

MAX20327 Evaluation Kit

Evaluate: MAX20327

General Description

The MAX20327 evaluation kit (EV kit) is a fully assembled and tested circuit board that demonstrates the functionality of the MAX20327 double-pole, double-throw (DPDT) analog switches in a 9-bump wafer-level package (WLP). The EV kits features 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.

Features

- Proven PCB Layout
 - Decreased 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

Ordering Information appears at end of data sheet.

Quick Start

Required Equipment

- MAX20327 EV kit
- USB power supply or 1.6V 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 devices 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 devices, 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 devices.
- 4) Verify that jumper JU3 has a shunt installed shorting pins 1-2. This shorts the control bit (CB) on the devices 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 J3 is in position 1-2, there is no audio signal heard on the speaker or headphones.

Detailed Description of Hardware

The MAX20327 EV kit is fully assembled and tested circuit board that demonstrates the functionality of the MAX20327 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 devices. SMA connectors (J2–J5) allow for direct connection to a network analyzer. 50 Ω termination resistors (R6, R7) provide termination to match the typical 50 Ω 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 either 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

Ordering Information

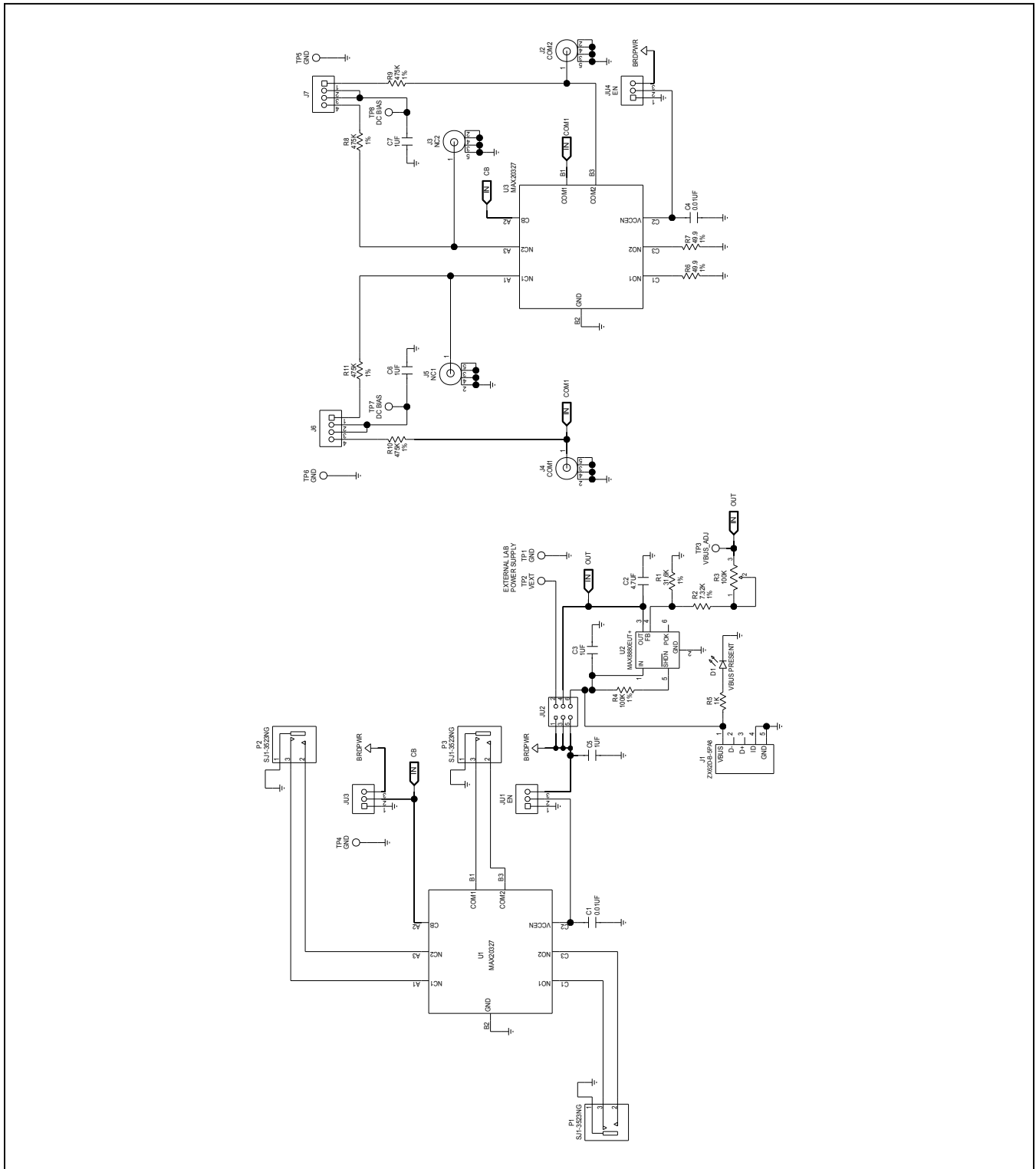
PART	TYPE
MAX20327EVKIT#	EV Kit

#Denotes RoHS compliant.

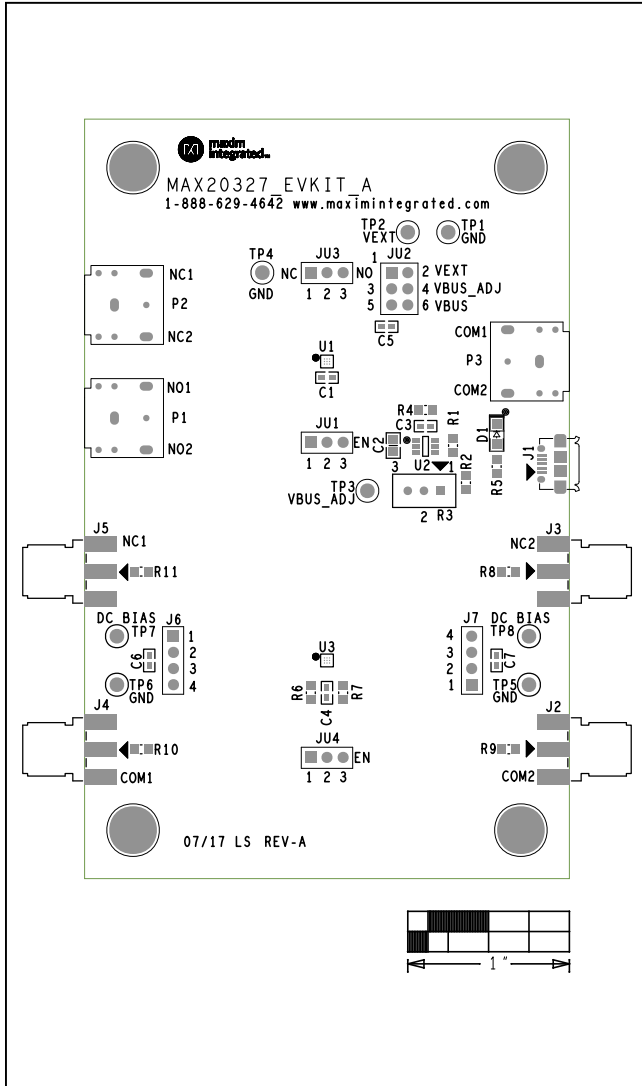
MAX20327 EV Kit Bill of Materials

ITEM	REF_DES	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION	COMMENTS
1	C1, C4	2	GRM188R71C103KA01; ECJ-1VB1C10; CL10B103KO8NHN	MURATA; PANASONIC; SAMSUNG	0.01UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.01UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEG; TC=X7R	
2	C2	1	GRM21BR71A475KA73; LMK212B7475KG-T; C2012X7R1A475K125AC	MURATA; TAIYO YUDEN; TDK	4.7UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 4.7UF; 10V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R	
3	C3, C5-C7	4	GRM188R61A105KA61; C1608X5R1A105K	MURATA/TDK	1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 10V; TOL=10%; MODEL=; TG=-55 DEGC TO +85 DEGC; TC=X5R;	
4	D1	1	SML-LX1206GW-TR	LUMEX OPTOCOMPONENTS INC	SML-LX1206GW-TR	DIODE; LED; STANDARD; GREEN; SMT (1206); PIV=2.2V; IF=0.02A; -40 DEGC TO +85 DEGC	
5	H1-H4	4	PMS_632_0031_PH	GENERIC PART	PMS_632_0031_PH	MACHINE FABRICATED; PAN- ; 6-32; 5/16IN; 8.8 ZINC PLATED STEEL	
6	J1	1	ZX62D-B-5PA8	HIROSE ELECTRIC CO LTD.	ZX62D-B-5PA8	CONNECTOR; MALE; THROUGH HOLE; MICRO-USB CONNECTOR; RIGHT ANGLE; 5PINS	
7	J2-J5	4	142-0701-851	JOHNSON COMPONENTS	142-0701-851	CONNECTOR; END LAUNCH JACK RECEPTACLE; BOARDMOUNT; STRAIGHT THROUGH; 2PINS;	
8	J6, J7	2	929647-09-04-I	SAMTEC	929647-09-04-I	CONNECTOR; MALE; THROUGH HOLE; 929 SERIES; STRAIGHT; 4PINS	
9	JU1, JU3, JU4	3	929647-09-03-I	3M	929647-09-03-I	CONNECTOR; MALE; THROUGH HOLE; 929 SERIES; STRAIGHT; 3PINS	
10	JU2	1	929665-09-03-I	3M	929665-09-03-I	CONNECTOR; MALE; THROUGH HOLE; 929 SERIES; STRAIGHT; 6PINS	
11	P1-P3	3	SJ1-3523NG	CUI INC.	SJ1-3523NG	CONNECTOR; FEMALE; THROUGH HOLE; 3.5MM NO SWITCH JACK STEREO, RIGHT ANGLE; 3PINS	
12	R1	1	CRCW080531K6FK; ERJ-6ENF3162V	VISHAY DALE/PANASONIC	31.6K	RESISTOR, 0805, 31.6K OHM, 1%, 100PPM, 0.125W, THICK FILM	
13	R2	1	CRCW08057K32FK	VISHAY DALE	7.32K	RESISTOR; 0805; 7.32K OHM; 1%; 100PPM; 0.125W; THICK FILM	
14	R3	1	3296W-1-104LF	BOURNS	100K	RESISTOR; THROUGH-HOLE-RADIAL LEAD; 100K OHM; 10%; 100PPM; 0.5W; MOLDER CERAMIC OVER METAL FILM	
15	R4	1	CRCW0805100KFK; RK73HZATTD1003; ERJ-6ENF1003V	VISHAY DALE/KOA SPEER/ PANASONIC	100K	RESISTOR; 0805; 100K; 1%; 100PPM; 0.125W; THICK FILM	
16	R5	1	ERJ-6GEY1102V	PANASONIC	1K	RESISTOR; 0805; 1K OHM; 5%; 200PPM; 0.125W; THICK FILM	
17	R6, R7	2	CRCW080549R9FK; ERJ-6ENF49R9	VISHAY DALE; PANASONIC	49.9	RESISTOR; 0805; 49.9 OHM; 1%; 100PPM; 0.125W; THICK FILM	
18	R8-R11	4	CRCW0805475KFK	VISHAY DALE	475K	RESISTOR; 0805; 475K; 1%; 100PPM; 0.125W; THICK FILM	
19	SU1-SU8	8	SX1100-B	KYCON	SX1100-B	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT;PHOSPHOR BRONZE CONTACT=GOLD PLATED	
20	TP1, TP4-TP6	4	5011 ?		5011	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
21	TP2, TP3	2	5010 ?		5010	TESTPOINT WITH 1.80MM HOLE DIA, RED, MULTIPURPOSE	
22	TP7, TP8	2	5012 ?		5012	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; WHITE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;	
23	U1, U3	2	MAX20327	MAXIM	MAX20327	EVKIT PART - IC; PACKAGE OUTLINE DRAWING: 21-100195; PACKAGE CODE: W91P1+1	
24	U2	1	MAX8880EUT+	MAXIM	MAX8880EUT+	IC; VREG; ULTRA-LOW-IQ LOW-DROPOUT LINEAR REGULATOR WITH POK; SOT23-6	
25	PCB	1	MAX20327	MAXIM	PCB	PCB:MAX20327	-
26	MECH1, MECH2	DNI	AK203-MM-R	ASSMANN	AK203-MM-R	CONNECTOR; MALE; WIREMOUNT; STEREO CONNECTION CABLE,2.0M, 3-PIN, 3.5MM STEREO MALE TO MALE; STRAIGHT; 3PINS	
27	MISC1	DNI	68784-0001	MOLEX	68784-0001	CONNECTOR; MALE; USB; USB A PLUG TO MICRO B PLUG CABLE ASSY; STRAIGHT; 4PINS-5PINS	
TOTAL		60					

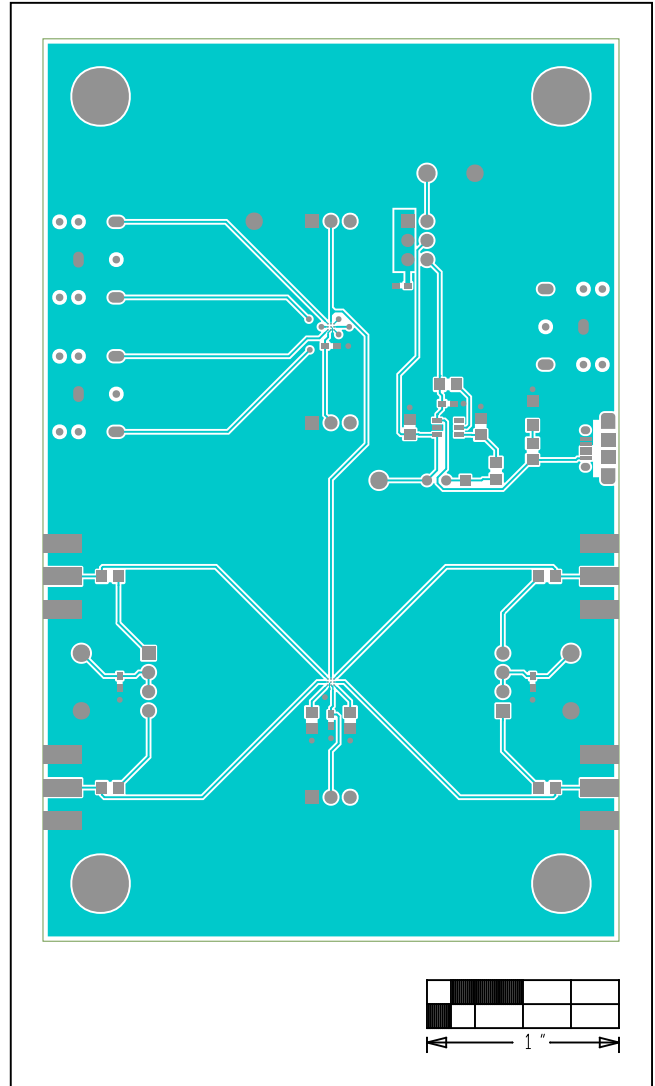
MAX20327 EV Kit Schematic



MAX20327 EV Kit PCB Layout Diagrams

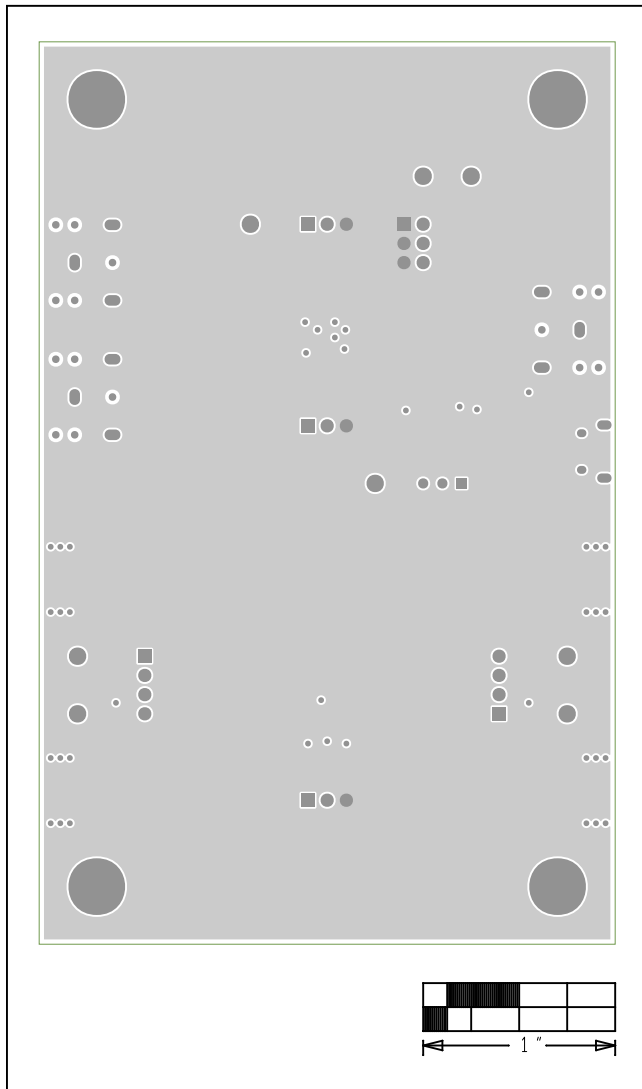


MAX20327 EV Kit—Top Silkscreen

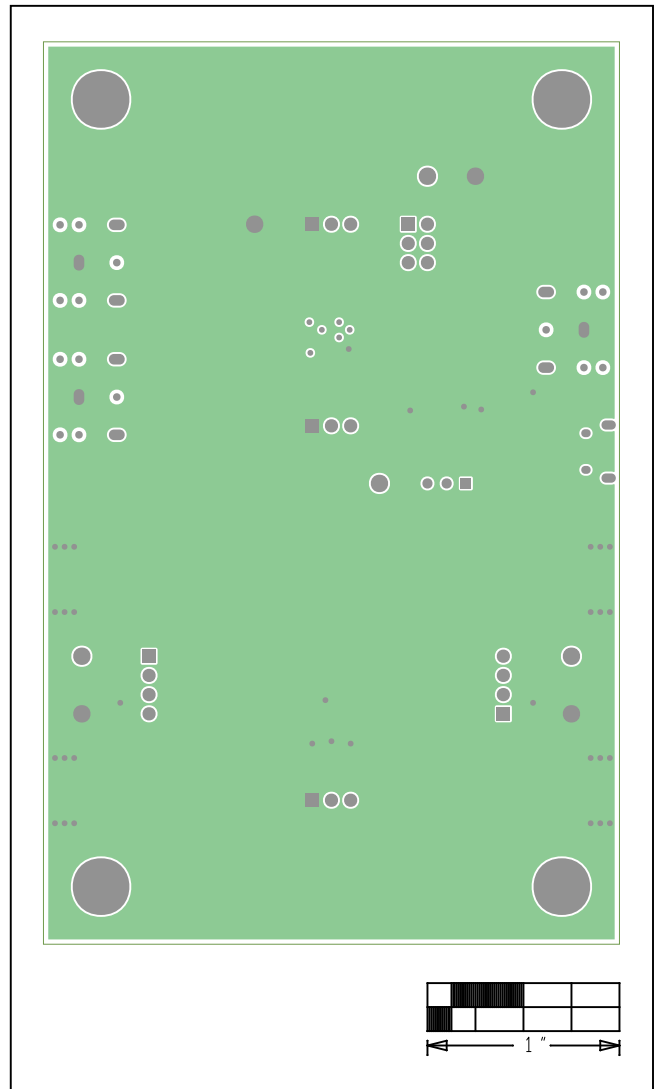


MAX20327 EV Kit—Top

MAX20327 EV Kit PCB Layout Diagrams (continued)

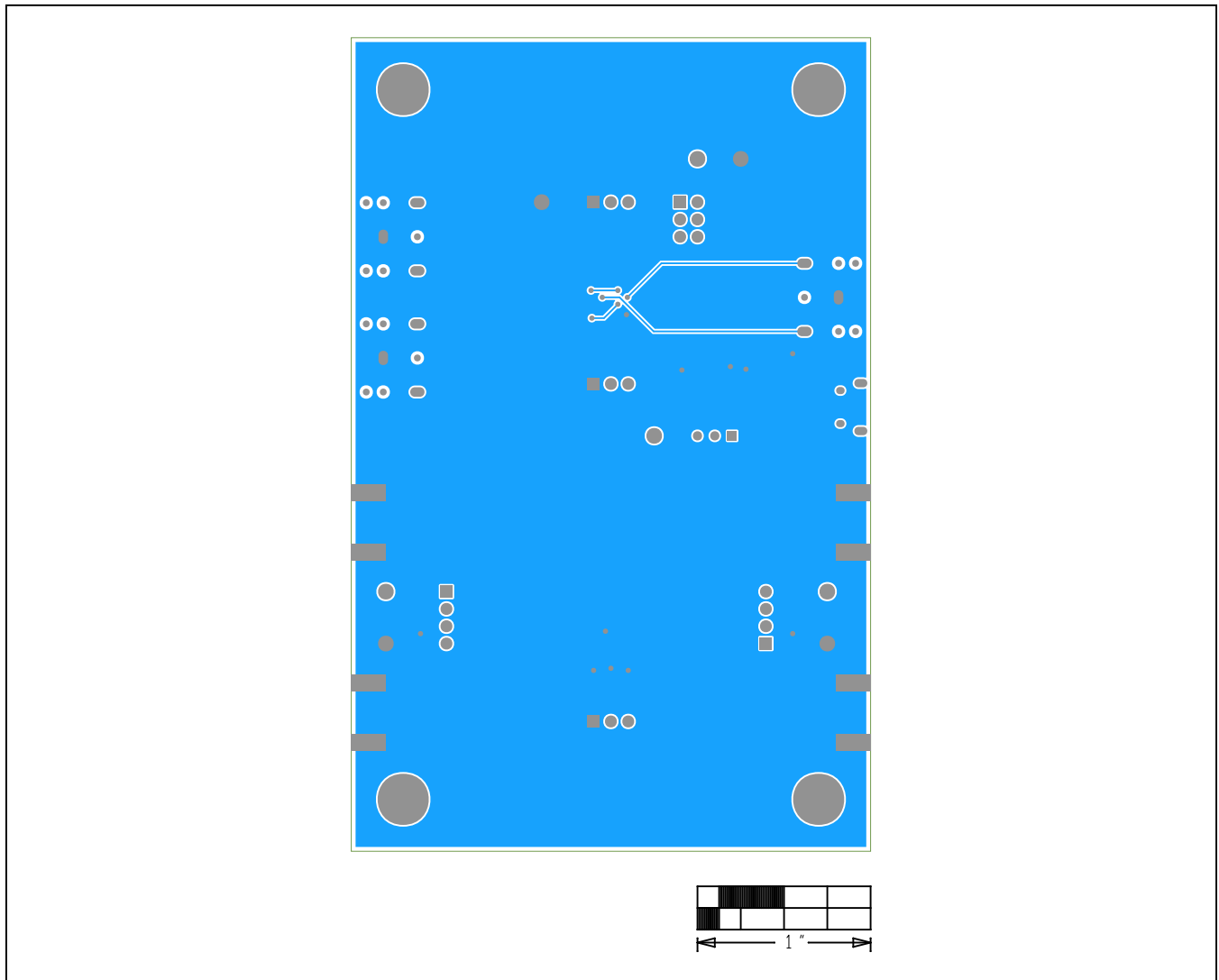


MAX20327 EV Kit—Internal 2



MAX20327 EV Kit—Internal 3

MAX20327 EV Kit PCB Layout Diagrams (continued)



MAX20327 EV Kit—Bottom