

LSIFC949X

Dual Channel, 4Gb/s Fibre Channel

<http://lsilogic.com/storage>



FUSION-MPT™
MESSAGE PASSING TECHNOLOGY



LSIFC949X single-chip, highly integrated dual channel Fibre Channel controller increases system performance for storage area networks, storage virtualization, and RAID applications.

FIBRE CHANNEL PROTOCOL CONTROLLER

The LSIFC949X controller features LSI Logic's Fibre Channel family of products adding a 4Gb/s Fibre Channel solution with integrated context memory. The controller allows for a cost effective solution for today's SANs, while expanding on the functionality and performance of the successful LSIFC929X product line. The LSIFC949X 4Gb/s Fibre Channel controller allows for investment protection while doubling performance over previous 2Gb/s generations. The LSIFC949X provides a "memory-less" build option for SMB SAN implementations reducing overall system costs.

An extremely cost-effective, power-efficient Fibre Channel solution, the LSIFC949X controller enables OEMs and system integrators to take full advantage of today's dual-channel SAN storage architectures by being fully compatible with 1, 2, and 4Gb/s infrastructures. The LSIFC949X is a true multifunction device supporting Fibre Channel Protocol (FCP) and Internet Protocol (IP) intermixed and simultaneous on both channels. The LSIFC949X controller features two independent, 4Gbit, full duplex channels and a large on-chip frame buffer credit providing efficient, long distance connection without the cost and real estate of extra external memory components.

Increased Performance

Expectations for industry leading performance reaching over 160,000 I/O per second. The LSIFC949X controller includes three embedded ARM® processors and advanced performance features, such as adaptive interrupt coalescing and native PCI-X.

APPLICATIONS

- Storage Area Networks (SANs)
- Storage virtualization implementations
- Embedded applications
 - HBAs
 - RAID storage systems
 - Routers and bridge implementations
 - Specialty servers
- Storage applications
- FC-tape applications

FEATURES

- Highly-integrated 4Gbit dual-channel, full duplex Fibre Channel protocol controller
- Integrated context memory
- 64-bit, 133MHz PCI-X host bus interface
- Integrated GigaBlaze™ 4 Gbit serial link
- Fusion-MPT™ architecture
- Auto-negotiation for legacy connect to 2G & 1G FC
- End-to-end data protection
- Custom ARM RISC processors
- Intelligent and high-performance context management
- Flexible synchronous SRAM external memory interface
- Full simultaneous target and initiator operations

Fibre Channel Interoperability Matrix
<http://interop.lsilogic.com>

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FEATURES (Continued)

- PC2001 compliant
- JTAG debug interface
- FCP-2 (tape)
- 544 Flip Chip package

FIBRE CHANNEL FEATURES

- BB credit of 16, alternate login of 1
- FC-PH, FC-AL2 r7.0, FC-FCP, FC-PLDA, FC-FLA, FCA-IP, FCP-2, and IETF-IPFC compliant
- N_Port supporting:
 - N_Port (Point-to-Point)
 - F_Port (Fabric Attach)
- NL_Port supporting:
 - NL_Port (Private Loop)
 - FL_Port (Public Loop)
- Supports all Fibre Channel topologies
- Supports scalable server I/O performance with multiple LSIFC949Xs
- Supports LAN over FC for cost-effective combined SAN and LAN in-band solution

Integrated Context RAM

The context integration is ideal for cost effective SMB & Blade server applications. The “memory-less” chip down implementation helps reduce overall solution cost and motherboard real estate requirements.

End-to-end Data Protection

Incorporates end-to-end data protection by appending the Data Integrity Field to block level data allowing integrity checks at each node of a system for enhanced data integrity & debug capability.

Multiple ALPA

Programmed to respond to multiple Alias Arbitrated Loop Physical Addresses (ALPA) up to the maximum FC-AL limit of 126. This capability enables targets to intercept packets for another failed controller, or for advanced clustering and virtualization applications. Each Alias port has full capabilities as the primary port.

HARDWARE FUNCTIONALITY

PCI Interface

The host PCI-X interface complies with the PCI Local Bus Specification Revision 2.3, and the PCI-X addendum. It implements a 133MHz, 64-bit bus and is backward compatible with 33/66MHz, 32/64-bit PCI.

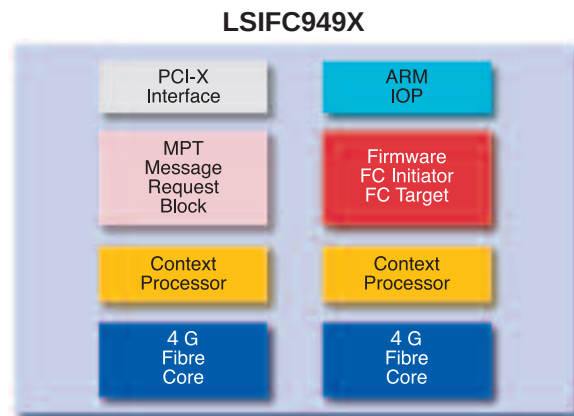


Figure 1: LSIFC949X block diagram

The LSIFC949X is a true PCI multifunction device and presents one electrical load to the PCI bus. It uses one REQ/-GNT/ pair to arbitrate for PCI bus mastership, and separate interrupt signals are generated for FC Channel A and FC Channel B for maximum performance. The LSIFC949X complies with PCI Power Management Interface Specification Revision 1.1 and PC2001. It supports power management capabilities, registers, and programmable values for PCI Subsystem Vendor ID and Subsystem ID. Extended access cycles (Memory Read Line, Memory Read Multiple, and Memory Write and Invalidate) are also supported.

32-bit Memory Controller

The memory controller in the LSIFC949X provides access to Flash ROM and 32-bit synchronous SRAM. The 32-bit memory controller also supports both interleaved and non-interleaved configurations up to a maximum of 16MB of synchronous SRAM. A general-purpose memory-expansion bus supports up to 1MB Flash ROM.

Custom ARM RISC Processor

The LSIFC949X utilizes 32-bit custom ARM RISC processors to control the system interface and dual-channel functionality, freeing the host CPU for other processing activity while maximizing overall I/O performance. The RISC processor and associated firmware has the ability to manage I/O's from start to finish without host intervention. The RISC processor also manages the SAN-architected, message-passing interface.

Link Control

The integrated link controller is FC-AL-2 r7.0 compliant and performs all link operations. The controller monitors the Link State and strictly adheres to the Loop Port State Machine, ensuring maximum system interoperability.

GigaBlaze™ Integrated 4 Gbit Transceivers

The LSIFC949X features LSI Logic's GigaBlaze dual integrated, 4Gbit transceivers, providing considerable reliability, speed and distance in interconnect technology. The channels independently support auto-negotiation down to 1Gbit rates, allowing for the investment protection of legacy and next-generation devices.

FIBRE CHANNEL FEATURES (Continued)

- MyStorage™ management software
- Support for failover and load balancing
- Supports target mode and SCSI initiator, concurrently
- Alias ALPA support – 126 addresses
- Concurrent SCSI and IP protocol

OS SUPPORT

- Windows Server 2003
- Windows 2000
- Windows XP
- Linux (Red Hat 6.X, SUSE, Turbo)
- Solaris SPARC™ 7 and higher
- Novell NetWare 6.5

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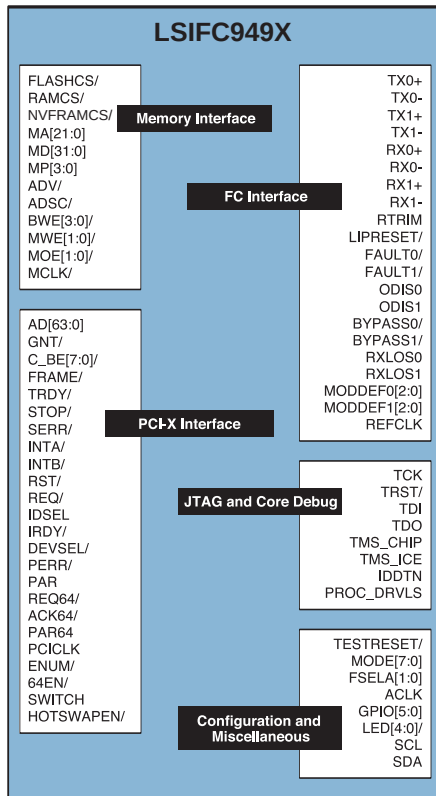


Figure 2: LSIFC949X functional signal grouping

FUSION-MPT ARCHITECTURE

LSI Logic's Fusion-MPT architecture has integrated internal processors that offload the server CPU for automatic linear scalability, giving you better overall system performance and more reliable data transfers at a faster rates. The Fusion-MPT architecture also has thinner host drivers that support better performance with a more versatile system.

Fusion-MPT is designed as a standard software interface that is independent of underlying physical interfaces and protocols. The LSIFC949X Fusion-MPT implementation allows compatibility with LSI Logic's complete line of Common Architecture Drivers. This technology provides the benefit of complete binary compatibility of host software across different physical interfaces (such as SCSI, Fibre Channel and Serial Attached SCSI) and future interface controller product generations. The result is reduced software development, as well as considerably less integration and certification time, for system designers with a critical need to shorten time to market.

For more information please visit the LSI Logic web site at:

<http://lsilogic.com/storage>

<http://adapters.lsilogic.com>



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Warranty

For more than 15 years, LSI Logic host adapters have been providing high-performance SCSI solutions to leading server, disk array and computer systems worldwide. Each host adapter carries a powerful chip built in LSI Logic's ISO 9001-certified fabrication facilities. Using only the highest quality components, LSI Logic host adapters are assembled and tested in world-class facilities to assure superior product reliability and performance. Because of stringent quality management programs, our host adapters carry a three-year limited warranty.

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