

MAXIM

MAX1742/MAX1842 Evaluation Kits

General Description

The MAX1742 and MAX1842 evaluation kits (EV kits) provide a +1.8V adjustable output voltage from a +3V to +5.5V input source. The MAX1742 delivers up to 1A of output current, and the MAX1842 delivers up to 2.5A of output current.

The MAX1742/MAX1842 are step-down switching regulators with internal synchronous-rectifiers that operate up to 1MHz, which minimizes external components. The devices feature resistor-programmable, fixed off-time current-mode operation for superior load- and line-transient response, and achieve efficiencies up to 95%.

The MAX1742/MAX1842 EV kits can also be used to evaluate other output voltages by adding feedback resistors R1 and R2 or by using the jumper-selectable +1.1V, +1.5V, +1.8V, or +2.5V settings.

Features

- ◆ 1A Output Current for MAX1742
2.5A Output Current for MAX1842
- ◆ Up to 1MHz Switching Frequency
- ◆ Up to 95% Efficiency
- ◆ Synchronous Rectification for Improved Efficiency
- ◆ No External Schottky Diode Required
- ◆ Output Voltage
+1.1V, +1.5V, +1.8V, or +2.5V Selectable
+1.1V to V_{IN} Adjustable
- ◆ +3V to +5.5V Input Voltage Range
- ◆ <1 μ A (typ) IC Shutdown Current
- ◆ Surface-Mount Construction
- ◆ Fully Assembled and Tested

Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX1742EVKIT	0°C to +70°C	16 QSOP
MAX1842EVKIT	0°C to +70°C	16 QSOP

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10 μ F, 6.3V, X5R ceramic capacitor Taiyo Yuden JMK316BJ106ML, Murata GRM42-6X5R106K6.3, or Panasonic ECJ3YBJ106K
C2	1	MAX1742 47 μ F, 6.3V low-ESR capacitor Sanyo 6TPA47M (POSCAP) MAX1842 100 μ F, 6.3V low-ESR capacitor Sanyo 6TPC100M (POSCAP)
C3	1	2.2 μ F, 10V, X5R ceramic capacitor Taiyo Yuden LMK212BJ225MG
C4	1	0.01 μ F, 50V, X7R ceramic capacitor
C5	1	470pF, 50V, X7R ceramic capacitor
C6	1	1 μ F, 10V, X7R ceramic capacitor Taiyo Yuden LMK212B105KG or Murata GRM40X7R105K010
C7	0	Not installed

DESIGNATION	QTY	DESCRIPTION
C8	1	33 μ F, 10V low-ESR capacitor Sanyo 10TPA33M (POSCAP)
JU1, JU3	2	2-pin headers
JU2	1	4-pin header
L1	1	MAX1742 5.3 μ H, 1.9A inductor Sumida CDRH5D28-5R3NC MAX1842 2.2 μ H, 3.8A inductor Sumida 4762-TO54, Coiltronics UP1B-2R2, or Murata LQS66C2R2M04
R1	0	Not installed
R2	0	Not installed
R3	1	10 Ω \pm 5% resistor
R4	1	1M Ω \pm 5% resistor
R5	1	75k Ω \pm 1% resistor
U1	1	MAX1742EEEE or MAX1842EEEE
NONE	3	Shunts

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Component Suppliers

SUPPLIER	PHONE	FAX
AVX	803-946-0690	803-626-3123
Coiltronics	561-241-7876	561-241-9339
Murata	814-237-1431	814-238-0490
Panasonic	201-392-7522	201-392-4441
Sanyo	619-661-6835	619-661-1055
Sprague	603-224-1961	603-224-1430
Sumida	847-956-0666	847-956-0702
Taiyo Yuden	408-573-4150	408-573-4159

Note: Please indicate that you are using the MAX1742 or MAX1842 when contacting these suppliers.

Quick Start

The MAX1742 and MAX1842 EV kits are fully assembled and tested surface-mount boards. Follow the steps below to verify board operation. **Do not turn on the power supply until all connections are completed.**

1. Verify that a shunt is on JU1 (shutdown disable) to enable operation and on JU2 (1-4) to set the output voltage for 1.8V.
2. Connect a voltmeter and load (if any) to VOUT and GND.
3. Connect a +3V to +5.5V supply to the pads marked VIN and GND.
4. Turn on the power and verify that the output voltage is +1.8V.
5. Refer to the *Output Voltage Selection* section to modify the board for a different output voltage.

Detailed Description

The MAX1742 and MAX1842 EV kits provide a +1.8V output voltage from a +3V to +5.5V input voltage. The MAX1742 EV kit delivers up to 1A of output current, and the MAX1842 EV kit delivers up to 2.5A of output current. Continuous operation at 2.5A with high ambient temperatures may be limited due to thermal consideration. (See the MAX1742/MAX1842 data sheet, *Extended Current Limit* section).

Jumper Selection

The 2-pin header JU1 selects the MAX1742/MAX1842 shutdown mode. Table 1 lists the jumper options.

Output Voltage Selection

The MAX1742 and MAX1842 EV kits are shipped with the output voltage set to +1.8V. To change the output voltage to +1.1V, +1.5V, or +2.5V, move the shunt on JU2 to the location listed in Table 2. For other voltages, remove the shunt on JU3, place a shunt on JU2 (1-3), and add resistors R1 and R2.

Never operate the board with the shunt removed from jumper JU3, unless resistors R1 and R2 are installed.

Use the following equation for calculating the resistors:

$$R2 = R1 (V_{OUT} / 1.1 - 1)$$

Typical values for R1 are 10k Ω to 56k Ω .

Note: The switching frequency of the MAX1742 and MAX1842 EV kits is 900kHz when the input voltage is +5V and the output voltage is +1.8V. This frequency will change when the input or output voltages change. When operated from a 3.3V input voltage, the switching frequency will be 650kHz. Do not operate the MAX1742 or MAX1842 above 1MHz. To set the switching frequency, change the TOFF resistor (R5) and the inductor. Refer to the MAX1742/MAX1842 IC data sheet to determine the values.

Input Capacitors

The MAX1742 and MAX1842 EV kits have a 33 μ F tantalum polymer capacitor and a 10 μ F ceramic capacitor on the input, but only the 10 μ F is actually needed. The 33 μ F capacitor may be needed to stabilize the input if a lab power supply is connected to the EV kit through long wires or if it has a poor transient response. In a typical application, where the MAX1742/MAX1842 input is directly connected to the output of a regulated supply, the additional capacitance will not be needed.

Table 1. Jumper JU1 Function

SHUNT LOCATION	SHDN PIN	MAX1742/MAX1842 OUTPUT
Open	Connected to GND through 1M Ω (R4)	Shutdown mode, V _{OUT} = 0
Closed (Default)	Connected to VIN	MAX1742/MAX1842 enabled, V _{OUT} = +1.8V.

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Table 2. Output Voltage Configurations

OUTPUT VOLTAGE (V)	JU3	JU2
1.1	Closed	1-3
1.5	Closed	Open
*1.8	Closed	1-4
2.5	Closed	1-2
Adjustable (Set by resistor divider R1/R2)	Open	1-3

*Default

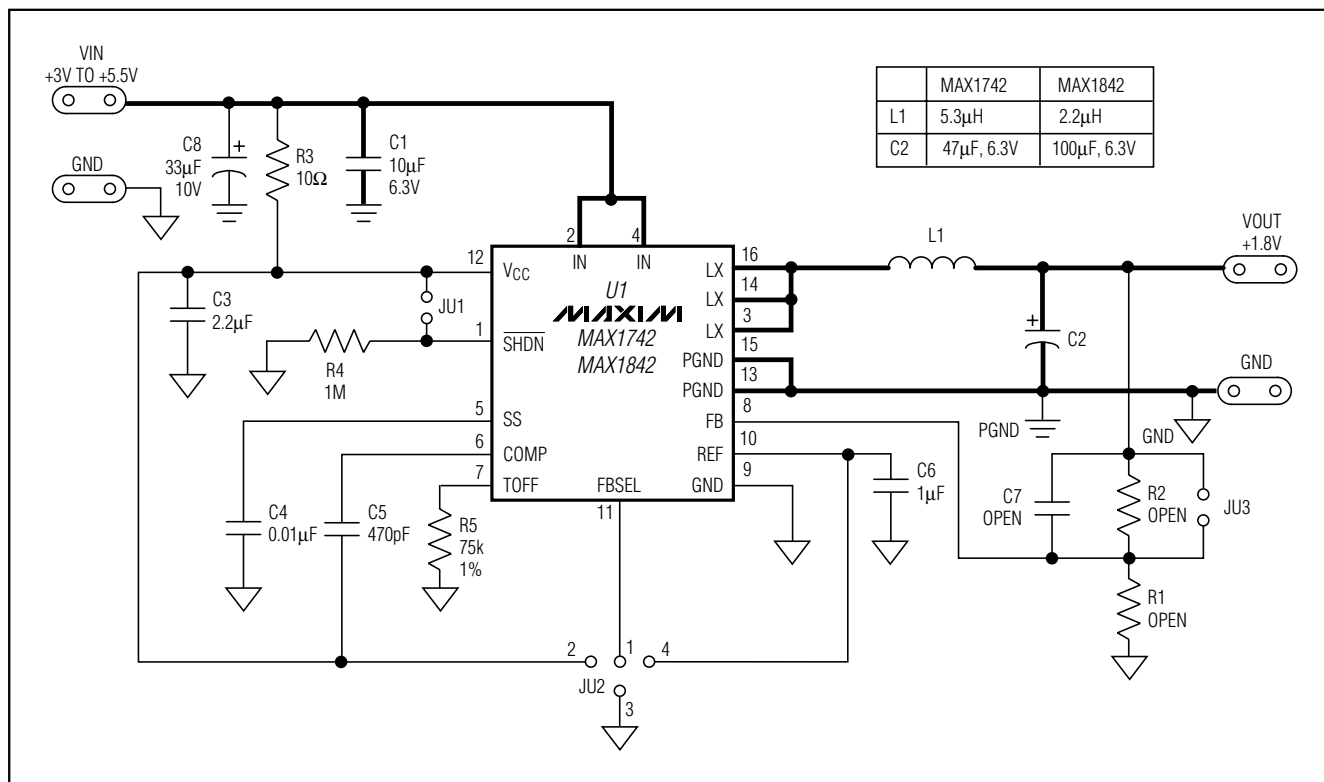


Figure 1. MAX1742/MAX1842 EV Kits Schematic

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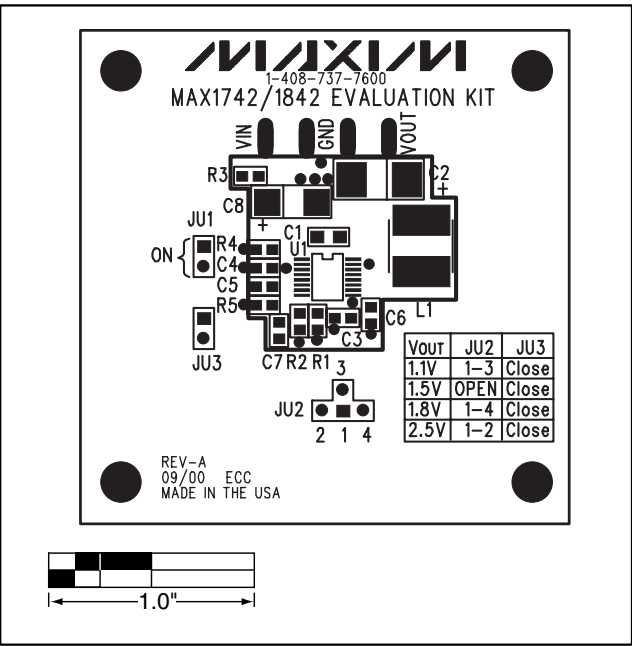


Figure 2. MAX1742/MAX1842 EV Kits Component Placement Guide—Component Side

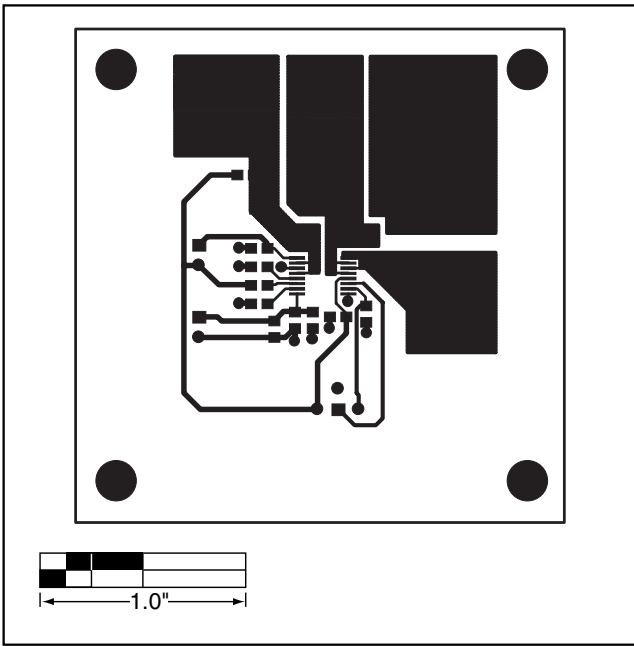


Figure 3. MAX1742/MAX1842 EV Kits PC Board Layout—Component Side

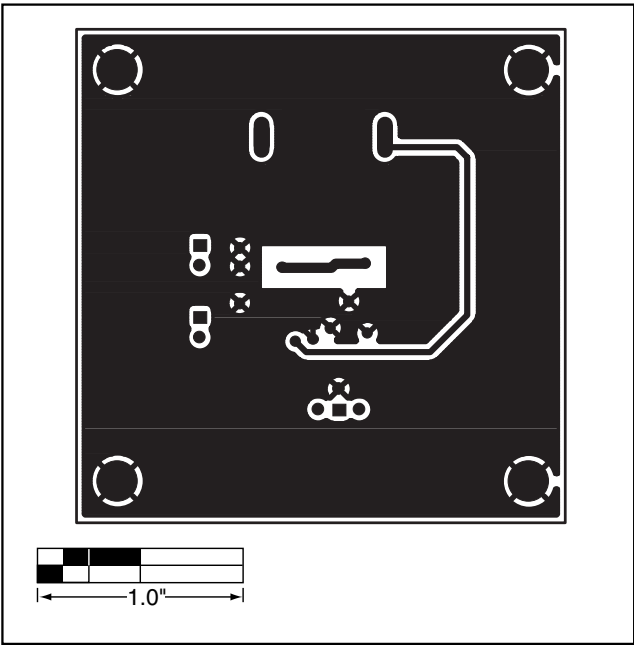


Figure 4. MAX1742/MAX1842 EV Kits PC Board Layout—Solder Side

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