

## MAX12930/MAX12931 Evaluation Kit

Evaluates: MAX12930, MAX12931

### General Description

The MAX12930/MAX12931 evaluation kit (EV kit) provides a proven design to evaluate the MAX12930 or MAX12931 two channel digital isolators. Two types of evaluation boards are available to support the narrow-body and wide-body package types.

The EV kit should be powered from two independent isolated power supplies with nominal output voltage in range from 1.71V to 5.5V. For evaluating the electrical parameters of the device without any isolation between the two sides, a single power supply can also be used.

The MAX1293XEVKIT# comes with U1 populated and supports the following digital isolators: MAX12930BASA+, MAX12930CASA+, MAX12930EASA+, MAX12930FASA+, MAX12931BASA+, MAX12931CASA+, MAX12931EASA+, MAX12931FASA+, MAX12931BAWE+

### Features

- Broad Range of Data Transfer Rates (from DC to 150Mbps)
- Two Unidirectional Channels in the Same Direction (MAX12930) or Two Unidirectional Channels in the Opposite Direction (MAX12931)
- SMA Connectors for Easy Connection to External Equipment
- Wide Power Supply Voltage Range from 1.71V to 5.5V
- Guaranteed Up to 3kV<sub>RMS</sub> Isolation (for the Narrow-Body SOIC Package) for 60s
- Guaranteed Up to 5kV<sub>RMS</sub> Isolation (for the Wide-Body SOIC Package) for 60s

Ordering Information appears at end of data sheet.

Table 1. EV Kit Options

EVKIT PART #	TARGET DEVICE	PACKAGE TYPE	COMMENT
MAX12930FEVKIT#	MAX12930FASA+	8-SOIC Narrow-Body	2 channel, 2/0, 150Mbps IC
MAX12930EEVKIT#	MAX12930EASA+	8-SOIC Narrow-Body	2 channel, 2/0, 25Mbps IC
MAX12931FEVKIT#	MAX12931FASA+	8-SOIC Narrow-Body	2 channel, 1/1, 150Mbps IC
MAX12931EEVKIT#	MAX12931EASA+	8-SOIC Narrow-Body	2 channel, 1/1, 25Mbps IC
MAX12931BWEVKIT#	MAX12931BAWE+	16-SOIC Wide-Body	2 channel, 1/1, 25Mbps IC

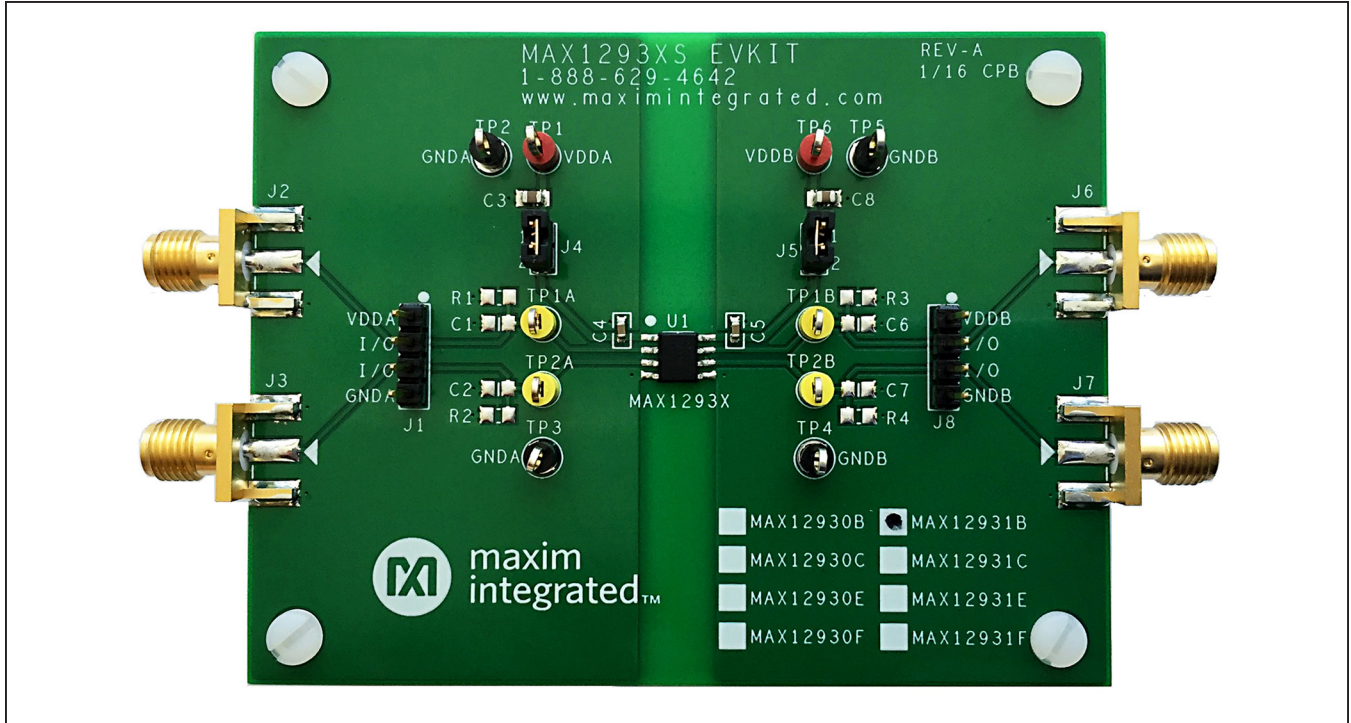


Figure 1. Narrow-Body MAX12931BS EVKIT

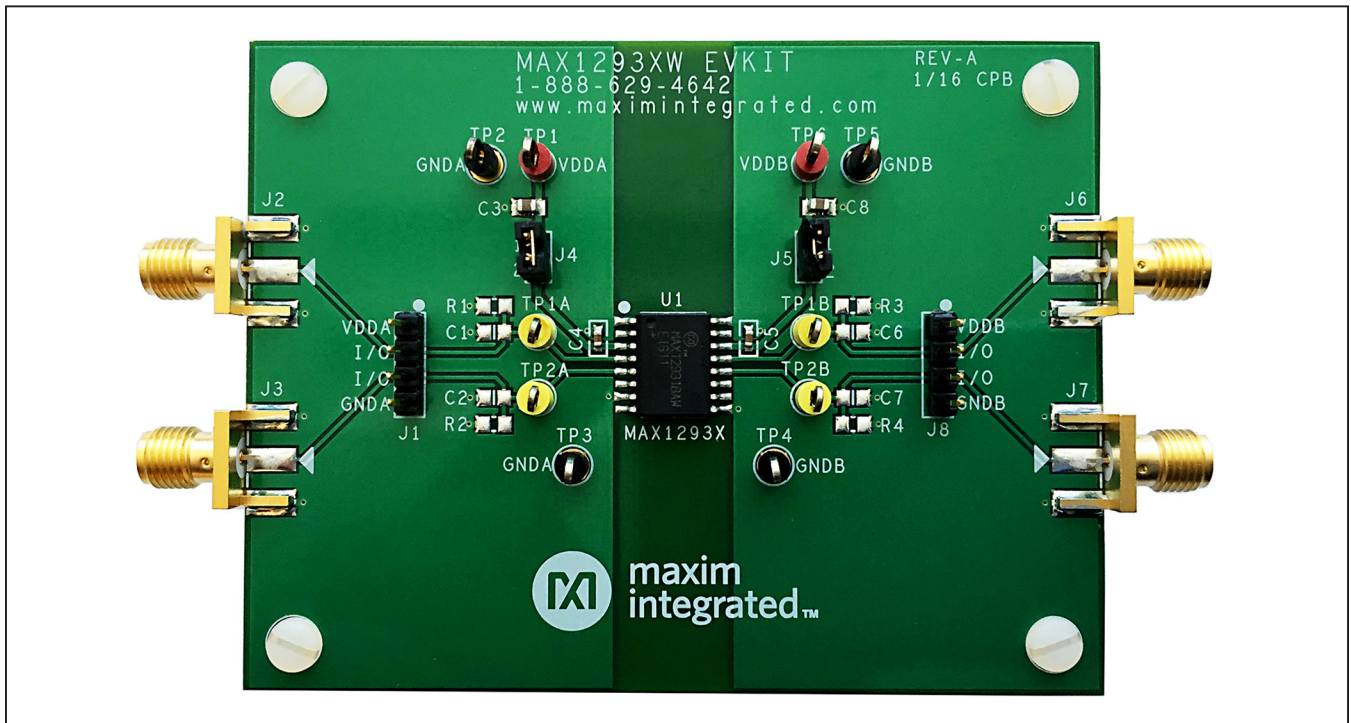


Figure 2. Wide-Body MAX12931BW EVKIT

## Quick Start

### Required Equipment

- MAX12930xS EV kit, MAX12931xS EV kit, or MAX12931BW EV kit
- Two adjustable +5V DC Power Supplies
- Signal/function generator
- Oscilloscope

**Note:** XS suffix stands for narrow-body EV kit; while BW suffix stands for wide-body EV kit.

### Procedure

The MAX12930xS, MAX12931xS, and MAX12931BW EV kits are fully assembled and ready for evaluation. Follow the steps below to verify board functionality:

- 1) Connect the DC power supplies between the MAX1293x EV kit's  $V_{DDA}/V_{DDB}$  and  $GNDA/GNDB$  test points.
- 2) Turn on the DC power supplies and set them between 1.71V and 5.5V, then enable the power supply output. **Note:** It is also possible to power the MAX1293X EV kit from a single power supply to test electrical parameters but this invalidates the digital isolation of the IC.
- 3) Connect the signal/function generator to the SMA connectors or test points of side A and observe the isolated signal on the other side, side B, using an oscilloscope.

**Table 2. MAX12930xS, MAX12931xS, and MAX12931BW Board Connectors and Shunt Positions**

CONNECTOR	SHUNT POSITION	DESCRIPTION
J1	1	Test point or input header for $V_{DDA}$
	2	Test point or input header for I/O; same as J2 SMA
	3	Test point or input header for I/O; same as J3 SMA
	4	Test point or input header for $GNDA$
J2 (SMA)	n/a	I/O on side A
J3 (SMA)	n/a	I/O on side A
J4	Open	Use ampere meter to measure current of side A
	1-2*	Connect power supply to $V_{DDA}$
J5	Open	Use ampere meter to measure current of side B
	1-2*	Connect power supply to $V_{DDB}$
J6 (SMA)	n/a	I/O on side B
J7 (SMA)	n/a	I/O on side B
J8	1	Test point or input header for $V_{DDB}$
	2	Test point or input header for I/O; same as J6 SMA
	3	Test point or input header for I/O; same as J7 SMA
	4	Test point or input header for $GNDB$

\*Default configuration

**Table 3. MAX12930xS, MAX12931xS, and MAX12931BW Test Points**

TEST POINT	DESCRIPTION
TP1	Test point for $V_{DDA}$
TP1A	Test point for SMA connector J2
TP1B	Test point for SMA connector J6
TP2, TP3	Test point for $GNDA$
TP2A	Test point for SMA connector J3
TP2B	Test point for SMA connector J7
TP4, TP5	Test point for $GNDB$
TP6	Test point for $V_{DDB}$

### Detailed Description of Hardware

The MAX12930xS, MAX12931xS, and MAX12931BW EV kit are powered from two external adjustable power supplies as described below.

#### External Power Supplies

Power to the MAX12930xS, MAX12931xS, and MAX12931BW EV kit are derived from two external sources which can both be between +1.71V and +5.5V. Connect one source between the V<sub>DDA</sub> and GNDA test points, and another source between the V<sub>DDDB</sub> and GNDB test points. Each supply can be set independently and can be present over the entire range from 1.71V to 5.5V, regardless of the level or presence of the other supply. The MAX12930/MAX12931 level-shifts the data, transmitting them across the isolation barrier.

Two SMA connectors on each side of the board allow easy connections to signal generator(s) and oscilloscope. A typical application diagram is shown in [Figure 3](#).

#### Decoupling Capacitors

Each power supply is decoupled with a 10µF ceramic capacitor placed close to the power supply test point, and a 0.1µF ceramic capacitor placed close to U1.

#### Termination

Each input and output has an unpopulated 0805 SMT resistor (R1–R4) and a 0805 SMT capacitor (C1, C2, C6, C7) to GND\_ to allow termination based on customer requirements.

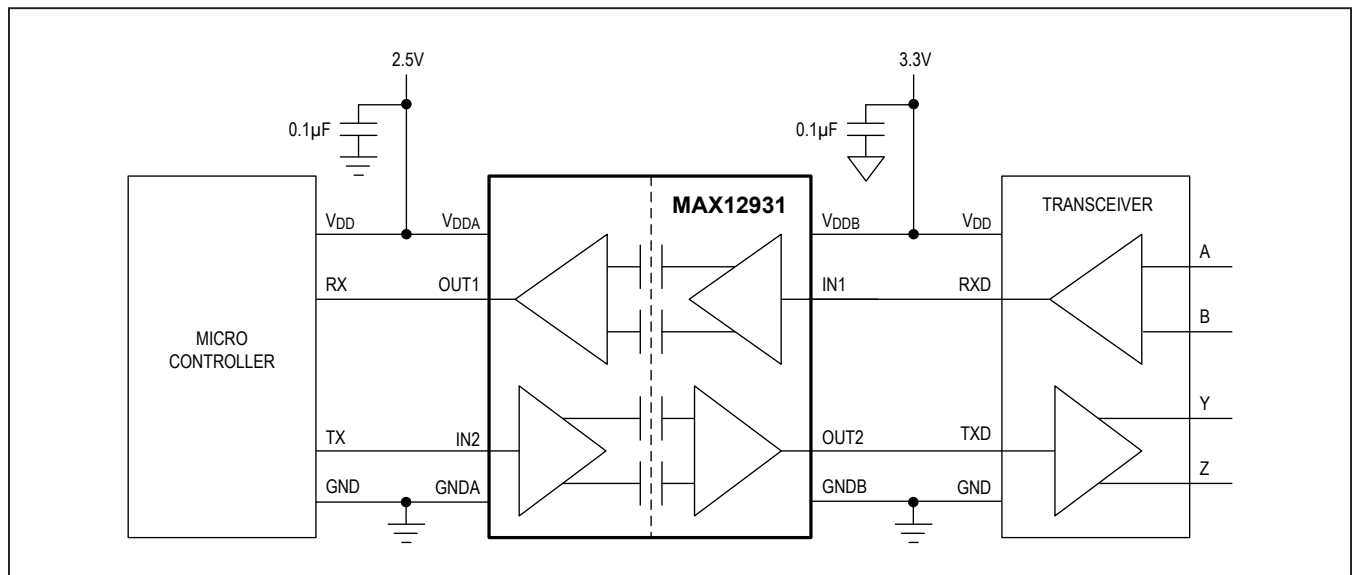


Figure 3. Typical Application Diagram

### Ordering Information

PART	TYPE
MAX12930FEVKIT#	EV Kit with installed MAX12930FASA+
MAX12930EEVKIT#	EV Kit with installed MAX12930EASA+
MAX12931FEVKIT#	EV Kit with installed MAX12931FASA+
MAX12931EEVKIT#	EV Kit with installed MAX12931EASA+
MAX12931BWEVKIT#	EV Kit with installed MAX12931BAWE+

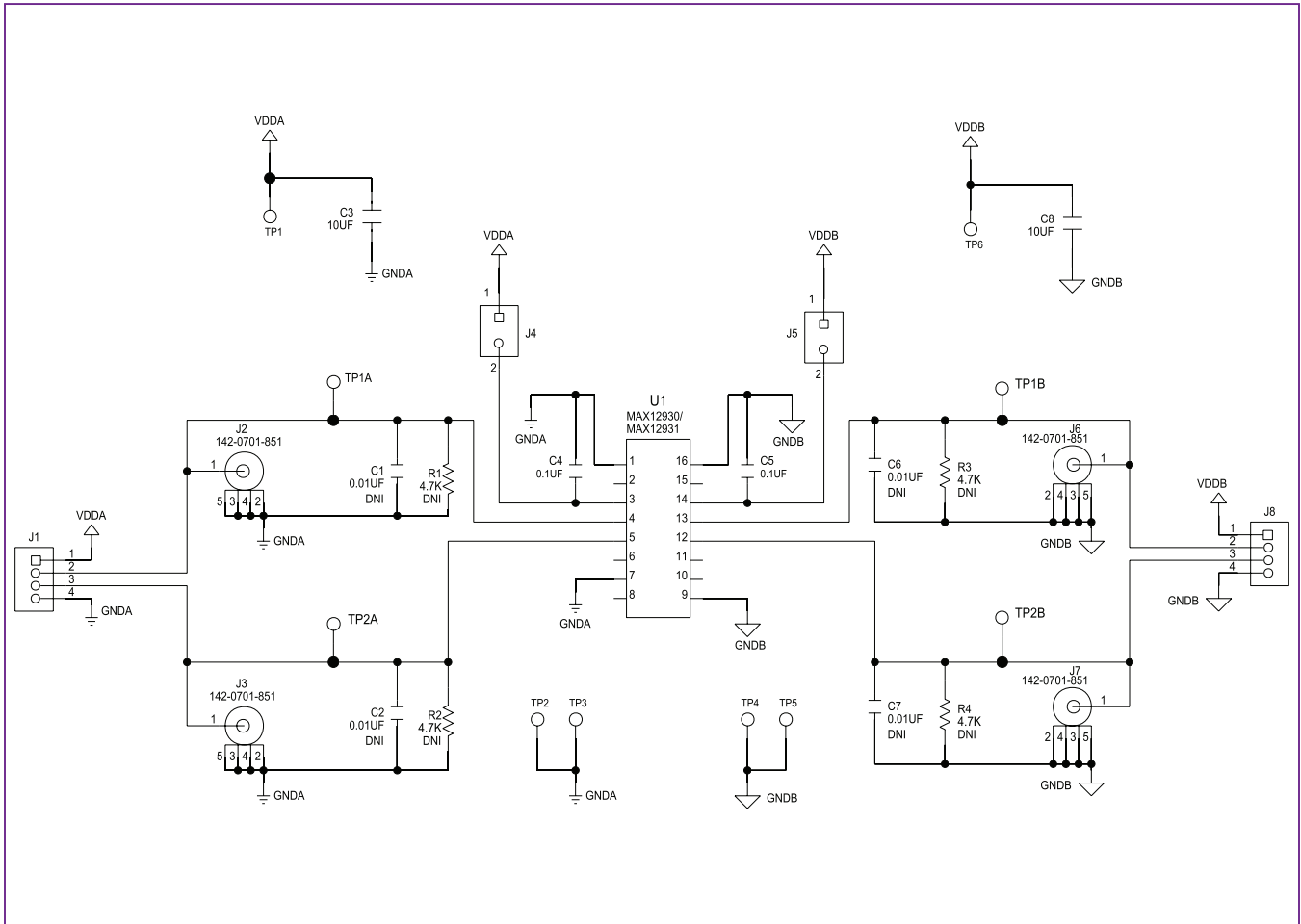
#Denotes RoHS compliance.

\*Future product—contact factory for availability.

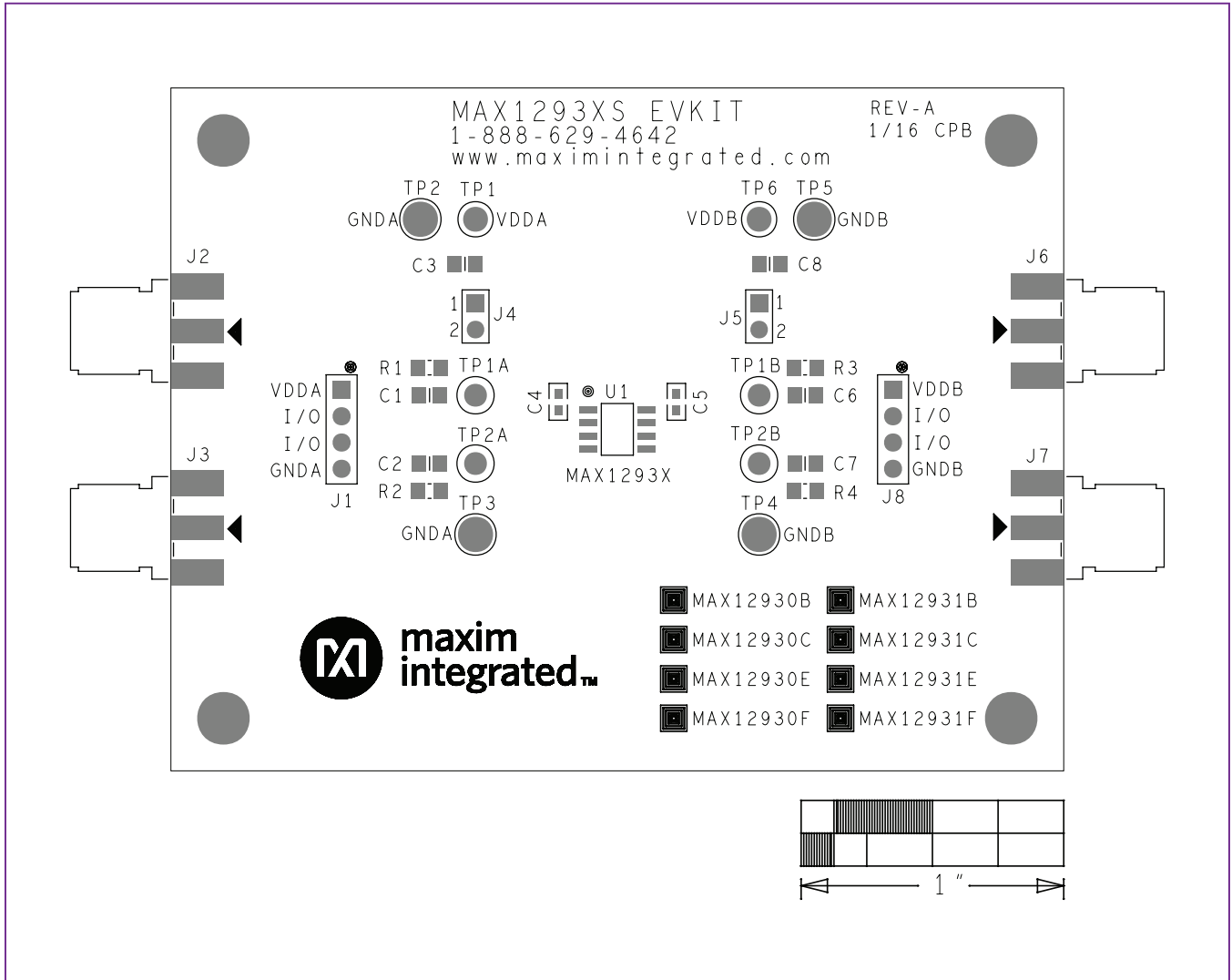
MAX1293XS EV Kit Bill of Materials

ITEM	REF_DES	DNI/ DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	C3, C8	-	2	ECJ-2FF1A106Z; CC0805ZKY5V6BB1	PANASONIC/YAGEO PHYCOMP	10UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 10UF; 10V; TOL=+80%-20%; MODEL=Y5V; TG= -30 DEGC TO +85 DEGC; T;
2	C4, C5	-	2	GRM188R61C104KA01; EMK107BJ104KAH	MURATA/TAIYO YUDEN	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 16V; TOL=10%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=X5R;
3	J1, J8	-	2	PEC04SAAN	SULLINS ELECTRONICS CORP.	PEC04SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 4PINS
4	J2, J3, J6, J7	-	4	142-0701-851	JOHNSON COMPONENTS	142-0701-851	CONNECTOR; END LAUNCH JACK RECEPTACLE; BOARDMOUNT; STRAIGHT THROUGH; 2PINS;
5	J4, J5	-	2	PCC02SAAN	SULLINS	PCC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 2PINS; -65 DEGC TO +125 DEGC
6	SU1, SU2	-	2	STC02SYAN	SULLINS ELECTRONICS CORP.	STC02SYAN	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.256IN; BLACK; INSULATION=PBT CONTACT=PHOSPHOR BRONZE; COPPER PLATED TIN OVERALL
7	TP1, TP6	-	2	5010	KEystone	N/A	TESTPOINT WITH 1.80MM HOLE DIA, RED, MULTIPURPOSE;
8	TP1A, TP1B, TP2A, TP2B	-	4	5009	KEystone	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.35IN; BOARD HOLE=0.063IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
9	TP2-TP5	-	4	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;
10	MTH1-MTH4	DNI	4	EVKIT_STANDOFF_4-40_3/8	?	EVKIT_STANDOFF_4-40_3/8	KIT; ASSY-STANDOFF 3/8IN; 1PC. STANDOFF/FEM/HEX/4-40IN/(3/8IN)/NYLON; 1PC. SCREW/SLOT/PAN/4-40IN/(3/8IN)/NYLON
11	C1, C2, C6, C7	DNP	0	GRM2195C1H103JA01	MURATA	0.01UF	CAPACITOR; SMT; 0805; CERAMIC; 0.01uF; 50V; 5%; COG; -55degC to +125degC; 0?30ppm/?C from -55degC to +125degC
12	R1-R4	DNP	0	ERJ-P06J472V	PANASONIC	4.7K	RESISTOR; 0805; 4.7K OHM; 5%; 200PPM; 0.25W; THICK FILM
13	PCB	-	1	MAX1293XS	MAXIM	PCB	PCB Board:MAX1293XS EVALUATION KIT
TOTAL			29				

MAX1293XS EV Kit Schematic

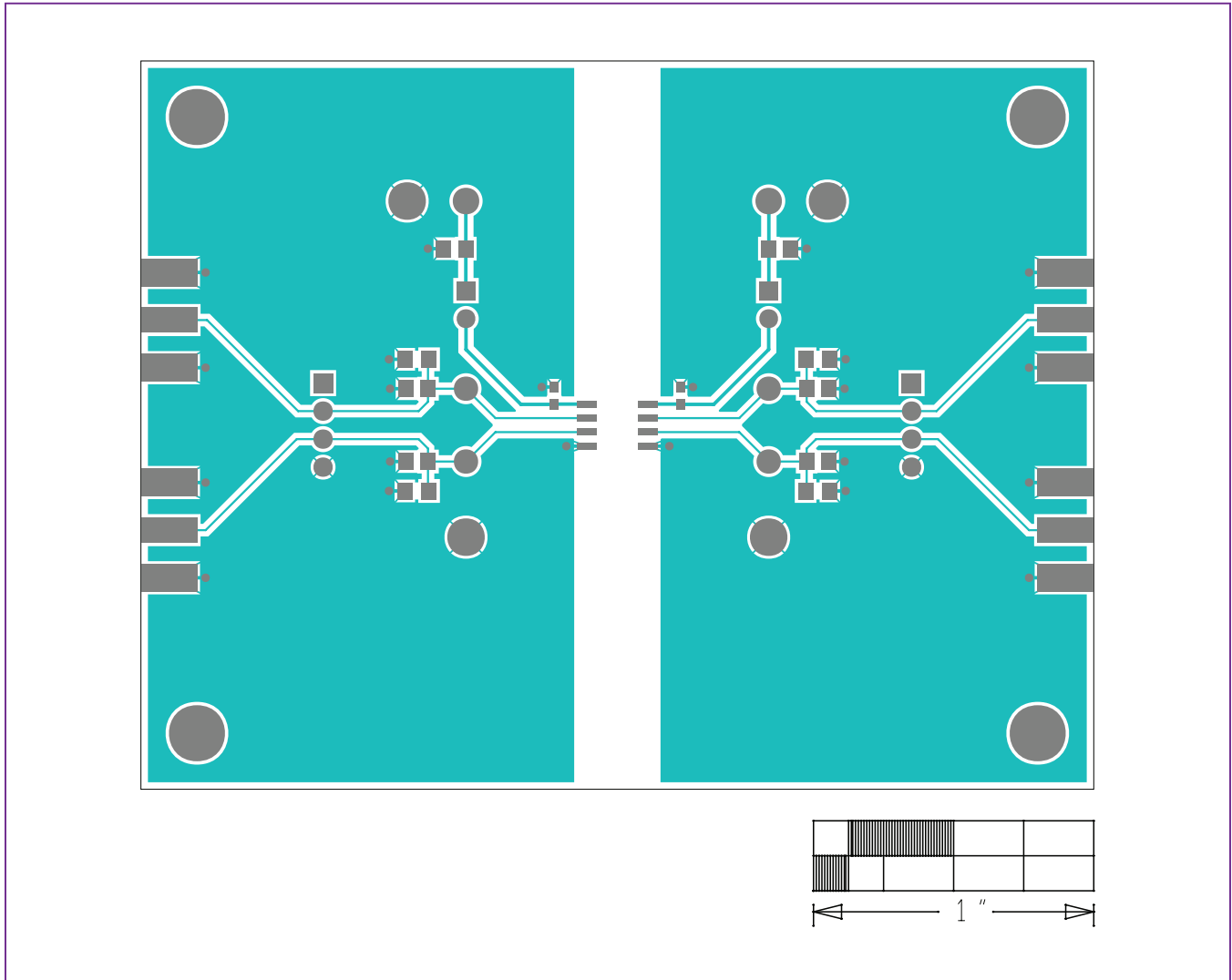


MAX1293XS EV Kit PCB Layout



MAX1293XS EV Kit—Top Silkscreen

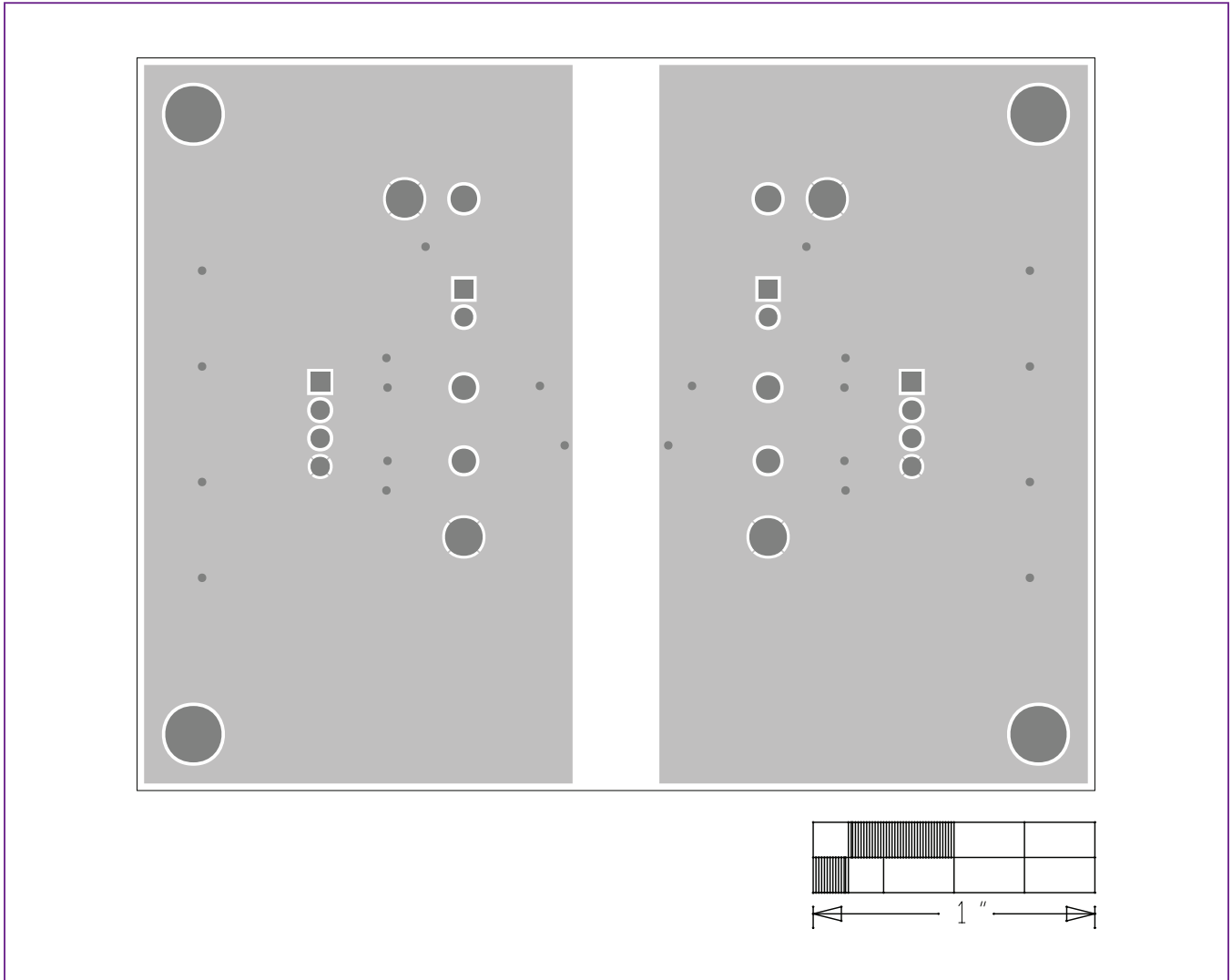
MAX1293XS EV Kit PCB Layout (continued)



MAX1293XS EV Kit—Top

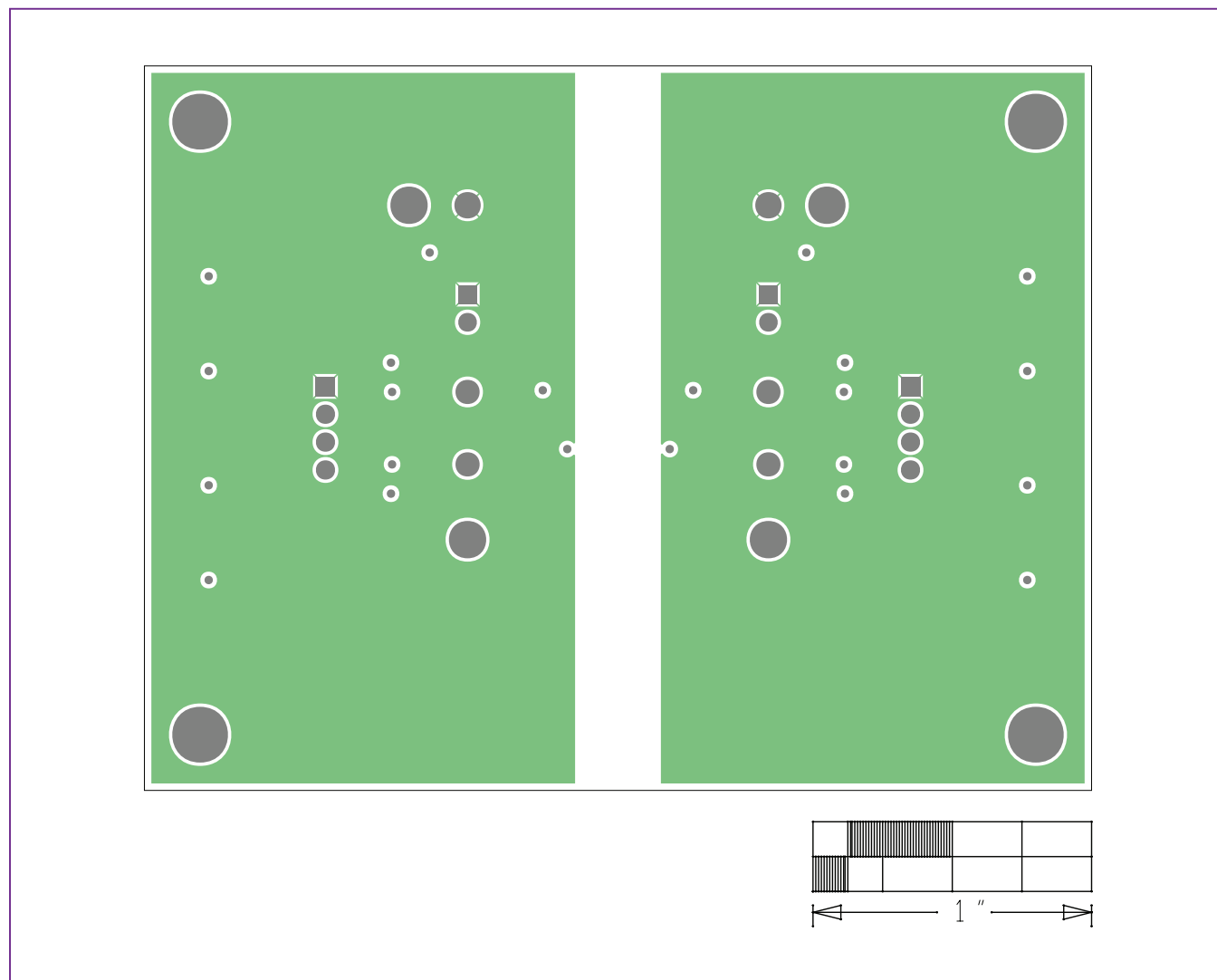


**MAX1293XS EV Kit PCB Layout (continued)**



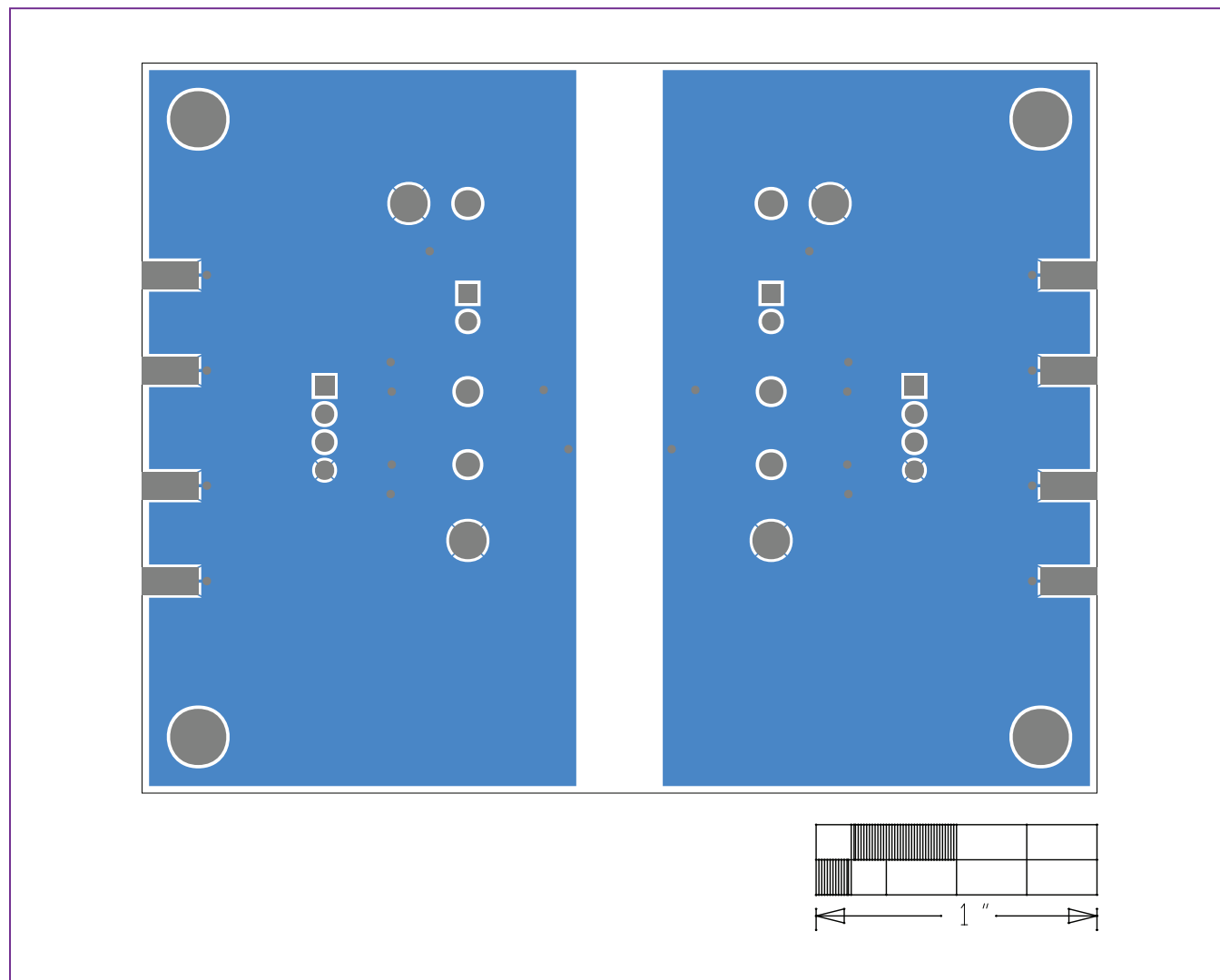
MAX1293XS EV Kit—Level 2 GND

MAX1293XS EV Kit PCB Layout (continued)



MAX1293XS EV Kit—Level 3 PWR

MAX1293XS EV Kit PCB Layout (continued)

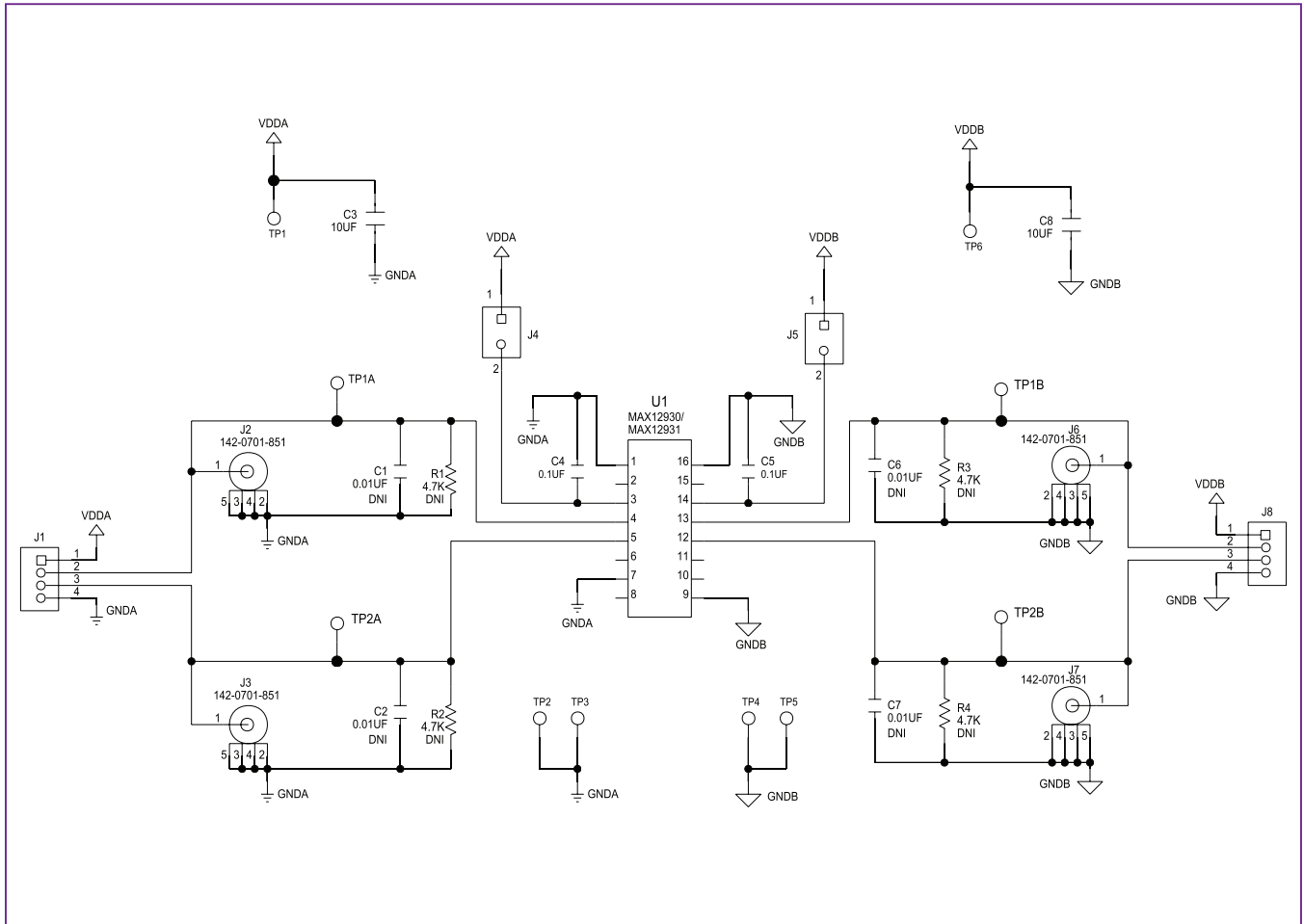


MAX1293XS EV Kit—Bottom

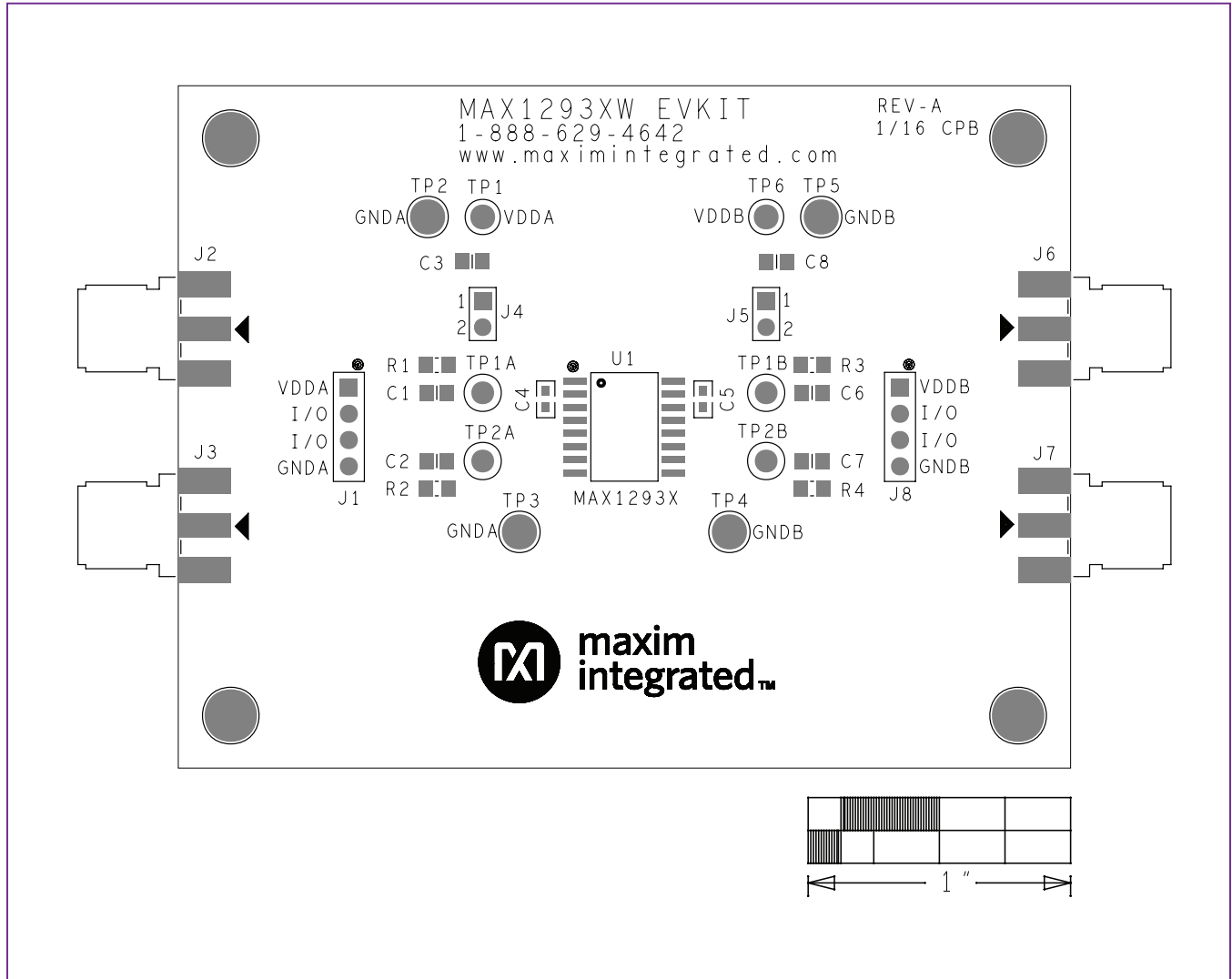
**MAX12931BW EV Kit Bill of Materials**

ITEM	REF_DES	DNI/D NP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	C3, C8	-	2	ECJ-2FF1A106Z; CC08052KY5V6BB1	PANASONIC/YAGEO PHYCOMP	10UF	CAPACITOR; SMT (0805); CERAMIC CHIP; 10UF; 10V; TOL=+80%-20%; MODEL=Y5V; TG= -30 DEGC TO +85 DEGC; T;
2	C4, C5	-	2	GRM188R61C104KA01; EMK107BJ104KAH	MURATA/TAIYO YUDEN	0.1UF	CAPACITOR; SMT (0603); CERAMIC CHIP; 0.1UF; 16V; TOL=10%; MODEL=; TG=-55 DEGC TO +125 DEGC; TC=X5R;
3	J1, J8	-	2	PEC04SAAN	SULLINS ELECTRONICS CORP.	PEC04SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 4PINS
4	J2, J3, J6, J7	-	4	142-0701-851	JOHNSON COMPONENTS	142-0701-851	CONNECTOR; END LAUNCH JACK RECEPTACLE; BOARDMOUNT; STRAIGHT THROUGH; 2PINS;
5	J4, J5	-	2	PCC02SAAN	SULLINS	PCC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 2PINS; -65 DEGC TO +125 DEGC
6	SU1, SU2	-	2	STC02SYAN	SULLINS ELECTRONICS CORP.	STC02SYAN	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.256IN; BLACK; INSULATION=PBT CONTACT=PHOSPHOR BRONZE; COPPER PLATED TIN OVERALL
7	TP1, TP6	-	2	5010	KEYSTONE	N/A	TESTPOINT WITH 1.80MM HOLE DIA, RED, MULTIPURPOSE;
8	TP1A, TP1B, TP2A, TP2B	-	4	5009	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.35IN; BOARD HOLE=0.063IN; YELLOW; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
9	TP2-TP5	-	4	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;
10	MTH1-MTH4	DNI	4	EVKIT_STANDOFF_4-40_3/8	?	EVKIT_STANDOFF_4-40_3/8	KIT; ASSY-STANDOFF 3/8IN; 1PC. STANDOFF/FEM/HEX/4-40IN/(3/8IN)/NYLON; 1PC. SCREW/SLOT/PAN/4-40IN/(3/8IN)/NYLON
11	C1, C2, C6, C7	DNP	0	GRM2195C1H103JA01	MURATA	0.01UF	CAPACITOR; SMT; 0805; CERAMIC; 0.01uF; 50V; 5%; COG; -55degC to + 125degC; 0?30ppm/?C from -55degC to +125degC
12	R1-R4	DNP	0	ERJ-P06J472V	PANASONIC	4.7K	RESISTOR; 0805; 4.7K OHM; 5%; 200PPM; 0.25W; THICK FILM
13	PCB	-	1	MAX1293XBW	MAXIM	PCB	PCB Board:MAX1293BW EVALUATION KIT
TOTAL			29				

MAX12931BW EV Kit Schematic

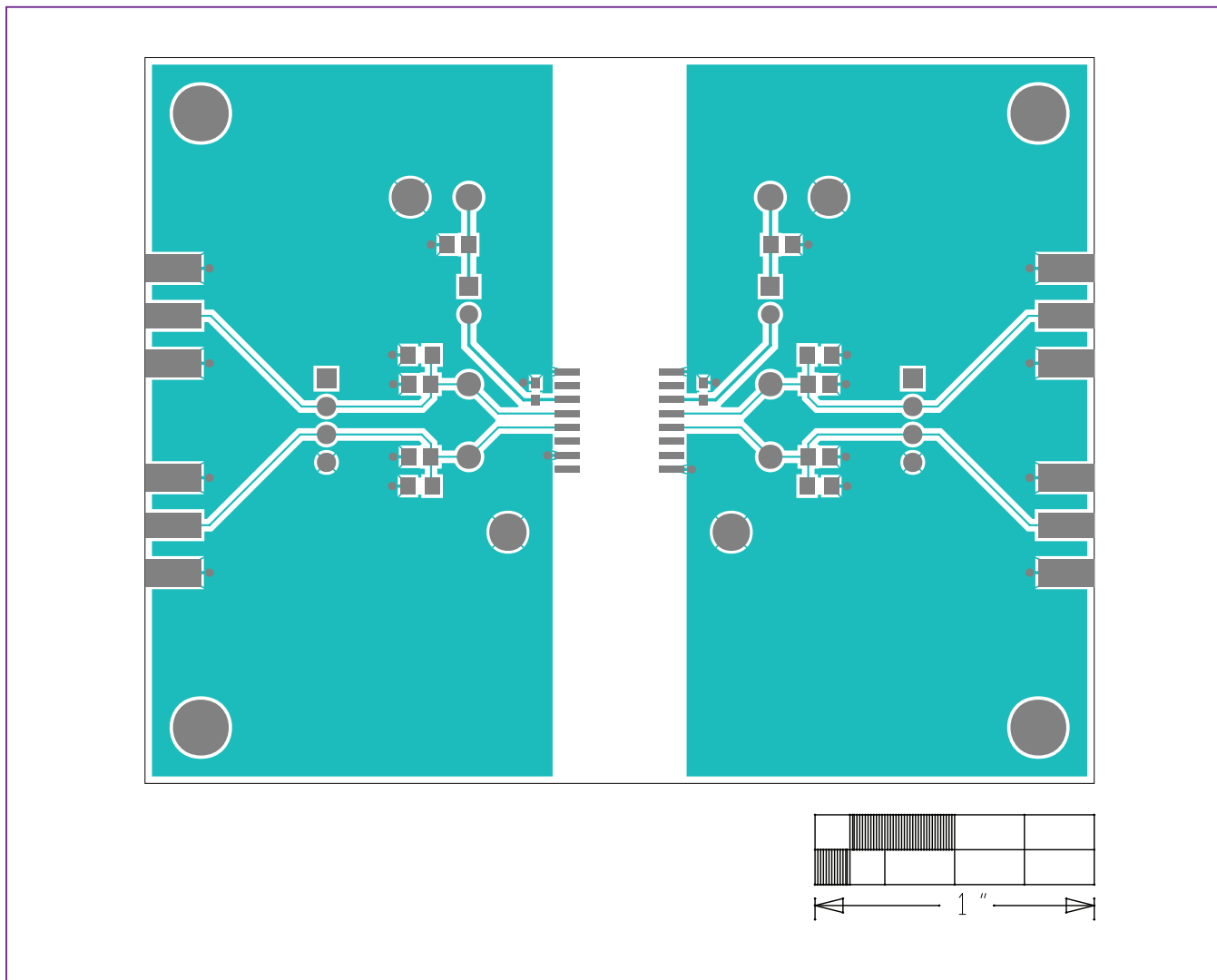


MAX12931BW EV Kit PCB Layout



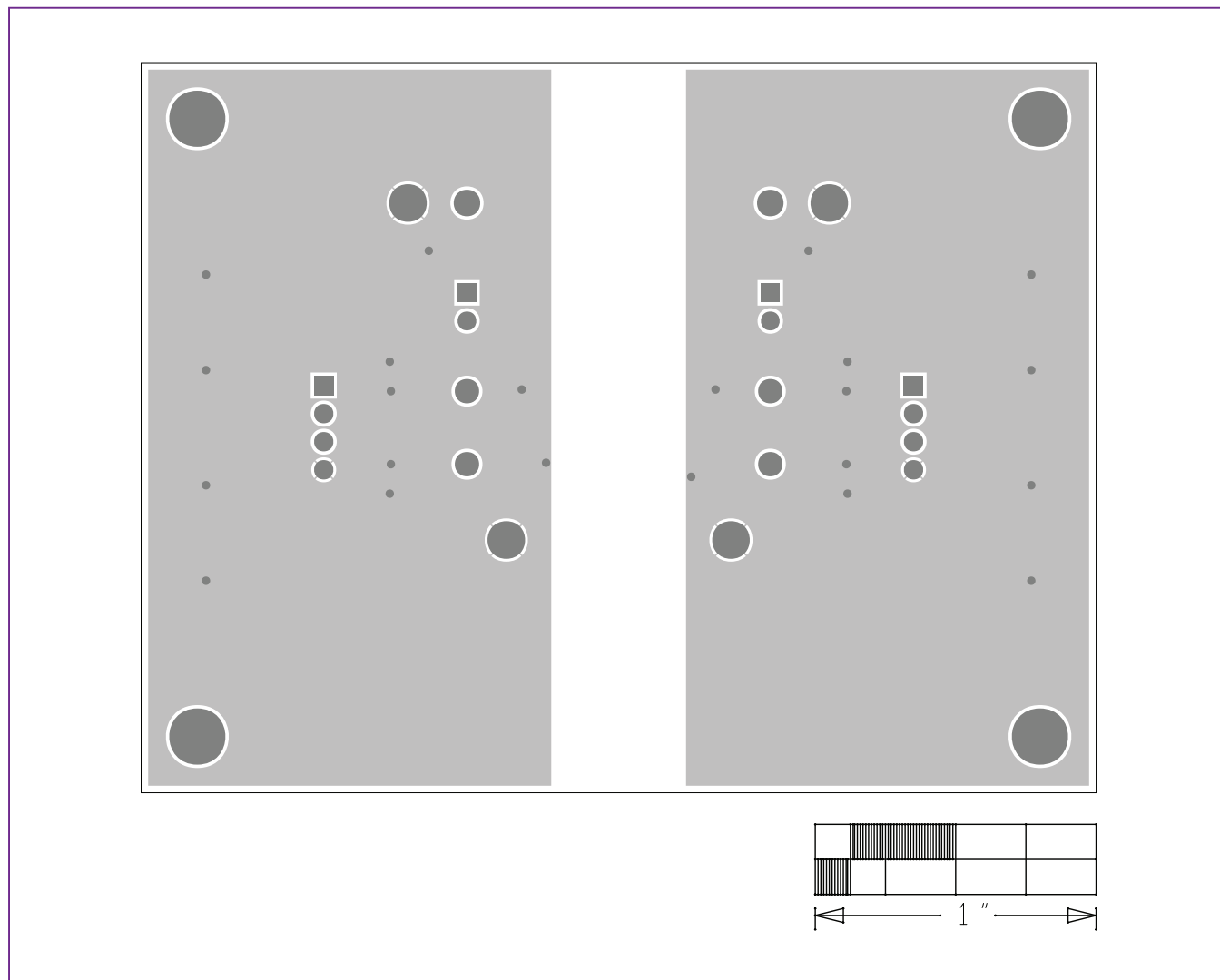
MAX12931BW EV Kit—Top Silkscreen

MAX12931BW EV Kit PCB Layout (continued)



MAX12931BW EV Kit—Top

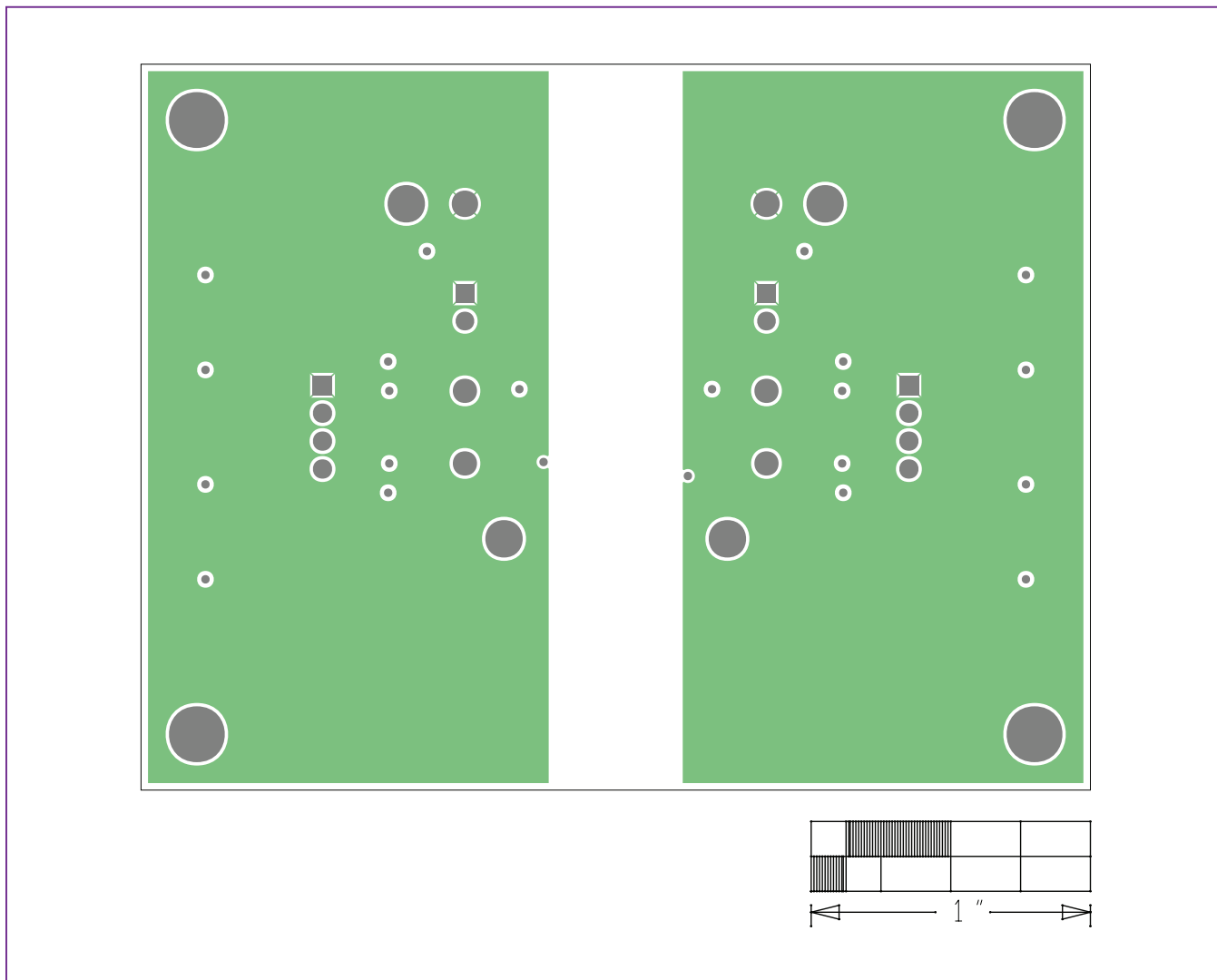
MAX12931BW EV Kit PCB Layout (continued)



MAX12931BW EV Kit—Level 2 GND

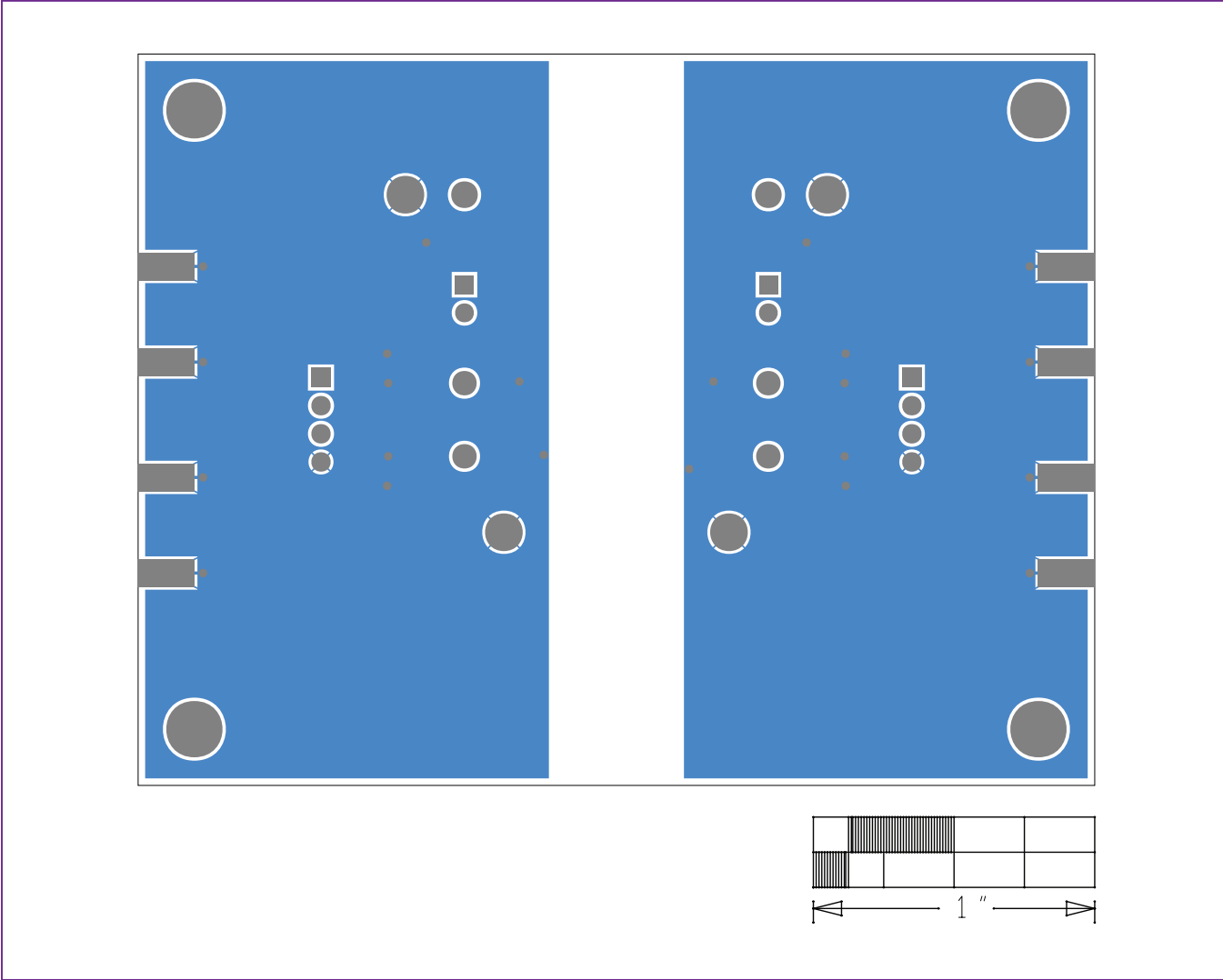


MAX12931BW EV Kit PCB Layout (continued)



MAX12931BW EV Kit—Level 3 PWR

MAX12931BW EV Kit PCB Layout (continued)



MAX12931BW EV Kit—Bottom