

# MAXIM

## MAX1951 Evaluation Kit

### General Description

The MAX1951 evaluation kit (EV kit) provides a 1.5V output voltage from a 2.6V to 5.5V input source. The output voltage can be adjusted from 0.8V to  $V_{IN}$ . The MAX1951 delivers up to 1.5A output current. The MAX1951 is a fixed-frequency, pulse-width modulated (PWM) step-down switching regulator with internal synchronous-rectifier. Operation at 1MHz minimizes external components.

The MAX1951 EV kit can also be used to evaluate other output voltages by changing the feedback resistors R2 and R3. The EV kit can also be used to evaluate the MAX1952, which is a 1.5A PWM step-down switching regulator with a 1.8V fixed output voltage.

### Component List

DESIGNATION	QTY	DESCRIPTION
C1, C5	2	10 $\mu$ F $\pm$ 20%, 6.3V X5R ceramic capacitors (1206) Taiyo Yuden JMK316BJ106ML or TDK C3216X5R0J106MT
C2	1	220pF $\pm$ 10%, 50V X7R ceramic capacitor (0603) Murata GRM39X7R221K050AD or Taiyo Yuden UMK107CH221KZ
C3, C4	2	0.1 $\mu$ F $\pm$ 20%, 16V X7R ceramic capacitors (0603) Taiyo Yuden EMK107BJ104MA or TDK C1608X7R1C104K or Murata GRM39X7R104K016AD
C6	0	Not installed, capacitor (1206)
D1	0	Not installed, Schottky diode
JU1	1	2-pin header
L1	1	2 $\mu$ H, 2A inductor Toko A915AY-2R0M or 1.8 $\mu$ H, 2A inductor Sumida CDRH4D28-1R8
Q1	1	NPN bipolar transistor SOT23 Fairchild MMBT3904 or Zetex FMMT413
R1	1	51.1k $\Omega$ $\pm$ 1% resistor (0603)
R2	1	15k $\Omega$ $\pm$ 1% resistor (0603)
R3	1	13k $\Omega$ $\pm$ 1% resistor (0603)
R4	1	10 $\Omega$ $\pm$ 5% resistor (0603)
R5	1	10k $\Omega$ $\pm$ 5% resistor (0603)
U1	1	MAX1951ESA 8-lead SO
None	1	Shunt
None	1	MAX1951 PC board

### Features

- ◆ 2.6V to 5.5V Input Range
- ◆ Output Voltage
  - Adjustable 0.8V to  $V_{IN}$  (MAX1951)
  - Fixed 1.8V (MAX1952)
- ◆ 1.5A Output Current
- ◆ Tiny Circuit Footprint: 0.55  $\times$  0.7in<sup>2</sup>
- ◆ Low-Profile Components: < 3mm
- ◆ All Ceramic Design
- ◆ Fixed 1MHz Switching Frequency
- ◆ No External Schottky Diode Required
- ◆ Surface-Mount Construction
- ◆ Fully Assembled and Tested

### Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX1951EVKIT	0°C to +85°C	8 SO

**Note:** To evaluate MAX1952ESA, request an MAX1952ESA-18 free sample with the MAX1951EVKIT.

### Quick Start

The MAX1951 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.**

- 1) Verify that there is no shunt (open) across JU1 (shutdown disabled).
- 2) Connect a voltmeter and load (if any) to the VOUT pad. Connect the ground to the GND closest to VOUT.
- 3) Connect a 2.6V to 5.5V 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 1.5V.

To evaluate other output voltages with the MAX1951, see the *Evaluating Other Output Voltages* section. To evaluate the MAX1952, see the *Evaluating the MAX1952* section.

# MAX1951 Evaluation Kit

## Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
Fairchild	888-522-5372	408-822-2102	www.fairchildsemi.com
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.component.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 MAX1951/MAX1952 when contacting these suppliers.

### Detailed Description

The MAX1951 EV kit provides a 1.5V output voltage from a 2.6V to 5.5V input voltage. The EV kit operates at 1MHz fixed frequency and delivers up to 1.5A of output current. An additional pad (D1) is provided on the bottom side of the EV kit for optimizing efficiency evaluation.

#### Evaluating Other Output Voltages

The MAX1951 EV kit can provide an output voltage from 0.8V to  $V_{IN}$ . The default output voltage is set to 1.5V. To evaluate other output voltages, select R2 between 20kΩ and 50kΩ. R3 is calculated by:

$$R3 = R2 (V_{OUT}/0.8 - 1)$$

For stable operation, minimum duty cycle should not be less than 18%.

#### Shutdown Selection

The MAX1951 enters shutdown mode when the COMP pin is below 0.17V or the IN pin is less than 2.25V. The MAX1951 EV kit incorporates JU1 with a bipolar

transistor to control COMP pin. JU1 provides options to select the circuit operating modes, normal or shutdown mode. Table 1 lists JU1 functions.

#### Evaluating the MAX1952

The MAX1951 EV kit can be used to evaluate the MAX1952. To evaluate the MAX1952, change the MAX1951ESA to a MAX1952ESA-18, remove R2 and R3, and short the two pads labeled R3.

**Table 1. Jumper JU1 Functions**

SHUNT LOCATION	COMP PIN	MAX1951 OUTPUT
On	Connected to GND	MAX1951 is disabled, $V_{OUT} = 0V$
Off (Open)	Connected to RC network	MAX1951 is enabled when $IN \geq 2.25V$ , $V_{OUT} = 1.5V$ MAX1951 is disabled when $IN < 2.25V$ , $V_{OUT} = 0V$

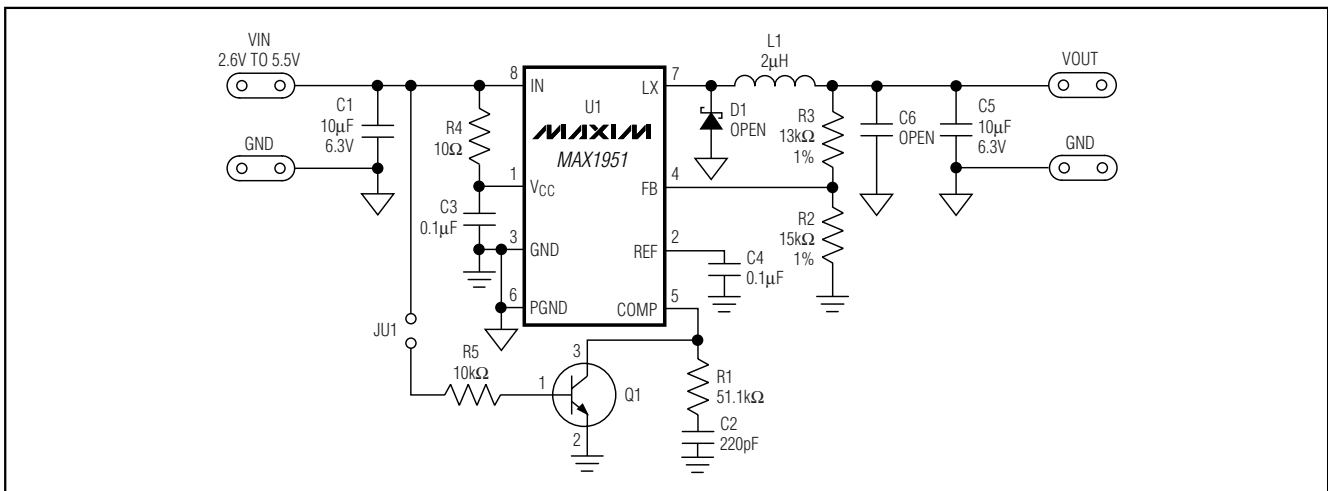


Figure 1. MAX1951 EV Kit Schematic

# MAX1951 Evaluation Kit

Evaluates: MAX1951/MAX1952

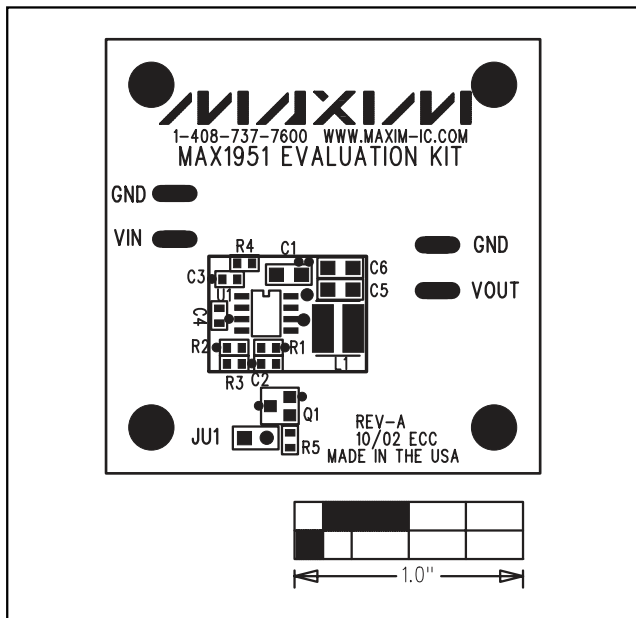


Figure 2. MAX1951 EV Kit Component Placement Guide—Component Side

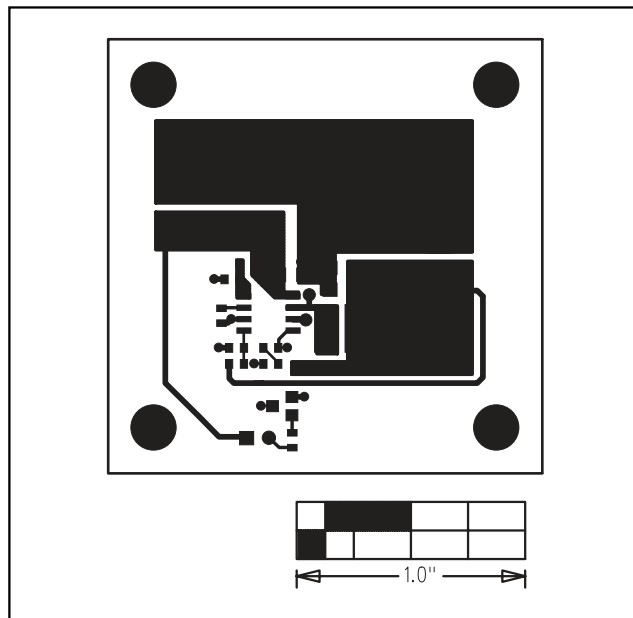


Figure 3. MAX1951 EV Kit PC Board Layout—Component Side

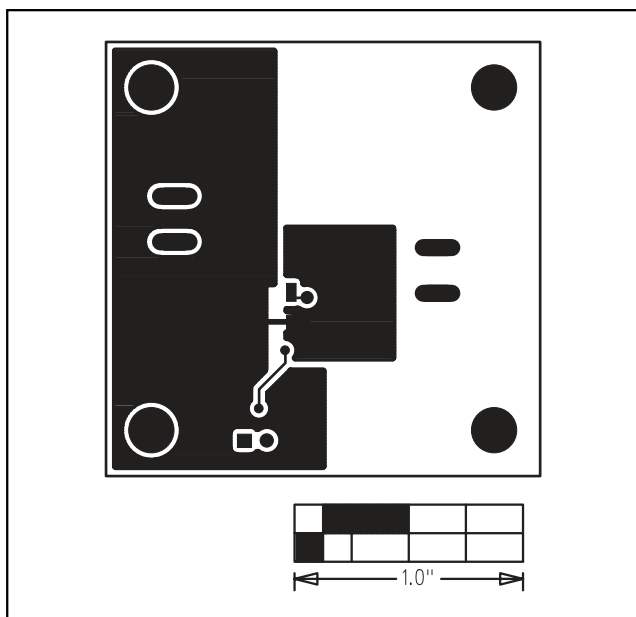


Figure 4. MAX1951 EV Kit PC Board Layout—Solder Side

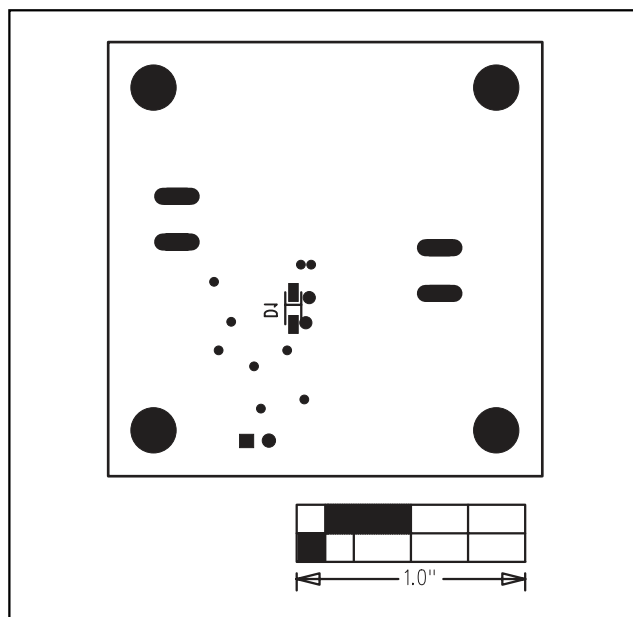


Figure 5. MAX1951 EV Kit Component Placement Guide—Solder Side

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