Optical Module Single-Fiber Bidirectional Wavelength



Overview

This comprehensive guide explains how WDM couplers combine and separate different wavelengths (1310nm/1550nm,1270nm/1330nm,850nm/900nm) to achieve bidirectional transmission on one fiber strand—cutting fiber usage by 50% while maintaining performance. Bidirectional over Single Fiber (BiDi) means that data transmission and reception can be completed simultaneously within a single optical fiber, unlike ordinary optical fibers which use two separate wires for transmission and reception. By reading this blog, you will understand how SFP BiDi technology allows you to save fiber, reduce costs, and simplify installation while enabling your network to increase. BiDi transceiver, a compact optical transceiver with WDM (wavelength division multiplexing) technology and SFP multi-source protocol (MSA) compliance, allows fast data transmission using a single fiber optic for both sending and receiving signals, saving resources and cutting infrastructure costs. In practical network deployments, this makes BiDi SFP modules a highly effective solution for. Typically, short to medium-distance BiDi networks spanning 10km to 40km use a wavelength combination of 1310nm/1490nm, while long-haul BiDi SFP applications spanning 80km to 120km usually employ a wavelength combination of 1490nm/1550nm. SFP+ BiDi transceivers are specifically engineered to support.



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Article Content

How do optical modules achieve single-fiber bidirectional transmission ...

It achieves bidirectional signal transmission over a single fiber through wavelength splitting and single-fiber multiplexing, adaptable to various speeds such as gigabit and 10-gigabit

BiDi Optical Modules: Unlocking Single-Fiber

Low on fiber but need faster and more dependable connections? What if you could double your network''s capacity without having to add any

The Essential Guide to BiDi Transceivers: Everything You Need to Know

BiDi transceiver, a compact optical transceiver with WDM (wavelength division multiplexing) technology and SFP multi-source protocol (MSA) compliance, allows fast data

BiDi SFP Module: A Complete Guide for Fiber Networks

BiDi SFP modules enable bidirectional transmission over a single-mode fiber using paired wavelengths. They are available across 155M, 1G, and 10G speeds, supporting both legacy and modern networks.

Single-fiber Bidirectional Transceivers

The most commonly used wavelength combination for 10G SFP+ BiDi transceivers is 1270nm/1330nm, which is employed for short to medium-distance optical fiber

The Complete Guide to BiDi Transceiver

Unlike traditional optical modules that use separate fibers for transmitting and receiving data, BiDi modules accomplish this bidirectional data transfer on a single fiber, optimizing space

Single-Fiber Bidirectional Transmission and Single-Fiber

Different center wavelengths are used for the two directions. This mode saves half of the fiber resources compared to the single-fiber unidirectional transmission mode, but it has a more complex design and

BiDi Transceivers: Single Fiber, Dual Wavelength Communication

Bidirectional (BiDi) transceivers represent a transformative technology that enables full-duplex communication over a single optical fiber strand by using different wavelengths for transmit

What is BiDi Transceiver: A Beginner''s Guide

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What is a BiDi Transceiver? BiDi transceiver, or Bidirectional or simplex optical transceiver, is an optical module that uses Wavelength Division

Single-Fiber Bidirectional Transmission and Single-Fiber

This mode is mainly used on the client side, implemented through the filtering function of a single-fiber bidirectional optical module. Different center wavelengths are used for the two directions.

SFP+ Transceiver CBO SFP-10G-BX-U 10G | AiO.lv

Short description CBO SFP-10G-BX-U is an SFP+ transceiver module supporting 10 Gbps transmission at 1310 nm wavelength. Designed for single-mode, bidirectional fiber links, it enables compact 10G

Small Form-factor Pluggable

Small Form-factor Pluggable Small Form-factor Pluggable connected to a pair of fiber-optic cables Small Form-factor Pluggable (SFP) is a compact, hot-pluggable network interface module format used for

10G BiDi SFP+ TX1550nm/RX1490nm 70KM LC Optical Transceiver

Product Description□10G BiDi SFP+ 1490nm/1550nm 70KM LC Optical Transceiver This high-performance bidirectional SFP+ transceiver delivers 10Gbps connectivity over 70km single-mode

Transceiver CBO SFP-10G-BX-D 10G SFP+ | AiO.lv

Short description CBO SFP-10G-BX-D is a fiber-optic SFP+ transceiver supporting 10 Gbps bidirectional transmission over a single fiber. Designed for data center and carrier networks, it enables duplex

1G Bidirectional Single-Mode Optical Module

SFP transceiver that supports 1G connections up to 3 km using single-mode fiber with a simplex LC UPC connector.

Transceiver CBO SFP-10G-BX-D SFP+ 10G | AiO.lv

Short description CBO SFP-10G-BX-D is a fiber optic SFP+ transceiver module supporting 10G data rates for single-fiber bidirectional links. Designed for use in compatible switches and routers, it

Lightmatter Achieves 16-Wavelength Bidirectional Link on Single

MOUNTAIN VIEW, Calif., Aug. 19, 2025 — Photonic supercomputing company Lightmatter has achieved a 16-wavelength bidirectional dense wavelength division multiplexing (DWDM) optical link

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Understanding Pluggable Optical Modules

Therefore, optical modules are also classified into single-mode and multimode modules to support different optical fibers. Single-mode optical modules are used with single-mode fibers.

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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