Marvell® FastLinQ® 57810S

10Gbps Dual-Port iSCSI, FCoE, and PCI-SIG SR-IOV x8 PCI Express® 2.0 Converged Controller

- Low-power, single-chip solution for two ports of 10GBASE-KR compliant backplane 1G/10G Ethernet
- Low-power, single-chip solution for two ports of SFP+ optical Converged Network Adapter
- iSCSI v1.0 Host Bus Adapter
- FCoE Host Bus Adapter applications
- Applications with energy efficient Ethernet (EEE) for power savings with 10GBASE-T
- Virtualization environments
- 10GBASE-KR mezzanine card for server blades
- 10GBASE-T copper NIC with external 100M/1G/10G copper PHY (BCM84833, for example)

The Marvell FastLinQ 57810S Converged Controller is a sixth-generation design for high-volume, converged LAN on motherboard (LOM) and Converged Network Adapter applications. The controller enables PCI-SIG single root input/output virtualization (SR-IOV), iSCSI, Fibre Channel over Ethernet (FCoE), on-chip TCP/IP offload engine (TOE), and data center bridging (DCB). The converged controller supports PCI Express (PCIe®) 2.0, along with embedded virtual bridging and other switching technologies for high-performance DMA and virtual machine (VM)-to-VM switching.

The Marvell FastLinQ 57810S Controller includes dual-channel 10GBASE-KR and SFF-8431 for SFP+ 10Gb and SFP 1Gb interfaces. The 57810S integrates two IEEE 802.3™-compliant MACs and supports the network controller-sideband interface (NC-SI). Host-BMC communication is also supported on top of NC-SI to permit high-speed communication between the local host and the baseboard management controller (BMC) or management controller (MC). The feature-complete converged controller requires only 0.82 square inches of printed circuit board (PCB) space and enables 10G speeds at low per-port power.

For more effective use of 10GbE bandwidth, the Marvell FastLinQ 57810S Controller offers Marvell switch-independent NIC partitioning (NPAR), which enables the segmentation of a single 10GbE port into four virtual ports with flexible bandwidth allocation to each partition. The segmentation allows IT organizations to improve resource utilization while lowering infrastructure and operational costs.

TheMarvell FastLinQ 57810S Controller enables convergence of all possible network communications in a server, such as data network (LAN), FCoE storage network or block (for example, iSCSI). The 57810S Controller can simultaneously support all offload traffic types on each of the ports, including simultaneous iSCSI and FCoE. Offload results in superior storage and networking performance, as well as low CPU usage, which results in significant system-level power savings.

The FastLinQ 57810S Controller is designed for *PCI Express Base Specification*, revisions 2.0 and 1.1. PCIe supports MSI and MSI-X capabilities. A separate PCI function is supported for each of the ports.

Features

Media Interfaces

- Integrated dual 10Gbps MAC with offload and dual 10GBASE-KR/ SFF-8431 (SFP+)
- Single 25.00MHz clock crystal for dual-port 10Gbps operation

Host Interfaces

- PCIe x8 2.0, 5GT/s and x8 1.1, 2.5GT/s compliant
- PCIe lanes x1, x4, and x8
- No external dynamic random-access memory (DRAM) required; flow-through architecture
- PCIe CLKREQ support
- SR-IOV
- Comprehensive IPv4 and IPv6 stateless offloads
- Broad OS and hypervisor support
- RSS and TSS
- Support for jumbo frames up to 9,600 bytes
- Network teaming, failover and load balancing
- MSI and MSI-X support
- Marvell switch-independent NPAR
- Generic routing encapsulation (NVGRE) packet task offloads
- Virtual extensible LAN (VXLAN) packet task offloads
- Generic network virtualization encapsulation packet task offloads
- Generic routing encapsulation (GRE) packet task offloads

Network Interfaces

- Dual-port 10GBASE-KR/SFF-8431 (SFP+) interfaces for 1Gbps and 10Gbps operation
- IEEE 802.3-2015 Clause 73-compliant auto-negotiation for backplane and copper cable operation
- IEEE 802.3-2015 Clause 37-compliant auto-negotiation for 1Gbps

iSCSI Controller

- Offloaded full Host Bus Adapter function iSCSI initiator
- iSCSI boot and iSCSI crash dump support

FCoE

- Receiver and transmitter CRC offload
- Offloaded full Host Bus Adapter function FCoE initiator
- FCoE boot from SAN
- Large, concurrent port logins and exchanges (4,096 each)
- N_Port ID virtualization (NPIV)
- Virtual Fibre Channel (vFC) on Windows Server® 2012, 2012 R2, 2016 Hyper-V

Robust Manageability

- NC-SI
- Pre-execution environment (PXE) v2.1 remote boot
- Statistics gathering (IEEE 802.3 Clause 30) using SNMP management information base [MIB] II and Ethernet MIB (IEEE 802.3.1-2013)
- Comprehensive diagnostic and configuration software suite

DCB

- Enhanced transmission selection (ETS) (IEEE 802.1Qaz)
- Quantized congestion notification (QCN)-capable (IEEE 802.1Qau)
- Priority-based flow control (PFC) (IEEE 802.1Qbb)
- IEEE 802.1Qbg- and IEEE 802.1Qbh-capable for traffic switching
- Lossless iSCSI-Offload-TLV over DCB

Benefits

- SR-IOV 10Gbps and converged solution—Power and space optimized for blade server, rack, tower, and Converged Network Adapter applications
- Extremely low CPU usage for iSCSI, FCoE, and TCP/IP
  - Host CPU is free to run application code
  - Minimal load on memory subsystem with zero copy
- Accelerated IP-based file and block storage
  - Lower CPU usage for file-level storage protocols such as common Internet file system (CIFS), server message block (SMB) protocol, and NFS
  - Offloaded and accelerated iSCSI block storage with high I/O per second and low CPU usage
- Accelerated FCoE
  - Offloaded and accelerated FCoE for Fibre Channel block storage with high I/O per second and low CPU usage
- Performance-focused—Optimized for high throughput, low latency, and CPU usage
  - Adaptive interrupt coalescing
  - Receive side scaling (RSS) reduces CPU usage on multi-CPU systems
  - MSI and MSI-X allows interrupt distribution in a multi-CPU system.
- Robust and highly manageable
  - NC-SI enables high bandwidth out-of-band system management functionality over shared infrastructure.
  - Guaranteed delivery of management traffic
  - PXE v2.1, ACPI v2.0b, and WoL
  - Host-BMC communication for connectivity between local host and management controller (MC or BMC)
- Server class reliability, availability, and performance features
  - Link aggregation and load balancing (switch-dependent)
  - IEEE 802.3ad (link aggregation control protocol [LACP]), generic trunking (GEC/FEC) (switch- and NIC-independent)
- RoHS compliant

Part Number

- B57810SB0KFSBR

Host Bus Interface Specifications

Bus Interface

- PCIe 2.0 x8 (x8 physical connector).

Host Interrupts

- MSI-X supports independent queues

I/O Virtualization

- SR-IOV (128 maximum virtual functions per device)
- Marvell switch-independent NPAR (8 physical function partitions per device)
- Network virtualization using generic routing encapsulation (NVGRE) packet task offloads
- Virtual extensible LAN (VXLAN) packet task offloads
- Generic network virtualization encapsulation (GENEVE) packet task offloads
- Generic routing encapsulation (GRE) packet task offloads

Compliance

- *PCI Express Base Specification*, rev. 2.0
- *PCI Bus Power Management Interface Specification*, rev 1.2
- *Advanced Configuration and Power Interface (ACPI)*, v2.0
- *SMBus* 2.0

Ethernet Specifications

Throughput

- 10Gbps full-duplex line rate per 10G port

Ethernet Frame

- Standard MTU sizes; jumbo frame up to 9,600 bytes

Stateless Offload

- TCP segmentation offload (TSO)
- Large send offload (LSO)
- Large receive offload (LRO)
- Giant send offload (GSO)
- TCP and user datagram protocol (UDP) checksum offloads
- Hardware transparent packet aggregation (TPA)
- Receive segment coalescing (RSC)
- Interrupt coalescing
- RSS and TSS—Maximum of 16 queues per any (1GbE or 10GbE) physical function (PF) in single function (SF) and Marvell switch-independent partitioning modes
- VMware® NetQueue and Microsoft® dynamic virtual machine queue (VMQ)

Ethernet Specifications (continued)

Compliance

- *IEEE 802.3ae-2012 (10Gb Ethernet)*
- *IEEE 802.3-2015 (IEEE 802.3bx) clause 72 (10Gb Ethernet)*
- *IEEE 802.1q (VLAN)*
- *IEEE 802.3ad (Link Aggregation)*
- *IEEE 802.3-2015 (Flow Control)*
- *IPv4 (RFC 791)*
- *IPv6 (RFC 2460)*
- *IEEE 802.1Qbb (Priority-Based Flow Control)*
- *IEEE 802.1Qaz (DCBX and Enhanced Transmission Selection)*
- *IEEE 802.1AS/1588-2002 PTPv1 (Hardware Precision Time Protocol)*
- *IEEE 1588-2008 PTPv2*
- *IEEE 802.3-2015 Clause 52 (10Gb Ethernet optical on SFP ports)*
- *SFF8431 Annex E (10Gb Direct Attach Copper on SFP ports)*
- *IEEE 802.3an-12 Clause 55 10GBASE-T (on BASE-T ports)*
- *IEEE 802.3ab-2012 Clause 39 1000BASE-T (on BASE-T ports)*
- *IEEE 802.3-2012 Clause 25 100BASE-TX (on BASE-T ports)*
- *IEEE 802.3az (Energy Efficient Ethernet on BASE-T ports)*
- *SFF8431 (enhanced Small Form Factor Pluggable modules)*

Tools and Utilities

Management Tools and Device Utilities

- QConvergeConsole® (QCC) integrated network management utility (GUI) for Linux and Windows
- Marvell FastLinQ PowerKit cmdlets for Linux and Windows
- QCC Plug-in for vSphere® (GUI) and ESXCLI plug-in for VMware
- QLogic® Control Suite (QCS) command line interface (CLI) for Linux and Windows
- Pre-boot unified extensible firmware interface (UEFI) Device Configuration pages in system BIOS)
- Marvell Comprehensive Configuration Management (CCM)
- Native OS management tools for networking

Boot Support

- iSCSI remote boot
- FCoE boot from SAN
- PXE 2.0

Operating System Support

- For the latest applicable operating system information, see Marvell.com

Controller Specifications

Ports

- Dual 10Gbps Ethernet

Connectors

- Two SFP+ ports (supporting 1G/10G) or;
- Two RJ45 ports (with external 10GBASE-T PHY supporting 100M/1G/10G) or;
- Two KR ports (supporting 1G/10G)

Certifications

- FCC A, UL, CE, VCCI, BSMI, C-Tick, KCC, TUV, and ICES-003

Temperature

- Storage: less than 86°F (less than 30°C)

Packaging

- 23mm × 23mm, 484-ball, flip-chip ball grid array with heat spreader (FCBGA-H)
- 1.0mm ball pitch

Environmental/Equipment

Compliance

- RoHS 6 compliant
- Halogen free

Ordering Information

Marvell FastLinQ 57810S, part number B57810SB0KFSBR

- Ships with a minimum order of 420 devices (60 devices per tray × 7 trays)

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To deliver the data infrastructure technology that connects the world, we're building solutions on the most powerful foundation: our partnerships with our customers. Trusted by the world's leading technology companies for 25 years, we move, store, process and secure the world's data with semiconductor solutions designed for our customers' current needs and future ambitions. Through a process of deep collaboration and transparency, we're ultimately changing the way tomorrow's enterprise, cloud, automotive, and carrier architectures transform—for the better.