

Article Overview

Low Power Optical (LPO) OSFP modules deliver high-speed 800G connectivity with ultra-low power consumption, reduced latency, and improved thermal efficiency for AI and HPC data centers.

Overview of OSFP Modules

The Octal Small Form-Factor Pluggable (OSFP) is a high-density optical module standard designed for next-generation data centers. OSFP modules support 400G, 800G, and emerging 1.6T speeds, offering a native 8-lane architecture that enables high bandwidth without changing the mechanical form factor. They provide a wider thermal envelope and improved airflow compared to QSFP-DD, making them ideal for AI cluster deployments and GPU-to-GPU topologies in 1RU switch configurations . OSFP modules typically support power budgets up to 60W, accommodating high-performance optics and coherent DSPs.

Low Power Optical (LPO) OSFP Modules

LPO OSFP modules are designed to address the power and latency challenges of traditional DSP-based optical modules. For example, the FS 800G LPO DR8 OSFP module operates at a maximum power consumption of 8.5W, which is roughly 50% lower than conventional 800G DSP-based modules . This reduction in power consumption:

- o Lowers thermal load on switches and servers
- o Reduces cooling requirements
- o Improves overall energy efficiency and operational cost savings By eliminating DSP chips, LPO modules also reduce latency, making them particularly suitable for AI/ML and HPC workloads where high-speed, low-latency interconnects are critical.

Technical Features

- o Data lanes: 8 lanes per direction, supporting 106.25 Gbps per lane with FEC
- o Optical interface: Dual MPO-12 APC connectors for multimode fiber (OM3/OM4)
- o Reach: Up to 60 m over OM3 fiber and 100 m over OM4 fiber
- o Management: Fully compatible with CMIS 4.0 for digital diagnostics and monitoring
- o Thermal design: Optimized for high-density switch environments with improved airflow

Advantages of LPO OSFP Modules

- o Ultra-low power consumption: Reduces energy footprint and cooling costs
- o Reduced latency: Eliminates DSP processing delays

- o High bandwidth: Supports 800G Ethernet and scalable AI/HPC interconnects
- o Thermal efficiency: Larger OSFP housing allows better heat dissipation
- o Forward compatibility: Supports future speed upgrades without mechanical redesign

Deployment Considerations

When deploying LPO OSFP modules, data center operators should consider:

- o Switch and server thermal capacity
- o Compatibility with existing OSFP cages and connectors
- o Fiber type (OM3 vs OM4) and link distance requirements
- o Management interface for monitoring power, temperature, and signal integrity LPO OSFP modules are increasingly becoming the preferred choice for AI training networks and high-performance computing clusters, offering a balance of performance, energy efficiency, and scalability .

OSFP-XD can also support 8-lane optics modules that want to take advantage of thermal management capabilities and useable

Master OSFP transceiver technology with our comprehensive guide. Covers 400G/800G/1.6T speeds, OSFP vs

Confused by SFP vs SFP+? Read the definitive 2026 guide on SFP modules. We explain Single Mode vs

OSFP (Octal Small Form Factor Pluggable) is a pluggable optical transceiver interface standard that supports eight

Complete OSFP form factor guide: dimensions, 8-lane architecture, thermal design, module types, and OSFP vs

Power your AI and cloud networks with next-gen OSFP optics. LINK-PP offers 400G/800G/1.6T modules, LPO, and

This specification defines the electrical connectors, electrical signals and power supplies, and mechanical and thermal requirements

Here we describe the power supply filtering requirements and the power supply sequencing requirements. The power supply filtering

Understanding the working principle of optical modules--especially SFP transceivers--is critical for network

Bonnie Mack and Terence Graham 1. Introduction Pluggable optics modules, (POMs), such as SFP, QSFP, QSFP+,

This specification defines the electrical connectors, electrical signals and power supplies, mechanical and thermal requirements of

Discover how OSFP modules provide high-speed optical connectivity for data center applications. Learn about the

Extremely high or low temperatures can impact the optical power and sensibility of the module. Hence, maintaining a

. Texas Instruments, TVL672x OSFP/OSFP-XD Module Low-Speed Signal Controller with ePPS Support . The Next Generation of

What Is an SFP Optical Module? Types and Speeds The complete technical guide to SFP

OSFP MSA Specification for OSFP OCTAL SMALL FORM FACTOR PLUGGABLE MODULE Rev 1.12 August 1 st, 2017 Abstract:

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