Evaluation Board User Guide

MAX3307XE Evaluation Kit

Evaluates: MAX33076E/MAX33078E

General Description

The MAX3307XE evaluation kit (EV kit) is a fully assembled and tested PCB that demonstrates the functionality of MAX33078E quad-channel RS-485/RS-422 receivers with extended ±25V input common-mode range and ±65V high fault-tolerant. Power for the MAX3307XE EV kit can be provided from a single +3V to +5.5V supply. The EV kit includes on-board terminations for easy evaluation.

The MAX3307XE EV kit is assembled with a MAX33078E in a 16-pin SOIC package. The EV kit can also be used to evaluate the MAX33076E with modification.

Features and Benefits

- Operation from a Single +3V to + 5.5V Supply
- Terminal Block Connectors for Easy RS-485/RS-422 Network Evaluation
- Proven PCB Layout
- Fully Assembled and Tested

Ordering Information appears at end of data sheet.

Quick Start

Required Equipment

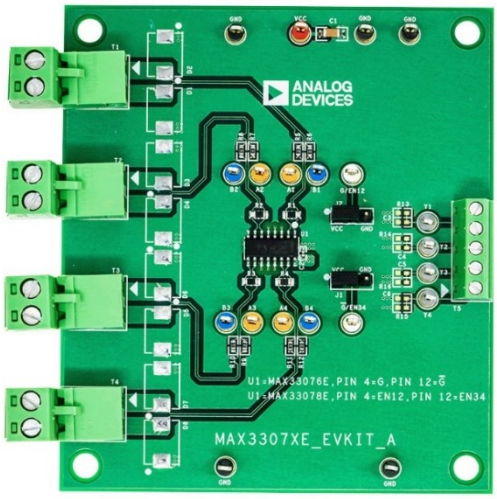
- MAX3307XE EV kit
- +5V, 100mA power supply
- Function/signal generator
- Oscilloscope

Startup Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify board operation (see *Figure 1*).

1. Verify that all jumpers are in their default settings (see *Table 1*).
2. With the power supply disabled, connect the positive terminal of the power supply to the VCC test point. Connect the power supply ground terminal to a GND test point.
3. Set the function/signal generator to output a 2MHz ±1V square wave.
4. Connect the positive output of the function/signal generator to the A1 test point and the negative output to the B1 test point.
5. Turn on the power supply.
6. Turn on the function/signal generator.
7. Using the oscilloscope, verify that the output signal on the Y1 test point switch as the A1 and B1 signals toggles.

MAX3307XE EV Kit Photo



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Detailed Description of Hardware

The MAX3307XE EV kit is a fully assembled and tested circuit board for evaluating the MAX33076E/MAX33078E quad-channel RS-485/RS-422 receivers (U1) with data rate up to 20Mbps, extended ±25V common-mode range, and ±65V fault-tolerant inputs. The EV kit can be powered by a single +3V to +5.5V power supply.

The MAX3307XE EV kit can be used for standalone evaluation or can be connected to an RS-485/RS-422 network for easy evaluation. The EV kit can achieve up to ±15kV Air-Gap Discharge and ±8kV Contact Discharge per IEC 61000-4-2 ESD standard.

Enable Connections

The MAX3307XE EV kit features two jumpers (J1 and J2) to enable/disable the quad-channel receiver outputs. Set J1 to high (1-2) and J2 to low (2-3) to put the MAX33076E in low-power shutdown mode. Set both J1 and J2 to low (2-3) to put the MAX33078E in low-power shutdown mode, see *Table 1* for jumper table.

The EV kit provides test points G/EN12 and $\overline{G}$/EN34 for easy evaluation with external control signals. To use external signals to control G/EN12 and $\overline{G}$/EN34 pins with a RS-485/RS-422 network, remove shunts on J1 and J2, and connect the control signals to G/EN12 and $\overline{G}$/EN34 test points.

Table 1. Jumper Table

U1	JUMPER	SHUNT POSITION	DESCRIPTION
MAX33076E	J1	1-2	$\overline{G}$ is high. When G is low, the device is in shutdown mode.
		2-3	$\overline{G}$ is low. Receivers are enabled.
		Open	$\overline{G}$ is open. Using an external signal, connect the control signal to the $\overline{G}$/EN34 test point.
	J2	1-2	G is high. Receivers are enabled.
		2-3	G is low. When $\overline{G}$ is high, the device is in shutdown mode.
		Open	G is open. Using an external signal, connect the control signal to the G/EN12 test point.
MAX33078E	J1	1-2	EN34 is high. Channels 3 and 4 are enabled.
		2-3	EN34 is low. Channels 3 and 4 are disabled. When EN12 is low, the device is in shutdown mode.
		Open	EN34 is open. Using an external signal, connect the control signal to the $\overline{G}$/EN34 test point.
	J2	1-2	EN12 is high. Channels 1 and 2 are enabled.
		2-3	EN12 is low. Channels 1 and 2 are disabled. When EN34 is low, the device is in shutdown mode.
		Open	EN12 is open. Using an external signal, connect the control signal to the G/EN12 test point.

**Default options are bold.*

Transient Immunity Protection

To meet more robust requirements beyond the MAX33076E/MAX33078E integrated ESD protection, the MAX3307XE EV kit provides SMC footprints on A_ and B_ bus lines for the installation of TVS diodes. Verify the choice of a TVS diode in the application system to ensure it does not slew signals at the required data rate.

Input Terminations

For easy evaluation with long cables, point-to-point communication, or an end-of-line receiver, the MAX3307XE EV kit includes 120Ω termination resistors (R1-R4) between A_ and B_ inputs on MAX33076E/MAX33078E.

Evaluating MAX33078E

The MAX3307XE EV kit is shipped with MAX33078E installed. To evaluate the MAX33076E, order a MAX33076EASE+ free sample with the MAX3307XE EV kit. Remove the MAX33078E (U1) on the EV kit and replace it with the MAX33076EASE+.

MAX3307XE EV Kit Connection Guide

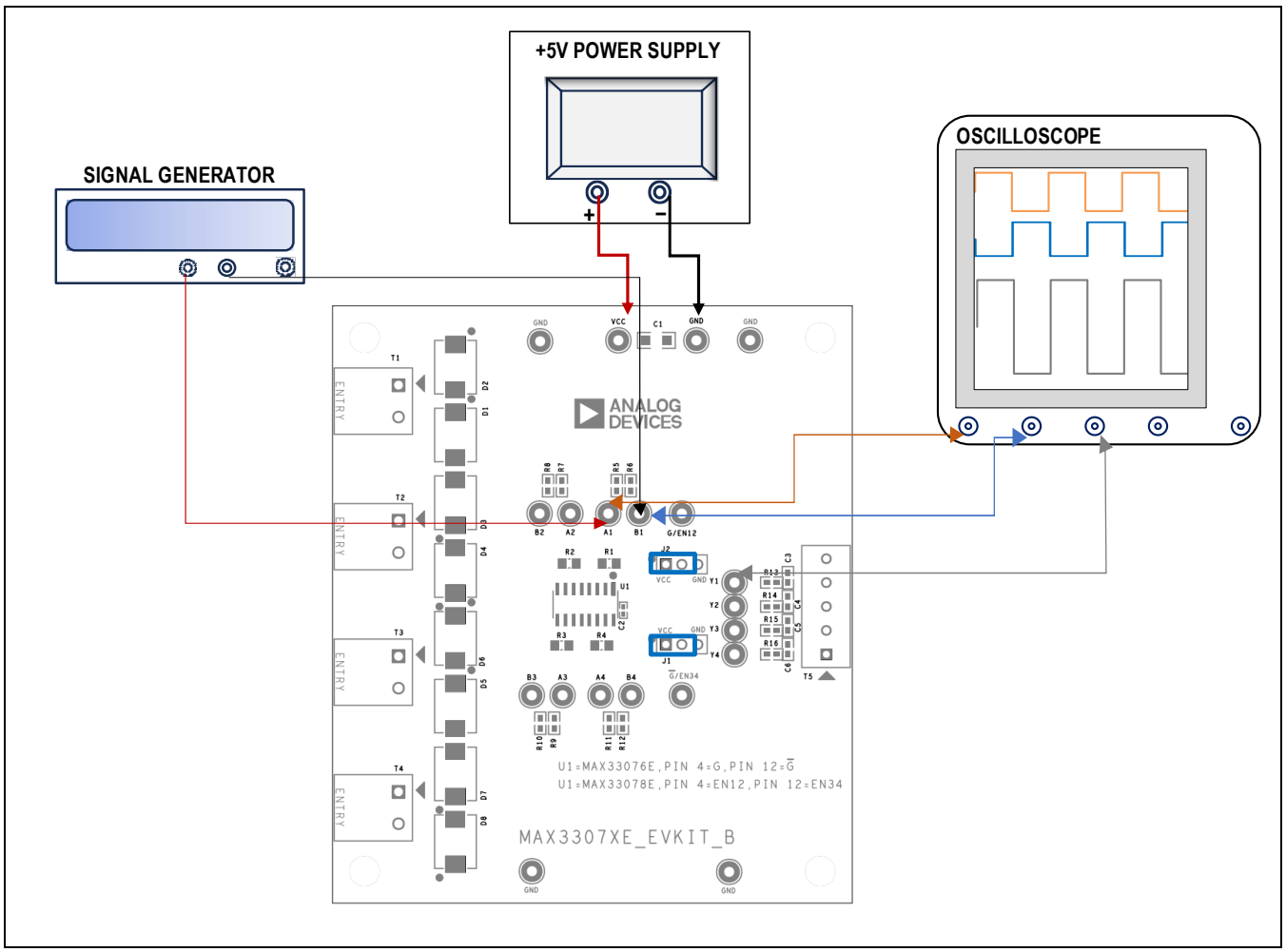


Figure 1. EV Kit Connection Guide

Ordering Information

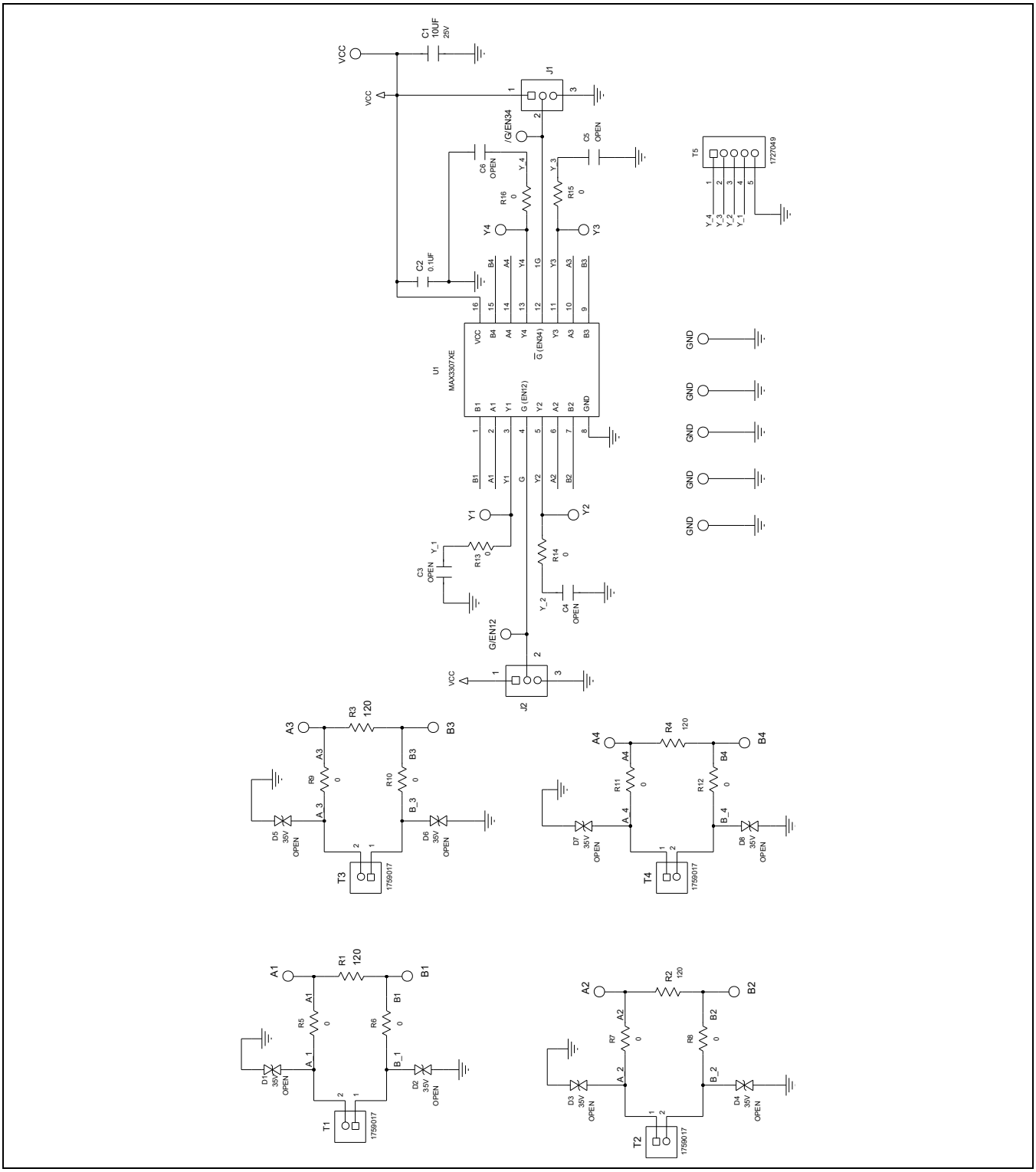
PART	TYPE
MAX3307XEEVKIT#	EV Kit

MAX3307XE EV Kit Bill of Materials

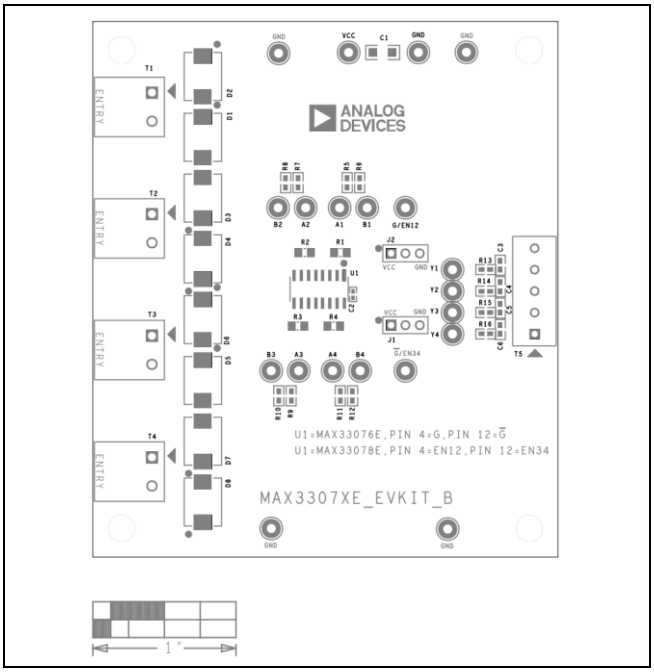
ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	$\overline{G}$/EN34, G/EN12	-	2	5012	KEYSTONE	N/A	TEST POINT; PIN DIA = 0.125IN; TOTAL LENGTH = 0.445IN; BOARD HOLE = 0.063IN; WHITE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
2	A1-A4	-	4	5013	KEYSTONE	N/A	TEST POINT; PIN DIA = 0.125IN; TOTAL LENGTH = 0.445IN; BOARD HOLE = 0.063IN; ORANGE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
3	B1-B4	-	4	5127	KEYSTONE	N/A	TEST POINT; PIN DIA = 0.125IN; TOTAL LENGTH = 0.445IN; BOARD HOLE = 0.063IN; BLUE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
4	BC1-BC4	-	4	1757019	PHOENIX CONTACT	1757019	CONNECTOR; TERM BLOCK; PLUG; CONNECTION TYPE: SCREW CONNECTION; COLOR: GREEN; 2PINS
5	C1	-	1	GRM31CR71E106KA12; CL31B106KAHNNN	MURATA; SAMSUNG	10UF	CAP; SMT (1206); 10UF; 10%; 25V; X7R; CERAMIC
6	C2	-	1	C0402C104J4RAC; GCM155R71C104JA55; C0402C104J4RACTU	KEMET;MURATA; KEMET	0.1UF	CAP; SMT (0402); 0.1UF; 5%; 16V; X7R; CERAMIC
7	GND, GND1-GND4	-	5	5011	KEYSTONE	N/A	TEST POINT; PIN DIA = 0.125IN; TOTAL LENGTH = 0.445IN; BOARD HOLE = 0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
8	J1, J2	-	2	PBC03SAAN	SULLINS	PBC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS; -65°C TO +125°C
9	R1-R4	-	4	CRCW0805120RFK	VISHAY DALE	120	RES; SMT (0805); 120; 1%; ±100PPM/°C; 0.1250W
10	R5-R16	-	12	CRCW06030000ZS; MCR03EZP	VISHAY; ROHM SEMICONDUCTOR; PANASONIC;	0	RES; SMT (0603); 0; JUMPER; JUMPER; 0.1000W

				J000;ERJ-3GEY0R00; CR0603AJ/-000ELF	BOURNS		
11	SPACER1-SPACER4	-	4	9032	KEYSTONE	9032	MACHINE FABRICATED; ROUND-THRU HOLE SPACER; NO THREAD; M3.5; 5/8IN; NYLON
12	SU1, SU2	-	2	S1100-B;SX1100-B;STC02SYAN	KYCON;KYCON; SULLINS ELECTRONICS CORP.	SX1100-B	TEST POINT; JUMPER; STR; TOTAL LENGTH = 0.24IN; BLACK; INSULATION = PBT; PHOSPHOR BRONZE CONTACT = GOLD PLATED
13	T1-T4	-	4	1759017	PHOENIX CONTACT	1759017	CONNECTOR; MALE; THROUGH HOLE; PCB HEADER; PLUGGABLE TERMINAL BLOCK; RIGHT ANGLE; 2PINS
14	T5	-	1	1727049	PHOENIX CONTACT	1727049	CONNECTOR; THROUGH HOLE; GREEN TERMINAL BLOCK; RIGHT ANGLE; 5PINS
15	U1	-	1	MAX3307XE	ANALOG DEVICES	MAX33078EASE+	EV KIT PART - IC; RECV; HIGH-SPEED QUAD RS-422/RS-485 RECEIVERS WITH ± 65V FAULT PROTECTION; ±25V CMR; AND ± 25KV ESD PROTECTION; NSOIC16;
16	VCC	-	1	5010	KEYSTONE	N/A	TEST POINT; PIN DIA = 0.125IN; TOTAL LENGTH = 0.445IN; BOARD HOLE = 0.063IN; RED; PHOSPHOR BRONZE WIRE SIL;
17	Y1-Y4	-	4	5128	KEYSTONE	N/A	TEST POINT; PIN DIA = 0.125IN; TOTAL LENGTH = 0.445IN; BOARD HOLE = 0.063IN; GREY; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
18	PCB	-	1	MAX3307XE	MAXIM	PCB	PCB:MAX3307XE
19	D1-D8	DNP	0	SM30T35CAY	ST MICRO ELECTRONICS	35V	DIODE; TVS; SMC (DO-214AB); PIV = 35V; IF = 0.2µA
20	C3-C6	DNP	0	N/A	N/A	OPEN	PACKAGE OUTLINE 0603 NON-POLAR CAPACITOR

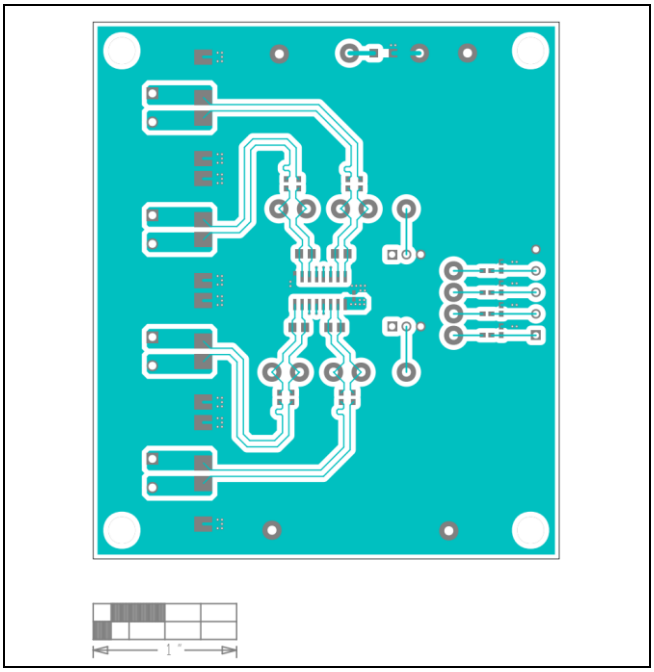
MAX3307XE EV Kit Schematic



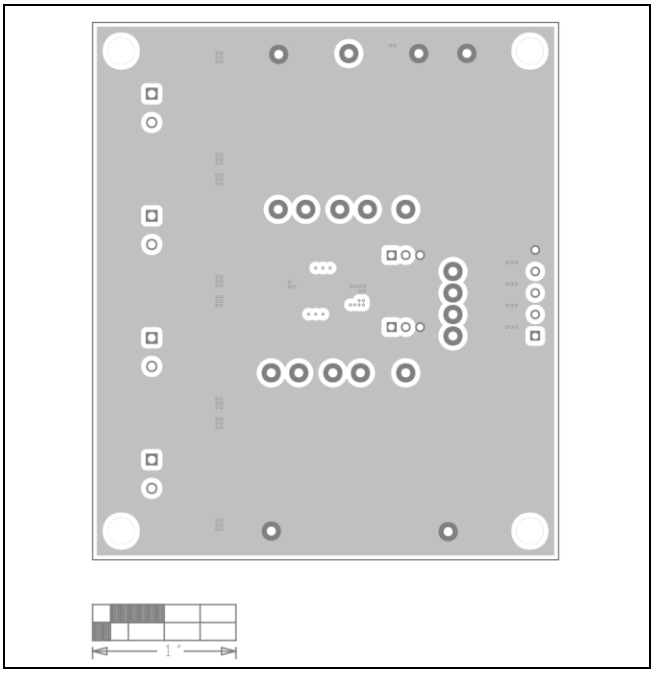
MAX3307XE EV Kit PCB Layout



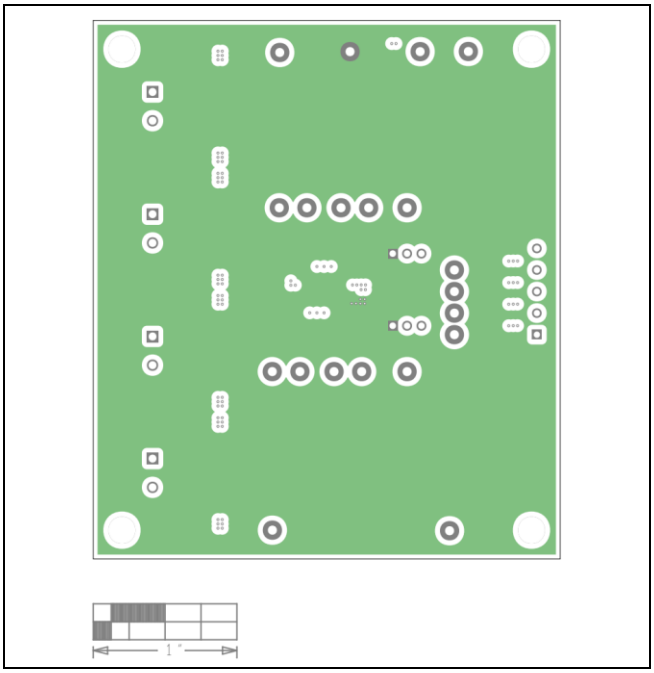
MAX3307XE EV Kit Component Placement Guide—Top Silkscreen



MAX3307XE EV Kit PCB Layout—Top Layer

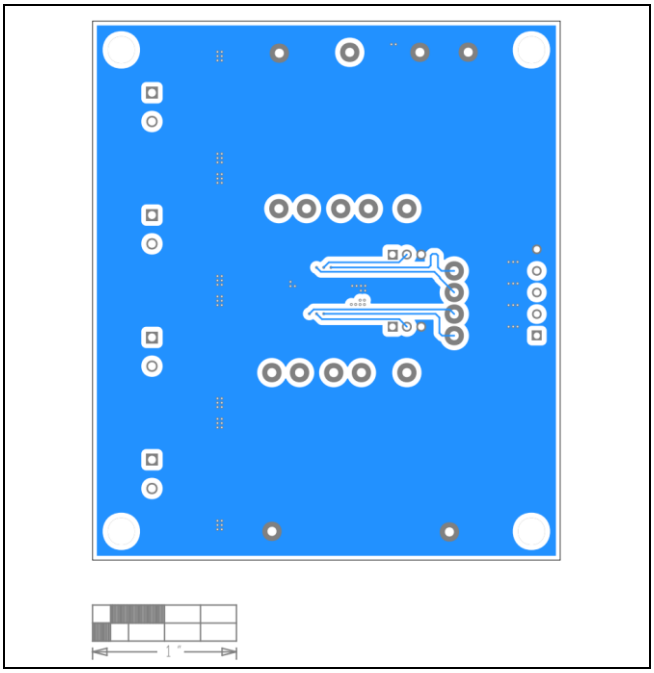


MAX3307XE EV Kit PCB Layout—Layer 2 (GND Layer)

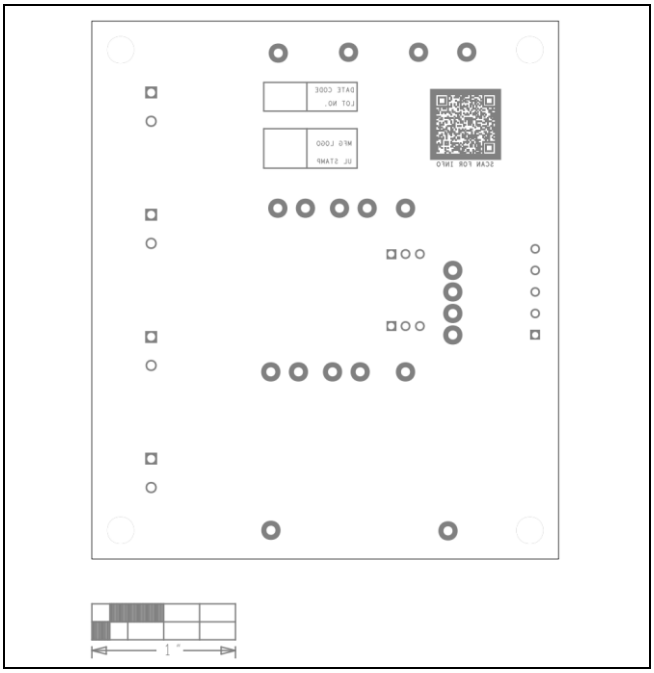


MAX3307XE EV Kit PCB Layout—Layer 3 (VCC Layer)

MAX3307XE EV Kit PCB Layout (continued)



MAX3307XE EV Kit PCB Layout—Bottom Layer



MAX3307XE EV Kit Component Placement Guide—Bottom Silkscreen

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	07/24	Initial release	—

Notes