Broadcom BCM57810S NetXtreme II® Converged Controller

Connecting everything®

10 Gbps DUAL-PORT iSCSI, FCoE, TOE, and RDMA PCI-SIG SR-IOV x8 PCI EXPRESS® 3.0-READY CONTROLLER

57810S

Highlights

- Low-power single-chip solution for two ports of 10GBASE-KR compliant backplane 10G Ethernet
- Low-power single-chip solution for two ports of SFP+ optical converged network adapter
- iSCSI v1.0 Host Bus Adapter (HBA)
- FCoE HBA applications
- Applications with Energy Efficient Ethernet™ for power savings with 10GBASE-T
- Virtualization environments
- 10GBASE-KR Mezzanine card for server blades
- 10GBASE-T copper NIC with Broadcom external 10G copper PHY (e.g., BCM84833)

	BCM57810S
Service Provider	●
Data Centers	●
Enterprise	●

◐ Supported   ● Best Choice

Overview

The BCM57810S is a sixth-generation Converged Controller designed for high-volume, converged LAN on motherboard (LOM) and converged network adapter applications, enables PCI SIG Single Root I/O Virtualization (SR-IOV), iSCSI, FCoE, DCB, on-chip TOE, and RDMA. The Converged Controller supports PCIe™ 3.0 along with Embedded Virtual Bridging and other switching technologies for high-performance direct memory access (DMA) and virtual machine (VM) to VM switching.

The BCM57810S includes dual-channel 10GBASE-KR and SFF-8431 for SFP+ 10 Gb interfaces. The BCM57810S integrates two IEEE 802.3™-compliant Media Access Controllers (MAC) and supports the 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 MC). The feature-complete Converged Controller requires only 0.82 square inches of PCB space and enables 10G speeds at low per port power.

The BCM57810S enables convergence of all the possible network communications in a server, such as data network (LAN), FCoE storage network, block, for example, iSCSI, or file, for example, CIFS/NFS, clustering or Interprocess Communications (IPC) by support of RDMA over TCP. The BCM57810S 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, and low CPU utilization, resulting in significant system level power savings.

The BCM57810S is designed for PCIe 3.0 and is also compatible with PCI Express® (PCIe) Base Specification Revisions 2.0 and 1.1. The PCI Express supports MSI and MSI-X capabilities. A separate PCI function is supported for each of the ports.

BCM57810S Features

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

Host Interfaces
- PCI Express x8 3.0, 8 GT/s-ready
- PCI Express x8 2.0, 5 GT/s compliant
- PCI Express x8 1.1, 2.5 GT/s compliant
- PCI Express Lanes x1, x4, x8
- No external DRAM required; flow-through architecture
- PCI Express CLKREQ support
- Single Root I/O Virtualization
- Message Signal Interrupt (MSI/MSI-X) support

Network Interfaces
- Dual-port 10GBASE-KR/SFF-8431 (SFP+) interfaces for 1 Gbps/10 Gbps operation
- IEEE 802.3ap Clause 73-compliant backplane operation
- IEEE 802.3xx Clause 37-compliant auto-negotiation for 1 Gbps

TCP/IP Offload Engine (TOE)
- Microsoft® TCP chimney compliant
- Full FASTPATH® TCP offload for IPv4 and IPv6

Internet Small Computer Systems Interface (iSCSI) Controller
- Offloaded full HBA functionality iSCSI initiator
- iSCSI boot and iSCSI crash dump support

Fibre Channel over Ethernet (FCoE)
- Receiver and transmitter CRC offload
- Offloaded full HBA functionality FCoE initiator
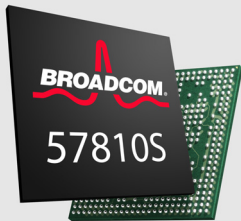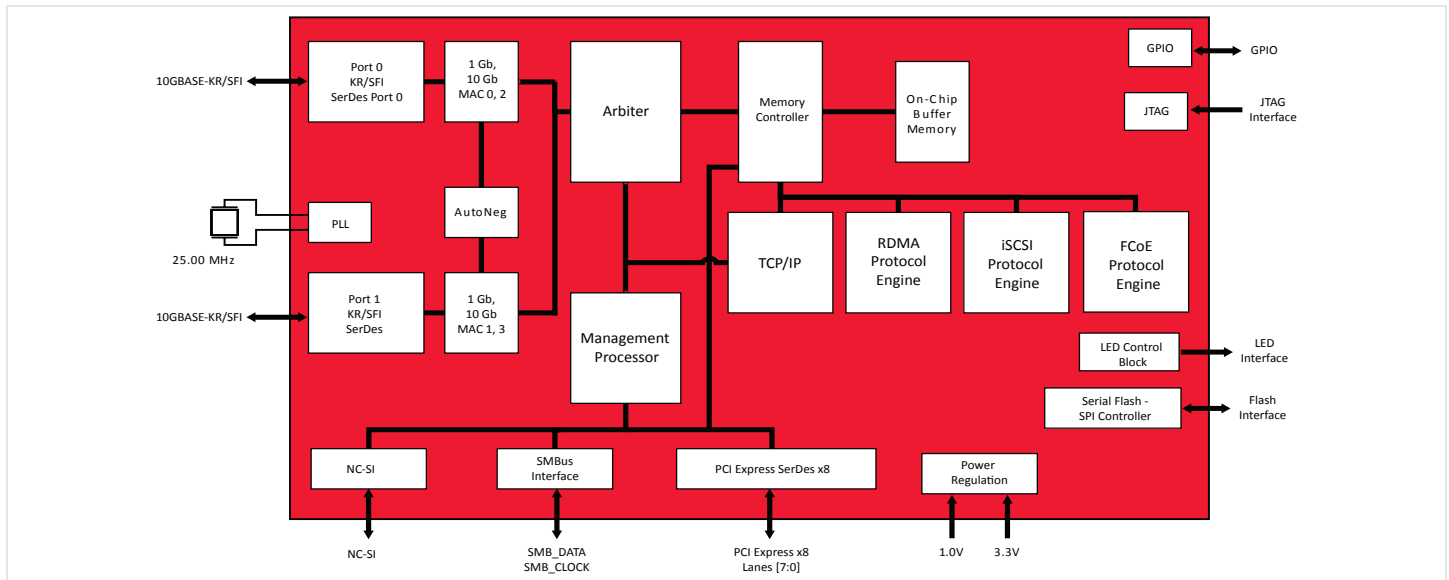
RDMA Controller (R-NIC)
- Hardware-based data placement in application buffers without CPU intervention (for user and Kernel modes)
- Low latency

Robust Manageability
- Network Controller Sideband Interface (NC-SI)
- PXE v2.1 remote boot
- Wake-on-LAN (WOL)
- Statistics gathering (SNMP MIB II, Ethernet MIB) (IEEE 802.2x, Clause 30)
- Comprehensive diagnostic and configuration software suite

Data Center Bridging (DCB)
- Enhanced Transmission Selection (ETS) (IEEE 802.1Qaz)
- Quantized Congestion Notification-Capable (QCN) (IEEE 802.1Qau)
- Priority Flow Control (PFC) (IEEE 802.1Qbb)
- IEEE 802.1Qbg- and IEEE 802.1Qbh-capable for traffic switching

BCM57810S Block Diagram

BCM57810S Benefits

SR-IOV 10 Gbps/Converged solution—Power and space optimized for Blade server, Rack, Tower, and Converged Network Adapter applications

Extremely low CPU utilization for iSCSI, FCoE, TCP/IP, and RDMA applications

- 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 utilization for file-level storage protocols such as CIFS/SMB and NFS
- Offloaded and accelerated iSCSI block storage with high I/O per second and low CPU utilization

Accelerated FCoE

- Offloaded and accelerated FCoE for Fibre Channel block storage with high I/O per second and low CPU utilization

Performance-focused—Optimized for high throughput, low latency, and CPU utilization

- Adaptive interrupt coalescing
- RSS reduces CPU utilization on multi-CPU systems.
- MSI/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, WOL
- Host-BMC Communication for connectivity between local host and Management Controller (MC/BMC)

Server class reliability, availability, and performance features

- Link aggregation and load balancing
  - Switch-dependent
- IEEE 802.3ad (LACP), generic trunking (GEC/FEC)
  - Switch- and NIC-independent

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Broadcom Corporation is a major technology innovator and global leader in semiconductors for wired and wireless communications. Broadcom products enable the delivery of voice, video, data and multimedia to and throughout the home, the office and the mobile environment. We provide the industry's broadest portfolio of state-of-the-art system-on-a-chip and software solutions to manufacturers of computing and networking equipment, digital entertainment and broadband access products, and mobile devices.

These solutions support our core mission: Connecting everything®.

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