

Article Overview

Dual-port optical modules enable high-speed, reliable interconnections between switches and servers, supporting multiple data rates and fiber types for modern data center and enterprise networks.

Overview

Dual-port optical modules are transceivers that provide two independent optical channels in a single module, allowing simultaneous connections to multiple devices or redundant paths. They are commonly used in high-density switches, routers, and network interface cards (NICs) to maximize port utilization and improve network reliability . These modules come in various form factors, including SFP+, OSFP, and QSFP, and support different speeds ranging from 10G to 800G depending on the module type .

Key Features

- o High-Speed Connectivity: Modules like the NADDOD OSFP 800G 2xSR4 support 800Gb/s Ethernet over multimode fiber with dual MPO-12/APC connectors, ideal for short-reach, high-bandwidth interconnects in data centers .
- o Form Factor and Compatibility: SFP+ modules, such as the Ruijie XG-SFP-LR-SM1310, operate at 10G over single-mode fiber with LC connectors and comply with IEEE 802.3ae and SFP+ MSA standards . OSFP modules provide higher density and are compatible with modern switches from NVIDIA, Arista, and Cisco .
- o Dual-Port Advantages: Two independent transceiver engines allow simultaneous data transmission, redundancy, or cross-connect configurations, improving network resilience and flexibility .
- o Distance and Fiber Type: Modules support single-mode fiber (SMF) for long-reach connections up to 10 km or multimode fiber (MMF) for short-reach connections up to 100 meters .

Certification and Reliability

For enterprise-grade switches, it is crucial to use certified optical modules to ensure transmission reliability and service stability. For example, Huawei requires modules to be certified for their switches, with labels indicating certification and compliance with specific firmware versions . Using non-certified modules may lead to network instability or unsupported operation.

Use Cases

- o Data Center Interconnects: High-density dual-port modules enable rack-to-rack or server-to-switch connections with minimal latency.
- o Redundant Links: Dual ports allow failover paths for critical network segments.
- o Lab and Testing Environments: Modules like the 2x2 mechanical optical cross switch allow cross or bypass

Dual-port optical module for switch

routing for testing optical networks .

o AI/ML Workloads: High-speed OSFP modules support AI cluster interconnects, maximizing throughput and reducing latency .

Conclusion

Dual-port optical modules are essential for modern high-speed networks, offering flexible, high-density, and reliable connectivity. When selecting a module, consider speed, form factor, fiber type, distance, and certification to ensure compatibility with your switch and network requirements .

What is the difference between a switch and a router? This guide explains Layer 2 vs Layer 3, OSI model roles, and

The Cisco® 100BASE-X Small Form-Factor Pluggable (SFP) device is a hot-swappable input/output device that plugs

Optical Switch Module Optical switch has an irreplaceable important role in all automated optical test system. It's the

Overview Arista's Optical Modules and Cable portfolio offer a wide variety of high-density and low-power 800G (dual 400G), 400G,

The module has eight pairs of multi-mode fiber with dual MPO-12 APC connectors. It is

The fastest, smallest, most reliable optical switches in the industry. Used in medical devices, undersea cables, quantum computers,

Describes what an optical module is and FAQs, including the fundamentals, appearance and structure, key performance counters,

Explore the working principles, structures, and performance metrics of optical modules, essential components of

Lfiber's optical switches (singlemode/multimode fiber switches) are micro-optic-based, opto-mechanical switches. These fiber

Optical ports on switches typically accommodate optical modules for transmitting data via fiber optic cables. In

Dual-port optical module for switch

Frames, Panels, Cassettes & Modules Frames, Panels, Cassettes & Modules ensure superior protection, reliability and scalability for

When planning a fiber optic network, one key decision is choosing between single-fiber (BiDi) and dual-fiber optical transceivers. This

As fiber optic networks continue to evolve, selecting the right optical transceiver becomes increasingly important.

The evolution of optical modules has been driven by the need for higher port density and

Optical Switches Includes optomechanical switches in different configurations from 1x1 to dual 2x2, and high durability Micro

The Cisco® 10GBASE SFP+ modules (Figure 1) give you a wide variety of 10 Gigabit Ethernet connectivity options for

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