

# MAXIM

## MAX863 Evaluation Kit

Evaluates: MAX863

### General Description

The MAX863 evaluation kit (EV kit) is an assembled and tested PC board that demonstrates the MAX863 dual, step-up DC-DC controller. The EV kit is factory preset to provide 5V and 3.3V outputs at 700mA and 1.1A, respectively ( $V_{IN} = 2.4V$ ). Both outputs can also be set to other voltages by pin-strapping or with external resistors.

### Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	330 $\mu$ F, 10V tantalum capacitor 0.060 $\Omega$ max ESR Sprague 594D337X0010R2
C2, C9	2	100 $\mu$ F, 16V tantalum capacitor 0.1 $\Omega$ max ESR AVX TPSE107M016R0100
C3, C6, C10, C11	0	Open
C4	1	10 $\mu$ F, 16V tantalum capacitor
C5	1	220 $\mu$ F, 16V tantalum capacitor 0.060 $\Omega$ max ESR Sprague 594D227X0016R2
C7, C8	1	0.1 $\mu$ F ceramic capacitor
D1, D2	2	3A, 40V Schottky diode Motorola MBRS340T3
JU1–JU5	5	3-pin headers
L1, L2	2	10 $\mu$ H, 2.5A inductor Sumida CD75-10uH (2.3A, 0.07 $\Omega$ )
R1, R3, R7, R9	0	Open
R2, R4	2	0.050 $\Omega$ , 1% sense resistor Dale WSL-2010-0.050 $\Omega$ $\pm$ 1% or IRC LR2010-R050-F
R5	1	165k $\Omega$ , 1% resistor
R6, R8	2	100k $\Omega$ , 1% resistors
U1	1	Maxim MAX863EEE
U2	1	Dual, logic-level N-channel FET International Rectifier IRF7301 ( $V_T < 0.70V$ , $R_{DS(ON)} = 0.070\Omega$ at 2.7V)
None	1	PC board

### Features

- ◆ **Output Voltages:** Preset 5V and 3.3V, or User-Defined
- ◆ **Output Currents:**
  - 700mA at 5V, 1.1A at 3.3V ( $V_{IN} = 2.4V$ )
  - 350mA at 5V, 600mA at 3.3V ( $V_{IN} = 1.5V$ )
- ◆ **Low-Battery Detector**
- ◆ **Fully Assembled and Tested**
- ◆ **Proven PC Board Layout**

### Ordering Information

PART	TEMP. RANGE	BOARD TYPE
MAX863EVKIT	0°C to +70°C	Surface Mount

### Component Suppliers

SUPPLIER*	PHONE	FAX
AVX	(803) 946-0690 (800) 282-4975	(803) 626-3123
Dale	(605) 668-4131	(605) 665-1627
International Rectifier	(310) 322-3331	(310) 322-3332
IRC	(512) 992-7900	(512) 992-3377
Motorola	(602) 303-5454	(602) 994-6430
Sprague	(603) 224-1961	(603) 224-1430
Sumida	USA	(847) 956-0666 (847) 956-0702
	Japan	81-3-3607-5111 81-3-3607-5144

\*Please indicate that you are using the MAX863 when contacting these suppliers.

### Quick Start

This section describes how to operate the MAX863 EV kit and evaluate its performance. **Do not turn on the power supply until all connections are completed.**

- 1) Configure the jumpers in accordance with Table 1.
- 2) Connect a 1.5V to 3.3V DC power supply between the VIN and GND input pads.
- 3) Turn on the power supply. With no load and the output in regulation, supply current for the board should be less than a few hundred microamperes.
- 4) Measure the output voltage at OUT1. With FB1 = GND (JU3 = 1-2), OUT1 will be preset to 5V.
- 5) Measure the output voltage at OUT2. The standard factory setting of R5 = 165k $\Omega$  and R6 = 100k $\Omega$  sets OUT2 to 3.3V.

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## Detailed Description of Hardware

### Adjustable Output Voltage

OUT2 must be set with a resistor divider. The EV kit board provides R5 and R6 for this purpose. OUT1 can be set with a resistor divider (R1 and R3) or configured for a preset value (JU3). The EV kit board is preset for a 5.0V output.

To configure OUT1 for an adjustable output, open jumper JU3 and then install resistors at sites R1 and R3. Select the resistors according to the following formulas:

$$R1 / R3 = (V_{OUT1} / V_{REF}) - 1$$

$$R5 / R6 = (V_{OUT2} / V_{REF}) - 1$$

where  $V_{REF} = 1.25V$ .

**Note:** Output capacitors C1 and C5 are rated for 10V and 16V, respectively. For higher output voltages, replace these capacitors.

The EV kit board provides space at C3, C6, C10, and C11 for optional compensation capacitors. Refer to the *Set Feedback Compensation* section in the MAX863 data sheet for more information.

### Low-Battery Detector

The EV kit board provides pads at R7 and R8 for an optional resistor divider for the low-battery voltage detector. When the voltage at the LBI pin falls below 1.25V, the LBO pin is pulled low. Select the resistors according to the following formula:

$$R7 / R8 = (V_{LOW} / V_{REF}) - 1$$

where  $V_{REF} = 1.25V$ .

**Table 1. Jumper Settings**

FUNCTION	JUMPER	STATE	DESCRIPTION
BOOT Pin	JU1	1-2*	BOOT = $V_{DD}$ ; bootstrapped mode ( $V_{IN} < 2.7V$ ). <b>If BOOT is high, <math>V_{DD}</math> must be connected to OUT1.</b>
		2-3	BOOT = GND; non-bootstrapped mode ( $V_{IN} > 2.7V$ ). <b>When using a non-bootstrapped circuit configuration, connect BOOT to GND.</b>
VDD Select	JU2	1-2*	$V_{DD} = OUT1$ ; bootstrapped mode ( $V_{IN} < 2.7V$ )
		2-3	$V_{DD} = V_{IN}$ ; non-bootstrapped mode ( $V_{IN} > 2.7V$ )
OUT1 Set	JU3	1-2*	FB1 = GND; OUT1 set to 5V; R1 and R3 should be open.
		2-3	FB1 = $V_{DD}$ ; OUT1 set to 3.3V; R1 and R3 should be open.
		Open	OUT1 determined by R1 and R3
OUT1 Shutdown	JU4	1-2*	$\overline{SHDN1} = V_{DD}$ ; OUT1 enabled
		2-3	$\overline{SHDN1} = GND$ ; OUT1 disabled; OUT1 and OUT2 can be independently disabled.
OUT2 Shutdown	JU5	1-2*	$\overline{SHDN2} = V_{DD}$ ; OUT2 enabled
		2-3	$\overline{SHDN2} = GND$ ; OUT2 disabled

\* Indicates default factory settings.

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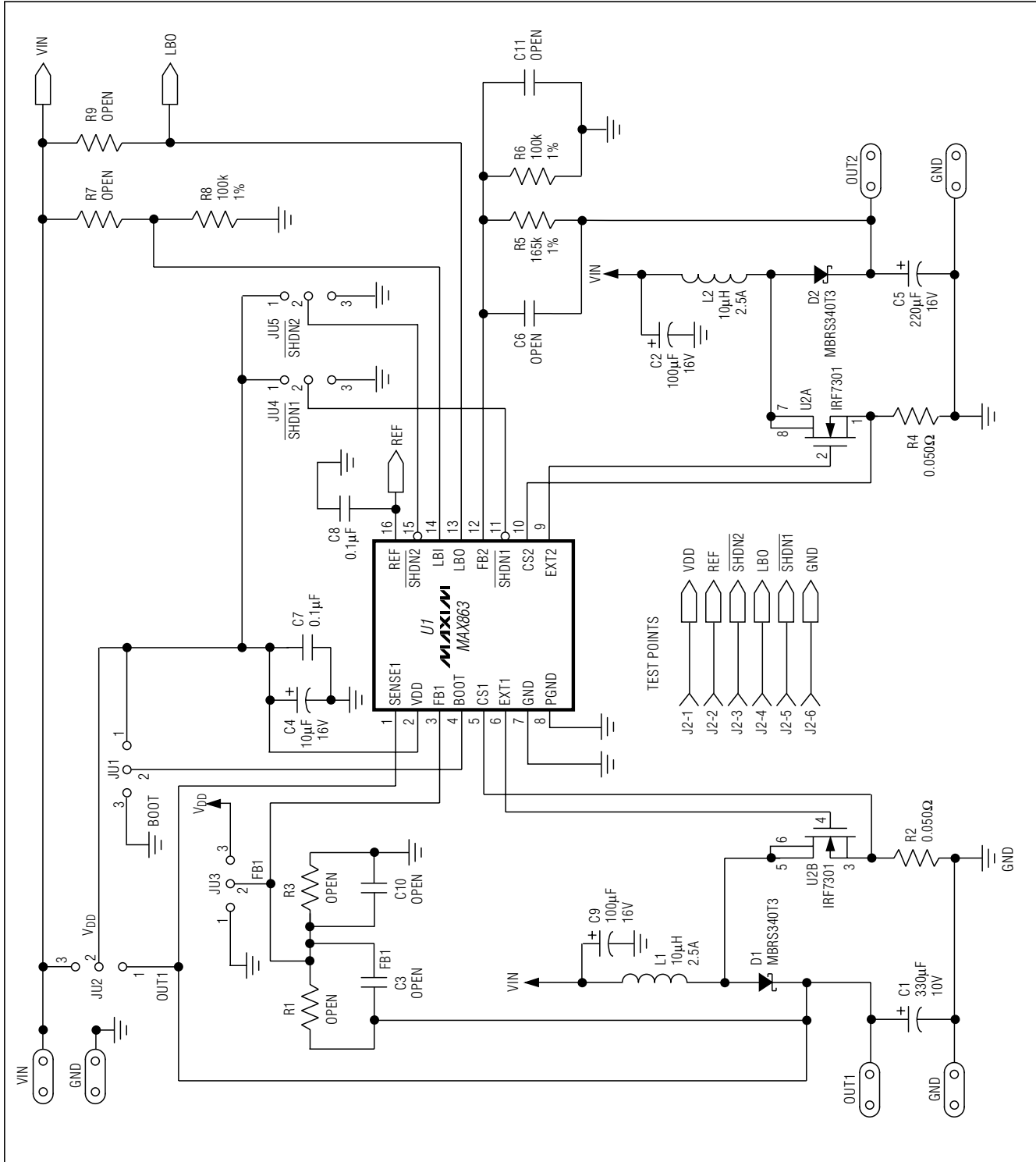


Figure 1. MAX863 EV Kit Schematic Diagram

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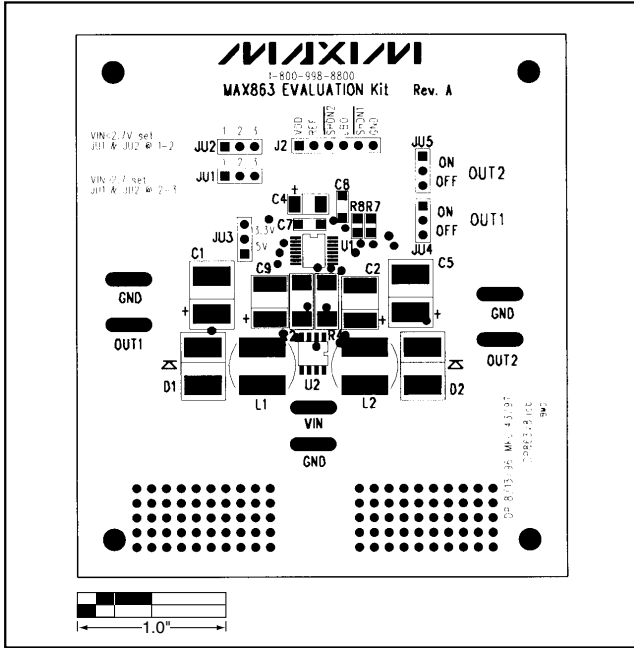


Figure 2. MAX863 EV Kit Component Placement Guide—Component Side

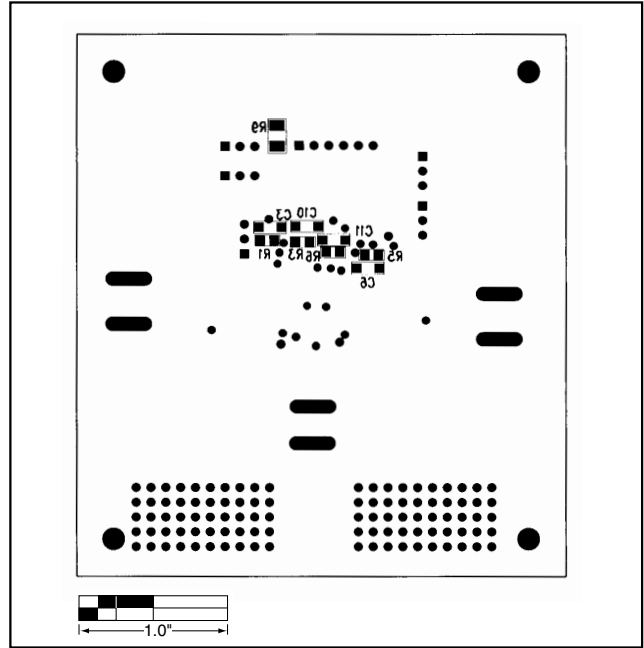


Figure 3. MAX863 EV Kit Component Placement Guide—Solder Side

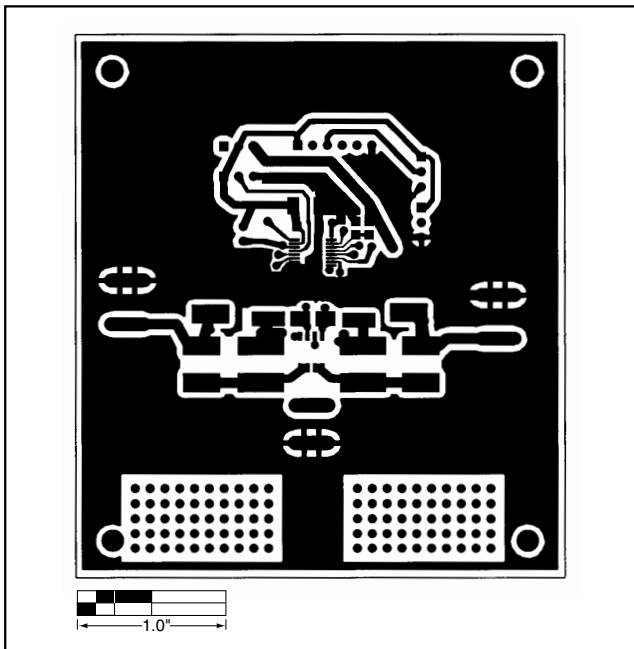


Figure 4. MAX863 EV Kit PC Board Layout—Component Side

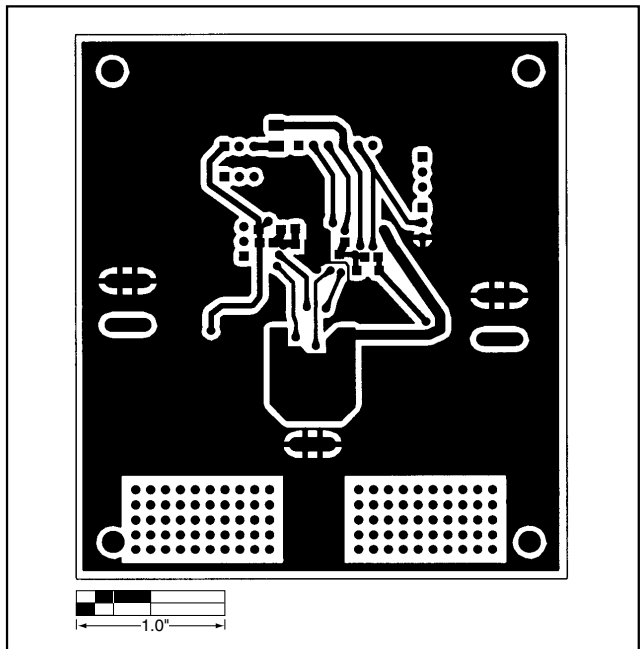


Figure 5. MAX863 EV Kit PC Board Layout—Solder Side

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