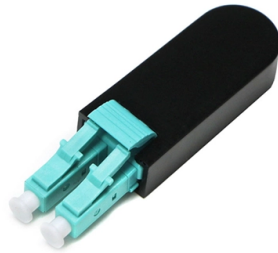


Single-core optical module without fusion splicing



Overview

Fiber Cassettes | Pre-Terminated & Splice Cassettes | LegrandThe Fiber Pigtail Cassette enables quick installation, reduces splicing errors, and simplifies.

Key Takeaways

Single-core optical modules can operate without fusion splicing by using mechanical splicing or plug-and-play connectors, supporting single-mode transmission over long distances.Overview

A single-core optical module uses a single fiber core for data transmission, ideal for long-distance, high-speed communication. These modules are typically single-mode (SM), allowing light to travel in a straight path with minimal signal loss, making them suitable for distances ranging from 15 km up to 120 km depending on the wavelength and module type .

Connection Methods Without Fusion Splicing

- Mechanical Splicing Mechanical splicing aligns two fiber ends using a precision holder and index-matching gel, creating a stable optical connection without permanently fusing the fibers. This method is reversible and avoids high-temperature fusion, making it suitable for field installations or temporary setups .

- **Connectorized Modules** Many single-core modules come with LC or SC interfaces that allow plug-and-play connections. These modules can be directly inserted into fiber patch panels or network equipment without splicing, providing low insertion loss and easy maintenance .

Key Specifications

- **Wavelengths:** Common single-mode wavelengths include 1310 nm (medium distance, low dispersion) and 1550 nm (long distance, low loss, up to 120 km) for single-core modules .
- **Data Rates:** Typical rates include 155 Mbps, 1.25 Gbps, 2.5 Gbps, and 10 Gbps, with backward compatibility for older systems .
- **Interfaces:** SFP modules usually use LC connectors, while GBIC modules use SC connectors .
- **Transmission Distance:** Depending on the module and fiber type, distances can range from 15 km to 120 km without repeaters .
- **Laser Type:** Semiconductor lasers are used to generate the optical signal, with output power and receiver sensitivity designed to maintain signal integrity over the specified distance .

Advantages

- No permanent splicing required, simplifying installation and maintenance.
- Reversible connections allow easy reconfiguration or troubleshooting.
- Compatibility with standard fiber panels and cassettes, supporting enterprise and data center deployments .
- High reliability with long service life (typically 50,000 hours of continuous operation), .

Applications

Single-core optical modules without fusion splicing are widely used in:

- Data centers for high-speed interconnects.
- Telecom networks for long-distance single-mode transmission.
- Enterprise networks where modular, flexible deployment is required.
- Temporary or test setups where permanent splicing is impractical. By selecting the appropriate wavelength, connector type, and module interface, single-core optical modules can provide efficient, long-distance optical communication without the need for fusion splicing, while maintaining high performance and reliability.

Article Content

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