ZITHA TECH SPECIALTY CABLES (Pty) Ltd

New Zealand Consulting QSFP-DD Optical Module DML



Overview

Cisco 400G QSFP-DD High-Power (Bright) Optical Learn how Cisco 400G QSFP-DD High-Power (Bright) Optical module's small size and low QSFP-DD Optical Transce.

Key Takeaways

QSFP-DD DML modules are high-density, high-speed optical transceivers designed for 400G and 800G Ethernet applications, offering backward compatibility, flexible deployment, and support for both NRZ and PAM4 modulation.

Overview of QSFP-DD DML Modules

QSFP-DD (Quad Small Form-Factor Pluggable Double Density) modules are the next-generation optical transceivers that double the number of high-speed electrical interfaces compared to standard QSFP28 modules, enabling 400G and 800G Ethernet speeds . The "DML" (Directly Modulated Laser) technology allows efficient optical signal generation for short- to medium-reach applications, typically within data centers or metro networks. QSFP-DD modules are backward compatible with QSFP+, QSFP28, and QSFP56, providing flexibility for network upgrades .

Key Features
• High Bandwidth Density: Supports up to 400G per module using PAM4 modulation, or 200G per module with NRZ .

• Interoperability: Compliant with OIF, OpenZR+, and OpenROADM MSA standards, ensuring multi-vendor compatibility .

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• Form Factor: Compact 2x1 stacked cage/connector design with thermal support up to 12W, suitable for high-density switch and router ports .

• Applications: Ideal for data center interconnect (DCI), metro/regional networks, and service provider access networks. Coherent QSFP-DD modules can support amplified DWDM links up to 120 km for 800ZR and beyond 1000 km for 800G ZR+ .

• Security and Compliance: Some modules offer AES-256 encryption for Layer 1 security and OTN compliance for seamless integration .

Modulation and Performance

• NRZ (Non-Return-to-Zero): Supports up to 25Gb/s per channel, suitable for 200G applications.

• PAM4 (4-Level Pulse Amplitude Modulation): Supports up to 50Gb/s per channel, enabling 400G applications .

• DML Technology: Provides cost-effective, energy-efficient optical transmission for short- to medium-range links, typically within 2 km to 10 km depending on fiber type and network design.

Deployment Considerations in New Zealand

While specific vendors in New Zealand may vary, QSFP-DD DML modules are widely supported by major networking vendors such as Cisco, Acacia, and Smartoptics . They are suitable for:

• High-density data centers in Auckland, Wellington, or Christchurch.

• Metro and regional interconnects between data centers or service provider networks.

• Network upgrades where backward compatibility with existing QSFP infrastructure is required.

Summary

QSFP-DD DML optical modules provide a high-performance, interoperable, and flexible solution for modern high-speed networks. They combine compact form factor, backward compatibility, and support for both NRZ and PAM4 modulation, making them ideal for 400G and 800G Ethernet deployments in data centers, metro, and service provider networks. For New Zealand deployments, these modules can be sourced from global vendors and integrated into existing network infrastructure with minimal disruption.

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QSFP-DD ports incorporate a riding heatsink that can be sized independently of the optical module, added on top of the module, or

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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