Aries PCIe® Smart Optical Driver

Portfolio Brief

Astera Labs (NASDAQ: ALAB) provides rack-scale AI infrastructure through purpose-built connectivity solutions. By collaborating with hyperscalers and ecosystem partners, Astera Labs enables organizations to unlock the full potential of modern AI. Astera Labs' Intelligent Connectivity Platform integrates CXL®, Ethernet, NVLink Fusion, PCIe®, and UALink™ semiconductor-based technologies with the company's COSMOS software suite to unify diverse components into cohesive, flexible systems that deliver end-to-end scale-up, and scale-out connectivity. The company's custom connectivity solutions business complements its standards-based portfolio, enabling customers to deploy tailored architectures to meet their unique infrastructure requirements. Discover more at **www.asteralabs.com**

Benefits and Features

- Up to 128 Gb/s per TX channel
- 8-channel bare-die architecture optimized for high-density LPO and NPO optical engines
- Low-power, low latency, and excellent linearity for PCIe 7 scale-up links
- Analog transmit circuitry with configurable CTLE, gain, and amplitude
- Digital channel monitoring for link-health visibility and optimization
- Designed for resilient optical connectivity beyond 50 meters across multi-rack AI systems

Applications

- Near-packaged optics for high-radix AI switches and GPUs
- Pluggable optics for multi-rack GPU connectivity
- Disaggregated PCIe 7 scale-up architectures
- Optical engines for switches, GPUs, XPUs, and other AI accelerators

Description

The Aries Smart Optical Driver is a high-density, low-power solution for PCIe 7 optical connectivity in next-generation AI scale-up systems. When integrated with high-speed optical modulators, it converts high-speed electrical data into a precisely controlled optical signal for transmission across extended-reach AI scale-up links. Its high-channel-count bare-die architecture enables integration into high-density LPO and NPO, that are needed for high-radix switch or accelerator implementations.

Digital channel monitoring, combined with configurable CTLE, gain, and output amplitude controls, enables channel tuning to optimize end-to-end link performance across variations in temperature, aging, and operating conditions. Integrated with Astera Labs' COSMOS Link Intelligence, it provides device-level visibility, diagnostics, and intelligent link optimization for reliable deployment and management of optical connectivity at scale.

Product Family Information

Aries Smart Optical Drivers are part of Astera Labs' PCIe 7 optical connectivity portfolio, alongside Smart Optical TIAs, Smart Cable Modules, Retimers, Redrivers, and Gearboxes. The Aries Smart Optical Driver is the transmit-side component of the optical link.

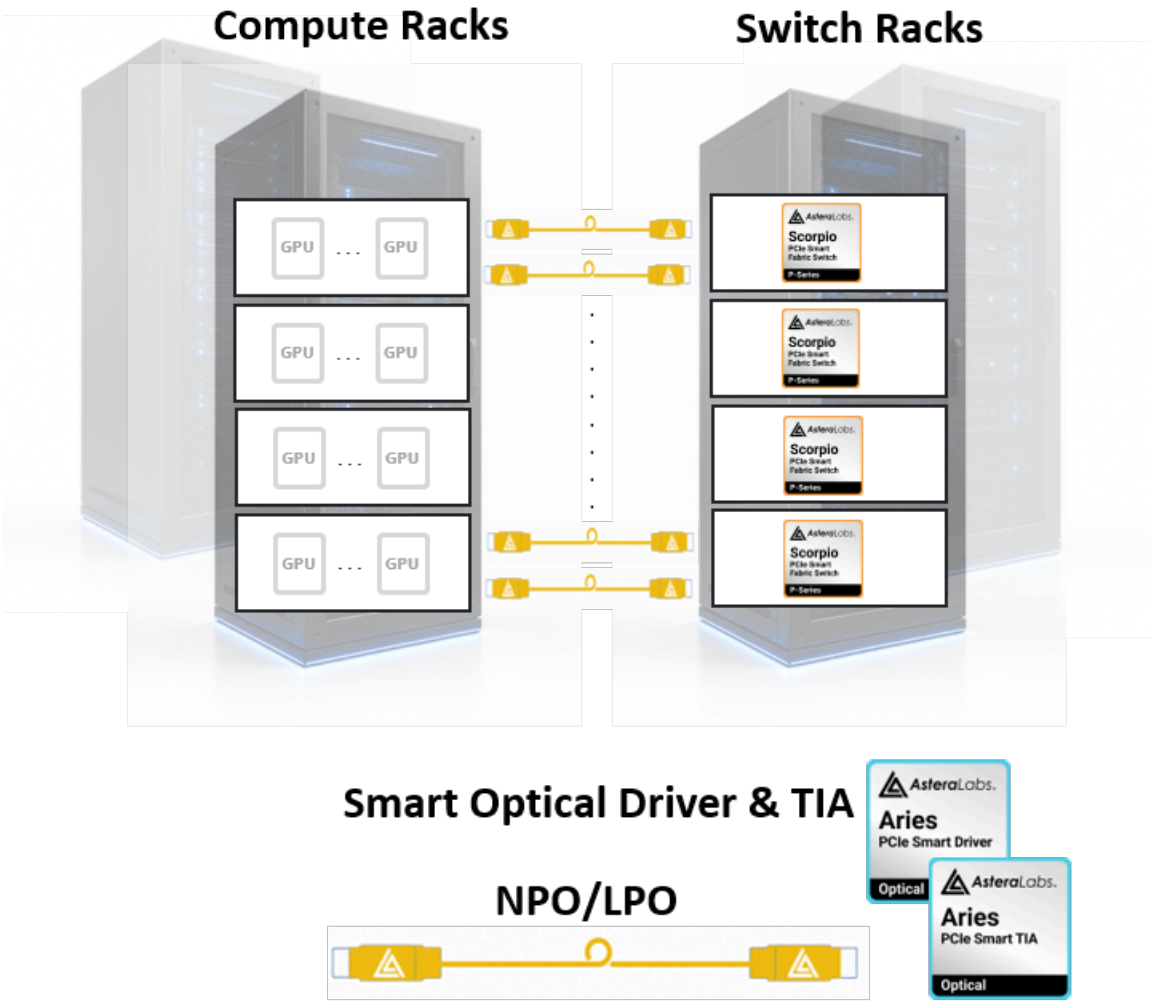
Part #	Max Line Rate	Form Factor	Max Data Rate	Function
PL7080L	128 Gbps PAM4	8-Channel Uni-Directional	1.02T	Smart Optical Driver

Astera Labs, Inc. reserves the right to update this brief without notice. For detailed information on specific products, please refer to the data sheet.

AI Server Platform Applications

The Aries PCIe® Smart Optical Driver portfolio enables high-density, low-power, low-latency connectivity for LPO and NPO in AI server platforms with disaggregated, multi-rack architectures, extended link distances, and increasing bandwidth demands across complex scale-up topologies.

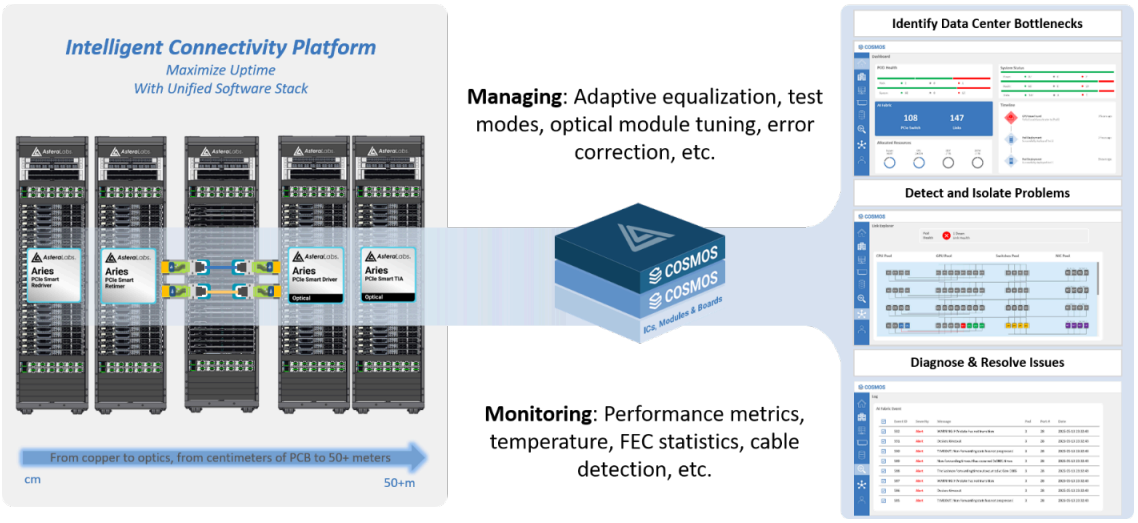
- Multi-rack GPU and accelerator scale-up
- High-radix PCIe fabric switches
- Disaggregated compute and memory architectures
- AI training and inference platforms requiring long-reach, high-density optical connectivity

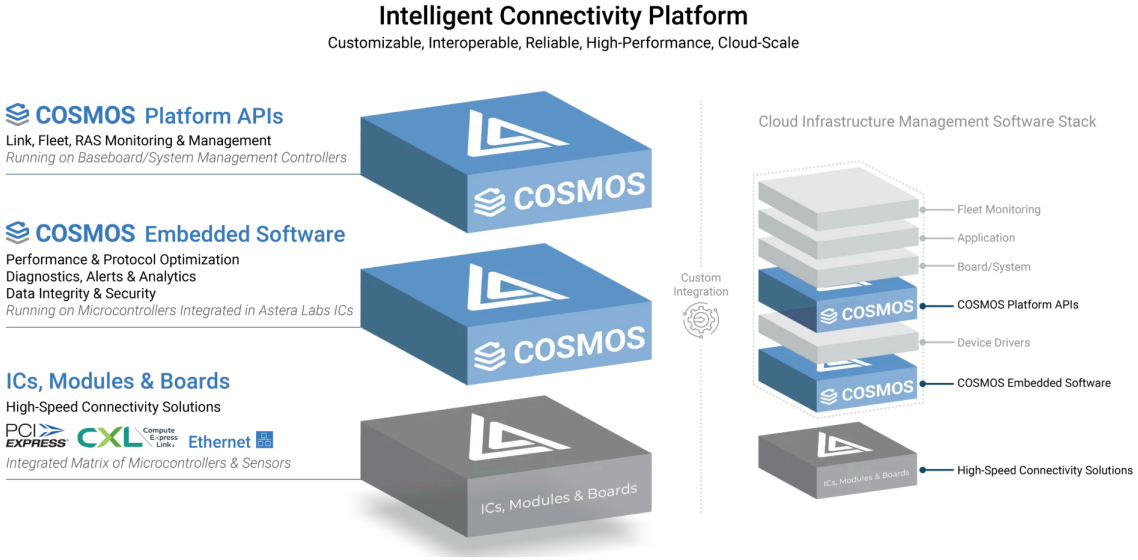


Astera Labs, Inc. reserves the right to update this brief without notice. For detailed information on specific products, please refer to the data sheet.

Astera Labs Intelligent Connectivity Platform

The Aries PCIe® Smart Optical Driver is an integral part of Astera Labs' Intelligent Connectivity Platform and enables device configuration, channel monitoring, diagnostics, and dynamic end-to-end link tuning. In addition to Aries, there are multiple PCIe, CXL and Ethernet ICs, Modules and Boards that are at the foundation of the platform. Astera Labs' COnnectivity System Management and Optimization Software (COSMOS) suite provides extensive Link, Fleet and RAS Management features and diagnostics. Through the combination of software and hardware, the Intelligent Connectivity Platform enables a smart connectivity backbone that is both scalable and customizable for AI and cloud infrastructure.





Astera Labs, Inc. reserves the right to update this brief without notice. For detailed information on specific products, please refer to the data sheet.