

Single Module Dual Fiber Optics



Article Overview

Single-fiber (BiDi) transceivers transmit and receive data over one fiber using two wavelengths, while dual-fiber transceivers use separate fibers for transmit and receive signals.

Overview

Single-fiber (BiDi) optical modules use Wavelength Division Multiplexing (WDM) to enable bidirectional communication over a single optical fiber. One wavelength is used for transmitting (TX) and another for receiving (RX), allowing both directions of data flow on a single strand. These modules must be deployed in matched pairs with complementary wavelengths (e.g., TX1310/RX1550 at one end and TX1550/RX1310 at the other) to function correctly. Dual-fiber optical modules have two separate fibers: one for transmitting and one for receiving. This design is simpler, widely supported, and typically uses a single wavelength per fiber. Dual-fiber modules are compatible with standard duplex LC interfaces and are preferred for high-speed or long-distance networks where fiber resources are abundant.

Key Differences

Feature	Single-Fiber (BiDi)	Dual-Fiber
Fiber count	1 fiber	2 fibers (TX and RX)
Transmission	Bidirectional using two wavelengths	Unidirectional per fiber, one wavelength each
Interface	Simplex LC (single port)	Duplex LC (two ports)
Fiber efficiency	Saves 50% of fiber resources	Uses more fibers
Cost	Higher per module due to WDM	Lower per module, simpler design
Applications	Fiber-scarce environments, metro networks, 5G fronthaul	Long-distance backbone, high-speed 25G+, 100G+ networks
Signal interference	Requires careful wavelength matching	Minimal interfere...

Article Content

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10G BiDi SFP+ modules utilize a unique optical mechanism that enables full-duplex data transmission over a single

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How do you choose between single mode and multimode fiber? Compare their differences in core size, light source,

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Optical Fiber: Single-Mode Multimode Single-Fiber Dual-Fiber

Single-fiber vs. dual-fiber refers to how many fiber strands are used to send and receive data. In this guide, we'll

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Single fiber vs dual fiber WDM architectures differ in fiber usage and performance. Dual fiber uses separate fibers for

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The optical module of a single fiber needs to receive and transmit on one optical port, and saves half of the optical

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

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

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Single Mode fibers have a smaller core, allowing light to travel in a single, straight path,

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Single Fiber vs Dual Fiber Transceivers Understanding

Among these devices, single-fiber modules (BiDi) and dual-fiber modules (standard duplex)

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What is the difference between single fiber and dual fiber optical ...

Dual fiber: The devices at both ends can use 10G SFP+ dual fiber optical modules with a wavelength of 1310nm.

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Dual-fiber Module: It has two independent fiber optic interfaces, one for transmitting and the other for receiving optical

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What is the difference between a single-fiber optical module and a dual ...

1, the appearance of the use: single-fiber optical module only a fiber interface to connect a fiber patch cord, dual-fiber

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SFP transceivers are valued for their flexibility, low power consumption and ability to support both single

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o In optical modules, "core" refers to the light-transmitting channel in the fiber. A 1-core

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Fiber Optics Part 2: Single-Mode Fiber vs. Multi-Mode

Written by Priya Maratukulam, Product Manager, Transceiver Modules Group, Cisco In our

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Optical fiber connector

An optical fiber connector is a device used to link optical fibers, facilitating the efficient transmission of light signals. An optical fiber

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Single Mode and Multimode Fiber: What's the Difference?

Learn more about Single Mode and Multimode Optical Fibers - their design, key differences, and intended fiber optic systems

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Choosing the Right SFP: Single Fiber vs Dual Fiber

Limited Compatibility Not all network devices support single fiber SFPs. Compatibility checks are essential before

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What is the difference between single fiber and dual fiber optical ...

How to choose single fiber vs dual fiber for my project? This article explains definition, structure, wavelength,

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What is the difference between single fiber and dual fiber optical modules?

In recent years, with the rapid development of networks, optical modules have become an essential part of fiber optic

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Single-mode vs Multimode SFP 2026: Fiber Types and

A guide to single-mode vs multimode SFP modules. Covers fiber types, wavelengths,

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fiber optic cable multimode versus singlemode duplex vs simplex

Workstations, fiber switches and servers, fiber modems, and similar hardware require duplex cable. Duplex fiber is available in

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Difference Between Single and Dual Fiber Optical Transceivers

Know the key differences between Single and dual-fiber optical transceivers for efficient network deployment and

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Single Fiber vs. Dual Fiber 100G Optical Modules: Key Differences ...

Choosing between a 100G single-fiber (BiDi) and a dual-fiber optical module is a critical decision in network design,

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Differences Between Dual Fiber SFP and Simplex SFP Modules

Dual fiber SFP and simplex SFP modules are two different SFP types, and understanding their differences is crucial for making

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Single vs Dual Fiber Media Converters (2025): A/B

Whether you choose single-fiber BiDi for fiber savings or dual-fiber for simplicity, the fundamentals are the

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The difference between single and dual fiber optical transceiver

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

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Multi-mode optical fiber

Multi-mode optical fiber is a type of optical fiber mostly used for communication over short distances, such as within a building or on a

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Single vs. Dual Fiber Networks

Compare single fiber vs dual fiber networks for utility deployments. Learn cost, performance, scalability, and last-mile

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What is the Difference Between Single Fiber and Dual Fiber SFP ...

Additionally, fewer fibers mean that there is less likelihood of encountering cable management issues, which can

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Single-fiber Transceiver & Dual-fiber Transceiver

Single-fiber optical modules and dual-fiber optical modules are two common types of optical modules. They all play an important role

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Single Fiber vs. Dual Fiber 100G Optical Modules: Key Differences ...

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