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BCM5751

PRODUCT Brief

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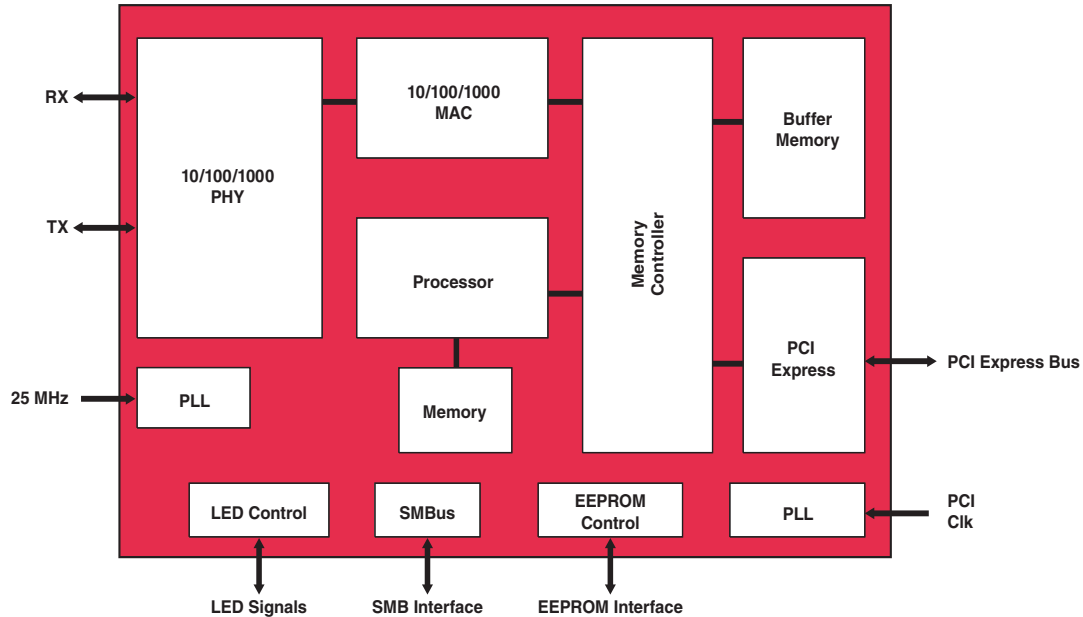# 10/100/1000BASE-T CONTROLLER WITH INTEGRATED TRANSCEIVER

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
  - High-speed RISC core with 24-KB cache
  - SMBus 2.0 controller
  - On-chip voltage regulation
  - Wake-on-LAN power switching circuit
- **PCI Express® host interface**
  - 1x lane
  - 4-pin interface
  - Functionality identical to PCI
- **Performance features**
  - TCP, IP, and UDP checksum
  - Microsoft® Large Send Offload
  - Large burst read
  - Interrupt coalescing
- **Robust Wake on LAN (WoL)**
  - Standards-compliant WoL
  - Innovative out-of-box mode WoL
  - Hardware power switching
  - Comprehensive diagnostic and configuration software suite
- **Industry-compliant alerting features**
  - Alert Standard Format (ASF) 2.0 support
  - Secure power-on and power-off
  - Fast hardware authentication (SHA-1, HMAC, MD5)
  - True hardware random number generation
- **Integrated TPM functionality**
  - Secure key management
  - Strong authentication capabilities
  - Platform state verification
- **3.3V I/Os (5V tolerant)**
- **JTAG**

SUMMARY OF BENEFITS

- **Wirespeed performance increases user performance**
  - PCI Express provides wirespeed non-blocking throughput
  - TCP/IP stack offloads significantly reduce utilization of CPU
  - TCP/IP stack offloads significantly increase throughput to enable faster downloads of large files
- **Industry's smallest GbE form factor enables easier motherboard design**
  - Innovative design reduces footprint to 67% smaller than competing solutions
  - 15 x 15-mm package
  - Integrated WoL switching eliminates external power switching components
- **Proven TPM-based security features protect corporate information**
  - Protect valuable data against theft
  - Strong authentication to prevent unauthorized network access
  - Virus protection for VPN users exposed to Internet
- **Secure alerting and power cycling reduces IT costs**
  - ASF 2.0 support for standards-based alerting. IT managers receive automatic alerts when PC support issues occur
  - Remote power-on/off features allow IT managers to power cycle PCs to address issues
  - Hardware-based authentication and random number generation ensures the highest level of security possible
- **Design flexibility allows feature consistency across SKUs**
  - Layout compatible with PCI-based BCM5750, enabling one motherboard layout to support both PCI and PCI Express
  - Single software driver image across PCI and PCI Express platforms

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BCM5751 Block Diagram

The BCM5751 is a fully integrated 10/100/1000BASE-T Gigabit Ethernet media access control and physical layer transceiver solution for high-performance network applications. The BCM5751 combines a triple-speed, IEEE 802.3 compliant media access controller (MAC), PCI Express bus interface, on-chip buffer memory, and integrated physical layer transceiver in a single device. It is fabricated in a low-voltage silicon process, providing an ultra-low power solution. By itself the BCM5751 provides a complete single-chip Gigabit Ethernet NIC or LOM solution.

The BCM5751 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, and full-duplex flow control.

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 an end 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. This includes 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.

Target applications of the BCM5751:

• Desktop PC NIC

• Desktop PC LOM

Software drivers available:

• Windows® 98, NT, 2000, XP

• Linux® 2.2, 2.4

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5751-PB03-R   03/28/06

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