



MAX1947 Evaluation Kit

Evaluates: MAX1947

General Description

The MAX1947 evaluation kit (EV kit) is a fully assembled and tested surface-mount circuit board demonstrating the low-voltage, skip-mode boost converter. The EV kit provides a 1.8V output voltage capable of sourcing 270mA (typ) load current from a 0.7V to 3.6V input source. The MAX1947 features skip mode to optimize efficiency and battery life. It also contains internal MOSFETs for lower cost and size. The 1.2MHz (max) switching frequency allows the use of small external components. The MAX1947 EV kit is fully assembled and tested. The MAX1947 EV kit can be used to evaluate the MAX1947ETA25, MAX1947ETA30, and MAX1947ETA33 with no PC board modification.

Features

- ◆ 0.7V to 3.6V Input Voltage Range
- ◆ 1.8V Output Voltage
- ◆ Up to 270mA Output Current
- ◆ No Current-Sense Resistor Needed
- ◆ 90% Efficiency
- ◆ Track Mode when $V_{IN} > V_{OUT}$
- ◆ Internal MOSFET Switch and Synchronous Rectifier
- ◆ True Shutdown™
- ◆ 1.2MHz (max) Switching Frequency
- ◆ Surface-Mount Components
- ◆ Fully Assembled and Tested

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10 μ F $\pm$ 20%, 6.3V X5R ceramic capacitor (0805) Taiyo Yuden JMK212BJ106ME
C2	1	22 μ F $\pm$ 20%, 6.3V X5R ceramic capacitor (0805) Taiyo Yuden JMK212BJ226MG
C3	0	Not installed, capacitor (0402)
C4	1	100 μ F, 6.3V SP polymer Panasonic EEFUD0J101XR
JU1	1	3-pin header
L1	1	2.2 μ H, 1.2A, 55m Ω inductor Sumida CDRH3D16-2R2
U1	1	MAX1947ETA18 (8-pin TDFN)
None	1	Shunt

True Shutdown is a trademark of Maxim Integrated Products, Inc.

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX1947EVKIT	0°C to +70°C	8 TDFN (3mm x 3mm)

Note: To evaluate the MAX1947ETA25, MAX1947ETA30, or MAX1947ETA33, request a free sample with the MAX1947EVKIT.

Quick Start

Recommended Equipment

- 6V, 1A variable power supply
- Digital multimeter (DMM)
- Dummy load capable of sinking 200mA

Procedure

The MAX1947 EV kit is fully assembled and tested. Follow these steps to verify board operation:

- 1) Preset the 6V power supply to 1.2V and turn off the power supply. **Do not turn on the power supply until all connections are made.**
- 2) Verify that there is a shunt across pins 1 and 2 of JU1 on the MAX1947 EV kit for normal operation.

Component Suppliers

SUPPLIER	COMPONENT	PHONE	WEBSITE
Panasonic	Capacitors	714-373-7366	www.panasonic.co.jp/maco/en/
Sumida	Inductors	81-03-3667-3381	www.sumida.com
Taiyo Yuden	Capacitors	408-573-4150	www.t-yuden.com
TDK	Capacitors	888-835-6646	www.component.tdk.com

Note: Indicate that you are using the MAX1947 when contacting these suppliers.



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For pricing, delivery, and ordering information, please contact Maxim/Dallas Direct! at 1-888-629-4642, or visit Maxim's website at www.maxim-ic.com.

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- 3) Connect the positive lead of the power supply to the VBATT pad on the EV kit and the negative lead of the power supply to the GND pad on the EV kit.
- 4) Connect the positive lead of the DMM to the VOUT pad on the EV kit and the negative lead of the DMM to the GND pad on the EV kit to measure the output voltage.
- 5) Turn on the power supply and sweep the input voltage from 0.7V to 1.8V.
- 6) Verify that the output voltage is approximately 1.8V over the entire input range.
- 7) Set the power supply to 1V.
- 8) Connect the 200mA load between the VOUT and GND pads on the EV kit.
- 9) Verify that the output voltage is approximately 1.8V.

Detailed Description

RESET

The MAX1947 utilizes a push-pull $\overline{\text{RESET}}$ output to signal when the output voltage has reached its regulation point. $\overline{\text{RESET}}$ goes high 120ms after the output voltage reaches 90% of its regulation voltage. $\overline{\text{RESET}}$ pulls low immediately after the output falls below 90% of the regulation voltage.

Shutdown

The MAX1947 features a True Shutdown mode to minimize quiescent current. During shutdown mode, the output is disconnected from the input and pulls to GND through an internal 500Ω (typ) resistor. Place a shunt between positions 2 and 3 of JU1 to shut down the MAX1947. Place a shunt between positions 1 and 2 of JU1 for normal operation.

Input Source

When using long input leads during bench evaluation, some oscillation can occur on the supply and translates to instability in the MAX1947 circuit. To counteract this, a bulk capacitor (C4) is added at the input to the circuit. This capacitor is not needed with most battery applications.

Jumper Settings

Table 1. Jumper JU1 Functions ($\overline{\text{SHDN}}$ Control)

SHUNT LOCATION	$\overline{\text{SHDN}}$ PIN	OPERATION
1 and 2	Connected to VBATT	Normal operation
2 and 3	Connected to GND	Shutdown mode

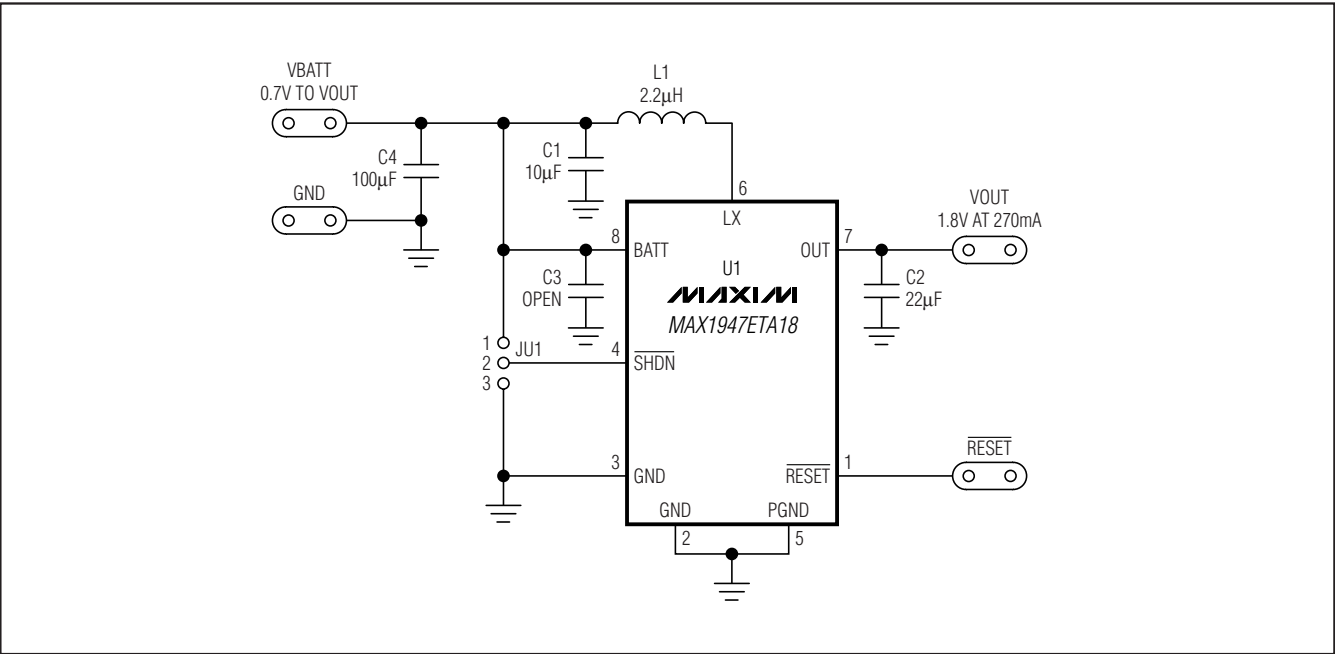


Figure 1. MAX1947 EV Kit Schematic

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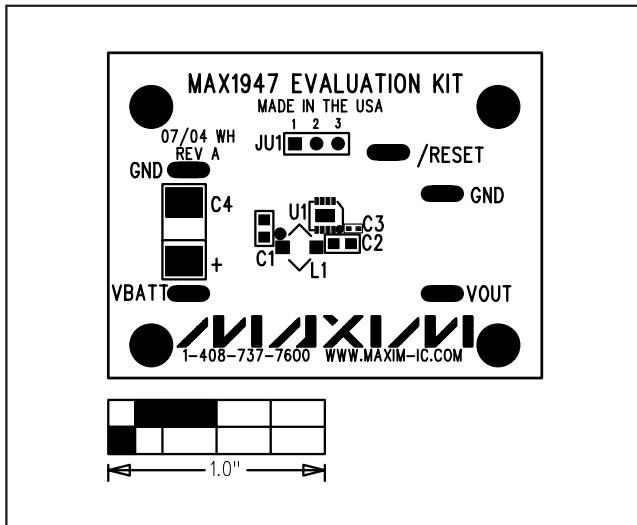


Figure 2. MAX1947 EV Kit Component Placement Guide—Top Silkscreen

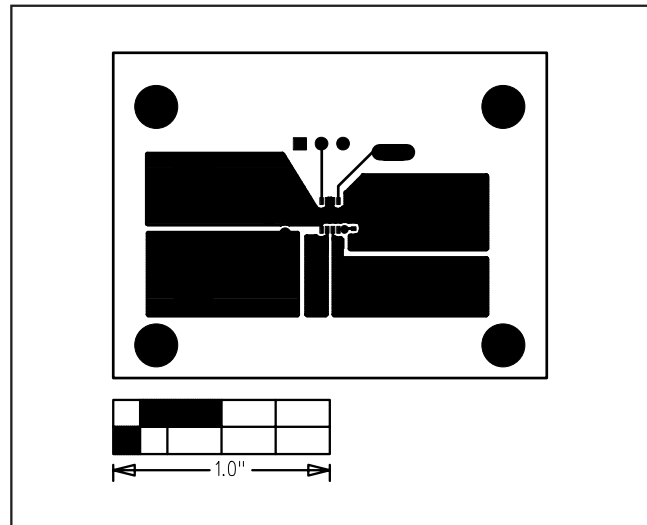


Figure 3. MAX1947 EV Kit PC Board Layout—Component Side

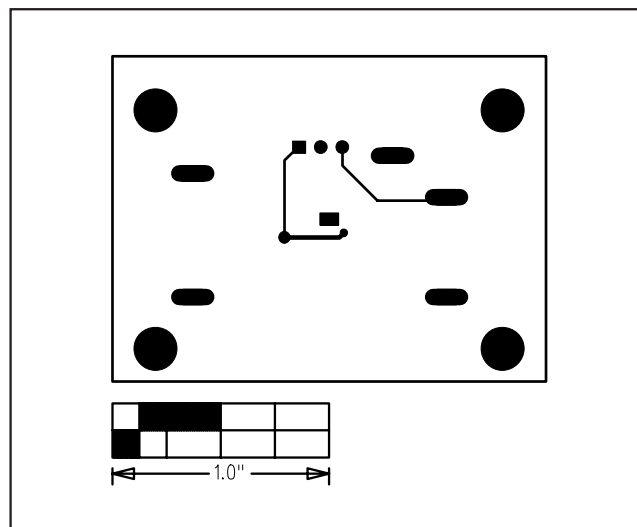


Figure 4. MAX1947 EV Kit PC Board Layout—Solder Side

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