

# MAXIM

## MAX887 Evaluation Kit

### General Description

The MAX887 evaluation kit (EV kit) provides a 3.3V output voltage from a +3.5V to +11V input. It delivers up to 600mA and operates with up to 100% duty cycle for low dropout voltage. Typical efficiencies are 93%. The MAX887 features a low-current (2.5µA typ) shutdown mode, as well as current-mode operation for superior load and line response. Cycle-by-cycle current limiting protects the internal MOSFET and rectifier.

This EV kit is a fully assembled and tested surface-mount circuit board. It can be used to evaluate other output voltages by changing feedback resistors R1 and R2.

### Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2	2	47µF, 16V tantalum capacitors AVX TPSD47M016R0150 Sprague 593D476X0016D2W
C3	1	0.33µF ceramic capacitor
C4	1	2.2µF, 20V tantalum capacitor Sprague 595D225X0020A2T
C5	1	0.047µF ceramic capacitor
C6	1	100pF ceramic capacitor
C7	0	Open
D1	1	Schottky diode Motorola MBRS130T3 Nihon EC10QS02
JU1, JU2	2	3-pin headers
L1	1	33µH inductor Sumida CD54-330
R1	1	165kΩ, 1% resistor
R2	1	100kΩ, 1% resistor
U1	1	MAX887HESA
None	2	Shunts
None	1	MAX887 PC board
None	1	MAX887 data sheet

### Component Suppliers

SUPPLIER	PHONE	FAX
AVX	(803) 946-0690 (800) 282-4975	(803) 626-3123
Coilcraft	(847) 639-6400	(847) 639-1469
Motorola	(602) 303-5454	(602) 994-6430
Nihon	(805) 867-2555	(805) 867-2698
Sprague	(603) 224-1961	(603) 224-1430
Sumida	(847) 956-0666	(847) 956-0702
Vishay/Vitramon	(203) 268-6261	(203) 452-5670

### Features

- ◆ 3.3V Output Voltage
- ◆ 600mA Output Current
- ◆ Efficiency = 93%,  $V_{IN} = 5V$ ,  
 $V_{OUT} = 3.3V @ I_{OUT} = 0.2A$
- ◆ Low Dropout Voltage
- ◆ 100% Max Duty Cycle
- ◆ Internal MOSFET
- ◆ Internal Synchronous Rectifier
- ◆ 5µA Max Shutdown Current
- ◆ 300kHz Switching Frequency
- ◆ 8-Pin SO, Surface-Mount Construction
- ◆ Fully Assembled and Tested

### Ordering Information

PART	TEMP. RANGE	BOARD TYPE
MAX887EVKIT-SO	0°C to +70°C	Surface Mount

### Quick Start

The MAX887 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 +5V supply voltage to the VIN pad. The ground connects to the GND pad.
- 2) Connect a voltmeter and load, if any, to the VOUT pad.
- 3) For normal operation, place the shunt on JU1 across pins 2 and 3.
- 4) Turn on the power supply to the board, and verify that the output voltage is 3.3V. (To select other output voltages, refer to the *Output Voltage Selection* section in the MAX887 data sheet for instructions on selecting feedback resistors R1 and R2.)

Evaluates: MAX887



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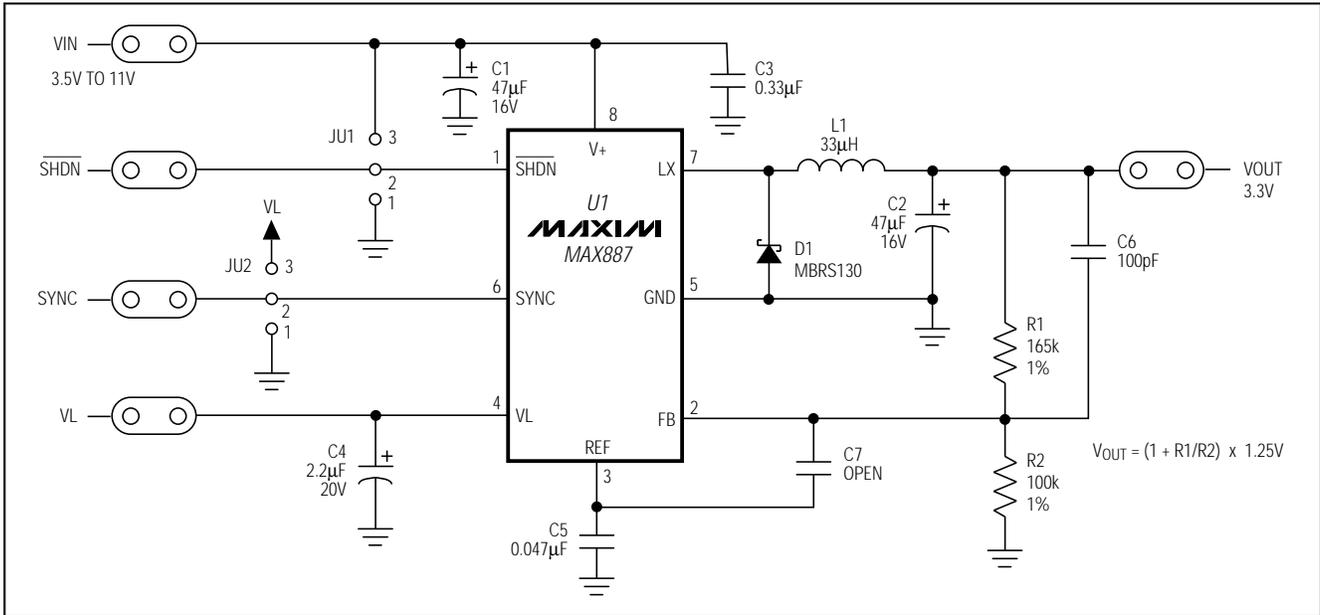


Figure 1. MAX887 EV Kit Schematic

## Detailed Description

The MAX887 provides a 3.3V output from a +3.5V to +11V input voltage. It delivers up to 500mA, and operates with up to 100% duty cycle for low dropout voltage. Other output voltages can be programmed by changing feedback resistor R1. R1 is given by the following equation:

$$R1 = R2 \left( \frac{V_{OUT}}{V_{FB}} - 1 \right)$$

where R2 = 100k and V<sub>FB</sub> = 1.25V

The 3-pin header JU1 selects shutdown mode. Table 1 lists the selectable jumper options. In shutdown, the internal switching MOSFET and synchronous rectifier turn off and the output voltage falls to 0V. Connect the SHDN pin to VIN for normal operation.

The 3-pin header JU2 selects synchronization mode. Table 2 lists the selectable jumper options.

To avoid RF interference with sensitive IF and data-acquisition circuits, a SYNC pad is provided on the board for synchronization to an external clock. When SYNC is connected to GND, Idle Mode™ operation is enabled and the MAX887 is placed in PFM mode at light loads. PFM

operation improves efficiency and reduces quiescent current typically to 200µA. When SYNC is connected to VL, forced PWM operation is enabled. PWM operation reduces noise in sensitive communications applications. Refer to the *Forced PWM and Idle Mode Operation* section in the MAX887 data sheet for more information.

Table 1. Jumper JU1 Functions

SHUNT LOCATION	SHDN PIN	MAX887 OUTPUT
1 & 2	Connected to GND	Shutdown mode, V <sub>OUT</sub> = 0V
2 & 3	Connected to VIN	MAX887 enabled, V <sub>OUT</sub> = 3.3V

Table 2. Jumper JU2 Functions

SHUNT LOCATION	SYNC PIN	OPERATING MODE
1 & 2	Connected to GND	Idle mode, PFM; I <sub>QUIESCENT</sub> = 200µA
2 & 3	Connected to VL	Low-noise, fixed-frequency PWM operation; I <sub>QUIESCENT</sub> = 2.7mA
Open	Connected to an external SYNC pad	Synchronization to an external clock

Idle Mode is a trademark of Maxim Integrated Products.

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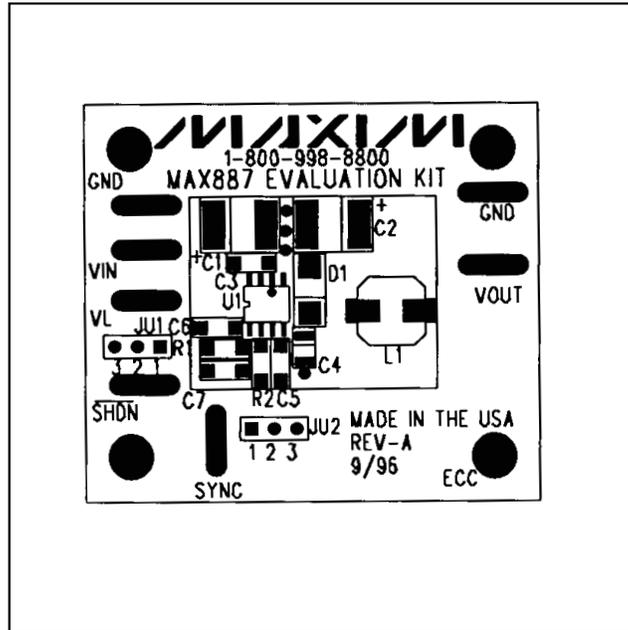


Figure 2. MAX887 EV Kit Component Placement Guide—Component Side

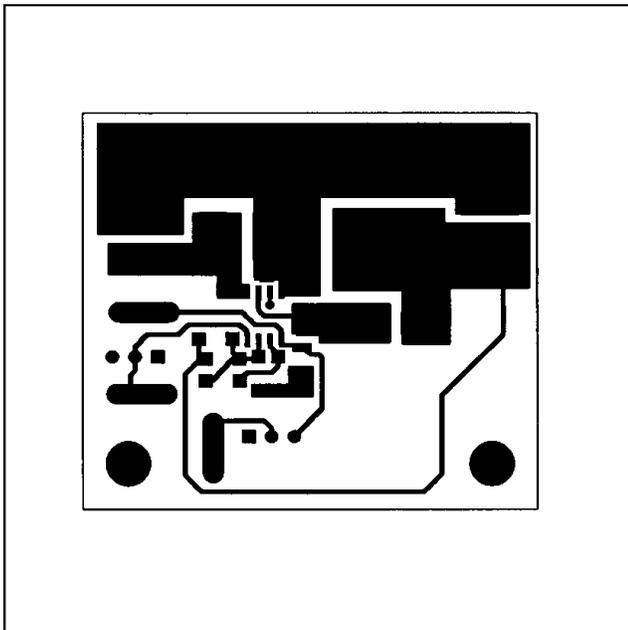


Figure 3. MAX887 EV Kit PC Board Layout—Component Side

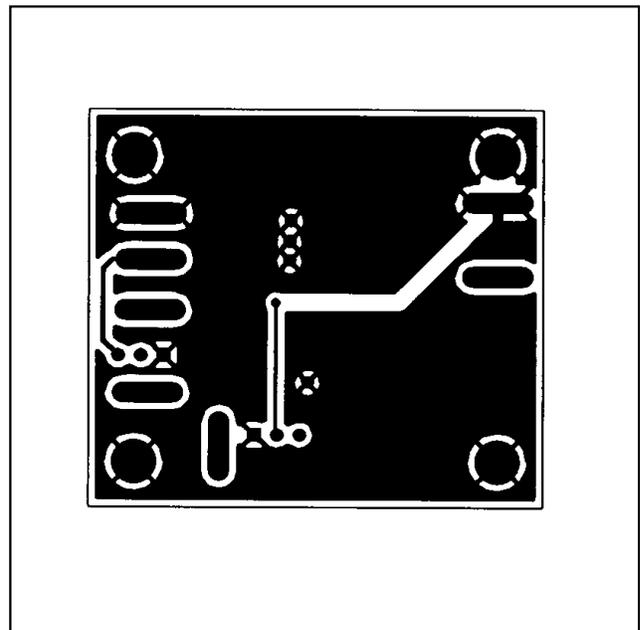


Figure 4. MAX887 PC Board Layout—Solder Side

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## NOTES

*Maxim cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim product. No circuit patent licenses are implied. Maxim reserves the right to change the circuitry and specifications without notice at any time.*

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