

Multimode fiber type



Overview

OM1-OM5 multimode fiber standards, detailing their core sizes, jacket colors, transmission capabilities and more.

Key Takeaways

Multimode fiber (MMF) comes in five main types—OM1, OM2, OM3, OM4, and OM5—each with different core sizes, bandwidths, and transmission distances for short-range communication.

Overview of Multimode Fiber

Multimode fiber is designed for short-distance communication, typically within buildings or campuses, and is widely used in LANs and data centers. It has a larger core diameter (50-62.5 μm) than single-mode fiber, allowing multiple light modes to propagate simultaneously, which increases data throughput but limits maximum transmission distance due to modal dispersion.

MM

F usually operates at 850 nm and 1300 nm wavelengths and uses LED or VCSEL light sources, making it more cost-effective than single-mode fiber.

Types of Multimode Fiber



Fiber Type

Core Size	Jacket Color	Bandwidth	Max 10GbE Distance	Typical Applications	Light Source
OM1	62.5 μm Orange	200 MHz·km	33 m	100Mb/s, 1Gb/s	LED
OM2	50 μm Orange	500 MHz·km	82 m	1Gb/s	LED
OM3	50 μm Aqua	2000 MHz·km	300 m	10Gb/s, 40/100Gb/s	Laser-optimized (VCSEL)
OM4	50 μm Aqua	4700 MHz·km	400 m	10Gb/s, 40/100Gb/s	Laser-optimized (VCSEL)
OM5	50 μm Lime Green	4700 MHz·km	(supports SWDM) 400 m	High-speed, shortwave WDM	Laser-optimized (VCSEL)

OM1 and OM2 are older standards, primarily used for 100Mb/s to 1Gb/s Ethernet, while OM3, OM4, and OM5 are laser-optimized for higher-speed applications like 10GbE, 40GbE, and 100GbE over short distances. OM5 additionally supports shortwave wavelength division multiplexing (SWDM), allowing multiple wavelengths to transmit simultaneously over a single fiber, increasing capacity without adding more cables.

Key Considerations

Distance Limitations: Multimode fiber is generally limited to up to 550 meters at 10GbE, with OM4 and OM5 extending reach slightly further in data center backbones.

Cost: MMF is less expensive than single-mode fiber due to lower-cost transceivers and electronics.

Applications: Ideal for in-building networks, data centers, and campus backbones, but not suitable for long-haul or metro networks where single-mode fiber is preferred.

Connectors: Common connectors include ST, SC, LC, and MTP/MPO, each with specific advantages for installation and performance.

Summary

Choosing the right multimode fiber depends on required data rate, distance, and future scalability. For legacy networks, OM1 or OM2 may suffice, but for modern high-speed networks, OM3, OM4, or OM5 are recommended to support 10GbE and beyond, with OM5 offering additional capacity through SWDM for future-proofing.

Article Content

Multi-mode optical fiber

Overview Applications Comparison with single-mode fiber Types Encircled flux External 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

OM1 vs OM2 vs OM3 vs OM4 vs OM5 Multimode Fiber

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

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

OM1-OM5 multimode fiber standards, detailing their core sizes, jacket colors, transmission capabilities and more.

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

Single-mode vs Multimode SFP 2026: Fiber Types and

A guide to single-mode vs multimode SFP modules. Covers fiber types, wavelengths, distances, BiDi, CWDM/DWDM, SMF vs MMF selection, and

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

Single mode fiber typically has a core diameter of about 9 μm , which allows only one mode of light to propagate. In contrast, multimode fiber has a larger core, usually 50 μm or 62.5 μm ,

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

Single Mode vs. Multimode Fiber Optic Cables

Multimode fiber optic cables are engineered with a larger core diameter—typically 50 or 62.5 microns—compared to single mode fibers, and

Fiber Optic Cable Types Explained

Multimode fiber optic cable, on the other hand, has a larger diameter core, typically 50 or 62.5 microns in diameter. This larger core allows multiple modes of light to

MPO/MTP-24 Female to Female OM4 Fiber Patch Cable | Type A

MPO-24 to MPO-24 OM4 Multimode Fiber Patch Cord | Female-Female Type A |
COMNEN The COMNEN MPO/MTP-24 to MPO/MTP-24 Multi-mode OM4 Fiber Patch Cord is an ultra-high-density

Fiber Optic Cable Types Explained

Our comprehensive guide to types of fiber optic cables. Learn all about the differences between single mode and multimode cables, as well as the various fiber wavelengths and standard core sizes used

How Far Can Multimode Fiber Optic Cables Transmit?

Fiber optic technology is the backbone of modern high-speed communication networks, enabling the transmission of data over vast distances

Multimode vs Single Mode Fiber

But not all fiber cables are created equal: multimode (MM) and single mode (SM) fibers are the two primary types, each engineered for specific use cases, from short-range data center

Optical Fiber: Single-Mode Multimode Single-Fiber Dual-Fiber

Understanding the difference between single-mode, multimode, single-fiber, and dual-fiber is important when designing or managing a fiber optic network. Each type has its own strengths

Fiber Optic Cable Types: A Complete Guide

Fiber Optic Cable Type FAQs What are the three types of fiber optic cable? The three main types of fiber optic cable are single mode fiber, multimode

Single Mode vs Multimode Fiber, What is The Difference?

Learn the key differences between single mode vs multimode fiber cables and choose the right one for your fiber optic system.

Fiber Optic Cable Types: Comprehensive Guide

Explore the different types of fiber optic cables and understand which type suits your specific needs for speed, distance, and durability.

Single Mode vs Multimode Fiber Adapters: 2025 Guide

Compare single-mode and multimode fiber adapters. Learn how core size, bandwidth, and distance impact performance to choose the right fiber adapter for your needs.

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