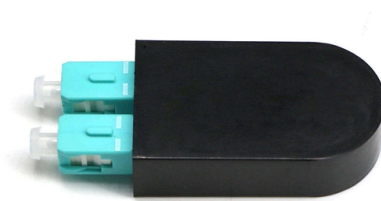


What is the bandwidth of a 10G optical module



Overview

What Is 10GBASE-SR?

Complete Guide to 10G SFP+ SR OpticsA 10GBASE-SR SFP module, also called 10G SFP+ SR, is a 10 Gbps multimode optical transceiver using.

Key Takeaways

A 10G optical module supports a data rate of 10 gigabits per second (Gbps) for both transmission and reception.Overview

A 10G optical module, commonly in the SFP+ form factor, is designed to handle 10 Gbps Ethernet or optical network traffic. These modules are widely used in data centers, enterprise networks, and high-speed fiber deployments, providing high-bandwidth connectivity for short- and long-range applications . Cisco 10G Routed PON ONTs, for example, support symmetrical 10 Gbps downstream and upstream connectivity, making them suitable for residential, SMB, and enterprise environments .

Types of 10G Modules

- 10GBASE-SR (Short Reach)
- Operates over multimode fiber (MMF) at 850 nm wavelength.
- Typical reach: 300–400 meters on OM3/OM4 fiber .
- Uses VCSEL technology for low power consumption and high port density .

- 10GBASE-LR (Long Reach)
- Operates over single-mode fiber (SMF) at 1310 nm wavelength.
- Typical reach: up to 10 km .
- Suitable for longer-distance connections between buildings or across campuses.
- 10G PON Modules (XGS-PON)
- Integrated optics for passive optical networks.
- Supports 10 Gbps symmetrical bandwidth for both upstream and downstream traffic .
- Often includes Ethernet switching and MAC capabilities for end-to-end network optimization.

Key Features

- Form Factor: SFP+ (enhanced small form-factor pluggable) is standard for 10G modules, allowing hot-swappable installation .
- Encoding: Typically uses 64b/66b encoding to maintain clock recovery and low bit error rates .
- Applications: Short-range switch-to-server links, server-to-storage interconnects, and high-density data center deployments .
- Power Efficiency: VCSEL-based SR modules consume less power than long-haul DFB lasers, making them ideal for dense deployments .

Summary

A 10G optical module provides 10 Gbps bandwidth, with variations in reach and fiber type depending on the module standard (SR, LR, or PON). These modules are essential for high-speed networking, offering low latency, high reliability, and flexible deployment options in both enterprise and data center environments .

Article Content

10G SR Module for High-Speed Data Center Connectivity

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Fiber SFP modules use optical fiber as the transmission medium, supporting longer distances, high bandwidth, and EMI immunity.

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