



PM42052 ☆

PAX 52xG4 Gen 4 Advanced Fabric PCIe Switch

Status: In Production

Features:

- High-performance PCIe fabric connectivity to a pool of GPUs, NVMe SSDs, and other endpoints, that overcomes the limitations of PCIe tree-based topologies for rack scale multi-host systems
- High-reliability PCIe with robust error containment, hot- and surprise-plug controllers per port, end-to-end data integrity protection, high-quality, low power SerDes
- Multi-host sharing of SR-IOV and multifunction endpoints
- Significant power, cost, and board space savings with support for up to 28 ports and flexible ×1, ×2, ×4, ×8, and ×16 port bifurcation with no restrictions on configuring ports as either upstream or downstream
- PAX Software Development Kit (SDK)
- Comprehensive diagnostics and debugging

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 **Overview**

 **Documents**

Device Overview

Summary

The Switchtec Gen 4 PM42052 PAX Advanced Fabric PCIe switch is a programmable, high reliability switch supporting high performance PCIe fabric connectivity to a shared pool of GPUs, NVMe, SSDs and other endpoints, multi-host sharing of single-root input/output virtualization (SR-IOV) endpoints, 52 lanes, 28 ports, and hot- and surprise-plug controllers for each port. PAX switches features advanced error containment, comprehensive diagnostics and debug capabilities, a wide breadth of I/O interfaces, and an integrated MIPS processor. PAX switches utilize a system-on-chip architecture that optionally enables customer differentiated solutions through firmware customization and enhancements.

Applications for the PAX family include scalable multi-host systems, SR-IOV-enabled JBOFs, composable GP-GPU fabrics, disaggregated systems and rack scale architectures.

Additional Features

- High-performance PCIe fabric connectivity to a pool of GPUs, NVMe SSDs, and other endpoints, that overcomes the limitations of PCIe tree-based topologies for rack scale multi-host systems
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- Multi-host sharing of SR-IOV and multifunction endpoints
- Significant power, cost, and board space savings with support for up to 28 ports and flexible ×1, ×2, ×4, ×8, and ×16 port bifurcation with no restrictions on configuring ports as either upstream or downstream
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- Comprehensive diagnostics and debugging

PCIe Fabrics and Multi-host SR-IOV Sharing

- High-performance PCIe fabric connectivity to a pool of GPUs, NVMe SSDs, and other endpoints, that overcomes the limitations of PCIe tree-based topologies for rack scale multi-host systems
- Multi-host sharing of SR-IOV and multifunction endpoints
- Virtualization of entire PCIe domains and endpoints with physical and virtual functions (for example, SR-IOV NVMe SSDs)

High-Performance Non-blocking Switching

- Up to 174 GBps switching capacity
- 52-lane variant
- Ports bifurcate to ×1*/×2/×4/×8/×16 lanes

Error Containment

- Advanced error reporting (AER) on all ports
- Downstream port containment (DPC) on all downstream ports
- Poisoned TLP blocking
- Completion timeout synthesis (CTS) to prevent an error state in an upstream host due to incomplete non-posted transactions
- Hot- and surprise-plug controllers per port
- GPIOs configurable for different cable/connector standards

PCIe Interfaces

- Passive, managed, and optical cables
- SFF-8644, SFF-8643, SFF-8639, OCUlink and other connectors

Diagnostics and Debug

- Real-time eye capture
- External loopback
- Errors, statistics, and performance counters

High-Speed I/O

- PCIe Gen 4 16 GT/s
- Supports OCUlink cabling, CEM x16 slots, and other interfaces

ChipLink Diagnostic Tools

- Extensive debug, diagnostics, configuration, and analysis tools with an intuitive GUI
- Access to configuration data, management capabilities, and signal integrity analysis tools (such as real-time eye capture)

Evaluation Kit

- The PM42100-KIT Switchtec Gen 4 PCIe switch evaluation kit is a device evaluation environment that supports multiple interfaces including optical PCIe-compliant link training and manual PHY configuration.

*** x1 natively on four lanes**

Parametrics

Name	Value
Lanes	52
Ports	28
Hot Plug Controllers	28

Product Name

PAX 52xG4

Generation

Gen 4



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