

# Single-Port Ethernet MAC Controller with Non-PCI Interface

## Description

The KSZ8841-series single-port chip includes PCI and non-PCI CPU interfaces, and are available in 8/16-bit and 32-bit bus designs.

The KSZ8841-16MQL (or -32MQL) is a single chip, mixed analog/digital device offering Wake-on-LAN technology for effectively addressing Fast Ethernet applications. It consists of a Fast Ethernet MAC controller, an 8-bit, 16-bit, and 32-bit generic host processor interface and incorporates a unique dynamic, fully utilizable 8KB buffer memory for both TX and RX directions in host buffer interface.

The KSZ8841-16MQL (or -32MQL) is designed to be fully compliant with the appropriate IEEE 802.3 standards.

Physical signal transmission and reception are enhanced through the use of analog circuitry, making the design more efficient and allowing for lower power consumption. The KSZ8841M is designed using a low-power CMOS process that features a single 3.3V power supply with 5V tolerant I/O. It has an extensive feature set that offers management information base (MIB) counters and CPU control/data interfaces.

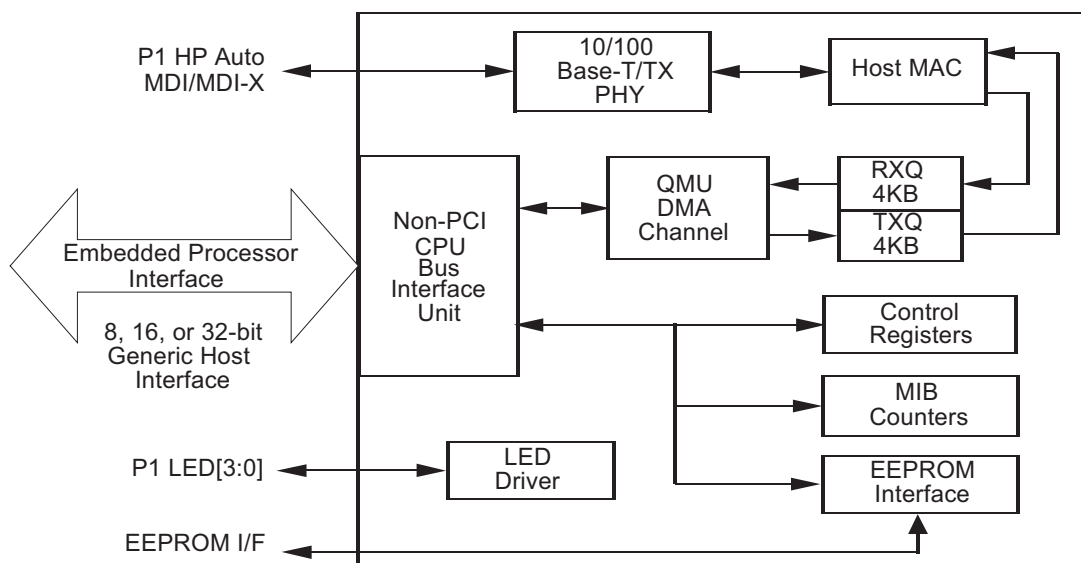
The KSZ8841M includes a unique cable diagnostic feature called LinkMD®. This feature determines the length of the cabling plant and also ascertains if there is an open or short condition in the cable. A companying software enables the cable length and cable conditions to be conveniently displayed. In addition, the KSZ8841M supports Hewlett Packard (HP) Auto-MDIX thereby eliminating the need to differentiate between straight or crossover cables in applications.

Industrial temperature support (-40°C to +85°C) is also provided with the KSZ8841-16MQL.

For additional information, contact your local Micrel Field Application Engineer or salesperson.

LinkMD is a registered trademark of Micrel, Inc.  
Magic Packet is a trademark of Advanced Micro Devices, Inc.  
Product names used in this datasheet are for identification purposes only and may be trademarks of their respective companies.

## Block Diagram



KSZ8841M Functional Diagram

## Features

- Single chip Ethernet controller with IEEE802.3u support
- Supports 10BASE-T/100BASE-TX
- Supports IEEE 802.3x full-duplex flow control and half-duplex backpressure collision flow control
- Supports burst data transfers
- 8KB internal memory for RX/TX FIFO buffers
- Early TX/RX functions to minimize latency through the device
- Optional serial EEPROM configuration for the 8-bit or 16-bit host interface
- Single 25MHz reference clock for both PHY and MAC
- RoHS compliant devices

## Network Features

- Fully integrated to comply with IEEE802.3u standards
- 10BASE-T and 100BASE-TX physical layer support
- Auto-negotiation: 10/100Mbps full and half duplex
- Adaptive equalizer
- Baseline wander correction
- Power Modes, Power Supplies, and Packaging:
  - Single power supply (3.3V) with 5V tolerant I/O buffers
  - Enhanced power management feature with power-down feature to ensure low power dissipation during device idle periods
  - Comprehensive LED indicator support for link, activity, full/half duplex, and 10/100 speed (4 LEDs) – User programmable
  - Low power CMOS design
  - Commercial temperature range: 0°C to +70°C

## Additional Features

In addition to offering all of the features of a Layer 2 controller, the KSZ8841M offers:

- Dynamic buffer memory scheme – Essential for applications such as Video over IP where image jitter is unacceptable
- Flexible 8-bit, 16-bit, and 32-bit generic host processor interfaces
- Micrel LinkMD® cable diagnostic capabilities to determine cable length, diagnose faulty cables, and determine distance to fault.
- Wake-on-LAN functionality – Incorporates Magic Packet™, network link state, and wake-up frame technology
- HP Auto MDI-X™ crossover with disable/enable option
- Ability to transmit and receive frames up to 1916 bytes

## Applications

- Video Distribution Systems
- High-end Cable, Satellite, and IP set-top boxes
- Video over IP
- Voice over IP (VoIP) and Analog Telephone Adapters (ATA)
- Industrial Control in Latency Critical Applications
- Motion Control
- Industrial Control Sensor Devices (Temperature, Pressure, Levels, and Valves)
- Security and Surveillance Cameras

## Markets

- Fast Ethernet
- Embedded Ethernet
- Industrial Ethernet

## Contact Micrel Semiconductor

Location	Address		Telephone	Fax
Corporate HQ	2180 Fortune Drive	San Jose, CA 95131 USA	+1 408 944 0800	+1 408 944 0970
Western USA	2180 Fortune Drive	San Jose, CA 95131 USA	+1 408 944 0800	+1 408 944 0970
Central USA	2425 N. Central Express Way, Suite 351	Richardson, TX 75080 USA	+1 972 393 2533	+1 408 474 1210
Eastern USA	93 Branch Street	Medford, NJ 08055 USA	+1 609 654 0078	+1 609 654 0989
Latin America	2425 N. Central Express Way, Suite 351	Richardson, TX 75080 USA	+1 972 393 2533	+1 408 474 1210
China	Rm 601, Bldg B, Int'l Chamber of Commerce Mansion, Fuhua Rd 1 Futian Dist	Shenzhen, P.R. China 518048	+86 755 8302 7618	+86 755 8302 7637
Japan	Queens Tower 14F, 2-3-1, Minatomirai, Nishi-ku, Yokohama-shi	Kanagawa 220-8543, Japan	+81 45 224 6616	+81 45 224 6716
Korea	8F, AnnJay Tower Bldg, 718-2, Yeoksam-dong, Kangnam-ku	Seoul 135-080, Korea	+82 2 538 2380	+82 2 538 2381
New Zealand	Office 2, CML Bldg, 2 Perry Street	Masterton, New Zealand	+64 6 378 9799	+64 6 378 9599
Singapore/India	300 Beach Road, #10-07 The Concourse	Singapore 199555	+65 6291 1318	+65 6291 1332
Taiwan	4F, No. 18 Lane 321, Yang-Guang Street, Nei-Hu Chu	Taipei 11475 Taiwan, R.O.C	+866 2 8751 0600	+866 2 8751 0746
UK/EMEA	1st Floor, 3 Lockside Place, Mill Lane, Newbury, Berks	United Kingdom RG14 5QS	+44 1635 524455	+44 1635 524466
France/Southern Europe	10 Avenue du Quebec, Villebon - B.P. 116, 91944 Courtaboeuf Cedex	France	+33 1 60 92 4190	+33 1 60 92 4189
Sweden/Nordic	Lundagatan 11 6tr, SE-171 63 Solna	Sweden	+46 8 470 5850	+46 8 470 5950