

# 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 $\pm$ 20% tantalum capacitors (E-case) AVX TPSE686M020R0150
C2	1	330 $\mu$ F, 10V $\pm$ 10% tantalum capacitor (E-case) AVX TPSE337K010R0060
C3, C4	2	0.1 $\mu$ F $\pm$ 10% ceramic capacitors (0805) Panasonic ECJ-3VB1H104K
C5	0	Not installed, capacitor (1206)
C7	0	Not installed, capacitor (D-case)
D1	1	Schottky diode Nihon NSQ03A03L
JU1	1	3-pin header
JU3	0	Not installed, shorted by PC trace
L1	1	47 $\mu$ H inductor Sumida CDRH125NP-470MC
P1	1	p-channel MOSFET (8-pin SO-8) International Rectifier IRF7416PBF Fairchild NDS8435A_NL
R1	1	0.050 $\Omega$ $\pm$ 1%, 0.5W resistor (2010) Dale WSL2010R0500FEA IRC LRC-LR2010LF-01-R050-F
R2	0	Not installed, resistor (1206)
R3	0	Not installed, resistor (1206)—shorted by PC trace
U1	1	MAX1649CSA+ (8-pin SO-8)
—	1	Shunt
—	1	PCB: MAX1649 Evaluation Kit+

### 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	TYPE
MAX1649EVKIT-SO+	EV Kit

+Denotes lead-free and RoHS compliant.

### Component Suppliers

SUPPLIER	PHONE	WEBSITE
AVX	843-946-0238	www.avx.com
Fairchild	888-522-5372	www.fairchildsemi.com
International Rectifier	310-322-3331	irf.com
IRC	361-992-7900	irctt.com
Nihon/NIEC	847-843-7500	www.niec.co.jp
Panasonic	800-344-2112	www.panasonic.com
Sumida Corp.	847-545-6700	www.sumida.com
Vishay/Dale Resistors	402-564-3131	www.vishay.com

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

### Quick Start

The MAX1649 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 PCB 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 (refer to the *Typical Operating Characteristics* 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 and 2	Connected to GND	MAX1649 enabled, $V_{OUT} = 5V$
2 and 3	Connected to VIN	Shutdown mode, $V_{OUT} = 0V$

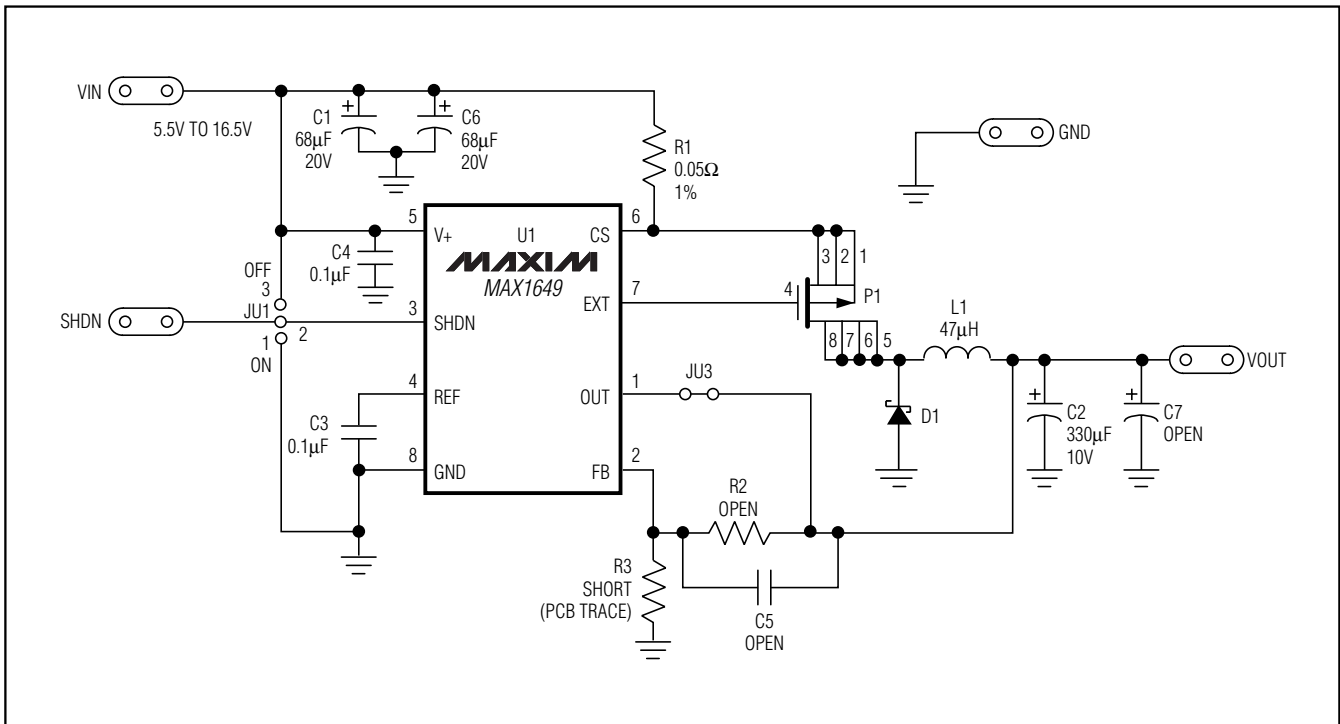


Figure 1. MAX1649 EV Kit Schematic

# MAX1649 Evaluation Kit

Evaluates: MAX649/MAX651/MAX652/MAX1649/MAX1651

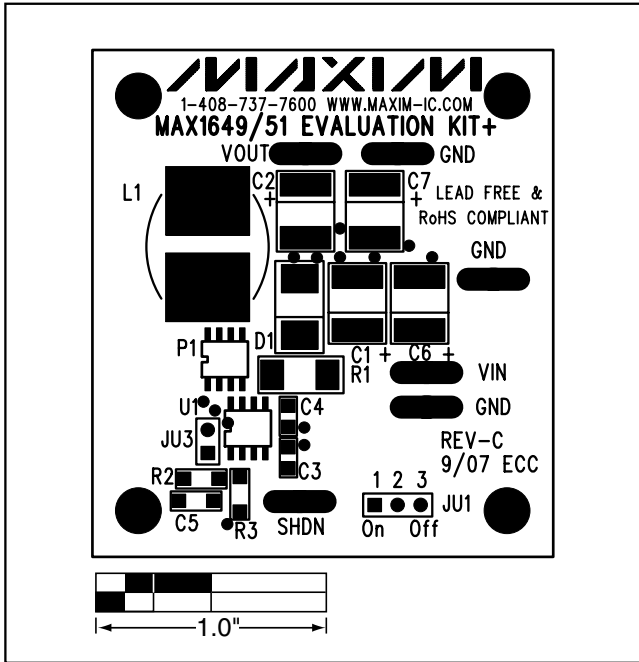


Figure 2. MAX1649 EV Kit Component Placement Guide—Component Side

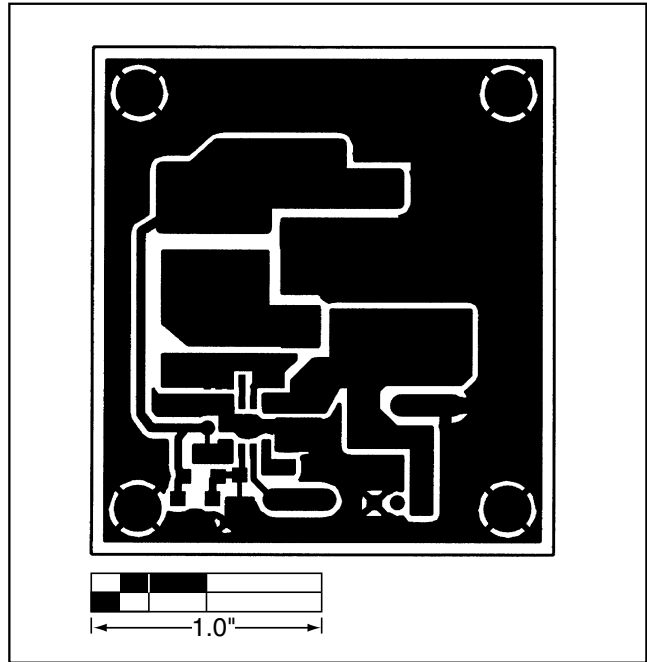


Figure 3. MAX1649 EV Kit PCB Layout—Component Side

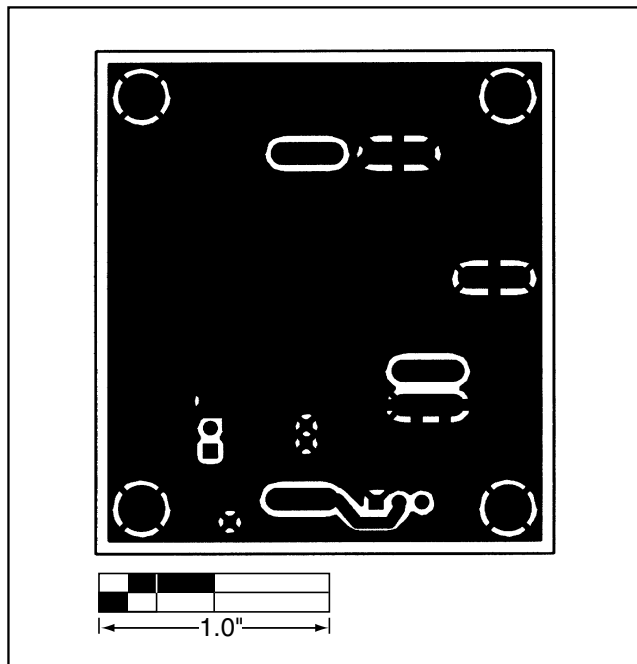


Figure 4. MAX1649 EV Kit PCB Layout—Solder Side

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## Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	10/97	Initial release	—
1	11/07	Update for RoHS compliance; update Component Suppliers list	1, 2, 3

Evaluates: MAX649/MAX651/MAX652/MAX1649/MAX1651

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