

Optical Fiber Trunk Line Transmission Distance Table



Article Overview

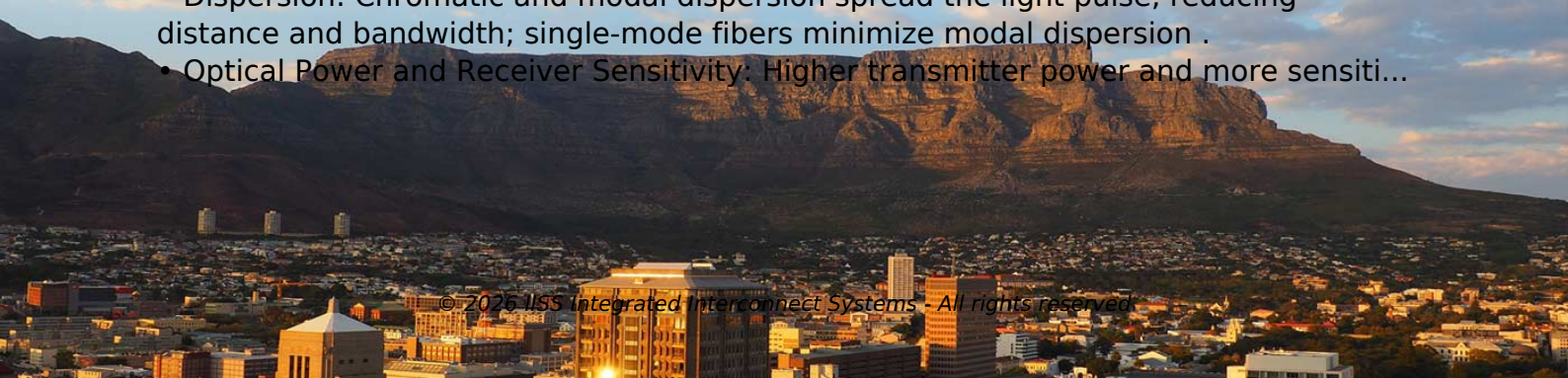
Single-mode fibers can transmit over tens to hundreds of kilometers, while multimode fibers are typically limited to a few hundred meters to a few kilometers depending on type and bandwidth.

Typical Transmission Distances by Fiber Type

Fiber Type	Wavelength	Typical Max Distance (without amplification)	Notes
Single-mode (OS1/OS2)	1310 nm	10–40 km	Standard telecom; low attenuation, suitable for long-haul networks
Single-mode (OS1/OS2)	1550 nm	40–100+ km	Lower loss at 1550 nm; can be extended with EDFAs or optical amplifiers
Multimode (OM1, 62.5/125 μm)	850 nm	300 m	Lower bandwidth; short-distance LAN or campus links
Multimode (OM2, 50/125 μm)	850 nm	500 m	Improved bandwidth over OM1
Multimode (OM3, 50/125 μm, laser-optimized)	850 nm	300–400 m	Supports 10G Ethernet; suitable for data centers
Multimode (OM4, 50/125 μm, laser-optimized)	850 nm	400–550 m	Higher bandwidth; supports 40G/100G Ethernet over short distances
Multimode (OM5, 50/125 μm, wideband)	850–950 nm	550–600 m	Optimized for shortwave WDM; high-speed data center applications

Key Factors Affecting Transmission Distance

- Attenuation: Signal loss per kilometer (dB/km) limits distance; single-mode fibers have lower attenuation than multimode fibers, allowing longer spans .
- Dispersion: Chromatic and modal dispersion spread the light pulse, reducing distance and bandwidth; single-mode fibers minimize modal dispersion .
- Optical Power and Receiver Sensitivity: Higher transmitter power and more sensi...



Article Content

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Power-over-fiber is a power transmission technology using optical fibers that offers various features not available in

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This guide explains how far fiber optic cables can transmit, compares single-mode and multimode fiber distance

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Calculating Fiber Loss and Distance

Calculating fiber distance involves the loss variables described above as well as the launch power and receive

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Calculating Fiber Loss and Distance Estimates

Estimate the total link loss across an existing fiber optic link if the fiber length and loss variables are known Estimate the maximum

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Fiber-optic cable

A fiber-optic cable, also known as an optical-fiber cable, is an assembly similar to an electrical cable but containing one or more

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Introduction This document describes how to calculate the maximum attenuation for an optical fiber. You can apply

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Calculating a "Loss Budget" transmission system would be used. Two operation centers are located about miles apart based on map

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Transmission Distance vs. dB Loss in Fiber Optic Cable

Transmission Distance vs. dB Loss in Fiber Optic Cable A common question that often arises when designing a fiber optic

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Network Topologies and Distances

Insertion loss measurements of installed fiber cables are made in accordance with ANSI/TIA/EIA-526-14A/method B and,

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Optical Fiber Maximum Transmission Distance Limited by Attenuation

Optical Fiber Maximum Transmission Distance Limited by Attenuation and Dispersion (Without Amplifier) In this tutorial, we will

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Fiber Optic Transmission Distance: Single Mode vs. Multimode Guide

Learn how fiber optic transmission distance varies between single mode vs. multimode fiber. Discover key factors

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Fiber Optic Cable Distance: A Comprehensive Guide

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

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Optimal Fiber Transmission Range Estimation | True Geometry's Blog

Optimal Fiber Transmission Range Estimation 19 Oct 2024 Tags: Optical Communications Telecommunications Fiber

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Fiber Optic Cable Distance: A Comprehensive Guide

In this guide, we'll explore how fiber optic cables function, the maximum distances for different types of fiber optics, and

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What is the Maximum Transmission Distance Between OLT and ONU?

In Passive Optical Network (PON) deployments, understanding the maximum transmission distance between the

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Understanding the Complete Spectrum of Fiber Optic

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Optimize Fiber Optic Performance with Accurate

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The FOA Reference For Fiber Optics

Fiber Optic Network Design Jump To: The Communications System Cabling Design Choosing Transmission Equipment Planning

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Optical Fibre Transmission Distance

Optical Fibre Transmission Distance ... The Standard Gigabit table covers the "First Window" of operation and this equates to

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