What are the functions of a single-fiber bidirectional module

AI Overview

A single-fiber bidirectional (BiDi) module enables simultaneous two-way data transmission over a single optical fiber using two different wavelengths, conserving fiber resources and simplifying network deployment.Core FunctionsBidirectional Data Transmission: A single-fiber BiDi module allows full-duplex communication over a single strand of optical fiber. It transmits and receives data simultaneously by assigning different wavelengths for each direction, typically using Wavelength Division Multiplexing (WDM) technology. For example, one module may transmit at 1310 nm and receive at 1550 nm, while the paired module at the other end uses the opposite configuration . Fiber Resource Optimization: By combining both transmission directions onto a single fiber, BiDi modules reduce fiber usage by up to 50% compared to traditional dual-fiber setups. This is particularly valuable in environments with limited fiber availability or high deployment costs, such as metropolitan area networks, telecom access networks, and enterprise campus links . Cost Reduction and Simplified Installation: Fewer fibers mean lower installation and maintenance costs. BiDi modules reduce the need for additional cabling, minimize physical connections, and streamline network upgrades or expansions, which also decreases potential points of failure . Flexible Networking and Compatibility: BiDi modules support various speeds and distances, from 1G SFPs to 25G SFP28 modules, and are compatible with standard LC connectors. They can be deployed in data centers, campus networks, and high-density installations, providing a scalable solution for increasing bandwidth without adding new fiber infrastructure . Operational Monitoring and Maintenance: Some BiDi modules integrate filtering functions to separate wavelengths and prevent signal interference, enabling easier...

Article Content

Understanding Optical Modules: A Comprehensive Guide

Optical Module Basics: Understanding the Core ConceptsOptical modules are compact devices that convert electrical signals into optical signals and vice versa. They are used in fiber optic

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.

SFP+ transceiver CBO Palo Alto SFP-10G-BX-U | AiO.lv

Short description SFP+ transceiver CBO compatible with Palo Alto Networks SFP-10G-BX-U, supporting 10 Gbps fiber optics. Designed as a single-fiber bidirectional (BX) module for use in switches, routers

BiDi SFP Module: A Complete Guide for Fiber Networks

A BiDi SFP module is a bidirectional fiber optic transceiver that enables simultaneous transmit and receive over a single strand of single-mode fiber, instead of the traditional two-fiber setup.

12G-SDI over Fiber Transceiver, Bi-Directional 12G-SDI

Panel & Size System Diagram Frequently Asked Questions Q): What is the transmission distance of this 12G-SDI over Fiber Transceiver? Does it support multi-mode fiber? A): This device is equipped with

BiDi Optical Modules: Unlocking Single-Fiber Bidirectional Connectivity

BiDi modules deliver a powerful approach to fiber savings and cost reductions through full-duplex communication over a single fiber strand. BiDi modules are compatible with existing

8 Best OTDR Fiber Optic Testing Equipment (June 2026) Expert

Discover the 8 best OTDR fiber optic testing equipment (June 2026). Our expert reviews highlight reliable, high-performance tools for accurate fiber network diagnostics and testing.

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

Confused by SFP vs SFP+? 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, Juniper, and more.

Understanding BIDI SFP Optical Transceiver Modules

Visually, a BIDI module has only one port and uses only one optical fiber for connection. The working principle of a BIDI optical module is that it uses a filter (filtering out unwanted center

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

Single-Fiber Bidirectional Transmission and Single-Fiber

This mode saves half of the fiber resources compared to the single-fiber unidirectional transmission mode, but it has a more complex design and requires more complicated operation, management,

SFP Bidirectional Transceiver (BiDi) Technical Guide

A BiDi (SFP Bidirectional Transceiver) is a pluggable optical module that enables full-duplex data transmission over a single strand of single-mode fiber (SMF) by using two different

BiDi SFP: The Complete Guide to Bidirectional SFP Transceivers and ...

A BiDi SFP is a specialized optical transceiver that enables bidirectional communication over a single strand of optical fiber. Unlike standard duplex SFPs that require two fibers—one for

The Comprehensive Guide to PON Architecture: Mastering OLT,

The most complex and critical function of the OLT is managing the upstream traffic flow. Since all 32 to 128 ONTs share a single fiber (and thus a single time domain) for transmission to the

Ubiquiti 10 Gbps Bidirectional Single-Mode Optical Module

Ubiquiti 10 Gbps Bidirectional Single-Mode Optical Module Single-mode, simplex, fiber transceiver module. The 10 Gbps Bidirectional Single-mode Optical Module is a simplex transceiver that delivers

Cisco 10GBASE SFP+ Modules Data Sheet

The Cisco® 10GBASE SFP+ modules (Figure 1) give you a wide variety of 10 Gigabit Ethernet connectivity options for data center, enterprise wiring closet, and service provider transport

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

It enables longer distance transmission while still maintaining high signal quality. The simplified single-chain structure reduces the potential connection failure points, reduces the error

How Do Optical Modules Achieve Single-Fiber Bidirectional ...

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...

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

Cisco 10GBASE SFP+ Modules Data Sheet

Cisco SFP-10G-BX40D-I and SFP-10G-BX40U-I (for 40Km single-fiber bidirectional applications) The Cisco SFP-10G-BX40D-I and SFP-10G-BX40U-I SFPs operate on a single strand of standard SMF.

SFP Module Transceivers, Manufacturer & Supplier

A BIDI optical module is a single-fiber bidirectional optical module, or BiDi (Bidirectional). Conventional modules are dual-fiber modules (connected by two

XGSPON ONU SFP+ 1270nm-TX/1577nm-RX 9.953G-TX/9.953G-RX

It functions as an integrated Optical Network Unit (ONU) by embedding a MAC controller and OMCI stack directly into an SFP+ form factor. This allows the module to handle bidirectional data

How do optical modules achieve single-fiber bidirectional

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

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

What are BiDirectional SFP Modules and How Do They Work?

What is a BiDirectional SFP Module? Bidirectional (BiDi) transmission involves using a single fiber core rather than the two used in traditional SFP modules. BiDi SFP modules achieve this bidirectional

Contact Us

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