Lightmatter Collaborates with Synopsys to Integrate Advanced Interface IP with Its Passage Co-Packaged Optics Platform

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Integrated solutions maximize power, reliability, and power efficiency for hyperscale AI infrastructure

MOUNTAIN VIEW, Calif.–(BUSINESS WIRE)–Lightmatter, the leader in photonic (super) computing, today announced a strategic collaboration with Synopsys, the leader in engineering solutions from silicon to systems, to integrate Synopsys 224G SerDes and UCIe IP for 3nm process into the Lightmatter's Passage™ 3D Co-Packaged Optics (CPO) platform. Through this collaboration, Lightmatter is developing a robust, low-latency CPO platform designed to scale to next-generation AI infrastructure, optimizing the electrical-to-optical interface and ensuring seamless, high-bandwidth connectivity between advanced AI accelerators and Lightmatter's 3D photonic engine.

"As AI models grow in size and complexity, the efficiency of the electrical interface to the optical engine becomes a critical design factor," said Ritesh Jain, SVP of Engineering & Operations at Lightmatter. "Integrating Synopsys' advanced and silicon-proven 224G SerDes and UCIe IP into our Passage platform allows us to provide a comprehensive, high-performance, high-volume manufacturing (HVM)-ready solution. This collaboration will help facilitate Passage CPO integration into our customers' XPU and switch designs to achieve maximum performance, reliability, and power efficiency."

Key benefits of the collaboration include:

- **Enhanced Bandwidth and Energy Efficiency:** Optimized 224G SerDes and UCIe IP maximize bandwidth and minimize latency while complementing the inherent energy-saving benefits of Lightmatter's 3D architecture.
- **Reduced Design Risk:** Pre-verified IP and proven design flows minimize complexity and uncertainty, helping customers confidently deliver high-performance AI silicon on schedule.
- **Accelerated Time-to-Market:** By leveraging Synopsys' AI-powered electronic design automation (EDA) and systems design tools – including 3DIC Compiler, the Lumerical product suite, and OptoCompiler – Lightmatter can speed the co-design of electrical and photonic components.

"As AI and high-performance computing systems scale in complexity and performance, electrical interfaces to advanced photonic and accelerator engines become a critical design enabler," said Neeraj Paliwal, senior vice president of IP product management at Synopsys. "By integrating our silicon-proven 224G SerDes and UCIe IP into Lightmatter's Passage 3D Co-Packaged Optics platform, we're delivering a high-bandwidth, low-latency, and energy-efficient solution ready for scale up and out connectivity. This collaboration bridges silicon-centric systems and emerging 3D photonic architectures, while reinforcing Synopsys' commitment to advancing the photonic IC design ecosystem with industry-leading tools and flows."

Analyst Perspective on Market Impact

“The integration of industry-leading high-speed SerDes IP optimized for advanced 3D photonic interconnects is a vital step in the maturation of the CPO ecosystem,” said Alan Weckel, Founder and Technology Analyst at 650 Group. “This collaboration between Synopsys and Lightmatter addresses the critical path to market for CPO-enabled next-generation AI silicon, providing hyperscalers with a validated, high-performance roadmap to scale AI clusters beyond the limits of shoreline-bound interconnect alternatives.”

About Lightmatter

Lightmatter is leading the 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 XPUs. 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.

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