

800g Optical Module Features



Overview

800G Optical Modules Explained: Standards, Types & Use Cases Discover everything about 800G optical modules—standards, packaging, types & applications. Learn.

Key Takeaways

800G optical modules deliver ultra-high-speed data transmission up to 800 Gigabits per second, supporting multiple form factors, modulation techniques, and both short- and long-distance applications. High-Speed Transmission and Connectivity

800G optical modules are designed for high-density, high-speed data transmission, capable of processing 8 billion bits per second, effectively doubling the capacity of 400G modules. They support multiple connectivity options, including 800GE, 2x400GE, 4x200GE, and 8x100GE, providing flexibility for data centers, AI/ML clusters, and high-performance computing networks. These modules are compliant with IEEE 802.3 standards and support interoperability with other IEEE-compliant interfaces.

Form Factors and Standards

Common form factors include QSFP-DD800 and OSFP800, which are pluggable and compatible with high-speed switch ports. The modules adhere to OSFP and QSFP-DD MSA specifications, ensuring standardized deployment and seamless integration across multivendor environments. They also comply with CMIS 5.3 for management and monitoring.

Modulation and Channel Technology

Most 800G modules use PAM4 (4-level pulse amplitude modulation), which doubles the bandwidth per channel without increasing the symbol rate. Modules often combine parallel channels and wavelength division multiplexing (WDM) to optimize fiber usage and extend transmission distances. Typical configurations include 8 Tx and 8 Rx channels for single-mode modules, each channel supporting 100Gbps.

Single-Mode vs Multimode

- Single-mode 800G modules: Use single-mode fibers for long-distance transmission, ranging from hundreds of meters to over 10 km. Standards include DR8, PSM8, 2xDR4, 2xFR4, 2xLR4, FR4, and FR8, suitable for core switch interconnections and data center campus links.
- Multimode 800G modules: Use multimode fibers for short-distance, high-density interconnections ($\leq 100\text{m}$), ideal for rack-to-rack or server-to-switch connections within data centers. Main standards include SR8, optimized for low-cost deployment.

800G optical modules are widely deployed in:

- Data centers for high-speed server interconnects and switch uplinks
- AI and HPC networks requiring ultra-low latency and high bandwidth
- Enterprise core and distribution layers
- Service provider networks for high-capacity backbone links

Key Benefits

- High port density for 100GE, 200GE, and 400GE interfaces
 - Flexible deployment across multiple distances and fiber types
 - Standards compliance for interoperability and reliability
 - Efficient thermal and power management with integrated heat sinks in OSFP modules
- In summary, 800G optical modules combine ultra-high-speed transmission, flexible form factors, advanced modulation, and broad standards compliance, making them essential for modern data centers, AI clusters, and high-performance networking environments.

Article Content

Demystifying 800G Transceiver: Types, Applications, and FAQs

In this article, we will provide an overview of the various types of 800G optical modules, discuss their applications, and

Cisco Transceiver Modules

Cisco Transceiver Modules - Learn product details such as features and benefits, as well as hardware and software specifications.

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The standard defines the solution to transport 800GbE optical signals using a single wavelength. The primary application of 800G-ZR

Everything You Need to Know About 800G/1.6T Optical Transceiver

The 800G optical module supports high-speed backhaul between 5G base stations through fronthaul and midhaul networks, and at

A Deep Dive into 800G Optical Modules

This article will provide an in-depth analysis of the technical details, packaging features, and application scenarios of OSFP 800G

Understanding 800G Optical Modules: Types, Applications, and

Understanding 800G Optical Modules: Types, Applications, and Solutions by Optech
As the demand for faster data transmission

Juniper 800G Optical Transceivers and Cables Guide

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