



BCM5789 PRODUCT Brief



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

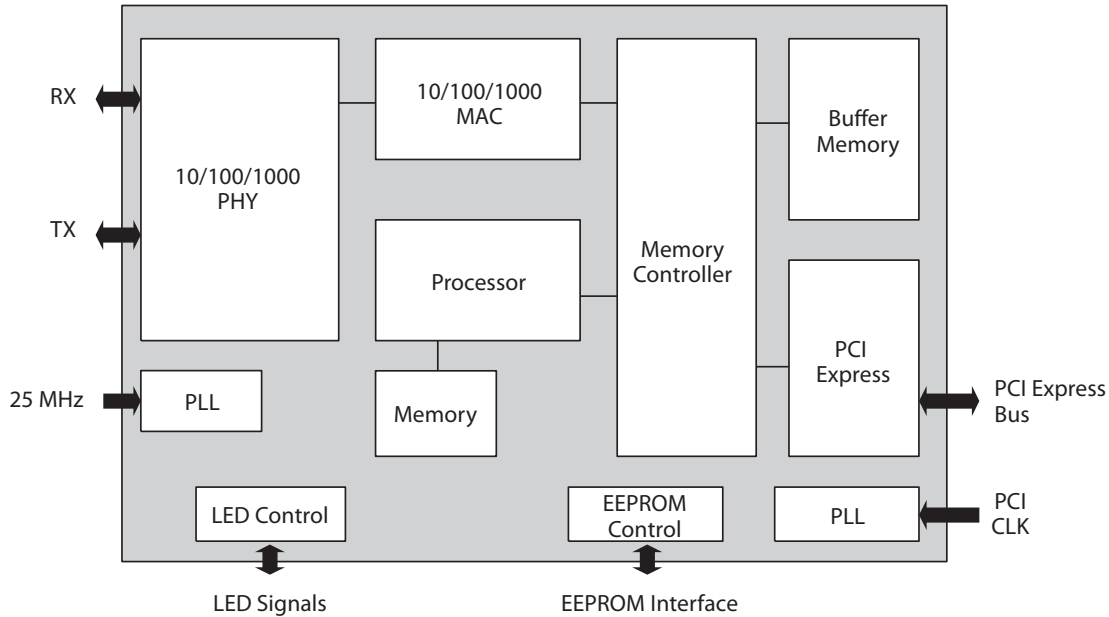
FEATURES

- **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
 - On-chip voltage regulation
 - Wake-on-LAN (WOL) power switching circuit
- **PCI Express® host interface**
 - 1x lane
 - 4-pin interface
 - Functionality identical to PCI
- **Performance features**
 - TCP, IP, and UDP checksum
 - Large burst read
- **Robust Wake-on-LAN**
 - Standards-compliant WOL
 - Innovative out-of-box mode WOL
 - Hardware power switching
 - Comprehensive diagnostic and configuration software suite
- **Industry-compliant alerting features**
 - Secure power-on and power-off
 - Fast hardware authentication (SHA-1, HMAC, MD5)
 - True hardware random number generation
- **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 mm x 15 mm package
 - Integrated WOL switching eliminates external power switching components.
- **Design flexibility allows feature consistency across SKUs.**
 - Common motherboard layout, enabling support for both PCI- and PCI-Express-based Ethernet controllers
 - Layout compatible with the following 10/100BASE-T and 10/100/1000BASE-T devices: BCM5752, BCM5751, BCM5705E, BCM5788E, BCM4401E
 - Single software driver image across PCI and PCI Express platforms

OVERVIEW



BCM5789 Reference Design

The BCM5789 is a fully integrated NetLink[®] 10/100/1000BASE-T Gigabit Ethernet Media Access Control (MAC) and Physical Layer (PHY) transceiver solution for high-performance network applications. The BCM5789 combines a triple-speed, IEEE 802.3[™]-compliant media access controller, 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 ultralow power solution. By itself, the BCM5789 provides a complete single-chip Gigabit Ethernet NIC or LOM solution.

The BCM5789 includes a 10/100/1000-Mbps Ethernet MAC with full-/half-duplex capability at all speeds. Support for the following IEEE 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

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 BCM5789:

- Desktop PC NIC
- Desktop PC LOM

Software drivers available:

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

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