

SmartROC 3200 Family of PCIe® Gen 4 SAS-4 Tri-Mode Storage Controllers

Advanced Data Protection and Caching with Optional Encryption for Server Storage

Summary

Microchip's 5th Generation SmartROC 3200 family is the industry's most versatile, fully featured and secure full RAID-enabled NVMe/SAS/SATA server storage performance solution. It features a fully integrated PCIe Gen 4 switch capable of x1 bifurcation, SAS-4 connectivity with Dynamic Channel Multiplexing (DCM) and NVMe™ capabilities for the next generation of enterprise and cloud data centers.

SmartROC 3200 controllers offer up to x16 PCIe Gen 4 connectivity to the host CPU, up to 32 storage lanes and advanced manageability through industry-standard interfaces. Highly efficient storage IO aggregation is now within reach with Microchip's DCM, which provides bandwidth aggregation for lower speed drives over a SAS-4 link when connected to Microchip's family of SXP 24G SAS-4 expanders.

These RAID-on-chip devices provide a fully integrated PCIe Gen 4 switch based on Switchtec™ technology for minimum latency and maximum performance when connecting to NVMe media. Capable of bifurcations from x1 to x8 when connecting to storage, the SmartROC 3200 is ready for all performance grades and configurations of NVMe SSDs. The SmartROC 3200 supports RAID and controller-based encryption for PCIe Gen 4 NVMe SSDs, SAS-4 media, and SATA media. Native HBA modes for all media types and fully transparent mode for NVMe* are also supported.

The SmartROC 3200 family introduces built-in hardware root-of-trust, providing the solid foundation needed for safeguarding information. SmartROC 3200's trusted platform support includes firmware signing with Secure Boot and Secure Update features to ensure firmware integrity and authenticity in the end-to-end value chain.

SmartROC 3200 offers a comprehensive feature set for enterprise server data storage solutions and best-in-class performance. Like all Microchip Smart Storage solutions, drivers for all major operating systems and a comprehensive set of management tools—including a GUI and CLI—are available, enabling unified management across your server and storage infrastructure. Big data just got easy.

Highlights and Benefits

Tri-Mode Support

- Automatic PCIe, SAS, and SATA detection and link speed negotiation to enable universal bay architectures
- Various RAID, HBA, or transparent modes selectable per drive

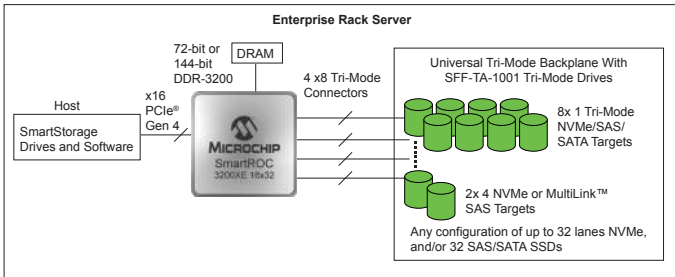
NVMe Storage Management

- Integrated Switchtec PCIe Gen 2 (5 GT/s), Gen 3 (8 GT/s) and Gen 4 (16 GT/s) Switch
- Low latency to NVMe targets in native or RAID modes
- PCIe error containment (including downstream port containment, upstream error containment, completion timeout synthesis, and poisoned TLP blocking)
- Up to 32 lanes of NVMe media support, down to x1 bifurcation
- 16-lane or 8-lane host support

SAS Storage Management

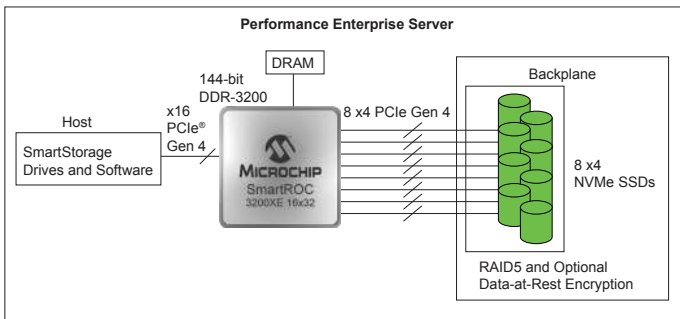
- Each PHY supports 24G SAS-4 with up to 2.4 Gbps bandwidth
- DCM for near 100% efficient bandwidth aggregation for all SAS/SATA drive rates over SAS-4 links

Dense High-Performance 2U Enterprise Rack Server With up to 32 Universal Bays



The tri-mode capability and x1 bifurcation along with new industry standards enable the universal bay architecture without sacrificing server density or performance.

High-Performance NVMe RAID

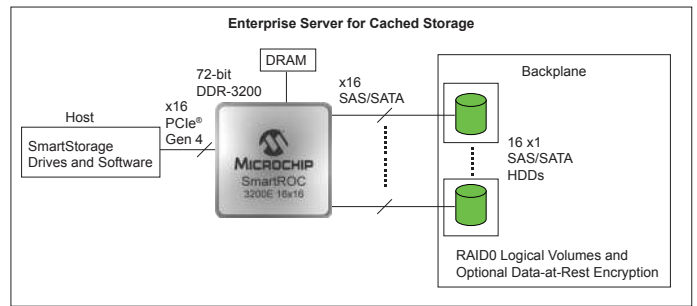


Ultra-high RAID 5 performance and capacity, 8 x4 optional data-at-rest encryption.

Ordering Information

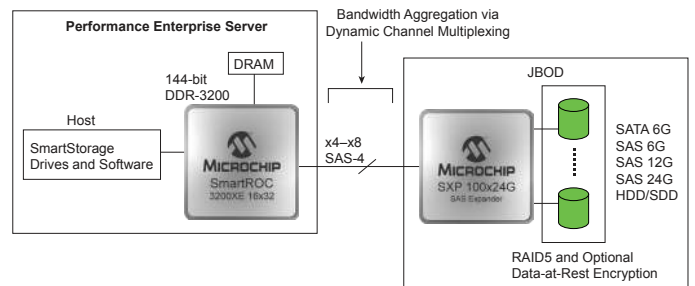
| Part Number | Product Host/Disk | Ports | Encryption | Memory | Packaging |
|--------------|-----------------------|-------|------------|--------------|---|
| PM8254B-F3EI | SmartROC 3200 8x8 | 8/8 | No | 72-bit DDR4 | 25 mm × 25 mm, 0.8 mm pitch, 900-pin FCBGA |
| PM8255B-F3EI | SmartROC 3200e 8x8 | 8/8 | Yes | 72-bit DDR4 | 25 mm × 25 mm, 0.8 mm pitch, 900-pin FCBGA |
| PM8264B-F3EI | SmartROC 3200 8x16 | 8/16 | No | 72-bit DDR4 | 25 mm × 25 mm, 0.8 mm pitch, 900-pin FCBGA |
| PM8265B-F3EI | SmartROC 3200e 8x16 | 8/16 | Yes | 72-bit DDR4 | 25 mm × 25 mm, 0.8 mm pitch, 900-pin FCBGA |
| PM8272B-F3EI | SmartROC 3200 16x16 | 16/16 | No | 72-bit DDR4 | 31 mm × 31 mm, 0.8 mm pitch, 1417-pin FCBGA |
| PM8273B-F3EI | SmartROC 3200e 16x16 | 16/16 | Yes | 72-bit DDR4 | 31 mm × 31 mm, 0.8 mm pitch, 1417-pin FCBGA |
| PM8276B-F3EI | SmartROC 3200 16x32 | 16/32 | No | 72-bit DDR4 | 31 mm × 31 mm, 0.8 mm pitch, 1417-pin FCBGA |
| PM8277B-F3EI | SmartROC 3200e 16x32 | 16/32 | Yes | 72-bit DDR4 | 31 mm × 31 mm, 0.8 mm pitch, 1417-pin FCBGA |
| PM8268B-FEI | SmartROC 3200p 16x16 | 16/16 | No | 144-bit DDR4 | 35 mm × 35 mm, 0.8 mm pitch, 1822-pin FCBGA |
| PM8269B-FEI | SmartROC 3200pe 16x16 | 16/16 | Yes | 144-bit DDR4 | 35 mm × 35 mm, 0.8 mm pitch, 1822-pin FCBGA |
| PM8278B-FEI | SmartROC 3200p 16x32 | 16/32 | No | 144-bit DDR4 | 35 mm x 35 mm, 0.8 mm pitch, 1822-pin FCBGA |
| PM8279B-FEI | SmartROC 3200pe 16x32 | 16/32 | Yes | 144-bit DDR4 | 35 mm x 35 mm, 0.8 mm pitch, 1822-pin FCBGA |

Caching HBA



The x16 host interface provides up to 26 Gbps throughput, supporting 16 to 32 RAID 0 logical volumes.

Externally Connected JBOD with DCM



SmartROC provides remote connectivity or expansion to lower speed targets such as SAS-3 and SATA through its DCM-enabled SAS-4 links to the SAS-4 SXP 24G expander.