

Classification of Gigabit Single-Fiber Bidirectional Optical Modules



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

The Complete Guide to BiDi Transceiver

Explore more about the BiDi transceiver's working principles, types, applications, and how to choose the right BiDi fiber cables for BiDi modules.

First acquaintance with optical modules: classification of

In addition, there is a BOSA (Bi-Directional Optical Sub-Assembly) component that combines the transmitting component and the receiving

Introduction Of 100M Single-mode SFP BIDI SC

100M single-mode SFP BIDI is widely used in SDH STM-1, SONET OC-3 IR1, LR1, LR2 and other scenarios. Compared with the 100M dual-fiber

SFP modules – transceivers for 1/2/4G fibre channel

BiDi (Bidirectional) SFP – Single-fiber SFP modules for FTTH and fiber-efficient networking, allowing both transmit and receive signals to travel over a single

What is 10G BIDI SFP+ Single-fiber Bidirectional ?

10G BIDI SFP+ optical module is packaged in SFP+, with a transmission rate of 10G, LC simplex interface, and a transmission distance of up to 80 kilometers when used with single-mode

BiDi Single-Fiber Bidirectional Optical Module Details

The interface of optical module is mainly divided into single-fiber bidirectional BiDi, dual-fiber bidirectional (Deplx) and other types. In WDM system, the line transmission method mainly

What is the difference between BIDI single-fiber bidirectional and dual ...

Learn the differences between BIDI single-fiber and dual-fiber bidirectional optical modules: structure, principle, components, applications, and how to choose.

Classification and Specifications of HUAWEI Transceivers

SFP transceivers support LC fiber connectors. eSFP: enhanced small form-factor pluggable. An eSFP module is an SFP module that supports monitoring of

Introduction to GPON Optical Modules and Their

As the demand for high-speed internet and fiber-to-the-home (FTTH) services continues to grow, Gigabit Passive Optical Networks (GPON) have

Cisco Compatible Optical Modules Catalog

Cisco Compatible Optical Modules Catalog - Official Technical Overview & Hardware Datasheet EXECUTIVE SUMMARY This document serves as the definitive technical reference for the Cisco

FS SFP module family for Gigabit Ethernet Applications

Learn about FS 's comprehensive range of 1G SFP optical module products, including copper and regular fiber optical transceivers, CWDM, DWDM, BIDI, Fiber Channel, and

Classification and basic principles of optical modules

The optical fiber connector is an indispensable passive device in the optical fiber communication system. Its use makes it possible to detachably connect the optical channels, which

The Difference Between Single/Dual Fiber and

As fiber optic networks continue to evolve, selecting the right optical transceiver becomes increasingly important. Whether you're designing a short

What Are The Types Of Gigabit Optical Modules

Gigabyte optical modules can be divided into two categories, namely, single fiber and dual fiber optical module. Single fiber refers to only one interface, which can be transmitted by using

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

Bidirectional single-fiber (BiDi) transmission technology is a core technology in the field of optical communication that combines practicality and economy. It achieves bidirectional signal

Introduction to GPON Optical Modules and Their

In this blog post, we'll provide an introduction to GPON optical modules and explore the key classification standards that define their

What is the difference between BIDI single-fiber

Learn the differences between BIDI single-fiber and dual-fiber bidirectional optical modules: structure,principle,components,applications,and

Cisco SFP Modules for Gigabit Ethernet Applications Data Sheet

The 1000BASE-EX SFP operates on standard single-mode fiber-optic link spans of up to 40 km in length. A 5- dB inline optical attenuator should be inserted between the fiber-optic cable and the

Gigabit single-mode single-core fiber optic module

Therefore, the 155M optical module is also called FE (100M) optical module, and the 1.25G optical module is also called GE (gigabit) optical module. This is the most widely used module

How to choose the right optical module

By considering these factors and taking a systematic approach to selecting optical modules, you can choose the right modules that meet your networking needs effectively and

1G SFP PRODUCT FAMILY

The 1000BASE-BX10-D and 1000BASE-BX10-U Single-Fiber Bidirectional SFP modules support a link length of up to 10km on a single strand of standard single-mode fiber (SMF, G.652).

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.

Classification of 10G SFP+ Transceiver Modules

This article introduces three types of 10G SFP+ optical transceivers: 10GBASE-T SFP+ copper module, and 10GBASE SFP+ multimode/singlemode

Comprehensive Guide to Optical Transceiver Classifications and

Understanding their classifications and types is essential for selecting the appropriate module for specific networking requirements. This guide covers the most common classification

Comprehensive Guide to Optical Transceiver

Introduction Optical modules are critical components in fiber optic communications, enabling the conversion between electrical and optical signals.

The Most Comprehensive Guide Of Optical Modules

Explore the ultimate guide to optical modules. Learn types, functions, performance metrics & how to choose the right module for your fiber network.

The Complete Guide to BiDi Transceiver

What Is BiDi Transceiver? BiDi transceivers have become synonymous with reliable and high-performance networking, which can achieve

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