STANDARD POWER PRODUCTS

Selector Guide

Fall 2016

Buck Regulators, Boost Regulators and LDOs

Whether you are designing a medical device, a sensor, a programmable logic controller, or a portable, battery powered product, you will certainly need power in your system. Fortunately, Maxim's power components can turn the "must have" power supply circuit into a tangible advantage by reducing heat dissipation, decreasing circuit size, and extending battery life. Explore our product line, featured technology, and customer stories to understand why so many engineers are using Maxim. Then, find the part that works right for you.

maxim integrated™

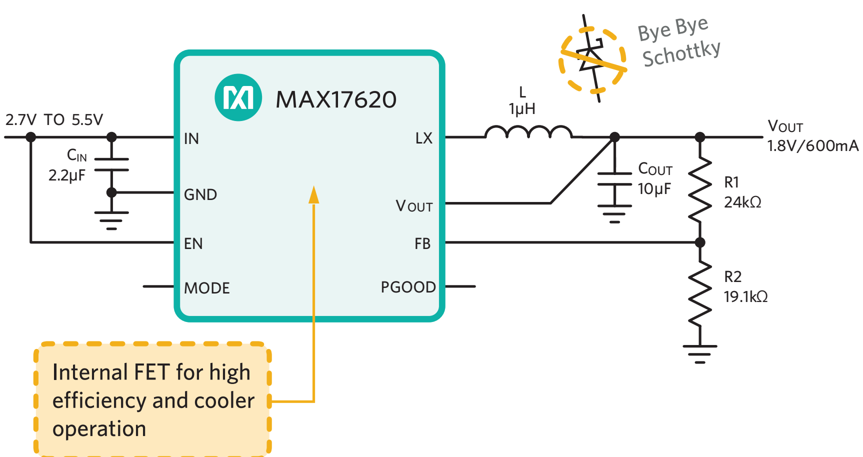
HIGH-EFFICIENCY BUCK REGULATORS

Our robust portfolio of high efficiency, high integration, and wide temperature range step-down switching regulators offers solutions for a variety of applications including industrial, portable, and low-power applications.

FEATURES AND BENEFITS

- Get superior conversion efficiency with “no-Schottky” synchronous operation
- Shrink component size and get fast transient response with high switching frequency
- Obtain high efficiency even for light loads with multi-mode operation
- Ensure reliable operation through EN55022 compliance

TYPICAL APPLICATION CIRCUIT

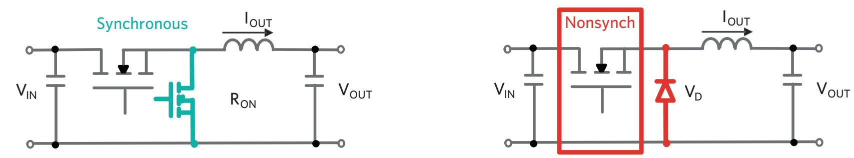


DESIGN TIP

Synchronous step-down regulators are a great choice for sensitive power designs that require a small battery for the power source. These devices provide much higher efficiency, reducing heat dissipation and improving battery life.

Here is a quick power loss calculation to compare synchronous versus nonsynchronous solutions.

$V_{IN} = 3.6V, V_{OUT} = 1.8V, I_{OUT} = 190mA$ at 4MHz



FET $R_{ON} = 0.08\Omega$
Power dissipation across the FET:
$P_{FET} = R_{ON} \times I^2_{OUT} \times (1 - V_{OUT}/V_{IN}) = 1.44mW$

Voltage drop across diode $V_D = 0.5V$
Power dissipation across the diode:
$P_D = V_D \times I_{OUT} \times (1 - V_{OUT}/V_{IN}) = 47.5mW$

As you can see, the synchronous solution reduces the power loss in the rectification diode by a factor of 33!

CUSTOMER INSIGHT

The **MAX17620** buck converter has been designed into many top-selling consumer products by major name brand companies. “Due to its high switching frequency, synchronous design with internal FET, and PWM/skip mode feature, the **MAX17620** was the best choice for our battery-powered devices or point of load,” said one company. Customers like the fact that the synchronous design with internal FET makes this buck converter very efficient, which also means lower heat dissipation in the final products.

www.maximintegrated.com/switching-regulators

BUCK REGULATORS WITH >90% EFFICIENCY

Product	Switch Type	V_{IN} (min) (V)	V_{IN} (max) (V)	V_{OUT} (min) (V)	V_{OUT} (max) (V)	I_{OUT}(A)	F_{SW}(kHz)	I_Q	No. of Outputs	Peak Efficiency	Package
MAX17620	Internal	2.7	5.5	1.5	V_{IN}	0.6	4000	40µA	1	91%	8-TDFN
MAX17509	Internal	4.5	16	0.9	5	3	1000, 500, 1500, 2000	1mA	2	94%	32-TQFN
MAX1836/7	Internal	4.5	24	1.25	V_{IN}	0.125/0.25	200	12µA	1	94%	6-TDFN, 6-SOT
MAX15023	External	4.5	28	0.6	$0.85xV_{IN}$	12	200 to 1000	4.5mA	2	93%	24-TQFN
MAX15026	External	4.5	28	0.6	$0.85xV_{IN}$	25	200 to 2000	1.75mA	1	90%	14-TDFN
MAX15048/9	External	4.7	23	0.6	V_{IN}	15	200 to 1200	6mA	3	95%	32-TDFN

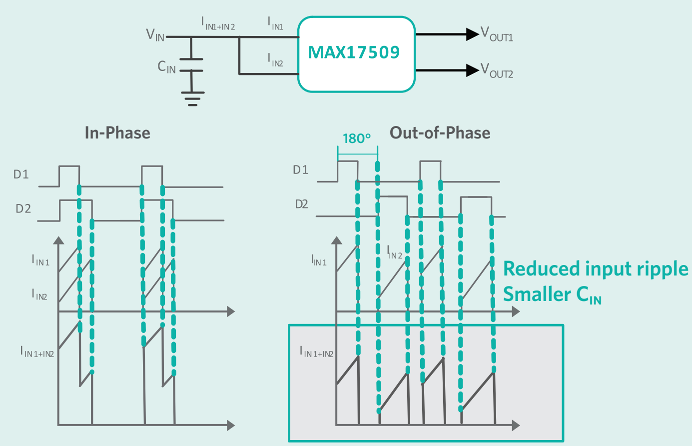
FEATURED TECHNOLOGY

Many electronic devices require two or more separate, stable and precisely regulated supply voltages. For example, microprocessors require a precise supply voltage of 3.3V or less, together with a conventional supply voltage of 5V. Integration of multiple converters into a single device helps to reduce BOM cost and PCB board space. Although device sizes are decreasing, increasingly higher power and higher operating efficiency are being required. One problem that can arise when using multiple switching power supplies is high RMS current draw during the ramping cycle, which occurs when the switching frequencies are in-phase. Phase shifting is a technique used to help reduce this high current draw while reducing electromagnetic interference (EMI).

Phase shifting of multiple converters prevents "ON" time overlap and reduces RMS current, ripple and input capacitor requirements, which will improve system EMI and power efficiency. This approach also eliminates the need for high input filtering.

The MAX17509 dual output, step-down DC-DC converter offers the option to set the relative PWM phase-shift between the regulators to be in-phase (0°) or interleaved (180° out-of-phase). During in-phase operation, both regulators' low-side MOSFETs turn on at the same time. During out-of-phase operation, the second regulator's low-side MOSFET turns on with a time delay relative to that of the first regulator, corresponding to half of the switching period. The instantaneous input current peaks of both regulators do not overlap, resulting in reduced RMS ripple current and input voltage ripple. This reduces the required input capacitor ripple current rating, allows for fewer or less expensive capacitors, and reduces shielding requirements for EMI.

Dual Channel 180° Out-of-Phase Operation



BUCK REGULATORS PORTFOLIO

Product	Switch Type	V_{IN} (min) (V)	V_{IN} (max) (V)	V_{OUT} (min) (V)	V_{OUT} (max) (V)	I_{OUT}(A)	Operating Frequency (kHz)	Package/ Pins	NOTES
MAX17620	Internal	2.7	5.5	1.5	V_{IN}	0.6	4000	TDFN/8	
MAX17509	Internal	4.5	16	0.9	5	3	500, 1000, 1500, 2000	THIN QFN/32	
MAX15048	External	4.7	23	0.6	V_{IN}	15	200 to 1200	TQFN/32	
MAX15049	External	4.7	23	0.6	V_{IN}	15	200 to 1200	TQFN/32	
MAX15037	Internal	4.5	23	0.6	28	3	200 to 2200	TQFN/16	
MAX15023	External	4.5	28	0.6	$0.85xV_{IN}$	12	200 to 1000	TQFN/24	
MAX15026	External	4.5	28	0.6	$0.85xV_{IN}$	25	200 to 2000	TDFN-EP/14	
MAX15002	External	4.5	23	0.6	$0.85xV_{IN}$	15	200 to 2200	TQFN/40	
MAX8655	Internal	4.5	25	0.7	5.5	25	200 to 1000	TQFN/56	
MAX8640Z	Internal	2.7	5.5	0.8	2.5	0.5	4000	µDFN/6, SC70/6	
MAX8640Y	Internal	2.7	5.5	0.8	2.5	0.5	2000	µDFN/6, SC70/6	
MAX1927	Internal	2.6	5.5	0.75	5	0.8	1000	µMAX®/10	
MAX1928	Internal	2.6	5.5	1.5	2.5	0.8	1000	µMAX/10	
MAX1837	Internal	4.5	24	1.25	V_{IN}	0.25	200	SOT/6 ,TDFN-EP/6	
MAX1836	Internal	4.5	24	1.25	V_{IN}	0.125	200	SOT/6 ,TDFN-EP/6	
MAX1644	Internal	3	5.5	1.1	V_{IN}	2	350	SSOP/16	
MAX653	Internal	4	11.5	1.3	V_{IN}	0.225	Variable	CDIP(N)/8, PDIP(N)/8, SOIC(N)/8	
MAX639	Internal	4	11.5	1.3	V_{IN}	0.225	Variable	CDIP(N)/8, PDIP(N)/8, SOIC(N)/8	
MAX640	Internal	4	11.5	1.3	V_{IN}	0.225	Variable	CDIP(N)/8, PDIP(N)/8, SOIC(N)/8	

View parametric table ›

BUCK REGULATORS PORTFOLIO

Product	Switch Type	V_{IN} (min) (V)	V_{IN} (max) (V)	V_{OUT} (min) (V)	V_{OUT} (max) (V)	I_{OUT}(A)	Operating Frequency (kHz)	Package/ Pins	NOTES
MAX649	External	4	16.5	1.5	V_{IN}	2.5	300	CDIP(N)/8, PDIP(N)/8, SOIC(N)/8	
MAX1684	Internal	2.7	14	1.25	V_{IN}	1	300	QSOP/16	
MAX1685	Internal	2.7	14	1.25	V_{IN}	1	600	QSOP/16	
MAX1692	Internal	2.7	5.5	1.25	V_{IN}	0.6	750	µMAX/10	
MAX1651	External	3	16	1.5	V_{IN}	2.5	300	PDIP(N)/8, SOIC(N)/8	
MAX1649	External	3	16	1.5	V_{IN}	2.5	300	PDIP(N)/8, SOIC(N)/8	
MAX1652	External	4.5	30	2.5	5.5	10	340	QSOP/16	
MAX1654	External	4.5	30	2.5	5.5	10	340	QSOP/16	
MAX1655	External	4.5	30	1	5.5	10	340	QSOP/16, SOIC(N)/16	
MAX1653	External	4.5	30	2.5	5.5	10	340	QSOP/16, SOIC(N)/16	
MAX1639	External	4.5	5.5	1.1	4.5	35	300, 600, 1000	SOIC(N)/16	
MAX1637	External	3.15	5.5	1.1	5.5	0.1	350	QSOP/16	
MAX1672	Internal	1.8	11	1.25	5.5	0.3	-	QSOP/16	
MAX1638	External	4.5	5.5	1.3	3.5	35	300, 600, 1000	SSOP/24	
MAX887	Internal	3.5	11	1.25	10.5	0.6	300	SOIC(N)/8	
MAX1626	External	2.6	16.5	3.3	5	3	300	SOIC(N)/8	
MAX1627	External	2.6	16.5	1.3	V_{IN}	3	300	SOIC(N)/8	
MAX735	Internal	4	6.2	-5.25	-4.75	0.275	160	SOIC(N)/8	
MAX755	Internal	2.7	9	-5.25	-4.75	0.275	160	SOIC(N)/8	
MAX750	Internal	4	11	4.75	5.25	0.450	160	SOIC(N)/8	

View parametric table ›

RELATED RESOURCES

READ

- DC-DC Converter Tutorial
- Power-Supply Solutions for Xilinx FPGAs
- Power-Supply Solutions for Altera FPGAs
- Choosing the Right Power-Supply IC for your Application
- Power Supplies Begin the Circuit Foundation, Taming Switching Power-Supply Layout

EXPLORE

- Reference Design Using the MAX15026 for an Auxiliary Power Supply for LCD TVs or Set-Top Boxes
- Palo Verde (MAXREFDES33#): Step-Down Converter

WATCH

- In The Lab: High-Efficiency Power Supply Reference Designs (Video)

CUSTOMER INSIGHT

The **MAX8640** was designed into a top selling consumer product because it is the best solution for minimizing conducted switching power supply noise when powering sensitive RF circuits like GPS. One customer shared that the **MAX8640** is considered the gold standard for noise when it comes to buck converters. In the application, to reduce the system power consumption, the **MAX8640** was used to power an RF circuit, directly bypassing an internal LDO, to improve battery life in wearables.

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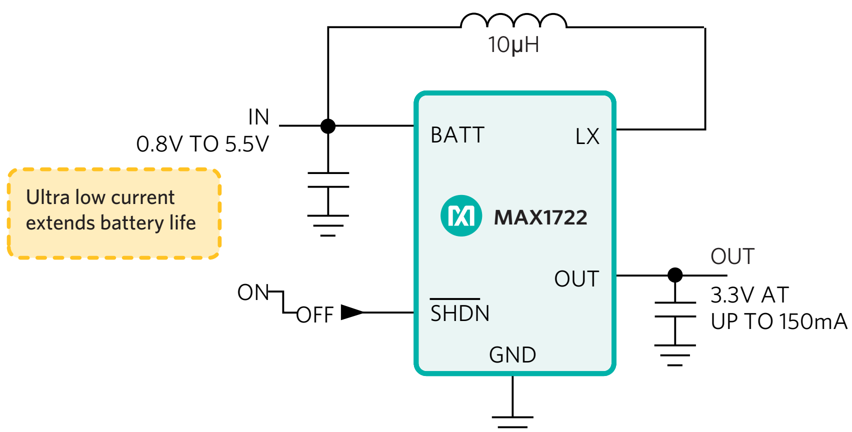
SMALL, LOW-POWER BOOST REGULATORS

Our high-efficiency, low-noise, and tiny packages make these step-up switching regulator solutions ideal for today's portable applications.

FEATURES AND BENEFITS

- Increase battery life with low quiescent current and True Shutdown™ mode
- Easily adapt to design requirements with single- or dual-cell battery input
- High switching frequencies provide fast transient response and shrink component size
- Minimize EMI in noise-sensitive applications using our proprietary LX-damping circuitry

TYPICAL APPLICATION CIRCUIT



DESIGN TIP

Addressing New Designs for the Wearable Market

Many companies are looking at wearables as the next big market opportunity following mobile phones. Smart watches appear to be the most popular wearable devices today, and the healthcare sector—including medical, fitness, and wellness—promises even broader opportunities. These devices require very small form factors and prolonged operating times, creating very difficult design challenges.

MAX1722 is a boost converter optimized for these wearable applications, delivering up to 150mA of current in a small 2mm x 2mm 6-pin μDFN package. Aggressive power savings techniques are utilized in order to reduce current consumption when the system is in sleep mode and the regulator is shutdown. In shutdown all the regulator control circuits are switched off, leaving only the unavoidable parasitic leakages producing minimal discharges of the battery and the output capacitor. Leakages of a few nanoamps are obtained at BATT, and tens of nanoamps at OUT.

CUSTOMER INSIGHT

Maxim offers a superior selection of DC-DC step-up converters for all types of applications. Utilized in a variety of applications, the **MAX1722** PWM step-up converter was the best choice for a portable audio device in a major consumer product. This boost converter features a patented idle mode that reduces operating current under light loads and maximizes efficiency. This solution is ideal for battery-powered portable devices that require high efficiency for prolonged battery life.

www.maximintegrated.com/switching-regulators

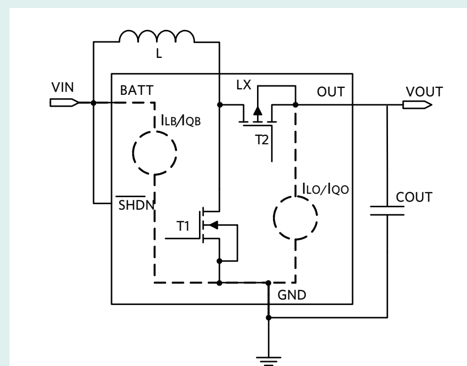
BOOST REGULATORS WITH >90% EFFICIENCY

Product	Switch Type	V_{IN} (min) (V)	V_{IN} (max) (V)	V_{OUT} (min) (V)	V_{OUT} (max) (V)	I_{IN} Limit*(A)	F_{SW}(kHz)	I_Q (µA)	Peak Efficiency	Package
MAX668/9	External	1.8	28	2.7	100	6	500	220	92%	10-µMAX
MAX8627	Internal	0.9	5.5	3	5	1	1000	20	95%	14-TDFN
MAX1674/5/6	Internal	0.7	5.5	2	5.5	0.5/1	500	16	94%	8-µMax
MAX1722/3/4	Internal	0.9	5.5	2	5.5	0.15	PFM	1.5	90%	5-TSOT, 6-µDFN
MAX1795/6/7	Internal	0.7	5.5	2	5.5	0.55	PFM	25	95%	8-µMax

$^*I_{OUT} = I_{IN}$ Limit × (V_{OUT}/V_{IN}) × Efficiency

FEATURED TECHNOLOGY

Our step-up converters contain an internal damping switch to minimize ringing at LX. The damping switch connects a resistor across the inductor when the inductor's energy is depleted. Normally, when the energy in the inductor is insufficient to supply current to the output, the capacitance and inductance at LX form a resonant circuit that causes ringing. The ringing continues until the energy is dissipated through the series resistance of the inductor. The damping switch supplies a path to quickly dissipate this energy, minimizing the ringing at LX. Damping LX ringing does not reduce V_{OUT} ripple, but does reduce EMI.



BOOST REGULATORS PORTFOLIO

Product	Switch Type	V_{IN} (min) (V)	V_{IN} (max) (V)	V_{OUT} (min) (V)	V_{OUT} (max) (V)	I_{OUT}(A)	Operating Frequency (kHz)	Package/ Pins	NOTES
MAX8815A	Internal	1.2	5.5	3.3	5.5	1	2000	TDFN-EP/10	
MAX8627	Internal	0.9	5.5	3	5	1	1000	TDFN-EP/14	
MAX8569	Internal	1.5	5.5	2	5.5	0.25	-	SOT/6, TDFN-EP/6	
MAX5026	Internal	3	11	V_{IN}	36	0.04	500	SOT/6	
MAX1723	Internal	1.2	5.5	2	5.5	0.15	-	µDFN/6, TSOT/5	
MAX1722	Internal	0.9	5.5	2	5.5	0.15	-	µDFN/6, TSOT/5	
MAX1724	Internal	0.9	5.5	2.7	5	0.15	-	µDFN/6, TSOT/5	
MAX1524	External	1.5	5.5	2.5	5	0.95	1000	SOT/6	
MAX1522	External	2.5	5.5	2.5	100	1	1000	SOT/6	
MAX1523	External	2.5	5.5	2.5	100	10	1000	SOT/6	
MAX1797	Internal	0.7	5.5	2	5.5	0.55	500	µMAX/8	
MAX1795	Internal	0.7	5.5	2	5.5	0.18	500	µMAX/8	
MAX1796	Internal	0.7	5.5	2	5.5	0.3	500	µMAX/8	
MAX1832	Internal	1.5	5.5	2	5.5	0.15	500	SOT/6	
MAX1833	Internal	1.5	5.5	3	3.3	0.15	500	SOT/6, TDFN-EP/6	
MAX1834	Internal	1.5	5.5	2	5.5	0.15	500	SOT/6	
MAX1771	External	2	16.5	2	100	2	300	CDIP(N)/8, PDIP(N)/8, SOIC(N)/8	
MAX856	Internal	0.8	6	3.3	5	0.5	500	µMAX/8, PDIP(N)/8, SOIC(N)/8	
MAX858	Internal	0.8	6	3.3	5	0.125	500	µMAX/8, PDIP(N)/8, SOIC(N)/8	

View parametric table ›

BOOST REGULATORS PORTFOLIO

Product	Switch Type	V_{IN} (min) (V)	V_{IN} (max) (V)	V_{OUT} (min) (V)	V_{OUT} (max) (V)	I_{OUT}(A)	Operating Frequency (kHz)	Package/ Pins	NOTES
MAX857	Internal	0.8	6	2.7	6	0.5	500	µMAX/8, PDIP(N)/8, SOIC(N)/8	
MAX859	Internal	0.8	6	2.7	6	0.125	500	µMAX/8, PDIP(N)/8, SOIC(N)/8	
MAX618	Internal	3	28	3	28	0.5	250	QSOP/16	
MAX669	External	1.8	28	3	28	6	500	µMAX/10	
MAX668	External	3V	28	3	100	6	500	µMAX/10	
MAX1675	Internal	0.7	5.5	2	5.5	0.22	500	µMAX/8	
MAX1676	Internal	0.7	5.5	2	5.5	0.42	500	µMAX/10	
MAX1674	Internal	0.7	5.5	2	5.5	0.42	500	µMAX/8	
MAX1678	Internal	0.7	5.5	2	5.5	0.1	150	µMAX/8	
MAX685	Internal	2.7	5.5	2.7	24	0.01	480	QSOP/16, TQFN/24	
MAX686	Internal	0.8	27	-27	27	0.5	300	QSOP/16	
MAX629	Internal	0.8	28	-28	28	0.5	300	SOIC(N)/8	
MAX863	External	1.5	11	1.25	100	2	-	QSOP/16	
MAX1706	Internal	0.7	5.5	2.5	5.5	0.4	400	QSOP/16	
MAX1705	Internal	0.7	5.5	2.5	5.5	0.8	400	QSOP/16	
MAX849	Internal	0.7	5.5	2.7	5.5	1	400	SOIC(N)/16	
MAX848	Internal	0.7	5.5	2.7	5.5	0.3	400	SOIC(N)/16	
MAX743	Internal	4.2	6	12	15	0.125	200	CDIP(N)/16, PDIP(N)/16, SOIC(W)/16	
MAX710	Internal	1.8	11	3.3	5	1.5	-	SOIC(N)/16	
MAX711	Internal	1.8	11	1.25	5.5	1.5	-	SOIC(N)/16	

View parametric table ›

RELATED RESOURCES

READ

- Small, High-Voltage Boost Converters
- Negative-to-Negative Switch-Mode Converter Offers High Current and High Efficiency
- ±15V or ±12V Output Switch-Mode Power Supply Has Wide Input-Voltage Range
- Current Limited DC-DC Controller Used as Step-Up Step-Down SEPIC Power Supply for USB Device
- Step-up Converter with LDO Beats SEPIC Efficiency
- Boost Converter Switches Between Battery and USB Power
- Protection from Blackouts: Dirt Cheap to Fully Integrated
- Introduction to Hearing Aids and Important Design Considerations
- Important Design Considerations for Digital Thermometers
- Charging Batteries Using USB Power

EXPLORE

- Oceanside (MAXREFDES9#): 3.3V To 15V Input, ±15V (±12V) Output, Isolated Power Supply

NOTES

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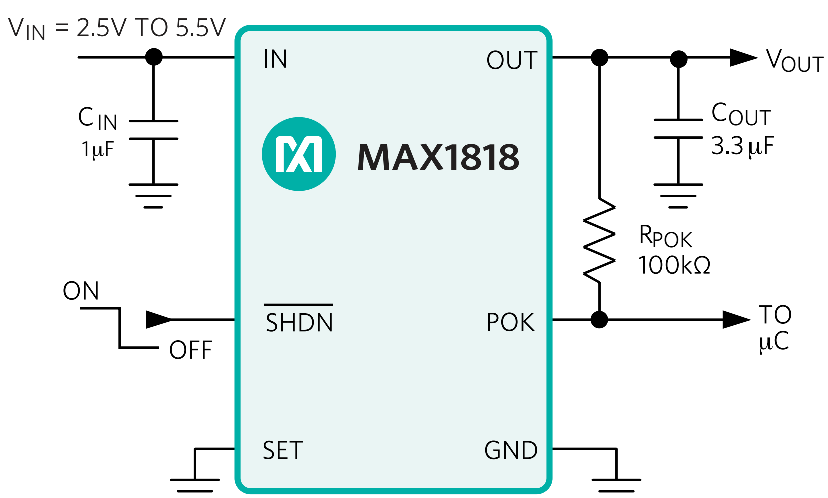
HIGH-ACCURACY, LOW-NOISE LDOs

High-accuracy, low-noise operation makes our low-dropout linear regulators ideal for a variety of portable applications.

FEATURES AND BENEFITS

- Very low dropout voltages reduce heat dissipation
- High output accuracy provides closely regulated voltages
- Ultra low noise ensures precise system measurements

TYPICAL APPLICATION CIRCUIT



DESIGN TIP

Choosing the Correct LDO Linear Regulator for Mobile Devices

Low-dropout linear regulators (LDOs) are used to power many sections of a typical mobile device. The baseband, RF, and audio sections have different requirements that influence which low-dropout linear regulator is most appropriate.

Ideally, one IC would have all these characteristics so only one LDO would be needed. But in practice, the various blocks are best powered by LDOs with different performance characteristics. For example, most cellular phone baseband chipsets require power supplies for three circuit blocks: internal digital circuitry, analog circuitry, and peripheral interface circuitry.

Internal digital circuits typically operate from 1.8V to 2.6V with plenty of battery headroom so dropout is not critical. Output noise and the PSRR are not critical specs for the digital circuits. This supply requires low quiescent current such as the **MAX1725**, at light loads because this LDO stays on at all times.

The RF circuits require low-noise and high PSRR LDOs. In particular, the VCO and PLL blocks' overall performance affects the radio's critical specifications. Noise can alter the oscillator's phase and amplitude characteristic and the oscillator's loop circuitry amplifies the noise. An LDO such as the **MAX8840** is more suited for this application.

High current LDOs like the **MAX1793** are required for audio circuit demands such as hands-free, game, and multimedia applications in cellular phones. This power supply requires low noise and high PSRR at audio frequency range (20Hz to 20kHz) in order to provide good audio quality.

HIGH-ACCURACY LDOs WITH LOW DROPOUT VOLTAGES

Product	V_{IN} (V)	V_{OUT}(V)	I_{OUT}(A)	I_Q(uA)	$V_{DROPOUT}$ (mV)	Accuracy (%)	PSRR-10kHz (dB)	No. of Outputs	Package
MAX8902	1.7 to 5.5	0.6 to 5.3	0.5	80	50	1.5	92	1	8-TDFN
MAX8510	2 to 6	1.5 to 4.5	0.12	40	120	3	72/78	1	8-TDFN 5-SC70
MAX8840/1/2	2 to 6	1.5 to 4.5; 1.5/1.8/2.5/2.6/2.7/ 2.8/2.85/3/3.33/4.5	0.15	40	120	3	72/78	1	6-µDFN
MAX1793	2.5 to 5.5	1.25 to 5	1	125	210	3	55	1	16-TSSOP
MAX1806	2.25 to 5.5	0.8 to 4.5	0.5	210	200	1	45	1	8-µDFN
MAX1818	2.5 to 5.5	1.25 to 5	0.5	125	120	3	63	1	6-SOT23
MAX1725/6	2.5 to 12	1.5 to 5; 1.8/2.5/3.3/5	0.02	2	300	3	40	1	5-SOT23
MAX8880/1	2.5 to 12	1.25 to 5; 1.8/2.5/3.3	0.2	3.5	100	1.5	40	1	6-TDFN 6-SOT23
MAX667	3.5 to 16.5	1.3 to 16	0.25	20	150	4	40	1	8 SO; 8 PDIP
MAX1615/6	4 to 28	1.24 to 28; 3.5/5	0.03	6.2	350*	2	65	1	5-SOT23

*max

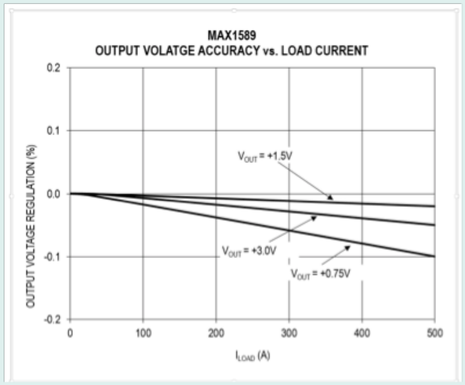
FEATURED TECHNOLOGY

To know which LDO you need, you must first define the application of your LDO and then examine which parameters are most important. With so many different LDO applications and the multiple parameters that characterize a particular LDO, it is not easy to determine which LDO is best suited. There are three basic design specs that will determine the overall functionality of the LDO. There are tradeoffs made in IC design to accommodate the various LDO requirements for specific applications.

For example, to design an LDO with a high input voltage range and very low quiescent (I_Q) current a tradeoff must be made at the FET level between low PSRR and higher noise. To design an LDO with wide input voltage range, a tradeoff must be made between wide input range and high output current.

Ultra-low noise LDOs, designed for sensitive applications, must tradeoff high PSRR with low I_Q. For applications such as in system measurement or RF circuits, the low I_Q is not a primary system requirement and the low noise LDO is a suitable choice.

There are many applications where the functionality of a circuit or device is highly dependent on the quality and accuracy of the power supply. For example power supplies that are used in applications to supply power sensitive CPUs, precision regulator applications or data-converter references must have a very high degree of accuracy. Due to IC design limitations, high accuracy output LDOs do not have a wide input supply range. Increasing the input range decreases accuracy. The **MAX1589** was designed to meet these tough accuracy requirements by achieving a typical line regulation accuracy of 0.02% at 25°C and no greater than 0.5% over the entire operating temperature range.



Maxim has addressed these needs and created many LDOs to meet the important criteria for specific applications to provide the very best solution for any given system.

LOW-NOISE LDOs PORTFOLIO

Product	V_{IN} (min) (V)	V_{IN} (max) (V)	Preset V_{OUT}(V)	$V_{DROPOUT}$ at Rated I_{LOAD} (typ) (V)	Rated I_{LOAD} (mA)	I_{CC} (typ) (µA)	Output Voltage Noise (typ) ($µV_{RMS}$)	Package/Pins	NOTES
MAX8940	2.8	6	2.8, 3	0.12	120	40	13	SC70/5	
MAX8891	2	6	1.5, 1.8, 2.5, 2.6, 2.8, 2.85, 2.9, 3.1, 3.3, 4.5	0.15	150	40	230	SC70/5	
MAX8892	2	6	-	0.15	150	40	230	SC70/5	
MAX8902	1.7	5.5	1.5, 1.8, 2, 2.5, 3, 3.1, 3.3, 4.6, 4.7	0.05	500	80	16	TDFN-EP/8	
MAX8840	2	6	1.5, 1.6, 1.8, 1.9, 2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3, 3.1, 3.3, 4.5	0.12	150	40	11	µDFN/6, UTLGA/6	
MAX8842	2	6	-	0.12	150	40	230	µDFN/6	
MAX8841	2	6	1.5, 1.6, 1.8, 1.9, 2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3, 3.1, 3.3, 4.5	0.12	150	40	230	µDFN/6	
MAX8510	2	6	1.5, 1.8, 2.5, 2.7, 2.8, 2.85, 3, 3.3, 4.5	0.12	120	40	11	SC70/5, TDFN-EP/8	
MAX8512	2	6	-	0.12	120	40	230	SC70/5, TDFN-EP/8	
MAX8511	2	6	1.5, 1.8, 2.5, 2.6, 2.8, 2.85, 2.9, 3.1, 3.3, 4.5	0.12	120	40	230	SC70/5, TDFN-EP/8	
MAX1935	2.25	5.5	1.5	0.175	500	200	300	TDFN-EP/8	
MAX1806	2.25	5.5	0.8, 1.5, 1.8, 2.5, 3.3	0.17	500	210	300	µMAX-EP/8	
MAX8867	2.5	5.5	2.5, 2.8, 2.84, 3, 3.15, 3.3, 3.6, 5	0.16	150	85	20	SOT/5, TSOT/5	
MAX8868	2.5	5.5	2.5, 2.8, 2.84, 3, 3.15, 3.3, 3.6, 5	0.16	150	85	20	SOT/5, TSOT/5	
MAX8865	2.5	5.5	2.8, 2.84, 3.15	0.11	100	105	220	µMAX/8	
MAX8873	2.5	6.5	2.8, 2.84, 3.15	0.13	120	73	220	SOT/5	
MAX8874	2.5	6.5	2.8, 2.84, 3.15	0.13	120	73	220	SOT/5	
MAX8878	2.5	6.5	1.5, 1.8, 2.5, 2.8, 2.84, 3, 3.15, 3.3, 3.6, 5	0.16	150	85	20	SOT/5, TSOT/5	
MAX1857	2.5	5.5	4.75	0.12	500	135	115	µMAX/8	

View parametric table ›

LOW-NOISE LDOs PORTFOLIO

Product	V_{IN} (min) (V)	V_{IN} (max) (V)	Preset V_{OUT} (V)	$V_{DROPOUT}$ at Rated I_{LOAD} (typ) (V)	Rated I_{LOAD} (mA)	I_{CC} (typ) (µA)	Output Voltage Noise (typ) ($µV_{RMS}$)	Package/Pins	NOTES
MAX8877	2.5	6.5	1.5, 1.8, 2.5, 2.8, 2.84, 3, 3.15, 3.3, 3.6, 5	0.16	150	85	20	SOT/5, TSOT/5	
MAX1818	2.5	5.5	1.5, 1.8, 2, 2.5, 3.3, 5	0.12	500	125	115	SOT/6	
MAX1793	2.5	5.5	1.5, 1.8, 2, 2.5, 3.3, 5	0.21	1000	125	115	TSSOP-EP/16	
MAX8883	2.5	6.5	1.8, 2.5, 2.85, 3.3	0.15	160	165	320	SOT/6	
MAX8882	2.5	6.5	1.8, 2.5, 2.85, 3.3	0.15	160	165	40	SOT/6	
MAX8881	2.5	12	1.8, 2.5, 3.3, 5	0.1	200	3.5	300	SOT/6	
MAX8880	2.5	12	-	0.1	200	3.5	300	SOT/6, TDFN-EP/6	
MAX1725	2.5	12	-	0.3	20	2	350	SOT/5	
MAX1726	2.5	12	1.8, 2.5, 3.3, 5	0.3	20	2	350	SOT/5	
MAX883	2.7	11.5	5	0.22	200	11	250	PDIP(N)/8, SOIC(N)/8	
MAX884	2.7	11.5	3.3	0.32	200	11	250	PDIP(N)/8, SOIC(N)/8	
MAX882	2.7	11.5	3.3	0.32	200	11	250	PDIP(N)/8, SOIC(N)/8	
MAX8860	2.5	6.5	1.8, 2.5, 2.77, 2.82, 3, 3.3	0.15	300	120	55	µMAX/8	
MAX1749	2.5	6.5	1.25	0.13	120	80	-	SOT/5	
MAX664	-2	-16.5	-5	0.35	40	6	-	CDIP(N)/8, PDIP(N)/8, SOIC(N)/8	
MAX666	2	16.5	5	0.9	40	6	-	CDIP(N)/8, PDIP(N)/8, SOIC(N)/8	
MAX663	2	16.5	5	0.9	40	6	-	CDIP(N)/8, PDIP(N)/8, SOIC(N)/8	

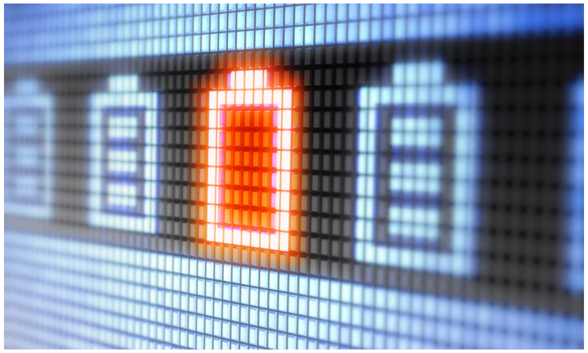
View parametric table ›

LOW-NOISE LDOs PORTFOLIO

Product	V_{IN} (min) (V)	V_{IN} (max) (V)	Preset V_{OUT} (V)	$V_{DROPOUT}$ at Rated I_{LOAD} (typ) (V)	Rated I_{LOAD} (mA)	I_{CC} (typ) (µA)	Output Voltage Noise (typ) (μV_{RMS})	Package/Pins	NOTES
ICL7663A	2	16	-	0.9	40	3.5	-	CDIP(N)/8, PDIP(N)/8, SOIC(N)/8, TO99/8	
MAX1616	4	28	-	0.35	30	6.2	-	SOT/5	
MAX1615	4	28	-	0.35	30	6.2	-	SOT/5	
MAX667	3.5	16.5	5	0.15	250	20	-	CDIP(N)/8, PDIP(N)/8, SOIC(N)/8	
MAX1659	2.7	16.5	5	0.49	350	30	2500	SOIC(N)/8	
MAX1658	2.7	16.5	3.3	0.65	350	30	2500	SOIC(N)/8	
MAX1976A	1.62	3.6	0.75, 0.85, 0.9, 0.75 to 3.0, 1, 1.1, 1.2, 1.3, 1.5, 1.6, 1.8, 1.85, 2.5, 2.85, 3	0.1	300	70	86	TDFN-EP/6, TDFN-EP/8, TSOT/6	
MAX1589A	1.62	3.6	0.75, 1, 1.3, 1.5, 1.8, 2.5, 3	0.175	500	70	86	TDFN-EP/6, TSOT/6	
MAX8864	2.5	6.5	2.8, 2.84, 3.15	0.055	120	70	220	SOT/5	
MAX8863	2.5	6.5	2.8, 2.84, 3.15	0.055	120	70	220	SOT/5	
MAX8866	2.5	5.5	2.8, 2.84, 3.15	0.055	100	105	220	µMAX/8	

CUSTOMER INSIGHT

The **MAX1716** is an ultra-low supply current, low-dropout linear regulator intended for low-power applications that demand the longest possible battery life. It was selected to support a power-sensitive smoke detector system. The system was required to run in idle mode until a detection occurred. Low I_Q was essential so the system could run for an extended period of time while powered by a 9V battery. Reverse polarity protection was also required in case the battery was installed incorrectly. The **MAX1725** was the perfect choice for this application offering a mere 2µA quiescent current with reverse-battery protection.



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- Analog ICs for Low Voltage Systems
- Complete Stand-Alone GPS Receiver Solution with MAX2742
- Improved Power-Supply Rejection for Linear Regulators

EXPLORE

- Reference Circuit 2765: Flexible Fault Protection
- System Board 6147: MAXREFDES73#: Wearable, Galvanic Skin Response System

NOTES