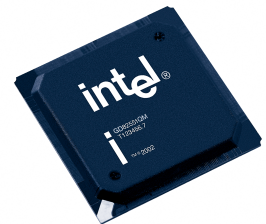# Intel® 82551QM
Fast Ethernet Multifunction PCI/CardBus Controller

Advanced, integrated functions for high-performance PCI/CardBus Ethernet applications

Product Brief

The Intelligent Way to Connect

- Advanced offloading features speed data transfers
- Enhanced manageability and system monitoring
- Footprint compatibility for flexible designs

Product Description

The Intel® 82551QM Fast Ethernet Multifunction PCI/CardBus Controller expands the family of Intel® 8255x controllers. The 82551QM provides excellent performance with offloading of TCP, UDP and IP checksums, plus support for TCP segmentation offload for operations such as Large Send.

The 82551QM, with optimized 32-bit interface and efficient scatter-gather bus mastering capabilities, enables the controller to perform high-speed data transfers over the PCI bus or CardBus. These capabilities accelerate the processing of high-level commands and operations, lowering CPU utilization. The device's architecture enables efficient data flow from the bus interface unit to the 3KB transmit and receive FIFOs, providing the perfect balance between the wire and system bus. In addition, multiple priority queues augment Quality of Service (QoS) performance.

The 82551QM integrates advanced manageability features into one component. It includes support for Alert on LAN* 2 and Alerting Standards Format (ASF) bi-directional alerting. A System Management Bus (SMB) interface can be used with bus management controllers. Both legacy and ASF sensor polling are supported, as well as remote-control capabilities. The 82551QM embeds the Universal NIC Driver Interface (UNDI) code, allowing it to support Pre-boot Execution Environment (PXE) without the use of an additional external ROM.

The 82551QM is pin-compatible with the Intel® 82550 and Intel® 82559 Fast Ethernet controllers, and it is layout-compatible with Intel® 82540 Gigabit Ethernet controller.

Applications

The Intel 82551QM Fast Ethernet Multifunction PCI/CardBus Controller is designed for use in the following applications:

- LAN on Motherboard (LOM) implementations
- PCI Mezzanine cards
- Industrial PCs and single-board computers
- Embedded applications

Features	Benefits

Monitoring/Safety Features

■ ASF 1.0 support	■ Supports standards-based alerting
■ MDI/MDI-X and Hardware Integrity (HWI) alerting	■ Indicates cabling problems that might impact link performance
■ Integrated Alert on LAN* 2 support	■ Increases Alert on LAN functionality ■ Eliminates need for a separate Alert on LAN 2 device

Performance-enhancement Features

■ Offloads TCP, UDP, and IP checksums from PC processor ■ Supports TCP segmentation offloading	■ Speeds data transfers ■ Improves Large Send operations
■ Multiple priority transmit queues	■ Enables packet prioritization for faster delivery of business-critical data
■ Combination 10/100Mbps Fast Ethernet controller and physical layer interface with glueless 32-bit PCI bus master interface	■ Provides low-cost network connectivity for LOM or PCI adapters ■ Reduces board space requirements and external support circuitry
■ Improved dynamic transmit chaining	■ Enhances performance

Power-reduction Features

■ Reduced D3 power consumption ■ Low-power 3.3V device	■ Improves battery life in mobile applications
■ Enhanced power management	■ Minimizes power requirements

Management/Compatibility Features

■ Backwards-compatible software drivers	■ Allows systems developed with the 82550 or 82559 to use the same device drivers ■ Supports robust, well-tested, high-performance drivers
■ Wired for Management (WfM) and Net PC Specifications compliant ■ Advanced Configuration and Power Interface (ACPI) Specifications compliant ■ Magic Packet filtering for Wake on LAN ■ ARP and flexible frame filtering	■ Enables PCs to be remotely managed for lower total cost of ownership ■ Complies with standards for LOM or NIC designs for next-generation Fast Ethernet-connected systems ■ Provides various power-down states and the ability to "wake up" on a unique packet addressed to the system ■ Permits development of virtually connected systems that will exit from a lower power state upon receipt of directed packets ■ Allows virtually connected Ipv6, Ipv4, Windows NT*, or next-generation systems
■ Modem interface for combination solutions	■ Allows single-NIC adapter with modem and LAN connectivity

Physical Features

■ Footprint-compatible with the Intel® 82540 Gigabit Ethernet controller	■ Enables single-board design, accommodating either 10/100/1000Mbps or 10/100Mbps Ethernet ■ Provides an easy and safe migration path to Gigabit Ethernet
■ Integrated UNDI ROM support	■ Minimizes requirement for external ROM
■ Thin BGA 15x15mm package	■ Minimizes board space requirements

Characteristics

Electrical
■ Power Supply   3.3V +/– 5%
■ Power Dissipation   0.5W (typical)

Environmental
■ Operating Temperature   0°C to 85°C (maximum)
■ Storage Temperature   -65°C to 140°C

Physical
■ Package   196-pin BGA (1mm ball pitch)

For more information, contact your Intel® sales representative.