Lightmatter Announces Passage L200, the Fastest Co-Packaged Optics for AI

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Revolutionary 3D photonic interconnect solution eliminates bandwidth bottlenecks

Mountain View, CA – March 31, 2025 – Lightmatter, the leader in photonic (super)computing, today announced Passage™ L200, the world's first 3D co-packaged optics (CPO) product. Designed to integrate with the latest XPU and switch silicon designs, Passage L200 unleashes unprecedented AI performance scaling by eliminating interconnect bandwidth bottlenecks. The L200 3D CPO family includes both 32 Tbps and 64 Tbps versions, representing a 5 to 10x improvement over existing solutions. This enables over 200 Tbps of total I/O bandwidth per chip package, resulting in up to 8X faster training time for advanced AI models.

Bandwidth scaling has significantly trailed gains in compute performance. Continued advances in AI compute require fundamental changes in interconnect technology. Current connectivity solutions, including electrical, optical and conventional CPO, are bandwidth limited because their I/O interfaces are restricted to the "shoreline," or edge of the chip. Passage L200 overcomes these constraints with the world's first edgeless I/O, scaling bandwidth across the entire die area. This modular 3D CPO solution leverages a standard interoperable UCIe die-to-die (D2D) interface, and facilitates scalable chiplet-based architectures to seamlessly integrate with next generation XPUs and switches.

The Passage L200 3D CPO integrates the latest of Alphawave Semi's chiplet technology portfolio, combining silicon-proven low power and low latency UCIe and optics-ready SerDes with Lightmatter's category-defining photonic integrated circuit (PIC). Alphawave Semi's advanced-node electrical integrated circuit (EIC) is 3D integrated on the Passage PIC using standard chip-on-wafer (CoW) techniques. Passage 3D integration enables SerDes I/O to be positioned anywhere on the die, rather than being confined to its shoreline, delivering the equivalent bandwidth of 40 pluggable optical transceivers per L200. Additionally, multiple L200s can be integrated in a package to serve a broad range of XPU and switch applications.

"Bandwidth scaling has become the critical impediment to AI advancement," said Nick Harris, founder and CEO of Lightmatter. "The engineering breakthroughs represented by our L200 family of 3D CPO solutions provide the fundamental building blocks that will pave the way for next-gen AI processors and switches."

"We are thrilled to collaborate with Lightmatter on the delivery of the L200," said Tony Pialis, president and Chief Executive Officer of Alphawave Semi. "Our extensive portfolio, featuring proven chiplets, optical DSPs, and connectivity silicon subsystems, synergizes with Lightmatter's 3D photonics to create a dynamic solution that propels the next generation of AI infrastructure forward."

"AI data center interconnects face growing bandwidth and power challenges," said Andrew Schmitt, founder and directing analyst at Cignal AI. "Co-Packaged Optics (CPO) – integrating optics directly onto XPUs and switches – is the inevitable solution. Lightmatter's bold approach delivers the essential elements of CPO and gives hyperscalers and chip manufacturers a path to deliver high-performance systems."

The L200 is engineered for high-volume manufacturing with industry leading silicon photonics fab and OSAT partners including Global Foundries, ASE, and Amkor as well as advanced node CMOS foundries. Built with advanced redundancy and resiliency, the L200 is powered by Lightmatter's Guide light engine, delivering exceptional laser integration and total optical power per module to support the full bandwidth of L200.

Lightmatter offers two product SKUs: the L200 (32Tbps) and L200X (64Tbps) 3D CPO engines. These solutions build upon the company's proven Passage technology platform, offering 16 WDM wavelengths per waveguide/fiber with the most advanced and fully integrated photonics control capabilities.

Key features of the L200 and L200X include:

- Advanced node CMOS EIC
    - 32Gbps UCIe D2D interface (IP offered royalty-free by Alphawave Semi for accompanying XPU/Switch die)
    - 320 Optically-optimized multi-rate/multi-protocol SerDes

- Passage PIC
    - L200: 56 Gbps NRZ, 32 Tbps total (Tx+Rx)
    - L200X: 106/112 Gbps PAM4, 64 Tbps total (Tx+Rx)
    - 16 wavelength WDM per waveguide/fiber for 800Gbps/1.6Tbps per fiber
    - Pluggable fiber connectors for lasers and data

Available in 2026, Lightmatter's L200 and L200X 3D CPO chips are designed to accelerate time to market and performance of next generation XPUs and switches for the next wave of foundation AI models.

Lightmatter will showcase its latest innovations in its booth (#5145) at the [Optical Fiber Conference](#) in San Francisco, from April 1-3, 2025.

For more information, please visit https://lightmatter.co/

About Lightmatter

Lightmatter is leading a revolution in AI data center infrastructure, enabling the next giant leaps in human progress. The company's groundbreaking [Passage](#)™ platform—the world's first 3D-stacked silicon photonics engine—connects thousands to millions of processors at the speed of light. Designed to eliminate critical data bottlenecks, Lightmatter's technology enables unparalleled efficiency and scalability for the most advanced AI and high-performance computing workloads, pushing the boundaries of AI infrastructure.

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