

Article Overview

DR (Distance Range) optical modules support high-speed data transmission over single-mode fiber up to 500 meters, typically using PAM4 modulation and QSFP/QSFP-DD/OSFP form factors.

Key Specifications

Data Rate and Modulation: DR modules operate at high data rates, such as 100 Gb/s per lane for 100G DR1 or 400 Gb/s for DR4, using PAM4 (4-level Pulse Amplitude Modulation) to double the effective data rate compared to NRZ modulation . **Fiber Type and Reach:**

- o Single-mode fiber (SMF) is used for DR modules.
- o Maximum reach: up to 500 meters, suitable for inter-data center or medium-range connections . **Form Factors:**
- o Common form factors include QSFP28, QSFP-DD, and OSFP, enabling high port density and low power consumption in data center environments . **Electrical Interface:**
- o DR modules use host-module electrical interfaces compatible with DSP-based SerDes and RS(544,514) FEC for error correction .
- o For 100G DR1 QSFP28, the interface follows IEEE 802.3 CAUI-4 standards . **Applications:**
- o Designed for data center interconnects, medium-range links, and Ethernet-like connections with 1, 2, 4, or 8 lanes.
- o Optimized for low latency, low power, and cost efficiency . **Additional Notes:**
- o DR modules are part of a broader classification of optical modules:
 - o SR (Short Range): up to 300 m, multimode fiber
 - o FR (Long Range): up to 2 km, single-mode fiber
 - o LR (Long Range): up to 10 km, single-mode fiber
- o DR modules specifically target medium distances (~500 m) over single-mode fiber . Example: The 100G QSFP28 DR1 module supports 500 m links over single-mode fiber via LC connectors, with compliance to IEEE 802.3bm Annex 83E for transmitter/receiver specifications . DR optical modules are essential for high-speed, medium-distance interconnects, providing a balance between reach, power efficiency, and port density in modern data center networks.

Optical modules are electronic devices used in communication systems to transmit optical signals. These modules

1.6T DR8 OSFP Flat Top 1310nm 500m Dual MPO-12/APC DOM Transceiver OSFP-DR8-1.6T-FL

Optical Module DR Specifications

FiberMall 400G DR4 QSFP-DD Optical Transceiver Module The 400G QSFP-DD DR4 fiber module achieves the

ET7402-DR1 Edgecore's QSFP28 DR1 transceiver module is designed for use in 100 Gigabit Ethernet links over 500 m single mode

Among the different optical standards that enable 400G, the OSFP 400G DR4 stands out for its parallel single-mode

High-bandwidth transceiver modules based on the QSFP112 form factor, targeting NICs

As the demand for faster data transmission continues to surge, 800G transceiver has gained significant attention due

View the TI Optical module block diagram, product recommendations, reference designs and start designing.

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

Discover everything about 400G DR4 and QDD 400G DR4-S transceivers, including IEEE 400GBASE-DR4

DR (Direct Reach) and FR (Far Reach) are commonly used terms in Ethernet optical transceivers, referring

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

Explore the working principles, structures, and performance metrics of optical modules, essential components of

Our CCIE/HCIE team shares lab-tested benchmarks for DR4, FR4, and LR8, focusing on power efficiency, latency,

This comprehensive guide covers all six major reach classifications currently deployed in modern optical networks:

What Is an Optical Module and Its FAQs (V200) Describes what an optical module is and FAQs, including the fundamentals,

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