

Co-packaged photonics smart technology shipping globally



Overview

Co-packaged optics (CPO): status, challenges, and solutions This event will bring together leading experts to explore how photonics and advanced semiconduct.

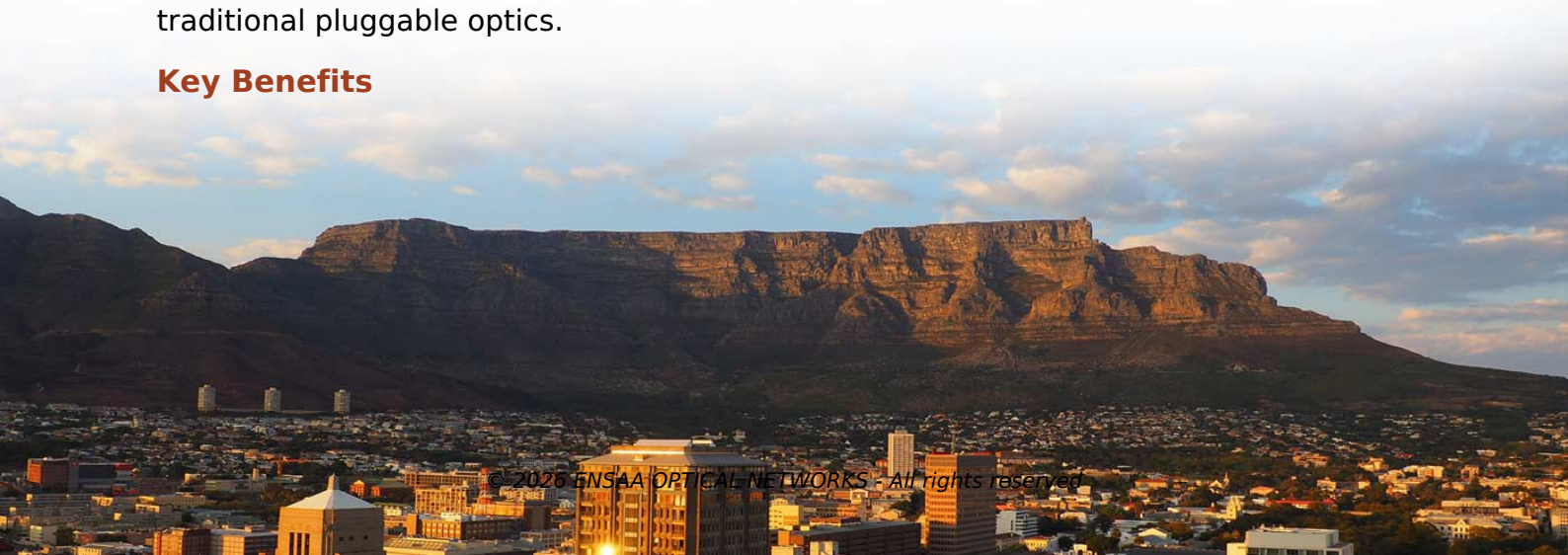
Key Takeaways

Co-packaged photonics (CPO) integrates optical engines with electronic ICs to deliver high-bandwidth, energy-efficient interconnects, with global deployment supported by leading suppliers.

Overview of Co-

Packaged Photonics (CPO) Co-packaged photonics (CPO) is a next-generation optical interconnect technology that integrates photonic integrated circuits (PICs) directly with switch ASICs or XPU within a single package, drastically reducing electrical path lengths and improving signal integrity, bandwidth, and power efficiency. By collapsing distances from inches to millimeters, CPO minimizes insertion loss, lowers latency, and enables high-density interconnects suitable for AI data centers, high-performance computing (HPC), and hyperscale networking. Early implementations have demonstrated 30–50% reductions in power consumption compared to traditional pluggable optics.

Key Benefits



High Bandwidth Density: Optical engines provide multi-terabit throughput, supporting 200G/channel links and scaling to 800G and 1.6T transceivers. **Energy Efficiency:** Reduces the need for high-power electrical drivers, retimers, and repeaters, enabling sub-pJ/bit energy consumption.

Thermal and Signal Optimization: Advanced packaging and thermal management strategies ensure stable performance under dynamic AI workloads. **Scalability:** Supports heterogeneous integration, including 2D side-by-side and 3D monolithic approaches, allowing flexible deployment across data center architectures.

Global Market and Suppliers

The CP

O ecosystem is rapidly expanding, with major players including Cisco, Broadcom, Marvell, TeraHop, Ayar Labs, Lightmatter, Celestial AI, and Nubis Communications. Foundries like TSMC, GlobalFoundries, Intel, and STM provide manufacturing capabilities, while equipment suppliers such as Applied Materials and ficonTEC enable high-performance production. China is emerging as a significant competitor, shipping millions of modules and closing the technology gap with Western suppliers.

This indicates that global shipping and distribution of CPO modules are feasible, particularly through established semiconductor and photonics supply chains.

Considerations for Global Deployment

Integration Complexity: CPO requires careful co-optimization of electrical, optical, thermal, and packaging parameters early in the design phase. **Thermal Management:** Photonic components are temperature-sensitive, necessitating advanced cooling strategies for high-density deployments. **Compatibility:** Solutions like UCle optical interconnect chiplets maintain interoperability while extending connectivity beyond copper limitations.

Conclusion Co-packaged photonics smart technology represents a transformative solution for high-speed, energy-efficient data interconnects, with a growing global market and multiple suppliers capable of international shipping. Organizations seeking to deploy CPO solutions can leverage vertically integrated suppliers, foundries, and equipment providers to source modules worldwide, ensuring compatibility with AI, HPC, and next-generation networking infrastructures.

Article Content

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We will start with Nvidia and Broadcom's solutions before discussing major CPO companies. We cover Ayar Labs, Nubis, Celestial AI, Lightmatter, Xscape Photonics, Ranovus and

Photonic and Electronic Co-Packaging Technologies – From

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The report is based on extensive research and interviews with industry experts and provides valuable insights for anyone interested in gaining a strategic understanding of Co-Packaged

Co-Packaged Optics (CPO): Evaluating Different Packaging

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Co-Packaged Optics (CPO) 2025-2035: Technologies,

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Co Packaged Optics CPO Technology Market: Transforming the

The convergence of photonics, semiconductors, and advanced networking technologies positions this market as a critical growth area with significant commercial potential across multiple

Co-Packaged Optics (CPO): Evaluating Different Packaging Technologies

IDTechEx Research Article: The rise of co-packaged optics is transforming modern data centers and high-performance networks by addressing critical challenges such as bandwidth density,

The advent of co-packaged optics (CPO) in 2025

Co-packaged optics (CPO)—the silicon photonics technology promising to transform modern data centers and high-performance networks by addressing critical challenges like

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This paper gives a brief overview of state-of-the-art of co-packaged optical I/O and requirements of its next generations. We also discuss ideas to exploit co-packaged optics in disaggregated AI systems

Co Packaged Optics Market Report: Size, Growth,

Co Packaged Optics Market size is projected to reach USD 0.84 Billion by 2032, growing at a CAGR of 27.5% from 2026 to 2032 The report provides key trends,

CPO (Co-Packaged Optics Solutions) | ASMPT SEMI Solutions

CPO solutions by ASMPT enable high-speed data and energy-efficient Co-Packaged Optics packages—optimize electronics and photonics integration now.

Co-packaged Optics Market 2026-2034 Analysis: Trends, Competitor ...

Co-packaged Optics Market 2026-2034 Analysis: Trends, Competitor Dynamics, and Growth Opportunities Co-packaged Optics Market by Component (Optical Engines/Transceivers, Photonic

Co-packaged Optics: The Future Driving Force in Silicon Photonics

In the foreseeable future, Co-packaged Optics CPO is expected to be the main driver in communication particularly in Silicon Photonics SiPh market. It shortens the electrical path, resulting

Co-packaged Optics Market Report 2034

Global co-packaged optics market reached USD 2.0 billion in 2025, projected to hit USD 27.1 billion by 2034 at a 35.2% CAGR.

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