

# MAXIM

## MAX1649 Evaluation Kit

### General Description

The MAX1649 evaluation kit (EV kit) provides a regulated 5V output voltage from a 5.5V to 16.5V source. The circuit is configured to deliver up to 1.5A of output current using all surface-mount components. The MAX1649's low quiescent current and unique current-limited PFM control scheme provide high efficiency over a wide range of load currents.

The MAX1649 EV kit can also be used to evaluate the MAX1651 (3.3V output), MAX649, MAX651, and MAX652. However, the MAX1649/MAX1651 are improved versions of the MAX649/MAX651, and are recommended for new designs.

### Component List

DESIGNATION	QTY	DESCRIPTION
C1, C6	2	68 $\mu$ F, 20V, low-ESR tantalum capacitors AVX TPSE686M020R0150
C2	1	330 $\mu$ F, 10V, low-ESR tantalum capacitor AVX TPSE337K010R0060 or Sprague 595D337X0010R
C3, C4	2	0.1 $\mu$ F ceramic capacitors
C5, C7	0	Not installed
D1	1	Schottky diode Nihon NSQ03A03 (3A) or SGS Thomson STP52L25L (2A)
JU1	1	3-pin header
L1	1	47 $\mu$ H inductor (SMT) Sumida CDRH125-470
P1	1	P-channel MOSFET (SO-8) International Rectifier IRF7416 or Fairchild NDS8435A
R1	1	0.05 $\Omega$ , 5% resistor (SMT) IRC LR2010-01-R050-J or Dale WSL-2010-R050-J
R2, R3	0	Not installed
U1	1	MAX1649ESA
None	1	Shunt
None	1	MAX1649/MAX1651 data sheet

### Features

- ◆ **+5.5V to +16.5V Input Supply Range**
- ◆ **Over 90% Efficiency for 10mA to 1.5A Loads**
- ◆ **100 $\mu$ A (max) Quiescent Supply Current**
- ◆ **Fixed 5V or Optional Adjustable Output Voltage**
- ◆ **1.5A Output Current Capability**
- ◆ **Fully Assembled and Tested**

### Ordering Information

PART	TEMP. RANGE	BOARD TYPE
MAX1649EVKIT-SO	0°C to +70°C	Surface Mount

### Component Suppliers

Supplier	Phone	Fax
AVX	(803) 946-0690	(803) 626-3123
Dale-Vishay	(402) 564-3131	(402) 563-6418
Fairchild	(408) 721-2181	(408) 721-1635
International Rectifier	(310) 322-3331	(310) 322-3332
IRC	(512) 992-7900	(512) 992-3377
Motorola	(303) 675-2140	(303) 675-2150
Nihon	(805) 867-2555	(805) 867-2698
SGS Thomson	(617) 259-0300	(617) 259-9442
Sprague	(603) 224-1961	(603) 224-1430
Sumida—USA	(847) 956-0666	(847) 956-0702

**Note:** Please indicate that you are using the MAX1649 when contacting these component suppliers.

### Quick Start

The MAX1649 evaluation kit (EV) kit is fully assembled and tested. Follow the steps below to verify board operation. **Do not turn on the power supply until all connections are completed.**

- 1) Connect a +5.5V to +16.5V power supply to the pad marked VIN.
- 2) Connect ground to the GND pad.
- 3) Connect a voltmeter and load (if any) to the VOUT pad.
- 4) For normal operation, place the shunt across pins 1 and 2 of jumper JU1.
- 5) Turn on the power supply and verify that the output voltage is 5V.

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## Detailed Description

### Shutdown Control

The MAX1649 provides a SHDN pin to disable the output. Table 1 lists the options available for shutdown control jumper JU1. An external controller can be used by removing the shunt on JU1 completely and connecting the external controller to the pad labeled SHDN. SHDN is a TTL/CMOS logic-level input.

### Output Voltage Adjustment

The output voltage can be adjusted with minor modifications to the EV kit board. First, select output voltage divider resistors R2 and R3 (refer to the *Setting the Output Voltage* section of the MAX1649 data sheet). Second, open jumper JU3 and resistor R3 by cutting the thin PC board trace between their pads. Finally, install R2 and R3. The standard output filter capacitor is rated at 10V. Use a higher-rated capacitor if necessary.

When using the MAX1651 or when adjusting the output of either device, an input voltage below 5.5V is accept-

able. However, the input voltage must be high enough to avoid dropout (see the *Typical Operating Characteristics* section of the MAX1649/MAX1651 data sheet).

### Evaluating the MAX649/MAX651/MAX652

The MAX1649 EV kit can also be used to evaluate the MAX649/MAX651/MAX652. In addition to replacing the MAX1649 with a MAX649, change resistor R1 to 0.1Ω. Contact Maxim for free samples of the MAX649CSA, MAX651CSA, or MAX652CSA. Note that the MAX1649/MAX1651 are recommended over the MAX649/MAX651/MAX652 for new designs.

**Table 1. Jumper JU1 Functions**

SHUNT LOCATION	SHDN PIN	MAX1649 OUTPUT
1 & 2	Connected to GND	MAX1649 enabled, $V_{OUT} = 5V$
2 & 3	Connected to $V_{IN}$	Shutdown mode, $V_{OUT} = 0V$

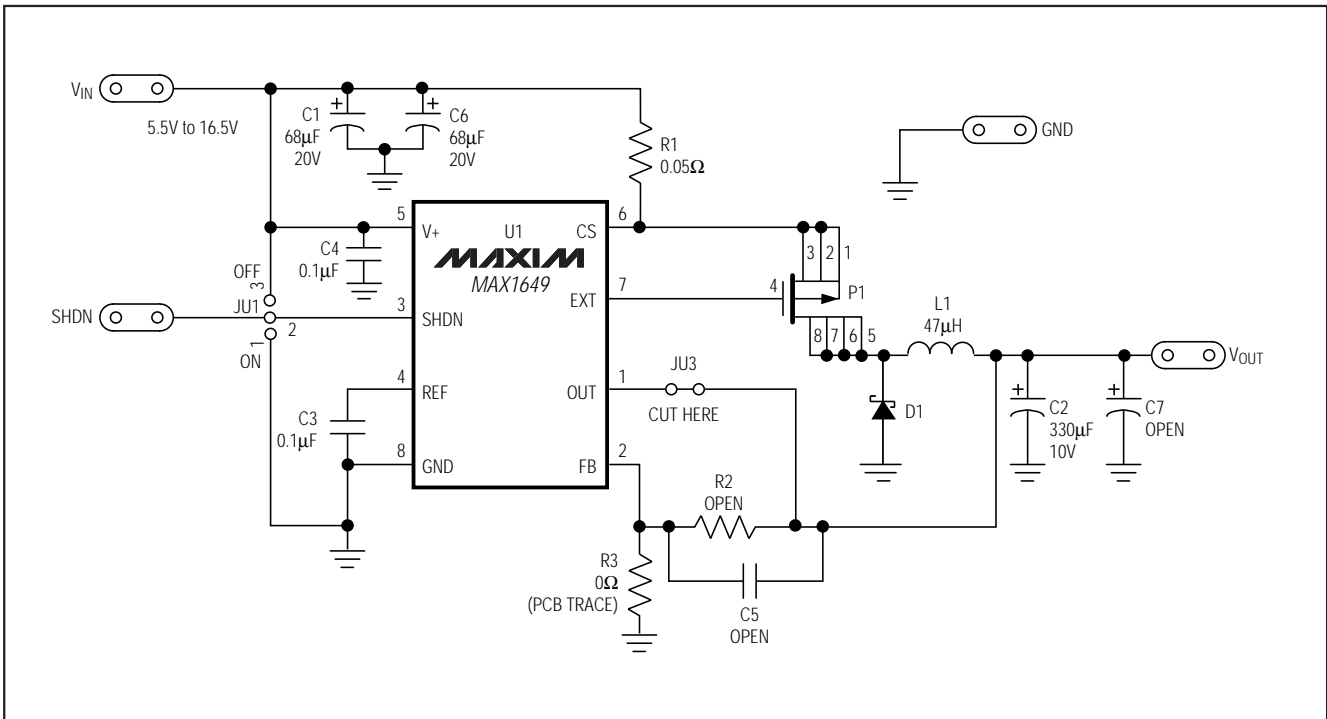


Figure 1. MAX1649 EV Kit Schematic

# MAX1649 Evaluation Kit

Evaluates: MAX649/MAX651/MAX652/MAX1649/MAX1651

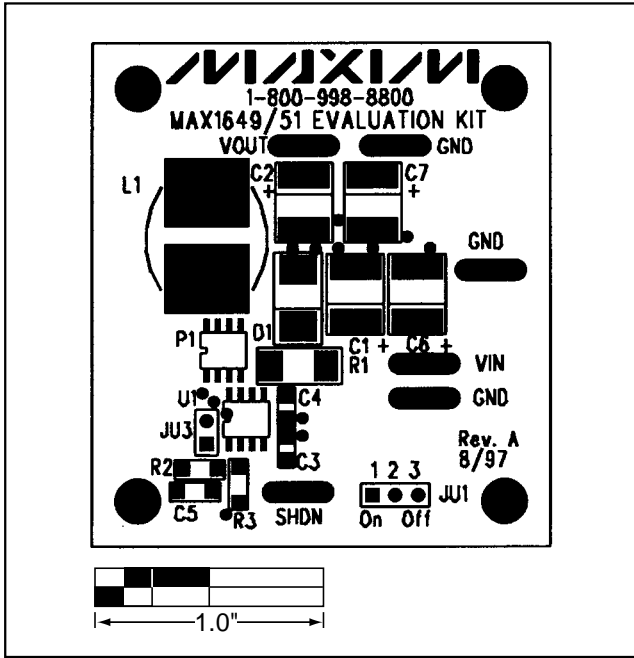


Figure 2. MAX1649 EV Kit Component Placement Guide—Component Side

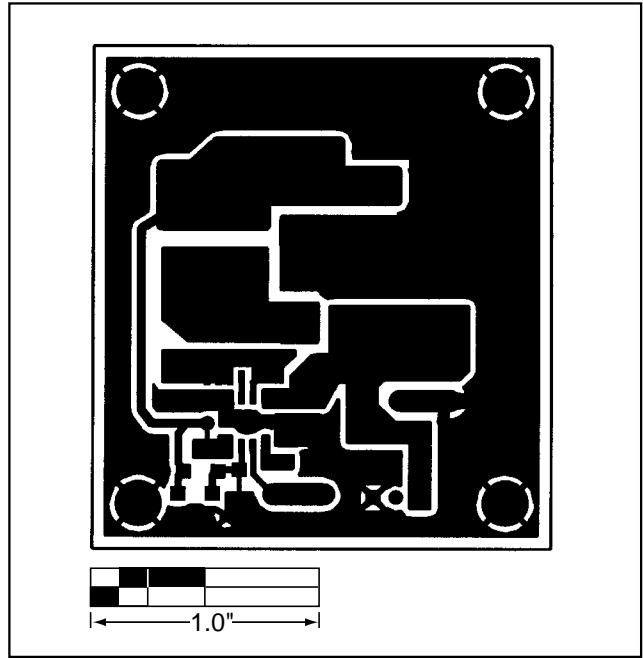


Figure 3. MAX1649 EV Kit PC Board Layout—Component Side

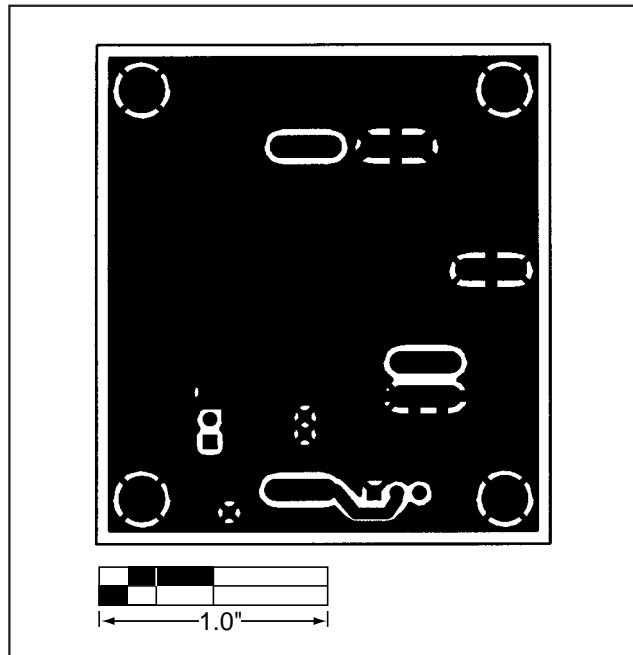


Figure 4. MAX1649 EV Kit PC Board Layout—Solder Side

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## NOTES

Evaluates: MAX649/MAX651/MAX652/MAX1649/MAX1651

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