MICREL®

Innovation Through Technology®

Military Catalog

May 2009

Dear Valued Customer,

Micrel is an enduring DSCC certified company that has, for many years, provided Mil-Std-883B products in hermetic ceramic packages. We have also provided products governed by source controlled drawings (SCD) where baseline control is important. Our in-house, U.S.-based wafer fab manufactures about 85 to 90 percent of the wafers used in Micrel's products and provides foundry services for fabless companies including a company providing DSCC certified products. Micrel is a high volume supplier of plastic encapsulated integrated circuits shipping more than 500 million units annually. Today, high quality plastic encapsulated integrated circuits are found in almost every application including the military. Frequently, our products have outstanding features such as the smallest package, highest power density, highest efficiency, or lowest power solution available. Micrel has both hermetic and plastic encapsulated products in military communications, vehicles, planes, space shuttles, and the international space station. Often our plastic packages provide size, electrical performance, or thermal performance advantages that are unmatched by other package styles. Whatever package style you purchase for whatever application, Micrel has only one quality standard, "world class". It has been our experience across all industries that the leading suppliers demand world class quality from us. Our policy is to deliver products and services that meet or exceed your expectations, error free, and at a competitive price. Every new product or base design that we bring to market has been reliability tested. We continuously monitor our products and processes with on-going reliability testing. We continuously improve our products and services through active involvement with our customers and suppliers. Whether it is rapidly responding to unforecasted demand, solving an applications issue, or providing quality services, Micrel prides itself on being involved with and satisfying our customers. Around the world, our customers have told us that we provide outstanding quality, service, and value. I want you to know that I stand behind our products and if you are ever dissatisfied with our quality or service please call me personally at 408-435-3409 or email me at Richard.zelenka@micrel.com and I will personally attend to the issue and get back to you.

Sincerely,

Richard Zelenka
Vice President Quality Assurance
Micrel, Inc.

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Contents

Corporate Profile

Micrel Semiconductor is a U.S. Company and a leading manufacturer of advanced, high performance communications, clock management, mixed-signal, analog and power ICs. Micrel is one of the few semiconductor companies that owns and operates its own US wafer fabrication manufacturing facility. The Company's fab is located in San Jose, California. Products include devices for a wide variety of military applications as well as fiber-optic telecommunications and networking, cellular telephones, servers, portable computer systems, computer peripherals, process control systems, consumer electronics and power supplies. While many other semiconductor companies routinely obsolete products, Micrel rarely obsoletes a product and still has in production products that are more than thirty years old.

Founded in 1978, Micrel has a portfolio of world class wafer fabrication processes that provide the ability to produce new products faster than its 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 also has high-speed bipolar with silicon germanium technology 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 Micrel can put multiple analog and digital functions on the same IC without the various functions causing interference found in alternate techniques.

Ethernet ICs

Micrel is a leader in Ethernet technology. The Company's Ethernet products are used in Wireless, VoIP, IP-STB, Industrial, Embedded and Media Converter Ethernet applications, to name but 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 ARM processor and fully managed 5-port switch. Micrel's comprehensive portfolio of Ethernet products operate over commercial and industrial temperature ranges, and are available in a series 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 to 7.5A power devices and LDO controllers for even higher current applications.

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.

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® 2mm x 2mm, 3mm x 3mm and 4mm 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 0.85mm x 0.85mm.

ISO 9001 Quality Assurance

When it comes to quality and reliability, at Micrel there is no compromise. In fact, the very name "Micrel" stands for micro circuits that are reliable. The Company spends 1.1 percent of sales on its quality assurance organization and 4 percent of Micrel's headcount is in the quality assurance department. From the Company's inception, there has existed a strong focus on quality and reliability; the foundation for military products. The focus on quality continues to this day with a dedicated, capable and extensive quality assurance organization led by the Company's Vice President of Quality Assurance who reports directly to the President of the Company. As part of the Corporation's on-going commitment to quality, Micrel conducts regular/quarterly quality management review meetings where senior management meets to discuss Micrel's quality roadmap. In addition, the Company discuses quality and reliability problems on a weekly basis at its operations meeting and as part of its operations review. Micrel first achieved ISO 9001 registration on March 31, 1997 and has maintained that registration through surveillance audits. Micrel is also certified to an ISO14001:2004 Environmental Management System and is DSCC (Defense Supply Center Columbus) certified for manufacture of our 883B products Micrel is committed to delivering products and services that meet or exceed customers' expectations — error free, on-schedule, and at a competitive price. At Micrel there exists 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 is deeply committed to contributing to its customers' success. The Company's internal processes have been developed with flexibility in mind, so that the entire organization can quickly react to changing requirements. The Company's outstanding sales, customer service and technical support organizations make it easy to get questions answered and solutions implemented.

Micrel's Quality Assurance and Military Customer Support

Micrel and it's products are particularly well-suited to the Military space. All quality and specialty services necessary to address military needs can be found below.

ROHS and Plastic Package Terminal Finish

Micrel continues to support lead-tin (Pb-Sn) solder lead finish when it is available from our subcontractors. Inevitably, lead-tin solder will be phased out due to RoHS requirements for lead (Pb) free product. Micrel has whenever possible used Nickel-Palladium-Gold (NiPdAu) lead finish instead of matte tin for RoHS-compliant product. Military customers frequently want to avoid the use of matte tin due to the tin "whisker" reliability concern. NiPdAu is "whisker" free. Military customers should find NiPdAu a good alternative to lead-tin solder without any concern for "whisker" related reliability issues. Currently, Micrel offers NiPdAu on most of its QFN (also known as MLF® Amkor), SC-70, SOT23, MSOP, and 8 lead SOIC packages . Larger packages continue to use matte tin. Micrel uses 400 micro-inches of tin over copper alloy leadframe. The Company performs a one hour 150ºC post plating bake for whisker mitigation. Results of whisker testing by Micrel and it subcontractors can be found in the quality and reliability section of the Micrel webpage (www.micrel.com). Micrel's plastic product has moisture sensitivity rated at 260ºC peak reflow temperature. Moisture sensitivity data is also found on the Micrel website. Package composition for RoHS-compliance is also available on the Micrel website.

High Reliability Services

Micrel has the capability of performing most classical reliability tests including high temperature operating life, biased moisture operating life, autoclave (pressure pot), and temperature cycle. Micrel's reliability services that apply to the 883B product are DESC certified. Micrel, has in the past, entertained special programs governed by contracts (source controlled drawings) which have included 883B style programs, sample burn-in, and in some cases 100 percent burn-in.

Reliability and MTBF

Micrel continuously monitors the reliability of it processes and packages through high temperature operating life and package reliability tests. Package level tests include temperature cycle (-65ºC to 150ºC), autoclave, high temperature storage (150ºC), and biased moisture testing. Micrel provides MTBF data based on actual operating life data and does not use models. MTBF reports by process are available on the Micrel webpage in the quality and reliability section (www.micrel.com). Micrel reports MTBF data at 55ºC with 60 precent upper confidence limit using the X2 statistic. Data is derated to 55ºC from the operating life test temperature using the Arrhenius equation with an activation energy of 0.7eV.

Process/Product Change Notification (PPCN)

Micrel notifies customers of major process changes including, but not limited to, changes in location of wafer fabrication, assembly, or test; changes in mold compound; die shrinks.

Micrel's change process is modeled after JESD46 and MIL-PRF-38535 APPENDIX A. Micrel does provide PPCN notification to all of its regional sales directors, field applications engineers, and distributors and they in turn notify their customers. For those that want direct notification from Micrel, the Company offers the opportunity to register for direct notification of all PPCN's at the Quality and Reliability section of our webpage (www.micrel.com). Micrel provides a minimum of 90 days notification for major changes.

Obsolescence

Micrel rarely obsoletes parts. If this should occur our policy is to provide one year notification. Micrel typically offers a lifetime buy. Micrel asks that the lifetime buy order be placed within the six months of the notification period for delivery at the end of the notification period.

REACH **R**egistration**, E**valuation**, A**uthorization and **R**egistration of Chemicals

Micrel does not produce substances or preparations which need to be registered according to the REACH regulation. Micrel's products are 'Articles' as defined in REACH Article 3(3). There is no intended release of substances subjected as to REACH and therefore, registration does not apply for Micrel products. Suppliers of articles must provide recipients with information on SVHC (Substances of Very High Concern). Micrel's products currently do not contain substances on the REACH SVHC Candidate List. Therefore, the Reach Article 7(2) to notify ECHA (European Chemical Agency) if an article contains >0.1 mass % of an SVHC and tonnage exceeds 1 tonne per importer per year is presently not applicable to Micrel. As an environmentally responsible Company, Micrel supports REACH and other legislations with the aim of improving the protection of our environment and human health and safety. Micrel will continue to monitor the developments of the REACH legislation to ensure continuous compliance. For additional information please contact Micrel at: **Environ@Micrel.com**.

Extended Temperature Capabilities and Screening

Micrel has the capability of performing tri-temperature (-55ºC, 25ºC, 125ºC) testing on most packages. Micrel can support special test screens (including extended temperature range) governed by contracts (source control drawings) or new design requirements.

Ethernet Design Support

- Design Package for evaluation boards
  - Schematics (both Orcad and PDF version)
  - BOM
  - Software drivers (where appropriate)
  - App note 111 (Layout and Design info)
  - Evaluation board use
  - IBIS Model
  - Linux v2.6 and WinCE v6.0 for Micrel SoC devices
- Datasheets
- Factory schematic and layout review; less than 48 hour turnaround response time
- Debug guide presentation
- App notes

Simulation Models

Micrel maintains an extensive database of both IBIS and Spice Models on the Company website.

IBIS Models can be found at: **http://www.micrel.com/page.do?page=_Models/IBIS/**

Spice Models are accessible at: **http://www.micrel.com/page.do?page=_Models1/SPICE/**

Reference Designs and Application Notes

Micrel constantly creates new reference designs for ease of design for its clients. Reference designs can be easily downloaded from Micrel's website. Some examples of reference designs currently available include:

Fiber Optic Module Chipset Reference Designs:
http://www.micrel.com/page.do?page=/product-info/Fiber_Optic.shtml

RF Reference Designs:
http://www.micrel.com/page.do?page=product-info/qwikradio.shtml

Product Application Notes:
http://www.micrel.com/page.do?page=product-info/app_notes.shtml
For additional reference designs please consult the Micrel website.

Product Support

Errata/ PCNs - Process Notification

Micrel adheres to a strict policy of notifying its customers of major part changes. All customers can register for notification at:

http://www.micrel.com/page.do?page=/_Forms/ppcn_reg_form.shtml

Material Declarations

Micrel's materials declaration can be viewed on line at:

http://www.micrel.com/page.do?page=product-info/qualrel.shtml

Micrel's Material Declarations (Reportable Substances in Component) are disclosures of the substances contained in our products such as plastics, metals, alloys, and chemicals. The Declarations show the concentrations of materials, intentionally added, by weight and percentage. The declaration is used by customers to verify compliance with customer content restrictions and environmental law. Micrel has a wide range of package options in its database. Package offerings range from the smallest outline low pin count packages up to high pin count BGA. The Company offers a wide range of power packages, thermally enhanced packages with exposed pads and fused lead frames. These packages provide excellent thermal properties (theta JA or JC) to reduce die operating temperatures for longer life and higher reliability. Thermal Resistance Information on these packages is available via Micrel datasheets or on the Company's website.

Package Information

Micrel has an extensive database of package information including package type and reliability, listed by package type. For information about packaging:

http://www.micrel.com/page.do?page=/product-info/package.jsp

Information regarding package reliability is available on Micrel's web site. This includes autoclave stress tests, Ethernet reliability monitor data, extended temperature cycle stress test, high temperature biased moisture life test, lead free solder joint reliability, lead free package solderability, moisture sensitivity levels of surface mount packages, MSOP package reliability monitor data, Sn-Pb package reflow profile, SOIC package reliability monitor data, SOT-23 package reliability monitor data, SOT-23 package reliability monitor data, SOT-223 package reliability monitor data, S-pak package reliability monitor data, storage life test (Bake).

http://www.micrel.com/page.do?page=product-info/qualrel.shtml

Thermal Resistance

Micrel has a wide range of package options. Package offerings range from the smallest outline low pin count packages up to high pin count BGA. The Company offers a wide range of power packages, thermally enhanced packages with exposed pads and fused lead frames. These packages provide excellent thermal properties (theta JA or JC) to reduce die operating temperatures for longer life and higher reliability. Thermal Resistance Information on these packages is available via Micrel datasheets or on the Company's website.

Thermal Resistance Table

Packages	LD#	θ_{JA} (°C/W)	θ_{JC} (°C/W)	PCB Layers
MSOP	8	160	67.8	4
MSOP-FUSED	8	96.8		4
MSOP-EPAD	8	64.4	19.2	4
MSOP	10	130.5	42.6	4
MSOP-EPAD	10	76.7	9.63	4
MLF1212D-FLIP CHIP	4	140.7	60.04	4
MLF1216D	4	172.6	127	4
MLF1616D	6	92.4	56.4	4
MLF22D	8	90	45	4
MLF33D	10	60.7	28.7	4
MLF33Q	16	59		4
MLF33Q-COL	16	71.3	52.3	4
MLF44Q	16	50.6	15.8	4
MLF44Q	24	43		4
MLF45D	20	44.1		4
MLF55Q	32	29.5	10.3	4
MLF77Q	44	24		4
QSOP	16	100.8	48.4	4
QSOP-EPAD	16	41		4
QSOP	20	84.9	31.4	4
SC70	3	258.3		4
SC70	5	256.5		4
SOICN	8	98.9	48.8	4
SOICN-FUSED	8	63		4
SOICN-EPAD	8	41	14.7	4
SOICN	14	80.6	43.9	4
SOICN	16	78.6	30	4
SOICW	16	77.9	34.5	4
SOICW	18	64	26.7	4
SOICW	20	57.9	24.5	4
SOICW	24	61.6	33.7	4
SOICW	28	53.4	29.1	4
SOT223	4	108.3	60.69	4
SOT23	3	202.7	149.3	4
SOT23	5	252.7		4
SOT23	6	177.2	109.2	4
SOT23	8	195		4
SPAK	5	38		4
TMLF1010Q-FLIP CHIP	6	192.93	90.42	4
TMLF1216D	4	172.6	127	4
TMLF1616D	6	92.4	56.4	4
TMLF22D	8	90	45	4
TMLF2025Q-FLIP CHIP	16	96.4	41.89	4
TO263	5	26.2	6.3	4
TO220	5	31.4	6.9	4
TO92	3	131.9		4
TQFP(7x7)	32	50	20	4
TQFP(7x7)-EPAD	32	28	4	4
TQFP(7x7)	48	57	13	4
TQFP(10x10)	64	42		4
TQFP(10x10)-EPAD	64	22		4
TQFP(14x14)-EPAD	80	18		4
TSOT	5	252.7		4
TSOT	6	177.2	109.2	4
TSSOP(4x4)	14	96.3	25.8	4
TSSOP(4x4)	16	97.5	29.9	4
TSSOP(4x4)-EPAD	16	36.5	6.8	4
TSSOP(4x4)	20	84.8	24	4
TSSOP(4x4)-EPAD	20	32.2	12.9	4
TSSOP(4x4)	24	78	23.5	4

Die Products

ES Components, our experienced "partner" in die sales and distribution, offers Micrel packaging solutions to meet a wide range of commercial, industrial, military, ruggedized and aerospace requirements. ES Components can be reached at: 108 Pratts Junction Road, Sterling, MA 01564; Tel: (978) 422-7641; Fax: (978) 422-0011.

Up-Screening

If an application does not require full military complaint screen and qualified devices but still requires mission-critical performance, consider commercial up-screening programs.

Features

- 100% Environmental Screening
- Extended Temperature Range Testing
- Burn-in

Benefits

- Reduced Field Failure Rates
- Guaranteed Electrical Performance
- Identify Latent Defects

Military and Aerospace screening is available as detailed below.

Hermetic Packaging

Various hermetic packaging, footprint and screening requirements are available to meet diverse program specifications.

- MIL-PRF-38535 Screening & QCI as required
- DIP, Flat Pack, CLCC package options
- Customer-specific configurations

Die

Die is available to support hybrid or multi-chip module designs. ES Components can provide bare die products which can be qualified to meet your specific program requirements. This brochure lists current products available in wafer/die form. Other products can be obtained in die form per customer request. For commercial and industrial applications, chose from a variety of Screening and Inspection Tests to meet customer requirements:

- 100 Percent Probe Test
- MIL-STD-883, Method 2010 Visual Inspection
- MIL-STD-883, Method 2011 Wirebond Evaluation
- MIL-STD-883 2018 SEM Analysis

For military or aerospace applications, select Element Evaluation by:

- MIL-PRF-38534, Class H Element Evaluation (Military Level)
- MIL-PRF-38534, Class K Element Evaluation (Space Level)

Radiation Data

Many Micrel products have been tested for Radiation Resistance, in both Single Event and Total Ionizing conditions. These tests were conducted by third parties, independent of Micrel, and provide unbiased evaluations. Searchable Radiation Databases can be found On-Line at the following urls:

Goddard Space Flight Center: **http://radhome.gsfc.nasa.gov/top.htm**

Jet Propulsion Laboratories: **http://radcentral.jpl.nasa.gov/**

Micrel Die Product Offerings

A listing of Micrel Products in Die Form follow on the next page.

Power Management

Product	Part Number
LDO	MIC29150-12CYW
LDO	MIC29150-3.3CYW
LDO	MIC29150-5.0CYW
LDO	MIC29151-12CYW
LDO	MIC29151-3.3CYW
LDO	MIC29151-5.0CYW
LDO	MIC29152CYW
LDO	MIC29204CYW
LDO	MIC29300-12CYW
LDO	MIC29300-3.3CYW
LDO	MIC29300-5.0CYW
LDO	MIC29302CYW
LDO	MIC29372CYW
LDO	MIC2937A-5.0CYW
LDO	MIC29500-3.3CYW
LDO	MIC2950-03CYW
LDO	MIC29500-5.0CYW
LDO	MIC29502CYW
LDO	MIC29503CYW
LDO	MIC2950CYW
LDO	MIC2951-03CYW
LDO	MIC29512CYW
LDO	MIC29712CYW
LDO	MIC29751-3.3CYW
LDO	MIC29751-5.0CYW
LDO	MIC29752CYW
LDO	MIC39100-2.5CYW
LDO	MIC3975CYW
PWM Controller	MIC38C43ACYW
PWM Controller	MIC38HC44CYW
PWM Controller	MIC38HC45CYW
Switch Mode Regulator	MIC4574CYW
Switch Mode Regulator	MIC44685CYW
Switch Mode Regulator	MIC4575CYW
LDO	MIC49500CYW
LDO Controller	MIC5159CYW
LDO	MIC5205CYW
LDO	MIC5209-3.0CYW
LDO	MIC5209CYW
LDO	MIC5219-5.0CYW
LDO	MIC5245-3.3CYW
LDO	MIC5255-2.5CYW
LDO	MIC5270-4.1CYW
LDO	MIC5310-PPCYW
LDO	MIC69502CYW

Clock/Logic/FOM

Product	Part Number
Differential Receiver	SY100E016WC
4-Bit D Flip Flop	SY100E131WC
Differential Receiver	SY100EL16VDWC
Differential Receiver	SY100EL16VDWC
Differential Receiver	SY100EL16VOWC
Differential Receiver	SY100EL16VWC
4:1 Differential Mux	SY100EL57WC
Differential Translator	SY100ELT20VWC
Differential Receiver	SY100EP16VSWC
Divide by 4	SY100EP33VWC
Differential Translator	SY100EPT20VWC
Differential Translator	SY100EPT21LWC
3-Bit Differential Flip Flop	SY10E431WC
Differential Receiver	SY10EL16VDWC
Differential Receiver	SY10EP16VWC
3 GHz AnyGate	SY55851UWC
LVDS Translator	SY55855VWC
10Gbps Clock/Data Retimer	SY58052UWC
LDD w/APC	SY88952LWI

Drivers

Product	Part Number
Latched Driver	MIC2981/82CYW
MOSFET Driver	MIC4125CYW
MOSFET Driver	MIC4416CYW
MOSFET Driver	MIC4417CYW
MOSFET Driver	MIC4420CYW
MOSFET Driver	MIC4421CYW
MOSFET Driver	MIC4422CYW
MOSFET Driver	MIC4423CYW
MOSFET Driver	MIC4424CYW
MOSFET Driver	MIC4425CYW
MOSFET Driver	MIC4426CYW
MOSFET Driver	MIC4427CYW
MOSFET Driver	MIC4428CYW
MOSFET Driver	MIC4429CYW
MOSFET Driver	MIC4452CYW
MOSFET Driver	MIC4469CYW
MOSFET Driver	MIC44R22AYW
MOSFET Driver	MIC5013CYW
MOSFET Driver	MIC5021CYW
Latched Driver 8-bit	MIC5821CYW
Latched Driver 8-bit	MIC5822CYW
Latched Driver 8-bit	MIC58P01CYW
LED Driver	MM5450CYW
LED Driver	MM5451CYW

Ethernet

Product	Part Number
3-Port Ethernet Switch	KS8993M-CYW
10/100 Ethernet PHY	KSZ8041-CYW

Linear

Product	Part Number
Voltage Reference	LM4040-2.5CYW
Voltage Reference	LM4040-4.1CYW
Op Amp	LMC7101CYW
Op Amp	MIC841NCYW
Load Switch	MIC94031CYW
Load Switch	MIC94060CYW
Load Switch	MIC862CWY

Contact ES Components regarding die availability for PNs other than those listed.

High Voltage 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

LDO Regulators

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
MAQ5280	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		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
LP2950	100mA	2V to 30V	5.0, 5.0 (0.5%)	100µA	380mV		2nd Source to Natl.	
LP2951	100mA	2V to 30V	5.0 (0.5%), 5.0 (1%), Adj.	100µA	380mV	SOIC, PDIP	2nd Source to Natl.	
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
MIC2950	150mA	2V to 30V	5.0, 5.0 (0.5%)	120µA	300mV		High VIN, Load Dump Protection.	
MIC2951	150mA	2V to 30V	3.3, 4.85, 5.0 (0.5%), 5.0 (1%) Adj	120µA	300mV	MSOP, SOIC, PDIP	High VIN, 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 w/Error Flag.	
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
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
MIC5207	180mA	2.5V to 16V	1.8, 2.5, 2.8, 2.9, 3.0, 3.1, 3.2, 3.3, 3.6, 3.8, 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.	
MIC2954	250mA	2V to 30V	5.0, 5.0 (0.5%) Adj.	140µA	375mV	SOIC, SOT-223, TO-220	Load Dump Protection.	
MIC29201	400mA	4.3V to 26V	3.3, 4.85, 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.	
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 w/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	300mV	SOT-23, P-MSOP, MLF® (2x2mm), TO-220, TO-263	Low Noise LDO.	
MIC5237	500mA	2.5V to 16V	2.5, 3.3, 5.0	80µA	300mV		>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 Battert Protection.	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.	
MIC3975	750mA	2.25V to 16V	1.8, 2.5, 3.0, 3.3, 5.0, Adj.	400µA	300mV	P-MSOP	Wide VIN Range.	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.	
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	Load Dump Protection.	

High Voltage Selection Guide

Single Outputs

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
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.	
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.	
MIC37301	3A	2.25V to 6V	1.5, 1.65, 1.8, 2.5, 3.3	27mA	300mV	SPAK		Yes
MIC39300	3A	2.25V to 16V	1.8, 2.5	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.	
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		
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.	
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

MIC5208	50/50mA	2.5V to 16V	3.3, 3.8, 4.0	180µA	250mV	MSOP	±3%	Yes
MIC5211	50/50mA	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, 3.3, 3.3/5.0, 3.6, 5.0,					
MIC5202	100/100mA	2.5V to 26V	3.0, 3.3, 4.8, 5.0	170µA	225mV	SOIC	±1%	
MIC5210	150/150mA	2.5V to 16V	2.7, 2.8, 3.0, 3.3, 3.6, 4.0, 5.0	80µA	165mV	MSOP	Low Noise LDO.	
MIC5212	500/500mA	4V to 16V	3.3/2.5	1.5mA	350mV	SOIC	Small, High-Current Dual.	

LDO Controllers (N- and P-Channel), and DDR Terminators

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments
MIC5156	—	3.0V to 36V	3.3, 5.0, Adj.	—	—	SOIC	Drives External N-Ch MOSFET.
MIC5157	—	3.0V to 36V	Selectable 3.3, 5.0, 12	—	—	PDIP, SOIC	Drives External N-Ch MOSFET.
MIC5158	—	3.0V to 36V	5.0, Adj.	—	—	PDIP, SOIC	Drives External N-Ch MOSFET.

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

Automotive (AEC-Q100 Qualified)

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comment
MAQ5280 *New!*	25mA	4.5V to 120V	Adj.	31µA	1.1V	eSOIC-8	AEC-Q100 qualified, wide V_{IN} range.

Synchronous Regulators

Buck Regulators (Internal Switches)

Device	V_{IN} Range	V_{OUT}	I_{SW}[(1)] (Avg)(Max)	Frequency	Package(s)	Comments
MIC4680	4V to 34V	3.3V, 5V, Adj.	1.3A	200kHz	SOIC-8	
MIC4681	4V to 30V	Adj.	2A Peak	200kHz	SOIC-8	
MIC4682	4V to 34V	Adj.	2A	200kHz	SOIC-8	10% Precision Adjustable Current Limit.
MIC4684	4V to 30V	Adj.	2A	200kHz	SOIC-8	
MIC4685	4V to 30V	Adj.	3A	200kHz	SPAK-7	33% Smaller Than TO-263 (D2PAK).
MIC4690	4V to 30V	Adj.	1.3A	500kHz	SOIC-8	500kHz: Small Inductor.
MIC4574	4V to 24V	3.3V, 5V, Adj.	0.5A	200kHz	PDIP-8, SOIC-14	
MIC4575	4V to 24V	3.3V, 5V, Adj.	1A	200kHz	TO220-5, TO263-5	
MIC4576	4V to 36V	3.3V, 5V, Adj.	3A	200kHz	TO220-5, TO263-5	
LM2574	4V to 40V	3.3V, 5V, 12V, Adj.	0.5A	52kHz	PDIP-8	

High Voltage Selection Guide

Buck Regulators (Internal Switches)

Device	V_{IN} Range	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package(s)	Comments
LM2575	4V to 40V	3.3V, 5V, 12V, Adj.	1A	52kHz	TO220-5, TO263-5, PDIP-16, SOIC-24	
LM2576	4V to 40V	3.3V, 5V, 12V, Adj.	3A	52kHz	TO220-5, TO263-5	

Synchronous Buck Regulators (Internal Switches)

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	

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

Buck Controllers (External Switches)

Device	V_{IN} Range	V_{OUT}	I_{SW}[1] (Avg)(Max)	Efficiency (Typ)	I_Q (Typ)	Shutdown I_Q (Typ)	Frequency	Package(s)	Comments
MIC2184	2.9V to 16V	Adj.	External P-FET, 1A to 10A	90%	600µA	0.5µA	200/400kHz	SOIC-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)

MIC2130	8V to 40V	Adj. to 0.7V	External FETs, 15A				150/400kHz	MLF-16, eTSSOP-16	
MIC2131	8V to 40V	Adj. to 0.7V	External FETs, 15A				150/400kHz	MLF-16, eTSSOP-16	Low EMI Frequency Dithering.
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	Small and Super Efficient.
MIC2169A	3V to 14.5V	Adj. to 0.8V	External N-FETs, 15A				500kHz	MSOP-10	Small and Super Efficient; Enable Function.
MIC2159	3V to 14.5V	Adj. to 0.8V	External N-FETs, 20A				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, TSSOP-16	
MIC2183	2.9V to 14V	Adj. to 1.25V	External N- and P-FET, 1A to 10A	95%+	600µA	0.5µA	400/200kHz	MSOP-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 (4mm x 4mm)	
MIC2199	4.5V to 32V	Adj. To 0.8V	External N-FETs, 1A to 20A	95%+	1.6mA	0.1µA	300kHz	MLF-12 (4mm x 4mm)	

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

Boost Regulators (Internal Switches)

Device	V_{IN} Range	V_{OUT}	I_{SW} (Typ)	Frequency	Package(s)	Comments
MIC2141	2.5V to 14V	Adj. to 22V	0.1A	330kHz	SOT-23-5	Dynamically Adjustable VOUT 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 (3mm x 3mm)	
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 (2mm x 2mm)	OLED Driver, High Accuracy, OVP.
MIC2289	2.5V to 10V	Adj. to 34V	0.75A	1.2MHz	MLF-8 (2mm x 2mm)	Internal Schottky White LED Driver, OVP.
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	SOIC-8	Low Input Voltage.
MIC2290	2.5V to 10V	Adj. to 34V	0.75A	1.2MHz	MLF-8 (2mm x 2mm)	Internal Schottky, OVP.
MIC2295	2.5V to 10V	Adj. to 34V	1.2A	1.2MHz	TSOT-23-5, MLF-8 (2mm x 2mm)	High-Current, High-Efficiency, OVP.
MIC2296	2.5V to 10V	Adj. to 34V	1.7A	0.6MHz	TSOT-23-5, MLF-8 (2mm x 2mm)	High-Current, High-Efficiency, OVP.
MIC2297	2.5V to 10V	Adj. to 40V	1.2A	0.6MHz	MLF-10 (2mm x 2mm)	High Voltage White LED Driver, OVP.
MIC2298	2.5V to 10V	Adj. to 15V	4.75A	1.0MHz	MLF-12 (3mm x 3mm)	High Power Photo Flash LED Driver with Torch Mode, OVP.
MIC2299	2.5V to 10V	Adj. to 30V	4.75A	2.0MHz	MLF-12 (3mm x 3mm)	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 (2mm x 2mm)	Enable Pin/SS/ Low Shutdown Current.
MIC2605/6	4.5V to 20V	Adj. to 40V	0.5A	1.2/2MHz	MLF-8 (2mm x 2mm)	Enable Pin/SS/ Low Shutdown Current. Integrated Schottky.
MIC3172	3V to 40V	Adj. to 34V	2.25A	100kHz	SOIC-8, PDIP-8	Enable Pin.

High Voltage Selection Guide

Boost Controllers (External Switches)

Device	V_{IN} Range	V_{OUT}	I_{SW}[1] (Avg)(Max)	Efficiency (Typ)	I_Q (Typ)	Shutdown I_Q (Typ)	Frequency	Package(s)	Comments
MIC2184	2.9V to 16V	Adj.	External P-FET, 1A to 10A	90%	600µA	0.5µA	200/400kHz	SOIC-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 Boost Controllers (External Switches)

MIC2185	2.9V to 14V	Adj.	External N-FET/P-FET, 1A to 10A	95%	600µA	0.5µA	400kHz	SOIC-8	High Efficiency.

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

Device	V_{IN} Range	Gate Drive	V_{START}	V_{STOP}	Start-Up Current (Max)	Duty Cycle (Max)	Topology	Frequency	Package(s)	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, -14	
MIC38C43A(1)	9V to 20V	0.5A	14.5V	9.0V	200µA	96%	Forward/Flyback	Adj. to 500kHz	SOIC-8, -14	
MIC38C44A(1)	15.5V to 20V	0.5A	14.5V	9.0V	200µA	50%	Forward/Flyback	Adj. to 500kHz	SOIC-8, -14	
MIC38C45A(1)	9V to 20V	0.5A	14.5V	9.0V	200µA	50%	Forward/Flyback	Adj. to 500kHz	SOIC-8, -14	

1. Recommended for new designs.

FPGA Specific Solutions

Device	V_{IN} Range	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package(s)	Comments
MIC4685	4V to 30V	Adj.	3A	200kHz	SPAK-7	33% Smaller Than TO-263 (D2PAK).

Low Voltage 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

LDO Regulators

Single Outputs

Device	I_{OUT}	V_{IN}	I_{GND} V_{OUT}	$V_{DROPOUT}$ (Typ.)	(Typ.)	Package	Comments	µCaP
MIC5232	10mA	2.7V to 5.5V	1.2, 2.8, 3.3	1.8µA	100mV	TSOT-23-5, MLF® (2mm x 2mm)	Ultra Low IQ µCap 10mA LDO with Reverse Current 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
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® (2mm x 2mm), T/SOT		Yes
MIC5248	150mA	2.7V to 6V	1.2	85µA	n/a	SOT-23	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® (2mm x 2mm), SOT-23	Low Noise LDO.	Yes
MIC5254	150mA	2.7V to 6V	3.3/2.5	117µA	135mV	MSOP	w/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® (2mm x 2mm), TSOT	Low Noise LDO.	Yes
MIC5256	150mA	2.7V to 6V	2.5, 2.6, 2.7, 2.9, 2.8, 2.85, 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	TSOT	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, 2.85, 2.8, 2.9, 3.0, 3.3, 4.6, Adj.	85µA	40mV	Thin MLF®, TSOT23-5, MLF® (1.6mm x 1.6mm)		Yes
MIC5302	150mA	2.3V to 5.5V	1.3, 1.5, 1.8, 2.1, 2.5, 2.85, 2.8, 2.9, 3.0, 3.3, 4.6, Adj.	85µA	50mV	Thin MLF®, (1.2mm x 1.6mm)	Ultra-small	Yes
MIC5304	150mA	2.3V to 5.5V	3.15/1.85	24µA	85mV	Thin MLF®, (1.6mm x 1.6mm)	Single 150mA Micro Power ULDO™ with Voltage Select Pin	Yes
MIC5305	150mA	2.25V to 5.5V	1.5, 1.8, 2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3.0, 3.3, 4.75, Adj.	90µA	60mV	MLF® (2mm x 2mm), TSOT, Thin MLF®	High PSRR Low Noise ULDO™.	Yes
MIC5306	150mA	2.25V to 5.5V	1.5, 1.8, 2.7, 2.8, 3.0, 3.1, 3.3	16µA	120mV	TSOT, MLF® (2mm x 2mm)	Low IQ, 150mA ULDO™.	Yes
MIC5308	150mA	1.6V to 5.5V	1.0, 1.2, 1.3, 1.5, Adj.	23µA	50mV	TSOT-23-6, MLF® (1.6mm x 1.6mm)	Low VIN/VOUT with Ultra-low IQ.	
MIC5365	150mA	2.5V to 5.5V	1.0, 1.2, 1.3, 1.5, 1.8, 2.0, 2.4, 2.5, 2.6, 2.8, 3.0, 3.3	32µA	180mV	Thin MLF® (1mm x 1mm), SC-70	Ultra-small Single 150mA ULDO™	Yes
MIC5366	150mA	2.5V to 5.5V	1.0, 1.2, 1.3, 1.5, 1.8, 2.0, 2.4, 2.5, 2.6, 2.8, 3.0, 3.3	32µA	180mV	Thin MLF® (1mm x 1mm), SC-70	Ultra-small Single 150mA ULDO™ with Auto Discharge	Yes
MIC5309	300mA	1.7V to 5.5V	1.0, 1.2, 1.3, 1.5, Adj.	23µA	100mV	TSOT-23-6, MLF® (1.6mm x 1.6mm)	Low VIN/VOUT with Ultra-low IQ.	
MIC5303	300mA	2.3V to 5.5V	1.3, 1.5, 1.8, 2.1, 2.5, 2.85, 2.8, 2.9, 3.0, 3.3, 4.6, Adj.	85µA	100mV	Thin MLF® (1.2mm x 1.6mm)	High IOUT, ultra-small.	Yes
MIC5307	300mA	2.4V to 5.5V	2.8, 3.0. Adj.	20µA	120mV	MLF® (1.6mm x 1.6mm), TSOT-23	Ultra-low IQ, 300mA ULDO™.	Yes
MIC5318	300mA	2.3V to 6.0V	2.8, 2.85, Adj.	85µA	100mV	Thin MLF® (1.6mm x 1.6mm), TSOT-23	High VIN.	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, 2.5, 2.8, 2.85, 3.0, 3.3	90µA	300mV	MLF® (2mm x 2mm), TSOT	High PSRR Low Noise LDO.	Yes
MIC5325	400mA	1.7V to 5.5V	1.2,1.5,1.8, Adj.	35µA	110mV	Thin MLF® (2mm x 2mm)	Single 400mA ULDO™. Pin Compatible to LTC3025.	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® (2mm x 2mm), TSOT	ULDO™ High PSRR.	Yes

Low Voltage Selection Guide

Single Outputs

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	300mV	P-MSOP	Wide VIN 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	w/EN and Error Flag.	Yes
MIC37102	1A	2.25V to 6V	Adj.	400µA	280mV	P-SOIC, SPAK		Yes
MIC47100	1A	1.0V to 3.6V	0.8, 1.0, 1.2, Adj.	350µA	80mV	MLF® (2mm x 2mm), eMSOP-8		
MIC69101	1A	1.65V to 5.5V	1.8	12mA	500mV	MLF® (3mm x 3mm), P-MSOP-8	Ultra-small 1A LDO. Single Supply Operation.	
MIC69103	1A	1.65V to 5.5V	Adj.	12mA	500mV	MLF® (3mm x 3mm), P-MSOP-8	Ultra-small 1A LDO. Single Supply Operation.	
MIC37139	1.5A	2.25V to 6V	1.8	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	w/EN and Error Flag.	Yes
MIC37152	1.5A	2.25V to 6V	Adj	17mA	325mV	SPAK		Yes
MIC37153	1.5A	2.25V to 6V	Adj	17mA	325mV	eSOIC	w/EN and Error Flag.	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 VIN LDO.	Yes
MIC69151	1.5A	1.65V to 5.5V	1.8	22mA	500mV	MLF® (3mm x 3mm), eSOIC-8	Single Supply Operation.	
MIC69153	1.5A	1.65V to 5.5V	Adj.	22mA	500mV	MLF® (3mm x 3mm), eSOIC-8	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® (3mm x 3mm)	Tracking & Ramp Control.	Yes
MIC37252	2.5A	3.0V to 6V	Adj.	40mA	550mV	SPAK, TO-263	Low Voltage µCap LDO.	
MIC37253	2.5A	3.0V to 6V	Adj.	40mA	600mV	eSOIC	w/EN and Error Flag.	
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	w/EN and Error Flag.	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 VIN LDO.	Yes
MIC69301	3A	1.65V to 5.5V	1.0, 1.2, 1.8	40mA	275mV	SPAK, eSOIC	Low Voltage Single Input Supply.	Yes
MIC69302	3A	1.65V to 5.5V	Adj.	40mA	275mV	SPAK, eSOIC	Low Voltage Single Input Supply.	Yes
MIC68400	4A	1.65V to 5.5V	0.8, 1.0, 1.2, 1.5, 1.8, 2.5, Adj.	18mA	300mV	TSSOP, MLF® (4mm x 4mm)	Tracking and Ramp Control.	Yes
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
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

Multiple Outputs, DUAL

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC5310	150/150mA	3.3/5.0, 3.6, 5.0, 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® (2mm x 2mm)	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	MLF® (1.6mm x 1.6mm) TSOT-06	Tiny ULDO™ • Dual Enable	Yes

Multiple Outputs, DUAL

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC5321	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	MLF® (1.6mm x 1.6mm) TSOT-6	Tiny ULDO™ • High PSRR • Common Enable • Bypass Pin	Yes
MIC5322	150/150mA	2.5V 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® (1.6mm x 1.6mm)	Tiny ULDO™ • High PSRR • Common Active Low Enable • Bypass	Yes
MIC5370	150/150mA	2.5V 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, 2.85/1.85, 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,	49µA	190mV	Thin MLF® (1.6mm x 1.6mm)	General Pupose Dual 150mA LDO.	Yes
MIC5371	150/150mA	2.5V 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, 2.85/1.85, 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,	49µA	190mV	Thin MLF® (1.6mm x 1.6mm)	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, 2.85/1.52.85/1.8, 2.85/2.85, 2.9/2.6, 3.0/1.8, 3.0/2.5, 3.0/2.8, 3.0/3.0, 3.3/3.3	75µA	210mV	MLF® (2.5mm x 2.5mm)	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® (3mm x 3mm)	LDO w/Driver & Error Flag.	
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® (3mm x 3mm)	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, 1.8/3.0, 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	48µA	120mV	MLF® (3mm x 3mm)	LDO w/POR.	Yes
MIC2213	150/300mA	2.25V to 5.5V	1.8/2.85, 1.8/3.3, 2.5/3.3, Adj/Adj.	48µA	120mV	MLF® (3mm x 3mm)	Sequenced w/POR & 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® (3mm x 3mm)	LDO w/POR & LED Driver.	Yes
MIC2219	150/300mA	2.25V to 5.5V	3.0/3.3	48µA	120mV	MLF® (3mm x 3mm)	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® (3mm x 3mm)	LowQ® Mode (7µA).	Yes
MIC5312	300/300mA	2.5V to 5.5V	1.8/2.8, 1.8/3.0, 1.85/2.6, 2.8/2.8, 2.85/2.85	28µA	120mV	MLF® (3mm x 3mm)	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® (2mm x 2mm)	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® (2.5mm x 2.5mm)	Dual 300mA Low V_{IN}/Low V_{OUT} LDO with POR and CSET.	Yes
MIC5315	300/300mA	1.7V to 5.5V	1.5/1.0,1.5/1.1,1.5/1.2,1.5/1.3,1.5/1.4,1.5/1.5, 1.8/1.2,1.8/1.8	37µA	85mV	Thin MLF® (2mm x 2mm)	Dual 300mA Low V_{IN}/Low V_{OUT} LDO with Voltage Scaling.	Yes
MIC5316	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® (2.5mm x 2.5mm)	Dual 300mA Low V_{IN}/Low V_{OUT} LDO with POR, CSET and Voltage Scaling.	Yes
MIC5330	300/300mA	2.3V to 5.5V	1.8/1.5, 1.8/1.5, 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	75mV	MLF® (2mm x 2mm)	Tiny ULDO™ • Dual Enable • High PSRR	Yes
MIC5331	300/300mA		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® (2x2mm)	Dual Micro Power 300mA ULDO™	Yes

Low Voltage Selection Guide

Multiple Outputs, DUAL

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC5332	300/300mA		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® (2mm x 2mm)	Dual Micro Power 300mA ULDO™ with POR and CSET	Yes
MIC5333	300/300mA		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® (2.5 x 2.5mm)	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,	75µA	75mV	Thin MLF® (1.6mm x 1.6mm)	High I_{OUT}, Ultra-small.	Yes
MIC5212	500/500mA	4.0V to 16V	3.3/2.5	1.5mA	350mV	SOIC	Small, High-Current Dual.	
MIC68220	2A/2A	1.65V to 5.5V	Adj./Adj.	15mA	300mV	MLF® (4mm x 5mm)	Trading and Ramp Control.	Yes

Multiple Outputs, TRIPLE

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,	110µA/LDO	170mV	MLF® (4mm x 4mm)	Triple High PSRR µCap LDO.	Yes

LDO Controllers (N- and P-Channel), and DDR Terminators

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments
MIC5159	—	1.65V to 5.5V	1.8, 3.0, Adj.	—	—	SOT-23	Low Input Voltage P-Ch MOSFET.
MIC5162	—	1.35V to 6V	—	—	—	MSOP	DDR Memory Termination.
MIC5190	—	0.9V to 5.5V	Adj. down to 0.5V	17mA	—	MSOP, MLF® (3mm x 3mm)	N-Ch Controller HBW>500kHz.
MIC5191	—	1.0V to 5.5V	Adj. down to 1.0V	17mA	—	MSOP, MLF® (3mm x 3mm)	N-Ch Controller HBW>500kHz.

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

Integrated/Ease of Use Solutions

HELDO™ (High-Efficiency LDO)

Device	I_{OUT}	V_{IN}	V_{OUT}	Output Noise	Package	Comment
MIC38300	2.2A	3.0V to 5.5V	Adj. to 1V	5mV	MLF® (4mm x 6mm x 0.9mm)	Integrated switcher, LDO, inductor, ultra-low noise. Fast transient response. Ease-of-use.

Synchronous Regulators

Buck Regulators (Internal Switches)

Device	V_{IN} Range	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package(s)	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 (3mm x 3mm)	Ultra-Fast, Ultra-Small.
MIC4723	2.7V to 5.5V	Adj. to 1V	3A	2MHz	MLF-12 (3mm x 3mm), eMSOP-10	Ultra-Fast, Ultra-Small.
MIC4724	6V	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 (3mm x 3mm), eTSSOP-16	Integrated Dual 2A Switcher.
MIC4744	2.9V to 5.5V	Adj. to 0.6V	2A Dual Output	4MHz	MLF-16 (3mm x 3mm), eTSSOP-16	High-efficiency, Integrated Dual 2A Switcher.
MIC2207	2.7V to 5.5V	Adj. to 1V	3A	2MHz	MLF-12 (3mm x 3mm)	Ultra-Fast, Ultra-Small.
MIC4720	2.7V to 5.5V	Adj. to 1V	2A	2MHz	MLF-12 (3mm x 3mm), eMSOP-10	Ultra-Fast, Ultra-Small.
MIC23150	2.7V to 5.5V	1.0V, 1.2V, 1.8V, 3.3V	1.5A	4MHz	MLF® (2mm x 2mm)	PWM Buck Regulator with HyperLight Load™.

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

Synchronous Buck Regulators (Internal Switches)

Device	V_{IN} Range	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package(s)	Comments
MIC2202	2.3V to 5.5V	Adj. to 0.5V	0.6A	2MHz	MSOP-10, MLF-10 (3mm x 3mm)	1µF Ceramic Stable.
MIC2203	2.3V to 5.5V	Adj. to 0.5V	0.3A	1MHz	MSOP-10, MLF-10 (3mm x 3mm)	1µF Ceramic Stable.
MIC2204	2.3V to 5.5V	Adj. to 1V	0.6A	2MHz	MSOP-10, MLF-10 (3mm x 3mm)	Synchronizable to External Clock.
MIC2205	2.7V to 5.5V	Adj.	0.6A	2MHz	MLF-10 (3mm x 3mm)	LowQ® LDO Mode. No Noise at Light Load.
MIC2245	2.7V to 5.5V	Adj.	0.5A	4MHz	MLF-10 (3mm x 3mm)	LowQ® LDO Mode. No Noise at Light Load.
MIC2285A	2.7V to 5.5V	Adj.	0.6A	8MHz	MLF-10 (2mm x 2mm)	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 (3mm x 3mm)	Voltage Scaling in LowQ® Mode.
MIC2224	2.7V to 5.5V	Adj. to 0.3V	0.6A	2MHz	MLF-10 (3mm x 3mm)	DAC Controlled VOUT with Bypass Switch.
MIC22200	2.6V to 5.5V	Adj. to 0.7V	2A	800kHz to 6MHz	MLF-12 (3mm x 3mm)	Sequencing/Tracking Easy Compensation.
MIC22400	2.6V to 5.5V	Adj. to 0.7V	4A	800kHz to 4MHz	MLF-20 (3mm x 4mm), eTSSOP-20	Sequencing/Tracking Easy Compensation.
MIC22600	2.6V to 5.5V	Adj. to 0.7V	6A	1MHz	MLF-24	Sequencing/Tracking Easy Compensation.
MIC23031	2.7V to 5.5V	1.0V, 1.2V, 1.5V, 1.8V, Adj.	0.4A	4MHz	MLF® (1.6mm 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	MLF® (1.6mm x 1.6mm)	PWM Buck Regulator with HyperLight Load™.
MIC23050	2.7V to 5.5V	1.2V, 1.8V, 3.3V	0.6A	4MHz	MLF® (2mm 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® (2mm x 2mm)	PWM Buck Regulator with HyperLight Load™ and Voltage Scaling.
MIC23150	2.7V to 5.5V	1.0V, 1.2V, 1.8V, 3.3V	1.5A	4MHz	MLF® (2mm x 2mm)	PWM Buck Regulator with HyperLight Load™.

Synchronous Buck Regulators (Internal Switches + Internal Inductor)

MIC33050	2.7V to 5.5V	1.2V, 1.8V, 3.3V	0.6A	4MHz	MLF-12 (3mm x 3mm)	4MHz Operation with Internal Chip Inductor.
MIC3385	2.7V to 5.5V	1.5V, Adj.	0.6A	8MHz	MLF-14 (3mm x 3.5mm)	8MHz Operation with Internal Chip Inductor, HyperLight Load™.

Dual Synchronous Buck Regulators (Internal Switches)

MIC4721	2.7V to 5.5V	Adj. to 1V	1.5A	2MHz	MSOP-10	Ultra-Fast Response Internal Compensation.
MIC2238	2.5V to 5.5V	1.2/1.8V, 1.2/1.5V, 1.2/2.5V, 1.2/3.3V, 1.0/1.5V, 1.0/1.8V, 1.0/2.5V, Adj./Adj.	800/800mA	2.5MHz	MLF-12 (3mm 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, 1.2/2.5V, 1.2/3.3V, 2.6/3.3V, Adj./Adj.	400/400mA	4MHz	MLF-10 (2mm x 2mm)	PWM Buck Regulators with HyperLight Load™. Independent Enables.

Buck Controllers (External Switches)

Device	V_{IN} Range	V_{OUT}	I_{SW}[1] (Avg)(Max)	Efficiency (Typ)	I_Q (Typ)	Shutdown I_Q (Typ)	Frequency	Package(s)	Comments
MIC2184	2.9V to 16V	Adj.	External P-FET, 1A to 10A	90%	600µA	0.5µA	200/400kHz	SOIC-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)

MIC2130	8V to 40V	Adj. to 0.7V	External FETs, 15A				150/400kHz	MLF-16, eTSSOP-16	
MIC2131	8V to 40V	Adj. to 0.7V	External FETs, 15A				150/400kHz	MLF-16, eTSSOP-16	Low EMI Frequency Dithering.
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	Small and Super Efficient.
MIC2169A	3V to 14.5V	Adj. to 0.8V	External N-FETs, 15A				500kHz	MSOP-10	Small and Super Efficient; Enable Function.
MIC2159	3V to 14.5V	Adj. to 0.8V	External N-FETs, 20A				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, TSSOP-16	
MIC2183	2.9V to 14V	Adj. to 1.25V	External N- and P-FET, 1A to 10A	95%+	600µA	0.5µA	400/200kHz	MSOP-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 (4mm x 4mm)	
MIC2199	4.5V to 32V	Adj. To 0.8V	External N-FETs, 1A to 20A	95%+	1.6mA	0.1µA	300kHz	MLF-12 (4mm x 4mm)	

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

Low Voltage Selection Guide

Boost Regulators (Internal Switches)

Device	V_{IN} Range	V_{OUT}	I_{SW} (Typ)	Frequency	Package(s)	Comments
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	SOIC-8	Low Input Voltage.
MIC2250	2.5V to 5.5V	Adj. to 32V	2.0A	Up to 2.5MHz	MLF-8 (2mm x 2mm)	High Light Load Efficiency Boost Regulator with low EMI.

Boost Controllers (External Switches)

Device	V_{IN} Range	V_{OUT}	I_{SW}[1] (Avg)(Max)	Efficiency (Typ)	I_Q (Typ)	Shutdown I_Q (Typ)	Frequency	Package(s)	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-8	High Efficiency.

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

Device	V_{IN} Range	Gate Drive	V_{START}	V_{STOP}	Start-Up Current (Max)	Duty Cycle (Max)	Topology	Frequency	Package(s)	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, -14	
MIC38C43A[1]	9V to 20V	0.5A	14.5V	9.0V	200µA	96%	Forward/Flyback	Adj. to 500kHz	SOIC-8, -14	
MIC38C44A[1]	15.5V to 20V	0.5A	14.5V	9.0V	200µA	50%	Forward/Flyback	Adj. to 500kHz	SOIC-8, -14	
MIC38C45A[1]	9V to 20V	0.5A	14.5V	9.0V	200µA	50%	Forward/Flyback	Adj. to 500kHz	SOIC-8, -14	

1. Recommended for new designs.

FPGA Specific Solutions

Device	V_{IN} Range	V_{OUT}	I_{SW}[1] (Avg)(Max)	Frequency	Package(s)	Comments
MIC5162	1.35V to 6V	—	—	—	MSOP	DDR Memory Termination.
MIC22400	2.6V to 5.5V	Adj. to 0.7V	4A	800kHz to 4MHz	MLF-20 (3mm x 4mm), eTSSOP-20	Sequencing/Tracking Easy Compensation.
MIC22600	2.6V to 5.5V	Adj. to 0.7V	6A	1MHz	MLF-24	Sequencing/Tracking Easy Compensation.
MIC23250	2.7V to 5.5V	1.2/1.8V, 1.0/1.2V, 0.9/1.1V, 1.2/1.6V, 1.2/2.5V, 1.2/3.3V, 2.6/3.3V, Adj./Adj.	400/400mA	4MHz	MLF-10 (2mm x 2mm)	PWM Buck Regulators with HyperLight
MIC68220	1.65V to 5.5V	Adj./Adj.	15mA	300mV	MLF® (4mm x 5mm)	Trading and Ramp Control.

Device	I_{OUT}	V_{IN}	V_{OUT}	I_{GND} (Typ.)	$V_{DROPOUT}$ (Typ.)	Package	Comments	µCaP
MIC5365	150mA	2.5V to 5.5V	1.0, 1.2, 1.3, 1.5, 1.8, 2.0, 2.4, 2.5, 2.6, 2.8, 3.0, 3.3	32µA	180mV	Thin MLF® (1mm x 1mm), SC-70	Ultra-small Single 150mA ULDO™	Yes

Switches Selection Guide

Micrel Advantage

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

Power Switches

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-23-6, MLF® (2mm x 2mm)
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-23-6, MLF® (2mm x 2mm)
MIC2005/15	Single	P-Channel	n/a	2.5V to 5.5V	500mA 800mA 1.2A		10mΩ@5V	No	Noninverting	Yes	Yes	Yes	Yes	Yes	SOT-23-6, MLF® (2mm x 2mm)
MIC2005A *New!*	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
MIC2005L *New!*	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® (2mm x 2mm)
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® (2mm x 2mm)
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® (2mm x 2mm)
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® (2mm x 2mm)
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
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, DIP-8
MIC2026-2	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	SOIC-8, DIP-8
MIC2027-1	Quad	N-Channel	Yes	2.7V to 5.5V	500mA		150mΩ@5V	Yes	Noninverting	Yes	Yes	Yes	Yes	Yes	SOIC-16
MIC2027-2	Quad	N-Channel	Yes	2.7V to 5.5V	500mA		150mΩ@5V	Yes	Inverting	Yes	Yes	Yes	Yes	Yes	SOIC-16
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
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
MIC2076-1	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Noninverting	Yes	Yes	Latched	Yes	Yes	SOIC-8, DIP-8
MIC2076-2	Dual	N-Channel	Yes	2.7V to 5.5V	500mA		140mΩ@5V	Yes	Inverting	Yes	Yes	Latched	Yes	Yes	SOIC-8, DIP-8
MIC2077-1	Quad	N-Channel	Yes	2.7V to 5.5V	500mA		150mΩ@5V	Yes	Noninverting	Yes	Yes	Latched	Yes	Yes	SOIC-16
MIC2077-2	Quad	N-Channel	Yes	2.7V to 5.5V	500mA		150mΩ@5V	Yes	Inverting	Yes	Yes	Latched	Yes	Yes	SOIC-16

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

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

High-Side Load Switches

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 (1.2mm x 1.2mm)
MIC94041	Single	1.7V	5.5V	3.0A	28mΩ	250Ω		High True		No	MLF-4 (1.2mm x 1.2mm)
MIC94042	Single	1.7V	5.5V	3.0A	28mΩ		100µs	High True		No	MLF-4 (1.2mm x 1.2mm)
MIC94043	Single	1.7V	5.5V	3.0A	28mΩ	250Ω	100µs	High True		No	MLF-4 (1.2mm 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, TMLF-4 (1.2mm x1.6mm)
MIC94061	Single	1.7V	5.5V	2.0A	77mΩ	200Ω		High True		No	SC-70-6, TMLF-4 (1.2mm x 1.6mm)
MIC94062	Single	1.7V	5.5V	2.0A	77mΩ		800µs	High True		No	SC-70-6, TMLF-4 (1.2mm x 1.6mm)
MIC94063	Single	1.7V	5.5V	2.0A	77mΩ	200Ω	800µs	High True		No	SC-70-6, TMLF-4 (1.2mm x 1.6mm)
MIC94064	Single	1.7V	5.5V	2.0A	77mΩ		115µs	High True		No	SC-70-6, TMLF-4 (1.2mm x 1.6mm)
MIC94065	Single	1.7V	5.5V	2.0A	77mΩ	200Ω	115µs	High True		No	SC-70-6, TMLF-4 (1.2mm x 1.6mm)
MIC94070	Single	1.7V	5.5V	1.2A	120mΩ			High True		No	SC-70-6, TMLF-4 (1.2mm x 1.6mm)
MIC94071	Single	1.7V	5.5V	1.2A	120mΩ	200Ω		High True		No	SC-70-6, TMLF-4 (1.2mm x 1.6mm)
MIC94072	Single	1.7V	5.5V	1.2A	120mΩ		800µs	High True		No	SC-70-6, TMLF-4 (1.2mm x 1.6mm)
MIC94073	Single	1.7V	5.5V	1.2A	120mΩ	200Ω	800µs	High True		No	SC-70-6, TMLF-4 (1.2mm x 1.6mm)
MIC94080	Single	1.7V	5.5V	2.0A	67mΩ			High True		No	TMLF-4 (0.85mm x 0.85mm)
MIC94081	Single	1.7V	5.5V	2.0A	67mΩ	250Ω		High True		No	TMLF-4 (0.85mm x 0.85mm)
MIC94082	Single	1.7V	5.5V	2.0A	67mΩ		800µs	High True		No	TMLF-4 (0.85mm x 0.85mm)
MIC94083	Single	1.7V	5.5V	2.0A	67mΩ	250Ω	800µs	High True		No	TMLF-4 (0.85mm x 0.85mm)
MIC94084	Single	1.7V	5.5V	2.0A	67mΩ		120µs	High True		No	TMLF-4 (0.85mm x 0.85mm)
MIC94085	Single	1.7V	5.5V	2.0A	67mΩ	250Ω	120µs	High True		No	TMLF-4 (0.85mm x 0.85mm)
MIC94090	Single	1.7V	5.5V	1.2A	130mΩ			High True		No	SC-70-6, TMLF-4 (1.2mm x 1.2mm)
MIC94091	Single	1.7V	5.5V	1.2A	130mΩ	250Ω		High True		No	SC-70-6, TMLF-4 (1.2mm x 1.2mm)
MIC94092	Single	1.7V	5.5V	1.2A	130mΩ		790µs	High True		No	SC-70-6, TMLF-4 (1.2mm x 1.2mm)
MIC94093	Single	1.7V	5.5V	1.2A	130mΩ	250Ω	790µs	High True		No	SC-70-6, TMLF-4 (1.2mm x 1.2mm)
MIC94094	Single	1.7V	5.5V	1.2A	130mΩ		120µs	High True		No	SC-70-6, TMLF-4 (1.2mm x 1.2mm)
MIC94095	Single	1.7V	5.5V	1.2A	130mΩ	250Ω	120µs	High True		No	SC-70-6, TMLF-4 (1.2mm 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 (2mm x 2mm)
MIC94067	Dual	1.7V	5.5V	2.0A	85mΩ	200Ω		High True		No	MLF-8 (2mm x 2mm)
MIC94068	Dual	1.7V	5.5V	2.0A	85mΩ		800µs	High True		No	MLF-8 (2mm x 2mm)
MIC94069	Dual	1.7V	5.5V	2.0A	85mΩ	200Ω	800µs	High True		No	MLF-8 (2mm x 2mm)

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-8	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.

MOSFETs

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 1,000pF	up to 100V	SOIC-8, MLF-8 (3mm x 3mm)(1)	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 1,000pF	up to 100V	SOIC-8, MLF-8 (3mm x 3mm)(1)	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 1,000pF	up to 100V	SOIC-8, MLF-8 (3mm x 3mm)(1)	Embedded Anti-Shoot through Protection.
MIC4103	Half-Bridge MOSFET Driver	Dual	Non-Inverting (CMOS)	3A/2A	1.25Ω/2.5Ω	10ns/6ns into 1000pF	27ns into 1,000pF	up to 100V	SOIC-8, MLF-8 (3mm x 3mm)(1)	
MIC4104	Half-Bridge MOSFET Driver	Dual	Non-Inverting (TTL)	3A/2A	1.25Ω/2.5Ω	10ns/6ns into 1000pF	27ns into 1,000pF	up to 100V	SOIC-8, MLF-8 (3mm x 3mm)(1)	
Low-Side Drivers										
MIC4120(2)	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 (3mm x 3mm)	MIC4420 upgrade; Advanced packaging; Higher input voltage; Input pulse down to 50ns.
MIC4123(2)	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 (4mm x 4mm)	MIC4423 upgrade; Advanced packaging; Higher input voltage; Input pulse down to 50ns.
MIC4124(2)	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 (4mm x 4mm)	MIC4424 upgrade; Advanced packaging; Higher input voltage; Input pulse down to 50ns.
MIC4125(2)	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 (4mm x 4mm)	MIC4425 upgrade; Advanced packaging; Higher input voltage; Input pulse down to 50ns.
MIC4126(2)	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 (3mm x 3mm)	MIC4426 upgrade; Advanced packaging; Higher input voltage; Input pulse down to 50ns.
MIC4127(2)	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 (3mm x 3mm)	MIC4427 upgrade; Advanced packaging; Higher input voltage; Input pulse down to 50ns.
MIC4128(2)	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 (3mm x 3mm)	MIC4428 upgrade; Advanced packaging; Higher input voltage; Input pulsedown to 50ns.
MIC4129(2)	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 (3mm x 3mm)	MIC4429 upgrade; Advanced packaging; Higher input voltage; Input pulse down to 50ns.
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	IttyBitty® Device.
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	IttyBitty® Device.
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 (2mm x 2mm), eMSOP-8,	High Speed; small, thermally efficient package.
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 (2mm x 2mm), eMSOP-8,	High Speed; small, thermally efficient package.
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 (2mm x 2mm), eMSOP-8	High Speed; small, thermally efficient package.
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(3)	Drives Hex 6–Hex 7 Size. MOSFET: 1,500pF to 16,000pF; Latch-Up Protected; Input to –5V.
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,	Drives a Hex 6–Hex 7 Size. MOSFET: 1,500pF to 16,000pF; Latch-Up Protected; Input to –5V.
MIC4421 MIC4421A(2)	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	Drives 1,500pF to 47,000pF; Latch-Up Protected; Input to –5V.
MIC4422 MIC4422A(2)	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	Drives 1,500pF to 47,000pF; Latch-Up Protected; Input to –5V.

1. Contact factory for MLF® availability.
2. Recommended for new designs.
3. SMD (military) 5962-8877003PA.

Drivers Selection Guide

MOSFETs

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
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	Drives Hex 4–Hex 5 Size. MOSFET: 6,000pF to 12,000pF; Latch-Up Protected; Input to –5V.
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(5)	Drives a Hex 4–Hex 5 Size. MOSFET: 6,000pF to 12,000pF; Latch-up Protected; Input to –5V.
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, -16 PDIP-8	Drives a Hex 4–Hex 5 Size. MOSFET: 6,000pF to 12,000pF; Latch-up Protected; Input to –5V.
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(6)	Drives a Hex 0–Hex 3 Size. MOSFET: 400pF to 3,000pF; Latch-up Protected; Input to –5V.
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(7)	Drives a Hex 0–Hex 3 Size. MOSFET: 400pF to 3,000pF; Latch-up Protected; Input to –5V.
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(8)	Drives a Hex 0–Hex 3 Size. MOSFET: 400pF to 3,000pF; Latch-up Protected; Input to –5V.
MIC4451 MIC4451A(4)	Low-Side Driver	Single	Inverting	12A	0.8Ω/0.6Ω	20ns/24ns into 15nF	15ns/35ns into 15nF	4.5V to 18V	SOIC-8, PDIP-8, TO-220-5	Drives 1,500pF to 62,000pF; Latch-up Protected; Input to –5V.
MIC4452 MIC4452A(4)	Low-Side Driver	Single	Non-inverting	12A	0.8Ω/0.6Ω	20ns/24ns into 15nF	15ns/35ns into 15nF	4.5V to 18V	SOIC-8, PDIP-8, TO-220-5	Drives 1,500pF to 62,000pF; Latch-up Protected; Input to –5V.
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	Drives a Hex 0–Hex 3 Size. 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	Drives a Hex 0–Hex 3 Size. 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	WSOIC-16, PDIP-14 CerDIP-14(9)	Drives a Hex 0–Hex 3 Size. MOSFET: 400pF to 3,000pF; Latch-up Protected; Input to –5V.

4. Recommended for new designs.
5. SMD (military) 5962-8850305PA.
6. SMD (military) 5962-8850307PA.
7. SMD (military) 5962-8850308PA.
8. SMD (military) 5962-8850309PA.
9. SMD (military) 5962-9459403MCA.

Latched Drivers

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.

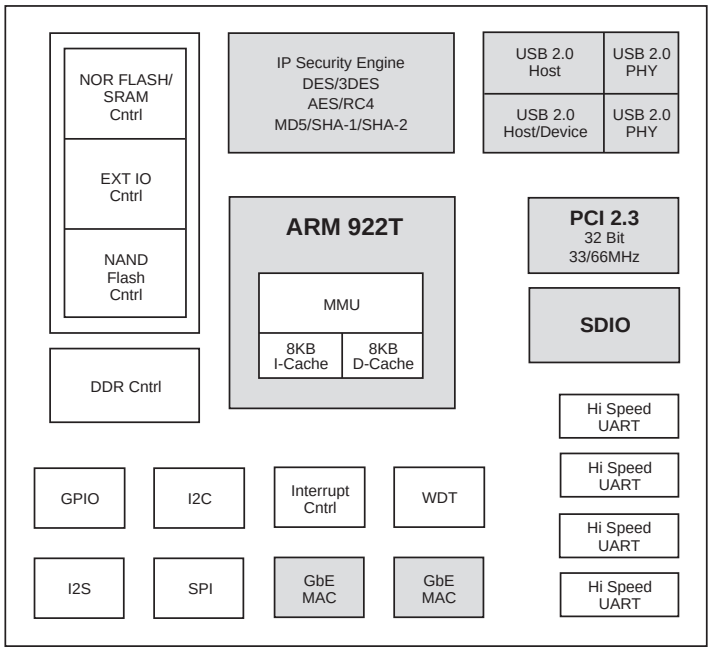
Micrel Advantage

- General Purpose Flexible Design

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

Ethernet Networking ICs

Based on leadership in performance, power, reliability and integration Micrel has established a major position as an Ethernet networking solutions provider. Unique strengths in analog technology, assembly and manufacturing further enable novel solutions for demanding high quality markets. The Company's products are widely used in a variety of applications including voice over IP, wireless access points, residential gateways and industrial. The broad portfolio of field-proven, multi-port products in a variety of packages, include Physical Layer Transceivers (Phys), Switches and System-on-Chip (SoC) ICs with an integrated ARM processor. The products operate over commercial and industrial temperature ranges, and are available in a series of environmentally friendly, lead-free packaging options.



KSZ8692PBI/KSZ9692PBI

The KSZ8692PBI/KSZ9692PBI are highly integrated Gigbit Ethernet System-on-Chip (SoC) containing an ARM 922T 32-bit processor and a rich set of peripherals to address the cost-sensitive, high-performance needs of a wide variety of high bandwidth networking and communications applications.

Features

ARM 922T High-Performance Processor Core

Memory Controller

Ethernet Interfaces

- Two GbE (10/100/1000 Mbps) MACs
- MII or RGMII interfacE

IP Security Engine

- Hardware IPSec Engine guarantees 100Mbps VPN
- Secure Socket Layer Support
- DES/3DES/AES/RC4 Cyphers
- MD-5, SHA-1, SHA-256 Hashing Algorithms
- HMAC
- SSLMAC

PCI Interface

Dual High-Speed USB 2.0 Interfaces

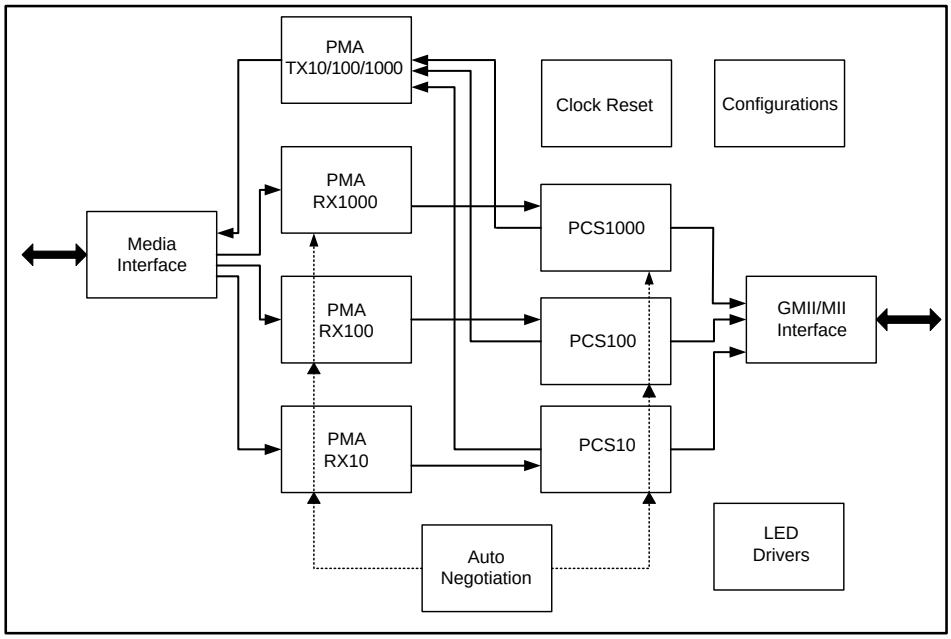
SDIO/SD Host Controller

DMA Controllers

Peripherals

- Four high-speed UART ports up to 5Mbps
- Two programmable 32-bit timers with watchdog timer capability
- Interrupt Controller
- Twenty GPIO ports
- One shared SPI/I2C interface
- One I2S port

Ethernet Product Highlight — KSZ9021GQI/RLI



KSZ9021GQI/RLI

The KSZ9021GQI and KSZ9021RLI are single-port 10/100/1000Base -T Gigabit transceivers, supporting data transfer over standard CAT-5 unshielded twisted pair cable. These devices offer robust performance and low power consumption. On-chip integration of termination resistors and LDO controller, along with built-in diagnostic features, significantly reduces the cost and the complexity of Gigabit Ethernet applications.

Features

10/100/1000Base-T IEEE 802.3 Compliance

- Ensures interoperability with other standard compliant devices

GMII, RGMII, and MII MAC Interfaces

- Flexible MAC interfaces (GMII/MII for KSZ9021GQ and RGMII for KSZ9021RL) support direct connection to MACs in Ethernet processors and switches at various data rates

Integration of a LDO Controller on the Chip

- On-chip termination (eliminating 8 external resistors) not only simplifies PCB design and reduces system BOM, but also improves overall signal integrity and EMII emission

LinkMD® TDR-based Cable Diagnostics

- Bulit-in LinkMD® diagnostics help identification of common cabling problems, including those not addressed by IEEE standards
- Simplifies network deployment and reduces network downtime

Automatic MDI/MDIX Crossover for IEEE 802.3 and EIA/TIA 568 Standards at all Speeds of Operation

- Auto-MDI/MDIX eliminates the need for crossover cable, thus reduces installation costs
- Easy to use

Applications

- Wired/wireless Gigabit SOHO/SMB Routers
- SOHO Media Converters
- Voice-over-Internet Protocol (VoIP) Gateways
- Network Attached Storage
- Laser Printers and Projectors
- GEPON ONU Routers
- Media Converter
- VPN/Firewall-based SMB/SME Routers
- Gigabit Ethernet LAN on Motherboard
- Integrated Broadband CPE (ADSL/VDSL/FTTH) Routers

Ethernet Selection Guide[1]

Micrel Advantage

- Performance
- Power
- Reliability
- Quality
- Integration

Physical Layer Products

Part Number	Description	Package
KSZ8041NLI[2]	3.3V, 10BASE-T/100BASE-TX Physical Layer Transceiver (Industrial version)	MLF-32
KSZ8041TLI	3.3V, 10/100BASE-TX MII/RMII Physical Layer Transceiver (Industrial version)	TQFP-48
KSZ8041FTLI	3.3V, 10/100BASE-TX/FX MII/RMII Physical Layer Transceiver (Industrial version)	TQFP-48
KSZ9021GQI *New!*	Single Gigabit Ethernet Transceiver with GMII/MII (Industrial version)	QFP-128
KSZ9021RLI *New!*	Single Gigabit Ethernet Transceiver with RGMII (Industrial version)	eLQFP-64

Embedded Controllers

Part Number	Description	Package
KSZ8841-PMQLI	Single Port Ethernet MAC Controller with 32b/33MHz PCI Interface (Industrial version)	PQFP-128
KSZ8851-16MLLI	Single Port Ethernet MAC Controller with 8- or 16-bit Generic Bus Interface (Industrial version)	LQFP-64
KSZ8851-32MQLI	Single Port Ethernet MAC Controller with 32-bit PCI Interface (Industrial version)	LQFP-128
KSZ8851-SNLI	Single Port Ethernet MAC Controller with SPI Interface (Industrial version)	QFN-32

Layer 2 Switch Products

Part Number	Description	Package
KSZ8842-16MVLI	3.3V, 2-Port Ethernet Switch Plus 8-, 16-bit Generic Bus Interface (Industrial version)	LQFP-128
KSZ8842-32MVLI	3.3V, 2-Port Ethernet Switch Plus 32-bit Generic Bus Interface (Industrial version)	LQFP-128
KSZ8842-16MBLI	3.3V, 2-Port Ethernet Switch Plus 16-bit Generic Bus Interface (Industrial version)	BGA-100
KSZ8842-32MBLI	3.3V, 2-Port Ethernet Switch Plus 32-bit Generic Bus Interface (Industrial version)	BGA-100
KSZ8842-PMQLI	3.3V, 2-Port Ethernet Switch Plus 32-bit/33MHz PCI Interface (Industrial version)	PQFP-128
KSZ8842-PMBLI	3.3V, 2-Port Ethernet Switch Plus 32-bit/33MHz PCI Interface (Industrial version)	BGA-100
KSZ8893MQLI	3.3V, 3-Port Ethernet Switch (Industrial version)	PQFP-128
KSZ8893MBLI	3.3V, 3-Port Ethernet Switch (Industrial version)	BGA-100
KSZ8893FQLI-FX	3.3V, 3-Port Ethernet Switch with one 100-FX Port (Industrial version)	PQFP-128
KSZ8993MI	3.3V/1.8V, 3-Port 10/100 Integrated Switch (Industrial version)	PQFP-128
KSZ8993MLI	3.3V, 3-Port 10/100 Integrated Switch (Industrial version)	PQFP-128
KSZ8893MQLI	3.3V, 3-Port Ethernet Switch (Industrial version)	PQFP-128
KSZ8995MAI	3.3V/1.8V, 5-Port 10/100 Integrated Managed Switch (Industrial version)	PQFP-128
KSZ8995FQI	3.3V/1.8V, 5-Port 10/100 Integrated Managed Switch with two 100-FX Ports (Industrial version)	PQFP-128
KSZ8999I	3.3V/1.8V, 9-Port 10/100 Integrated Switch (Industrial version)	PQFP-208

System-On-a-Chip

Part Number	Description	Package
KSZ9692PBI *New!*	3.3V/1.2V, Integrated Gigabit Ethernet and Communication Controller with IPSec (Industrial version)	PBGA-400
KSZ8692PBI *New!*	3.3V/1.2V, Integrated 10/100Mbps Ethernet and Communication Controller with IPSec (Industrial version)	PBGA-400
KSZ8695PI	3.3V/1.8V, 5-Port 10/100 Integrated Managed Switch and PHY with 3 PCI Master Support (Industrial version)	PBGA-289

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 Precision Edge® Product Family

Micrel Advantage

- Highest precision, lowest Jitter
  - Internal Termination — Stubless Design
  - MUX Isolation — 70% Crosstalk Noise Improvement
  - Fail-Safe Input — Prevents Metastable Condition
  - Runt Pulse Elimination
- Highest Speed
  - CML
  - LVPECL
  - LVDS
- Smallest Footprint
  - MLF® Package
  - Integration

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. In addition, Micrel's innovative products simplify design, saves board space, lowers power consumption, and reduces cost.

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 *New!*	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 with 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 with 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	MLF-16	Fanout Buffer with Fail-Safe Input.
SY58608U	1:2	ANY	LVDS	2.5V	2	MLF-16	Fanout Buffer with Fail-Safe Input.
SY89112U	2:12	ANY	LVPECL	2.5/3.3V	3	MLF-44	Improved EP111 Replacement.
SY89113U	2:12	ANY	LVDS	2.5V	1	MLF-44	Fanout Buffer.
SY89200U	1:8	ANY	LVDS	2.5V	1.5	MLF-32	3 Banks (÷1, ÷2, ÷4).
SY89202U	1:8	ANY	LVPECL	2.5/3.3V	1.5	MLF-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.
SY10/100E111	1:9	PECL	PECL	5	0.75	PLCC-28	w/ 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	w/ 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	w/ enable
SY100EL14V	1:5	PECL	PECL	3.3/5	0.75	SOIC-20	w/ enable
SY100EL15L	1:4	PECL	PECL	3.3	0.75	SOIC-16	w/ enable
SY100HA643	1:8	ECL	TTL	5/-5	0.75	PLCC-28	w/ enable
SY100S811	1:9	PECL/TTL	PECL	5	0.75	PLCC/SOIC-28	w/ enable
SY100S815	1:4	PECL/TTL	PECL	5	0.75	SOIC-16	w/ enable
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.

Clock Distribution (continued)

Part Number	Fanout	Input	Output	Voltage	Max. Freq. (GHz)	Package	Description
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	MLF-32	RPE, FSI Fanout with 2:1 MUX Input.
SY89843U	2:2 RPE	ANY	LVPECL	2.5/3.3V	1.5	MLF-24	RPE, FSI Fanout with 2:1 MUX Input.
SY89844U	2:2 RPE	ANY	LVDS	2.5V	1.5	MLF-24	RPE, FSI Fanout with 2:1 MUX Input.
SY89464U	2:10 RPE	ANY	LVPECL	2.5/3.3V	2	MLF-44	RPE, FSI Input MUX with 2:1 MUX Input.
SY89465U	2:10 RPE	ANY	LVDS	2.5V	2	MLF-44	RPE, FSI Input MUX with 2:1 MUX Input.
SY89473U	2:2	ANY	LVPECL	2.5/3.3V	3	MLF-24	Fanout Buffer/Translator.
SY89474U	2:2	ANY	LVDS	2.5V	2.5	MLF-24	Fanout Buffer/Translator.
SY89846U	2:5	ANY	LVPECL	2.5/3.3V	1.5	MLF-32	Fanout Buffer with Fail-Safe Input.
SY89847U	2:5	ANY	LVDS	2.5V	1.5	MLF-32	Fanout Buffer with Fail-Safe Input.
SY89850U	1:1	ANY	LVPECL	2.5/3.3V	4	MLF-8	LVPECL Line Driver/Receiver.
SY89851U	1:2	ANY	LVPECL	2.5/3.3V	3	MLF-16	Low Power Fanout Buffer/Trans.
SY89854U	1:4	ANY	LVPECL	2.5/3.3V	3.5	MLF-16	Low Power Fanout Buffer/Trans.
SY89856U	2:6	ANY	LVPECL	2.5/3.3V	3	MLF-32	Low Power Fanout Buffer with 2:1 MUX Input.
SY89858U	1:8	ANY	LVPECL	2.5/3.3V	3	MLF-32	Low Power Fanout Buffer.

Clock Dividers/Generators

Part Number	Fanout Buffer	Input	Output	Voltage	Max. Freq. (GHz)	Package	Description
SY89200U	Y	ANY	LVDS	2.5V	1.5	MLF-32	3 Banks (÷1, ÷2, ÷4) 8 Total.
SY89202U	Y	ANY	LVPECL	2.5/3.3V	1.5	MLF-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	MLF-16	÷3, ÷5 FSI Input.
SY89229U	N	ANY	LVDS	2.5V	1	MLF-16	÷3, ÷5 FSI Input.
SY89230U	N	ANY	LVPECL	2.5/3.3V	3.2	MLF-16	÷3, ÷5.
SY89231U	N	ANY	LVDS	2.5V	3.2	MLF-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
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)

Clock Synthesis

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	MLF-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	MLF-32	Clock Synthesizer with Ultra Low Jitter.

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 *New!*	ANY	CML	1.2/1.8/2.5V	6.4	MLF-32	2x2 Crosspoint Switch with Six Outputs.
SY56040AR *New!*	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.

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 (2mm x 2mm)	Low Voltage CML Translator with Fail-Safe Input.
SY54016AR	ANY	CML	1.2/1.8V	3.2	3.2	MLF-8 (2mm x 2mm)	Low Voltage CML Translator.
SY56016R *New!*	ANY	CML	1.2/1.8/2.5V	6.4	5	MLF-10 (2mm x 2mm)	Differential Line Driver with EQ.
SY56216R *New!*	ANY	CML	1.2/1.8/2.5V	6.4	5	MLF-16 (3mm x 3mm)	Dual Channel EQ Buffer.
SY58016L	CML/PECL	CML	3.3V	10.7	7	MLF-16 (3mm x 3mm)	Differential CML Line Driver/Receiver.
SY58600U	ANY	CML	2.5/3.3V	10.7	7	MLF-8 (2mm x 2mm)	Line/Driver Receiver.
SY58601U	ANY	LVPECL	2.5/3.3V	5	5	MLF-8 (2mm x 2mm)	Line/Driver Receiver.
SY58602U	ANY	RS-LVPECL	2.5/3.3V	10.7	7	MLF-8 (2mm x 2mm)	Line/Driver Receiver with 400mV Output Swing.
SY58603U	ANY	CML	2.5/3.3V	4.25	2.5	MLF-8 (2mm x 2mm)	Line/Driver Receiver with Fail-Safe Input.
SY58604U	ANY	LVPECL	2.5/3.3V	3.2	2.5	MLF-8 (2mm x 2mm)	Line/Driver Receiver with Fail-Safe Input.
SY58605U	ANY	LVDS	2.5V	3.2	2	MLF-8 (2mm x 2mm)	Line/Driver Receiver with Fail-Safe Input.
SY58620L	ANY	CML	3.3V	4.25	2.5	MLF-24 (4mm x 4mm)	Backplane Transceiver.
SY89206V	ECL/PECL	ECL/PECL	3.3/5V	—	1	MLF-8 (2mm 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 (2mm x 2mm)	Receiver/Buffer-10k Comp.
SY89250V	ECL/PECL	ECL/PECL	3.3/5V	—	—	MLF-8 (2mm x 2mm)	Enhanced Differential Receiver.
SY89306V	ECL/PECL	ECL/PECL	3.3/5V	—	2.5	MLF-8 (2mm x 2mm)	Receiver/Buffer-100k Comp.
SY89307V	ECL/PECL	ECL/PECL	3.3/5V	2.5	—	MLF-8 (2mm x 2mm)	Variable Output Swing Differential Receiver.
SY89316V	ECL/PECL	ECL/PECL	3.3/5V	—	2.5	MLF-8 (2mm x 2mm)	Differential Receiver/Buffer-10k Comp.
SY89835U	LVDS	LVDS	2.5V	3.2	2	MLF-8 (2mm x 2mm)	Buffer with Fail-Safe Input.
SY89850U	CML/PECL/LVDS	LVPECL	2.5/3.3V	3.2	4	MLF-8 (2mm 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
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 (2mm x 2mm)	ECL Differential Receiver/Driver
SY100EP16V	ECL/PECL	ECL/PECL	3.3/5V	2.5	4	MLF-8 (2mm x 2mm)	ECL Differential Receiver/Driver

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)	MLF-24	5ps /Step Programmable Delay, Dual Channel.
SY55856U	CML	CML	2.5/3.3V	2.5	TQFP-32	Two Channel Delay Line.
SY10/100E195	PECL	PECL	5V	1.5	PLCC-28	Programmable Delay
SY10/100E196	PECL	PECL	5V	1.5	PLCC-28	Programmable Delay with Fine Tune Control.

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

Registers and Flip-Flops

Part Number	Channel	Voltage	MaxFeq	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 & 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 & 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

Latch

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

Phase-Locked Loop

Part Number	Input	Output	Voltage	Max. Data Rate (Gbps)	Package	Description
SY89420V	Ref.	PECL	3.3/5V	10MHz to 666MHz	PLCC-28	Dual Phase-Locked Loop w/Freq. Doubler Mode.
SY89421V	Ref.	PECL	3.3/5V	10MHz to 666MHz	SOIC-20	High-Performance Phase-Locked Loop.

Multiplexers

Part Number	MUX	Input	Output	Voltage	Frequency (Gbps)	Max. Freq. (GHz)	Package	Description
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	w/ 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	w/ Enable
SY100S863	8:1	PECL	PECL TTL	5			PLCC-28	
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-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.
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.

Translators

Part Number	Input	Output	Voltage	Max. Freq. (GHz)	Package	Single/Dual
SY10/100ELT20V	TTL	PECL	3.3/5	0.75	SOIC-8	Single
SY10/100ELT21	PECL	TTL	5	0.32	SOIC-8	Single
SY10/100ELT21L	PECL	TTL	3.3	0.55	SOIC-8	Single
SY10/100ELT22	TTL	PECL	5	0.75	SOIC-8	Dual
SY10/100ELT22L	TTL	PECL	3.3	0.75	SOIC-8	Dual
SY10/100ELT23	PECL	TTL	5	0.32	SOIC-8	Dual
SY10/100ELT23L	LVPECL	LVTTL	3.3	0.4	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
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 (2mm x 2mm)	Dual
SY89223L	LVPECL	LVTTL	3.3V	0.16	MLF-8 (2mm x 2mm)	Dual
SY89321L	LVPECL	LVTTL	3.3V	0.275	MLF-8 (2mm x 2mm)	Single
SY89322V	LVTTL	LVPECL	3.3/5V	0.8	MLF-8 (2mm x 2mm)	Dual
SY89323L	LVPECL	LVTTL	3.3V	0.275	MLF-8 (2mm x 2mm)	Dual
SY89325V	ANY	LVDS	3.3V	0.750	MLF-8 (2mm x 2mm)	Single
SY89327L	ANY	LVPECL	3.3V	2.5	MLF-8 (2mm x 2mm)	Single
SY89328L	LVPECL/LVTTL	LVTTL/LVPECL	3.3V	0.275	MLF-8 (2mm x 2mm)	Single
SY89329V	LVTTL	LVPECL	3.3/5V	0.8	MLF-8 (2mm x 2mm)	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 (3mm x 3mm)	Single
SY89832U	LVPECL/HSTL/LVDS/CML	LVDS	2.5V	2.5	MLF-16 (3mm x 3mm)	Single
SY89833L	LVPECL/HSTL/LVDS/CML	LVDS	3.3V	2.0	MLF-16 (3mm x 3mm)	Single
SY89834U	LVTTL/CMOS	LVPECL	2.5/3.3V	1.0	MLF-16 (3mm x 3mm)	Single

Backplane and Cable Management Solutions

Part Number	Input	Output	Voltage	Max. Data Rate (Gbps)	Package	Description
SY58620L	ANY	CML	3.3V	4.25	MLF-24	Backplane Transceiver with Integrated Loopback.
SY58621L	ANY	LVPECL/CML	3.3V	3.2	MLF-24	Backplane Transceiver with Integrated Loopback.
SY58626L	ANY	CML	3.3V	6.4	MLF-32	Pre-Emphasis Driver with Integrated Loopback.
SY58627L	ANY	CML	3.3V	6.4	MLF-32	Equalization Receiver with Integrated Loopback.

MLF-8 (2mm x 2mm) Solutions

Part Number	Equivalent	Input	Output	Voltage	Max. Freq. (GHz)	Description
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

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.

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

Fiber Optic Transceiver ICs

Laser Drivers

Part Number	Description	Data Rate (Gbps)	Drive Current (mA)	V_{CC}	Package	Eval. Board
SY88212L	Laser Driver with APC and Power Monitoring	2.5	85	3.3V	MLF-24 (4mm x 4mm)	Yes
SY88216L	Burst Mode Laser Driver	2.5	85	3.3V	MLF-24 (4mm x 4mm)	Yes
SY88422L[4]	Laser Driver with Integrated Bias	4.25	90	3.3V	MLF-16 (3mm x 3mm)	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	MLF-16 (3mm x 3mm)	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	MLF-16 (3mm x 3mm)	n/a
SY88922	SONET/SDH VCSEL Laser Driver	2.5	25	5V	MSOP-10 (3mm x 3mm)	n/a
SY88922V	SONET/SDH VCSEL Laser Driver	2.5	25	3.3/5V	MSOP-10 (3mm x 3mm)	n/a
SY88932L[4]	VCSEL/FP/DFB Laser Driver	4.25	60	3.3V	MLF-16 (3mm x 3mm)	Yes
SY88982L[4]	High-Current, Low Power FP/DFB Laser Driver	2.7	90	3.3V	MLF-16 (3mm x 3mm)	Yes
SY88992L[4]	VCSEL Driver	4.25	25	3.3	MLF-16 (3mm x 3mm)	Yes
SY89307V[4]	Output Swing Differential Receiver—VCSEL Driver	2.125	25	3.3V/5V	MLF-8 (2mm x 2mm)	Yes
SY100EL1001	5V 1.25Gbps Laser Diode Driver with D Flip Flop	1.25	75mA	5V	SOIC-16	n/a
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 (3mm x 3mm), SOIC-8	n/a
SY100EP16VS	Variable Output Swing Differential Receiver	2.5	25	3.3V/5V	MSOP-8 (3mm x 3mm), SOIC-8	n/a

4. To be interfaced with MIC3001/2 controllers.

Optical Transceiver Controllers

Part Number	Description	Package
MIC3001	FOM Management IC with Internal Calibration	MLF-24 (4mm x 4mm)
MIC3002	FOM Management IC with Internal/External Calibration	MLF-24 (4mm x 4mm)

Post Amplifiers

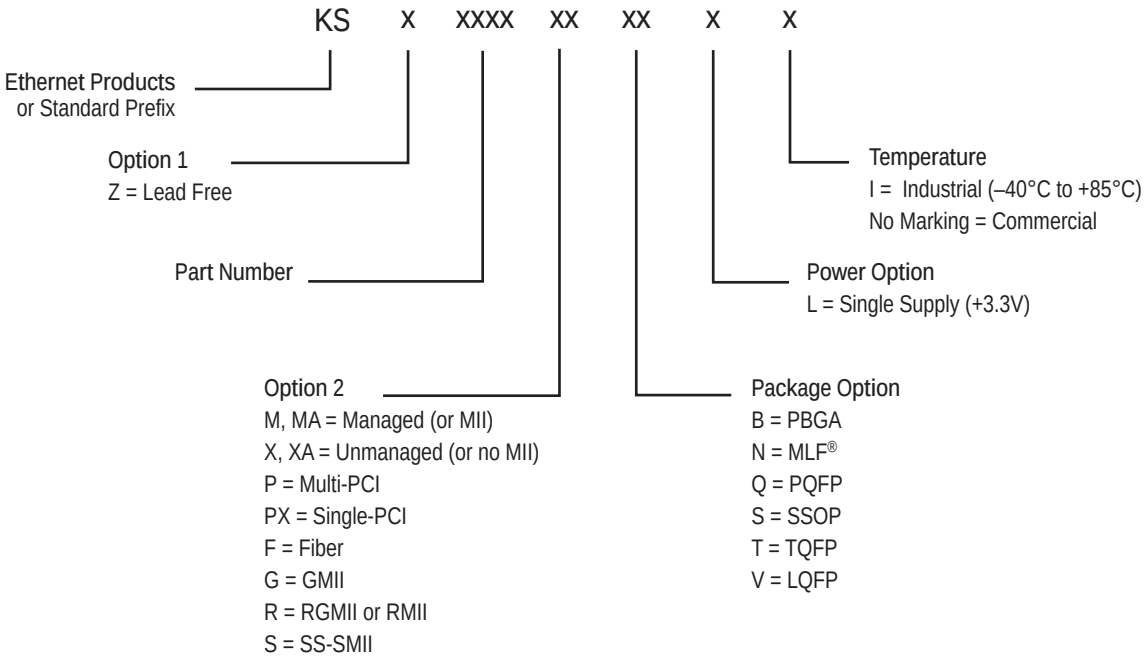
Part Number	Data Rate (Gbps)	V_{CC}	LOS/SD	Input	Output	LOS/SD Gain	RC Time Constant	Hysteresis Typ. (dB)	Package
SY88993AL *New!*	1.25	3.3V	LOS (TTL)	PECL	PECL	1X	1X	5.6	MSOP-10
SY88147DL	1.25	3.3V	LOS (TTL)	PECL	PECL	4X	20X	3.5	MSOP-10
SY88149CL	1.25	3.3V	SD (TTL)	PECL	PECL	4X	1X	3.5	MSOP-10
SY88289AL(1)	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	MLF-16
SY88289CL(1)	3.2	3.3V	LOS (TTL)	PECL	CML	4X	20X	3.5	MLF-16
SY88289HL	3.2	3.3V	LOS (TTL)	PECL	CML	4X	20X	3.5	MLF-16
SY88303BL	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	0.5X	20X	3.5	EPAD-MSOP-10, MLF-16
SY88305BL	3.2	3.3V	SD (TTL)	PECL with internal 50Ω to V_{REF}	CML	0.5X	20X	3.5	EPAD-MSOP-10, MLF-16
SY88307BL	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	PECL	0.5X	20X	3.5	EPAD-MSOP-10, MLF-16
SY88309BL	3.2	3.3V	SD (TTL)	PECL with internal 50Ω to V_{REF}	PECL	0.5X	20X	3.5	EPAD-MSOP-10, MLF-16
SY88313BL	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	EPAD-MSOP-10, MLF-16
SY88315BL	3.2	3.3V	SD (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	EPAD-MSOP-10, MLF-16
SY88343BL	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	4X	20X	3.5	EPAD-MSOP-10, MLF-16
SY88343DL	3.2	3.3V	LOS (TTL)	PECL	CML	4X	20X	3.5	MLF-16
SY88343HL	3.2	3.3V	LOS (TTL)	PECL	CML	4X	20X	3.5	MLF-16
SY88345BL	3.2	3.3V	SD (TTL)	PECL with internal 50Ω to V_{REF}	CML	4X	20X	3.5	EPAD-MSOP-10, MLF-16
SY88347DL	3.2	3.3V	LOS (TTL)	PECL	PECL	4X	20X	3.5	MSOP-10
SY88353BL(2)	3.2	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	MLF-16
SY88403BL	4.25	3.3V	LOS (TTL)	PECL with internal 50Ω to V_{REF}	CML	1X	20X	3.5	EPAD-MSOP-10, MLF-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, MLF-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 , MLF-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
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(2)	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(3)	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. I/O compatible with ADN2891.
2. With Decision Threshold Adjustment: to correct input DC offset and optimize BER performance.
3. The pull-up resistor between LOS output and VCC is external.

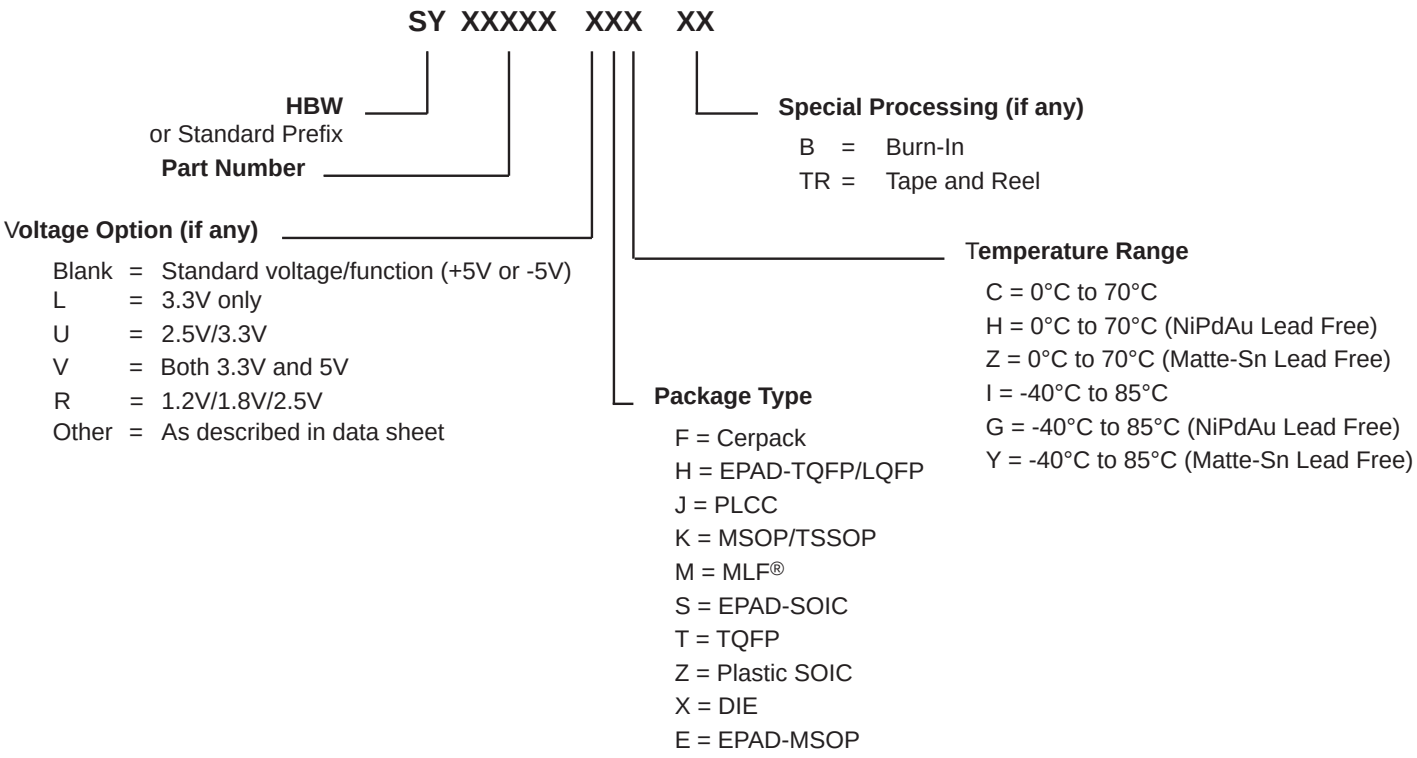
Multiplexer/Demultiplexer

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

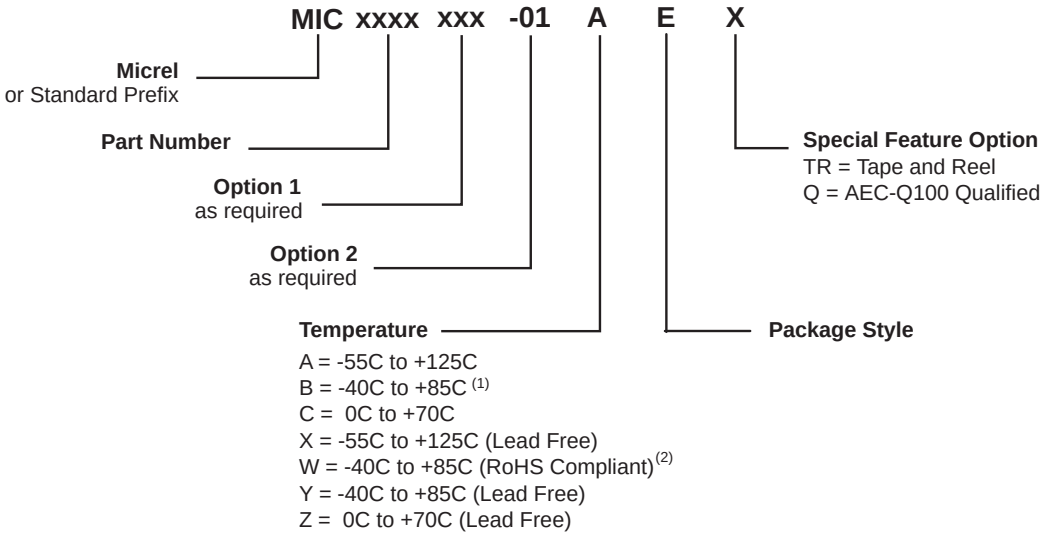


High Bandwidth Part Identification



Analog Part Identification

Micrel Analog Standard

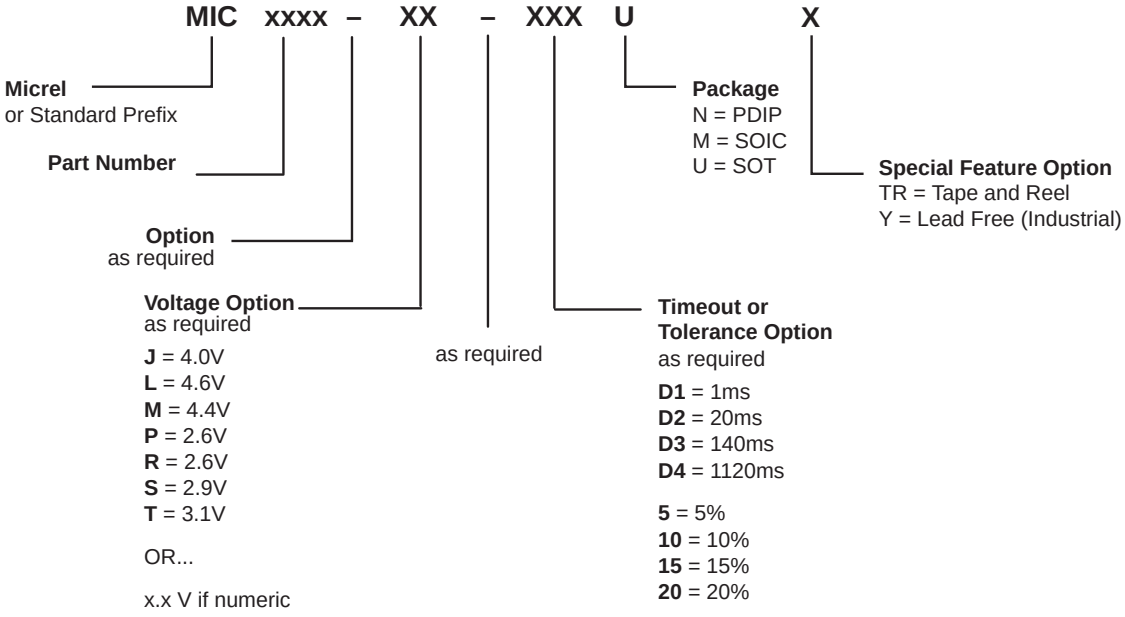


Notes:

1. Typically, industrial grade power products rate the junction temperature up to +125C. 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
C4 = SC70-4
C5 = SC70-5
C6 = SC70-6
D5 = Thin SOT
FL = MLF®
HL = Hybrid MLF®
J = Ceramic DIP
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



Worldwide Representatives and Distributors

Worldwide Sales Offices

Corporate HQ	2180 Fortune Dr.	San Jose, CA 95131 USA	Tel: (408) 944-0800	Fax: (408) 944-0970
Western USA	2180 Fortune Dr.	San Jose, CA 95131 USA	Tel: (408) 944-0800	Fax: (408) 944-0970
Central USA	2425 N. Central Expressway, Suite 351	Richardson, TX 57080 USA	Tel: (972) 393-2533	Fax: (408) 474-1210
Eastern USA	93 Branch St.	Medford, NJ 08055 USA	Tel: (609) 654-0078	Fax: (609) 654-0989
Latin America	2425 N. Central Expressway, Suite 351	Richardson, TX 57080 USA	Tel: (972) 393-2533	Fax: (408) 474-1210
China	Rm 601, Bldg. B, Int'l Chamber of Commerce Mansion, Fuhua Rd. 1, Futian Dist.	Shenzhen, P.R. China 518048	Tel: + 86-755-8302-7618	Fax: + 86-755-8302-7637
Japan	Queen's Tower A 14F, 2-3-1, Minato Mirai, Nishi-Ku, Yokohama-Shi	Kanagawa 220-6014, Japan	Tel: + 81-45-224-6616	Fax: + 81-45-224-6716
Korea	4th Fl., Manzo 2Bldg., 198-47, Gungnae-Dong, Bungdang-Ku	Seongnam-City, Kyungki-do, 463-470 Korea	Tel: 82 (2) 538-2380	Fax: 82 (2) 538-2381
Singapore/India	7500A Beach Road, #07-324 The Plaza	Singapore 199591	Tel: + 65-6291-1318	Fax: + 65-6291-1332
Taiwan	4F, No. 43 Lane 188, Rueiguang Rd., Neihu District	Taipei, Taiwan, R.O.C.	Tel: + 866 (2) 8751-0600	Fax: +866 (2) 8751-0746
France/S. Europe	Les Laurentides – Batiment Ontario, 3, Avenue du Quebec	91140 Villebon sur Yvette, France	Tel: + 33 (0) 1.6092.4193	Fax: + 33 (0) 1.6092.4189
UK/EMEA	1st Floor, 3 Lockside Place, Mill Lane, Newbury, Berks	United Kingdom RG14 5QS	Tel: + 44 (1635) 524455	Fax: + 44 (1635) 524466
Sweden/Nordic	Nackrosvagen 16	169 37 Solna Sweden	Tel: +46 (8) 470 5950	Fax: + 46 (70) 572 7823

U.S. Sales Representatives

Rep.	Southbridge	650 Sun Temple Dr., Suite 101, P.O. Box 1246	Madison, AL 35758	Tel: (256) 461-1990	Fax: (256) 461-4047	www.southbridge.net
Rep.	Thom Luke Sales, Inc.	1048 N. 44th Street, Suite 245	Phoenix, AZ 85008	Tel: (602) 214-0000	Fax: (602) 626-3515	www.thomlukesales.com
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Rep.	Thom Luke Sales, Inc.	9000 E. Nichols Ave., Suite 115	Englewood, CO 80112	Tel: (303) 649-9717	Fax: (303) 649-9719	www.thomlukesales.com
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