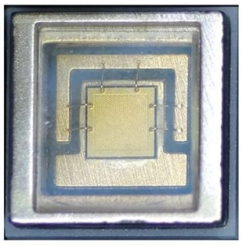
Four types of multimode optical fibers



Overview

Compare OM1, OM2, OM3, OM4, and OM5 multimode fiber specs, distances, bandwidth, and applications. Essential guide for data center fiber selection.

Key Takeaways

The four main multimode optical fibers—OM1, OM2, OM3, and OM4—differ in core size, bandwidth, data rate, transmission distance, and typical applications, with OM1 and OM2 suited for legacy systems and OM3/OM4 optimized for high-speed data centers.

Overview of Multimode Fiber

Multimode fiber (MMF) has a larger core diameter, typically 50–62. 5 µm, allowing multiple light modes to propagate simultaneously. This makes it ideal for short-distance communication, such as within buildings or campus networks, and allows the use of lower-cost LED or VCSEL light sources.

MM

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F is generally used for high-speed LANs, data centers, and backbone connections where distances are limited by modal dispersion. Key Characteristics of the Four TypesFiber TypeCore SizeBandwidthMax Distance (10 Gbps)Typical ApplicationsJacket ColorLight SourceOM162. 5 µm200 MHz·km33 mLegacy 100 Mbps Ethernet, short linksOrangeLEDOM250 µm500 MHz·km82 m1 Gbps Ethernet, short intra-building linksOrangeLEDOM350 µm2000 MHz·km300 m10 Gbps Ethernet, data centersAquaLaser-optimized (VCSEL)OM450 µm4700 MHz·km550 m10–100 Gbps Ethernet, high-speed data centersAquaLaser-optimized (VCSEL)OM1 and OM2 are older standards, primarily used in legacy networks, while OM3 and OM4 are optimized for laser-based transmission, supporting higher data rates and longer distances.

OM4 is backward compatible with OM3 and allows longer 10 Gbps links and higher-speed applications like 40/100 Gbps over short distances.

Practical Considerations

Distance and Speed: OM1 and OM2 are limited to shorter distances and lower speeds, making them suitable for small-scale or older networks. OM3 and OM4 are preferred for modern enterprise and data center environments. Cost: Multimode fiber transceivers are generally less expensive than single-mode equivalents, making MMF cost-effective for short-range high-speed networks.

Installation: Larger core sizes simplify connector alignment and termination, reducing installation complexity.

Future-

Proofing: For new high-density networks, OM4 is recommended, and OM5 (not included in the four) supports multiple wavelengths for next-generation applications like 400 Gbps and SWDM systems. Choosing the right multimode fiber depends on your network's speed requirements, distance, and future scalability. OM1 and OM2 may suffice for legacy or small networks, while OM3 and OM4 are ideal for high-speed, high-density environments.

Article Content

Multi-mode optical fiber

OverviewApplicationsComparison with single-mode fiberTypesEncircled fluxExternal links

Multi-mode optical fiber is a type of optical fiber mostly used for communication over short distances, such as within a building or on a campus. Multi-mode links can be used for data rates up to 800 Gbit/s. Multi-mode fiber has a fairly large core diameter that enables multiple light modes to be propagated and limits the maximum length of a transmission link because of modal dispersion. The standard G.651.1 defines the mos

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

Compare OM1, OM2, OM3, OM4, and OM5 multimode fiber specs, distances, bandwidth, and applications. Essential guide for data center fiber selection.

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

This comprehensive guide explores Multimode Fiber Cable Types, covering technical specifications, deployment scenarios, and best practices to help you optimize your fiber infrastructure

Everything You Need to Know About Multimode Fiber Cable

Explore multimode fiber optic cables for enterprise, campus, and data center networks. Learn about OM1–OM5 types, transmission ranges, installation tips, and cost-effective high-speed

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

This comprehensive guide elaborates on the definition, classification, core differences, and practical application scenarios of various multimode fiber types, helping you select the most

Multimode Fiber Types: OM1 vs OM2 vs OM3 vs OM4

A complete guide to multimode fiber types OM1, OM2, OM3, OM4, and OM5. Compare speed, distance, bandwidth, and applications, and learn how

A Guide to Multimode Fiber Types (OM1-OM5) –

We have seen many multimode (MMF) fiber types introduced, and technology has improved. Not only this, but from the beginning with OM1, to the

OM1 vs OM2 vs OM3 vs OM4 vs OM5: Understanding

With several types available—OM1, OM2, OM3, OM4, and OM5—each offering distinct performance characteristics, selecting the right fiber

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

There are several types of multimode fibers classified by the ISO 11801 standard, including OM1, OM2, OM3, OM4, and the recently released OM5 fiber. Each fiber type has distinct

The Ultimate Guide to Fiber Optic Cables – Types, Standards, and ...

Discover how to choose the right fiber optic cables for your network. Learn about fiber types, cable constructions, connectors, and industry standards — plus expert recommendations from

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OM2, OM3, OM4 vs. OM5 | How to Choose the Right Fiber Optic

The difference between multimode fiber optic cables is important when choosing the right cabling for your network. Therefore, we take a detailed look at the four multimode types and provide

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

Fiber Optic Cable Types | Omnitron Systems Guide

Conclusion Understanding fiber optic cable types, fiber core sizes, and proper installation methods is essential for building high-speed, reliable fiber networks.

What Is Fiber Optics? Definition from SearchNetworking

Types of fiber optic cables Multimode fiber and single-mode fiber are the two primary types of fiber optic cable. Single-mode fiber Single-mode fiber is used for longer distances due to the

Single Mode vs Multimode Fiber Explained | TRG Datacenters

In today''s data-driven world, fiber optic technology is the backbone of high-speed communication. Whether you are upgrading a data center, building a corporate LAN, or connecting facilities across

Optical Splitters in Modern Networks

Classified by Manufacturing Technique There are two main types of optical splitters based on manufacturing techniques: Fused Biconic Taper (FBT) splitter and Planar Lightwave Circuit (PLC)

Choosing the Right Fiber Optic Cable: Singlemode vs

Although single-mode fiber (SM) and multimode fiber (MM) cable types are widely used in various applications, their differences can still be

10 Best Fiber Optic Manufacturers for 2026

Discover the best fiber optic manufacturers globally, offering cutting-edge multimode and single mode fiber solutions. See who tops the list for quality and innovation.

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