

Are dual-fiber optical modules divided into A and B types



Overview

10G SFP+ Optical Module Selection Guide: Demystifying LRM, SR, This guide delves into the key differences between these 10G SFP+ dual-fiber modules across.

Key Takeaways

Dual-fiber optical modules use two separate fibers—one for transmitting (TX) and one for receiving (RX)—and are differentiated using A and B polarity to ensure correct end-to-end connectivity. How Dual-Fiber Modules Work

Dual-fiber (or duplex) optical modules have two independent fiber strands: one dedicated to transmitting data (TX) and the other to receiving data (RX). This separation ensures stable, high-speed communication and reduces signal interference, making dual-fiber modules ideal for data centers, backbone networks, and long-distance links. Unlike single-fiber BiDi modules, which use wavelength division multiplexing (WDM) to send and receive over a single fiber, dual-fiber modules rely on physical separation of fibers for bidirectional communication.

A and B Fiber Differentiation

To maintain proper connectivity, dual-fiber links follow the A-B polarity standard:

- Fiber A: Typically carries the transmit (TX) signal from one end to the receive (RX) port at the other end.



- Fiber B: Carries the receive (RX) signal from one end to the transmit (TX) port at the other end. This ensures that TX always connects to RX, preventing miswiring that could disrupt communication . Duplex patch cords are labeled with A and B ends, and the orientation is standardized: when facing the open port in the "key up" position, B is on the left and A is on the right. Following this standard guarantees correct polarity across multiple segments and adapters, regardless of the number of cable runs .

Practical Considerations

- Patch Cord Connection: Use a duplex LC patch cord with A-B polarity to connect the module ends. Cross-connect TX→RX and RX→TX using the A-B labeling.
- Interoperability: Any two dual-fiber modules can be connected as long as the TX and RX fibers are correctly paired; no special wavelength matching is required for standard duplex modules .
- Testing: Verify connectivity using link/activity LEDs or network testing tools like ping or iPerf to ensure proper A-B pairing .

Summary

Dual-fiber optical modules are physically divided into two fibers for TX and RX. The A-B labeling system is used to maintain correct polarity, ensuring that the transmitter on one end connects to the receiver on the other. Proper adherence to this standard is essential for reliable network operation and simplifies installation and maintenance in duplex fiber networks .

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