

Models of dual-mode and single-mode optical modules



Summary of Content

Yes, optical modules are available in both single-mode and dual-mode configurations, with single-mode modules optimized for long distances and dual-mode (dual-core) modules using two fibers for simultaneous transmit and receive.

Single-Mode vs Multi-Mode

Single-mode (SM) optical modules use a very small core ($\sim 9 \mu\text{m}$) that allows light to travel in a single, straight path. This minimizes signal loss and modal dispersion, making them ideal for long-distance, high-speed networks such as metro, telecom, and data center backbones. They typically operate at wavelengths like 1310 nm or 1550 nm. Multi-mode (MM) optical modules have a larger core (50–62.5 μm), allowing multiple light paths. They are suitable for short-distance applications like intra-data center links, but modal dispersion limits their performance at higher speeds or longer distances.

Single-Core (Single-Fiber) vs Dual-Core (Dual-Fiber)

Optical modules can also be classified by the number of fiber cores they use:

- Single-core (1-core) modules transmit and receive data over a single fiber, often using BiDi (bidirectional) technology with two wavelengths on the same fiber. This saves fiber infrastructure and space.
- Dual-core (2-core) modules use two separate fibers—one for transmitting and one for receiving. This setup is simpler to deploy and provides stable communication, commonly used in traditional fiber links.

Article Content

Understanding Single-mode and Multi-mode Optical Modules and

In the realm of fiber optic communication, the choice between single-mode and multi-mode optical modules and fibers is critical for

Fiber Optics Part 2: Single-Mode Fiber vs. Multi-Mode

Written by Priya Maratukulam, Product Manager, Transceiver Modules Group, Cisco In our

Fiber Optic Cable Types – Multimode and Single Mode

Single Mode fibers are identified by the designation OS or Optical Single-mode Fiber. Single Mode cable has a much smaller core (8

Comparing Single-Mode vs Multimode SFP

Explore the differences between single-mode and multimode SFP transceivers. Find the

Difference Between Single-mode and Multimode Optical Fiber

The major difference single-mode and multimode optical fiber is that in single-mode optical fiber light ray propagates only through a

2025 How to Identify Single-Mode vs. Multimode SFP Modules for

Learn how to identify single-mode and multimode SFP modules with our comprehensive guide. Explore SFP features,

Optical Fiber: Single-Mode Multimode Single-Fiber Dual-Fiber

Understanding the difference between single-mode, multimode, single-fiber, and dual-fiber is important when designing

Key Differences Between Single-Mode and Multimode Optical Modules

Compare single-mode and multimode optical modules by core size, distance, speed, and cost. Choose the right

Singlemode vs Multimode Optical Fibre

The synonyms of singlemode fibre are mono-mode optical fibre, singlemode fibre, singlemode optical waveguide and uni-mode fibre.

Singlemode vs Multimode Fiber Optic Cable

We breakdown the differences between single mode and multimode fiber optic cable, covering aspects like physical

The Difference Between Single/Dual Fiber and

Whether you're designing a short-range data center network or a long-distance metro

Single Mode vs Multimode SFP Modules: Which One to

Single Mode vs Multimode SFP Modules: Compare fiber types, wavelengths, cost, and

The Most Comprehensive Guide Of Optical Modules

The central wavelength of single mode optical module is generally 1310nm, 1550nm, which

Differences Between Single-mode & Multimode Fiber Optic ...

According to different transceiver models, optical modules can be divided into single-mode fiber optic transceivers

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

Single Mode fibers have a smaller core, allowing light to travel in a single, straight path,

Single-Mode Fiber and Multiple-Mode Fiber

A fiber supports as many transmission modes as its diameter allows. Fibers are classified into single-mode (SM) and multi-mode

What Is A Single-Fiber BiDi Transceiver?--ETU-LINK

When planning a fiber optic network, one key decision is choosing between single-fiber (BiDi) and dual-fiber optical transceivers. This

The Key Differences Between 1-core, 2-core, Single Mode, and Multi-mode ...

Understanding 1-core, 2-core, Single Mode, and Multi-mode optical modules helps you design efficient networks.

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

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

SFP Modules: Types, Selection Guide & Applications

Dual Media Support: Works with both fiber optic cables (single-mode and multimode) and copper cables (twisted-pair),

Single-mode vs Multimode SFP 2026: Fiber Types and distances

A guide to single-mode vs multimode SFP modules. Covers fiber types, wavelengths, distances, BiDi, CWDM/DWDM,

SFP Single Mode vs Multimode – Features, Differences, Applications ...

Understand the difference between Single Mode and Multimode SFP modules. Learn about fiber types, wavelengths,

Difference Between Single and Dual Fiber Optical Transceivers

Fiber optic technology has seen incredible growth over the past several years and will likely experience even more

Single-Mode vs. Multimode Optical Transceivers: Three Major

Single-mode transceivers support a single light mode, while multimode transceivers support multiple light modes.

Multi-mode and single-mode of optical modules

The single-mode and multi-mode in the optical module actually only refer to the type of optical fiber. LC/PC refers to

Single-Mode Vs Multimode Optical Modules: Detailed Differences

Is your data center or campus network best served by Single Mode or Multimode Optical Modules? Choosing between Single Mode

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