

# MAXIM

## MAX649 Evaluation Kit

### General Description

The MAX649 evaluation kit (EV kit) provides a regulated 5V output voltage from a 6V to 16.5V source. The circuit is configured to deliver up to 1.5A of output current using all surface-mount components. The MAX649's low quiescent current and unique current-limited PFM control scheme provide high efficiency over a wide range of load currents.

The MAX649 EV kit can also be used to evaluate the MAX651 (3.3V output) and the MAX652 (3.0V output).

### Features

- ◆ 6.0V to 16.5V Input Supply Range
- ◆ Over 90% Efficiency for 10mA to 1.5A Loads
- ◆ 100µA Max Quiescent Supply Current
- ◆ Fixed 5V or Optional Adjustable Output Voltage
- ◆ 1.5A Output Current Capability
- ◆ Fully Assembled and Tested

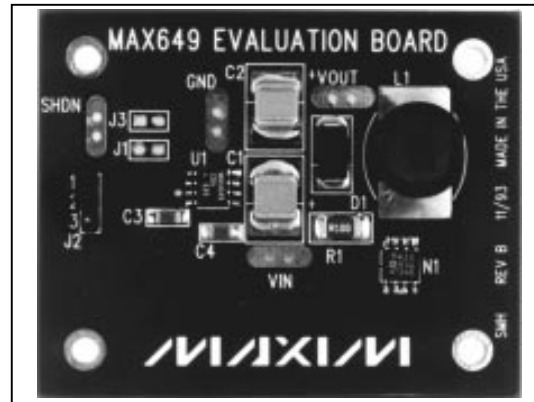
### Component List

DESIGNATION	QTY	DESCRIPTION
U1	1	MAX649CSA
C1	1	100µF, 20V, low-ESR tantalum capacitor Sprague 595D107X0020R2B
C2	1	330µF, 10V, low-ESR tantalum capacitor Sprague 595D337X0010R2B
C3, C4	2	0.1µF ceramic capacitors
D1	1	1N5820 Schottky diode (SMT) (BV = 20V, I <sub>MAX</sub> = 3A) Nihon NSQ03A02L or Motorola MBRS340T3
R1	1	0.1Ω, 5% resistor (SMT) IRC LR2010-01-R100-J Dale WSL-2512-R100-J
L1	1	22µH, 2.2A inductor (SMT) Sumida CD125-220 Coilcraft D03316-223
P1	1	P-channel MOSFET (SO-8) (B <sub>VGS</sub> = 20V, r <sub>DS(ON)</sub> = 0.06Ω @V <sub>GS</sub> = 10V) Siliconix SI9430
J2	1	3-pin header
None	1	Shunt
None	1	MAX649 data sheet

### Ordering Information

PART	TEMP. RANGE	BOARD TYPE
MAX649EVKIT-SO	0°C to +70°C	Surface Mount

### EV Kit



### Component Suppliers

SUPPLIER	PHONE	FAX
<b>Capacitors</b>		
AVX	(207) 282-5111	(207) 283-1941
Matsuo	(714) 969-2491	(714) 960-6492
Murata Erie	(814) 237-1431	(814) 238-0490
	(800) 831-9172	
Sprague	(603) 224-1961	(603) 224-1430
<b>Inductors</b>		
Coilcraft	(708) 639-6400	(708) 639-1469
Coiltronics	(407) 241-7876	(407) 241-9339
Sumida	(708) 956-0666	(708) 956-0702
<b>Diodes</b>		
Nihon	(805) 867-2555	(805) 867-2556
Central Semiconductor	(516) 435-1110	(516) 435-1824
<b>Power MOSFETs</b>		
Harris	(407) 724-3739	(407) 724-3937
Motorola	(602) 244-3576	(602) 244-4015
Siliconix	(408) 988-8000	(408) 970-3950
<b>Resistors</b>		
Dale-Vishay	(402) 564-3131	(402) 563-1841
IRC	(512) 992-7900	(512) 992-3377

Evaluates: MAX649/MAX651/MAX652

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## Quick Start

The MAX649 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 complete.**

- 1) Connect a 6.0V 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 shunts across pins 1 and 2 on J2.
- 5) Turn on the power supply and verify that the output voltage is 5V.

## Detailed Description

### Shutdown Control

The MAX649 provides a SHDN pin to disable the output. Table 1 lists the options available for the shutdown control jumper, J2. An external controller can be used by removing the shunt on J2 completely and connecting the external controller to the pad labeled SHDN. SHDN is a TTL/CMOS logic level input.

**Table 1. Jumper J2 Functions**

SHUNT LOCATION	SHDN PIN	MAX649 OUTPUT
1 & 2	Connected to GND	MAX649 Enabled, V <sub>OUT</sub> = 5V
2 & 3	Connected to VIN	Shutdown Mode, V <sub>OUT</sub> = 0V

### 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 and install them on the solder side of the PC board. Refer to the *Setting the Output Voltage* section of the MAX649 data sheet to select R2 and R3 values. Second, open jumpers J1 and J3 by cutting the thin PC board trace between the pads. The standard output filter capacitor is rated at 10V. Use a higher rated capacitor if necessary.

When using the MAX651 or MAX652, or when adjusting the output of any of the three devices, an input voltage below 6.0V is acceptable. However, input voltage must be high enough to avoid dropout (see the *Typical Operating Characteristics* section of the MAX649/MAX651/MAX652 data sheet). Although the MAX649/MAX651/MAX652 operate from voltages as low as 4.0V, the minimum V<sub>GS</sub> required by the Si9430 only allows input voltages as low as 4.7V.

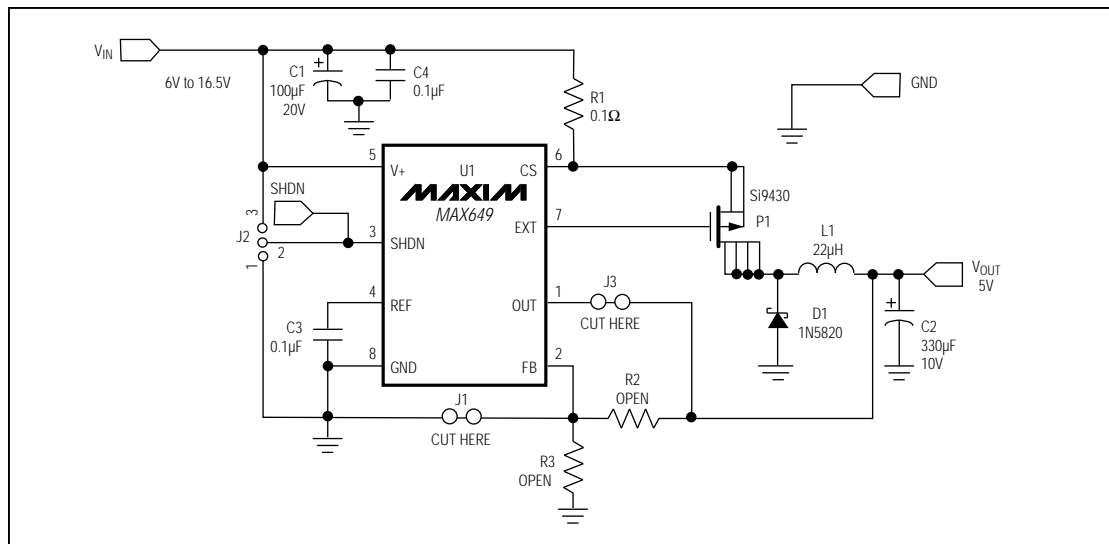


Figure 1. MAX649 EV Kit Schematic Diagram

# MAX649 Evaluation Kit

Evaluates: MAX649/MAX651/MAX652

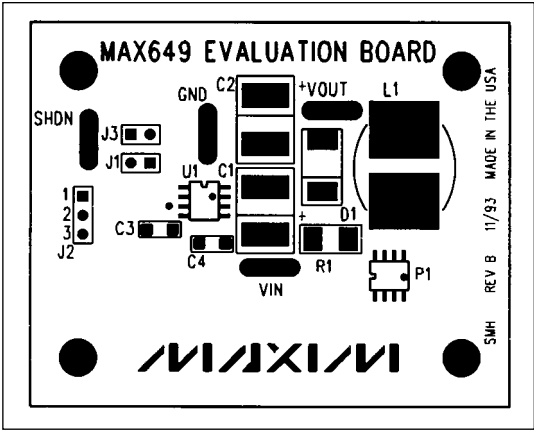


Figure 2. MAX649 EV Kit Component Placement Guide—Component Side

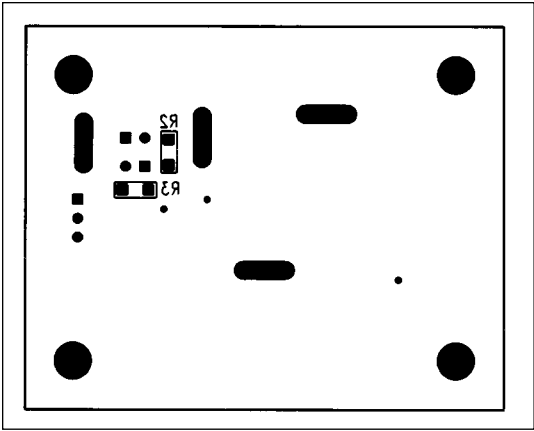


Figure 3. MAX649 EV Kit Component Placement Guide—Solder Side

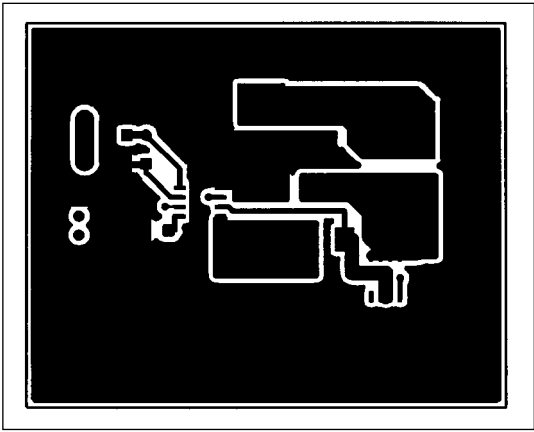


Figure 4. MAX649 EV Kit PC Board Layout—Component Side

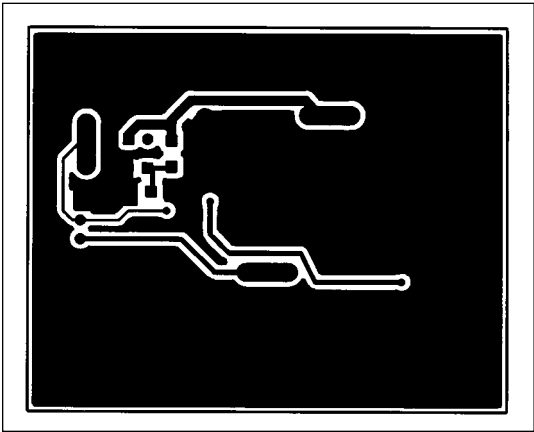
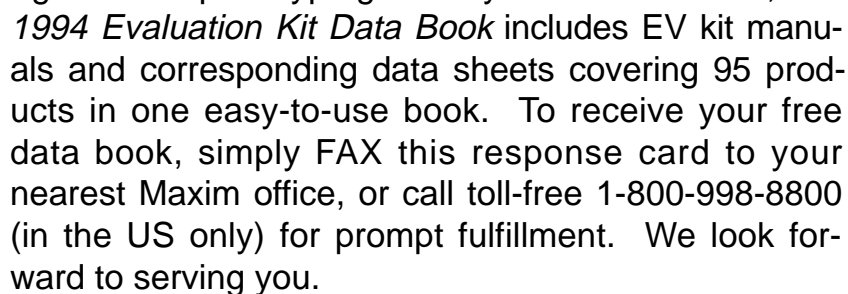


Figure 5. MAX649 EV Kit PC Board Layout—Solder Side

Evaluates: MAX649/MAX651/MAX652

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