Shortform Catalog

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MICREL®

Innovation Through Technology®

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Corporate Profile

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. Web: http://www.micrel.com.

Founded in 1978, Micrel maintains a portfolio of world class wafer fabrication processes that enable the Company to produce new products faster than the competition. The Company uses, singularly or in combination, CMOS, Bipolar and DMOS technologies in its analog products. With the acquisition of Synergy Semiconductor in 1998, Micrel has high-speed bipolar capability in the form of ASSET™ (All Spacer Separated Element Transistor) process. This proprietary, patented bipolar technology employs a narrow deep-trench isolation technique allowing for electrical isolation between adjacent circuit elements. This means the Company can place multiple analog and digital functions on the same IC without the various functions causing interference typically found when alternate techniques are utilized.

Ethernet ICs

Micrel is an established leader in wired Ethernet networking with more than 300 million ports shipped. The Company's Ethernet products are widely used in Digital Home devices (IP-STB, IP-TV, etc.), routers, access points, VoIP, Automotive, Industrial and Power over Ethernet (PoE) applications, to name a few. There are a wide range of field-proven, multi-port products in a variety of packages, including Physical Layer Transceivers (PHYs), Embedded Controllers, Unmanaged and Managed Switches and System-on-Chip (SoC) ICs with an integrated processor. Micrel's comprehensive portfolio of Ethernet products operate over commercial, industrial and extended temperature ranges, and are available in a variety of environmentally friendly, lead-free packaging options.

High-Bandwidth and Communication Semiconductor Solutions

Micrel's High-Bandwidth and Communication products include PMD (Physical Media Device) ICs such as multi-rate (up to 4.25Gbps) Laser drivers, post amplifiers and optical module management controllers for all types of fiber optical module applications. It also includes physical layer ICs such as 155Mbps and multi-rate (up to 2.7Gbps) CDRs (Clock and Data Recovery), and MUX/DeMUX ICs for Access and Telecommunications applications. This growing family of devices leads the industry in design innovation and flexibility. The ICs often exceed stringent industry requirements.

Precision Edge® Products

Micrel's Precision Edge® product family includes precision frequency synthesizers, clock distribution and translation, multiplexers, crosspoint switches, and high-speed gates — all aimed at meeting the most rigorous, timing-critical applications. All Precision Edge® products are designed to provide the lowest skew and jitter IC solutions available.

Low-Dropout Voltage Regulators

Micrel has gained a reputation as a leading supplier of LDO regulators and is a major global supplier to the mobile phone and computing industries. The Company maintains a very broad portfolio of LDO regulators ranging from 10mA devices in Teeny™ SC-70-5 packages to 7.5A power devices and LDO controllers for even higher current applications.

Radio Frequency Products

Micrel's RF offering consists of two product groups: QwikRadio® receivers and transmitters for actuation devices such as remote controls and remote keyless entry; and RadioWire® transceivers for connectivity applications such as wire replacement in industrial control and security systems.

Universal Serial Bus and PCMCIA

As a recognized leader of USB and PC Card power distribution solutions, Micrel's extensive selection of ICs are consistently used by many of the leading PC and peripheral OEMs.

Hot Swap Controllers

Micrel's hot swap power controllers support the industry requirement for high availability (24/7/365) operation in servers, telecom and datacom equipment, and enterprise storage networks. These products allow customers to upgrade or replace system boards without having to power down the entire system. Offering products for primary- and secondary-side applications, Micrel's family of hot swap power controllers offers customers a wide range of product choices uniquely suited to these applications. This product portfolio includes the award-winning MIC2590B, the industry's most integrated dual-slot hot swap power controller for PCI and CompactPCI® applications. Leveraging Micrel's expertise in power control and distribution, the MIC2590B was designed to support Intel's Itanium® 64-bit server platforms. To address the next generation, more dual-slot power controllers are in development. For primary-side applications, the Company continues to add innovative products to the high-voltage hot swap product portfolio, addressing power control applications for the telecommunications, data communications, and data storage equipment markets.

MOSFET Drivers

Micrel offers a broad range of MOSFET drivers, ranging from IttyBitty® devices in SOT-23 packaging to 12A high-power devices. "New" device families offer thermally enhanced exposed pad SOIC, MSOP and space saving efficient MLF® 2 x 2mm, 3 x 3mm and 4 x 4mm package options.

Switch-Mode Power Supply Products

Micrel has a rapidly expanding portfolio of switching regulator products serving the mobile device, portable computer, telecommunications and industrial markets. All products combine Micrel's advanced processes with the Company's strong design expertise to produce best-in-class products. These products address step-up, step-down and multi-output systems, all offering designers speed and efficiency advantages.

System/Thermal Management Products

Thermal management is an increasingly critical function in today's portable and high performance systems. Micrel's proprietary technology enables more functionality in smaller packages and superior, real-world accuracy in temperature measurement via embedded thermal diodes. Thermal diodes are increasingly used to monitor the die temperature of high-performance integrated circuits such as Intel® and AMD® microprocessors, Xilinx Virtex®, FPGAs, and ASICs. Micrel's family of products include the world's first and only IttyBitty® SOT-23 thermal diode supervisor IC and the smallest three-zone thermal supervisor. All together, Micrel offers a complete family of one, two, and three-zone thermal supervisor ICs as well as both analog and digital fan controllers.

Operational Amplifiers and Comparators

The Company has a broad range of high and low voltage op amps and comparators. These ICs range from general purpose to high speed devices. Of particular note is the MIC86x family of ICs which are, by far, the lowest power consumption op amps of their type on the market. The advanced features of these products make them ideally suited for all forms of battery-powered equipment.

Other Product Lines

- Charge pumps
- Voltage references
- Voltage/processor supervisors
- Miniature MOSFETs
- Serial and parallel-input latched drivers
- Display drivers
- Latch drivers
- Custom and semi-custom products

Big Technology, Small Package Innovation

In response to increasing demands for smaller and smaller footprint solutions, Micrel leads the industry in packaging innovation with IC packaging options, including MLF® technology, down to 1mm x 1mm and smaller.

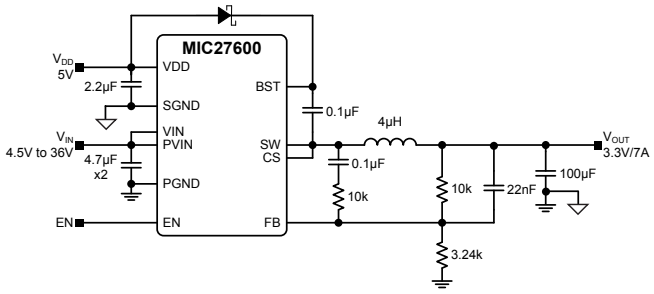
Quality Assurance

Micrel first achieved ISO 9001 registration on March 31, 1997 and on December of 2004, the Company's wafer fabrication facility was certified to ISO14001:1996, the International Environmental Management System Standard. The goal of the environmental management system is to ensure regulatory compliance and to reduce environmental impact through waste reduction and recycling. Micrel is committed to delivering products and services that meet or exceed our customers' expectations — error free, on-schedule, and at a competitive price. Micrel maintains a culture of continuous improvement that runs through all disciplines in the company and includes the activities of its suppliers.

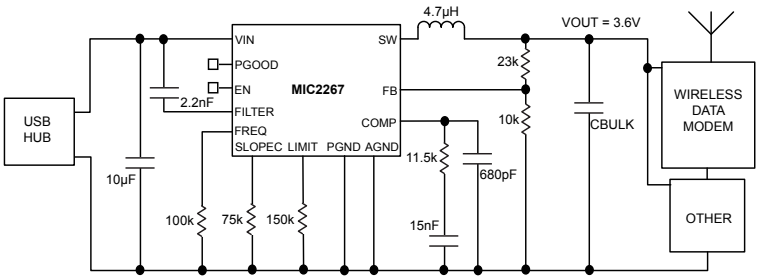
Commitment to Customer Satisfaction

Micrel remains committed to contributing to its customers' success. Internal processes have been developed with flexibility in mind, so the Company can quickly react to changing requirements. Micrel's outstanding sales, customer service and technical support organizations are set up to address customer needs and requirements.

Analog Product Highlight — MIC27600 & MIC2267



MIC27600



MIC2267

SuperSwitcher II™

The Micrel MIC27600, the latest addition to the SuperSwitcher II™ family, is a constant-frequency, synchronous buck regulator featuring a unique digitally modified adaptive on-time control architecture. The MIC27600 operates over an input supply range of 4.5V to 36V and provides a regulated output of up to 7A of output current. The output voltage is adjustable down to 0.8V with a guaranteed accuracy of ±1%, and the device operates at a switching frequency of 300kHz.

Micrel's Hyper Speed Control™ architecture allows for ultra-fast transient response while reducing the output capacitance and also makes (High V_{IN})/(Low V_{OUT}) operation possible. This digitally modified adaptive t_{ON} ripple control architecture combines the advantages of fixed-frequency operation and fast transient response in a single device.

The MIC27600 offers a full suite of protection features to ensure protection of the IC during fault conditions. These include undervoltage lockout to ensure proper operation under power-sag conditions, internal soft-start to reduce inrush current, foldback current limit, "hiccup" mode short-circuit protection and thermal shutdown.

Features

- Hyper Speed Control™ architecture enables
- 4.5V to 36V voltage input
- Adjustable output from 0.8V to 5.5V (V_{HSD} ≤ 28V)
- Adjustable output from 0.8V to 3.6V (V_{HSD} ≤ 36V)
- ±1% FB accuracy
- Any Capacitor™ Stable - Zero-ESR to high-ESR
- 7A output current capability, up to 95% efficiency
- 300kHz switching frequency
- Internal compensation, 6ms internal soft-start
- Thermal shutdown
- Supports safe startup into a pre-biased load
- 28-pin 5mm x 6mm MLF® package

Applications

- Distributed power systems
- Communications/networking infrastructure
- Set-top box, gateways and routers
- Printers, scanners, graphic cards and video cards

USB Power Maximizer™

The MIC2267 is a USB Power Maximizer™ which transfers the maximum power from the limited USB current source by shaping the input current limit profile. It incorporates a high efficiency, integrated synchronous step down regulator. Internal 150mΩ switches and adjustable operating frequency allows the MIC2267 to achieve greater than 90% efficiency across a broad load range. It replaces the USB current limit switch, 5V buck regulator and minimizes capacitance for many USB applications. The adjustable frequency control can be utilized to move harmonics away from sensitive frequency bands.

The MIC2267 allows the input current limit profile to be shaped for various applications. With a current mode control with external compensation, the MIC2267 transient response can be optimized over load and output capacitance making it highly flexible for many applications.

Additional features include 1µA shutdown current, output current limit and thermal shutdown protection.

Features

- Input voltage range: 3.0V to 5.5V
- Output voltage adjustable down to 1.0V
- Up to 96% efficiency at 500mA output
- Efficiency >90% across a broad load range
- Fast transient response
- Adjustable frequency from 400kHz to 1.5MHz
- Adjustable input current limiting 100mA to over 1A
- 100% maximum duty cycle
- Fully integrated MOSFET switches
- Micropower shutdown
- Thermal shutdown and output current-limit protection
- 12-pin 3mm x 3mm MLF®

Applications

- USB power
- Wireless router cards
- General buck converter applications

LDO Regulator Selection Guide

Micrel Advantage

- Industry's broadest LDO portfolio
- Lowest input voltages
- Best transient performance
- Lowest quiescent current and dropout
- High PSRR, Low noise
- Small and efficient packaging

Single Outputs

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC5231	10mA	3.5V to 12V	2.75, 3.0, 3.3, 5.0	650nA	150mV	SOT-23		Yes
MIC5232	10mA	2.7V to 7.0V	1.2, 2.5, 2.8, 3.3	1.8µA	100mV	TSOT-23-5, MLF® (2x2mm)	Ultra Low I_Q µCap 10mA LDO with Reverse Current Protection.	Yes
MIC5280	25mA	4.5V to 120V	Adj.	31µA	1.1V	eSOIC-8	Wide Input Voltage Range.	
MIC5203	80mA	2.5V to 16V	2.6, 2.8, 3.0, 3.3, 3.6, 3.8, 4.0, 4.5, 5.0	180µA	300mV	SOT-23, SOT-143		Yes
MIC5213	80mA	2.5V to 16V	2.5, 2.6, 2.7, 2.8, 3.0, 3.3, 3.6, 5.0	180µA	300mV	SC70		Yes
LP2951	100mA	2V to 30V	5.0 (0.5%), 5.0 (1%), Adj.	100µA	380mV	SOIC, PDIP	2nd Source to National.	
MIC5200	100mA	2.5V to 26V	3.0, 3.3, 4.8, 5.0	130µA	230mV	MSOP, SOIC, SOT-223	Load Dump Protection.	
MIC5233	100mA	2.3V to 36V	1.8, 2.5, 3.0, 3.3, 5.0, Adj.	18µA	270mV	SOT-23	Reverse Battery Protection.	Yes
MIC5253	100mA	2.7V to 6V	1.5, 1.8, 1.85, 2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3.0, 3.1, 3.2, 3.3	100µA	165mV	SC70		Yes
MIC5270	100mA	–2V to –16V	–3.0, –4.1, –5.0, Adj.	35µA	480mV	SOT-23	Negative µCap LDO.	Yes
MIC5271	100mA	–3.3V to –16V	–3.0, –5.0, Adj.	35µA	480mV	SOT-23	Negative µCap LDO.	Yes
MIC2951	150mA	2V to 30V	3.3, 4.85, 5.0 (0.5%), 5.0 (1%) Adj	120µA	300mV	MSOP, SOIC, PDIP	High V_{IN}, Load Dump Protection.	
MIC5205	150mA	2.5V to 16V	2.5, 2.7, 2.8, 2.85, 2.9, 3.0, 3.1, 3.2, 3.3, 3.6, 3.8, 4.0, 5.0, Adj.	80µA	165mV	SOT-23	Low Noise LDO.	
MIC5206	150mA	2.5V to 16V	2.5, 2.7, 3.0, 3.2, 3.3, 3.6, 3.8, 4.0, 5.0, Adj	80µA	165mV	MSOP, SOT-23	Low Noise LDO with Error Flag.	
MIC5225	150mA	2.5V to 16V	1.5, 1.8, 2.5, 2.7, 3.0, 3.3, 5.0, Adj.	29µA	310mV	SOT-23	Zero Shutdown Current, Reverse Battery Protection.	Yes
MIC5235	150mA	2.3V to 24V	1.5, 1.8, 2.5, 2.7, 3.0, 3.3, 5.0, Adj.	18µA	310mV	SOT-23	Zero Shutdown Current, Reverse Battery Protection.	Yes
MIC5295	150mA	2.3V to 24V	3.0, 3.3, 5.0, Adj.	18µA	310mV	TO-252-5	Zero Shutdown Current, Reverse Battery Protection.	Yes
MIC5236	150mA	2.3V to 30V	2.5, 3.0, 3.3, 5.0, Adj.	20µA	350mV	P-MSOP, P-SOIC	Load Dump Protected µCap LDO.	Yes
MIC5238	150mA	1.5V to 6V	1.0, 1.1, 1.2, 1.3	23µA	310mV	T/SOT	Low Voltage, Dual Supply µCap.	Yes
MIC5247	150mA	2.7V to 6V	1.5, 1.6, 1.8, 1.85, 2.0, 2.4	85µA	150mV	MLF® (2x2mm), T/SOT		Yes
MIC5248	150mA	2.7V to 6V	1.2	85µA	n/a	SOT-23, MLF® (2x2mm)	1.2V LDO with Power Good.	Yes
MIC5252	150mA	2.7V to 6V	1.8, 2.5, 2.8, 2.85, 3.0, 4.75	90µA	135mV	MLF® (2x2mm), SOT-23	Low Noise LDO.	Yes
MIC5254	150mA	2.7V to 6V	3.3/2.5	117µA	135mV	MSOP	With Error Flags.	Yes
MIC5255	150mA	2.7V to 6V	2.5, 2.6, 2.7, 2.75, 2.8, 2.85, 2.9, 3.0, 3.1, 3.2, 3.3, 3.5	90µA	135mV	MLF® (2x2mm), T/SOT	Low Noise LDO.	Yes
MIC5256	150mA	2.7V to 6V	1.5, 1.8, 2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3.0, 3.1, 3.3	90µA	135mV	T/SOT	Low Noise with Error Flag.	Yes
MIC5258	150mA	2.7V to 6V	1.2	85µA	n/a	SOT-23	1.2V LDO with Power Good.	Yes
MIC5265	150mA	2.7V to 5.5V	1.5, 1.8, 1.85, 2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3.0, 3.1, 3.2, 3.3	75µA	210mV	T/SOT	General Purpose LDO.	Yes
MIC5268	150mA	2.7V to 6V	1.2	85µA	n/a	SOT-23		Yes
MIC5301	150mA	2.3V to 5.5V	1.3, 1.5, 1.8, 2.1, 2.5, 2.6, 2.85, 2.8, 2.9, 3.0, 3.3, 4.6, Adj.	85µA	40mV	Thin MLF®, TSOT-23-5 MLF® (1.6x1.6mm)		Yes
MIC5302	150mA	2.3V to 5.5V	1.3, 1.5, 1.8, 2.1, 2.5, 2.6, 2.85, 2.8, 2.9, 3.0, 3.3, 4.6	85µA	50mV	Thin MLF®, (1.2x1.6mm)	Ultra-small.	Yes
MIC5304	150mA	2.3V to 5.5V	3.15/1.85, 3.15/1.875, 3.2/1.8	24µA	85mV	Thin MLF®, (1.6x1.6mm)	Single 150mA Micro Power ULDO™ with Voltage Select Pin.	Yes
MIC5326	150mA	2.3V to 5.5V	2.8	24µA	85mV	Thin MLF®, (1.2x1.6mm)	Single 150mA Micro Power ULDO™	Yes
MIC5305	150mA	2.25V to 5.5V	1.5, 1.8, 2.0, 2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3.0, 3.3, 4.6, 4.75, Adj.	90µA	60mV	MLF® (2x2mm), TSOT, Thin MLF®	High PSRR Low Noise ULDO™.	Yes
MIC5306	150mA	2.25V to 5.5V	1.5, 1.8, 2.5, 2.6, 2.8, 3.0, 3.1, 3.3	16µA	120mV	T/SOT	Low I_Q, 150mA ULDO™.	Yes
MIC5308	150mA	1.6V to 5.5V	1.2, 1.3, 1.5, 1.8, Adj.	23µA	50mV	TSOT-23-6, MLF® (1.6x1.6mm)	Low V_{IN}/V_{OUT} with Ultra-low I_Q.	
MIC5365	150mA	2.5V to 5.5V	1.0, 1.2, 1.3, 1.5, 1.8, 2.0, 2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3.0, 3.3	32µA	180mV	Thin MLF® (1x1mm), SC-70	Ultra-small Single 150mA LDO.	Yes

LDO Regulator Selection Guide

Single Outputs (Continued)

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC5366	150mA	2.5V to 5.5V	1.0, 1.2, 1.3, 1.5, 1.8, 2.0, 2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3.0, 3.3	32µA	180mV	Thin MLF® (1x1mm), SC-70	Ultra-small Single 150mA LDO with Auto Discharge.	Yes
MIC5375	150mA	2.5V to 5.5V	2.8	29µA	120mV	Thin MLF® (1x1mm), SC-70	High Performance Low Dropout 150mA ULDO™.	Yes
MIC5376	150mA	2.5V to 5.5V	2.8	29µA	120mV	Thin MLF® (1x1mm), SC-70	High Performance Low Dropout 150mA ULDO™ with Auto Discharge.	Yes
MIC5377	150mA	2.5V to 5.5V	Adj.	29µA	120mV	Thin MLF® (1.2x1.2mm), SC-70	High Performance Adjustable Low Dropout 150mA ULDO™.	Yes
MIC5378	150mA	2.5V to 5.5V	Adj.	29µA	120mV	Thin MLF® (1.2x1.2mm), SC-70	High Performance Adjustable Low Dropout 150mA ULDO™ with Auto Discharge.	Yes
MIC5207	180mA	2.5V to 16V	1.8, 2.5, 2.8, 2.9, 3.0, 3.1, 3.2, 3.3, 4.0, 5.0, Adj.	80µA	165mV	T/SOT	Low Noise LDO.	
MIC5201	200mA	2.5V to 26V	3.0, 3.3, 4.8, 5.0, Adj	130µA	270mV	SOIC, SOT-223	Load Dump Protection.	
MIC5367	200mA	2.5V to 5.5V	1.2, 1.5, 3.3	29µA	180mV	Thin MLF® (1.6x1.6mm)	High Performance 200mA Peak, 150mA Continuous LDO.	Yes
MIC5368	200mA	2.5V to 5.5V	1.2, 1.5, 3.3	29µA	180mV	Thin MLF® (1.6x1.6mm)	High Performance 200mA Peak, 150mA Continuous LDO with Auto Discharge.	Yes
MIC5309	300mA	1.7V to 5.5V	1.2, 1.5, 1.8, Adj.	23µA	100mV	TSOT-23-6, Thin MLF® (1.6x1.6mm)	Low V_{IN}/V_{OUT} with Ultra-low I_Q.	
MIC2954	250mA	2V to 30V	5.0, 5.0 (0.5%) Adj.	140µA	375mV	SOIC, SOT-223, TO-220	Load Dump Protection.	
MIC5303	300mA	2.3V to 5.5V	1.3, 1.5, 1.8, 2.1, 2.5, 2.6, 2.85, 2.8, 2.9, 3.0, 3.3, 4.6	85µA	100mV	Thin MLF® (1.2x1.6mm)	High I_{OUT}, Ultra-small.	Yes
MIC5307	300mA	2.4V to 5.5V	1.5, 1.8, 2.8, 3.0	20µA	120mV	Thin MLF® (1.6x1.6mm) TSOT-23	Ultra-low I_Q, 300mA ULDO™.	Yes
MIC5318	300mA	2.3V to 6V	1.5, 1.8, 2.5, 2.8, 2.85, 3.0, 3.3, Adj.	85µA	100mV	Thin MLF® (1.6x1.6mm) TSOT-23	High V_{IN}.	Yes
MIC5327	300mA	2.3V to 5.5V	1.8, 2.8	24µA	180mV	Thin MLF® (1.2x1.6mm)	Single 300mA Micro Power ULDO™	Yes
MIC5249	300mA	2.7V to 6V	1.8, 2.5, 2.6, 2.8, 2.85, 3.0, 3.3	90µA	400mV	MSOP	LDO w/POR.	Yes
MIC5259	300mA	2.7V to 6V	1.5, 1.8, 2.1, 2.5, 2.8, 2.85, 3.0, 3.3	90µA	300mV	MLF® (2x2mm), TSOT	High PSRR Low Noise LDO.	Yes
MIC29201	400mA	4.3V to 26V	3.3, 4.8, 5.0, 12	140µA	450mV	SOIC, TO-220, TO-263	Load Dump Protection.	
MIC29202	400mA	4.3V to 26V	Adj.	140µA	450mV	TO-220, TO-263	Load Dump Protection.	
MIC29204	400mA	4.3V to 26V	5.0, Adj.	140µA	450mV	SOIC, PDIP	Load Dump Protection.	
MIC2920A	400mA	4.3V to 26V	3.3, 4.8, 5.0, 12	140µA	450mV	SOT-223, TO-220	Load Dump Protection.	
MIC5325	400mA	1.7V to 5.5V	1.2,1.5,1.8, 3.6	35µA	110mV	Thin MLF® (2x2mm)	Single 400mA ULDO™. Pin Compatible to LTC3025.	Yes
MIC5209	500mA	2.5V to 16V	1.8, 2.5, 3.0, 3.3, 3.6, 4.2, 5.0, Adj.	80µA	300mV	P-SOIC, SOT-223, TO-263	Low Noise LDO.	
MIC5216	500mA	2.5V to 12V	2.5, 3.3, 3.6, 5.0	80µA	300mV	SOT-23, P-MSOP	Low Noise LDO with Error Flag.	
MIC5219	500mA	2.5V to 12V	2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3.0, 3.1, 3.3, 3.6, 5.0, Adj.	80µA	350mV	SOT-23, P-MSOP, Thin MLF® (2x2mm), MLF® (2x2mm)	Low Noise LDO.	
MIC5237	500mA	2.5V to 16V	2.5, 3.3, 5.0	80µA	300mV	TO-220 TO-263	>3% O/P Voltage Accuracy.	
MIC5239	500mA	2.3V to 30V	1.5, 1.8, 2.5, 3.0, 3.3, 5.0, Adj.	23µA	350mV	P-MSOP, P-SOIC, SOT-223	Reverse Battery Protection.	Yes
MIC5319	500mA	2.5V to 5.5V	1.375, 1.8, 1.85, 2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3.0, 3.3, 5.0, Adj.	90µA	200mV	MLF® (2x2mm), TSOT	ULDO™ High PSRR.	Yes
MIC5353	500mA	2.6V to 6V	1.8, 2.5, 2.6, 2.8, 3.0, 3.3, Adj.	90µA	160mV	Thin MLF® (1.6x1.6mm)	High Perpormance Low Dropout 500mA ULDO™.	Yes
MIC47050	500mA	1.0V to 3.6V	1.2, Adj.	6µA	44mV	MLF® (2x2mm) Thin MLF® (2x2mm)	Low V_{IN}/V_{OUT} 500mA ULDO™ with UVLO.	Yes
MIC29371	750mA	4.3V to 26V	3.3, 5.0, 12	160µA	370mV	TO-220, TO-263	Load Dump Protection.	
MIC29372	750mA	4.3V to 26V	Adj.	160µA	370mV	TO-220, TO-263	Load Dump Protection.	
MIC2937A	750mA	4.3V to 26V	3.3, 5.0, 12	160µA	370mV	TO-220, TO-263	Load Dump Protection.	

LDO Regulator Selection Guide

Single Outputs (Continued)

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC3775	750mA	2.25V to 6V	1.5, 1.65, 1.8, 2.5, 3.0, 3.3, Adj.	400µA	280mV	P-MSOP	Wide V_{IN} Range.	Yes
MIC3975	750mA	2.25V to 16V	1.65, 1.8, 2.5, 3.0, 3.3, 5.0, Adj.	400µA	300mV	P-MSOP	Wide V_{IN} Range.	Yes
MIC37100	1A	2.25V to 6V	1.5, 1.65, 1.8, 2.5, 3.3	400uA	280mV	SOT-223		Yes
MIC37101	1A	2.25V to 6V	1.5, 1.65, 1.8, 2.1, 2.5, 3.3	400µA	280mV	P-SOIC	With EN and Error Flag.	Yes
MIC37102	1A	2.25V to 6V	Adj.	400µA	280mV	P-SOIC, SPAK		Yes
MIC39100	1A	2.25V to 16V	1.8, 2.5, 3.3, 5.0	400µA	410mV	SOT-223, TO-220, TO-263	Ultra-Low Dropout.	
MIC39101	1A	2.25V to 16V	1.8, 2.5, 3.3, 5.0	400µA	410mV	P-SOIC	Ultra-Low Dropout.	
MIC39102	1A	2.25V to 16V	Adj.	400µA	410mV	P-SOIC	Ultra-Low Dropout.	
MIC47100	1A	1.0V to 3.6V	0.8, 1.0, 1.2, Adj.	350µA	80mV	MLF® (2x2mm), eMSOP-8		
MIC69101	1A	1.65V to 5.5V	1.8	12mA	500mV	MLF® (3x3mm),	Ultra-small 1A LDO. Single Supply Operation.	
MIC69103	1A	1.65V to 5.5V	Adj.	12mA	500mV	MLF® (3x3mm),	Ultra-small 1A LDO. Single Supply Operation.	
MIC2940A	1.25A	4.3V to 26V	3.3, 5.0, 12	240µA	400mV	TO-220, TO-263	Load Dump Protection.	
MIC2941A	1.25A	4.3V to 26V	Adj.	240µA	400mV	TO-220, TO-263	Load Dump Protection.	
MIC2915x	1.5A	2.25V to 26V	3.3, 5.0, 12, Adj.	225µA	350mV	TO-220, TO-263, TO-252	Load Dump Protection, new D-PAK package.	
MIC35152	1.5A	2.25V to 6V	Adj	11mA	365mV	TO-252	New Power D-PAK package.	Yes
MIC37139	1.5A	2.25V to 6V	1.8, 2.5	17mA	350mV	SOT-223		Yes
MIC37150	1.5A	2.25 to 6V	1.5, 1.65, 1.8, 2.5, 3.3	17mA	325mV	SPAK	Fixed Voltage in 3-pin Package.	Yes
MIC37151	1.5A	2.25V to 6V	1.5, 1.65, 1.8, 2.5, 3.3	17mA	325mV	SPAK, eSOIC	With EN and Error Flag.	Yes
MIC37152	1.5A	2.25V to 6V	Adj	17mA	325mV	SPAK, SOIC, TO-263		Yes
MIC37153	1.5A	2.25V to 6V	Adj	17mA	325mV	eSOIC	With EN and Error Flag.	Yes
MIC39150	1.5A	2.25V to 16V	1.65, 1.8, 2.5	300µA	375mV	TO-220, TO-263	Ultra-Low Dropout.	
MIC39151	1.5A	2.25V to 16V	1.65, 1.8, 2.5	300µA	375mV	TO-220, TO-263	Ultra-Low Dropout w/EN.	
MIC39152	1.5A	2.25V to 16V	Adj.	300µA	375mV	TO-252, TO-263	Ultra-Low Dropout.	
MIC47150	1.5A	1.4V to 6V	Adj.	15mA	280mV	TO-252	Dual Supply µCap LDO, New Power D-PAK package.	Yes
MIC49150	1.5A	1.4V to 6V	0.9, 1.2, 1.5, 1.8, Adj.	15mA	280mV	P-MSOP, S-PAK	Dual Supply µCap LDO.	Yes
MIC59150	1.5A	1.0V to 3.3V	Adj.			eSOIC-8	Dual Supply, Low V_{IN} LDO.	Yes
MIC69151	1.5A	1.65V to 5.5V	1.8	22mA	500mV	MLF® (3x3mm), eSOIC-8	Single Supply Operation.	
MIC69153	1.5A	1.65V to 5.5V	Adj.	22mA	500mV	MLF® (3x3mm), eSOIC-8	Single Supply Operation.	
MIC61150 ***New!***	1.5A	1.1V to 3.6V	1.0, Adj.	7.6mA	200mV	MLF® (3x3mm), eMSOP-10	Low V_{IN}/V_{OUT} and Single Supply Operation.	
MIC49200	2A	1.4V to 6V	1.0, 1.8, Adj	15mA	400mV	SPAK, TO-263	Dual Supply µCap LDO.	Yes
MIC68200	2A	1.65V to 5.5V	1.2, 1.5, 1.8, 2.5, 3.3, Adj.	7mA	140mV	MLF® (3x3mm)	Tracking & Ramp Control.	Yes
MIC37252	2.5A	3.0V to 6V	Adj.	40mA	550mV	SPAK, TO-263	Low Voltage µCap LDO.	
MIC2930x	3A	2.25V to 26V	3.3, 5.0, 12, Adj.	225µA	370mV	TO-220, TO-263	Load Dump Protection.	
MIC29310/2	3A	2.3V to 16V	3.3, 5.0, Adj.	400µA	600mV	TO-220, TO-263		
MIC29311	3A	2.3V to 16V	5.1	400µA	600mV	TO-220	USB LDO.	
MIC35302	3A	2.25V to 6V	Adj.	20mA	370mV	TO-252	New Power D-PAK package.	Yes
MIC37301	3A	2.25V to 6V	1.5, 1.65, 1.8, 2.5, 3.3	27mA	300mV	SPAK		Yes
MIC37302	3A	2.25V to 6V	Adj.	27mA	300mV	SPAK, TO-263		Yes
MIC37303	3A	2.25V to 6V	Adj.	27mA	325mV	eSOIC	With EN and Error Flag.	Yes
MIC39300	3A	2.25V to 16V	1.8, 2.5, 2.8	5mA	300mV	TO-220, TO-263	Ultra-Low Dropout.	
MIC39301	3A	2.25V to 16V	1.8, 2.5	5mA	350mV	TO-220, TO-263	Ultra-Low Dropout w/EN.	
MIC39302	3A	2.25V to 16V	Adj.	5mA	350mV	TO-263	Ultra-Low Dropout w/EN, Adjustable V_{OUT}.	
MIC47300	3A	1.4V to 6V	Adj.	25mA	230mV	TO-252	Dual Supply µCap LDO, New Power D-PAK package	Yes
MIC49300	3A	1.4V to 6V	0.9, 1.2, 1.5, 1.8, Adj.	25mA	280mV	SPAK	Dual Supply µCap LDO.	Yes
MIC59300	3A	1.0V to 3.8V	Adj., 1.2V	0.1µA	205mV	TO-263-5, eSOIC-8	Dual Supply, Low V_{IN} LDO.	Yes
MIC69301	3A	1.65V to 5.5V	1.2	40mA	275mV	SPAK, eSOIC, TO-263	Low Voltage Single Input Supply.	Yes

LDO Regulator Selection Guide

Single Outputs (Continued)

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC69302	3A	1.65V to 5.5V	Adj.	40mA	275mV	SPAK, eSOIC, TO-263	Low Voltage Single Input Supply.	Yes
MIC61300 ***New!***	3A	1.1V to 3.6V	1.0, Adj.	7.6mA	350mV	MLF® (3x3mm), eMSOP-10	Low V_{IN}/V_{OUT} and Single Supply Operation.	
MIC68400	4A	1.65V to 5.5V	1.2, 1.8, Adj.	18mA	300mV	MLF® (4x4mm)	Tracking and Ramp Control™.	Yes
MIC2950x	5A	2.25V to 26V	3.3, 5.0, Adj.	225µA	370mV	TO-220, TO-263	Load Dump Protection.	
MIC29510/2	5A	2.3V to 16V	3.3, 5.0, Adj.	500µA	700mV	TO-220		
MIC37501	5A	2.3V to 6V	1.5, 1.65, 1.8, 2.5, 3.3	57mA	330mV	SPAK		Yes
MIC37502	5A	2.3V to 6V	Adj	57mA	330mV	SPAK, TO-263		Yes
MIC39500	5A	2.25V to 16V	1.8, 2.5	70mA	350mV	TO-220, TO-263	Ultra-Low Dropout.	
MIC39501	5A	2.25V to 16V	1.8, 2.5	70mA	350mV	TO-220, TO-263	Ultra-Low Dropout w/EN.	
MIC49500	5A	1.4V to 6V	.0.9, 1.2, Adj	55mA	290mV	SPAK, TO-263	Dual Supply µCap LDO.	Yes
MIC69502	5A	1.65 to 5.5V	Adj.	54mA	250mV	SPAK	Low Voltage Single Input Supply.	Yes
MIC2971x	7.5A	2.3V to 16V	3.3, 5.0, Adj.	1mA	700mV	TO-220		
MIC29750	7.5A	2.5V to 26V	3.3, 5.0	35mA	425mV	TO-247	Load Dump Protection.	
MIC29751	7.5A	2.5V to 26V	3.3, 5.0	35mA	425mV	TO-247	Load Dump Protection.	
MIC29752	7.5A	2.5V to 26V	Adj.	35mA	425mV	TO-247	Load Dump Protection.	

Multiple Outputs, DUAL

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC5208	50/50mA	2.5V to 16V	3.3, 3.8, 4.0	180µA	250mV	MSOP	±3%	Yes
MIC5211	50/50mA 80/80mA	2.5V to 16V	1.8, 1.8/2.5, 1.8/3.3, 2.5, 2.5/3.3, 2.7, 2.8, 3.0, 3.2, 3.3, 3.3/5.0, 3.6, 5.0,	90µA	250mV	SOT-23	Reverse Input Polarity Protection	Yes
MIC5202	100/100mA	2.5V to 26V	3.0, 3.3, 4.8, 5.0	170µA	225mV	SOIC	±1%, Reverse Input Polarity Protection	
MIC5210	150/150mA	2.5V to 16V	2.7, 2.8, 3.0, 3.3, 3.6, 4.0, 5.0	80µA	165mV	MSOP	±1%, Low Noise LDO	
MIC5310	150/150mA	2.3V to 5.5V	1.8/1.5, 1.8/1.8, 1.8/1.6, 2.5/1.8, 2.5/2.5, 2.6/1.85, 2.6/1.8 2.7/2.7, 2.8/1.5, 2.8/1.8, 2.8/2.6, 2.8/2.8, 2.85/1.85, 2.85/2.6, 2.85/2.85, 2.9/1.5, 2.9/1.8, 2.9/2.9, 3.0/1.8, 3.0/2.5 3.0/2.6, 3.0/2.8, 3.0/2.85, 3.0/3.0, 3.3/1.5, 3.3/1.8, 3.3/2.5 3.3/2.6, 3.3/2.8, 3.3/2.85, 3.3/2.9, 3.3/3.0, 3.3/3.2, 3.3/3.3,	75µA	35mV	MLF® (2x2mm)	Tiny ULDO™ • Dual Enable • High PSRR	Yes
MIC5320	150/150mA	2.3V to 5.5V	1.8/1.5, 1.8/1.8, 1.8/1.6, 2.4/1.5, 2.5/1.8, 2.5/2.5, 2.6/1.85, 2.6/1.8, 2.7/2.7, 2.8/1.5, 2.8/1.8, 2.8/2.6, 2.8/2.8, 2.85/1.85, 2.85/2.6, 2.85/2.85, 2.9/1.5, 2.9/1.8, 2.9/2.9, 3.0/1.8, 3.0/2.5, 3.0/2.6, 3.0/2.8, 3.0/2.85, 3.0/3.0, 3.3/1.5, 3.3/1.8, 3.3/2.5, 3.3/2.6, 3.3/2.8, 3.3/2.85, 3.3/2.9, 3.3/3.0, 3.3/3.2, 3.3/3.3, 4.6/2.8	75µA	35mV	Thin MLF® (1.6x1.6mm) MLF® (1.6x1.6mm) TSOT-6	Tiny ULDO™ • Dual Enable	Yes
MIC5321	150/150mA	2.3V to 5.5V	1.8/1.5, 1.8/1.8, 1.8/1.6, 2.5/1.8, 2.5/2.5, 2.6/1.85, 2.6/1.8, 2.7/2.7, 2.8/1.5, 2.8/1.8, 2.8/2.6, 2.8/2.8, 2.85/1.85, 2.85/2.6, 2.85/2.85, 2.9/1.5, 2.9/1.8, 2.9/2.9, 3.0/1.8, 3.0/2.5, 3.0/2.6, 3.0/2.8, 3.0/2.85, 3.0/3.0, 3.3/1.5, 3.3/1.8, 3.3/2.5, 3.3/2.6, 3.3/2.8, 3.3/2.85, 3.3/2.9, 3.3/3.0, 3.3/3.2, 3.3/3.3, 4.6/2.8,	75µA	35mV	Thin MLF® (1.6x1.6mm) MLF® (1.6x1.6mm) TSOT-6	Tiny ULDO™ • High PSRR • Common Enable • Bypass Pin	Yes
MIC5322	150/150mA	2.3V to 5.5V	2.8/1.5, 2.8/1.8, 2.85/2.85, 3.0/2.8, 3.0/2.85, 3.0/3.0	150µA	35mV	Thin MLF® (1.6x1.6mm)	Tiny ULDO™ • High PSRR • Common Active Low Enable • Bypass	Yes
MIC5370	150/150mA	2.5V to 5.5V	1.2/1.0, 1.8/1.2, 1.8/1.5, 2.8/1.2, 2.8/1.8, 2.8/2.6, 3.0/1.8, 3.0/2.6, 3.0/2.8, 3.0/3.0, 3.3/1.8, 3.3/2.6, 3.3/2.8, 3.3/3.0, 3.3/3.3,	32µA	155mV	Thin MLF® (1.6x1.6mm)	General Purpose Dual 150mA LDO.	Yes
MIC5371	150/150mA	2.5V to 5.5V	1.2/1.0, 1.8/1.2, 2.8/1.2, 2.8/1.5, 2.8/1.8, 2.8/2.8, 3.0/2.8, 3.0/3.0, 3.3/1.8, 3.3/1.8, 3.3/3.0, 3.3/3.3	32µA	155mV	Thin MLF® (1.6x1.6mm)	General Purpose Dual 150mA LDO with Auto Discharge.	Yes
MIC5380	150/150mA	2.5V to 5.5V	1.8/1.2, 2.6/2.0, 2.7/2.7, 2.8/1.2, 2.8/1.8, 3.0/3.0, 3.3/3.3	32µA	155mV	Thin MLF® (1.0x1.0mm)	Ultra-Small General Purpose Dual 150mA LDO.	Yes
MIC5381	150/150mA	2.5V to 5.5V	1.8/1.2, 2.8/1.2, 2.8/1.8, 3.0/3.0, 3.3/3.3	32µA	155mV	Thin MLF® (1.0x1.0mm)	Ultra-Small General Purpose Dual 150mA LDO with Auto Discharge.	Yes
MIC5264	150/150mA	2.7V to 5.5V	2.5/1.8, 2.6/1.8, 2.6/2.6, 2.8/1.5, 2.8/1.8, 2.8/2.5, 2.8/2.6, 2.8/2.8, 2.85/1.5, 2.85/1.8, 2.85/2.85, 2.9/1.5, 2.9/1.8, 2.9/2.6, 2.9/2.6, 3.0/1.8, 3.0/2.5, 3.0/2.8, 3.0/3.0, 3.3/3.0, 3.3/1.8, 3.3/2.5, 3.3/3.3	75µA	210mV	MLF® (2.5x2.5mm)	µCap LDO Regulator.	Yes
MIC2210	150/300mA	2.25V to 5.5V	1.5/2.8, 1.8/3.3, 2.8/1.6, 2.8/3.0, 3.0/3.3, 3.3/3.3	48µA	120mV	MLF® (3x3mm)	LDO with Driver and Error Flag.	

LDO Regulator Selection Guide

Multiple Outputs, DUAL (Continued)

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC2211	150/300mA	2.25V to 5.5V	Adj/Adj, 1.5/1.8, 1.5/2.8, 1.5/2.85, 1.5/2.9, 1.5/3.1, 1.6/2.8, 1.6/2.9, 1.6/3.3, 1.8/2.5, 1.8/2.6, 1.8/2.8, 1.8/2.9, 1.8/3.0, 1.8/3.3, 1.9/2.8, 2.0/3.0, 2.5/1.8, 2.5/1.9, 2.5/2.8, 2.5/3.0, 2.5/3.3, 2.6/1.8, 2.6/2.85, 2.6/3.0, 2.7/1.8, 2.7/3.0, 2.8/1.5, 2.8/1.6, 2.8/1.8, 2.8/2.5, 2.8/2.8, 2.8/3.0, 2.8/3.3, 2.85/2.85, 2.85/3.3, 2.9/1.5, 2.9/2.9, 3.0/1.6, 3.0/2.7, 3.0/2.8, 3.0/2.85, 3.0/3.0, 3.0/3.3, 3.3/1.8, 3.3/2.8, 3.3/3.3, 3.6/3.6	48µA	120mV	MLF® (3x3mm)	LDO.	Yes
MIC2212	150/300mA	2.25V to 5.5V	1.6/2.8, 1.6/3.3, 1.8/2.6, 1.8/2.7, 1.8/2.8, 1.8/3.3, 1.85/2.85, 1.85/2.9, 2.5/3.3, 2.6/2.8, 2.6/2.85, 2.7/2.8, 2.7/2.9, 2.7/3.0, 2.8/2.6, 2.8/2.8, 2.8/3.0, 2.85/2.85, 3.0/2.8, 3.0/2.85, 3.0/3.0, 3.0/3.3, 3.3/1.8, 3.3/2.5, 3.3/2.8, 3.3/3.6	48µA	120mV	MLF® (3x3mm)	LDO with POR.	Yes
MIC2213	150/300mA	2.25V to 5.5V	1.8/2.85, 2.5/3.3, Adj/Adj.	48µA	120mV	MLF® (3x3mm) MLF® (4x4mm)	Sequenced with POR and Driver.	Yes
MIC2214	150/300mA	2.25V to 5.5V	1.5/2.8, 1.6/2.8, 1.6/3.0, 1.6/3.3, 1.8/2.6, 1.8/2.7, 1.8/2.8, 1.8/2.9, 1.8/3.0, 1.8/3.3, 1.85/2.6, 1.85/2.65, 1.85/2.7, 1.85/2.85, 1.85/2.9, 2.5/1.8, 2.5/2.8, 2.5/3.0, 2.5/3.1, 2.6/2.6, 2.6/2.8, 2.6/2.85, 2.6/3.0, 2.7/2.8, 2.7/3.0, 2.8/2.8, 2.8/3.0, 2.85/2.85, 3.0/2.8, 3.0/2.85, 3.0/3.3, 3.0/1.6, 3.3/1.8, 3.3/2.8, 3.3/1.6, Adj/Adj.	48µA	120mV	MLF® (3x3mm) MLF® (4x4mm)	LDO with POR and LED Driver.	Yes
MIC2219	150/300mA	2.25V to 5.5V	3.0/3.3	48µA	120mV	MLF® (3x3mm)	Dynamically Adjustable µCap.	Yes
MIC5311	300/300mA	2.5V to 5.5V	1.8/2.8, 1.85/2.6, 2.85/2.7	28µA	120mV	MLF® (3x3mm)	LowQ® Mode (7µA).	Yes
MIC5312	300/300mA	2.5V to 5.5V	1.8/2.8, 1.85/2.6	28µA	120mV	MLF® (3x3mm)	LowQ® Mode & POR (7µA).	Yes
MIC5313	300/300mA	1.7V to 5.5V	1.5/1.0,1.5/1.1,1.5/1.2,1.5/1.3,1.5/1.4,1.5/1.5, 1.8/1.2,1.8/1.8	37µA	85mV	Thin MLF® (2x2mm)	Dual 300mA Low V_{IN}/Low V_{OUT} LDO.	Yes
MIC5314	300/300mA	1.7V to 5.5V	1.5/1.0,1.5/1.1,1.5/1.2,1.5/1.3,1.5/1.4,1.5/1.5, 1.8/1.2,1.8/1.8	37µA	85mV	Thin MLF® (2.5x2.5mm)	Dual 300mA Low V_{IN}/Low V_{OUT} LDO with POR and CSET.	Yes
MIC5315	300/300mA	1.7V to 5.5V	1.5/1.2/1.0,1.5/1.3/1.0, 1.8/1.6/1.1, 1.8/1.8/1.0	37µA	85mV	Thin MLF® (2x2mm)	Dual 300mA Low V_{IN}/Low V_{OUT} LDO with Voltage Select.	Yes
MIC5316	300/300mA	1.7V to 5.5V	1.5/1.2/1.0,1.5/1.3/1.0, 1.8/1.6/1.1, 1.8/1.8/1.0	37µA	85mV	Thin MLF® (2.5x2.5mm)	Dual 300mA Low V_{IN}/Low V_{OUT} LDO w/POR, CSET and Voltage Select.	Yes
MIC5330	300/300mA	2.3V to 5.5V	1.8/1.5, 1.8/1.8, 1.8/1.6, 2.5/1.8, 2.5/2.5, 2.6/1.85 2.6/1.8, 2.7/2.7, 2.8/1.5, 2.8/1.8, 2.8/2.6, 2.8/2.8, 2.85/1.85, 2.85/2.6, 2.85/2.85, 2.9/1.5, 2.9/1.8, 2.9/2.9, 3.0/1.8, 3.0/2.5, 3.0/2.6, 3.0/2.8, 3.0/2.85, 3.0/3.0, 3.3/1.5, 3.3/1.8, 3.3/2.5, 3.3/2.6, 3.3/2.8, 3.3/2.85, 3.3/2.9, 3.3/3.0, 3.3/3.2, 3.3/3.3	85µA	75mV	MLF® (2x2mm)	Tiny ULDO™ • Dual Enable • High PSRR	Yes
MIC5331	300/300mA	2.3V to 5.5V	1.8/1.2, 2.5/1.2, 2.8/2.8, 2.8/2.85, 2.85/2.85, 3.0/2.8 3.0/2.85,3.0/3.0	40µA	120mV	Thin MLF® (2x2mm)	Dual Micro Power 300mA ULDO™	Yes
MIC5332	300/300mA	2.3V to 5.5V	1.8/1.2, 2.5/1.2, 2.8/2.8, 2.8/2.85, 2.85/2.85, 3.0/2.8, 3.0/2.85,3.0/3.0	40µA	120mV	Thin MLF® (2x2mm)	Dual Micro Power 300mA ULDO™ with POR and CSET .	Yes
MIC5333	300/300mA	2.3V to 5.5V	2.5/1.2, 2.8/2.8, 2.8/2.85, 2.85/2.85, 3.0/2.85,3.0/3.0	40µA	120mV	Thin MLF® (2.5x2.5mm)	Dual Micro Power 300mA ULDO™ with Two PORs and CSETs.	Yes
MIC5335	300/300mA	2.3V to 5.5V	1.8/1.5, 1.8/1.8, 1.8/1.6, 2.5/1.8, 2.5/2.5, 2.6/1.85, 2.6/1.8, 2.7/2.7, 2.8/1.5, 2.8/1.8, 2.8/2.6, 2.8/2.8, 2.85/1.85, 2.85/2.6, 2.85/2.85, 2.9/1.5, 2.9/1.8, 2.9/2.9, 3.0/1.8, 3.0/2.5, 3.0/2.6, 3.0/2.8, 3.0/2.85, 3.0/3.0, 3.3/1.5, 3.3/1.8, 3.3/2.5 3.3/2.6, 3.3/2.7, 3.3/2.8, 3.3/2.85, 3.3/2.9, 3.3/3.0, 3.3/3.2, 3.3/3.3	90µA	75mV	Thin MLF® (1.6x1.6mm)	Tiny ULDO™ • Dual Enable • High PSRR	Yes
MIC5338	300/300mA	2.5V to 5.5V	1.2/1.0, 1.8/1.2, 2.8/1.2, 2.8/1.8, 3.3/2.8	38µA	220mV	Thin MLF® (1.6x1.6mm)	General Purpose Dual 300mA LDO.	Yes
MIC5339	300/300mA	2.5V to 5.5V	1.2/1.0, 1.8/1.2, 2.8/1.2, 2.8/1.8, 3.3/2.8	38µA	220mV	Thin MLF® (1.6x1.6mm)	General Purpose Dual 300mA LDO with Active Low Enable.	Yes
MIC5212	500/500mA	4.0V to 16V	3.3/2.5	1.5mA	350mV	SOIC	Small, High-Current Dual.	Yes
MIC5350	300/500mA	2.6V to 5.5V	2.8/1.8, 2.8/2.8, 3.0/1.8, 3.3/1.8, 3.3/2.8	95µA	75mV/125mV	Thin MLF® (2x2mm)	Dual 300/500mA LDO.	Yes
MIC5355 ***New!***	500/500mA	2.5V to 5.5V	1.8/1.2, 2.5/1.8, 3.3/1.0, 3.3/1.2, 3.3/1.8	38µA	350mV	ePad MSOP-8	Dual 500/500mA LDO.	Yes
MIC5356 ***New!***	500/500mA	2.5V to 5.5V	1.8/1.2, 2.5/1.8, 3.3/1.0, 3.3/1.2, 3.3/1.8	38µA	350mV	ePad MSOP-8	Dual 500/500mA LDO with Auto Discharge.	Yes
MIC5357 ***New!***	500/500mA	2.6V to 5.5V	1.8/1.5, 2.8/1.8, 3.3/1.8, 3.3/2.8	95µA	130mV	ePad MSOP-8	High Performance Dual 500/500mA ULDO™.	Yes

LDO Regulator Selection Guide

Multiple Outputs, TRIPLE

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC68220	2A/2A	1.65V to 5.5V	Adj./Adj.	15mA	300mV	MLF® (4x5mm)	Trading and Ramp Control™.	Yes
MIC2215	250/250/250mA	2.25V to 5.5V	2.8/2.8/2.8, 3.0/2.8/2.8, 3.0/3.0/2.8, 3.0/3.0/1.8, 3.0/3.0/3.0, Adj/Adj/Adj.	110µA/LDO	170mV	MLF® (4x4mm)	Triple High PSRR µCap LDO.	Yes
MIC5385	150/150/150mA	2.5V to 5.5V	3.3/1.8/1.5	32µA/LDO	180mV	Thin MLF® (2x2mm)	Ultra Small High Performance Triple LDO.	Yes
MIC5387	150/150/150mA	2.5V to 5.5V	1.8/2.8/1.8, 1.8/2.8/2.8, 3.3/1.8/1.2, 3.3/1.8/1.5	32µA/LDO	180mV	Thin MLF® (1.6x1.6mm)	Ultra Small High Performance Triple LDO w/Common Enable.	Yes

LDO Controllers (N- and P-Channel)

MIC5156	—	3.0V to 36V	3.3, 5.0, Adj.	—	—	PDIP, SOIC	Drives External N-Channel MOSFET.	
MIC5157	—	3.0V to 36V	Selectable 3.3, 5.0, 12	—	—	PDIP, SOIC	Drives External N-Channel MOSFET.	
MIC5158	—	3.0V to 36V	5.0, Adj.	—	—	PDIP, SOIC	Drives External N-Channel MOSFET.	
MIC5159	—	1.65V to 5.5V	1.8, 3.0, Adj.	—	—	SOT-23	Low Input Voltage P-Channel MOSFET.	
MIC5190	—	0.9V to 5.5V	Adj. down to 0.5V	17mA	—	MSOP, MLF® (3x3mm)	N-Channel Controller HBW>500kHz.	
MIC5191	—	1.0V to 5.5V	Adj. down to 1.0V	17mA	—	MSOP, MLF® (3x3mm)	N-Channel Controller HBW>500kHz.	

DDR Terminators

MIC5162	—	1.35V to 6V	$0.5*V_{IN}$	—	—	MSOP	DDR Memory Termination.	
MIC5163	—	0.75V to 6V	$0.5*V_{IN}$	—	—	MSOP	Low Voltage DDR3 Memory Termination.	
MIC5164	—	1.35V to 6V	$0.5*V_{IN}$	—	—	MSOP	DDR Memory Termination w/Power Good.	
MIC5165	—	0.75V to 6V	$0.5*V_{IN}$	—	—	MSOP	Low Voltage DDR3 Memory Termination with Power Good.	
MIC5167 ***New!***	±6A	2.6V to 5.5V	Adj. down to 0.35V	—	—	MLF® (4x4mm)	Fully Integrated, High Efficiency, Synchronous Buck.	

Specific voltage/package options offered as noted on posted data sheets at: www.mcirel.com.
T/SOT = Thin SOT-23 & SOT-23.
ULDO™ = Ultra Low Dropout.

Battery Charger Selection Guide

Linear Battery Chargers

Device	Charge Cell Type	Charge Voltage	Voltage Accuracy	V_{IN}	I_{GND} (Typ.)	I_{GND} Shutdown (Typ.)	$V_{DROPOUT}$ +25°C (Typ.)	$V_{DROPOUT}$ Temp. Max.	Package
MIC79050	Li-Ion, 1 cell	4.2V	±0.75%	2.5V to 16V	85µA	3µA	380mV	600mV	MSOP, Power SOIC, SOT-223
MIC79110	Li-Ion	4.2V, Adj.	±0.75%	2.5V to 16V	2mA	0.1µA	375mV	550mV	MLF® (3x3mm)

Power Management ICs (PMICs) Selection Guide

Device	I_{OUT}	V_{IN}	V_{OUT}[1]	Package	Comments
MIC2225	DC/DC: 600mA LDO: 300mA	2.7V to 5.5V	DC/DC: down to 1.0V LDO: down to 0.8V	Thin MLF®-10 (2x2mm)	Digital Power Management IC, 2MHz DC/DC converter with LDO and independent enable, >95% efficiency.
MIC23060	DC/DC: 600mA LDO: 300mA	2.7V to 5.5V	DC/DC: 1.8V/3.3V LDO: 1.2V	Thin MLF®-12 (2.5x2.5mm)	4MHz 600mA DC/DC Regulator and 300mA LDO Regulator with flexible sequencing feature. DC/DC features HyperLight Load™. >95% efficiency.
MIC2800	DC/DC: 600mA 2 LDOs: 300mA each	2.7V to 5.5V	DC/DC: 1.8V/3.3V LDO1: 0.8V to V_{DCDC}-V_{DD} LDO2: 0.8V to 3.6V	MLF®-16 (3x3mm)	Digital Power Management IC, 2MHz DC/DC converter with two Linear Regulators. LDO1 is directly connected to the output of the DC/DC converter. POR/Power Good pin and LOWQ mode.
MIC2807	DC/DC: 600mA 2 LDOs: 200/30mA	2.7V to 5.5V	DC/DC: DAC controlled from 0.3V to V_{IN} LDOs: 2.85V/2.85V	MLF®-17 (2.5x2.8mm)	RF Power Management IC, 600mA DC/DC converter with DAC controlled output to power amplifier. 200mA RF LDO output current (provides bias voltage supply for PA), 30mA PA LDO (provides highly accurate PA reference voltage).
MIC2808	DC/DC: 600mA 2 LDOs: 200/30mA	2.7V to 5.5V	DC/DC: DAC controlled from 0.3V to V_{IN} LDOs: 2.85V/2.85V	Thin MLF®-16 (2.0x2.5mm)	RF Power Management IC, 600mA DC/DC converter with DAC controlled output to power amplifier. 200mA RF LDO output. Reduced package size and LDO dropout compared to MIC2807.
MIC2810	DC/D: 600mA 2 LDOs: 300mA each	DC/DC: 2.7V to 5.5V LDO1: 1.65V to 5.5V LDO2: 2.7V to 5.5V	DC/DC: 1.0V/2.0V LDOs: 0.8V to 3.6V	MLF®-16 (3x3mm)	Digital Power Management IC, 2MHz with two Linear Regulators. LDO1 has a separate V_{IN} pin and can either post-regulate the DC/DC converter or be connecte directly to the main input supply. POR/Power Good pin.
MIC2811	DC/DC: 600mA 3 LDOs: 300mA each	DC/DC: 2.7V to 5.5V LDO1: 1.65V to 5.5V LDO2: 1.65V to 5.5V LDO3: 2.7V to 5.5V	DC/DC: 1.0V/2.0V LDO1: 0.8V to 3.6V LDO2: 0.8V to 3.6V LDO3: 1.0V to 3.9V	MLF®-16 (3x3mm)	Digital Power Management IC, 2MHz DC/DC converter with 3 LDOs. Bypass cap for improved noise performance on LDO1 and LDO2. LDO1 and LDO2 have separate V_{IN} pins. Separate enable pins.
MIC2821	DC/DC: 600mA 3 LDOs: 300mA each	DC/DC: 2.7V to 5.5V LDO1: 1.65V to 5.5V LDO2: 1.65V to 5.5V LDO3: 2.7V to 5.5V	DC/DC: 1.0V/2.0V LDO1: 0.8V to 3.6V LDO2: 0.8V to 3.6V LDO3: 1.0V to 3.9V	MLF®-16 (3x3mm)	Digital Power Management IC, 2MHz DC/DC converter with 3 LDOs. LDO1 and 2 have separate V_{IN} pins. Independent enable for all four regulators.
MIC2826	DC/DC: 500mA 3 LDOs: 150mA each	2.7V to 5.5V	DC/DC: I^2C and Dynamic Scaling from 0.8V to 1.8V LDOs: I^2C and Dynamic Scaling from 0.8V to 3.3V	Thin MLF®-14 (2.5x2.5mm)	4MHz DC/DC HyperLight Load™ converter with 1.8V to DVIN Adj. via I^2C & Dynamic Voltage Scaling 3 LDOs. Fast-mode (400kHz) I^2C Control for Startup, Enables and Output Voltages. Optional Default Startup Sequence and Voltages. Fault Monitoring Flag (IRQb).
MIC2827	DC/DC: 500mA 2 LDOs: 150mA each	2.7V to 5.5V	DC/DC: I^2C and Dynamic Scaling from 0.8V to 1.8V LDOs: I^2C and Dynamic Scaling from 0.8V to 3.3V	MLF®-14 (2.5x2.5mm)	4MHz DC/DC HyperLight Load™ converter with Dynamic Voltage Scaling and 2 LDOs. Fast-mode (400kHz) I^2C Control for Startup, Enables and Output Voltages. Optional Default Startup Sequence and Voltages. Fault Monitoring Flag (IRQb).
MIC2829	6 DC/DCs: 1000/300/600/600/ 800/800mA 5 LDOs: 200mA each 6 LNRs: 200mA each	2.7V to 5.5V	DC/DCs: 0.8V to 1.8V LDOs: 0.8V to 3.3V	LGA-76, FBGA-85 (5.5x5.5mm)	Highly integrated PMIC for 3G/4G wireless data and portable applications. 6 buck regulators, 5 general purpose LDOs, 6 low noise regulators, SIM card level shifter, and PGOOD indicator with adjustable delay.

1. Contact factory for additional output voltage options.

Multiple Outputs, TRIPLE

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC5373	200/200/200mA	1.7V to 5.5V	2.8/1.8/1.2	10µA/LDO	170mV	Thin MLF® (2.5x2.5mm)	Low V_{IN}/V_{OUT} Triple LDO with Active High EN & POR, User Defined Voltage Monitoring.	Yes
MIC5383	200/200/200mA	1.7V to 5.5V	2.8/1.8/1.2	10µA/LDO	170mV	Thin MLF® (2.5x2.5mm)	Low V_{IN}/V_{OUT} Triple LDO with Active High EN & POR, User Defined Voltage Monitoring.	Yes
MIC5374	200/200/200mA/1mA	1.7V to 5.5V	3.3/2.5/1.8/1.0	10µA/LDO	170mV	Thin MLF® (2.5x2.5mm)	Low V_{IN}/V_{OUT} Triple LDO with RTC LDO Active High EN & POR, User Defined Voltage Monitoring.	Yes
MIC5384	200/200/200mA/1mA	1.7V to 5.5V	2.8/1.8/1.2/1.2	10µA/LDO	170mV	Thin MLF® (2.5x2.5mm)	Low V_{IN}/V_{OUT} Triple LDO with RTC LDO Active High EN & POR, User Defined Voltage Monitoring.	Yes

Power Management Selection Guide

HELDO® (High Efficiency LDO)

Device	I_{OUT}	V_{IN}	V_{OUT}	Output Noise	Package	Comment
MIC38150	1.5A	3.0 to 5.5V	Adj. to 1V	5mV	MLF® (4x6x0.9mm)	Integrated switcher, LDO, inductor, ultra-low noise. Fast transient response. Ease-of-use.
MIC38300	2.2A	3.0 to 5.5V	Adj. to 1V	5mV	MLF® (4x6x0.9mm)	Integrated switcher, LDO, inductor, ultra-low noise. Fast transient response. Ease-of-use.

Automotive (AEC-Q100 Qualified)

Single Output LDO

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$	Package	Comment
MAQ5280	25mA	4.5 to 120V	Adj.	31µA	1.1V	eSOIC-8	AEC-Q100 Qualified, Wide V_{IN} Range.

High Power LED Drivers

Device	V_{IN}	I_{LED}	Dimming	Switching Frequency	I_{LED} Accuracy	Feedback Looping	Package	Comments
MAQ3203 ***New!***	4.5V to 42V	Controller (external FET)	PWM	1.5MHz	±5%	200mV	SOIC-8	Step Down LED Driver.

High-Side Load Switches Selection Guide

Micrel Advantage

- Lowest R_{DSON}
- Highest Power Handling
- Highest Current Drive Capability
- Soft-Start

Single

Device	Type	Operating Voltage Min.	Operating Voltage Max.	Max. Switch Current	R_{DS} ON @5V	Load Discharge	Soft-Start	Enable Logic	Input Pull-Up Resistor	Reverse Current Blocking	Package
MIC94030	Single	2.7V	13.5V	1.0A	750mΩ			Low True		Yes	SOT-143
MIC94031	Single	2.7V	13.5V	1.0A	750mΩ			Low True	Yes	Yes	SOT-143
MIC94040	Single	1.7V	5.5V	3.0A	28mΩ			High True		No	MLF®-4 (1.2 x 1.2mm)
MIC94041	Single	1.7V	5.5V	3.0A	28mΩ	250Ω		High True		No	MLF®-4 (1.2 x 1.2mm)
MIC94042	Single	1.7V	5.5V	3.0A	28mΩ		100µs	High True		No	MLF®-4 (1.2 x 1.2mm)
MIC94043	Single	1.7V	5.5V	3.0A	28mΩ	250Ω		High True		No	MLF®-4 (1.2 x 1.2mm)
MIC94044 ***New!***	Single	1.7V	5.5V	3.0A	28mΩ		900µs	High True		No	MLF®-4 (1.2 x 1.2mm)
MIC94045 ***New!***	Single	1.7V	5.5V	3.0A	28mΩ	200Ω	900µs	High True		No	MLF®-4 (1.2 x 1.2mm)
MIC94050	Single	1.8V	5.5V	1.8A	125mΩ			Low True		Yes	SOT-143
MIC94051	Single	1.8V	5.5V	1.8A	125mΩ			Low True	Yes	Yes	SOT-143
MIC94052	Single	1.8V	5.5V	2.0A	70mΩ			Low True		No	SC-70-6
MIC94053	Single	1.8V	5.5V	2.0A	70mΩ			Low True	Yes	No	SC-70-6
MIC94060	Single	1.7V	5.5V	2.0A	77mΩ			High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.6mm)
MIC94061	Single	1.7V	5.5V	2.0A	77mΩ	200Ω		High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.6mm)
MIC94062	Single	1.7V	5.5V	2.0A	77mΩ		800µs	High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.6mm)
MIC94063	Single	1.7V	5.5V	2.0A	77mΩ	200Ω	800µs	High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.6mm)
MIC94064	Single	1.7V	5.5V	2.0A	77mΩ		115µs	High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.6mm)
MIC94065	Single	1.7V	5.5V	2.0A	77mΩ	200Ω	115µs	High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.6mm)
MIC94070	Single	1.7V	5.5V	1.2A	120mΩ			High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.6mm)
MIC94071	Single	1.7V	5.5V	1.2A	120mΩ	200Ω		High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.6mm)
MIC94072	Single	1.7V	5.5V	1.2A	120mΩ		800µs	High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.6mm)
MIC94073	Single	1.7V	5.5V	1.2A	120mΩ	200Ω	800µs	High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.6mm)
MIC94080	Single	1.7V	5.5V	2.0A	67mΩ			High True		No	Thin MLF®-4 (0.85 x 0.85mm)
MIC94081	Single	1.7V	5.5V	2.0A	67mΩ	250Ω		High True		No	Thin MLF®-4 (0.85 x 0.85mm)
MIC94082	Single	1.7V	5.5V	2.0A	67mΩ		800µs	High True		No	Thin MLF®-4 (0.85 x 0.85mm)
MIC94083	Single	1.7V	5.5V	2.0A	67mΩ	250Ω	800µs	High True		No	Thin MLF®-4 (0.85 x 0.85mm)
MIC94084	Single	1.7V	5.5V	2.0A	67mΩ		120µs	High True		No	Thin MLF®-4 (0.85 x 0.85mm)
MIC94085	Single	1.7V	5.5V	2.0A	67mΩ	250Ω	120µs	High True		No	Thin MLF®-4 (0.85 x 0.85mm)
MIC94090	Single	1.7V	5.5V	1.2A	130mΩ			High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.2mm)
MIC94091	Single	1.7V	5.5V	1.2A	130mΩ	250Ω		High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.2mm)
MIC94092	Single	1.7V	5.5V	1.2A	130mΩ		790µs	High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.2mm)
MIC94093	Single	1.7V	5.5V	1.2A	130mΩ	250Ω	790µs	High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.2mm)
MIC94094	Single	1.7V	5.5V	1.2A	130mΩ		120µs	High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.2mm)
MIC94095	Single	1.7V	5.5V	1.2A	130mΩ	250Ω	120µs	High True		No	SC-70-6, Thin MLF®-4 (1.2 x 1.2mm)

Dual

Device	Type	Operating Voltage Min.	Operating Voltage Max.	Max. Switch Current	R_{DS} ON @5V	Load Discharge	Soft-Start	Enable Logic	Input Pull-Up Resistor	Reverse Current Blocking	Package
MIC94066	Dual	1.7V	5.5V	2.0A	85mΩ			High True		No	MLF®-8 (2 x 2mm)
MIC94067	Dual	1.7V	5.5V	2.0A	85mΩ	200Ω		High True		No	MLF®-8 (2 x 2mm)
MIC94068	Dual	1.7V	5.5V	2.0A	85mΩ		800µs	High True		No	MLF®-8 (2 x 2mm)
MIC94069	Dual	1.7V	5.5V	2.0A	85mΩ	200Ω	800µs	High True		No	MLF®-8 (2 x 2mm)

Switch-Mode Voltage Regulator Selection Guide

Micrel Advantage

- Best efficiency
- Highest speed
- Smallest solution size

Buck Regulators (Internal Switches)

Device	V_{IN}	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package	Comments
MIC4721	2.7V to 5.5V	Adj. to 1V	1.5A	2MHz	MSOP-10	Ultra-Fast Response Internal Compensation.
MIC4722	2.7V to 5.5V	Adj. to 1V	3A	2.7MHz	MLF®-12 (3x3mm)	Ultra-Fast, Ultra-Small.
MIC4723	2.7V to 5.5V	Adj. to 1V	3A	2MHz	MLF®-12 (3x3mm), eMSOP-10	Ultra-Fast, Ultra-Small.
MIC4724	3.0V to 6.0V	Adj. to 1V	3A	2MHz	eMSOP-10	Ultra-Fast, Ultra-Small.
MIC4742	2.9V to 5.5V	Adj. to 0.6V	2A Dual Output	2MHz	MLF®-16 (3x3mm), eTSSOP-16	Integrated Dual 2A switcher.
MIC4782	3.0V to 6.0V	Adj. to 0.6V	2A Dual Output	1.8MHz	MLF®-16 (3x3mm)	Low-cost Dual 2A switcher.
MIC4744	2.9V to 5.5V	Adj. to 0.6V	2A Dual Output	4MHz	MLF®-16 (3x3mm), eTSSOP-16	High-efficiency, Integrated Dual 2A switcher.
MIC2207	2.7V to 5.5V	Adj. to 1V	3A	2MHz	MLF®-12 (3x3mm)	Ultra-Fast, Ultra-Small.
MIC2208	2.7V to 5.5V	Adj. to 1V	3A	1MHz	MLF®-12 (3x3mm)	External Compensation.
MIC4720	2.7V to 5.5V	Adj. to 1V	2A	2MHz	MLF®-12 (3x3mm), eMSOP-10	Ultra-Fast, Ultra-Small.
MIC4680	4.0V to 34V	3.3V, 5V, Adj.	1.3A	200kHz	SOIC-8	
MIC4681	4.0V to 30V	Adj.	2A Peak	200kHz	SOIC-8	
MIC4682	4.0V to 34V	Adj.	2A	200kHz	SOIC-8	10% Precision Adjustable Current Limit.
MIC4684	4.0V to 30V	Adj.	2A	200kHz	SOIC-8	
MIC4685	4.0V to 30V	Adj.	3A	200kHz	SPAK-7	33% Smaller Than TO-263 (D2Pak).
MIC4690	4.0V to 30V	Adj.	1.3A	500kHz	SOIC-8	500kHz: Small Inductor.
MIC4574	4.0V to 24V	3.3V, 5V, Adj.	0.5A	200kHz	PDIP-8, SOIC-14	
MIC4575	4.0V to 24V	3.3V, 5V, Adj.	1A	200kHz	TO220-5, TO263-5	
MIC4576	4.0V to 36V	3.3V, 5V, Adj.	3A	200kHz	TO220-5, TO263-5	
LM2574	4.0V to 40V	3.3V, 5V, 12V, Adj.	0.5A	52kHz	PDIP-8	
LM2575	4.0V to 40V	3.3V, 5V, 12V, Adj.	1A	52kHz	TO220-5, TO263-5, PDIP-16, SOIC-24	
LM2576	4.0V to 40V	3.3V, 5V, 12V, Adj.	3A	52kHz	TO220-5, TO263-5	

Synchronous Buck Regulators (Internal Switches)

Device	V_{IN}	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package	Comments
MIC2267 ***New!***	3.0V to 5.5V	Adj. to 1V	1.6A	400kHz to 300kHz	MLF®-12 (3x 3mm)	Input Current Limiting Synchronous Buck Regulator - USB Power Maximizer™.
MIC26400	4.5V to 26V	Adj. to 0.8V	5A	300kHz	MLF®-28 (5x6mm)	Ultra-Fast Transient Response, High V_{IN} to Low V_{OUT}, Any Capacitor™ Stable.
MIC26600	4.5V to 26V	Adj. to 0.8V	7A	300kHz	MLF®-28 (5x6mm)	Ultra-Fast Transient Response, High V_{IN} to Low V_{OUT}, Any Capacitor™ Stable.
MIC26950	4.5V to 26V	Adj. to 0.8V	12A	300kHz	MLF®-28 (5x6mm)	Ultra-Fast Transient Response, High V_{IN} to Low V_{OUT}, Any Capacitor™ Stable.
MIC27600 ***New!***	4.5V to 36V	Adj. to 0.8V	7A	300kHz	MLF®-28 (5x6mm)	Ultra-Fast Transient Response, High V_{IN} to Low V_{OUT}, Any Capacitor™ Stable.
MIC2177	4.5V to 16.5V	3.3V, 5V, Adj.	2.5A	200kHz	WSOIC-20	Auto-Skip Mode.
MIC2178	4.5V to 16.5V	3.3V, 5V, Adj.	2.5A	200kHz	WSOIC-20	Manual-Select Skip Mode.
MIC2179	4.5V to 16.5V	3.3V, 5V, Adj.	1.5A	200kHz	SSOP-20	
MIC2202	2.3V to 5.5V	Adj. to 0.5V	0.6A	2MHz	MSOP-10, MLF®-10 (3x3mm)	1µF Ceramic Stable.
MIC2203	2.3V to 5.5V	Adj. to 0.5V	0.3A	1MHz	MSOP-10, MLF®-10 (3x3mm)	1µF Ceramic Stable.
MIC2204	2.3V to 5.5V	Adj. to 1V	0.6A	2MHz	MSOP-10, MLF®-10 (3x3mm)	Synchronizable to External Clock.
MIC2205	2.7V to 5.5V	1.58V, Adj.	0.6A	2MHz	MLF®-10 (3x3mm)	LowQ® LDO Mode. No Noise at Light Load.
MIC2245	2.7V to 5.5V	Adj.	0.5A	4MHz	MLF®-10 (3x3mm)	LowQ® LDO Mode. No Noise at Light Load.
MIC2285A	2.7V to 5.5V	Adj.	0.6A	8MHz	Thin MLF®-10 (2x2mm)	LowQ® LDO Mode. No Noise at Light Load.
MIC2206	2.7V to 5.5V	1.8V(1.0V), 1.2V(1.0V)	0.6A	2MHz	MLF®-10 (3x3mm)	Voltage Scaling in LowQ® Mode.
MIC2224	2.7V to 5.5V	Adj. to 0.3V	0.6A	2MHz	MLF®-10 (3x3mm)	DAC Controlled V_{OUT} with Bypass Switch.
MIC22200	2.6V to 5.5V	Adj. to 0.7V	2A	800kHz to 4MHz	MLF®-12 (3x3mm)	Sequencing/Tracking Easy Compensation.
MIC22400	2.6V to 5.5V	Adj. to 0.7V	4A	300kHz to 4MHz	MLF®-20 (3x4mm), eTSSOP-20	Sequencing/Tracking Easy Compensation.
MIC22600	2.6V to 5.5V	Adj. to 0.7V	6A	1MHz	MLF®-24 (4x4mm)	Sequencing/Tracking Easy Compensation.

Switch-Mode Voltage Regulator Selection Guide

Synchronous Buck Regulators (Internal Switches) (Continued)

Device	V_{IN}	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package	Comments
MIC22601	2.6V to 5.5V	Adj. to 0.7V	6A	4MHz	MLF®-24 (4 x 4mm)	High PWM Frequency; High Efficiency.
MIC22602	2.6V to 5.5V	Adj. to 0.7V	6A	1MHz	MLF®-24 (4 x 4mm)	High Efficiency; Hiccup Mode Current Limiting.
MIC22700	2.6V to 5.5V	Adj. to 0.7V	7A	1MHz	MLF®-24 (4 x 4mm)	High Efficiency, Sequencing/Tracking.
MIC22705 ***New!***	2.9V to 5.5V	Adj. to 0.7V	7A	1MHz	MLF®-24 (4 x 4mm)	Pre-bias Safe, High Efficiency.
MIC22950	2.6V to 5.5V	Adj. to 0.7V	10A	400kHz to 2MHz	MLF®-32 (5 x 5mm)	Highest power density, >95% Efficiency.
MIC23031	2.7V to 5.5V	1.0V, 1.2V, 1.5V, 1.8V, Adj.	0.4A	4MHz	Thin MLF® (1.6 x 1.6mm)	PWM Buck Regulator with HyperLight Load™.
MIC23030	2.7V to 5.5V	1.0V, 1.2V, 1.5V, 1.8V, Adj.	0.4A	8MHz	Thin MLF® (1.6 x 1.6mm)	PWM Buck Regulator with HyperLight Load™.
MIC23050	2.7V to 5.5V	1.0V, 1.2V, 1.8V, 3.3V	0.6A	4MHz	MLF® (2 x 2mm)	PWM Buck Regulator with HyperLight Load™.
MIC23051	2.7V to 5.5V	1.2V (1.0V), 1.25V (0.95V), 1.4V (1.15V), 1.8V (1.0V)	0.6A	4MHz	MLF® (2 x 2mm)	PWM Buck Regulator with HyperLight Load™ and Voltage Scaling.
MIC23150	2.7V to 5.5V	1.0V, 1.2V, 1.35V, 1.8V, 3.3V	2.0A	4MHz	Thin MLF® (2 x 2mm)	PWM Buck Regulator with HyperLight Load™.
MIC23153	2.7V to 5.5V	1.8V, Adj.	2.0A	4MHz	Thin MLF® (2.5 x 2.5mm)	PWM Buck Regulator with HyperLight Load™ Power Good and Soft Start.

Synchronous Buck Regulators (Internal Switches + Internal Inductor)

Device	V_{IN}	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package	Comments
MIC33030	2.7V to 5.5V	1.2V, 1.8V, 2.5, Adj.	0.4A	8MHz	MLF®-12 (2.5 x 2mm)	8MHz Operation with Internal Chip Inductor, HyperLight Load™.
MIC33050	2.7V to 5.5V	1.0V, 1.2V, 1.8V, 3.3V	0.6A	4MHz	MLF®-12 (3 x 3mm)	4MHz Operation with Internal Chip Inductor, HyperLight Load™.
MIC33153 ***New!***	2.7V to 5.5V	1.2V, Adj.	1.2A	4MHz	MLF®-14 (3 x 3.5mm)	4MHz Operation with Internal Chip Inductor, HyperLight Load™.
MIC3385	2.7V to 5.5V	1.5V, Adj.	0.6A	8MHz	MLF®-14 (3 x 3.5mm)	8MHz Operation with Internal Chip Inductor, HyperLight Load™.

Dual Synchronous Buck Regulators (Internal Switches)

Device	V_{IN}	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package	Comments
MIC2238	2.5V to 5.5V	1.2/1.8V, 1.2/2.5V, 1.2/3.3V, 1.8/1.58 1.8/3.3, 3.3/3.3, Adj./Adj.	800/800mA	2.5MHz	MLF®-12 (3 x 3mm)	POR/PG Pin. Trickle Mode™ at Light Load. Independent Enables.
MIC23250	2.7V to 5.5V	1.2/1.8V, 1.0/1.2V, 0.9/1.1V, 1.2/1.6V, 1.2/1.5V 1.2/3.3V, 1.575/1.8V, 2.6/3.3V, Adj./Adj.	400/400mA	4MHz	Thin MLF®-10 (2 x 2mm) Thin MLF®-12 (2.5x2.5mm)	PWM Buck Regulators with HyperLight Load™. Independent Enables.
MIC23254	2.7V to 5.5V	1.0/1.8V	400/400mA	4MHz	Thin MLF®-10 (2 x 2mm)	PWM Buck Regulators with HyperLight Load™. Independent Enables.
MIC25400 ***New!***	4.5V to 13.2V	Adj. down to 0.7V	2A per channel	1MHz	MLF®-24 (4 x42mm)	Dual Channel, 180° Out of Phase. Programmable Current Limit.

Buck Controllers (External Switches)

Device	V_{IN}	V_{OUT}	I_{SW}[1] (Avg)(Max)	Efficiency (Typ)	I_Q (Typ)	Shutdown I_Q (Typ)	Frequency	Package	Comments
MIC2184	2.9V to 16V	Adj.	External P-FET, 1A to 10A	90%	600µA	0.5µA	200/400kHz	SOIC-16 QSOP-16	Can also be configured as Buck-Boost.
MIC2194	2.9V to 14V	Adj.	External P-FET, 1A to 10A	90%	1mA	0.5µA	400kHz	SOIC-8	

Synchronous Buck Controllers (External Switches)

Device	V_{IN}	V_{OUT}	I_{SW}[1] (Avg)(Max)	Efficiency (Typ)	I_Q (Typ)	Shutdown I_Q (Typ)	Frequency	Package	Comments
MIC2124	3V to 18V	Adj. to 0.8V	External FETs, 25A	94%	1.4mA	1mA	300kHz	MSOP-10	Hyper Speed Control™ Architecture.
MIC2164	3V to 28V	Adj. to 0.8V	External FETs, 25A	95%	1.4mA	0.8mA	300kHz	MSOP-10	Hyper Speed Control™ Architecture.
MIC2164C	3V to 28V	Adj. to 0.8V	External FETs, 25A	95%	1.4mA	0.8mA	300kHz	MSOP-10	V_{OUT} Down to 0.8V w/±3% Accuracy.
MIC2164-2	3V to 28V	Adj. to 0.8V	External FETs, 25A	95%	1.4mA	0.8mA	600kHz	MSOP-10	Hyper Speed Control™ Architecture.
MIC2164-3	3V to 28V	Adj. to 0.8V	External FETs, 25A	95%	1.4mA	0.8mA	1MHz	MSOP-10	Hyper Speed Control™ Architecture.
MIC2165	4.5V to 28V	Adj. to 0.8V	External FETs, 25A	95%	450µA	5µA	600kHz	EPAD-MSOP-10	HyperLight Load™ Efficiency.
MIC2166	4.5V to 28V	Adj. to 0.8V	External FETs, 25A	95%	950µA	5µA	600kHz	EPAD-MSOP-10	Hyper Speed Control™ Architecture.
MIC2174	3V to 40V	Adj. to 0.8V	External FETs, 25A	95%	1.4mA	0.8mA	300kHz	MSOP-10	Hyper Speed Control™ Architecture.

Switch-Mode Voltage Regulator Selection Guide

Synchronous Buck Controllers (External Switches) (Continued)

Device	V_{IN}	V_{OUT}	I_{SW}[1] (Avg)(Max)	Efficiency (Typ)	I_Q (Typ)	Shutdown I_Q (Typ)	Frequency	Package	Comments
MIC2174C	3V to 40V	Adj. to 0.8V	External FETs, 25A	95%	1.4mA	0.8mA	300kHz	MSOP-10	V_{OUT} Down to 0.8V w/±3% Accuracy.
MIC2176 ***New!***	4.5V to 75V	Adj. to 0.8V	External FETs, 15A	95%	1.4mA	0.7mA	300kHz	MSOP-10	V_{OUT} Down to 0.8V w/±1% Accuracy.
MIC2130	8V to 40V	Adj. to 0.7V	External FETs, 15A		4mA	0.18mA	150/400kHz	MLF®-16 (4x4mm), EPAD-TSSOP-16	
MIC2131	8V to 40V	Adj. to 0.7V	External FETs, 15A		4mA	0.18mA	150/400kHz	MLF®-16 (4x4mm), EPAD-TSSOP-16	Low EMI Frequency Dithering.
MIC2150	4V to 14.5V	Adj. to 0.7V	External FETs, 20A	93%	4.2mA	50µA	500kHz	MLF®-24 (4x4mm)	Dual Sync Controller with Outputs Switching 180° Out-of-Phase.
MIC2151	4V to 14.5V	Adj. to 0.7V	External FETs, 20A	93%	4.2mA	50µA	300kHz	MLF®-24 (4x4mm)	Dual Sync Controller with Outputs Switching 180° Out-of-Phase.
MIC2155	4.5V to 14.5V	Adj. to 0.7V	External FETs, 25A per Phase	95%	6mA	210µA	500kHz	MLF®-32 (5x5mm)	Sync Controller with Outputs Switching 180° Out-of-Phase.
MIC2156	4.5V to 14.5V	Adj. to 0.7V	External FETs, 25A per Phase	95%	6mA	210µA	300kHz	MLF®-32 (5x5mm)	Sync Controller with Outputs Switching 180° Out-of-Phase.
MIC2168	3V to 14.5V	Adj. to 0.8V	External N-FETs, 10A	95%	1mA	50µA	1MHz	MSOP-10	Small and Fast.
MIC2168A	3V to 14.5V	Adj. to 0.8V	External N-FETs, 10A	95%	1mA	50µA	1MHz	MSOP-10	Small and Fast, Enable Function.
MIC2169	3V to 14.5V	Adj. to 0.8V	External N-FETs, 15A	95%	1mA	50µA	500kHz	MSOP-10	See MIC2169B for new desings.
MIC2169A	3V to 14.5V	Adj. to 0.8V	External N-FETs, 15A		1.3mA	None	500kHz	MSOP-10	See MIC2169B for new desings.
MIC2169B	3V to 14.5V	Adj. to 0.8V	External N-FETs, 30A		1.5mA	None	500kHz	MSOP-10, EPAD-MSOP-10	Output Pre-bias Protection; Small and Super Efficient. Recommended for new designs.
MIC2159	3V to 14.5V	Adj. to 0.8V	External N-FETs, 20A		1.5mA	None	400kHz	EPAD-MSOP-10	Higher Current, Enable Function.
MIC2182	4.5V to 32V	3.3V, 5V, Adj.	External N-FETs, 2.5A to 20A	90%+	600µA	2µA	300kHz	SOIC-16, SSOP-16	
MIC2183	2.9V to 14V	Adj. to 1.25V	External N- and P-FET, 1A to 10A	95%+	600µA	0.5µA	400/200kHz	SOIC-16, QSOP-16	100% Max. Duty Cycle.
MIC2193	2.9V to 14V	Adj.	External N- and P-FET, 1A to 10A	93%+	1mA	–	400kHz	SOIC-8	100% Max. Duty Cycle.
MIC2198	4.5V to 32V	Adj. To 0.8V	External N-FETs, 1A to 20A	95%+	3.5mA	0.1µA	500kHz	MLF®-12 (4x4mm)	
MIC2199	4.5V to 32V	Adj. To 0.8V	External N-FETs, 1A to 20A	95%+	1.6mA	0.1µA	300kHz	MLF®-12 (4x4mm)	

1. I_{SW} (Avg) refers to the average current flowing through the switch.

Boost Regulators (Internal Switches)

Device	V_{IN}	V_{OUT}	I_{SW} (Typ)	Frequency	Package	Comments
MIC2141	2.5V to 14V	Adj. to 22V	0.1A	330kHz	SOT-23-5	Dynamically Adjustable V_{OUT} for LCD Bias.
MIC2142	2.2V to 16V	Adj. to 22V	0.1A	330kHz	SOT-23-5	
MIC2145	2.4V to 16V	Adj. to 16V	1A	450kHz	MSOP-8, MLF®-10 (3x3mm)	
MIC2171	3V to 40V	Adj. to 60V	4A	100kHz	TO-220-5, TO-263-5	High-Current, High-Voltage.
MIC2172	3V to 40V	Adj. to 60V	2.5A	100kHz	SOIC-8, DIP-8	Sync Pin., High-Current, High-Voltage.
MIC2288	2.5V to 10V	Adj. to 34V	1.2A	1.2MHz	TSOT-23-5, MLF®-8 (2x2mm)	OLED Driver, High Accuracy, OVP.
MIC2289	2.5V to 10V	Adj. to 34V	0.75A	1.2MHz	TSOT-23-6, MLF®-8 (2x2mm)	Internal Schottky White LED Driver, OVP. ±5% Feedback Voltage.
MIC2289C	2.5V to 10V	Adj. to 34V	0.75A	1.2MHz	TSOT-23-6	Internal Schottky White LED Driver, OVP. ±5% Feedback Voltage.
MIC2570	1.3V to 15V	2.85V, 3.3V, 5V, Adj. to 33V	1.1A	20kHz	SOIC-8	Low Input Voltage.
MIC2571	0.9V to 15V	2.85V, 3.3V, 5V, Adj. to 33V	1.1A	20kHz	MSOP-8	Low Input Voltage.
MIC2250	2.5V to 5.5V	Adj. to 32V	2.0A	Up to 2.5MHz	MLF®-8 (2x2mm)	High Light Load Efficiency Boost Regulator with low EMI.
MIC2253	2.5V to 10V	Adj. to 30V	3.5A	1MHz	MLF®-12 (3x3mm)	OVP, OTP, Enable and Softstart
MIC2290	2.5V to 10V	Adj. to 34V	0.75A	1.2MHz	MLF®-8 (2x2mm)	Internal Schottky, OVP.
MIC2295	2.5V to 10V	Adj. to 34V	1.2A	1.2MHz	TSOT-23-5, MLF®-8 (2x2mm)	High-Current, High-Efficiency, OVP.
MIC2296	2.5V to 10V	Adj. to 34V	1.7A	0.6MHz	TSOT-23-5, MLF®-8 (2x2mm)	High-Current, High-Efficiency, OVP.
MIC2297	2.5V to 10V	Adj. to 40V	1.2A	0.6MHz	MLF®-10 (2.5x2.5mm)	High Voltage White LED Driver, OVP.
MIC2298	2.5V to 10V	Adj. to 30V	4.75A	1.0MHz	MLF®-12 (3x3mm)	High Power Photo Flash LED Driver with Torch Mode, OVP.
MIC2299	2.5V to 10V	Adj. to 30V	4.75A	2.0MHz	MLF®-12 (3x3mm)	High Power Photo Flash LED Driver with Torch Mode, OVP.
MIC2601/2	4.5V to 20V	Adj. to 40V	1.2A	1.2/2MHz	MLF®-8 (2x2mm)	Enable Pin/SS/Low Shutdown Current.

Switch-Mode Voltage Regulator Selection Guide

Boost Regulators (Internal Switches) (Continued)

Device	V_{IN}	V_{OUT}	I_{SW} (Typ)	Frequency	Package	Comments
MIC2605/6	4.5V to 20V	Adj. to 40V	0.5A	1.2/2MHz	MLF®-8 (2 x 2mm)	Enable Pin/SS/Low Shutdown Current. Integrated Schottky Diode.
MIC2619	2.8V to 6.5V	Adj. to 35V	350mA	1.2MHz	TSOT-23-6	Programmable OVP, Enable Pin/SS/Low Shutdown Current.
MIC3172	3V to 40V	Adj. to 34V	2.25A	100kHz	SOIC-8, PDIP-8	Enable Pin.

Boost Controllers (External Switches)

Device	V_{IN}	V_{OUT}	Output Current	Efficiency (Typ)	I_Q (Typ)	Shutdown I_Q (Typ)	Frequency	Package	Comments
MIC2186	2.9V to 14V	Adj.	External N-FET, 1A to 10A	90%	600µA	0.5µA	100/200/400kHz	SOIC-16, QSOP-16	
MIC2196	2.9V to 14V	Adj.	External N-FET, 1A to 10A	90%	1mA	0.5µA	400kHz	SOIC-8	Boost, SEPIC, Cuk Configurations.

Synchronous Boost Controllers (External Switches)

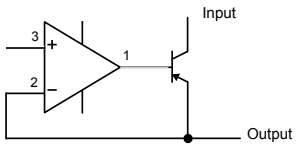
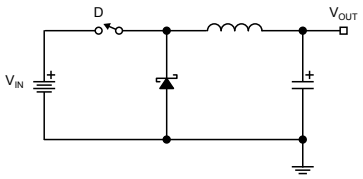
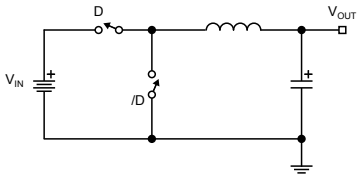
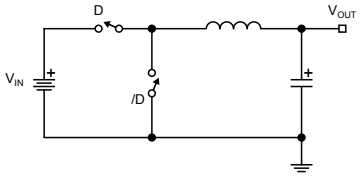
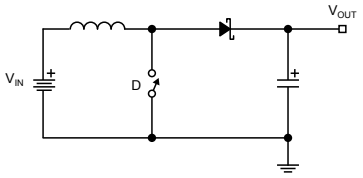
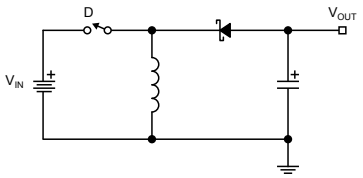
MIC2185	2.9V to 14V	Adj.	External N-FET/P-FET, 1A to 10A	95%	600µA	0.5µA	400kHz	SOIC-16, QSOP-16	High Efficiency.

Flyback/Forward Converter/Push-Pull Controllers for Isolated Applications (External Switches)

Device	V_{IN}	Gate Drive	V_{START}	V_{STOP}	Start-Up Current (Max)	Duty Cycle (Max)	Topology	Frequency	Package	Comments
MIC9130	9V to 180V	1A	9V	–	–	50%	Forward/Flyback	Adj. to 1.5MHz	SOIC-16, QSOP-16	Fast. Built-in 180V Start-up Circuitry.
MIC9131	9V to 180V	1A	9V	–	–	75%	Forward/Flyback	Adj. to 1MHz	SOIC-16, QSOP-16	Fast. Built-in 180V Start-up Circuitry.
MIC3808	8.3V to 15V	0.5A	12.5V	8.3V	130µA	50%	Push-Pull	Adj. to 1MHz	SOIC-8, MSOP-8	High-Output Current.
MIC3809	4.1V to 15V	0.5A	4.3V	4.1V	130µA	50%	Push-Pull	Adj. to 1MHz	SOIC-8, MSOP-8	High-Output Current.
MIC3838	8.3V to 15V	0.5A	12.5V	8.3V	130µA	50%	Push-Pull	Adj. to 1MHz	MSOP-10	Can Implement Volt-Second Clamp.
MIC3839	4.1V to 15V	0.5A	4.3V	4.1V	130µA	50%	Push-Pull	Adj. to 1MHz	MSOP-10	Can Implement Volt-Second Clamp.
MIC38C42	15.5V to 20V	0.5A	14.5V	9.0V	200µA	96%	Forward/Flyback	Adj. to 500kHz	PDIP-8, -14, MSOP-8 SOIC-8, -14	
MIC38C43	9V to 20V	0.5A	8.4V	7.6V	200µA	96%	Forward/Flyback	Adj. to 500kHz	PDIP-8, -14, MSOP-8 SOIC-8, -14	
MIC38C44	15.5V to 20V	0.5A	14.5V	9.0V	200µA	50%	Forward/Flyback	Adj. to 500kHz	PDIP-8, -14, MSOP-8 SOIC-8, -14	
MIC38C45	9V to 20V	0.5A	8.4V	7.6V	200µA	50%	Forward/Flyback	Adj. to 500kHz	PDIP-8, -14, MSOP-8 SOIC-8, -14	
MIC38HC42	15.5V to 20V	1A	14.5V	9.0V	200µA	96%	Forward/Flyback	Adj. to 500kHz	PDIP-8, -14, SOIC-8, -14	
MIC38HC43	9V to 20V	1A	8.4V	7.6V	200µA	96%	Forward/Flyback	Adj. to 500kHz	PDIP-8, -14, SOIC-8, -14	
MIC38HC44	15.5V to 20V	1A	14.5V	9.0V	200µA	50%	Forward/Flyback	Adj. to 500kHz	PDIP-8, -14, SOIC-8, -14	
MIC38HC45	9V to 20V	1A	8.4V	7.6V	200µA	50%	Forward/Flyback	Adj. to 500kHz	PDIP-8, -14, SOIC-8, -14	
MIC38C42A[1]	15.5V to 20V	0.5A	14.5V	9.0V	200µA	96%	Forward/Flyback	Adj. to 500kHz	SOIC-8, MSOP-8	
MIC38C43A[1]	9V to 20V	0.5A	14.5V	9.0V	200µA	96%	Forward/Flyback	Adj. to 500kHz	SOIC-8, MSOP-8	
MIC38C44A[1]	15.5V to 20V	0.5A	14.5V	9.0V	200µA	50%	Forward/Flyback	Adj. to 500kHz	SOIC-8, MSOP-8	
MIC38C45A[1]	9V to 20V	0.5A	14.5V	9.0V	200µA	50%	Forward/Flyback	Adj. to 500kHz	SOIC-8, MSOP-8	

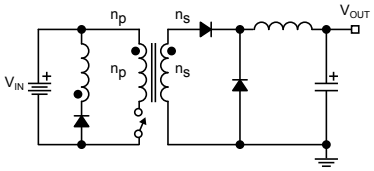
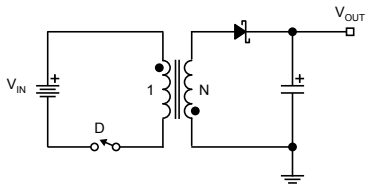
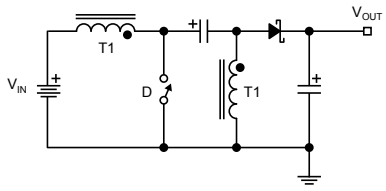
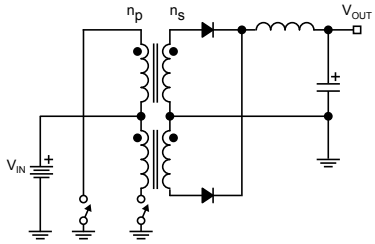
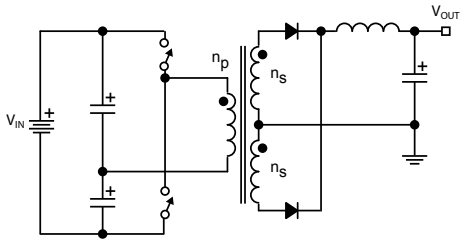
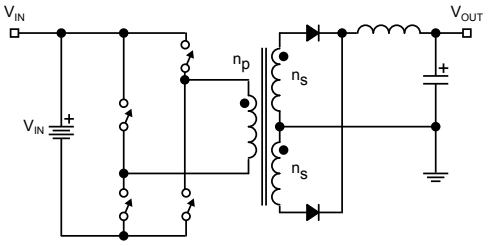
1. Recommended for new designs.

Voltage Regulator DC-to-DC Topologies

Device		Typical Applications	Pros	Cons
MIC/MAQ5280* MIC2940A MIC5203 MIC5205 MIC5219 MIC5245 MIC37102/502 MIC37302* MIC39100/150/302	MIC47050*/100* MIC47150/300 MIC49150/300* MIC59150/300* MIC61150/300* MIC68220* MIC68400* MIC69100*/153*/302*		**Linear Regulator** Only Steps Down ($V_{OUT} < V_{IN}$) – Inexpensive – Very Small – Low Noise/EMI – Ideal for: – 3.3V to 2.5V – 2.5V to 1.8V – 1.8V to 1.2V	Inefficient at high input-to-output voltage differential $Eff = V_{OUT}/V_{IN}$ *Note*: If a linear regulator gets too hot, then use a buck switching regulator instead of the new HELDO® MIC38300.
LM257x MIC2176* MIC457x MIC2207/8* MIC468x* MIC4690* MIC472x* MIC4782* MIC4742*/4*			**Buck Regulator (Internal Switch)** Only Steps Down ($V_{OUT} < V_{IN}$) – Lowest Peak Current – Only One Switch Voltage Drop – Low-Ripple Currnet In – Output-Filter Capacitor – Simple Inductor – Low Switch-Stress Voltage Eff ≈ +85%	High-Side Switch $I_{SW}\,(Avg) \approx I_{OUT}$ $DC \approx \frac{V_{OUT}}{V_{IN} \times Eff}$
MIC2177* MIC2178* MIC2179* MIC2202/3/4/5/6* MIC22200* MIC2224* MIC2225* MIC22400* MIC2245/85/85A* MIC22600/1/2*	MIC2267 MIC22700/705* MIC22950* MIC23xxx* MIC26400* MIC26600* MIC26950* MIC27600* MIC33xxx* Note 1		**Synchronous Buck Regulator (Internal Switch)** – Highest Efficiency (+90%) – Highest Efficiency Step Down – Pros are the same as Buck – High Output Current (up to 20A)	Two Switches $I_{SW}\,(Avg) \approx I_{OUT}$ $DC \approx \frac{V_{OUT}}{V_{IN} \times Eff}$
MIC2124* MIC2130/1* MIC2155/6 MIC2159* MIC2164* MIC2165/6* MIC2168A	MIC2169A/B* MIC2174 MIC2176* MIC2182* MIC2183 MIC2193* MIC2198*/9*		**Synchronous Buck Regulator (External Switch)** – Highest Efficiency (+90%) – Highest Efficiency Step Down – Pros are the same as Buck – High Output Current (up to 20A)	Two Switches $I_{SW}\,(Avg) \approx I_{OUT}$ $DC \approx \frac{V_{OUT}}{V_{IN} \times Eff}$
MIC2141* MIC2142* MIC2145* MIC2171* MIC2185* MIC2186* MIC2250* MIC2253* MIC2287*/8*/9* MIC2290* MIC2291/2/3*	MIC2295* MIC2296 MIC2297* MIC2298*/9* MIC2570* MIC2601/2* MIC2605/6* MIC3172 MIC3287* MIC3291		**Boost** Only Steps Down ($V_{OUT} < V_{IN}$) – Low Peak Current – Low-Side Switch – Simple Inductor – Low Switch-Stress Voltage Eff ≈ 85%	Output can't be completely turned off. No short-circuit protection. $I_{SW}\,(Avg) \approx \frac{I_{OUT}}{1 - DC}$ $DC \approx \frac{V_{OUT} - (V_{IN} \times Eff)}{V_{OUT}}$
LM257x MIC2196* MIC457x MIC4680 MIC4681 MIC4690			**Inverter/Buck-Boost** Negative Output Only – Simple Inductor Eff ≈ 85%	High-Side Switch High Peak Currents $I_{SW}\,(Avg) \approx \frac{I_{OUT}}{1 - DC}$ $DC \approx \frac{V_{OUT}}{V_{OUT} + (V_{IN} \times Eff)}$

Notes:
* = evaluation board is available.
1 = internal inductor

Voltage Regulator DC-to-DC Topologies

Device	Typical Applications	Pros	Cons
MIC38C4x MIC38HC4x		**Forward** Step Up and Down – Isolated Outputs – Low Side Switch Low Input/Output Ripple Eff ≈ 90%	$I_{SW}\,(Avg) \approx \frac{n_S}{n_P} \times I_{OUT}$ $DC \approx \frac{V_{OUT}}{(Eff \times V_{IN})} \times \frac{n_P}{n_S}$
MIC2171 MIC2186* MIC2196* MIC38C4x MIC384HC4x MIC9130** (POE) MIC9131*		**Flyback Applications (External Switches)** Step Up and Down – Isolated Outputs – Multiple Outputs – Negative Output – High Output Voltage – Low-Side Switch Eff ≈ 80%	Transformer instead of Inductor. High Peak Current. High Switch-Stress Voltage. $I_{SW}\,(Avg) \approx \frac{I_{OUT}}{1 - DC}$ $DC \approx \frac{V_{OUT}}{V_{OUT} + N \cdot V_{IN} \cdot Eff}$
MIC2142* MIC2145* MIC2171* MIC2172* MIC2185 MIC2186* MIC2196* MIC2288* MIC2295* MIC2298 MIC2570* MIC3172*		**SEPIC** Step Up and Down – Low-Side Switch Eff ≈ 80%	High Peak Currents 2 inductors or coupled inductor. High Switch-Stress Voltage. $I_{SW}\,(Avg) \approx \frac{V_{OUT} \times I_{OUT} + I_{OUT}}{V_{OUT} \times Eff}$ $DC \approx \frac{V_{OUT}}{V_{OUT} + (V_{IN} \times Eff)}$
MIC3808/9 MIC3838/9		**Push-Pull** Step Up and Down – Isolated Outputs – Low Side Switches – Low Input/Output Ripple Eff ≈ 94%	$I_{SW}\,(Avg) \approx \frac{n_S}{n_P} \times I_{OUT}$ $DC \approx \frac{V_{OUT}}{2(Eff \times V_{IN})} \times \frac{n_P}{n_S}$
MIC3808 MIC3809* MIC3838/9		**Half-Bridge** Step Up and Down – Isolated Outputs – Low FET Stress – Low Transformer Leakage Eff ≈ 95%	$I_{SW}\,(Avg) \approx \frac{n_S}{n_P} \times I_{OUT}$ $DC \approx \frac{V_{OUT}}{2(Eff \times V_{IN})} \times \frac{n_P}{n_S}$
MIC3808 MIC3809* MIC3838/9		**Full-Bridge** Step Up and Down – Isolated Outputs – High Power – Low FET Stress Eff ≈ 95%	$I_{SW}\,(Avg) \approx \frac{n_S}{n_P} \times I_{OUT}$ $DC \approx \frac{V_{OUT}}{2(Eff \times V_{IN})} \times \frac{n_P}{n_S}$

Note:
* = evaluation board is available.

WLED Driver Selection Guide

Boost LED Drivers

Device	V_{IN}	V_{OUT}	I_{SW} (Typ)	Frequency	Package	Comments
MIC2287	2.5V to 10V	Adj. to 34V	0.75A	1.2MHz	TSOT-23-5, MLF®-8 (2x2mm)	White LED Driver.
MIC2287C	2.5V to 10V	Adj. to 34V	0.75A	1.2MHz	TSOT-23-5, MLF®-8 (2x2mm)	White LED Driver. 10% ILED accuracy.
MIC2289	2.5V to 10V	Adj. to 34V	0.75A	1.2MHz	MLF®-8 (2x2mm)	Internal Schottky White LED Driver, OVP.
MIC2291	2.5V to 10V	Adj. to 34V	1.2A	1.2MHz	TSOT23-5, MLF®-8 (2x2mm)	Photo Flash LED Driver, OVP.
MIC2292	2.5V to 10V	Adj. to 34V	0.5A	1.6MHz	MLF®-8 (2x2mm)	High-Frequency White LED Driver with Internal Schottky Diode, OVP, ±5% Feedback Voltage.
MIC2292C	2.5V to 10V	Adj. to 34V	0.5A	1.6MHz	MLF®-8 (2x2mm)	High-Frequency White LED Driver with Internal Schottky Diode, OVP, ±5% Feedback Voltage.
MIC2293	2.5V to 10V	Adj. to 34V	0.5A	2MHz	MLF®-8 (2x2mm)	High-Frequency White LED Driver with Internal Schottky Diode, OVP.
MIC2293C	2.5V to 10V	Adj. to 34V	0.5A	2MHz	MLF®-8 (2x2mm)	High-Frequency White LED Driver with Internal Schottky Diode, OVP, 10% ILED accuracy.
MIC2297	2.5V to 10V	Adj. to 40V	1.2A	0.6MHz	MLF®-10 (2.5x2.5mm)	High Voltage White LED Driver, OVP.
MIC2298	2.5V to 10V	Adj. to 30V	4.75A	1.0MHz	MLF®-12 (3x3mm)	High Power Photo Flash LED Driver with Torch Mode, OVP.
MIC2299	2.5V to 10V	Adj. to 30V	4.75A	2.0MHz	MLF®-12 (3x3mm)	High Power Photo Flash LED Driver with Torch Mode.
MIC3287	2.8V to 5.5V	Adj. to 24V	0.35A	1.2MHz	TSOT-23-5, TSOT-23-6, MLF®-8 (2x2mm)	White LED Driver.
MIC3289	2.5V to 6.5V	Adj. to 24V	0.75A	1.2MHz	TSOT-23-6, MLF®-8 (2x2mm)	Single Wire Digital (Logrithmic) Brightness Control with Internal Schottky Diode.
MIC3291 ***New!***	2.5V to 6.5V	Adj. to 25V	0.75A	1.2MHz	TSOT-23-6, MLF®-8 (2x2mm)	Single Wire Digital (Linear) Brightness Control with Internal Schottky Diode.
MIC3223	4.5V to 20V	Adj. to 37V	3.5A	1.0MHz	eTSSOP-16 (4 x 4mm)	Boost High Power LED Driver with Integrated FET and PWM Dimming.
MIC3263	6V to 40V	Adj. to 40V	1.5A	400kHz - 1.8MHz	MLF®-24 (4 x 4mm)	Six-Channel WLED Driver for Backlighting Applications with Flicker-free Dimming.

Linear LED Driver

Device	V_{IN}	Output	Dimming	I_{LED} Matching	LDOs	Package	Comments
MIC2841A	3.0V to 5.5V	4 x 20mA	PWM to 500kHz	1.5%	–	Thin MLF®-10 (2x2mm)	Linear WLED Driver.
MIC2842A	3.0V to 5.5V	4 x 20mA	32-Step Digital	1.5%	–	Thin MLF®-10 (2x2mm)	Linear WLED Driver.
MIC2843A	3.0V to 5.5V	6 x 20mA	PWM to 500kHz	1.5%	–	Thin MLF®-10 (2x2mm)	Linear WLED Driver.
MIC2844A	3.0V to 5.5V	6 x 20mA	32-Step Digital	1.5%	–	Thin MLF®-10 (2x2mm)	Linear WLED Driver.
MIC2845A	3.0V to 5.5V	6 x 20mA	PWM to 500kHz	1.5%	2	Thin MLF®-14 (2.5x2.5mm)	Linear WLED Driver with 2 LDOs.
MIC2846A	3.0V to 5.5V	6 x 20mA	32-Step Digital	1.5%	2	Thin MLF®-14 (2.5x2.5mm)	Linear WLED Driver with 2 LDOs.
MIC2860-2D ***New!***	3.0V to 5.5V	2 x 30.2mA	32-Step Digital	0.50%	–	SC-70-6, TSOT-23-6	2-Channel Linear WLED Driver with Single Wire Digital Control.
MIC2860-2P ***New!***	3.0V to 5.5V	2 x 30.2mA	PWM	0.50%	–	SC-70-6, TSOT-23-6	2-Channel Linear WLED Driver with PWM Interface.
MIC4801 ***New!***	3.0V to 5.5V	600mA	PWM to 500kHz	±10%	–	SOIC-8	Linear WLED Driver.
MIC4802 ***New!***	3.0V to 5.5V	800mA	PWM to 500kHz	±10%	–	eSOIC-8	Linear WLED Driver.
MIC4811 ***New!***	3.0V to 5.5V	6 x 50mA	PWM to 500kHz	±1%	–	MSOP-10	Linear WLED Driver.
MIC4812 ***New!***	3.0V to 5.5V	6 x 100mA	PWM to 500kHz	±1%	–	eMSOP-10	Linear WLED Driver.

High Power LED Drivers

Device	V_{IN}	I_{LED}	Dimming	Switching Frequency	I_{LED} Accuracy	Feedback Looping	Package	Comments
MIC3201	6V to 20V	1A	PWM	1MHz	±5%	200mV	eSOIC-8	Step Down LED Driver.
MIC3202 ***New!***	6V to 37V	1A	PWM	1MHz	±5%	200mV	eSOIC-8	Step Down LED Driver.
MIC3203	4.5V to 42V	Controller (external FET)	PWM	1.5MHz	±5%	200mV	SOIC-8	Step Down LED Driver, AEC-Q100 Qualified.

WLED Driver Selection Guide

High Power LED Drivers (Continued)

Device	V_{IN}	I_{LED}	Dimming	Switching Frequency	I_{LED} Accuracy	Feedback Looping	Package	Comments
MAQ3203 ***New!***	4.5V to 42V	Controller (external FET)	PWM	1.5MHz	±5%	200mV	SOIC-8	Step Down LED Driver.
MIC3201	6V to 20V	1A	PWM	1MHz	±5%	200mV	eSOIC-8	Step Down LED Driver.
MIC3230	6V to 45V	Controller (external FET)	PWM	100kHz to 1MHz	3%	250mV	eTSSOP-16, MLF®-12 (3x3mm)	Boost Controller High Power LED Driver.
MIC3231	6V to 45V	Controller (external FET)	PWM	100kHz to 1MHz	3%	250mV	eTSSOP-16 MLF®-12 (3x3mm)	Boost Controller High Power LED Driver with dithering.
MIC3232	6V to 45V	Controller (external FET)	PWM	400kHz	3%	250mV	MSOP-10	Fixed Frequency Boost Controller. High Power LED Driver.

General Purpose Power Distribution Switch Selection Guide

Micrel Advantage

- Highest Efficiency
- Highest Current Density
- Low R_{DS} ON
- Best CLS Performance

Device	Type	Switch Element	Internal Charge Pump	Operating Voltage	Current Limit Fixed (Min.)	Current Limit Adj. (Max.)	Output Resistance	Body Diode Blocking	Enable Logic	Under Voltage Lockout	Current Limit	Thermal Shutdown	Fault Flag	Flag Transient Filter	Package
MIC2003/13	Single	P-Channel	n/a	2.5V to 5.5V	500mA 800mA 1.2A		100mΩ@5V	No	Noninverting	Yes	Yes	Yes	No	Yes	SOT-23-5, MLF® (2x2mm)
MIC2004/14	Single	P-Channel	n/a	2.5V to 5.5V	500mA 800mA 1.2A		100mΩ@5V	No	Noninverting	Yes	Yes	Yes	No	Yes	SOT-23-5, MLF® (2x2mm)
MIC2005/15	Single	P-Channel	n/a	2.5V to 5.5V	500mA 800mA 1.2A		100mΩ@5V	No	Noninverting	Yes	Yes	Yes	Yes	Yes	SOT-23-5, SOT-23-6 MLF® (2x2mm)
MIC2005A	Single	P-Channel	n/a	2.5V to 5.5V	500mA		170mΩ@5V	No	Noninverting	Yes	Yes	Yes	Yes	Yes	SOT-23-5, SOT-23-6
MIC2009A	Single	P-Channel	n/a	2.5V to 5.5V	100mA-0.9A		170mΩ@5V	No	Noninverting	Yes	Yes	Yes	Yes	Yes	SOT-23-6
MIC2005L	Single	P-Channel	n/a	2.5V to 5.5V	500mA 800mA 1.2A		100mΩ@5V	No	Noninverting	Yes	Yes	Yes	Yes	Yes	SOT-23-5
MIC2006/16	Single	P-Channel	n/a	2.5V to 5.5V	500mA 800mA 1.2A		100mΩ@5V	No	Noninverting	Yes	Yes	Yes	No	Yes	SOT-23-6, MLF® (2x2mm)
MIC2007/17	Single	P-Channel	n/a	2.5V to 5.5V	200mA	2.0A	100mΩ@5V	No	Noninverting	Yes	Yes	Yes	No	Yes	SOT-23-6, MLF® (2x2mm)
MIC2008/18	Single	P-Channel	n/a	2.5V to 5.5V	200mA	2.0A	100mΩ@5V	No	Noninverting	Yes	Yes	Yes	No	Yes	SOT-23-6, MLF® (2x2mm)
MIC2009/19	Single	P-Channel	n/a	2.5V to 5.5V	200mA	2.0A	100mΩ@5V	No	Noninverting	Yes	Yes	Yes	Yes	Yes	SOT-23-6, MLF® (2x2mm)
MIC2025-1	Single	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	SOIC-8, MSOP-8, PDIP-8
MIC2025-2	Single	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	SOIC-8, MSOP-8
MIC2026-1	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	SOIC-8, PDIP-8
MIC2026-2	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	SOIC-8, PDIP-8
MIC2026A-1	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	SOIC-8, PDIP-8
MIC2026A-2	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	SOIC-8, PDIP-8
MIC2027-1	Quad	N-Channel	Yes	2.7V to 5.5V	500mA		150mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	SOIC-16, WSOIC-16, PDIP-8
MIC2027-2	Quad	N-Channel	Yes	2.7V to 5.5V	500mA		150mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	SOIC-16, WSOIC-16, PDIP-8
MIC2040-1	Single	N-Channel	Yes	0.8V to 5.5V	250mA	1.5A	80mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	MSOP-10
MIC2040-2	Single	N-Channel	Yes	0.8V to 5.5V	250mA	1.5A	80mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	MSOP-10

General Purpose Power Distribution Switch Selection Guide

(Continued)

Device	Type	Switch Element	Internal Charge Pump	Operating Voltage	Current Limit Fixed (Min.)	Current Limit Adj. (Max.)	Output Resistance	Body Diode Blocking	Enable Logic	Under Voltage Lockout	Current Limit	Thermal Shutdown	Fault Flag	Flag Transient Filter	Package
MIC2041-1	Single	N-Channel	Yes	0.8V to 5.5V	250mA	1.5A	80mΩ@5V	Yes	Noninverting	Yes	Latched	Yes	Yes	Yes	MSOP-10
MIC2041-2	Single	N-Channel	Yes	0.8V to 5.5V	250mA	1.5A	80mΩ@5V	Yes	Inverting	Yes	Latched	Yes	Yes	Yes	MSOP-10
MIC2042-1	Single	N-Channel	Yes	0.8V to 5.5V	500mA	3.0A	40mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	SOIC-8, TSSOP-14
MIC2042-2	Single	N-Channel	Yes	0.8V to 5.5V	500mA	3.0A	40mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	SOIC-8, TSSOP-14
MIC2043-1	Single	N-Channel	Yes	0.8V to 5.5V	500mA	3.0A	40mΩ@5V	Yes	Noninverting	Yes	Latched	Yes	Yes	Yes	SOIC-8, TSSOP-14
MIC2043-2	Single	N-Channel	Yes	0.8V to 5.5V	500mA	3.0A	40mΩ@5V	Yes	Inverting	Yes	Latched	Yes	Yes	Yes	SOIC-8, TSSOP-14
MIC2044-1	Single	N-Channel	Yes	0.8V to 5.5V	1.0A	6.0A	20mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	TSSOP-16
MIC2044-2	Single	N-Channel	Yes	0.8V to 5.5V	1.0A	6.0A	20mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	TSSOP-16
MIC2045-1	Single	N-Channel	Yes	0.8V to 5.5V	1.0A	6.0A	20mΩ@5V	Yes	Noninverting	Yes	Latched	Yes	Yes	Yes	TSSOP-16
MIC2045-2	Single	N-Channel	Yes	0.8V to 5.5V	1.0A	6.0A	20mΩ@5V	Yes	Inverting	Yes	Latched	Yes	Yes	Yes	TSSOP-16
MIC2075-1	Single	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Noninverting	Yes	Yes	Latched	Yes	Yes	SOIC-8, MSOP-8
MIC2075-2	Single	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Inverting	Yes	Yes	Latched	Yes	Yes	SOIC-8, MSOP-8, PDIP-8
MIC2076-1	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Noninverting	Yes	Yes	Latched	Yes	Yes	SOIC-8, PDIP-8
MIC2076-2	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Inverting	Yes	Yes	Latched	Yes	Yes	SOIC-8, PDIP-8
MIC2076A-1	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Noninverting	Yes	Yes	Latched	Yes	Yes	SOIC-8
MIC2076A-2	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Inverting	Yes	Yes	Latched	Yes	Yes	SOIC-8
MIC2077-1	Quad	N-Channel	Yes	2.7V to 5.5V	500mA		150mΩ@5V	Yes	Noninverting	Yes	Yes	Latched	Yes	Yes	SOIC-16, WSOIC-16
MIC2077-2	Quad	N-Channel	Yes	2.7V to 5.5V	500mA		150mΩ@5V	Yes	Inverting	Yes	Yes	Latched	Yes	Yes	SOIC-16, WSOIC-16
MIC2095-1	Single	P-Channel	N/A	2.5V to 5.5V	500mA		275mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	Thin MLF®-6 (1.6x1.6mm)
MIC2095-2	Single	P-Channel	N/A	2.5V to 5.5V	500mA		275mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	Thin MLF®-6 (1.6x1.6mm)
MIC2097-1	Single	P-Channel	N/A	2.5V to 5.5V		1.1A	275mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	Thin MLF®-6 (1.6x1.6mm)
MIC2097-2	Single	P-Channel	N/A	2.5V to 5.5V		1.1A	275mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	Thin MLF®-6 (1.6x1.6mm)
MIC2098-1	Single	P-Channel	N/A	2.5V to 5.5V	900mA		275mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	Thin MLF®-6 (1.6x1.6mm)
MIC2098-2	Single	P-Channel	N/A	2.5V to 5.5V	900mA		275mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	Thin MLF®-6 (1.6x1.6mm)
MIC2099-1	Single	P-Channel	N/A	2.5V to 5.5V		1.1A	275mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	Thin MLF®-6 (1.6x1.6mm)
MIC2099-2	Single	P-Channel	N/A	2.5V to 5.5V		1.1A	275mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	Thin MLF®-6 (1.6x1.6mm)
MIC2505	Single	N-Channel	Yes	2.7V to 7.5V	2.0A		50mΩ@5V	Yes	Noninverting		Yes	Yes	Yes	Yes	SOIC-8, PDIP-8
MIC2505-1	Single	N-Channel	Yes	2.7V to 7.5V	2.0A		50mΩ@5V	Yes	Noninverting		Yes	Yes	Yes	Yes	SOIC-8
MIC2505-2	Single	N-Channel	Yes	2.7V to 7.5V	2.0A		50mΩ@5V	Yes	Inverting		Yes	Yes	Yes	Yes	SOIC-8
MIC2506	Dual	N-Channel	Yes	2.7V to 7.5V	1.0A		125mΩ@5V	Yes	Noninverting		Yes	Yes	Yes	Yes	SOIC-8
MIC2514	Single	P-Channel	Yes	3V to 13.5V	400mA		2.4Ω@5V		Noninverting		Yes	Yes			SOT-23-5
MIC2536-1	Dual	N-Channel	Yes	2.7V to 5.5V	100mA		700mΩ@5V	Yes	Noninverting		Yes	Yes	Yes	Yes	SOIC-8, MSOP-8
MIC2536-2	Dual	N-Channel	Yes	2.7V to 5.5V	100mA		700mΩ@5V	Yes	Inverting		Yes	Yes	Yes	Yes	SOIC-8, MSOP-8
MIC2537-1	Quad	N-Channel	Yes	2.7V to 5.5V	100mA		700mΩ@5V	Yes	Noninverting		Yes	Yes	Yes		SOIC-16
MIC2537-2	Quad	N-Channel	Yes	2.7V to 5.5V	100mA		700mΩ@5V	Yes	Inverting		Yes	Yes	Yes		SOIC-16
MIC2544-1	Single	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Noninverting		Yes	Yes	Yes		SOIC-8, MSOP-8
MIC2544-2	Single	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Inverting		Yes	Yes	Yes		SOIC-8, MSOP-8
MIC2544A-1	Single	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Noninverting		Yes	Yes	Yes		SOIC-8, MSOP-8
MIC2544A-2	Single	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Inverting		Yes	Yes	Yes		SOIC-8, MSOP-8
MIC2545A-1	Single	N-Channel	Yes	2.7V to 5.5V	500mA	3.0A	50mΩ@5V	Yes	Noninverting		Yes	Yes	Yes		SOIC-8, PDIP-8, TSSOP-14
MIC2545A-2	Single	N-Channel	Yes	2.7V to 5.5V	500mA	3.0A	50mΩ@5V	Yes	Inverting		Yes	Yes	Yes		SOIC-8, PDIP-8, TSSOP-14
MIC2546-1	Dual	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Noninverting		Yes	Yes	Yes		SOIC-16, TSSOP-16
MIC2546-2	Dual	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Inverting		Yes	Yes	Yes		SOIC-16, TSSOP-16
MIC2547-1	Dual	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Noninverting		Yes	Latched	Yes		SOIC-16, TSSOP-16
MIC2547-2	Dual	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Inverting		Yes	Latched	Yes		SOIC-16, TSSOP-16
MIC2548-1	Single	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Noninverting		Yes	Latched	Yes		SOIC-8, MSOP-8
MIC2548-2	Single	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Inverting		Yes	Latched	Yes		SOIC-8, MSOP-8
MIC2548A-1	Single	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Noninverting		Yes	Latched	Yes		SOIC-8, MSOP-8
MIC2548A-2	Single	N-Channel	Yes	2.7V to 5.5V	100mA	1.5A	120mΩ@5V	Yes	Inverting		Yes	Latched	Yes		SOIC-8, MSOP-8
MIC2549A-1	Single	N-Channel	Yes	2.7V to 5.5V	500mA	3.0A	50mΩ@5V	Yes	Noninverting		Yes	Latched	Yes		SOIC-8, PDIP-8, TSSOP-14
MIC2549A-2	Single	N-Channel	Yes	2.7V to 5.5V	500mA	2.5A	50mΩ@5V	Yes	Inverting		Yes	Latched	Yes		SOIC-8, PDIP-8, TSSOP-14

General Purpose Power Distribution Switch Selection Guide

USB Switches and USB Switches Supporting ACPI S0/S3 State Transitions[1]

Device	Type	Switch Element	Internal Charge Pump	Operating Voltage	Current Limit Fixed (Min.)	Current Limit Adj. (Max.)	Output Resistance	Body Diode Blocking	Enable Logic	Under Voltage Lockout	Current Limit	Thermal Shutdown	Fault Flag	Flag Transient Filter	Package
MIC2010-1	Dual	N-Channel	Yes	4.5V to 5.5V	500mA	300mA[2]	140mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	QSOP-16
MIC2010-2	Dual	N-Channel	Yes	4.5V to 5.5V	500mA	300mA[2]	140mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	QSOP-16
MIC2012-1	Dual	N-Channel	Yes	4.5V to 5.5V	500mA		140mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	QSOP-16
MIC2012-2	Dual	N-Channel	Yes	4.5V to 5.5V	500mA		140mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	QSOP-16
MIC2012	Dual	N-Channel	Yes	4.5V to 5.5V	500mA		140mΩ@5V	Yes	—	Yes	Yes	Yes	Yes	Yes	SOIC-8
MIC2070-1	Dual	N-Channel	Yes	4.5V to 5.5V	500mA	300mA[2]	140mΩ@5V	Yes	Noninverting	Yes	Yes	Latched	Yes	Yes	QSOP-16
MIC2070-2	Dual	N-Channel	Yes	4.5V to 5.5V	500mA	300mA[2]	140mΩ@5V	Yes	Inverting	Yes	Yes	Latched	Yes	Yes	QSOP-16
MIC2072-1	Dual	N-Channel	Yes	4.5V to 5.5V	500mA		140mΩ@5V	Yes	Noninverting	Yes	Yes	Latched	Yes	Yes	QSOP-16
MIC2072-2	Dual	N-Channel	Yes	4.5V to 5.5V	500mA		140mΩ@5V	Yes	Inverting	Yes	Yes	Latched	Yes	Yes	QSOP-16
MIC2072	Dual	N-Channel	Yes	4.5V to 5.5V	500mA		140mΩ@5V	Yes	—	Yes	Yes	Latched	Yes	Yes	SOIC-8
MIC2073	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		210mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	SOIC-8
MIC2074	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		210mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	SOIC-8

1. Contact factory for availabilty of specific options. Specifications are given for "MAIN" mode operation.
2. S3 State.

USB Transceiver Selection Guide

Device	Description	Supported Speeds	Package
MIC2550	Universal Serial Bus Transceiver	1.5Mbps (low) and 12Mbps (full)	TSSOP-14, MLF®-16
MIC2550A[1]	Universal Serial Bus Transceiver	1.5Mbps (low) and 12Mbps (full)	TSSOP-14, MLF®-16
MIC2550A-2.5[1]	Universal Serial Bus Transceiver	1.5Mbps (low) and 12Mbps (full)	MLF®-14 (2.5x2.5mm)
MIC2551	Universal Serial Bus Transceiver	1.5Mbps (low) and 12Mbps (full)	TSSOP-14, MLF®-16
MIC2551A[1]	Universal Serial Bus Transceiver	1.5Mbps (low) and 12Mbps (full)	TSSOP-14, MLF®-16
MIC2551A-2.5[1]	Universal Serial Bus Transceiver	1.5Mbps (low) and 12Mbps (full)	MLF®-14 (2.5 x 2.5mm)
MIC2555[1]	Universal Serial Bus On-The-Go (OTG) Transceiver	1.5Mbps (low) and 12Mbps (full)	MLF®-24 (4 x 4mm)

1. Recommended for new designs.

USB Power Management Selection Guide

Device	Description	V_{IN}	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package
MIC2267 ***New!***	Input Current Limiting Synchronous Buck Regulator USB Power Maximizer™	3.0V to 5.5V	Adj. to 1V	1.6A	400kHz-1.5MHz	MLF®-12 (3 x 3mm)

1. I_{SW} (Avg) refers to the average current flowing through the switch.

PC Card/PCMCIA/CardBus Power Distribution Switch Selection Guide

Micrel Advantage

- Single Chip Smallest Footprint Solution
- First Company with PCMCIA Solution

Device	Slots Supported	V_{CC3} On-Resistance	V_{CC5} On-Resistance	V_{PP} On-Resistance	Current Limit	Thermal Shutdown	Charge Pump[1]	Package
MIC2560	Single	40mΩ	70mΩ	550mΩ	Yes	Yes		WSOIC-16
MIC2561	Single	110mΩ	210mΩ	550mΩ	Yes	Yes		SOIC-14
MIC2562A	Single	100mΩ	70mΩ	600mΩ	Yes	Yes	Yes	SOIC-14, TSSOP-16
MIC2563A	Dual	100mΩ	70mΩ	600mΩ	Yes	Yes	Yes	SSOP-28
MIC2564A	Dual	120mΩ	85mΩ	1300mΩ	Yes	Yes	Yes	SSOP-24, TSSOP-24
MIC2566	Single	120mΩ	85mΩ	—	Yes	Yes	Yes	SOIC-14, TSSOP-14
MIC2568	Dual	120mΩ	85mΩ	—	Yes	Yes	Yes	SSOP-28, TSSOP-28
MIC2569		90mΩ	—	275mΩ	Yes	Yes	Yes	QSOP-16

1. 12V is not required for switching when equipped with a charge pump.

Operational Amplifier Selection Guide

Micrel Advantage

- Low Power
- Low Current
- Can Drive Large Capacitance Loads
- Best Performance

Device	Description	GBW	Slew Rate	Supply Current (per Op Amp)	Input Offset Voltage (max.)	Input Bias Current	Supply Range	Rail-to-Rail I/O	# of Op Amps Per Package	Package	Comments
MIC6211	High-Voltage Op Amp	2.5MHz	6V/µs	1.2mA	7mV	50nA	4V–32V		1	SOT-23-5	High-Voltage General Purpose.
LMC7101	General Purpose Op Amp	500kHz	0.5V/µs	500µA	6mV	1pA	2.7V–10V	Input/Output	1	SOT-23-5	Rail-to-Rail Input and Output.
MIC7111	Micropower 1.8V Op Amp	25kHz	20mV/µs	15µA	7mV	1pA	1.8V–11V	Input/Output	1	SOT-23-5	Rail-to-Rail Input and Output.
MIC7122	Rail-to-Rail Dual Op Amp	750kHz	0.7V/µs	350µA	9mV	1pA	2.2V–15V	Input/Output	2	MSOP-8	Rail-to-Rail Input and Output.
MIC7300	High Output Drive Op Amp	500kHz	0.5V/µs	700µA	9mV	0.5pA	2.2V–10V	Input/Output	1	SOT-23-5 MSOP-8	Rail-to-Rail Input and Output.
MIC860	4MHz/30µA Op Amp	4MHz	3V/µs	30µA	15mV	20pA	2.43V–5.25V	Output	1	SC-70-5	Very Low Power.
MIC861	400kHz/4.6µA Op Amp	400kHz	0.12V/µs	4.6µA	10mV	20pA	2.43V–5.25V	Output	1	SC-70-5	Very Low Power.
MIC862	Dual 3MHz/31µA Op Amp	3MHz	4V/µs	31µA	6mV	10pA	2V–5.25V	Output	2	SOT-23-8	Very Low Power.
MIC863	Dual 450KHz/4.2µA Op Amp	450KHz	0.35V/µs	4.2µA	6mV	10pA	2V–5.25V	Output	2	SOT-23-8	Very Low Power.
MIC910	135MHz Op Amp	135MHz	270V/µs	2.4mA	15mV	3.5µA	5V–18V		1	SOT-23-5	Low Power/High Speed.
MIC911	105MHz Op Amp	105MHz	120V/µs	1.25mA	10mV	1.5µA	5V–18V		1	SOT-23-5	Low Power/High Speed.
MIC912	200MHz Op Amp	200MHz	360V/µs	2.4mA	15mV	3.5µA	5V–18V		1	SOT-23-5	Low Power/High Speed.
MIC913	350MHz Op Amp	350MHz	500V/µs	4.2mA	16mV	5.5µA	5V–18V		1	SOT-23-5	Low Power/High Speed.
MIC914	160MHz Op Amp	160MHz	160V/µs	1.25mA	10mV	1.5µA	5V–18V		1	SOT-23-5	Low Power/High Speed.
MIC915	Dual MIC910	135MHz	270V/µs	2.4mA	15mV	3.5µA	5V–18V		2	MSOP-10	Low Power/High Speed.
MIC916	Triple MIC910	135MHz	270V/µs	2.4mA	15mV	3.5µA	5V–18V		3	QSOP-16	Low Power/High Speed.
MIC918	1500V/µs Op Amp	51MHz	1500V/µs	550µA	5mV	0.26µA	5V–18V		1	SC-70-5	Low Power/High Speed.
MIC919	1500V/µs Op Amp	27MHz	1500V/µs	360µA	5mV	0.13µA	5V–18V		1	SC-70-5	Low Power/High Speed.
MIC920	3000V/µs Op Amp	80MHz	3000V/µs	500µA	5mV	0.26µA	5V–18V		1	SC-70-5	Low Power/High Speed.
MIC921	3000V/µs Op Amp	45MHz	3000V/µs	300µA	5mV	0.13µA	5V–18V		1	SC-70-5	Low Power/High Speed.
MIC922	230MHz Op Amp	230MHz	1500V/µs	2.5mA	5mV	1.7µA	5V–18V		1	SC-70-5	Low Power/High Speed.
MIC923	410MHz/2200V/µs Op Amp	410MHz	2200V/µs	2.5mA	5mV	1.7µA	5V–18V		1	SC-70-5	Low Power/High Speed.

Comparator Selection Guide

Device	Description	Response Time	Supply Current	Input Offset Voltage (max.)	Input Bias Current	Supply Range	Package	Comments
MIC6270	High-Voltage Comparator	600ns	0.3mA	5mV	25nA	2V–36V	5-Pin SOT-23	
MIC7211	Rail-to-Rail Input Comparator	4µs	5µA	10mV	5pA	2.2V–10V	5-Pin SOT-23	Push-Pull Output.
MIC7221	Rail-to-Rail Input Comparator	4µs	5µA	10mV	5pA	2.2V–10V	5-Pin SOT-23	Open-Drain Output.
MIC833	Comparator and Reference w/Adjustable Hysteresis	5µs	1µA	n/a	5pA	1.5V–5.5V	5-Pin SOT-23	Internal 1% Reference.
MIC834	Comparator and Reference	5µs	1.5µA	n/a	5pA	1.5V–5.5V	5-Pin SOT-23	Internal 1% Reference.
MIC841	Comparator and Reference w/Adjustable Hysteresis	12µs	1.5µA	n/a	5pA	1.5V–5.5V	5-Pin SC-70	Internal 1.25% Reference.
MIC842	Comparator and Reference	12µs	1.5µA	n/a	5pA	1.5V–5.5V	5-Pin SC-70	Internal 1.25% Reference.
MIC845	Micro-Power Comparator Battery Monitor	12µs	1.0µA	n/a	5pA	2.75V–5.5V	5-Pin SC-70	Internal 2% Reference, 2.55V Reference.

MOSFET Driver Selection Guide

Device	Function	Type	Logic	Sink/Source Peak Output	Sink/Source Output Impedance	t_r/t_f	t_{pd} (input rise/fall)	Supply Voltage	Package	Comments
Half-Bridge Drivers										
MIC4100	Half-Bridge MOSFET Driver	Dual	Non-Inverting (CMOS)	2A/2A	2.5Ω/2.5Ω	10ns into 1000pF	27ns into 1000pF	up to 100V	SOIC-8	Hysteresis on input pins for noisy or slow signals.
MIC4101	Half-Bridge MOSFET Driver	Dual	Non-Inverting (TTL)	2A/2A	2.5Ω/2.5Ω	10ns into 1000pF	27ns into 1000pF	up to 100V	SOIC-8	Level shift between V_{IN} signal and V_{DD} supply voltage.
MIC4102	High-Voltage Sync. Buck Driver	Dual	Non-Inverting (TTL)	3A/2A	1.5Ω/2.5Ω	10ns/6ns into 1000pF	27ns into 1000pF	up to 100V	SOIC-8	Embedded Anti-Shoot through Protection, PWM Input.
MIC4103	Half-Bridge MOSFET Driver	Dual	Non-Inverting (CMOS)	3A/2A	1.25Ω/2.5Ω	10ns/6ns into 1000pF	27ns into 1000pF	up to 100V	SOIC-8	
MIC4104	Half-Bridge MOSFET Driver	Dual	Non-Inverting (TTL)	3A/2A	1.25Ω/2.5Ω	10ns/6ns into 1000pF	27ns into 1000pF	up to 100V	SOIC-8,	
Low-Side Drivers										
MIC4416	Low-Side Driver	Single	Non-Inverting	1.2A	7.6Ω/7.8Ω	24ns/28ns into 1000pF	42ns into 1,000pF	4.5V to 18V	SOT-143	
MIC4417	Low-Side Driver	Single	Inverting	1.2A	7.6Ω/7.8Ω	24ns/28ns into 1000pF	37ns into 1,000pF	4.5V to 18V	SOT-143	
MIC4467	Low-Side Driver	Quad	Non-inverting NAND Inputs	1.2A	5Ω	14ns/13ns into 470pF	30ns/45ns into 470pF	4.5V to 18V	WSOIC-16, PDIP-14	MOSFET: 400pF to 3,000pF; Latch-up Protected; Input to –5V.
MIC4468	Low-Side Driver	Quad	Non-inverting AND Inputs	1.2A	5Ω	14ns/13ns into 470pF	30ns/45ns into 470pF	4.5V to 18V	WSOIC-16, PDIP-14	MOSFET: 400pF to 3,000pF Latch-up Protected; Input to –5V.
MIC4469	Low-Side Driver	Quad	Inverting + Non-inverting AND Inputs	1.2A	5Ω	14ns/13ns into 470pF	30ns/45ns into 470pF	4.5V to 18V PDIP-14	WSOIC-16, CerDIP-14	MOSFET: 400pF to 3,000pF; Latch-up Protected; Input to –5V. SMD (Military) 5962-9459403MCA.
MIC4126	Low-Side Driver	Dual	Inverting	1.5A	6Ω	13ns/15ns into 1000pF	37ns/40ns into 1000pF	4.5V to 20V	eSOIC-8, eMSOP-8, MLF®-8 (3 x 3mm)	MIC4426 upgrade; Higher input voltage; Input pulse down to 50ns.
MIC4127	Low-Side Driver	Dual	Non-Inverting	1.5A	6Ω	13ns/15ns into 1000pF	37ns/40ns into 1000pF	4.5V to 20V	eSOIC-8, eMSOP-8, MLF®-8 (3 x 3mm)	MIC4427 upgrade; Higher input voltage; Input pulse down to 50ns.
MIC4128	Low-Side Driver	Dual	Inverting + Non-Inverting	1.5A	6Ω	13ns/15ns into 1000pF	37ns/40ns into 1000pF	4.5V to 20V	eSOIC-8, eMSOP-8, MLF®-8 (3 x 3mm)	MIC4428 upgrade; Higher input voltage; Input pulsedown to 50ns.
MIC4426	Low-Side Driver	Dual	Inverting	1.5A	6Ω	18ns/15ns into 1000pF	17ns/23ns into 1000pF	4.5V to 18V	SOIC-8, MSOP-8, PDIP-8 CerDIP-8	MIC4126 is recommended upgrade. SMD (Military) 5962-8850307PA.
MIC4427	Low-Side Driver	Dual	Non-inverting	1.5A	6Ω	18ns/15ns into 1000pF	17ns/23ns into 1000pF	4.5V to 18V	SOIC-8, MSOP-8, PDIP-8V CerDIP-8	MIC4127 is recommended upgrade. SMD (Military) 5962-8850309PA.
MIC4428	Low-Side Driver	Dual	Inverting + Non-Inverting	1.5A	6Ω	18ns/15ns into 1000pF	17ns/23ns into 1000pF	4.5V to 18V	SOIC-8, MSOP-8, PDIP-8 CerDIP-8	MIC4128 is recommended upgrade. SMD (Military) 5962-8850309PA.
MIC4123	Low-Side Driver	Dual	Inverting	3A	2.2Ω	23ns/25ns into 1800pF	44ns/59ns into 1,800pF	4.5V to 20V	eSOIC-8, MLF®-8 (4 x 4mm)	MIC4423 upgrade; Higher input voltage; Input pulse down to 50ns.
MIC4124	Low-Side Driver	Dual	Non-Inverting	3A	2.2Ω	23ns/25ns into 1800pF	44ns/59ns into 1,800pF	4.5V to 20V	eSOIC-8, MLF®-8 (4 x 4mm)	MIC4424 upgrade; Higher input voltage; Input pulse down to 50ns.
MIC4125	Low-Side Driver	Dual	Inverting + Non-Inverting	3A	2.2Ω	23ns/25ns into 1800pF	44ns/59ns into 1,800pF	4.5V to 20V	eSOIC-8, MLF®-8 (4 x 4mm)	MIC4425 upgrade; Higher input voltage; Input pulse down to 50ns.
MIC4423	Low-Side Driver	Dual	Inverting	3A	3.8Ω/3.5Ω	23ns/25ns into 1800pF	33ns/38ns into 1800pF	4.5V to 18V	SOIC-8, WSOIC-16, PDIP-8	
MIC4424	Low-Side Driver	Dual	Non-inverting	3A	3.8Ω/3.5Ω	23ns/25ns into 1800pF	33ns/38ns into 1800pF	4.5V to 18V	SOIC-8, WSOIC-16, PDIP-8, CerDIP-8	SMD (Military) 5962-8850305PA.
MIC4425	Low-Side Driver	Dual	Inverting + Non-Inverting	3A	3.8Ω/3.5Ω	23ns/25ns into 1800pF	33ns/38ns into 1800pF	4.5V to 18V	SOIC-8, WSOIC-16 PDIP-8	
MIC4223	Low-Side Driver	Dual	Inverting	4A		15ns/15ns into 2000pF	25ns/35ns into 2000pF	4.5V to 18V	8-pin SOIC, eMSOP-8	MOSFET Drivers with Enable.
MIC4224	Low-Side Driver	Dual	Non-Inverting	4A		15ns/15ns into 2000pF	25ns/35ns into 2000pF	4.5V to 18V	8-pin SOIC, eMSOP-8	MOSFET Drivers with Enable.
MIC4225	Low-Side Driver	Dual	Complimentary	4A		15ns/15ns into 2000pF	25ns/35ns into 2000pF	4.5V to 18V	8-pin SOIC, eMSOP-8	MOSFET Drivers with Enable.

MOSFET Driver Selection Guide

Device	Function	Type	Logic	Sink/Source Peak Output	Sink/Source Output Impedance	t_r/t_f	t_{pd} (input rise/fall)	Supply Voltage	Package	Comments
Low-Side Drivers (Continued)										
MIC4120	Low-Side Driver	Single	Non-Inverting	6A	1.5Ω	12ns/13ns into 2500pF	45ns/50ns into 2,500pF	4.5V to 20V	eSOIC-8, MLF®-8 (3x3mm)	MIC4420 upgrade; Recommended for new designs; Higher input voltage; Input pulse down to 50ns.
MIC4420	Low-Side Driver	Single	Non-Inverting	6A	1.7Ω/1.5Ω	12ns/13ns into 2500pF	18ns/48ns into 2500pF	4.5V to 18V	SOIC-8, MSOP-8, PDIP-8, TO-220-5, CerDIP-8	SMD (Military) 5962-8877003PA.
MIC4129	Low-Side Driver	Single	Inverting	6A	1.5Ω	12ns/13ns into 2500pF	45ns/50ns into 2,500pF	4.5V to 20V	eSOIC-8, MLF®-8 (3x3mm)	MIC4429 upgrade; Recommended for new designs; Higher input voltage; Input pulse down to 50ns.
MIC4429	Low-Side Driver	Single	Inverting	6A	1.7Ω/1.5Ω	12ns/13ns into 2500pF	18ns/48ns into 2500pF	4.5V to 18V	SOIC-8, MSOP-8, PDIP-8, TO-220-5	
MIC44F18	N-Channel MOSFET Driver	Single	Non-Inverting (TTL)	6A	2Ω	10ns/10ns into 1000pF	15ns/13ns into 1000pF	4.5V to 13.2V	MLF®-8 (2x2mm), eMSOP-8	High Speed; small, thermally efficient package with enable.
MIC44F19	P-Channel MOSFET Driver	Single	Inverting (TTL)	6A	2Ω	10ns/10ns into 1000pF	15ns/13ns into 1000pF	4.5V to 13.2V	MLF®-8 (2x2mm), eMSOP-8,	High Speed; small, thermally efficient package with enable.
MIC44F20	N-Channel MOSFET Driver	Single	Inverting (TTL)	6A	2Ω	10ns/10ns into 1000pF	15ns/13ns into 1000pF	4.5V to 13.2V	MLF®-8 (2x2mm), eMSOP-8	High Speed; small, thermally efficient package with enable.
MIC4421	Low-Side Driver	Single	Inverting	9A	0.8Ω/0.6Ω	20ns/24ns into 10nF	15ns/35ns into 10nF	4.5V to 18V	PDIP-8, SOIC-8, TO-220-5	MIC4421A is recommended upgrade. Latch-Up Protected; Input to –5V.
MIC4421A	Low-Side Driver	Single	Inverting	9A	0.8Ω/0.6Ω	20ns/24ns into 10nF	15ns/35ns into 10nF	4.5V to 18V	PDIP-8, SOIC-8, TO-220-5	Recommended upgrade to MIC4421. 50ns minimum input pulse width.
MIC4422	Low-Side Driver	Single	Non-inverting	9A	0.8Ω/0.6Ω	20ns/24ns into 10nF	15ns/35ns into 10nF	4.5V to 18V	PDIP-8, SOIC-8, TO-220-5	MIC4422A is recommended upgrade. Latch-Up Protected; Input to –5V.
MIC4422A	Low-Side Driver	Single	Non-inverting	9A	0.8Ω/0.6Ω	20ns/24ns into 10nF	15ns/35ns into 10nF	4.5V to 18V	PDIP-8, SOIC-8, TO-220-5	Recommended upgrade to MIC4422. 50ns minimum input pulse width.
MIC4451	Low-Side Driver	Single	Inverting	12A	0.8Ω/0.6Ω	20ns/24ns into 15nF	30ns/35ns into 15nF	4.5V to 18V	SOIC-8, PDIP-8, TO-220-5	Latch-up Protected; Input to –5V.
MIC4452	Low-Side Driver	Single	Non-inverting	12A	0.8Ω/0.6Ω	20ns/24ns into 15nF	30ns/35ns into 15nF	4.5V to 18V	SOIC-8, PDIP-8, TO-220-5	Latch-up Protected; Input to –5V.
MIC5011	High- or Low-Side Driver	Single	Non-inverting	–	–	60µs into 1,000pF		4.75V to 32V	SOIC-8, PDIP-8	External Charge Pump.Capacitors (opt.).
MIC5014	High- or Low-Side Driver	Single	Non-inverting	–	–	90µs into 1,000pF		2.75V to 30V	SOIC-8, PDIP-8	
MIC5015	High- or Low-Side Driver	Single	Inverting	–	–	90µs into 1,000pF		2.75V to 30V	SOIC-8, PDIP-8	
MIC5018	High- or Low-Side Driver	Single	Non-inverting	–	–	2.1ms into 3,000pF		2.7V to 9V	SOT-143	
MIC5020	Complementary Low-Side Driver	Single	Non-inverting	–	–	1.1µs into 1,500pF		11V to 50V	SOIC-8	Current Sense (50mV nominal).
High-Side Drivers										
MIC5011	High- or Low-Side Driver	Single	Non-inverting	–	–	60µs into 1,000pF		4.75V to 32V	SOIC-8, PDIP-8	External Charge Pump.Capacitors (opt.).
MIC5013	High- or Low-Side Driver	Single	Non-inverting	–	–	60µs into 1,000pF		7V to 32V	SOIC-8, PDIP-8	Current Sense, Fault.
MIC5014	High- or Low-Side Driver	Single	Non-inverting	–	–	90µs into 1,000pF		2.75V to 30V	SOIC-8, PDIP-8	
MIC5015	High- or Low-Side Driver	Single	Inverting	–	–	90µs into 1,000pF		2.75V to 30V	SOIC-8, PDIP-8	
MIC5018	High- or Low-Side Driver	Single	Non-inverting	–	–	2.1ms into 3,000pF		2.7V to 9V	SOT-143	
MIC5021	High-Speed High-Side Driver	Single	Non-inverting	–	–	0.9µs into 1,500pF		12V to 36V	SOIC-8, PDIP-8	Current Sense (50mV nominal).
MIC5060	High-Side Driver	Single	Non-inverting	–	–	90µs into 1,000pF		2.75V to 30V	MLF®-8 (3x32mm)	

Voltage Monitors and Microprocessor Supervisor Selection Guide

Micrel Advantage

- Industry Standards
- Cross to Maxim
- Low I_Q
- Low Supply Voltage
- Adjustable Hysteresis

Single Voltage Supervisors

Device	Reset Output	Reset Threshold Voltage	t_{RESET} (ms)	I_{SUPPY} (µA)	Package
MIC803 ***New!***	Active-Low/Open-Drain	2.63V, 2.93V, 3.00V, 3.08V, 4.00V, 4.10V 4.38V, 4.63V	20/140/1100	5.0	SOT-23-3, SC-70-3
MIC809	Active-Low/Push-Pull	2.63V, 2.93V, 3.08V, 4.00V, 4.38V, 4.63V	140	5.0	SOT-23-3, SC-70-3
MIC809-5	Active-Low/Push-Pull	2.93V	30	5.0	SOT-23-3, SC-70-3
MIC810	Active-High/Push-Pull	2.63V, 2.93V, 3.08V, 4.00V, 4.38V, 4.63V	140	5.0	SOT-23-3, SC-70-3
MIC1810	Active-Low/Push-Pull	4.12V, 4.37V, 4,62V	100	5.0	SOT-23-3
MIC1815	Active-Low/Push-Pull	2.55V, 2.88V	100	5.0	SOT-23-3
MIC8114	Active-Low/Push-Pull	3.08V	790	5.0	SOT-143

Single Voltage Supervisors with Manual Reset

Device	Reset Output	Reset Threshold Voltage	t_{RESET} (ms)	I_{SUPPY} (µA)	Package
MIC811	Active-Low/Push-Pull	2.63V, 2.93V, 3.08V, 4.00V, 4.38V, 4.63V	140	5.0	SOT-143
MIC812	Active-High/Push-Pull	2.63V, 2.93V, 3.08V, 4.00V, 4.38V, 4.63V	140	5.0	SOT-143
MIC2775	Active-High/Low/Push-Pull	1.69V, 2.25V, 2.34V, 2.53V, 2.67V, 2.81V, 2.93V, 3.09V, 4.43V, 4.68V	140	5.0	SOT-23-5
MIC2776N	Active-Low/Open-Drain	0.3V, external adjustable w/resistor divider	140	3.0	SOT-23-5
MIC2776H	Active-High/Push-Pull	0.3V, external adjustable w/resistor divider	140	3.0	SOT-23-5
MIC2776L	Active-Low/Push-Pull	0.3V, external adjustable w/resistor divider	140	3.0	SOT-23-5
MIC2785	Active-Low/Push-Pull	1.62V	0.025	4.5	Thin MLF®-6 (1.2x1.2mm)
MIC6315	Active-Low/Open-Drain	2.63V, 2.93V, 3.00V, 3.08V, 4.00V, 4.10V, 4.38V, 4.63V	20/140/1100	5.0	SOT-143
MIC8115	Active-Low/Push-Pull	3.08V	1100	5.0	SOT-143

Single Voltage Supervisors with Manual Reset and Watchdog Timer

Device	Reset Output	Reset Threshold Voltage	t_{RESET} (ms)	I_{SUPPLY} (µA)	Watchdog Timer	Package
MIC1232	Active-High/Low/Push-Pull	4.37V, 4.62V	250	18	62.5/250/500	SOIC-8, PDIP-8
MIC1832	Active-High/Low/Push-Pull	2.55V, 2.88V	250	15	62.5/250/500	SOIC-8, PDIP-8

Single Voltage Supervisors with Manual Reset and Power Fail Comparator

Device	Power Fail Threshold Voltage	Reset Output	Reset Threshold Voltage	t_{RESET} (ms)	I_{SUPPLY} (µA)	Package
MIC707	1.25V	Active-High/Low/Push-Pull	4.65V	140	30	SOIC-8, PDIP-8
MIC708	1.25V	Active-High/Low/Push-Pull	2.63V, 2.93V, 3.08V, 4.40V	140	30	SOIC-8, PDIP-8

Single Voltage Supervisors with Manual Reset, Watchdog Timer and Power Fail Comparator

Device	Power Fail Threshold Voltage	Reset Output	Reset Threshold Voltage	t_{RESET} (ms)	I_{SUPPLY} (µA)	Watchdog Timer	Package
MIC705	1.25V	Active-Low/Push-Pull	4.65V	140	30	1600	SOIC-8, PDIP-8
MIC706	1.25V	Active-Low/Push-Pull	2.63V, 2.93V, 3.08V, 4.40V	140	30	1600	SOIC-8, PDIP-8

Voltage Monitors and Microprocessor Supervisor Selection Guide

Dual Voltage Supervisors

Device	Reset Output	Reset Threshold Voltage	Second Reset Threshold Voltage	t_{RESET} (ms)	I_{SUPPLY} (µA)	Manual Reset	Package
MIC2772	Active-Low/Open-Drain	2.93V, 3.08V, 4.38V, 4.63V	2.93V, 3.08V, 4.38V, 4.63V	20/140/1100	10	Yes	MLF®-8 (2x2mm)
MIC2774N	Active-Low/Open-Drain	1.69V, 2.25V, 2.34V, 2.53V, 2.67V, 2.81V, 2.93V, 3.09V, 4.43V, 4.68V	300mV	140	3.5	Yes	SOT-23-5
MIC2774H	Active-High/Push-Pull	1.69V, 2.25V, 2.34V, 2.53V, 2.67V, 2.81V, 2.93V, 3.09V, 4.43V, 4.68V	300mV	140	3.5	Yes	SOT-23-5
MIC2774L	Active-Low/Push-Pull	1.69V, 2.25V, 2.34V, 2.53V, 2.67V, 2.81V, 2.93V, 3.09V, 4.43V, 4.68V	300mV	140	3.5	Yes	SOT-23-5
MIC2777	Active-High/Low/Push-Pull	1.69V, 2.25V, 2.34V, 2.53V, 2.67V, 2.81V, 2.93V, 3.09V, 4.43V, 4.68V	300mV	140	3.5	No	SOT-23-5

Under and Over-Voltage Supervisors

Device	Manual Reset	Reset Output	Under-Voltage Threshold	Over-Voltage Threshold	t_{RESET} (ms)	I_{SUPPLY} (µA)	Package
MIC2755	Yes	Active-Low/Open-Drain	1.24V	0.31V	700	2.0	MSOP-8
MIC2778	No	Active-Low/Open-Drain	1.24V	1.24V	140	1.0	SOT-23-5
MIC2779H	No	Active-High/Push-Pull	1.24V	1.24V	140	1.0	SOT-23-5
MIC2779L	No	Active-Low/Push-Pull	1.24V	1.24V	140	1.0	SOT-23-5

Single Comparators with Reference

Device	Reset Output	Reference Voltage	Propagation Delay	I_{SUPPLY} (µA)	Package
MIC834	Open-Drain	1.24V	8µs	1.5	SOT-23-5
MIC842	Open-Drain/Push-Pull	1.24V	8µs	1.5	SC-70-5
MIC845	Open-Drain/Push-Pull	2.55V	8µs	1.0	SC-70-5

Comparators with Reference and Adjustable Hysteresis

Device	Reset Output	Reference Voltage	Propagation Delay	I_{SUPPLY} (µA)	Package
MIC833	Open-Drain	1.24V	5µs	1.0	SOT-23-5
MIC841	Open-Drain/Push-Pull	1.24V	8µs	1.5	SC-70-5

Thermal/System Management, Transistors and Arrays, Timers, References, and SCSI Terminators Selection Guides

Micrel Advantage

- General Purpose Flexible Design

2-Wire Serial Thermal Supervisors

Device	Description	Remote Zone	Internal Zone	Data Width	CRIT Output	Device Bus	Resolution (Bits)	Accuracy	Package
MIC184	Local/Remote Thermal Supervisor	1[1]	Yes	9	—	8[2]	9	3%	SOIC-8, MSOP-8
MIC280	Precision IttyBitty® Thermal Supervisor	1	Yes	12	Yes	8	12	1%	SOT-23-6
MIC281	Low-Cost IttyBitty® Thermal Sensor	1	—	8	—	8	8	3%	SOT-23-6
MIC284	2-Zone Thermal Supervisor w/CRIT Output	1	Yes	8	Yes	8	8	3%	SOIC-8, MSOP-8
MIC384	3-Zone Thermal Supervisor	2	Yes	8	—	8	8	3%	SOIC-8, MSOP-8

1. MIC184 has limit registers for monitoring one zone at a time; either the internal or external zone may be monitored at any given time.
2. In LM75 mode; 4 when using T1 function.

Fan Management ICs

Device	Description	Package
MIC502	Fan Management IC	PDIP-8, SOIC-8
MIC74	2-Wire Serial I/O Expander and Fan Controller	QSOP-16

I/O Expanders

Device	Description	Package
MIC74	2-Wire Serial I/O Expander and Fan Controller	QSOP-16

Transistors/Switches

Device	Description	Voltage Range	On-Resistance	Substrate Pin	Gate Pull-Up Resistor	Package
MIC94030	Single P-Channel MOSFET	2.7V to 13.5V	0.75Ω @ V_{GS} = 4.5V	Yes	—	SOT-143-4
MIC94031	Single P-Channel MOSFET	2.7V to 13.5V	0.75Ω @ V_{GS} = 4.5V	Yes	Yes	SOT-143-4
MIC94050	Single P-Channel MOSFET	1.8V to 5.5V	0.125Ω @ V_{GS} = 4.5V	Yes	—	SOT-143-4
MIC94051	Single P-Channel MOSFET	1.8V to 5.5V	0.125Ω @ V_{GS} = 4.5V	Yes	Yes	SOT-143-4
MIC94052	Single P-Channel MOSFET	1.8V to 5.5V	0.07Ω @ V_{GS} = 4.5V	—	—	SC-70-6
MIC94053	Single P-Channel MOSFET	1.8V to 5.5V	0.07Ω @ V_{GS} = 4.5V	—	Yes	SC-70-6

Array

Device	Description	Voltage	Input Signal	Package
MIC2981/82	Octal Source-Driver Array	50V	5V-TTL or 5V-to-15V CMOS or PMOS	PDIP-18, WSOIC-18

Timers

Device	Description	Package
MIC1555	IttyBitty® RC Timer/Oscillator	SOT-23-5
MIC1557	IttyBitty® RC Oscillator	SOT-23-5

References

Device	Description	Package
LM4040/4041	Precision Micropower Shunt Voltage Reference	SOT-23-3

Hot Swap Power Controller Selection Guide

Micrel Advantage

- Robustness
- High Voltage Capability
- Superior Parametric Performance
- Smallest Solution Size

Device	Outputs	Input Voltage Range	Latch Off	Auto Retry	/FAULT	/POR	PWRGD or RST	OV SCR	Foldback Current Limit	Package	Comments
MIC2085	1	+2.3V to +16.5V	Yes		Yes	Yes		Yes	Yes	QSOP-16	Pin-for-pin equivalent to LTC1642; Uncommitted comparator and crowbar output.
MIC2086	1	+2.3V to +16.5V	Yes		Yes	Yes	/PWRGD	Yes	Yes	QSOP-20	Uncommitted comparator, crowbar output, and C_L discharge capability.
MIC2580A	4	±12V , +3.3V, +5V	Yes		Yes	Yes	/PWRGD		Yes	TSSOP-24	Single-slot controller for CompactPCI applications.
MIC2582	1	+2.3V to +13.2V	Yes			Yes				SOIC-8	Pin-for-pin functional equivalent to LTC1422; Dual-level fault detection.
MIC2583	1	+2.3V to +13.2V	Yes		Yes	Yes	PWRGD			QSOP-16	Dual-level fault detection; C_L discharge capability.
MIC2583R	1	+2.3V to +13.2V		Yes	Yes	Yes	PWRGD			QSOP-16	Dual-level fault detection; C_L discharge capability.
MIC2310-1 MIC2310-2	1	+10.8V to +13.2V	Yes	Yes	HW_FLT, I_FLT HW_FLT, /I_FLT		PWRGD /PWRGD			TSSOP-24	Single FET, constant power-limit, Hot plug controller for general purpose power-limiting applications and UL60950 systems (240-VA).
MIC2584	2	CH1: +2.3V to +13.2V CH2: +1V to +13.2V	Yes		Yes	Yes				TSSOP-16	Output voltage tracking with dual-level fault detection.
MIC2585-1 MIC2585-2	2 2	CH1: +2.3V to +13.2V CH2: +1V to +13.2V	Yes		Yes	Yes	PWRGD			TSSOP-24	V_{OUT} sequencing/tracking with dual-level detection and C_L discharge capability: –1: V_{OUT2} follows V_{OUT1}; –2: V_{OUT1} follows V_{OUT2}.
MIC2590B	10	±12V, +5V, +3.3V, and +3.3V_{AUX}	Yes		Yes					TQFP-48	Dual-slot controller for PCI v2.x and PCI-X 1.0b. Compliant applications with IPMI v1.0 support.
MIC2593	10	±12V, +5V, +3.3V, and +3.3V_{AUX}	Yes		Yes					TQFP-48	Dual-slot controller for PCI v2.x and PCI-X 1.0b. Compliant applications without IPMI v1.0 support.
MIC2341 MIC2341R	6	+12V, +3.3V, and +3.3V_{AUX}	Yes	Yes	Yes		/PWRGD /DLY_PWRGD			TQFP-48	Dual-slot controller for PCI-Express systems without the SMBus interface (hardware mode only); MAIN & AUX outputs are independent.
MIC2342 MIC2342R	6	+12V, +3.3V, and +3.3V_{AUX}	Yes	Yes	Yes		/PWRGD /DLY_PWRGD			TQFP-48	Dual-slot controller for PCI-Express systems without the SMBus interface (hardware mode only); MAIN & AUX outputs are inter-dependent upon AUX overcurrent event.
MIC2591B	6	+12V, +3.3V, and +3.3V_{AUX}	Yes		Yes		/PWRGD			TQFP-48	Dual-slot controller for PCI-Express systems with IPMI v1.0 support.
MIC2592B	6	+12V, +3.3V, and +3.3V_{AUX}	Yes		Yes		/PWRGD			TQFP-48	Dual-slot controller for PCI-Express systems where IPMI v1.0 support not needed.
MIC2586-1 MIC2586-2	1	+10V to +80V	Yes				PWRGD /PWRGD		Yes	SOIC-14	Multiple PWRGD outputs for sequencing, user-programmable delay.
MIC2586R-1 MIC2586R-2	1	+10V to +80V		Yes			PWRGD /PWRGD		Yes	SOIC-14	Multiple PWRGD outputs for sequencing, user-programmable delay.
MIC2587-1 MIC2587-2	1	+10V to +80V	Yes				PWRGD /PWRGD		Yes	SOIC-8	1st Generation +48V controller. Pin-for-pin equivalent to LT1641–1.
MIC2587R-1 MIC2587R-2	1	+10V to +80V		Yes			PWRGD /PWRGD		Yes	SOIC-8	1st Generation +48V controller. Fault condition: Auto-retry. Pin-for-pin equivalent to LT1641–2.
MIC2588-1 MIC2588-2	1	–19V to –80V	Yes				PWRGD /PWRGD			SOIC-8	1st Generation –48V controller; pin-for-pin equivalent to LT1640/LT/LT1640A/LT4250.
MIC2594-1 MIC2594-2	1	–19V to –80V	Yes				PWRGD /PWRGD			SOIC-8	MIC2588 with Programmable input ON/OFF control.
MIC2589-1 MIC2589-2	1	–19V to –80V	Yes				PWRGD /PWRGD			SOIC-14	Programmable UVLO and OV protection and three PWRGD outputs for sequencing.
MIC2589R-1 MIC2589R-2	1	–19V to –80V		Yes			PWRGD /PWRGD			SOIC-14	Programmable UVLO and OV protection and three PWRGD outputs for sequencing.
MIC2595-1 MIC2595-2	1	–19V to –80V	Yes				PWRGD /PWRGD			SOIC-14	Programmable input ON/OFF control and three PWRGD outputs for sequencing.
MIC2595R-1 MIC2595R-2	1	–19V to –80V		Yes			PWRGD /PWRGD			SOIC-14	Programmable input ON/OFF control and three PWRGD outputs for sequencing.

Micrel Advantage

- Highest Performance Transceivers
- Lowest Power
- High Sensitivity
- Micrel Net
- Low Component Count
- Easy to Design
- Modules Available

RF Remote Packet Generator

Device	Data Rate	Internal Address	Address Combos	CRC	Supply Current	Supply Voltage	Temp. Range	Package
MICRF302	<4.8kbps	20-bit	>1M	8-bit	130µA	1.8V to 3.6V	-40°C to +85°C	MLF®-10 (2.5 x 2.5mm)

RF Transmitter (QwikRadio® and RadioWire®)

Device	Frequency Range	Modulation	Data Rate/ Modulation	Output Power	Supply Current	Supply Voltage	Temp. Range	Package
MICRF405	290MHz–980MHz	ASK FSK	<200kbps FSK <50kbps ASK	+10dBm	18mA	2.2V to 3.6V	-40°C to +125°C	MLF®-24 (4 x 4mm)
MICRF113	300 to 450MHz	ASK OOK	<10kbps	+10dBm	12.3mA	1.8V to 3.6V	-40°C to +85°C	SOT-23-6 (2.8 x 2.9mm)
MICRF112	300 to 450MHz	ASK FSK	<50kbps ASK <10kbps FSK	+10dBm	8.5mA 12.5mA	1.8V to 3.6V	-40°C to +125°C	MSOP-10 (3.0 x 4.9mm)

RF Receivers (QwikRadio®)

Device	Frequency Range	Modulation	Maximum Data Rate	Sensitivity	Supply Current	Supply Voltage	Temp. Range	Package
MICRF221	850 to 950MHz	ASK/OOK	<10kbps	-109dBm @1kbps	9.0mA	3.0V to 3.6V	-40°C to +105°C	QSOP-16 (4.9 x 6.0mm)
MICRF220	300 to 450MHz	ASK/OOK	<10kbps	-110dBm @ 1kbps	4.0mA	3.0V to 3.6V	-40°C to +105°C	QSOP-16 (4.9 x 6.0mm)
MICRF219	300 to 450MHz	ASK/OOK	<10kbps	-110dBm @ 1kbps	4.0mA	3.0V to 3.6V	-40°C to +105°C	QSOP-16 (4.9 x 6.0mm)
MICRF218	300 to 450MHz	ASK/OOK	<10kbps	-110dBm @ 1kbps	5.5mA	3.0V to 3.6V	-40°C to +85°C	QSOP-16 (4.9 x 6.0mm)
MICRF213	300 to 350MHz	ASK/OOK	<7.2kbps	-110dBm @ 1kbps	3.9mA	3.0V to 3.6V	-40°C to +105°C	QSOP-16 (4.9 x 6.0mm)
MICRF211	380 to 450MHz	ASK/OOK	<10kbps	-110dBm @ 1kbps	6.0mA	3.0V to 3.6V	-40°C to +105°C	QSOP-16 (4.9 x 6.0mm)
MICRF010	300 to 440MHz	ASK/OOK	<2kbps	-105dBm @ 1kbps	2.9mA	5V	-40°C to +85°C	SOIC-8 (4.9 x 6.0mm)
MICRF009	300 to 440MHz	ASK/OOK	<2kbps	-104dBm @ 1kbps	2.9mA	5V	-40°C to +85°C	SOIC-8 (4.9 x 6.0mm)

RF Transceivers (RadioWire®)

Device	Frequency Range	Modulation	Maximum Data Rate	Sensitivity	Output Power	Supply Current	Supply Voltage	Temp. Range	Package
MICRF505	850 to 950MHz	FSK	<200kbps	-111dBm @ 2.4kbps	+10dBm	13.5mA Rx 28mA Tx	2.0V to 2.5V	-40°C to +85°C	MLF®-32 (5 x 5mm)
MICRF505L	850 to 950MHz	FSK	<200kbps	-110dBm @ 2.4kbps	+10dBm	13.5mA Rx 28mA Tx	2.25V to 5.5V	-40°C to +85°C	MLF®-32 (5 x 5mm)
MICRF506	410 to 450MHz	FSK	<200kbps	-113dBm @ 2.4kbps	+11dBm	12.0mA 21.5mA Tx	2.0V to 2.5V	-40°C to +85°C	MLF®-32 (5 x 5mm)
MICRF507	470 to 510MHz	FSK	<200kbps	-113dBm @ 2.4kbps	+11dBm	12.0mA Rx 21.5mA Tx	2.0V to 2.5V	-40°C to +85°C	MLF®-32 (5 x 5mm)

Electroluminescent Drivers Selection Guide

Micrel Advantage

- Low Noise
- Low Power
- Bright Light

Device	Description	Package
MIC4826	Low Input Voltage, 160V_{PP} Output Voltage EL Driver	MSOP-8
MIC4827	Low Input Voltage, 180V_{PP} Output Voltage EL Driver	MSOP-8
MIC4830	Low Input Voltage, Low Noise, 180V_{PP} Output Voltage EL Driver	MLF®-8 (3 x 3mm), MSOP-8
MIC4832	Low Input Voltage, Low Noise, 220V_{PP} Output Voltage EL Driver	MLF®-8 (3 x 3mm), MSOP-8
MIC4833	Low Input Voltage, Low Noise, 220V_{PP} Output Voltage EL Driver	MLF®-12 (3 x 3mm)
MIC4834	Low Input Voltage, Low Noise, 220V_{PP} Output Voltage EL Driver with Slew Rate Control	MLF®-10 (3 x 3mm), MSOP-10

Display Driver Selection Guide

Micrel Advantage

- High Current
- High Voltage
- Video Image Speeds

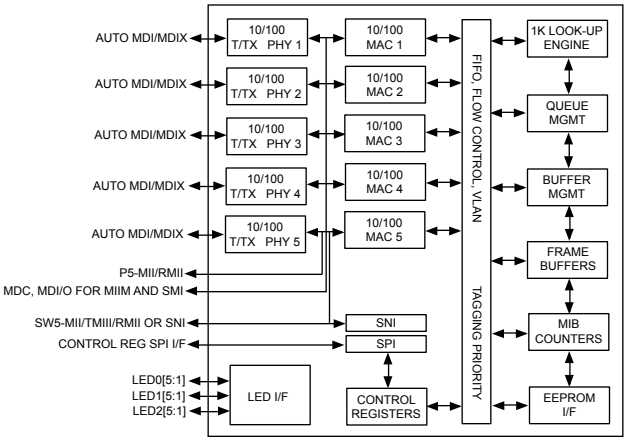
Device	Description	Segments	LEDs	Package
MIC5400	LED Video Display Driver		16	SOIC-28
MM5450	LED Display Driver	34		PDIP-40, PLCC-44
MM5451	LED Display Driver	35		PDIP-40, PLCC-44

Latched Driver Selection Guide

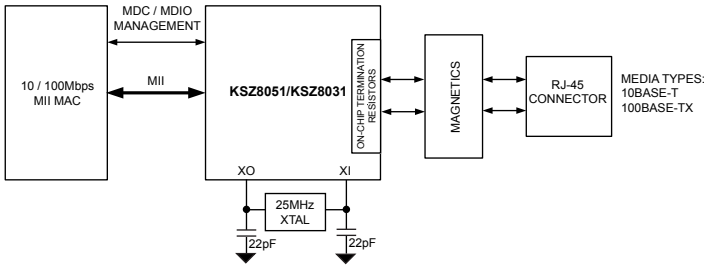
Device	Input	Number Output Channels	Nominal Sink Current	Nominal Source Current	Maximum Output Voltage	Thermal, UVLO, Overcurrent Protection	Packages SOIC	PLCC	PDIP	CerDIP
MIC5800	Parallel	4	400mA	—	50V	—	14-pin	—	14-pin	—
MIC5801	Parallel	8	400mA	—	50V	—	24-pin	28-pin	22-pin	22-pin(1)
MIC58P01	Parallel	8	400mA	—	80V	Yes	24-pin wide	28-pin	22-pin	—
MIC5821	Serial	8	400mA	—	50V / 35V	—	—	—	16-pin	—
MIC5822	Serial	8	400mA	—	80V / 50V	—	—	—	16-pin	—
MIC5841	Serial	8	400mA	—	50V / 35V	—	18-pin wide	20-pin	18-pin	—
MIC5842	Serial	8	400mA	—	80V / 50V	—	18-pin wide	20-pin	18-pin	—
MIC58P42	Serial	8	400mA	—	80V / 50V	Yes	18-pin wide	20-pin	18-pin	—
MIC5891	Serial	8	—	400mA	50V	—	16-pin wide	—	16-pin	—
MIC59P50	Parallel	8	400mA	—	80V	Yes	24-pin wide	28-pin	24-pin	—
MIC59P60	Serial	8	400mA	—	80V / 50V	Yes	20-pin wide	20-pin	20-pin	—

1. SMD (military) 5962-8764001WA.

Ethernet Product Highlight — Low Power, Small Package



KSZ8895MQ



KSZ8051MNL

The KSZ8895MQ/RQ/FMQ is a highly-integrated Layer 2 managed five-port switch with optimized design and plentiful features. It is designed for cost-sensitive 10/100Mbps five-port switch systems with lowest power consumption, on-chip termination and internal core power controller. These features will save more system cost. It supports high-performance memory bandwidth, shared memory based switch fabric with non-blocking configuration.

It also provides an extensive feature set such as power management, programmable rate limit and priority ratio, tag/port-based VLAN, packets filtering, four queues QoS prioritization, management interfaces and MIB counters. KSZ8895 family provides multiple CPU data interfaces to effectively address both current and emerging fast Ethernet applications when port 5 is configured to apart MAC5 with SW5 and PHY5 with P5-MII/RMII interfaces.

The configurations provided by the KSZ8895 family enables the flexibility to meet different requirements:

KSZ8895MQ: Five 10/100Base-T/TX transceivers, one SW5-MII and one P5-MII interface.

KSZ8895RQ: Five 10/100Base-T/TX transceivers, one SW5-RMII and one P5-RMII interface.

KSZ8895FMQ: Three 10/100Base-T/TX transceiver on Ports 1, 2, 5 and two 100Base-FX transceivers on Ports 3, 4, one SW5-MII and one P5-MII interface.

The KSZ8051/8031/8021 family of ultra low-power, small package single-port 10/100 Physical Layer Transceivers. The ICs provide the MII or RMII interface to transmit and receive data over standard CAT-5 unshielded twisted pair (UTP) cable or fiber. The solution is based on Micrel's enhanced mixed-signal design which enables power consumption to be reduced by half compared to the prior generation. The devices feature high integration (on-chip termination and integrated regulator), reduced system cost and simplified system design. The ICs also feature higher performance and an extended feature set all in very compact package options.

Energy efficiency and compliance to important green standards such as ENERGY STAR are becoming paramount in the digital home making Micrel's new devices a key enabler for the pervasive adoption of IP connectivity in devices such as Digital TVs, Set-Top-Boxes and media players. The low emissions and Micrel's signature high reliability and quality also make these devices suitable for connectivity applications in the fast growing industrial automation and automotive markets.

Full compliance to the IEEE 802.3/802.3u standard ensures that the devices will work seamlessly with other standards compliant, already deployed devices. The ultra low power design satisfies the green requirement in today's consumer, industrial and automotive Ethernet applications. On-chip termination not only eliminates components, simplifies PCB design and reduces system BOM, but also improves overall signal integrity and EMI emissions. The single external power supply (3.3V), with integrated regulator, enables core operation at 1.2V with IO at 1.8V/2.5V/3.3V. The KSZ8051MLL/FLL comes in a 48-pin LQFP package and provides a MII MAC interface with the option to interface to copper or fiber media. The KSZ8051MNL/RNL is a copper transceiver housed in a 32-pin QFN with the option for a MII or RMII MAC interface. The KSZ8031RNL and KSZ8021RNL offer the smallest package, 24-pin QFN, with an RMII MAC interface. Auto MDI/MDIX crossover support eliminates the need for a cross-over cable, thus reducing installation costs. Easy to use, the LinkMD® TDR-based cable diagnostics allow for identification of common cabling problems, including those not addressed by IEEE standards. This simplifies network deployment and reduces network downtime.

Ethernet Selection Guide(1)

Micrel Advantage

- Best-in-class patented mixed signal technology resulting in the lowest power dissipation in the industry for Fast Ethernet products
- Best-in-class feature sets for targeted applications (e.g. VoIP, ATA, IP-STB)
- Largest family of cost effective Embedded Controllers in the industry

Physical Layer Products

Part Number	Description	Package	Comments
KSZ8021RNL ***New!***	3.3V, 10BASE-T/100BASE-TX Physical Layer Transceiver with RMII Support	QFN-24	
KSZ8031RNL ***New!***	3.3V, 10BASE-T/100BASE-TX Physical Layer Transceiver with RMII Support	QFN-24	
KSZ8041NL	3.3V, 10BASE-T/100BASE-TX Physical Layer Transceiver	MLF®-32	
KSZ8041NLI(2)	Same as KSZ8041NL (lead free, industrial version)	MLF®-32	
KSZ8041NLJ ***New!***	Same as KSZ8041NL (lead free, industrial version with 125ºC)	MLF®-32	
KSZ8041TL	3.3V, 10BASE-T/100BASE-TX Physical Layer Transceiver (lead free version)	TQFP-48	
KSZ8041TL I	Same as KSZ8041TL (industrial version)	TQFP-48	
KSZ8041FTL	3.3V, 10BASE-T/100BASE-TX/FX Physical Layer Transceiver (lead free version)	TQFP-48	
KSZ8041FTLI	Same as KSZ8041FTL (industrial version)	TQFP-48	
KSZ8041MLL	3.3V, 10BASE-T/100BASE-TX Physical Layer Transceiver with MII Support	LQFP-48	
KSZ8041MLLI	Same as KSZ8041MLL (industrial version)	LQFP-48	
KSZ8041RNL	3.3V, 10BASE-T/100BASE-TX Physical Layer Transceiver with RMII Support	MLF®-32	
KSZ8041RNLI	Same as KSZ8041RNL (industrial version)	MLF®-32	
KSZ8051MNL ***New!***	3.3V, 10BASE-T/100BASE-TX Physical Layer Transceiver with MII Support	QFN-32	
KSZ8051RNL ***New!***	3.3V, 10BASE-T/100BASE-TX Physical Layer Transceiver with RMII Support	QFN-32	
KSZ8051MLL ***New!***	3.3V, 10BASE-T/100BASE-TX Physical Layer Transceiver with MII Support	LQFP-48	
KS8721B	2.5V/3.3V Tolerant I/O, 10/100BASE-TX/FX MII Physical Layer Transceiver with Auto Crossover	SSOP-48	
KSZ8721B	Same as KS8721B (lead free version)	SSOP-48	
KSZ8721BI(2)	Same as KS8721B (lead free, industrial version)	SSOP-48	
KS8721BL	3.3V 10/100BASE TX/FX MII Physicial Layer Transceiver	LQFP-48	
KSZ8721BL	Same as KS8721BL (lead free version)	LQFP-48	
KS8721BLI(2)	3.3V 10/100BASE TX/FX MII Physicial Layer Transceiver (industrial version)	LQFP-48	
KSZ8721BLI(2)	Same as KS8721BLI (lead free, industrial version)	LQFP-48	
KS8721BT	2.5V 10/100BASE-TX/FX MII Physical Layer Transceiver with Auto Crossover	TQFP-48	
KSZ8721BT	Same as KS8721BT (lead free version)	TQFP-48	
KS8721CL	Single 3.3V Supply, 10/100BASE-TX/FX MII Physical Layer Transceiver with Auto Crossover	LQFP-48	
KSZ8721CL	Same as KS8721CL (lead free version)	LQFP-48	
KS8721SL	3.3V 10/100BASE TX/FX MII Physicial Layer Transceiver	SSOP-48	
KSZ8721SL	Same as KS8721SL (lead free version)	SSOP-48	
KSZ8721SLI(2)	Same as KS8721SL (lead free, industrial version)	SSOP-48	
KSZ9021GQ	Single Gigabit Ethernet Transceiver with GMII/MII	QFP-128	
KSZ9021GQI ***New!***	Same as KSZ9021GQ (industrial version)	QFP-128	
KSZ9021RL	Single Gigabit Ethernet Transceiver with RGMII	eLQFP-64	
KSZ9021RLI	Same as KSZ9021RL (industrial version)	eLQFP-64	
KSZ9021GN	Single Gigabit Ethernet Transceiver with GMII/MII	QFN-64	
KSZ9021GNI ***New!***	Same as KSZ9021GN (industrial version)	QFN-64	
KSZ9021RN	Single Gigabit Ethernet Transceiver with RGMII	TQFN-48	
KSZ9021RNI	Same as KAS9021RN (industrial version)	TQFN-48	

Layer 2 Switch Products - Unmanaged

Part Number	Description	Package	Comments
KSZ8993	3-Port 10/100 Integrated Switch	PQFP-128	
KS8995XA	5-Port 10/100 Integrated Switch (Unmanaged)	PQFP-128	
KSZ8995XA	Same as KS8995XA (lead free version)	PQFP-128	
KSZ8997	8-Port 10/100 Integrated Switch	PQFP-128	
KSZ8999	9-Port 10/100 Integrated Switch	PQFP-208	
KSZ8999I(2)	Same as KS8999I (industrial version)	PQFP-208	

Ethernet Selection Guide[1]

Embedded Controllers

Part Number	Description	Package	Comments
KSZ8841-16MBL	Single Port Ethernet MAC Controller with 8- or 16-Bit Generic Bus Interface (lead free version)	LFBGA-100	
KSZ8841-16MBLI	Same as KSZ8841-16MBL (industrial version)	LFBGA-100	
KSZ8841-16MQL	Single Port Ethernet MAC Controller with 8- or 16-Bit Generic Bus Interface (lead free version)	PQFP-128	
KSZ8841-16MVL	Single Port Ethernet MAC Controller with 8- or 16-Bit Generic Bus Interface (lead free version)	LQFP-128	
KSZ8841-16MVLI[2]	Same as KSZ8841-16MVL (industrial version)	LQFP-128	
KSZ8841-32MQL	Single Port Ethernet MAC Controller with 32b Generic Bus Interface (lead free version)	PQFP-128	
KSZ8841-32MVL	Single Port Ethernet MAC Controller with 32b Generic Bus Interface (lead free version)	LQFP-128	
KSZ8841-32MVLI	Same as KSZ8841-32MVL (industrial version)	LQFP-128	
KSZ8841-PMQL	Single Port Ethernet MAC Controller with 32b/33MHz PCI Interface (lead free version)	PQFP-128	
KSZ8841-PMQLI[2]	Same as KSZ8841-PMQL (industrial version)	PQFP-128	
KSZ8851-16MLL	Single-Port Ethernet MAC Controller with 8-Bit or 16-Bit Non-PCI Interface	LQFP-48	
KSZ8851-16MLLI	Same as KSZ8851-16MLL (industrial version)	LQFP-48	
KSZ8851-16MLLJ ***New!***	Same as KSZ8851-16MLL (industrial version with 125ºC)	LQFP-48	
KSZ8851-16MQL	Single-Port Ethernet MAC Controller with 8/16-Bit Non-PCI Interface	PQFP-128	
KSZ8851-16MQLI	Same as KSZ8851-16MQL (industrial version)	PQFP-128	
KSZ8851-32MQL	Single-Port Ethernet MAC Controller with 32-Bit Non-PCI Interface	PQFP-128	
KSZ8851-32MQLI	Same as KSZ8851-32MQL (industrial version)	PQFP-128	
KSZ8851SNL	Single-Port Ethernet Controller with SPI Interface	MLF®-32	
KSZ8851SNLI	Same as KSZ8851SNL (industrial version)	MLF®-32	

Layer 2 Switch Products - Managed

Part Number	Description	Package	Comments
KSZ8842-16MBL	2-Port Ethernet Switch Plus 8-, 16-Bit Generic Bus Interface (lead free version)	LFBGA-100	
KSZ8842-16MBLI	Same as KSZ8842-16MBL (industrial version)	LFBGA-100	
KSZ8842-16MQL	2-Port Ethernet Switch Plus 8-, 16-Bit Generic Bus Interface (lead free version)	PQFP-128	
KSZ8842-16MVL	2-Port Ethernet Switch Plus 8-, 16-Bit Generic Bus Interface (lead free version)	LQFP-128	
KSZ8842-16MVLI[2]	Same as KSZ8842-16MVL (industrial version)	LQFP-128	
KSZ8842-32MQL	2-Port Ethernet Switch Plus 32-Bit Generic Bus Interface (lead free version)	PQFP-128	
KSZ8842-32MVL	2-Port Ethernet Switch Plus 32-Bit Generic Bus Interface (lead free version)	LQFP-128	
KSZ8842-32MVLI	Same as KSZ8842-32MVL (industrial version)	LQFP-128	
KSZ8842-PMBL	2-Port Ethernet Switch Plus 32b/33MHz PCI Interface (lead free version)	LFBGA-100	
KSZ8842-PMBLI	Same as KSZ8842-PMBL (industrial version)	LFBGA-100	
KSZ8842-PMQL	2-Port Ethernet Switch Plus 32b/33MHz PCI Interface (lead free version)	PQFP-128	
KSZ8842-PMQLI[2]	Same as KSZ8842-PMQL (industrial version)	PQFP-128	
KSZ8863MLL	3-Port 10/100 Ethernet Switch with 1x MII Interface	LQFP-48	
KSZ8863MLLI ***New!***	Same as KSZ8863MLL (industrial version)	LQFP-48	
KSZ8863RLL	3-Port 10/100 Ethernet Switch with 1x RMII Interface	LQFP-48	
KSZ8863RLLI ***New!***	Same as KSZ8863RLL (industrial version)	LQFP-48	
KSZ8863FLL	3-Port 10/100 Ethernet Switch with 1x TX and 1x FX Ports	LQFP-48	
KSZ8863FLLI ***New!***	Same as KSZ8863FLL (industrial version)	LQFP-48	
KSZ8864RMN ***New!***	4-Port 10/100 Integrated Switch with 2x MII/RMII Interfaces	LQFP-48	
KSZ8873MLL	3-Port 10/100 Ethernet Switch with 1x MII Interface	LQFP-64	
KSZ8873MLLI	Same as KSZ8873MLL (industrial version)	LQFP-64	
KSZ8873RLL	3-Port 10/100 Ethernet Switch with 1x RMII Interface	LQFP-64	
KSZ8873RLLI	Same as KSZ8873RLL (industrial version)	LQFP-64	
KSZ8873FLL	3-Port 10/100 Ethernet Switch with 2x FX Ports	LQFP-64	
KSZ8873FLLI	Same as KSZ8873FLL (industrial version)	LQFP-64	
KSZ8873MML	3-Port 10/100 Ethernet Switch with 2x MII Interface	LQFP-64	
KSZ8873MMLI	Same as KSZ8873MML (industrial version)	LQFP-64	
KSZ8893MBL	3-Port Ethernet Switch (lead free version)	LFBGA-100	
KSZ8893MBLI	Same as KSZ8893MBL (industrial version)	LFBGA-100	

Ethernet Selection Guide[1]

Layer 2 Switch Products - Managed (Continued)

Part Number	Description	Package	Comments
KSZ8893MQL	3-Port Ethernet Switch (lead free version)	PQFP-128	
KSZ8893MQLI[2]	Same as KSZ8893MQL (industrial version)	PQFP-128	
KSZ8993M	3-Port 10/100 Integrated Switch	PQFP-128	
KSZ8993MI[2]	Same as KS8993M (industrial version)	PQFP-128	
KSZ8993ML	Single 3.3V, 3-Port 10/100 Integrated Switch	PQFP-128	
KSZ8993MLI	Same as KS8993ML (industrial version)	PQFP-128	
KSZ8895MQ ***New!***	5-Port 10/100 Integrated Switch with 1x MII Interface	PQFP-128	
KSZ8995MA	5-Port 10/100 Integrated Managed Switch	PQFP-128	
KSZ8995MAI[2]	Same as KS8995MA (industrial version)	PQFP-128	
KSZ8995FQ	5-Port 10/100 Integrated Managed Switch (FX on port 3, 4)	PQFP-128	
KSZ8995FQI	Same as KS8995FQ (industrial version)	PQFP-128	

System-On-a-Chip

Part Number	Description	Package	Comments
KSZ8692PB	Integrated 10/100Mbps Ethernet and Communication Controller with IPSec	PBGA-400	
KSZ8692PBI	Same as KSZ8692PB (industrial version)	PBGA-400	
KSZ8692XPB	Integrated 10/100Mbps Ethernet and USB Controller	PBGA-400	
KSZ8695X	5-Port 10/100 Managed Switch and PHY	PQFP-208	
KSZ8695P	5-Port 10/100 Integrated Managed Switch and PHY with 3 PCI Master Support	PBGA-289	
KSZ8695PI[2]	Industrial version of KSZ8695P (industrial version)	PBGA-289	
KSZ8695PX	5-Port 10/100 Integrated Managed Switch and PHY with 3 PCI Master Support	PBGA-289	
KSZ9692PB	Integrated Gigabit Ethernet and Communication Controller with IPSec	PBGA-400	
KSZ9692PBI	Same as KSZ9692PB (industrial version)	PBGA-400	
KSZ9692XPB	Integrated Gigabit Ethernet and USB Controller	PBGA-400	

Media Converters

Part Number	Description	Package	Comments
KSZ8862-16MQL	2-Port Ethernet Switch with Integrated 10B-FL/100B-SX LED Driver and Post Amplifier Plus 8- or 16-bit Generic Bus Interface	PQFP-128	
KSZ8862-16MQL-FX	2-Port Ethernet Switch with 100B-FX TTC TS-1000 V2-Compliant OAM Sublayer Plus 8- or 16-bit Generic Bus Interface	PQFP-128	
KSZ8862-32MQL	2-Port Ethernet Switch with Integrated 10B-FL/100B-SX LED Driver and Post Amplifier plus 32-bit Generic Bus Interface	PQFP-128	
KSZ8862-32MQL-FX	2-Port Ethernet Switch with 100B-FX TTC TS-1000 V2-Compliant OAM Sublayer plus 32-bit Generic Bus Interface	PQFP-128	
KSZ8893FQL	3-Port Ethernet Switch with Integrated 10B-FL/100B-SX LED Driver and Post Amplifier	PQFP-128	
KSZ8893FQL-FX	3-Port Ethernet Switch with 100B-FX TTC TS-1000 V2-Compliant OAM Sublayer	PQFP-128	
KSZ8893FQLI-FX	Same as KSZ8893FQL-FX (industrial version)	PQFP-128	
KSZ8993F	Same as KS8993F (lead free version)	PQFP-128	
KSZ8993FL	Single Chip Fast Ethernet Media Converter with TTC TS-1000-Compliant OAM Sublayer	PQFP-128	
KSZ8999	9-Port Ethernet Switch with 4 100Base-FX Ports and 4 100Base-TX Ports Plus MII Interface	PQFP-208	

Automotive Products

Part Number	Description	Package	Comments
KSZ8041NL AM	3.3V, 10Base-T/100Base-TX Physical Layer Transceiver (automotive version)	MLF®-32	
KSZ8842-PMBL AM	2-Port Ethernet Switch Plus 32-bit/33MHz PCI Interface (automotive version)	LFBGA-100	
KSZ8873MLL AM	3-Port 10/100 Ethernet Switch with 1x MII Interface (automotive version)	LQFP-64	
KSZ8893MQL AM	3-Port Ethernet Switch (automotive version)	PQFP-128	

Power Over Ethernet Products

Part Number	Description	Package	Comments
MIC2385YLQ	Octal Power over Ethernet Power Sourcing Equipment Controller	LQFP-64	

1. "KSZ" is the lead-free RoHS-compliant version of the KS part.
2. If the part number has an "I" at the end of it (e.g.: KSZ8721BI), this indicates it is industrial temperature tested.

High Bandwidth Product Highlight — ClockWorks™ Family

The Next Generation of Ultra-Low Jitter Clock Synthesizer

Micrel's new ClockWorks™ products are comprised of the SM84xxxx and SM802xxx series featuring breakthrough technology advancements.

The SM84xxxx family is a standard line of LVCMOS, LVPECL and LVDS clock synthesizers that offers 1, 2, 4, and 6 output options capable of ultra-low jitter reference frequency generation from 75MHz to 625MHz.

The new SM802xxx series is the first offering within the new ClockWorks™ Flex family, the next generation of high performance programmable clock synthesizers. These One Time Programming (OTP) devices eliminate the need for lengthy mask spin cycles and allow prototypes to be typically supplied within days, allowing for fast and optimized clock tree solutions.

Common applications include SONET, Gigabit Ethernet, 10 Gigabit Ethernet, and similar networking standards. The device synthesizes different low noise LVPECL output frequencies such as 125MHz, 156.25MHz, 312.5Mhz, and 625MHz for Ethernet applications and 77.76Mhz, 155.52MHz, 311.04MHz, and 622.08MHz for SONET applications.

Features

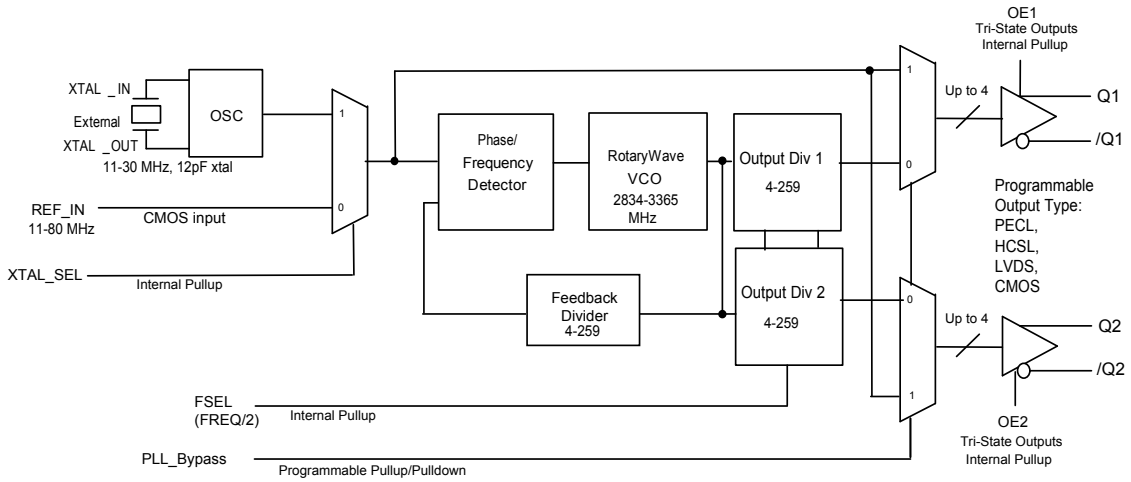
- Typical RMS phase jitter
  - 60fs (1.875MHz – 20MHz)
  - 250fs (12kHz – 20MHz)
- High PSRR
- LVCMOS, LCPECL, LVDS and HCSL output logic
- 2.5V/3.3V supply voltage
- 75MHz to 625MHz
- Up to 8 differential or 16 single-ended outputs

Applications

- SONET/SDH
- GbE
- 10GbE/XAUI
- Fibre Channel
- SAS/SATA
- PCIe/sRIO
- Infiniband
- CPRI

Markets

- Switches/routers
- Networking
- Storage servers
- Data centers
- SONET/SDH transport
- FTTH PON
- Cellular base stations



ClockWorks™ Products

Part Number	No. Output / Type	Application	Package
SM802108	4 / LVPECL	GbE, 10GbE	QFN-24
SM802110	1 / LVPECL	CPRI	QFN-24
SM840001	1 / LVCMOS	Fibre Channel	TSSOP-8
SM840002	2 / LVCMOS	GbE, 10GbE	TSSOP-16
SM840004-11	4 / LVCMOS	GbE	TSSOP-20
SM840021	1 / LVCMOS	GbE	TSSOP-8
SM840051	1 / LVCMOS	SONET, 10GbE	TSSOP-8
SM843001-106	1 / LVPECL	Fibre Channel	TSSOP-8
SM843001-212	1 / LVPECL	Fibre Channel	TSSOP-8
SM843031-01	1 / LVPECL	10GbE	TSSOP-8
SM843251-156	1 / LVPECL	10GbE	TSSOP-8
SM843256	6 / LVPECL	GbE, 10GbE, SONET, SAS/SATA	TSSOP-24
SM844256	6 / LVDS	GbE, 10GbE, SONET, SAS/SATA	TSSOP-24

Clock Distribution

Part Number	Fanout	Input	Output	Voltage	Max. Freq. (GHz)	Package	Description
SY54011R	1:2	ANY	CML	1.2/1.8V	3.2	MLF®-16	Low Voltage CML Fanout Buffer/Translator.
SY56011R	1:2	ANY	CML	1.2/1.8/2.5V	4.5	MLF®-16	Low Voltage EQ Fanout Buffer.
SY56020R	1:4	ANY	CML	1.2/1.8/2.5V	4.5	MLF®-16	Low Voltage EQ Fanout Buffer.
SY56020XR	1:4	ANY	CML	1.2/1.8/2.5V	4.5	MLF®-16	Low Voltage EQ Fanout Buffer.
SY58011U	1:2	ANY	CML	2.5/3.3V	7	MLF®-16	Fanout Buffer/Translator.
SY58012U	1:2	ANY	LVPECL	2.5/3.3V	5	MLF®-16	Fanout Buffer/Translator.
SY58013U	1:2	ANY	RS-LVPECL	2.5/3.3V	6	MLF®-16	Fanout Buffer/Translator w/400mV Output Swing.
SY58020U	1:4	ANY	CML	2.5/3.3V	6	MLF®-16	Fanout Buffer/Translator.
SY58021U	1:4	ANY	LVPECL	2.5/3.3V	4	MLF®-16	Fanout Buffer/Translator.
SY58022U	1:4	ANY	RS-LVPECL	2.5/3.3V	5.5	MLF®-16	Fanout Buffer/Translator w/400mV Output Swing.
SY58031U	1:8	ANY	CML	2.5/3.3V	5	MLF®-32	Fanout Buffer.
SY58032U	1:8	ANY	LVPECL	2.5/3.3V	4	MLF®-32	Fanout Buffer.
SY58033U	1:8	ANY	RS-LVPECL	2.5/3.3V	5.5	MLF®-32	Fanout Buffer with 400mV Output Swing.
SY58034U	2:6	ANY	CML	2.5/3.3V	6	MLF®-32	Fanout Buffer w/2:1 MUX Input.
SY58035U	2:6	ANY	LVPECL	2.5/3.3V	4.5	MLF®-32	Fanout Buffer w/2:1 MUX Input.
SY58036U	2:6	ANY	RS-LVPECL	2.5/3.3V	6	MLF®-32	Fanout Buffer w/2:1 MUX Input and 400mV Output Swing.
SY58606U	1:2	ANY	CML	2.5/3.3V	2.5	MLF®-16	Fanout Buffer with Fail-Safe Input.
SY58607U	1:2	ANY	LVPECL	2.5/3.3V	2.5	QFN-16	Fanout Buffer with Fail-Safe Input.
SY58608U	1:2	ANY	LVDS	2.5V	2	QFN-16	Fanout Buffer with Fail-Safe Input.
SY89112U	2:12	ANY	LVPECL	2.5/3.3V	3	QFN-44	Improved EP111 Replacement.
SY89113U	2:12	ANY	LVDS	2.5V	1	QFN-44	Fanout Buffer.
SY89200U	1:8	ANY	LVDS	2.5V	1.5	QFN-32	3 Banks (÷1, ÷2, ÷4).
SY89202U	1:8	ANY	LVPECL	2.5/3.3V	1.5	QFN-32	3 Banks (÷1, ÷2, ÷4).
SY89311U	1:2	ECL/PECL/LVPECL/LVECL	ECL/PECL/LVPECL/LVECL	2.5/3.3/5V	3	MLF®-8	Differential Fanout Buffer.
SY89467U	2:20	ANY	LVPECL	2.5/3.3V	1.5	TQFP-64	Fanout Buffer with Fail-Safe Input.
SY89468U	2:20	ANY	LVDS	2.5V	1.5	TQFP-64	Fanout Buffer with Fail-Safe Input.
SY89645L	1:4	LVCMOS/LVTTL	LVDS	3.3V	0.65	TSSOP-16	LVCMOS/LVTTL-to-LVDS Fanout Buffer.
SY89808L	1:9	LVPECL/HSTL	HSTL	3.3V	0.5	TQFP-32	Fanout Buffer.
SY89809L	1:9	LVPECL/HSTL	HSTL	3.3V	0.5	TQFP-32	Bus Clock Driver.
SY89823L	1:22	LVPECL/HSTL	HSTL	3.3V	0.5	TQFP-64	Fanout Buffer/Translator.
SY89824L	1:22	LVPECL/HSTL	HSTL	3.3V	0.5	TQFP-64	Bus Clock Driver.
SY89825U	1:22	LVPECL/LVDS	LVPECL	2.5/3.3V	1	TQFP-64	Bus Clock Driver/Translator.
SY89826L	1:22	LVPECL/LVDS	LVDS	3.3V	1	TQFP-64	Fanout Buffer/Translator.
SY89827L	Dual 1:10	LVPECL/HSTL	HSTL	3.3V	0.5	TQFP-64	Fanout Buffer/Translator.
SY89828L	Dual 1:10	LVPECL/LVDS	LVDS	3.3V	1	TQFP-64	Fanout Buffer/Translator.
SY89829U	Dual 1:10	LVPECL/LVDS	LVPECL	2.5/3.3V	2	TQFP-64	Clock Driver.
SY89830U	2:4	ECL/PECL/LVPECL/LVECL	ECL/PECL/LVPECL/LVECL	2.5/3.3/5V	2.5	TSSOP-16	Clock Driver with 2:1 MUX Input.
SY89831U	1:4	ANY	LVPECL	2.5/3.3V	2.0	MLF®-16	Fanout Buffer/Translator.
SY89832U	1:4	ANY	LVDS	2.5V	2.0	MLF®-16	Fanout Buffer/Translator.
SY89833L	1:4	ANY	LVDS	3.3V	2	MLF®-16	Fanout Buffer/Translator.
SY89834U	2:4	LVTTL	LVPECL	2.5/3.3V	1	MLF®-16	Fanout Buffer with 2:1 MUX Input.
SY89837U	2:8 RPE	ANY	LVPECL	2.5/3.3V	1.5	MLF®-32	RPE, FSI Fanout with 2:1 MUX Input.
SY89838U	2:8 RPE	ANY	LVDS	2.5V	1.5	QFN-32	RPE, FSI Fanout with 2:1 MUX Input.
SY89843U	2:2 RPE	ANY	LVPECL	2.5/3.3V	1.5	QFN-24	RPE, FSI Fanout with 2:1 MUX Input.
SY89844U	2:2 RPE	ANY	LVDS	2.5V	1.5	QFN-24	RPE, FSI Fanout with 2:1 MUX Input.
SY89464U	2:10 RPE	ANY	LVPECL	2.5/3.3V	2	QFN-44	RPE, FSI Input MUX with 2:1 MUX Input.
SY89465U	2:10 RPE	ANY	LVDS	2.5V	2	QFN-44	RPE, FSI Input MUX with 2:1 MUX Input.
SY89473U	2:2	ANY	LVPECL	2.5/3.3V	3	QFN-24	Fanout Buffer/Translator.

Clock Distribution (Continued)

Part Number	Fanout	Input	Output	Voltage	Max. Freq. (GHz)	Package	Description
SY89474U	2:2	ANY	LVDS	2.5V	2.5	QFN-24	Fanout Buffer/Translator.
SY89846U	2:5	ANY	LVPECL	2.5/3.3V	1.5	QFN-32	Fanout Buffer with Fail-Safe Input.
SY89847U	2:5	ANY	LVDS	2.5V	1.5	QFN-32	Fanout Buffer with Fail-Safe Input.
SY89850U	1:1	ANY	LVPECL	2.5/3.3V	4	QFN-8	LVPECL Line Driver/Receiver.
SY89851U	1:2	ANY	LVPECL	2.5/3.3V	3	QFN-16	Low Power Fanout Buffer/Trans.
SY89854U	1:4	ANY	LVPECL	2.5/3.3V	3.5	DFN-16	Low Power Fanout Buffer/Trans.
SY89856U	2:6	ANY	LVPECL	2.5/3.3V	3	QFN-32	Low Power Fanout Buffer with 2:1 MUX Input.
SY89858U	1:8	ANY	LVPECL	2.5/3.3V	3	QFN-32	Low Power Fanout Buffer.
SY897132L	1:2	LVPECL	LVPECL	3.3V	0.8	TSSOP-28	Link Replicator.
SY89809AL ***New!***	1:9	LVPECL/HSTL	HSTL	1.8/3.3V	0.75	TQFP-32	Fanout Buffer.
SY898530U	1:16	LVPECL	LVPECL	3.3V	0.5	TQFP-48	Fanout Buffer.
SY898533L	1:4	LVPECL	LVPECL	3.3V	0.65	TSSOP-20	Fanout Buffer.
SY10/100E111	1:9	PECL	PECL	5	0.75	PLCC-28	With Enable.
SY10/100E111A/L	1:9	PECL	PECL	3.3/5	0.75	PLCC-28	
SY10/100E111AE/LE	1:9	PECL	PECL	3.3/5	0.75	PLCC-28	With Enable.
SY10/100EL11V	1:2	PECL	PECL	3.3/5	0.75	SOIC-8	
SY10/100EL15	1:4	PECL	PECL	5	0.75	SOIC-16	With Enable.
SY100EL14V	1:5	PECL	PECL	3.3/5	0.75	SOIC-20	With Enable.
SY100EL15L	1:4	PECL	PECL	3.3	0.75	SOIC-16	With Enable.
SY100EP14U	1:15	LVPECL	LVPECL	2.5/3.3V	2	SOIC-20	Fanout Buffer.
SY100EP14AU	1:15	LVPECL	LVPECL	2.5/3.3V	2	SOIC-20	Fanout Buffer with Enhanced MUX.
SY100HA643	1:8	ECL	TTL	5/-5	0.75	PLCC-28	With Enable.
SY100S811	1:9	PECL/TTL	PECL	5	0.75	PLCC/SOIC-28	With Enable.
SY100S815	1:4	PECL/TTL	PECL	5	0.75	SOIC-16	With Enable.

Clock Generators

Part Number	Input	Output	Voltage	Min Freq. (MHz)	Max Freq. (MHz)	Package	Description
SY87729L	XTAL	PECL	3.3V	10	365	TQFP-32	AnyClock® Fractional-N Synthesizer.
SY87739L	XTAL	PECL	3.3V	10	730	TQFP-32	AnyClock® Fractional-N Synthesizer.
SY89426	TTL	PECL	5V	33	622	PLCC-28	SONET OC-12/OC -3.
SY89529L	XTAL	LVPECL	3.3V	—	200	TQFP-32, SOIC-28	Spectrum Clock Synthesizer.
SY89531L	XTAL	HSTL/LVPECL	3.3V	33	500	TQFP-64	XTAL Input Synthersizer.
SY89532L	XTAL	LVPECL	3.3V	33	500	TQFP-64	XTAL Input Synthesizer.
SY89533L	XTAL	LVDS/LVPECL	3.3V	33	500	TQFP-64	XTAL Input Synthesizer.
SY89534L	ANYX	LVPECL	3.3V	33	500	TQFP-64	Reference Input Synthesizer.
SY89535L	ANYX	LVDS/LVPECL	3.3V	33	500	TQFP-64	Reference Input Synthesizer.
SY89536L	ANYX	HSTL/LVPECL	3.3V	33	500	TQFP-64	Reference Input Synthesizer.
SY89537L	ANYX	LVDS/LVPECL	3.3V	73	750	QFN-44	Reference and XTAL Prog. Frequency.
SY89538L	ANYX	LVDS/LVPECL	3.3V	73	750	TQFP-64	Reference Input, Multiple Banks, Zero Delay.
SY89610L	ANY	CML	3.3V	19	694	QFN-32	Clock Synthesizer with Ultra Low Jitter.

Ultra Low Jitter Clock Synthesizers

Part Number	Input	Output	Voltage	Min Freq. (MHz)	Max Freq. (MHz)	Package	Description
SM802108 ***New!***	XTAL/RefIn	LVPECL	2.5V/3.3V	125	156.25	QFN-24	GbE & 10GbE, Ultra Low Jitter Synthesizer.
SM802110 ***New!***	XTAL	LVPECL	2.5V/3.3V	153.6	153.6	QFN-24	CPRI, Ultra Low Jitter Synthesizer.
SM840001	XTAL	LVCMOS/LCTTL	2.5V/3.3V	106.25	212.5	TSSOP-8	106.25/212.5MHz Fibre Channel Clock.
SM840002 ***New!***	XTAL	LVCMOS	2.5V/3.3V	62.5	156.25	TSSOP-16	GbE & 10GbE, Ultra Low Jitter LVCMOS Synthesizer.
SM840004-11 ***New!***	XTAL	LVCMOS	2.5V/3.3V	62.5	125	TSSOP-20	GbE, 4 Output Ultra Low Jitter LVCMOS Synthesizer.
SM840051	XTAL	LVCMOS/LCTTL	2.5V/3.3V	77.76	161.13	TSSOP-8	156.25MHz 10 Gigabit Ethernet Clock.
SM843001-106 ***New!***	XTAL	LVPECL	2.5V/3.3V	106.25	106.25	TSSOP-8	Fibre Channel, Ultra Low Jitter Synthesizer.
SM843001-212 ***New!***	XTAL	LVPECL	2.5V/3.3V	212.5	212.5	TSSOP-8	Fibre Channel, Ultra Low Jitter Synthesizer.
SM843031-01 ***New!***	XTAL	LVPECL	2.5V/3.3V	312.5	312.5	TSSOP-8	10GbE, Ultra Low Jitter Synthesizer.
SM843251-156 ***New!***	XTAL	LVPECL	2.5V/3.3V	156.25	156.25	TSSOP-8	10GbE, Ultra Low Jitter Synthesizer.
SM843256 ***New!***	XTAL	LVPECL	2.5V/3.3V	75	625	TSSOP-24	10GbE & SONET, 6 Output, Ultra Low Jitter LVPECL Frequency Synthesizer.
SM844256 ***New!***	XTAL	LVDS	2.5V/3.3V	75	625	TSSOP-24	10GbE & SONET, 6 Output, Ultra Low Jitter LVDS Frequency Synthesizer.

Skew Management

Part Number	Input	Output	Voltage	Max. Freq. (GHz)	Package	Channels
SY89295U	LVPECL/LVTTL	LVPECL	2.5/3.3V	1.5	TQFP/MLF®-32	Programmable Delay.
SY89296U	LVPECL/LVTTL	LVPECL	2.5/3.3V	1.5	TQFP/MLF®-32	Programmable Delay with Fine Tune Control.
SY89297U	ANY	CML	2.5V	1.6/3.2(Gbps)	QFN-24	5ps /Step Programmable Delay, Dual Channel.
SY55856U	CML	CML	2.5/3.3V	2.5	TQFP-32	Two Channel Delay Line.

Clock Dividers/Generators

Part Number	Fanout Buffer	Input	Output	Voltage	Max. Freq. (GHz)	Package	Description
SY89200U	Y	ANY	LVDS	2.5V	1.5	QFN-32	3 Banks (÷1, ÷2, ÷4) 8 Total.
SY89202U	Y	ANY	LVPECL	2.5/3.3V	1.5	QFN-32	3 Banks (÷1, ÷2, ÷4) 8 Total.
SY89218U	Y	ANY	LVDS	2.5V	1.5	TQFP-64	4 Banks (÷1, ÷2, ÷4) 15 Total FSI Input.
SY89221U	Y	ANY	LVPECL	2.5/3.3V	1.5	TQFP-64	4 Banks (÷1, ÷2, ÷4) 15 Total FSI Input.
SY89228U	N	ANY	LVPECL	2.5/3.3V	1	QFN-16	÷3, ÷5 FSI Input.
SY89229U	N	ANY	LVDS	2.5V	1	QFN-16	÷3, ÷5 FSI Input.
SY89230U	N	ANY	LVPECL	2.5/3.3V	3.2	QFN-16	÷3, ÷5.
SY89231U	N	ANY	LVDS	2.5V	3.2	QFN-16	÷3, ÷5.
SY89312V	N	ECL/PECL	ECL/PECL	3.3/5V	4	MLF®-8	÷2.
SY89313V	N	ECL/PECL	ECL/PECL	3.3/5V	4	MLF®-8	÷4.
SY89871U	Y	ANY	LVPECL	2.5/3.3V	2.5	MLF®-16	2 Banks (÷1, ÷2, ÷4, ÷8, ÷16).
SY89872U	Y	ANY	LVDS	2.5V	2	MLF®-16	2 Banks (÷1, ÷2, ÷4, ÷8, ÷16).
SY89873L	Y	ANY	LVDS	3.3V	2	MLF®-16	2 Banks (÷1, ÷2, ÷4, ÷8, ÷16).
SY89874U	Y	ANY	LVPECL	2.5/3.3V	2.5	MLF®-16	÷1, ÷2, ÷4, ÷8, ÷16.
SY89875U	Y	ANY	LVDS	2.5V	2	MLF®-16	÷1, ÷2, ÷4, ÷8, ÷16.
SY89876L	Y	ANY	LVDS	3.3V	2	MLF®-16	÷1, ÷2, ÷4, ÷8, ÷16.
SY100S834L	N	ECL/PECL/LVPECL	ECL/PECL	3.3/5V	—	SOIC-16	(÷1, 2, 4) or (÷2, 4, 8).
SY100S838L	N	ECL/PECL/LVPECL	ECL/PECL	3.3/5V	—	SOIC-20	(÷1, 2/3) or (÷2, 4/6).
SY100S839V	N	ECL/PECL/LVPECL	ECL/PECL	3.3/5V	—	SOIC-20	(÷2/4) or (÷4/5/6).
SY10/100EL32V	N	ECL	ECL	3.3/5	3	SOIC-8	÷2
SY10/100EL33/L	N	ECL	ECL	3.3/5	4	SOIC-8	÷4

Clock Dividers/Generators (Continued)

Part Number	Fanout Buffer	Input	Output	Voltage	Max. Freq. (GHz)	Package	Description
SY10/100EL34/L	Y	ECL	ECL	3.3/5	—	SOIC-16	3 Outputs ÷2, 4, or 8.
SY10/100EL38/L	Y	ECL	ECL	3.3/5	—	SOIC-20	2 Banks (÷2) ,(÷4/6).

Registers and Flip-Flops

Part Number	Channel	Voltage	Max. Feq.	Package	Description
SY10/100E131	Quad	5	1.1	PLCC-28	4-Bit D Flip Flop.
SY10/100E141	Single	5	0.7	PLCC-28	8-Bit Shift Register.
SY10/100E142	Single	5	0.7	PLCC-28	9-Bit Shift Register.
SY10/100E151	Single	5	1.1	PLCC-28	6-Bit D Register.
SY10/100E451	Single	5	1.1	PLCC-28	6-Bit D Register.
SY10/100E452	Single	5	1.1	PLCC-28	5-Bit D Register
SY10/100EL31	Single	5	2.8	PLCC-28	D Flip Flop w/ Set and Reset.
SY10/100EL35	Single	5	2.2	SOIC-8	JK Flip Flop.
SY10/100EL51	Single	5	2.8	SOIC-8	Differential Clock D Flip Flop.
SY10/100EL52	Single	5	2.0	SOIC-8	Differential Data and Clock D Flip Flop
SY100S331	Single	5	0.8	PLCC-28	Triple D Flip Flop.
SY100S351	Single	5	0.7	PLCC-28	Hex D Flip Flop.
SY100S341	Single	5	0.6	PLCC-28	8-Bit Shift Register.
SY10/100S891	Single	5		PLCC-28	5-Bit Registered Transceiver.

Receivers/Buffers/Drivers

Part Number	Input	Output	Voltage	Max. Data Rate (Gbps)	Max. Freq. (GHz)	Package	Description
SY54016R	ANY	CML	1.2/1.8V	3.2	2.5	MLF®-8 (2 x 2mm)	Low Voltage CML Translator with Fail-Safe Input.
SY54016AR	ANY	CML	1.2/1.8V	3.2	3.2	MLF®-8 (2 x 2mm)	Low Voltage CML Translator.
SY56016R	ANY	CML	1.2/1.8/2.5V	6.4	5	MLF®-10 (2 x 2mm)	Differential Line Driver with EQ.
SY56216R	ANY	CML	1.2/1.8/2.5V	6.4	5	MLF®-16 (3 x 3mm)	Dual Channel EQ Receiver.
SY58016L	CML/PECL	CML	3.3V	10.7	7	MLF®-16 (3 x 3mm)	Differential CML Line Driver/Receiver.
SY58600U	ANY	CML	2.5/3.3V	10.7	7	MLF®-8 (2 x 2mm)	Line Driver/Receiver.
SY58601U	ANY	LVPECL	2.5/3.3V	5	5	MLF®-8 (2 x 2mm)	Line Driver/Receiver.
SY58602U	ANY	RS-LVPECL	2.5/3.3V	10.7	7	MLF®-8 (2 x 2mm)	Line Driver with 400mV Output Swing.
SY58603U	ANY	CML	2.5/3.3V	4.25	2.5	MLF®-8 (2 x 2mm)	Line/Driver Receiver with Fail-Safe Input.
SY58604U	ANY	LVPECL	2.5/3.3V	3.2	2.5	MLF®-8 (2 x 2mm)	Line/Driver Receiver with Fail-Safe Input.
SY58605U	ANY	LVDS	2.5V	3.2	2	MLF®-8 (2 x 2mm)	Line/Driver Receiver with Fail-Safe Input.
SY58620L	ANY	CML	3.3V	4.25	2.5	MLF®-24 (4 x 4mm)	Backplane Transceiver.
SY89206V	ECL/PECL	ECL/PECL	3.3/5V	—	1	MLF®-8 (2 x 2mm)	Receiver/Buffer-100k Comp.
SY89207L	LVECL/LVPECL	PECL	3.3V	—	0.8	MSOP-10	Amp. w/Low-Gain Feedback.
SY89216V	ECL/PECL	ECL/PECL	3.3/5V	—	1	MLF®-8 (2 x 2mm)	Receiver/Buffer-10k Comp.
SY89250V	ECL/PECL	ECL/PECL	3.3/5V	—	—	MLF®-8 (2 x 2mm)	Enhanced Differential Receiver.
SY89306V	ECL/PECL	ECL/PECL	3.3/5V	—	2.5	MLF®-8 (2 x 2mm)	Receiver/Buffer-100k Comp.
SY89307V	ECL/PECL	ECL/PECL	3.3/5V	2.5	—	MLF®-8 (2 x 2mm)	Variable Output Swing Differential Receiver.
SY89316V	ECL/PECL	ECL/PECL	3.3/5V	—	2.5	MLF®-8 (2 x 2mm)	Differential Receiver/Buffer-10k Comp.
SY89835U	LVDS	LVDS	2.5V	3.2	2	MLF®-8 (2 x 2mm)	Buffer with Fail-Safe Input.
SY89850U	CML/PECL/LVDS	LVPECL	2.5/3.3V	3.2	4	MLF®-8 (2 x 2mm)	Low Power.
SY10/100E112	ECL/PECL	ECL/PECL	5V	—	—	PLCC-28	Quad Driver.
SY10/100E116	ECL/PECL	ECL/PECL	5V	—	—	PLCC-28	Quint Differential Line Driver.
SY10/100E416	ECL/PECL	ECL/PECL	5V	—	—	PLCC-28	Quint Differential Line Driver.

Receivers/Buffers/Drivers (Continued)

Part Number	Input	Output	Voltage	Max. Data Rate (Gbps)	Max. Freq. (GHz)	Package	Description
SY10/100EL12	ECL/PECL	ECL/PECL	5V	—	—	SOIC-8	Low Impedance Driver.
SY10/100EL16V	ECL/LVPECL	ECL/LVPECL	3.3/5V	—	—	SOIC/MSOP-8	Differential Receiver.
SY10/100EL16VA-VF	ECL/LVPECL	ECL/LVPECL	3.3/5V	—	—	SOIC/MSOP-8	Enhanced Differential Receiver.
SY10/100EL16VS	ECL/LVPECL	ECL/LVPECL	3.3/5V	—	—	SOIC/MSOP-8	Variable Output Swing Receiver.
SY100EL17V	ECL/LVPECL	ECL/LVPECL	3.3/5V	—	—	SOIC-20	Quad Differential Receiver.
SY10EL1189	ECL/PECL	ECL/PECL	5V	—	—	SOIC-16	FC Coaxial Cable Driver.
SY10EL89	ECL/LVPECL	ECL/LVPECL	3.3/5V	—	—	SOIC-8	Coaxial Cable Driver.
SY10/100EP16U	ECL/PECL	ECL/PECL	2.5/3.3V	2.5	4	MLF®-8 (2x2mm)	ECL Differential Receiver/Driver.
SY100EP16V	ECL/PECL	ECL/PECL	3.3/5V	2.5	4	MLF®-8 (2x2mm)	ECL Differential Receiver/Driver.

Crosspoint Switches

Part Number	Input	Output	Voltage	Max. Data Rate (Gbps)	Package	Description
SY54023R	ANY	CML	1.2/1.8V	3.2	MLF®-16	2x2 with Fail-Safe Inputs.
SY56023R	ANY	CML	1.2/1.8/2.5V	6.4	MLF®-16	2x2 with Equalization.
SY56034AR	ANY	CML	1.2/1.8/2.5V	6.4	MLF®-32	2x2 Crosspoint Switch with Six Outputs.
SY56040AR	ANY	CML	1.2/1.8/2.5V	6.4	MLF®-44	4x4 Crosspoint Switch.
SY58023U	ANY	CML	2.5/3.3V	10.7	MLF®-16	2x2.
SY58024U	ANY	CML	2.5/3.3V	10.7	MLF®-32	Dual 2x2.
SY58040U	ANY	CML	2.5/3.3V	5	MLF®-44	4x4.
SY89540U	ANY	LVDS	2.5V	3.2	MLF®-44	4x4.
SY55854U	ANY	CML	2.5/3.3/5V	2.5	QSOP-16	2x2.
SY55858U	CML/PECL/LVPECL	CML	2.5/3.3V	3	TQFP-32	Dual 2x2.
SY55859L	CML	CML	3.3V	2.7	MLF®-32	Dual 2x2.

Multiplexers

Part Number	Fanout	Input	Output	Voltage	Frequency (Gbps)	Max. Freq. (GHz)	Package	Description
SY54017R	2:1	ANY	CML	1.2/1.8V	3.2	2.5	MLF®-16	Low Voltage CML with Fail-Safe Input.
SY54017AR	2:1	ANY	CML	1.2/1.8V	3.2	2.5	MLF®-16	Low Voltage CML MUX.
SY56017R	2:1	ANY	CML	1.2/1.8/2.5V	6.4	3.2	MLF®-32	Low Voltage EQ MUX.
SY56028XR	4:1	ANY	CML	1.2/1.8/2.5V	6.4	4.5	MLF®-32	Low Voltage EQ MUX.
SY56572XR	4:1	ANY	CML	1.2/1.8/2.5V	6.4	4.5	MLF®-16	Low Voltage EQ MUX.
SY58017U	2:1	ANY	CML	2.5/3.3V	10.7	7	MLF®-16	Internal Termination.
SY58018U	2:1	ANY	LVPECL	2.5/3.3V	5	4	MLF®-16	Internal Termination and 800mV Output Swing.
SY58019U	2:1	ANY	RS-LVPECL	2.5/3.3V	10.7	7	MLF®-16	Internal Termination and 400mV Output Swing.
SY58025U	Dual 2:1	ANY	CML	2.5/3.3V	10.7	7	MLF®-32	Internal Termination.
SY58026U	Dual 2:1	ANY	LVPECL	2.5/3.3V	5	6	MLF®-32	Internal Termination and 800mV Output Swing.
SY58027U	Dual 2:1	ANY	RS-LVPECL	2.5/3.3V	10.7	6	MLF®-32	Internal Termination and 400mV Output Swing.
SY58028U	4:2	ANY	CML	2.5/3.3V	10.7	7	MLF®-32	Internal Termination.
SY58029U	4:2	ANY	LVPECL	2.5/3.3V	5	4	MLF®-32	Internal Termination and 800mV Output Swing.
SY58030U	4:2	ANY	RS-LVPECL	2.5/3.3V	10.7	7	MLF®-32	Internal Termination and 400mV Output Swing.
SY58037U	8:2	ANY	CML	2.5/3.3V	5	4	MLF®-44	Internal Termination.
SY58038U	8:2	ANY	LVPECL	2.5/3.3V	4.5	5	MLF®-44	Internal Termination and 800mV Output Swing.
SY58039U	8:2	ANY	RS-LVPECL	2.5/3.3V	5	5.5	MLF®-44	Internal Termination and 400mV Output Swing.
SY58609U	2:1	ANY	CML	2.5/3.3V	4.25	2.5	MLF®-16	Fail-Safe Input and Internal Termination.
SY58610U	2:1	ANY	LVPECL	2.5/3.3V	3.2	2.5	MLF®-16	Fail-Safe Input and Internal Termination.
SY58611U	2:1	ANY	LVDS	2.5V	3.2	2.5	MLF®-16	Fail-Safe Input and Internal Termination.
SY89208V	2:1	ECL/PECL	ECL/PECL	3.3/5V	—	3	MLF®-8	Internal Termination and 800mV Output Swing.

Multiplexers (Continued)

Part Number	Fanout	Input	Output	Voltage	Frequency (Gbps)	Max. Freq. (GHz)	Package	Description
SY89464U	2:10	ANY	LVPECL	2.5/3.3V	—	2	MLF®-44	Internal Termination and 800mV Output Swing.
SY89465U	2:10	ANY	LVDS	2.5V	—	2	MLF®-44	Fast Edge Rates and Internal Termination.
SY89473U	2:2	ANY	LVPECL	2.5/3.3V	2.5	2.5	MLF®-24	Internal Termination and 800mV Output Swing.
SY89474U	2:2	ANY	LVDS	2.5V	2.5	2.5	MLF®-24	Fast Edge Rates and Internal Termination.
SY89542U	Dual 2:1	ANY	LVDS	2.5V	3.2	4	MLF®-32	Fast Edge Rates and Internal Termination.
SY89543L	Dual 2:1	ANY	LVDS	3.3V	3.2	3	MLF®-32	Fast Edge Rates and Internal Termination.
SY89544U	4:1	ANY	LVDS	2.5V	3.2	4	MLF®-32	Fast Edge Rates and Internal Termination.
SY89545L	4:1	ANY	LVDS	3.3V	3.2	3	MLF®-32	Fast Edge Rates and Internal Termination.
SY89546U	4:2	ANY	LVDS	2.5V	3.2	4	MLF®-32	Fast Edge Rates and Internal Termination.
SY89547L	4:2	ANY	LVDS	3.3V	3.2	4	MLF®-32	Fast Edge Rates and Internal Termination.
SY89840U	2:1	ANY	LVPECL	2.5/3.3V	—	2	MLF®-16	Internal Termination and 800mV Output Swing.
SY89841U	2:1	ANY	LVDS	2.5V	—	1.5	MLF®-16	Fast Edge Rates and Internal Termination.
SY89842U	2:1	ANY	CML	2.5/3.3V	—	2	MLF®-16	Internal Termination.
SY89843U	2:2	ANY	LVPECL	2.5/3.3V	—	2	MLF®-24	Internal Termination and 800mV Output Swing.
SY89844U	2:2	ANY	LVDS	2.5V	—	2	MLF®-24	Fast Edge Rates and Internal Termination.
SY89845U	2:2	ANY	CML	2.5/3.3V	—	2	MLF®-24	Internal Termination.
SY89852U	2:1	ANY	LVPECL	2.5/3.3V	2.5	2.5	MLF®-16	Internal Termination and 800mV Output Swing.
SY89853U	Dual 2:1	ANY	LVPECL	2.5/3.3V	2.5	2.5	MLF®-32	Internal Termination and 800mV Output Swing.
SY89855U	4:2	ANY	LVPECL	2.5/3.3V	2.5	2.5	MLF®-32	Internal Termination and 800mV Output Swing.
SY89859U	8:2	ANY	LVPECL	2.5/3.3V	2.5	2.5	MLF®-44	Internal Termination and 800mV Output Swing.
SY897132L	2:1	LVPECL	LVPECL	3.3V	1.5	0.8	TSSOP-28	Link Replicator.
SY10/100EL57	4:1	ECL	ECL	4.2-5.5			SOIC-16	
SY10/100EL58	2:1	ECL	ECL	4.2-5.5			SOIC-8	
SY100EL56V	Dual 2:1	ECL	ECL	3.3/5			SOIC-20	With Individual Selects.
SY100EL57L	4:1	ECL	ECL	3.3			SOIC-16	
SY100S355	4:1	ECL	ECL	4.2-5.5			PLCC-28	Quad Mux/Latch.
SY100S363	Dual 8:1	ECL	ECL	4.2-5.5			PLCC-28	
SY100S364	16:1	ECL	ECL	4.2-5.5			PLCC-28	
SY100S370	1 of 4/8	ECL	ECL	4.2-5.5			PLCC-28	Universal Demux/Decoder.
SY100S371	Triple 4:1	ECL	ECL	4.2-5.5			PLCC-28	With Enable.
SY100S863	8:1	PECL	PECL TTL	5			PLCC-28	

Translators

Part Number	Input	Output	Voltage	Max. Freq. (GHz)	Package	# of Channels
SY10/100ELT20V	TTL	PECL	3.3/5	0.75	SOIC-8	Single
SY10/100ELT21	PECL	TTL	5	0.32	SOIC-8	Single
SY10/100ELT22	TTL	PECL	5	0.75	SOIC-8	Dual
SY10/100ELT23	PECL	TTL	5	0.32	SOIC-8	Dual
SY100ELT24	TTL	ECL	5	0.5	SOIC-8	Single
SY100ELT25	ECL	TTL	5	0.5	SOIC-8	Single
SY100E417	LVPECL/PECL	LVPECL/PECL	5	0.5	PLCC-28	Five
SY100EL90V	ECL/LVECL	PECL/LVPECL	3.3	0.5	SOIC-20	Triple
SY100EL91	PECL	ECL	3.3/5.0	0.5	SOIC-20	Triple
SY100EL91L	PECL	ECL	5	0.4	SOIC-20	Triple
SY100EL92	PECL/LVPECL	PECL/LVPECL	5/-5	0.3	SOIC-20	Triple
SY100ELT982	PECL	CML	5	1.25	MSOP-10	Single
SY100HA643	ECL	TTL	5	0.32	PLCC-28	Single
SY100S324	TTL	ECL	5	0.8	PLCC-28	Six
SY100S325	ECL	TTL	5	0.32	PLCC-28	Six
SY100S391	TTL	PECL	5	0.8	PLCC-28	Six

Translators (Continued)

Part Number	Input	Output	Voltage	Max. Freq. (GHz)	Package	# of Channels
SY100S811	PECL/TTL	PECL	5	0.8	PLCC-28	Single
SY100S815	PECL/TTL	PECL	5	0.8	SOIC-16	Single
SY55851/A	PECL/LVPECL/CML	CML	2.5/3.3V	3	MSOP-10	Single
SY55855V	ANY	LVDS	3.3/5V	0.75	MSOP-10	Dual
SY55857L	ANY	LVPECL	3.3V	2.5	MSOP-10	Dual
SY89222L	TTL	PECL	3.3V	0.4	MLF®-8 (2x2mm)	Dual
SY89223L	LVPECL	LVTTL	3.3V	0.16	MLF®-8 (2x2mm)	Dual
SY89321L	LVPECL	LVTTL	3.3V	0.275	MLF®-8 (2x2mm)	Single
SY89322V	LVTTL	LVPECL	3.3/5V	0.8	MLF®-8 (2x2mm)	Dual
SY89323L	LVPECL	LVTTL	3.3V	0.275	MLF®-8 (2x2mm)	Dual
SY89325V	ANY	LVDS	3.3V	0.750	MLF®-8 (2x2mm)	Single
SY89327L	ANY	LVPECL	3.3V	2.5	MLF®-8 (2x2mm)	Single
SY89328L	LVPECL/LVTTL	LVTTL/LVPECL	3.3V	0.275	MLF®-8 (2x2mm)	Single
SY89329V	LVTTL	LVPECL	3.3/5V	0.8	MLF®-8 (2x2mm)	Single
SY89464U	ANY	LVPECL	2.5/3.3V	2.0	MLF®-44	Single
SY89465U	ANY	LVDS	2.5V	2.0	MLF®-44	Single
SY89645L	LVCMOS/LVTTL	LVDS	3.3V	0.65	TSSOP-16	Single
SY89825U	LVDS/LVPECL	LVPECL	2.5/3.3V	1.0	TQFP-64	Single
SY89826L	LVDS/LVPECL	LVDS	3.3V	1.0	TQFP-64	Single
SY89827L	HSTL/LVPECL	HSTL	3.3V	0.5	TQFP-64	Dual
SY89828L	LVDS/LVPECL	LVDS	3.3V	1.0	TQFP-64	Dual
SY89829U	LVDS/LVPECL	LVPECL	2.5/3.3V	1.0	TQFP-64	Dual
SY89831U	LVPECL/HSTL/CML	LVPECL	2.5/3.3V	2.5	MLF®-16 (3x3mm)	Single
SY89832U	LVPECL/HSTL/LVDS/CML	LVDS	2.5V	2.5	MLF®-16 (3x3mm)	Single
SY89833L	LVPECL/HSTL/LVDS/CML	LVDS	3.3V	2.0	MLF®-16 (3x3mm)	Single
SY89834U	LVTTL/CMOS	LVPECL	2.5/3.3V	1.0	MLF®-16 (3x3mm)	Single

Gates

Part Number	Input	Output	Voltage	Max. Freq. (GHz)	Package	Description
SY58051U	ANY	CML	2.5/3.3V	7	MLF®-16	CML AnyGate®.
SY58052U	ANY	CML	2.5/3.3V	10.7	MLF®-16	Data/Clock Synchronizer.
SY55851/A	CML/PECL/LVPECL	CML	2.5/3.3V	3	MSOP-10	CML AnyGate®.
SY55852U	CML/PECL/LVPECL	CML	2.5/3.3/5V	2.5	MSOP-10	D Flip Flop.
SY55853U	CML/PECL/LVPECL	CML	2.5/3.3/5V	2.5	MSOP-10	D Latch.
SY10/100E101	ECL	ECL	5	—	PLCC-28	Quad 4-Input OR/NOR.
SY10/100E104	ECL	ECL	5	—	PLCC-28	Quint 2-Input AND/NAND.
SY10/100E122	ECL	ECL	5	—	PLCC-28	9 Bit Buffer.
SY10/100EL01	ECL	ECL	5	2	SOIC-8	4-Input OR/NOR.
SY10/100EL04	ECL	ECL	5	—	SOIC-8	2-Input AND/NAND.
SY10/100EL05	ECL	ECL	5	—	SOIC-8	2-Input Diff. AND/NAND.
SY10/100EL07	ECL	ECL	5	—	SOIC-8	2-Input XOR/XNOR.
SY100S301	ECL	ECL	5	—	PLCC-28	Triple 5-Input OR/NOR.
SY100S302	ECL	ECL	5	—	PLCC-28	Quint 2-Input OR/NOR.
SY100S304	ECL	ECL	5	—	PLCC-28	Quint AND/NAND.
SY100S307	ECL	ECL	5	—	PLCC-28	Quint XOR/XNOR.
SY100S317	ECL	ECL	5	—	PLCC-28	Triple 2-Wide OA/OAI.
SY100S318	ECL	ECL	5	—	PLCC-28	5-Wide 5,4,4,4,2 OA/OAI.
SY100S321	ECL	ECL	5	—	PLCC-28	Low-Power 9-Bit Inverter.
SY100S322	ECL	ECL	5	—	PLCC-28	9 Bit Buffer.

Latch

Part Number	Description	Voltage	Package
SY100S350	Hex D Latch	5V	PLCC-28
SY100S355	Quad Multiplexer/Latch	5V	PLCC-28

Backplane and Cable Management Solutions

Part Number	Input	Output	Voltage	Max. Data Rate (Gbps)	Package	Description
SY56016R	ANY	CML	1.2/1.8/2.5V	6.4	MLF®-10 (2 x 2mm)	Differential Line Driver with EQ
SY56216R	ANY	CML	1.2/1.8/2.5V	6.4	QFN-16 (3 x 3mm)	Dual Channel EQ Receiver.
SY58620L	ANY	CML	3.3V	4.25	QFN-24	Backplane Transceiver with Integrated Loopback.
SY58621L	ANY	LVPECL/CML	3.3V	3.2	QFN-24	Backplane Transceiver with Integrated Loopback.
SY58626L	ANY	CML	3.3V	6.4	QFN-32	Pre-Emphasis Driver with Integrated Loopback.
SY58627L	ANY	CML	3.3V	6.4	QFN-32	Equalization Receiver with Integrated Loopback.

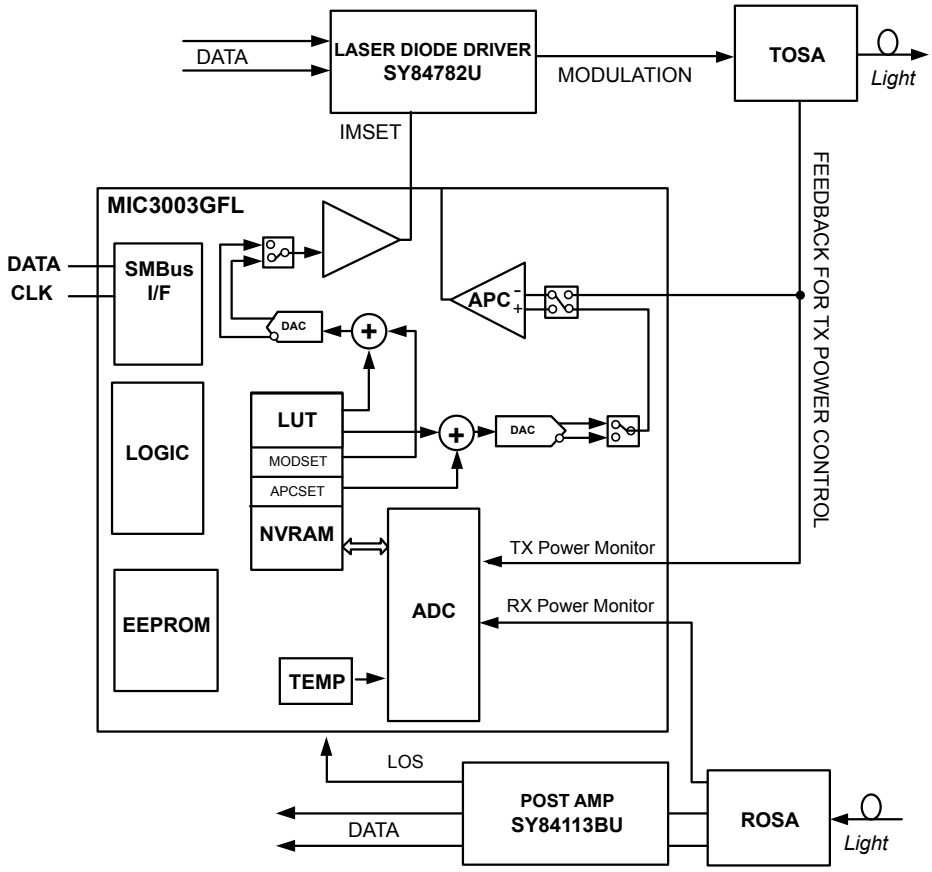
Compact (2 x 2mm) Products

Part Number	Equivalent	Input	Output	Voltage	Max. Freq. (GHz)	Description
SY54016R	—	ANY	CML	1.2/1.8V	2.5	Low Voltage CML Translator w/ FSI.
SY54016AR	—	ANY	CML	1.2/1.8V	3.2	Low Voltage CML Translator.
SY58600U	—	ANY	CML	2.5V/3.3V	7	7GHz/10.7Gbps Differential Translator.
SY58601U	—	ANY	LVPECL	2.5V/3.3V	5	5GHz/5Gbps Differential Translator.
SY58602U	—	ANY	LVPECL	2.5V/3.3V	7	7GHz/10.7Gbps Differential Translator.
SY58603U	—	ANY	CML	2.5V/3.3V	2.5	Fail-Safe Input Buffers.
SY58604U	—	ANY	LVPECL	2.5V/3.3V	2.5	Fail-Safe Input Buffers.
SY58605U	—	ANY	LVDS	2.5V	2	Fail-Safe Input Buffers.
SY89206V	100EL16V	PECL	PECL	3.3/5V	1	Differential Receiver/Buffer.
SY89208V	100EP58V	PECL	PECL	3.3/5V	3	2:1 Multiplexer.
SY89216V	10EL16V	PECL	PECL	3.3/5V	1	Differential Receiver/Buffer.
SY89222L	100ELT22L	TTL	PECL	3.3V	0.40	Dual Differential Translator.
SY89223L	100ELT23L	LVPECL	LVTTL	3.3V	0.16	Dual Differential Translator.
SY89250V	100EL16VC	PECL	PECL	3.3/5V	1	Enhanced Differential Receiver.
SY89306V	100EP16V	PECL	PECL	3.3/5V	2.5	Differential Receiver/Buffer.
SY89307V	100EP16VS	PECL	PECL	3.3/5V	2.5	Variable-out Differential Receiver.
SY89311U	100EP11U	PECL	PECL	2.5/3.3/5V	3	Differential 1:2 FOB.
SY89312V	100EP32V	PECL	PECL	3.3/5V	4	÷2 Clock Generator.
SY89313V	100EP33V	PECL	PECL	3.3/5V	4	÷4 Clock Generator.
SY89316V	10EP16V	PECL	PECL	3.3/5V	2.5	Differential Receiver/Buffer.
SY89321L	100EPT21L	LVPECL	LVTTL	3.3V	0.275	Differential Translator.
SY89322V	100EPT22V	LVTTL	LVPECL	3.3/5V	0.800	Dual Differential Translator.
SY89323L	100EPT23L	LVPECL	LVTTL	3.3V	0.275	Dual Differential Translator.
SY89325V	55855V	ANYX	LVDS	3.3/5V	0.750	Differential Translator.
SY89327L	55857L	ANYX	LVPECL	3.3V	2.5	Differential Translator.
SY89328L	100EPT28L	LVTTL/LVPECL	LVTTL/LVPECL	3.3V	0.275	Dual Differential Translator.
SY89329V	100EPT20V	LVTTL	LVPECL	3.3/5V	0.800	Differential Translator.

Super 300K (Fairchild Semiconductor Second Source)

Part Number	Input	Output	Voltage	Package	Description
SY10/100S891	ECL	ECL	5	PLCC-28	5-Bit Registered Transceiver.
SY100S301	ECL	ECL	5	PLCC-28	Triple 5-Input OR/NOR.
SY100S302	ECL	ECL	5	PLCC-28	Quint 2-Input OR/NOR.
SY100S304	ECL	ECL	5	PLCC-28	Quint AND/NAND.
SY100S307	ECL	ECL	5	PLCC-28	Quint XOR/XNOR.
SY100S313	ECL	ECL	5	PLCC-28	Quad Driver.
SY100S314	ECL	ECL	5	PLCC-28	Quint Differential Line Receiver.
SY100S317	ECL	ECL	5	PLCC-28	Triple 2-Wide OA/OAI.
SY100S318	ECL	ECL	5	PLCC-28	5-Wide 5,4,4,4,2 OA/OAI.
SY100S321	ECL	ECL	5	PLCC-28	Low-Power 9-Bit Inverter.
SY100S322	ECL	ECL	5	PLCC-28	9 Bit Buffer.
SY100S324	TTL	ECL	5	PLCC-28	Low Power Hex TTL to ECL Translator.
SY100S325	ECL	TTL	5	PLCC-28	Low Power Hex ECL to TTL Translator.
SY100S331	ECL	ECL	5	PLCC-28	Triple D Flip Flop.
SY100S341	ECL	ECL	5	PLCC-28	8-Bit Shift Register.
SY100S350	ECL	ECL	5	PLCC-28	Hex D Latch.
SY100S351	ECL	ECL	5	PLCC-28	Hex D Flip Flop.
SY100S355	ECL	ECL	5	PLCC-28	Quad Multiplexer/Latch.
SY100S360	ECL	ECL	5	PLCC-28	Dual Parity Checker/Generator.
SY100S363	ECL	ECL	5	PLCC-28	Dual 8-Input Multiplexer.
SY100S364	ECL	ECL	5	PLCC-28	16-Input Multiplexer.
SY100S366	ECL	ECL	5	PLCC-28	9-Bit Comparator.
SY100S370	ECL	ECL	5	PLCC-28	Universal Demux/Decoder.
SY100S371	ECL	ECL	5	PLCC-28	Triple 4-Input Multiplexer w/ Enable.
SY100S391	TTL	ECL	5	PLCC-28	Low Power Hex TTL to PECL Translator.
SY100S811	PECL/TTL	PECL	5	PLCC-28	1:9 PECL/TTL-to-PECL Fanout Buffer.
SY100S815	PECL/TTL	PECL	5	SOIC-16	Quad PECL/TTL-to-PECL Fanout Buffer.
SY100S834/L	LVPECL/PECL	LVPECL/PECL	3.3/5	SOIC-16	(÷1, ÷2, ÷4) or (÷2, ÷4, ÷8) Clock Generator.
SY100S838/L	LVPECL/PECL	LVPECL/PECL	3.3/5	SOIC-20	(÷1, ÷2/3) or (÷2, ÷4/6) Clock Generator.
SY100S863	ECL	ECL	5	PLCC-28	8-Input PECL Differential Multiplexer.

Communications Product Highlight — Lowest Power SFP



SFP/SFF Optical Module

The **MIC3003GFL** is a fiber optic module controller which enables the implementation of sophisticated, hot-pluggable fiber optic transceivers with intelligent laser control and an internally calibrated Digital Diagnostic Monitoring Interface per SFF-8472. It essentially integrates all non-data path functions of an SFP/SFP+ transceiver into a tiny (3mm x 3mm) QFN package. It also works well as a microcontroller peripheral in transponders or 10Gbps transceivers. The MIC3003GFL uses the same die as the MIC3003 with all its functions, but in a smaller package and different pin out.

Communication with the MIC3003 is via an industry standard 2-wire SMBus serial interface. Nonvolatile memory is provided for serial ID, configuration, and separate OEM and user scratchpad spaces.

The **SY84782U** is a single 2.5V supply, ultra-low power, small form factor laser diode driver for telecom/datacom applications. Intended to drive FP/DFB lasers at data rates up to 1.25Gbps, it is especially useful for Compact SFP, SFP and SFF modules where power requirements are quite stringent. The driver can deliver modulation current up to 90mA and offers a high compliance voltage, all of which make the SY84782U suitable for high current operations in both AC- and DC-coupled applications.

The SY84782U is intended to be used with Micrel's MIC3003 Optical Transceiver Management IC, which allows for both modulation and bias current control and monitoring. Furthermore, the MIC3003 offers power control and temperature compensation.

The **SY84113BU** low power limiting post amplifier is designed for use in fiber-optic optical modules for multirate applications up to 1.25Gbps. The device connects to a typical transimpedance amplifier (TIA) and can produce output signals to CML-level waveforms. Intended for use in GbE and Fibre Channel applications, the SY84113BU offers a wide LOS range. It is able to detect input signals for as low as $5mV_{PP}$ and as high as $100mV_{PP}$. The SY84113BU is intended to be used in AC-coupled input applications.

The SY84113BU generates a Loss-of-Signal (LOS) open-collector TTL output. A programmable Loss-of-Signal level set pin (LOSLVL) sets the sensitivity of the input amplitude detection. LOS asserts high if the input amplitude falls below the threshold set by LOSLVL and de-asserts low otherwise. The enable input (/EN) de-asserts the true output signal without removing the input signal. The LOS output can be fed back to the /EN input to implement the squelch function that maintains output stability under a loss-of-signal condition.

CDRs with Integrated Clock Synthesis

Part Number	Description	Function	Data Rate (Mbps)	Data Output Type	V_{CC}	Package	Eval. Board
SY69753AL[1]	Clock and Data Recovery	CDR	125-155	PECL	3.3V	EPAD-TQFP-32	Yes
SY69754AL	Clock and Data Recovery	CDR	622	PECL	3.3V	EPAD-TQFP-32	Yes
SY87700AL[1]	AnyRate® Clock and Data Recovery	CDR	32–208	PECL	3.3V	EPAD-TQFP-32, SOIC-28[2]	Yes
SY87701AL[1]	AnyRate® Clock and Data Recovery	CDR	28-1300	PECL	3.3V	EPAD-TQFP-32, SOIC-28[2]	Yes
SY87813L	AnyRate® Clock and Data Recovery with Differential Clock	CDR	28-1300	PECL	3.3V	EPAD-TQFP-32	Yes
SY87700V	AnyRate® Clock and Data Recovery	CDR	32–175	PECL	3.3/5V	EPAD-TQFP-32, SOIC-28[2]	Yes
SY87700L	AnyRate® Clock and Data Recovery	CDR	32–175	PECL	3.3V	EPAD-TQFP-32, SOIC-28[2]	Yes
SY87701V	AnyRate® Clock and Data Recovery	CDR	32–1250	PECL	3.3/5V	EPAD-TQFP-32, SOIC-28[2]	Yes
SY87701L	AnyRate® Clock and Data Recovery	CDR	32–1250	PECL	3.3V	EPAD-TQFP-32, SOIC-28[2]	Yes
SY87721L	AnyRate® Clock and Data Recovery	CDR	28–2700	CML/PECL	3.3V	EPAD-TQFP-64	Yes
SY69753L	Clock and Data Recovery	CDR	125-155	PECL	3.3V	EPAD-TQFP-64	Yes
SY69952	Clock Recovering Transceiver	Transceiver	51.84–155	PECL	5V	SOIC-28[2]	n/a

1. Run on 30% less I_{CC} than the SY69753L, SY87700V/L or SY87701V/L and are recommended for new designs.
2. 28-Pin SOIC is available, but not recommended for new designs.

Fiber Optic Transceiver ICs

Single-Chip Transceivers

Part Number	Description	Features	V_{CC}	Package	Eval. Board
SY88236L/AL[3]	GEPON and GPON ONU/ONT Module Transceiver	• 2.5ns Tx Enable/Disable Time • Bias and Mod monitoring, RSSI • 70mA I_{BIAS}/85mA I_{MOD}	3.3V	QFN-32 (5x5mm)	Yes
SY88232L/AL	SONET/GbE SFF/SFP Module Transceiver	• Bias and Mod monitoring, RSSI • 70mA I_{BIAS}/85mA I_{MOD}	3.3V	QFN-32 (5x5mm)	Yes

3. The L version has internal input termination while the AL version does not.

Laser Drivers

Part Number	Description	Data Rate (Gbps)	Drive Current (mA)	V_{CC}	Package	Eval. Board
SY84402L	Tiny VCSEL Laser Diode Driver	4.25	25	3.3V	QFN-10 (2x2mm)	Yes
SY84782L ***New!***	Ultra Low Power 1.25Gbps Laser Diode Driver	1.25	90	2.5V	QFN-16 (3x3mm)	Yes
SY88022L	11.3Gbps FP/DFB Laser Diode Driver with Integrated Bias	11.3	60	3.3V	QFN-16 (3x3mm)	Yes
SY88024L	11.3Gbps VCSEL Laser Diode Driver with Integrated Bias	11.3	20	3.3V	QFN-16 (3x3mm)	Yes
SY88212L	Laser Driver with APC and Power Monitoring	2.5	85	3.3V	QFN-24 (4x4mm)	Yes
SY88216L	Burst Mode Laser Driver with APC and Power Monitoring	2.5	85	3.3V	QFN-24 (4x4mm)	Yes
SY88422L[4]	Laser Driver with Integrated Bias	4.25	90	3.3V	QFN-16 (3x3mm)	Yes
SY88722V	Laser Driver with Output Enable	0.622	30	3.3/5V	MSOP-10	Yes
SY88782L[4]	High-Current, Low Power FP/DFB Laser Driver	1.25	90	3.3V	QFN-16 (3x3mm)	n/a
SY88822V	Laser Driver with Output Enable	0.155	25	3.3/5V	MSOP-10	Yes
SY88902V	VCSEL Laser Driver with Output Enable	1.25	25	5V	MSOP-10	n/a
SY88912L	SONET/SDH Laser Driver	3.2	60	3.3V	QFN-16 (3x3mm)	n/a
SY88922	SONET/SDH VCSEL Laser Driver	2.5	25	5V	MSOP-10 (3x3mm)	n/a
SY88922V	SONET/SDH VCSEL Laser Driver	2.5	25	3.3/5V	MSOP-10 (3x3mm)	n/a
SY88932L[4]	VCSEL/FP/DFB Laser Driver with Output Enable	4.25	60	3.3V	QFN-16 (3x3mm)	Yes
SY88982L[4]	High-Current, Low Power FP/DFB Laser Driver	2.7	90	3.3V	QFN-16 (3x3mm)	Yes
SY88992L[4]	VCSEL Driver with PE and Output Enable	4.25	25	3.3	QFN-16 (3x3mm)	Yes
SY89307V[4]	Output Swing Differential Receiver—VCSEL Driver	2.125	25	3.3V/5V	QFN-8 (2x2mm)	Yes

Laser Drivers (Continued)

Part Number	Description	Data Rate (Gbps)	Drive Current (mA)	V_{CC}	Package	Eval. Board
SY100EL1003	Laser Driver with Output Enable	1.25	75	5V	SOIC-16	n/a
SY100EL16VS	Variable Output Swing Differential Receiver	1.25	25	3.3V/5V	MSOP-8 (3 x 3mm), SOIC-8	n/a
SY100EP16VS	Variable Output Swing Differential Receiver	2.5	25	3.3V/5V	MSOP-8 (3 x 3mm), SOIC-8	n/a

4. To be interfaced with MIC300x controllers.

Controllers

Part Number	Description	Package
MIC3001	FOM Management IC with Internal Calibration	QFN-24 (4 x 4mm)
MIC3002	FOM Management IC with Internal/External Calibration	QFN-24 (4 x 4mm)
MIC3003GML	FOM Management IC with Internal/External Calibration	QFN-24 (4 x 4mm)
MIC3003GFL ***New!***	Ultra Small FOM Management IC with Internal/External Calibration	QFN-24 (3 x 3mm)

Post Amplifiers

Part Number	Data Rate (Gbps)	V_{CC}	LOS/SD	Input	Output	LOS/SD Gain	RC Time Constant	Hysteresis Typ. (dB)	Package
SY84403BL	4.25	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	QFN-10 (2 x 2mm)
SY84113BU ***New!***	1.25	2.5V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	QFN-16
SY88993AL	1.25	3.3V	LOS (TTL)	PECL	PECL	1X	1X	5.6	MSOP-10
SY88147DL	1.25	3.3V	LOS (TTL)	PECL	PECL	4X	20X	3.5	MSOP-10
SY88149CL	1.25	3.3V	SD (TTL)	PECL	PECL	4X	1X	3.5	MSOP-10
SY88053AL	1.25	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	QFN-16
SY88149HL[1]	1.25	3.3V	SD & LOS (TTL)	PECL	PECL	4X	5ns	3.0	QFN-16
SY88289AL	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	QFN-16
SY88289CL	3.2	3.3V	LOS (TTL)	PECL	CML	4X	20X	3.5	QFN-16
SY88289HL	3.2	3.3V	LOS (TTL)	PECL	CML	4X	20X	3.5	QFN-16
SY88303BL	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	0.5X	20X	3.5	EPAD-MSOP-10, QFN-16
SY88305BL	3.2	3.3V	SD (TTL)	PECL with internal 50Ω to V_{REF}	CML	0.5X	20X	3.5	EPAD-MSOP-10, QFN-16
SY88307BL	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	PECL	0.5X	20X	3.5	EPAD-MSOP-10, QFN-16
SY88309BL	3.2	3.3V	SD (TTL)	PECL with internal 50Ω to V_{REF}	PECL	0.5X	20X	3.5	EPAD-MSOP-10, QFN-16
SY88313BL	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	EPAD-MSOP-10, QFN-16
SY88315BL	3.2	3.3V	SD (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	EPAD-MSOP-10, QFN-16
SY88343BL	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	4X	20X	3.5	EPAD-MSOP-10, QFN-16
SY88343DL	3.2	3.3V	LOS (TTL)	PECL	CML	4X	20X	3.5	QFN-16
SY88343HL	3.2	3.3V	LOS (TTL)	PECL	CML	4X	20X	3.5	QFN-16
SY88345BL	3.2	3.3V	SD (TTL)	PECL with internal 50Ω to V_{REF}	CML	4X	20X	3.5	EPAD-MSOP-10, QFN-16
SY88347DL	3.2	3.3V	LOS (TTL)	PECL	PECL	4X	20X	3.5	MSOP-10
SY88353BL	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	QFN-16
SY88403BL	4.25	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	EPAD-MSOP-10, QFN-16
SY88713V	0.622	3.3V/5V	SD (PECL)	PECL	PECL	1X	1X	4.6	MSOP-10
SY88773V	3.2	3.3V/5V	LOS (TTL)	PECL	CML	1X	1X	4.6	EPAD-MSOP-10, QFN-16
SY88803V	0.155	3.3V/5V	LOS (TTL)	PECL	PECL	1X	1X	4.6	MSOP-10
SY88813V	0.155	3.3V/5V	SD (PECL)	PECL	PECL	1X	1X	4.6	MSOP-10
SY88843V	3.2	3.3V/5V	SD (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	1X	4.6	EPAD-MSOP-10 , QFN-16
SY88903AL	1.25	3.3V	LOS (TTL)	PECL	PECL	4X	1X	3.5	MSOP-10
SY88903V	1.25	3.3V/5V	LOS (TTL)	PECL	PECL	1X	1X	4.6	MSOP-10
SY88913V	1.25	3.3V/5V	LOS (PECL)	PECL	PECL	1X	1X	4.6	MSOP-10
SY88923AV	3.2	3.3V/5V	LOS (TTL)	PECL	PECL	1X	1X	4.6	EPAD-MSOP-10, MSOP-10
SY88923V	2.5	3.3V/5V	LOS (TTL)	PECL	PECL	1X	1X	4.6	MSOP-10
SY88933AL	1.25	3.3V	SD (TTL)	PECL	PECL	4X	20X	3.5	MSOP-10

Post Amplifiers (Continued)

Part Number	Data Rate (Gbps)	V_{CC}	LOS/SD	Input	Output	LOS/SD Gain	RC Time Constant	Hysteresis Typ. (dB)	Package
SY88933V	1.25	3.3V/5V	SD (TTL)	PECL	PECL	1X	1X	4.6	MSOP-10
SY88943V	2.5	3.3V/5V	SD (TTL)	PECL	PECL	1X	1X	4.6	MSOP-10
SY88953L	10.7	3.3V	SD & LOS (TTL)	CML	CML	1X	1X	4.6	MLF®-16
SY88973V	3.2	3.3V/5V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	1X	4.6	EPAD-MSOP-10 , MLF®-16
SY88973BL(2)	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	1X	4.6	MLF®-16
SY88983V	3.2	3.3V/5V	SD (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	1X	4.6	EPAD-MSOP-10 , MLF®-16
SY88993AV	3.2	3.3V/5V	LOS (TTL)	PECL	CML	1X	1X	4.6	MSOP-10
SY88993V	3.2	3.3V/5V	LOS (TTL)	PECL	CML	1X	1X	5.6	MSOP-10

1. Fastest LOS/SD Assert & De-assert time in the Industry.
2. External pull-up resistor between LOS output and VCC.

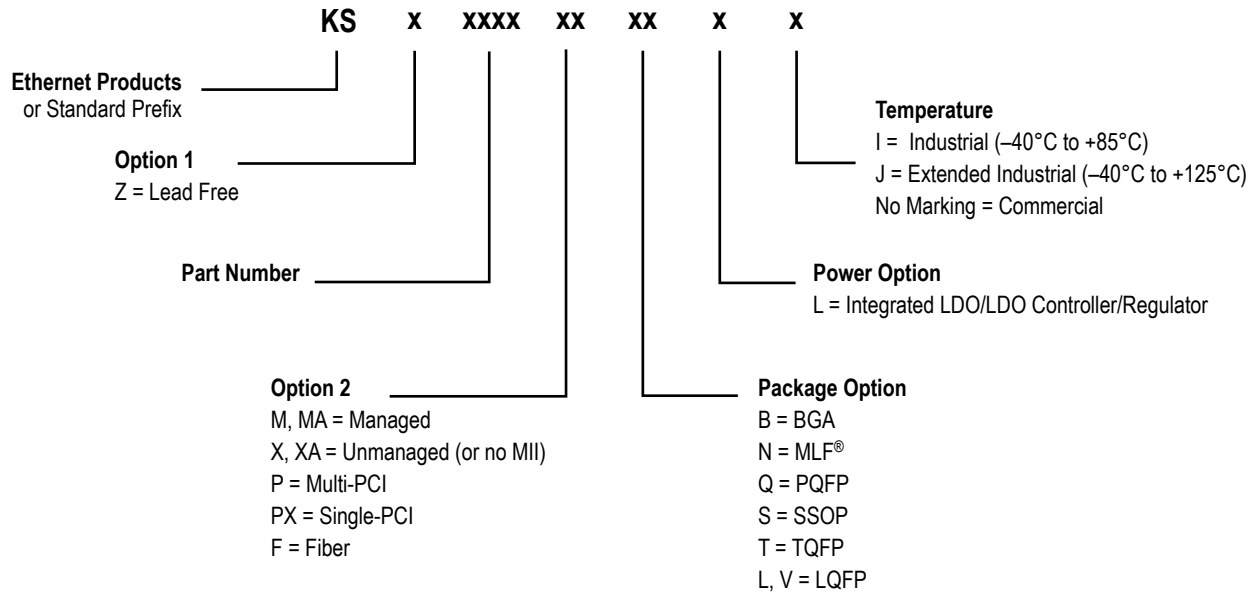
Fractional N Synthesizers

Part Number	Description	Output Range	Input Ref. Osc.	Temperature	Package	Eval. Software
SY87729L	3.3V, AnyClock® 10MHz to 365MHz Fractional N Synthesizer	10MHz to 365MHz	27MHz	Industrial	TQFP-32	Yes
SY87739L	3.3V, Protocol Transparent 10MHz to 729MHz Factional N Synthersizer	10MHz to 729MHz	27MHz	Industrial	TQFP-32	Yes

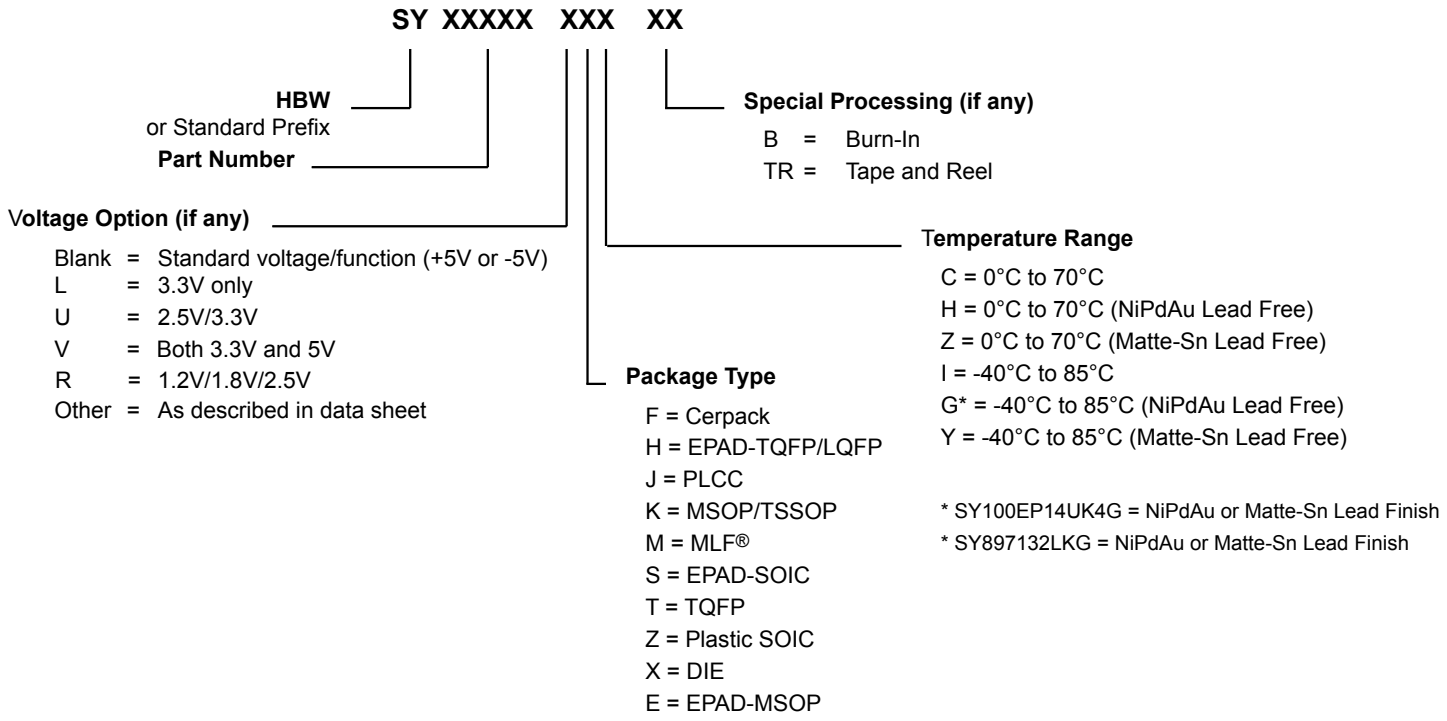
Multiplexer/Demultiplexer

Part Number	Function	Data Rate	Data Output	V_{CC}	Temperature	Conversion	Package
SY87724L	MUX and DeMUX	2.7Gbps	PECL	3.3V	Industrial	1:, 1:5, 1:8, 1:10, 4:1, 5:1, 8:1, 10:1	TQFP-80
SY87725L	SERDES	2.5Gbps	CML	3.3V	Industrial	1:4, 4:1	EPAD-TQFP-64
SY10/100E445	DeMUX	2.5Gbps	PECL	5V	Commercial	1:4	LPCC-28
SY10/100E446	MUX	1.6Gbps	PECL	5V	Commercial	4:1	LPCC-28

Ethernet Part Identification

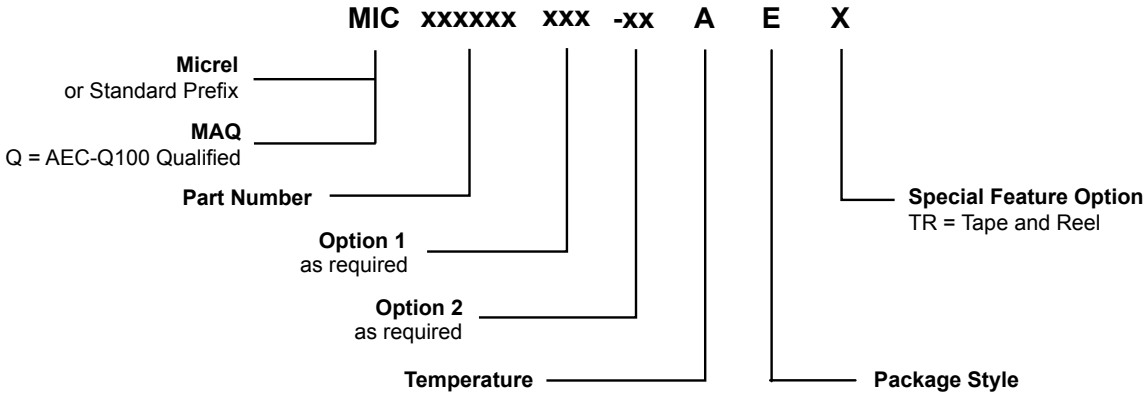


High Bandwidth Part Identification



Analog Part Identification

Micrel Analog Standard



A = -55°C to +125°C
B = -40°C to +85°C(1)
C = 0°C to +70°C

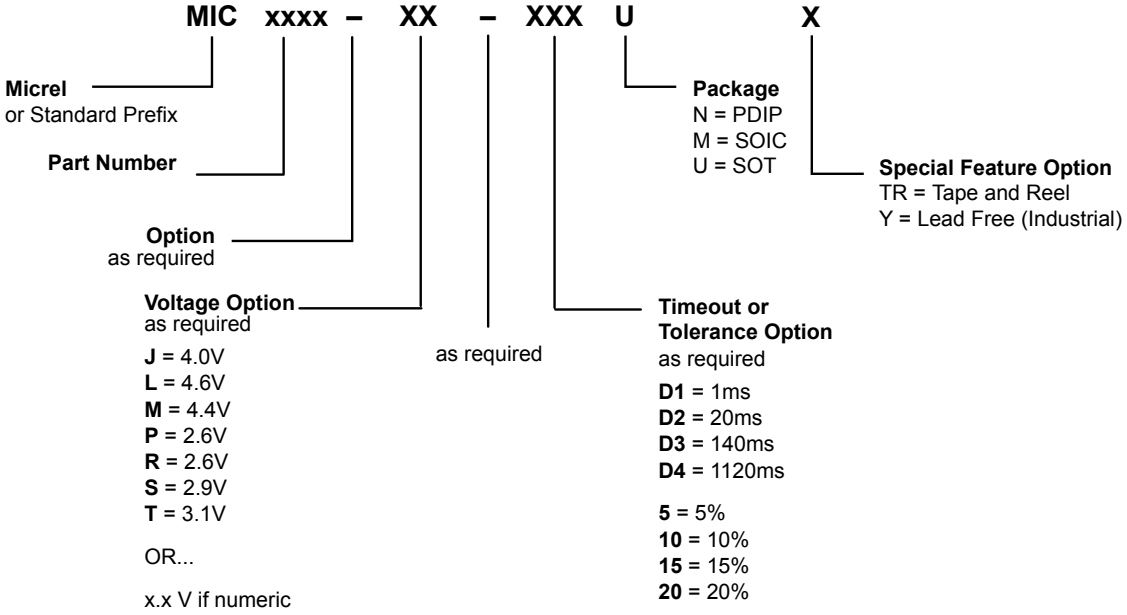
X = -55°C to +125°C (RoHS Compliant)(1)
V = -40°C to +125°C (RoHS Compliant) (*Supervisor Products*)
W = -40°C to +85°C (RoHS Compliant with exception)(2)
Y = -40°C to +85°C (RoHS Compliant)
Z = 0°C to +70°C (RoHS Compliant)

Notes:

1. Typically, industrial grade power products rate the junction temperature up to +125°C. Varies from device-to-device. Refer to the datasheet.
2. Applicable to TO-220, TO-247, TO-263, SOT-223, SPAK packages using 85% lead plus lead alloy die attach material. Refer to the datasheet.

C3 = SC70-3
C5 = SC70-5
C6 = SC70-6
D = TO-252
D5 = Thin SOT
D6 = Thin SOT
FL = MLF®
HL = Hybrid MLF®
HJ = MLF® (Height > /mm)
J = Ceramic DIP
JL = MLF®
LQ = LQFP (Low Profile QFP)
M = 150 mil SOIC
ME = 150 mil EPAD-SOIC
ML = MLF®
MM = MSOP
MME = EPAD-MSOP
MT = Thin MLF®
M3 = SOT-23-3
M4 = SOT-143
M5 = SOT-23-5
M6 = SOT-23-6
M8 = SOT-23-8
N = Plastic DIP
QS = QSOP
QSE = EPAD-QSOP
R = SPAK
S = SOT-223
SM = SSOP
T = TO-220
TS = TSSOP
TSE = EPAD-TSSOP
TQ = TQFP
TQE = EPAD-TQFP
U = TO-263
V = PLCC
WM = 300 mil Wide SOIC
WME = 300 mil Wide EPAD-SOIC
WT = TO-247

Industry Standard Voltage Supervisors



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