

RTL8111B

Single-Chip Gigabit LOM Ethernet Controller for PCI Express

General Description

This product is covered by one or more of the following patents:

US5,307,459, US5,434,872, US5,732,094, US6,570,884, US6,115,776, and US6,327,625.

The Realtek RTL8111 Gigabit Ethernet controller combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, PCI Express bus controller, and embedded memory. With state-of-the-art DSP technology and mixed-mode signal technology, it offers high-speed transmission over CAT 5 UTP cable or CAT 3 UTP (10Mbps only) cable. Functions such as Crossover Detection & Auto-Correction, polarity correction, adaptive equalization, cross-talk cancellation, echo cancellation, timing recovery, and error correction are implemented to provide robust transmission and reception capability at high speeds.

The device supports the PCI Express 1.0a bus interface for host communications with power management and is compliant with the IEEE 802.3u specification for 10/100Mbps Ethernet and the IEEE 802.3ab specification for 1000Mbps Ethernet. It also supports an auxiliary power auto-detect function, and will auto-configure related bits of the PCI power management registers in PCI configuration space.

Advanced Configuration Power management Interface (ACPI)—power management for modern operating systems that are capable of Operating System-directed Power Management (OSPM)—is also supported to achieve the most efficient power management possible. PCI Message Signaled Interrupt (MSI) is also supported.

In addition to the ACPI feature, remote wake-up (including AMD Magic Packet™, Re-LinkOk, and Microsoft® Wake-up frame) is supported in both ACPI and APM (Advanced Power Management) environments. To support WOL from a deep power down state (e.g., D3cold, i.e. main power is off and only auxiliary exists), the auxiliary power source must be able to provide the needed power for the RTL8111.

The RTL8111 is fully compliant with Microsoft® NDIS5 (IP, TCP, UDP) Checksum and Segmentation Task-offload features, and supports IEEE 802.1P Layer 2 priority encoding and 802.1Q Virtual bridged Local Area Network (VLAN). The above features contribute to lowering CPU utilization, especially benefiting performance when in operation on a network server.

The device features next-generation PCI Express interconnect technology. PCI Express is a high-bandwidth, low pin count, serial, interconnect technology that offers significant improvements in performance over conventional PCI and also maintains software compatibility with existing PCI infrastructure.

The RTL8111 is suitable for multiple market segments and emerging applications, such as desktop, mobile, workstation, server, communications platforms, and embedded applications.

Features

- Integrated 10/100/1000 transceiver
- Auto-Negotiation with Next Page capability
- Supports PCI Express™ 1.0a
- Supports pair swap/polarity/skew correction
- Crossover Detection & Auto-Correction
- Wake-on-LAN and remote wake-up support
- Microsoft® NDIS5 Checksum Offload (IP, TCP, UDP) and Largesend Offload support
- Supports Full Duplex flow control (IEEE 802.3x)
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
- Supports IEEE 802.1P Layer 2 Priority Encoding
- Supports IEEE 802.1Q VLAN tagging
- Serial EEPROM
- Transmit/Receive on-chip buffer (8KB/16KB) support
- Supports power down/link down power saving
- Supports PCI Message Signaled Interrupt (MSI)
- 64-pin QFN package