

## **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.

DESIGNATION	QTY	DESCRIPTION
C1	1	10µF, 6.3V, X5R ceramic capacitor Taiyo Yuden JMK325BJ106MN
C2	1	47μF, 6.3V, low ESR, electrolytic capacitor, Sanyo 6TPA47M or 47μF, 16V tantalum capacitor Sprague 594D476X0016C2T
C3	1	0.1µF ceramic capacitor
C4	1	0.22µF ceramic capacitor
C5	1	47pF ceramic capacitor
L1	1	10μH inductor Sumida CDR63B-100 (shielded) or CD43-100 (unshielded)
R1	1	309kΩ, 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 List

## **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 VIN
- 600mA Output Current
- 100% Duty Cycle in Dropout
- ✤ 750kHz Fixed-Frequency PWM Operation
- Internal MOSFET Switch and Synchronous Rectifier
- ♦ 0.1µA IC Shutdown Current
- Surface-Mount Components
- Fully Assembled and Tested

## \_Ordering Information

PART	TEMP. RANGE	IC-PACKAGE	
MAX1692EVKIT	0°C to +70°C	10 μMAX	

### \_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 VOUT 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	SHDN PIN	MAX1692 OUTPUT
1 & 2	Connected to VIN	MAX1692 enabled, $V_{OUT} = 2.5$
2 & 3	Connected to GND	Shutdown mode, $V_{OUT} = 0$

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

### Table 2. Jumper JU2 Functions

#### **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 2pin header JU2 selects the operating mode (Table 2).

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

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

#### **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  $5k\Omega$  to  $500k\Omega$  range. R1 is then given by:

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

where  $V_{FB} = 1.232V$  and  $V_{OUT} =$  output voltage. The unloaded output voltage is typically 1% above the nominal output voltage. Table 3 lists values for R1 for different output voltages.

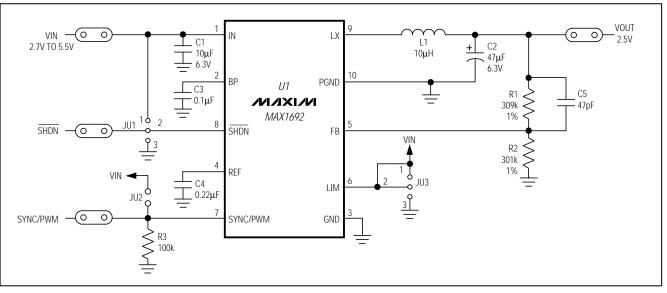


Figure 1. MAX1692 EV Kit Schematic

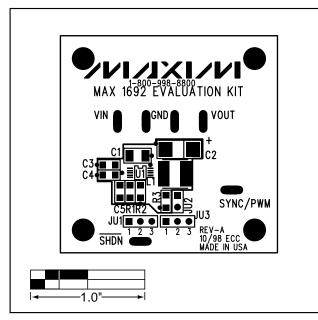


Figure 2. MAX1692 EV Kit Component Placement Guide— Component Side

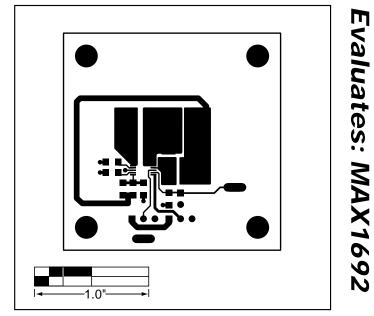


Figure 3. MAX1692 EV Kit PC Board Layout—Component Side

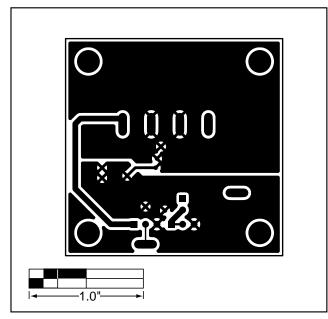


Figure 4. MAX1692 EV Kit PC Board Layout—Solder Side



# **MAX1692 Evaluation Kit**

NOTES

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