

Article Overview

Co-packaged OSFP installation requires careful alignment, thermal management, and adherence to optical safety standards to ensure reliable high-speed operation.

Overview of Co-Packaged OSFP

Co-packaged optical OSFP modules integrate optical engines (OEs) directly with switch ASICs or NICs, reducing electrical trace lengths and improving energy efficiency. Unlike standard pluggable OSFP modules, co-packaged systems often use ELSFPs with blind-mate optical connectors, enabling precise optical alignment and hot-swap capability without end-user pluggability . This architecture supports high-speed data rates, including 400G, 800G, and future 1.6T configurations, while minimizing insertion loss and power consumption .

Key Installation Considerations

1. Thermal Management High-speed OSFP modules, especially 800G, can consume 25W or more per port. Proper heat dissipation is critical to prevent thermal throttling or damage. Co-packaged systems may integrate heat sinks or rely on airflow management within the chassis . 2. Optical Alignment Co-packaged OSFP modules use coarse and fine alignment pins to ensure ferrule end-faces mate correctly before electrical contacts engage. Blind-mate connectors allow precise optical alignment while maintaining safety and minimizing discontinuities . Ensure that ferrule guide pins and PCB alignment pins are properly seated during installation. 3. Electrical and Mechanical Integration The host cage must accommodate the OSFP module, including EMI springs and latches for secure retention. Co-packaged designs often require larger package substrates to support dense high-speed routing without excessive power penalties . Verify that the module is compatible with the host ASIC and cage design. 4. Safety Precautions ELSFPs may use Class 3B or 4 CW lasers. Follow laser safety guidelines and ensure interlocks are functional to prevent accidental exposure . Only qualified optical modules should be used to avoid thermal or operational issues. 5. Cabling and Connectivity Select the appropriate optical interface (e.g., SR8, DR8, FR8, LR8) based on reach and fiber type. Co-packaged systems may use MPO-12 or duplex fiber connections, depending on the module standard . Ensure consistent FEC configuration across endpoints to avoid link failures.

Installation Steps (High-Level)

- o Prepare the host system: Ensure the cage and PCB are clean and free of debris. Verify airflow and thermal provisions.
- o Align the module: Insert the OSFP module carefully, allowing coarse alignment pins to seat first, followed by fine ferrule alignment.
- o Engage electrical contacts: Once optical alignment is confirmed, secure the module with latches and EMI springs.



Installing co-packaged optical OSFP

- o Connect fiber: Attach the appropriate optical cables, ensuring correct polarity and connector type.
- o Verify operation: Monitor temperature, optical power, and link status via the management interface (CMIS 5.0/5.2) to confirm proper installation .

Best Practices

- o Use qualified modules and cables to prevent host damage and ensure warranty compliance .
- o Plan for high-density deployments with adequate cooling and structured cabling .
- o Follow a three-phase deployment process: pre-deployment planning, installation, and post-installation verification .
- o Maintain a hot-swap capability for reliability and minimal downtime . By carefully addressing thermal, optical, and mechanical requirements, co-packaged OSFP modules can deliver high-speed, energy-efficient performance in modern data center networks.

Co-packaged Optical systems integrate lasers systems with signal processing ASICS, and other photonics elements.

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

Co-Packaged Optics (CPO) is an advanced integration of optics and silicon on a single packaged substrate

We designed and fabricated an external laser source (ELS) for a network switch equipment employing the Co-Packaged Optics

Co-packaged optics are enabling designers to mount dissimilar chips directly on a common

Fiber infrastructures for co-packaged optics can be designed and assembled to achieve high reliability at scale.
Failure mechanisms

Use the information in this topic to install OSFP or QSFP-DD optical transceivers and fiber-optic cables.
Juniper

ABSTRACT: This Implementation Agreement specifies key aspects and electro-optical-mechanical details of a

This White Paper describes the recommended system management architecture for the delivery of optical power to co

Installing co-packaged optical OSFP

Live demonstration for 3.2T Co-Packaged Copper link - Part of the Co-Packaging demo: The OIF is the first organization to

Co-Packaged Optics (CPO) addresses this by relocating the optical conversion function -- the point at which electrical

The OIF's co-packaging framework project was initiated to explore the next generation industry needs for co

The formal OSFP-XD specification is expected to be released in 2023. OSFP-XD is

This allows for easy maintenance, upgrades, and installation. These pluggable optical transceivers conform to standards defined by

This document provides guidance on the requirements for co-packaged optic assemblies designed for high-radix, network switch

We have successfully developed a die-to-die channel using a CPC solution implemented

Web: <https://in-au.co.za>

