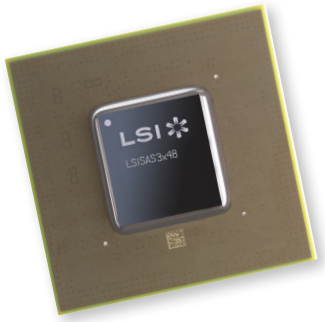
LSI
Storage. Networking. Accelerated.

Product Brief

LSI® 12Gb/s SAS/SATA Expander

LSI SAS3x48, LSI SAS3x40, LSI SAS3x36





LSI SAS3x48

Applications

- SAS/SATA drive enclosures
- External RAID subsystems

Features

- Integrated Enclosure Processor
  - ARM® Cortex-R4 @ 300MHz
- 12Gb/s SAS Interface
  - 48, 40, 36-port SAS/SATA expanders
  - Supports 12Gb/s, 6Gb/s, and 3Gb/s SAS, and 6Gb/s and 3Gb/s SATA data transfer rates
  - Ports are non-denominational - initiator and target connect
  - Supports narrow and wide port configurations
  - Spread spectrum clocking
  - Supports SSP initiator and target, SMP initiator and target, STP initiator and SATA protocols
  - DataBolt™ Bandwidth Optimizer (40 ports)
- T-10 zoning – 255 zones
- Port mirroring
- 16 GPIO Pins (64)
- 1 LED Pins per Phy
  - Configurable for link status, drive activity, fault LED outputs
  - Can be used as GPIOs
- SFF-8485 Compliant (2 SGPIO ports)
- External memory interface support
  - 8/16 bit FLASH/NVSRAM

Enhance your external storage environment with high scalability and performance with LSI SAS Expanders

Overview

The 12Gb/s SAS Expanders are LSI's seventh generation of expanders that incorporate the latest enhancements in SAS technology. The 48, 40, 36-port option expanders are designed with an integrated ARM Cortex-R4 processor for topology management functions such as discovery, enclosure and drive management, and LED management. The expanders support SAS data transfer rates of 12, 6, 3 Gb/s, and SATA data transfer rates of 6 and 3Gb/s.

The LSI SAS expanders also incorporate the latest enhancements in SAS technology which includes Spread Spectrum Clocking for EMI reduction and T-10 based zoning for network storage security applications. Other innovative, unique features include DataBolt™ Bandwidth Optimizer. DataBolt™ Bandwidth Optimizer is designed to help facilitate the industry transition to 12Gb/s SAS-enabled systems by allowing users to take advantage of 12Gb/s speeds while utilizing existing 6Gb/s drives and backplanes. The expander buffers 6Gb/s data and then transfers it out to the host at 12Gb/s speeds in order to match the bandwidth between faster hosts and slower SAS or SATA devices. Additional features such as Port Mirroring allow the customer to access signals that are not easily accessible by mirroring that signal to an external connection for debug and diagnosis. The SATA affiliation option allows for turning off all affiliations and allowing multiple hosts to control various SATA drives.

For improving system reliability for today's data center and storage subsystems, the LSI SAS expanders are ideal for connecting multiple targets and hosts in a SAS switched environment. This will support scalability and fault- tolerant path-redundancy.

SAS Leadership

LSI is a storage market leader in SAS, Enterprise RAID, and Application Acceleration, enabling the entire storage ecosystem. LSI offers the broadest product portfolio in the industry including SAS ROCs, IO Controllers, Expanders, Host Bus Adapters, MegaRAID® controller cards, switches, advanced software options, and application acceleration solutions. LSI solutions provide the performance, connectivity, scalability, and manageability required for today's enterprise storage environments.

These products use the LSI proven SAS core which has completed extensive stress test and interoperability testing resulting in the industry's most robust, interoperable solution.

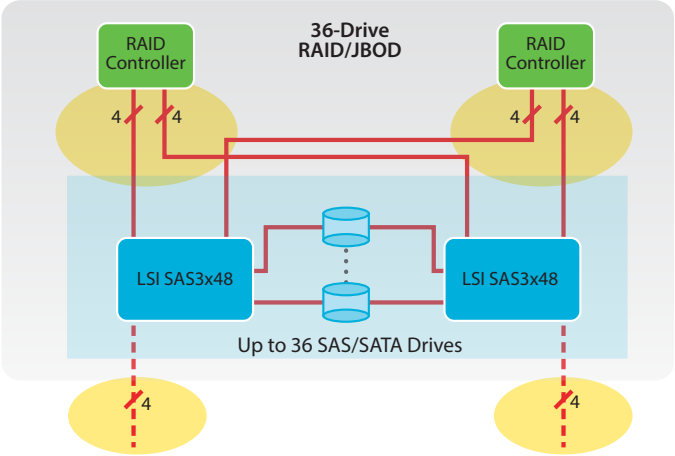
SDK

A full Software Development Kit (SDK) is available to help enable efficient OEM specific firmware implementations. The SDK includes source code for the SES module with examples of typical SES device drivers, the SSP Target, the ISTWI Target, the CLI Interface and the Serial

Features (Continued)

- Communication Interfaces
  - Twelve I2C interfaces for enclosure management services or debug
  - Two UART interfaces for debug as well as an out of band communication port
  - 10/100/1000 Ethernet Management Port interface for out of band communication
- USB 2.0 port
- JTAG support
- 1020 FPB32GU (33mm x 33mm)

Debug port. API support is also included for most HAL functions including, but not limited to, SSP and SMP Target and Initiator, STP Initiator, UART, ISTWI Master and Slave, all LED management including GPIO and SGPIO, Configuration Page Management, PHY configuration and control, firmware event logging and firmware tracing.



Enclosure Functions

- LED Control
- Temp Monitoring
- Drive/Array Control
- Fan Control/Monitor
- Power Supply Control/Monitor
- Alarms/Notifications

LSI SAS3x48 SAS Expander Technical Specifications			
SEP	ARM Cortex R4 300MHz	Pulse Width Modulator	2
Instructions	1.6 DMIPs/MHz	DDR Interface	DDR3 - 20 bit interface (16-bits Data w/ 4 bits ECC)
Internal Memory	2MB SRAM	External Memory Interfaces	8/16-bit Flash, w/ 6 chip selects SRAM, NVSRAM
SAS Ports	48, 40, 36	Security Features	TRNG/Hash & HMAC Generator/Secret Root Key
Data Transfer	12.0/6.0/3.0 Gb/s SAS 6.0/3.0 Gb/s SATA	8-bit SEP interface	Y
DataBolt Bandwidth Optimizer (EDFB)	40 ports (LSI IP)	I2C Interfaces	12
SSC (Spread Spectrum Clocking)	Y	SGPIO interface	2, SFF- 8485
Port Mirroring	Y (LSI IP)	Ethernet Interface	10/100/1000
Direct, Table, & Subtractive Routing Methods	Y	USB 2.0 Interfaces	1
Route Table Entries	2048	UART Interfaces	2
Phy Based Zoning, T-10 Zoning	Y	LED	1 LED pin per PHY
T-10 Optical Support	Y	GPIO	16
A/D Converter	1, (2 analog inputs)	Package	1020 FPB32GU 1.0 mm pad pitch (33mm x 33mm)

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