

Scorpio Smart Fabric Switch

Portfolio Brief

Asteralabs 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, Asteralabs addresses data, memory, and networking bottlenecks while fostering trusted partnerships with hyperscalers and the broader data center ecosystem.

Benefits and Features

- Purpose-built portfolio to deploy cloud-scale AI platforms at an accelerated pace
- **P-Series** Fabric Switches architected for mixed traffic head node connectivity using PCI Express® Gen6/5/4/3/2/1 mixing GPUs, NICs, CPUs, Storage in various configurations
- **X-Series** Fabric Switches deliver the highest backend scale-up bandwidth with support for platform-specific customizations to enhance performance in homogeneous GPU-to-GPU clusters
- Line-rate peer-to-peer traffic with non-blocking crossbar and ACS restriction capability
- Host and Downstream Port Containment (DPC) and Advanced Error Reporting (AER)
- Connectivity System Management and Optimization Software (COSMOS) suite with deep telemetry and diagnostics for link and device health monitoring to provide unprecedented data center observability
- Protocol Trace Capture, LTSSM log, RX margining, Loopback, and PRBS Generate/Check
- Lane margining at the Receiver (both timing and voltage) to maximize uptime and utilization
- Easy to deploy with next-gen accelerators and GPUs to improve signal integrity, reduce crosstalk, which improves system reliability

Applications

- **P-Series:** GPU-to-CPU/NIC/Storage PCIe® 6.x & PCIe® 5.x connectivity to support mixed traffic AI head-node interconnects across a diverse ecosystem of PCIe hosts and endpoints with bandwidth matching
- **X-Series:** GPU-to-GPU connectivity with platform-specific optimizations targeted to enhance homogeneous scale-up communications

Description

The Scorpio Smart Fabric Switch Portfolio is designed from the ground up to provide predictable performance per watt for head-node connectivity and scale-out using P-Series and accelerator-to-accelerator scale-up connectivity with platform customization using X-Series.

Scorpio P-Series provides line-rate performance even when mixing PCIe 6.x & PCIe 5.x devices such as CPUs, GPUs, NICs, and Storage. Scorpio X-Series provides line-rate peer-to-peer performance between accelerators with protocol customizations to enhance performance.

Scorpio Smart Fabric Switches are the result of deep collaboration with industry leaders and enables predictable performance, high performance per watt, and easy routing to propel AI Server deployments through differentiated P-Series and X-Series architectures, allowing system integrators to mix current and next generation devices in the same platform, providing for a seamless upgrade path.

Each Port features a detailed LTSSM state logger and protocol trace capture buffer to simplify protocol-level and electrical- level debug. on-die temperature, process monitoring sensors facilitate environmental monitoring and operational management. Full-featured software developer kits (SDKs) facilitate rapid deployment of advanced telemetry and monitoring at large scale, abstracting complex tasks such as electrical parameter monitoring into easy-to-use APIs.

When combined with Aries Smart DSP Retimers, Scorpio Smart Fabric Switches supercharge CoSMoS by adding link-layer visibility providing unprecedented data center observability. By leveraging CoSMoS in both products, data center operators can identify and repair degraded links minimizing downtime and maximizing platform utilization.

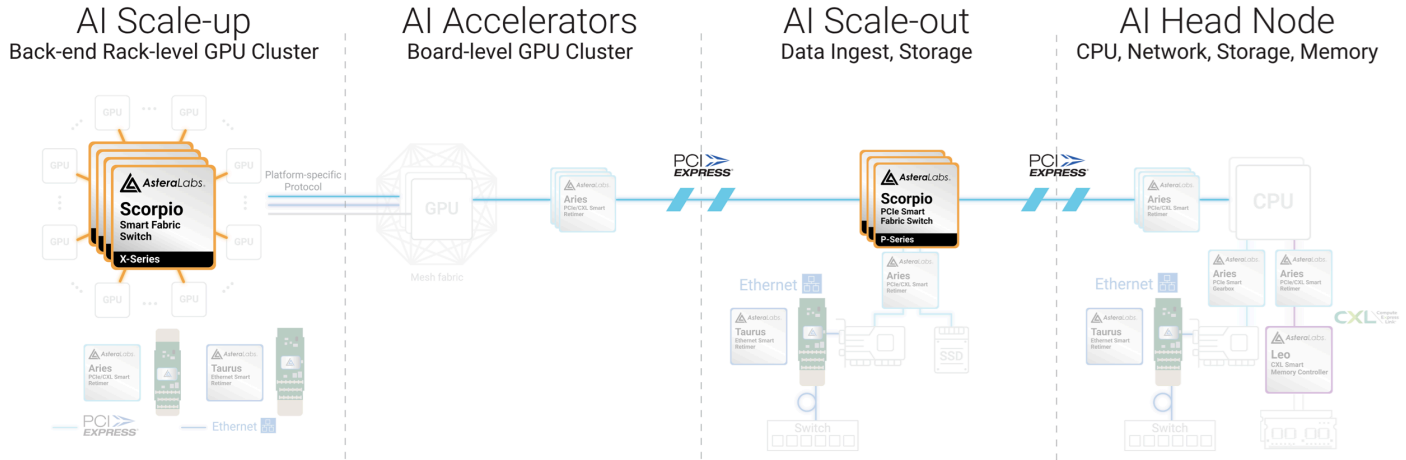
Product Family Information

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Series	Part #	PCIe	Lanes	Package Size [mm]	Status
P-Series	PF60641L	6.x	64	29x29	Pre-Production
	PF50641L	5.x	64	29x29	Pre-Production
	X6064-1M04	Xami MClo-MCio Evaluation Kit			Pre-Production
X-Series	Customer Specific				Contact Us

AI Server Platform Applications

Two application-specific product lines built from the ground up for AI servers and AI clusters: P-Series for mixed traffic AI head- node connectivity and X-Series to deliver the highest back-end bandwidth for AI scale-up.



Astera Labs' Intelligent Connectivity Platform

The rapid growth in AI and the accelerated pace of AI platform design cycles is driving the need for exponential compute at cloud-scale, and purpose-built connectivity solutions are required to unlock the full potential of AI and cloud infrastructure.

Driven by the growth of AI workloads at scale, Astera Labs devised the innovative concept of the Intelligent Connectivity Platform, allowing holistic design with monitoring and tracking capabilities for long-term health and performance of connectivity infrastructure. The Scorpio Smart Fabric Switch Portfolio adds to an already long list of ICs, Modules, and Boards that support the unified COSMOS connectivity infrastructure.

Intelligent Connectivity Platform

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

COSMOS Platform APIs

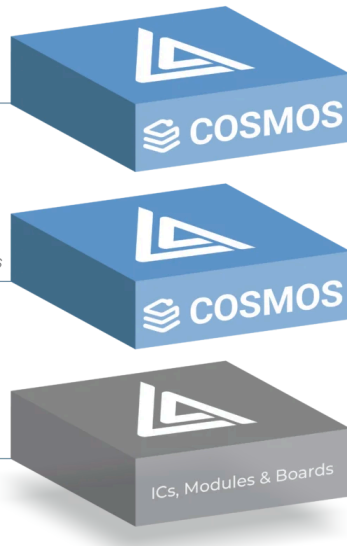
Link, Fleet, RAS Monitoring & Management
Running on Baseboard/System Management Controllers

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



Cloud Infrastructure Management Software Stack

