

Article Overview

Yes, 400G optical modules are available in various types and form factors, suitable for data centers, metro, and long-haul networks.

Overview

400G optical modules are pluggable transceivers capable of delivering up to 400 Gbps per port, designed to meet the growing bandwidth demands of hyperscale data centers, 5G/5.5G networks, and high-capacity transport networks . They use advanced technologies such as PAM4 modulation, digital signal processing (DSP), and coherent optics to achieve high performance and longer reach .

Types and Form Factors

- o QSFP-DD (Quad Small Form Factor Pluggable Double Density): Common for 400G Ethernet, supporting multiple lanes (e.g., 8x50G or 4x100G) and PAM4 modulation .
- o SR4/SR4.2 Modules: Short-range, multimode fiber modules ideal for intra-data center connections. SR4 supports up to 100 meters on OM4 fiber, while SR4.2 extends up to 150 meters with enhanced performance .
- o DR4, FR4, LR4 Modules: Designed for longer distances, including single-mode fiber applications.
- o Coherent Modules (ZR, ZR+, ULH): Support metro and ultra-long-haul networks with coherent optics, enabling high spectral efficiency and extended reach over DWDM networks .

Key Features

- o High Bandwidth Density: 400G per module using multiple lanes, reducing port count while increasing throughput .
- o Advanced Modulation: PAM4 doubles the bit rate per lane, while coherent modules use DP-mQAM for long-haul transmission .
- o Power Efficiency: Typical power consumption is a few watts, suitable for dense deployments .
- o Digital Diagnostics: Real-time monitoring of temperature, voltage, and optical power for proactive maintenance .
- o Flexible Deployment: Modules can support breakout modes (e.g., 4x100G) and multiple transmission rates, allowing adaptation to different network requirements .

Application Scenarios

- o Data Centers: High-density, short-to-medium distance interconnects using SR4/SR4.2 modules .
- o Metro Networks: Coherent ZR/ZR+ modules for scalable metro backbone capacity .
- o Long-Haul Transport: Ultra-long-haul coherent modules for regional and transcontinental DWDM networks



Optical module device 400g

. In summary, 400G optical modules are widely available in multiple form factors and technologies, making them suitable for a range of high-speed networking applications from short-range data center links to ultra-long-haul optical transport networks.

The QSFP-DD 400G optical module has become a key element in the fast-changing field of

Shop high-speed optical transceivers from Unitekfiber. We offer 100% compatible 40G, 100G, and 400G QSFP-DD modules for data

These modules utilize advanced modulation schemes and multiplexing techniques to achieve higher data

How pluggable coherent optics bring performance and low power to industry standard transceiver module formats

Nowadays, the progress of 400G optical module development and mass production is

Marvell and Molex Unveil 400G OpenZR+ Pluggable Optical Module for Carrier and Cloud Data Center Networks

The high performance and low power of the 400G QSFP-DD ULH

400G Coherent Optics is a complex system that integrates key photonic and electronic components to enable high

Explore the architecture, key technologies, applications, and future trends of 400G coherent optical devices in modern

As part of a broader upgrade of its interconnect portfolio, Molex has introduced new 100G and 400G optical

Explore the key features and applications of 400G transceivers. Learn how these optical modules enhance data

These compact optical transceivers. offer a convenient and cost-effective solution for short reach interconnections in the data center.

The module follows the IEEE 802.3bs standard and complies with the OIF standard for optical modules. As a low

Discover the OSFP 400G DR4 Optical Transceiver Module, a high-performance solution



Optical module device 400g

Huawei OSFP-400G-SR4-D Optical Module Datasheet

With the continuous growth of network demand, optical modules with different rates have

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