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Marvell Announces Industry's First 5nm Transmit-Only 800G PAM4 Optical DSP for AI and Cloud Interconnects

- *Spica Gen2-T adds to the Marvell industry-leading portfolio of 800 Gbps DSPs, the most widely deployed optical DSPs in cloud data centers and AI clusters.*
- *Based on Spica Gen2, Spica Gen2-T enables the development of a new class of energy efficient modules to further optimize AI and cloud infrastructure.*

SANTA CLARA, Calif., March 25, 2024 /PRNewswire/ -- [Marvell Technology, Inc.](https://www.marvell.com) (NASDAQ: MRVL), a leader in data infrastructure semiconductor solutions, today announced Spica Gen2-T, the industry's first 5nm 800 Gbps transmit-only PAM4 optical DSP. Designed for transmit retimed optical modules (TRO modules), Spica Gen2-T can reduce the power consumption of 800 Gbps optical modules by more than 40%¹ while maintaining interoperability with conventional optical modules and IEEE 802.3 compliant host devices.

Escalating cloud and AI compute demands are driving service providers to expand the breadth and capacity of their optical interconnect networks and adopt higher-bandwidth optical modules so they can connect a growing number of accelerators into a single logical compute node. With some AI clusters requiring tens of thousands of connections, higher optical interconnect efficiency is critical.

To enable cloud service providers to optimize their infrastructure, Marvell has reduced power per bit and cost per bit with every generation of optical DSPs. Additionally, Marvell develops DSPs fine-tuned for specific operating characteristics, emerging use cases and/or new classes of modules such as TRO to serve the broadening spectrum of link types and use cases, compatible with existing industry standards to ensure full interoperability.

TRO modules use transmit-only DSPs to digitize, process, equalize, and amplify data from host devices, performing electrical-to-optical conversion on the egress path; and use TIAs only to perform the optical-to-electrical conversion on the ingress path. TROs with transmit-only DSPs can reduce power consumption yet maintain the auto adaptation and compensation capability to minimize part-to-part, system-to-system variation when deployed in scale, which has become critical for large AI system deployment.

"Industrywide shipments of PAM4 optical DSPs are expected to more than triple by 2029 due to the urgent demand for bandwidth. At the same time, the growing pervasiveness and importance of optical technology in data center architectures will put a premium on efficient solutions," said Vlad Kozlov, CEO and founder of LightCounting. "With transmit-only DSPs, Marvell is continuing its efforts to expand the boundaries for what can be accomplished with PAM4 technology."

Spica Gen2-T is the latest member of the Marvell family of 800 Gbps optical DSPs, the most widely deployed optical DSP in cloud data centers and AI clusters². The 800 Gbps portfolio

also includes Spica, the world's first 800 Gbps PAM4 for pluggable modules; Spica Gen2, a 5nm bidirectional optical DSP for 500m -10km connections; and Perseus, a 5nm optical DSP featuring integrated TIAs and drivers. Spica, Spica Gen2, Spica Gen2-T, and Perseus are all based on the [Marvell industry-leading PAM4 optical DSP architecture](#). By developing a portfolio of products optimized for different use cases from a core set of technologies, Marvell provides hyperscale cloud providers and others with the necessary ingredients for lowering costs, improving utilization, and optimizing their accelerated infrastructure.

Notable features of Spica Gen2-T include:

- Enables <8W 800G transmit retimed optical (TRO) module
- Supports 1x800G, 2x400G, 8x100G connectivity
- Supports independent lane operation
- IEEE, MSA and CMIS compliant DSP that supports all 200G/400G/800G applications
- Low-power transmit path-only DSP with integrated laser drivers for a wide range of optics
- Advanced diagnostic feature for link monitoring

"Millions of 800G modules based on Marvell's Spica product family have been deployed globally to meet the surging demand for AI. As a result, the underlying systems and networks supporting these applications are evolving rapidly," said Xi Wang, Ph.D., vice president of product marketing for Optical Connectivity at Marvell. "Spica Gen2-T underscores our commitment to improve the performance, efficiency, and reliability of accelerated infrastructure and give our customers technology for optimizing infrastructure to suit their unique needs."

Availability

Spica Gen2-T is sampling now to select customers.

About Marvell

To deliver the data infrastructure technology that connects the world, we're building solutions on the most powerful foundation: our partnerships with our customers. Trusted by the world's leading technology companies for over 25 years, we move, store, process and secure the world's data with semiconductor solutions designed for our customers' current needs and future ambitions. Through a process of deep collaboration and transparency, we're ultimately changing the way tomorrow's enterprise, cloud, automotive, and carrier architectures transform—for the better.

1. Marvell estimates based on internal testing.
2. Marvell estimates based on company and analyst report data.

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