Marvell® FastLinQ® BCM57811S

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

- Low-power, single-chip solution for one port of 10GBASE-KR compliant backplane 1G/10G Ethernet
- Low-power, single-chip solution for one port 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® BCM57811S is a sixth-generation converged controller designed 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 direct memory access (DMA) and virtual machine (VM)-to-VM switching.

The BCM57811S includes a single-channel 10GBASE-KR and SFF-8431 for SFP+ 10Gb and SFP 1Gb interface. The BCM57811S integrates an IEEE 802.3™-compliant MAC 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 the 10GbE bandwidth, the Marvell FastLinQ BCM57811S offers 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 efficiency while lowering infrastructure and operational costs.

The BCM57811S enables convergence of all possible network communications in a server, such as data network (LAN), FCoE storage network, or block (for example, iSCSI). The BCM57811S can simultaneously support all offload traffic types, 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 BCM57811S is designed for the PCI Express Base Specification, revisions 2.0 and 1.1. PCI Express supports MSI and MSI-X capabilities.

Features

Media Interfaces

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

Host Interfaces

- PCIe x8 2.0, 5GT/s and PCIe x8 1.1, 2.5GT/s compliant
- PCI Express lanes x1, x4, and x8
- No external dynamic random-access memory (DRAM) required; flowthrough architecture
- PCI Express 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
- Switch-independent NIC partitioning
- 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

Network Interfaces

- Single-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 cyclic redundancy check (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 on Windows Server® 2012, 2012 R2, 2016 Hyper-V

Robust Manageability

- NC-SI
- Pre-execution environment (PXE) v2.1 remote boot
- Wake-on-LAN (WoL)
- 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 Protocol (SMB), 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 function 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

- B57811SB0KFSBR

Host Bus Interface Specifications

Bus Interface

- PCI Express 2.0 x8 (x8 physical connector)

Host Interrupts

- MSI-X supports independent queues

I/O Virtualization

- SR-IOV (128 maximum virtual functions per device)
- QLogic switch-independent NIC partitioning (8 physical function partitions per device)
- Network virtualization using NVGRE packet task offloads
- VXLAN packet task offloads
- GENEVE 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

- 1,500 bytes and larger (jumbo frames)

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 QLogic switch-independent partitioning modes
- VMware® NetQueue and Microsoft® virtual machine queue (VMQ)

Ethernet Specifications

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 802.3x (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 (Hardware Precision Time Protocol)*
- *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®
- QCC 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
- QLogic 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 www.marvell.com, **Downloads.**

Controller Specifications

Ports

- Single 10Gbps Ethernet

Connectors

- 10Gbe: one SFP+ port or one RJ45 port (with external 10GBASE-T PHY) or one KR port

Certifications

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

Temperature

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

Controller Specifications

RoHS Compliance

- Green (RoHS 6 compliant and halogen free

Packaging

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

Ordering Information

QLogic BCM57811S, part number B57811SB0KFSBR

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