

BCM5708C





10/100/1000BASE-T TCP Offload Engine, RDMA, iSCSI/iSER and Ethernet Controller with PCI-Express™

FEATURES

Single-chip solution for LAN on Motherboard (LOM) and Network Interface Card (NIC) applications

- Integrated 10BASE-T/100BASE-TX/1000BASE-T transceivers
- Host interfaces
 - PCI-ExpressTM x4 Host interface

TCP offload engine

- Full "fast Path" TCP offload
- Compliant with Microsoft's TOE Chimney Architecture

• iSCSI controller

- iSCSI initiator
- iSER (iSCSI over RDMA)

RDMA controller (RNIC)

- RDMA over TCP (iWARP)—RDMAC 1.0 compliant
- Hardware-based data placement in application buffers without CPU intervention (User and Kernel modes)

Other performance features

- Receive Side Scaling (RSS)
- TCP, IP checksum
- · TCP segmentation
- Adaptive interrupts
- Message Signal Interrupt (MSI) support

Robust manageability

- Universal Management Port (UMP)
- PXE 2.0 remote boot
- Alert Standard Format (ASF v1.0) support
- Wake-On LAN
- IPMI 'pass-through' feature
- Statistics gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30))
- · Comprehensive diagnostic and configuration software suite
- ACPI 1.1a compliant power management

Advanced network features

- Virtual LANs—802.1q VLAN tagging
- Jumbo frames (9 KB)
- 802.3x flow control

Low-power CMOS design

- On-chip power circuit controller
- 400-ball 21x21 mm FBGA package
- 3.3V I/Os
- JTAG

SUMMARY OF BENEFITS

- Industry's first 10/100/1000 TOE solution—power and space optimized for server blade and low-profile NIC applications.
- Extremely low CPU utilization for TCP/IP applications
 - Host CPU is free to run application code
 - Easy integration with Microsoft's TOE Chimney Architecture

Accelerated IP-based storage

- Lower CPU utilization for file-level storage protocols such as CIFS and NFS
- iSCSI functionality with low CPU utilization
- RDMA support for data placement in application buffers reduces CPU utilization and lowers data transit latencies.

Future-proof

- Flexible implementation for TCP, iWARP and iSCSI can accommodate specification changes and interoperability
- Performance-focused optimized for throughput and CPU utilization
 - Adaptive interrupts
 - RSS reduces CPU utilization on multi-CPU systems.
 - MSI allows interrupt distribution in a multi-CPU host system.
 - PCI-Express host interface allows a low-latency access to CPU and Memory resources.

Robust and highly manageable

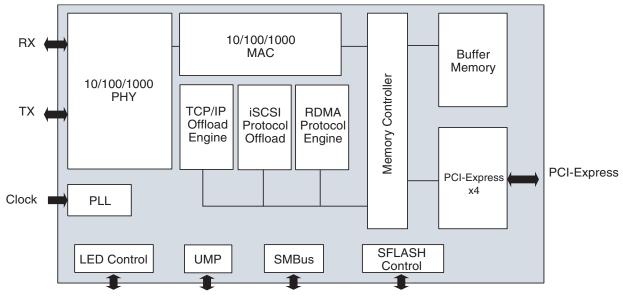
- UMP enables high bandwidth "out-of-band" system management functionality over shared infrastructure.
- PXE 2.0, ACPI 1.1, Wake-On LAN, ASF 1.0.
- IPMI 'pass-through' capability allows on-board management controllers access to the network in OS-present and OS-absent states
- Server class reliability, availability, and performance features
 - Link aggregation and load balancing
 - Switch-dependent
 - 802.3ad (LACP), generic trunking (GEC/FEC)
 - Switch and NIC independent

• Low power for zero airflow implementations

- Advanced power management
- Minimal real estate—ideal for LOM
 - On-chip power circuit controller



OVERVIEW



LED Signals UMP Interface SMB Interface SFLASH Interface

The BCM5708C provides a fully integrated Layer 4 and Layer 5 solution - TCP/IP, RDMA and iSCSI 1.0/iSER along with a complete 10/100/1000BASE-T Gigabit Ethernet, IEEE 802.3 compliant Media Access Control (MAC) and Physical Layer Transceiver solution for high performance network applications. By itself, the BCM5708C provides a complete single-chip Gigabit Ethernet NIC with a TCP/IP Offload Engine, RDMA NIC (RNIC), iSCSI 1.0/iSER HBA or LOM solution.

The BCM5708C is different from other network controllers because it can process the TCP/IP and relevant L5 protocols on data directly from the application buffers on the host, therefore relieving the host CPU from these time-consuming operations. On the receive path, the BCM5708C processes the frame up to the highest layer supported present in it, e.g., the BCM5708C processes the frame for RDMA when the frame is an RDMA frame.

With the appropriate configuration, the **BCM5708C** can simultaneously support any two of the following three functions:

- RDMA Network Interface Controller (RNIC)
- iSCSI or iSER Host Bus Adapter
- TOE Chimney-enabled network accelerator

Target Applications of the BCM5708C

- Gigabit Ethernet NICs and LAN-on Motherboard (LOM)
- ISCSI 1.0 / iSER Host Bus Adapters (HBA)
- RDMA Network Interface Card (RNIC)

| Network Interface Cards (NIC) designs | | LAN on Motherboard (LOM) designs | |
|---------------------------------------|--------------------|----------------------------------|-------------------|
| 10/100/1000 | PCI-Express x4 NIC | 10/100/1000 | PCI-Express |
| BASE-T | | BASE-T | x4, x2, or x1 LOM |

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