Recommended Dual-Fiber Optic Modules



Overview

Learn how to choose the right SFP module based on compatibility, speed, fiber type, wavelength, and distance. Practical guide for engineers and IT buyers.

Key Takeaways

Dual-fiber optic modules use two fibers for bidirectional communication, with types varying by wavelength, fiber mode, and data rate.

Overview of Dual-

Fiber ModulesDual-fiber SFP modules are optical transceivers that use two separate fibers—one for transmitting and one for receiving data—enabling full-duplex communication. They are commonly used in 1G, 10G, and higher-speed networks and are compatible with both single-mode (SMF) and multimode fibers (MMF). These modules are typically equipped with LC duplex connectors and require a pair of fibers for operation.

Types Based on Fiber ModeSingle-Mode Dual-Fiber Modules (SMF)Operate over OS2 single-mode fiber with a ~9 µm core. Support long-distance transmission, ranging from 10 km to over 160 km depending on wavelength and module type. Common wavelengths: 1310 nm, 1550 nm.

Multimode Dual-

Fiber Modules (MMF)Operate over OM3/OM4/OM5 multimode fiber with ~50 µm cores. Suitable for short-distance applications, typically up to 2 km. Common wavelength: 850 nm.

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Types Based on Wavelength850 nm: Primarily for multimode fiber, short-range connections. 1310 nm: Single-mode fiber, medium-range connections. 1550 nm: Single-mode fiber, long-range connections, often used in data centers and telecom backbones.

Types Based on Data Rate1G SFP: Standard gigabit dual-fiber modules. 10G SFP+: Higher-speed dual-fiber modules for data center and enterprise networks. 25G SFP28 and above: Advanced dual-fiber modules for high-density, high-speed applications.

Advantages of Dual-

Fiber Modules

Stable full-duplex communication with separate transmit and receive fibers. Simpler setup compared to single-fiber BIDI modules in some network designs. Compatibility with standard LC duplex ports and widely supported by network equipment.

Comparison with Single-Fiber (Simplex/BIDI) ModulesDual-fiber modules require two fibers but provide straightforward full-duplex operation. Single-fiber (BIDI) modules use one fiber for both directions, saving fiber resources but requiring wavelength-specific transceivers. Dual-fiber modules are often preferred when fiber availability is not limited and long-term reliability is a priority.

SummaryDual-fiber optic modules are categorized by fiber mode (single vs. multimode), wavelength (850, 1310, 1550 nm), and data rate (1G, 10G, 25G, etc.). They are widely used in enterprise, data center, and telecom networks for reliable, full-duplex optical communication, offering flexibility and compatibility with standard network equipment while ensuring high performance over varying distances.

Article Content

The Key Differences Between 1-core, 2-core, Single

A 1-core fiber is like a single-lane road—only one car (or data signal) can travel at a time. A 2-core fiber is like a two-lane highway, allowing twice the

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How to Choose SFP Module for Compatibility, Speed, and Distance

Learn how to choose the right SFP module based on compatibility, speed, fiber type, wavelength, and distance. Practical guide for engineers and IT buyers.

Single Fiber vs Dual Fiber Transceivers Understanding the Key

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Among these devices, single-fiber modules (BiDi) and dual-fiber modules (standard duplex) are two primary categories. Understanding their differences is essential for network

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Opticonnects offers a range of passive WDM devices for both Dual Fiber as Single Fiber Bidirectional connections, using Wave Division Multiplexing technology.

Which Optical Module Should You Choose: Single-Fiber or Dual

Dual-fiber modules are cost-effective and offer better compatibility when fiber resources are sufficient. Single-fiber modules are ideal for saving fiber resources, especially in...

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As a leading optical module manufacturer, Velolan Networks offers a comprehensive portfolio from 1G to 800G. Our range of high-quality, standards-compliant 10G SFP+ dual-fiber

Single-fiber Transceiver & Dual-fiber Transceiver

Single-fiber optical modules and dual-fiber optical modules are two common types of optical modules. They all play an important role in optical fiber communications. The single-fiber optical module uses

How to choose the right SFP module ?

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Discover how to choose the right SFP module for your fiber optic network in 5 key steps: compatibility, environment, fiber type, wavelength, and data rate.

What is the difference between single fiber and dual fiber optical ...

In this issue,ETU-LINK will introduce what is a single fiber optical module and a dual fiber optical module,and what are the differences between them. Learn the differences between single

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Choose a module that meets your requirements without exceeding your budget. WHGEARLINK Brand Optical Modules WHGEARLINK is a reputable brand known for producing high-quality 10G SFP+

Single Fiber vs Dual Fiber Transceivers Understanding

In fiber optic communication systems, optical transceivers play a critical role in ensuring seamless data transmission. Among these devices, single

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