

MAX14589E/MAX14594E/ MAX14689 Evaluation Kits

Evaluate: MAX14589E/MAX14594E/ MAX14689

General Description

The MAX14589E/MAX14594E/MAX14689 evaluation kits (EV kits) are fully assembled and tested circuit boards that demonstrate the functionality of the MAX14589E, MAX14594E, and MAX14689 double-pole double-throw (DPDT) analog switches in a 9-bump wafer-level package (WLP). The features of the EV kits enable evaluation of the analog switches through audio jack inputs and outputs, as well as SMA connectors for AC characteristic evaluation. Input power to the EV kits is provided by a Micro-USB, type-B connector or an external power supply.

Ordering Information appears at end of data sheet.

Quick Start

Required Equipment

- MAX14589E, MAX14594E, or MAX14689 EV kit
- USB power supply or 1.8V to 5.5V power supply
- Audio source (e.g., MP3 player, computer, etc.)
- External speakers or headphones with 3.5mm audio jack

Procedure

The EV kits are fully assembled and tested. Follow the steps below to verify board operation and begin evaluation:

- 1) If using a USB power supply to power the board through the Micro-USB connector (J1), verify that a shunt is installed shorting pins 3-4 on jumper JU2. This powers the device from the output of the on-board LDO. To adjust the LDO output voltage, connect a voltmeter at test point T3 and turn the screw on the potentiometer (R3) until reaching the desired value. To use the raw bus voltage as the power supply for the device, place the shunt so that it is shorting pins 5-6 on JU2.
- 2) If an external power supply is used, apply the power at test point T2 and use the shunt to short pins 1-2 on JU2 to provide power to the parts from the external supply.
- 3) Verify that jumper JU1 has a shunt installed shorting pins 2-3, and that jumper JU4 has a shunt installed shorting pins 2-3. Installing the shunts in these locations provides power from the source to the V_{CC} pin of the device.

Features and Benefits

- Proven PCB Layout
 - Decrease Evaluation Time
 - Fully Assembled and Tested
 - SMA and 3.5mm Audio Jack Connectors
 - Directly Evaluate AC Characteristics through SMA Connectors
 - Quickly Evaluate Audio Performance with 3.5mm Audio Jack Connectors
 - USB 5V Power with On-Board Adjustable LDO
- 4) Verify that jumper JU3 has a shunt installed shorting pins 1-2. This shorts the control bit (CB) on the device to GND, electrically connecting NC1 to COM1 and NC2 to COM2.
 - 5) Connect an audio source to the normally closed audio jack (P2), using the male-to-male 3.5mm audio cable included with the EV kit.
 - 6) Connect external speakers or headphones to the common audio jack (P3).
 - 7) When the audio source outputs the audio signal, and JU3 has a shunt shorting pins 1-2, the audio signal should be heard on the speakers or headphones connected at P3.
 - 8) Move the shunt on JU3 from pins 1-2 to pins 2-3. The audio signal should no longer be heard on the speakers or headphones connected at P3.
 - 9) If the audio source connection moves from the normally closed audio jack (P2) to the normally open audio jack (P1) with a shunt in position 2-3 on JU3, the audio signal on the common audio jack (P3) is heard on the speakers or headphones. If the shunt on JU3 is in position 1-2, there is no audio signal heard on the speaker or headphones.

Detailed Description of Hardware

The MAX14589E, MAX14594E, and MAX14689 EV kits are fully assembled and tested circuit boards that demonstrate the functionality of the MAX14589E, MAX14594E, and MAX14689 DTD analog switches in a 9-bump WLP. The EV kit features enables evaluation of the analog switches through audio jack inputs and outputs, as well as SMA connectors for AC characteristic evaluation. Input power to the EV kits is provided by a Micro-USB, type-B connector or an external power supply. The EV kit PCBs are designed with 1oz copper.

Power Supply

The EV kits are powered by a user-supplied 1.6V to 5.5V external DC power supply connected between V_{EXT} and GND, the raw USB bus supplied at the Micro-USB connector (J1), or the regulated output of the LDO (U2) that is powered by the USB bus.

AC Evaluation

The EV kits have a secondary IC configured for evaluation of the AC characteristics of the device. SMA connectors (J2–J5) allow for direct connection to a network analyzer. 50Ω termination resistors (R6, R7) provide termination to match the typical 50Ω source resistance of the network analyzer, allowing for easy evaluation of these parameters. The ability to connect external DC bias voltages at test points T7 and T8 further simplifies evaluation of AC characteristics, while using a network analyzer that cannot provide DC offset voltages.

V_{BUS} Status LED

An indicator diode (D1) is included on the EV kits, indicating that a V_{BUS} voltage is present on the Micro-USB connector (J3). If the LED glows green, power is present at J3 and the board can be powered by the LDO output or by the raw V_{BUS} supply (see Table 1 for jumper configurations). The status LED does not glow when a voltage is present on test point T2.

Table 1. Jumper Settings (J6, J7, JU1–JU4)

JUMPER	SHUNT POSITION	DESCRIPTION
J6	1-2	Connects NC1 on U2 to DC bias applied at test point T7 through a 475kΩ resistor
	3-4	Connects COM1 on U2 to DC bias applied at test point T7 through a 475kΩ resistor
J7	1-2	Connects NC2 on U2 to DC bias applied at test point T8 through a 475kΩ resistor
	3-4	Connects COM2 on U2 to DC bias applied at test point T8 through a 475kΩ resistor
JU1	1-2	Connects V_{CC} of U1 to GND; places U1 in shutdown mode
	2-3*	Connects V_{CC} of U1 to the power-supply bus; places U1 in normal, powered operation
JU2	1-2	Connects the external power supply applied at T2 to the power-supply bus
	3-4*	Connects the regulated LDO output to the power-supply bus
	5-6	Connects raw V_{BUS} voltage from the USB to the power-supply bus
JU3	1-2*	Connects CB of U1 and U2 to GND; NC_ and COM_ are electrically connected
	2-3	Connects CB of U1 and U2 to V_{CC} ; NO_ and COM_ are electrically connected
JU4	1-2	Connects V_{CC} of U2 to GND; places U3 in shutdown mode
	2-3*	Connects V_{CC} of U2 to power supply bus; places U3 in normal, powered operation

*Default position.

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C4	2	0.01 μ F \pm 10%, 16V X7R ceramic capacitors (0603)
C2	1	4.7 μ F \pm 10%, 10V X7R ceramic capacitor (0805)
C3, C5–C7	4	1 μ F \pm 10%, 10V X5R ceramic capacitors (0603)
D1	1	Green LED (1206) Lumex SML-LX1206GW-TR
J1	1	Micro-USB, type-B receptacle Hirose ZX62D-B-5PA8
J2–J5	4	Side-mount SMA connectors Johnson 142-0701-851
J6, J7	2	4-pin, single-row headers
JU1, JU3, JU4	3	3-pin, single-row headers
JU2	1	6-pin, dual-row header
P1–P3	3	3.5mm audio connectors CUI Inc. SJ1-3523NG
R1	1	31.6k Ω \pm 1% resistor (0805)

DESIGNATION	QTY	DESCRIPTION
R2	1	7.32k Ω \pm 1% resistor (0805)
R3	1	100k Ω \pm 10%, 0.5W potentiometer Bourns 3296W-1-104LF
R4	1	100k Ω \pm 1% resistor (0805)
R5	1	1k Ω \pm 5% resistor (0805)
R6, R7	2	49.9 Ω \pm 1% resistors (0805)
R8–R11	4	475k Ω \pm 1% resistors (0805)
T1, T4–T6	4	Black test points
T2, T3	2	Red test points
T7, T8	2	White test points
U1, U3	2	See the <i>EV Kit-Specific Component List</i>
U2	1	Ultra-low-I _Q , low-dropout linear regulator with POK (6 SOT) Maxim MAX8880EUT+
—	8	Shunts
—	1	PCB: MAX14589/94/689 EVKIT

EV Kit-Specific Component List

PART	DESIGNATION	DESCRIPTION
MAX14589EEVKIT#	U1, U3	High-density DPDT analog switches (9 WLP) Maxim MAX14589EEWL+
MAX14594EEVKIT#		High-density DPDT analog switches (9 WLP) Maxim MAX14594EEWL+
MAX14689EEVKIT#		High-density DPDT analog switches (9 WLP) Maxim MAX14689EEWL+

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Bourns, Inc.	951-781-5500 x2778	www.bourns.com/
CUI Inc.	800-275-4899	www.cui.com/
Hirose Electric Co. Ltd.	—	www.hirose-connectors.com/
Johnson Components	507-833-8822	johnsoncomponents.com/
Lumex Optocomponents Inc.	800-278-5666	www.lumex.com/

Note: Indicate that you are using the MAX14589/MAX14594/MAX14689 when contacting these component suppliers.

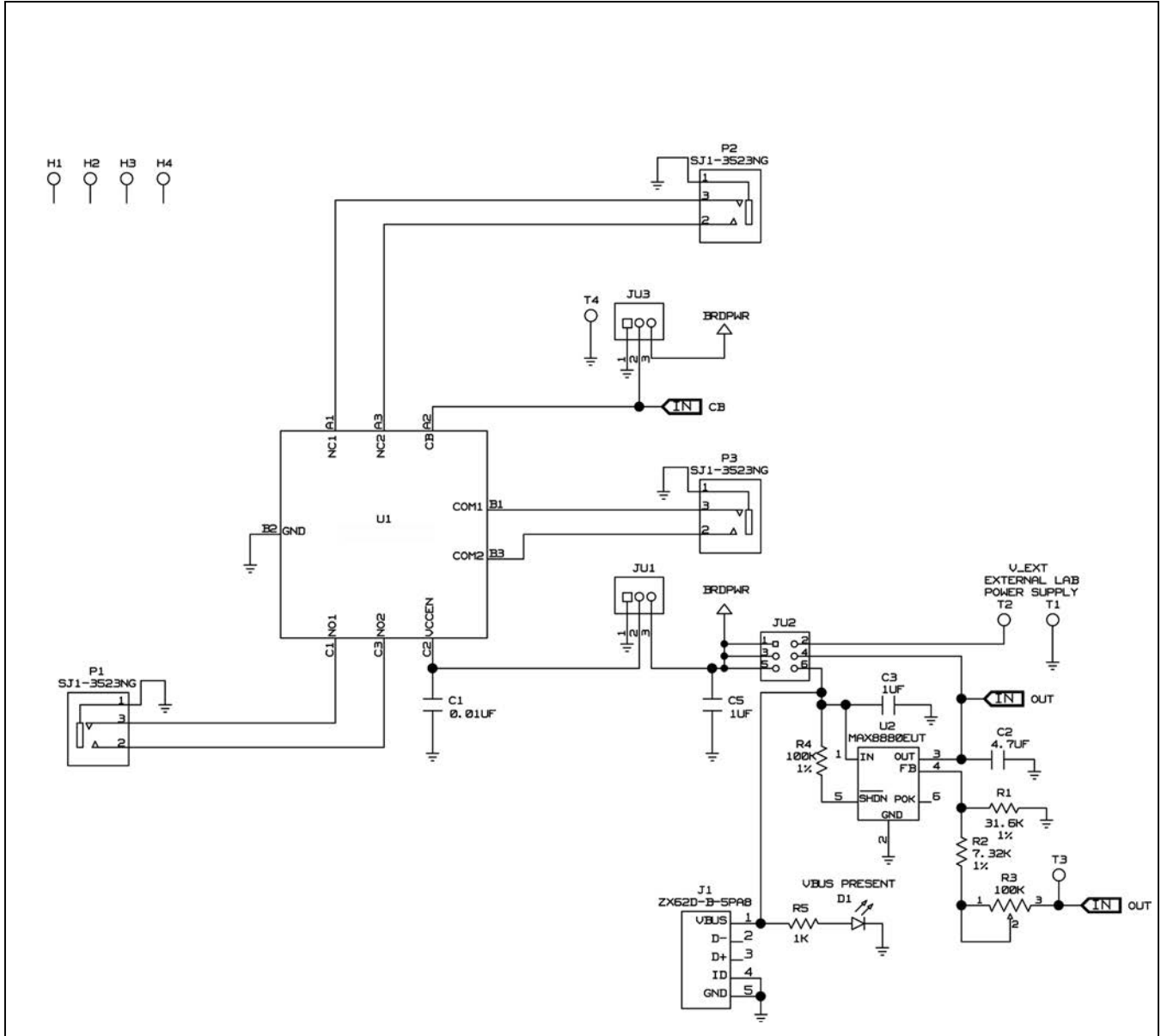


Figure 1a. MAX14589E/MAX14594E/MAX14689 EV Kit Schematic (Sheet 1 of 2)

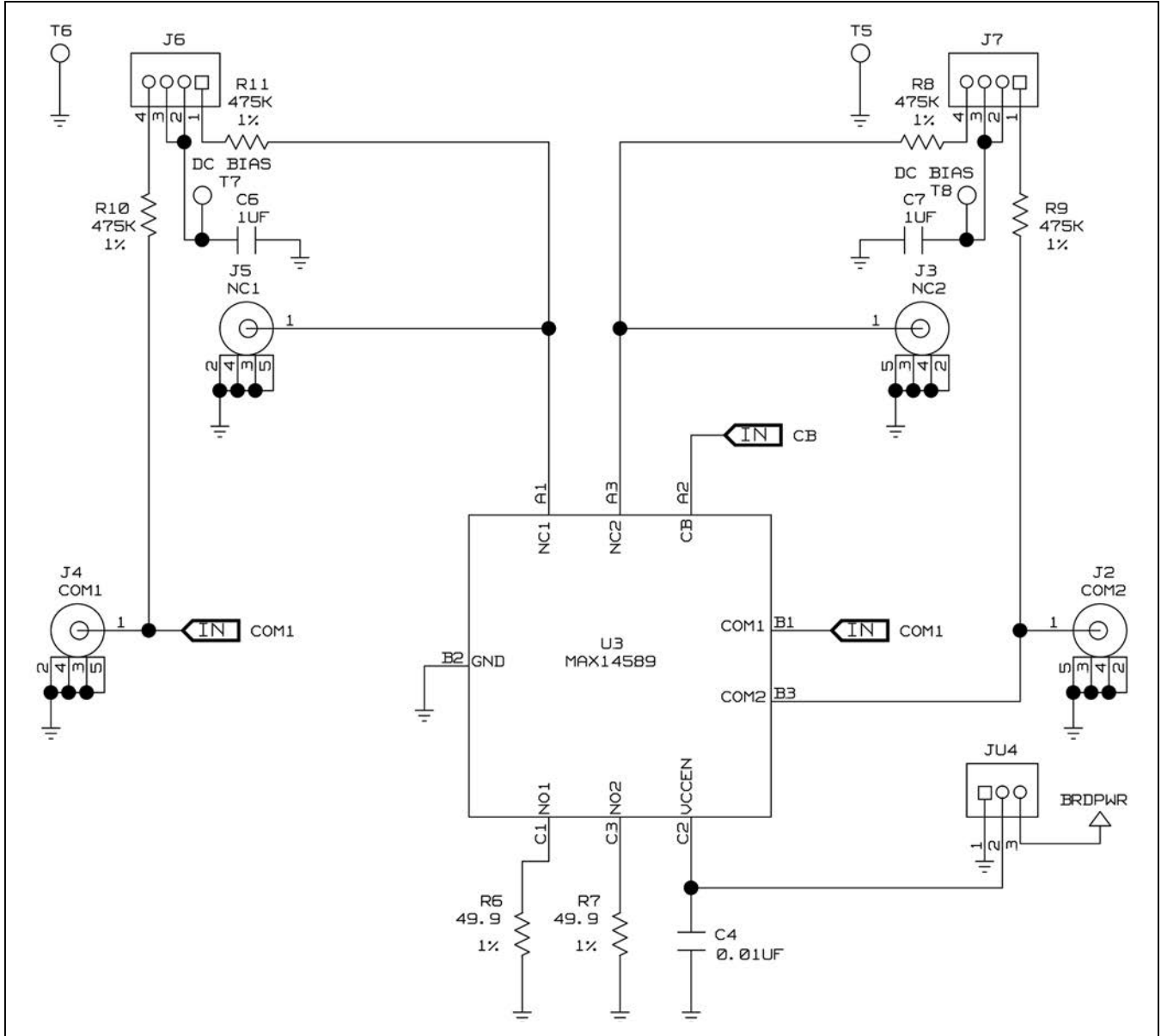


Figure 1b. MAX14589E/MAX14594E/MAX14689 EV Kit Schematic (Sheet 2 of 2)

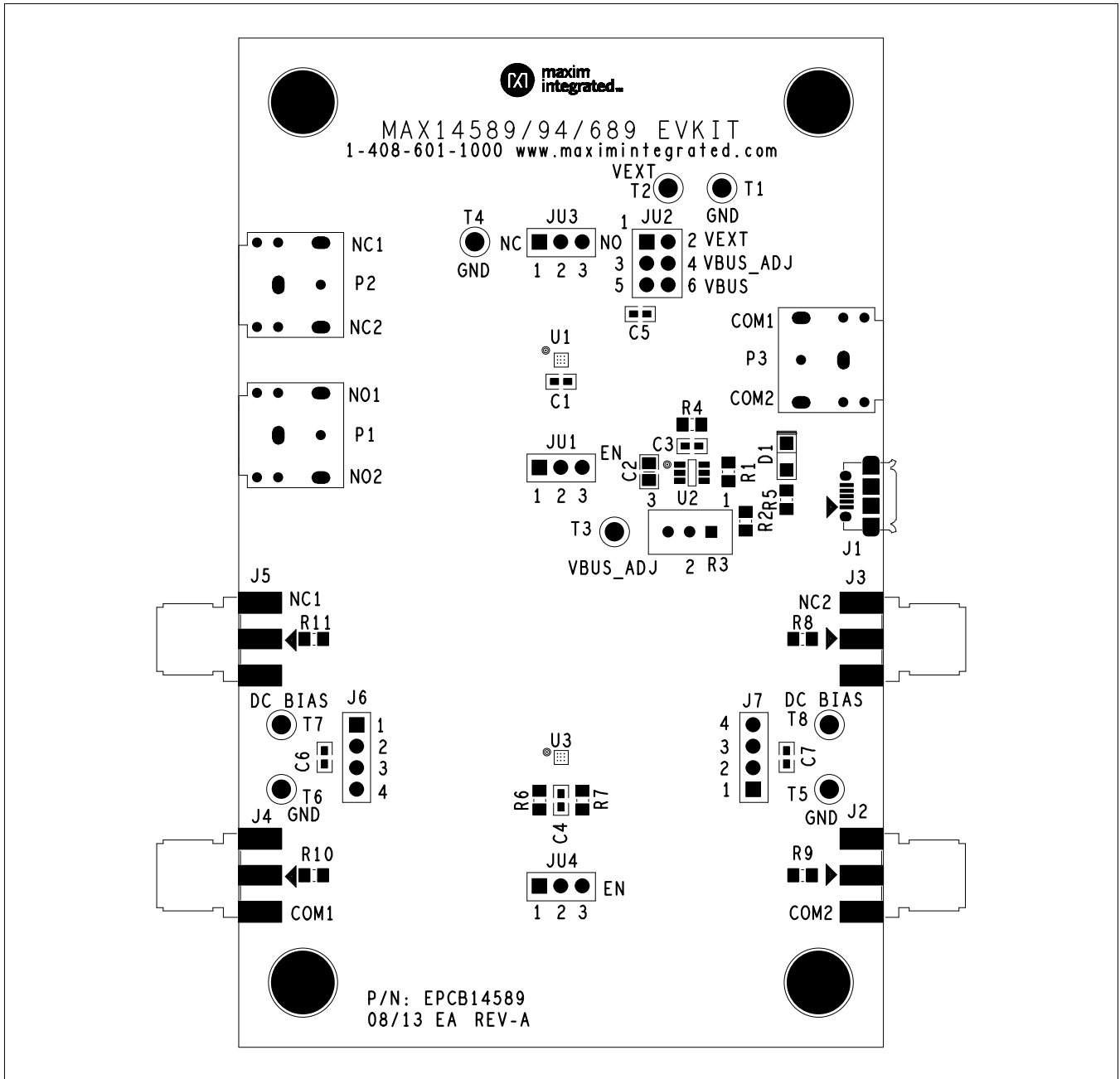


Figure 2. MAX14589E/MAX14594E/MAX14689 EV Kit Component Placement Guide

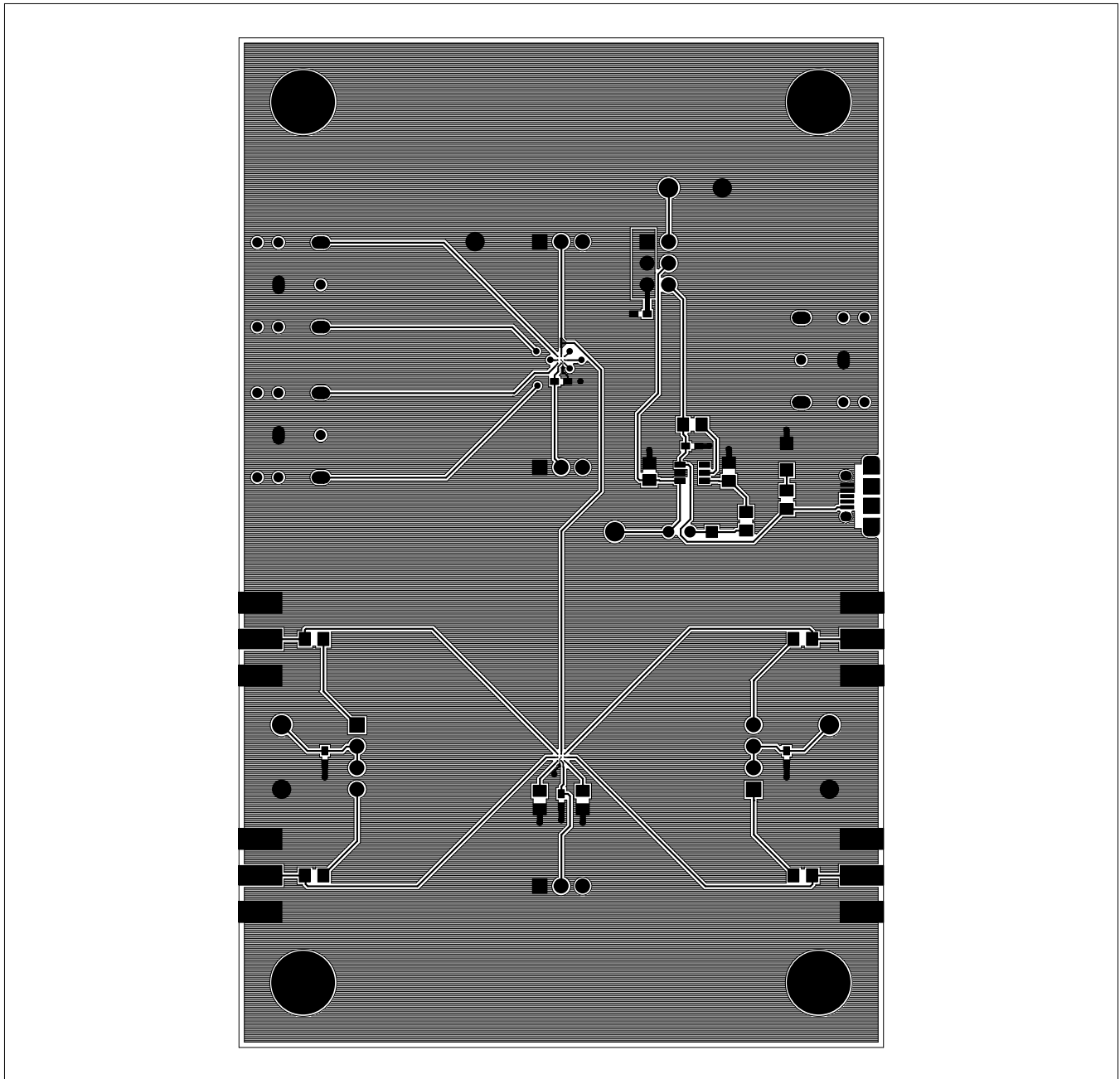


Figure 3. MAX14589E/MAX14594E/MAX14689 EV Kit PCB Layout—Component Side

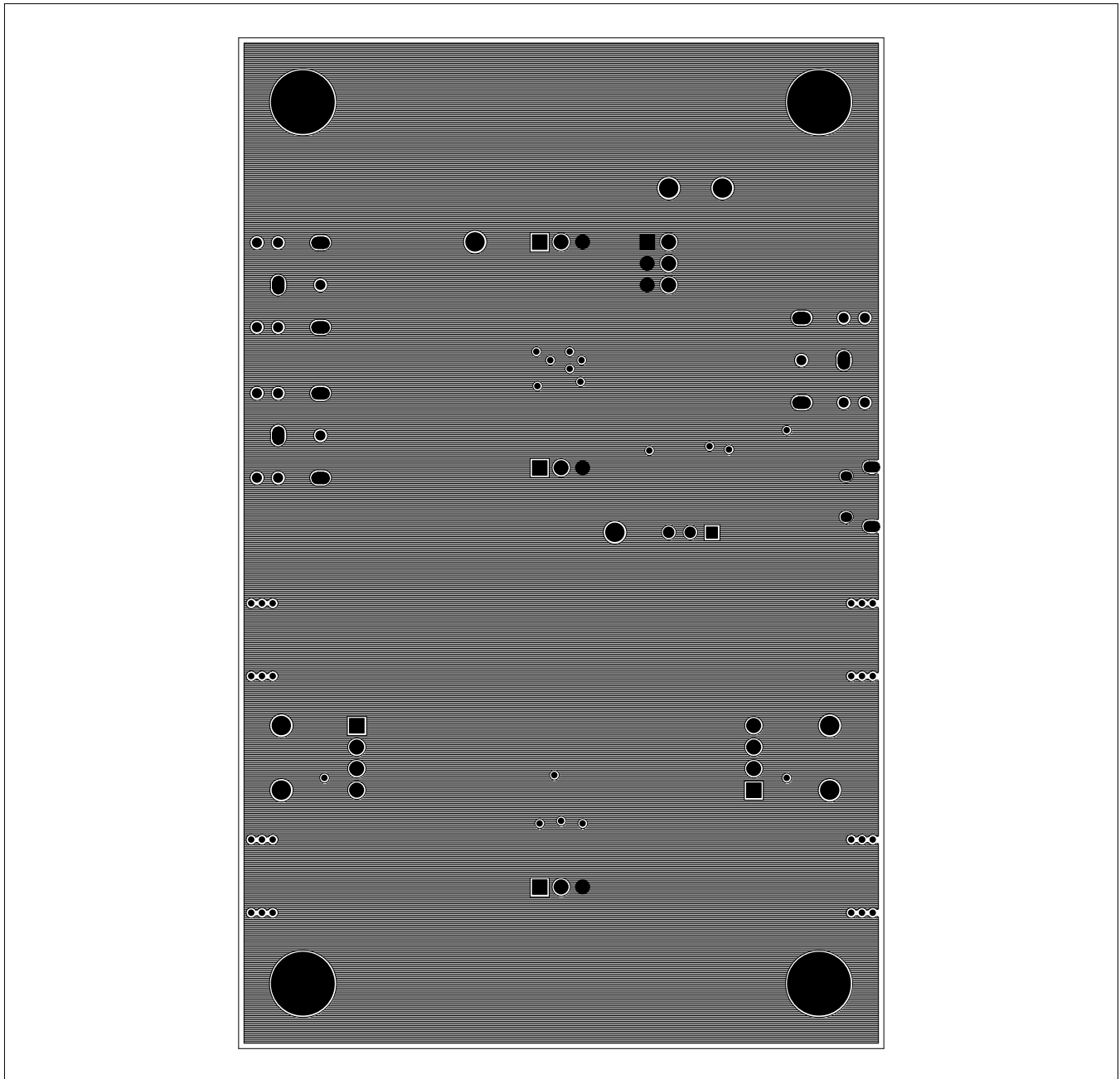


Figure 4. MAX14589E/MAX14594E/MAX14689 EV Kit PCB Layout—Layer 2

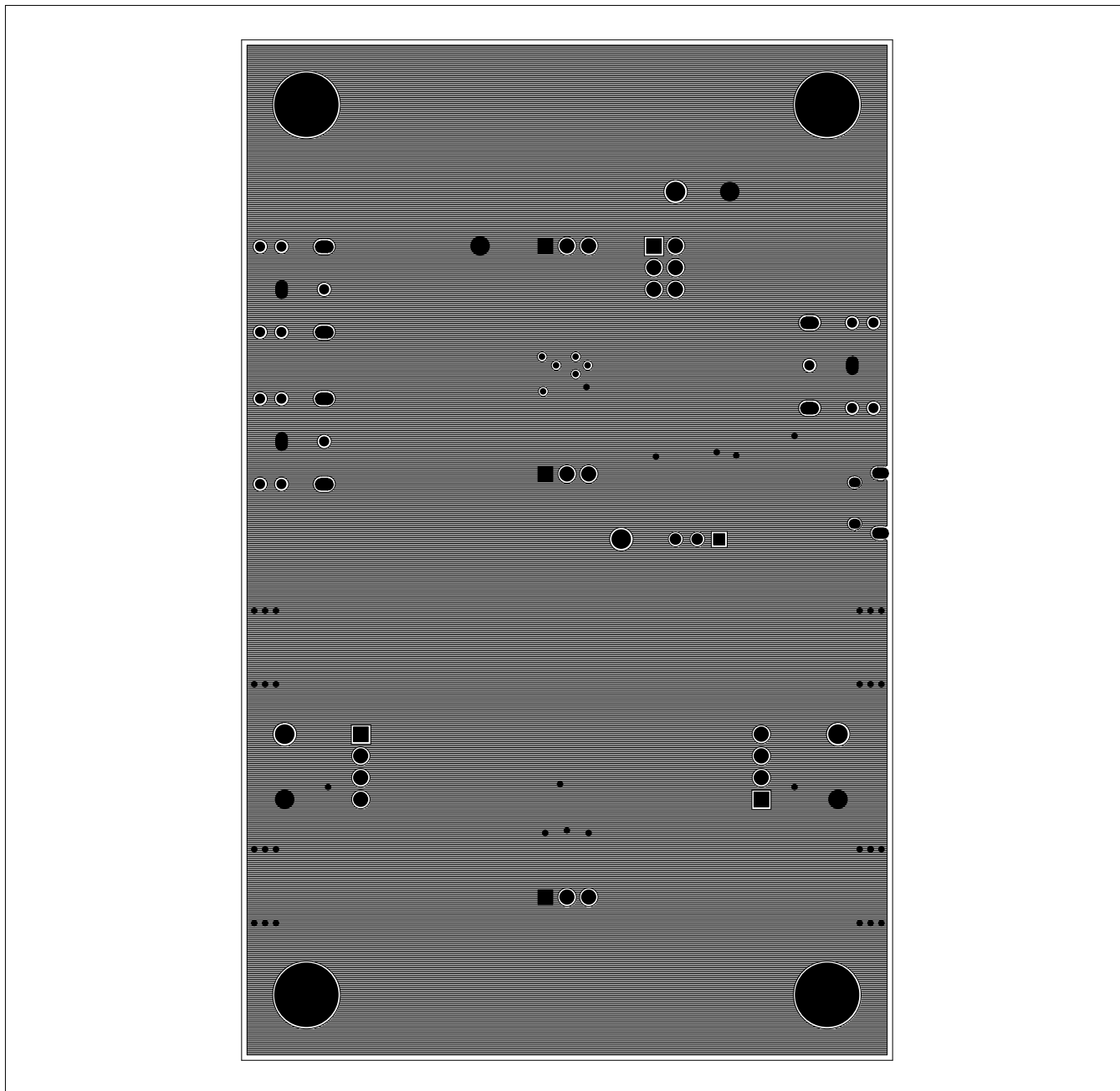


Figure 5. MAX14589E/MAX14594E/MAX14689 EV Kit PCB Layout—Layer 3

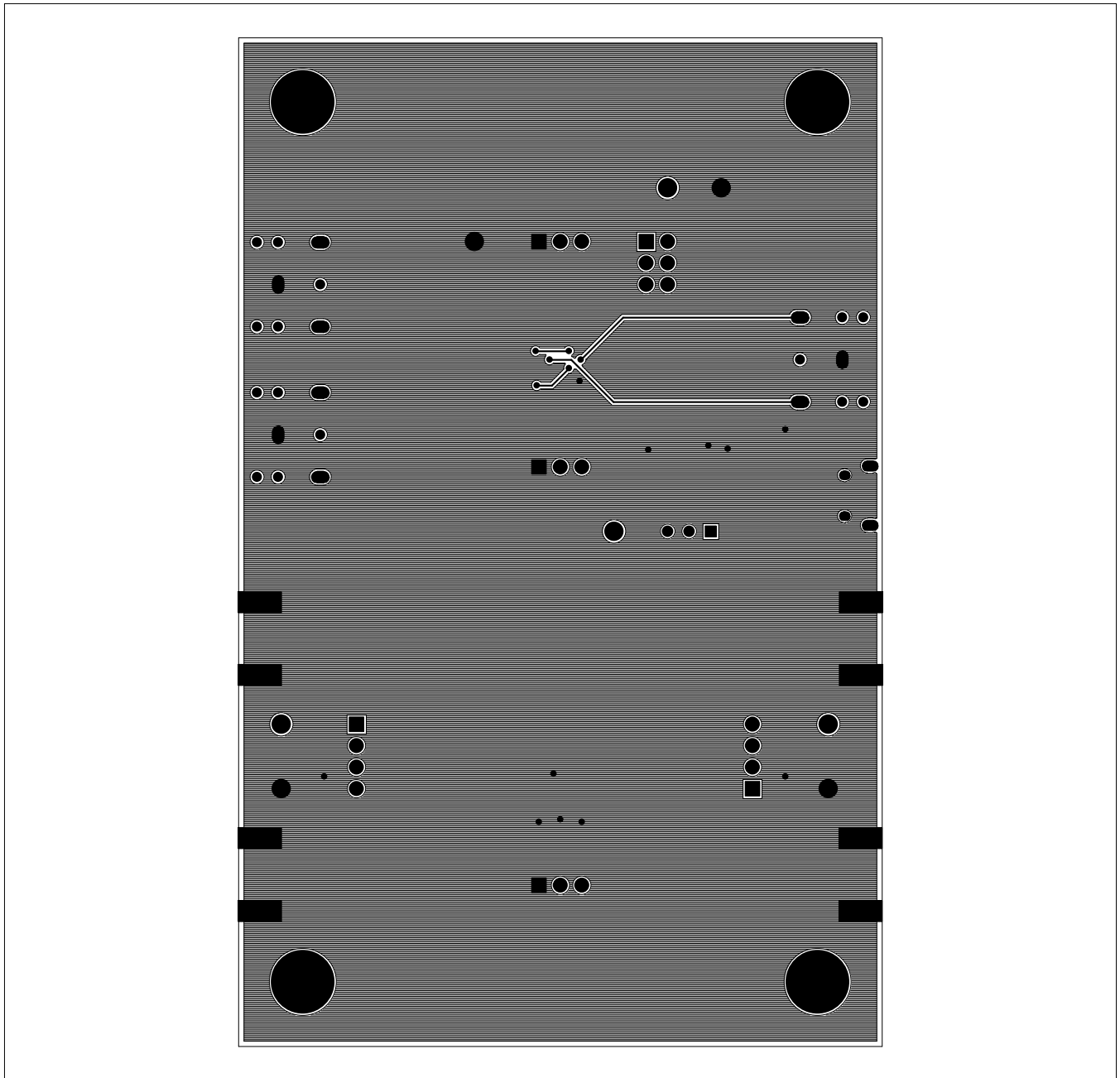


Figure 6. MAX14589E/MAX14594E/MAX14689 EV Kit PCB Layout—Solder Side

MAX14589E/MAX14594E/
MAX14689 Evaluation Kits

Evaluate: MAX14589E/MAX14594E/
MAX14689

Ordering Information

PART	TYPE
MAX14589E EVKIT#	EV Kit
MAX14594E EVKIT#	EV Kit
MAX14689E EVKIT#	EV Kit

#Denotes RoHS compliant.

MAX14589E/MAX14594E/
MAX14689 Evaluation Kits

Evaluate: MAX14589E/MAX14594E/
MAX14689

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	9/13	Initial release	—

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