Aries PCI Express® / CXL® Smart Cable Modules

1   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
- Compatible with PCIe 5.0, Including Backwards Compatibility with Previous PCIe Generations
- 32 GT/s, 16 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

2   Applications

- Server-to-JBOG External PCIe Cabling
- JBOG-to-JBOG External PCIe Cabling
- Switch-to-JBOG External PCIe Cabling

Product Family Information

PCIe Version	Lane Count	Part Number
PCIe 5.0 32 GT/s	Various	PM20-5xx

3   Description

The Aries Smart Cable Module is a highly integrated system consisting of the Aries PCIe Smart 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 require cost-effective interconnects which are thin, bendable, and 1-7 meters or more in length. Large Artificial Intelligence (AI) clusters require interconnecting AI training hardware within and across racks. The Aries Smart Cable Module makes these architectures possible by enabling PCIe 5.0 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.

Typical Aries Smart Cable Module