How long is multimode fiber



Overview

This article discusses multimode fiber distance limits, the types of multimode fiber and their respective distance capabilities, and solutions to overcome these limitations.

Key Takeaways

Multimode fiber supports short- to medium-range transmission, with maximum distances ranging from 33 meters for OM1 at 10G to 550 meters for OM4 at 10G. Maximum Transmission Distances by Fiber TypeOM1 (62. 5 µm core, LED source): Supports 100 Mbps Ethernet up to 2 km, 1G Ethernet up to 275 meters, and 10G Ethernet up to 33 meters.

OM2 (50 µm core, LED source): Suitable for 1G Ethernet and limited 10G applications; 10G Ethernet can reach up to 82 meters. OM3 (50 µm core, laser-optimized, VCSEL source): Supports 10G Ethernet up to 300 meters, 40G/100G Ethernet up to 100 meters. OM4 (50 µm core, laser-optimized, VCSEL source): Extends 10G Ethernet up to 550 meters and 40G/100G Ethernet up to 150 meters.

OM5 (50 µm core, wideband multimode, SWDM capable): Backwards compatible with OM4, optimized for multiple wavelengths, suitable for 100G and 400G networks over short distances.

Factors Affecting Multimode Fiber Length

Core Size: Larger cores (OM1) allow easier light coupling but suffer from modal dispersion, limiting distance at high speeds. Smaller cores (OM2–OM5) reduce dispersion and support longer distances with laser sources. Light Source: LEDs are used in OM1/OM2, limiting distance and bandwidth.

© 2026 DOLPHIN FIBER SYSTEMS - All rights reserved

VCSE

Ls in OM3–OM5 enable higher speeds and longer reach. Data Rate: Higher data rates reduce maximum distance due to increased modal dispersion. For example, OM3 can carry 10G up to 300 meters but only 40G/100G up to 100 meters.

Modal Dispersion: Multiple light modes in multimode fiber travel at different speeds, which limits the effective transmission distance compared to single-mode fiber. Practical ConsiderationsShort-range networks: OM1 and OM2 are suitable for legacy or intra-building connections. Data centers and high-speed LANs: OM3, OM4, and OM5 are preferred for 10G, 25G, 40G, 100G, and beyond, providing longer reach and future-proofing.

Cost efficiency: Multimode fiber is generally cheaper than single-mode fiber for short distances due to lower-cost transceivers and easier installation. In summary, multimode fiber is ideal for distances up to several hundred meters, with OM3–OM5 fibers offering the longest reach for high-speed applications, while OM1 and OM2 are limited to shorter distances and lower data rates.

Article Content

Exploring Multimode Fiber Distance Limits in Data Centers

This article discusses multimode fiber distance limits, the types of multimode fiber and their respective distance capabilities, and solutions to overcome these limitations.

OM1 vs OM2 vs OM3 vs OM4 vs OM5 Multimode Fiber Guide

Typically, OM3 fiber is used for 10G Ethernet and can make connections up to 220 meters long. However, it can also be used for 25G Ethernet connections up to 70 meters long and 40G/100G

Multimode Fiber Distance — OM3, OM4 Max Distance by Data Rate

This guide covers the actual distance limits for OM3 and OM4 multimode fiber at every common data rate, what determines those limits, and when to stop fighting multimode and switch to

Multimode Fiber Types: OM1 vs OM2 vs OM3 vs OM4 vs OM5

Multimode fiber (MMF) is a kind of optical fiber mostly used in communication over short distances, for example, inside a building or for the campus. Multimode fiber optic cable has a larger

Single Mode vs. Multimode Fiber Optic Cables

© 2026 DOLPHIN FIBER SYSTEMS - All rights reserved

Multimode fiber is typically suitable for shorter distances, with OM3 supporting up to about 300 meters at 10 Gbps, OM4 up to 550 meters, and OM5 designed for similar or slightly longer

Multimode Fiber Cable Types: OM1/OM2/OM3/OM4/OM5 Compared

Compare all five multimode fiber grades — OM1 through OM5 — with full specs, bandwidth, distance limits, and real-world data center use cases. Learn which grade fits your

Everything You Need to Know About Multimode Fiber Cable

Multimode fiber works well for short to medium distances, providing scalable capacity and cost-effective deployment for data centers, office buildings, and campuses.

Understanding the Distance Limitations of Multimode Fiber in Data ...

Multimode fibers are categorized into OM1, OM2, OM3, OM4, and OM5, each with different bandwidth and distance capabilities. For example: OM1 and OM2: Support distances up to

How Far Can Multimode Fiber Optic Cables Transmit?

The transmission distance of multimode fibers varies significantly based on the data rate and the specific fiber type used. Here, we examine the limitations across common transmission

What Is Multimode Fiber? OM Grades, Distance, and Cost

Compared to single-mode fiber, which uses a tiny core and a single light path for long-haul connections, multimode fiber pairs with less expensive light sources and transceivers, making it the

What are achievable distances of singlemode vs multimode fibre

OM5 is a wide band multimode fibre – especially suited to allow WDM (wave division multiplexing) of 4 channels into two. Singlemode cable is the only option for certain lengths or bandwidth, but since

Single Mode vs. Multimode Fiber Optic Cables

The main drawback of multimode fiber is modal dispersion, where multiple light modes travel at different speeds causing signal distortion over

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

Written by Priya Maratukulam, Product Manager, Transceiver Modules Group, Cisco In our previous post we described the phenomenon of

Singlemode vs Multimode Fiber Optic Cable

© 2026 DOLPHIN FIBER SYSTEMS - All rights reserved

Singlemode fiber excels in long-distance, high-bandwidth applications, while multimode fiber is ideal for shorter-distance, cost-sensitive installations. Understanding the differences between

Single Mode vs Multimode Fiber: What''s the difference?

Single mode and multimode fiber differ mainly in core size, distance and use case: single mode is built for long-distance, high-throughput

Fiber Optic Cable Types – Multimode and Single Mode

Single Mode Fiber Core Size: 8 – 9um Note: Core measurement is in microns (um) In General, Single Mode (SM) fiber is used for long distances or

What Is Multimode Fiber for Networking? | Equal Optics

What is multimode fiber? Learn about the differences, advantages, and options available for high-speed networking in enterprise applications.

Choosing the Right Fiber Optic Cable: Singlemode vs

What is Single-mode Fiber? Compared with multimode fiber, single-mode fiber optic cable has a smaller core diameter (8-10 microns) and can

Related Video Reference

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

Contact Us

Continue your research online:

Website: https://dolphinspreschool.co.za
Technical inquiry: https://dolphinspreschool.co.za/project-desk.html
African project coordination: Waterfall City, Midrand, Gauteng, South Africa

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

© 2026 DOLPHIN FIBER SYSTEMS - All rights reserved