

MAX148X1 Evaluation Kit

Evaluates: MAX14852/MAX14854/
MAX14856/MAX14858

General Description

The MAX148X1 evaluation kit (EV kit) is a fully assembled and tested PCB that demonstrates the functionality of the MAX14852 isolated RS-485/RS-422 transceiver. The EV kit operates from a single 3.3V supply and features an on-board isolated power supply to power the secondary-side of the circuit.

The MAX148X1 EV kit may also be used to evaluate the MAX14854, MAX14856, and the MAX14858.

Features

- Operates From a Single 3.3V Supply
- Terminal Block Connectors for Easy RS-485/RS-422 Evaluation
- Up to 5000V_{RMS} Isolation for 60s
- Fully Assembled and Tested

Quick Start

Required Equipment

- MAX148X1 EV kit
- 3.3V, 1A DC power supply
- Signal/function generator
- Oscilloscope

Startup Procedure

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

- 1) Set the DC power supply to 3.3V and connect the DC power supply between the EV kits V_{DDA} and G_{NDA} connectors.
- 2) Ensure that all jumpers are in their default positions (see [Table 1](#)).
- 3) Turn on the power supply.
- 4) Set the signal/function generator to output a 100kHz 0-to-3V square wave. *NOTE: Set the signal/function generator to operate with a high-impedance load. If needed, the R1 pad is available to add a 50Ω impedance to ground.*
- 5) Connect the signal/function generator to the TXD test point.
- 6) Using the oscilloscope, verify that the Y and Z outputs switch as the signal toggles.

[Ordering Information](#) appears at end of data sheet.

Detailed Description of Hardware

The EV kit is a fully assembled and tested circuit board for evaluating the MAX14852 isolated RS-485/RS-422 transceiver (U2). The EV kit has been designed to allow for evaluating the MAX14852 alone or in a standard RS-485 configuration. The EV kit is powered from a single 3.3V power supply.

Powering the Board

The power on the EV kit is derived from a single 3.3V source. Connect an external supply from GNDA to either the V_{DDA} test point or P1 connector to supply the 3.3V to the logic-side (A) of the circuit.

An on-board MAX258 transformer driver (U1) and external transformer (TX1) generate an isolated supply for powering the (B) isolated side of the board. To disable the MAX258 circuit, connect jumper J1 to 2-3. To disconnect the output of the transformer circuit from the MAX14852 LDO input, remove the shunt on J5.

Evaluating the Isolated RS-485 Interface

Driver and Receiver Enable Selection

The EV kit features three jumpers (J2, J3, and J4) to enable/disable the driver and receiver outputs. Set J2 to 2-3 to enable the receiver. Set J3 to 1-2 to enable the driver. To actively control both enables, remove J2 and J3 and close J4, which connects DE and $\overline{RE}$ together.

Loopback Configuration

The MAX14852 features one drive channel and one receive channel. Driver outputs are Y and Z and receiver inputs are A and B. To configure the device for loopback testing, close J7 and J8 to connect B to Z and A to Y, respectively.

Resistors R2 – R4 Configuration

For end-of-the-line transceivers, close J9 to connect a 120 Ω termination resistor (R6) between the A and B RS-485 receiver inputs on the MAX14852.

Close J6 to connect a 120 Ω termination resistor (R3) between the Y and Z driver outputs.

Pullup and pulldown resistors are generally used on the receiver inputs to guarantee a known state in the event that all nodes on the bus are in receive mode, or the cable becomes disconnected. The exact value for these resistors will vary with the application. R2 and R4 pads are provided for pullup and pulldown resistors on the Y and Z lines. R5 and R7 pads provide for pullup and pulldown resistors on the A and B lines, if needed. The use of any of these resistors is purely optional. Note that the MAX14852 features true fail-safe receiver inputs, which ensures that RXD is high when the receiver inputs are shorted, open, or connected to an idle bus.

Table 1. Jumper Table (J1-J9)

JUMPER	SHUNT POSITION	DESCRIPTION
J1	1-2	MAX258 transformer driver is disabled.
	2-3*	MAX258 transformer driver is enabled.
J2	1-2*	$\overline{RE}$ is high. The RS-485 receiver is disabled.
	2-3	$\overline{RE}$ is low. The RS-485 receiver is enabled.
J3	1-2*	DE is high. The RS-485 driver outputs are enabled.
	2-3	DE is low. The RS-485 driver outputs are disabled.
J4	Open*	DE and $\overline{RE}$ are not connected together.
	Closed	DE and $\overline{RE}$ are connected together.
J5	Open	The output of the transformer circuit is not connected to VLDO.
	Closed*	The output of the transformer circuit is connected to VLDO and powers the B-side of the MAX14852.
J6	Open*	Y and Z are connected through the on-board 120 Ω termination resistor.
	Closed	Y and Z are not connected through the on-board termination resistor.
J7	Open*	B is not connected to Z.
	Closed	B is connected to Z.
J8	Open*	A is not connected to Y.
	Closed	A is connected to Y.
J9	Open*	A and B are connected through the on-board 120 Ω termination resistor.
	Closed	A and B are not connected through the on-board termination resistor.

*Default position.

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Component Information, PCB Layout and Schematic

See the following links for component information, PCB layout diagrams, and schematic.

- [MAX148X1 EV BOM](#)
- [MAX148X1 EV PCB](#)
- [MAX148X1 EV Schematic](#)

Ordering Information

PART	TYPE
MAX148X1EVKIT#	EV Kit

#Denotes RoHS compliant.

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Revision History

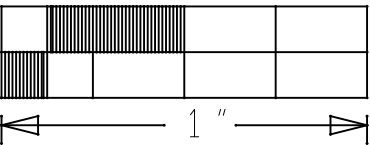
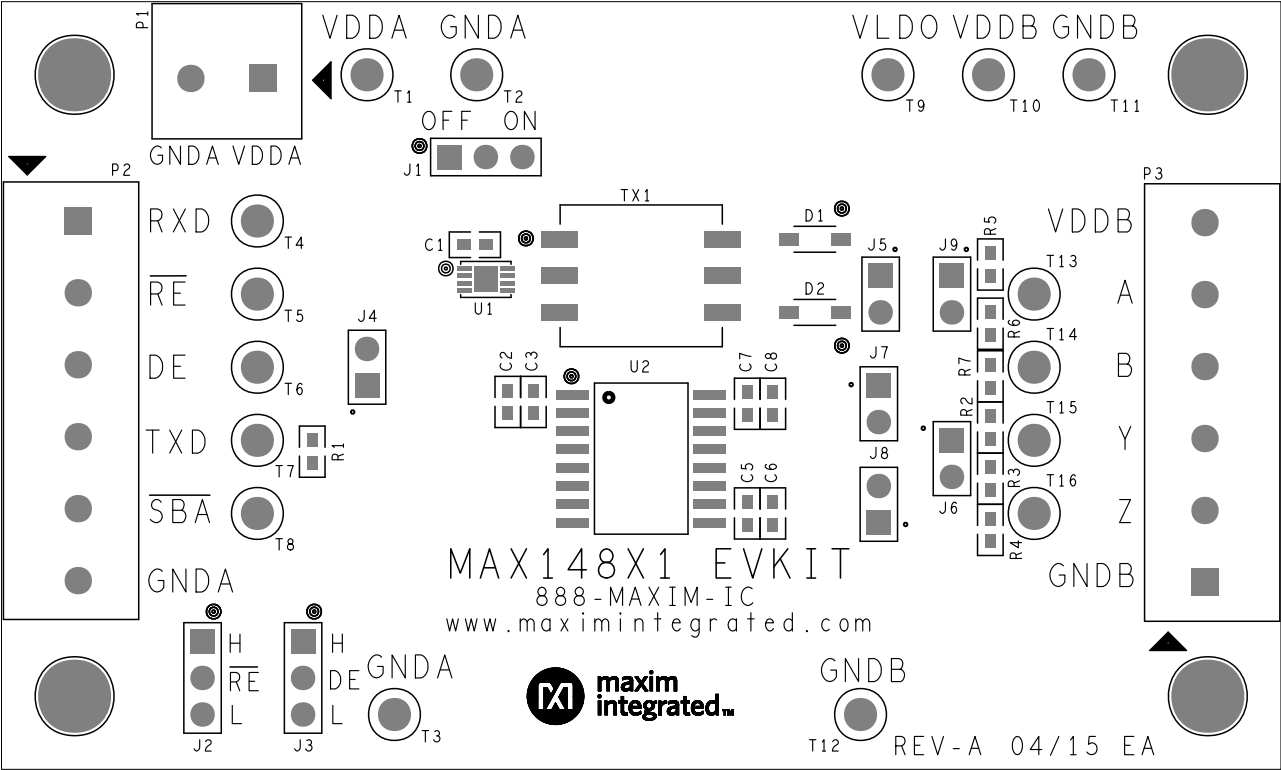
REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	7/16	Initial release	—

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.

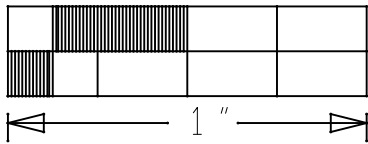
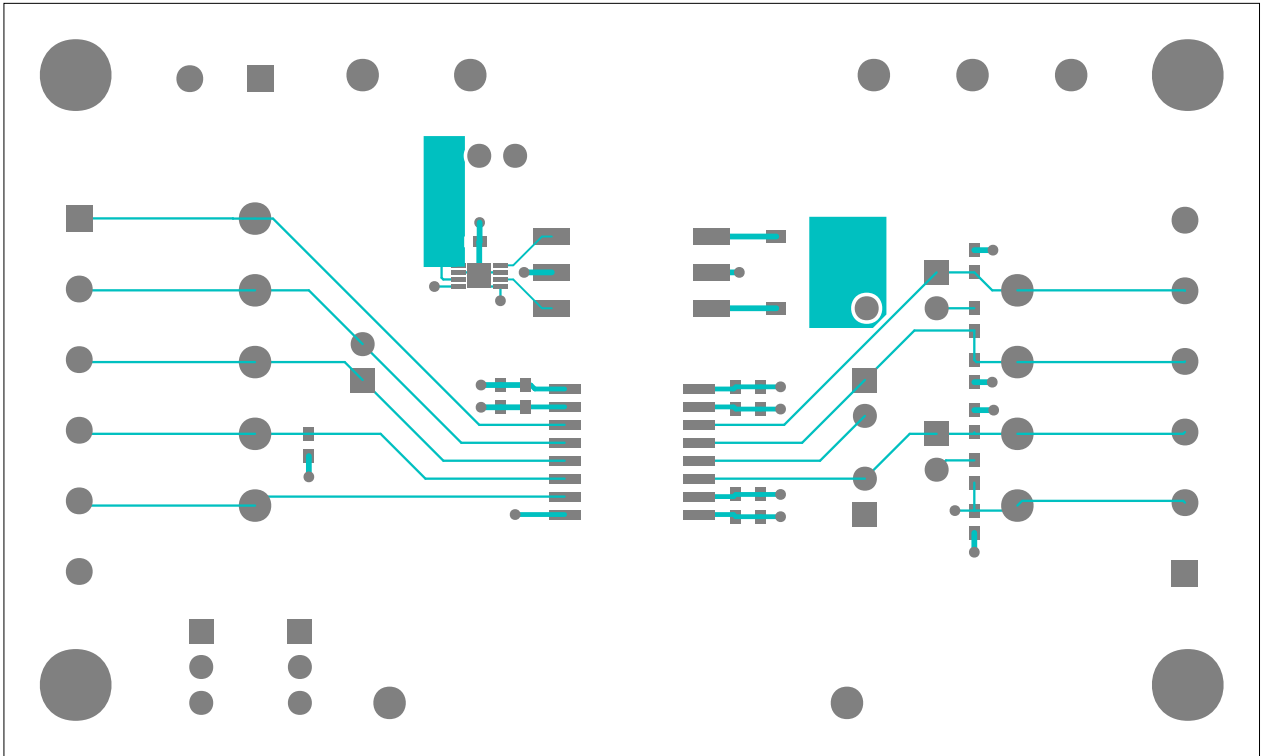
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TITLE: Bill of Materials
DATE: 04/09/2015
DESIGN: max148x1_evkit_a

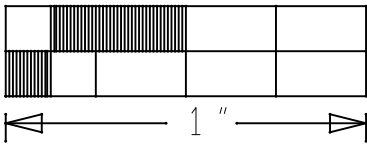
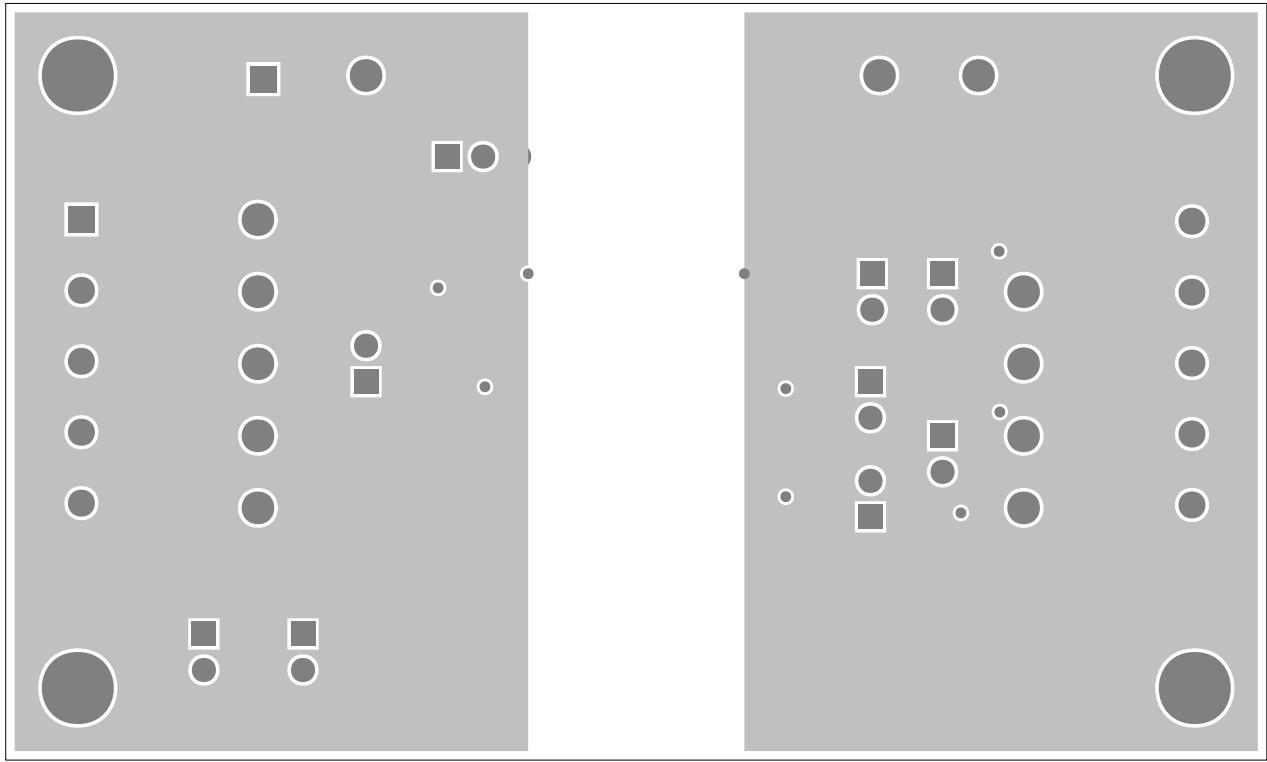
ITEM	REF_DES	DNI	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	C1, C3, C6, C8	-	4	GRM188R71E105KA12D; CGA3E1X7R1E105K	MURATA	1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 1UF; 25V; TOL=10%; MODEL=GRM SERIES; TG=-55 DEGC TO +125 DEGC; TC=X7R
2	C2, C7	-	2	C0603C104K4RAC; GCM188R71C104KA37; C1608X7R1C104K; GRM188R71C104K; C0603X7R160-104KNE	KEMET/MURATA/T DK/VENKEL LTD.	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 16V; TOL=10%; TG=-55 DEGC TO +125 DEGC; TC=X7R;
3	C4, C10	-	2	GRM21BR61E106K; C2012X5R1E106K125AB; C2012X5R1E106K	MURATA/TDK	10UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 10UF; 25V; TOL=10%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=X5R
4	C5	-	1	C0603C104K3RAC; GRM188R71E104KA01; C1608X7R1E104K	KEMET/MURATA/ TDK	0.1UF	CAPACITOR; SMT; 0603; CERAMIC; 0.1uF; 25V; 10%; X7R; -55degC to + 125degC; +/-15% from -55degC to +125degC;
5	D1, D2	-	2	MBR0520	GENERIC PART	MBR0520	DIODE; SCH; SCHOTTKY RECTIFIER; SMT (SOD-123); PIV=20V; IF=0.5A; -55 DEGC TO +150 DEGC
6	J1-J3	-	3	PEC03SAAN	SULLINS	PEC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS
7	J4-J9	-	6	PEC02SAAN	SULLINS	PEC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS
8	P1	-	1	1935161	PHOENIX CONTACT	1935161	CONNECTOR; FEMALE; THROUGH HOLE; GREEN TERMINAL BLOCK; STRAIGHT; 2PINS
9	P2, P3	-	2	1935200	PHOENIX CONTACT	1935200	CONNECTOR; FEMALE; THROUGH HOLE; GREEN TERMINAL BLOCK; STRAIGHT; 6PINS
10	R3, R6	-	2	CRCW0603120RJN	VISHAY DALE	120	RESISTOR; 0603; 120 OHM; 5%; 200PPM; 0.10W; THICK FILM
11	SU1-SU4	-	4	STC02SYAN	SULLINS ELECTRONICS CORP.	STC02SYAN	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.256IN; BLACK; INSULATION=PBT CONTACT=PHOSPHOR BRONZE; COPPER PLATED TIN OVERALL
12	T1, T9, T10	-	3	5010	?	5010	TESTPOINT WITH 1.80MM HOLE DIA, RED, MULTIPURPOSE
13	T2, T3, T11, T12	-	4	5011	?	5011	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
14	T4-T8, T13-T16	-	9	5014	?	5014	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
15	TX1	-	1	TGMS-1455V6LF	HALO ELECTRONICS, INC	TGMS-1455V6LF	TRANSFORMER; SMT; 1:1.5; POWER TRANSFORMER; DRAFT DATASHEET ONLY
16	U1	-	1	MAX258ATA+	MAXIM	MAX258ATA+	IC; DRV; 0.5A; PUSH-PULL TRANSFORMER DRIVER FOR ISOLATED POWER SUPPLY; TDFN8-EP 2X3
17	U2	-	1	MAX14852GWE+	MAXIM	MAX14852	EVKIT PART-IC; PACKAGE CODE: W16M+10; OUTLINE DRAWING NO.: 21-0042; LAND PATTERN DRAWING NO.: 90-0107; WSOIC16 300MIL
18	R1, R2, R4, R5, R7	DNP	5	N/A	N/A	OPEN	PACKAGE OUTLINE 0603 RESISTOR - EVKIT
TOTAL			53				



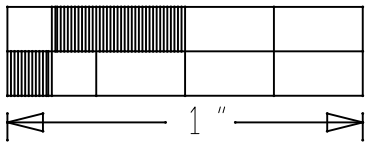
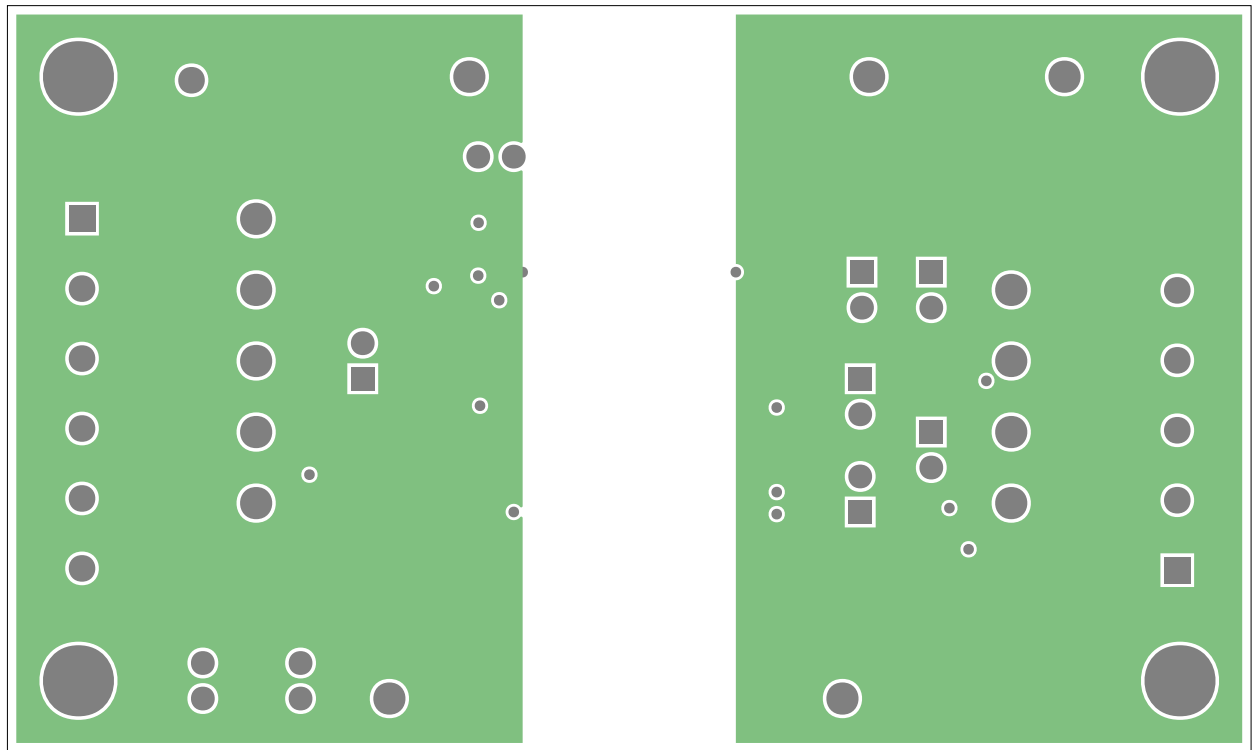
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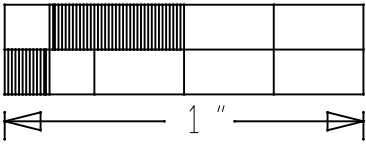
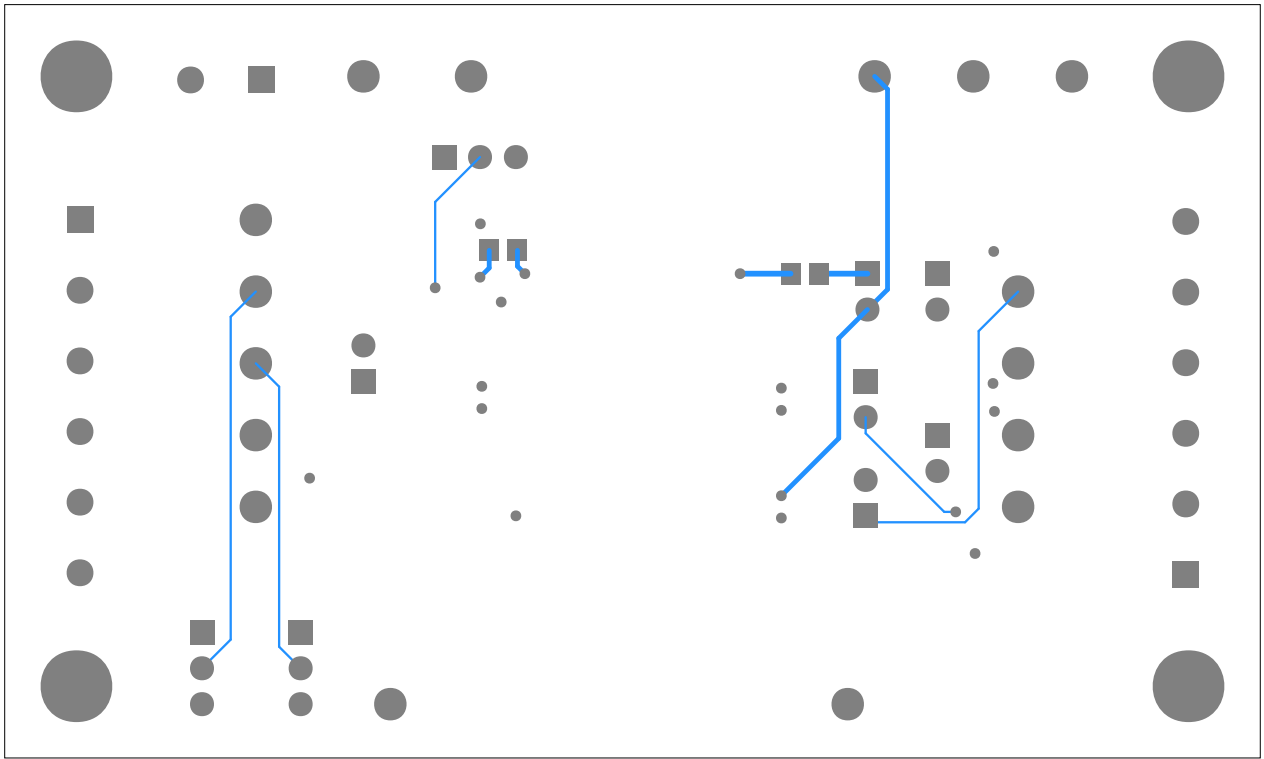
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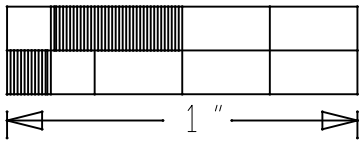
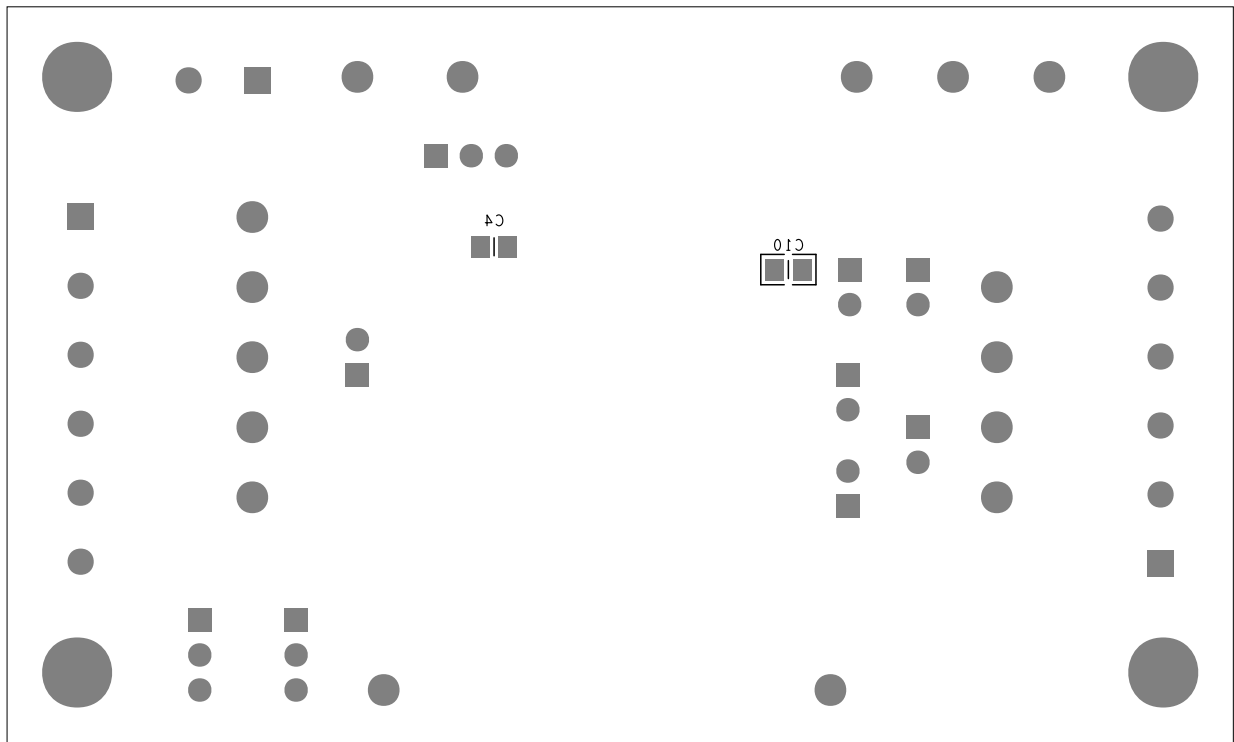
INTERNAL 2



INTERNAL 3



BOTTOM



BOTTOM SILKSCREEN

