

## General Description

The MAX1606 evaluation kit (EV kit) is a fully assembled and tested surface-mount circuit board that contains a step-up switching converter that generates a positive voltage to drive low-power LCD displays. The circuit is configured for a +18V output voltage and provides up to 20mA. Higher output voltages are possible by selecting different components.

The IC operates from a +2.4V to +5.5V supply voltage but can boost battery voltages as low as +0.8V up to +28V at the output. The IC also offers a true shutdown mode that disconnects the output from the input. Three different inductor current limits can be evaluated with the EV kit as configured.

## Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10 $\mu$ F, 6.3V, X5R ceramic cap (1206) Taiyo Yuden JMK316BJ106ML or equivalent
C2	1	0.1 $\mu$ F, 16V, X7R ceramic cap (0603) Taiyo Yuden EMK107BJ104KA or equivalent
C3	1	1.0pF, 25V, X7R ceramic cap (1206) Taiyo Yuden TMK316BJ105KL or equivalent
C4	1	10pF, 50V, COG ceramic cap (0603) Murata GRM39COG100D050 or Taiyo Yuden UMK107CG100DZ
R1	1	1.0M $\Omega$ $\pm$ 1% resistor (0805)
R2	1	75k $\Omega$ $\pm$ 1% resistor (0805)
D1	1	0.5A schottky diode (SOD-123) Nihon EP05Q03L
L1	1	10 $\mu$ H, 1.2A inductor Sumida CDRH5D18-100
U1	1	MAX1606EUA (8-pin $\mu$ MAX)
JU1, JU2	2	3-pin headers
None	2	Shunts
None	1	MAX1606 PC board
None	1	MAX1606 data sheet
None	1	MAX1606 EV kit data sheet

# MAXIM

## MAX1606 Evaluation Kit

## Features

- ◆ **Input Voltage**  
+0.8V to +5.5V (VIN)  
+2.4V to +5.5V (Vcc)
- ◆ **Output Voltage**  
+18V Output Up to 20mA (as configured)
- ◆ **True Shutdown** (output disconnected from input)
- ◆ **Output Voltage Adjustable with Resistors**
- ◆ **Adjustable Inductor Current-Limit Setting**
- ◆ **Internal MOSFET Switches**
- ◆ **1 $\mu$ A (max) IC Shutdown Current**
- ◆ **Switching Frequency Up to 500kHz**
- ◆ **Surface-Mount Components**
- ◆ **Fully Assembled and Tested**

## Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX1606EVKIT	0°C to +70°C	8 $\mu$ MAX

## Component Suppliers

SUPPLIER	PHONE	FAX
Murata	814-237-1431	814-238-0409
Nihon USA	661-867-2555	661-867-2698
Sumida	847-956-0666	847-956-0702
Taiyo Yuden	408-573-4150	408-573-4159

**Note:** Please indicate that you are using the MAX1606 when contacting these component suppliers.

## Quick Start

The MAX1606 EV kit is fully assembled and tested. Follow these steps to verify board operation. **Do not turn on the power supply until all connections are completed.**

1. Verify that shunts are across pins 1 and 2 of jumpers JU2 (SHDN) and JU1 (LIM, 500mA).
2. Connect a +0.8V to +5.5V DC power supply to the VIN pad. Connect the supply ground to the GND pad (or use the same supply and limits as in step 3)
3. Connect a +2.4V to +5.5V DC power supply to the VCC pad. Connect the supply ground to the GND pad.

**Evaluates: MAX1606**

# MAX1606 Evaluation Kit

- Turn on the VCC power supply, then the VIN power supply. Power-supply sequencing is not critical.
- Verify that the output (VOUT) is +18V.

For instructions on selecting the feedback resistors for other output voltages, see the *Evaluating Other Output Voltages* section.

## Detailed Description

The MAX1606 EV kit is a fully assembled and tested surface-mount circuit board that contains a step-up switching converter generating +18V used to drive low-power LCD displays. The circuit provides up to 20mA of current to the EV kit's output. Higher output voltages up to +28V are possible by selecting different feedback resistors.

Power for the converter circuit can be supplied from a +0.8V to +5.5V DC source or a multiple-cell lithium-ion (Li+) battery. The IC requires a +2.4V to +5.5V DC source. The IC can also be powered from the converter's input supply if the input voltage is limited to between +2.4V and +5.5V.

Three different inductor current limits can be evaluated with the EV kit—125mA, 250mA, and 500mA—by changing a jumper position.

The MAX1606 EV kit demonstrates low quiescent current (18µA typ).

### Jumper Selection

#### Shutdown Mode

The MAX1606 EV kit features a shutdown mode that reduces MAX1606 supply current to <1µA and disconnects the output from the input, thus preserving battery life and obtaining a true shutdown output voltage of 0V. The 3-pin jumper, JU2, selects the shutdown mode for the MAX1606. Table 1 lists the selectable jumper options.

#### Inductor Current Limit

The MAX1606 EV kit features options for evaluating several different inductor current limits.

The 3-pin jumper, JU1, selects the inductor current limit for the MAX1606 EV kit. Table 2 lists the selectable jumper options.

## Evaluating Other Output Voltages

### Output

The MAX1606 EV kit's step-up converter output (VOUT) is set to +18V by two feedback resistors (R1, R2). To generate output voltages other than +18V (VIN to +28V), select different voltage-divider resistors (R1, R2). Refer to the *Setting the Output Voltage* section in the MAX1606 data sheet for instructions on selecting the resistors. The output voltage (VOUT) is determined by the following equation:

$$V_{OUT} = V_{FB}((R_1 / R_2) + 1)$$

where  $V_{FB} = 1.25V$ .

## Single-Supply Operation

### VIN and VCC

The MAX1606 EV kit can be operated from a single power supply. To evaluate the EV kit with a single supply, connect a jumper wire from the VIN pad to the VCC pad. Connect a +2.4V (min) to +5.5V (max) power supply to the VIN or VCC pad.

**Table 1. Jumper JU2 Options**

SHUNT LOCATION	SHDN PIN	MAX1606 OUTPUT
1 and 2	Connected to VCC	MAX1606 enabled, VOUT = +18V (as configured)
2 and 3	Connected to GND	Shutdown mode, VOUT = 0V

**Table 2. Jumper JU1 Options**

SHUNT LOCATION	LIM PIN	INDUCTOR CURRENT LIMIT (mA)
1 and 2	Connected to VCC	500
2 and 3	Connected to GND	125
None	Floating	250

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**Evaluates: MAX1606**

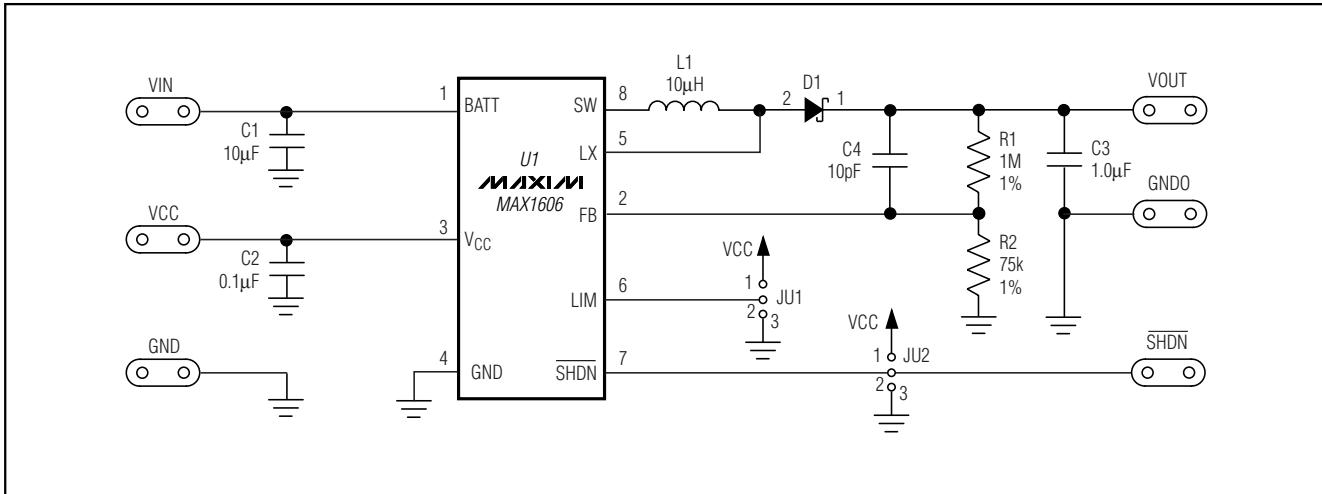


Figure 1. MAX1606 EV Kit Schematic

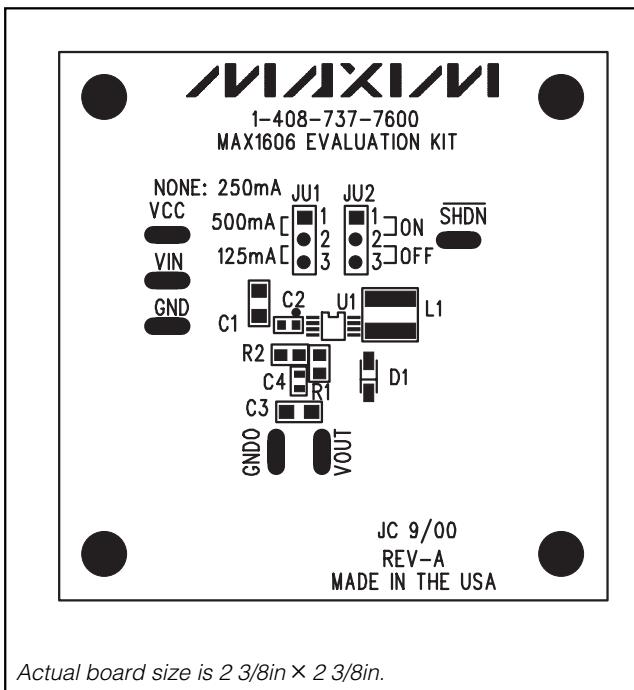


Figure 2. MAX1606 EV Kit Component Placement Guide—Component Side

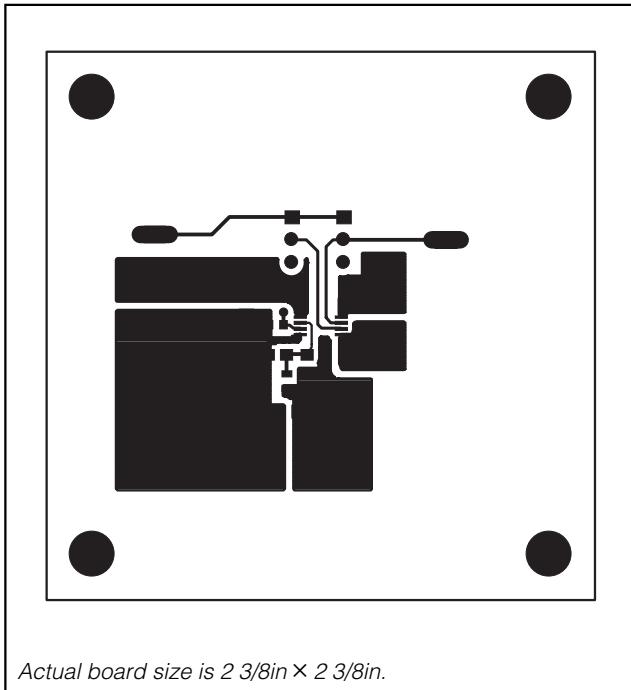


Figure 3. MAX1606 EV Kit PC Board Layout—Component Side

## **MAX1606 Evaluation Kit**

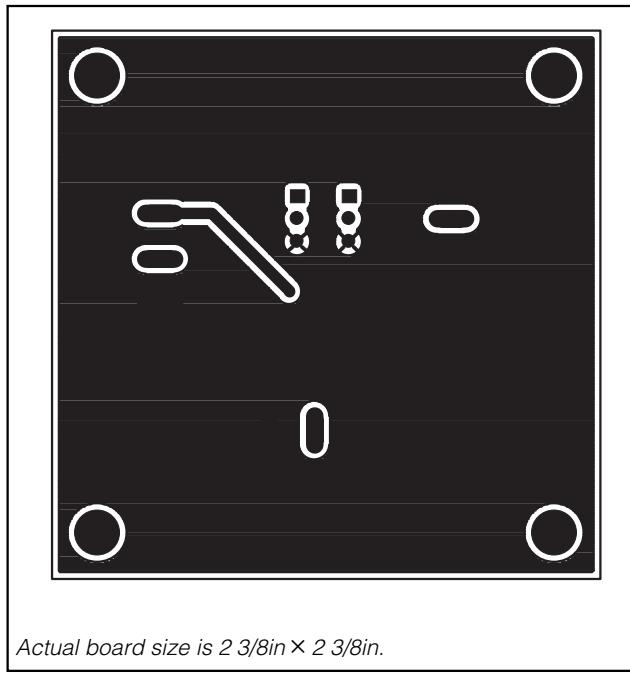


Figure 4. MAX1606 EV Kit PC Board Layout—Solder Side

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