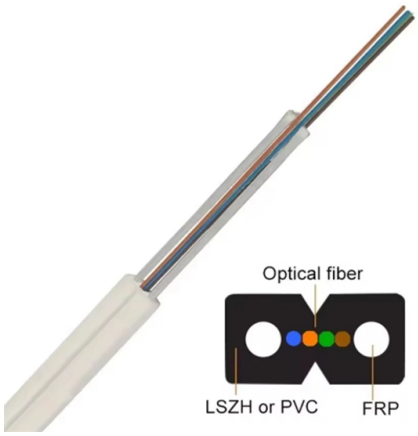
Fiber optic module single-mode dual-core



Overview

Single Mode fibers have a smaller core, allowing light to travel in a single, straight path, ideal for long distances with less signal loss.

Key Takeaways

A single-mode fiber optic module with dual cores uses two separate fiber channels to transmit and receive light signals, enabling long-distance, high-speed, and full-duplex communication.

Overview

A dual-core single-mode module (also called a dual-fiber module) contains two optical fibers: one for transmitting (TX) and one for receiving (RX) data. Each fiber has a narrow core, typically 9 microns in diameter, allowing light to travel in a single, straight path. This design minimizes signal loss and supports long-distance transmission, often ranging from 2 km up to 120 km depending on the module type.

Key Characteristics

Fiber Type: Single-mode (SM), optimized for long-distance communication with minimal dispersion. Wavelengths: Commonly 1310 nm or 1550 nm, suitable for high-speed networks. Connector Type: Usually LC connectors for single-mode modules.

Full-

Duplex Operation: Dual-core modules allow simultaneous transmission and reception, improving network efficiency. Compatibility: Can be used with switches, routers, and other network devices that support dual-fiber SFP, SFP+, or similar transceivers.

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Advantages

High Bandwidth: Two cores allow simultaneous bidirectional communication, effectively doubling data throughput compared to single-core modules.

Long-

Distance Transmission: Single-mode fibers reduce signal attenuation, making them ideal for metropolitan, campus, or long-haul networks. Ease of Deployment: Unlike single-fiber BiDi modules, dual-core modules do not require wavelength pairing and can connect any two compatible transceivers directly. Reliability: Dual-core modules provide stable communication with less interference and lower error rates over long distances.

Applications

Telecommunications: Long-haul fiber networks and backbone connections. Data Centers: High-speed interconnects between switches and servers. Enterprise Networks: Campus or building-to-building links requiring high bandwidth and reliability.

Industrial Networks: Environments where robust, long-distance optical links are needed. Comparison with Single-Core ModulesSingle-Core (BiDi): Uses one fiber for both TX and RX, requiring wavelength multiplexing. Saves fiber but needs matched transceivers.

Dual-

Core: Uses two fibers, simpler setup, full-duplex, and more flexible for network expansion. In summary, a single-mode dual-core fiber optic module is ideal for long-distance, high-speed, and reliable network connections, offering full-duplex communication and easier deployment compared to single-core BiDi modules.

Article Content

The Key Differences Between 1-core, 2-core, Single

Single Mode fibers have a smaller core, allowing light to travel in a single, straight path, ideal for long distances with less signal loss. Multi-mode

The Difference Between Single/Dual Fiber and

Understanding the distinction between single vs. dual fiber and single-mode vs. multi-mode is essential when deploying optical modules in any fiber

Single Mode vs. Multimode Fiber: Core Differences and Selection Guide

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How do you choose between single mode and multimode fiber? Compare their differences in core size, light source, bandwidth, transmission distance, and cost to identify the right application.

What Is A Single-Fiber BiDi Transceiver?--ETU-LINK

Single fiber module also called BiDi transceiver or WDM module. It uses WDM technology to realize the bidirectional transmission of optical signals on one optical fiber.

Single-mode vs Multimode SFP 2026: Fiber Types and distances

A guide to single-mode vs multimode SFP modules. Covers fiber types, wavelengths, distances, BiDi, CWDM/DWDM, SMF vs MMF selection, and application scenarios.

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