

Gigabit Single-Fiber Bidirectional Optical Module Types



AI Overview

Gigabit Single-Fiber Bidirectional (BiDi) Optical Modules enable simultaneous two-way data transmission over a single fiber using Wavelength Division Multiplexing (WDM), effectively halving fiber usage while maintaining full-duplex communication.

Overview A BiDi optical module is a compact, high-performance transceiver used in fiber optic networks that allows bidirectional communication over a single fiber strand. Unlike traditional dual-fiber modules, which require separate fibers for transmitting (Tx) and receiving (Rx), BiDi modules use different wavelengths of light to carry upstream and downstream signals simultaneously, reducing fiber requirements and cabling complexity.

Working Principle BiDi modules operate using Wavelength Division Multiplexing (WDM) technology. Each module contains a transmitter optical sub-assembly (TOSA) and a receiver optical sub-assembly (ROSA) integrated into a single fiber connector, often referred to as BOSA. An internal optical filter separates the wavelengths:

- Transmission side (Tx):** Emits light at a specific wavelength (e.g., 1310 nm) for sending data.
- Reception side (Rx):** Receives light at a different wavelength (e.g., 1490 nm or 1550 nm) from the opposite end. This setup allows full-duplex communication over a single fiber, similar to a two-lane road where each lane carries traffic in opposite directions.

BiDi modules must be used in pairs with complementary wavelength configurations to ensure proper communication.

Common Types and Data Rates

- 1G BiDi SFP:** Typically uses 1310 nm (Tx) / 1490 nm (Rx) for short to medium distances (10–40 km) and 1490 nm / 1550 nm for long-haul applications (80–160 km).
- 10G BiDi SFP+:** Uses 1270 nm / 1330 nm for short/medium distances (10–60 km) and 1490 nm / 1550 nm for long-haul (80–100 km).
- 25G BiDi SFP28:** Supports 25G Ethernet and CPRI applica...

Article Content

Cisco SFP Modules for Gigabit Ethernet Applications

This data sheet describes the benefits, specifications, and ordering information for the Cisco SFP Modules for Gigabit Ethernet Applications.

Cisco SFP Modules for Gigabit Ethernet Applications

1000BASE-BX40-D and 1000BASE-BX40-U for Single-Fiber Bidirectional Applications
The Cisco GLC-BX40-D-I, GLC-BX40-DA-I, and GLC-BX40-U-I SFPs operate on a single strand of standard SMF.

Gigabit SFP Transceiver 1.25G SMF 20km LC Single Fiber BiDi SFP Optical ...

Product Description This 1.25G BiDi SFP optical module is a hot-pluggable transceiver designed for single-mode single-fiber communication. It adopts a single LC port to transmit and receive signals

The Ultimate Guide to ZTE SFP Module Distance and Wavelength

However, the physical layer performance is dictated by the SFP's optics. The fundamental architectural choice is the wavelength and fiber type, which directly determine the maximum transmission

SFP Optical Transceivers: How Pluggable Optics Are Reshaping

1. Introduction: The Pluggable Revolution In the era of hyperscale AI computing and always-on global connectivity, the optical transceiver module has quietly become one of the most

BiDi Optical Modules: Unlocking Single-Fiber

Comprehensive guide on BiDi Optical modules, detailing single-fiber bidirectional connectivity, deployment tips, troubleshooting, and multi-speed

1G BiDi SFP Module Selection Guide: Maximize Fiber

Choose the right 1G BiDi sfp module by checking compatibility, wavelength pairing, fiber type, and distance to ensure reliable network performance.

BiDi SFP Module: A Complete Guide for Fiber Networks

Learn what a BiDi SFP module is, how it works, key types, benefits, and when to use BiDi optics in fiber networks.

Mastering Composite Fiber Optic Cable: Installation and

What's a Composite Fiber Optic Cable? The composite fiber optic cable is a type of cable that combines both fiber optic and copper conductors

How to choose the right optical module

Optical modules, as key components for achieving high-speed optical fiber communication, are being more widely applied in data centers, communication networks, cloud

Cisco 25GBASE SFP28 Modules Data Sheet

The Cisco 25GBASE SFP28 (Small Form-Factor Pluggable) portfolio offers customers a wide variety of high-density and low-power 25 Gigabit

7 Best Fiber Optic ONT | Don't Buy Until You Read This

For most users, the best fiber optic ont winner is the 10Gtek Gigabit Ethernet Media Converter because it delivers UL-certified safety, matched SFP modules, and proven surge isolation at a mid-range price

The Essential Guide to BiDi Transceivers: Everything

BiDi transceivers are available at varying speeds, transmission rates, and wavelengths. The following provides a thorough explanation of the various

Small Form-factor Pluggable

SFP modules are commonly available in several different categories. Note that the QSFP/QSFP+/QSFP28/QSFP56 are designed to be electrically backward

Gigabit SFP modules with fiber optic modes » buy

Our SFP modules support various fiber modes, including singlemode and multimode. Depending on your requirements, you need to select your SFP

Network Transceiver Modules

Buy Network Transceiver Modules from top brands like C2G, Black Box, Facilis and HPE Aruba Networking. Go to B& H for amazing prices and service.

The Ultimate Guide to SFP Modules (2026): Types,

Read the definitive 2026 guide on SFP modules. We explain Single Mode vs Multimode, DDM diagnostics, and how to choose the right transceiver for Cisco,

CBO E1MG-BXD-BO fiber SFP 1000 Mbit/s LC BX-D | AiO.lv

CBO E1MG-BXD-BO is a fiber optic SFP transceiver supporting 1000 Mbit/s data rate with LC connector and BX-D (bidirectional) operation. Designed for single-fiber links up to 10,000 m, it enables long

Contact Us

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