

Article Overview

Bestselling single-fiber bidirectional (BiDi) fiber solutions include 1G, 10G, 25G, 40G, 100G, and 400G BiDi SFP/SFP+/QSFP modules, which maximize fiber efficiency using wavelength division multiplexing (WDM) over a single strand.

Overview of BiDi Technology

BiDi optical modules enable full-duplex communication over a single fiber by using two different wavelengths for transmit (Tx) and receive (Rx) signals, typically 1310 nm and 1550 nm for single-mode fiber or 850 nm for multimode fiber . This approach reduces fiber usage by up to 50%, simplifies cabling, and lowers installation and maintenance costs . BiDi modules must operate in complementary pairs, where the Tx wavelength of one module matches the Rx wavelength of the other .

Popular BiDi Models and Specifications

- o 1G BiDi SFP: Designed for 1G deployment, commonly using 1310/1550 nm or 1310/1490 nm wavelength pairs for distances up to 40 km, and 1550/1490 nm for distances beyond 40 km .
- o 10G BiDi SFP+: Supports 10G serial optical communication with 1490/1550 nm wavelength pairs, reaching distances up to 80 km .
- o 25G BiDi SFP: Provides 25GBase-BX throughput up to 40 km over single-mode fiber using 1310 nm-TX/1270 nm-RX via LC simplex connectors .
- o 40G BiDi QSFP+: Typically uses 850 nm for multimode fiber, with OM3 patch cables supporting 300 m, OM4 up to 400 m, and OM5 up to 500 m .
- o 100G BiDi: Duplex LC interface, distances of 75 m (OM3), 100 m (OM4), and 150 m (OM5), suitable for Ethernet and data center applications .
- o 400G BiDi: Quad version of 100G BiDi, often using four fiber pairs (4+4 MPO), compatible with digital coherent CFP2 transceivers for high-capacity networks .

Advanced Coherent BiDi Solutions

For mobile transport and high-capacity networks, coherent single-fiber BiDi transceivers operate at a single center frequency (e.g., 193.0 THz) for both upstream and downstream, optimizing power efficiency and minimizing reflections without additional electro-optical nodes . These solutions are ideal for unified end-to-end transport infrastructures in metro and mobile networks.

Deployment Benefits



Bestselling Single-Fiber Bidirectional Fiber Configuration Solution

- o Fiber Savings: Reduces fiber usage by up to 50%, critical in fiber-limited environments .
- o Cost Efficiency: Lowers installation, leasing, and maintenance costs by maximizing existing fiber infrastructure .
- o Simplified Management: Fewer physical connections reduce potential failure points and accelerate network deployment .
- o Versatility: Passive BiDi adapters, such as RAD's BiDi QSFP, are compatible with multiple data rates (10G-400G) and existing SFPs, enabling immediate infrastructure upgrades without replacing installed modules .

Key Considerations

When selecting BiDi modules, consider:

- o Wavelength pairing and compatibility with existing modules
 - o Transmission distance and fiber type (single-mode vs multimode)
 - o Data rate support (1G, 10G, 25G, 40G, 100G, 400G)
 - o Device support and interoperability
 - o Optical isolation to prevent crosstalk between Tx and Rx signals
- Bestselling single-fiber BiDi solutions combine high performance, cost-effectiveness, and ease of deployment, making them ideal for campus networks, metro rings, data centers, and mobile transport networks.

"Bidirectional Transceivers Approved Networks" bi-directional (BiDi) transceivers are designed to optimize optical networking by

Service providers, fiber owners, and primary users can effectively double the capacity of their fiber infrastructure without the need for

In many optical network deployments, fiber resources are limited while bandwidth requirements continue to grow. A bidirectional SFP

A single fiber passive solution in Point-to-Point configuration uses 2 wavelengths of WDM per service. This is how you

In optical fiber networks, one of the most important parts is bidi modules since they allow bidirectional data transfer

Explore how 10G BiDi SFP+ modules enable high-speed, bidirectional data over a single fiber, cutting costs, saving fiber, and



Bestselling Single-Fiber Bidirectional Fiber Configuration Solution

BiDi technology optimizes bidirectional data transmission on a single fiber, thereby improving network efficiency, and

Learn the differences between BIDI single-fiber and dual-fiber bidirectional optical modules:

Bidirectional (BiDi) transceivers represent a transformative technology that enables full-duplex communication over a

At present, bidi single fiber bidirectional optical module is usually used in ISP network, FTTx or data center network

BiDi SFP modules enable bidirectional transmission over a single-mode fiber using paired wavelengths. They are available across

We manufacture a range of bidirectional SFP transceivers for applications supporting data transfer rates of 10/100/1000Mbps,

Learn how to choose the right bidirectional SFP for single-fiber links. Compare wavelengths, distances, and compatibility to optimize

Comprehensive guide on BiDi Optical modules, detailing single-fiber bidirectional

BiDi SFP technology offers a cost-effective, fiber-saving, and high-performance solution for modern optical networking.

Solution The WDM system supports single transmission in two modes: Single-Fiber Unidirectional and Single-Fiber

Web: <https://www.kremgroup.co.za>

