

# MAXIM

## MAX5026 Evaluation Kit

### General Description

The MAX5026 evaluation kit (EV kit) provides a +30V output voltage from a +3V to +11V input source. It delivers up to 6mA output current, depending on the input voltage. The MAX5026 is a constant-frequency, pulse-width-modulating (PWM), current-mode step-up voltage converter with an internal power switch that operates at 500kHz. This EV kit demonstrates the low-noise performance of the device.

The MAX5026 EV kit is a fully assembled and tested surface-mount circuit board. With modifications, this EV kit can also be used to evaluate MAX5025/MAX5027/MAX5028. The EV kit can be used to evaluate other output voltages by changing the feedback resistors.

### Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	4.7 $\mu$ F, 16V, X5R, 20% ceramic capacitor (1206) Taiyo Yuden EMK316BJ475ML
C2, C3	2	1 $\mu$ F, 50V, X7R, 10% ceramic capacitors (1210) TDK C3216X7R1H105K (populates with 1206 case capacitor)
C4, C5	0	Not installed, capacitor (1210)
L1	1	47 $\mu$ H $\pm$ 20% power inductor Toko A915BY-470M Sumida CDRH4D28-470
D1	1	0.5A, 40V Schottky diode (SOT23) Zetex ZHCS500
R1	1	147k $\Omega$ $\pm$ 1% resistor (0603)
R2	1	6.34k $\Omega$ $\pm$ 1% resistor (0603)
R3	1	100 $\Omega$ $\pm$ 5% resistor (0805)
<b>U1</b>	<b>1</b>	<b>MAX5026EUT (6-Pin SOT23)</b>
JU1	1	3-pin header (JU1)
J1	1	5mm oscilloscope jack
None	1	Shunt
None	1	MAX5026 PC board

### Features

- ◆ +3V to +11V Input Voltage Range (MAX5026/MAX5028)
- ◆ +4.5V to +11V Input Voltage Range (MAX5025/MAX5027)
- ◆ Output Voltage:
  - Adjustable Output Voltage Up to +36V (MAX5025/MAX5026)
  - +30V Fixed Output Voltage (MAX5027/MAX5028)
- ◆ Low Switching Noise
- ◆ 500kHz Switching Frequency
- ◆ Less than 1mVp-p High-Frequency Output Switching Ripple at 2mA Load
- ◆ Up to 6mA Output Current with +5V Input
- ◆ 6-Pin SOT23 Package
- ◆ Surface-Mount Construction
- ◆ Fully Assembled and Tested

### Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX5026EVKIT	0°C to +70°C	6 SOT23-6

**Note:** To evaluate the MAX5025/MAX5027/MAX5028, request a MAX5025EUT/MAX5027EUT/MAX5028EUT free sample with the MAX5026EVKIT.

Evaluates: MAX5025-MAX5028

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## Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
Murata	770-436-1300	770-436-3030	www.murata.com
Sumida	847-545-6700	847-545-6720	www.sumida.com
Taiyo Yuden	800-348-2496	847-925-0899	www.t-yuden.com
TDK	847-803-6100	847-390-4405	www.tdk.com
Toko	847-297-0070	847-699-1194	www.tokoam.com
Zetex	631-543-7100	631-864-7630	www.zetex.com

**Note:** Please indicate that you are using the MAX5025-MAX5028 when contacting these component suppliers.

### Quick Start

The MAX5026 EV kit is a fully assembled and tested surface-mount board. Follow the steps below to verify board operation. **Do not turn on the power supply until all connections are completed.**

#### Evaluating MAX5026

- 1) Verify that there is a shunt across JU1 (SHDN) pins 1 and 2.
- 2) Connect a voltmeter and load (if any) to the VOUT pad (and/or plug an oscilloscope probe into the oscilloscope jack).
- 3) Connect a +3V to +11V power supply to the VIN pad. Connect the power-supply ground to the GND pad closest to VIN.
- 4) Turn on the power supply and verify that the output voltage is approximately +30V.

To evaluate other output voltages, refer to the *Evaluating Other Output Voltages* section.

### Detailed Description

#### Shutdown Function

The MAX5026 EV kit contains a boost converter. The circuit provides a +30V output with less than 2mVp-p high-frequency ripple from a +3V to +11V input voltage, and delivers up to 6mA. The setting of jumper JU1 selects the circuit operating modes. Table 1 shows the functions of jumper JU1.

#### Noise Performance

The MAX5026 EV kit is specifically designed for low-noise performance. An RC filter at the regulator's output reduces its noise further. To observe this filtered output, monitor the signal at oscilloscope jack J1. The high-frequency output ripple voltage is less than 1mVp-p at 2mA load current. Extra capacitor pads (C4 and C5) are provided for further noise reduction. To reduce low-frequency noise, add a 10 $\mu$ F electrolytic capacitor at

the pads labeled C5. Without the 10 $\mu$ F capacitor, the peak-to-peak low-frequency noise is about 20mV. The peak-to-peak low-frequency noise drops to 3mV when the 10 $\mu$ F capacitor is included.

#### Evaluating Other Output Voltages

The default output for the MAX5026 EV kit is +30V. To generate output voltages other than +30V with either the MAX5025EUT or MAX5026EUT, change feedback resistors R1 and R2. Limit the current through R1 and R2 to about 200 $\mu$ A.  $R1 = R2 [(V_{OUT} / 1.25V) - 1]$ .

#### Evaluating MAX5027/MAX5028

The MAX5026 EV kit can also be used to evaluate the MAX5027/MAX5028 boost converters with fixed +30V output. To evaluate MAX5027/MAX5028, remove the feedback resistors R1 and R2, short the two pads of R1, and replace the MAX5026EUT with a MAX5027EUT/MAX5028EUT.

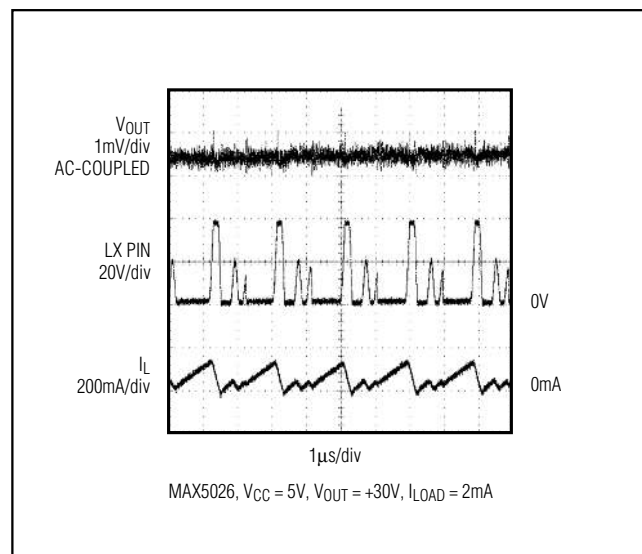


Figure 1. Medium-Load Switching Waveform with RC Filter

# MAX5026 Evaluation Kit

**Table 1. Jumper JU1 Functions**

SHUNT LOCATION	$\overline{\text{SHDN}}$ PIN	MAX5026 OUTPUT
1 and 2	Connected to VIN	MAX5026 enabled, $V_{\text{OUT}} = +30\text{V}$
2 and 3	Connected to GND	Shutdown mode, $V_{\text{OUT}} = V_{\text{IN}} - V_{\text{D}}$ , where $V_{\text{D}}$ is the diode forward-voltage drop
Open	Connected to $\overline{\text{SHDN}}$ pad	External logic signal enables or disables the MAX5026 output

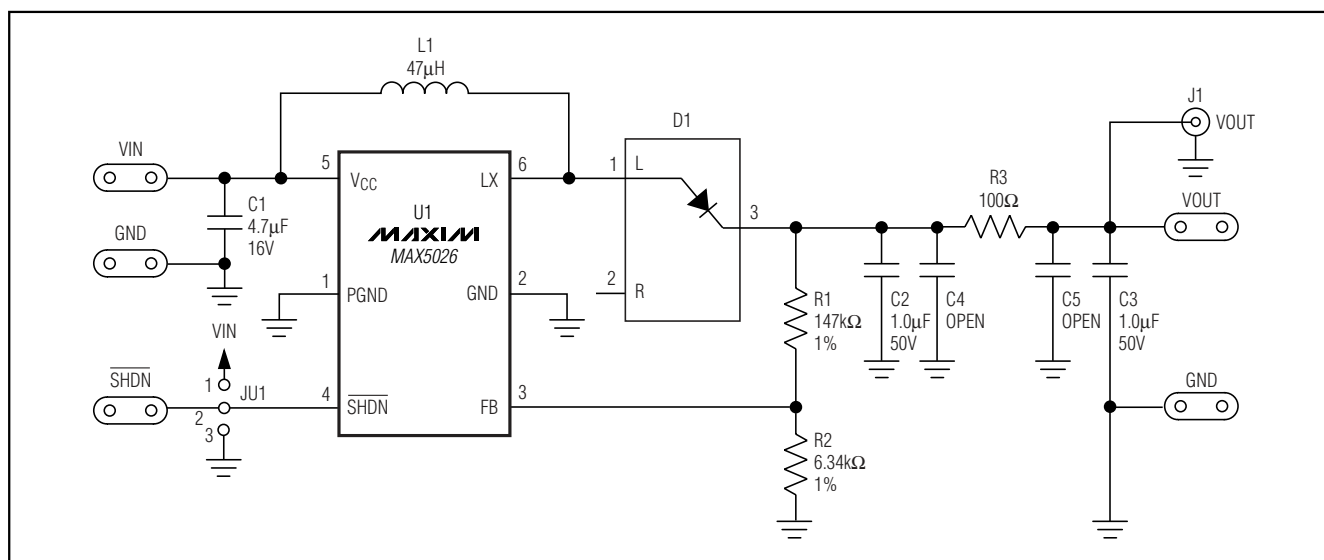


Figure 2. MAX5026 EV Kit Schematic

**Evaluates: MAX5025-MAX5028**

# MAX5026 Evaluation Kit

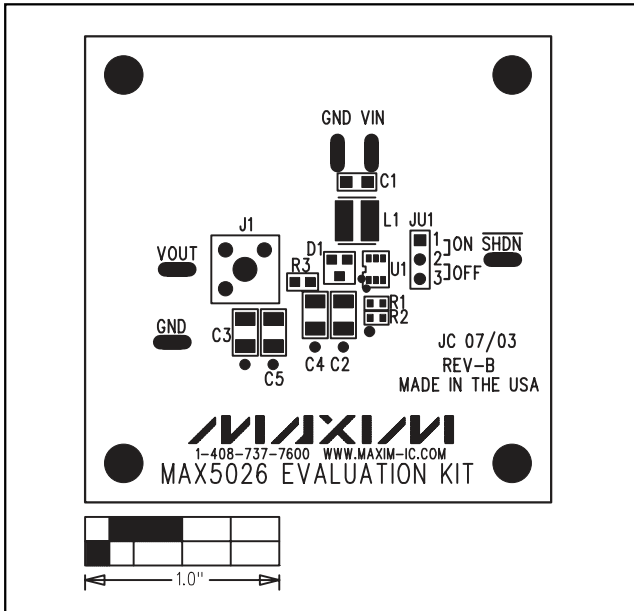


Figure 3. MAX5026 EV Kit Component Placement Guide—Top Silkscreen

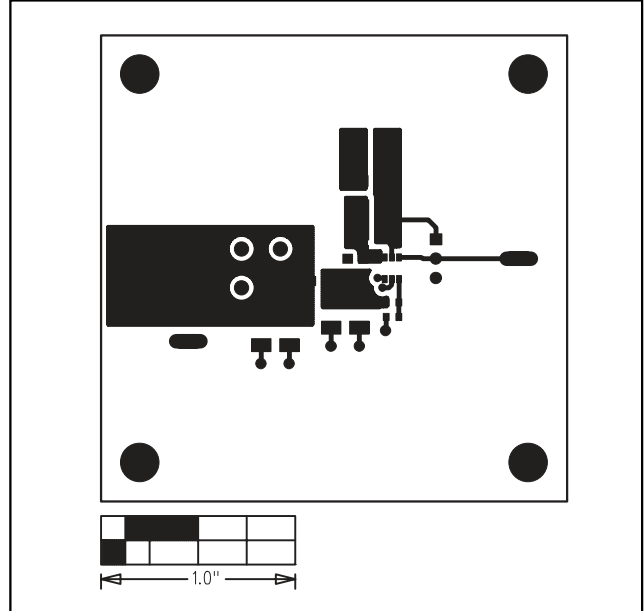


Figure 4. MAX5026 EV Kit PC Board Layout—Component Side

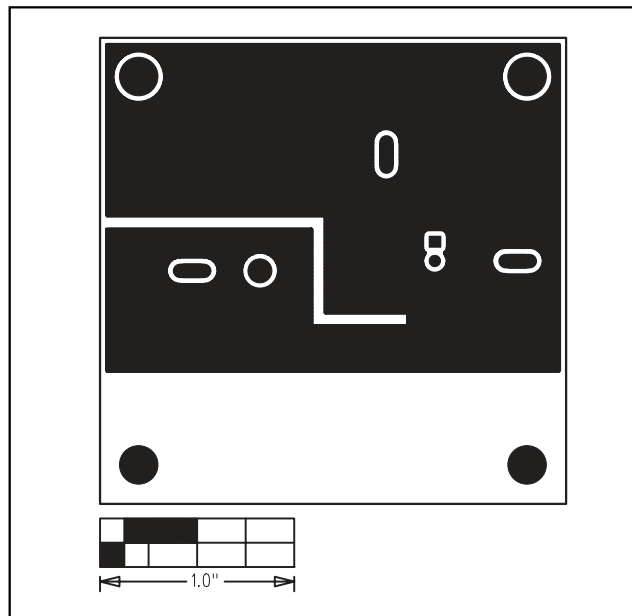


Figure 5. MAX5026 EV Kit PC Board Layout—Solder Side

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