BCM57781

PRODUCT Brief

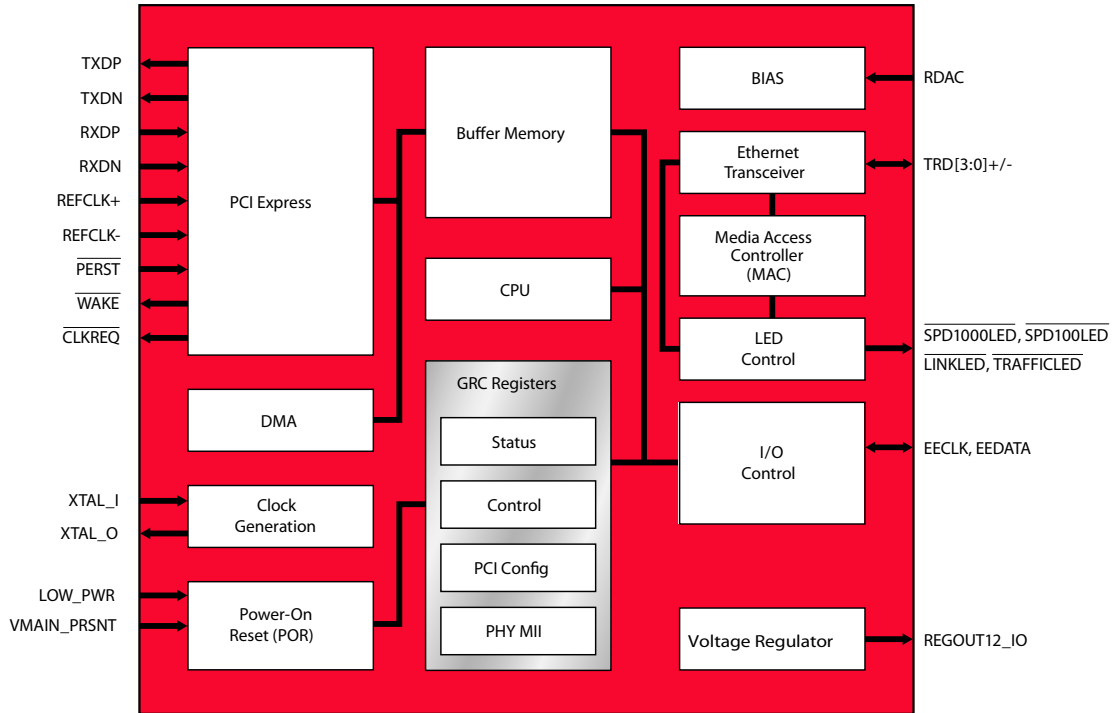# INTEGRATED GIGABIT ETHERNET CONTROLLER

FEATURES

- **Integrated 10/100/1000BASE-T transceiver**
  - 10/100/1000BASE-T triple-speed MAC
  - Compliant with IEEE standards
  - Compliant with IEEE 802.3az draft for Energy Efficient Ethernet™ (EEE)
  - State-of-the-art physical layer interface that exceeds IEEE requirements
  - On-chip voltage regulation using switching regulator

- **PCI Express® host interface**
  - x1 PCIe™ v1.1
  - Active State Power Management (ASPM) capability
  - Message Signaled Interrupt (MSI)

- **Intelligent power management**
  - Centralized power management enables easy and efficient control of various power modes
  - Innovative implementation that optimizes power consumption dynamically and transparently, depending on network and system states

- **Performance features**
  - TCP, IP, and UDP Checksum Offload (CSO)
  - Receive side scaling (RSS) for multicore client processors
  - IPV4 and IPV6 Microsoft® Large Send Offload (LSO)
  - Interrupt coalescing
  - Microsoft Windows®7 WoL and Proxy support

- **Robust ACPI-compliant WOL**

SUMMARY OF BENEFITS

- **Single-chip solution for LAN on motherboard (LOM) applications**

- **Proven technology built on twelve generations of controller products**

- **Wirespeed performance increases user performance**
  - PCI Express provides wirespeed non-blocking throughput.
  - TCP/IP checksum offload significantly reduces CPU usage and increases network throughput for large file download.

- **Extremely low power consumption enables environment-friendly designs**
  - Increases battery life in mobile applications and saves energy in desktop implementations
  - Advanced power management capabilities with ASPM L0s, L1, and PCIe CLKREQ
  - Eliminates false system wake-up with NIC proxy capabilities
  - Enables Energy Star®-compliant platforms

- **Small package, enabling smaller and more portable designs**
  - 6 mm x 6 mm, 48-pin QFN package

- **Lower BOM cost and chip cost, reducing overall cost of solution**
  - 65 nm process
  - Fully integrated power regulation with minimal external discrete component
  - On-chip nonvolatile memory that eliminates the need for external memory device

Functional Block Diagram

The BCM57781 is a Broadcom® NetLink® twelfth-generation 10/100/1000BASE-T Ethernet LAN controller solution for high-performance network applications. The device combines a triple-speed IEEE 802.3™-compliant media access controller (MAC) with a triple-speed Ethernet transceiver, x1 PCIe bus interface, and on-chip buffer memory in a single device. The BCM57781 is fabricated in a 65 nm CMOS process, providing a low-power system solution.

The device performs all the physical layer functions for 1000BASE-T, 100BASE-T, and 10BASE-T Ethernet on standard Category 5 UTP cable. Based on proven DSP technology, the device is a highly integrated solution combining digital adaptive equalizers, ADCs, PLLs, line drivers, echo cancellers, crosstalk cancellers, and all other required support circuitry. A full-featured MAC provides full-/half-duplex capability at all speeds.

The on-chip high-performance processor enables custom frame processing features. For a lower total solution cost and lower-power system-level power consumption, the BCM57781 integrates on-chip switching regulators and nonvolatile memory that eliminates the need for external NVRAM device. The BCM57781 is truly a single-chip solution for a Gigabit-Ethernet LOM.

Target applications:
- Desktop and mobile PC LOM

Software drivers available:
- Windows® 2000, XP, Vista®, and 7
- Linux® 2.4, and 2.6

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