

Optical modules DR4 and SR4



Summary of Content

SR4 modules are short-reach, multimode solutions for intra-data center links, while DR4 modules are single-mode, medium-reach solutions for inter-data center connections up to 500 meters.

Overview

SR4 (Short Reach, 4 lanes) is designed for short distances, typically within a single rack or between racks in a data center. It uses multimode fiber (MMF), commonly OM3 or OM4, and transmits data over four parallel optical channels, each at 100Gbps, achieving a total of 400Gbps using PAM4 modulation. The typical reach is 30 meters on OM3 and 50 meters on OM4, with some OM5 deployments extending up to 150 meters. SR4 modules use MPO-12 APC connectors and are optimized for high-density, cost-effective deployments with low power consumption (around 4-5W per module) (). DR4 (Datacenter Reach, 4 lanes) is intended for medium-short distances, up to 500 meters, using single-mode fiber (SMF, OS2). Like SR4, it uses four optical channels at 100Gbps each with PAM4 modulation, but it employs DFB lasers instead of VCSELs. DR4 is suitable for inter-rack or inter-room connections within a data center, bridging dense fabrics to aggregation or spine switches. It also uses MPO-12 APC connectors for parallel single-mode transmission ().

Key Differences

Feature	SR4	DR4
Fiber Type	Multimode (OM3/OM4/OM5)	Single-mode (OS2)
Maximum Distance	30-50 m (OM3/OM4), up to 150 m (OM5)	500 m
Laser Type	VCSEL	DFB
Connector	MPO-12 APC	MPO-12 APC
Typical Use	Intra-rack or intra-data center	Inter-rack or inter-room within data center
Power Consumption	4-5 W	Slightly higher than SR4
Cost	Lower	Higher due to single-mode optics

Article Content

The Ultimate Guide to OSFP 400G DR4 Optical Modules

The OSFP (Octal Small Form-Factor Pluggable) 400G DR4 optical module plays a critical role in today's high-speed

400G ZR, DR4, FR4, LR4, SR8 QSFP-DD Optical Transceiver

There are two types of 400G QSFP-DD DR4 optical modules: traditional electric-optical chip-separated optical

400G Optical Transceiver Guide | 400G OSFP SR4, SR8, DR4, FR4,

Juniper's 400G-capable switches rely heavily on SR4 and DR4 optics for intra-data center connectivity. Their solutions

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As data centers evolve to support AI, HPC, and hyperscale workloads, 400G optical transceivers have become critical

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What do the suffixes “SR8, DR4, xDR4 FR4 and 2FR4”

The letters are reach specifications, and the number refers to the number of optical channels: Description

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This guide explores the key features, differences, and applications between 400G SR4 and 400G DR4 InfiniBand

A Comprehensive Guide to 400G Optical Modules: Navigating VR4,

We have presented a comprehensive overview of the transmission standards governing 400G optical modules. We

400G Sr4 Vs Dr4 Optical Transceivers: The difference between them

Quick summary: SR4 modules are short-reach, multimode solutions that use MPO/MTP ribbon connections and are optimized for

What do the Suffixes SR8, SR4, DR4 Stand for?

In general, the letters refer to reach or optics technology, and the number refers to the

100G Optical Module: How to Choose Between SR4, DR4, FR4, LR4,

Continuing our discussion on 100G optical modules, let's explore the essential 100G transmission standards—SR4,

400G SR4 vs DR4 vs FR4 vs LR4: What Are the Differences and How

400G SR4 vs DR4 vs FR4 vs LR4: key differences in distance, fiber, cost, and use cases. Choose the right optical

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400G Optical Modules Explained: SR4 Vs. DR4 Vs. FR4 Vs. LR4

Key differences between SR4, DR4, FR4, and LR4 400G optical modules. Expert advice from Asterfusion engineers

400G SR4 vs DR4 vs FR4 vs LR4: What Are the Differences and How

For many engineers encountering 400G optical modules for the first time and planning to deploy them, they will face

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