

MAXIM

MAX688 Evaluation Kit

Evaluates: MAX687/MAX688/MAX689

General Description

The MAX688 evaluation kit (EV kit) provides a regulated 3.3V output voltage while operating on input voltages from 3.5V to 11V. It delivers a 0.5A output current from a 3.5V to 5.75V input, with less than 200mV dropout. Operation with higher input voltages (up to 11V) is possible as long as the maximum power dissipation across the pass transistor is less than 1.25W.

The MAX688 EV kit is a fully assembled and tested surface-mount printed circuit board. The board comes with a 3.3V-output MAX688 IC installed, but can also be used to evaluate the MAX689 (3.0V output), or MAX687 (3.3V output, automatic shutdown). Additional pads are provided on the board's solder side to accommodate the external components used with the MAX687.

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	2.2 μ F ceramic capacitor Marcon THCR30E1E225Z or AVX 1206YG225ZATZA
C2	1	68 μ F, 20V, low-ESR tantalum capacitor AVX TPSE686M020R0150 or Sprague 595D686X0016D2B
C4	1	0.01 μ F ceramic capacitor
R1	1	10 Ω , 5% resistor
R2	1	100k Ω , 5% resistor
Q1	1	PNP power transistor $V_{BRCE} = 25V$, $I_C = 3A$, $\beta > 100$ Zetex FZT749
U1	1	Maxim MAX688CSA
JU1	1	3-pin header
JU2	1	2-pin header
None	2	Shunts
None	1	MAX688 PC board
None	1	MAX688 data sheet

Component Suppliers

SUPPLIER	PHONE	FAX
AVX	(803) 946-0238	(803) 626-3123
IRC	(213) 772-2000	(213) 772-9028
Marcon	(708) 913-9980	(708) 913-1150
Sprague	(508) 339-8900	(508) 339-5063
Zetex	(516) 543-7100	(516) 864-7630

Features

- ◆ 3.5V to 11V Input Supply Range
- ◆ 3.3V Output Voltage
- ◆ Up to 0.5A Output Current
- ◆ <0.02 μ A Shutdown Supply Current
- ◆ 150 μ A Quiescent Current
- ◆ External PNP Pass Transistor
- ◆ Adjustable Current Limit
- ◆ Surface-Mount Construction
- ◆ Fully Assembled and Tested

Ordering Information

PART	TEMP. RANGE	BOARD TYPE
MAX688EVKIT-SO	0°C to +70°C	Surface Mount

Quick Start

The MAX688 EV kit is a fully assembled and tested surface-mount board. Follow these steps to verify board operation. **Do not turn on the power supply until all connections are completed.**

- 1) Connect a 3.5V to 11V power supply to the pad marked VIN. The ground connects to the GND pad.
- 2) Connect a voltmeter and load (if any) to the VOUT pad.
- 3) Place one shunt across JU1 pins 2 and 3 and remove the other shunt from JU2 for normal operation.
- 4) Turn on the power and verify that the output voltage is 3.3V.

Instructions for modifying the board for a 3.0V output appear in the section *Evaluating the MAX689*.



MAX688 Evaluation Kit

Detailed Description

Shutdown Function

The MAX688 has an active-low shutdown control input to turn its output on or off at any time. The 3-pin header JU1 selects the shutdown mode. Remove the shunt when driving shutdown with an external signal. Table 1 lists the jumper selectable options.

Evaluating the MAX689

The MAX688 can be replaced with a MAX689 to generate a 3.0V output voltage with output current up to 0.5A. The only modification required is to replace the IC.

Table 1. Jumper JU1 Functions

SHUNT LOCATION	SHDN PIN	MAX688 OUTPUT
2 & 3	Connected to VIN	MAX688 Enabled, $V_{OUT} = 3.3V$
2 & 1	Connected to GND	Shutdown Mode, $V_{OUT} = 0V$

Evaluating the MAX687

The MAX688 can be replaced with a MAX687 to generate a 3.3V output voltage with output current up to 0.5A. The only modifications required are as follows: 1) replace the IC, 2) remove R2 and the shunt from JU1, and 3) add R3 and C3 (located on the board's solder side) or drive the ON pin with an external signal.

The MAX687's 3.3V output automatically shuts down whenever the output voltage drops below 2.96V. A power-fail comparator also monitors the output and provides an early warning of low output voltage before the device shuts down. When shut down, the output is latched off until the ON input is pulsed.

Base-Current Limiting

The output current can be limited by installing a current-limiting resistor, R1, between BASE (pin 7) and BLIM (pin 6) of U1. This EV kit comes with a 10Ω current-limiting resistor that limits the base current to 6.67mA. If R1 is shorted via jumper JU2, base current is limited to 20mA.

Refer to the MAX687/MAX688/MAX689 data sheet for instructions on selecting the current-limiting resistor value.

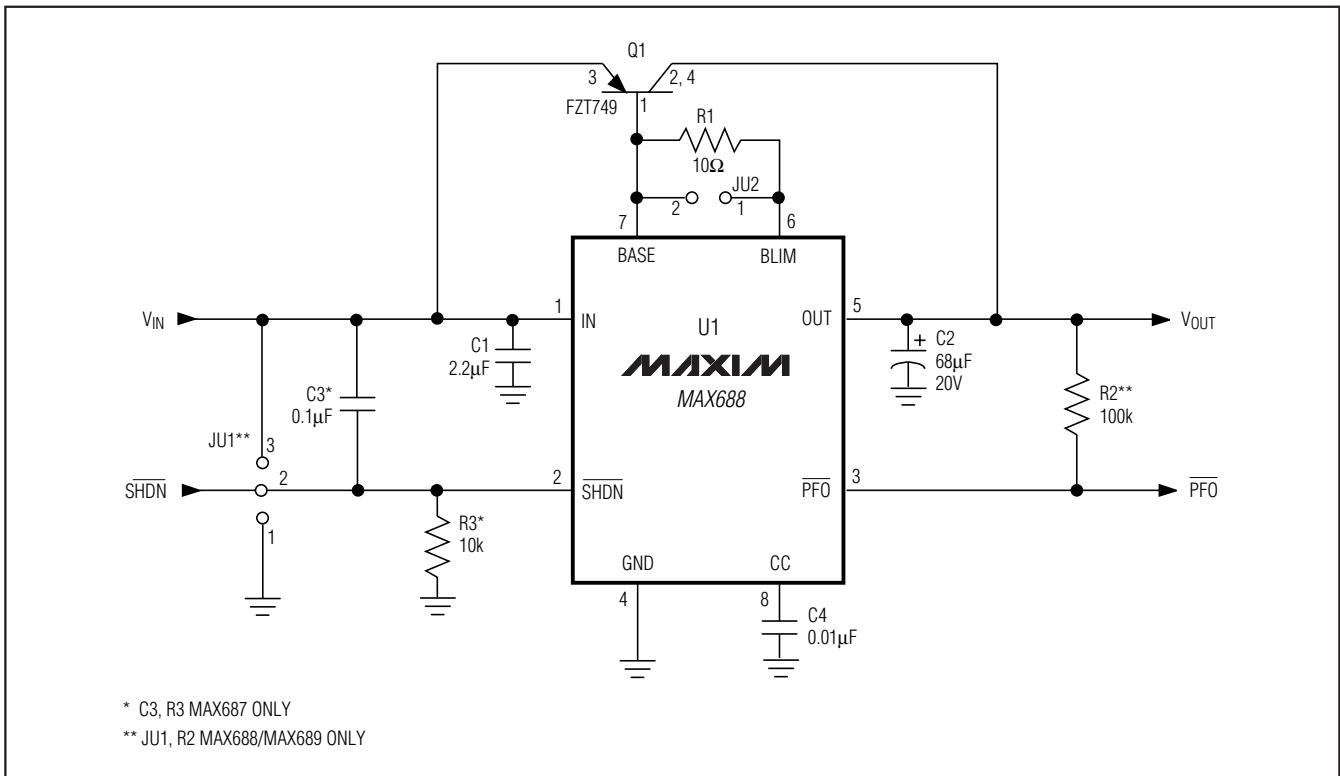


Figure 1. MAX688 EV Kit Schematic

MAX688 Evaluation Kit

Evaluates: MAX687/MAX688/MAX689

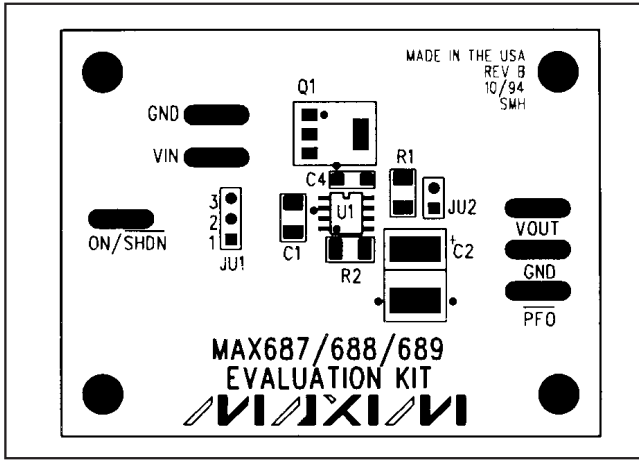


Figure 2. MAX688 EV Kit Component Placement Guide—Component Side

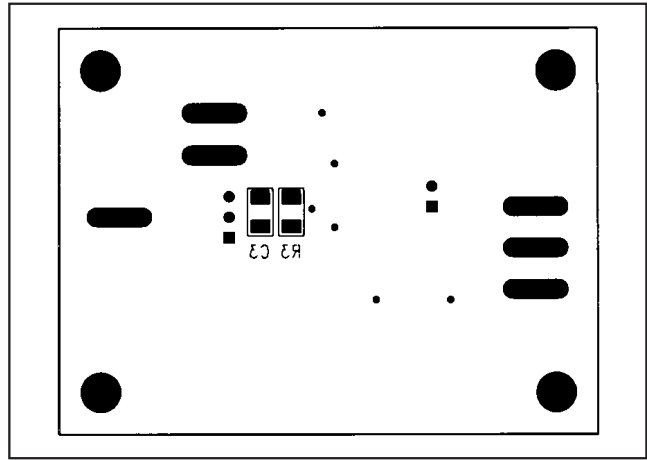


Figure 3. MAX688 EV Kit Component Placement Guide—Solder Side

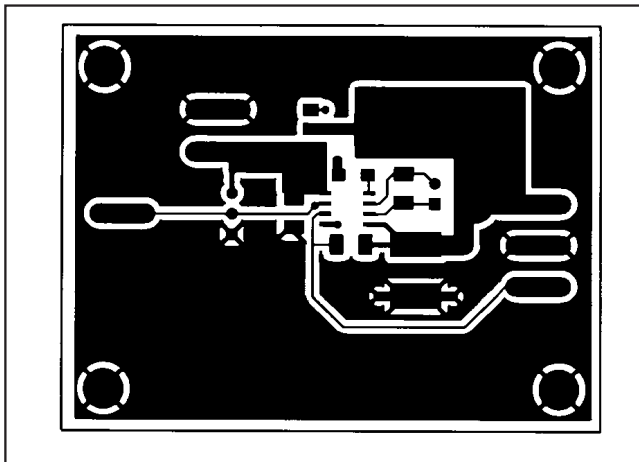


Figure 4. MAX688 EV Kit PC Board Layout—Component Side

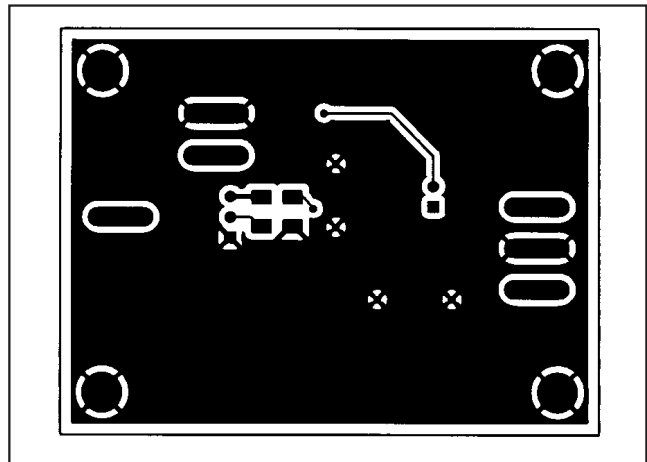


Figure 5. MAX688 EV Kit PC Board Layout—Solder Side

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