

Aries PCIe®/CXL® Smart Cable Modules

Portfolio Brief

Astera Labs is a worldwide leader in purpose-built connectivity solutions for AI and cloud infrastructure. It is at the forefront of software-defined architectures that are both scalable and customizable. With PCIe®, CXL®, and Ethernet-based semiconductor solutions, Astera Labs addresses data, memory, and networking bottlenecks while fostering trusted partnerships with hyperscalers and the broader data center ecosystem.

Benefits and Features

- Purpose-built in multiple form factors for a flexible supply chain
- Supports various copper cable gauges up to 7 meters in length for PCIe 5.0 and up to 6 meters for PCIe 6.x
- Compatible with PCIe 6.x, including backwards compatibility with previous PCIe generations
- 64 GT/s, 32 GT/s, 8 GT/s, 5 GT/s, and 2.5 GT/s data rates with automatic link equalization
- Flexible link bifurcation including 1x16, 2x8, 4x4, 8x2, and others
- Automatic orientation detection for symmetric cable design and operation
- Supports SRIS and SRNS clock topologies
- Supports hot plug and hot un-plug
- Supports lane margining at the Receiver (both timing and voltage) and protocol loopback
- Supports systems with lane reversal and implements automatic polarity correction
- Low-power advanced CMOS process
- Supports L1.0 low-power modes
- Connectivity System Management and Optimization Software (COSMOS) suite for extensive link management, fleet management and RAS features
- Full featured C and Python SDKs for rapid integration of advanced diagnostics features
- Non-disruptive module firmware update capability

Applications

- Server-to-JBOG external PCIe cabling
- JBOG-to-JBOG external PCIe cabling
- Switch-to-JBOG external PCIe cabling

Product Family Information

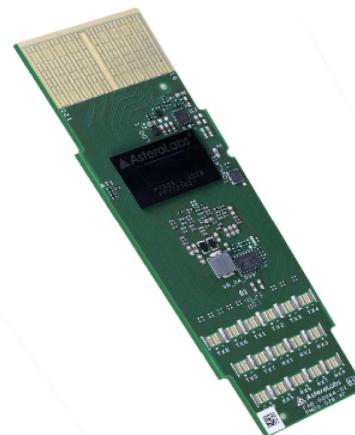
Part #	PCIe Gen	Lanes	Status
PM20-5xx	PCIe 5.0	Various	Production
PM30-6xx	PCIe 6.x	Various	Production

Description

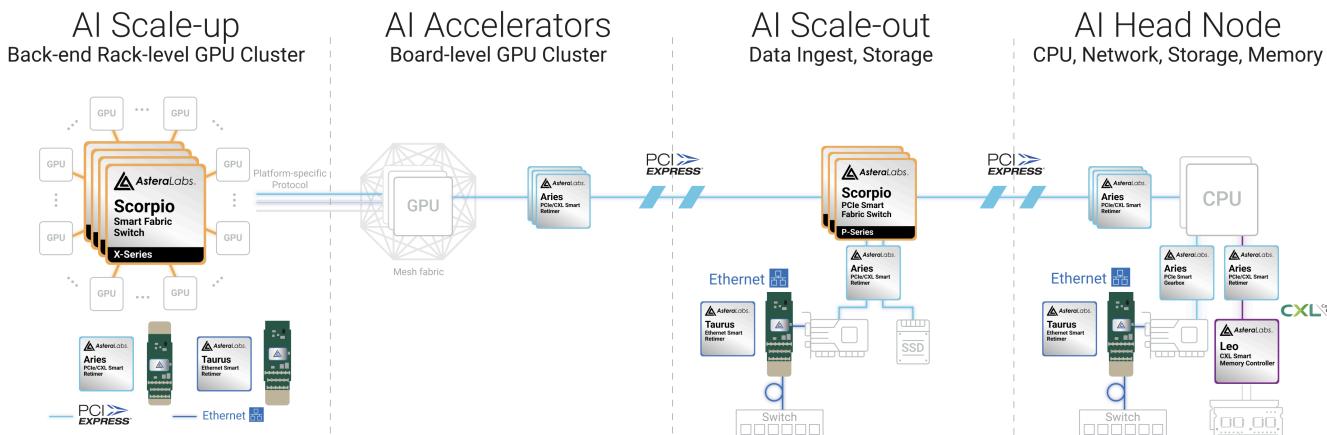
The Aries Smart Cable Module is a highly integrated system consisting of the Aries PCIe/CXL Smart DSP Retimer integrated circuit (IC) and peripheral components assembled on multiple form factors. The paddle card module is designed to be integrated into active electrical cable (AEC) assemblies supporting a variety of applications, such as straight cables and breakout cables.

Rack infrastructure in hyperscale data centers requires cost-effective interconnects which are thin, bendable, and 1-7 meters or more in length. Large AI clusters require interconnecting AI training hardware within and across racks. The Aries Smart Cable Modules make these architectures possible by enabling PCIe 6.x x16 connectivity over thin-gauge copper cables.

Fleet management and diagnostics are just as important as cable reach, cable bulk, and interconnect cost. Astera Labs' COSMOS suite enables system baseboard/system management controllers (BMCs/SMCs) to utilize an array of customizable diagnostics and telemetry features to enable continuous monitoring of critical server-to-JBOG, JBOG-to-JBOG, and Switch-to-JBOG links. Parameters such as eye opening, equalization levels, junction temperature, and more are monitored, and interrupts to the host can be enabled whenever configurable limits are crossed. A full set of self-test features – host-side and line-side loopback, pseudo-random bit sequence (PRBS) generation and checking, etc. – enable rapid troubleshooting to minimize link down time and accelerate fault isolation.



Purpose-Built Connectivity Solutions for AI and Cloud Infrastructure



Astera Labs' Intelligent Connectivity Platform

The Aries PCIe®/CXL® Smart DSP Retimer portfolio is an integral part of Astera Labs' Intelligent Connectivity Platform. In addition to Aries, there are multiple PCIe, CXL and Ethernet ICs, Modules & 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.

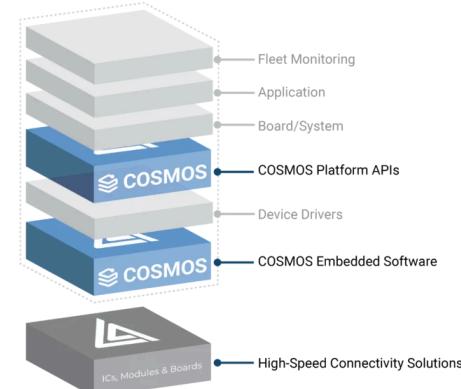
Intelligent Connectivity Platform

Customizable, Interoperable, Reliable, High-Performance, Cloud-Scale

 **COSMOS Platform APIs**
Link, Fleet, RAS Monitoring & Management
Running on Baseboard/System Management Controllers



Cloud Infrastructure Management Software Stack



 **COSMOS Embedded Software**
Performance & Protocol Optimization
Diagnostics, Alerts & Analytics
Data Integrity & Security
Running on Microcontrollers Integrated in Astera Labs ICs



 **ICs, Modules & Boards**
High-Speed Connectivity Solutions
PCI EXPRESS, CXL, Compute Express Link, Ethernet
Integrated Matrix of Microcontrollers & Sensors

