BROADCOM®

Product Brief

SAS3008

PCI Express® to 8-Port 12 Gb/s SAS+SATA Controller

Extending Its RAID and SAS Technology Leadership, Broadcom Introduces Its Fourth Generation of SAS+SATA Controllers

Broadcom offers the industry's broadest portfolio of storage solutions, backed by decades of experience and trusted by the world's leading server and storage suppliers. Broadcom provides the building blocks for storage solutions that help customers understand, prioritize, store and protect critical data.

The Avago 12 Gb/s SAS portfolio includes MegaRAID® controller cards, host bus adapters (HBAs), advanced software options, and SAS storage ICs, including RAID-on-Chip (ROCs), I/O controllers and expanders.

Overview

The SAS 3008 is the fourth generation of Serial Attached SCSI (SAS) controllers based on the industry-leading Fusion-MPT™ (Message Passing Technology) architecture. The SAS 3008 integrates the latest enhancements in SAS and PCI Express technology.

The SAS 3008 supports 8 PCIe® lanes and complies with the PCI Express 3.0 specification that extends the PCIe data rates up to 8.0 GT/s per lane, and is backwards compatible to the 5.0/2.5 GT/s data rate supported by PCIe 2.x., 1.x. It also incorporates enhancements such as End-to-End CRC (ECRC) with Advanced Error Reporting (AER) and the latest advancements in lane and polarity reversal, power management, hot plug support, and MSI/ MSI-X and legacy interrupt generation.

The eight-port controller device provides SAS data transfer rates of 12, 6, and 3 Gb/s per lane, and SATA at 6 and 3 Gb/s data transfer rates per lane. The device automatically negotiates between the speeds. Enhanced features are supported such as T-10 Data Protection Model for early detection of and recovery from data corruption, and Spread Spectrum Clocking (SSC) for EMI reduction. Additional features include DataBolt™ Technology allowing users to take advantage of 12 Gb/s speeds while utilizing existing 6 Gb/s drives and backplanes.

The SAS 3008 is ideal for the host or drive side connect for external storage controllers requiring a SAS/SATA interface. The SAS 3008 can support up to 1,000 devices and 8,000 outstanding IOs without external RAM and can achieve over 1 million IOs per second.

Applications

- Direct Attached SAS/SATA controller solutions for entry to mid-range servers
- Blade Servers
- External storage controllers requiring SAS+SATA interface for the host or drive side connect

Key Features

- Integrated RAID – RAID Levels 0, 1, 1E, and 10
  - Integrated MegaRAID® support available upon request
- High Performance IOP
- 12 Gb/s SAS Interface
  - 8 port SAS+SATA controller
  - Supports 12, 6, and 3 Gb/s SAS and 6, 3 Gb/s SATA data transfer rates
  - Spread spectrum clocking
  - Supports SSP, SMP, STP and SATA protocols
  - SAS+SATA device support
  - Supports narrow and wide ports
  - T-10 data protection model
  - T-10 Optical Support
  - DataBolt Technology
  - Supports up to 1,000 devices

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Key Features (con't)

- PCI Express 3.0 Interface
  - Supports x8, x4, x2, x1 PCIe lanes at a transfer rate up to 8.0 GT/s per lane, full duplex
  - Lane and polarity reversal
  - Supports End-to-End CRC (ECRC) and Advanced Error Reporting (AER)
  - PCI Express hot plug support
- Advanced Power Management support
  - Variable PCIe bandwidth negotiation
- External memory interface support
  - Flash ROM
  - NVSRAM for Integrated Mirroring
- Communication Interfaces
  - I²C interfaces for enclosure management
  - UART and Ethernet interface for debug
- SFF-8485 Compliant, SGPIO
- JTAG support

The SAS 3008 offered with the Avago Integrated RAID (IR) feature is a low cost, high performance RAID solution designed for blade, entry and mid-range servers that require redundancy and high availability but where a full featured RAID implementation is cost prohibitive or not desired. The Avago advanced Integrated RAID options include Integrated Mirroring (IM), which is RAID 1, Integrated Mirroring Enhanced (IME), known as RAID 1E, Integrated Striping (IS), which is RAID 0, and Integrated Mirroring and Striping (IMS) which is RAID 10. By simplifying the RAID configuration options, Integrated RAID is easy to install and configure and meets the needs of most internal RAID requirements.

Avago provides a complete suite of industry standard operating system drivers.

Fusion-MPT Architecture Overview

Fusion-MPT architecture marks the next generation of I/O architecture designed to deliver the highest performance available today while reducing time to market, integration, and certification time. Fusion-MPT devices are high performance, cost-effective protocol controllers that represent the newest system- level integration technology in intelligent I/O processors from Avago.
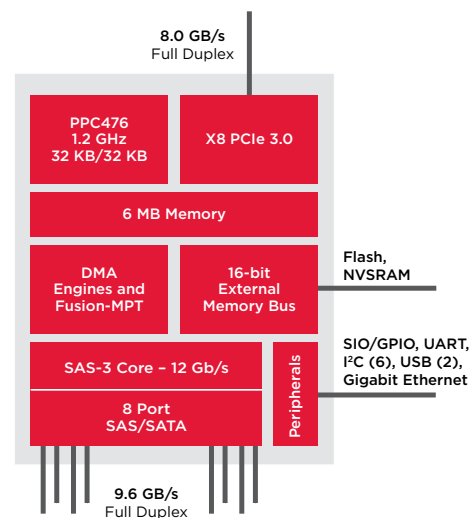
Figure 1: SAS3008 Block Diagram

Figure 2: SAS3008 Topology Diagram