



## 10/100/1000BASE-T CONTROLLER WITH INTEGRATED TRANSCEIVER

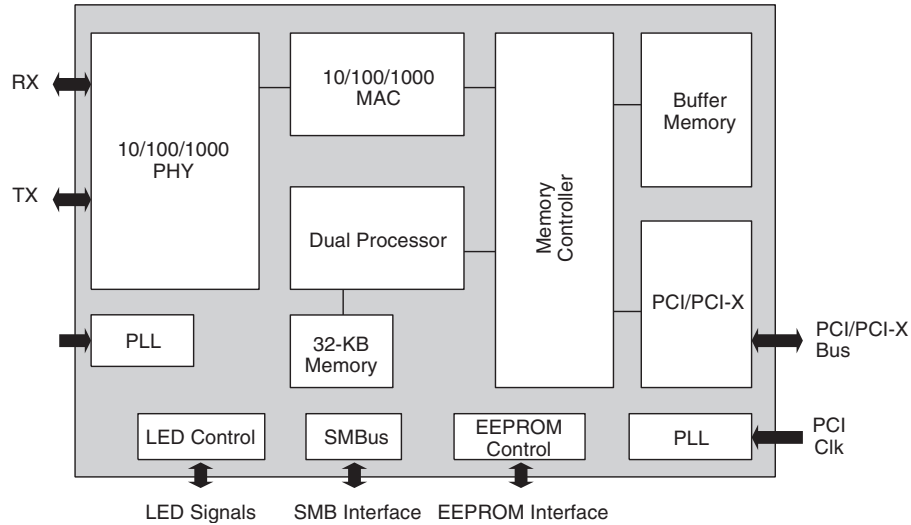
### FEATURES

- **Single-chip solution for LAN on Motherboard (LOM) and network interface card (NIC) applications**
  - Integrated 10BASE-T/100BASE-TX/1000BASE-T transceivers
  - 10/100/1000 triple-speed MAC
  - Host interfaces
    - PCI v2.2—32/64 bits, 33/66 MHz
    - PCI-X v1.0—64 bits, 66/100/133 MHz
  - Ultra-deep 96-KB on-chip packet buffer
  - Dual high-speed RISC cores with 16-KB caches
    - Programmable, in-line packet classification
  - SMBus 2.0 controller
  - On-chip power circuit controller and Wake on LAN (WOL) power switching circuit
- **Performance features:**
  - TCP, IP, UDP checksum
  - TCP segmentation
  - CPU task offload
  - Adaptive interrupts
  - Ultra-deep 96-KB packet buffer
- **Robust manageability:**
  - PXE 2.0 remote boot
  - Alert Standard Format—ASF 1.0 support
  - Wake on LAN
  - Out-of-box (OOB) Wake on LAN
  - Intelligent platform management interface (IPMI), version 1.5
  - Statistic gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB)
  - Comprehensive diagnostic and configuration software suite
  - ACPI 1.1a compliant multiple power modes
- **Advanced network features:**
  - Priority queuing—802.1p layer 2 priority encoding; support for four priority queues
  - Virtual LANs—802.1q VLAN tagging; support for up to 64 VLANs
  - Jumbo frames (9 KB)
  - 802.3x flow control
- **Advanced server features:**
  - Link aggregation—802.3ad, GEC/FEC, Smart Load Balancing™ (supports heterogeneous teams)
  - Heterogeneous, mixed-speed failover
  - PCI Hot-Plug support
- **Low-power, 0.13-um CMOS design**
- **400-pin FBGA package**
- **3.3V I/Os (5V tolerant)**
- **JTAG**

### SUMMARY OF BENEFITS

- **Industry's smallest 10/100/1000 MAC+PHY solution—power and space optimized for LOM and low-profile NIC applications**
- **Completely backward-compatible:**
  - To existing 10/100 network infrastructure
  - To existing PCI-based desktop and server platforms
- **Futureproof**
  - PCI-X interface, on-chip programmable CPUs, ASF support
- **Performance focused—optimized for throughput and CPU utilization**
  - Adaptive interrupts
  - PCI-X eliminates PCI bottlenecks
  - Ultra-deep 96-KB packet buffer lowers CPU utilization and avoids PCI congestion
  - CPU task offloads reduces utilization level of CPU
- **Robust and highly manageable**
  - PXE 2.0, ACPI 1.1a, Wake on LAN, ASF 1.0, IPMI
  - Integrated cable testing—link quality, length, pair skew, pair polarity, pair swap
- **Advanced features**
  - VLAN, priority queuing, jumbo frames
  - RISC processors for advanced packet classification
- **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
  - Smart Load Balancing™—unique technology that supports heterogeneous teams, and can operate with any switch
  - Failover
  - Smart Load Balancing allows heterogeneous failover
  - PCI Hot Plug
- **Low-power for zero airflow implementations**
  - 0.13-um CMOS design
  - Advanced power management
- **Space savings for LOM**
  - 400-pin FBGA package
  - No external memory
  - Integrated power circuitry

# OVERVIEW



The BCM5703 is a fully integrated 10/100/1000BASE-T Gigabit Ethernet media access control and physical layer transceiver solution for high performance network applications. The BCM5703 is a highly integrated solution combining a triple-speed, IEEE 802.3 compliant media access controller (MAC), PCI and PCI-X bus interfaces, an on-chip buffer memory, and an integrated physical layer transceiver in a single device. The BCM5703 is fabricated in a low-voltage, 0.13- $\mu\text{m}$  CMOS process providing a low-power system solution. The BCM5703 provides a complete single-chip Gigabit Ethernet NIC or LOM solution.

The BCM5703 includes a 10/100/1000-Mbps Ethernet MAC with full/half-duplex capability at all speeds and a 10/100/1000 copper PHY. Support for the following 802.3 functions is featured in the MAC: VLAN tagging, layer 2 priority encoding, link aggregation, and full-duplex flow control.

The device provides both PCI v2.2 and PCI-X v1.0 bus interfaces. The BCM5703 provides a large on-chip buffer memory for stand-alone operation. Dual on-chip high-performance processors enable custom frame processing features, including TCP segmentation.

The transceiver is fully compatible with the IEEE 802.3 standard for auto-negotiation of speed. Additionally, several Plug and Play enhancements have been added to make the device even more user-friendly. A link quality indicator LED gives installers an instant visual indication of any issues with the wiring plant supporting operation at the desired speed, which include physical wiring defects or channel conditions, such as excessive cable length, return loss, crosstalk, echo, and noise. Broadcom's remote cable management and diagnostics

software can be used with the device to provide remote management of the cable and a first level of diagnostics and fault isolation.

The BCM5703 continually monitors various channel conditions. The optional wirespeed capability allows the BCM5703 to force auto-negotiation to be automatically limited by the speed that the channel can reliably support (rather than by the performance of the end equipment).

## Target Applications of the BCM5703

Network Interface Cards (NIC) designs		LAN on Motherboard (LOM) designs	
<b>Single Port</b>			
10/100/1000 BASE-T	PCI 2.2 Adapters PCI-X v1.0 Adapters	10/100/1000 BASE-T	PCI 2.2 LOM PCI-X v1.0 LOM
1000 BASE-SX	PCI 2.2 Adapters PCI-X v1.0 Adapters	<b>Dual Port</b>	
1000 BASE-LX	PCI 2.2 Adapters PCI-X v1.0 Adapters	10/100/1000 BASE-T	PCI 2.2 LOM PCI-X v1.0 LOM
<b>Dual Port</b>			
10/100/1000 BASE-T	PCI 2.2 Adapters		

Gigabit Ethernet Network Interface Cards (NICs) and LAN-on Motherboard (LOM) applications for servers and workstations.

## BCM5703 Software Support

- Microsoft® Windows® 98, NT4.0, 2000, XP, NT64
- Linux® 2.2, 2.4
- Linux64®
- NetWare® 4.x, 5.x, 6.x
- PXE 2.0

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