



**Adam Tas Corridor Energy**

# **CPU optical module**





## Overview

---

Intel recently developed an optical chip interconnect system and demonstrated its first fully integrated optical I/O (OCI) chiplet. This chiplet addresses one of the biggest challenges facing computer architects in the age of AI: the energy and latency cost of traditional electrical. LPO (Linear-drive Pluggable Optics), NPO (Near Package Optics), and CPO (Co-Packaged Optics) architectures are becoming core areas of industry focus. Although co-packaged optics (CPO) and on-board optics (OBO) have been proposed to increase bandwidth density, these approaches introduce significant challenges in field serviceability, scalability, and manufacturability, making them difficult to deploy widely in hyperscale environments. Intel says its new silicon photonics DWDM optical chiplet uses only 5 pJ/bit versus 15 pJ/bit for pluggable modules. Although Intel sold its Silicon Photonics pluggable business to Jabil, the company still has a SiPho team that is showing off its new optical interconnect chiplet.



## CPU optical module

---



### Intel CPU with Optical Compute Interconnect Chiplet

Intel showed off a pretty cool piece of technology integrating an optical I/O chiplet with a CPU. The first iteration of the design is a fully integrated

### Electronic Chip Package and Co-Packaged Optics

Meanwhile, the optical module, enabled by silicon photonics, is now treated similarly to electronic chips, and advanced co-packaged optics (CPO) is



### The Rise of Co-Packaged Optics

In this scenario, Co-Packaged Optics (CPO) is now gaining momentum, emerging mainly as an alternative to the pluggable optical modules

### Intel Demonstrates Optical I/O Chiplet With an Intel CPU

Home > Computing Intel Demonstrates Optical I/O Chiplet With an Intel CPU Onboard The move



to optical fiber over copper can increase



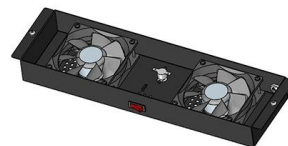
### Optical Interconnect Technology Analysis: LPO, NPO, CPO

NPO, or Near-Packaged Optics, is a highly integrated optical interconnect solution that falls between traditional pluggable optical modules and



### XPO: Redefining Pluggable Optics for AI Networking

To address these challenges, Arista Networks, together with an ecosystem of more than 45 industry partners, introduces eXtra-dense Pluggable Optics (XPO) . XPO represents a new class of optical



### Integrated Photonics , Transitioning to End-to-End

Integrated Photonics , Transitioning to End-to-End Optical I/O Since 2004, Intel Labs has pioneered silicon photonics research from architecture design to





## Co-Packaged Optics -- a deep dive , APNIC Blog

The optical engine of a transceiver -- whether co-packaged or part of a pluggable module -- typically includes an electronic integrated circuit (EIC) and



## What is Co-Packaged Optics (CPO) Technology? , Corning

Co-Packaged Optics (CPO) is a technology and design approach where optical components, such as lasers and photodetectors, are integrated alongside

## Intel launches optical compute interconnect chiplet:

The optical compute interconnect (OCI) chiplet can be attached to CPUs and GPUs to enable high bandwidth, low power consumption, and



## Intel unveils high-speed optical I/O chiplet

A fully integrated optical compute interconnect (OCI) chiplet from Intel delivers up to 4 Tbps of bidirectional data transfer. The company's Integrated





## Intel Photonics

CPU to CPU Optical Communication First demonstration of CPU-to-CPU communication over co-packaged OCI and fiber CPU1 injects 32Gb/s/lane PRBS31 data, CPU2 receives and detects errors



## Intel's OCI-Compatible Chiplet Provides 64 Optical

Intel paired one of its CPUs with an optical compute interconnect (OCI) chiplet.

## Lightmatter Announces Passage L200, the Fastest Co

Lightmatter Announces Passage L200, the Fastest Co-Packaged Optics for AI Revolutionary 3D photonic interconnect solution eliminates



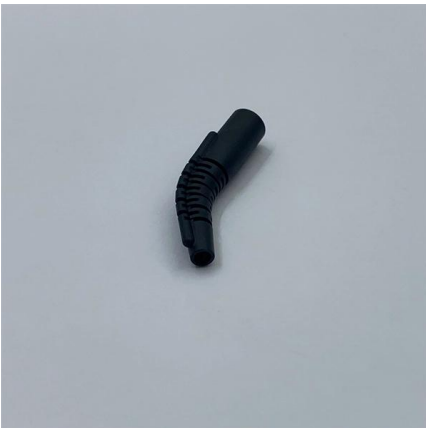
## Intel Photonics

We refer to this approach as Co-Packaged Optics (CPO) when applied to networking applications and Optical Compute Interconnect (OCI) when applied to compute fabrics



### **S7-400 sync modules and fiber-optic sync cables**

Two modules (sync modules) are to be inserted in each CPU for the fiber-optic connection. Sync modules are available for a range of CPU models and cable lengths. The sync



### **Marvell Announces Breakthrough Co-Packaged Optics**

XPU's with integrated Co-Packaged Optics (CPO) enhance AI server performance by increasing XPU density from tens within a rack to hundreds

### **Intel Demonstrates First Fully Integrated Optical IO Chiplet**

Intel Corporation has achieved a revolutionary milestone in integrated photonics technology for high-speed data transmission. At the Optical Fiber





## Optical Interconnect Technology Analysis: LPO, NPO, CPO

Exploring optical interconnects for AI data centers: LPO for low-power, short-distance links, NPO for high-density, near-package connections,

### Intel shows OCI optical I/O chiplet co-packaged with

Explosive AI infrastructure growth is bringing high bandwidth density and low power performance requirements to compute architectures which optical



### Intel unveils high-speed optical I/O chiplet

The OCI chiplet combines a silicon photonics IC, which includes on-chip lasers and optical amplifiers, with an electrical IC. While the chiplet



### Speeding AI Compute, Intel Debuts First Integrated

Intel recently developed an optical chip interconnect system and demonstrated its first fully integrated optical I/O (OCI) chiplet. This chiplet

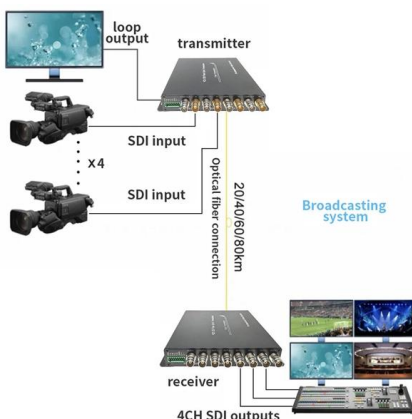


### XPO: Redefining Pluggable Optics for AI Networking

The Arista XPO (eXtra-dense Pluggable Optics) module is a purpose-built solution designed from the ground up to address the unique challenges of hyperscale AI data centers.

### Intel Demonstrates First Fully Integrated Optical I/O Chiplet

Intel Corporation's Integrated Photonics Solutions (IPS) Group has demonstrated the industry's first fully integrated bidirectional optical compute



### Silicon Photonics in Pluggable Optics White Paper

Example of a silicon photonics based 100-Gbps optical module Benefits of silicon photonics Manufacturing efficiency and automation Reduction



## Contact Us

---

For datasheets, pricing, or custom telecom energy solutions, please visit:  
<https://www.koskolong.co.za>