

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 ($\overline{\text{POK}}$) 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

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

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.

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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

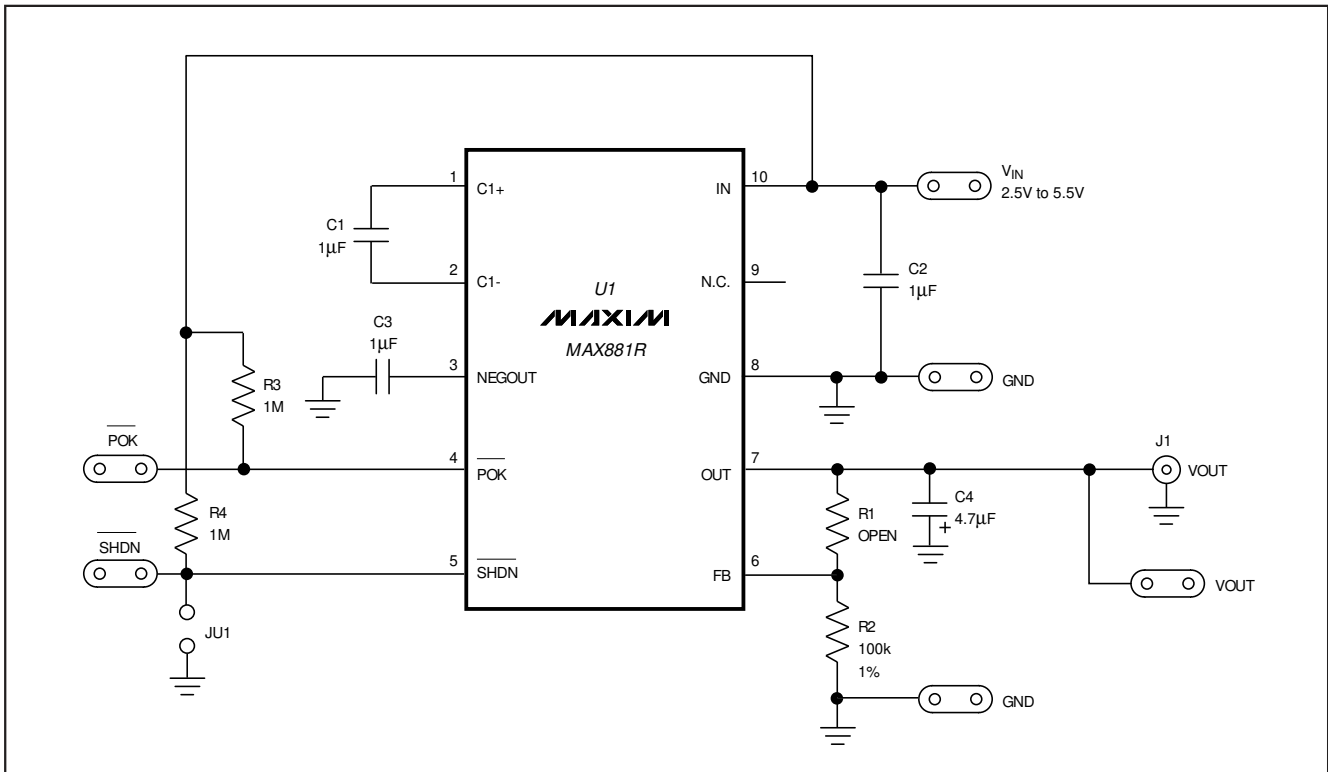


Figure 1. MAX881R EV Kit Schematic

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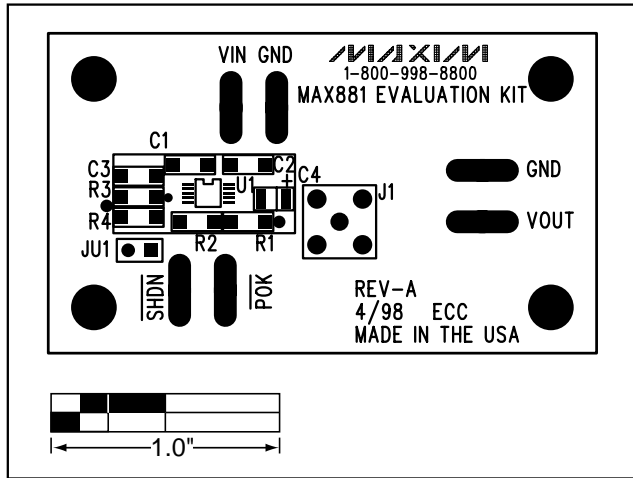


Figure 2. MAX881R EV Kit Component Placement Guide—Component Side

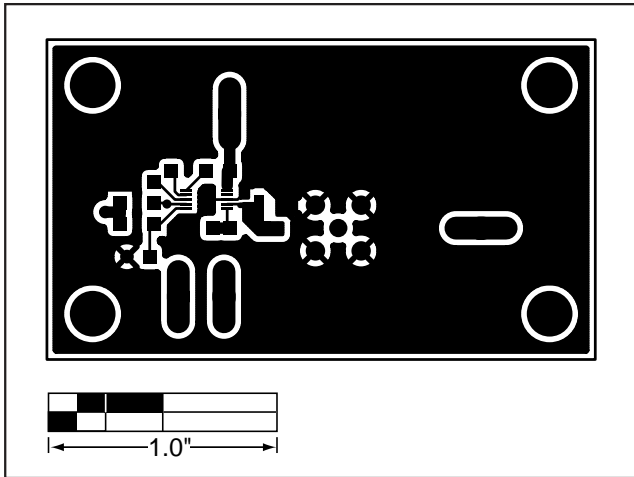


Figure 3. MAX881R EV Kit PC Board Layout—Component Side

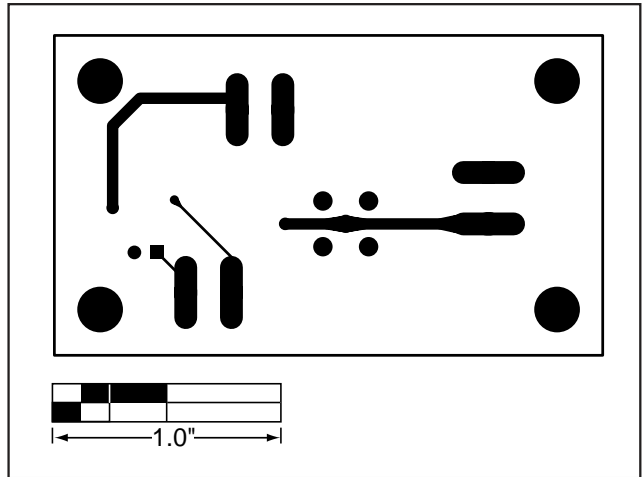


Figure 4. MAX881R EV Kit PC Board Layout—Solder Side

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NOTES

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