

Single-mode fiber optic cables Gigabit and 10 Gigabit



Overview

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

Key Takeaways

Single-mode fiber optic cables can support both gigabit (1 Gbps) and 10-gigabit (10 Gbps) transmission speeds, depending on the fiber type and distance. Single-mode fiber (SMF) is designed with a very small core diameter, typically 8–10 micrometers, allowing only a single light mode to propagate. This minimizes modal dispersion and enables high-bandwidth transmission over long distances, far exceeding the capabilities of multimode fiber.

Transmission Speeds and Distances: OS1 single-mode fiber can transmit data at speeds up to 10 Gbps over distances of approximately 10 kilometers, and supports 1 Gbps over even longer distances. OS2 single-mode fiber is optimized for longer distances, supporting 10 Gbps up to 40 kilometers and 1 Gbps over distances up to 80–125 kilometers, depending on the network design. Single-mode fiber is also capable of supporting higher speeds, such as 40 Gbps or 100 Gbps, especially in data center interconnects and telecom backbone networks, though typical specifications often list 1–10 Gbps as standard.



Comparison with Multimode Fiber: Multimode fiber (MMF) has a larger core and supports multiple light modes, which limits its effective distance at higher speeds. For example, OM2 multimode fiber is typically used for 1 Gbps, while OM3 and OM4 can support 10 Gbps over shorter distances (up to 300–400 meters). Single-mode fiber is preferred for long-distance, high-speed applications, such as campus backbones, telecom networks, and data center interconnects, due to its superior bandwidth and minimal signal loss.

Conclusion: Single-mode fiber is not inherently limited to a specific speed category. It is capable of supporting both gigabit and 10-gigabit transmissions, with the actual achievable speed depending on the fiber type (OS1 or OS2), wavelength, and distance. For long-distance, high-speed applications, OS2 single-mode fiber is typically the preferred choice.

Article Content

Singlemode Fibre | Comms InfoZone

Single-mode fibre is recommended over multimode fibre when planning for Gigabit Ethernet. The multiple light modes found in multimode fibre can create distortion

1000BASE-SX, 1000BASE-LX, 1000BASE-ZX&BX SFP: A Simple

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Single-mode Fiber and 10 Gigabit Ethernet

Most optical fibers that comply to the current G.652 (standard single-mode fiber) and G.655 (non-zero dispersion shifted fiber) standards are suitable for 10 Gbps transmission in WAN-size applications.

Single-Mode Fiber Cable Guide: Types, Specs & Selection

This comprehensive guide explores Single-Mode Fiber Optic Cable, covering technical specifications, deployment scenarios, and best practices to help you optimize your fiber infrastructure

OS2 Singlemode Cables

OS2 single-mode fiber optic cable is typically used to support high-speed optical communication systems such as 10 Gigabit Ethernet, 40 Gigabit Ethernet, 100

OS2 Single Mode Fiber Optic Cables, SMF Duplex

Get OS2 single mode duplex fiber patch cables for 1G/10G/40G/100G/400G Ethernet fiber connections to transport data up to 10km at 1310nm and 40km at

10 Gigabit Ethernet Fiber Design Considerations

In addition, decisions may have to be made regarding whether to use single-mode or multimode fiber. This paper has introduced some basic fiber related concepts and outlined some of the key points to

Fiber Optic Cable Range: Comprehensive Guide

Fiber optic cable range varies depending on whether you're using single or multimode fiber. Learn the potential for both cable types.

Fiber Optic Cable Types: A Complete Guide

The plethora of fiber optic cable types can seem overwhelming, but choosing the right cable for the job is important. Read on to learn what fiber optic

SFP Optical Transceiver | SFP Optical Module | Perle

Perle SFP Optical Transceivers are hot-swappable, compact media connectors that provide instant fiber connectivity for your networking gear. They are a cost effective way to connect a single network

Optic Modules Datasheet

4 Optic Modules Data Sheet ... SFP (form factor) = small form-factor pluggable transceiver SMF (media) = single-mode fiber-optic MMF (media) = multimode fiber-optic XFP (form factor) = 10-gigabit small

SFP+ Cables

Online shopping. w/24h-delivery, 7Days & Refund Guarantee. CE, RoHS and ISO9001 Certified. SFP+ Cables, QSFP+ Cables, MiniSAS Cables, XFP Cables, CX4 Cables and Fiber Optic Transceivers.

Used Tripp-Lite N785-001-LC-MM Gigabit Fiber Media Converter

Tripp-Lite Gigabit Media Converter (N785-001-LC-MM) Description: An economical, plug-and-play solution for extending a 10/100/1000 Mbps Ethernet connection over fiber optic cable.

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10 Best Loose Tube Fiber Optic Cables (July 2026)

The OS1/OS2 single mode fiber requires 1310nm SFP modules for standard gigabit and 10 gigabit applications. Some multi-mode optics at 850nm will not function with this single mode

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What Is Fiber Optics? Definition from SearchNetworking

For example, Verizon and Google use fiber optics in their Verizon Fios and Google Fiber services, respectively, providing Gigabit internet speeds to users. How fiber optics works Fiber optics

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

