

Article Overview

The maximum distance of multimode fiber depends on the fiber type and data rate, ranging from 33 meters for 10G Ethernet on OM1 to up to 2 kilometers for 1G Ethernet on OM2 under optimal conditions.

Multimode Fiber Types and Maximum Distances

- o OM1 (62.5 um core, LED source): Supports 1G Ethernet up to 275 meters and 10G Ethernet up to 33 meters. Primarily used for short-distance LANs and low-speed applications .
- o OM2 (50 um core, LED source): Can transmit 1G Ethernet up to 550 meters and 10G Ethernet up to 82 meters. Under optimal conditions, 1G Ethernet can reach up to 2 km .
- o OM3 (50 um core, laser-optimized, VCSEL source): Designed for higher data rates. Supports 10G Ethernet up to 300 meters, 40G Ethernet up to 100 meters, and 100G Ethernet up to 100 meters .
- o OM4 (50 um core, laser-optimized, higher modal bandwidth): Extends distances compared to OM3. Supports 10G Ethernet up to 400 meters, 25G up to 100 meters, 40G up to 150 meters, and 100G up to 100 meters .
- o OM5 (50 um core, wideband multimode fiber, WDM capable): Supports multiple wavelengths, increasing capacity. Can carry 40G Ethernet up to 150 meters and 100G Ethernet up to 100 meters, making it ideal for high-speed data centers .

Factors Affecting Maximum Distance

- o Modal Dispersion: Multimode fibers allow multiple light paths, causing pulse spreading and limiting distance .
- o Bandwidth: Higher modal bandwidth (MHz.km) allows longer distances at a given data rate. OM3 has 2000 MHz.km, OM4 has 4700 MHz.km .
- o Light Source: LEDs are used in OM1/OM2, while VCSEL lasers are used in OM3/OM4/OM5, enabling higher speeds and longer distances .
- o Data Rate: Doubling the data rate roughly halves the maximum distance due to increased modal dispersion .
- o Installation Quality: Factory-terminated connectors, minimal splices, and clean links help achieve maximum distances .

Summary

Multimode fiber is optimized for short- to medium-range high-speed communication, typically within buildings or data centers. For longer distances or higher reliability over kilometers, single-mode fiber is preferred. Choosing the right multimode fiber type depends on the required data rate, distance, and future scalability.



Maximum distance of multimode fiber

This guide covers the actual distance limits for OM3 and OM4 multimode fiber at every common data rate, what

Compare OM1, OM2, OM3, OM4, and OM5 fiber types. Get the 2025 bandwidth specs, max distance charts for

Capacity Impacts: Affects the maximum achievable data rate and overall system throughput. Navigating the Pros and Cons of

Complete multimode fiber distance reference. Maximum distances for OM3 and OM4 fiber at

Multi-mode fiber has a fairly large core diameter that enables multiple light modes to be propagated and limits the maximum length of

However, fiber optic cable performance over distance varies depending on factors such as cable type, installation

Generally speaking, multimode fiber is designed for use over shorter distances than single mode fiber, which is designed for longer

The type, transmission rate, fiber material, and other factors affect the maximum transmission distance of fiber optic

Multimode fiber optic cables are used to transmit data over shorter distances, typically within a building or a campus.

As data rates climb, the maximum achievable multimode distance drops significantly compared to older 10G networks. Mapping

For multimode fiber, which is typically used for shorter distances within buildings or campuses, the maximum range is

Given this inherent limitation, multimode fiber optic cable is usually deployed at distances of 1,312 feet or less to

Typical Maximum Distance: For 1 Gbps: Multimode fiber can typically support distances of up to 2 kilometers (1.2 miles). For 10

Campus and Data Center Links Multimode fiber serves high-density server rooms and intra-building backbones, with

Maximum distance of multimode fiber

Max Length: Typically up to 500 meters (1,640 feet) for high-speed applications, though older multi-mode fibers may

Explore the distance limitations of multimode fibers across various transmission speeds. Analyze the key factors that

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