

Data Center CPO Optical Module



Article Overview

CPO (Co-Packaged Optics) optical modules integrate optical engines directly with switch ASICs, reducing power, latency, and enabling higher bandwidth in modern data centers.

Overview of CPO Technology

Co-Packaged Optics (CPO) is a data center optical module architecture where the optical engine—comprising lasers, modulators, photodetectors, drivers, and transimpedance amplifiers (TIAs)—is integrated directly onto the same substrate or interposer as the switching or routing ASIC. Unlike traditional pluggable transceivers, CPO modules are not hot-swappable and are tightly co-located with the ASIC, shortening the high-speed electrical lanes from centimeters to millimeters. This integration improves signal integrity, reduces latency, and lowers power consumption, often by up to 50% compared to conventional designs.

Key Benefits

- **Power Efficiency:** Shorter electrical paths reduce the need for high-power DSPs or retimers, cutting energy usage and operational costs.
- **High Bandwidth:** Direct integration with ASICs supports higher data rates, enabling next-generation data center throughput.
- **Low Latency:** Minimizing electrical trace length and DSP processing reduces signal delay, critical for HPC and AI workloads.
- **Scalability:** Compact integration allows more optical channels per rack, supporting dense AI compute trays and large-scale data fabrics

Article Content

Co-packaged Optics: all eyes on high-performance computing

AI bottlenecks drive the adoption of optical interconnects for next-generation HPC systems. OUTLINE The CPO market is expected

Datacenter providers see future-proofed possibilities in co-packaged optics

Datacenter operators want to introduce Co-Packaged Optics (CPO) to keep pace with ever-higher speed and capacity demands.

Co-packaged Optics: The Next-Gen Data Center Tech

CPO, or "Co-Packaged Optics," is an advanced opto-electronic co-packaging technology. It involves co-packaging the

Co-packaged optics are inching closer to

The optical interconnect industry is growing fast, and many factors affect its success as well as delays in deployment. (U)HD video

Contact Us

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