Serial ATA: Meeting Storage Needs Today and Tomorrow

Introducing SATA 6Gb/s and the

Serial ATA Revision 3.0 Specification

May 27 - June 6, 2009

Agenda

- About SATA-IO

- SATA Technology

- SATA Market Share

- Introducing SATA Revision 3.0

- SATA 6Gb/s: Fast Just Got FASTER

- Overview of Other Features

- SATA-IO Interoperability and Certified Logo Programs

About SATA-IO

- SATA-IO is a non-profit industry consortium driving industry adoption of Serial ATA (SATA) technology.

- With nearly 220 leading technology companies as members, the group is headed by board member companies Dell, Hewlett-Packard, Hitachi GST, Intel, Maxim, Seagate and Western Digital.

- In addition to defining, developing and delivering the SATA specification, the group also promotes interoperability through testing and a certified logo program.

Get the latest information on SATA specs, tools and upcoming events at www.sata-io.org

SATA Technology

- Serial ATA (SATA) is the primary internal storage interconnect for desktop and mobile PCs. It connects the host system to peripherals such as hard drives, solid state drives, optical drives, and removable magnetic media devices.

- More than 1.1 billion SATA hard drives have shipped from 2001 through 2008.*

- SATA hard drives also have a significant presence in enterprise applications, enabling the integration of higher capacity, cost effective storage solutions.

- Storage systems with SATA cost significantly less than systems with SCSI or Fibre Channel hard drives.

- New SATA solid state drives are establishing new levels of performance.

*Source: IDC Doc #215614, "Economic Crisis Response: Worldwide 2008-2012 Forecast Update," December 2008

SATA Interface Market Share

- SATA's market share in the desktop PC market has increased from **58.1% in 2006 to 99% in 2008**

- SATA's market share in the mobile PC market has increased from **43% in 2006 to 97.7% in 2008**

- SATA's market share in the enterprise market has increased from **21.6% in 2006 to 27.6% in 2008**

New SATA Revision 3.0 Spec

- The newly released Serial ATA Revision 3.0 specification doubles the current SATA transfer rates to 6Gb/s, paving the way for a new generation of faster SATA products

- Enables end-users to move large amounts of data at a faster rate

- Provides end-users with the speed they crave, without compromising the quality and performance they've come to expect from SATA technology

- Solidifies SATA's ubiquity in desktop and mobile segments, and will spur continued growth in the low-cost enterprise market sector

- Maintains the low cost and low power for which the popular storage interface is acclaimed

- Backward compatible with SATA 1.5 and 3.0Gb/s

- Includes new features for additional functionality

SATA 6Gb/s: *Fast Just Got FASTER*

- Today's applications rely on fast transfers of multimedia content, which require interface technologies that can accommodate high bandwidth.

- New SATA solid state drives (SSDs) are establishing new levels of performance.

- SATA 6Gb/s helps enable this by providing faster transfer of short bursts of data from the drive cache.

- There are over 30 manufacturers of SATA SSDs, reflecting the wide range of applications ─ from notebooks and DAS server storage up to datacenter accelerators integrated into SSD RAID systems.
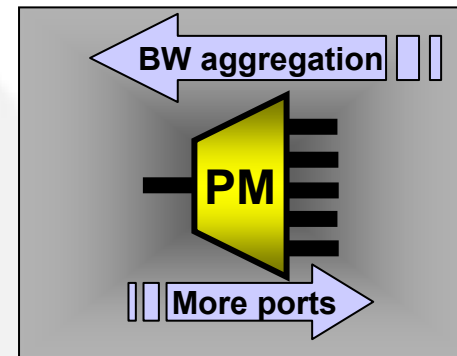
SATA 6Gb/s (continued)

- SATA 6Gb/s enables faster read and write speeds.

- SATA 6Gb/s is well suited for high-end PCs used for bandwidth-hungry applications like video editing because they require high performance to memory.

- RAID cards which are designed for data redundancy and performance will want to move to SATA 6Gb/s as well.

- SATA 6Gb/s ensures market requirements can be accommodated with cost-effective solutions, while providing an easy upgrade path for high-bandwidth applications.

The Need for Speed

- SATA 6Gb/s supports the higher bandwidth aggregation that can be achieved through port multipliers, which allow a single SATA port to communicate with multiple drives.

- Port multipliers provide cost-effective and expanded drive scalability to storage systems.

- Simplified cabling allows the host to be connected to up to fifteen SATA devices by a single cable.

Other SATA Revision 3.0 Features

- Native Command Queuing (NCQ) streaming command enables isochronous data transfers for bandwidth-hungry audio and video applications

- NCQ Management feature helps optimize performance by enabling host processing and management of outstanding NCQ commands

- Improved power management capabilities for conserving energy and minimizing costs

- A small Low Insertion Force (LIF) connector for more compact 1.8-inch storage devices

- A connector designed to accommodate 7mm optical disk drives for thinner and lighter notebooks

- Alignment with the INCITS ATA8-ACS standard

See SATA 6Gb/s Products in Action

- Visit the SATA-IO Booth H810 at Computex on June 2-6 in Taipei, Taiwan, to see SATA 6Gb/s products in action

- The booth will feature SATA 6Gb/s product demonstrations by AMD, Marvell, Seagate and Synopsys

SATA-IO Interoperability Program
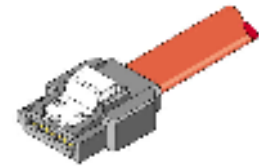
- SATA-IO's stringent Interoperability Program is designed to assure a high level of interoperability among SATA devices

- Devices on the SATA-IO Integrators List have undergone extensive testing for specification compliance

- Regularly scheduled plugfests and workshops enable manufacturers to test products

- Next event on June 8-11 in Milpitas, California

  - Workshop: Member companies with production-ready products can verify product interoperability and adherence to specification requirements. Products that pass testing are placed on Integrators List.

  - Plugfest: Member companies can validate new designs implementing SATA protocol/features and demonstrate interoperability.

- Four test labs around the world provide year-round interoperability certification

SATA-IO Certified Logo Program

- Recently SATA-IO introduced a Certified Logo Program to enhance its Interoperability Program

- Certified devices have undergone extensive testing for specification compliance, thereby assuring a high level of interoperability with other certified devices

- Devices that pass SATA-IO interoperability testing are authorized to bear the SATA certified logos, indicating adherence to the SATA specifications

- Certified logos enable manufacturers and end-users to quickly and easily identify SATA certified products
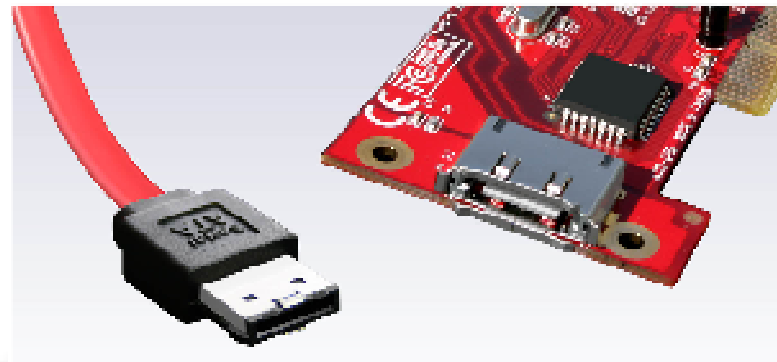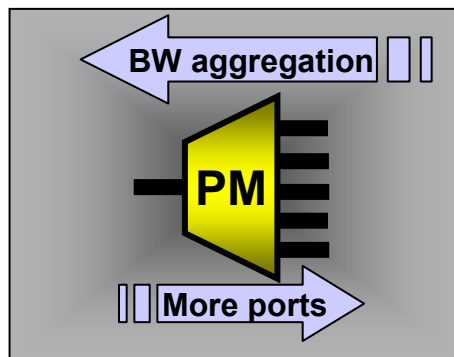
Back-Up Slides

2007 SATA-IO Developments

In 2007, SATA-IO:

- Released SATA Revision 2.6 specification
  - New features for adoption in smaller form factors

- Introduced SATA Everywhere Product List

- Tested new categories:
  - eSATA Host and Device (cable/connector assemblies after IW#4)
  - Port Multiplier Host and Device

In 2007, SATA-IO began testing port multiplier host and devices, as well as eSATA hosts and devices

SATA Revision 2.6 Spec

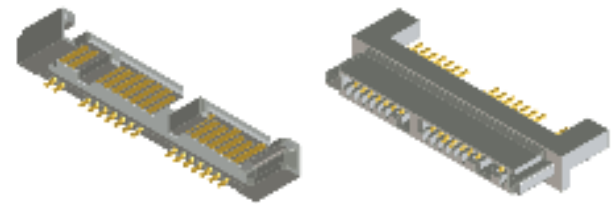**Combines new feature definitions and enhancements with previously published SATA Revision 2.5 material**

Benefits include:

•**Internal Slimline cable and connector:**

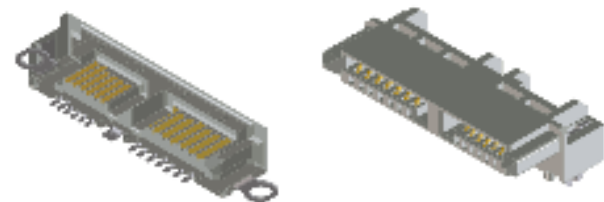- Enables SATA optical drives to be included in smaller form factors

•**Internal Micro SATA connector for 1.8" HDD:**

- Facilitates SATA hard drives in Ultra-mobile portable PC applications
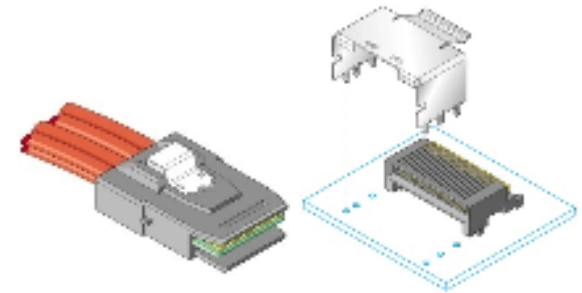

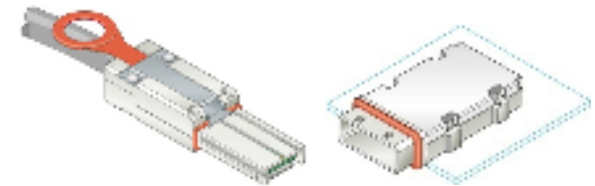**Internal Slimline cable and connector**

Internal Micro SATA connector

- **Mini SATA Internal/External Multilane cable and connector –** provides access for internal use in high-bandwidth backplane designs, as well as for external use in eSATA or xSATA protocols for high-bandwidth external storage enclosures

- **Native Command Queuing (NCQ) Priority enhancement** – adds priority to data in complex workload environments

- **NCQ Unload enhancement** – enhances robustness of the hard disk drive against drop events in mobile system applications

Mini SATA Internal Multilane Cable and Connector

Mini SATA External Multilane Cable and Connector

Integrators List

A database on the SATA-IO Web site with information about components that have passed Serial ATA Interoperability testing.

- The Integrators List:
  - Preserves the integrity of the SATA specification implementation
  - Allows member companies to demonstrate a desire to support industry compatibility

- Feature support capabilities available for Interop testing:

Cable Features	- Asynchronous Signal Recovery
- ClickConnect	- Interface Power Management - device initiated
HDD/ODD Features	-Interface Power Management - host initiated
- Spread-Spectrum Clocking	**Hosts**
- Native Command Queuing	
- 3Gb/s	- Spread-Spectrum Clocking
- Software Settings Preservation	- 3Gb/s

SATA-IO Building Blocks List

SATA-IO recently unveiled a new resource for members: the Building Blocks List

- Provides SATA-IO members with an avenue to broaden their market reach of the SATA-enabled components that are necessary to build higher-level SATA solutions.

- Relies on the same tests as those used to qualify Integrators List products; however, certification under the Building Block program requires completion of only one test area whereas Integrators List products must pass the full set of prescribed tests.

- Products that qualify to be included in the Building Blocks List include:

  - Customer reference boards

  - IP products

  - Other SATA components that have successfully concluded Interoperability Tests applicable to their product category

SATA Everywhere Product List

- Launched Nov. 5, 2007

- Complements the SATA-IO's Interoperability Workshop efforts

- Central "go to" area for ALL SATA products

- Product visibility for members and non-members

- Boosts visibility of tested SATA products

- Offers an incentive for non-members to join

Using the Product Database

Search by:

- Company
- Classification
- Category
- Words

IL

Products with IL dot are on the Integrators List

SATA Everywhere Product Database

To view the complete list of SATA industry products, please select the appropriate search criteria from the menu(s) below. At least one search field must be completed to generate search results.

Category	Disk Drives
Classification	
Company	
Word Search	

Search Show All

	IL SATA-IO Members	Product Name Product Description Company Category Class Model no. Part no.	Contact Product URL

IL SERIAL ATA Member	Product Name:	PCI-X to Serial ATA Controller	
	Description:	PCI-X to Serial ATA Controller	Contact
	Company:	Silicon Image	
	Category:	Controller Cards	
	Class:	SATA	
	Model no.:	SiI3124	Product URL
	Part no.:	SiI3124	