



SteelMine™ Storage Processor

SATA to Dual eSATA Storage Processor with Automatic Drive Locking

The SiI5733 is a low-cost, single chip solution designed to be built into DVR's, PC motherboards, and consumer electronic devices. This SteelVine Storage Processor has a 3Gbps SATA host interface and two eSATA capable device ports. In addition to patent-pending eSATA based capacity expansion, the SiI5733 features automatic drive locking, which protects data stored on an external drive by locking it to the SiI5733 using a unique built in password. Once locked, the data will only be accessible when attached to the SiI5733 with the proper password. This protects user data and provides a secure link to external drives for digital rights management applications.

The SiI5723 SteelVine Storage Processor extends the capabilities of consumer electronics and DVR devices as well as PC motherboards with advanced storage features on a single chip that easily integrates with existing designs via a SATA connection. With eSATA based capacity expansion the storage capacity of the SiI5723 enabled motherboard or device can be easily expanded either by adding additional drives or by adding additional SteelVine enabled devices in a cascaded topology. When in BIG mode, these additional drives or devices will dynamically appear to the host system as increased storage capacity in an existing SteelVine volume. In addition, the SiI5723 supports single-button backup through third-party applications for simple and worry-free data protection.

SiI5723 storage processors support JBOD and the following RAID modes: FAST (RAID 0), SAFE

(RAID 1) and BIG (Concatenation) as well as two new 'multi-RAID' modes, SAFE33, and SAFE50. Multi-RAID modes automatically create two virtual volumes, one SAFE and the other BIG and are designed to balance the benefits of capacity and protection with only two drives. SAFE50 divides the physical space on each drive equally to create each virtual volume. In SAFE33, two-thirds of the available physical space is used to create the BIG partition, and the remaining one-third is used for the SAFE partition. When adding two drives to the SiI5723, BIG, FAST, SAFE, SAFE33, SAFE50 and JBOD are supported. When drives are cascaded, BIG, SAFE, SAFE33 and SAFE50 are available. RAID mode configuration can be accomplished through a GUI, strap pins, or I2C for true software-free implementations.

SiI5733

Applications

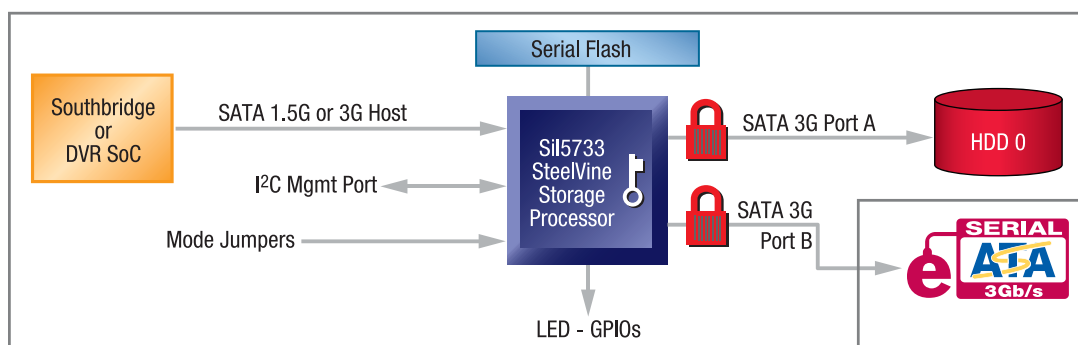
- DVR motherboards
- PC and CE motherboards

Key Features

- Automatic drive locking
- eSATA capable device ports
- eSATA capacity expansion
- Backup button
- RAID modes: FAST (RAID 0), SAFE (RAID 1), SAFE33, SAFE50, BIG (Concatenation), JBOD



SiI5733 System Diagram



Si5733 Features

Si5733 Automatic Drive Locking

Drives are locked to the storage processor using the ATA maximum security mode. This access control approach prevents all attached drives from being read until they are unlocked. A 128-bit secret key, which is not accessible to the host, is burned into the Si5733. This unique password will lock and unlock all drives automatically, including cascaded drives. This feature can be used as part of an overall DRM scheme to lock a drive or set of cascaded drives to a single specific host PC, STB, or DVR.

Serial ATA Host Interface Features

- Serial ATA Gen2m compliance
- eSATA and 2-meter cable support
- 3 Gbps (auto-negotiates to 1.5 Gbps)
- Compatible with PM aware and non-PM aware hosts
- Allows multiple drives to be accessed by non-PM aware drive hosts
- Supports NCQ

Device Interface Features

- Serial ATA Gen2m compliance
- eSATA and 2-meter cable support
- 3 Gbps (auto-negotiates to 1.5 Gbps)
- Independent 8 KB FIFO / Port
- Power management capabilities
- Supports hot plug
- Supports ATAPI & asynchronous notification

Electrical Specifications

- 3.3V IO supply, 1.8V core supply
- 1.02 watts (typical)

Environmental

- Operating temperature: 0°C to 70°C
- Operating relative humidity: 5% to 80%
- Non-operating relative humidity: 5% to 95%

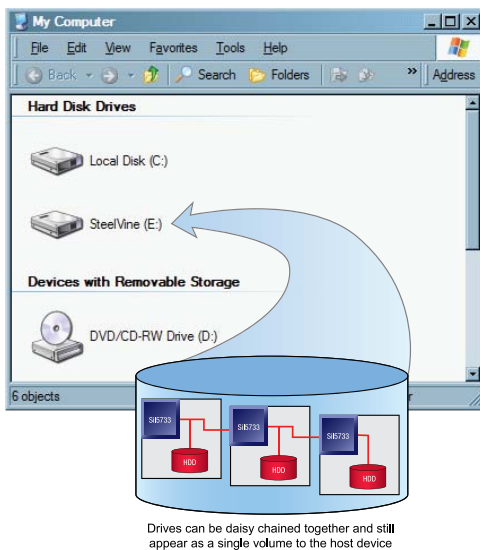
Physical Specifications

- 88-pin QFN
- 10mm x 10mm

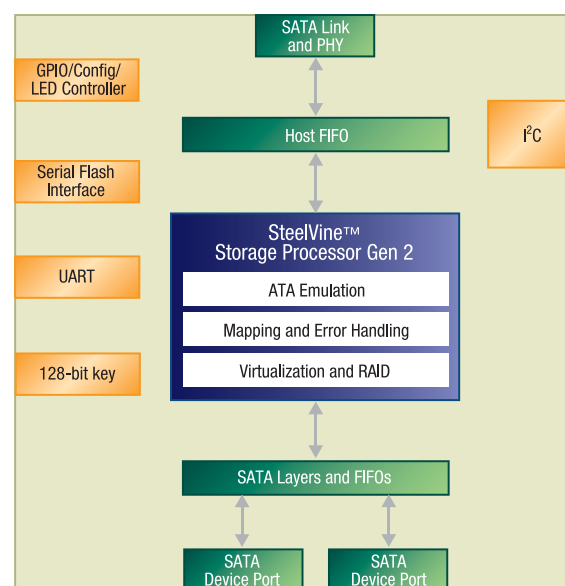
Additional SteelVine features

- No driver, BIOS or software required
- User API interface through I²C
- No drive reformatting on RAID change
- Email notification
- Optional XML API
- RAID 1 drive racing
- Optional SteelVine Manager GUI
- Mandatory SMART commands available
- SAFE later

Capacity Expansion Diagram



Block Diagram



Silicon Image, Inc.

1060 E. Arques Avenue
Sunnyvale, CA 94085

T 408.616.4000
F 408.830.9530

www.siliconimage.com

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