Door-to-door optical core router QSFP-DD



Overview

QSFP-DD Optical Transceivers for High-Speed Connections QSFP-DD ports incorporate a riding heatsink that can be sized independently of the optical module.

Key Takeaways

QSFP-DD digital coherent optics enable direct, high-speed 400G and 800G connections from routers to DWDM networks, eliminating the need for intermediate transponders. Overview of QSFP-DD ModulesQSFP-DD (Quad Small Form Factor Pluggable Double Density) is a high-density optical transceiver standard that extends the QSFP family from 4 to 8 high-speed electrical lanes, supporting 400G and 800G aggregate throughput using PAM4 signaling. It maintains backward mechanical compatibility with QSFP28 and QSFP56, allowing seamless upgrades in high-density router and switch deployments while doubling port density without increasing power or space requirements.

QSFP-DD modules are designed for cloud-scale, AI-driven, and carrier-grade networks. 400G QSFP-DD Digital Coherent OpticsCisco and other vendors offer 400G digital coherent QSFP-DD modules compliant with the OIF 400ZR standard. These modules support point-to-point transmission up to 120 km over DWDM networks using C-band tunable optics and LC duplex connectors.



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By plugging these modules directly into routers or switches, operators can bypass traditional transponder or muxponder layers, reducing capital and operational expenditures, lowering power consumption, and simplifying network management. The modules are optimized for IP-over-DWDM architectures, making them suitable for metro and regional core networks. 800G QSFP-DD Coherent OpticsFor higher-capacity applications, 800G QSFP-DD modules (including 800ZR and 800ZR+) enable single-wavelength 800G traffic over amplified DWDM links up to 120 km for 800ZR and beyond 1000 km for 800ZR+.

These modules leverage advanced CMOS and coherent technologies, supporting OpenROADM PCS modes for interoperability. They are ideal for data center interconnects (DCI), metro, and regional service provider networks, providing high-performance, long-reach optical connectivity directly from router ports.

Key Benefits for Door-to-

Door Core Routing

Direct integration: QSFP-DD modules plug directly into router ports, eliminating intermediate optical equipment. High density: Double the port density in the same chassis footprint. Cost efficiency: Reduces capital and operational expenses by removing transponders and muxponders.

Energy and space savings: Lower power consumption and cooling requirements in central offices or co-location sites. Scalability: Supports 400G and 800G speeds, enabling future-proof network upgrades. Standards compliance: OIF 400ZR, OpenZR+, and QSFP-DD MSA ensure interoperability across vendors.

ConclusionDoor-to-door optical core routers equipped with QSFP-DD digital coherent optics provide a compact, high-performance solution for modern DWDM networks. They enable direct, high-speed connections from routers to optical transport networks, supporting 400G and 800G traffic with reduced complexity, lower costs, and improved operational efficiency, making them ideal for metro, regional, and data center interconnect applications.

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Article Content

QSFP-DD Optical Transceivers for High-Speed Connections

QSFP-DD ports incorporate a riding heatsink that can be sized independently of the optical module, added on top of the module, or placed between modules. This flexibility enables switch and routing

QSFP-DD Product Family » Acacia

Quad Small Form-factor Pluggable Double Density (QSFP-DD) solution that fits into high-density switch and router client ports for optical interconnect links

Cisco 400G QSFP-DD Cable and Transceiver Modules

It provides a QSFP-DD-to-QSFP-DD copper direct-attach solution. QDD-400-CuxM cables are suitable for very short links and offer a cost-effective

QSFP-DD Linear Pluggable Optics (LPO)

Amphenol''s QSFP-DD Linear Pluggable Optical (LPO) Transceiver delivers low-latency, high-bandwidth PCIe ® Gen 5.0 over optical link, enabling

Understanding the QSFP-DD Standard: The Foundation of 400G

The QSFP-DD was conceived by the QSFP-DD MSA group, including Cisco, Intel, Broadcom, and Mellanox (now NVIDIA). The goal was to enable 400G and 800G speeds within the

Specification – QSFP-DD

July 11, 2019 – QSFP-DD Hardware Specification for QSFP DOUBLE DENSITY 8X PLUGGABLE TRANSCEIVER – Rev 5.0 May 8, 2019 – Common Management Interface

QSFP-DD Optical Transceivers – MapYourTech

QSFP-DD is an advanced hot-pluggable optical transceiver form factor that doubles the bandwidth density of traditional QSFP28 modules by

Understanding QSFP-DD 400G Optical Transceivers – The ...

QSFP-DD delivers unprecedented speed in a familiar form factor. It enables scalable, future-proof networks without massive hardware changes. For organizations scaling to meet AI, 5G,

QSFP-DD Optical Transceivers Unlocking Faster

The QSFP-DD (Quad Small Form-Factor Pluggable Double Density) optical transceiver is a revolutionary advancement in high-speed data

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OFC: Acacia launches 400G QSFP-DD pluggable modules for

The 400G ER1 QSFP-DD pluggable coherent optical module has a rich feature set including client multiplexing and interoperability based on both OIF and OpenZR+ protocols. Acacia''s

Cisco QSFP-DD and OSFP 800G ZR/ZR+ Coherent

These digital coherent optics modules enable 800G traffic over amplified DWDM links up to 120 km for 800ZR and over 1000 km for 800G ZR+.

Understanding QSFP-DD 400G Optical Transceivers – The ...

QSFP-DD stands for Quad Small Form-factor Pluggable Double Density. It''s an upgraded version of the standard QSFP form factor, designed to double the data rate without

QSFP-DD Optical Transceivers – MapYourTech

QSFP-DD (Quad Small Form-Factor Pluggable Double Density) represents a transformative advancement in optical transceiver technology, addressing the exponential growth in

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

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 DCI/Cloud, metro access/aggregation,

Quadwire® QSFP-DD Active Optical Cables | Coherent

Networking Quadwire® QSFP-DD Active Optical Cables Drive high-speed connectivity enabled by multiple (4 or 8) parallel channels in AOCs with our

QSFP Versus QSFP-DD Here Are the Key Differences

With optical modules, it is often helpful to think of them in three parts: Form factor (QSFP, QSFP-DD, OSFP) Electrical connectivity configuration

The Ultimate Reference Table for SFP & QSFP Optical Transceiver ...

Executive Summary: Navigating the 2025 Optical Landscape In 2025, the optical transceiver market has shifted decisively. While 100G remains the workhorse for enterprise edges,

800G Optical Transceiver Overview: QSFP-DD and OSFP Packages

This article provides an overview of 800G optical transceivers, focusing on the QSFP-DD and OSFP packages. Explore the features, differences of these high-speed transceiver form factors

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