

Microsemi 12 Gbps Smart I/O Controller for Storage

16 + 2-Port SSCi+ and SSCiE+

Microsemi's SmartIOC SAS I/O Controller products provide reliable ultra-high performance HBA functionality with industry-leading low-power operation. These SmartIOCs provide unparalleled flexibility along with a broad range of standard features designed to meet the most demanding server storage applications.

The PM8238 and PM8239 offer optional entry-level hardware RAID 0/1/10/5 modes without any external DRAM. These devices also offer additional dedicated RAID-capable boot ports.

The PM8238 and PM8239 support Microsemi Smart Storage solution drivers for all major operating systems and a comprehensive set of management tools, including a GUI and CLI.



Highlights

- Industry-leading throughput
- Compatible with Microsemi Smart Storage solution drivers for all major operating systems and their unified management utilities
- Two additional 6G SAS/SATA boot ports with RAID 1 support
- RAID 0, 1, 10, 5 with hardware acceleration and no additional host software requirements
- No DDR memory required, regardless of mode
- The PM8239 includes support for maxCrypto controller-based encryption

HBA Features

- Persistent logging and binding
- Up to 1.6M IOPS performance (4K random reads)
- Up to 6.9 GB/s bandwidth
- Transport Layer Retry (TLR) support
- Multi-initiator (host)/clustering for SAS
- TRIM and UNMAP support for SSDs
- SAS dual path failover (RAID stack managed Active/Standby)
- Baseboard management controller (BMC) support with Management Component Transport Protocol (MCTP) over PCIe or I²C
- 4K native sector support
- Hot plug drive support
- Adapter power management modes
- S.M.A.R.T. diagnostic access
- SMP commands using ARCONF
- Supports eight lanes of PCIe 3.0 to the host, each lane supporting PCIe Gen 3 rates up to 8.0 Gbps
- Enclosure Management: SES-2/3
SGPIO: SFF-8485
IBPI: SFF-8489
SGPIO as a virtual SES enclosure: SFF-8448

Entry-Level RAID Features

- Flexible configuration for RAID mode
- Dynamic sector repair
- Multiple LUN support
- Support for up to 238 raw devices
- Support for up to 32 target devices in RAID mode
- Supports up to eight SAS/SATA Logical/RAID volumes
- Split mirror and combine
- Copyback hot spare
- Displays raw devices on connector
- RAID Build modes
 - Quick Initialization
 - Background Initialization
 - Rapid Parity Initialization
- Heal array and Move array
- Bootable array support
- Erase drive
- Configurable stripe size
- Bad stripe marking
- Hot spare support (dedicated, global, or predictive)
- Persistent logging for RAID and HBA
- 4K native sector support in RAID

Microsemi Storage Management Utilities

MaxView provides both server-based and remote administration. This fully browser-based tool supports all standard browsers and also is available through a USB boot image. MaxView controller management components include:

- MaxView GUI
- ARCCONF CLI
- Event Monitor (event logging and email alerts)
- VSphere plug-in
- OpenStack plug-in
- Smart Storage Administrator CLI

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Tools for Setup and Troubleshooting

Microsemi provides a complete suite of design-in collateral to support embedded designs with this product, including reference designs, detailed hardware specifications, and design-in guides.

- UEFI HII configuration tool
- CTRL-A Legacy BIOS configuration tool
- 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
 - Connects to device over UART

Operating System Support

- Extensive operating system supports includes major software releases for Microsoft Windows/Server, VMware ESXi, Red Hat Enterprise Linux, SUSE Enterprise Linux, Ubuntu, CentOS, XenServer, Fedora, Debian, and Solaris
- Certification for Microsoft WHQL, VMware IOVP, and VMware VSAN

High-Speed I/O

- x8 PCIe Gen 3 8 GT/s
 - PCIe link rates supported: 8 GT/s, 5 GT/s, 2.5 GT/s
 - PCIe-compliant link training and manual PHY configuration
- 16x SAS-3 PHYs for high-speed targets
 - SAS link rates supported: 12 Gbps, 6 Gbps, 3 Gbps
 - SATA link rates supported: 6 Gbps, 3 Gbps, 1.5 Gbps
- 2x SAS-2 PHYs for boot devices
 - SAS link rates supported: 6 Gbps, 3 Gbps
 - SATA link rates supported: 6 Gbps, 3 Gbps, 1.5 Gbps

High-Speed I/O (continued)

- SAS or SATA operation on a per-PHY basis
- Independent per-channel selectable high-speed outputs support multiple programmable levels of pre-emphasis and output swing
- Multiple programmable levels of receive equalization
- Integrated resistive termination
- Automatic negotiation of link speed
- Decision Feedback Equalizer provides robust recovery of 12 Gbps SAS signals over lossy channels

Peripheral I/O Interfaces

- Eight multi-master and seven master-only two-wire interfaces (TWIs) support variable bit rates up to 400 Kbps
- Two industry-standard 16750 UARTs
- Seven SFF-8485-compliant serial GPIO (SGPIO) ports
- Up to 30 GPIO ports depending on SGPIO port configuration
- Firmware API for peripheral control including features such as activity LED, UART configuration, zoning configuration, inter-processor communications, and enclosure control

Note: Some peripheral I/O interface pins are multiplexed.

maxCrypto Encryption (PM8239 Only)

- AES data encryption and decryption with key sizes of 128/196/256 bits

Ordering Information

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PM8238A-F3EI
PM8239A-F3EI (with encryption)

¹A: Revision number; F3: package descriptor; E: RoHS 6-compliant; I: industrial temperature.



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