

Maximum distance for 1Gb multimode fiber optic transmission

Article Overview

The maximum distance for 1 Gbps Ethernet over multimode fiber ranges from 275 meters on OM1 to 550 meters on OM2, OM3, and OM4 fibers depending on fiber type and quality.

Maximum Distances by Fiber Type

- o OM1 (62.5 um core, LED source, 200 MHz.km bandwidth): Supports up to 275 meters at 1 Gbps, typically used for short-distance LANs and low-speed applications .
- o OM2 (50 um core, LED source, 500 MHz.km bandwidth): Can reach up to 550 meters at 1 Gbps, suitable for medium-distance LANs .
- o OM3 (50 um core, laser-optimized, 2,000 MHz.km bandwidth): Supports up to 550 meters at 1 Gbps, designed for higher-speed networks and longer distances than OM1/OM2 .
- o OM4 (50 um core, laser-optimized, 4,700 MHz.km bandwidth): Also supports up to 550 meters at 1 Gbps, offering improved performance and future-proofing for high-speed applications .
- o OM5 (Wideband multimode fiber, SWDM capable): While optimized for higher data rates and wavelength division multiplexing, it can also support 1 Gbps over similar distances as OM4, though its main advantage is at higher speeds .

Factors Affecting Maximum Distance

- o Bandwidth and Modal Dispersion: Higher bandwidth fibers (OM3/OM4) reduce modal dispersion, allowing longer distances at the same data rate .
- o Light Source: LEDs are used in OM1/OM2, while VCSEL lasers are used in OM3/OM4, providing more precise light injection and longer reach .
- o Connectors and Splices: Poor-quality connectors or excessive splices can introduce signal loss, reducing effective distance .
- o Cable Management: Excessive bends, twists, or stress on the fiber can degrade performance and shorten maximum transmission distance .

Practical Considerations

For 1 Gbps Ethernet, OM2, OM3, and OM4 fibers are generally preferred for distances beyond 300 meters, while OM1 is suitable only for short links. Choosing laser-optimized fibers (OM3/OM4) ensures better performance, lower attenuation, and future scalability for higher-speed upgrades. Proper installation, high-quality connectors, and minimal splicing are essential to achieve the maximum rated distances.



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Explore multimode fiber distance limits in data centers, including fiber types, performance, and solutions like WDM technology to

A stripped multi-mode fiber Multi-mode optical fiber is a type of optical fiber mostly used for communication over short distances,

Compare 10GBASE-SR and 1G SFP multimode transceiver distances on OM2, OM3, OM4 fiber types. Maximize

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

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

Fiber optic transmission distance is influenced by the operating wavelength, with common options being 850nm,

When designing data center networks, one of the key considerations is the type of fiber

Fiber optic cable speeds explained with distance limits, cable types, and performance tips, including single-mode and

Match your fiber type to your distance needs and network speeds. The table below shows all critical distance specs across OM1

Fiber optic technology is the backbone of modern high-speed communication networks,

Table showing a comparison of the maximum rated transmission distances for the various types of Digital Video

Benchmark Transmission Distances Across Network Types Campus and Data Center Links

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

Multimode fibers are categorized into OM1, OM2, OM3, OM4, and OM5, each with different bandwidth and distance

Compare OM1, OM2, OM3, OM4, and OM5 multimode fiber specs, distances, bandwidth, and applications.



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Essential

OM4 Multimode Fiber Optic - 550 meters OM4 fiber optic carries a 10GB up to 550 meters, providing a distance

Web: <https://bssoda.pl>

