G, coherent optics, and market trends shaping next-gen network infrastructure.

Introduction to 400G Optical Modules · KAD

A clear, engineer-friendly overview of 400G optical modules, including standards, packaging formats, functions, and market outlook for next-generation data centers.

400G OSFP/QSFP-DD/QSFP112 Module Introduction and Selection

The explosive growth of global data volume has placed higher demands on the bandwidth and performance of data center networks, making 400G optical modules a critical

400G Optical Modules Explained: SR4 Vs. DR4 Vs. FR4 Vs. LR4

Today, we have provided a definitive overview of the transmission standards for 400G optical modules. We are confident that this article will assist you in selecting the optimal standard.

Know Your 400G Transceiver | Juniper Networks

400 Gigabit Ethernet (400G) transceivers are optical modules capable of handling data rates of 400 Gbps. With a transmission rate of up to 400 Gbps, 400G transceivers offer double the capacity of

400G Optics

400G Optics Qualified for use across Juniper''s 400GbE-capable ACX, MX, PTX, and QFX product families, Juniper offers a broad portfolio of 400G coherent and direct-detect optical transceivers to

Wholesale Optical Transceivers Module | 100G QSFP28, 40G QSFP

Shop high-speed optical transceivers from Unitekfiber. We offer 100% compatible 40G, 100G, and 400G QSFP-DD modules for data centers. Expert technical support & wholesale pricing.

Arista 400G Transceivers and Cables: Q&A

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Arista''s 400G-VSR4 modules will optically interop over 50m MMF with third-party QSFP112 or OSFP-RHS modules that are compliant to the IEEE 400GBASE-SR4 or 400GBASE-VR4 optical standards.

Cisco 400G QSFP-DD High-Power (Bright) Optical

Learn how Cisco 400G QSFP-DD High-Power (Bright) Optical module''s small size and low power make it an optimal choice for a wide range of

Lumentum

Lumentum Holdings Inc. (“Lumentum”), a global leader in photonic solutions, today announced its showcase of technology and product demonstrations designed to meet the

400G vs 800G Optical Modules: Differences, Use Cases, and

Compare optical modules for data centers and AI clusters. Learn key differences in standards, power, cabling, and use cases.

Cisco 400G Digital Coherent Optics QSFP-DD Optical

The latest addition to the Cisco portfolio pushes this boundary further with the introduction of the 400G DIGITAL COHERENT QSFP-DD PLUGGABLE

400Gb/s QSFP-DD ZR+ Coherent Optical Transceiver

Description The 400G QSFP-DD ZR+ Transceiver is a high performance, cost effective module for optical data communication applications from 100G to 400G. The 400G QSFP-DD ZR+ is

Arista QDD-400G-DR4 Compatible 400GBASE-DR4 QSFP-DD 500m

Description Arista QDD-400G-DR4 Compatible 400GbE QSFP-DD DR4 1310nm 500m FEC SMF Optical Transceiver Moudle (PAM4, MTP/MPO, DDM, Commercial Temp) NADDOD Arista QDD

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HTF DWDM equipment,OTN Solution,QSFP28 OSFP

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Optical Transceivers | Coherent

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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