

Single-mode fiber optic bandwidth specifications and models



Article Overview

Single-mode fiber (SMF) supports high-bandwidth, long-distance transmission with core diameters around $9\mu\text{m}$, primarily in OS1 and OS2 models, optimized for 1310nm and 1550nm wavelengths.

Core Characteristics

Single-mode fibers have a small core diameter of approximately $8\text{--}10\mu\text{m}$, which allows light to travel in a single path, minimizing modal dispersion and enabling long-distance, high-speed transmission. This design supports distances up to 100 kilometers without signal regeneration, making SMF ideal for telecom backbones, data center interconnects, and FTTH deployments.

Bandwidth and Wavelength

SMF operates primarily in the 1310nm (O-band) and 1550nm (C-band) wavelength windows, with low attenuation and minimal dispersion. Typical attenuation values are:

- OS1: 0.4 dB/km at 1310nm, 0.3 dB/km at 1550nm
- OS2: Lower attenuation than OS1, optimized for outdoor and long-haul applications

The bandwidth of single-mode fiber is effectively very high, limited mainly by the transceiver technology rather than the fiber itself, allowing 10 Gbps, 40 Gbps, 100 Gbps, and beyond over long distances....

Article Content

Jul 25, 2026

OS1/OS2 Singlemode Optical Fiber

These fibers ensure performance over the entire 1260nm to 1625nm spectrum and are compatible with legacy fiber and the

Jun 03, 2026

Recommendation ITU-T G.652 (08/2024)

This Recommendation describes a single-mode optical fibre and cable which has zero-dispersion wavelength around

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What is Single-mode Fiber Optic and Types?

Fiber optic technology has revolutionized the way we transmit data, providing high-speed and high-capacity

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Specifications For Fiber Optic Networks

Specifications For Legacy Fiber Optic Networks A listing of many fiber optic LANs and links available in the last 30 years, with basic

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Singlemode Fibre | Comms InfoZone

Singlemode fibre transmits signals over longer distances than multimode. Singlemode optical fibre cable has a role in next

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What Is Single Mode Fiber and How Does It Work

Future-Proof Infrastructure: Investing in single mode fiber optic cable is an investment in longevity. Its inherent

Feb 17, 2026

Recommendation ITU-T G.652 (08/2024)

This document outlines the specifications for a single-mode optical fiber and cable designed for use around the 1310 nm zero

Dec 18, 2025

5 Types of Single-Mode Fiber: Understanding Your Options

In the intricate world of fiber optics, the details make all the difference! Understanding the types of single-mode fiber is

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Key Specifications of Single-Mode Fiber Optic Cables

Single-mode fiber optic cables are widely used for long-distance, high-bandwidth optical communication.

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What are the key specifications of... | AIMIFIBER

What are the characteristics of single mode fiber optic cable? I often meet project managers who ask about single

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Optical Fiber Types

For optical fiber specifications and standards, ISO and IEC collaborate on several Joint Technical Committees (JTC). IEC

Oct 14, 2025

OS1/OS2 Singlemode Optical Fiber

PANDUIT OS1/OS2 fibers meet or exceed numerous standards for optical fiber, including ITU-TG.652 (Categories A, B, C and D),

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SINGLE-MODE OPTICAL FIBER IN LOOSE TUBE AND RIBBON

This ultra-low-loss single-mode fiber with advanced bend capability for long haul terrestrial applications utilized in optical fiber cable

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

How do you choose between single mode and multimode fiber? Compare their differences in core size, light source,

Aug 27, 2025

Single-Mode Optical Fiber (SMF)

Draka Single-Mode Fiber (SMF) provides optimum performance in both the 1310 nm and 1550 nm wavelength operation ranges

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Fiber Type vs. Speed and Distance

Compare fiber type vs. speed and distance in fiber optic cabling. Learn the differences between multimode and singlemode fiber for

Apr 19, 2026

Single-Mode Fiber Cable Guide: Types, Specs & Selection

Introduction Fiber optic cables are the backbone of modern telecommunications infrastructure, enabling high-speed

Apr 26, 2026

Single Mode Fibers

8.11.2.3.1 Single-mode fiber The information-carrying capacity of an optical fiber is determined by its impulse response. The impulse

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Fiber Optic Cables: Speed, Standards, and More

There are several different types of fiber optic cables, specified by rigorous standards, each with its advantages from speed to

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Fiber Optic Cable Types – Multimode and Single Mode

Application Fiber Optic connectors and cables are present in nearly every communications project that we might sell into, be it a DAS

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Basics of Fiber Optics

Increased bandwidth: The high signal bandwidth of optical fibers provides significantly greater information carrying capacity. Typical

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Multi-mode optical fiber

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

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Everything You Need to Know About Single Mode Fiber Optic Cable

Single mode fiber explained: find out how it works, why it's ideal for high-speed connections, and what sets it apart from other fiber

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Single-Mode Fiber Cable Guide: Types, Specs & Selection

This comprehensive guide explores Single-Mode Fiber Optic Cable, covering technical specifications, deployment

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Fiber-optic communication

An optical fiber patching cabinet. The yellow cables are single-mode fibers; the orange and blue cables are

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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,

Jun 24, 2026

Single Mode Fiber Cable Explained

Camplex manufactures fiber optic solutions that improve and extend the performance of broadcast operations. Because the Camplex

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Single Mode Fiber Wiki: Concerning Types and Applications

This post will illustrate everything important about single mode fibers, including its definition, fiber types, advantages

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Single Mode vs Multimode Fiber Cable: Guide to Fiber Optic Cable

Single Mode vs Multimode Fiber Cable: Compare core size, bandwidth, distance, cost, and best use cases to help you

Mar 17, 2026

Single-mode optical fiber

In fiber-optic communication, a single-mode optical fiber, also known as fundamental- or mono-mode, is an optical fiber designed

Jan 22, 2026

Single Mode Fiber: Types and Applications

Single mode fiber (SMF) is a type of fiber optic cable that only allows one light mode to transmit at a time. Generally,

Jan 03, 2026

OS1 vs OS2: The Ultimate Guide to Single-Mode Fiber Optic Cables

Both OS1 and OS2 are categories of single-mode fiber (SMF) under the ISO/IEC 11801 standard, designed to carry

Contact Us

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