

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	100μF capacitor is connected to OUT
	Not installed*	100μF capacitor is not connected to OUT
JU5	Installed	50Ω resistor is connected to OUT
	Not installed*	50Ω 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.

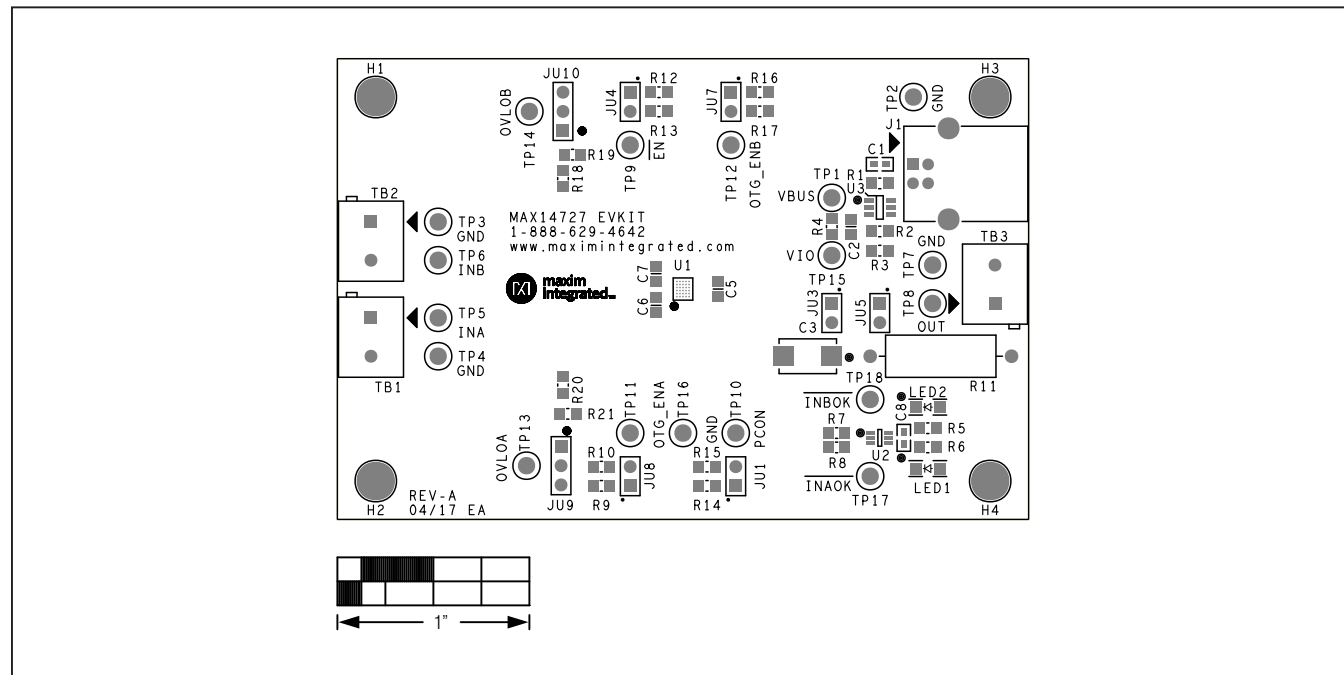
MAX14727 Evaluation Kit

Evaluates: MAX14727/
MAX14728/MAX14731

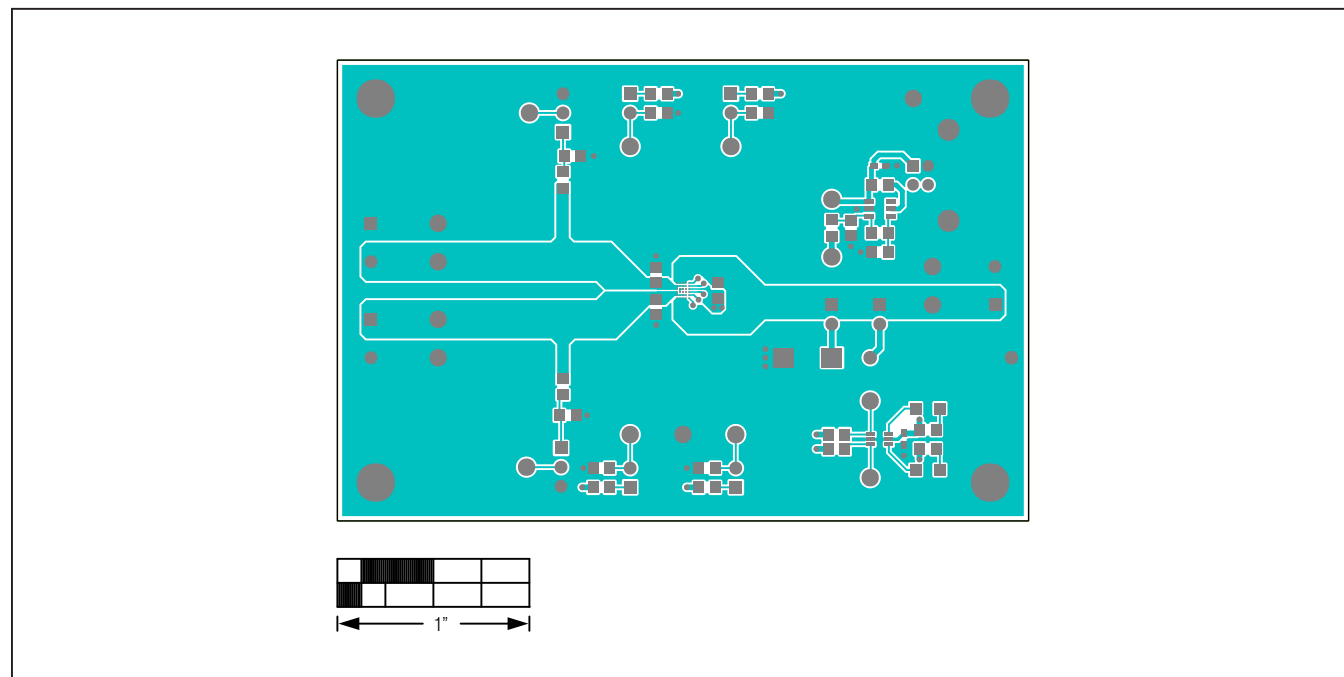
MAX14727 EV Kit Bill of Materials

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	CRCW0805332RKF; 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	TEST POINT 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	MAX14727EWV+	MAXIM	MAX14727EWV+	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

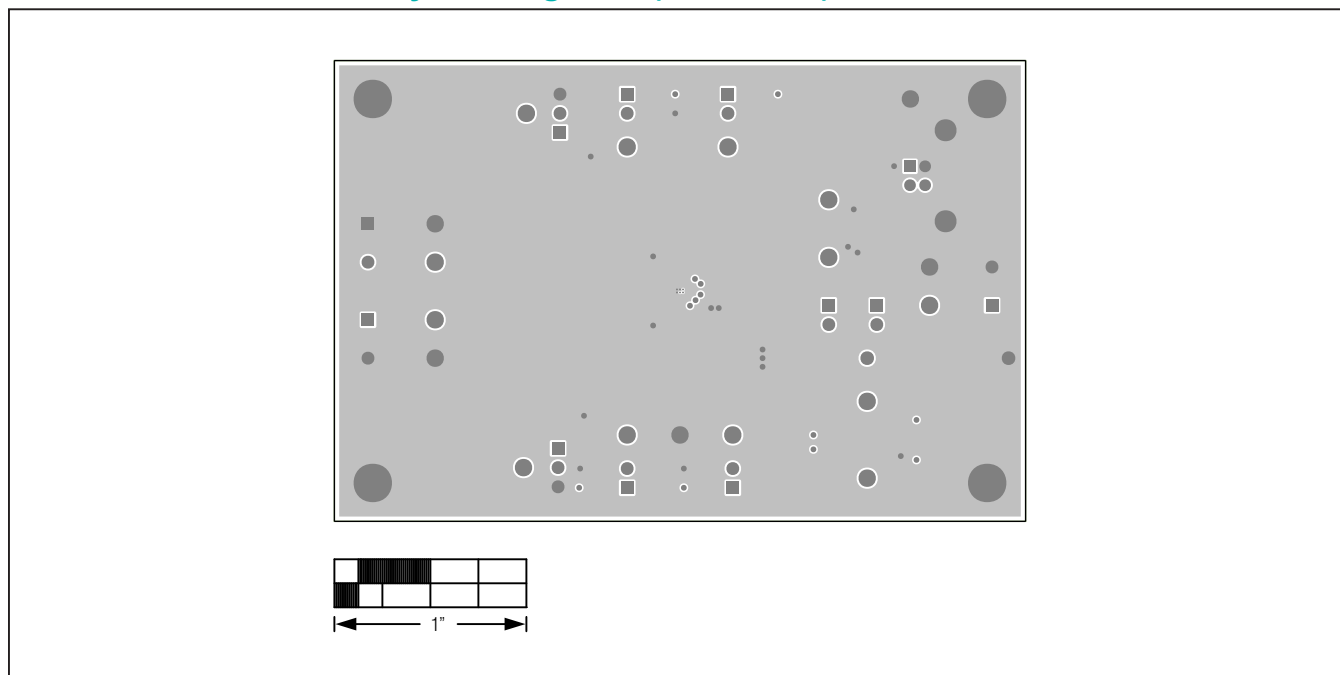


MAX14727 EV Kit—Top Silkscreen

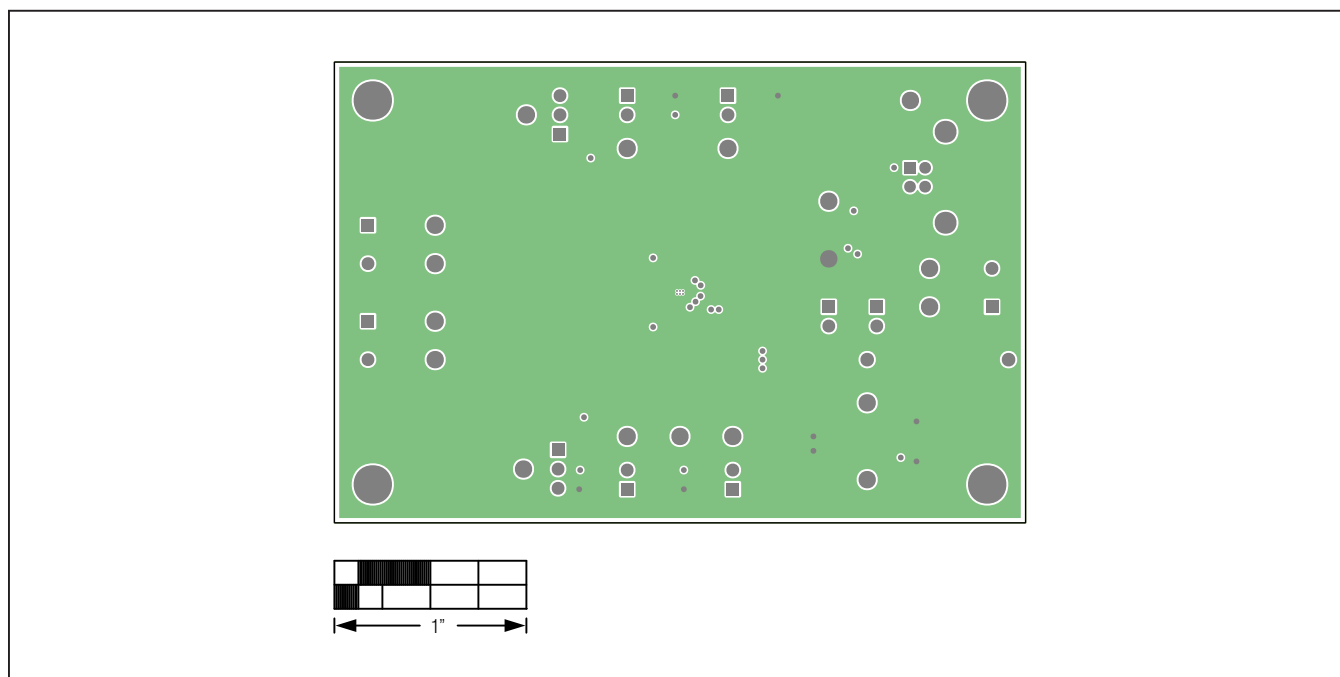


MAX14727 EV Kit—Top

MAX14727 EV Kit PCB Layout Diagrams (continued)

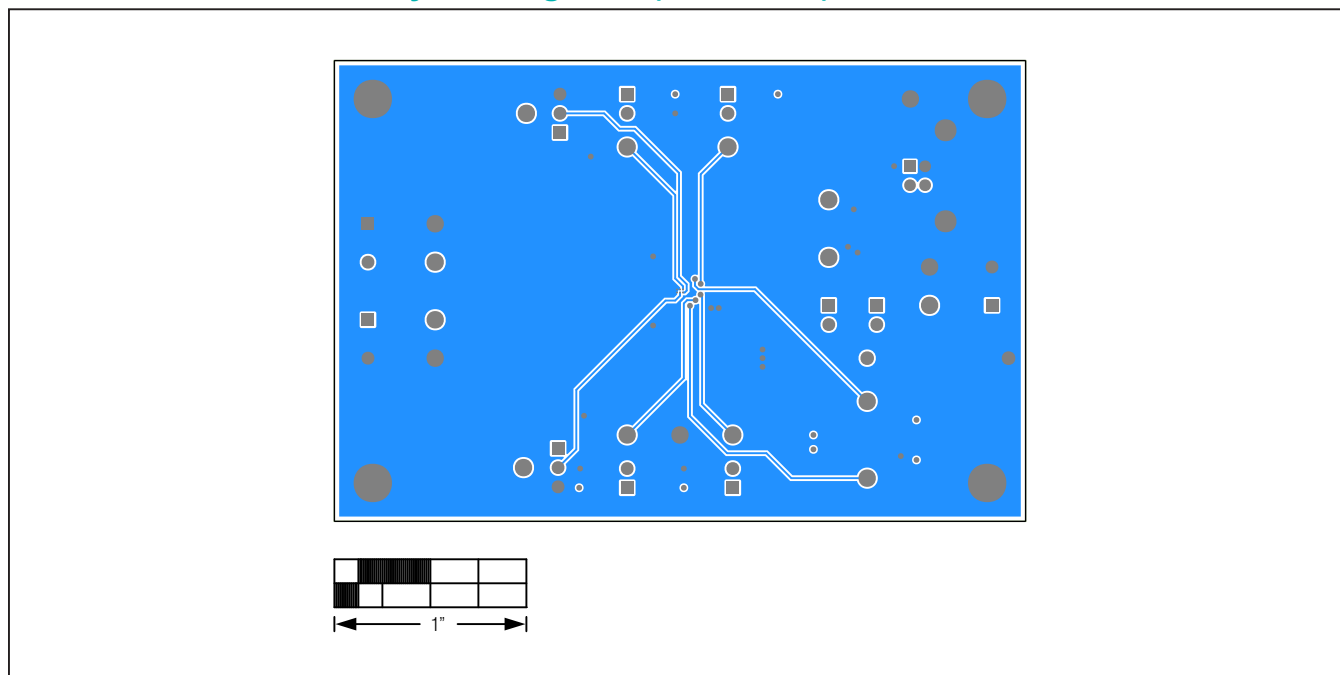


MAX14727 EV Kit—Inner Layer2



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	—

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