

# Ethernet Product Highlight

## IEEE 1588v2 EtherSynch™ Switch for Industrial Ethernet Networks

Micrel's KSZ84XX family provides efficient end-device connectivity for Industrial Ethernet networks, minimizing per-device attachment costs.

The KSZ84XX family features EtherSynch™ technology, blending IEEE 1588v2 time stamping, precision local clock, synchronized I/O, and wire-speed Ethernet switching in a compact package. The device supports leading Industrial Ethernet standards including Ethernet/IP™, Profinet™, PowerLink™, among others.

Precision GPIO extends synchronization to local devices and allows multiple end devices to share the Industrial Ethernet attachment. The 12 Precision GPIO are capable of creating complex waveforms, with multiple GPIO events supported per pin.

Micrel pre-qualified and optimized the KSZ84XX family to operate with an optimized Precision Timing Protocol (PTPv2) protocol stack to get up and running quickly.

The hardware-oriented chip architecture reduces synchronization and communications processing demands, streamlining the Host CPU.

Micrel features the industry's most robust, and low-power Industrial Ethernet switches, complemented by advanced physical layer technology, and power management.

The KSZ84XX family is the ideal choice for real-time, Industrial Ethernet applications, and ease of integration with Host CPUs.

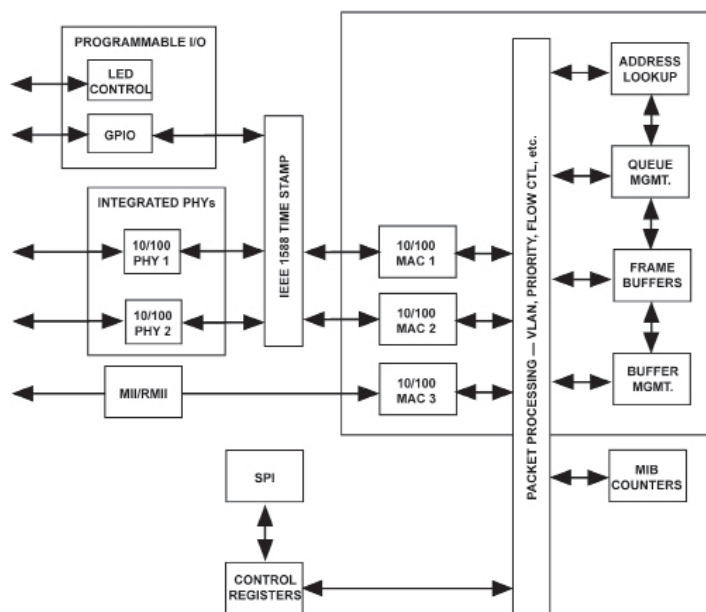
### Applications

- Industrial Ethernet end-device attachments for both distributed and centralized topologies
- Daisy Chained 1588 networks

### Ordering Information

P/N	Ports	Interface
KSZ8463MLI	3	MII
KSZ9463RLI	3	RMI
KSZ8442HLI	3	8/16-Bit
KSZ8441HLI	1	8/16-Bit

- Package: ROHS 64-pin LQFP (10mm x 10mm)
- Power: single 3.3V supply, @ < 500mW
- Industrial temperature range: -40°C to +85°C



KSZ8463MLI / RLI

# LAN Solutions Selection Guide

## PHYS

<b>Bold = New P/N</b>	Copper Support	Fiber Support	MII	RMII	Interface GMII	RGMI	Vdd I/O (V)	LinkMD® (Cable Diag)	Temp Range	802.3az EEE	Int Term	Package
KSZ9021GN	10/100/1000		X		X		3.3	X	C, I		X	8x8
KSZ9021RN	10/100/1000					X	2.5/3.3	X	C, I		X	7x7
KSZ9021GQ	10/100/1000		X		X		3.3	X	C, I		X	PQFP-128
KSZ9021RL	10/100/1000					X	2.5/3.3	X	C, I		X	eLQFP-64
<b>KSZ9031GN *</b>	10/100/1000		X		X		1.8/2.5/3.3	X	C, I	X	X	8x8
<b>KSZ9031RN *</b>	10/100/1000					X	1.8/2.5/3.3	X	C, I	X	X	7x7
<b>KSZ8031RNL-E *</b>	10/100			X			1.8/2.5/3.3	X	C, I	X	X	4x4
<b>KSZ8021RNL-E *</b>	10/100			X			1.8/2.5/3.3	X	C	X	X	4x4
<b>KSZ8051MNL-E *</b>	10/100		X				1.8/2.5/3.3	X	C, I	X	X	5x5
<b>KSZ8051RNL-E *</b>	10/100			X			1.8/2.5/3.3	X	C, I	X	X	5x5
<b>KSZ8051MLL-E *</b>	10/100		X				1.8/2.5/3.3	X	C, I	X	X	LQFP-48
KSZ8031RNL	10/100			X			1.8/2.5/3.3	X	C, I		X	4x4
KSZ8021RNL	10/100			X			1.8/2.5/3.3	X	C		X	4x4
KSZ8051MNL	10/100		X				1.8/2.5/3.3	X	A*, C, I		X	5x5
KSZ8051RNL	10/100			X			1.8/2.5/3.3	X	A*, C, I		X	5x5
KSZ8051MLL	10/100		X				1.8/2.5/3.3	X	C, I		X	LQFP-48
KSZ8051FLL*	10/100	100FX	X				1.8/2.5/3.3	X	C, I		X	LQFP-48
KSZ8041NL	10/100		X	X			3.3		A, C, I, J			5x5

C (Commercial) 0° to 70°C  
 I (Industrial) -40° to 85°C  
 A (Automotive) -40° to 85°C  
 J (Extended) -40° to 125°C

\* Consult Micrel for availability

# LAN Solutions Selection Guide

## Controllers

<b>P/N</b>	<b># of Eth Ports</b>	<b>Copper Support</b>	<b>Fibre Support</b>	<b>Interface</b>				<b>V<sub>DD</sub> I/O (V)</b>	<b>LinkMD® (Cable Diag)</b>	<b>Temp. Range</b>	<b>Package</b>
				8/16-Bit	32-Bit	SPI	PCI				
KSZ8851-16MLL	1	10/100		X				1.8/2.5/3.3	X	A, C, I, J	LQFP-48
KSZ8851-16MQL	1	10/100		X				1.8/2.5/3.3	X	C, I	PQFP-128
KSZ8851-32MQL	1	10/100			X			1.8/2.5/3.3	X	C, I	PQFP-128
KSZ8851SNL	1	10/100				X		1.8/2.5/3.3	X	C, I	5x5
KSZ8841-PMQL	1	10/100					X	3.3/5.0	X	C, I	PQFP-128
KSZ8842-16MQL	2	10/100		X				3.3/5.0	X	C	PQFP-128
KSZ8842-16MVL	2	10/100		X				3.3/5.0	X	C, I	LQFP-128
KSZ8842-16MBL	2	10/100		X				3.3/5.0	X	C, I	LFPGA-100
KSZ8842-32MQL	2	10/100			X			3.3/5.0	X	C	PQFP-128
KSZ8842-32MVL	2	10/100			X			3.3/5.0	X	C, I	LQFP-128
KSZ8842-PMQL	2	10/100					X	3.3/5.0	X	C, I	PQFP-128
KSZ8842-PMBL	2	10/100					X	3.3/5.0	X	A, C	LFPGA-100
KSZ8862-16MQL-FL	2	10/100	10FL	X				3.3/5.0	X	C	PQFP-128
KSZ8862-16MQL-FX	2	10/100	100FX	X				3.3/5.0	X	C	PQFP-128
KSZ8862-16MQL-SX	2	10/100	100SX	X				3.3/5.0	X	C	PQFP-128
KSZ8862-32MQL-FL	2	10/100	10FL		X			3.3/5.0	X	C	PQFP-128
KSZ8862-32MQL-FX	2	10/100	100FX		X			3.3/5.0	X	C	PQFP-128
KSZ8862-32MQL-SX	2	10/100	100SX		X			3.3/5.0	X	C	PQFP-128

C (Commercial)

0° to 70°C

I (Industrial)

-40° to 85°C

A (Automotive)

-40° to 85°C

J (Extended)

-40° to 125°C

# LAN Solutions Selection Guide

## Switches

P/N	# of Eth Ports	Copper Support	Fiber Support	MII	Interface				V <sub>DD</sub> I/O (V)	LinkMD® (Cable Diag)	Temp Range	Int Term	Package
					RMI	SNI	8/16-Bit	32-Bit					
KSZ8863MML	3	10/100 (2)		X					1.8/2.5/3.3	X	C, I	LQFP-48	
KSZ8863RLL	3	10/100 (2)							1.8/2.5/3.3	X	C, I	LQFP-48	
KSZ8863FLL	3	10/100 (1)	100FX(1)	X					1.8/2.5/3.3	X	C, I	LQFP-48	
KSZ8873MML	3	10/100 (2)		X					1.8/2.5/3.3	X	A, C, I, J	LQFP-64	
KSZ8873RLL	3	10/100 (2)				X			1.8/2.5/3.3	X	C, I	LQFP-64	
KSZ8873FLL	3		100FX (2)	X					1.8/2.5/3.3	X	C, I	LQFP-64	
KSZ8873MML	3	10/100 (1)		X					1.8/2.5/3.3	X	C, I	LQFP-64	
<b>KSZ8864RMN</b>	4	10/100(2)		X(2)	X				1.8/2.5/3.3		A, C, I	X 8x8	
<b>KSZ8895MQ</b>	5	10/100 (5)		X(2)		X			1.8/2.5/3.3		C, I	X PQFP-128	
<b>KSZ8895RQ</b>	5	10/100 (5)			X(2)	X			1.8/2.5/3.3		C, I	X PQFP-128	
<b>KSZ8995FMQ</b>	5	10/100 (3)	100FX (2)	X(2)					1.8/2.5/3.3		C, I	X PQFP-128	
<b>KSZ8895MLU</b>	5	10/100 (4)		X(2)					1.8/2.5/3.3		A	X LQFP-128	
KSZ8997	8	10/100 (8)							3.3		C	PQFP-128	
KSZ8999	9	10/100 (8)	100FX (8)	X		X			3.3		C, I	PQFP-208	
KSZ8842-16MQL	2	10/100 (2)					X		3.3/5.0	X	C	PQFP-128	
KSZ8842-16MVL	2	10/100 (2)					X		3.3/5.0	X	C, I	LQFP-128	
KSZ8842-16MBL	2	10/100(2)					X		3.3/5.0	X	C, I	LFPGA-100	
KSZ8842-32MQL	2	10/100 (2)					X		3.3/5.0	X	C	PQFP-128	
KSZ8842-32MVL	2	10/100 (2)					X		3.3/5.0	X	C, I	LQFP-128	
KSZ8842-PMQL	2	10/100 (2)					X		3.3/5.0	X	C, I	PQFP-128	
KSZ8842-PMBL	2	10/100(2)					X		3.3/5.0	X	C, A	LFPGA-100	
KSZ8862-16MQL	2	10/100	FL,SX,FX				X		3.3/5.0		C	PQFP-128	
KSZ8862-32MQL	2	10/100	FL,SX,FX				X		3.3/5.0		C	PQFP-128	

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# LAN Solutions Selection Guide

## IEEE-1588 Ethernet

<b>Bold = New</b> P/N	# of Eth Ports	Copper Support	Fiber Support	Interface MII	RMI	8/16-Bit	# of GPIO	V <sub>DD</sub> I/O (V)	LinkMD® (Cable Diag)	Temp Range	802.3az EEE	Int Term	Package
<b>KSZ8463MLI</b> *	2	10/100 (2)	100FX(2)	X			12	1.8/2.5/3.3	X	I	X	X	LQFP-64
<b>KSZ8463RLI</b> *	2	10/100 (2)	100FX(2)		X		12	1.8/2.5/3.3	X	I	X	X	LQFP-64
<b>KSZ8442HLI</b> *	2	10/100 (2)	100FX(2)			X	7	1.8/2.5/3.3	X	I	X	X	LQFP-64
<b>KSZ8441HLI</b> *	1	10/100	100FX			X	7	1.8/2.5/3.3	X	I	X	X	LQFP-64

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## ARM Based Ethernet SOC

<b>Bold = New</b> P/N	# of Eth Ports	Copper Support	Fiber Support	# of PCI Ports	Processor Speed	UART(s) Speed	USB 2.0	SDIO	GPIO	Counter Timer	Other I/O	DES/3DES Security Engine	LinkMD® Cable Diag	Supply Voltage	Temp Range	Package
KSZ8695PX	5	10/100	100FX	1	ARM922T 166MHz	1 x 115Kbps			16	2 x 32-bit				1.8V, 3.3V	C	PQFP-208
KSZ8695P	5	10/100	100FX	3	ARM922T 166MHz	1 x 115Kbps			16	2 x 32-bit				1.8V, 3.3V	C, I	PBGA-289
KSZ8695X	5	10/100	100FX		ARM922T 166MHz	1 x 115Kbps			8	2 x 32-bit				1.8V, 3.3V	C	PBGA-289
KSZ8692PB	2	10/100 MAC		3	ARM922T 250MHz	4 x 10Mbps	2 x Host/ Device 480Mbps	X	20	2 x 32-bit	I2S, SPI, I2C	X	X	1.2V, 2.5V, 3.3V	C, I	PBGA-400 24 x 24
KSZ8692PB-S	2	10/100 MAC		3	ARM922T 250MHz	4 x 10Mbps	2 x Host/ Device 480Mbps	X	20	2 x 32-bit	I2S, SPI, I2C	X	X	1.2V, 2.5V, 3.3V	C	PBGA-400 17 x 17
KSZ8692XPB	2	10/100 MAC		1	ARM922T 250MHz	4 x 10Mbps	2 x Host/ Device 480Mbps		20	2 x 32-bit	I2S, SPI, I2C		X	1.2V, 2.5V, 3.3V	C	PBGA-400 24 x 24
KSZ9692PB	2	10/100/1000 MAC		3	ARM922T 250MHz	4 x 10Mbps	2 x Host/ Device 480Mbps	X	20	2 x 32-bit	I2S, SPI, I2C	X	X	1.2V, 2.5V, 3.3V	C, I	PBGA-400 24 x 24
KSZ9692PB-S	2	10/100/1000 MAC		3	ARM922T 250MHz	4 x 10Mbps	2 x Host/ Device 480Mbps	X	20	2 x 32-bit	I2S, SPI, I2C	X	X	1.2V, 2.5V, 3.3V	C	PBGA-400 17 x 17
KSZ9692XPB	2	10/100/1000 MAC		1	ARM922T 250MHz	2 x 10Mbps	2 x Host/ Device 480Mbps		20	2 x 32-bit	I2S, SPI, I2C		X	1.2V, 2.5V, 3.3V	C	PBGA-400 24 x 24

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## Power Over Ethernet (POE)

<b>Bold = New</b> P/N	# of Ports	Comments	Package
MIC2358	802.3af 8 port PSE Controller	LQFP-64	64-LQFP

# Automotive (AEC-Q100 Qualified) Selection Guide

## Power Management

<b>Bold = New P/N</b>	<b>VIN</b>	<b>Comments</b>	<b>Package</b>
MAQ5280	4.5V to 120V	25mA LDO with Reverse Battery Protection	eSOIC-8
MAQ3203	4.5V to 42V	1.5MHz Step-Down LED Driver	SOIC-8
MAQ4123	4.5V to 20V	Low-Side Mosfet Driver, Dual Inverting	eSOIC-8
MAQ4124	4.5V to 20V	Low-Side Mosfet Driver, Dual Non-Inverting	eSOIC-8
MAQ4125	4.5V to 20V	Low-Side Mosfet Driver, Inverting + Non-Inverting	eSOIC-8

## LAN Solutions

<b>Bold = New P/N</b>	<b>VIN</b>	<b>Comments</b>	<b>Package</b>
<b>KSZ8051MNLU *</b>	3.3V	10/100 Ethernet PHY w/ MII	5x5
<b>KSZ8051RNLU *</b>	3.3V	10/100 Ethernet PHY w/ RMII	5x5
KSZ8041NLAM	3.3V	10/100 Ethernet PHY w/ MII & RMII	5x5
<b>KSZ8851-16MLLU</b>	3.3V	10/100 Ethernet (MAC+PHY) Controller w/ 16-bit Host bus	LQFP-48
<b>KSZ8873MLL AM</b>	3.3V	10/100 Ethernet 3-Port Switch w/ MII	LQFP-64
KSZ8842-PMBLAM	3.3V	10/100 Ethernet 2-Port Switch w/ PCI	LFBGA-100
KSZ8893MQLAM	3.3V	10/100 Ethernet 3-Port Switch w/ MII & RMII	PQFP-128
<b>KSZ8895MLU</b>	3.3V	10/100 Ethernet 5-Port Switch w/ MII	LQFP-128
<b>KSZ8864RMNU</b>	3.3V	10/100 Ethernet 4-Port Switch w/ MII & RMII	8x8

\*Contact Micrel for availability.

# Mouser Electronics

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