

## General Description

The MAX14727 evaluation kit (EV kit) is a fully assembled and tested circuit board that demonstrates the MAX14727 dual-input, bidirectional overvoltage protection with automatic path control device. The EV kit comes with the MAX14727EWV+ installed. To evaluate the MAX14728/MAX14731, request a sample from Maxim and replace the MAX14727 with the MAX14728/MAX14731.

## Features

- 3V to 28V Operating Voltage Range
- LEDs Showing  $\overline{\text{INAOK}}$ ,  $\overline{\text{INBOK}}$
- Proven PCB Layout
- Fully Assembled and Tested

## EV Kit Contents

- EV Kit Board Containing a MAX14727

Ordering Information appears at end of data sheet.

## Quick Start

### Required Equipment

- MAX14727 EV kit
- Two 15V DC power supply
- USB Cable or 5V power supply
- Multimeter

### Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify board operation:

- 1) Connect one power supply to INA and one power supply to INB.
- 2) Connect voltmeter to OUT.
- 3) Connect USB cable to J1 or connect 5V power supply on TP1 to source VIO.
- 4) Supply 4.5V to INA. Verify OUT is 4.5V and LED1 is on.
- 5) Increase voltage on INA and verify OUT voltage follows INA voltage. Keep increasing INA voltage, when INA reaches OVLO threshold 13.75V, OUT voltage goes down and LED1 is off.
- 6) Decrease INA voltage, then OUT comes back to be the same as INA voltage and LED1 is on. Turn off INA power supply.
- 7) Supply 4.5V to INB. Verify OUT is 4.5V and LED2 is on.
- 8) Increase voltage on INB and verify OUT voltage follows INB voltage. Keep increasing INB voltage, when INB reaches OVLO threshold 13.75V, OUT voltage goes down and LED2 is off.
- 9) Decrease INB voltage, then OUT comes back to be the same as INB voltage and LED2 is on.
- 10) Set INB voltage to 5V and verify OUT is 5V.
- 11) Set INA voltage to 3V and turn on INA power supply. Verify OUT is still 5V.
- 12) Increase INA voltage. Verify when INA goes to about 4.5V, LED1 is on and OUT voltage is the same as INA voltage.

### Detailed Description

The MAX14727 EV kit is a fully assembled and tested circuit board demonstrating the MAX14727 dual-input, bidirectional overvoltage protection with automatic path control device in a 30-bump WLP package.

#### LEDs

LED1/LED2 turns on when  $\overline{\text{INAOK}}/\overline{\text{INBOK}}$  is asserted.

#### Digital Inputs

Use USB cable or external power supply to power digital inputs. Use JU1, JU4, JU7, and JU8 to control digital inputs ([Table 1](#)).

#### Output Load

Use JU3, and JU5 to add output capacitor or resistor ([Table 2](#)).

#### Overvoltage Threshold

Use JU9, and JU10 to choose internal or external overvoltage threshold setting ([Table 3](#)).

**Table 1. JU1, JU4, JU7, JU8 Jumper Setting**

JUMPER	SHUNT POSITION	DESCRIPTION
JU1	Installed	PCON is high (no break before make time)
	Not installed*	PCON is low (break before make time enabled)
JU4	Installed	$\overline{\text{EN}}$ is high (device disabled)
	Not installed*	$\overline{\text{EN}}$ is low (device enabled)
JU7	Installed	OTG_ENB high (channel B OTG enabled)
	Not installed*	OTG_ENB low (channel B OTG disabled)
JU8	Installed	OTG_ENA high (channel A OTG enabled)
	Not installed*	OTG_ENA low (channel A OTG disabled)

**Table 2. JU3, JU5 Jumper Setting**

JUMPER	SHUNT POSITION	DESCRIPTION
JU3	Installed	100 $\mu$ F capacitor is connected to OUT
	Not installed*	100 $\mu$ F capacitor is not connected to OUT
JU5	Installed	50 $\Omega$ resistor is connected to OUT
	Not installed*	50 $\Omega$ resistor is not connected to OUT

\*Default position.

**Table 3. JU9, JU10 Jumper Setting**

JUMPER	SHUNT POSITION	DESCRIPTION
JU9	1-2	OVLOA is connected to resistor divider. Using external overvoltage threshold.
	2-3*	OVLOA is connected to ground. Using internal overvoltage threshold.
JU10	1-2	OVLOB is connected to resistor divider. Using external overvoltage threshold.
	2-3*	OVLOB is connected to ground. Using internal overvoltage threshold.

\*Default position.

### Ordering Information

PART	TYPE
MAX14727EVKIT#	EVKIT

#Denotes RoHS compliant.

# MAX14727 Evaluation Kit

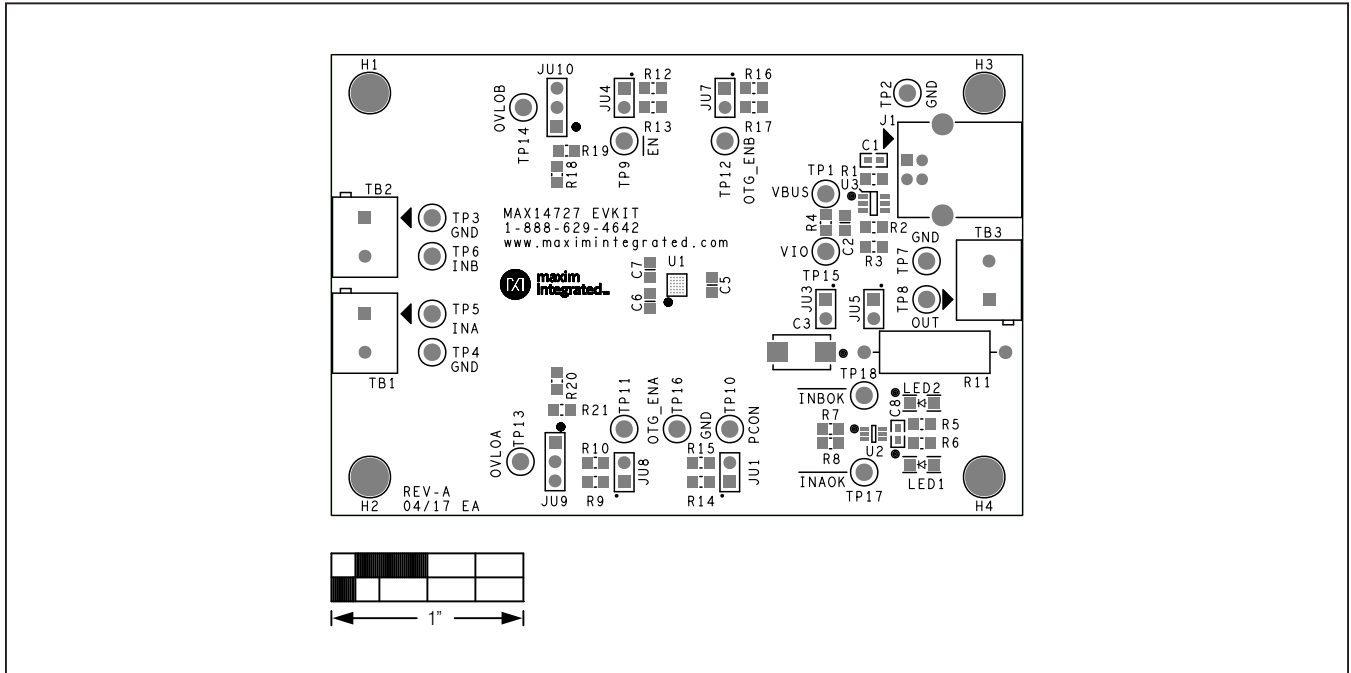
Evaluates: MAX14727/  
MAX14728/MAX14731

## MAX14727 EV Kit Bill of Materials

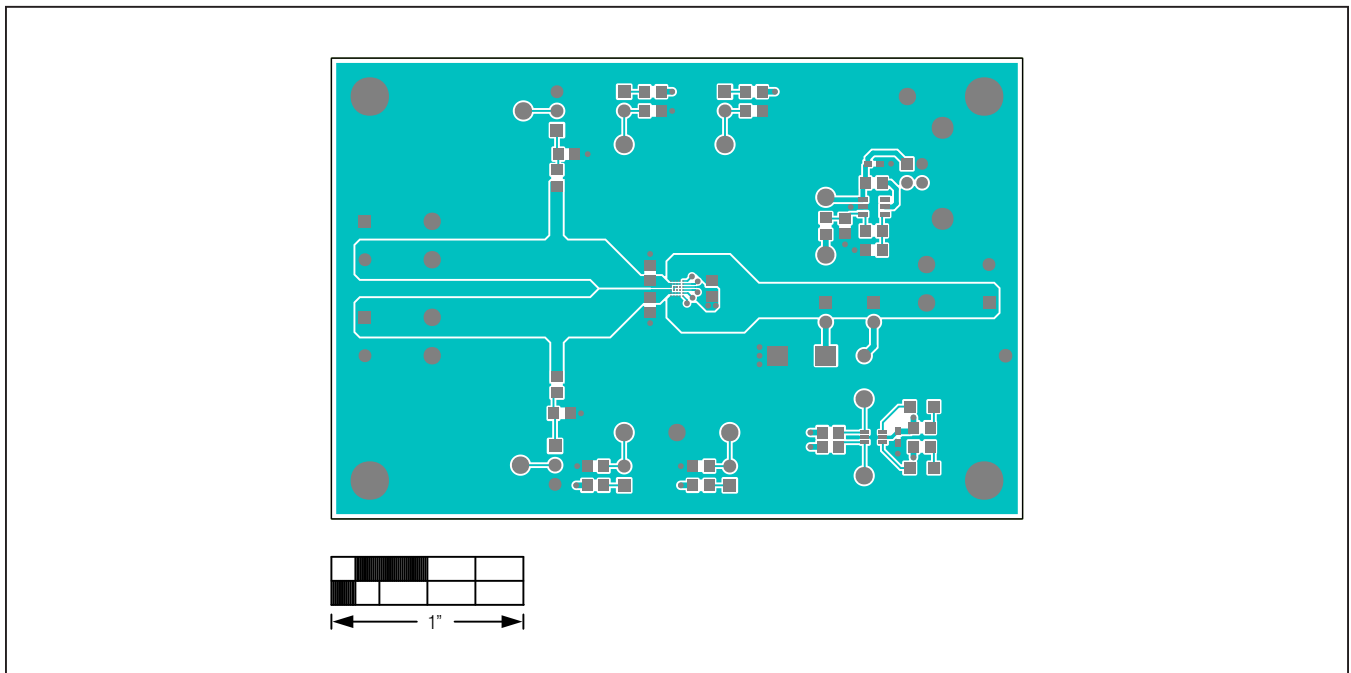
ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	C1, C8	-	2	C0603X5R160-105KNP; EMK107BJ105KA; C1608X5R1C105K; GRM188R61C105K	VENKEL LTD./TAIYO YUDEN/ TDK/MURATA	1UF	CAPACITOR; SMT; 0603; CERAMIC; 1uF; 16V; 10%; X5R; -55degC to + 85degC; 0 +/-15% degC MAX.USE 20-0001u-63 FOR NEW DESIGN
2	C2	-	1	C0805C475K4PAC; ECJ-2FB1C475K; CL21A475KOFNNN	KEMET/PANASONIC/ SAMSUNG ELECTRONICS	4.7UF	CAPACITOR; SMT; 0805; CERAMIC; 4.7uF; 16V; 10%; X5R; -55degC to + 85degC; 0 +/-15% degC MAX.
3	C3	-	1	T495X107M020ATE100	KEMET	100UF	CAPACITOR; SMT (7343-43); TANTALUM CHIP; 100UF; 20V; TOL=20%; TG=-55 DEGC TO +125 DEGC; AUTO; LOW ESR
4	C5	-	1	GRM21BR61H105KA12	MURATA	1UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 1UF; 50V; TOL=10%; MODEL=GRM SERIES; TG=-55 DEGC TO +85 DEGC; TC=X5R
5	C6, C7	-	2	C0805C104K5RAC; GRM21BR71H104K; C2012X7R1H104K085AA	KEMET; MURATA; TDK	0.1UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 0.1UF; 50V; TOL=10%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=X7R;
6	J1	-	1	61729-0010BLF	FCI CONNECT	61729-0010BLF	CONNECTOR; FEMALE; THROUGH-HOLE; UNIVERSAL SERIES BUS B-TYPE CONNECTOR; RIGHT ANGLE; 4PINS
7	JU1, JU3-JU5, JU7, JU8	-	6	PEC02SAAN	SULLINS	PEC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS
8	JU9, JU10	-	2	PEC03SAAN	SULLINS	PEC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS
9	LED1, LED2	-	2	LG N971-KN-1	OSRAM	LG N971-KN-1	DIODE; LED; SMT (1206); PIV=2.6V; IF=0.025A; -30 DEGC TO +85 DEGC; GREEN
10	R1, R7, R8, R10, R13, R15, R17	-	7	CRCW0805100KFK; RK73H2ATTD1003; ERJ-6ENF1003V	VISHAY DALE/KOA SPEER/ PANASONIC	100K	RESISTOR; 0805; 100K; 1%; 100PPM; 0.125W; THICK FILM
11	R2	-	1	CRCW080510K0FK; MCR10EZHF1002; ERJ-6ENF1002V; RC0805FR-0710KL	GENERIC PART	10K	RESISTOR; 0805; 10K; 1%; 100PPM; 0.125W; THICK FILM
12	R3	-	1	CRCW08056K04FK; MCR10EZPF6041	VISHAY DALE/ROHM	6.04K	RESISTOR; 0805; 6.04K; 1%; 100PPM; 0.125W; THICK FILM
13	R4	-	1	RC0805JR-070RL	YAGEO PHYCOMP	0	RESISTOR; 0805; 0 OHM; 5%; JUMPER; 0.125W; THICK FILM
14	R5, R6	-	2	CRCW0805332RFK; MCR10EZHF3320	VISHAY DALE/ROHM	332	RESISTOR; 0805; 332 OHM; 1%; 100PPM; 0.125W; THICK FILM
15	R9, R12, R14, R16	-	4	CRCW08051K00FK; ERJ-6ENF1001V; MCR10EZHF1001; RC0805FR-071KL	VISHAY DALE; PANASONIC; ROHM; YAGEO	1K	RESISTOR; 0805; 1K; 1%; 100PPM; 0.125W; THICK FILM
16	R11	-	1	UB5C-50RF1	RIEDON INC	50	RESISTOR; THROUGH HOLE-AXIAL LEAD; 50R OHM; 1%; 20PPM; 5W; SILICON COATED WIREWOUND
17	SU1-SU8	-	8	STC02SYAN	SULLINS ELECTRONICS CORP	STC02SYAN	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.256IN; BLACK; INSULATION=PBT CONTACT=PHOSPHOR BRONZE; COPPER PLATED TIN OVERALL
18	TB1-TB3	-	3	398800302	MOLEX	398800302	CONNECTOR; FEMALE; THROUGH HOLE; 5.08/200 EUROSTYLE LOW; SINGLE ROW FIXED BLOCK; RIGHT ANGLE; 2PINS
19	TP1, TP5, TP6, TP8, TP15	-	5	5010	Keystone	5010	TESTPOINT WITH 1.80MM HOLE DIA, RED, MULTIPURPOSE
20	TP2-TP4, TP7, TP16	-	5	5011	Keystone	5011	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
21	TP9-TP14, TP17, TP18	-	8	5014	Keystone	5014	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
22	U1	-	1	MAX14727EWW+	MAXIM	MAX14727EWW+	IC; PROT; 13.75V OVLO; DUAL INPUT; BIIRECTIONAL OVERVOLTAGE PROTECTOR WITH AUTOMATIC PATH CONTROL; WLP30 2.537X2.197
23	U2	-	1	NC7WZ07P6X	FAIRCHILD SEMICONDUCTOR	NC7WZ07P6X	IC; BUF; TINY LOGIC ULTRA-HIGH SPEED DUAL BUFFER; SC70-6
24	U3	-	1	MAX8880EUT+	MAXIM	MAX8880EUT+	IC; VREG; ULTRA-LOW-IO LOW-DROPOUT LINEAR REGULATOR WITH POK; SOT23-6
25	PCB	-	1	MAX14727	MAXIM	PCB	PCB:MAX14727
26	R18-R21	DNP	0	N/A	N/A	OPEN	PACKAGE OUTLINE 0805 RESISTOR
TOTAL			68				



MAX14727 EV Kit PCB Layout Diagrams

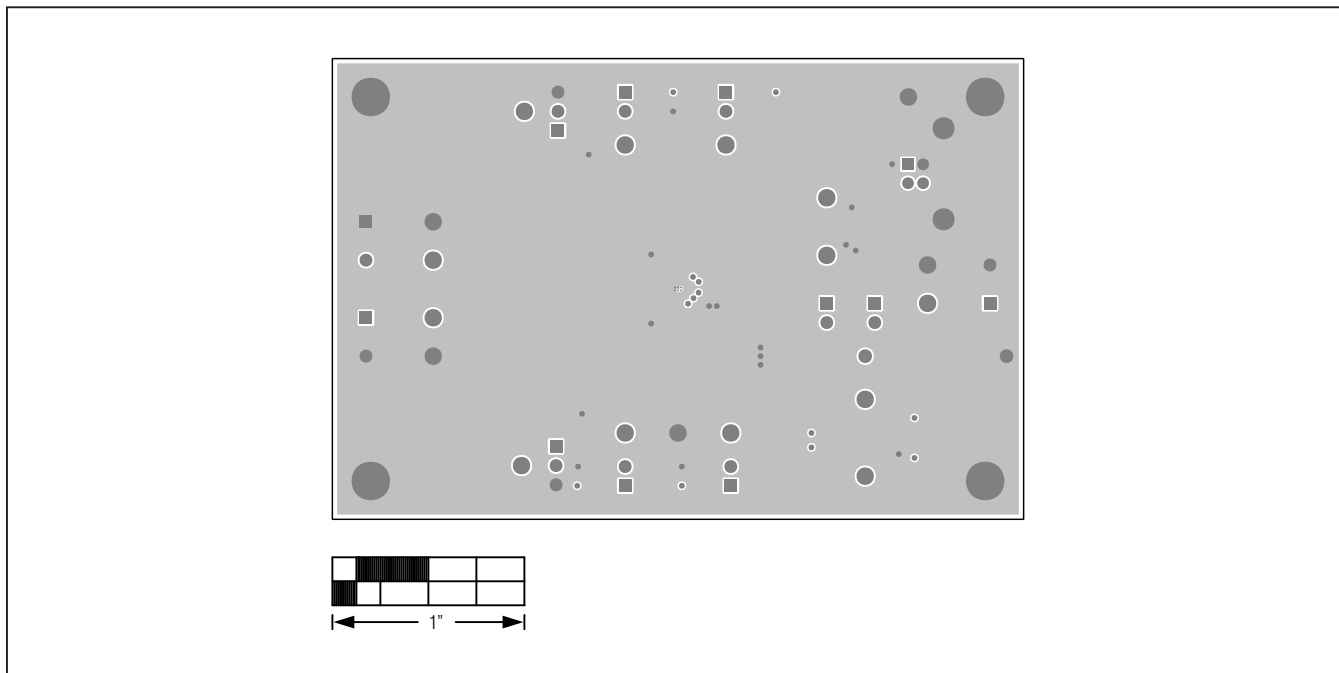


MAX14727 EV Kit—Top Silkscreen

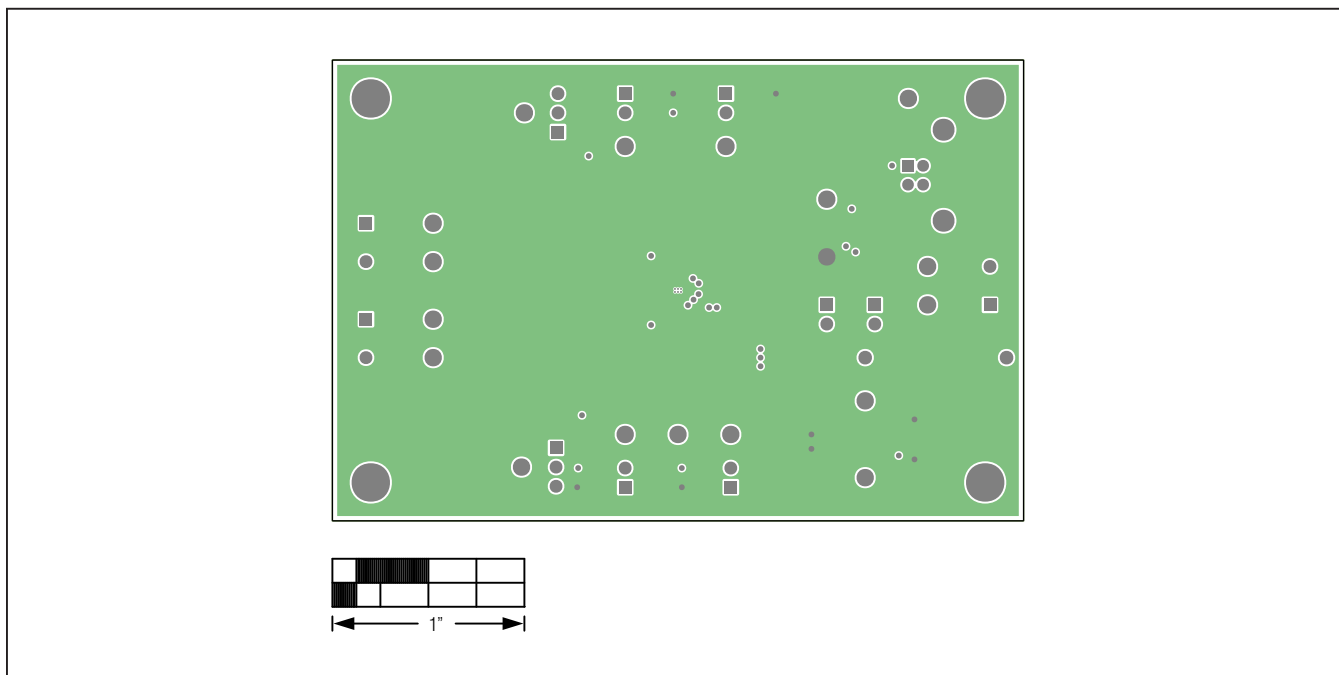


MAX14727 EV Kit—Top

**MAX14727 EV Kit PCB Layout Diagrams (continued)**

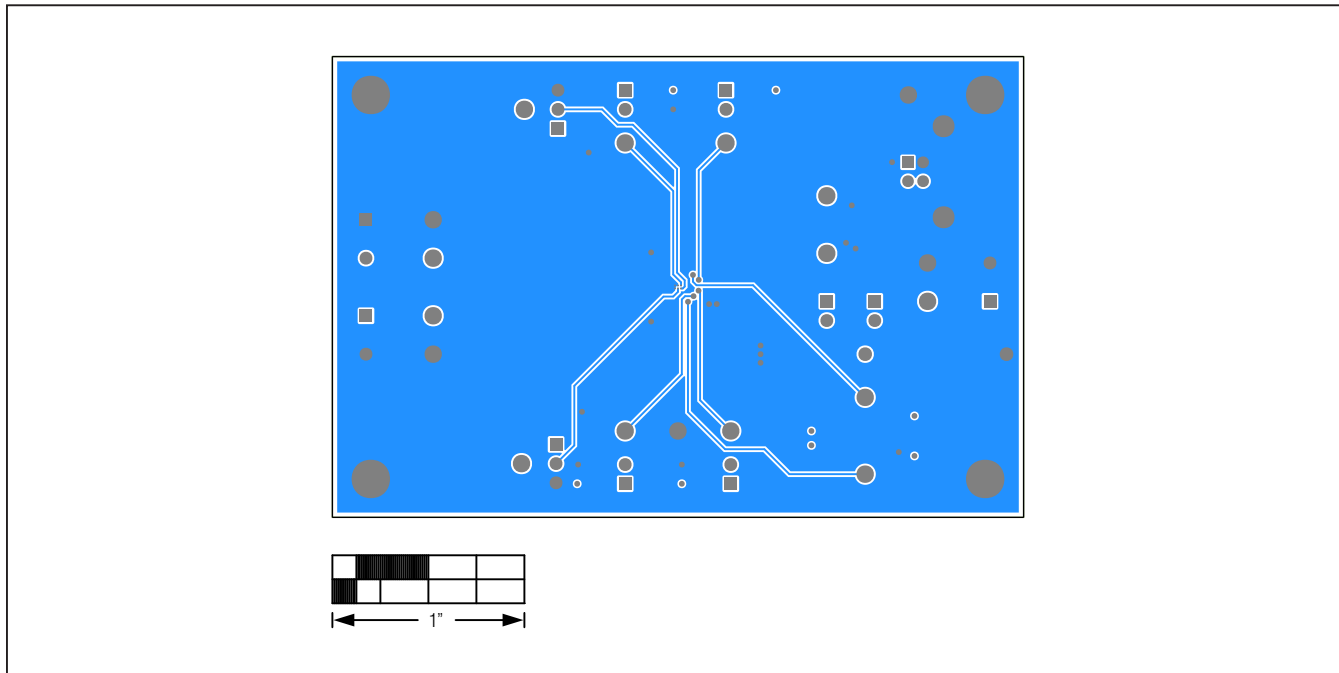


MAX14727 EV Kit—Inner Layer2



MAX14727 EV Kit—Inner Layer3

MAX14727 EV Kit PCB Layout Diagrams (continued)



MAX14727 EV Kit—Bottom

### Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	7/17	Initial release	—

For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim Integrated's website at [www.maximintegrated.com](http://www.maximintegrated.com).

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