

# LSI SAS1078

## Eight-Port PCI Express to 3Gb/s SAS ROC



### APPLICATIONS

- Embedded RAID-On-a-Chip for enterprise servers
- Low-cost PCI Express/SAS RAID host bus adapter
- Entry-level external RAID and NAS storage solutions

### FEATURES

- High level of system integration with the patented RAID-on-a-Chip (ROC) architecture
- Provides a cost effective RAID solution
  - Examples of supported RAID levels are 0, 1, 5, 10, and 50
- Provides an Exclusive-OR hardware RAID 5 Parity Assist Engine to speed parity backup and recovery calculations
- RAID 6 hardware acceleration support for advanced data protection
- Supports a high speed DDR and DDR2 SDRAM with ECC
  - Up to 166/333MHz (DDR) and up to 333/666MHz (DDR2) Modes

Extending Its Industry SAS Leadership and Building on 20 years of SCSI and RAID Technology Experience, the LSI SAS1078 is LSI's 3rd Generation ROC

### Overview

The LSI SAS1078 is the industry's first PCI Express to 3Gb/s SAS RAID-On-a-Chip (ROC) controller. The LSI SAS1078 integrates several industry-leading technologies, Fusion-MPT™ (Message Passing Technology), MegaRAID®, PCI Express, SAS, PowerPC, and advanced RAID assist. The eight-port ROC provides Serial Attached SCSI (SAS) and SATA data rates of 1.5 and 3Gb/s per port and is based on a LSI patented ROC architecture. The LSI SAS1078 integrates a high speed 64-bit, ECC protected DDR SDRAM interface, a hardware RAID assist engine for parity calculations, and supports an I<sup>2</sup>O message unit, resulting in unsurpassed performance. It is powered by a state-of-the-art PowerPC 440 RISC processor, which includes both instruction and data cache for additional performance boost. It is ideal for today's enterprise servers, leveraging existing SCSI infrastructure for investment protection and ease of migration and implementation. The LSI SAS1078 also is an ideal platform for entry-level external storage using SAS and/or SATA drives. You can implement a very capable, low-cost external SAS-to-SAS/SATA RAID controller in a single chip. With one additional chip you can

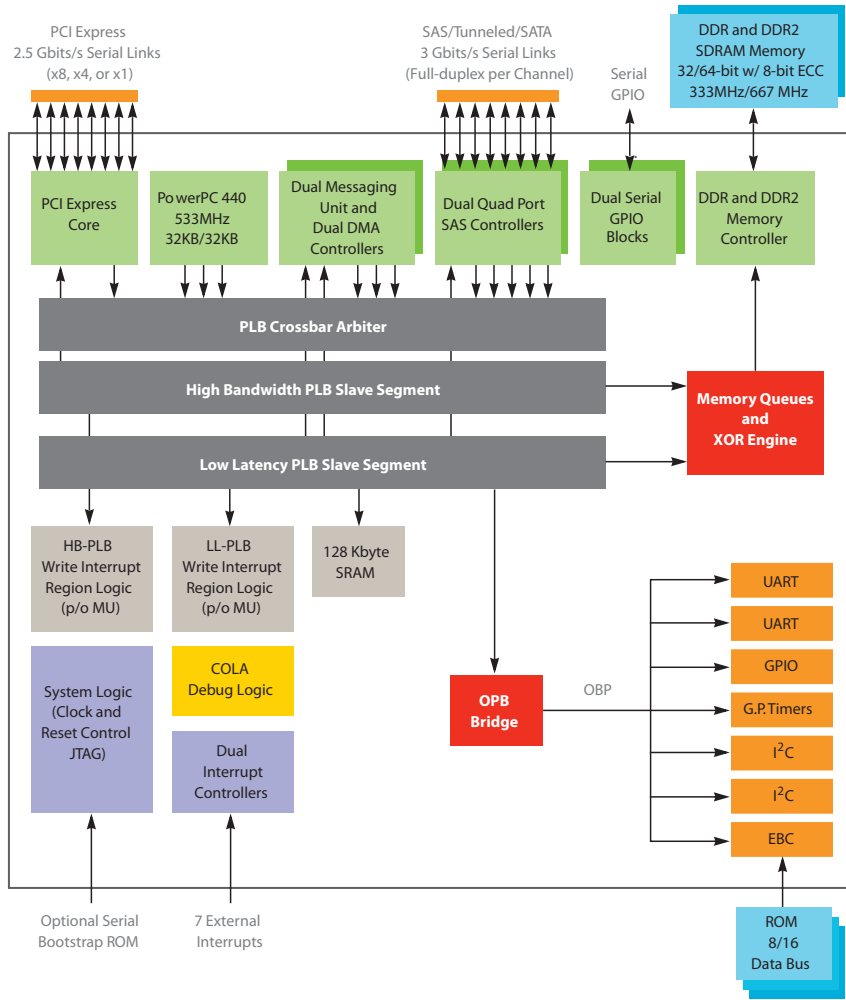
implement a Fibre Channel RAID controller, an iSCSI RAID controller, or even a NAS controller.

The LSI SAS1078 complies with the PCI Express 1.0a specification and supports 8 PCI Express lanes at 2.5Gb/s, full duplex, for an aggregate bandwidth of up to 4GB/sec. The PCI Express architecture is an industry standard high-performance, general-purpose serial I/O interconnect utilizing a cost-effective, low-pin count interface offering high bandwidth per pin. For investment protection and ease of development migration, it retains PCI compatibility by using the established PCI software programming models, thus facilitating a smooth transition to new hardware while allowing software to evolve to take advantage of PCI Express features.

### Fusion-MPT Architecture

LSI's Fusion-MPT architecture provides unparalleled performance, binary compatibility of host software with LSI's Ultra320 SCSI, Serial Attached SCSI, and Fibre Channel products, and significantly reduces software development time. With advanced architecture, the LSI product family can be quickly adapted to respond to emerging I/O interfaces.

Figure 1. LSI SAS1078 Controller Block Diagram



**FEATURES (Continued)**

- Supports 8 PCI Express lanes at a transfer rate up to 2.5Gb/s per lane, full duplex
- Automatically negotiates PCI Express link widths
  - Supports x8, x4, x1 link widths
- Supports PCI Express hot plug
- Power Management support
- PCI Express software is compatible with PCI and PCI-X software
- 8-port SAS/SATA controller
  - Ports can be flexibly configured as x1s (drive attach) or grouped into x2 or x4 “wide” ports to support larger, expanderbased drive topologies
- Supports 1.5 and 3.0Gb/s SAS and SATA data transfer rates
- Compatible with SATA target devices
- Supports SSP, SMP, STP, and SATA protocols
- PowerPC processor (440 @ 533MHz)
- 575 FCPBGA package



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