

# MAXIM

## MAX629 Evaluation Kit

Evaluates: MAX629

### General Description

The MAX629 evaluation kit (EV kit) contains two separate switching-regulator circuits. The first circuit converts a +0.8V to  $V_{OUT}$  battery voltage to a +24V LCD backplane bias voltage for currents up to 20mA. The second circuit converts a +0.8V to +12V battery voltage to a -20V voltage for currents up to 20mA. The MAX629 requires a +2.7V to +5.5V supply at  $V_{CC}$ , but the inductor can be powered from as low as 0.8V. Both output voltages can be adjusted by changing the feedback-resistor values.

The MAX629 EV kit provides low quiescent current and high efficiency for maximum battery life. Operation up to 300kHz allows the use of a tiny surface-mount inductor. This EV kit is a fully assembled and tested surface-mount circuit board.

### Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2, C10, C11	4	10 $\mu$ F, 35V tantalum capacitors AVX TPSD106M035R0300 or Sprague 593D106X0035D2W
C3, C4, C8, C9	4	0.1 $\mu$ F ceramic capacitors
C5, C6	2	150pF ceramic capacitors
C7	1	2.2 $\mu$ F ceramic capacitor Marcon/United Chemi-Con THCR30E1225Z
D1, D2, D3	3	40V, 0.5A Schottky diodes Motorola MBR0540LT3
JU1–JU4	4	3-pin headers
L1, L2	2	47 $\mu$ H inductors Sumida CD54-470
R1, R3	2	576k $\Omega$ , 1% resistors
R2	1	31.6k $\Omega$ , 1% resistor
R4	1	35.7k $\Omega$ , 1% resistor
R5	1	2 $\Omega$ , 5% resistor
U1, U2	2	MAX629ESA (SO-8)
None	4	Shunts
None	1	MAX629 PC board

### Features

- ◆ **Output Voltage:**  
+24V Positive  
-20V Negative
- ◆ **Battery Input Voltage:**  
+0.8V to  $V_{OUT}$  (Positive Output)  
+0.8V to +15V (Negative Output)
- ◆ **+2.7V to +5.5V  $V_{CC}$  Supply Range**
- ◆ **Up to 20mA Output Current**
- ◆ **Internal 28V N-Channel Switch**
- ◆ **1 $\mu$ A (Max) IC Shutdown Current**
- ◆ **Up to 300kHz Switching Frequency**
- ◆ **Surface-Mount Components**
- ◆ **Fully Assembled and Tested**

### Ordering Information

PART	TEMP. RANGE	BOARD TYPE
MAX629EVKIT	0°C to +70°C	Surface Mount

### Component Suppliers

SUPPLIER*	PHONE	FAX
AVX	(803) 946-0690	(803) 626-3123
Coilcraft	(847) 639-6400	(847) 639-1469
Coiltronics	(561) 241-7876	(561) 241-9339
Dale-Vishay	(402) 564-3131	(402) 563-6418
Marcon/United Chemi-Con	(847) 696-2000	(847) 696-9278
Motorola	(602) 303-5454	(602) 994-6430
Sprague	(603) 224-1961	(603) 224-1430
Sumida	(847) 956-0666	(847) 956-0702
Vishay/Vitramon	(203) 268-6261	(203) 452-5670

\* Please indicate that you are using the MAX629 when contacting these suppliers.

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## Quick Start

The MAX629 EV kit is fully assembled and tested. Follow these steps to verify board operation. VCC and VBATT are separated on each circuit to demonstrate operation of VBATT down to 0.8V. VCC and VBATT can be connected together and to a single supply from 2.7V to 5.5V. **Do not turn on the power supply until all connections are completed.**

### Positive Output:

- 1) Connect a +2.7V to +5.5V supply to the VCC pad, and a +0.8V to V<sub>OUT</sub> supply to the VBATT pad. Connect the grounds to the GND pad.
- 2) Connect a voltmeter and load, if any, to the V<sub>OUT</sub> pad.
- 3) Place the shunt on JU1 across pins 2 and 3.
- 4) Turn on the power supplies and verify that the output voltage is +24V.

### Negative Output:

- 1) Connect a +2.7V to +5.5V supply to the VCC pad, and a +0.8V to +15V supply to the VBATT pad. Connect the grounds to the GND pad.
- 2) Connect a voltmeter and load, if any, to the V<sub>OUT</sub> pad.
- 3) Place the shunt on JU3 across pins 2 and 3.
- 4) Turn on the power supplies and verify that the output voltage is -20V.

For other output voltages, refer to the *Setting the Output Voltage* section in the MAX629 data sheet for instructions on selecting the feedback resistors.

## Detailed Description

The MAX629 EV kit contains two separate switching-regulator circuits. The first circuit provides a +24V output for currents up to 20mA with 87% typical conversion efficiency. The second circuit provides a -20V output voltage for currents up to 20mA with 82% typical conversion efficiency. Both output voltages can be adjusted by changing the feedback-resistor values.

## Shutdown Mode

The MAX629 EV kit features a shutdown mode that reduces quiescent current to less than 1 $\mu$ A to preserve battery life. The two-pin header JU1 selects shutdown mode for the positive output, and JU3 selects shutdown mode for the negative output. Tables 1 and 2 list the selectable jumper options.

## Current Limit

The two-pin header JU2 selects the current limit for the positive output, and JU4 selects the current limit for the negative output. Table 3 lists the selectable jumper options. The MAX629 EV kit comes configured for a 500mA current limit.

**Table 1. Jumper JU1 Functions (Positive Output)**

SHUNT LOCATION	$\overline{\text{SHDN}}$ PIN	MAX629 OUTPUT
1 and 2	Connected to GND	Shutdown mode, V <sub>OUT</sub> = V <sub>BATT</sub> - V <sub>DIODE</sub>
2 and 3	Connected to VCC	MAX629 enabled, V <sub>OUT</sub> = +24V

**Table 2. Jumper JU3 Functions (Negative Output)**

SHUNT LOCATION	$\overline{\text{SHDN}}$ PIN	MAX629 OUTPUT
1 and 2	Connected to GND	Shutdown mode, V <sub>OUT</sub> = 0V
2 and 3	Connected to VCC	MAX629 enabled, V <sub>OUT</sub> = -20V

**Table 3. Jumper JU2 and JU4 Functions**

SHUNT LOCATION	$\overline{\text{ISET}}$ PIN	CURRENT LIMIT (mA)
1 and 2	Connected to GND	250
2 and 3	Connected to VCC	500

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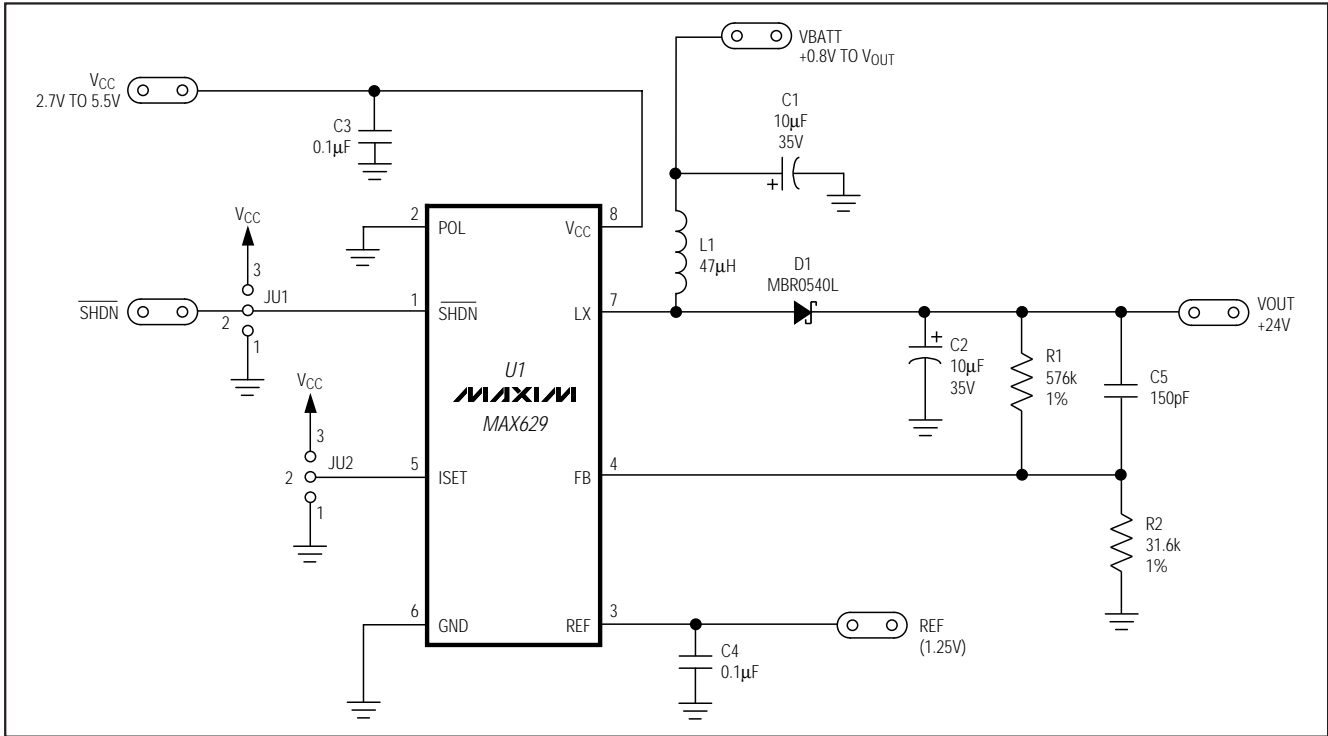


Figure 1a. MAX629 EV Kit Schematic (Positive Output Voltage)

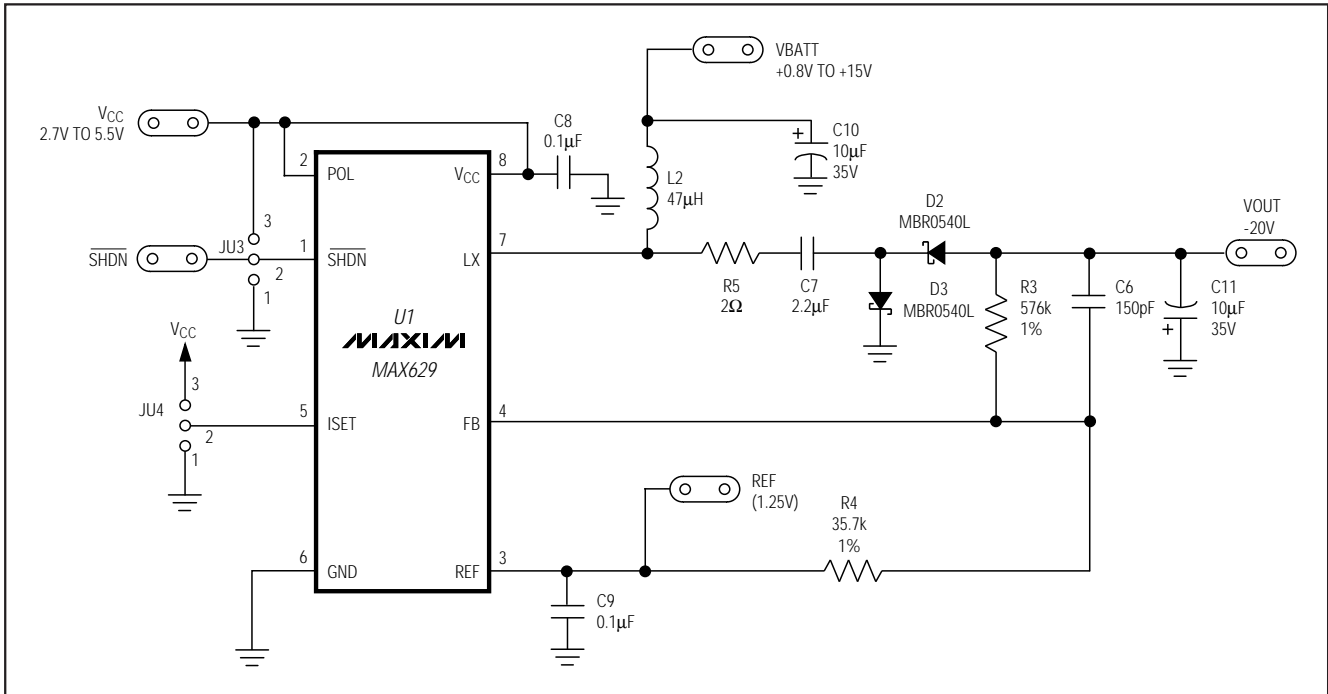


Figure 1b. MAX629 EV Kit Schematic (Negative Output Voltage)

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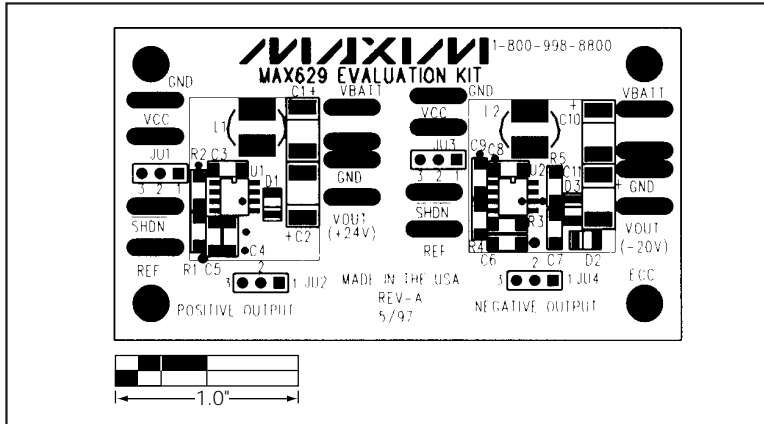


Figure 2. MAX629 EV Kit Component Placement Guide—Component Side

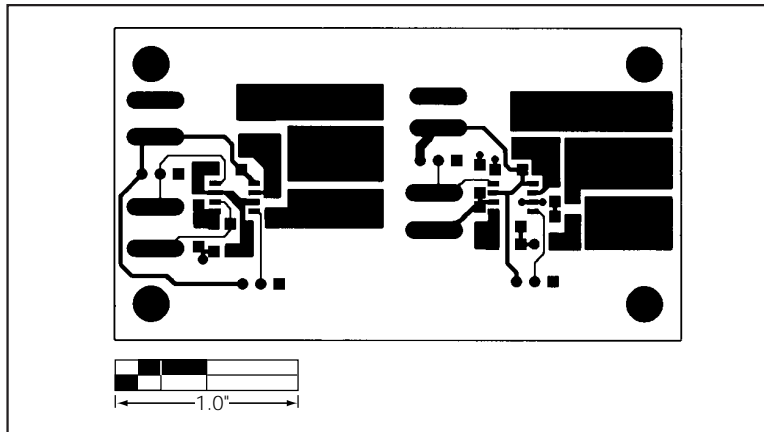


Figure 3. MAX629 EV Kit PC Board Layout—Component Side

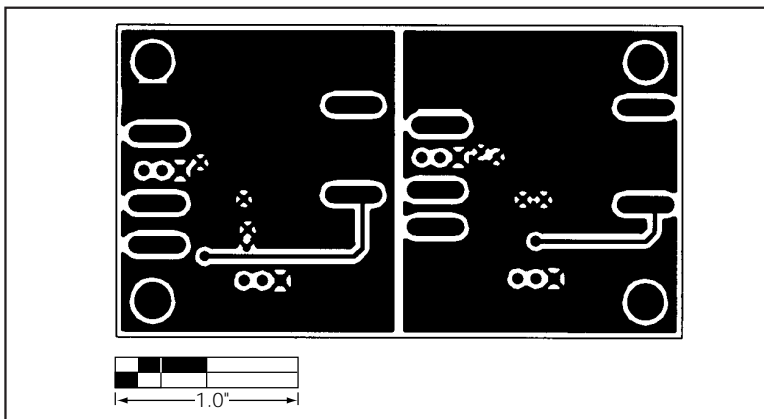


Figure 4. MAX629 EV Kit PC Board Layout—Solder Side

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