

# MAXIM

## MAX685 Evaluation Kit

### General Description

The MAX685 evaluation kit (EV kit) provides dual-output +15V and -7.5V voltages from 2.7V to 5.5V input voltage. Each output regulates separately, and each can deliver 10mA output current. Both output voltages can be adjusted by changing the feedback resistor values.

The MAX685 EV kit provides low quiescent current and high efficiency for maximum battery life. The EV kit operates at a fixed 200kHz or 400kHz frequency, which allows the use of a tiny surface-mount inductor. This EV kit is a fully assembled and tested surface-mount circuit board.

### Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10 $\mu$ F, 10V tantalum capacitor Sprague 595D106X0010A2T or AVX TAJA106K010R
C2, C3	2	2.2 $\mu$ F, 25V ceramic capacitors (1206) Marcon/United Chemi-Con THCR30E1E225ZT
C4, C5	2	0.22 $\mu$ F ceramic capacitors
C6	1	47pF ceramic capacitor
C7	0	Open
D1, D2	2	0.5A, 20V Schottky diodes Motorola MBR0520LT3
JU1, JU2, JU3	3	3-pin headers
L1	1	22 $\mu$ H inductor Murata LQH4N220K04M00 or TDK NLC453232 220K
R1	1	1.0M $\Omega$ , 1% resistor (1206)
R2	1	90.9k $\Omega$ , 1% resistor (1206)
R3	1	750k $\Omega$ , 1% resistor (1206)
R4	1	124k $\Omega$ , 1% resistor (1206)
R5	1	100k $\Omega$ , 5% resistor (1206)
U1	1	MAX685EEE
None	3	Shunts
None	1	MAX685 PC board
None	1	MAX685 data sheet

### Features

- ◆ +15V Positive Output Voltage
- ◆ -7.5V Negative Output Voltage
- ◆ 2.7V to 5.5V Battery Input Voltage
- ◆ 10mA Output Current
- ◆ Single Inductor for Both Outputs
- ◆ 0.1 $\mu$ A Shutdown Current
- ◆ 200kHz or 400kHz Fixed Frequency
- ◆ Power-OK Output
- ◆ Surface-Mount, Low-Profile Components
- ◆ Fully Assembled and Tested

### Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX685EVKIT	0°C to +70°C	16 QSOP

### Component Suppliers

SUPPLIER	PHONE	FAX
AVX	(803) 946-0690	(803) 626-3123
Coilcraft	(847) 639-6400	(847) 639-1469
Dale-Vishay	(402) 564-3131	(402) 563-6418
Marcon/ United Chemi-Con	(847) 696-2000	(847) 696-9278
Motorola	(602) 303-5454	(602) 994-6430
Murata	(814) 237-1431	(814) 238-0490
Sprague	(603) 224-1961	(603) 224-1430
Sumida	(847) 956-0666	(847) 956-0702
TDK	(847) 390-4373	(847) 390-4428
Vishay/Vitramon	(203) 268-6261	(203) 452-5670

**Note:** Please indicate that you are using the MAX685 when contacting these component suppliers.

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## Quick Start

The MAX685 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 +2.7V to +5.5V power supply to the VIN pad. Connect ground to the GND pad.
- 2) Connect voltmeters and loads, if any, to the +VOUT and VOUT- pads.
- 3) Verify that the shunts are on JU1, JU2, and JU3 across pins 2 and 3.
- 4) Turn on the power supply and verify the positive output voltage is +15V and the negative output is -7.5V.
- 5) For other output voltages, refer to the *Setting the Output Voltage* section in the MAX685 data sheet for instructions on selecting the feedback resistors.

## Detailed Description

The MAX685 EV kit provides dual-output +15V and -7.5V voltages from 2.7V to 5.5V input voltage. Each output regulates separately and each can deliver 10mA output current. Both output voltages can be adjusted by changing the feedback-resistor values.

The EV kit minimizes total circuit size and cost by using a single inductor for both output voltages. It operates at a fixed 200kHz or 400kHz frequency and includes a shutdown function and a power-OK output.

## Jumper Selection

The MAX685 EV kit features a shutdown mode that reduces quiescent current to 0.1 $\mu$ A typical to preserve battery life. The 3-pin header JU1 selects the shutdown mode. Table 1 lists the selectable jumper options.

The 3-pin header JU2 selects the switching frequency. Table 2 lists the selectable jumper options. The 3-pin header JU3 selects the power sequence. Table 3 lists the selectable jumper options.

**Table 1. Jumper JU1 Functions**

SHUNT LOCATION	$\overline{\text{SHDN}}$ PIN	MAX685 OUTPUT
1 and 2	Connected to GND	Shutdown mode, +VOUT = 0, VOUT- = 0
2 and 3	Connected to VIN	MAX685 enabled, VOUT = +15V, VOUT- = -7.5V

**Table 2. Jumper JU2 Functions**

SHUNT LOCATION	SYNC PIN	FREQUENCY (kHz)
1 and 2	Connected to GND	200
2 and 3	Connected to VIN	400

**Table 3. Jumper JU3 Functions**

SHUNT LOCATION	SEQ PIN	POWER SEQUENCE
1 and 2	Connected to GND	Negative output powers up before positive output.
2 and 3	Connected to VIN	Positive output powers up before negative output.

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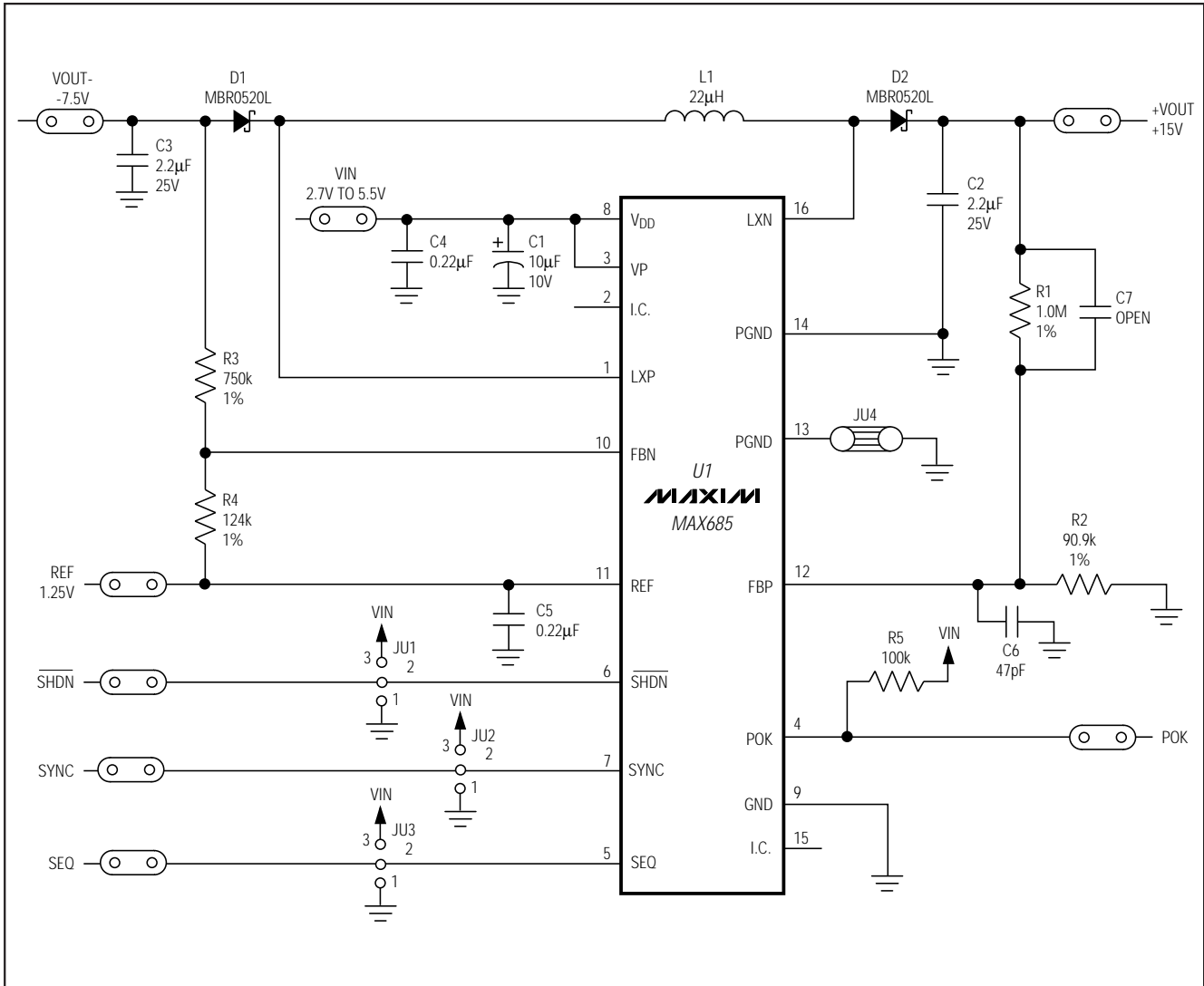


Figure 1. MAX685 EV Kit Schematic

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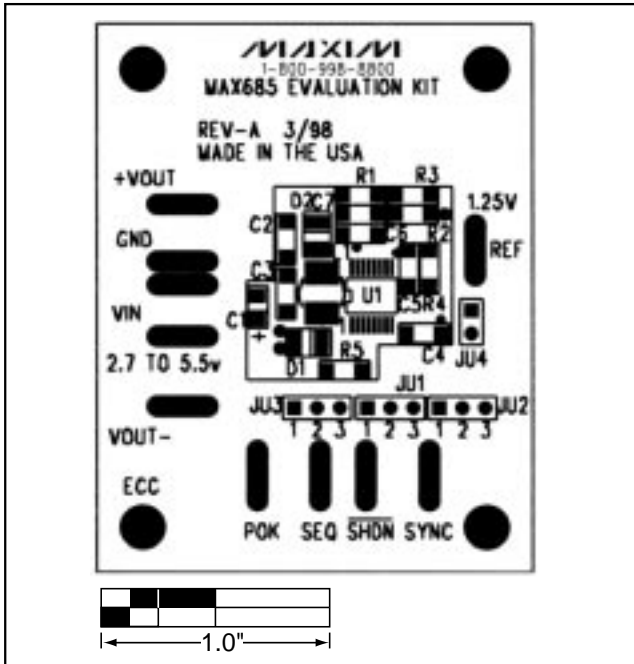


Figure 2. MAX685 EV Kit Component Placement Guide—Component Side

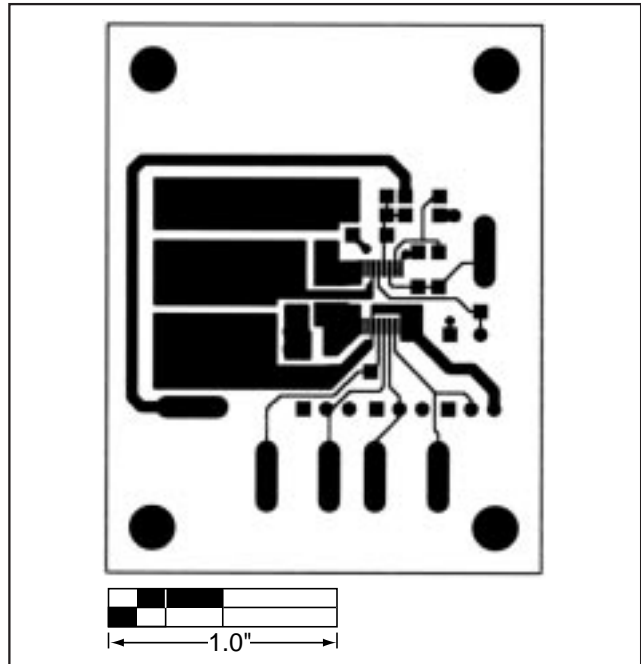


Figure 3. MAX685 EV Kit PC Board Layout—Component Side

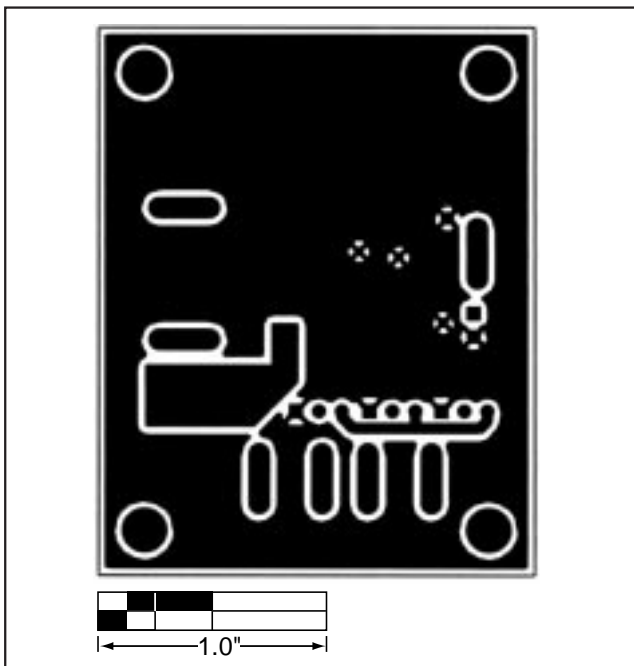


Figure 4. MAX685 EV Kit PC Board Layout—Solder Side

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4 \_\_\_\_\_ Maxim Integrated Products, 120 San Gabriel Drive, Sunnyvale, CA 94086 408-737-7600