19-1457; Rev 1; 7/00

MAX1644 Evaluation Kit

Evaluates: MAX1644

General Description

The MAX1644 evaluation kit (EV kit) provides a 1.5V output voltage from a +3V to +5.5V input source. It delivers up to 2A output current with 92% (max) efficiency. The MAX1644 is a step-down switching regulator with an internal synchronous rectifier to reduce the number of external components. It features a resistor-programmable fixed off-time as well as current-mode operation for superior load- and line-transient response.

The MAX1644 EV kit can also be used to evaluate other output voltages by changing the feedback resistors (R1 and R2) or by using the preset +3.3V or +2.5V settings.

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C8, C9	3	10µF, 6.3V, X5R ceramic capacitors Taiyo Yuden JMK316BJ106ML or Murata GRM42-6X5R106K6.3
C2	1	100µF, 6.3V, low-ESR capacitor Sanyo 6TPC100M (POSCAP), AVX TPSD107M010R0080 (tantalum), Sprague 594D107X0010C2T (tantalum)
C3	1	2.2µF, 10V, X5R ceramic capacitor Taiyo Yuden LMK212BJ225MG
C4	1	0.01µF, 50V, X7R ceramic capacitor
C5	1	470pF, 50V, X7R ceramic capacitor
C6	1	1µF, 10V, X7R ceramic capacitor Taiyo Yuden LMK212B105KG or Murata GRM40X7R105K010
C7	0	Not installed
D1	0	Not installed
JU1	1	2-pin header
L1	1	6.0µH, 2.25A inductor Sumida CDRH6D28-6R0NC
R1	1	49.9kΩ ±1% resistor
R2	1	18.2kΩ ±1% resistor
R3	1	10Ω ±5% resistor
R4	1	1MΩ ±5% resistor
R5	1	270kΩ ±5% resistor
U1	1	Maxim MAX1644EAE
None	1	Shunt

Features

- **+3V to +5.5V Input Voltage Range**
- **Output Voltage Preset to 1.5V**
  2.5V or 3.3V Selectable
  1.1V to V_{IN} Adjustable
- **2A Output Current**
- **92% Efficiency**
- **300kHz Switching Frequency**
- **Synchronous Rectification for Improved Efficiency**
- **No External Schottky Diode Required**
- **Less than 1µA typical IC Shutdown Current**
- **Surface-Mount Construction**
- **Fully Assembled and Tested**

Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX1644EVKIT	0°C to +70°C	16 SSOP

Component Suppliers

SUPPLIER	PHONE	FAX
AVX	803-946-0690	803-626-3123
Murata	814-237-1431	814-238-0490
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

Quick Start

The MAX1644 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) Connect a +3V to +5.5V supply to the pads marked VIN and GND.
2) Connect a voltmeter and load (if any) to VOUT and GND.
3) Verify that the shunt is on JU1.
4) Turn on the power and verify that the output voltage is +1.5V.
5) Refer to *Output Voltage Selection* to modify the board for a different output voltage.

Detailed Description

The MAX1644 EV kit provides a 1.5V output voltage from a +3V to +5.5V input voltage. It delivers up to 2A of output current.

Jumper Selection

The 2-pin header JU1 selects the MAX1644's shutdown mode. Table 1 lists the jumper options.

Table 1. Jumper JU1 Functions

SHUNT LOCATION	$\overline{SHDN}$ PIN	MAX1644 OUTPUT
Open	Connected to GND through 1MΩ (R4)	Shutdown mode, V_{OUT} = 0
Closed (Default)	Connected to VIN	MAX1644 enabled V_{OUT} = +1.5V

Output Voltage Selection

The MAX1644 EV kit is programmed for a 1.5V output voltage. However, the output voltage may also be adjusted by changing the resistor divider formed by R1 and R2 or by using the preset +2.5V or +3.3V settings. For selecting the resistor values, refer to *Setting the Output Voltage* in the MAX1644 data sheet.

To use the preset +2.5V or +3.3V settings, place a short across JU3 and cut the trace between pins 1 and 4 of JU2. See Table 2 for further instructions.

Thermal Resistance

The MAX1644's junction-to-ambient thermal resistance is 60°C/W, based on the MAX1644 EV kit printed circuit board.

Table 2. Output Voltage Configurations

OUTPUT VOLTAGE	JU3	JU2	R2
1.1	Closed	Short 1-4 (default trace)	Shorted by JU3
1.5	Open	Short 1-4 (default trace)	Default value
2.5	Closed	Cut default trace across 1-4; short 1-2	Shorted by JU3
3.3	Closed	Cut default trace across 1-4; leave open	Shorted by JU3
Adjustable	Open	Short 1-4	Change

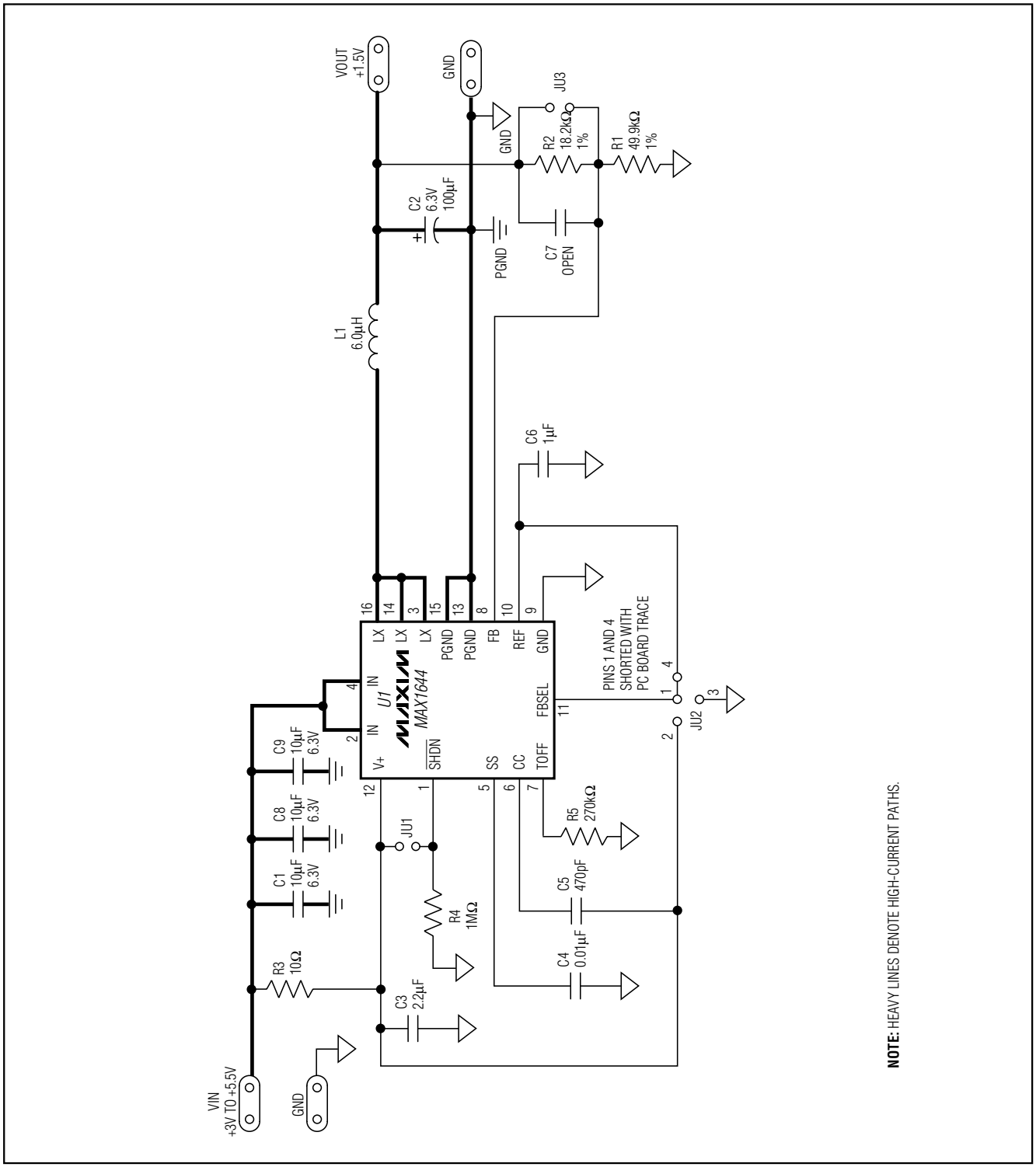

Figure 1. MAX1644 EV Kit Schematic

MAX1644 Evaluation Kit

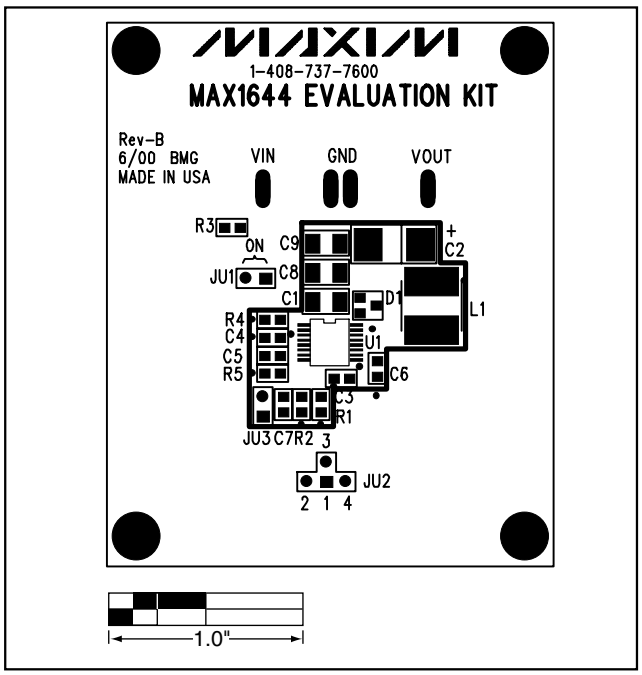

Figure 2. MAX1644 EV Kit Component Placement Guide—Component Side

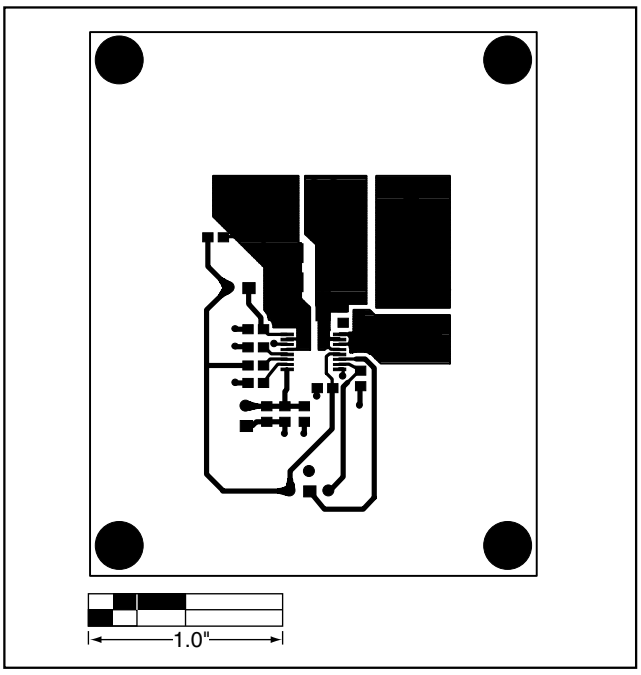

Figure 3. MAX1644 EV Kit PC Board Layout—Component Side

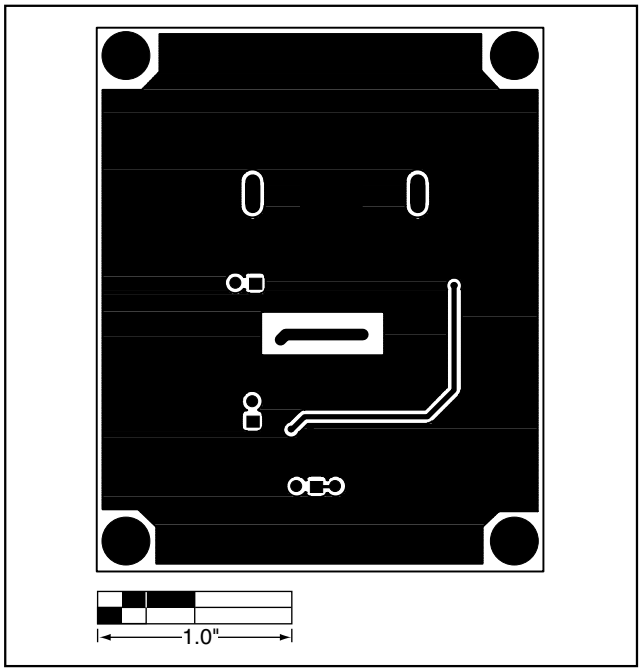

Figure 4. MAX1644 EV Kit PC Board Layout—Solder Side