Single-mode optical module interface



Overview

This data sheet describes the benefits, specifications, and ordering information for the Cisco SFP Modules for Gigabit Ethernet Applications.

Key Takeaways

Single-mode optical modules typically use LC connectors and operate over a 9 µm core fiber at 1310 nm or 1550 nm wavelengths for long-distance transmission. Fiber and Core CharacteristicsSingle-mode optical modules are designed for long-distance, high-speed communication. They use a narrow fiber core of about 9 µm with a 125 µm cladding, allowing light to travel in a single mode with minimal dispersion and attenuation.

This enables transmission distances ranging from 2 km up to 120 km, depending on the module type and wavelength. Common wavelength standards include 1310 nm and 1550 nm, with some modules supporting CWDM or DWDM wavelengths for extended reach.

Connector Types

The physical interface of single-mode modules is most commonly the LC connector, which is compact and supports high-density deployments. Legacy networks may use SC connectors, while MPO/MTP connectors are reserved for high-density backbone applications. The connector type determines how the fiber physically couples with the transceiver and affects patch cable selection, insertion loss, and network scalability.

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Module Form FactorsSingle-mode modules are available in various SFP form factors, including SFP, SFP+, and QSFP, which are hot-pluggable and compatible with switches, routers, and other network devices. Each form factor supports different data rates, such as 1G, 10G, 25G, 40G, and 100G, and must match the device port for proper operation. Transmission TypesSingle-mode modules can be dual-fiber (separate fibers for TX and RX) or single-fiber bidirectional (BIDI), which uses two wavelengths on a single fiber for transmit and receive.

Dual-fiber modules are widely supported and standard in most networks, while BIDI modules are useful for reducing fiber usage in constrained environments.

Summary

Fiber type: Single-mode (9 µm core, 125 µm cladding)Wavelengths: 1310 nm, 1550 nm, CWDM/DWDM optionsConnector type: LC (standard), SC (legacy), MPO/MTP (high-density)Form factors: SFP, SFP+, QSFPTransmission: Dual-fiber or single-fiber BIDIDistance: 2 km to 120 km depending on module and wavelength Using the correct single-mode module with compatible fiber and connector ensures minimal signal loss, reliable long-distance communication, and proper integration with network devices.

Article Content

The Difference Between Single/Dual Fiber and

– Single-mode modules typically require LC connectors and operate over longer distances, whereas multi-mode modules often use SC or MPO

Cisco SFP Modules for Gigabit Ethernet Applications

This data sheet describes the benefits, specifications, and ordering information for the Cisco SFP Modules for Gigabit Ethernet Applications.

Single-mode optical fiber

OverviewConnectorsHistoryCharacteristicsFiber optic switchesQuadruply clad fiberExternal links

Optical fiber connectors are used to join optical fibers where a connect/disconnect capability is required. The basic connector unit is a connector assembly. A connector assembly consists of an adapter and two connector plugs. Due to the sophisticated polishing and tuning procedures that may be incorporated into optical connector manufacturing, connectors are generally assembled onto optical fiber in a supplier''s manufacturing facility. However, the assembly and polishing operations involved can be performed in t

The Ultimate Guide to SFP Modules (2026): Types,

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SFP (Small Form-factor Pluggable) is a compact, hot-pluggable network interface module used to connect network devices (switches, routers, firewalls) to fiber

1G Bidirectional Single-Mode Optical Module

SFP transceiver that supports 1G connections up to 3 km using single-mode fiber with a simplex LC UPC connector.

LPO MSA Specification

It builds on IEEE 802.3 and OIF CEI-112G-LINEAR-PAM4 specifications. It enables Ethernet-like links with 1, 2, 4, or 8 lanes for data centers, using low power, high port density, low cost, and low latency

The Key Differences Between 1-core, 2-core, Single

Understanding 1-core, 2-core, Single Mode, and Multi-mode optical modules helps you design efficient networks. Whether you''re working on long

Module with Separable Single-Mode Expanded-Beam Optical

Demonstrate the principles of a separable single-mode (SM) expanded-beam optical connector to chip interface by assembling a demonstrator module and verifying optical performance.

Single-Mode Optical Fiber

Dual-mode optical fiber having a larger core diameter than single-mode optical fiber, without sacrificing bandwidth, was proposed as an alternative to single-mode optical fiber.

XFP transceiver

XFP are available with a variety of transmitter and receiver types, allowing users to select the appropriate transceiver for each link to provide the required optical reach over the available optical

mpo 16: 2026 Procurement Guide

The mpo 16 connector is a high-density optical interface engineered to house 16 individual glass fibers within a single Mechanical Transfer (MT) ferrule. Unlike legacy designs that

Ubiquiti 10G Single-Mode Optical Module UACC-OM-SM-10G-D-2

Ubiquiti 10G Single-Mode Optical Module SFP+ transceiver that supports 10G connections up to 10 km using single-mode fiber with a duplex LC UPC connector. Max data rate: 10 Gbps Compatible with

100GBASE QSFP-100G Modules Data Sheet

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QSFP-100G Optical modules Features and benefits of Cisco QSFP modules Hot-swappable input/output device that plugs into a 100G Gigabit

Ubiquiti Compatible XGSPON ONU SFP+ 1270nm-TX/1577nm-RX

Overview The XGS-SFP-ONT-MAC-I is an SFP+ transceiver module engineered for 10-Gigabit capable symmetric passive optical network (XGS-PON) systems. It utilizes bidirectional transmission over a

NVIDIA/Mellanox MMS4A00 Compatible 1.6T 2 x DR4/DR8 OSFP224

Dual MPO-12/APC Connectivity: Each of the two 800G ports utilizes a dedicated MPO-12/APC interface for connection to single-mode fiber infrastructure. Silicon Photonics Technology: Implements a SiPh

QSFP-DD Optical Transceivers for High-Speed

QSFP-DD800 modules enable higher radix for next-generation network designs and provide super-high-density connections over copper, single

Gigabit SFP modules with fiber optic modes » buy

Our SFP modules support various fiber modes, including singlemode and multimode. Depending on your requirements, you need to select your SFP

Fibre Channel

SFP modules support a variety of distances via multi-mode and single-mode optical fiber as shown in the table below. SFP modules use duplex fiber cabling with LC connectors. SFP-DD modules are

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