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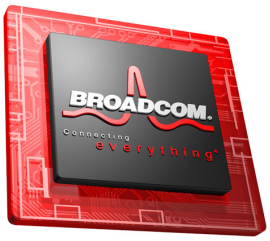
# BCM5708C PRODUCT Brief




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

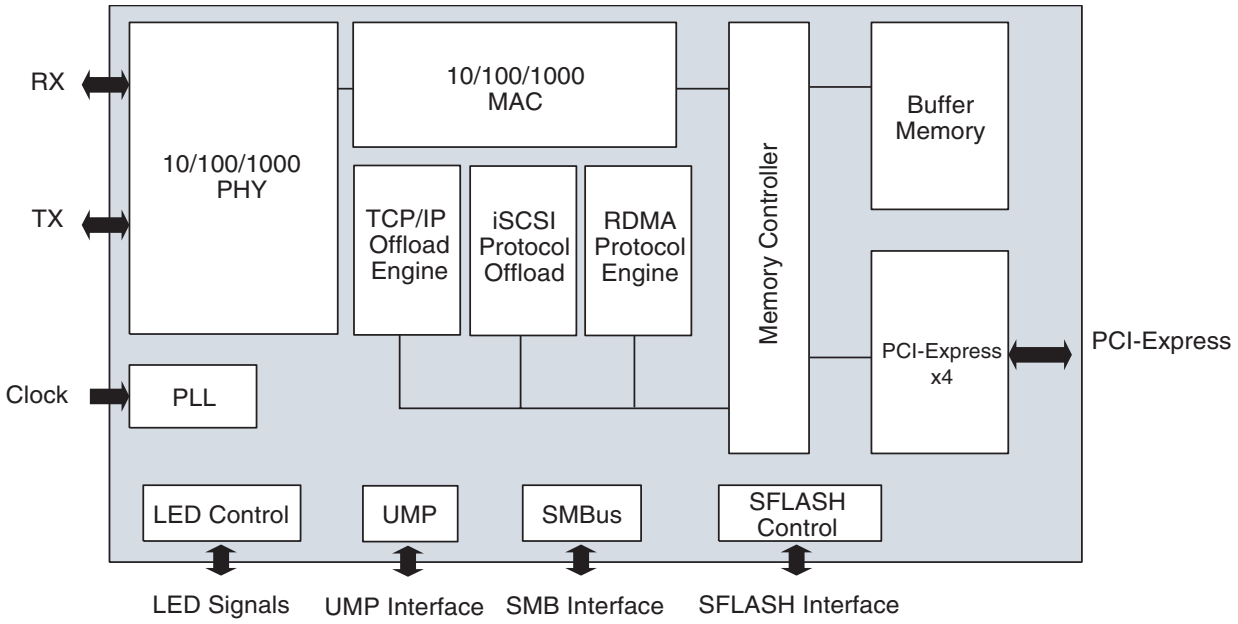
### FEATURES

- **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-Express™ 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 issues.
- **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




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 BASE-T | **PCI-Express x4 NIC** | 10/100/1000 BASE-T | **PCI-Express x4, x2, or x1 LOM** |



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