



MAX747 Evaluation Kit

Evaluates: MAX747

General Description

The MAX747 evaluation kit (EV kit) provides a regulated 5.0V output voltage from a 6V to 15V input. It delivers a 1.25A output current and up to 95% efficiency from a 6V supply using small, surface-mount components.

Ordering Information

PART	TEMP. RANGE	BOARD TYPE
MAX747EVKIT-SO	0°C to +70°C	Surface Mount

EV Kit



Features

- ♦ 6.0V to 15.0V Input Voltage Range
- ♦ Fixed 5V or Optional Adjustable Output Voltage
- ♦ 1.25A Output Current Capability
- ♦ Up to 95% Efficiency
- ♦ PWM Architecture
- ♦ External Shutdown Control
- ♦ Fully Assembled and Tested

Component List

DESIGNATION	QTY	DESCRIPTION
C3, C4	2	0.1µF ceramic capacitors
C5	1	0.22µF ceramic capacitor
C6	1	470pF ceramic capacitor
C1, C8	2	220µF, 10V, low-ESR tantalum capacitors AVX TPSE227M010R0100 or Sprague 595D227X0010R2T
C2, C7	2	68µF, 20V, low-ESR tantalum capacitors AVX TPSE686M020R0150 or Sprague 595D686X0020R2T
D1	1	3A, 20V Schottky diode (SMT) Nihon NSQ03A02, Motorola MBR340T3 or IR30BQ040
L1	1	33µH, 1.8A inductor (SMT) Sumida CDR125-330, CoilCraft D03316-333
P1	1	P-channel MOSFET (SO-8) Motorola MMSF3P02HD, Siliconix Si9430DY or IRF7204
R6	1	0.068Ω, 5% resistor (SMT) Dale WSL-2010-R068-J or IRC LR2010-05-R068-J
U1	1	MAX747CSD
JU1	1	3-pin header
None	1	Shunt
None	1	MAX747 data sheet

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Component Suppliers

SUPPLIER	PHONE	FAX
Capacitors		
AVX	(207) 282-5111 (800) 282-4975	(207) 283-1941
Matsuo	(714) 969-2491	(714) 960-6492
Murata Erie	(814) 237-1431 (800) 831-9172	(814) 238-0490
Sprague	(603) 224-1961	(603) 224-1430
Inductors		
CoilCraft	(708) 639-6400	(708) 639-1469
Coiltronics	(407) 241-7876	(407) 241-9339
Sumida	(708) 956-0666	(708) 956-0702
Diodes		
Central Semiconductor	(516) 435-1110	(516) 435-1824
Motorola	(602) 244-5303	(602) 244-4015
Nihon	(805) 867-2555	(805) 867-2556
Power MOSFETs		
IR	(310) 322-3331	(310) 322-3332
Motorola	(602) 244-3576	(602) 244-4015
Siliconix	(408) 988-8000	(408) 970-3950
Resistors		
Dale-Vishay	(402) 564-3131	(402) 563-1841
IRC	(512) 992-7900	(512) 992-3377

Quick Start

The MAX747 EV kit is fully assembled and tested. Follow these steps to verify board operation. **Do not turn on the power supply until all connections are completed.**

- 1) Connect a 6V to 15V power supply to the pad marked VIN. Connect ground to the GND pad.
- 2) Connect a voltmeter and load (if any) to the VOUT pad.
- 3) Place the shunt across pins 1 and 2 of JU1 for normal operation.
- 4) Turn on the power supply and verify that the output voltage is 5V.

Detailed Description

Jumper Selection

The MAX747 has a TTL/CMOS-logic level input pin (SHDN) to disable the output. Table 1 lists the options for the shutdown control jumper, JU1. An external signal may be used by removing the JU1 shunt and connecting the control signal to the SHDN pad.

Table 1. Jumper JU1 Functions

SHUNT LOCATION	SHDN PIN	MAX747 OUTPUT
1 & 2	Connected to GND	MAX747 Enabled, VOUT = 5V
2 & 3	Connected to VIN	Shutdown Mode, VOUT = 0V

Setting the Output Voltage

The MAX747's output voltage can be set to 5V by grounding FB, or it can be adjusted from 2V to 14V using an external voltage divider. Resistors R4 and R5, located on the solder side of the PC board, form a voltage divider between the output voltage and the FB pin. Select a value between 10k Ω and 1M Ω for resistor R4. Calculate R5 as follows:

$$R5 = (R4) \left(\frac{V_{OUT}}{2V} - 1 \right)$$

Resistor R4 is shorted for a fixed 5V output. Be sure to cut the shorting trace between the pads of R4 before installing the resistor. Also, the shorting trace at JU2 must be cut to disconnect the OUT pin from the output.

In adjustable mode, the FB pin becomes the compensation input pin (instead of the CC pin). Remove the CC pin capacitor (C6) and install an FB pin compensation capacitor (C9). Refer to the *Compensation Capacitor* section of the MAX747 data sheet for instructions on selecting an appropriate capacitor value. The supplied output capacitors are rated at 10V; use a higher rated capacitor if necessary.

Using the Low-Battery Indicator

The MAX747 has an additional comparator that is useful for monitoring the voltage level of the input source.

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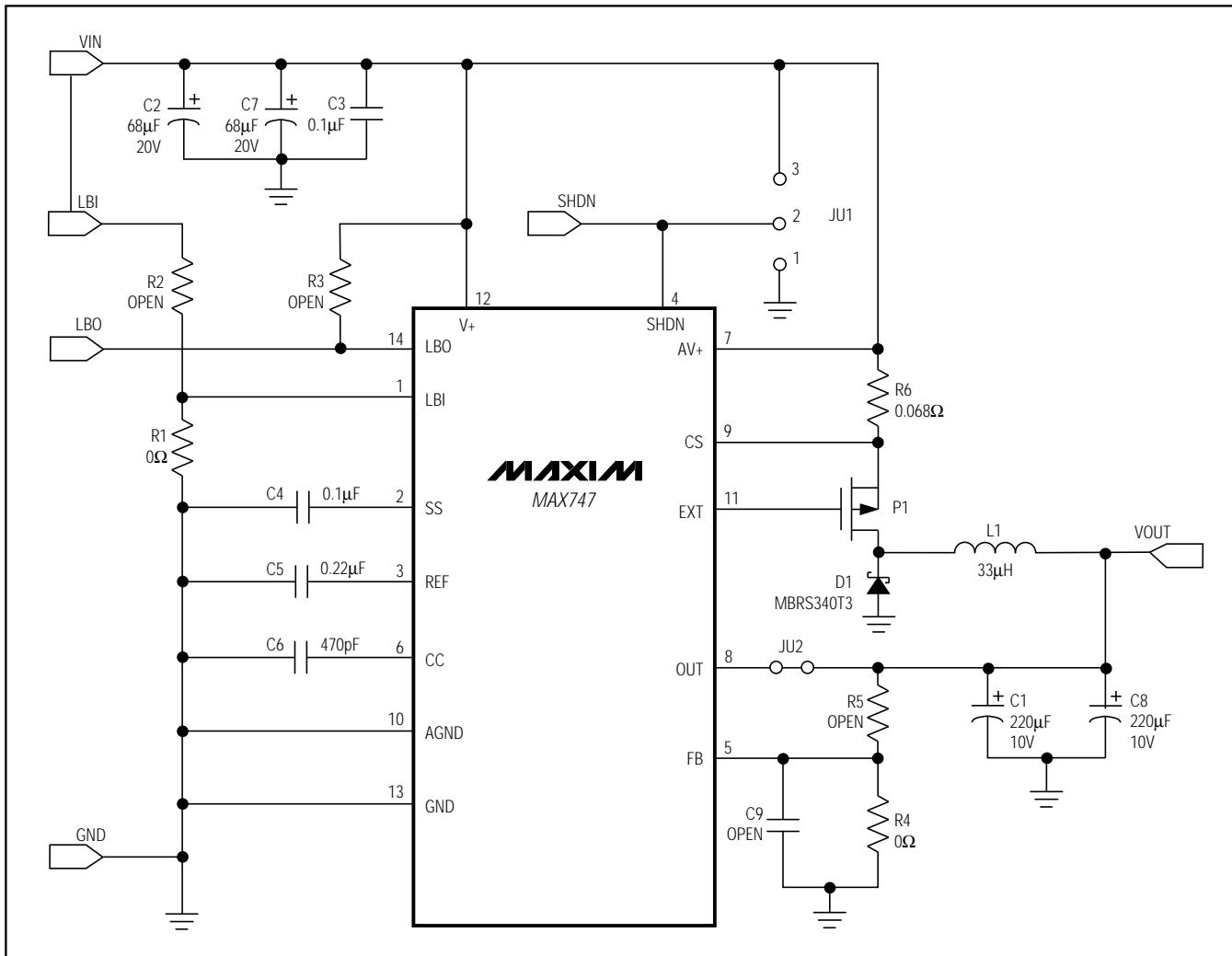


Figure 1. MAX747 EV Kit Schematic

Resistor locations R1 and R2, on the solder side of the PC board, are connected as a voltage divider between the LBI pad and the MAX747 LBI pin. Note that a PC board trace across R1 shorts the LBI pin to ground when this function is not used. Cut the trace before installing R1. Also note that the LBI pad is shorted to the VIN pad by another PC board trace. Cut this trace if a voltage other than VIN is to be monitored. Refer to the *Setting the Low-Battery Detector Voltage* section of the MAX747 data sheet for instructions on selecting values for resistors R1 and R2.

When using the LBO output, install a 100kΩ pull-up resistor (R3). LBO is disabled in shutdown mode.

High Output Current Capability

The MAX747 can be configured to deliver higher output currents. Take care to size external components according to higher peak currents. Refer to the *Design Procedure* section of the MAX747 data sheet for further details.

Surface-mount inductors with higher current capability are available from Coiltronics (CTX-03-12384) and CoilCraft (DO3340).

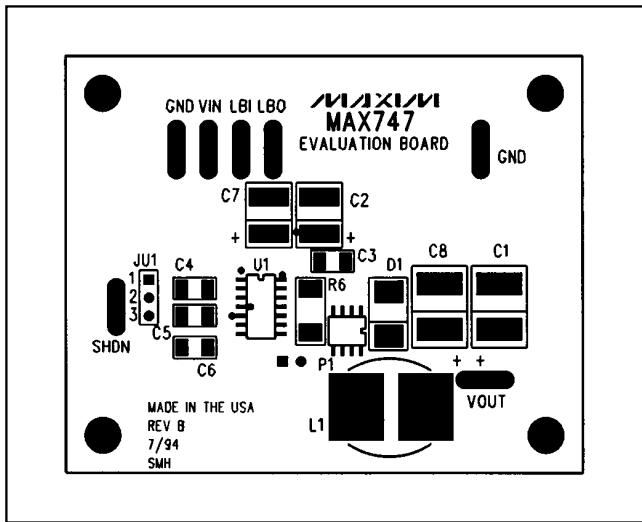


Figure 2. MAX747 EV Kit Component Placement Guide—Component Side

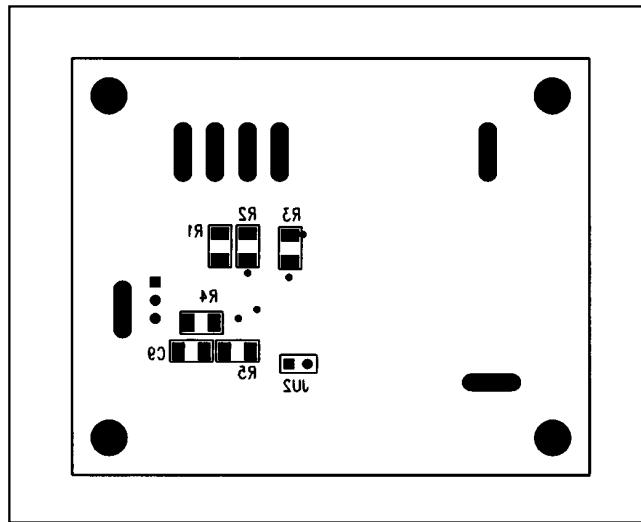


Figure 3. MAX747 EV Kit Component Placement Guide—Solder Side

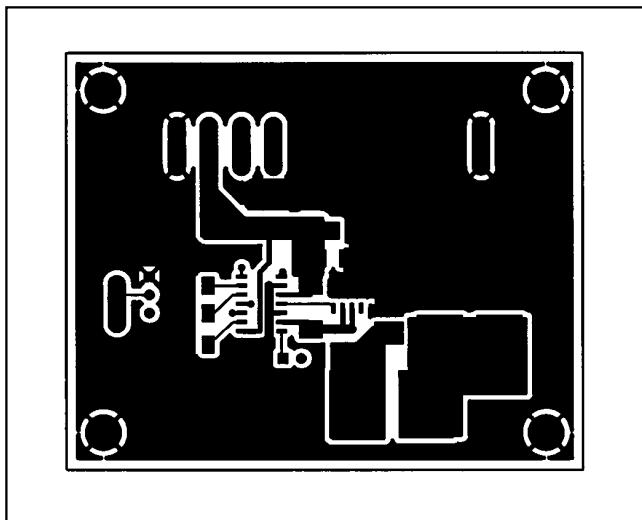


Figure 4. MAX747 EV Kit PC Board Layout—Component Side

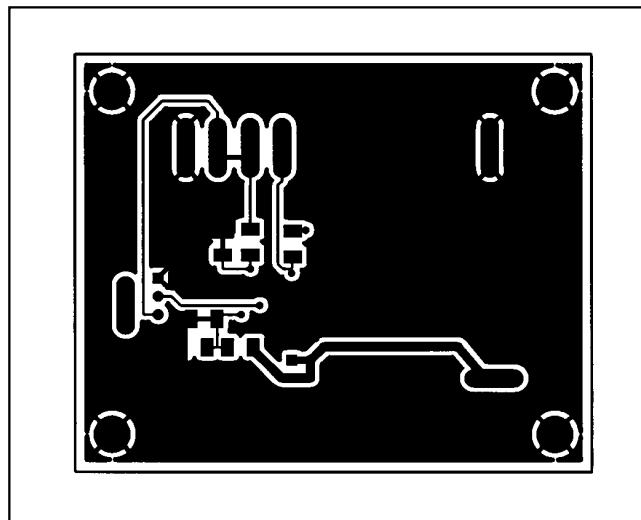


Figure 5. MAX747 EV Kit PC Board Layout—Solder Side

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