

NEW First Factory-Programmable Gain-Amps™ in SOT23

0.1% Accuracy, Optimized Frequency Compensation, and Low Power!

1 Choose the Gain

Gain Code	R _F /R _G Inverting Gain (V/V)	Non-Inverting Gain (V/V)
AB	0.25	1.25
AC	0.5	1.5
AD*	1	2
AE	1.25	2.25
AF	1.5	2.5
AG*	2	3
AH	2.5	3.5
AJ	3	4
AK*	4	5
AL	5	6
AM	6	7
AN	8	9
AO*	9	10
BA*	10	11
BB	12.5	13.5
BC	15	16
BD	20	21
BE*	24	25
BF	25	26
BG	30	31
BH	40	41
BJ*	49	50
BK*	50	51
BL	60	61
BM	80	81
BN*	99	100
CA*	100	101

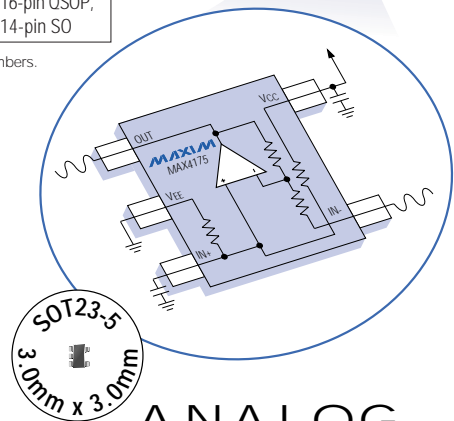
2 Order a Gain Amp

Part	Internal V _{cc} /2 Bias	GBW Product (MHz)	No. of Amps per Pkg	Pin-Package
MAX4174__†	No	2.1 to 23	1	5-pin SOT23
MAX4175__†	Yes	2.1 to 23	1	5-pin SOT23
MAX4274__†	No	2.1 to 23	2	8-pin μMAX/SO
MAX4275__†	Yes	2.1 to 23	2	8-pin μMAX/SO
MAX4281**	No	1.25	1	5-pin SOT23, 8-pin SO
MAX4282**	No	1.25	2	8-pin μMAX/SO
MAX4284**	No	1.25	4	16-pin QSOP, 14-pin SO



†Insert the desired Gain Code into the blanks to complete the part numbers.
 **Future product—contact factory for availability.

- **Rail-to-Rail Output**
- **Internal V_{cc}/2 Bias**
- **0.1% Gain Accuracy**
- **Low 300μA Supply Current**
- **Drives 1kΩ Load**
- **Frequency Compensation Optimized for Higher Gains**



*These gain versions are available as samples and in small quantities.

Maxim's new "Gain-Amps" provide the smallest and simplest possible op amp solution by combining precision-trimmed on-chip resistors and a high-performance Rail-to-Rail® op amp in a SOT23 package. Maxim's proprietary trimming technology trims internal resistors to provide 0.1% gain accuracy, so you won't need to.

The MAX4174/MAX4175/MAX4274/MAX4275 Gain-Amps offer fixed gains of 0.25V/V to 100V/V, as well as internal resistors. The MAX4281/MAX4282/MAX4284 feature an adjustable gain that's unity-gain stable; these devices require external resistors.

Rail-to-Rail is a registered trademark of Nippon Motorola, Ltd.
 Gain-Amp is a trademark of Maxim Integrated Products.

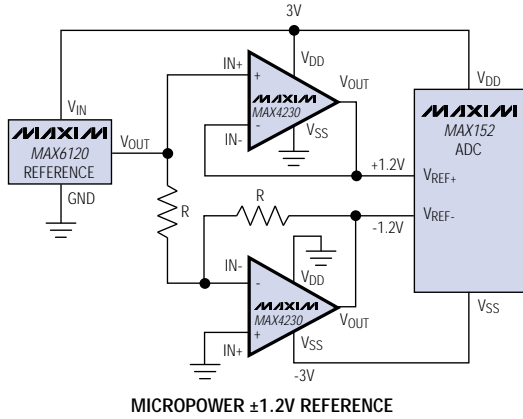
MAXIM is a registered trademark of Maxim Integrated Products. © 1999 Maxim Integrated Products.

1	Multiplexers, Switches, Military
2	Interface Products
3	Op Amps, Comparators
4	DC-DC Converters, Power Supplies
5	μP Supervisory
6	Analog Filters
7	A/D Converters
8	High Speed: Video, Comparators
9	D/A Converters
10	Display Drivers
11	Voltage References
12	3V Analog

FUTURE PRODUCTS

First 7 μ A, Beyond-the-Rails™ Op Amps in SOT23

Perfect for Portable/Battery-Powered Equipment



The MAX4230 op amp family exhibits a superior speed/power ratio, drawing only 7 μ A while delivering up to 240kHz gain bandwidth. These devices operate from a single +2.7V to +5.5V supply with an input common-mode range that extends 100mV Beyond-the-Rails and an output that swings to within 10mV of either rail. Using a proprietary architecture, these devices achieve a very high input common-mode rejection ratio without the mid-swing distortion present in other Rail-to-Rail® op amps. This architecture also maintains high open-loop gain and output swing while driving substantial loads, making these devices ideal choices for portable/battery-powered equipment and other low-power, low-voltage, single-supply applications.



Part	No. of Op Amps per Pkg.	Gain Bandwidth (kHz)	Min Stable Gain (V/V)	Pin-Package
MAX4230*	1	36	1	5-pin SOT23, 8-pin μ MAX/SO
MAX4231*	2	36	1	8-pin μ MAX/SO
MAX4232*	4	36	1	16-pin OSOP, 14-pin SO
MAX4233*	1	240	10	5-pin SOT23, 8-pin μ MAX/SO
MAX4234*	2	240	10	8-pin μ MAX/SO
MAX4235*	4	240	10	16-pin OSOP, 14-pin SO

*Future product—contact factory for availability.
Beyond-the-Rails is a trademark of Maxim Integrated Products.
Rail-to-Rail is a registered trademark of Nippon Motorola, Ltd.

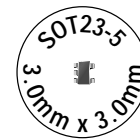
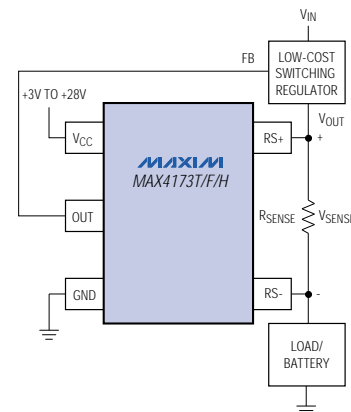
FUTURE PRODUCT

World's Only High-Side Current-Sense Amp in SOT23

Ideal for Closed-Loop Battery Charging

The new low-cost MAX4173T/F/H* (gain of 20/50/100V/V) are the world's first complete high-side current-sense amplifiers available in a space-saving SOT23 package. Ideal for monitoring current in portable equipment, the MAX4173 requires a minimum of external components and doesn't interfere with the circuit's ground path. Its 0 to +28V input common-mode range is independent of the supply voltage and ensures that the current-sense feedback remains accurate even when connected to a 2-cell battery pack in deep discharge. Wide 2MHz bandwidth makes the MAX4173 ideal for closed-loop battery charger applications.

*Future product—contact factory for availability.

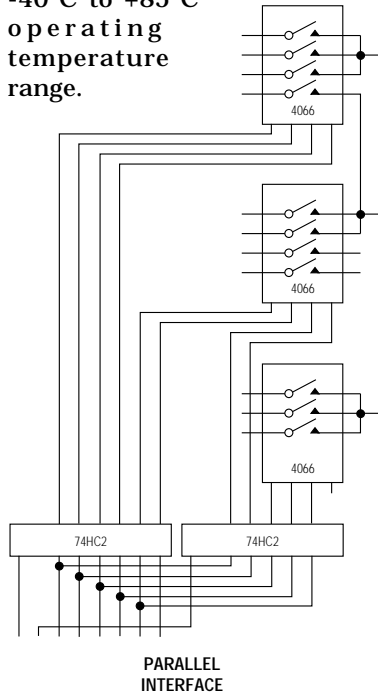


FUTURE PRODUCTS

Serially Controlled, Multipurpose, "Clickless" Audio/Video Switches

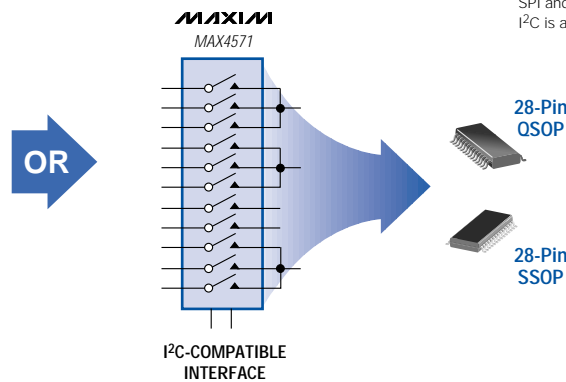
The new MAX4571-MAX4574 are serially interfaced, programmable switch arrays that minimize controller I/O port assignments while maximizing the number of switches per package/pin. They feature a soft switching mode—individually selectable for each switch—that allows "clickless" or standard audio and video operation. These devices are suited for routing multiple signals in audio, video, or industrial equipment. They're available in space-saving 28-pin QSOP and SSOP packages, as well as a wide SO, and are

tested to the -40°C to +85°C operating temperature range.



Part	Serial-Interface Type	Switch Configuration	Supply Voltage (V)	Typical RON (Ω)	Crosstalk and Off-Isolation (dB)	
					Audio (at 10kHz)	Video (at 3.4MHz)
MAX4571*	2-Wire, Fast Mode, I ² C™ Compatible	11 SPST	+2.7 to +5.5	25	-80	-50
MAX4572*	2-Wire, Fast Mode, I ² C™ Compatible	6 SPDT + 2 SPST	+2.7 to +5.5	25	-80	-50
MAX4573*	3-Wire, SPI™/QSPI™ Compatible	11 SPST	+2.7 to +5.5	25	-80	-50
MAX4574*	3-Wire, SPI/QSPI Compatible	6 SPDT + 2 SPST	+2.7 to +5.5	25	-80	-50

*Future product—contact factory for availability. SPI and QSPI are trademarks of Motorola, Inc. I²C is a trademark of Philips Corp.



FUTURE PRODUCTS

Video/RF Muxes Provide 90MHz -3dB Signal Bandwidth

Versatile Muxes Feature Parallel & SPI/Microwire Interface

The new MAX4588*/MAX4589* muxes are designed for switching video and RF signals up to 100MHz in 50Ω and 75Ω systems. The MAX4588 contains eight switches and the MAX4589 contains four. These versatile devices can be configured as either a single-ended or differential mux, and both can be controlled by a parallel or SPI/MICROWIRE™ interface. Each channel is constructed using a "T" switch configuration, ensuring excellent high-frequency off-isolation. Both parts offer ESD protection greater than 2000V per Method 3015.7.

- -80dB Off-Isolation at 10MHz
- > 80dB Crosstalk at 10MHz
- 60Ω max On-Resistance
- Single-Supply Operation: +2.7V to +12V
- Dual-Supply Operation: ±2.7V to ±6V
- Rail-to-Rail, Bidirectional Signal Handling
- Dual Configuration Selection: Single-Ended or Differential
- TTL/CMOS-Compatible Input Control

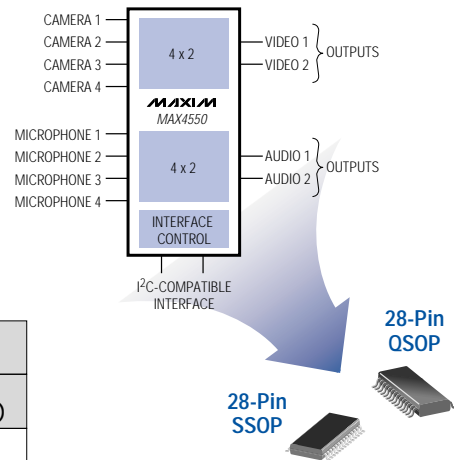
*Future product—contact factory for availability. MICROWIRE is a trademark of National Semiconductor Corp.





Serially Controlled, Dual 4x2, “Clickless” Audio/Video Crosspoint Switches

The new MAX4550/MAX4570 serially interfaced, programmable, dual 4x2 crosspoint switches are ideal for multimedia audio/video applications. These devices have two identical sections, each consisting of a 4-input/2-output crosspoint switch. Each switch can be selectively programmed for hard-mode operation or for soft-mode when “clickless” audio operation is desired. The outputs can be switched to a set of resistor voltage-dividers, to be biased at $\frac{1}{2}V_{CC}$ for AC coupling the inputs. Four auxiliary outputs are provided to extend μP ports, allowing additional circuitry to be controlled from the same 2- or 3-wire interface. SX and SY are additional crosspoint inputs that can be used as a shunt to improve feedthrough. The MAX4550/MAX4570 are available in space-saving 28-pin QSOP and SSOP packages, in addition to a wide SO; they operate in the $-40^{\circ}C$ to $+85^{\circ}C$ temperature range.



Part	Serial-Interface Type	Switch Configuration	Supply Voltage (V)	Crosstalk and Off-Isolation (dB)	
				Audio (at 20kHz)	Video (at 4.2MHz)
MAX4550	2-Wire, Fast Mode, I2C Compatible	Dual 4x2	+2.7 to +5.5, ±2.7 to ±5.5	-95	-55
MAX4570	3-Wire, SPI/QSPI Compatible	Dual 4x2	+2.7 to +5.5, ±2.7 to ±5.5	-95	-55



Cal-Muxes Provide Voltage Reference for System Calibration

Maxim’s newest family of muxes now offers five “cal-mux” versions. These cal-muxes are available with 8-to-1 or dual 4-to-1 functionality and with operating supplies of $\pm 2.7V$ to $\pm 5V$. The MAX4539/MAX4540 offer internal resistors, which set a precision voltage that can be used for calibration or self-monitoring in ADC systems. The simplified MAX4598 does not include resistors, but has all the calibration and system monitoring functions of the other versions. These functions can be accessed in the MAX4598 by asserting the CAL pin along with the ENABLE pin, allowing the three address pins to select among the various functions.

Part	Function	R _{ON} (Ω max)	I _{COM(OFF)} (nA)	R _{ON} Match (Ω max)	R _{ON} Flatness (Ω max)	t _{ON} (ns max)	t _{OFF} (ns max)	Supply Voltage (V)	Internal Voltage Reference	Pin-Package
MAX4539	8-to-1	100	±2	6	10	150	100	±2.7 to ±5	Yes	20-pin SSOP/DIP
MAX4540	Dual 4-to-1	100	±1	6	10	150	100	±2.7 to ±5	Yes	20-pin SSOP/DIP
MAX4598	8-to-1 or Dual 4-to-1	75	±2	8	10	150	100	±2.7 to ±5	No	20-pin SSOP/DIP



Guaranteed 3V Operation, On-Resistance Matching/Flatness, and Low Charge Injection

**Unrivalled Performance at Single-Supply Operation of +2.0V to +16V
and Dual Supplies of ±2.7V to ±8V**

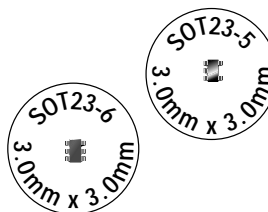
Don't sacrifice performance in your low-voltage system by using switches and muxes that were designed for high-voltage operation and are not tested or specified for low voltages. Maxim offers the broadest family of low-voltage analog switches and muxes in the industry (**now totaling 50 devices**). These products are designed to give the maximum performance at single-supply (+2V to +16V) and dual-supply (±2.7V to ±8V) operation. They are pin-compatible with many of the industry's standard high-voltage parts, and are also available in space-saving packages such as the μ MAX, QSOP, and SOT23.

Choose the Best Switch/Mux for Your 3V Application!

Part	Function	On-Resistance (Ω max)	On-Resistance Match/Flatness (Ω max)	Charge Injection (pC max)	Upgrade for:	Operating Supplies (V)	Pin-Package
SWITCHES							
MAX320/1/2	Dual SPST (NO, NC)	35	2 / 6	5	TSCW66F	±2.7 to ±8	8-pin μ MAX/SO
MAX323/4/5	Dual SPST (NO, NC)	60	2 / 6	5	TSCW66F	+2.7 to +16	8-pin μ MAX/SO
MAX381/3/5	Dual SPST/SPDT/DPST	35	2 / 6	5	DG401/3/5	±2.7 to ±8	16-pin SO/DIP/QSOP
MAX391/2/3	Quad SPST (NO, NC)	35	2 / 6	5	DG411/12/13	±2.7 to ±8	16-pin SO/DIP
MAX394	Quad SPDT	35	2 / 6	5	MAX333	±2.7 to ±8	20-pin SO/DIP/SSOP
MAX395	8 SPST w/Serial Control	100	5 / 10	10	MAX335	±2.7 to ±8	24-pin SO/DIP/SSOP
MAX4066/A	Quad SPST (NO)	45	2 / 6	10	74HC4066	+2 to +16	14-pin SO/DIP/QSOP
MAX4501/2	SPST (NO, NC)	250	–	10	TC7566F	+2 to +12	8-pin SO, 5-pin SOT23
MAX4503/4	SPST (NO, NC)	250	–	10	DG418/17	±2.7 to ±6	8-pin SO, 5-pin SOT23
MAX4514/15	SPST (NO, NC)	20	–	10	TC7566F	+2 to +12	8-pin SO, 5-pin SOT23
MAX4516/17	SPST (NO, NC)	20	–	10	DG418/17	±2.7 to ±6	8-pin SO, 5-pin SOT23
MAX4521/2/3	Quad SPST (NO, NC)	100	4 / 6	5	DG211/212	+2 to +12	16-pin SO/DIP/QSOP
MAX4536/7/8	Quad SPST w/Enable	100	4 / 6	5	74HC4316	±2 to ±6	16-pin SO/DIP/QSOP
MAX4541/2/3	Dual SPST (NO, NC)	35	2 / 6	5	MAX323/4/5	+2 to +12	8-pin μ MAX/SO
MAX4544	SPDT in SOT23	35	2 / 6	5	–	+2 to +12	6-pin SOT23, 8-pin SO
MULTIPLEXERS							
MAX382/384	Dual 4/8-Channel w/Latch	100	10 / 16	5	DG428/429	±2.7 to ±8	18-pin SO/DIP
MAX349/350	Dual 4/8-Channel Serial	100	10 / 16	10	–	±2.7 to ±8	18-pin SO/DIP/SSOP
MAX396/397	Dual 8/16-Channel Parallel	100	6 / 10	5	DG406/407	±2.7 to ±8	28-pin SO/DIP/SSOP
MAX398/399	Dual 4/8-Channel Parallel	100	4 / 10	5	DG408/409	±2.7 to ±8	16-pin SO/DIP/QSOP
MAX4051/2/3	Dual 4/8-Channel Parallel	100	6 / 10	10	74HC4051/2/3	±2.7 to ±8	16-pin SO/DIP/QSOP
MAX4518/19	Dual 4/2-Channel	100	6 / 10	5	–	±2.7 to ±6	14-pin DIP/QSOP
MAX4530/1/2	Dual 4/8-Channel w/Latch	100	6 / 10	10	74HC4351/2/3	±2.7 to ±6	20-pin SO/DIP/SSOP

**Need help selecting the best switch or multiplexer for your application?
Call Maxim's applications engineers today at 1-800-998-9872.**

**A number of
our 3V switches
now come in ultra-small
SOT packages.**



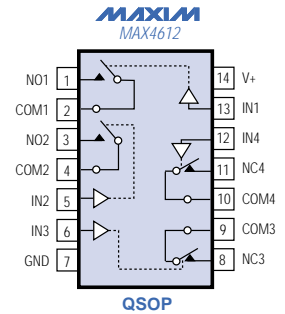
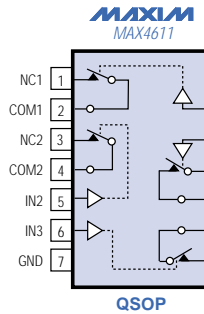
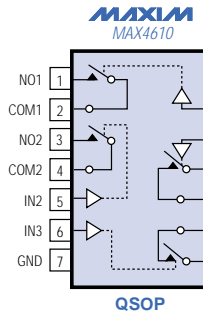
FUTURE
PRODUCTS

80Ω, Quad SPST Switches in QSOP

Improve the Industry Standard

Guaranteed Operation from +2V to +12V

The new MAX4610*/MAX4611*/MAX4612* are low-voltage, quad, single-pole/single-throw (SPST) CMOS switches. The MAX4610's switches are configured as normally open (NO), the MAX4611's switches are configured as normally closed (NC), and the MAX4612 is configured with 2 NO and 2 NC switches. Compare them to the industry-standard '4066, which only offers its switches in the NO configuration. The MAX4610/MAX4611/MAX4612 feature guaranteed operation from +2V to +12V and can handle Rail-to-Rail® bidirectional signals. ESD protection is greater than 2000V per Method 3015.7.



Improvements

- **Guaranteed Supply Operation: +2V to +12V**
- **Guaranteed On-Resistance Matching to 4Ω max**
- **Guaranteed On-Resistance Flatness of 6Ω max**
- **Low THD: 0.02% typical**

Other Features

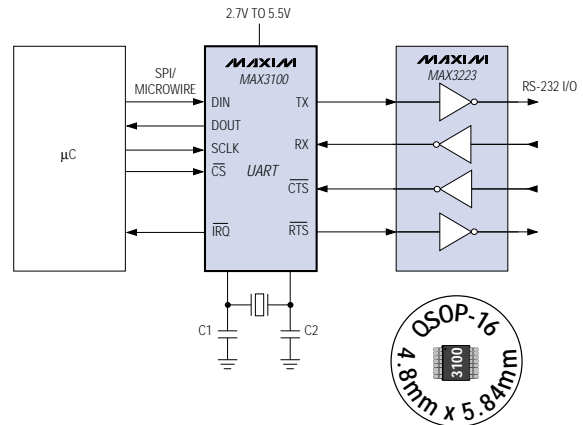
- **Pin-Compatible with Industry-Standard 74HC4066/74HC4066A**
- **Low On-Resistance: 80Ω max**
- **Guaranteed Low Leakage: 1nA at +25°C, 10nA at +85°C**
- **> 2000V ESD per Method 3015.7**

*Future product—contact factory for availability.

World's Smallest UART: QSOP-16

The MAX3100 is the first UART specifically optimized for small microcontroller-based systems. It uses only 0.5mA from a +2.7V to +5.5V supply, communicates with the host μC using an SPI/MICROWIRE interface, and comes in a compact 16-pin QSOP package. It is suitable for use in RS-232/RS-485 data links up to 230kbps. In addition, the MAX3100 supports the IrDA SIR format at 2.4kbps to 115.2kbps.

This full-featured UART includes a crystal oscillator, programmable baud-rate generator, and 8-word receive FIFO. Additional features to support industrial and other non-PC applications include both software- and hardware-invoked shutdown modes and a flexible interrupt structure with four sources, including address recognition on 9-bit networks. Designed for maximum flexibility, parity is under complete software control, and the CTS/RTS hardware-handshaking control lines are directly controlled by register bits as simple I/O lines.

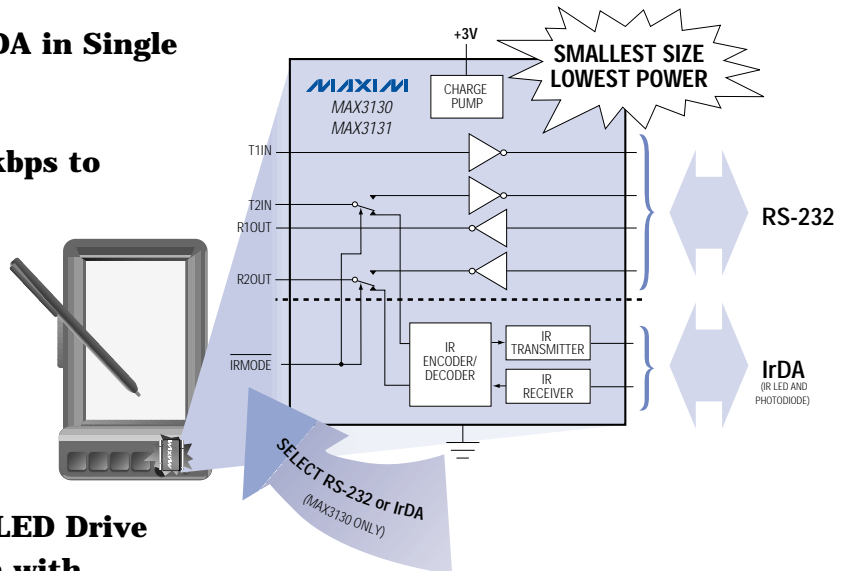




World's First Integrated IrDA/ RS-232 Transceivers Save Space and Battery Life

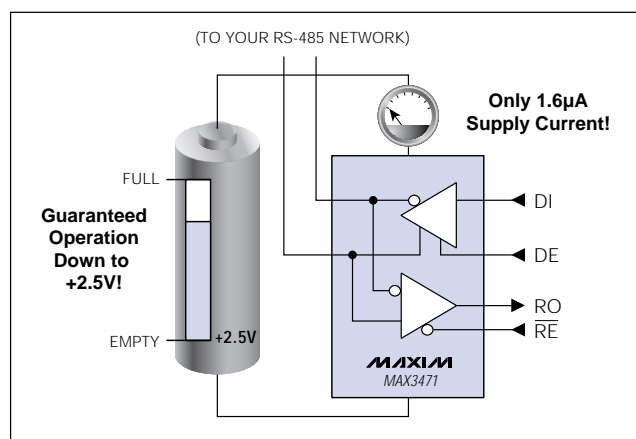
Meet IrDA and EIA/TIA-232 Specifications Down to $V_{CC} = 3V$

- Integrated RS-232 and IrDA in Single 28-Pin SSOP Package
- 370 μ A Supply Current
- IrDA 1.2 Compatible: 2.4kbps to 115.2kbps
- On-Board IR Encoder/Decoder Allows Use of Non-IrDA UARTs
- +3V to +5.5V Single-Supply Operation
- Meets EIA/TIA-232 Specifications Down to $V_{CC} = 3.0V$
- 200mA, High-Current IR LED Drive
- 1 μ A Low-Power Shutdown with RS-232 Receivers Active



World's Lowest Power, Lowest Voltage RS-485 IC: 1.6 μ A, +2.5V Operation!

The Only Solution for Battery-Powered Networks



The MAX3471 is ideal for lithium-battery-powered hand-held and remote sensing applications.

MAX3471:

- 1.6 μ A Operating Supply Current
- +2.5V to +5.5V Operation
- True Fail-Safe Receiver Input
- μ MAX Package (half the size of an 8-pin SO)
- 1/8-Unit-Load Receiver Input



Lowest Power and Highest Speed 3V RS-232 Interface ICs Now Include ±15kV ESD Protection

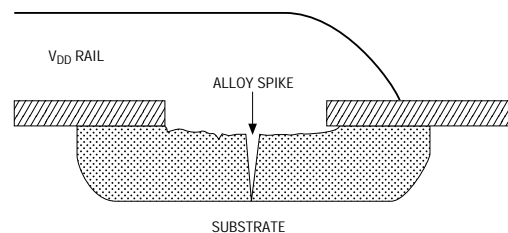
**Use Only 1µA Supply Current and Achieve 1Mbps Operation
with MegaBaud™**

Whenever someone replaces a cable or even touches an I/O port, ESD (electrostatic discharge) can render the port useless by destroying the interface ICs connected to it. These failures result in costly warranty repairs and reduce the perceived quality of a product.

To protect I/O ports from ESD damage, engineers had only one choice: use costly external protection devices, such as TransZorbs™, at a rate of up to 30¢ per line. Recognizing the need for a cost-effective ESD-protection method and anticipating the minimum ESD standard soon to be required by the European Community, Maxim's design engineers developed an ESD structure to meet stringent criteria:

- ESD structures should be transparent during normal operation.
- Devices should comply with all relevant ESD test standards:
 - ±15kV ESD using the Human Body Model
 - ±8kV ESD using IEC 1000-4-2 Contact Discharge
 - ±15kV ESD using IEC 1000-4-2 Air-Gap Discharge
 - ±4kV* using IEC 1000-4-4 Electrical Fast Transient/Burst
- No latchup should occur during an ESD event.

Typical IC Failure Due to ESD



Maxim's "E" series of RS-232 products meets the above criteria.

MegaBaud is a trademark of Maxim Integrated Products.
TransZorb is a trademark of General Semiconductor Industries, Inc.
*Pending completion of testing.

Select the Latchup-Free, ±15kV ESD-Protected, 3V RS-232 IC for Your Design

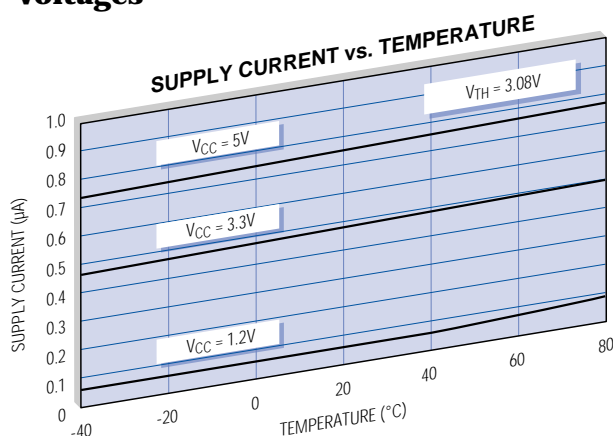
Part	Supply Voltage Range (V)	No. of Tx/Rx	Supply Current (µA)	AutoShutdown Plus	AutoShutdown	±15kV ESD Protection	External Capacitors (µF)	Guaranteed Data Rate (bps)
MAX3241E	+3.0 to +5.5	3/5	300	—	—	Yes	4 x 0.1	250k
MAX3243E	+3.0 to +5.5	3/5	1	—	Yes	Yes	4 x 0.1	250k
MAX3244E	+3.0 to +5.5	3/5	1	Yes	—	Yes	4 x 0.1	250k
MAX3245E	+3.0 to +5.5	3/5	1	Yes	—	Yes	4 x 0.1	1M
MAX3232E	+3.0 to +5.5	2/2	300	—	—	Yes	4 x 0.1	250k
MAX3222E	+3.0 to +5.5	2/2	300	—	—	Yes	4 x 0.1	250k
MAX3223E	+3.0 to +5.5	2/2	1	—	Yes	Yes	4 x 0.1	250k
MAX3224E	+3.0 to +5.5	2/2	1	Yes	—	Yes	4 x 0.1	250k
MAX3225E	+3.0 to +5.5	2/2	1	Yes	—	Yes	4 x 0.1	1M
MAX3221E	+3.0 to +5.5	1/1	1	—	Yes	Yes	4 x 0.1	250k
MAX3226E	+3.0 to +5.5	1/1	1	Yes	—	Yes	4 x 0.1	250k
MAX3227E	+3.0 to +5.5	1/1	1	Yes	—	Yes	4 x 0.1	1M

Monitor 2.5V with the World's Only 500nA SOT Reset ICs!

Perfect for Portable Equipment and Battery-Operated Systems

Save space and extend the battery life of your portable 2.5V/3V/3.3V/5V system with the MAX6326/MAX6327/MAX6328 and MAX6346/MAX6347/MAX6348. These precision power-on reset ICs consume only 500nA supply current over temperature at 3.3V. Reset threshold voltages are available from 2.20V to 4.63V, in approximately 100mV increments.

- 500nA Supply Current (MAX6326/7/8)
- Precision 100ms Timeout Delay
- No External Components Required
- Precision Monitoring of 2.5V/3V/3.3V/5V Power-Supply Voltages
- Low Cost
- Fully Specified Over Temperature
- Guaranteed **RESET** Valid to $V_{CC} = 1V$
- Pin-Compatible with MAX809/MAX810
- 3-Pin SOT23 Package



Part	Active-Low RESET	Active-High RESET	Open-Drain RESET
MAX6326/46	✓		
MAX6327/47		✓	
MAX6328/48			✓

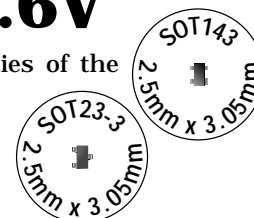
1) Contact factory for minimum order quantities.
 2) Sample quantities are generally held for the following versions:
 MAX632_UR31, MAX632_UR29, MAX632_UR26, MAX632_UR23,
 MAX632_UR22, MAX634_UR46, MAX634_UR44.

FUTURE PRODUCTS

The Only Stand-Alone Reset ICs that Monitor Voltages Down to 1.6V

Maxim's new MAX6332-MAX6337 family of SOT reset ICs extends the capabilities of the industry-standard MAX809-MAX812 to include voltage monitoring down to 1.6V. Simplify the design of your 2-cell DSP system with a precise on-board delay generator that eliminates the need for external components—while using less than 5 μA !

- Trip Thresholds Available from 1.6V to 2.5V, in 100mV Increments
- No External Components Required
- Pin-Compatible with MAX809/MAX810 and MAX811/MAX812
- Three Precise Reset Timeout Periods: 1ms, 20ms, and 100ms
- Available in SOT23 and SOT143 Packages
- Low Cost



Part	Reset Output			Manual RESET Input
	Active-High Push/Pull	Active-Low Push/Pull	Active-Low Open-Drain	
MAX6332*	✓			
MAX6333*		✓		
MAX6334*			✓	
MAX6335*	✓			✓
MAX6336*		✓		✓
MAX6337*			✓	✓

*Future product—contact factory for availability.





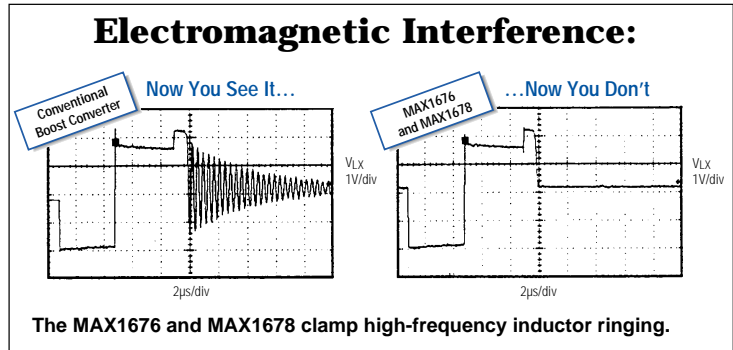
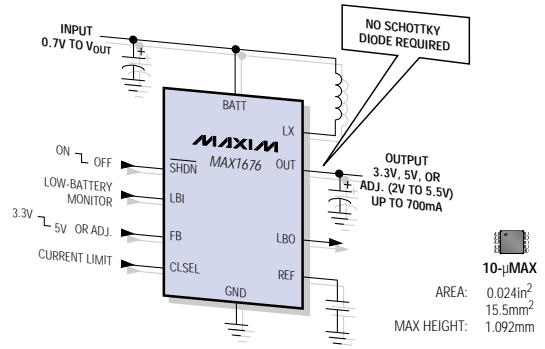
Low-Cost, Low-Noise Step-Ups Reduce EMI in Noise-Sensitive Apps

95% Efficient Regulators Consume Just 16µA and Fit in µMAX

Part	Current Limit (A)	EMI-Damping Circuitry	Pin-Package
MAX1674	1	No	8-pin µMAX
MAX1675	0.5	No	8-pin µMAX
MAX1676	1 or 0.5	Yes	10-pin µMAX

The new MAX1674/MAX1675/MAX1676 are ideal for 1-cell and 2-cell step-up applications. Their internal switches and synchronous rectifier eliminate the need for an external MOSFET switch and Schottky diode, improving efficiency and reducing solution size and cost.

These step-up converters have preset (pin-selectable) outputs of 3.3V or 5V, or are adjustable from 2V to 5.5V using a resistor-divider. The MAX1674 and MAX1675 feature 1A and 500mA switches, respectively, allowing optimization of external component size. The MAX1676 features a pin-selectable current limit (1A or 500mA), as well as circuitry to damp inductor ringing, eliminating a source of EMI in noise-sensitive applications. All three parts are packaged in an ultra-small, 1.1mm-high µMAX.

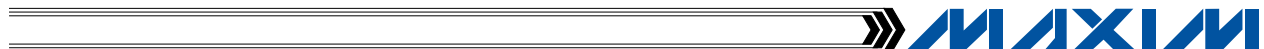
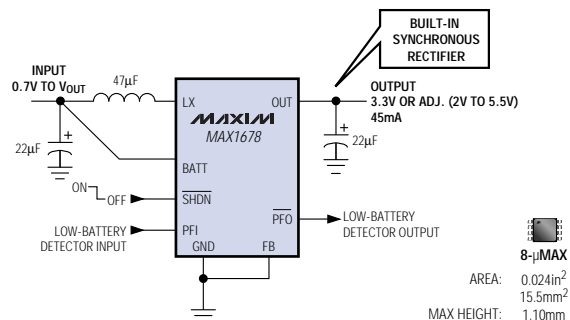


Efficient 1-Cell Boost Converter for Pagers

The MAX1678 is a high-efficiency step-up regulator optimized for low-power 1-cell and 2-cell applications, such as pagers and remote controls. Packaged in an ultra-small 8-pin µMAX package, the MAX1678 requires no external MOSFET switch or Schottky diodes, reducing solution size and cost. Also included is an uncommitted comparator for low-battery detection, and circuitry to eliminate EMI in noise-sensitive applications.

The MAX1678 employs a proprietary constant-peak-current control scheme, which combines the ultra-low quiescent current of traditional PFM converters with high full-load efficiency and low output voltage ripple. Operating from inputs as low as 0.7V, the output voltage may be preset to 3.3V or adjusted between 2V and 5.5V.

- 0.85V Guaranteed Start-Up
- >90% Efficient
- Low-Noise Anti-Ringing Feature
- Built-In Synchronous Rectifier (No External Diode Needed)
- 45mA Output Current (at 3.3V from 1.2V Input)
- 37µA Quiescent Current
- µMAX Package: 1/2 Size of SO-8
- Uncommitted LBI/LBO Comparator
- 2µA Shutdown Mode
- Evaluation Kit Available

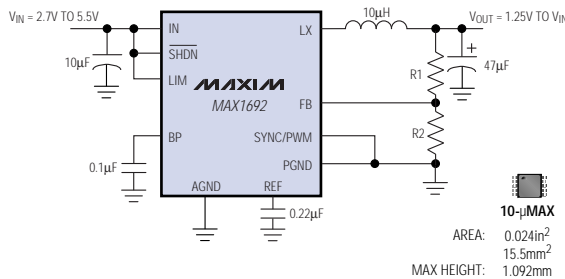


NEW

Low-Voltage, Low-Noise, PWM Step-Down Converters in μ MAX

The MAX1692 is a low-noise, pulse-width-modulated (PWM), DC-DC step-down converter capable of supplying a minimum of 600mA to loads as low as 1.25V. This device features an internal synchronous rectifier to increase efficiency and eliminate the need for an external Schottky diode. Its fixed 750kHz operating frequency permits use of a small inductor and capacitors, while its synchronizable fixed-frequency PWM operation eases postfiltering and steers harmonics away from sensitive IF bands in wireless systems.

The MAX1692's 2.7V to 5.5V input voltage range and low 85 μ A quiescent supply current are ideal for 1-cell Li+ and 2 or 3-cell NiCd applications. Its small size and low output voltage capability make it the perfect choice for providing local power to sub-3V processor cores in otherwise 3V or 5V systems.



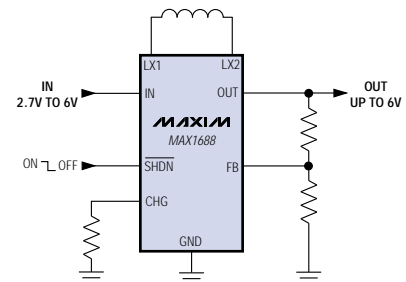
- 2.7V to 5.5V Input Range
- Adjustable Output from 1.25V to V_{IN}
- 600mA Guaranteed Output Current
- High Efficiency
- No Schottky Diode Required
- 85 μ A Quiescent Supply Current
- Duty-Cycle Operation
- 750kHz (or Synchronous) Fixed-Frequency Operation
- Accurate Reference
- Small 10-Pin μ MAX Package

FUTURE PRODUCTS

World's First Boost Converters Optimized for GSM Operation

The MAX1687*/MAX1688* step-up DC-DC converters feature a unique control scheme (patent pending) that's optimized for "burst-load" systems, such as GSM handsets. This scheme accurately controls the recharge rate of the PA's reservoir capacitor by limiting the peak battery current, preventing the large surge currents associated with conventional boost converters in these applications. The MAX1687/MAX1688 operate from a 2.7V to 6V supply and generate an output of up to 6V. Operation at frequencies of up to 1MHz reduces external component size and cost, and a thin 16-pin TSSOP (or 8-pin SO) package makes them the ideal choice for wireless PCMCIA-card applications such as wireless LANs (WLANs) and wireless modems.

The MAX1687 features a precise voltage-controlled current limit, which is set with a single resistor. The MAX1688 features an adaptive constant-recharge-time control scheme that monitors the reservoir capacitor's voltage drop during the PA burst in order to adjust its current limit and ensure the lowest possible peak-battery-current operation. Both parts contain internal synchronous rectifiers to provide excellent efficiency and eliminate the need for an external Schottky diode; they fully disconnect the output from the input during shutdown and replace the P-channel drain switch required with GaAs PAs. Additionally, the MAX1687/MAX1688 may be synchronized to stop switching during the RF burst to reduce transient-induced distortion in the PA.



*Future product—contact factory for availability.

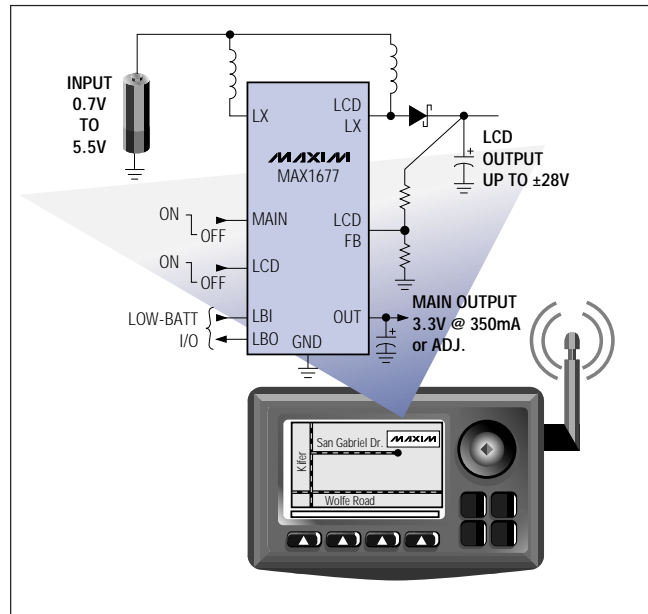


NEW

Highly Integrated Dual-Output Power IC for PDA or GPS

1-Cell or 2-Cell Inputs, Up to 350mA Output Current, 95% Efficiency

The MAX1677 is a compact, high-efficiency, dual-output step-up converter that generates a 3.3V or adjustable (2.5V to 5.5V) main output at up to 350mA. It also generates an adjustable secondary output of up to +28V or -28V for LCD bias. This compact power system for PDAs and GPS receivers requires no external FETs and comes in a 16-pin QSOP package that is the same size as an 8-pin SO. Its synchronous rectification eliminates a Schottky diode and gives the best efficiency (up to 95%), while its low-noise, 300kHz fixed-frequency PWM operation is ideal for wireless applications.



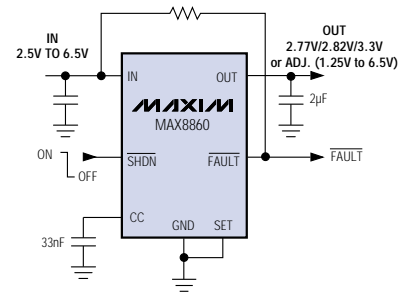
FUTURE PRODUCT

Lowest Dropout Regulator Delivers 300mA

Features FAULT Output in μ MAX Package

The MAX8860* is a low-noise, low-dropout linear regulator featuring a $\overline{\text{FAULT}}$ output that signals when the output is out of regulation. It operates from a 2.5V to 6.5V input range and delivers up to 300mA. The MAX8860's low-resistance PMOS pass element permits quiescent supply currents of just 110 μ A at full load, while reducing the dropout voltage to just 55mV (at 100mA). A small 2 μ F output capacitor reduces the total solution size and cost and minimizes start-up time. This device is ideal for battery-operated portable equipment such as cellular phones and PDAs.

The MAX8860 features Dual-Mode™ operation: the output voltages are preset (at 2.77V for the MAX8860A, 2.82V for the MAX8860B, and 3.3V for the MAX8860C) or are adjustable with an external resistor-divider. Other features include a shutdown mode, short-circuit protection, reverse battery protection, and thermal shutdown. The MAX8860 is available in a space-saving 8-pin μ MAX package, which is half the size of an 8-pin SO.



- **Low Dropout Voltage (55mV at 100mA)**
- **Low Quiescent Current (110 μ A, even in dropout)**
- **Excellent ($\pm 1.5\%$) Output Voltage Accuracy**
- **Low Output Noise (70 μ VRMS)**
- **Accurate $\overline{\text{FAULT}}$ Indicator**
- **10nA Logic-Controlled Shutdown Mode**

- **Excellent Line and Load Regulation**
- **Space-Saving μ MAX Package**
- **Small 2 μ F Output Capacitor**
- **Saves Space and Cost**
- **Minimizes Start-Up Time**
- **Reduces Wasted Charge in Power-Cycled Applications**

Dual-Mode is a trademark of Maxim Integrated Products.
*Future product—contact factory for availability.



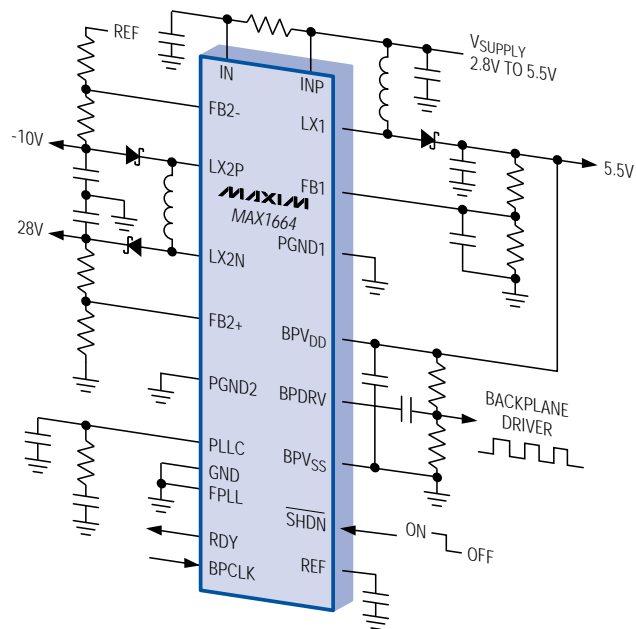
NEW

Highly Integrated Active-Matrix LCD Power Supply

The MAX1664 integrates power-supply and backplane drive circuitry for active-matrix thin-film-transistor (TFT) liquid crystal displays. Included are a single-output, pulse-width-modulation boost converter (0.25Ω switch), a dual-output (positive and negative) gate-driver supply using one inductor, an LCD backplane driver, and a simple phase-locked loop to synchronize all three outputs.

High switching frequency (1MHz nominal) and phase-locked operation allow the use of small, minimum-height external components while maintaining low output noise.

The MAX1664 is supplied in a 20-pin, 1.1mm-high TSSOP package.



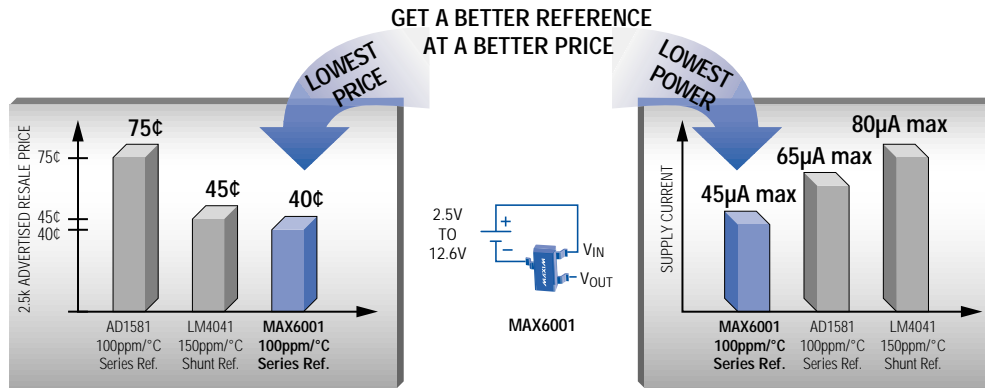
- **Integrates All Active Circuitry for Three DC-DC Converters**
- **Ultra-Small External Components (ceramic capacitors, 2.7μH to 4.7μH inductors)**
- **DC-DC Converters Phase-Locked to Backplane Frequency for Lowest Noise**
- **Operates Down to +2.8V**
- **+2.8V to +5.5V Input Voltage**
- **New TSSOP Package (1.1mm high)**
- **Adjustable Output Voltage from VIN to +5.5V**
- **Load Currents up to 500mA**
- **Adjustable TFT Gate-Driver Supply Voltage**
 - **Positive, VIN to +28V**
 - **Negative, 0 to -10V (-20V with added components)**
- **Includes 0.35Ω Backplane Driver**
- **1μA Shutdown Current**
- **Power-Ready Output Signal**

Our Web Site at <http://www.maxim-ic.com> is the fastest, easiest way to get Maxim data sheets and free samples. Visit it today!



NEW

µPower SOT23 References at Shunt Reference Prices



Save valuable board space by replacing your shunt-mode references that require external resistors. Devices in the MAX6001 family of references are internally compensated—no external capacitor is needed. In addition, these devices further reduce board space by eliminating the need for an external resistor.

- **1% max Initial Accuracy**
- **100ppm/°C max Tempco**
- **Low Dropout: <200mV**
- **45µA max Supply Current**
- **No Output Capacitor Needed**
- **Saves Power Over Shunts**

Part	Output Voltage (V)	Input Voltage (V)	Temperature Range (°C)	Pin-Package	Price† (\$)
MAX6001	1.2	2.5 to 12.6	-40 to +85	3-pin SOT23	0.40
MAX6002	2.5	2.7 to 12.6	-40 to +85	3-pin SOT23	0.40
MAX6003*	3	3.2 to 12.6	-40 to +85	3-pin SOT23	0.40
MAX6004	4.096	4.3 to 12.6	-40 to +85	3-pin SOT23	0.40
MAX6005	5	5.2 to 12.6	-40 to +85	3-pin SOT23	0.40

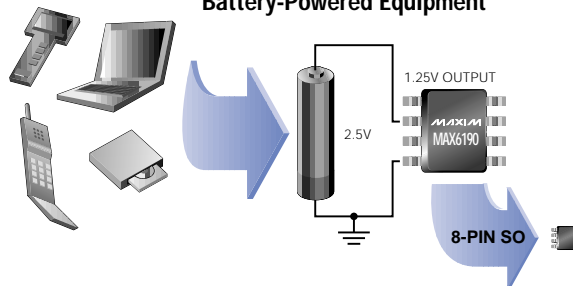
*Future product—contact factory for availability. †2500 pc., factory-direct price, FOB USA.

NEW

Best 1.25V Reference Guarantees 2.5V Operation

Maxim's MAX6190 family of precision, micropower, low-dropout voltage references offers high initial accuracy (0.04%, MAX6195A) and very low temperature coefficients (5ppm/°C). These series-mode bandgap references are internally compensated and draw a maximum of only 35µA quiescent supply current. Supply current is virtually immune to input voltage variations, which translates to longer battery life.

Guaranteed Operation at 2.5V:
Ideal Solution for Precision Battery-Powered Equipment



Part	Output Voltage (V)	Operating Voltage Range (V)	Dropout Voltage (V)	Maximum Tempco (ppm/°C)		
				A Grade	B Grade	C Grade
MAX6190	1.25	2.5 to 12.6	—	5	10	25
MAX6191	2.048	2.5 to 12.6	—	5	10	25
MAX6192	2.5	2.7 to 12.6	0.2	5	10	25
MAX6193	3	3.2 to 12.6	0.2	5	10	25
MAX6198	4.096	4.3 to 12.6	0.2	5	10	25
MAX6194	4.5	4.7 to 12.6	0.2	5	10	25
MAX6195	5	5.2 to 12.6	0.2	5	10	25



NEW

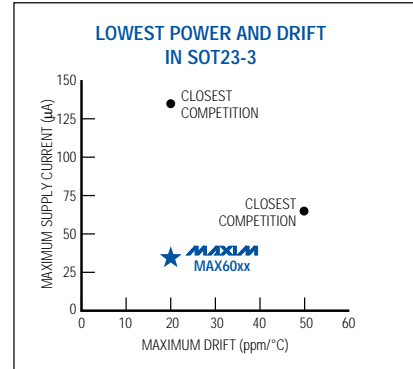
First SOT23 Voltage References to Guarantee 20ppm/°C from Only 35µA



Maxim's new family of precision, low-dropout, micropower voltage references features temperature coefficients of less than 20ppm/°C in 3-pin SOT23 packages. Output voltage options are fixed at 1.25V (MAX6012), 2.048V (MAX6021), 2.5V (MAX6025), 3.0V (MAX6030*), 4.096V (MAX6041), 4.5V (MAX6045), and 5.0V (MAX6050).

The combination of only 35µA max supply current and a 200mV minimum dropout voltage makes these references ideal for battery-operated systems requiring high accuracy. Devices in the MAX6012 family are the first three-terminal references to offer 20ppm/°C max tempco using only 35µA supply current. These parts operate in the -40°C to +85°C temperature range.

*Future product—contact factory for availability.



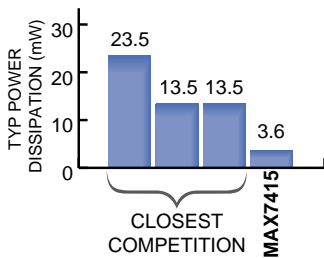
NEW

World's Lowest Power 5th-Order Lowpass Filters Fit in µMAX

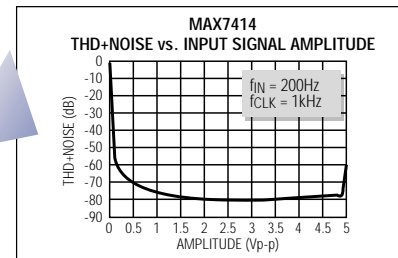
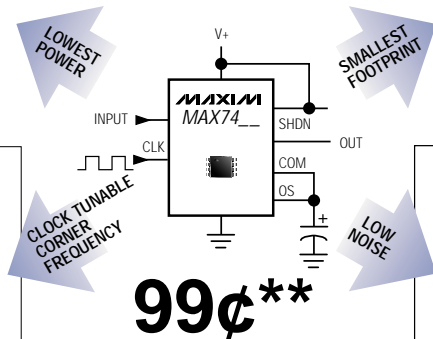
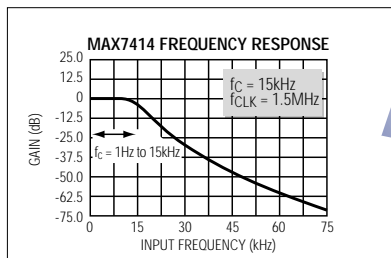
Consume No More than 1.2mA; Priced from Just 99¢**

Ideal for low-power post-DAC filtering and anti-aliasing applications, Maxim's 5th-order, lowpass, switched-capacitor filters consume only 1.2mA (or 0.2µA in shutdown) and are available in 8-pin µMAX and DIP packages. Corner frequencies for the MAX7412–MAX7415 are clock tunable from 1Hz to 15kHz, with either self-clocking or external clocking available.

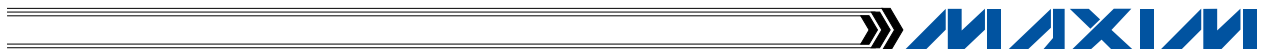
Part	Filter Type	Filter Characteristics
MAX7412	Elliptic	Steep rolloff, 53dB of stopband rejection
MAX7413	Bessel	Linear phase response
MAX7414	Butterworth	Maximally flat passband and stopband response
MAX7415	Elliptic	Steepest rolloff, 37dB of stopband rejection



AVAILABLE IN 8-PIN µMAX PACKAGE
3.0mm x 5.0mm



**100,000 pc., FOB USA.

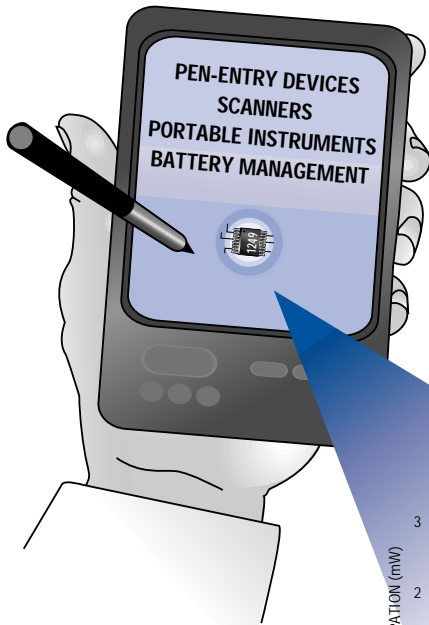


The Most Complete Selection of 3V Serial ADCs for Portable Applications

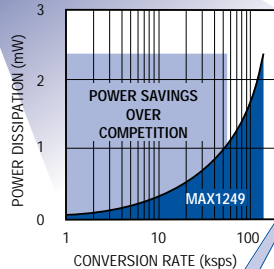
**100µA at 10ksps, 1µA Power-Down—
Ideal for Portable Devices**

The MAX1243 and the MAX1249/MAX148 reduce power requirements in 3V, 10-bit applications. They are the lowest power 3V ADCs available with a 1µA power-down mode. In addition, these 10-bit ADCs are the first to operate down to +2.7V. Other features include a 3-wire serial interface and space-saving packages. The 4-channel MAX1249 comes in a small 16-pin QSOP (about the same area as an 8-pin SO). For portable applications, look to the MAX1243 and the MAX1249/MAX148 for your lowest power, lowest voltage, and smallest size solutions.

Lowest Power
2.7V, 10-Bit
ADCs



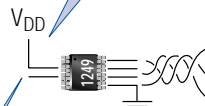
THE MAX1249 OFFERS THE LOWEST POWER 10-BIT SOLUTION



2µA Power-Down Mode for Battery-Powered Systems

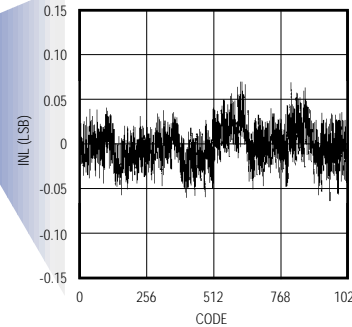
+2.7V to +5.25V Supply

3-Wire Serial Interface, SPI/MICROWIRE Compatible



Small 16-Pin QSOP Package

INTEGRAL NONLINEARITY vs. CODE



Part	Resolution (Bits)	No. of Channels	Reference* (V)	Supply Voltage (V)	Sample Rate (kHz)	Pin-Package	Supply Current (mA)
MAX1108	8	2	Ext/Int, +2.048	+2.7 to +5.5	50	8-pin µMAX	0.25
MAX1111	8	4	Ext/Int, +2.048	+2.7 to +5.5	50	16-pin QSOP	0.25
MAX1110	8	8	Ext/Int, +2.048	+2.7 to +5.5	50	20-pin SSOP	0.25
MAX1243	10	1	Ext	+2.7 to +5.25	73	8-pin SO	0.9
MAX159	10	1	Ext	+2.7 to +5.5	110	8-pin µMAX	1
MAX157	10	2	Ext	+2.7 to +5.5	110	8-pin µMAX	1
MAX1249	10	4	Ext	+2.7 to +5.25	133	16-pin QSOP	0.9
MAX148	10	8	Ext	+2.7 to +5.25	133	20-pin SSOP	0.9
MAX1242	10	1	Int, +2.5	+2.7 to +3.6	73	8-pin SO	1.5
MAX1248	10	4	Int, +2.5	+2.7 to +5.25	133	16-pin QSOP	1.5
MAX149	10	8	Int, +2.5	+2.7 to +3.6	133	20-pin SSOP	1.5
MAX1241	12	1	Ext	+2.7 to +5.25	73	8-pin SO	0.9
MAX145	12	2	Ext	+2.7 to +5.5	110	8-pin µMAX	1
MAX144	12	1	Ext	+2.7 to +5.5	110	8-pin µMAX	1
MAX1247	12	4	Ext	+2.7 to +5.25	133	16-pin QSOP	0.9
MAX147	12	8	Ext	+2.7 to +5.25	133	20-pin SSOP	0.9
MAX1240	12	1	Int, +2.5	+2.7 to +3.6	73	8-pin SO	1.5
MAX1246	12	4	Int, +2.5	+2.7 to +3.6	133	16-pin QSOP	1.5
MAX146	12	8	Int, +2.5	+2.7 to +3.6	133	20-pin SSOP	1.5

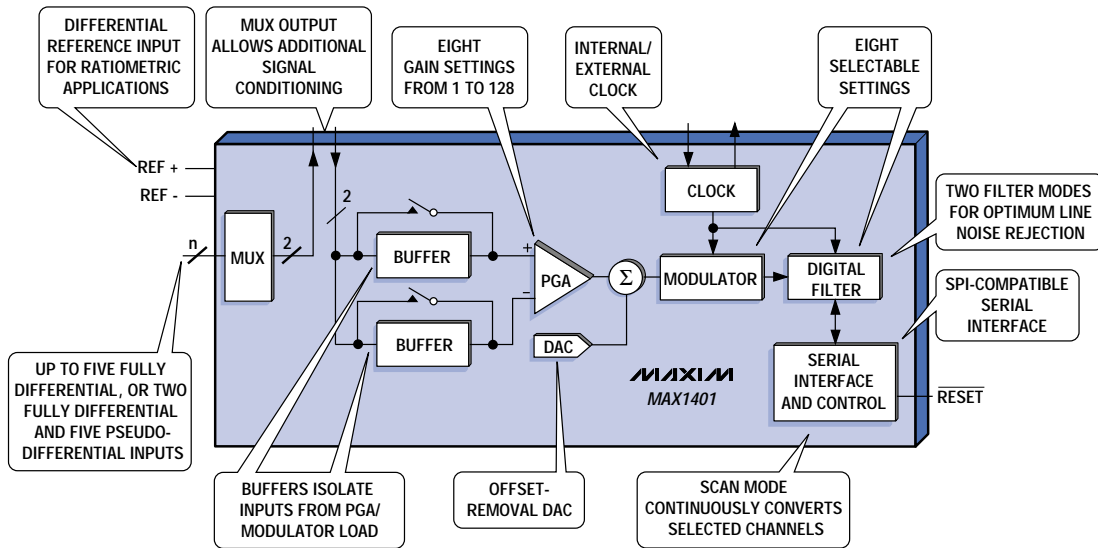
*Ext = External, Int = Internal.

FUTURE PRODUCTS

18-Bit Sigma-Delta ADCs Offer Best INL Performance!

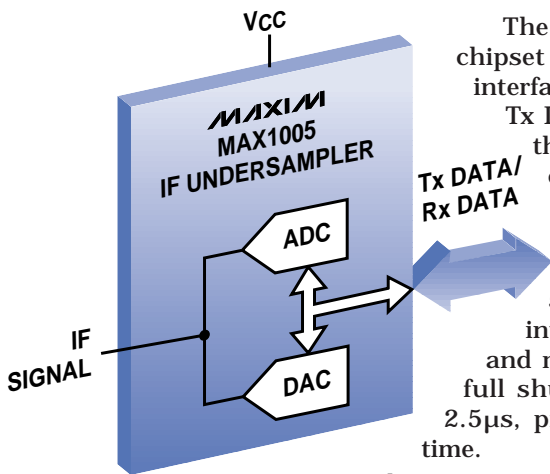
Best for Industrial and Instrumentation Applications

Maxim's new MAX1401*/MAX1403* 18-bit sigma-delta ADCs provide the highest available accuracy at the lowest power. These ADCs are ideal for your next high-resolution data-acquisition application. They maintain 16-bit performance at 480sps. On-chip signal conditioning allows direct connections to low-level signal sources. Power consumption is a low 810 μ W. A power-down mode further reduces the supply current to 10 μ A. In addition, a scan mode is available, providing for continuous conversion of selected channels.



*Future product—contact factory for availability.

PWT1900 Chipset IF Undersampler



The MAX1005 is an integral part of the world's first dedicated chipset solution to comply with the PWT1900 (TAG-6) U.S. PCS air interface standard. The MAX1005 includes a 5-bit Rx ADC and a 7-bit Tx DAC plus voltage reference. In Rx mode, the ADC undersamples the data signal bandwidth centered on the IF. The wide 15MHz converter input bandwidth provides for IFs in excess of 10.7MHz. The low-glitch DAC recreates the IF subcarrier and transmission data.

This device requires very little power (13mA in Rx and 5.5mA in Tx mode) while providing a high level of signal integrity. Supply-voltage operation is guaranteed down to +2.7V and multiple shutdown modes are provided, including a 1 μ A (max) full shutdown mode. Wake-up time from partial shutdown is just 2.5 μ s, providing for power savings even during short periods of idle time.

Based on proven DECT (Digital European Cordless Telephone) technology, the PWT1900 standard is ideal for toll-quality wireless PBX, PCS, and wireless local-loop (WLL) applications. Maxim's PWT1900 chipset provides an easy-to-implement adaptation of existing DECT platforms using GFSK (Gaussian Frequency Shift Keying) to the $\pi/4$ DQPSK modulation specified in the PWT1900 standard for operation in the U.S.



Improve Receiver Sensitivity and Linearity Performance with SiGe LNAs and Mixers



Advanced SiGe Process Technology Brings GaAs-Like Performance to LNAs up to 2.5GHz

The MAX2640/MAX2641 low-noise amplifiers (LNAs) are designed to provide low noise figure, high gain, and high input third-order intercept point (IP3) for front-end applications in the cellular, PCS, GPS, and 2.4GHz ISM frequency bands. Operating from a single +2.7V to +5.5V supply, these devices consume only 3.5mA of current. These devices are internally biased, eliminating the need for external bias resistors and chokes. In a typical application, the only external components needed are a two-element input match, input and output blocking capacitors, and a VCC bypass capacitor. The devices are offered in space-saving 6-pin SOT23 packages.

MAX2640 400MHz to 1500MHz Operation

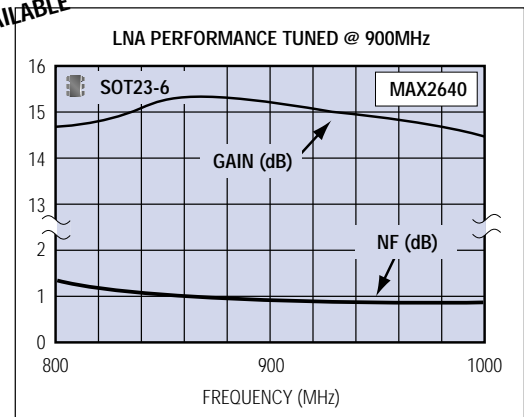
Applications:

- 400/900MHz ISM Radios
- Cellular/Cordless Phones
- Two-Way Pagers
- Wireless Security
- Wireless Data

Performance at 900MHz:

- NF = 0.9dB
- Gain = 15.1dB
- IIP3 = -10dBm
- I/O VSWR < 1.8:1
- 40dB Reverse Isolation
- 3V, 3.5mA
- Priced from 80¢ (1000 pc., FOB USA)

EV KITS AVAILABLE



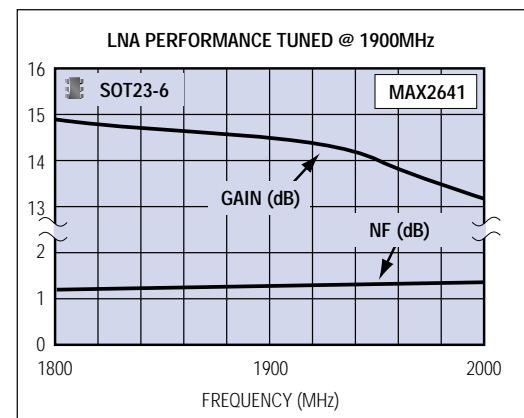
MAX2641 1400MHz to 2500MHz Operation

Applications:

- GPS Receivers
- PCS Handsets
- Cellular W-CDMA
- DECT Handsets
- IEEE 802.11 WLAN/HomeRF
- 2.4GHz ISM Radios

Performance at 1900MHz:

- NF = 1.3dB
- Gain = 14.4dB
- IIP3 = -4dBm
- I/O VSWR < 1.7:1
- 30dB Reverse Isolation
- 3V, 3.5mA
- Priced from 80¢ (1000 pc., FOB USA)



MAX2641 Performance at Other Key Application Frequencies

Part	Applications	Gain (dB)	Noise Figure (dB)	Input IP3 (dBm)	Input Return (dB)	Output Return Loss (dB)
1575	GPS	15.7	1.15	-1.2	-8	-15
2450	WLAN, HomeRF, ISM	13.5	1.50	-2.5	-10	-10

Improve Receiver Sensitivity and Linearity Performance with SiGe LNAs and Mixers



Advanced SiGe Process Technology Yields the Best Combination of Mixer IIP3, Noise Figure, and Conversion Gain at 900MHz

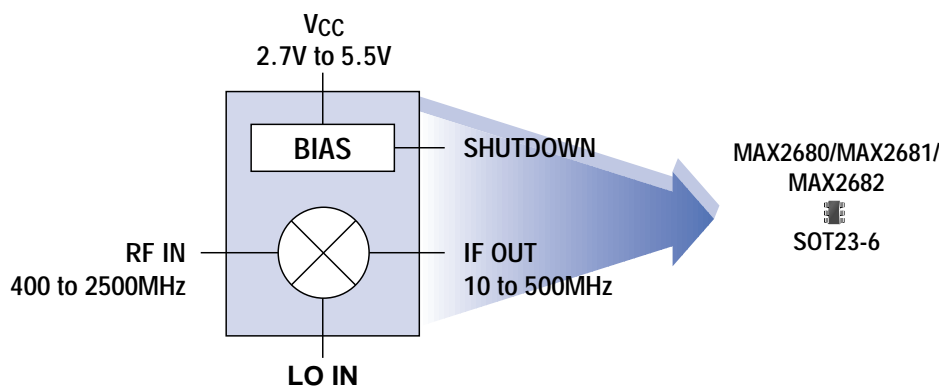
INCREASING PERFORMANCE



Technology	Part	I _{cc} (mA)	IIP3* (dBm)	NF* (dB)	Conv. Gain* (dB)
SiGe	MAX2681	9	-6	7	14.2
GaAs	HP IAM91563	9	-6	7	11
Si Bipolar	NEC UPC8112T	9	-10	9	15

- Higher Conversion Gain vs. GaAs
- Higher IIP3 and Lower NF vs. Si Bipolar

*Performance at 900MHz.



Applications:

- 400MHz/900MHz/2.4GHz ISM Radios
- Cellular/PCS Handsets
- Cordless Phones
- Wireless Local Loop
- WLAN

Features:

- 400MHz to 2500MHz Operation
- Low Noise Figure
- High Input IP3
- 2.7V to 5.5V Supply Range
- Low Supply Current
- Shutdown Mode
- Miniature SOT23-6 Package
- Priced from 92¢ (1000 pc., FOB USA)

EV KITS AVAILABLE

Select the Right Mixer to Maximize Your System Performance

Part	I _{cc} (mA)	900MHz			1950MHz			2450MHz		
		IIP3 (dBm)	NF (dB)	Gain (dB)	IIP3 (dBm)	NF (dB)	Gain (dB)	IIP3 (dBm)	NF (dB)	Gain (dB)
MAX2680	5.0	-12.9	6.3	11.6	-8.2	8.3	7.6	-6.9	11.7	7.0
MAX2681	8.7	-6.1	7.0	14.2	0.5	11.1	8.4	1.0	12.7	7.7
MAX2682	15.0	-1.8	6.5	14.7	4.4	10.2	10.4	3.2	13.4	7.9

