

# MAXIM

## MAX1692 Evaluation Kit

Evaluates: MAX1692

### General Description

The MAX1692 evaluation kit (EV kit) is a fully assembled and tested surface-mount circuit board that contains a pulse-width-modulated (PWM), step-down DC-DC converter. The EV kit provides a +2.5V output voltage from a +2.7V to +5.5V input source. It delivers up to 600mA output current. The MAX1692 features internal MOSFET switches, low dropout voltage, and a 1.2%-accurate 1.25V reference.

The MAX1692 EV kit provides low quiescent current and high efficiency (up to 95%) for maximum battery life. Operation at 750kHz allows the use of a tiny surface-mount inductor.

### Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10 $\mu$ F, 6.3V, X5R ceramic capacitor Taiyo Yuden JMK325BJ106MN
C2	1	47 $\mu$ F, 6.3V, low ESR, electrolytic capacitor, Sanyo 6TPA47M or 47 $\mu$ F, 16V tantalum capacitor Sprague 594D476X0016C2T
C3	1	0.1 $\mu$ F ceramic capacitor
C4	1	0.22 $\mu$ F ceramic capacitor
C5	1	47pF ceramic capacitor
L1	1	10 $\mu$ H inductor Sumida CDR63B-100 (shielded) or CD43-100 (unshielded)
R1	1	309k $\Omega$ , 1% resistor
R2	1	301k $\Omega$ , 1% resistor
R3	1	100k $\Omega$ , 5% resistor
U1	1	MAX1692EUB
JU1	1	3-pin header
None	1	Shunt (JU1)
JU2	1	2-pin header
None	1	MAX1692 PC Board
None	1	MAX1692 data sheet

### Component Suppliers

SUPPLIER	PHONE	FAX
Dale-Vishay	402-564-3131	402-563-6418
Sanyo	619-661-6835	619-661-1055
Sprague	603-224-1961	603-224-1430
Sumida	708-956-0666	708-956-0702
Taiyo Yuden	408-573-4150	408-573-4159

**Note:** Please indicate that you are using the MAX1692 when contacting these component suppliers.

### Features

- ◆ +2.7V to +5.5V Input Voltage Range
- ◆ +2.5V Output Voltage or Adjustable Output from 1.25V to  $V_{IN}$
- ◆ 600mA Output Current
- ◆ 100% Duty Cycle in Dropout
- ◆ 750kHz Fixed-Frequency PWM Operation
- ◆ Internal MOSFET Switch and Synchronous Rectifier
- ◆ 0.1 $\mu$ A IC Shutdown Current
- ◆ Surface-Mount Components
- ◆ Fully Assembled and Tested

### Ordering Information

PART	TEMP. RANGE	IC-PACKAGE
MAX1692EVKIT	0°C to +70°C	10 $\mu$ MAX

### Quick Start

The MAX1692 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) Connect a +2.7V to +5.5V supply to the  $V_{IN}$  pad. Connect the ground to the GND pad.
- 2) Connect a voltmeter to the  $V_{OUT}$  pad.
- 3) Verify that the shunt is across JU1 pins 1 and 2.
- 4) Turn on the power supply and verify that the output is at +2.5V.

### Detailed Description

#### Jumper Selection

##### Shutdown Mode

The MAX1692 EV kit features a shutdown mode that reduces the MAX1692 IC's quiescent current to 0.1 $\mu$ A, preserving battery life. The 3-pin header, JU1, selects the shutdown mode (Table 1).

**Table 1. Jumper JU1 Functions**

SHUNT LOCATION	$\overline{\text{SHDN}}$ PIN	MAX1692 OUTPUT
1 & 2	Connected to $V_{IN}$	MAX1692 enabled, $V_{OUT} = 2.5$
2 & 3	Connected to GND	Shutdown mode, $V_{OUT} = 0$

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**Table 2. Jumper JU2 Functions**

SHUNT LOCATION	SYNC/PWM PIN	OPERATING MODE
On	Connected to VIN	MAX1692 operates in PWM low-noise mode.
Off (not installed)	Pulled to GND via 100k	MAX1692 operates in PWM/PFM mode.
	Driven from external clock	SYNC/PWM pin is driven by an external clock between 500kHz and 1000kHz.

### Operating Mode

The MAX1692 operates in one of three modes to optimize performance. A fixed-frequency (PWM) mode switches at a fixed frequency for easy post-filtering. A synchronizable PWM mode uses an external clock to control harmonics. A PWM/PFM mode extends battery life by operating in PWM mode under heavy loads and in PFM mode under light loads for reduced power consumption.

The EV kit operates at a 750kHz switching frequency and allows the use of a small-value inductor. The switching frequency can also be synchronized to an external clock ranging from 500kHz to 1000kHz. The 2-pin header JU2 selects the operating mode (Table 2).

**Table 3. R1/R2 for Other Output Voltages**

V <sub>OUT</sub> (V)	R1 (1%)	R2 (1%)
1.50	66.5k	301k
1.80	140k	301k
2.50	309k	301k
2.70	357k	301k
3.32	511k	301k

### Changing Current Limit

The inductor current limit can be set to 0.6A or 1.2A. The EV kit is factory-configured for a 1.2A limit. To set the limit to 0.6A, cut the PC trace shorting JU3 pins 1 & 2, and then short JU3 pins 2 & 3. This allows for use of the smallest possible inductor for low-current applications.

### Evaluating Other Output Voltages

The EV kit's output is set to +2.50V by connecting FB to resistor-divider R1/R2. However, the output voltage can also be adjusted between +1.232V and V<sub>IN</sub> by changing R1 and R2 values. Select feedback resistor R2 in the 5kΩ to 500kΩ range. R1 is then given by:

$$R1 = R2 [(V_{OUT} / V_{FB}) - 1]$$

where V<sub>FB</sub> = 1.232V and V<sub>OUT</sub> = output voltage. The unloaded output voltage is typically 1% above the nominal output voltage. Table 3 lists values for R1 for different output voltages.

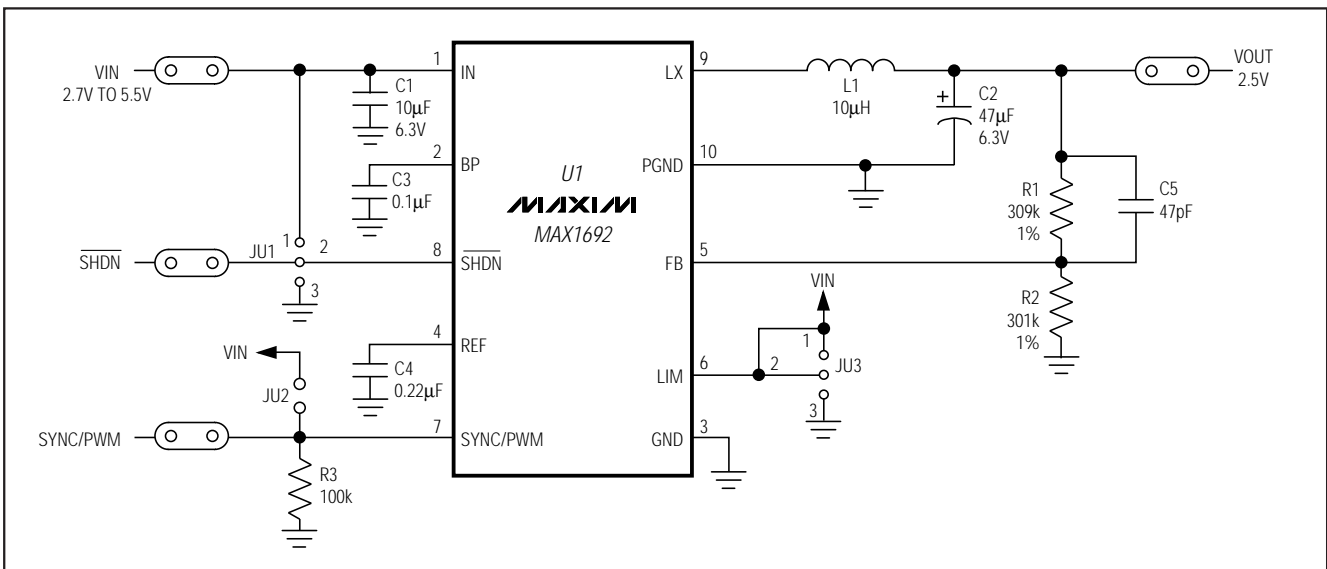


Figure 1. MAX1692 EV Kit Schematic

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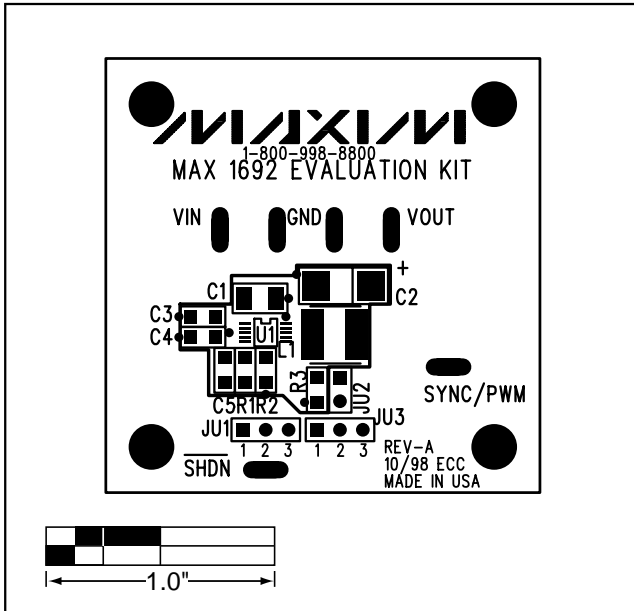


Figure 2. MAX1692 EV Kit Component Placement Guide—Component Side

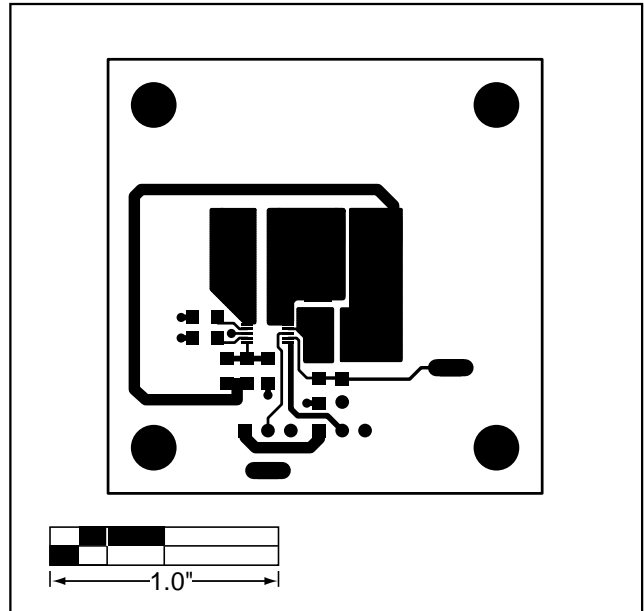


Figure 3. MAX1692 EV Kit PC Board Layout—Component Side

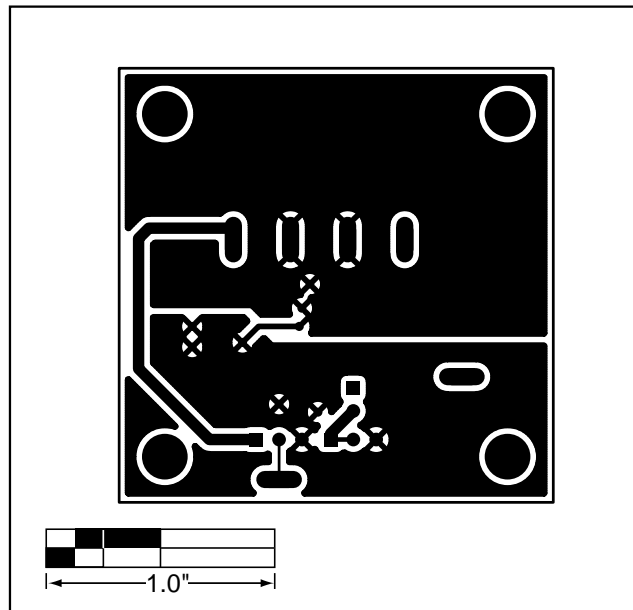


Figure 4. MAX1692 EV Kit PC Board Layout—Solder Side

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## NOTES

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