



## PRODUCT OVERVIEW

The Marvell® 88SX6041/88SX6081 devices are the industry's first 4-port and 8-port Serial ATA II, 3 Gbps PCI-X host controllers. Based on Marvell's industry-leading Serial ATA PHY technology, the 88SX6041/88SX6081 products offer OEMs an ideal solution for developing next-generation Serial ATA II server, storage array and RAID adapter applications.

The 88SX6041/88SX6081 devices employ proven Marvell Serial ATA II physical layer (PHY) technology supporting both 1.5 and 3 Gbps operation. Configurable per-port PHY pre-emphasis and amplitude settings support high-speed backplane implementations. Selectable Spread Spectrum Clocking (SSC) provides optimal Electromagnetic Interference (EMI) performance in high-density Hard Disk Drive (HDD) subsystems. 3 Gbps operation combined with the Serial ATA II port multiplier support is ideal for aggregating multiple 1.5 Gbps HDDs into a single host port.

The 88SX6041/88SX6081 devices are developed to support enterprise-class storage systems. The 133 MHz PCI-X interface provides a high-speed connection to industry-standard server/workstation chipsets and embedded system controllers. For optimal performance and flexibility, the 88SX6041/88SX6081 devices support both Serial ATA II Native Command Queuing and Serial ATA I/ATA-6 Tag Command Queuing. The Marvell Enhanced DMA (EDMA) engine offloads the host processor by automating the process of sending command requests and retrieving responses for each of the requests and response queue pairs (one pair per port).

For inter-chip communication for functions such as failover, the 88SX6041/88SX6081 devices support Serial ATA target mode operation, whereby two 88SX6041/88SX6081 devices can communicate by configuring individual ports as initiator or target ports.

The software Application Programmer Interface (API) appears as a SCSI subsystem interface to the application, minimizing host processor loading and allowing quick software migration of SCSI software. The 88SX6041/88SX6081 devices are software compatible with the existing Serial ATA I host controllers (88SX5080/88SX5081/88SX5040/88SX5041) allowing a seamless transition to Serial ATA II technology.

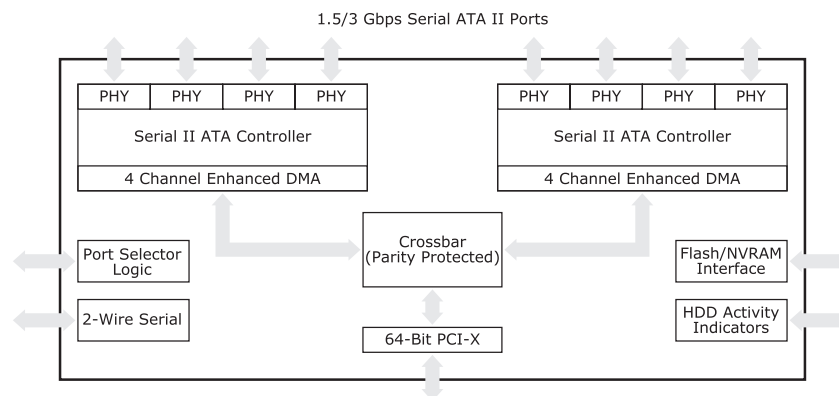


Fig 1. Serial ATA II Host Controller (88SX6041/88SX6081) Block Diagram

## FEATURES

- 3 Gbps PHY operation
- Native command queuing with EDMA
- SCSI programming model
- Software compatible with Marvell Serial ATA I host controllers (88SX5080/88SX5081/88SX5040/88SX5041)

## BENEFITS

- Supports next-generation HDD designs and aggregation of 1.5 Gbps ports via port multipliers
- Significantly increases HDD and system performance by reducing data latency and host CPU overhead
- High-performance, low CPU overhead software
- Leverage Serial ATA I host controller software investment



## FEATURES

- Port multiplier support
- 64-bit/133 MHz PCI-X
- Target mode operation
- Staggered HDD spin-up
- Programmable pre-emphasis and amplitude PHY settings per port
- Spread Spectrum Clocking (SSC)

## BENEFITS

- Enables high density HDD architectures as well as Serial ATA II external JBOD solutions
- Provides a standard, high-bandwidth CPU subsystem interface
- Simple 88SX6041/88SX6081 inter-chip communication method for failover and other applications
- Allows host-side control of HDD spin-up to manage power budget during system power-up
- Enable optimal per-port PHY tuning for Serial ATA backplane designs
- Reduces EMI for enterprise storage and server applications

## APPLICATIONS

The 88SX6041/88SX6081 host controllers can be used in a variety of storage applications. The 88SX6041/88SX6081 products provide an ideal platform for RAID on Motherboard (ROMB) solutions and Serial ATA RAID adapter cards. The Serial ATA II feature set allows connection with both internal server storage as well as external Serial ATA JBODs. When coupled with a microprocessor subsystem, implementing devices such as the Marvell Discovery™ system controllers, the 88SX6041/88SX6081 devices enable high-performance, very high capacity Serial ATA storage solutions for Network Attached Storage (NAS), Storage Area Network (SAN), Direct Attached Storage (DAS), and Nearline Storage Array applications. In combination with Serial ATA II port multipliers, very high-density HDD solutions can be created, aggregating large numbers of HDD connections into a single host controller.

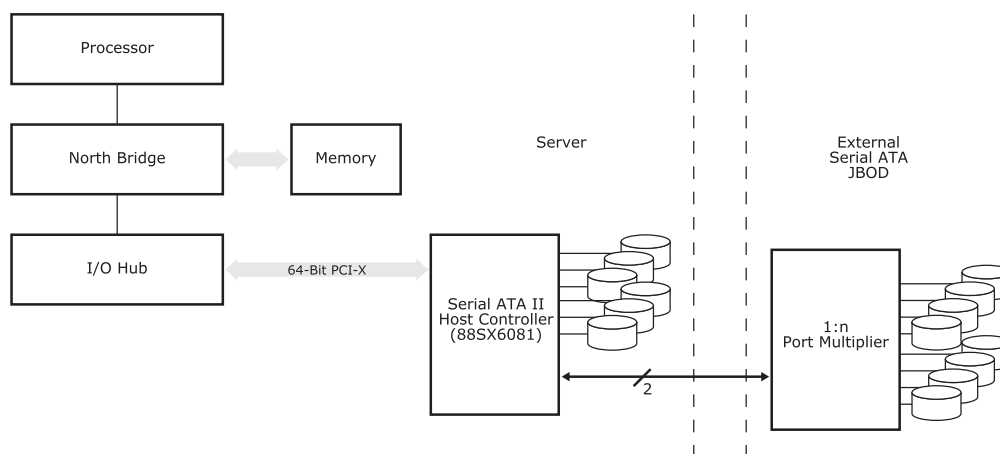


Fig 2. Serial ATA II Host Controller (88SX6081) Applications Diagram

**THE MARVELL ADVANTAGE:** The Marvell 88SX6041/88SX6081 Serial ATA II host controllers come with a complete set of hardware and software development tools to assist engineers developing next generation storage networking solutions with product evaluation and development. Marvell's worldwide field applications engineers collaborate closely with storage networking equipment vendors to develop and deliver innovative products to market. Marvell utilizes recognized world-leading semiconductor foundry and packaging services to reliably deliver high-volume and low cost total solutions.

For more information, visit our website at [www.marvell.com](http://www.marvell.com).



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