

MAXIM

MAX881R Evaluation Kit

Evaluates: MAX881R

General Description

The MAX881R IC is an inverting, charge-pump DC-DC converter with a low-noise, regulated output. Low output ripple voltage makes this device ideal for biasing the GaAsFETs commonly found in cellular telephone transmitters.

The MAX881R evaluation kit (EV kit) is a fully assembled and tested surface-mount board. Provisions are made for mounting a second voltage-divider resistor, which is required for setting output voltages other than -2V. A special scope-probe socket is also mounted on the board, so output noise can be observed on an oscilloscope.

Features

- ◆ 1mVp-p Output Voltage Ripple
- ◆ 2.5V to 5.5V Input Range
- ◆ Uses One 4.7 μ F and Three 1 μ F Ceramic Capacitors
- ◆ -2V Regulated Output (or Adjustable)
- ◆ 4mA Output Current
- ◆ Power OK (POK) Output
- ◆ Fully Assembled and Tested Surface-Mount Board

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2, C3	3	1 μ F, 16V, low-ESR ceramic capacitors Taiyo Yuden EMK316BJ105KL
C4	1	4.7 μ F, 10V, low-ESR ceramic capacitor Taiyo Yuden LMK316BJ475ML
J1	1	Scope-probe connector Berg Electronics 33JR135-1
JU1	1	2-pin jumper
R1	0	Not installed
R2	1	100k Ω , 1% resistor
R3, R4	2	1M Ω resistors
U1	1	MAX881RREUB
None	1	Shunt
None	1	Printed circuit board

Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX881REVKIT	-40°C to +85°C	10 μ MAX

Quick Start

The MAX881R EV kit is fully assembled and tested. Follow the steps below to verify board operation. **Do not turn on the power supply until all connections are completed.**

- 1) Connect a 2.5V to 5.5V supply to the pad labeled VIN. Connect the ground lead to the pad labeled GND.
- 2) Connect a voltmeter and the load to the VOUT pad.
- 3) Make sure there is no shunt across JU1.
- 4) Turn on the power and verify that the output is -2V. You can insert a scope probe into J1 to observe the output noise. Be sure the scope ground makes contact with the outside of the connector.

Component Suppliers

SUPPLIER	PHONE	FAX
Berg Electronics	(317) 738-2800	(317) 738-2858
Sprague	(603) 224-1961	(603) 224-1430
Taiyo Yuden	(408) 573-4150	(408) 573-4159

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Detailed Description

Jumper Selection

The 2-pin header, JU1, controls pin 5 ($\overline{\text{SHDN}}$) on the IC. Table 1 outlines the shunt positions for JU1.

The $\overline{\text{POK}}$ pad allows easy connection to an external system. This output pulls low when the bias voltage has reached 92.5% of its set value.

Output Voltage Adjustment

For output voltages other than -2V, install R1 to complete the R1/R2 output voltage divider. R2 is a 100k Ω , 1% resistor. To maintain accuracy, use a 1% resistor for R1. Use the following equations to calculate R1:

$$R1 = -R2 (2 \times V_{\text{OUT}} + 1)$$

$$R1 = -100\text{k}\Omega (2 \times V_{\text{OUT}} + 1)$$

Capacitor Selection

Use capacitors with a low effective series resistance (ESR), such as ceramic or surface-mount chip tantalum types.

Output ripple with the supplied components is typically 1mVp-p. For lower output ripple, replace C4 with a 10 μF ceramic capacitor such as the Taiyo Yuden JMK316BJ106ML or a 10 μF tantalum such as the Sprague 595D106X0010A2.

Table 1. JU1 Shunt Position

SHUNT POSITION	MAX881R FUNCTION
Open	Device enabled, or apply signal to the $\overline{\text{SHDN}}$ pad
Closed	Device disabled

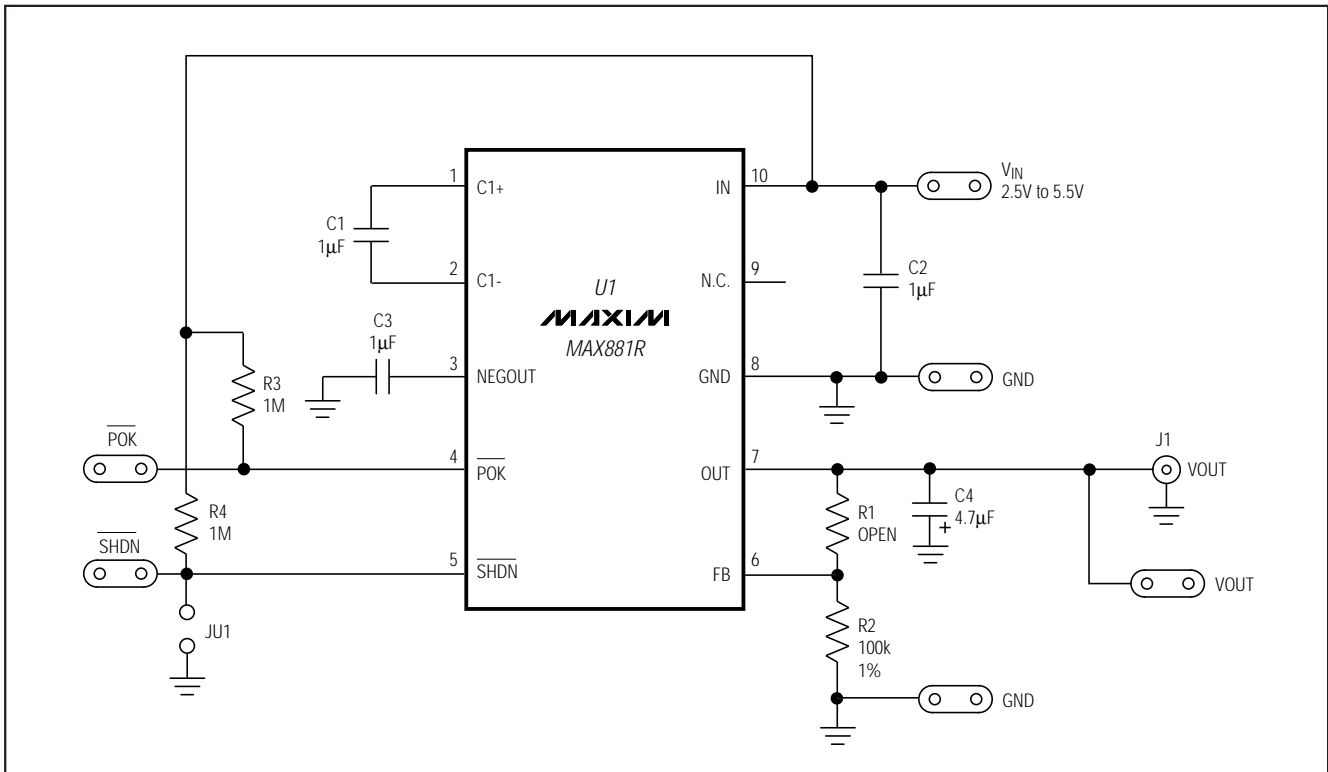


Figure 1. MAX881R EV Kit Schematic

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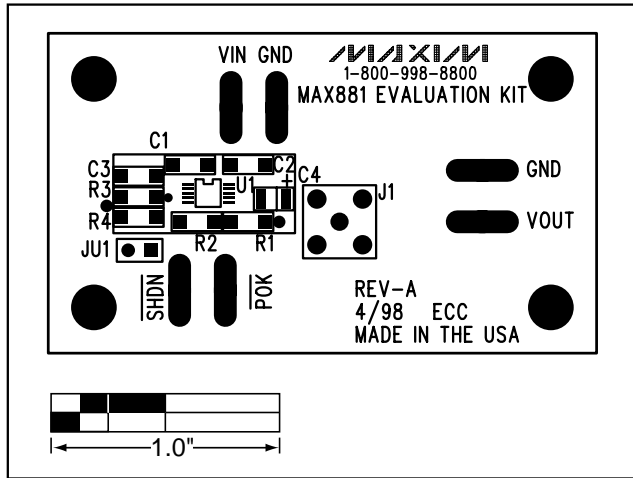


Figure 2. MAX881R EV Kit Component Placement Guide—Component Side

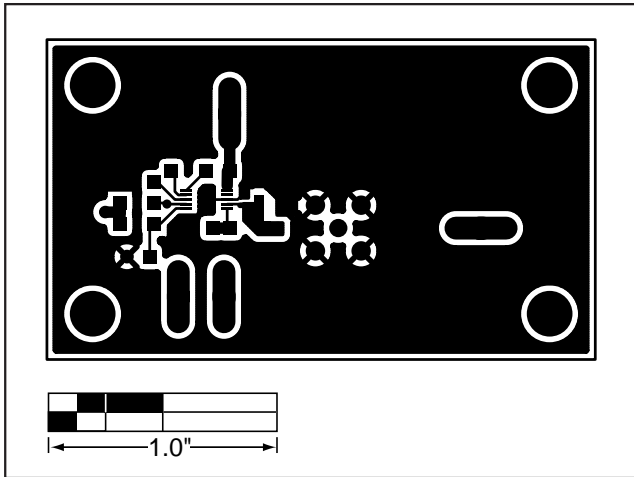


Figure 3. MAX881R EV Kit PC Board Layout—Component Side

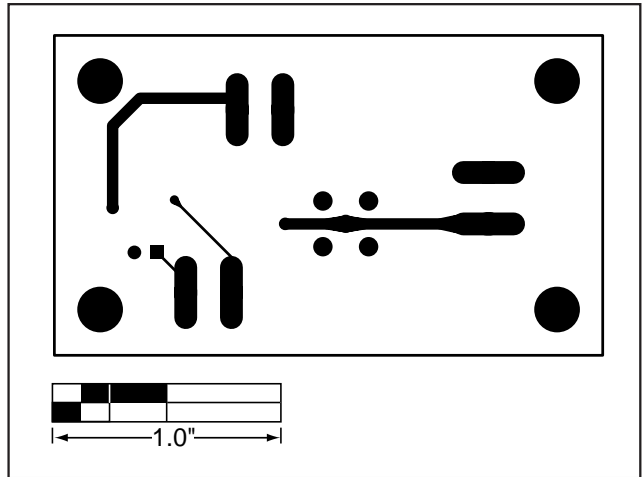


Figure 4. MAX881R EV Kit PC Board Layout—Solder Side

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NOTES

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