

Article Overview

40km optical modules support long-reach high-speed transmission over single-mode fiber, typically using 4-lane CWDM or LAN WDM optics with QSFP+ or QSFP28 interfaces.

Key Types and Standards

- o 40GBASE-ER4: A 40GbE standard using four CWDM wavelengths (1271nm, 1291nm, 1311nm, 1331nm) over single-mode fiber, achieving up to 40km reach. It splits a 40Gbps signal into four ~10Gbps lanes, multiplexed onto a duplex LC fiber pair, and demultiplexed at the receiver. Compliant with IEEE 802.3ba and QSFP+ MSA, it is widely used in metro and extended campus networks .
- o 100GBASE-ER4 / ER4L QSFP28: Converts four 25Gbps electrical channels into four LAN WDM optical signals, multiplexed into a single fiber for 100Gbps transmission. Typical wavelengths are 1296nm, 1300nm, 1305nm, and 1309nm. FEC support extends reach to 40km, while APD receivers ensure high sensitivity .
- o 100G OWDM: Supports 8 channels with 400GHz spacing in the O-band, reaching 40km without amplifiers or dispersion compensation. It features low power consumption (~5.5W) and Digital Optical Monitoring (DOM) for operational efficiency .

Optical and Electrical Parameters

- o Transmission Distance: Up to 40km over single-mode fiber.
- o Wavelengths: CWDM or LAN WDM channels, e.g., 1271-1331nm for 40GBASE-ER4, 1296-1309nm for 100G ER4.
- o Data Rate: 40Gbps for ER4, 100Gbps for ER4/ER4L modules.
- o Lanes: 4 optical lanes per module; 40G splits 40Gbps into 4x10Gbps, 100G splits 100Gbps into 4x25Gbps.
- o Connectors: Duplex LC/UPC for single-mode fiber.
- o Receiver Type: APD (Avalanche Photodiode) for high sensitivity.
- o Power Consumption: Typically 5-6W for 100G modules.
- o FEC Support: Forward Error Correction enabled to achieve full 40km reach.

Applications

- o Data Center Interconnects (DCI)
- o Metro and backbone networks
- o Extended campus networks
- o Scenarios where 10km or 20km optics are insufficient but DWDM is unnecessary

Additional Features

40km optical module parameters

- o Digital Optical Monitoring (DOM): Provides real-time monitoring of optical power, temperature, and voltage.
- o Multiplexing: CWDM or LAN WDM MUX/DEMUX integrated for single-fiber transmission.
- o Compatibility: QSFP+ or QSFP28 form factors, compliant with IEEE and MSA standards. These parameters ensure high-speed, long-reach, and reliable optical transmission for modern network deployments, balancing performance, cost, and operational efficiency .

Explore the ultimate guide to optical modules. Learn types, functions, performance metrics

The MSA recommends host termination resistor value of 560 Ohms, which provides the best balance of performance for both open

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

Description DCM (Dispersion Compensation Modules) provides fixed chromatic dispersion compensation for high-speed metro core,

What are the detailed parameters of the optical module? Optical module center wavelength, transmission distance, loss

Overview The 10G SFP+ transceivers are high performance, cost effective modules supporting data rate of 10Gbps and 40km

The above is the full content of the common parameters of optical modules and the basic knowledge of optical

Considering that some newcomers to optical modules may not understand the letters on the optical module or the

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

Technical guide to 40GBASE-ER4 QSFP+ optics covering CWDM wavelengths, optical specs, power, interfaces, and 40km

Low Power Mode (LPMode) pin is used to set the maximum power consumption for the product in order to protect hosts that are not

Understand SFP+ 40km (10GBASE-ER) modules, including specs, SMF compatibility, and how to choose the right

40km optical module parameters

In this article, we will provide a detailed overview of these different types of 40km 100G modules, analyzing their

100G QSFP ER4L 40km o Support line rates from 103.125 Gbps to 111.81Gbps o Compliant with QSFP28 Standard: SFF-8665

In modern optical transport networks, 100G optical modules with a transmission distance of 40km have emerged as a core

As one of the most professional 400g qsfp-dd er4 40km optic module manufacturers and suppliers in China, we're featured by

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