MICROCHIP

High-Throughput Ethernet Interface Solutions

www.microchip.com/ethernet
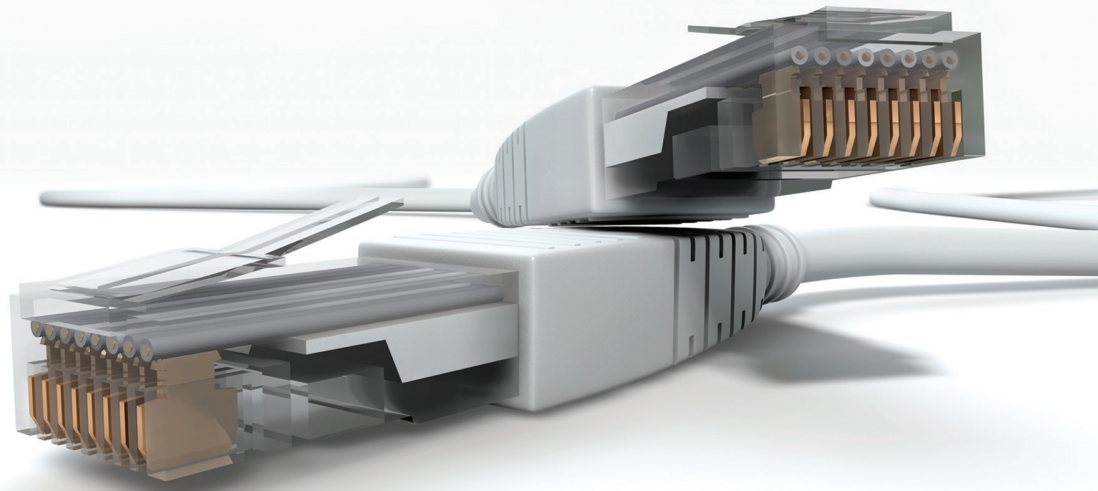
Ethernet communication provides robust, reliable communication, offering real-time performance and Gigabit speeds ideal for a vast array of networking applications. Microchip's comprehensive portfolio includes transceivers (PHYs), bridges, controllers and switches to accommodate networks large and small.

Ethernet Made Easy

- Tested to stringent IEEE 802.3 Standards at UNH-IOL
- Robust evaluation boards, reference designs and application notes
- Extensively tested, free drivers for MPLAB® Harmony, Windows®, OS X® and Linux® operating systems
- Complimentary LANCheck® online design review leveraging in-house Ethernet experts for your design

Our Ethernet Portfolio

PHY/Transceivers
- Up to Gigabit speeds, industrial/extended temperatures and Quiet-WIRE® technology-enhanced robustness and EMC

Bridges
- Enable Ethernet with your processor's USB port

Controllers
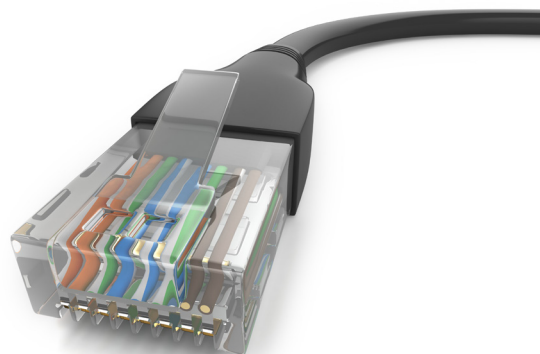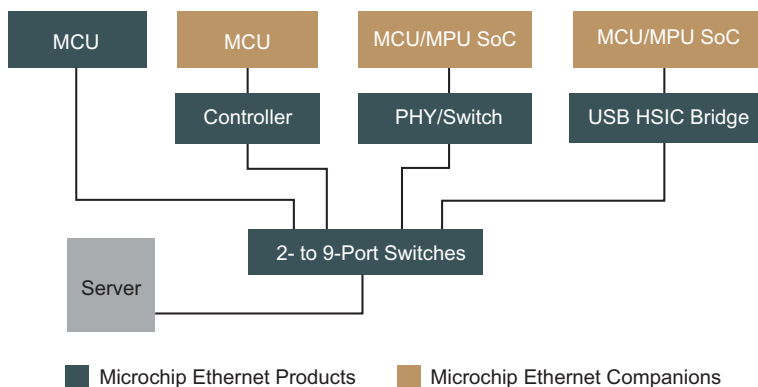- Add Ethernet with reduced MCU/MPU/SoC overhead via a variety of processor interfaces

Switches
- Up to nine ports, up to Gigabit speeds, advanced features and industrial/automotive temperatures

Applications

- Internet of Things (IoT)
- Point-of-sale machine
- Home/building/lighting automation
- Smart energy/smart grid
- Remote equipment monitoring
- Security and IP cameras
- Industrial sensors and controls
- Automotive/industrial in-vehicle networking
- IP telephony
- Media players/set-top boxes
- Digital televisions
- Wireless 4G/LTE modems
- Broadband modems and routers

Microchip's Ethernet Products

MCU	MCU	MCU/MPU SoC	MCU/MPU SoC
	Controller	PHY/Switch	USB HSIC Bridge

2- to 9-Port Switches

Server

■ Microchip Ethernet Products   ■ Microchip Ethernet Companions

LANCheck Online Design Review

Microchip's Design Check Online Review is a personalized, value-added service exclusive to Microchip and available at no charge to customers who have selected our Ethernet, USB and Capacitive Sensing offerings application design-in. Design Check will support your design process by providing guidance through the complete design cycle— from initial schematic design to PCB design. After an initial Design Check registration, you may submit the design schematic, PCB layout or PCB routing design information to a confidential and secure environment where it is promptly analyzed by Microchip's engineers who will provide you with personalized feedback. Submit your design today at www.microchip.com/lancheck.
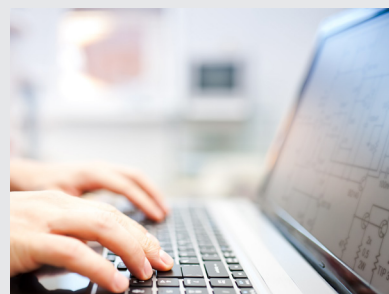
IoT and Industrial IoT

To address Industrial Internet of Things (IoT) projects, Ethernet connectivity offers the most reliable and stable technology. The IoT Ethernet Kit powered by AWS IoT (DM990004) uses an Ethernet LAN8740A PHY driven by a 32-bit microcontroller with 2 MB of Flash (PIC32MZ EF) that provides ample memory space for your application. On the sensor side, hundreds of different sensors can be plugged into the MikroElektronka mikroBUS™ footprint allowing for prototyping a large variety of IoT proof-of-concepts.
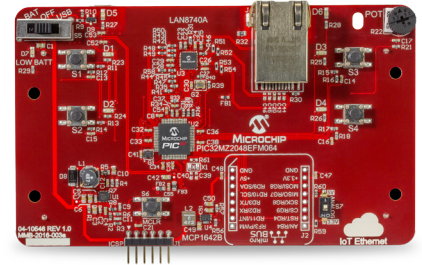
This IoT kit takes advantage of the AWS IoT service and provide a smooth user experience coming preloaded with the corresponding firmware. AWS IoT is a managed cloud platform that allows connected devices to interact easily and securely with cloud applications and other devices. Additionally, the firmware in the kit makes use of MPLAB Harmony, FreeRTOS™, WolfMQTT and WolfSSL allowing you to quick-start your IoT design.

IoT Ethernet Kit Features

- Developed as a reference for industrial Ethernet environments
- Complete development kit that includes IoT edge device and setup instructions for using AWS IoT
- Easy setup out of the box with your own AWS account
- JSON-based data payload
- MPLAB Harmony: integrated software framework
- Simple 32-bit microcontroller-based design
- Four input buttons, four output LEDs and one analog input potentiometer on edge device to show bidirectional control via AWS IoT
- mikroBUS header for extendability to build any IoT use case using available or custom sensors

IoT Ethernet Kit Bill of Materials

- LAN8740A: Ethernet PHY module
- PIC32MZ2048EFM064: 32-bit microcontroller
- MCP1642B: Boost Regulator

Available Reference Material on GitHub

github.com/MicrochipTech/aws-iot-firmware-pic32mz

- Firmware
- Out-of-box guides
- Compile and programming guides
- Circuit schematics
- Insight on Things desktop application

Software Drivers

Microchip develops, tests and certifies software drivers for MPLAB Harmony, Microsoft Windows, OS X, Linux OS and many proprietary stacks used in MCU, MPU and SoC-based systems. MPLAB Harmony drivers are included in MPLAB Harmony download and support Microchip's starter kits, allowing you to get your application online quickly. Our Windows drivers comply to Microsoft's rigorous Windows Logo Program for Hardware (WHQL), ensuring seamless operation in Windows-based systems. The Linux drivers from Microchip are submitted to the Linux kernel and thoroughly vetted by members of the community, giving you high-quality, peer-reviewed software for your application. See our website for links to software drivers.

Devices with Available Drivers

- PHY transceivers
- Bridging devices
- Ethernet controllers
- Ethernet switches

Additional MPLAB Harmony Software

- TCP/IP stack
- WolfSSL SSL/TSL encryption library
- USB host/device stack

Microchip's 10/100 and Gigabit PHY portfolios are a low-cost way to seamlessly attach to SoCs, MCUs and CPUs with industry standard interfaces (GMII, RGMII, RMII, MII). Designed with energy-efficient Ethernet and Wake-On-LAN, the devices minimize power consumption, while features like Quiet-WIRE technology minimize emissions and increase immunity to noisy environments. The availability of high-temperature versions make these devices ideal for industrial and automotive applications. LinkMD®+ enables advanced diagnostics, critical to maintaining scalable network deployments. Standard Linux drivers are provided to ensure minimal code development.

Available Features

- Standard MAC interface
- Small 4 × 4 mm 24-pin package

- On-chip termination
- Energy-efficient Ethernet (802.3az)

- Quiet-WIRE robustness technology
- LinkMD+ with signal quality indicator

Choose Your Best Fit Processor

Microchip provides drivers for our award-winning MPLAB Harmony software framework, or for open operating systems like Linux. Whether your application is large or small, we have the driver to cover your needs.

Feature	KSZ8081	KSZ8091	LAN8742A	LAN8740A	KSZ8061 (Quiet-WIRE® Technology)	KSZ9031
Bandwidth	10Base-T/100Base-TX					10/100/1000Base-T
Interface	MII/RMII		RMII		MII/RMII	MII/RGMII/GMII
Wake-On-LAN	–	✓	✓	✓	–	✓
EEE	–	✓	–	✓	–	–
V_{DD} I/O	1.8/2.5/3.3		1.6–3.3	1.3–3.3	1.8/2.5/3.3	
LinkMD® Technology	✓	✓	✓	✓	LinkMD+ with signal quality indicator	✓
Power	155 mW total		286 mW total	269 mW total	170 mW total + µA standby	448 mW total
Temperature	–40 to 85°C				–40 to 105°C (AEC-Q100)	–40 to 105°C (AEC-Q100)
Packages	24-pin VQFN, 32-pin VQFN, 48-pin LQFP		24-pin QFN	32-pin QFN	32-pin VQFN, 48-pin VQFN	48-pin VQFN, 64-pin VQFN

PHY Evaluation Boards

Getting started with Microchip's Ethernet PHYs is easy. For development in the MPLAB Harmony Software Framework, select the PIC32 Starter Kit for Ethernet II (DM320004-2). For development with processors running the Linux OS, choose from our evaluation boards with standard MAC interfaces. Our most popular options are below but you can find a complete list of PHY evaluation boards at www.microchip.com/EthernetPHY.

PIC32 Ethernet Starter Kit II (DM320004-2)
This kit provides the easiest and lowest-cost method to experience 10/100 Ethernet development with PIC32 microcontrollers. It is combined LAN8720A and Microchip's free TCP/IP software.

KSZ9031RNX Gigabit Ethernet Evaluation Board (KSZ9031RNX-EVAL)
This board features an integrated triple-speed (10Base-T/100Base-TX/1000Base-T) Ethernet physical layer transceiver for transmission and reception of data over CAT-5 UTP cable. The KSZ9031RNX provides RGMII for direct connection to RGMII MACs.

KSZ8061MNX Evaluation Board (KSZ8061MNX-EVAL)
This board enables testing of the KSZ8061MNZ PHY with Quiet-WIRE technology. Additionally, a second PHY, the KSZ8081 (10/100 Ethernet PHY) is used to provide a second-line interface for simple full-duplex traffic through the KSZ8061. This board is not intended for evaluation of the KSZ8081.

LAN8742 10/100 High-Speed Ethernet Transceiver Evaluation Board (EVB8742)
This board has a standard 40-pin MII connector for RMII configurations and supports Wake-on-LAN and cable diagnostics.

For SoCs and MPUs/CPUs that have USB but no Ethernet standard interface, Microchip offers a portfolio of bridge devices. These devices are fully integrated with on-chip USB and Ethernet MAC/PHY, so application size and BOM costs are minimized. Microchip provides Windows, OS X and Linux drivers to enable transparent operation and compatibility. Microchip's Ethernet bridge devices are compatible with USB 2.0, USB 3.1 Gen1 and HSIC, delivering 10/100 and Gigabit performance.

Available Features

- Wire-speed USB 3.1 Gen1 to Ethernet
- Internal or external PHY Interface
- Small 6 × 6 mm 48-pin package

- On-chip configuration OTP memory
- Bridge USB 3.1 to 100Base-T1 or HDBase-T

- Energy-efficient Ethernet (802.3az), WoL and Microsoft AOAC

Choose Your Best Fit Processor

Microchip provides drivers for our award winning MPLAB Harmony software framework, Windows, OS X and open operating systems such as Linux. Whether your application is large or small, we have the driver to cover your needs.

Feature	LAN9730	LAN9500A	LAN9512/3/4	LAN7500	LAN7850	LAN7801	LAN7800
Ethernet Bridge	HSIC to 10/100	USB 2.0 to 10/100		USB 2.0 to 10/100/1000	USB 2.0/HSIC to 10/100/1000	USB 3.1 Gen1 to 10/100/1000	
USB Hub Ports	–	–	2/3/4	–	–	–	–
External PHY I/F	MII		–	–	–	RGMII	–
NetDetatch™ Technology	✓	✓	–	✓	✓	✓	✓
Wake-On-LAN	✓	✓	✓	✓	✓	✓	✓
PME Support	✓	✓	–	✓	✓	✓	✓
Integrated Regulator	3.3 to 1.2V		3.3 to 1.8V	–	3.3 to 1.8V		
Energy Efficient Ethernet	–					✓	
Temperature	–40 to 85°C					–40 to 105°C, AEC-Q100	–40 to 85°C
Packages	56-pin QFN	64-pin QFN		56-pin QFN	56-pin QFN	64-pin QFN	48-pin QFN

Bridge Evaluation Boards

The low-cost dongle format of USB-to-Ethernet bridges makes getting started a snap. A complete suite of software drivers for Linux and Windows are provided. Our most popular options are below but you can find a complete list of bridge evaluation boards at www.microchip.com/EthernetBridge.

LAN7500 High-Speed USB 2.0-to-10/100/1000 Ethernet Evaluation Board (EVB-LAN7500)

This board is a fully functional, bus-powered USB-to-Ethernet solution with on-board Ethernet RJ45 and USB Type A connectors. The on-board 4K EEPROM loads the USB configuration parameters and MAC address. Software drivers for Windows, OS X and Linux operating systems are available.

**LAN7800 Super-Speed USB-to-Ethernet Low-Cost Evaluation Board (EVB-LAN7800LC)**

With a ultra-low cost BOM, this evaluation board integrates the USB Type-C™ connector to implement a high-speed data transfer to Gigabit Ethernet with on-board RJ45 connector. Linux, OS X and Windows drivers are available.
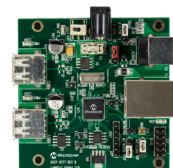
LAN9512 High-Speed USB Hub-to-Ethernet Evaluation Board (EVB9512)

This board provides a two port USB 2.0 hub with an integrated 10/100 Ethernet controller and USB connectivity via one Type B upstream USB connector and two Type A downstream USB connectors. An RJ-45 integrated magnetics Ethernet jack with link/activity LEDs provides 10/100 Ethernet connectivity. The board supports both bus-powered and self-powered modes of operation.

![Microchip logo]

You can implement managed or unmanaged networks using Microchip's portfolio of 10/100 and Gigabit switches. These L2+ switches feature multiple ports, extensive advanced switch functionality and a small footprint, assuring optimal network performance. For real-time control, like Time-Sensitive Networking (TSN), Microchip's switches feature IEEE 1588 v2 Precision Time Protocol (PTP) with microsecond precision, traffic scheduling/shaping and path reservation.
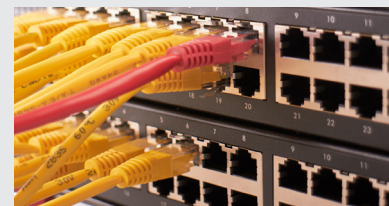
Available Features

- Up to Gigabit speeds
- Audio/video bridging (AVB)
- Energy-efficient Ethernet
- IEEE 802.1Q av-based traffic scheduler
- IEEE 802.1X port-based authentication
- Precision time protocol (IEEE 1588 v2, 802.1AS)
- Network fault recovery (DLR/HSR)
- Industrial temperatures
- LinkMD+ cable diagnostics with signal quality indicator
- Synchronous Ethernet support
- Supports TSN

Management Processor Support

Microchip provides switch drivers for our award winning MPLAB Harmony software framework, or for open operating systems like Linux. Whether your application is large or small, we have the driver to cover your needs.

Gigabit Switch Family

Feature	KSZ989x	KSZ956x	KSZ947x
Bandwidth		10Base-T/100Base-TX/1000Base-T	
Ports	3, 6, 7	3, 7	7
Interface		SGMII/RGMII/GMII/RMII/MII	
Cable Diagnostics	LinkMD® Technology	LinkMD+ with signal quality indicator	
IEEE 1588 v2/802.1AS	–	✓	✓
Audio/Video Bridging (AVB)	–	✓	✓
Time Aware Scheduler	–	✓	✓
Low Latency Cut Through	–	✓	✓
Quiet-WIRE® Technology	–	–	✓
Network Fault Recovery (DLR/HSR)	–	–	✓
IEEE 802.1X	✓	✓	✓
EEE/Wake-On-LAN	✓	✓	✓
Industrial Temperature		–40 to 85°C	
Packages	64-pin QFN	128-pin TQFP	128-pin TQFP

Microchip offers an extensive line of Fast Ethernet switches to meet a variety of consumer, industrial and automotive needs. The following are just a portion of the entire portfolio. For the complete portfolio, please go to www.microchip.com/EthernetSwitch.

3-Port Switches

Feature	KSZ8863	KSZ8873	KSZ8463	KSZ8563	LAN9303	LAN935x	LAN9355
Bandwidth		10Base-T/100Base-TX/100Base-FX			10Base-T/100Base-TX	10Base-T/100Base-TX/100Base-FX	
Interface		MII/RMII		MII/RMII/RGMII	MII/RMII	SPI/SQI/RMII/MII	MII
EEE	–	–	✓	✓	–	✓	✓
V_{DD} I/O		1.8/2.5/3.3			3.3	1.6–3.3	
Cable Diagnostics	✓	✓	✓	✓	–	✓	✓
IEEE 1588	–	–	✓	✓	–	✓	✓
Power	520 mW		330 mW		640 mW	555 mW	
Temperature	–40 to 85°C	–40 to 85°C (AEC-Q100)			–40 to 85°C		
Packages	48-pin LQFP	64-pin LQFP		64-pin QFN	56-pin QFN	56-/64-/72-pin QFN, 64-/80-pin TQFP	88-pin QFN, 80-pin TQFP

5- to 9-Port Switches

| Feature	KSZ8864	KSZ8895	KSZ8794	KSZ8795	KSZ8775	KSZ8765	KSZ8565	KSZ8567	KSZ8999
Bandwidth	10/100Base-T/TX, 100Base-FX		10/100Base-T/TX with GigE Uplink			10/100Base-T/TX, 100Base-FX with GigE Uplink	10/100Base-T/TX with GigE Uplink		10/100Base-T/TX, 100Base-FX
Number of Ethernet Ports	4	5	4	5				7	9
Interface	MII/RMII (×2)		RGMII MII/RMII	GMII/RGMII MII/RMII	RGMII MII/RMII	GMII/RGMII MII/RMII	RGMII/MII/ RMII	RGMII/MII/ RMII/SGMII	MII, SNI
Wake-On-LAN EEE	–	–	✓	✓	✓	✓	✓	✓	–
IEEE 802.1X	–	–	–	–	–	–	✓	✓	–
V_{DD} I/O	1.8/2.5/3.3								3.3
LinkMD® Technology	✓	✓	✓	✓	✓	✓	LinkMD+ with signal quality indicator		–
Power	253 mW	435 mW	430 mW	560 mW	460 mW	560 mW	–	–	1472 mW
Temperature	–40 to 85°C (AEC-Q100)	–40 to 85°C					–40 to 105°C (AEC-Q100)		–40 to 85°C
Packages	64-pin QFN	128-pin LQFP	64-pin QFN	80-pin LQFP			128-pin TQFP		208-pin PQFP

Switch Evaluation Boards

You can implement Ethernet networks with ease by starting with Microchip's switch evaluation boards. For development in MPLAB Harmony software framework, select the PIC32 Starter Kit for Ethernet II and the LAN9303 Daughter Card. For development with processors running Linux OS, choose from our evaluation boards with standard MAC interfaces. Our most popular options are below, but you can find a complete list of switch evaluation boards at www.microchip.com/EthernetSwitch.

LAN9303 PHY Switch Daughter Board (AC320004-4)

Used with the PIC32 Ethernet Starter Kit II, this board provides an easy and low-cost way to implement 10/100 Ethernet switching. Combined with Microchip's free TCP/IP software, this kit gets your project running quickly.

KSZ8765 10/100 Ethernet Evaluation Board (KSZ8765CLX-EVAL)

This board features an integrated 5-port switch with Gigabit up-link. It contains four MAC/PHYs with two fiber ports, two copper ports and one GMAC interface that is configurable GMII/RGMII/MII/RMII interfaces. The board is designed to allow Gigabit up-link with the Gigabit port of any processor.
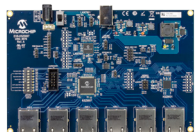
KSZ9897 Gigabit Ethernet Evaluation Board (EVB-KSZ9897)

This board features a completely integrated triple speed (10Base-T/100BASE-TX/1000Base-T) Ethernet switch with seven ports. The board has six physical ports and one USB-to-Ethernet port. The board also features the LAN7800 USB-to-Ethernet bridge and KSZ9031 Gigabit PHY.

KSZ9477 Gigabit Ethernet Evaluation Board (EVB-KSZ9477)

This board features a completely integrated triple speed (10Base-T/100-Base-TX/1000Base-T) Ethernet switch with five ports and one SFP port. The ARM®-based ATSAMA5D3 host processor implements advanced switch management features such as IEEE 1588 v2, AVB, authentication and is reprogrammable.

![Microchip logo]

For embedded applications, like those using MCUs, our Ethernet controller family offers many flexible interfaces, including SPI, PCI and 8-/16-/32-bit parallel host bus interfaces. All of these interfaces work with an integrated MAC and PHY, delivering 10/100 performance with minimal CPU overhead. Microchip offers free compact TCP/IP stacks for 8-, 16- and 32-bit MCUs. Our Ethernet controllers are also available in small package options.

Available Features

- Variety of flexible processor interfaces
- Small 5 × 5 mm 32-pin packaging
- IEEE 1588 v2 precision time protocol
- Hardware AES encryption engine
- Energy-efficient Ethernet (802.3az)

Choose Your Best Fit Processor

Microchip provides drivers for our award-winning MPLAB Harmony software framework, or for open operating systems like Linux. Whether your application is large or small, we have the driver to cover your needs.

Feature	ENC28J60	ENC624J600	KSZ885X	LAN9250	LAN9221	KSZ8441	KSZ8462
Bandwidth	10Base-T	10/100Base-T/TX	10/100Base-T/TX, 100Base-FX	10/100Base-T/TX		10/100Base-T/TX, 100Base-FX	
TX/RX Buffer	8 KB	24 KB	12 KB (RX), 6 KB (TX)	16 KB		12 KB (RX), 6 KB (TX)	
Interface	SPI	SPI, Parallel	SPI, 8-/16-bit	SPI, 16-bit	16-bit	8-/16-bit	
IEEE 1588 v2	–	–	–	✓	–	✓	✓
Wake-On-LAN	–	–	✓	✓	–	–	–
EEE 802.3az	–	✓	✓	✓	–	✓	✓
Number of Ports	1	1	1 or 2	1	1	1	2
Cable Diagnostics	–	–	✓	✓	–	✓	✓
Power	–	–	330 mW	344 mW	522 mW	330 mW	
Temperature	–40 to 85°C						
Packages	28-pin QFN, 28-pin SOIC 300 mil, 28-pin SPDIP, 28-pin SSOP 208 mil	48-pin QFN, 48-pin TQFP, 64-pin TQFP	32-pin QFN, 48-pin LQFP, 128-pin PQFP	56-pin VQFN		64-pin LQFP	

Controller Evaluation Boards

Adding an Ethernet controller to your application is easy. The Ethernet PICtail™ Plus Daughter Board used with the Explorer 16, is an ideal solution for your PIC24/PIC32-based applications. For development in the MPLAB Harmony software framework, select the LAN9250 10/100 Ethernet Controller Evaluation Board. For development with processors running the Linux OS, the KSZ8851SNL Evaluation Board provides SPI-to-Ethernet connectivity. Our most popular options are below but you can find a complete list at www.microchip.com/EthernetController.

Ethernet PICtail Plus Daughter Board (AC164123)

Designed for flexibility while evaluating and developing Ethernet control applications, this board can be plugged into Microchip's Explorer 16 (DM240001) and can be used with the Microchip TCP/IP stack to connect with any Microchip 16-bit MCU.

KSZ8851SNL Evaluation Board (KSZ8851SNL-EVAL)

This board is for the evaluation of this single-port Ethernet controller. With a 32-pin QFN (5 × 5 mm) package, it is ideal for applications requiring SPI and provides a basic software driver and configuration utility.

LAN9250 10/100 Ethernet Controller Evaluation Board (EVB-LAN9250)

The simple, yet highly functional host bus interface provides a glue-less connection to most common MPUs and MCUs, or the device can be accessed via SPI/SQI. You can also fit an optical fiber interface via an SFP module. The on-board PIC32MX MCU can be interfaced to the LAN9250 using an HBI or SPI interface.

Microchip's LAN9252 is a 2/3-port EtherCAT slave controller with dual integrated Ethernet PHYs which are each capable of full-duplex 100Base-TX. The LAN9252 supports HP Auto-MDIX, allowing the use of direct-connect or cross-over LAN cables. 100Base-FX is supported by an external fiber transceiver via LVPECL. This device provides you a highly integrated and cost-effective solution for realizing EtherCAT slave solutions.

Available Features

- Operates with/without Host processor
- Fast SPI, Quad SPI or 8-/16-bit interfaces
- Multifunction GPIO
- Compact 12 × 12 mm 64-pin package
- Flexible operation modes with up to 3 ports

Development Tools

	Development Tool	Part Number	Description
	Add-On for EL9800 Development Platform	EVB-LAN9252-ADD-ON	This is designed to be used as an add-on board (ESC board) with the Beckhoff EL9800 EtherCAT® Evaluation Board. This board supports the SPI and DIGIO PDI modes of the LAN9252.
	PICtail™ Plus for Explorer 16 Platform	EVB-LAN9252-PICTAIL	This board is used to evaluate the LAN9252. It is an expansion board for the Explorer 16 Development Board (DM240001).
	3-Port EtherCAT Slave Controller Evaluation Kit with SPI PDI Interface	EVB-LAN9252-3PORT	This evaluation board is a standalone platform with SPI/SQI as the PDI interface. It supports the on-board PIC32MX or the option for other SoCs.
	4-Port Slave Controller Evaluation Kit in Expansion Mode	EVB-LAN9252-4PORT	This board features a unique design by cascading two LAN9252 ESC in back-to-back configuration though the MII interface. It is a standalone platform to develop an EtherCAT slave device with SPI/SQI™ as the PDI interface. This board supports the on-board PIC32MX or the option for other SoCs.
	EtherCAT Slave Controller Evaluation Kit with DIGIO PDI Interface	EVB-LAN9252-DIGIO	This board satisfies the demand for hardware-only EtherCAT slave devices. The exposed DIGIO interface together with control signals can operate without an attached MCU.
	EtherCAT Slave Controller Evaluation Kit with HBI PDI Interface	EVB-LAN9252-HBIPLUS	This board is a standalone platform to develop an EtherCAT slave device with PIC32 or other SoCs/MCUs/MPUs with more advanced features over the standard HBI board.

Find out more at www.microchip.com/EtherCAT.

Microchip has over 150 PIC® MCUs and SAM ARM MCU/MPUs with Ethernet MAC to support networking applications. Options range from fully integrated PIC MCUs plus 10Base-T MAC/PHY to MPUs with on-board 10/100/1000 MAC interfacing to external PHYs or switches.
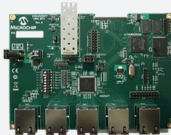
Ethernet Companion Processors

- PIC18 with on-board MAC/PHY
- Over 90 PIC MCUs with on-board MAC
- Over 40 SAM 32-bit ARM MCUs with on-board 10/100 MAC
- Over 15 SAM A5/ARM9 32-bit ARM MPUs with on-board 10/100 or Gigabit MAC

Choose Your Best Fit Processor

Microchip provides a free TCP/IP stack for our PIC and SAM ARM-based MCUs/MPUs. In addition we provide Ethernet drivers for the MPLAB Harmony software framework, and for open operating systems like Linux OS.

Development Tools

	Development Tool	Part Number	Description
	PIC32 Ethernet Starter Kit II	DM320004-2	This board provides an easy and low-cost method to experience 10/100 Ethernet development with PIC32 MCUs. Combined with Microchip's free TCP/IP software, this kit gets your project running quickly. Features include a socket accommodating various 10/100 Ethernet transceiver (RJ-45) PHY daughter boards.
	SAME70 Xplained Evaluation Kit	ATSAM70-XPLD	Featuring the KSZ8081 10/100 Ethernet PHY, this board is ideal for evaluating and prototyping fast Ethernet for consumer and industrial applications. The MCU is a ATSAME70Q21 ARM® Cortex®-M7 MCU with on-board debugger. Expansion boards can be purchased separately.
	SAM V71 Xplained Ultra Evaluation Kit	ATSAMV71-XULT	Featuring the KSZ8061 10/100 Ethernet PHY with Quiet-WIRE® technology, this board is ideal for evaluating Ethernet for harsh-environment applications. The MCU is an ATSAMV71Q21 ARM Cortex-M7 with on-board debugger. Extension boards can be purchased separately.
	SAM A5 D3 Xplained	ATSAMA5D3-XPLD	Featuring the KSZ9031 Gigabit PHY and the KSZ8081 10/100 Ethernet PHY, this board supports fast prototyping and evaluation of 10/100 and Gigabit Ethernet microprocessor-based designs. It includes a rich set of connectivity and storage peripherals with expansion headers for customization, as well as a a Linux® OS distribution and software package. Power and debug with the on-board USB connector.
	KSZ9567 Gigabit Ethernet Evaluation Board	EVB-KSZ9477	This board features a completely integrated triple speed (10BASE-T/100Base-TX/1000Base-T) Ethernet switch featuring five ports and one SFP port. The ARM-based ATSAMA5D3 host processor implements advanced switch management features such as IEEE 1588 v2, AVB, authentication and is reprogrammable.
	PIC32MZ with FPU (with/without Crypto Engine) Embedded Connectivity Starter Kit	DM320007 (without Crypto Engine) DM320007-C (with Crypto Engine)	Featuring the LAN8740 10/100 PHY, the PIC32MZ with FPU Embedded Connectivity Starter Kit provides a low-cost method for the development and testing of USB and Ethernet-based application with PIC32MZ EF family devices.

Product	Bandwidth	Interface (Upstream)	Wake-On-LAN	EEE	Temperature*	Packages
Ethernet Controllers						
ENC28J60	10	SPI	–	–	I	28-pin SPDIP, SSOP, SOIC, QFN
ENC624J600	10/100	SPI/Parallel	–	–	I	24-pin TQFN, QFN, 64-pin TQFN
LAN9217	10/100	16-bit Host Bus/MII	–	–	–	100-pin TQFP
LAN9218	10/100	32-bit Host Bus	–	–	I	100-pin TQFP
LAN9220/1	10/100	16-bit Host Bus	–	–	I	56-pin QFN
LAN9250	10/100	SPI, SQI™, HBI	✓	✓	I	64-pin QFN, 64-pin TQFP-EP
LAN9420	10/100	32-bit PCI 3.0	–	–	I	128-pin VTQFP
LAN89218	10/100	32-bit Host Bus	–	–	A, I	100-pin TQFP
KSZ8851	10/100	8-/16-/32-bit or SPI	✓	–	A, I	32-pin QFN, 48-pin LQFP, 128-pin PQFP
KSZ8852	10/100	8-/16-/32-bit	✓	✓	I	64-pin LQFP
KSZ8441	10/100	8-/16-/32-bit or SPI	✓	✓	I	64-pin LQFP
USB to Ethernet						
LAN9500A	10/100	USB 2.0	✓	–	I	56-pin QFN
LAN9730	10/100	USB 2.0 (HSIC)/MII	–	–	I	56-pin QFN
LAN9512/13/14	10/100	USB 2.0	–	–	I	64-pin QFN
LAN89530	10/100	USB 2.0	✓	–	A, I	56-pin QFN
LAN89730	10/100	HSIC	✓	–	I	56-pin QFN
LAN7500	Gigabit	USB 2.0	✓	–	I	56-pin QFN
LAN7800/01/50	Gigabit	USB 3.1/USB 2.0/HSIC	✓	✓	I	48-pin SQFN, 64-pin SQFN, 66-pin SQFN
Ethernet Transceivers (PHYs)						
LAN8710A	10/100	MII/RMII	–	–	I	32-pin QFN
LAN8720A	10/100	RMII	–	–	I	24-pin QFN
LAN8740A	10/100	MII/RMII	✓	✓	I	32-pin QFN
LAN8741A	10/100	MII/RMII	–	✓	I	32-pin QFN
LAN8742A	10/100	RMII	✓	–	I	24-pin QFN
LAN88730	10/100	MII/RMII	–	–	A, I	32-pin QFN
KSZ8051	10/100	MII/RMII	–	–	A, I	32-pin QFN
KSZ8061	10/100	MII/RMII	✓	✓	A, I	32-/48-pin QFN
KSZ8081	10/100	MII/RMII	–	–	I	24-/32-pin QFN, 48-pin LQFP
KSZ8091	10/100	MII/RMII	✓	✓	I	24-/32-pin QFN, 48-pin LQFP
LAN8810	Gigabit	GMII	–	–	I	72-pin QFN
LAN8820	Gigabit	RGMII	–	–	I	56-pin QFN
KSZ9031	Gigabit	MII/RMII/RGMII	✓	–	A, I	48-/64-pin QFN

Product	Bandwidth	Ports	Interface (Upstream)	1588–v2	Cable Diags	100 Fx	Temperature*	Packages
EtherCAT® Controllers								
LAN9252	10/100	2/3	SPI, SQI™, 8-/16-/32-bit host bus	Clock Sync.	✓	✓	I	64-pin QFN, 64-pin TQFP-EP
Ethernet Switches								
LAN9352	10/100	2	SPI/SQI/HBI	✓	✓	–	I	72-pin QFN, 80-pin TQFP-EP
LAN9303	10/100	3	MII/RMII/Turbo MII	–	–	✓	I	56-pin QFN, 72-pin QFN
LAN89303	10/100	3	MII/RMII/Turbo MII	–	–	✓	A, I	56-pin QFN
LAN9353	10/100	3	MII/RMII/Turbo MII	✓	✓	✓	I	64-pin QFN, 64-pin TQFP-EP
LAN9354	10/100	3	RMII	✓	✓	✓	I	56-pin QFN
LAN9355	10/100	3	MII/RMII/Turbo MII	✓	✓	✓	I	64-pin QFN, 64-pin TQFP-EP
KSZ8863	10/100	3	MII/RMII	–	✓	✓	I	48-pin LQFP
KSZ8873	10/100	3	MII/RMII	–	✓	✓	A, I	64-pin VQFN
KSZ8463	10/100	3	MII/RMII	✓	✓	✓	I	64-pin LQFP
KSZ8864	10/100	4	MII/RMII	–	✓	–	A, I	64-pin VQFN
KSZ8794	10/100	4	MII/GMII/RGMII	–	✓	–	I	64-pin VQFN
KSZ8795	10/100	5	GMII/RGMII/MII/RMII	–	✓	–	I	80-pin LQFP
KSZ8775	10/100	5	MII/GMII/RGMII	–	✓	–	I	80-pin LQFP
KSZ8765	10/100	5	MII/GMII/RGMII	–	✓	✓	I	64-pin QFN, 80-pin LQFP
KSZ8895	10/100	5	MII/RMII	–	✓	–	I	128-pin LQFP
KSZ8567	10/100	3, 5, 7	SGMII/RGMII/MII/RMII	✓	LinkMD®+ with signal quality indicator	with SGMII	A, I	64-pin QFN, 128-pin LQFP
KSZ9897	Gigabit	3, 6, 7	SGMII/RGMII/MII/RMII	–	✓	with SGMII	I	64-pin QFN, 128-pin LQFP
KSZ9567	Gigabit	3, 7	SGMII/RGMII/MII/RMII	1588 + AVB	LinkMD+ with signal quality indicator	with SGMII	I	64-pin QFN, 128-pin LQFP
KSZ9477	Gigabit	7	SGMII/RGMII/MII/RMII	1588 + AVB +HDR/DLR	LinkMD+ with signal quality indicator	with SGMII	I	128-pin LQFP

Note: All products above are supported with 3.3V operating voltage   *A = Automotive temperature range, I = Industrial temperature range

Support

Microchip is committed to supporting its customers in developing products faster and more efficiently. We maintain a worldwide network of field applications engineers and technical support ready to provide product and system assistance. For more information, please visit www.microchip.com:

- Technical Support: www.microchip.com/support
- Evaluation samples of any Microchip device: www.microchip.com/sample
- Knowledge base and peer help: www.microchip.com/forums
- Sales and Global Distribution: www.microchip.com/sales

Training

If additional training interests you, Microchip offers several resources including in-depth technical training and reference material, self-paced tutorials and significant online resources.

- Overview of Technical Training Resources: www.microchip.com/training
- MASTERs Conferences: www.microchip.com/masters
- Developer Help Website: www.microchip.com/developerhelp
- Technical Training Centers: www.microchip.com/seminars

Sales Office Listing

AMERICAS	EUROPE	EUROPE	ASIA/PACIFIC	ASIA/PACIFIC
Atlanta, GA Tel: 678-957-9614	Austria - Wels Tel: 43-7242-2244-39	Israel - Ra'anana Tel: 972-9-744-7705	Australia - Sydney Tel: 61-2-9868-6733	China - Zhuhai Tel: 86-756-321-0040
Austin, TX Tel: 512-257-3370	Denmark - Copenhagen Tel: 45-4450-2828	Italy - Milan Tel: 39-0331-742611	China - Beijing Tel: 86-10-8569-7000	India - Bangalore Tel: 91-80-3090-4444
Boston, MA Tel: 774-760-0087	Finland - Espoo Tel: 358-9-4520-820	Italy - Padova Tel: 39-049-7625286	China - Chengdu Tel: 86-28-8665-5511	India - New Delhi Tel: 91-11-4160-8631
Chandler, AZ (HQ) Tel: 480-792-7200	France - Paris Tel: 33-1-69-53-63-20	Netherlands - Drunen Tel: 31-416-690399	China - Chongqing Tel: 86-23-8980-9588	India - Pune Tel: 91-20-3019-1500
Chicago, IL Tel: 630-285-0071	France - Saint Cloud Tel: 33-1-30-60-70-00	Norway - Trondheim Tel: 47-7289-7561	China - Dongguan Tel: 86-769-8702-9880	Japan - Osaka Tel: 81-6-6152-7160
Dallas, TX Tel: 972-818-7423	Germany - Garching Tel: 49-8931-9700	Poland - Warsaw Tel: 48-22-3325737	China - Guangzhou Tel: 86-20-8755-8029	Japan - Tokyo Tel: 81-3-6880-3770
Detroit, MI Tel: 248-848-4000	Germany - Haan Tel: 49-2129-3766-400	Romania - Bucharest Tel: 40-21-407-87-50	China - Hangzhou Tel: 86-571-8792-8115	Korea - Daegu Tel: 82-53-744-4301
Houston, TX Tel: 281-894-5983	Germany - Heilbronn Tel: 49-7131-67-3636	Spain - Madrid Tel: 34-91-708-08-90	China - Hong Kong SAR Tel: 852-2943-5100	Korea - Seoul Tel: 82-2-554-7200
Indianapolis, IN Tel: 317-773-8323 Tel: 317-536-2380	Germany - Karlsruhe Tel: 49-721-62537-0	Sweden - Gothenberg Tel: 46-31-704-60-40	China - Nanjing Tel: 86-25-8473-2460	Malaysia - Kuala Lumpur Tel: 60-3-6201-9857
Los Angeles, CA Tel: 949-462-9523 Tel: 951-273-7800	Germany - Munich Tel: 49-89-627-144-0	UK - Wokingham Tel: 44-118-921-5800	China - Qingdao Tel: 86-532-8502-7355	Malaysia - Penang Tel: 60-4-227-8870
Raleigh, NC Tel: 919-844-7510	Germany - Rosenheim Tel: 49-8031-354-560		China - Shanghai Tel: 86-21-3326-8000	Philippines - Manila Tel: 63-2-634-9065
New York, NY Tel: 631-435-6000			China - Shenyang Tel: 86-24-2334-2829	Singapore Tel: 65-6334-8870
San Jose, CA Tel: 408-735-9110 Tel: 408-436-4270			China - Shenzhen Tel: 86-755-8864-2200	Taiwan - Hsin Chu Tel: 886-3-577-8366
Canada - Toronto Tel: 905-695-1980			China - Wuhan Tel: 86-27-5980-5300	Taiwan - Kaohsiung Tel: 886-7-213-7830
			China - Xiamen Tel: 86-592-2388138	Taiwan - Taipei Tel: 886-2-2508-8600
			China - Xian Tel: 86-29-8833-7252	Thailand - Bangkok Tel: 66-2-694-1351

10/28/16

MICROCHIP

www.microchip.com

Microchip Technology Inc.　|　2355 W. Chandler Blvd.　|　Chandler AZ, 85224-6199