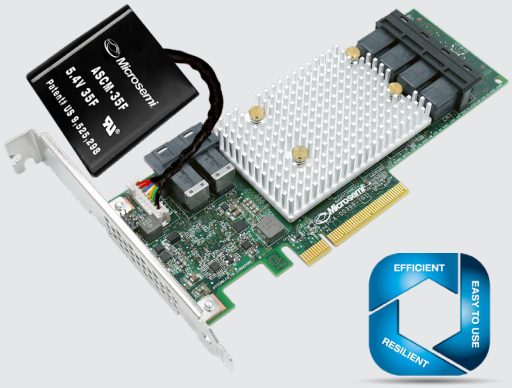
Adaptec® SmartRAID 3100 Series: 24i/8i16e/16i/8i8e/8i/8e/4i

12 Gbps PCIe Gen3 SAS/SATA RAID Adapters

Maximum Performance and Flexibility

Data center, Enterprise IT and general consumer server environments have a broad range of requirements—from basic connectivity to extreme data storage capacities. Effective data access and protection is crucial to their ultimate success. The 12 Gbps SmartRAID 3100 adapters, coupled with 12 Gbps SSDs, provide maximum read/write bandwidth and IOPS as well as acceleration and latency optimization through caching for the most performance-hungry transactional and database applications. Furthermore, the SmartRAID 3100, built upon the unified Smart Storage stack, unlocks all features and performance of the HBA 1100 when the drives are configured as raw devices.



maxCache 4.0 SSD Caching

maxCache accelerates HDD-based RAID arrays and logical drives, advancing the performance capabilities for a broader set of application workloads. SmartRAID 315x adapters support read- and write-back caching. By caching writes to a redundant SSD cache pool, maxCache 4.0 leverages the performance and latency capabilities of SSD technology for both read and write workloads. Read performance is also improved by caching frequently accessed data on the SSD tier with additional optimizations through the learned-path algorithm, which leverages the aggregate performance of all available storage devices.

Integrated Cache Protection

The SmartRAID family continues a battery-free portfolio. The SmartRAID 315x Series integrates flash-based cache backup to enable instant cache protection. The tethered Adaptec® ASCM-35Fw capacitor module supports a five-year lifetime and is continuously monitored by the Smart firmware to make sure that the data can be safely backed up to the Flash memory on the SmartRAID adapter in case of a power loss.

Advanced Data Protection and Ease of Use

Microchip's industry-leading Smart Storage stack delivers maximum reliability and best-in-class performance that all RAID levels come to expect, plus unique features like Mixed Mode support (RAID and HBA devices can be used simultaneously), adapter power management (reduces power consumption up to 30 percent), and Advanced Data Management (ADM) features that allow data migration from existing RAID arrays to new ones when upgrading old hard disks or worn-out SSDs.

Adaptec maxView provides an HTML5 web interface that can be used in standard desktops and mobile browsers for all storage configuration and management needs. It supports local and remote management, and comes with plugins for major storage management software suites for enterprises and data centers.

Benefits

- Ideal for enabling 12 Gbps storage capabilities in performance-hungry server and workstation platforms, without compromising proven reliability
- Provides high I/O transaction and high bandwidth processing solutions that reduce energy consumption and maintenance costs
- Accelerates storage with up to 4 GB of high-speed DRAM cache with integrated cache protection (SmartRAID 315x SKUs only)

Highlights

- maxCache 4.0 caching software
- RAID levels: 0, 1, 5, 6, 10, 50, 60, 1 ADM and 10 ADM
- Supports simultaneous use of RAID and raw devices (mixed mode)
- Fifth-generation Zero-Maintenance Cache Protection (ZMCP)
- Up to 24 native SAS/SATA ports in a LP/MD2 design
- 12 Gbps and 6 Gbps compatibility with HDD or SSD SAS/SATA devices
- 12 Gbps throughput per SAS port using mini-SAS HD connectors
- 1.7M random read 4 KB IOPS[1]
- Industry's lowest-power 28 nm SmartROC SAS/SATA protocol controller
- Quality and reliability through the unified, hardened Smart Storage stack, which is deployed in over 30M servers

[1]16- and 24-port adapters can achieve 1.7M random read IOPS for 4 KB I/Os. Adapters with 8 ports and fewer are capable of 1.5M IOPS.

Parameters

Parameter	Description		
Key Software Features	• maxCache 4.0 caching software (SmartRAID 315x products with cache protection) • Mixed mode allows devices connected to the same adapter to be used in RAID and HBA modes simultaneously • Adapter dynamic power management to save up to 30% power • Support for up to 256 SAS/SATA target devices (238 SSDs/HDDs maximum support, remainder are reserved for expanders and enclosure management) • Support for native 4K sector SAS/SATA devices in addition to 512-byte sector devices • RAID ADM through triple mirroring, move array, and split mirroring	• Quick initialization • Online capacity expansion • Copyback hot spare • Dynamic caching algorithm • Native Command Queuing (NCQ) • Background initialization • Hot-plug drive support • RAID level migration • Hot spares—global, dedicated, and pooled • Automatic/manual rebuild of hot spares • SES and SGPIO enclosure management • Configurable stripe size • S.M.A.R.T. support	• BMC support • Dynamic sector repair • Staggered drive spin-up • Bootable array support • Support for tape devices, autoloaders • Smart PQI driver with multip queue and MSI-X support for all device drivers for all supported OSes • Secure boot support for the uEFI host BIOS • USB image available on storage.microsemi.com/en-us/support/start to boot maxView GUI from any USB device for enhanced GUI-based setup and offline maintenance
Management Utilities	maxView Storage Manager • Web-based GUI management utility • Windows®, Linux®, Solaris, VMware support • Remote configuration, monitoring, and notification • Remote firmware updates • SMI-S support • SMTP	ARCCONF • Command-line interface • SMI-S support for VMware BIOS Configuration Utility (CTRL+A) • Legacy configuration utility • Flashable BIOS support	ROM-Based uEFI BIOS Configuration Utilities • HII-based pre-boot GUI configuration utility • Arcconf CLI for uEFI shell • Flashable BIOS support Event Monitor • Lightweight event monitoring and logging tool • Distributes adapter events and notifies user
Operating Systems	Microsoft Windows Server, Windows 10, Windows 8.1, Windows 7, Red Hat Enterprise Linux, CentOS, SuSE Linux Enterprise Server, Ubuntu Linux, Debian Linux, Oracle Linux, Citrix XenServer, Solaris, FreeBSD, VMware ESXi, and open-source Linux drivers. The latest drivers are available at storage.microsemi.com/en-us/support/start. Supports open-source Linux drivers and inbox drivers.		
CPU Architecture	Intel, AMD, Cavium ThunderX2		
Dimensions	2.535" H × 6.6" L (64 mm × 167 mm)		
Operating Temperature	0°C to 55°C with 200 LFM airflow (SmartRAID 3154-24i requires 250 LFM). Note: This adapter contains a powerful RAID processor that requires adequate airflow to operate reliably. Only install this card into server or PC chassis with at least 200 LFM airflow (250 LFM airflow for (SmartRAID 3154-24i). Temperature measured 1 inch from RAID adapter.		
Regulatory Certification	CE, FCC, UL, C-tick, VCCI, KCC, CNS		
Environmental Compliance	RoHS		
MTBF	1.37 million hours (all 4i and 8i board variants), 2.0 million hours (8i8e and 8i16e), and 1.7 million hours (24i and 16i), measured at 40°C		
Warranty	3 years		

Ordering Information

SmartRAID 3100 Series	Part Number	RAID Levels	Host Interface	SAS/SATA Ports	Cache	Cache Width	Cache Backup (ZMCP)	maxCache 4.0
SmartRAID 3154-24i	2294700-R	0, 1 ,5, 6, 10, 50, 60, 1 ADM, 10 ADM	8-Lane PCIe Gen3	24 internal	4 GB DDR4/2100 MHz	64-bit	Yes, integrated	Yes, integrated
SmartRAID-3154-8i16e	2294600-R			8 internal/16 external	4 GB DDR4/2100 MHz	64-bit	Yes, integrated	Yes, supported
SmartRAID 3154-16i	2295000-R			16 internal	4 GB DDR4/2100 MHz	64-bit	Yes, integrated	Yes, integrated
SmartRAID-3154-8i8e	2295100-R			8 internal/8 external	4 GB DDR4/2100 MHz	64-bit	Yes, integrated	Yes, integrated
SmartRAID 3154-8e	2290800-R			8 external	4 GB DDR4/2100 MHz	64-bit	Yes, integrated	Yes, integrated
SmartRAID 3154-8i	2291000-R			8 internal	4 GB DDR4/2100 MHz	64-bit	Yes, integrated	Yes, integrated
SmartRAID 3152-8i	2290200-R			8 internal	2 GB DDR4/2100 MHz	64-bit	Yes, integrated	Yes, integrated
SmartRAID 3102-8i	2294800-R			8 internal	2 GB DDR4/2100 MHz	64-bit	No	No
SmartRAID 3151-4i	2294900-R			4 internal	1 GB DDR4/2100 MHz	32-bit	Yes, integrated	Yes, integrated
SmartRAID 3101-4i	2291700-R			4 internal	1 GB DDR4/2100 MHz	32-bit	No	No

For More Information

https://www.microsemi.com/product-directory/smart-storage-platform/4323-12g-smartraid-3100-series-adapters

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