

Article Overview

Single-mode duplex fiber optic cables feature a 9-micron core, support long-distance high-speed transmission, and consist of two fibers for simultaneous bi-directional communication.

Core and Light Propagation

Single-mode fiber has a small core diameter of approximately 9 microns, allowing only a single light mode to propagate. This minimizes modal dispersion, enabling long-distance transmission with low signal loss and high bandwidth efficiency (). The cladding surrounding the core is typically 125 microns in diameter and reflects light back into the core to maintain signal integrity ().

Duplex Configuration

A duplex cable contains two fibers, usually arranged side-by-side in a zipcord style. One fiber is used for transmitting data, and the other for receiving, enabling full-duplex communication. This configuration is essential for network devices such as switches, servers, and fiber modems that require simultaneous bi-directional data transfer (). In contrast, simplex cables contain a single fiber for one-way transmission.

Optical Performance

Single-mode duplex fibers are optimized for long-haul and high-speed networks, including telecommunications, data centers, and internet backbones. Typical specifications include:

- o Attenuation: OS1 cables have 0.4 dB/km at 1310 nm and 0.3 dB/km at 1550 nm; OS2 cables have 0.3 dB/km at 1310-1550 nm ().
- o Bandwidth: OS1 supports 200 MHz.km at 1310 nm, while OS2 supports 500 MHz.km at 1310 nm ().
- o Wavelength compatibility: Designed for 1310 nm and 1550 nm regions, suitable for both analog and digital transmission ().

Mechanical and Environmental Attributes

Single-mode duplex cables are available with various jackets for indoor and outdoor use:

- o PVC: Standard indoor applications.
- o LSZH (Low Smoke Zero Halogen): Fire-safe indoor environments.
- o Plenum-rated: Air-handling spaces with strict fire codes.
- o Outdoor jackets: UV-resistant and water-blocking for external installations ().



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Applications

Single-mode duplex fiber is ideal for:

- o Long-distance telecommunications and metro networks.
- o High-speed data center interconnects.
- o Full-duplex point-to-point links requiring minimal signal degradation over tens of kilometers (). In summary, single-mode duplex fiber optic cables combine a small core for single-mode light propagation with two fibers for bi-directional communication, offering low attenuation, high bandwidth, and suitability for long-distance, high-speed network applications.

Anixter - Wire and Cable, Networking, Security and Utility Power Solutions

QSFPTEK provides OS2 single-mode fiber optic cable with duplex LC-LC, LC-SC, and SC-SC connector types to reach a distance of

The Singlemode Duplex Fiber Optic Cable (9/125) with FC to FC connectors is engineered for precise and efficient data transmission

Get the highest quality ST fiber optic cables from FiberCablesDirect. We carry Singlemode, Multimode Duplex ST Fiber Patch

Features Manufactured from 9/125 duplex (zipcord) fiber PVC jacket Length: 5-meter. Connectors: 2 LC and 2 LC connectors on

OS2 LC LC Single Mode Fiber Patch Cable | 1Gb/10Gb Duplex 9/125 LC to LC Singlemode Jumper Cord. Manufactured with the

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Learn the differences between simplex fiber cable and duplex fiber cable, including transmission methods, applications,

Explore OS2 singlemode fiber optic cables with LC, SC, FC, and ST connectors for long-reach 1G-400G

Assembled 2 fibers rugged and lightweight mobile field cable, excellent cable retention due to aramid yarn, black PUR outer jacket,



Single-mode duplex fiber optic cable

What Is a Simplex vs. Duplex Fiber-Optic Cable? A duplex fiber-optic connector connects to

OS2 LC to SC 9/125 Single-mode Duplex Fiber Optic Patch Cable, manufactured with the highest quality Corning optical fiber glass

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We can provide the longer cables in indoor/outdoor, aerial or burial, custom configurations. These are duplex cables (two fibers and

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Discover the differences between simplex and duplex fiber optic cables, their pros, cons, and best applications in

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