Network speed of single-mode dual-core fiber optic cable



Overview

How do you choose between single mode and multimode fiber? Compare their differences in core size, light source, bandwidth, transmission distance, and cost to identify the right application.

Key Takeaways

Single-mode fiber optic cables can support network speeds up to 100 Gbps over distances of 10 km, with potential for higher speeds using advanced equipment.

Overview of Single-

Mode FiberSingle-mode fiber (SMF) features a small core diameter of approximately 9 µm, allowing light to travel in a single path, which minimizes modal dispersion and enables high-speed, long-distance transmission. The two main types are OS1 and OS2: OS1: Optimized for indoor or short-range applications, supporting speeds up to 10 Gbps over 10 km at 1310 nm wavelength. OS2: Designed for outdoor and long-haul networks, capable of 10 Gbps over 40 km and up to 100 Gbps over 10 km with appropriate transceivers.

Speed and Distance Considerations

The maximum network speed depends on several factors: Wavelength: Commonly 1310 nm or 1550 nm; longer wavelengths reduce attenuation and allow higher speeds over longer distances. Attenuation: OS1 has ~0. 4 dB/km at 1310 nm, while OS2 has ~0.

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3 dB/km at 1550 nm, enabling longer spans without repeaters. Equipment: Using advanced transceivers and multiplexing techniques can push speeds beyond 100 Gbps over shorter distances.

Dual-

Core FiberDual-core single-mode fiber contains two separate single-mode cores within the same cable, effectively doubling the potential data channels. Each core can independently support the maximum speeds mentioned above, so a dual-core cable can theoretically handle up to 200 Gbps combined, assuming both cores are fully utilized with compatible networking equipment. ApplicationsSingle-mode dual-core fiber is ideal for: Data center interconnects requiring high bandwidth over moderate distances.

Telecom backbones spanning cities or campuses. Long-haul networks where minimal signal loss and high-speed transmission are critical. In summary, a single-mode dual-core fiber optic cable can support up to 100 Gbps per core over 10 km, with potential for higher speeds using modern transceivers, making it suitable for high-performance, long-distance networking.

Article Content

Single Mode vs. Multimode Fiber: Core Differences and Selection Guide

How do you choose between single mode and multimode fiber? Compare their differences in core size, light source, bandwidth, transmission distance, and cost to identify the right application.

Single Mode vs. Multimode Fiber Optic Cables

Fiber optic cable speeds explained with distance limits, cable types, and performance tips, including single-mode and multimode transmission for 2025 networks.

Fiber Optic Cable Types Explained

Learn all about the differences between single mode and multimode cables, as well as the various fiber wavelengths and standard core sizes used in fiber optics.

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

Single Mode fibers have a smaller core, allowing light to travel in a single, straight path, ideal for long distances with less signal loss. Multi-mode fibers have a larger core, allowing...

Recommendation ITU-T G.652 (08/2024)

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This document outlines the specifications for a single-mode optical fiber and cable designed for use around the 1310 nm zero-dispersion wavelength, suitable for both the 1310 nm and 1550 nm regions,

Single Mode vs Multimode Fiber, What is The Difference?

In this in-depth single mode vs. Multimode Fiber comparison, I will compare those two fiber optic cables, helping you learn the difference and determine which best suits your fiber cabling

Multimode vs Single Mode Fiber Optic Cables: A Complete Guide to

Learn the differences between multimode (OM1-OM5) and single mode (OS1-OS2) fiber optic cables—speed, distance, applications, and how to choose the right one for data centers and

Fiber Optic Cable Speeds: Everything You Need to Know

Therefore, single mode fiber optic cables carry higher bandwidth than multimode fiber optic cables. Single mode fiber optic cables are also less susceptible to attenuation than multimode

Single Mode vs. Multimode Fiber Optic Cables

There are two main types of fiber optic cables: single mode and multimode. Although they can do the same job in some instances, the different

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C2G30026 Extend 4K HDMI up to 328ft over a single Cat6a network patch cable using HDBaseT technology.

OS1 vs OS2, OM3 vs OM4 vs OM5 – Fiber Optic Cable Differences

Introduction In high-speed network infrastructure, choosing the right type of fiber optic cable is essential for performance, cost-efficiency, and long-term scalability. This article explains the

Singlemode vs Multimode Fiber Optic Cable

We breakdown the differences between single mode and multimode fiber optic cable, covering aspects like physical structure, bandwidth over distance, and typical integration in networks.

Fiber Optic Patch Cord, Single Mode & Multimode Patch Cord

Fiber Optic Patch Cord In this category, you will find various duplex and simplex LC/SC/FC/ST/Uniboot LC/MDC fiber optic patchcords, which are used to connect network devices such as switches,

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10 Best Fiber Optic Media Converters (May 2026) Expert Reviews

I remember the frustration vividly. Our warehouse network kept dropping connections every time the nearby welding equipment fired up. The copper Ethernet cables were acting like giant

Everything you need to know about fiber optic termination

Fiber Optic Termination Tutorial We terminate fiber optic cable two ways - with connectors that can mate two fibers to create a temporary joint and/or connect

10 Best Fiber Optic Fusion Splicer Machines (June

Discover the 10 best fiber optic fusion splicer machines (June 2026). Our expert reviews highlight reliable, high-precision splicers ideal for efficient

Cables, Adapters, & Docking Stations: USB4, USB-C,

Cable Matters provides a large selection of innovative cables and accessories, we also educate consumers on the best product offerings. USB4, USB C,

Black Box 16.4ft OS2 Singlemode Fiber Optic Patch Cable (Yellow)

The Black Box FOSM-005M-SCSC is a 16.4-foot OS2 singlemode fiber optic patch cable designed to deliver reliable, high-speed network connections. With a 9/125 micron core and a 2.0-mm duplex

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

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