General Description

The MAX1817 is a compact, high-efficiency, dual-output step-up converter for portable devices that provides both the main logic supply and the LCD bias. The device operates from an input voltage of +1.5V to +5.5V, allowing the use of 2- or 3-cell alkaline batteries, or 1-cell lithium-ion (Li+) batteries.

The MAX1817's main regulator supplies 125mA at either a preset 3.3V or an adjustable 2.5V to 5.5V output voltage with up to 88% efficiency. A 0.1µA shutdown state also minimizes battery drain. The MAX1817's secondary step-up converter provides the LCD bias voltage and is adjustable up to +28V.

Other features include a fast switching frequency to reduce the size of external components and a low quiescent current to maximize battery life. Both outputs can be independently shut down for improved flexibility.

The MAX1817 is supplied in a compact 10-pin μ MAX package. The MAX1817 evaluation kit (MAX1817EVKIT) is available to speed up design.

Applications

_Features

- Dual Step-Up Converter in a Tiny 10-Pin µMAX Package
- Main Output Up to 125mA Load Current Fixed 3.3V or Adjustable 2.5V to 5.5V Up to 88% Efficiency Internal Switch
- LCD Output Up to 28V for LCD Bias Internal Switch
- Input Voltage Range +1.5V to +5.5V
- Minimal External Components Required
- ♦ 0.1µA Logic-Controlled Shutdown

FB 1

ON 2

ONLCD 3

FBLCD 4

AGND 5

Low 15µA Quiescent Supply Current

Ordering Information

Pin Configuration

10 OUT

9 | LX

8 GND

6 N.C.

7 LXLCD

ΝΛΧΙΛΝ

MAX1817

μΜΑΧ

| PART | TEMP. RANGE | PIN-PACKAGE | |
|------------|----------------|-------------|--|
| MAX1817EUB | -40°C to +85°C | 10 µMAX | |

Organizers/Translators PDAs MP3 Players GPS Receivers



Typical Operating Circuit

M/IXI/M

_ Maxim Integrated Products 1

For price, delivery, and to place orders, please contact Maxim Distribution at 1-888-629-4642, or visit Maxim's website at www.maxim-ic.com.

TOP VIEW

ABSOLUTE MAXIMUM RATINGS

| OUT to GND | 0.3V to +6V |
|---|--------------------------------|
| ON, ONLCD, FB, FBLCD, LX to GND0.3 | V to (V _{OUT} + 0.3V) |
| LXLCD to GND | 0.3V to +30V |
| AGND to GND | 0.3V to +0.3V |
| Continuous Power Dissipation ($T_A = +70^{\circ}C$) | |
| 10-Pin µMAX (derate 5.6mW/°C above +70 | ^o °C)444mW |
| LXLCD, LX Maximum Current | 0.5A _{RMS} |

| Operating Temperature Range | 40°C to +85°C |
|-----------------------------------|----------------|
| Junction Temperature | +150°C |
| Storage Temperature Range | 65°C to +150°C |
| Lead Temperature (soldering, 10s) | +300°C |

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

 $(V_{ON} = V_{ONLCD} = V_{OUT} = +3.3V, FB = GND, T_A = 0^{\circ}C \text{ to } +85^{\circ}C, unless otherwise noted. Typical values are at T_A = +25^{\circ}C.)$

| PARAMETER | CONDITIONS | MIN | ТҮР | MAX | UNITS |
|---|--|------|------|------|-------|
| GENERAL | | | | | |
| Input Voltage Range | | 1.5 | | 5.5 | V |
| Startup Voltage | $R_{LOAD} = 35\Omega$ | | 1.5 | | v |
| Startup Voltage | $R_{LOAD} = \infty$, $V_{FB} = 1.35V$ | | 1.2 | 1.55 | v |
| Quiescent Current from OUT (Main Only) | $V_{FB} = V_{FBLCD} = 1.35V,$ $V_{ONLCD} = 0$ | | 5 | 10 | μA |
| Quiescent Current from OUT | $V_{FB} = V_{FBLCD} = 1.35V$ | | 15 | 30 | μA |
| Shutdown Quiescent Current | $V_{ON} = V_{ONLCD} = 0$ | | 0.1 | 1 | μA |
| MAIN OUTPUT | | | | | |
| OUT Undervoltage Lockout | V_{OUT} rising, $V_{FB} = 1.35V$ | | 2.2 | 2.4 | v |
| OUT Undervoltage Lockout | V_{OUT} falling, $V_{FB} = 1.35V$ | 1.95 | 2.15 | | v |
| Fixed-Mode Output Voltage | $V_{FB} \le 45 mV$ | 3.14 | 3.3 | 3.47 | V |
| Adjustable-Mode FB Regulation Voltage | | 1.20 | 1.25 | 1.30 | V |
| FB Input Bias Current | V _{FB} = 1.35V | | | 50 | nA |
| FB Dual Mode [™] Threshold | | 45 | 75 | 105 | mV |
| Output Voltage Adjustment Range | | 2.5 | | 5.5 | V |
| Maximum LX On-Time | V _{FB} = 0.5V | 2.4 | 5 | 7.5 | μs |
| Zero Crossing Comparator Threshold (V _{LX} - V _{OUT}) | | 0 | 20 | 40 | mV |
| Zero Crossing Comparator Backup Timer | VFB = +0.5V | 22 | 45 | 70 | μs |
| Line Regulation | $I_{OUT} = 100$ mA, $V_{IN} = +2V$ to $+3V$ | | 1.6 | | % |
| Load Regulation | $V_{IN} = +2.5V,$ $I_{LOAD} = 10mA$ to 100mA | | 1.6 | | % |
| LX On-Resistance | $V_{OUT} = 3.3V, I_{LX} = 100mA$ | | 0.35 | 0.65 | Ω |
| LX Current Limit | | 0.5 | 0.75 | 1.05 | А |

Dual Mode is a trademark of Maxim Integrated Products.



ELECTRICAL CHARACTERISTICS (continued)

 $(V_{ON} = V_{ONLCD} = V_{OUT} = +3.3V, FB = GND, T_A = 0^{\circ}C \text{ to } +85^{\circ}C, unless otherwise noted. Typical values are at T_A = +25^{\circ}C.)$

| PARAMETER | CONDITIONS | MIN | ТҮР | MAX | UNITS |
|--------------------------|--|------|------|------|-------|
| LX Leakage Current | $V_{ON} = GND, V_{LX} = 5.5V$ | | 0.1 | 1 | μA |
| ON Input Low Voltage | $1.8V < V_{OUT} < 5.5V, V_{FB} = 0.5V$ | | | 400 | mV |
| ON Input High Voltage | $1.8V < V_{OUT} < 5.5V, V_{FB} = 0.5V$ | 1.6 | | | V |
| ON Input Bias Current | | | | 1 | μA |
| LCD OUTPUT | | | | | |
| LXLCD Voltage | | | | 28 | V |
| LXLCD On-Resistance | $V_{OUT} = 3.3V$, $I_{LXLCD} = 100mA$ | | 1.1 | 2.0 | Ω |
| LXLCD Current Limit | | 0.28 | 0.5 | 0.7 | А |
| LXLCD Leakage Current | $V_{LXLCD} = 28V, V_{ONLCD} = 0$ | | 0.1 | 1 | μA |
| FBLCD Regulation Voltage | | 1.20 | 1.25 | 1.30 | V |
| FBLCD Input Bias Current | $V_{FBLCD} = 1.35V$ | | | 50 | nA |
| LCD Line Regulation | $I_{LOAD} = 5mA$, $V_{IN} = +2V$ to $+3V$ | | 0.1 | | % |
| LCD Load Regulation | $I_{LOAD} = 1$ mA to 5mA, $V_{IN} = +2.5V$ | | 0.5 | | % |
| Maximum LXLCD On-Time | | 4 | 9 | 14 | μs |
| Minimum LXLCD Off-Time | V _{FBLCD} ≥ 1.2V | 0.5 | 1 | 1.5 | |
| Minimum Exect On-Time | V _{FBLCD} ≤ 0.7V | 2.4 | 5 | 7.5 | μs |
| ONLCD Input Low Voltage | 2.5V < V _{OUT} < 5.5V | | | 400 | mV |
| ONLCD Input High Voltage | $2.5V < V_{OUT} < 5.5V$ | 1.6 | | | V |
| ONLCD Input Bias Current | | | | 1 | μA |

ELECTRICAL CHARACTERISTICS

 $(V_{ON} = V_{ONLCD} = V_{OUT} = +3.3V, FB = GND, T_A = -40^{\circ}C \text{ to } +85^{\circ}C, \text{ unless otherwise noted.})$ (Note 1)

| PARAMETER | CONDITIONS | MIN | МАХ | UNITS |
|---|---|------|------|-------|
| GENERAL | | | | |
| Input Voltage Range | | 1.5 | 5.5 | V |
| Startup Voltage | $R_{LOAD} = \infty$, $V_{FB} = 1.35V$ | | 1.7 | V |
| Quiescent Current from OUT (Main Only) | $V_{FB} = V_{FBLCD} = 1.35V, V_{ONLCD} = 0$ | | 10 | μA |
| Quiescent Current from OUT | $V_{FB} = V_{FBLCD} = 1.35V$ | | 30 | μA |
| Shutdown Quiescent Current | $V_{ON} = V_{ONLCD} = 0$ | | 1 | μA |
| MAIN OUTPUT | | | | |
| | V_{OUT} rising, $V_{FB} = 1.35V$ | | 2.4 | V |
| OUT Undervoltage Lockout | V_{OUT} falling, $V_{FB} = 1.35V$ | 1.95 | | v |
| Fixed-Mode Output Voltage | $V_{FB} \le 45 mV$ | 3.14 | 3.47 | V |
| Adjustable-Mode FB Regulation Voltage | | 1.20 | 1.30 | V |
| FB Input Bias Current | V _{FB} = 1.35V | | 50 | nA |



3

MAX1817

ELECTRICAL CHARACTERISTICS (continued)

 $(V_{ON} = V_{ONLCD} = V_{OUT} = +3.3V$, FB = GND, T_A = -40°C to +85°C, unless otherwise noted.) (Note 1)

| PARAMETER | CONDITIONS | MIN | MAX | UNITS |
|---|--|------|------|-------|
| FB Dual Mode Threshold | | 45 | 105 | mV |
| Output Voltage Adjustment Range | | 2.5 | 5.5 | V |
| Maximum LX On-Time | $V_{FB} = 0.5V$ | 2.4 | 7.5 | μs |
| Zero Crossing Comparator Threshold (V _{LX} - V _{OUT}) | | 0 | 40 | mV |
| Zero Crossing Comparator Backup Timer | V _{FB} = 0.5V | 22 | 70 | μs |
| LX On-Resistance | V _{OUT} = 3.3V, I _{LX} = 100mA | | 0.65 | Ω |
| LX Current Limit | | 0.42 | 1.05 | A |
| LX Leakage Current | $V_{ON} = GND, V_{LX} = 5.5V$ | | 1 | μA |
| ON Input Low Voltage | 1.8V < V _{OUT} < 5.5V, V _{FB} = 0.5V | | 400 | mV |
| ON Input High Voltage | $1.8V < V_{OUT} < 5.5V, V_{FB} = 0.5V$ | 1.6 | | V |
| ON Input Bias Current | | | 1 | μA |
| LCD OUTPUT | | | | |
| LXLCD Voltage | | | 28 | V |
| LXLCD On-Resistance | $V_{OUT} = 3.3V$, $I_{LXLCD} = 100$ mA | | 2 | Ω |
| LXLCD Current Limit | | 0.25 | 0.7 | A |
| LXLCD Leakage Current | $V_{LXLCD} = 28V, V_{ONLCD} = 0$ | | 1 | μA |
| FBLCD Regulation Voltage | | 1.20 | 1.30 | V |
| FBLCD Input Bias Current | $V_{FBLCD} = 1.35V$ | | 70 | nA |
| Maximum LXLCD On-Time | | 4 | 14 | μs |
| Minimum LXLCD Off-Time | V _{FBLCD} ≥ 1.2V | 0.5 | 1.5 | 110 |
| | $V_{FBLCD} \le 0.7V$ | 2.2 | 7.5 | μs |
| ONLCD Input Low Voltage | 2.5V < V _{OUT} < 5.5V | | 400 | mV |
| ONLCD Input High Voltage | 2.5V < V _{OUT} < 5.5V | 1.6 | | V |
| ONLCD Input Bias Current | | | 1 | μA |

Note 1: Specifications to -40°C are guaranteed by design and not production tested.



Typical Operating Characteristics

MAX1817



_Pin Description

| PIN | NAME | FUNCTION |
|-----|-------|--|
| 1 | FB | Main Output Feedback Input. Connect FB to GND for fixed 3.3V main output. For other output voltages, use a resistive voltage-divider to set the output voltage. The feedback regulation voltage is 1.25V at FB. |
| 2 | ON | Main Step-Up Converter On/Off Control. Connect ON to OUT for automatic startup. Connect ON to GND to put the IC into shutdown mode. |
| 3 | ONLCD | LCD Output On/Off Control. Connect ONLCD to OUT to enable the LCD output. Connect ONLCD to GND to disable the LCD output. The main output must be \geq 2.4V to enable the LCD output. |
| 4 | FBLCD | LCD Output Feedback Input. Use a resistive voltage-divider from the LCD output to FBLCD to set the voltage. The feedback regulation voltage is 1.25V at FBLCD. |
| 5 | AGND | Analog Ground. Connect AGND to GND as close to the IC as possible. |
| 6 | N.C. | No Connection. Not internally connected. |
| 7 | LXLCD | LCD Output Switching Node. Drain of the internal N-channel MOSFET that drives the LCD output. Connect an external inductor and rectifier to LXLCD. |
| 8 | GND | Power Ground. Connect GND to AGND as close to the IC as possible. |
| 9 | LX | Main Output Switching Node. Drain of the internal N-channel MOSFET that drives the main output. Connect an external inductor and rectifier to LX. |
| 10 | OUT | Main Step-Up Converter Output. OUT is used to measure the output voltage in fixed mode (FB = GND) and is the internal bias supply input to the IC. When shut down (ON = ONLCD = GND), OUT is high impedance, drawing 1μ A (max). |

Detailed Description

The MAX1817 dual step-up converter is designed to supply the main power and LCD bias for low-power, hand-held devices. The MAX1817's main step-up converter includes a 0.35Ω N-channel power MOSFET switch and provides a fixed 3.3V or adjustable 2.5V to 5.5V output at up to 125mA from an input as low as 1.5V. The MAX1817's LCD bias step-up converter includes a high-voltage 1.1 Ω power MOSFET switch to support as much as 5mA at 28V (Figure 1). During startup, the MAX1817 extends the LCD MOSFET switch minimum off-time, limiting surge current. Both converters require an inductor and external rectifier.

The MAX1817 runs in bootstrap mode, powering the IC from the main step-up converter's output. Independent logic-controlled shutdown for the main and LCD step-up converters reduces quiescent current to 0.1μ A.

Main Step-Up Converter

The MAX1817 main step-up converter runs from a +1.5V to +5.5V input voltage and produces a fixed 3.3V or adjustable 2.5V to 5.5V output voltage as well as



biasing the internal control circuitry. The MAX1817 switches only as often as is required to supply sufficient power to the load. This allows the converter to operate at lower frequencies at light loads, improving efficiency.

The control scheme maintains regulation when the error amplifier senses the output voltage is below the feedback threshold, turning on the internal N-channel MOS-FET and initiating an on-time. The on-time is terminated when the 0.75A current limit is reached or when the maximum on-time is reached. The N-channel MOSFET remains off until the inductor current drops to 0, forcing discontinuous inductor current. At the end of a cycle, the error comparator waits for the voltage at FB to drop below the regulation threshold, at which time another cycle is initiated.

The main step-up converter uses a startup oscillator to allow it to start from an input voltage as low as +1.2V. This is necessary since the control circuitry is powered from the step-up converter output (OUT). When the voltage at OUT is below the OUT undervoltage lockout, a fixed 50% duty cycle drives the internal N-channel MOSFET, forcing the main output voltage to rise. Once





Figure 1. MAX1817 Simplified Functional Diagram

the output voltage rises above the undervoltage threshold, the control circuitry is enabled, allowing proper regulation of the output voltage.

LCD Step-Up Converter

The MAX1817's LCD step-up converter generates an LCD bias voltage up to 28V by use of a 500mA, 1.1Ω internal N-channel switching MOSFET (Figure 1). The LCD step-up converter control circuitry is powered from the main step-up converter output (OUT), so the voltage at OUT must be above the OUT undervoltage lockout voltage for the LCD step-up converter to operate.

During startup, the MAX1817 extends the minimum offtime to 5 μ s for V_{FBLCD} voltages <0.9V, limiting initial surge current. The LCD step-up converter features an independent shutdown control, ONLCD.

The LCD step-up converter features a minimum-offtime, current-limited control scheme. A pair of oneshots that set a minimum off-time and a maximum ontime governs the duty cycle. The switching frequency can be up to 500kHz and depends upon the load, and input and output voltages.





Figure 2. Setting Main Output Voltage Using External Resistors

Low-Voltage Startup

The MAX1817's internal circuitry is powered from OUT. The main step-up converter has a low-voltage startup circuit to control main DC-DC converter operation until V_{OUT} exceeds the 2.2V (typ) undervoltage lockout threshold. The minimum startup voltage is a function of load current (see *Typical Operating Characteristics*). The MAX1817 main converter typically starts up into a 35 Ω load with input voltages down to +1.5V, allowing startup with two alkaline cells even in deep discharge.

Shutdown: ON and ONLCD

The MAX1817 features independent shutdown control of the main and LCD step-up converters. With both converters shut down, supply current is reduced to 0.1μ A. A logic low at ON shuts down the main step-up converter, and LX enters a high-impedance state. However, the main output remains connected to the input through the inductor and output rectifier, holding V_{OUT} to one diode drop below the input voltage when the main converter is shut down. If the input voltage is sufficiently high to drive V_{OUT} above the undervoltage lockout voltage, the LCD step-up converter operates.

A logic low at ONLCD shuts down the LCD step-up converter, and LXLCD enters a high-impedance state. The LCD output remains connected to the input through the inductor and output rectifier, holding it to one diode drop below the input.



Figure 3. Typical Application Circuit

_Design Procedure

Setting the Main Output Voltage

The main step-up converter feedback input (FB) features Dual Mode operation. With FB grounded, the main output voltage is preset to 3.3V. It can also be adjusted from 2.5V to 5.5V with external resistors R3 and R4 as shown in Figure 2. To set the output voltage externally, select resistor R4 from $10k\Omega$ to $100k\Omega$. Calculate R3 using:

$$R3 = R4 [(V_{OUT} / V_{FB}) - 1]$$

where V_{FB} = 1.25V, and V_{OUT} can range from 2.5V to 5.5V.

Setting the LCD Output Voltage

Set the LCD output voltage with two external resistors R1 and R2 as shown in Figure 3. Since the input leakage current at FBLCD has a maximum of 50nA, large resistors can be used without significant accuracy loss. Begin by selecting R2 in the $10k\Omega$ to $100k\Omega$ range, and calculate R1 using the following equation:

$$R1 = R2 [(V_{LCD} / V_{FBLCD}) - 1]$$

where V_{FBLCD} = 1.25V, and V_{LCD} can range from V_{IN} to 28V.









Figure 4. Negative Voltage for LCD Bias

Using a Charge Pump to Make Negative LCD Output Voltage

The MAX1817 can generate a negative LCD output by adding a diode-capacitor charge-pump circuit (D3, D4, and C6) to the LXLCD pin as shown in Figure 4. FBLCD is driven through a resistive voltage-divider from the positive output, which is not loaded, allowing a very small capacitor value at C2. For best stability and lowest ripple, the time constant of the R1 + R2 series combination and C2 should be near that of C5 and the effective load resistance. Output load regulation of the negative output degrades compared to the standard positive output circuit and may rise at very light loads. If this is not acceptable, reduce the resistance of R1 and R2, while maintaining their ratio, to effectively preload the output with a few hundred µA. This is why the R1 and R2 values shown in Figure 4 are lower than typical values for a positive-output design. When loaded, the magnitude of the negative output voltage is slightly lower (closer to ground by approximately a diode forward voltage) than the voltage on C2.

Applications Information

Inductor Selection

The MAX1817's high switching frequency allows the use of small surface-mount inductors. The $10\mu H$ values

shown in Figure 3 are recommended for most applications, although values between 4.7μ H and 47μ H are suitable. Smaller inductance values typically offer a smaller physical size for a given series resistance, allowing the smallest overall circuit dimensions. Larger inductance values exhibit higher output current capability, but larger physical dimensions.

Circuits using larger inductance values may start up at lower input voltages and exhibit less ripple, but they may provide reduced output power. This occurs when the inductance is sufficiently large to prevent the maximum current limit from being reached before the maximum on-time expires. The inductor's saturation current rating should be greater than the peak switching current. However, it is generally acceptable to bias most inductors into saturation by as much as 20%, although this may slightly reduce efficiency.

For best efficiency, select inductors with resistance no greater than the internal N-channel FET resistance in each step-up converter.

For maximum output current, choose L such that:

$L < [(V_{IN} \times t_{ON}) / I_{PEAK}]$

where t_{ON} is the maximum switch on-time (5µs for main step-up converter) or 9µs for LCD step-up converter) and IPEAK is the switch peak current limit (0.75A for the main step-up converter, or 0.5A for the LCD step-up converter). With this inductor value, the maximum output current the main converter is able to deliver is given by:

$$I_{OUT(MAX)} = 0.5 \times I_{PEAK} / (1 + t_{ON} / t_{OFF})$$

where $t_{ON} / t_{OFF} = (V_{OUT} + V_D - V_{IN}) / (V_{IN} - V_{ON})$, V_{IN} and V_{OUT} are the input and output voltages, V_D is the Schottky diode drop (0.3V typ), and $V_{ON} = I_{PEAK} \times R_{ON}$, where R_{ON} is the switch on-resistance.

For V_{IN} = 1.5V and V_{OUT} = 3.3V, with a minimum I_{PEAK} value of 0.5A, and V_{ON(MAX)} given by $(0.5) \times (0.65) = 0.325V$, the available output current that the converter can provide is at least 90mA.

For larger inductor values, IPEAK is determined by:

$$I_{PEAK} = [(V_{IN} \times t_{ON}) / L]$$

External Rectifiers

The high maximum switching frequency of the MAX1817 requires a high-speed rectifier. Schottky diodes such as the Motorola MBR0530 or the Nihon EP05Q03L are recommended. To maintain high efficiency, the average current rating of the Schottky diode should be greater than the peak switching current. A junction diode such as the Central Semiconductor CMPD4448 can be used for the LCD output with little



loss in efficiency. Choose a reverse breakdown voltage greater than the output voltage.

Input Bypass Capacitor

The input supplies high currents to the inductors and requires local bulk bypassing close to the inductors. A low equivalent series resistance (ESR) input capacitor connected in parallel with the battery will reduce peak battery currents and input-reflected noise. Battery bypassing is especially helpful at low input voltages and with high-impedance batteries (such as alkaline types). Benefits include improved efficiency and lower useful end-of-life voltage for the battery. A single 10µF low-ESR surface-mount capacitor is sufficient for most applications.

Output Bypass Capacitors

For most applications, use a small surface-mount 22µF or greater ceramic capacitor on the main converter output, and a 1µF or greater ceramic capacitor on the LCD output. For small ceramic capacitors, the output ripple voltage is dominated by the capacitance value. If tantalum or electrolytic capacitors are used, the ESR of the capacitors dominates the output ripple voltage. Decreasing the ESR reduces the output ripple voltage and the peak-to-peak transient voltage.

LCD Compensation

The MAX1817's LCD step-up converter feedback requires a small 4.7pF feed-forward capacitor for the typical application circuit. Circuits with adjustable V_{OUT}

(main converter) from 2.5V to 5.5V may require a larger value LCD feed-forward capacitor to prevent multipulsing of the LCD converter. Larger feed-forward capacitors slightly degrade load regulation, so choose the smallest value capacitor that provides stability.

Layout Considerations

The MAX1817's high-frequency operation makes PC board layout important for optimal performance. Use separate analog and power ground planes. Connect the two planes together at a single point as close as possible to the IC. Use surface-mount components where possible. If leaded components are used, minimize lead lengths to reduce stray capacitance and keep the components close to the IC to minimize trace resistance. Where an external voltage-divider is used to set output voltage, the traces from FB or FBLCD to the feedback resistors should be extremely short (less than 0.2in or 5mm) to minimize coupling from LX and LXLCD. Refer to the MAX1817 evaluation kit for a full PC board example.

Chip Information

TRANSISTOR COUNT: 2785 PROCESS: BICMOS



Maxim cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim product. No circuit patent licenses are implied. Maxim reserves the right to change the circuitry and specifications without notice at any time.

Printed USA

12

_____Maxim Integrated Products, 120 San Gabriel Drive, Sunnyvale, CA 94086 408-737-7600

© 2000 Maxim Integrated Products

is a registered trademark of Maxim Integrated Products.