

400G optical module with high temperature resistance



AI Overview

400G high-temperature resistant optical modules are advanced transceivers designed for high-speed, high-bandwidth data transmission in demanding environments, supporting QSFP-DD or OSFP form factors with PAM4 or coherent modulation. Overview A 400G optical module converts electrical signals into optical signals for transmission over fiber and back into electrical signals at the receiver, enabling ultra-high-speed data transfer up to 400Gb/s. These modules are critical for modern data centers, cloud computing, and enterprise networks, especially where high-density and high-performance connections are required. Key Features Form Factors: QSFP-DD (Quad Small Form Factor Pluggable Double Density) and OSFP (Octal Small Form Factor Pluggable) are the most common 400G module form factors. QSFP-DD supports backward compatibility with QSFP28, while OSFP provides slightly larger dimensions for higher thermal dissipation. Modulation Techniques: PAM4 (4-Level Pulse Amplitude Modulation) is widely used for short-reach modules like SR4 and SR4.2, while coherent DP-16QAM modulation is used in long-reach modules like 400ZR for single-wavelength 400G transmission. Transmission Distance: Short-reach SR4 modules typically support 70–100 meters on OM3 fiber and up to 150 meters on OM4 fiber. Long-reach LR4/ER4 modules can achieve 10–30 km, and 400ZR modules can reach up to 120 km over single-mode fiber. Fiber Type: Multimode fiber (MMF) is used for short-reach modules, while single-mode fiber (SMF) is used for long-reach and DWDM applications. High-Temperature Resistance: Modules designed for high-temperature environments feature enhanced thermal management, including heat sinks and optimized PCB layouts, allowing stable operation in elevated ambient temperatures typical of industrial or high-density data center deployments. Applicati...

Article Content

Meta 400G FR4 Optical Transceiver Specification for OCP_Rev0.1

2.2 Overview The 400G-FR4 OCP optical specification is based on IEEE 400GBASE-FR4 specification as defined in IEEE 802.3 cu. Similar to 200G-FR4 OCP specification, it is optimized considering both

400G Optical Transceivers | OEM Compatibility

What is a 400G optical transceiver? A 400G optical transceiver is a hot-swappable module that sits in a switch, router, or NIC and converts

Exploring 400G Optical Module Typical Applications

Conclusion Currently, mainstream 400G optical modules are widely used in various network scenarios, including data center networks, metropolitan carrier networks, and long-distance

The Hidden Challenges of Optical Module Housings in

Explore the critical challenges of optical module housings in the 400G/800G era: heat management, material limits, signal integrity, and how

Optical Modules Evolution and Innovation From 400G to

Explore the evolution of optical modules in speed and form factors from 400G to 1.6T, stressing key enhancement technologies, and paths to

Thermal Management for 400G, 800G & 1.6T Optical

What is the Structure of an Optical Transceiver? An optical transceiver (commonly referred to as an optical module) is primarily constructed from an optical

OSFP Optical Module Thermal Design: Structure, Heat Dissipation ...

Explore how OSFP optical modules are thermally designed for optimal cooling and reliability. Learn about airflow impedance, gradient fins, heatsinks, and cooling solutions for 400G+

Specialty Optical Fibers | Coherent

Distributed sensing fibers for temperature, pressure, flow, acoustics, or strain, that operate even in harsh environments with superior optical

400G Optical Modules 2026 Guide: DR4 vs. FR4 vs.

Quick Answer: What are 400G Optical Modules? 400G optical modules are high-speed transceivers using PAM4 modulation and multi-lane architectures to

Comprehensive understanding of 400G optical modules

In the past two years, the demand for 400G optical modules in high-performance data centers, intelligent computing centers, super-computing centers, cloud

GOLOHO | 400G Optical Module Thermal Management Solution

This 400G optical module adopts the QSFP-DD form factor. Optical components are highly temperature-sensitive, and optoelectronic chips are prone to performance degradation due to temperature

PDF document

Read this PDF document online, download the original file, and browse related details on device.report. Additional coding instructions can be found in the Article File chapter of

Thermal Design Strategies for 400G OSFP Transceivers

Learn how 400G OSFP optical modules use flat-top, finned-top, and dual-side heatsinks to manage heat, ensuring stable, reliable performance in

Ultimate Guide to QSFP-DD 400G Optical Modules:

Discover the latest 400G QSFP-DD optical modules for high-performance data centers. Learn about PAM4, 8 channels, and more for optimal

JCO400 Coherent Optical Transceivers Datasheet

Co-developed by Juniper and an industry-leading optical partner, JCO400 Coherent Optical Transceivers are essential building blocks that enable operators to realize a transformative strategy

400G Coherent Optics Guide: ZR, ZR+ & MZR

Master 400G coherent optics with our comprehensive guide covering ZR, ZR+, MZR variants, reach capabilities, power consumption & deployment

Unlocking High-Speed Networks with 400G Coherent

400G Coherent Optics is a complex system that integrates key photonic and electronic components to enable high-speed data transmission.

100G/400G Optical Transceiver

The 100G/400G Optical Transceiver platform is built upon a scalable, hot-swappable form factor architecture, compatible with QSFP-DD and OSFP industry standards. The optical ...

Key Differences Of 100G, 400G, And 800G Explained

What Is An Optical Module? Differences Between 100G, 400G And 800G Optical Modules By fiberlife. Posted on September 9, 2024 As an

Cisco 400G QSFP-DD Cable and Transceiver Modules

The Cisco's QDD-400G-VR4 Module (Figure 5) is a hot pluggable optical transceiver compliant with 400G Ethernet. The optical interface supports

Analysis of 400G OSFP SR4 Optical Module

Traditional 100G/200G optical modules can no longer meet the demands of high-density, low-latency traffic surges. The 400G OSFP SR4 optical

Efficient Heat Dissipation of Uncooled 400-Gbps (16×25-Gbps) Optical ...

This excellent thermal dissipation with brass block embedded in the PCB of the proposed 400-Gbps transceiver module is experimentally performed even under high temperature and long-term operation.

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

Cisco 400G QSFP-DD High-Power (Bright) Optical module's small size and low power make it an optimal choice for a wide range of DCI/Cloud, metro access/aggregation, wireless backhaul, and

How 400G Optical Modules Are Shaping Next-Gen

Discover key factors driving the rapid adoption of 400G optical transceivers, including AI, 5G, coherent optics, and market trends shaping next

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

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

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