LSI™

FW643E

PCI Express 1394b Link / PHY Open Host Controller Interface

FEATURE SUMMARY

- **Single-chip, integrated Link and PHY for PCI Express 1394b**
- **Supports three 1394b 800-Mb/s ports**
- **High-performance, pipelined data transfer**
- **Sustained performance of 87-MByte/s read and 78-MByte/s write**
- **Dedicated asynchronous and isochronous descriptor-based DMA engines**
- **Large DMA FIFOs**
- **Enhanced power management**
- **480-mW typical power consumption**
- **Full Advanced System Power Management (ASPM) and CLKREQ power management support**
- **Single 24.576-MHz crystal for lower BOM costs**
- **Single 3.3-V supply**
- **Optional configuration EEPROM support**
- **Small form factor halogen-free BGA package – 7 x 7mm footprint**
- **Also available in 11 x 11 mm BGA package for lower-cost board layouts**
- **Support for Windows and MacOS operating systems**
- **Supports eight isochronous contexts for greater number of concurrent video streams**

Brief Description

The LSI FW643E is a second-generation 1394b Open Host Controller Interface (OHCI) designed specifically for high-performance, PCI Express applications. Based on LSI's proven TrueFire® technology, the FW643E has enhanced performance and power management features to deliver improved data transfer rates with lower power consumption.

The FW643E is the fastest 1394b device and the only single-chip PCI Express 1394b device available on the market today.

The FW643E is ideally suited for high-end PC desktops and notebooks, adapter cards, PC gaming systems, external disk drive backups, industrial vision systems, and other applications where reliable, high-performance, data transfer is required.

LSI provides support for the FW643 with:

- Evaluation adapter board
- Ready-to-manufacture adapter card reference design
- Manufacturing test utilities
- Configuration EEPROM image
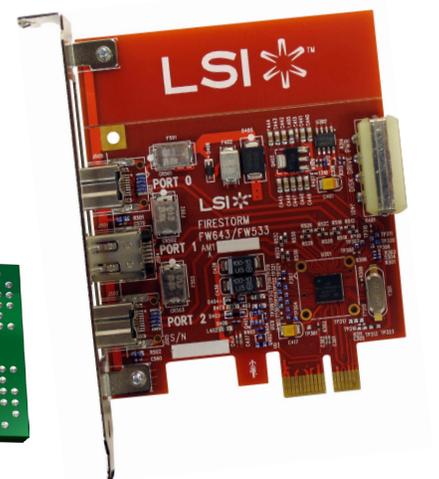
Open Host Controller Interface (OHCI) Features

- Supports OHCI 1.1 and OHCI 1.2 draft features

- Configurable via EEPROM for backward-compatible OHCI 1.0 mode

- Dedicated DMA engines and FIFOs for each 1394 traffic type

  – 8-Kbyte isochronous transmit FIFO

  – 4-KByte asynchronous transmit FIFO

  – 8-KByte isochronous receive FIFO

  – 8-KByte asynchronous receive FIFO

- Supports parallel processing of incoming physical read and write requests

- Supports 48-bit addressing of physical DMA transfers

PCI Express Features

- Fully compliant with PCI Express revision 1.1 base specification

- Provides multiple virtual channel (VC0, VC1) support for differentiating 1394 isochronous traffic

- Supports eight user-programmable traffic classes

- Supports 32-bit and 64-bit platforms

- Supports interrupts via legacy INTx interface or Message Signaled Interrupts (MSI)

- Supports Advanced System Power Management (ASPM) and all power management states (L0, L0s, L1, and L2/L3)

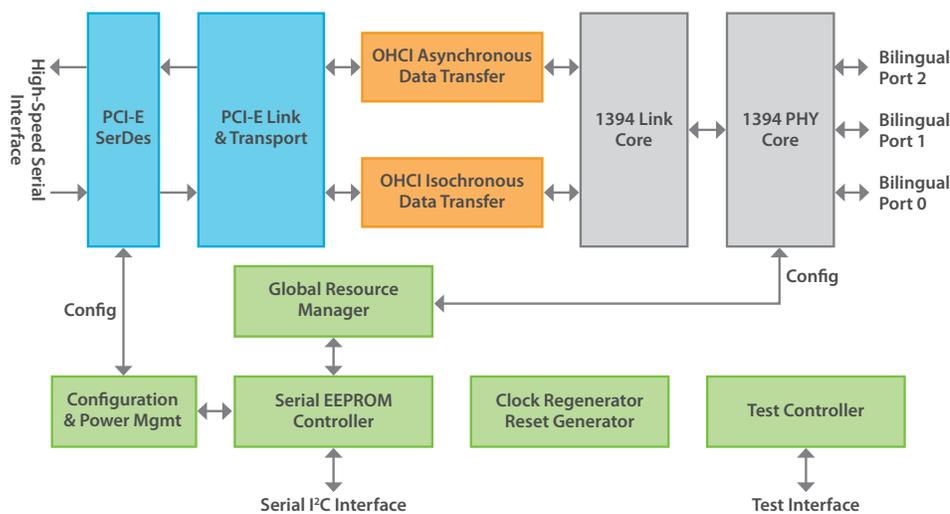- Supports wake-up from a low-power state via in-band beacon signaling and side-band WAKE_N signal

1394b-2002 Link Features

- Each port configurable for 1394b or 1394a support

- Cycle Master and Isochronous Resource Manager capabilities

- Supports 1394a-2000 and 1934b-20002 acceleration features

1394b-2002 PHY Features

- Supports 1394b speeds of 800 Mb/s and 400 Mb/s (S800B and S400B, respectively)

- Backwards compatible with 1394a speeds of 100 Mb/s, 200 Mb/s, and 400 Mb/s (S100, S200 and S400)

- Eliminates the need for link support during hub operations

- Supports extended BIAS_HANDSHAKE time for enhanced interoperability with 1394 camcorders

- Supports arbitrated short bus reset to improve utilization of the bus

- Supports ack-accelerated arbitration and fly-by concatenation

- Supports PHY pinging and remote PHY access packets

- Supports suspend and resume functions

ORDERING INFORMATION:

Device	Comcode
FireStorm FW643E Evaluation Board	711014225
Chile Reference Design	711016904
L-FW643E-01-DB	711018932
L-FW643E-01-BP-DB	711021419
L-FW643E-01-DT (tape and reel)	711023670
L-FW643E-01-BP-DT (tape and reel)	711023671

Functional Block Diagram