

Mid-range optical module



Summary of Content

Mid-range optical modules are fiber-optic transceivers designed for 2-10 km transmission, enabling high-speed, low-latency connectivity in data centers, enterprise networks, and telecom infrastructure.

Overview

Mid-range optical modules are optoelectronic devices that convert electrical signals into optical signals and transmit them over fiber, typically covering distances from 2 km to 10 km . They combine photoelectric technology with optical fiber transmission, providing stable, high-bandwidth communication for short-to-medium-range links. These modules are essential for data center interconnects, metro networks, and enterprise backbone links, bridging the gap between short-range (SR) and long-range (LR) optical solutions.

Common Types and Specifications

- **QSFP-DD FR4/FR8 Modules:** Designed for 2 km transmission over single-mode fiber (SMF). FR4 uses four non-cooled EML lasers with CWDM wavelengths, achieving 106.25 Gbps per channel using PAM4 modulation. FR8 uses eight DML lasers with LWDM wavelengths at 50 Gbps per channel .
- **QSFP-DD LR4 Modules:** Support 10 km transmission over SMF, using four EML lasers with CWDM wavelengths and PAM4 modulation at 106.25 Gbps per channel. These modules often require TEC cooling for temperature stability .
- **Form Factors:** QSFP-DD and OSFP are common, supporting high-density deployments and compatibility with modern switches and routers .

Applications

Article Content

Overview of 400G QSFP-DD Mid-Range Optical Modules

QSFP-DD LR4 Optical Module The "LR" in QSFP-DD LR4 optical module denotes long-distance transmission of

FS Community

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Optical module

An optical module is a typically hot-pluggable optical transceiver used in high-bandwidth data

Cisco Optics | Transform Your Network

Get the highest quality, performance-leading optical transceivers for any network architecture. Find the transceiver model to fit your

Optical Modules Market Research Report 2034

The optical modules market was valued at \$14.8 billion in 2025 and is projected to reach \$39.6 billion by 2034, growing at a CAGR of

Cisco 400G QSFP-DD High-Power (Bright) Optical Module

These small, modular optical interface transceivers offer a convenient and cost-effective solution for an array of applications in the

Understanding Optical Modules: Types and Troubleshooting Guide

An optical module is mainly composed of optoelectronic devices (including the optical transmitter and optical receiver), functional

What is Optical Link Module?

Explore the world of optical link modules, essential components in optical fiber communication. Learn about the different types of

Mid-distance Optical Module Market 2026 to 2032

Mid-distance optical modules are optoelectronic devices used for fiber-optic communication, combining photoelectric

Comprehensive Guide to Optical Transceiver Classifications and

Introduction Optical modules are critical components in fiber optic communications, enabling the conversion between

The Key External Components of Optical Modules

An optical module serves as the backbone of modern fiber-optic communication. Its appearance often resembles a

How Optical Modules Power the Evolution of 5G Networks

Optical modules enable high-speed, low-latency 5G networks by converting signals for fast, reliable data transfer,

Mid-Infrared Free-Space Optical Communications: Technologies ...

Recent demonstrations have extended these concepts to practical mid-IR transmitter and receiver modules using

FireFly™ Mid-Board Optical Transceivers

As a VITA™ 57.1 FMC™, the Samtec 14 Gbps FireFly™ FMC™ Module can be used for optical data communication on any FPGA

The Most Comprehensive Guide Of Optical Modules

Explore the ultimate guide to optical modules. Learn types, functions, performance metrics & how to choose the right

What Are the Key Parameters of Optical Modules

Understand the key parameters of optical modules, including transmission rate, distance, wavelength, and fiber

Overview of 400G QSFP-DD Mid-Range Optical Modules

This article briefly introduces the application scenarios of QSFP-DD in data centers—mid-range transmission.

Top Optical Transceiver Modules for Data Center Applications

Introduction: Why Optical Modules Are Critical to Data Center Infrastructure In today's cloud-first, AI-driven, and 5G

Cisco 400G QSFP-DD High-Power (Bright) Optical Module Data Sheet

Learn how Cisco 400G QSFP-DD High-Power (Bright) Optical module's small size and low power make it an optimal

Optical module

The main trade show for the large optical module industry is the Optical Fiber Conference (OFC), that is

How to Choose Optical Modules Correctly?

What is an Optical Modules? Optical modules are pivotal components in optical fiber communication systems,

Optical Modules

Optical modules are optical transceivers used for high-speed data transmission, and are used anywhere larger amounts of data

High Performance Active Optics & Passive Optics Solutions

Samtec is the industry-leading provider of mid-board optical transceiver solutions. This growing and comprehensive family of

Understanding Optical Modules

Optical modules are the backbone of modern optical communication systems, enabling high-speed, reliable data transmission that

Types of Optics | Juniper Networks

Fully-retimed Optics Fully-retimed optics are traditional optical modules designed to ensure the highest levels of signal integrity and

DCI Optical Modules | Delivering high bandwidth over distance

Marvell offers a portfolio of DCI modules designed to efficiently transmit data over regional fiber networks.

Fortinet Transceivers Data Sheet

Take the Guesswork Out of Selecting Transceivers Common connectivity problems in enterprise and data center networks are often

Optical Module Industry Statistics 2026

The optical module industry is facing increasing pressure to reduce its carbon footprint, with 40% of manufacturers

FireFly™ Mid-Board Optical Transceivers

Samtec's FireFly™ Micro Flyover System™ embedded and rugged mid-board optical transceivers take data connection "off board"

What Is An Optical Module?

An optical module is an important part of today's data systems. It helps send data using light signals through fiber optic

Contact Us

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