

Single-mode four-core fiber optic FC connector

Article Overview

A 4-core single-mode FC connector is a threaded, keyed fiber optic connector designed for precise alignment, low insertion loss, and high return loss in single-mode fiber systems.

Overview

The FC (Ferrule Connector) type is widely used in single-mode fiber applications due to its threaded coupling mechanism, which ensures secure connections in high-vibration environments and prevents fiber rotation during mating. The connector typically uses a 2.5 mm ferrule, often made of zirconia ceramic, to hold the fiber ends in precise alignment. In a 4-core configuration, four individual fibers are terminated within a single connector assembly, allowing simultaneous transmission over multiple channels.

Connector Types

- o FC/PC (Physical Contact): The fiber end is polished to a slightly curved surface, providing low insertion loss and moderate return loss. Suitable for general single-mode applications.
- o FC/APC (Angled Physical Contact): The fiber end is polished at an 8° angle, minimizing back reflections and achieving high return loss (typically ~60 dB). Ideal for high-precision or laser-based single-mode systems.

Performance Characteristics

- o Insertion Loss: Typically around 0.25 dB per connection when mated with the same type of FC connector.
- o Return Loss: FC/APC connectors can achieve 60 dB, while FC/PC connectors have lower return loss but still suitable for most single-mode applications.
- o Vibration Resistance: Threaded coupling ensures stable performance in environments with mechanical vibrations.
- o Ferrule Material: Zirconia ceramic ferrules provide high precision and durability, while stainless steel ferrules are available for multimode or specialized applications.

Installation and Handling

- o Cleaning: Always clean fiber end faces before mating to prevent permanent damage and increased coupling loss.
- o Strain Relief: Use compatible strain relief boots (e.g., O2 mm or O3.8 mm) to protect fibers from bending or mechanical stress.
- o Mating: FC connectors should be mated only with the same type (PC with PC, APC with APC) to avoid

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excessive insertion loss .

Applications

- o Telecommunications and Datacom: Multi-channel single-mode transmission using 4-core connectors.
- o Measurement Equipment: High-precision optical instruments requiring low back-reflection.
- o Single-Mode Lasers: Systems where return loss and signal integrity are critical.

Summary

A 4-core single-mode FC connector combines the precision alignment of FC connectors with multi-fiber capability, offering low insertion loss, high return loss, and secure threaded coupling. Choosing between FC/PC and FC/APC depends on the application's sensitivity to back reflections, with APC preferred for high-precision or laser-based systems. Proper cleaning, strain relief, and mating practices are essential to maintain optimal performance .

Read Whitepaper: Discover the fiber optic cable and connector types, specifications, benefits, typical

The FC Connector screw-design and alignment key make them ideal for single-mode fibers. FC Connectors pioneered

FC connectors are available for both single-mode and multimode applications, and are available with tuned single-mode ferrules for

The FC Connector offers a durable, threaded design for secure fiber optic connections. It is cost-effective and

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A comprehensive guide to fiber optic connectors including FC, SC, LC, ST, and MPO/MTP types.

We offer a variety of FC fiber optic connectors to accommodate both single-mode fibers and large-core multimode optical fibers. The

Fiber connectors are connectors used as terminations of optical fiber cables. They are widely used in optical fiber communications

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Fiber-optic cable with connector 4 core 1 Model Number 1.1 Model Number Description(Table 1) Example.)
TFC-4C-SM-SC-OPEN

Shop single-mode fiber connectors in SC, LC, FC & ST styles. Simplex, duplex & quad configurations for telecom & long-distance

Singlemode Fiber Optic Connectors are available at Mouser Electronics. Mouser offers inventory, pricing, & datasheets for

FC Fiber Connector (Ferrule Core) FC (Fiber Channel) connectors are a type of fiber optic connector that are specifically designed

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The FC connector is a fiber-optic connector with a threaded body, which was designed for use in high

Fiber Optics Connector FC/UPC Simplex Single Mode Product Description Beyondtech's single mode FC/UPC epoxy-polish

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