

Price List for 1G Co-packaged Photonics for Data Center Interconnects



Overview

Co-Packaged Optics, Silicon Photonics Boost AI Data Center This post takes a close look at the latest forecast for optical interconnects in AI data centers.

Key Takeaways

Exact 1G CPO pricing is not publicly listed, but market trends suggest costs are influenced by integration complexity, data rate, and scale, with early-stage modules typically commanding premium prices. Market Context and Cost Drivers

Co-packaged optics (CPO) integrates photonic integrated circuits (PICs) and lasers directly with switching ASICs, reducing electrical I/O distance, improving signal integrity, and lowering power consumption compared to traditional pluggable modules. The technology is increasingly adopted in AI-driven and hyperscale data centers, where high bandwidth and low latency are critical. Key factors influencing pricing include:

- Integration Method: 3D monolithic integration (embedding photonics within the same die as electronics) is more expensive due to R&D and fabrication complexity, while 2D integration (side-by-side PIC and EIC on PCB) is cheaper but less efficient.
- Data Rate and Bandwidth: Higher-speed modules (400G, 800G, 1.6T) are more costly; 1G modules are at the lower end of the spectrum but still benefit from advanced packaging and silicon photonics processes.

- **Component Costs:** PICs, lasers, modulators, and electrical ICs contribute significantly to the overall cost, with silicon photonics fabrication and assembly being major cost drivers .
- **Volume and Scale:** Early-stage deployments are expensive due to low production volumes, while large-scale adoption in hyperscale data centers can reduce per-unit costs through economies of scale .

Estimated Pricing Range

While no public price list exists for 1G CPO modules, industry reports suggest:

- Early-stage, low-volume CPO modules can cost several hundred to over a thousand USD per module, depending on integration complexity and performance requirements .
- As production scales and technology matures, prices are expected to decline significantly, similar to trends observed in 400G and 800G pluggable optics .

Supplier Landscape

Major players in the CPO ecosystem include TeraHop, Cisco, Broadcom, Marvell, Ayar Labs, Lightmatter, Celestial AI, and Nubis Communications, with foundries like TSMC, Intel, GlobalFoundries, and STM supporting high-performance manufacturing . These suppliers influence pricing through proprietary technology, integration expertise, and production scale.

Practical Considerations

- **Thermal Management:** CPO modules require advanced cooling solutions, which can add to system-level costs .
- **Compatibility:** Ensure modules are compatible with existing switch ASICs and interconnect protocols (PCIe Gen5/Gen6, CXL 1.1–3.1) to avoid additional integration costs .
- **Future-Proofing:** Investing in scalable CPO solutions may reduce long-term costs as data center bandwidth demands increase. In summary, while exact 1G CPO prices are not publicly disclosed, understanding the integration method, data rate, component costs, and supplier ecosystem provides a realistic framework for budgeting and procurement planning in data center interconnects.

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