Switch Optical Module Stacking Technology

Overview

At GTC 2025, NVIDIA announced two new networking switch platforms – Spectrum-X Photonics and Quantum-X Photonics – based on co-packaged optics (CPO) technology. Spectrum-X, targeting Ethernet-based architectures, will be released in 2026 and offers configurations ranging from 128 ports at 800 Gb/s. OFC 2025 made one thing clear: The transition to Co-Packaged Optics (CPO) switches in data centres is inevitable, driven primarily by the power savings they offer. From Jensen Huang showcasing CPO switches at GTC 2025 to a wide range of vendors demonstrating optical engines integrated inside ASIC. Molex introduces integrated optical interconnect solutions and High-Radix Optical Circuit Switch Platform that simplify largescale AI networking by enabling modular, serviceable connectivity and dynamic, low-power optical reconfiguration. Co-packaged optics (CPO), by merging optics and electronics, brings about a revolution in data center design, significantly enhancing power efficiency and bandwidth density. As the demand for higher bandwidth data. ECTC progress report on enabling technologies, including cooling chiplets, 1μm hybrid bonding, RDL buildups, and co-packaged optics.

Article Content

Co-Packaged Optics (CPOs)

From Jensen Huang showcasing CPO switches at GTC 2025 to a wide range of vendors demonstrating optical engines integrated inside ASIC packages at OFC 2025, co-packaged optics ...

Molex Accelerates AI Cluster Deployment with One-Stop Optical ...

Molex unveils a full optical stack including serviceable CPO solution, detachable fibertochip interfaces and a High Radix Optical Circuit Switch platform to accelerate AI cluster ...

Broadcom Announces Third-Generation Co-Packaged Optics (CPO) ...

Broadcom''s 200G/lane CPO technology is designed for next-generation, high-radix scale-up and scale-out networks, which will demand parity with copper interconnect reliability and ...

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A failure in an optical engine might require replacing an entire CPO switch line card or server board rather than just swapping a pluggable module. Developing robust testing, diagnostics, ...

Novel Assembly Approaches For 3D Device Stacks

The Industrial Technology Research Institute (ITRI) and Brewer Science demonstrated five-layer stack build-ups of a polymer/copper RDL followed by copper-copper hybrid bonding, which ...

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The Packaging Technologies Behind NVIDIA''s 3D-Stacked CPO

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How to Choose Optical Modules for Switch Stacking?

To sum up, from the perspective of practicality and economy, DAC should be used for data transmission or switch stacking below 7 meters. AOC is used for data transmission or stacking ...

Next Generation Switch Optics for 400G and Beyond

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