June 27, 2024

Marvell Extends Connectivity Leadership With Industry's First 1.6T PAM4 DSP for Active Electrical Cables

- *New Alaska® A 1.6T PAM4 DSP for copper interconnects is built on Marvell industry-leading 5nm PAM4 technology.*
- *Addresses the growing need for 200G/lane I/O to handle AI accelerator and GPU bandwidth demands.*
- *Enables 1.6T short-reach copper connectivity within accelerated compute racks.*

SANTA CLARA, Calif., June 27, 2024 /PRNewswire/ -- Marvell Technology, Inc. (NASDAQ: MRVL), a leader in data infrastructure semiconductor solutions, today introduced the Marvell® Alaska® A 1.6T PAM4 DSP for active electrical cables (AECs), the industry's first 1.6 Tbps AEC DSP to address emerging 200G/lane-based accelerated infrastructure architectures. Artificial intelligence (AI) and machine learning (ML) applications are driving greater connectivity bandwidth requirements between AI accelerators, server to top-of-rack links and switch-to-switch interconnects within data center racks. The latest addition to the Alaska A family is built on 5nm process and leverages industry-leading Marvell PAM4 DSP technology to enable short-reach copper interconnect solutions that meet the growing bandwidth requirements of accelerated infrastructure.

According to 650 Group, the AEC silicon market is expected to grow at 64% per year to reach $1 billion by 2028 with DSPs powering AECs to reach nearly 40 million units per year[1]. "AI is driving the need for short-reach copper connectivity at 1.6T," said Alan Weckel, 650 co-founder. "Marvell leadership is clear with the introduction of its Alaska 1.6T AEC DSP, which continues the company's history of delivering best-in-class PAM DSPs that enable cable vendors to offer interconnect solutions optimized for the different cloud AI architectures."

Copper PAM4 DSP Technology for Accelerated Infrastructure
The short-reach copper connections between AI accelerators, server to top-of-rack links and switch-to-switch interconnects within a rack have traditionally been addressed by direct attached cable (DAC). As speeds increase to 200G/lane, the distance over which passive DACs can be used declines significantly. AECs use PAM4 DSPs to retime the signal to extend the reach of copper interconnects and enable thinner cables within high-density data center racks.

AECs are increasingly being used in a wide variety of applications, including as part of the AI server compute fabric. Historically, most AI server designs used copper trace connections on printed circuit boards to connect accelerators to one another. Now, to address larger AI workloads, an increasing number of accelerators per AI server are needed, resulting in the distribution of accelerators across multiple boards within the rack that are connected using

copper cables. As the speed of the accelerator-to-accelerator interconnects transitions to 200G/lane signaling, AECs will play a crucial role in enabling this connectivity.

The new Alaska A device leverages over a decade of Marvell PAM4 leadership. The Alaska A 1.6T DSP features eight 200 Gbps SerDes lanes to the host device and eight 200 Gbps SerDes lanes to the copper cable. The industry-leading equalization engine built into the Alaska A 1.6T DSP enables cable reaches of greater than three meters, addressing the reach requirements for inside-the-rack copper connections. The Alaska A 1.6T DSP is designed for next-generation accelerated infrastructure with 200 Gbps I/O interfaces on AI accelerators, GPUs, NICs and switches.

Key features of the Alaska A 1.6T AEC DSP include:

- Proven DSP-based 200G PAM4 SerDes
- Advanced digital equalizer with Feed Forward (FFE), Decision Feedback (DFE) and Maximum Likelihood Sequence Detection (MLSD)
- Greater than 3-meter reach at 200G/lane
- 200 Gbps per lane electrical line-side interface
- Optimized for QSFP-DD and OSFP form factors
- Retiming and gearboxing support
- Cable reference design for 1.6T AECs
- SDK support for advanced telemetry and diagnostics

"The next wave of AI clusters will need 200 Gbps signaling to handle the bandwidth requirements of generative AI and large language models," said Venu Balasubramonian, vice president of product marketing, Connectivity Business Unit, at Marvell. "The newest addition to our Alaska A product line extends our leadership in delivering PAM4 DSP technology for short-reach copper connectivity for cloud AI clusters."

Industry-Leading Cable Manufacturer Support
"Our portfolio of interconnect solutions is designed to meet critical performance, efficiency and reliability requirements for next-generation infrastructure architectures. With the Marvell Alaska A 1.6T PAM4 AEC DSP we can offer an advanced AEC copper interconnect solution for 200G/lane connectivity that brings price-performance and power consumption advantages for high-density AI clusters and data-center infrastructure," said Brian Kirk, group CTO, High Speed Products, at Amphenol Communications Solutions.

"Molex's AEC portfolio offers a complete solution for our customers' cloud interconnect architectures. As speeds continue to rise driven by AI and ML, copper cable reach becomes very challenging for next-generation AI platforms. The Marvell Alaska A 1.6T AEC DSP enables us to deliver AEC solutions to meet the copper cable reach requirements at 200G/lane," said Jairo Guerrero, vice president and general manager, Copper Solutions, at Molex.

"200G/lane will be the speed of choice for next generation AI data centers, with copper cables playing a critical role for short reach intra-rack connectivity. The combination of the Marvell Alaska A 1.6T PAM4 AEC DSP with TE's advanced cabling solutions will deliver the bandwidth needed for next-generation, intra-rack AI copper interconnects," said Vishwas Rao, vice president of product management at TE Connectivity.

Availability

Leading cable partners will sample Alaska A 1.6T PAM4 DSP-based active electrical cables in August.

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.

Footnote 1: 650 Group: AEC Quarterly Market and Long-Term Forecast Report, June 2024.

Marvell and the M logo are trademarks of Marvell or its affiliates. Please visit www.marvell.com for a complete list of Marvell trademarks. Other names and brands may be claimed as the property of others.

This press release contains forward-looking statements within the meaning of the federal securities laws that involve risks and uncertainties. Forward-looking statements include, without limitation, any statement that may predict, forecast, indicate or imply future events or achievements. Actual events or results may differ materially from those contemplated in this press release. Forward-looking statements are only predictions and are subject to risks, uncertainties and assumptions that are difficult to predict, including those described in the "Risk Factors" section of our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and other documents filed by us from time to time with the SEC. Forward-looking statements speak only as of the date they are made. Readers are cautioned not to put undue reliance on forward-looking statements, and no person assumes any obligation to update or revise any such forward-looking statements, whether as a result of new information, future events or otherwise.

For further information, contact:
Michael Kanellos
pr@marvell.com



View original content to download multimedia:https://www.prnewswire.com/news-releases/marvell-extends-connectivity-leadership-with-industrys-first-1-6t-pam4-dsp-for-active-electrical-cables-302184240.html

SOURCE Marvell