



# MAX2840/MAX2841 Evaluation Kits

## General Description

The MAX2840/MAX2841 evaluation kits (EV kits) simplify evaluation of the MAX2840/MAX2841 power amplifiers (PAs). They enable testing of the devices' RF performance and require no additional support circuitry. The EV kits' signal inputs and outputs use SMA connectors to facilitate the connection of RF test equipment.

## Features

- ◆ Easy Evaluation of the MAX2840/MAX2841
- ◆ +2.7V to +3.6V Single-Supply Operation
- ◆ Include All Critical Peripheral Components

## Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX2840EVKIT	-40°C to +85°C	3 × 4 UCSP™
MAX2841EVKIT	-40°C to +85°C	3 × 4 UCSP

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## MAX2840 Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	100pF ±5% capacitor (0402) Murata GRP1555C1H101J
C2, C18, C19	3	1000pF ±10% capacitors (0402) Murata GRP155R71H102K
C13	1	5pF ±0.1pF capacitor (0402) Murata GRP1555C1H5R0B
C14	1	6.8pF ±0.1pF capacitor (0402) Murata GRP1555C1H6R8B
C15	1	1.2pF ±0.1pF capacitor (0402) Murata GRP1555C1H1R2B <b>Note:</b> Location of this capacitor is critical.
C16	1	18pF ±5% capacitor (0402) Murata GRP1555C1H180J
C17	1	0.6pF ±0.1pF capacitor (0402) ATC ATC650L0R6BW <b>Note:</b> Location of this capacitor is critical.
C20, C22	2	10pF ±0.1pF capacitors (0402) Murata GRP1555C1H100B
C21	1	3pF ±0.1pF capacitor (0402) Murata GRP1555C1H3R0B

DESIGNATION	QTY	DESCRIPTION
C23	1	0.1μF ±10% capacitor (0603) Murata GRM188R71C104K
C24	1	10μF ±10% tantalum capacitor AVX TAJB106K010
J8, J9	2	SMA connectors, edge mount, tab contact EFJohnson 142-0701-851 or Digi-Key J658-ND
JU4, JU5, J7, J10	4	Test points Digi-Key 5000K-ND
JU6	1	2-pin header, in line, 100-mil centers Digi-Key S1012-36-ND
L1	1	5.6nH ±0.5nH inductor (0603) Murata LQW18AN5N6D00
R1	1	5kΩ ±5% resistor (0402)
R2	1	10kΩ ±1% resistor (0402)
R4	1	100kΩ ±1% resistor (0402)
U2	2	MAX2840EBC 3 × 4 UCSP
None	1	MAX2840 EV kit circuit board, rev 3
None	1	MAX2840/MAX2841 data sheet
None	1	MAX2840/2841 EV kit data sheet

Evaluate: MAX2840/MAX2841

# MAX2840/MAX2841 Evaluation Kits

## MAX2841 Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	100pF ±5% capacitor (0402) Murata GRP1555C1H101J
C2, C18, C19	3	1000pF ±10% capacitors (0402) Murata GRP155R71H102K
C13	1	5pF ±0.1pF capacitor Murata GRP1555C1H5R0B
C14	1	6.8pF ±0.1pF capacitor (0402) Murata GRP1555C1H6R8B
C15	1	1.2pF ±0.1pF capacitor (0402) Murata GRP1555C1H1R2B <b>Note:</b> Location of this capacitor is critical.
C16	1	18pF ±5% capacitor (0402) Murata GRP1555C1H180J
C17	1	1.0pF ±0.1pF capacitor (0402) ATC ATC650L1R0BW <b>Note:</b> Location of this capacitor is critical.
C20, C22	2	10pF ±0.1pF capacitors (0402) Murata GRP1555C1H100B
C21	1	3pF ±0.1pF capacitor (0402) Murata GRP1555C1H3R0B
C23	1	0.1µF ±10% capacitor (0603) Murata GRM188R71C104K

DESIGNATION	QTY	DESCRIPTION
C24	1	10µF ±10% tantalum capacitor AVX TAJB106K016
J8, J9	2	SMA connectors, edge mount, round contacts EJohnson 142-0701-801 or Digi-Key J502-ND
JU4, JU5, J7, J10	4	Test points, Digi-Key 5000K-ND
JU6	1	2-pin header, in line, 100 mil centers Digi-Key S1012-36-ND
L1	1	5.6nH ±0.5nH inductor (0603) Murata LQW18AN5N6D00
R1	1	5kΩ ±5% resistor (0402)
R2	1	10kΩ ±1% resistor (0402)
R3	1	330Ω ±1% resistor (0402)
R4	1	100kΩ ±1% resistor (0402)
R5	1	10Ω ±1% resistor (0402)
U2	2	MAX2841EBC 3 × 4 UCSP
None	1	MAX2841 EV kit circuit board, rev 3
None	1	MAX2840/MAX2841 data sheet
None	1	MAX2840/MAX2841 EV kit data sheet

### Quick Start

The MAX2840/MAX2841 EV kits are fully assembled and factory tested. Follow the instructions in the *Connections and Setup* section for proper device evaluation.

### Test Equipment Required

This section lists the recommended test equipment to verify operation of the MAX2840/MAX2841. It is intended as a guide only, and some substitutions are possible:

- One RF signal generator capable of delivering at least +5dBm OFDM modulated output power at the operating frequency (HPE4433B, Yokogawa 703230-D or equivalent)
- One RF power sensor capable of handling at least +20dBm of modulated output power at the operating frequency (HP 8481D or equivalent)
- One RF power meter capable of measuring up to

+20dBm of output power at the operating frequency (HP 437B or equivalent)

- An RF spectrum analyzer that covers the MAX2840/MAX2841 operating frequency range, as well as a few harmonics (FSEB20, for example)
- A power supply capable of up to 1A at +2.7V to +5.0V
- A power supply with a 0 to +3.0V output range
- Two 50Ω SMA cables
- One 20dB high-power attenuator
- (Optional) One ammeter for measuring the supply current
- (Optional) A network analyzer (HP 8753D, for example) to measure small-signal return loss and gain

# MAX2840/MAX2841 Evaluation Kits

## Connections and Setup

This section provides a step-by-step guide to operating the EV kits and testing the devices' function. **Do not turn on the DC power or RF signal generators until all connections are made:**

- 1) Connect a DC supply set to +3.3V (through an ammeter if desired) to the VCC and GND terminals on the EV kit. Do not turn on the supply.
- 2) Connect a DC supply set to +1.6V (MAX2840) or 1.9V (MAX2841) to the bias-control terminal (JU4) on the EV kit. Do not turn on the supply.
- 3) Connect one RF signal generator to the RFIN SMA connector. Do not turn on the generator's output. Set the generator to 5.25GHz output frequency and output power of -9dBm (MAX2840) or -5dBm (MAX2841).
- 4) Connect a 20dB high-power attenuator to the RFOUT SMA connector on the EV kit. This prevents overloading of the power sensor and the power meter.
- 5) Connect a power sensor to the 20dB high-power attenuator.
- 6) Connect the power sensor to a power meter. Set the power meter offset to 20dB and frequency. For better accuracy, measure the actual offset.
- 7) Connect jumper JU1 to make  $\overline{\text{SHDN}} = \text{VCC}$ .
- 8) Turn on the DC supply. The supply current should read approximately 120mA (MAX2840) or 165mA (MAX2841).
- 9) Activate the RF generator's output. The power meter should read approximately +15dBm (MAX2840) or +18dBm (MAX2841).
- 10) (Optional) Another method for determining gain is by using a network analyzer. This has the advantage of displaying gain vs. a swept-frequency band, in addition to displaying input return loss. Refer to the network analyzer manufacturer's user manual for setup details.

## Layout Issues

A good PC board is an essential part of an RF circuit design. The EV kit PC board can serve as a guide for laying out a board using the MAX2840/MAX2841. Keep traces carrying RF signals as short as possible to minimize radiation and insertion loss. Use impedance control on all RF signal traces. The VCC node on the PC board should have decoupling capacitors to the closest ground. Refer to the *Layout* section of the MAX2840/MAX2841 data sheet for more information.

## Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
ATC	949-583-9119	949-583-9213	www.atc.com
AVX	843-448-9411	843-448-7139	www.avxcorp.com
Digi-Key	800-344-4539	218-681-3380	www.digikey.com
Murata Electronics	770-436-1300	770-436-3030	www.murata.com



# MAX2840/MAX2841 Evaluation Kits

Evaluate: MAX2840/MAX2841

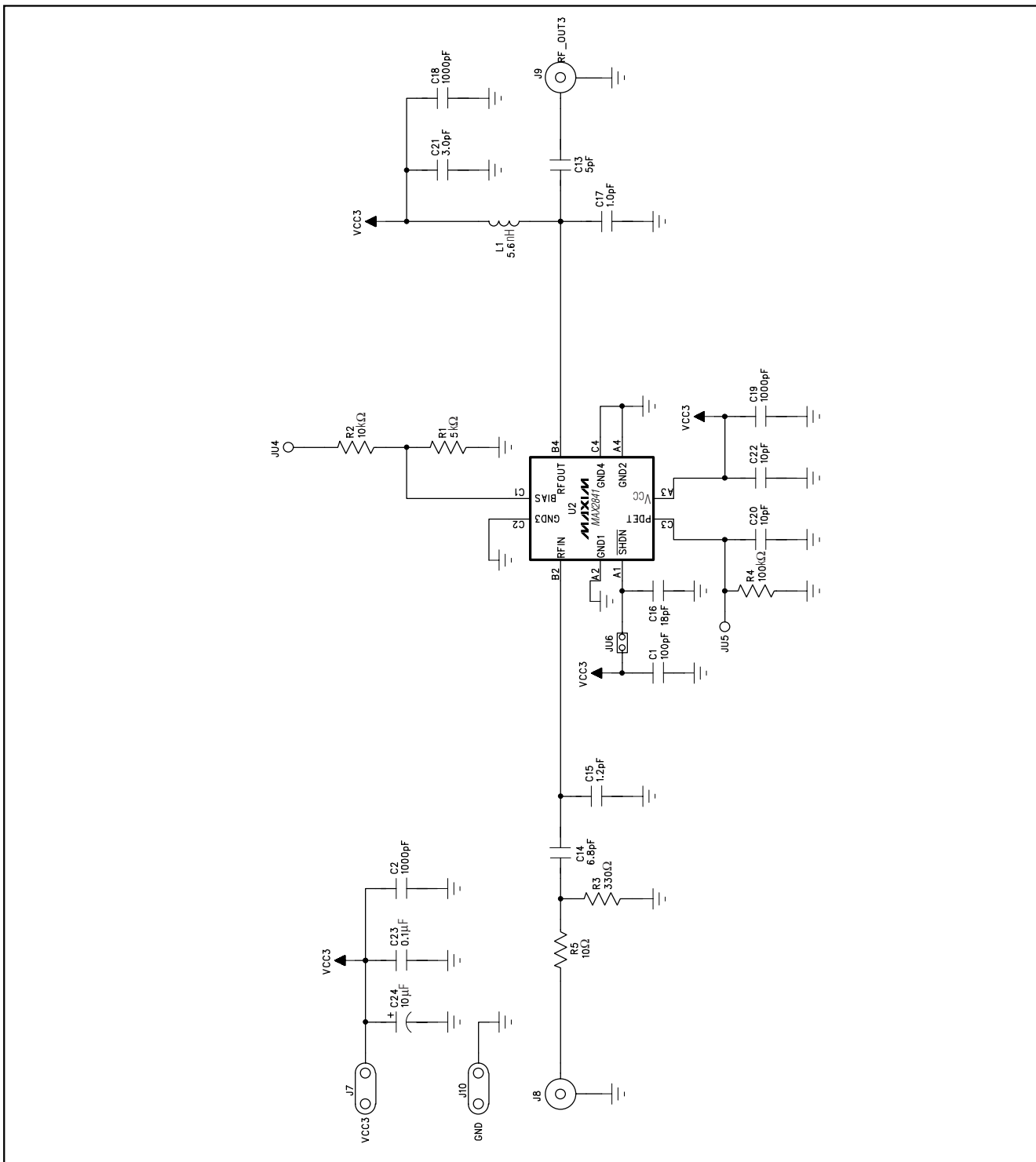


Figure 2. MAX2841 EV Kit Schematic

# MAX2840/MAX2841 Evaluation Kits

Evaluate: MAX2840/MAX2841

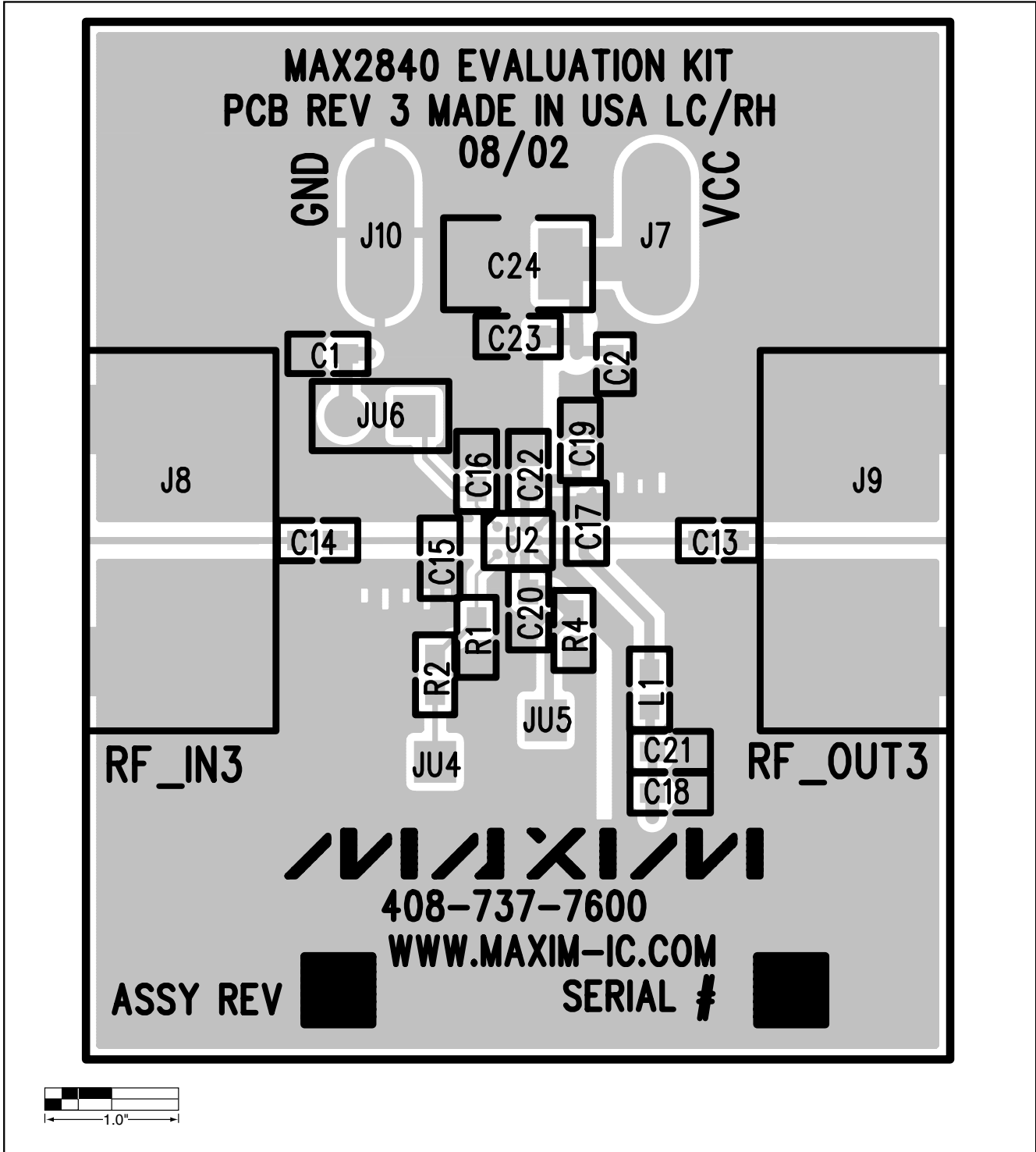


Figure 3. MAX2840 EV Kit Component Placement Guide—Component Side

# MAX2840/MAX2841 Evaluation Kits

Evaluate: MAX2840/MAX2841

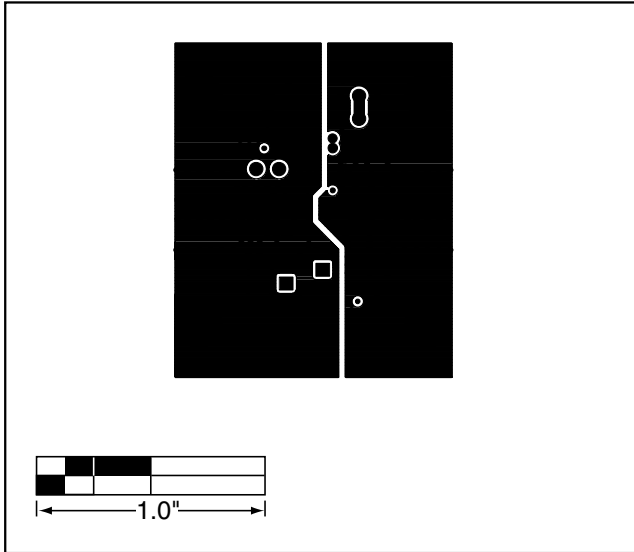


Figure 4. MAX2840 EV Kit PC Board Layout—Layer 2

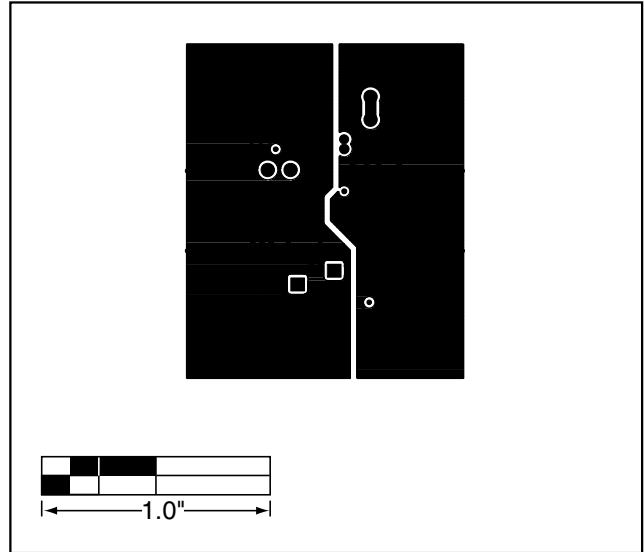


Figure 5. MAX2840 EV Kit PC Board Layout—Layer 3

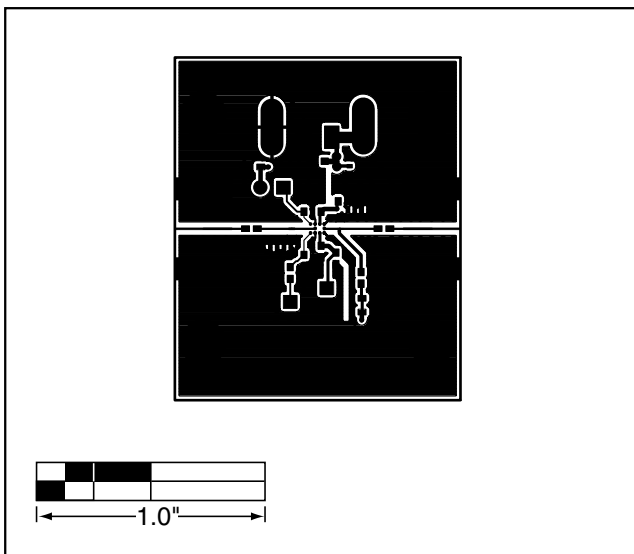


Figure 6. MAX2840 EV Kit PC Board Layout—Primary Component Side

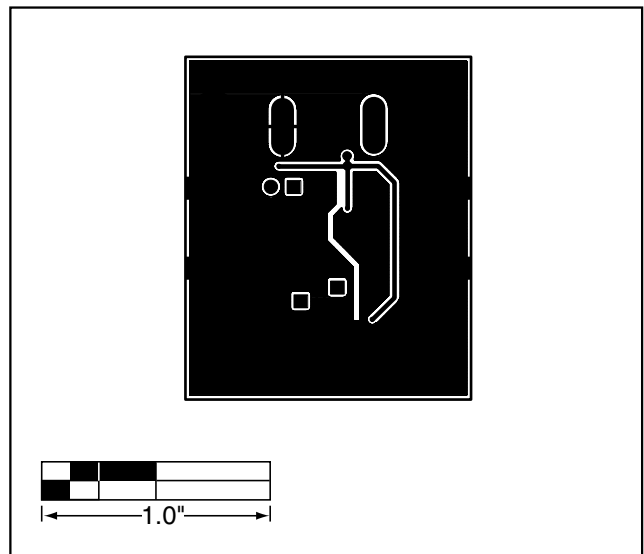


Figure 7. MAX2840 EV Kit PC Board Layout—Secondary Side

# MAX2840/MAX2841 Evaluation Kits

Evaluate: MAX2840/MAX2841

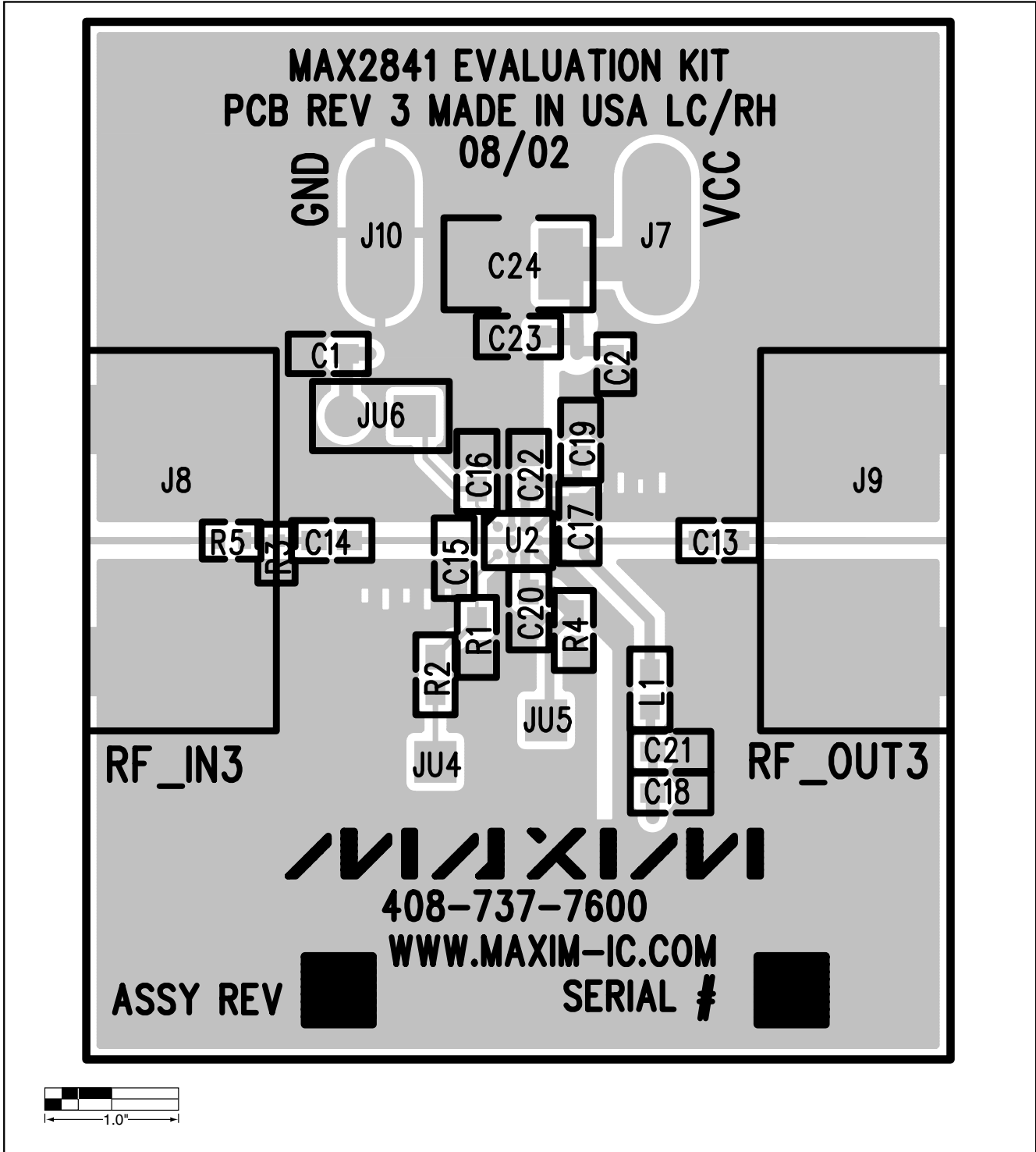


Figure 8. MAX2841 EV Kit Component Placement Guide—Component Side



# MAX2840/MAX2841 Evaluation Kits

Evaluate: MAX2840/MAX2841

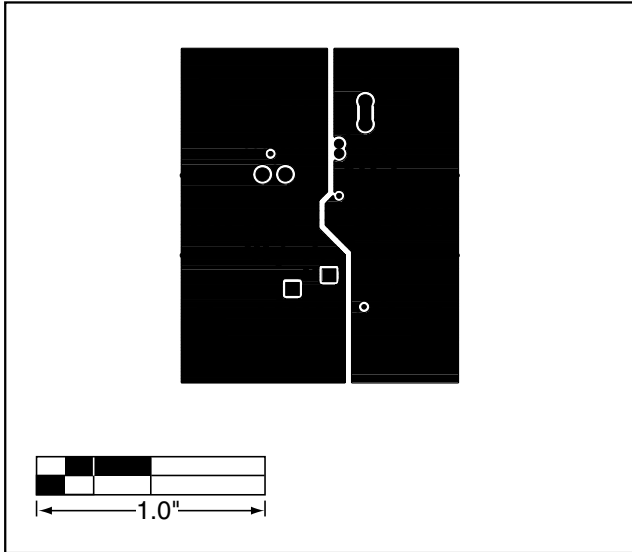


Figure 9. MAX2841 EV Kit PC Board Layout—Layer 2

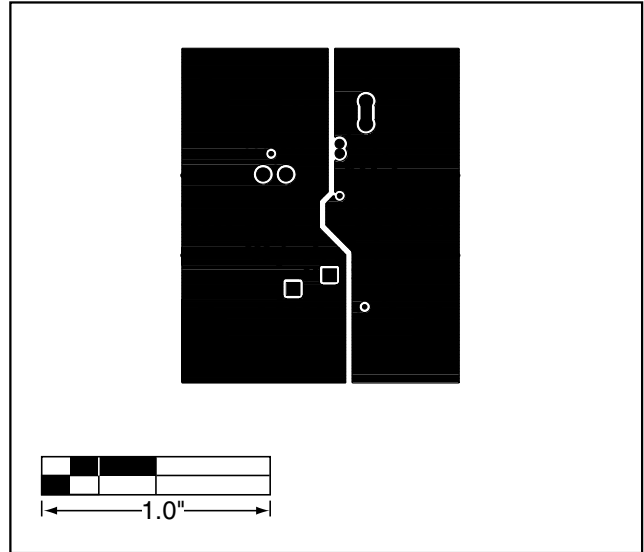


Figure 10. MAX2841 EV Kit PC Board Layout—Layer 3

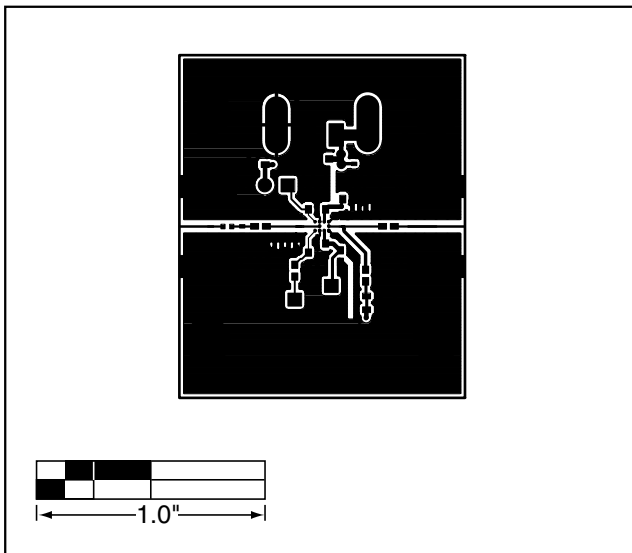


Figure 11. MAX2841 EV Kit PC Board Layout—Primary Component Side

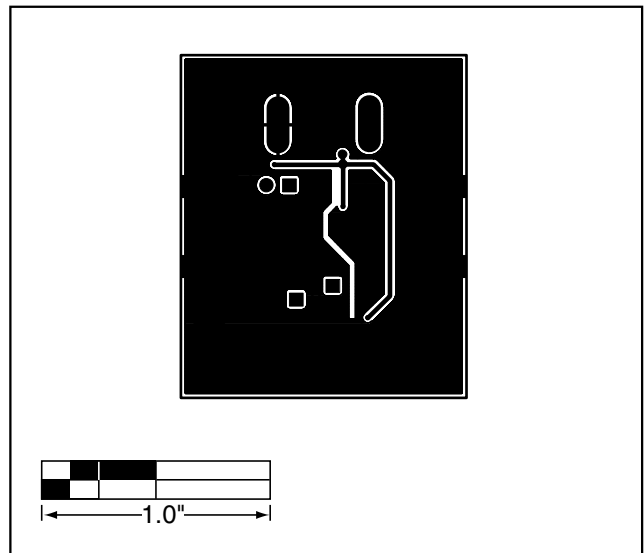


Figure 12. MAX2841 EV Kit PC Board Layout—Secondary Side

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