

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

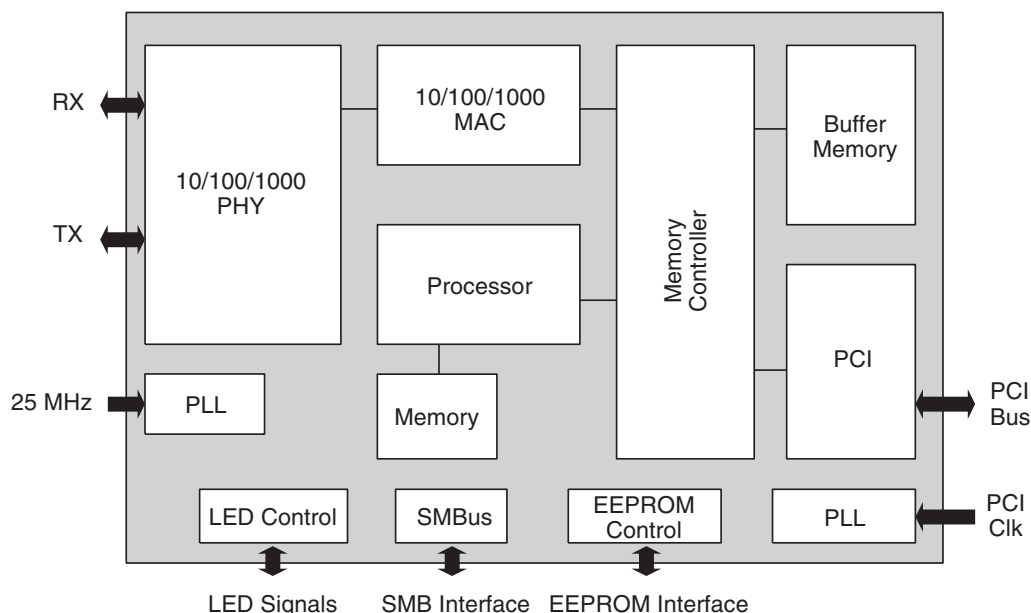
### FEATURES

- **Single-chip device for desktop LAN on Motherboard (LOM) or network interface card (NIC) applications**
- **Integrated 10/100/1000BASE-T transceiver**
  - 10/100/1000BASE-T triple-speed MAC
  - PCI v2.2, 32-bit/33-MHz host interface
  - High-speed RISC core with 24-KB caches
  - SMBus 2.0 controller
  - On-chip power circuit controller and Wake on LAN power switching circuit
- **Advanced power management—ACPI compliance**
- **Performance features**
  - TCP, IP, and UDP checksum
  - Microsoft® large send
  - TCP segmentation
  - CPU task offload
  - Adaptive interrupts
- **Robust manageability**
  - Wake on LAN
  - Out-of-Box mode Wake on LAN
  - PXE 2.0 remote boot
  - Alert Standard Format (ASF) 1.0 support
  - Statistic gathering (SNMP MIB II, Ethernet-like MIB, and Ethernet MIB [802.3x, clause 30])
  - Comprehensive diagnostic and configuration software suite
  - ACPI 1.1a complaint—multiple power modes
- **Advanced network features**
  - Virtual LANs—802.1q VLAN tagging that supports 64 VLANs
  - 802.3x flow control
  - Cable analyzer features detect cabling problems
- **3.3V I/Os (5V tolerant)**
- **JTAG**
- **Industry's smallest 10/100/1000 MAC+PHY solution**
  - Optimized for desktop LOM and NIC applications
  - Enables small form factor PCs

### SUMMARY OF BENEFITS

- **Ultra-low power for small form factor PCs**
  - 0.13μ CMOS design allows industry's lowest power
  - Advanced power management
- **Enables desktop PC products for all segments—allows one board layout for both Gigabit and Fast Ethernet applications**
- **Completely backward compatible, with existing:**
  - 10/100 network infrastructure
  - PCI-based desktop and mobile platforms
- **Futureproof with flexible firmware architecture**
  - Flexible firmware adapts to changing standards
  - Wirespeed custom packet filtering via on-board CPUs
- **Power optimized through reduced CPU utilization**
  - Adaptive interrupts minimizes calls to the PC's CPU
  - TCP/IP offloads reduce CPU burden significantly
  - Reduces power consumption of PC processor
  - Allows use of lower power/performance PC processor
- **Cable analyzer tests for network cable issues**
  - Customers can field-test using self-diagnostics
  - Dramatically reduces customer calls, returns, and costs
- **Robust and highly manageable**
  - PXE 2.0, ACPI 1.1, Wake on LAN
  - Integrated cable testing—link quality, length, pair skew, pair polarity, and pair swap
  - Flexible ASF 1.0
- **Space savings for LOM**
  - 196-pin HBGA package
  - No external memory
  - Integrated power circuitry reduces BOM costs

## OVERVIEW



The BCM5705 is a fully integrated 10/100/1000BASE-T Gigabit Ethernet media access control and physical layer transceiver solution for high-performance network applications. The BCM5705 combines a triple-speed, IEEE 802.3 compliant media access controller (MAC), a PCI bus interface, an on-chip buffer memory, and an integrated physical layer transceiver in a single device. The BCM5705 is fabricated in a low-voltage 0.13 $\mu$  CMOS process, providing an ultra-low power solution. By itself, the BCM5705 provides a complete single-chip Gigabit Ethernet NIC or LOM solution.

The BCM5705 includes a 10/100/1000-Mbps Ethernet MAC with full-/half-duplex capability at all speeds. Support for the following 802.3 functions is featured in the MAC:

- VLAN tagging
- Layer 2 priority encoding
- Link aggregation
- Full-duplex flow control

The device provides a PCI v2.2 bus interface and integrated on-chip buffer memory for a stand-alone operation. An embedded high-performance processor enables 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 are included to make the device even more user-friendly. A unique integrated cable analyzer feature allows a user to self-diagnose any issues with the network cabling that could affect the host machine. A link quality indicator LED and a GUI application give installers an instant visual indication of problems, 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 BCM5705 continually monitors various channel conditions. The optional wirespeed capability allows the BCM5705 to force auto-negotiation to be automatically limited by the speed that the channel can reliably support rather than the performance of the end equipment.

### Target Applications of the BCM5705

- Desktop PC NIC
- Desktop PC LOM

### Software Drivers Available

- Windows® 98, NT, 2000, XP
- Linux® 2.2, 2.4

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