



# MAX2825/MAX2826/MAX2827 Evaluation Kits

## General Description

The MAX2825/MAX2826/MAX2827 evaluation kits (EV kits) simplify the testing of the MAX2825/MAX2826/MAX2827, respectively. The EV kits provide 50Ω SMA connectors for all RF inputs and outputs, and all baseband inputs and outputs. Differential-to-single-ended and single-ended-to-differential line drivers are provided to convert the differential I/Q baseband inputs and outputs of the MAX2825/MAX2826/MAX2827 to single-ended ports.

The EV kits simplify evaluation of the receive and transmit performance in the corresponding 802.11x bands.

## Features

- ◆ On-Board Line Drivers and Voltage Reference
- ◆ 50Ω SMA on All RF and Baseband Ports
- ◆ PC Control Software Available at [www.maxim-ic.com](http://www.maxim-ic.com)
- ◆ 3-Wire Serial Interface

## Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX2825EVKIT	-40°C to +85°C	56 Thin QFN
MAX2826EVKIT	-40°C to +85°C	56 Thin QFN
MAX2827EVKIT	-40°C to +85°C	56 Thin QFN

## MAX2825 Component List

DESIGNATION	QTY	DESCRIPTION
C1, C8, C14, C15, C31, C44, C48, C49, C61	9	Open
C2, C12, C13	3	10pF ±0.1pF 0402 capacitors Murata GJ61555C1H100B
C4	1	1.0pF ±0.1pF 0402 capacitor Murata GJ61555C1H1R0B
C5, C7, C10, C11, C17, C18, C21, C22, C29, C35, C37, C40, C42, C43, C45, C46, C50, C52, C54, C59, C60	21	0.1μF ±10% 0402 capacitors Murata GRP155R61A104K
C6, C9, C16, C19, C20, C23–C28, C30, C32, C36, C38, C41, C56, C57, C58	17	0.01μF ±10% 0402 capacitors Murata GRP155R71C103K
C33, C34	2	330pF ±10% 0402 capacitors Murata GRP155R71H331K
C39, C51, C53, C55	4	10μF ±10% tantalum capacitors— A case AVX TAJA106K010
C47	1	100pF ±5% 0402 capacitor Murata GRP1555C1H101B

DESIGNATION	QTY	DESCRIPTION
J1, J4, J5–J9	7	SMA edge-mount—round contacts Johnson 142-0701-801
J2, J3	2	Open
J12–J16	5	1 x 2 headers Sullins PTC36SAAN
J18	1	DB25, right angle—male AMP 747238-4
JP21, JP22	2	1 x 3 headers Sullins PTC36SAAN
L1	1	6.8nH ±5% 0402 inductor Murata LQG15HN6R8J00
L3, L4, L5	3	Open
L6	1	3.9nH ±0.2nH 0402 inductor Murata LQP15MN3N9C00
R1, R2, R6, R10, R16, R17, R22, R27	8	75Ω ±1% 0402 resistors
R3, R7, R18, R23, R25	5	10kΩ ±1% 0402 resistors
R4, R5, R21, R26	4	49.9Ω ±1% 0402 resistors
R8, R9, R12, R13, R28, R29, R31, R32, R36, R42	10	0Ω ±5% 0402 resistors

Evaluate: MAX2825/MAX2826/MAX2827



# MAX2825/MAX2826/MAX2827 Evaluation Kits

## MAX2825 Component List (continued)

DESIGNATION	QTY	DESCRIPTION
R11, R30, R33, R35, R38	5	Open
R14	1	267 $\Omega$ $\pm$ 1% 0402 resistor
R15	1	11k $\Omega$ $\pm$ 1% 0402 resistor
R19	1	EMI filter $\pm$ 0.2nH (0603) Murata BLM18AG221SN1D
R20, R24	2	365 $\Omega$ $\pm$ 1% 0402 resistors
R34, R37	2	100k $\Omega$ $\pm$ 1% 0402 resistors
R39, R40, R41	3	100 $\Omega$ $\pm$ 1% 0402 resistors
R43	1	1k $\Omega$ $\pm$ 1% 0402 resistor
T1	1	SMD balun Murata LDB182G4510C-110
T2	1	Open

DESIGNATION	QTY	DESCRIPTION
TP1-TP8, TP10-TP23	22	Test points Keystone 5000
U1, U5	2	Differential line drivers Maxim MAX4447ESE
U2, U6	2	Line receivers Maxim MAX4444ESE
U3	1	LDO Maxim MAX6061BEUR
U4	1	Maxim MAX2827ETN
U7	1	Open
U8, U9	2	Octal buffer/driver Texas Instruments SN74LVTH244ADBR

## MAX2826 Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	0.75pF $\pm$ 0.1pF 0402 capacitor Murata GRM1555C1HR75B
C2, C4, C8, C12, C13, C31, C44, C48, C49, C61	10	Open
C5, C7, C10, C11, C17, C18, C21, C22, C29, C35, C37, C40, C42, C43, C45, C46, C50, C52, C54, C59, C60	21	0.1 $\mu$ F $\pm$ 10% 0402 capacitors Murata GRP155R61A104K
C6, C9, C16, C19, C20, C23-C28, C30, C32, C36, C38, C41, C56, C57, C58	17	0.01 $\mu$ F $\pm$ 10% 0402 capacitors Murata GRP155R71C103K
C14, C15	2	1.2pF $\pm$ 0.1pF 0402 capacitors Murata GJ61555C1H1R2B
C33, C34	2	330pF $\pm$ 10% 0402 capacitors Murata GRP155R71H331K

DESIGNATION	QTY	DESCRIPTION
C39, C51, C53, C55	4	10 $\mu$ F $\pm$ 10% tantalum capacitors— A case AVX TAJA106K010
C47	1	100pF $\pm$ 5% 0402 capacitor Murata GRP1555C1H101B
J1, J4	2	Open
J2, J3, J5-J9	7	SMA edge-mount—round contacts Johnson 142-0701-801
J12-J16	5	1 x 2 headers Sullins PTC36SAAN
J18	1	DB25, right angle—male AMP 747238-4
JP21, JP22	2	1 x 3 headers Sullins PTC36SAAN
L1, L3, L4, L6	4	Open
L5	1	4.3nH $\pm$ 0.2nH 0402 inductor Murata LQP15MN4N3C00
R1, R2, R6, R10, R16, R17, R22, R27	8	75 $\Omega$ $\pm$ 1% 0402 resistors
R3, R7, R18, R23, R25	5	10k $\Omega$ $\pm$ 1% 0402 resistors

# MAX2825/MAX2826/MAX2827 Evaluation Kits

## MAX2826 Component List (continued)

DESIGNATION	QTY	DESCRIPTION
R4, R5, R21, R26	4	49.9Ω ±1% 0402 resistors
R8, R9, R12, R13, R28, R29, R31, R32, R36, R42	10	0Ω ±5% 0402 resistors
R11, R30, R33, R35, R38	5	Open
R14	1	267Ω ±1% 0402 resistor
R15	1	11kΩ ±1% 0402 resistor
R19	1	EMI filter ±0.2nH (0603) Murata BLM18AG221SN1D
R20, R24	2	365Ω ±1% 0402 resistors
R34, R37	2	100kΩ ±1% 0402 resistors
R39, R40, R41	3	100Ω ±1% 0402 resistors
R43	1	1kΩ ±1% 0402 resistor

DESIGNATION	QTY	DESCRIPTION
T1	1	Open
T2	1	SMD balun Murata LDB215G2505C-001
TP1-TP8, TP10-TP23	22	Test points Keystone 5000
U1, U5	2	Differential line drivers Maxim MAX4447ESE
U2, U6	2	Line receivers Maxim MAX4444ESE
U3	1	LDO Maxim MAX6061BEUR
U4	1	Maxim MAX2827ETN
U7	1	Open
U8, U9	2	Octal buffer/driver Texas Instruments SN74LVTH244ADBR

## MAX2827 Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	0.75pF ±0.1pF 0402 capacitor Murata GRM1555C1HR75B
C2, C12, C13	3	10pF ±0.1pF 0402 capacitors Murata GJ61555C1H100B
C4	1	1.0pF ±0.1pF 0402 capacitor Murata GJ61555C1H1R0B
C5, C7, C10, C11, C17, C18, C21, C22, C29, C35, C37, C40, C42, C43, C45, C46, C50, C52, C54, C59, C60	21	0.1μF ±10% 0402 capacitors Murata GRP155R61A104K
C6, C9, C16, C19, C20, C23-C28, C30, C32, C36, C38, C41, C56, C57, C58	17	0.01μF ±10% 0402 capacitors Murata GRP155R71C103K

DESIGNATION	QTY	DESCRIPTION
C8, C31, C44, C48, C49, C61	14	Open
C14, C15	2	1.2pF ±0.1pF 0402 capacitors Murata GJ61555C1H1R2B
C33, C34	2	330pF ±10% 0402 capacitors Murata GRP155R71H331K
C39, C51, C53, C55	4	10μF ±10% tantalum capacitors— A case AVX TAJA106K010
C47	1	100pF ±5% 0402 capacitor Murata GRP1555C1H101B
J1-J9	9	SMA edge-mount—round contacts Johnson 142-0701-801
J12-J16	5	1 x 2 headers Sullins PTC36SAAN
J18	1	DB25, right angle—male AMP 747238-4
JP21, JP22	2	1 x 3 headers Sullins PTC36SAAN

Evaluate: MAX2825/MAX2826/MAX2827

# MAX2825/MAX2826/MAX2827 Evaluation Kits

## MAX2827 Component List (continued)

DESIGNATION	QTY	DESCRIPTION
L1	1	6.8nH $\pm 5\%$ 0402 inductor Murata LQG15HN6R8J00
L3, L4	2	Open
L5	1	4.3nH $\pm 0.2$ nH 0402 inductor Murata LQP15MN4N3C00
L6	1	3.9nH $\pm 0.2$ nH 0402 inductor Murata LQP15MN3N9C00
R1, R2, R6, R10, R16, R17, R22, R27	8	75 $\Omega$ $\pm 1\%$ 0402 resistors
R3, R7, R18, R23, R25	5	10k $\Omega$ $\pm 1\%$ 0402 resistors
R4, R5, R21, R26	4	49.9 $\Omega$ $\pm 1\%$ 0402 resistors
R8, R9, R12, R13, R28, R29, R31, R32, R36, R42	10	0 $\Omega$ $\pm 5\%$ 0402 resistors
R11, R30, R33, R35, R38	5	Open
R14	1	267 $\Omega$ $\pm 1\%$ 0402 resistor
R15	1	11k $\Omega$ $\pm 1\%$ 0402 resistor

DESIGNATION	QTY	DESCRIPTION
R19	1	EMI filter $\pm 0.2$ nH (0603) Murata BLM18AG221SN1D
R20, R24	2	365 $\Omega$ $\pm 1\%$ 0402 resistors
R34, R37	2	100k $\Omega$ $\pm 1\%$ 0402 resistors
R39, R40, R41	3	100 $\Omega$ $\pm 1\%$ 0402 resistors
R43	1	1k $\Omega$ $\pm 1\%$ 0402 resistor
T1	1	SMD balun Murata LDB182G4510C-110
T2	1	SMD balun Murata LDB215G2505C-001
TP1-TP8, TP10-TP23	22	Test points Keystone 5000
U1, U5	2	Differential line drivers Maxim MAX4447ESE
U2, U6	2	Line receivers Maxim MAX4444ESE
U3	1	LDO Maxim MAX6061BEUR
U4	1	Maxim MAX2827ETN
U7	1	Open
U8, U9	2	Octal buffer/driver Texas Instruments SN74LVTH244ADBR

## Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
AVX	843-448-9411	843-448-1943	www.avx.com
Digi-Key	800-344-4539	218-681-3380	www.digikey.com
Johnson Components	800-247-8256	507-833-6287	www.johnsoncomponents.com
Murata	770-436-1300	770-436-3030	www.murata.com
Texas Instruments	—	—	www.ti.com

### Quick Start

Each EV kit is fully assembled and factory tested. Follow the instructions in the *Connections and Setup* section to test the device.

### Test Equipment Required

This section lists the recommended test equipment to verify the operation of the MAX2825/MAX2826/

MAX2827. It is intended as a guide only, and substitutions may be possible.

- DC supply capable of delivering +5.0V and 200mA of continuous current
- DC supply capable of delivering -5.0V and 200mA of continuous current
- DC supply capable of delivering +3.6V and 400mA of continuous current

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- HP8663A or equivalent low-noise signal source capable of generating a 20MHz or 40MHz reference oscillator signal
  - Two HP8648 or equivalent signal sources capable of generating 0dBm up to 6GHz
  - 802.11x I/Q waveform generator (optional)
  - HP8561E or equivalent RF spectrum analyzer with a minimum frequency range of 100kHz to 6GHz
  - TDS3012 or equivalent oscilloscope with 200MHz bandwidth
  - IBM PC or compatible with Windows95/98/2000/NT® 4.0, or later operating system and an available parallel port
  - Male-to-female 25-pin parallel cable, straight through
- 3) Set the register setting to the default values listed in the MAX2825/MAX2826/MAX2827 data sheet. Use the software to select between 802.11g and 802.11a modes. In the program, set the frequency to either 2442MHz (802.11g) or 5.255GHz (802.11a). Set the RX gain to maximum using either the slider bar or the control bits.
  - 4) Connect the spectrum analyzer to either RXBBI or RXBBQ. Set the center frequency to 5MHz with a 10MHz span.
  - 5) Turn on the RF signal source. The output at 5MHz should be approximately -4dBm (802.11g) or -5dBm (802.11a).

## Transmit Mode

To evaluate the devices in transmit mode:

- ### Connections and Setup
- This section provides step-by-step instructions for getting the EV kit up and running in all modes:
- 1) Install and run the MAX2825/MAX2826/MAX2827 control software.
  - 2) To control the EV kit through the 3-wire interface, connect the male-to-female 25-pin parallel cable between the PC and EV kit.
  - 3) With the power supply turned off, connect a +2.7V power supply to the header labeled VCC (J13). Connect the power-supply ground to the header labeled GND (J12).
  - 4) With the power supply turned off, connect a +5V power supply to the header labeled +5V (J16), and a -5V power supply to the header labeled -5V (J14). Connect the power-supply ground to the header labeled GND (J21).
  - 5) Connect the low-noise signal source to FREF (J9).
  - 6) Turn on the +5V and -5V power supplies, followed by the +2.7V power supply. Set the low-noise signal source to 20MHz and 2dBm. Enable the signal source. The lock indicator should be green.
- 1) Set the TXON jumper (JP21) to the On position and the RXON jumper (JP22) to the Off position.
  - 2) Connect a 2MHz I/Q signal to TXBBQ and TXBBI. Set the input amplitude of each channel to 100mVRMS.
  - 3) Set the register setting to the default values listed in the MAX2825/MAX2826/MAX2827 data sheet. Use the software to select between 802.11g and 802.11a modes. In the program, set the frequency to either 2437MHz (802.11g) or 5.25GHz (802.11a). Set the TX gain to maximum using either the slider bar or the control bits.
  - 4) Connect the spectrum analyzer to either TXRFL (802.11g, J1) or TXRFH (802.11a, J2).
  - 5) Turn on the baseband signal sources. The output at RF should be approximately -2dBm (802.11g) or -4dBm (802.11a).

## Layout Considerations

The MAX2825/MAX2826/MAX2827 EV kits can serve as guides for board layout. Keep PC board trace lengths as short as possible to minimize parasitic inductance. Also, keep decoupling capacitors as close to the IC as possible with a direct connection to the ground plane. Please refer to the MAX2825/MAX2826/MAX2827 data sheet for more detailed information. Gerber files for these EV kits can be requested at [www.maxim-ic.com](http://www.maxim-ic.com).

## Receive Mode

To evaluate the devices in receive mode:

- 1) Set the RXON jumper (JP22) to the On position and the TXON jumper (JP21) to the Off position.
- 2) Connect the RF signal source to either RXRFL (802.11g, J4) or RXRFH (802.11a, J3). Set the RF frequency to 2437MHz (802.11g) or 5.25GHz (802.11a). Set the signal power to -100dBm.

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# MAX2825/MAX2826/MAX2827 Evaluation Kits

## Evaluate: MAX2825/MAX2826/MAX2827

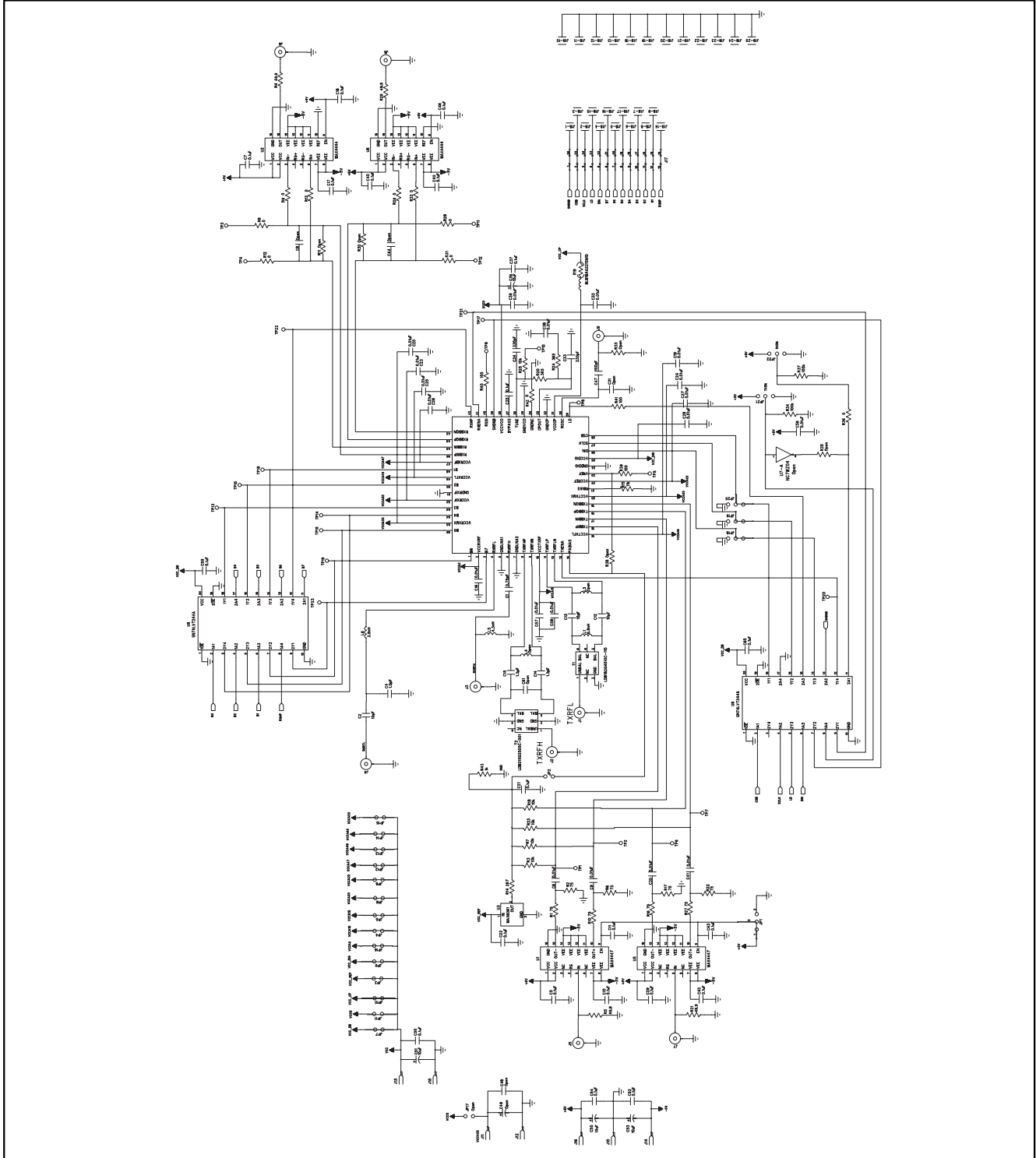


Figure 1. MAX2825/MAX2826/MAX2827 EV Kit Schematics

# MAX2825/MAX2826/MAX2827 Evaluation Kits

Evaluate: MAX2825/MAX2826/MAX2827

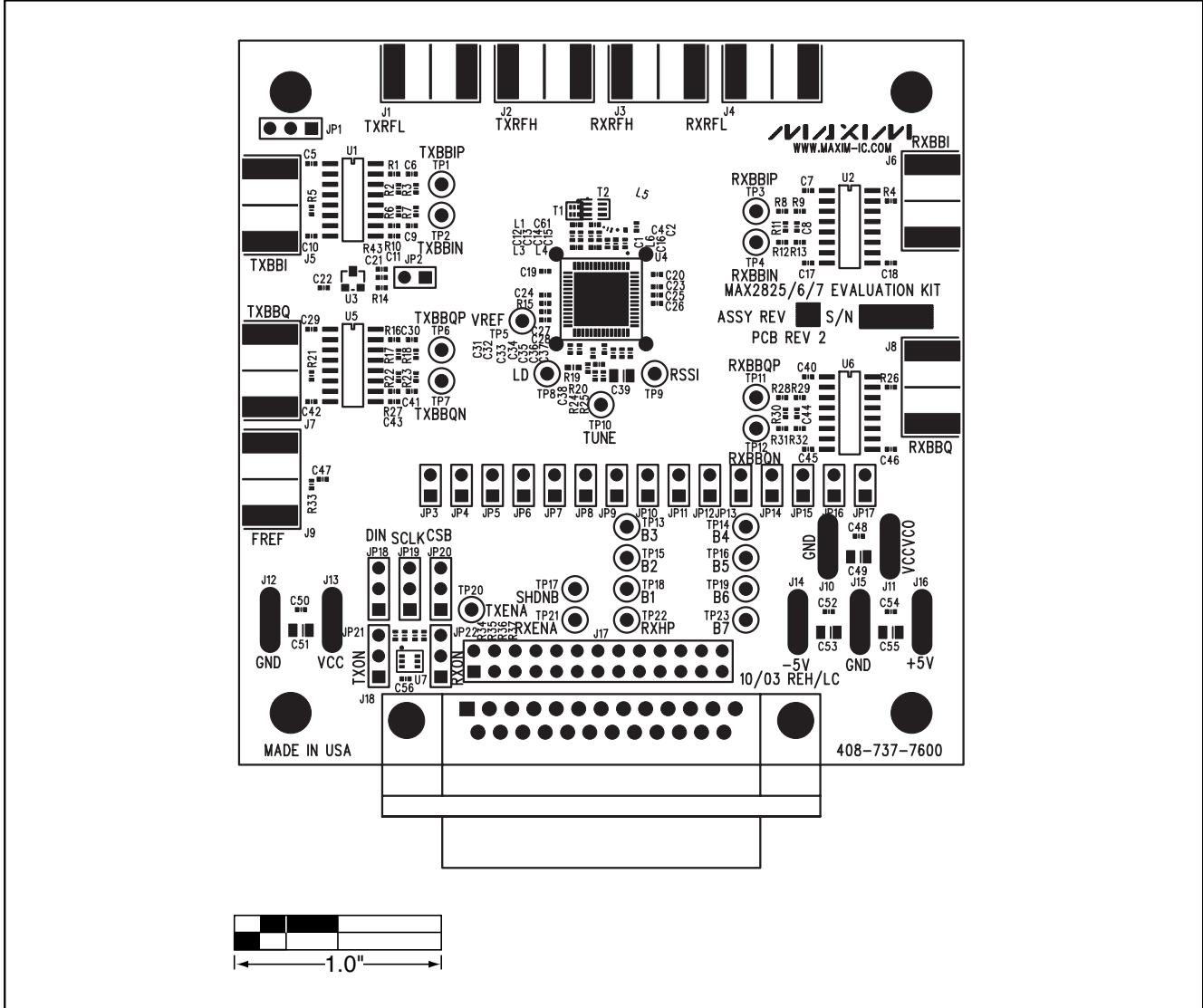


Figure 2. MAX2825/MAX2826/MAX2827 EV Kit PC Board Layout—Top Silkscreen

# MAX2825/MAX2826/MAX2827 Evaluation Kits

**Evaluate: MAX2825/MAX2826/MAX2827**

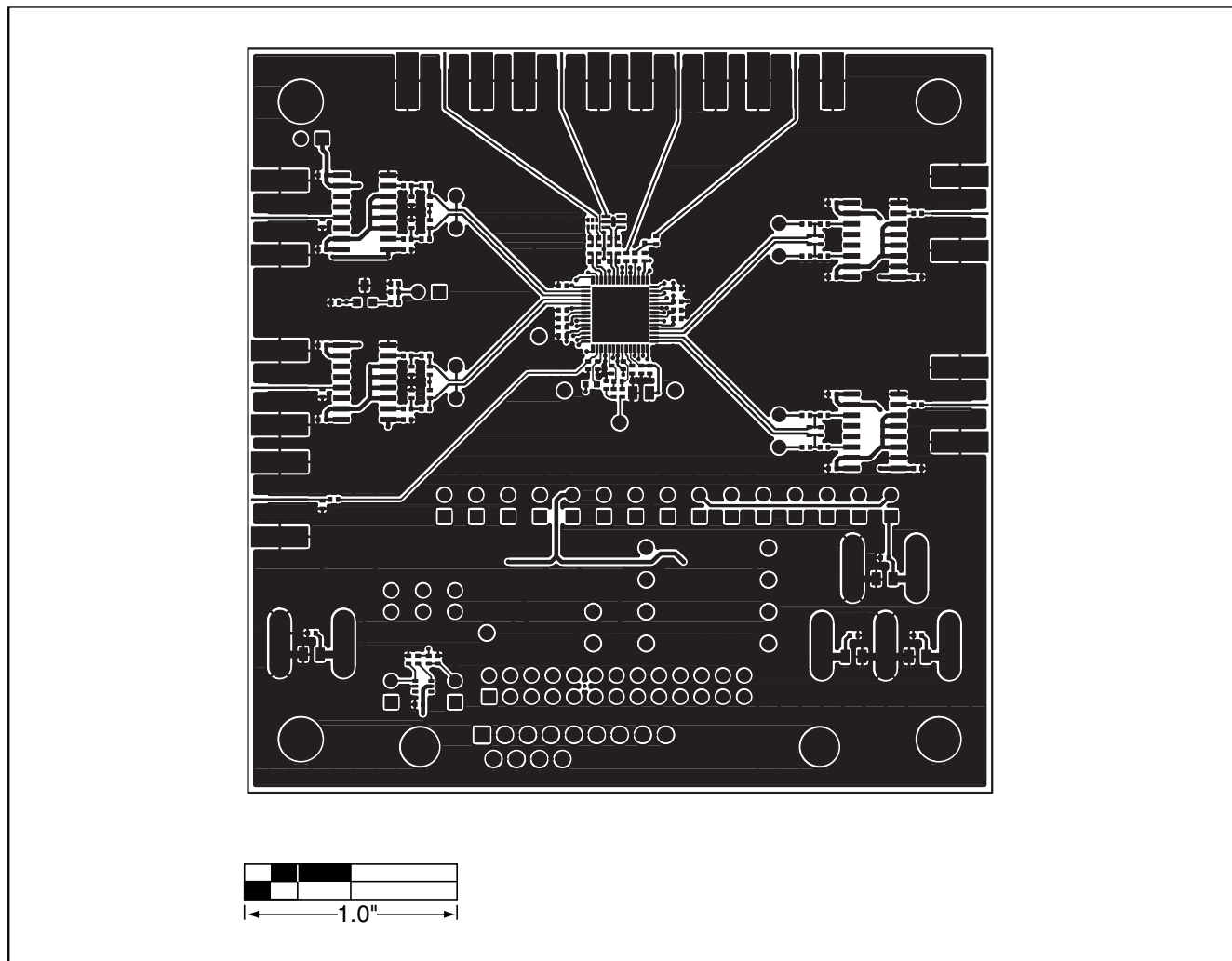


Figure 3. MAX2825/MAX2826/MAX2827 EV Kit PC Board Layout—Component Side



# MAX2825/MAX2826/MAX2827 Evaluation Kits

Evaluate: MAX2825/MAX2826/MAX2827

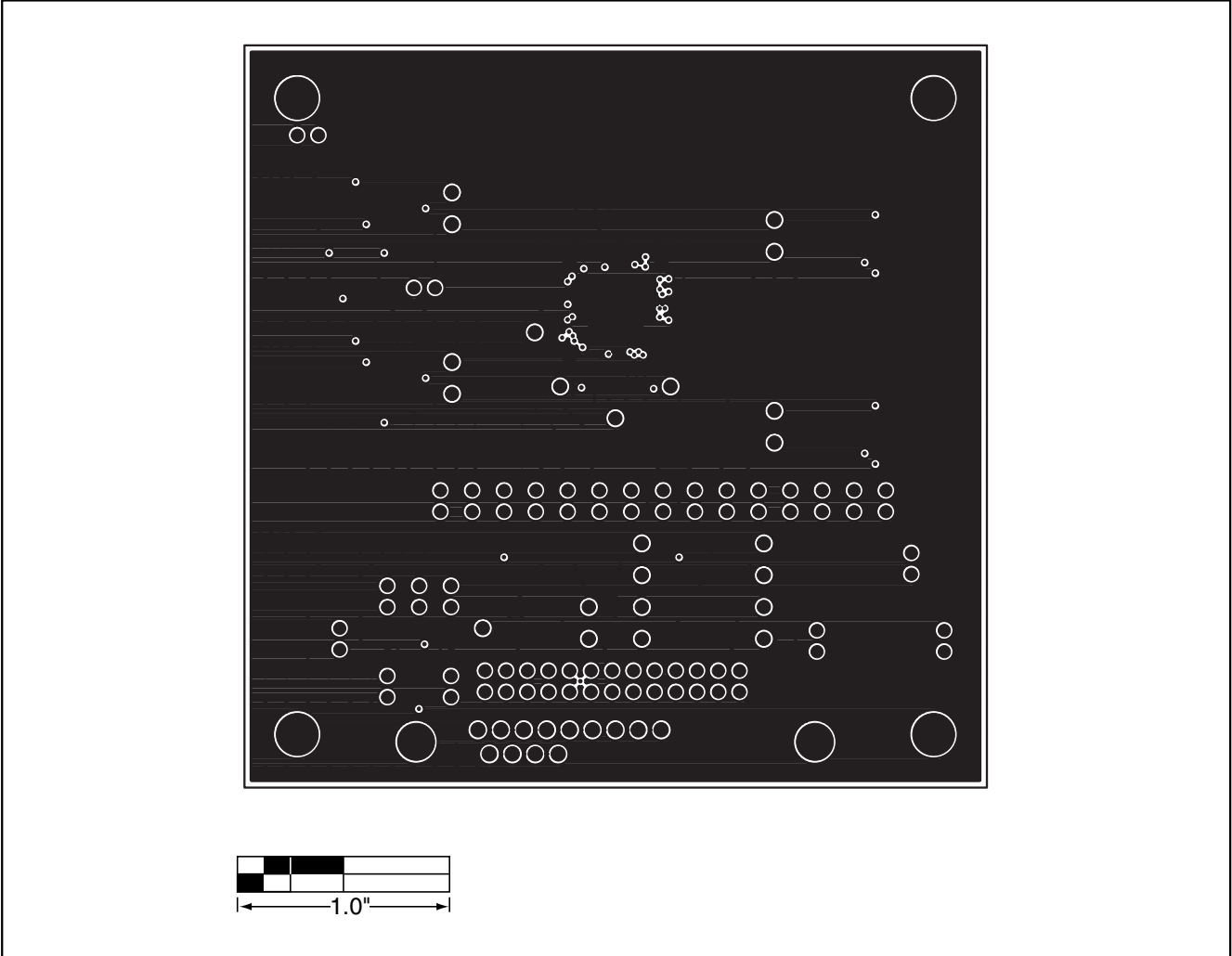


Figure 4. MAX2825/MAX2826/MAX2827 EV Kit PC Board Layout—Inner Layer 2, Gound Layer

# MAX2825/MAX2826/MAX2827 Evaluation Kits

**Evaluate: MAX2825/MAX2826/MAX2827**

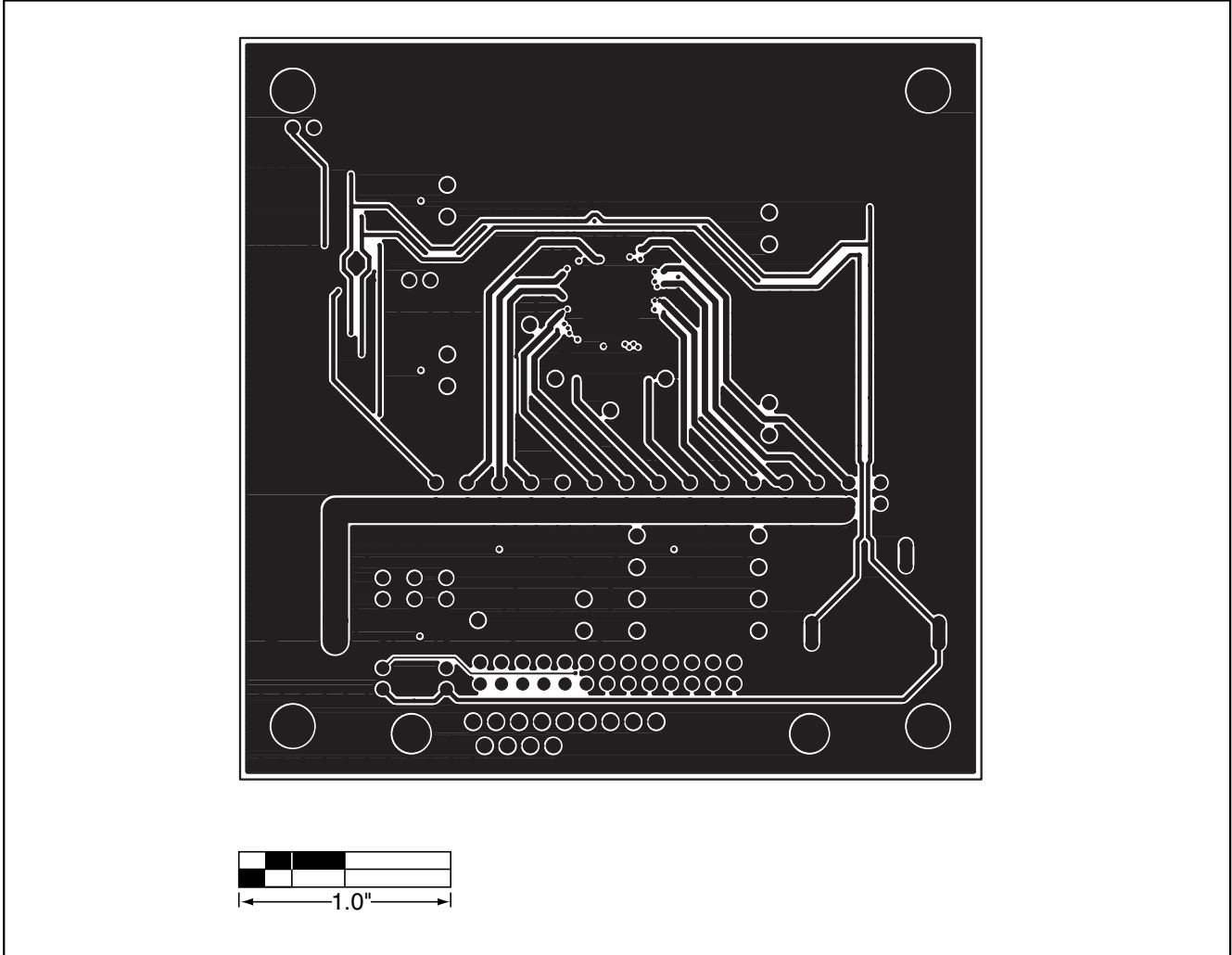


Figure 5. MAX2825/MAX2826/MAX2827 EV Kit PC Board Layout—Inner Layer 3, Routes

# MAX2825/MAX2826/MAX2827 Evaluation Kits

Evaluate: MAX2825/MAX2826/MAX2827

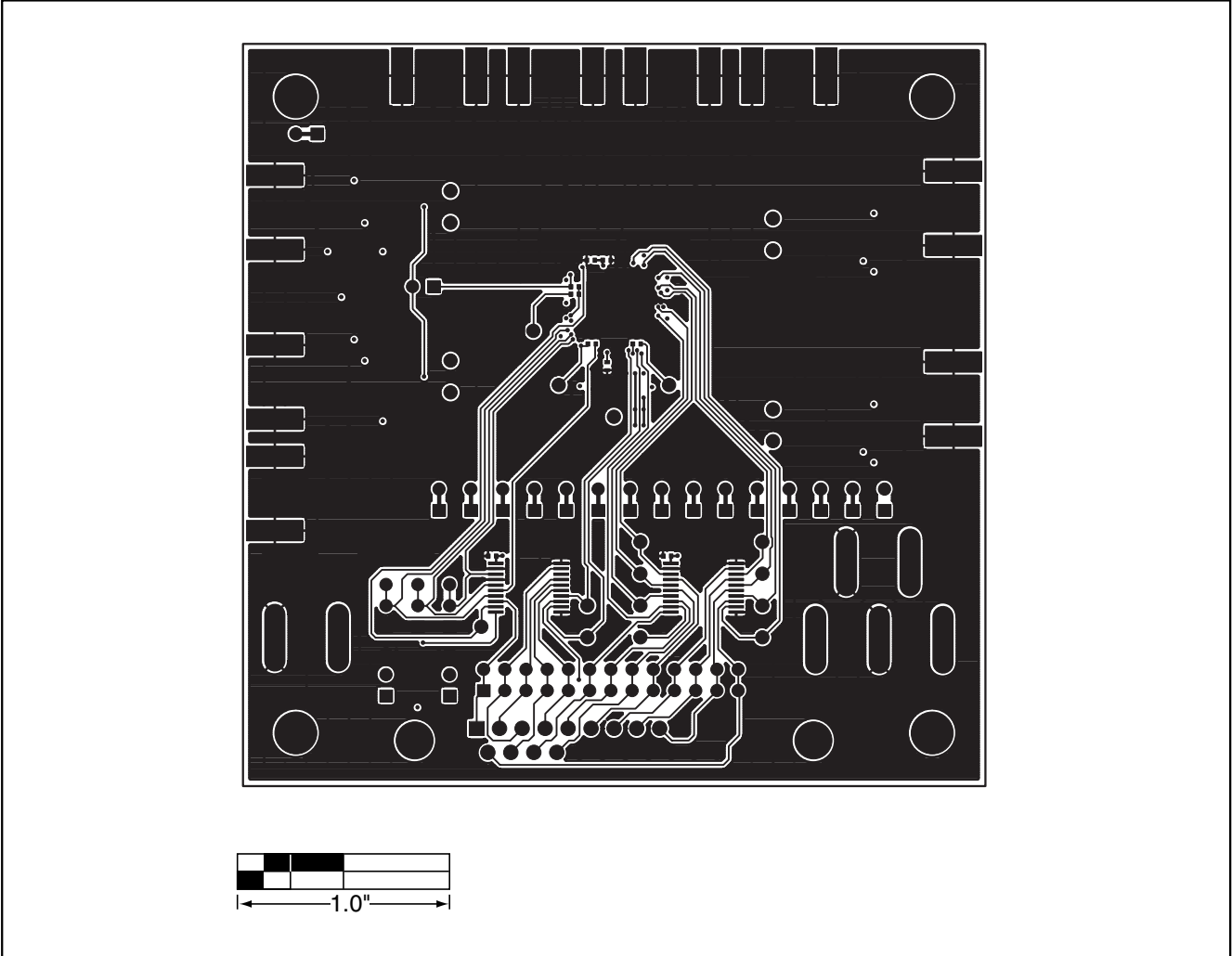


Figure 6. MAX2825/MAX2826/MAX2827 EV Kit PC Board Layout—Solder Side

# MAX2825/MAX2826/MAX2827 Evaluation Kits

**Evaluate: MAX2825/MAX2826/MAX2827**

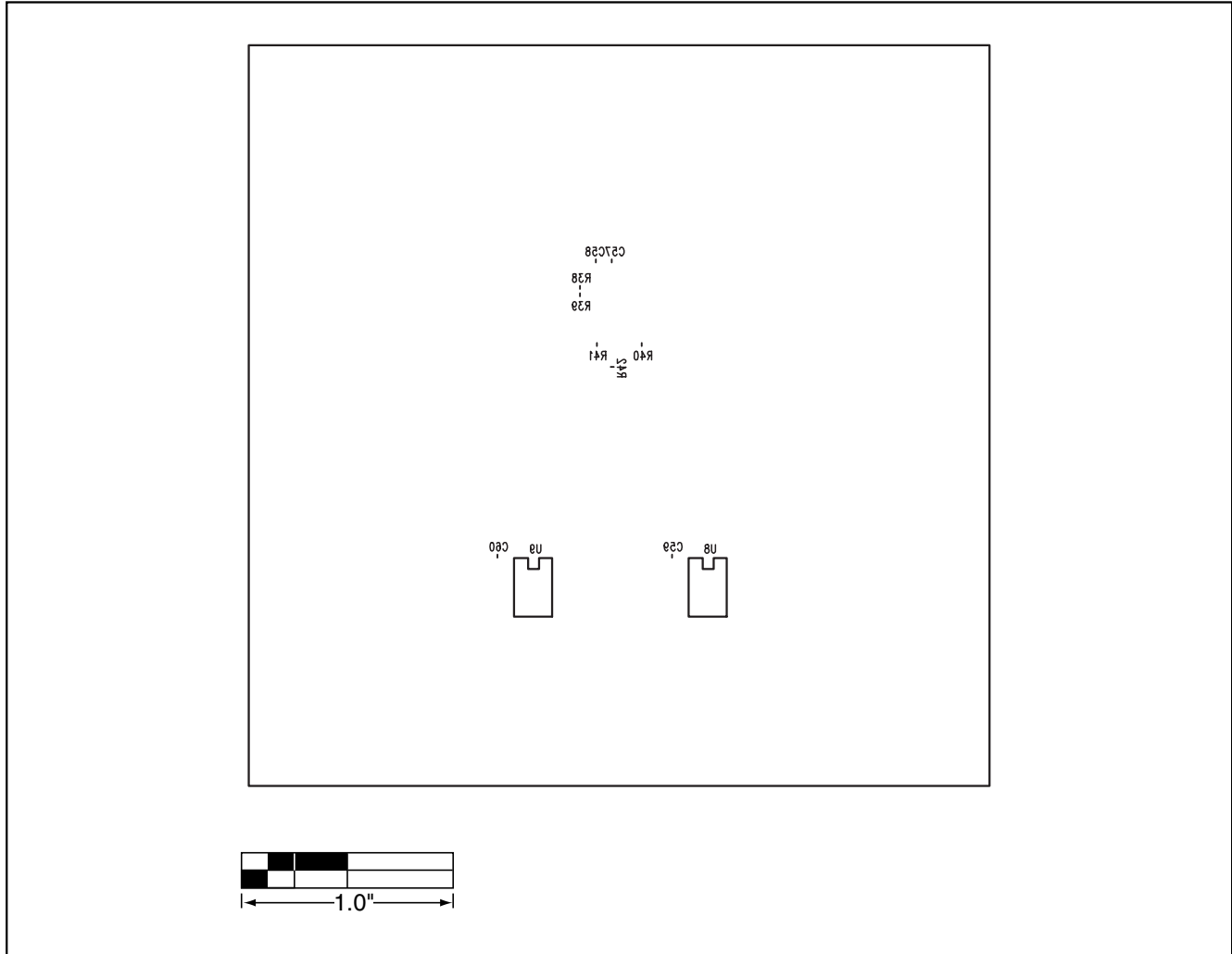


Figure 7. MAX2825/MAX2826/MAX2827 EV Kit PC Board Layout—Bottom Silkscreen

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