

# *Micrel New Product Highlights*

Micrel Inc., is a leading global manufacturer of IC solutions for the worldwide analog, Ethernet and high-bandwidth markets. The Company's products include advanced mixed-signal, analog and power semiconductors; high performance communication, clock management, Ethernet switch and physical layer transceiver ICs. Company customers include leading manufacturers of enterprise, consumer, industrial, mobile, telecommunications, automotive, and computer products. Corporation headquarters and state-of-the-art wafer fabrication facilities are located in San Jose, CA with regional sales and support offices and advanced technology design centers situated throughout the Americas, Europe and Asia. In addition, the Company maintains an extensive network of distributors and reps worldwide.

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Innovation Through Technology<sup>®</sup>

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## MIC2310 — Single-FET, Constant Power-Limit Hot Swap Controller

The MIC2310 is a single-channel, positive voltage, constant power-limit hot swap controller designed to provide for the safe insertion and removal of pc boards into fixed, rack, and pedestal mid- or back-planes using few external components. In addition, the MIC2310 employs a patent-pending, output load, power-limiting technique, this is where the current limit is inversely proportional to the output load voltage, such that the power product will not exceed the programmed power limit any longer than the externally programmed primary overcurrent period. The MIC2310 is ideally suited to address the power-limiting and timing requirements per the UL60950 specification for 240-VA applications. The MIC2310 incorporates high-side controller circuitry for an external N-channel MOSFET for which the MOSFET drain current rate of change is user-programmable via an external capacitor. The MIC2310 employs dual-speed, dual-level overcurrent fault protection. The primary overcurrent detector response time is programmable via an external current sense resistor and the secondary overcurrent detector is 2-bit user-programmable and exhibits a very fast (default) response to faults to ensure that the system power supplies are protected against catastrophic load current and short-circuit faults. Additionally, an analog output (voltage) signal is provided that is proportional to the steady-state load current to allow monitoring of the system's power. A PWRGD signal is provided to indicate a valid output voltage that can be used to enable a DC/DC power module.

### Features

- Provides safe PCB insertion and removal from live +12V back-planes
- Patent-pending, adaptive circuit breaker threshold control
  - Power-limit product (VA) is externally programmable for various power applications
- Dual-level, dual-speed overcurrent detection/protection
  - Programmable primary detector response time
  - Fast ( $< 1\mu\text{s}$ ) secondary detector response time to short circuit conditions
- Steady-state load current monitoring
- Programmable inrush current slew-rate control
- Electronic circuit breaker functions after fault
- Programmable input undervoltage lockout and overvoltage protection
- Fault reporting:
  - Open-drain 'Power-is-Good' output
  - Open-drain 'I\_FLT' output signaling for all current faults
  - Shorted RSENSE and Damaged MOSFET detection (D-G and D-S shorts)

### Applications

- UL60950, EN60950, and CSA1950 systems (240-VA)
- General power-limiting applications
- Base stations
- Enterprise servers
- High-reliability servers
- Enterprise switch networks

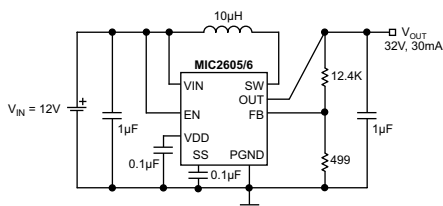
## MIC2605/6 — 0.5A, 1.2MHz/2MHz Wide Input Range Boost Regulators with Integrated Switch and Schottky

The MIC2605/6 are 1.2MHz/2MHz, PWM DC/DC boost switching regulators available in a (2mm x 2mm) MLF<sup>®</sup> package. High power density is achieved with the MIC2605/6's internal 40V/0.5A switch and Schottky diode, allowing it to power large loads in a tiny footprint.

The MIC2605/6 implements constant frequency 1.2MHz/2MHz PWM current mode control. The MIC2605/6 offers internal compensation that offers excellent transient response and output regulation performance. The high frequency operation saves board space by allowing small, low-profile external components. The fixed frequency PWM scheme also reduces spurious switching noise and ripple to the input power source.

The MIC2605/6 is available in an 8-pin (2mm x 2mm) MLF<sup>®</sup> leadless package. This package has an output over-voltage protection feature.

The MIC2605/6 has an operating junction temperature range of  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ .



**MIC2605/6 Typical Application**

### Features

- 4.5V to 20V wide input voltage range
- Output voltage adjustable to 40V
- 0.5A switch current and schottky diode
- MIC2605 operates at 1.2MHz
- MIC2606 operates at 2MHz
- Programmable soft start
- Stable with small size ceramic capacitors
- High efficiency
- Low input and output ripple
- $< 10\mu\text{A}$  shutdown current
- Output over-voltage and over-temperature protection
- Available in an 8-pin (2mm x 2mm) MLF<sup>®</sup> package

### Applications

- TV-tuners
- Broadband communications
- TFT-LCD bias supplies
- Positive output regulators
- SEPIC converters
- DSL applications
- Local boost regulators

## MIC2811/21 — Digital Power Management IC 2MHz, 600mA DC/DC with Triple 300mA LDOs

The MIC2811/21 are high performance power management ICs, supporting four output voltage rails with maximum efficiency. The four rails are generated by a single 600mA DC/DC converter and three 300mA LDOs. LDO1 and LDO2 are capable of operating at a low input voltage down to 1.65V useful for post regulating the output voltage of the DC/DC converter. The MIC2811 supports the use of a bypass cap for improved noise performance on LDO1 & LDO2 while the MIC2821 offers a separate enable pin for LDO3.

Featuring an operating frequency of 2MHz, the DC/DC converter uses small values of L and C to reduce board space but still retains operating efficiencies up to 86% at load currents up to 600mA.

The MIC2811/21 feature a  $\mu$ Cap design, operating with very small ceramic output capacitors and inductors for stability, reducing required board space and component cost and it is available in fixed output voltages in the 16-pin (3mm x 3mm) MLF<sup>®</sup> leadless package.

### Applications

- Mobile phones / PDAs
- Portable media players
- Mobile television receivers

### Features

- 2MHz DC/DC converter and three LDOs
- Thermal shutdown protection
- $\pm 2\%$  output voltage accuracy on all outputs
- Current-limit protection
- Available in a 16-pin (3mm x 3mm) MLF<sup>®</sup> package

#### DC/DC Converter

- 2.7V to 5.5V input voltage range
- Output current to 600mA
- 2MHz PWM operation
- Up to 86% efficiency (1.2V output)

#### LDO 1 & 2

- 1.65V to 5.5V input voltage range
- 300mA output current
- Fixed Output voltage as low as 0.8V
- Low 142mV dropout
- 70dB PSRR at 1kHz

#### LDO 3

- 2.7V to 5.5V input voltage range
- 300mA output current
- Fixed Output voltage as low as 1.0V

## MIC4724 — 3A 2MHz Integrated Switch Buck Regulator with 6Vmax Input

The Micrel MIC4724 is a high efficiency PWM buck (step-down) regulator that provides up to 3A of output current. The MIC4724 operates at 2MHz and has proprietary internal compensation that allows a closed loop bandwidth of over 200KHz.

The low on-resistance internal P-Channel MOSFET of the MIC4724 allows efficiencies over 92%, reduces external components count and eliminates the need for an expensive current sense resistor.

The MIC4724 operates from 3V to 6V input and the output can be adjusted down to 1V. The devices can operate with a maximum duty cycle of 100% for use in low-dropout conditions.

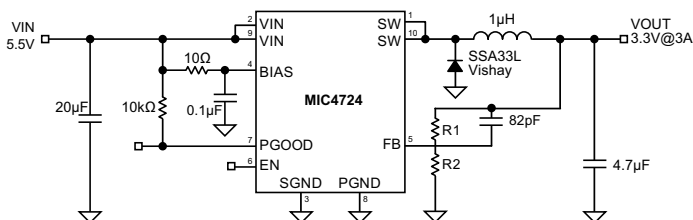
The MIC4724 is available in 10-pin ePAD MSOP package with a junction operating range from  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ .

### Features

- 3V to 6V input voltage range
- 2MHz PWM mode
- Output current to 3A
- Up to 94% efficiency
- 100% maximum duty cycle
- Adjustable output voltage option down to 1V
- Ultra-fast transient response
- Ultra-small external components
- Stable with a  $1\mu\text{H}$  inductor and a  $4.7\mu\text{F}$  output capacitor
- Fully integrated 3A MOSFET switch
- Micropower shutdown
- Thermal shutdown and current-limit protection
- Available in a 10-pin ePAD MSOP package

### Applications

- FPGA/DSP/ASIC applications
- General point-of-load
- Broadband communications
- DVD/TV recorders
- Point-of-sale
- Printers / scanners
- Set top boxes
- Computing peripherals
- Video cards



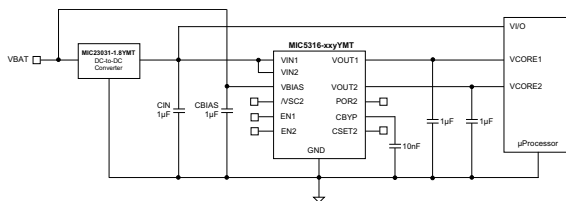
**MIC4724 Typical Application**

## MIC531x Family — High Side Power Switches

The MIC531x family are high performance, dual low input voltage, low dropout regulators. The MIC5314 and MIC5316 include the Power On Reset (POR) feature. The MIC5315 and MIC5316 include the voltage select feature. Other major features include two 300mA LDOs, input voltage down to 1.7V, ultra low dropout of 85mV at full load. Each LDO has its own low voltage input for system flexibility. The low input voltages and low dropout operation provides high efficiency by reducing the input to output voltage step which minimizes the regulator power loss. For the MIC5315 and MIC5316 voltage select is incorporated into the second output, which reduces the output voltage to further save power while in stand-by mode. An adjustable delay time POR output is provided for the second regulator for design flexibility on the MIC5314 and MIC5316.

Ideal for battery operated applications; the MIC531x family offers 1% accuracy and low ground current to increase light load efficiency. These devices can also be put into a zero-off-mode current state, drawing virtually no current when disabled.

The MIC531x family is available in fixed output voltages in the 10-pin (2mm x 2mm) and 12-pin (2.5mm x 2.5mm) Thin MLF<sup>®</sup> leadless packages.



**MIC5316 Typical Application**

## MIC23030/1 — 8MHz/4MHz PWM 400mA Buck Regulators with HyperLight Load™

The MIC23030/1 are high efficiency 8MHz and 4MHz, 400mA synchronous buck regulators with HyperLight Load™ mode. HyperLight Load™ provides very high efficiency at light loads and ultra-fast transient response which is perfectly suited for supplying processor core voltages. An additional benefit of this proprietary architecture is very low output ripple voltage throughout the entire load range with the use of small output capacitors. The tiny (1.6mm x 1.6mm) Thin MLF<sup>®</sup> package saves precious board space and requires only three external components.

The MIC23030/1 are designed for use with a very small inductor, down to 0.47µH, and an output capacitor as small as 2.2µF that enables a sub-1mm height.

These devices have a very low quiescent current of 21µA and achieves as high as 83% efficiency for the MIC23030 and 88% efficiency for the MIC23031 at 1mA. At higher loads, the MIC23030 provides a constant switching frequency around 8MHz while achieving peak efficiencies up to 91%. The MIC23031 provides a constant switching frequency around 4MHz while achieving peak efficiencies up to 93%.

Both devices are available in a 6-pin (1.6mm x 1.6mm) Thin MLF<sup>®</sup> package with an operating junction temperature range from -40°C to +125°C.

### Features

- 300mA output current for each LDO
- Dual low voltage regulator inputs: 1.7V to 5.5V
- Low output voltage range: 0.8V to 2.0V
- Ultra-low dropout voltage of 85mV @ 300mA
- Voltage select function (MIC5315 & MIC5316)
- Power On Reset output with adjustable delay (MIC5314 & MIC5316)
- Stable with 1µF ceramic output capacitors
- Very fast transient response
- Thermal shutdown and current limit protection
- Available in a 10-pin (2mm x 2mm) Thin MLF<sup>®</sup> package (MIC5313 & MIC5315)
- Available in a 12-pin (2.5mm x 2.5mm) Thin MLF<sup>®</sup> package (MIC5314 & MIC5316)

### Applications

- Mobile phones
- GPS and navigation devices
- Portable media players
- Digital still and video cameras
- PDAs
- Portable electronics

### Features

- 2.7V to 5.5V input voltage range
- 400mA output current
- Up to 91% efficiency and 83% at 1mA (MIC23030)
- Up to 93% efficiency and 88% at 1mA (MIC23031)
- 21µA typical quiescent current
- 8MHz PWM operation in continuous mode (MIC23030)
- 4MHz PWM operation in continuous mode (MIC23031)
- Ultra fast transient response
- Low voltage output ripple
- 0.01µA shutdown current
- Fixed and adjustable output voltage options available
- Available in a 6-pin (1.6mm x 1.6mm) Thin MLF<sup>®</sup>

### Applications

- Mobile handsets
- Portable media / MP3 players
- Portable navigation devices (GPS)
- WiFi / WiMax / WiBro modules
- Digital cameras
- Wireless LAN cards
- USB powered devices

## MIC9404x Family — 28mΩ R<sub>DS(ON)</sub> 3A High Side Load Switches

The MIC94040/1/2/3 is a family of high-side load switches designed to operate from 1.7V to 5.5V input voltage. The load switch pass element is an internal 28mΩ R<sub>DS(ON)</sub> P-channel MOSFET which enables the device to support up to 3A of continuous current. Additionally, the load switch supports 1.5V logic level control and shutdown features in a tiny 4-pin (1.2mm x 1.2mm) MLF® package.

The MIC94040 and MIC94041 feature rapid turn on, while the MIC94042 and MIC94043 provide a slew rate controlled soft-start turn-on of 100µs. The soft-start feature is provided to prevent an in-rush current event from pulling down the input supply voltage.

The MIC94041 and MIC94043 feature an active load discharge circuit which switches in a 200Ω load when the switch is disabled to automatically discharge a capacitive load.

An active pull-down on the enable input keeps the MIC94040/1/2/3 in a default OFF state until the enable pin is pulled above 1.2V. Internal level shift circuitry allows low voltage logic signals to switch higher supply voltages. The enable voltage can be as high as 5.5V and is not limited by the input voltage.

The MIC94040/1/2/3 operating voltage range makes them ideal for Lithium ion and NiMH/NiCad/Alkaline battery powered systems, as well as non-battery powered applications. The devices provide low quiescent current and low shutdown current to maximize battery life.

## MICRF113 — QwikRadio® ASK Transmitter

The MICRF113 is a high performance, easy to use, single chip ASK Transmitter IC for remote wireless applications in the 300 to 450MHz frequency band. This transmitter IC is a true “data-in, antenna-out” monolithic device. MICRF113 has three strong attributes: power delivery, operating voltage and operating temperature. In terms of power, the MICRF113 is capable of delivering +10 dBm into a 50Ω load. This power level enables a small form factor transmitter (lossy antenna) such as a key fob transmitter to operate near the maximum limit of transmission regulations. In terms of operating voltage, the MICRF113 operates from 1.8V to 3.6V. Many transmitter ICs in the same frequency band stop operating below 2V. The MICRF113 will work with most batteries to the end of their useful limits. In terms of operating temperature, the MICRF113 operates from -40°C to +85°C.

The MICRF113 is easy to use. It requires a reference frequency (RF carrier frequency divided by 32 times) generated from a crystal with a few additional external parts to create a complete versatile transmitter.

The MICRF113 operates with ASK/OOK (Amplitude Shift Keying/On-Off Keyed) UHF receiver types from wide-band super-regenerative radios to narrow-band, high performance super-heterodyne receivers. The MICRF113's maximum ASK data rate is 10kbps (Manchester Encoding).

The MICRF113 transmitter solution is ideal for industrial and consumer applications where simplicity and form factor are important.

### MICRF113 Typical Application

## Features

- 1.7V to 5.5V input voltage range
- 28mΩ R<sub>DS(ON)</sub>
- 3A continuous operating current
- Internal level shift for CMOS/TTL control logic
- Ultra low quiescent current
- Micro-power shutdown current
- Soft-start: MIC94042, MIC94043
- Load discharge circuit: MIC94041, MIC94043
- Ultra-fast turn off time
- Available in a 4-pin (1.2mm x 1.2mm) MLF® package

## Applications

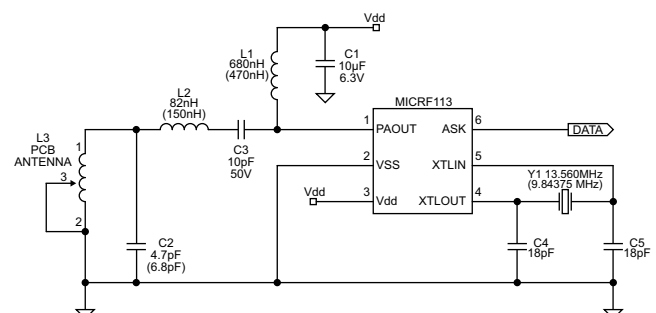
- Cellular phones
- Portable navigation devices (PND)
- Personal media players (PMP)
- Ultra mobile PCs
- Portable instrumentation
- PDAs
- Industrial and DataComm equipment

## Features

- Complete UHF transmitter
- Frequency range 300MHz to 450MHz
- Data rates up to 10kbps ASK
- Output power to 10dBm
- Low external part count
- Low voltage operation (down to 1.8V)
- Operate with crystals or ceramic resonators

## Applications

- Fan controllers
- Remote power switches
- Multi-media remote control
- Remote sensor data links
- Infrared transmitter replacement

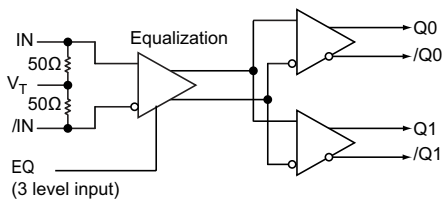


## SY560xxR Family — Industry's First Low Voltage CML Family of a Buffer, Multiplexer, and Crosspoint Switch with Equalization

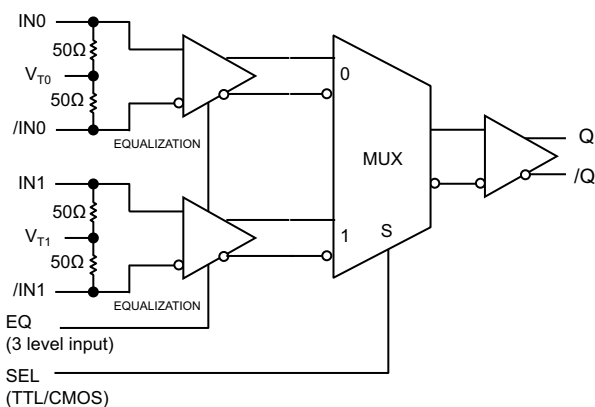
This new family of three new products, a buffer, a multiplexer, and a crosspoint switch can interface to 1.2V/1.8V/2.5V CML receivers. This family features patented 3-pin internal termination. The equalization circuit compensates for the signal degradation caused from long FR4 traces or cables. The multiplexer and the crosspoint switch feature a patented Crosstalk isolation design. This new family includes SY56011R fanout buffer, SY56017R multiplexer, and SY56023R crosspoint switch.

The SY56xxR family can interface to FPGAs and ASICs that require 1.2V, 1.8V, or 2.5V CML signals. These products consume lower power than that of similar products. The 3-pin input termination simplifies designs and interfaces to any differential signal, AC- or DC-coupled, without any level shifting or termination resistor networks in the signal path. The equalization circuit improves eye openings of data patterns that pass through up to 30" FR4 trace. To further improve the jitter performance of SY56017R and SY56023R, superior MUX input crosstalk isolation design is implemented that reduces crosstalk by up to 70 percent.

This family offers AC performance that guarantees data rates up to 6.4Gbps and clock frequency throughput up to 4.5GHz. Jitter performance is guaranteed to be less than 10psPP over temperature and voltage. The product family guarantees operation over the full industrial temperature range -40°C to +85°C. All solutions are available in MLF® packages which feature low inductance and capacitance, making the SY560xxR family ideal for today's high-speed, low jitter designs.



**SY56011R Block Diagram (Fanout Buffer)**



**SY56017R Block Diagram (Multiplexer)**

## Features

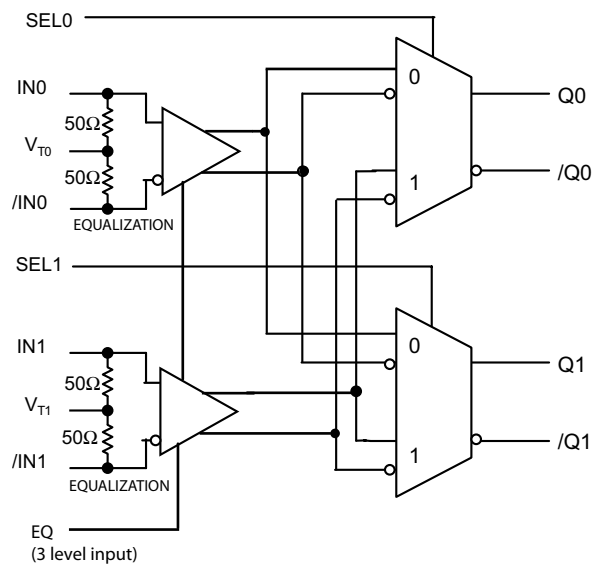
- 1.2V/1.8V/2.5V CML Outputs
- Ultra-low jitter design
  - <math><1\text{ps}\_{\text{RMS}}</math> cycle-to-cycle jitter
  - <math><10\text{ps}\_{\text{PP}}</math> total jitter
  - <math><1\text{ps}\_{\text{RMS}}</math> random jitter
  - <math><10\text{ps}\_{\text{PP}}</math> deterministic jitter
- 2.5V  $\pm$  5%, 1.2V/1.8V/2.5V  $\pm$  5% power supply operation
- Industrial temperature range: -40° to +85°C
- Available in a 16-pin (3mm X 2mm) MLF®

## Applications

- SONET clock and data distribution
- Fibre Channel
- Gigabit Ethernet
- Storage and server
- Video broadcast

## Family Description Table

Part Number	Description	Speed (Gbps / GHz)	Package
SY56011R	1:2 Fanout w/Equalization	6.4 / 4.5	3mm x 3mm
SY56017R	2:1 MUX w/Equalization	6.4 / 4.5	3mm x 3mm
SY56023R	2x2 Crosspoint w/Equalization	6.4 / 4.5	3mm x 3mm



**SY56023R Block Diagram (Crosspoint Switch)**

## **KSZ8851-16MLL/MLLI, KSZ8851-16/32MQL/ MQLI — Single-Port Ethernet MAC Controller with 8/16-Bit or 32-Bit Non-PCI Interface**

The KSZ8851M-series is a single-port controller chip with a non-PCI CPU interface and is available in 8/16-bit bus designs for the MLL or 8/16-bit and 32-bit bus designs for the MQL. The KSZ8851-16MLL uses the 48-pin LQFP and the KSZ8851-16/32MQL uses the 128-pin PQFP for applications requiring high-performance from single-port Ethernet Controller with 8/16-bit or 32-bit (for the MQL) generic processor interface. The KSZ8851M offers the most cost-effective solution for adding high-throughput Ethernet connectivity to traditional embedded systems.

The KSZ8851M 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 memory pointer with 4-byte buffer boundary and a fully utilizable 18KB for both TX (allocated 6KB) and RX (allocated 12KB) directions in host buffer interface.

The KSZ8851M is designed to be fully compliant with the appropriate IEEE 802.3 standards. An industrial temperature-grade version of the KSZ8851M, the KSZ8851MLLI and KSZ8851MQLI are also available.

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 KSZ8851M is designed using a low-power CMOS process that features a single 3.3V power supply with options for 1.8V, 2.5V or 3.3V VDD I/O. The device includes an extensive feature set that offers management information base (MIB) counters and CPU control/data interfaces with single bus timing.

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## **KSZ8851-SNL/SNLI — Single-Port Ethernet Controller PCI Interface**

The KSZ8851SNL is a single-chip Fast Ethernet controller consisting of a 10/100 physical layer transceiver (PHY), a MAC, and a Serial Peripheral Interface (SPI). The KSZ8851SNL is designed to enable an Ethernet network connectivity with any host micro-controller equipped with SPI interface. The KSZ8851SNL offers the most cost-effective solution for adding high-throughput Ethernet link to traditional embedded systems with SPI interface.

The KSZ8851SNL 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, SPI interface and incorporates a unique dynamic memory pointer with 4-byte buffer boundary and a fully utilizable 18KB for both TX (allocated 6KB) and RX (allocated 12KB) directions in host buffer interface.

The KSZ8851SNL is designed to be fully compliant with the appropriate IEEE 802.3 standards. An industrial temperature-grade version of the KSZ8851-SNL, the KSZ8851SNLI is also available.

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 KSZ8851SNL is designed using a low-power CMOS process that features a single 3.3V power supply with options for 1.8V, 2.5V or 3.3V VDD I/O. The device includes an extensive feature set that offers management information base (MIB) counters and a fast SPI interface with clock speed up to 50MHz.

### **Features**

- Integrated MAC and PHY Ethernet controller fully compliant with IEEE 802.3/802.3u standards
- Designed for high performance and high throughput applications
- Supports 10BASE-T/100BASE-TX
- Supports IEEE 802.3x full-duplex flow control and half-duplex back-pressure collision flow control
- Supports DMA-slave burst data read and write transfers
- Supports IP Header (IPv4)/TCP/UDP/ICMP checksum generation and checking
- Automatic 32-bit CRC generation and checking
- Simple SRAM-like host interface easily connects to most common embedded MCUs.
- Supports multiple data frames for transmit and receive without address bus and byte-enable signals
- Supports both Big- and Little-Endian processors
- Larger internal memory with 12K Bytes for RX FIFO and 6K Bytes for TX FIFO. Programmable low, high and overrun watermark for flow control in RX FIFO
- Efficient architecture design with configurable host interrupt schemes to minimize host CPU overhead and utilization
- Powerful and flexible address filtering scheme
- Single 25MHz reference clock for both PHY and MAC

### **Features**

- Integrated MAC and PHY Ethernet controller fully compliant with IEEE 802.3/802.3u standards
- SPI Interface with clock speeds up to 50MHz for high throughput applications
- Supports 10BASE-T/100BASE-TX
- Supports IEEE 802.3x full-duplex flow control and half-duplex back-pressure collision flow control
- Supports RXQ and TXQ FIFO DMA for fast data read and write transfers
- Supports IP Header (IPv4)/TCP/UDP/ICMP checksum generation and checking
- Automatic 32-bit CRC generation and checking
- Supports simple command and data phases in SPI cycle for RXQ/ TXQ FIFO and registers read/write
- Supports multiple data frames for TXQ FIFO and RXQ FIFO without additional command phase
- Supports flexible Byte (8-bit), Word (16-bit) and double word (32-bit) read/write access to internal registers
- Larger internal memory with 12K Bytes for RX FIFO and 6K Bytes for TX FIFO. Programmable low, high and overrun watermark for flow control in RX FIFO
- Efficient architecture design with configurable host interrupt schemes to minimize host CPU overhead and utilization
- Powerful and flexible address filtering scheme
- Optional to use external serial EEPROM configuration for MAC address
- Single 25MHz reference clock for both PHY and MAC

## Analog Products - Quarter Releases

Part Number	Description	Evaluation Board	Production	Package(s)	Comments
<b>Switch-Mode Regulators</b>					
MIC2605/6	0.5A, 1.2MHz/1.2MHz Wide Input Range Boost Regulator with Integrated Switch and Schottky	Yes	Yes	8-Pin (2mm x 2mm) MLF®	Datasheet online
MIC4724	3A, 2MHz Integrated Switch Buck Regulator with 6V <sub>MAX</sub> Input	Yes	Yes	10-Pin EPAD MSOP	Datasheet online
<b>LDOs</b>					
MIC5313	Low Voltage Dual 300mA LDO	Yes	Yes	10-Pin (2mm x 2mm) Thin MLF®	Datasheet online
MIC5314	Low Voltage Dual 300mA LDO with Power On Reset	Yes	Yes	12-Pin (2.5mm x 2.5mm) Thin MLF®	Datasheet online
MIC5315	Low Voltage Dual 300mA LDO with Voltage Select	Yes	Yes	10-Pin (2mm x 2mm) Thin MLF®	Datasheet online
MIC5316	Low Voltage Dual 300mA LDO with Power On Reset and Voltage Select	Yes	Yes	12-Pin (2.5mm x 2.5mm) Thin MLF®	Datasheet online
MIC69101/03	Single Supply V <sub>IN</sub> , Low V <sub>IN</sub> , Low V <sub>OUT</sub> , 1A LDO	Yes	Yes	10-Pin (3mm x 3mm) MLF®	Datasheet online
MIC69150/03	Single Supply V <sub>IN</sub> , Low V <sub>IN</sub> , Low V <sub>OUT</sub> , 1.5A LDO	Yes	Yes	10-Pin (3mm x 3mm) MLF®	Datasheet online
MIC69301/02	Single Supply V <sub>IN</sub> , Low V <sub>IN</sub> , Low V <sub>OUT</sub> , 3A LDO	Yes	Yes	5-Pin S-PAK	Datasheet online
MIC47100	1A High Speed Low VIN LDO	Yes	Yes	8-Pin (2mm x 2mm) MLF®	Datasheet online
<b>High Side Power Switches</b>					
MIC94040/1/2/3	28mΩ R <sub>DS(ON)</sub> , 3A High Side Load Switch	Yes	Yes	4-Pin (1.2mm x 1.6mm) MLF®	Datasheet online
<b>Hot Swap</b>					
MIC2310	Single-FET, Constant Power-Limit Hot Swap Controller	Yes	Yes	24-Pin TSSOP	Datasheet online
<b>Power Management ICs</b>					
MIC2811/21	Digital Power Management IC 2MHz, 600mA DC/DC with Triple 300mA LDOs	Yes	Yes	16-Pin (3mm x 3mm) MLF®	Datasheet online
<b>Radio Frequency</b>					
MICRF113	QwikRadio® ASK Transmitter	Yes	Yes	6-Pin SOT23	Datasheet online

## HBW Products - Quarter Releases

Part Number	Description	Evaluation Board	Production	Package(s)	Comments
<b>Precision Edge®</b>					
SY54023R	Low Voltage 1.2V/1.8V CML 2x2 Crosspoint Switch with Fail Safe Input 3.2Gbps, 2.5GHz	Yes	Yes	16-Pin (3mm x 3mm) MLF®	Datasheet online
SY56011R	Low Voltage 1.2V/1.8V/2.5V CML 1:2 Fanout Buffer 6.4Gbps with Equalization	Yes	Yes	16-Pin (3mm x 3mm) MLF®	Datasheet online
SY56017R	Low Voltage 1.2V/1.8V/2.5V CML 2:1 MUX 6.4Gbps with Equalization	Yes	Yes	16-Pin (3mm x 3mm) MLF®	Datasheet online
SY56023R	Low Voltage 1.2V/1.8V/2.5V CML 2x2 Crosspoint Switch 6.4Gbps with Equalization	Yes	Yes	16-Pin (3mm x 3mm) MLF®	Datasheet online

## Ethernet Products - Quarter Releases

Part Number	Description	Evaluation Board	Production	Package(s)	Comments
<b>Controllers (MAC + PHY)</b>					
KSZ8851-16MLL	Single-Port Ethernet MAC Controller with 8-Bit or 16-Bit Non-PCI Interface	—	Yes	48-Pin LQFP	Datasheet online
KSZ8851-16MQL	Single-Port Ethernet MAC Controller with 8/16-Bit or 32-Bit Non-PCI Interface	—	Yes	128-Pin PQFP	Datasheet online
KSZ8851SNL	Single-Port Ethernet Controller with PCI Interface	—	Yes	32-Pin (5mm x 5mm) MLF®	Datasheet online

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