Lightmatter Joins Open CPX MSA, Introduces the Industry's First Bidirectional CPX Optical Engine

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By combining transmit and receive on a single fiber, Passage® L20 CPX halves the optical cabling in AI scale-up networks

MOUNTAIN VIEW, Calif. – September 17, 2026 – Lightmatter, the leader in photonic (super)computing, today announced that it has joined the Open CPX Multi-Source Agreement (MSA) and introduced the Passage L20 CPX, the industry's first Open CPX module for AI infrastructure with bidirectional (BiDi) optical link technology. The solution is powered by the Passage L20 optical engine, Lightmatter's near-package optics (NPO) platform, announced in March, delivering 6.4 terabits per second (Tbps) in a single socketed module while halving the fiber and connectors needed to support it.

Fiber is becoming a hard limit on how fast AI clusters can be built. A conventional link transmits on one fiber and receives on a second. BiDi technology combines transmit and receive on a single fiber by assigning each direction its own wavelength of light. In a 512-GPU scale-up pod, Lightmatter's analysis in a recent tech brief shows that customers will save more than 200 miles of fiber, taking the pod from about 130,000 fibers to 65,000, with approximately 16,000 fewer connectors. Fewer connectors and cables mean fewer potential failure points. The reduction saves about 15 percent of total scale-up interconnect network cost, speeds deployment and simplifies fiber plant maintenance and long-term operational cost.

"AI infrastructure is scaling faster than copper can follow, and co-packaged optics is the answer. CPX is the on-ramp. It gets the optics, the fiber, and the supply chain into production now, so that when CPO arrives, the hard parts are already proven. That's why we joined the Open CPX MSA," said Nick Harris, Ph.D., Founder and CEO of Lightmatter. "Passage L20 CPX is bidirectional and enables transmit and receive over a single fiber, which halves fiber requirements. At cluster scale that means faster bring-up, fewer failures, and less time chasing broken links."

"As AI clusters scale up, the constraints are shifting from compute to the physical infrastructure around it, including power, cabling, and the time it takes to bring a pod online," said Sameh Boujelbene, Vice President at Dell'Oro Group. "Standardization efforts like the Open CPX MSA are critical to commercializing optics close to the package across a broad multi-vendor ecosystem. A bidirectional architecture that halves fiber count without giving up bandwidth addresses a cost and complexity problem that operators feel immediately."

The Open CPX MSA defines a standardized CPO/NPO module form factor for high-bandwidth, low-latency I/O placed directly adjacent to the host ASIC, switch, or GPU. Modules mount to the PCB or substrate, so the form factor adapts to different XPU and switch board designs. Bandwidth density in a pluggable system is capped by faceplate area. Placing the NPO near the XPU removes this cap, increasing bandwidth density while reducing cost and power as compared to conventional pluggable transceivers.

Built on the Passage L-Series optical engine platform, the Passage L20 CPX is designed to deliver 12.8 Tbps of total bandwidth (6.4 Tbps transmit and 6.4 Tbps receive) and 32 optical lanes per direction at a 212.5 Gbps PAM4 line rate. It uses the Type 2 single RF+MP pin field defined by the MSA, reaches beyond 500 meters over single-mode fiber, follows the IEEE 802.3dj DR link architecture, and uses the OIF-CMIS management protocols. The module supports O-band wavelengths 1331 nm and 1311 nm and can pair with Lightmatter's Guide® DR laser module, or other compatible external laser sources. The Passage L20 is also available in an XPO form factor.

Passage L20 CPX module evaluation kits are anticipated to ship to customers in the first quarter of 2027.

Specifications in this release are preliminary and subject to change. Performance and cost figures are based on internal testing or modeling under specific conditions, and actual results may vary by configuration and deployment.

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, and Guide®, the industry's first VLSP™ light engine, connect thousands to millions of processors. Designed to eliminate critical data bottlenecks, Lightmatter's technology delivers unprecedented bandwidth density and energy efficiency for the most advanced AI and high-performance computing workloads, fundamentally redefining the architecture of next-generation AI infrastructure. Visit www.lightmatter.co to learn more.

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