

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

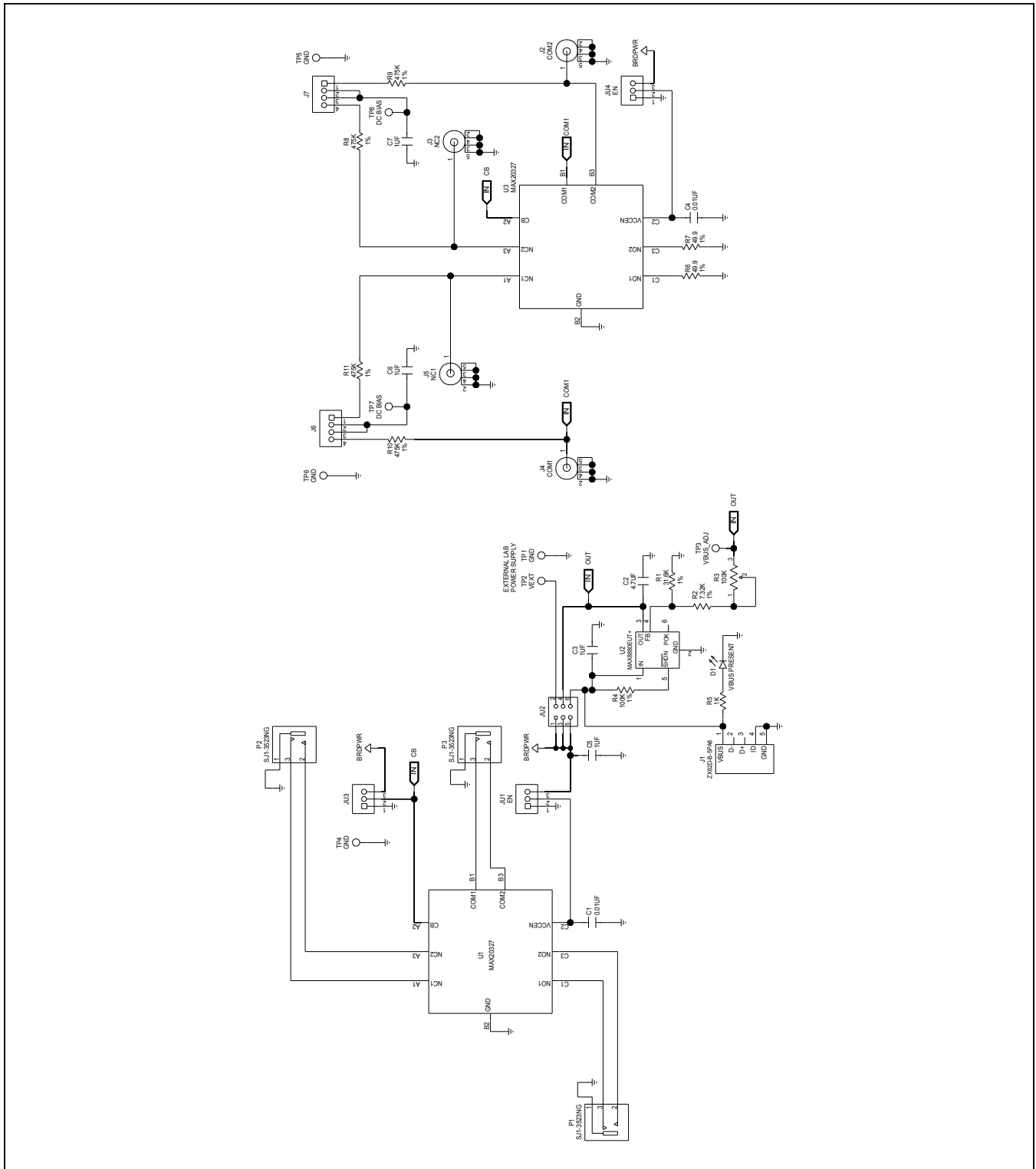
| PART | TYPE |
|----------------|--------|
| MAX20327EVKIT# | EV Kit |

#Denotes RoHS compliant.

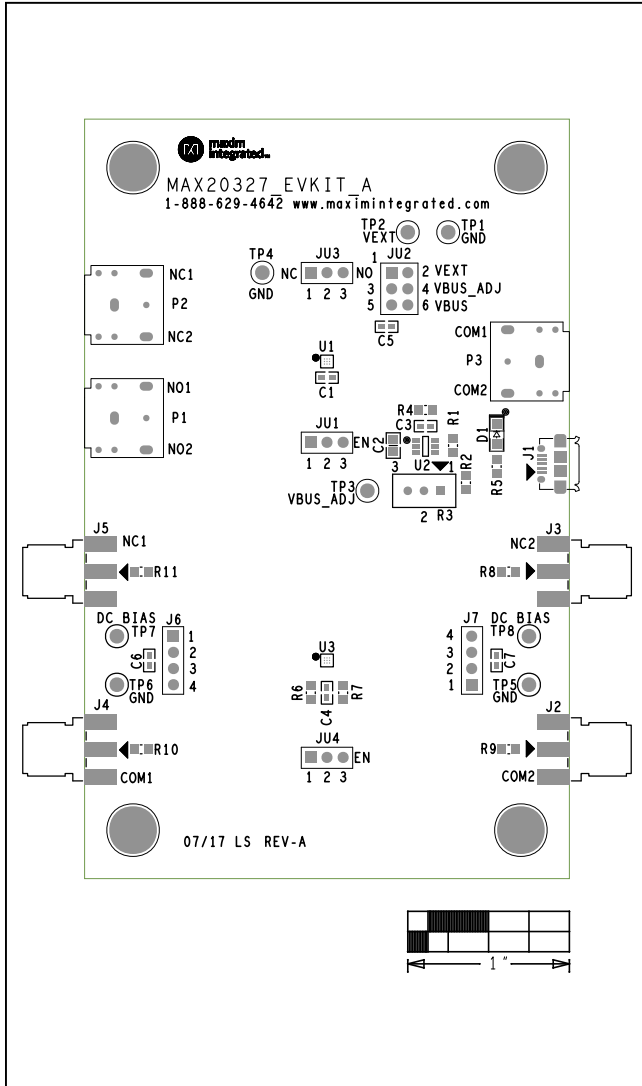
MAX20327 EV Kit Bill of Materials

| ITEM | REF_DES | QTY | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION | COMMENTS |
|-------|---------------|-----|---|-------------------------------------|-----------------|---|----------|
| 1 | C1, C4 | 2 | GRM188R71C103KA01; ECJ-1VB1C10; CL10B103KO8NNN | 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 | | | | | |

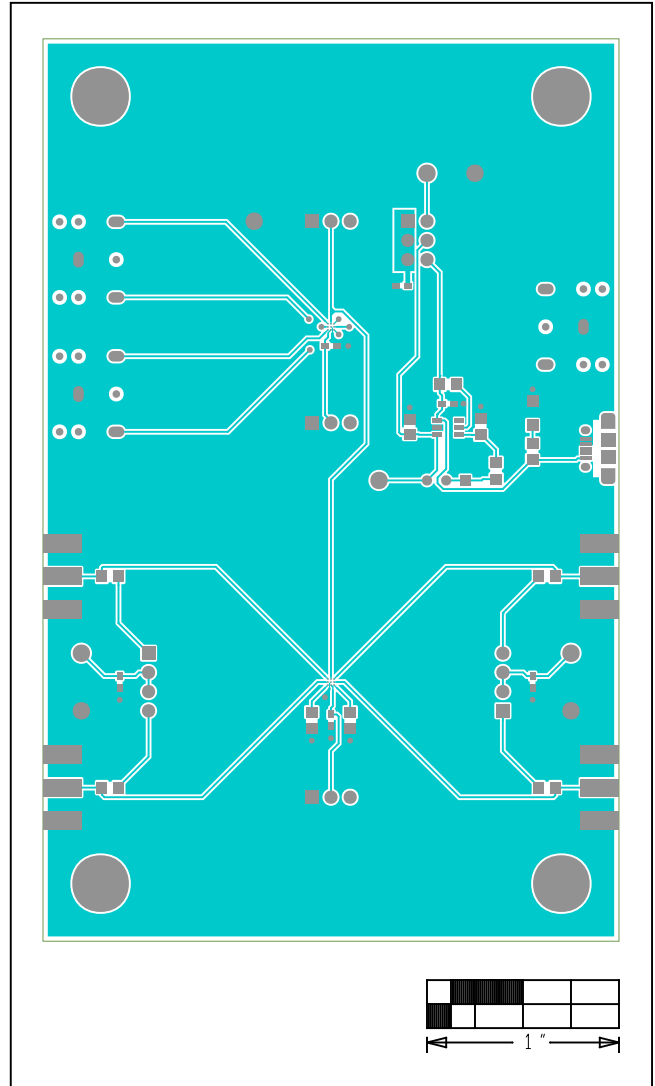
MAX20327 EV Kit Schematic



MAX20327 EV Kit PCB Layout Diagrams

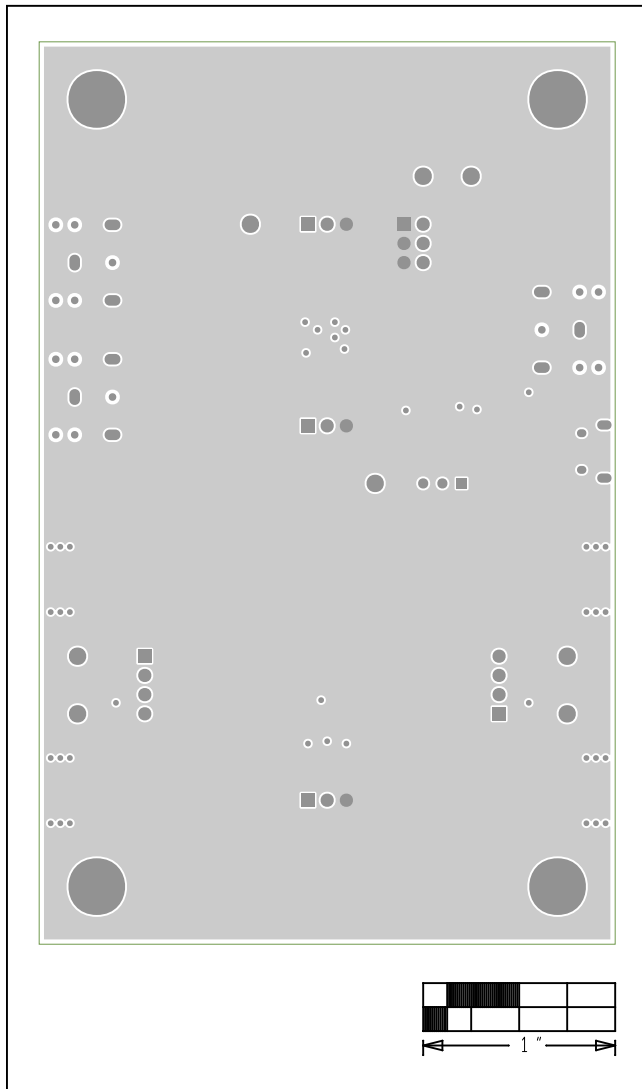


MAX20327 EV Kit—Top Silkscreen

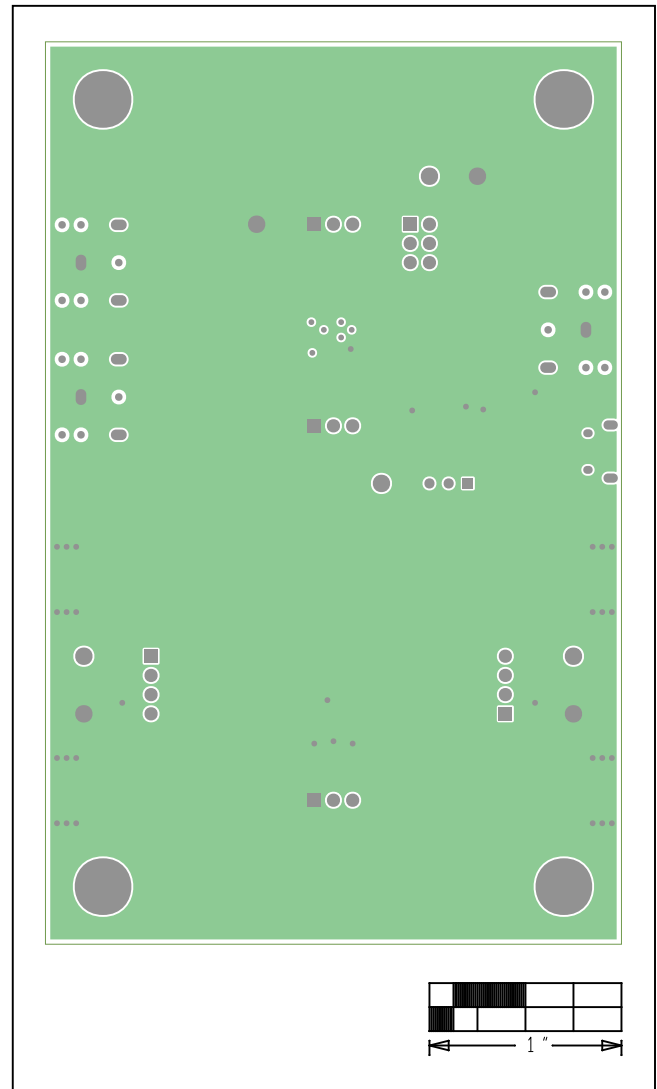


MAX20327 EV Kit—Top

MAX20327 EV Kit PCB Layout Diagrams (continued)

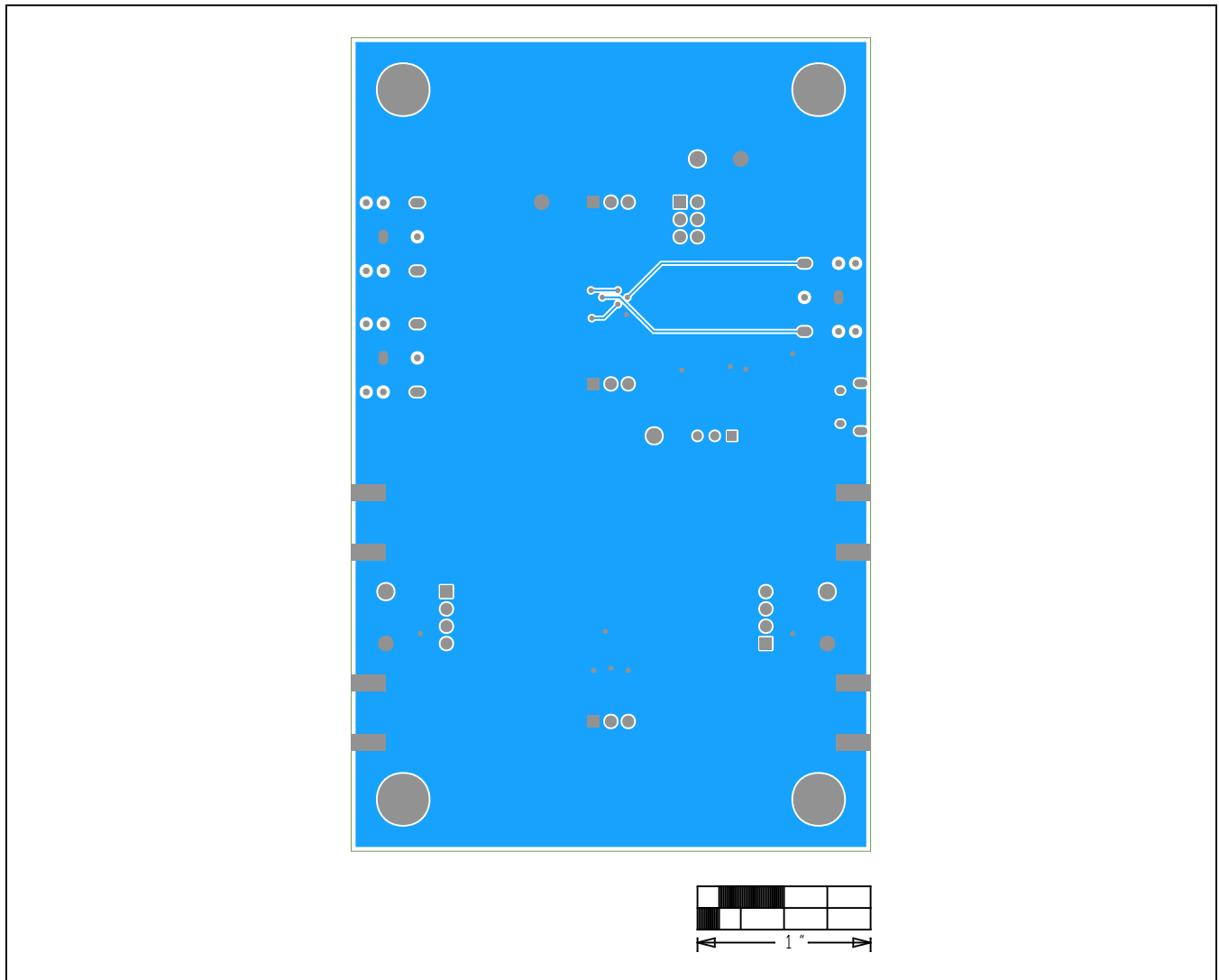


MAX20327 EV Kit—Internal 2



MAX20327 EV Kit—Internal 3

MAX20327 EV Kit PCB Layout Diagrams (continued)



MAX20327 EV Kit—Bottom

Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|-----------------|---------------|-----------------|---------------|
| 0 | 8/18 | Initial release | — |

For pricing, delivery, and ordering information, please visit Maxim Integrated's online storefront at <https://www.maximintegrated.com/en/storefront/storefront.html>.

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