

Article Overview

Optical module port rates range from 100 Mbps to 400 Gbps depending on the module type, with SFP supporting up to 4 Gbps, SFP+ up to 10 Gbps, SFP28 up to 25 Gbps, QSFP up to 40 Gbps, and QSFP28/QSFP-DD supporting 100-400 Gbps.

Overview of Optical Module Rates

Optical modules are classified by their data transmission rates, which determine the speed at which bits are transmitted over fiber. Common rates include 100 Mbps, 1 Gbps, 10 Gbps, 25 Gbps, 40 Gbps, 100 Gbps, and 400 Gbps, with each rate corresponding to specific module types and network applications .

SFP Family

- o SFP (Small Form-factor Pluggable): Supports 1-4 Gbps, suitable for Gigabit Ethernet and Fibre Channel applications .
- o SFP+: Enhanced SFP module supporting up to 10 Gbps, commonly used for 10 Gigabit Ethernet (10GbE) and high-speed data center links .
- o SFP28: Supports 25 Gbps, enabling next-generation server-to-switch connectivity and aggregation in 100G networks .

QSFP Family

- o QSFP/QSFP+: Quad-lane modules supporting 40 Gbps, using four 10 Gbps channels, ideal for data center and campus networks .
- o QSFP28: Supports 100 Gbps using four 25 Gbps lanes, widely used in hyperscale and cloud data centers .
- o QSFP-DD: Double-density QSFP modules with eight lanes, each capable of 25 Gbps (NRZ) or 50 Gbps (PAM4), achieving 200-400 Gbps aggregate rates .

Other Considerations

- o Single-fiber unidirectional modules: Typically range from 125 Mbps to 5 Gbps, while bidirectional modules range from 125 Mbps to 2.67 Gbps .
- o Port compatibility: The optical module rate must match the host port rate. Using mismatched rates (e.g., 10G SFP+ on a 25G SFP28 port) can result in link failure .
- o Fiber type and wavelength: Multi-mode fiber (MMF) and single-mode fiber (SMF) have different wavelength requirements (850 nm for MMF, 1310/1550 nm for SMF) and affect achievable distances .

Summary

Optical port rate of the optical module

The optical port rate is a critical parameter for selecting the appropriate module for a network. It depends on the module type, number of lanes, modulation format, and fiber compatibility. Modern optical modules provide scalable solutions from 1 Gbps to 400 Gbps, supporting enterprise, data center, and carrier-grade networks .

What Is an SFP Optical Module? Types and Speeds The complete technical guide to SFP optical modules (SFP,

The core of an optical port switch 's interface lies in its optical modules, while the ports on the switch panel (such as

This guide dives into the key SFP Optical Module Specifications that engineers, network architects, and procurement professionals

In general, the higher the rate, the worse the receiving sensitivity, that is, the greater the minimum received optical

To meet various transmission rate requirements, optical modules with different rates are provided, including 400GE,

Explore the world of optical link modules, essential components in optical fiber communication. Learn about the different types of

An optical module converts electrical signals to light for fast, reliable data transfer in networks, essential for cloud

Systematic classification of optical modules by data rate, form factor, transmission distance, and fiber type.

A practical guide to SFP Optical Module Specifications, covering data rates, optical budget, Tx/Rx power, DDM/DOM, standards, and

Understand the key parameters of optical modules, including transmission rate, distance, wavelength, and fiber

EPON and 10G-EPON Module EPON Module EPON module, defined by the IEEE 802.3ah standard in 2004, which

High-Speed Interconnects: Backend network requires high speed 100G/200G or 800G optics to connect servers and network

Optical port rate of the optical module

In fiber-optic communication, a single-mode optical fiber, also known as fundamental- or mono-mode, is an optical fiber designed

Optical modules are essential components in enterprise networking. According to different rates, encapsulation types

The optical module optical ports come in 12-core and 16-core versions, with corresponding optical fiber connectors

Small Form-factor Pluggable Small Form-factor Pluggable connected to a pair of fiber-optic cables Small Form-factor Pluggable

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