

Article Overview

QSFP-DD (Quad Small Form-Factor Pluggable Double Density) modules are high-speed, intelligent optical transceivers capable of 400G data rates, designed for modern data centers, telecom, and long-haul networks.

Overview

QSFP-DD modules represent a next-generation optical transceiver technology that doubles the bandwidth density of traditional QSFP28 modules by using eight electrical lanes instead of four, enabling aggregate data rates up to 400 Gb/s with PAM4 modulation and a clear evolution path to 800 Gb/s . These modules are hot-pluggable, compact, and support backward compatibility with previous QSFP standards, making them suitable for high-performance computing, cloud, AI, and 5G network deployments .

Key Variants and Capabilities

- o Cisco 400G Digital Coherent QSFP-DD: Available in ZR and ZR Plus variants. The ZR variant supports point-to-point 400G transmission up to 120 km, while the ZR Plus variant extends to regional and long-haul distances with multiple amplification sites, supporting advanced modulation schemes like QPSK, 8-QAM, and 16-QAM . Both variants allow flexible configuration for baud rates, TX filter shaping, and modulation, supporting 100G, 200G, 300G, and 400G per wavelength .
- o Huawei QSFP-DD-400G-SR8: Designed for short-reach interconnections in data centers, offering plug-and-play flexibility and cost-effective deployment for high-density environments .

Standards Compliance

QSFP-DD modules adhere to SFF-8636, a universal management interface standard for 4-lane and 8-lane optical modules. This ensures interoperability, reliability, and predictable performance across multi-vendor environments, enabling seamless integration in hyperscale data centers, telecom backbones, and enterprise networks . The standard supports I2C-based memory mapping, smart diagnostics, and thermal protection, which are critical for intelligent optical module management.

Applications in Ethiopia

In Ethiopia, QSFP-DD modules can be deployed to:

- o Upgrade data center infrastructure to support 400G interconnects for cloud services, AI, and high-performance computing.
- o Enhance telecom backbone networks, enabling long-haul 400G transmission with coherent optics for

regional connectivity.

o Support enterprise networks with high-density, energy-efficient optical interconnects, reducing port footprint while increasing bandwidth capacity.

Benefits

- o High bandwidth density: Four times the throughput of QSFP28 in the same port footprint.
- o Flexible deployment: Supports short-reach, regional, and long-haul applications.
- o Intelligent management: Real-time diagnostics, thermal monitoring, and multi-vendor interoperability.
- o Future-proof: Scalable to 800G with evolving electrical interfaces and modulation schemes. QSFP-DD intelligent optical modules provide Ethiopia's network operators and data centers with a scalable, high-performance solution to meet growing bandwidth demands while maintaining operational efficiency and compatibility with existing infrastructure .

QSFP-DD (Quad Small Form Factor Pluggable Double Density) is an evolution of the QSFP family, extending its lane

Discover the key technologies, benefits, and applications of 400G QSFP-DD optical modules in high-performance

Introduction: OSFP vs QSFP-DD vs QSFP112 in Modern Optical Networks In today's rapidly evolving data center and

Bandwidth & Application The QSFP-DD module provides maximum bandwidth 400Gbps, whereas the

QSFP-DD Optical Transceivers deliver up to 800Gbps speeds, offering high bandwidth, energy efficiency, and

Powered by Greylock and Delphi DSP ASICs, and silicon photonic integrated circuits (PICs) for an

Discover the benefits and applications of 800G QSFP-DD optical modules, a cutting-edge solution for high-speed

The explosive growth of global data volume has placed higher demands on the bandwidth and performance of data

In this blog we will make the case for using QSFP-DD (Quad Small Form Factor - Double

Cisco's QSFP-DD 400G ZR/ZR+ low-power coherent optical modules provide power savings in high-port-density

In this comprehensive guide, we will explore how QSFP DD works, why it has become a

Cisco now offers a range of all new 400G Digital Coherent QSFP-DD transceivers. Cisco already offers a range of

Amphenol's QSFP-DD Linear Pluggable Optical (LPO) Transceiver delivers low

Compare QSFP-DD, QSFP28, and OSFP form factors. Learn about compatibility, power constraints, migration TCO,

Ethiopia QSFP-DD optical module 10G The optical amplifier module developed by GIGALIGHT is designed for long-distance

Delve deep into the world of optical modules. From SFP to the latest QSFP-DD, explore

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