19-2369; Rev 0; 4/02

MAXIM

MAX3802 Evaluation Kit

Evaluates: MAX3802

General Description

The MAX3802 evaluation kit (EV kit) is an assembled demonstration board that provides easy evaluation of the MAX3802 quad adaptive equalizer with cable drivers. SMA connectors with 50Ω controlled-impedance transmission lines to the MAX3802 are provided for all input and output ports.

Features

- **Fully Assembled and Tested**
- **Single +3.3V Power-Supply Operation**
- **SMA Connectors for Inputs and Outputs**
- **Includes Potentiometer for Adjusting Driver Output Amplitude**

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C3	2	33µF ±10% tantalum capacitors (Case-B)
C2, C4	2	1µF ±10% ceramic capacitors (0805)
C7–C66	60	0.1µF ±10% ceramic capacitors (0402)
J1, J2, J35, J36, TP1–TP8	12	Test points
J3–J34	32	SMA connectors (edge mount)
L1, L2	2	56nH inductors (0805)
R1–R4	4	100kΩ ±1% resistors (0402)
R5, R8, R10, R12	4	Open
R6, R7, R9, R11	4	0Ω resistors (0402)
R13–R16	4	20kΩ potentiometers
U1	1	MAX3802UGK 68-pin QFN
None	1	MAX3802 EV board
None	1	MAX3802 data sheet

Component Suppliers

SUPPLIER	PHONE	FAX
AVX	803-946-0690	803-626-3123
Coilcraft	847-639-6400	847-639-1469
Murata	814-237-1431	814-238-0490
Venkel	800-950-8365	512-794-0087

Please indicate that you are using the MAX3802 when contacting these component suppliers.

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX3802EVKIT	0°C to +85°C	68 QFN-EP

**EP = exposed pad*

Quick Start

Connect power-supply ground to the GND pin (J35). Apply +3.3V to the $V_{CC}1$ pin (J1). Due to a small voltage drop across the inductor, the true voltage on the part (measured across C1) is slightly lower than +3.3V. Adjust the power supply until the voltage across C1 measures +3.3V. **Note:** This step applies power to channels 1 and 2 only. To supply power to channels 3 and 4, ground and a +3.3V supply must be connected to J35 (GND) and J1 ($V_{CC}2$).

Cable Driver

1) Connect a differential input signal (600mV$_{P-P}$ differential input amplitude) to one of the cable driver inputs at SMA edge connectors J9 (DIN1-) and J10 (DIN1+).
2) Connect a 50Ω oscilloscope to SMA output connectors J7 (DOUT-) and J8 (DOUT+) to observe the output of the cable driver.

3) Adjust R13, the $R_{MOD}1$ potentiometer, for 20kΩ resistance by turning the potentiometer clockwise until a faint click is heard.
4) Potentiometer R13 ($R_{MOD}1$) can be adjusted between 10kΩ and 20kΩ to change the cable driver output amplitude.

Note: Measuring the resistance on the potentiometer is difficult because of internal resistances and ESD diodes on the IC. The potentiometer can be removed and discrete resistors placed on the R5, R8, R10, and R12 positions, so that the exact resistance of R_{MOD} can be known. Refer to Cable Driver Output vs. R_{MOD} in the *Typical Operating Characteristics* of the MAX3802 data sheet for R_{MOD} values.

Adaptive Cable Equalizer

1) Connect a differential input signal (600mV_{P-P} differential input amplitude) to a cable. Connect the other end of the cable to one of the cable equalizers' inputs at SMA edge connectors J3 (EIN1-) and J4 (EIN1+).
2) Connect a 50Ω oscilloscope to SMA output connectors J5 (EOUT1-) and J6 (EOUT1+) to view the output of the cable equalizer.
3) The cable integrity monitor (CIM1) high-impedance output can be monitored at TP1.
4) The loss-of-signal ($\overline{LOS1}$) TTL output can be monitored at TP5.

Note: The MAX3802 equalizer design requires that the data stream be scrambled or coded to provide a rich frequency spectrum for the adaptation algorithm. In the absence of an input signal (nonstandard application), amplified noise can appear at the output due to the large gain of the device.

Detailed Description

Connecting CML Outputs to 50Ω Oscilloscopes

CML outputs have a common-mode voltage near V_{CC}, which is incompatible with oscilloscopes terminated in 50Ω to ground. To avoid interfering with the common-mode voltage, all MAX3802 CML outputs are AC-coupled on board with 0.1µF capacitors. The CML outputs should not be connected directly through 50Ω to ground.

Exposed-Pad Package

The EP of the 68-pin QFN package provides a very low thermal resistance path for heat removal from the IC. The pad is also electrical ground on the MAX3802 and must be soldered to the circuit board for proper thermal and electrical performance. Refer to Maxim Application Note HFAN-08.1, *Thermal Considerations for QFN and Other Exposed Pad Packages,* available at www.maxim-ic.com for additional application information.

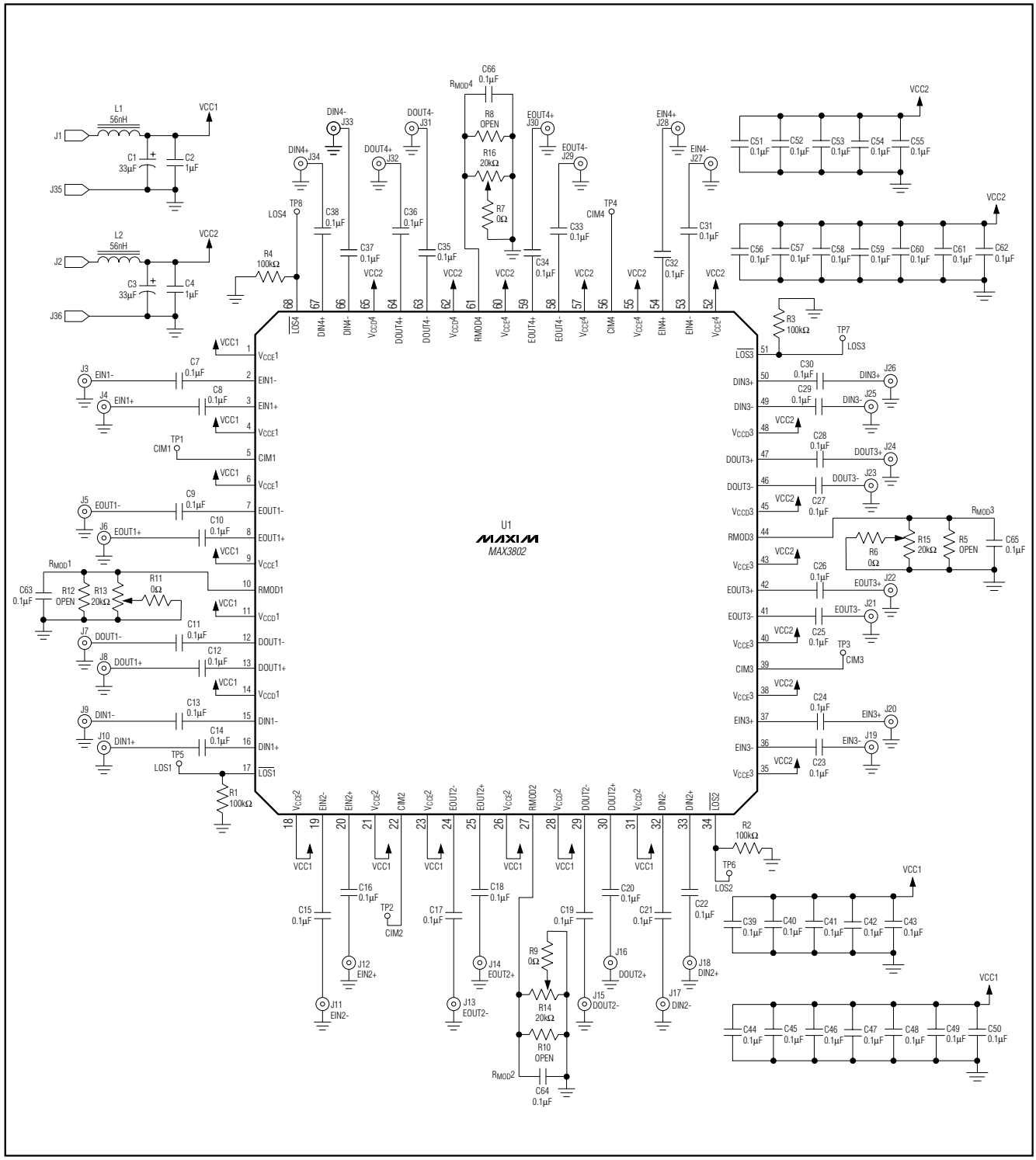

Figure 1. MAX3802 EV Kit Schematic

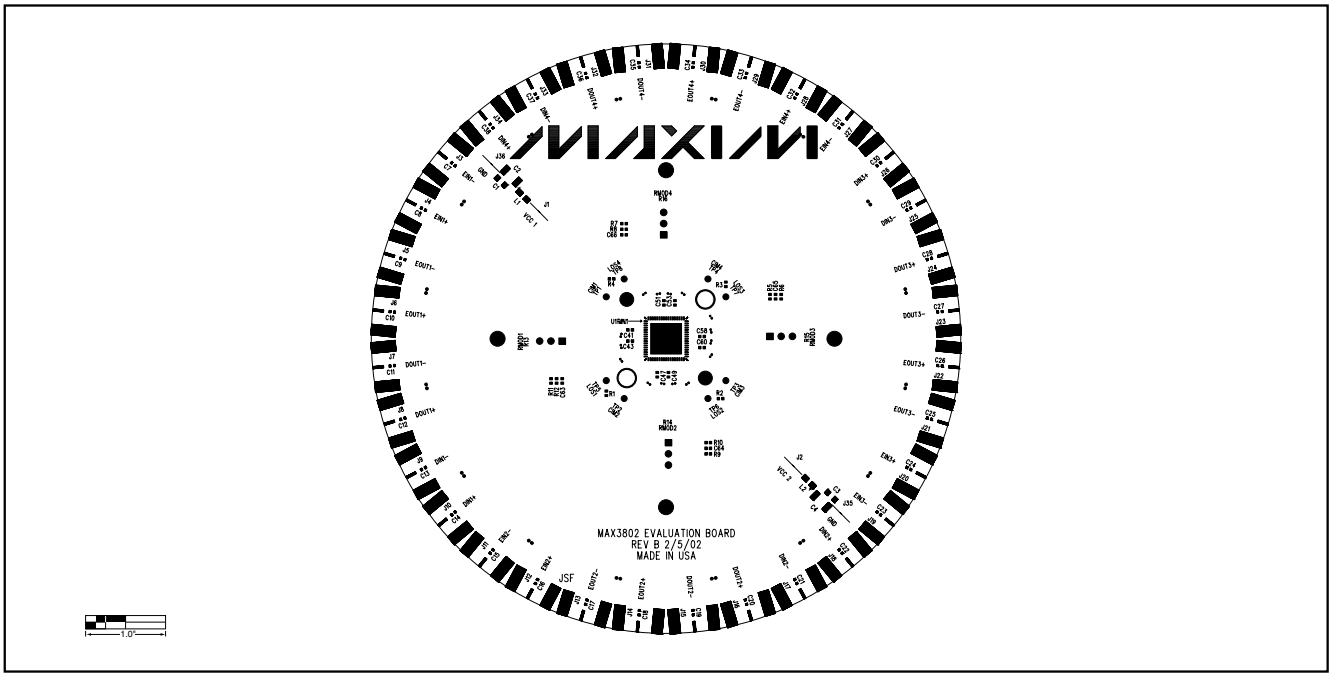

Figure 2. MAX3802 EV Kit Component Placement Guide—Component Side

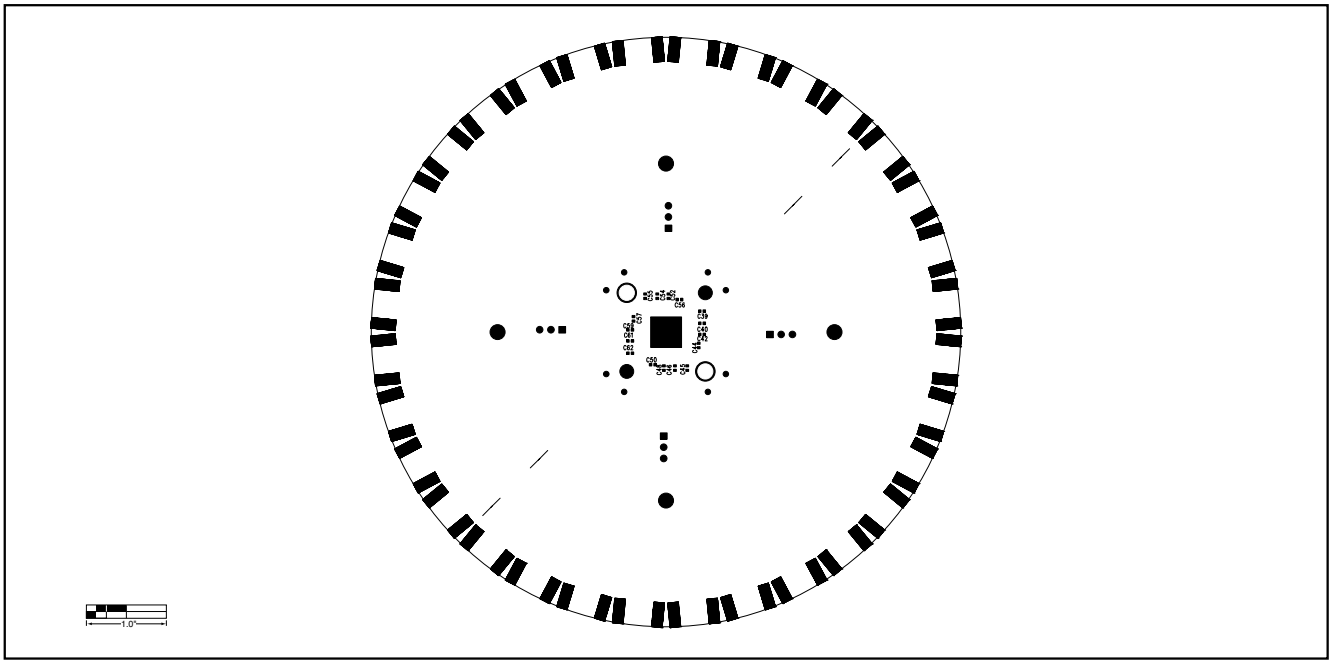

Figure 3. MAX3802 EV Kit Component Placement Guide—Solder Side

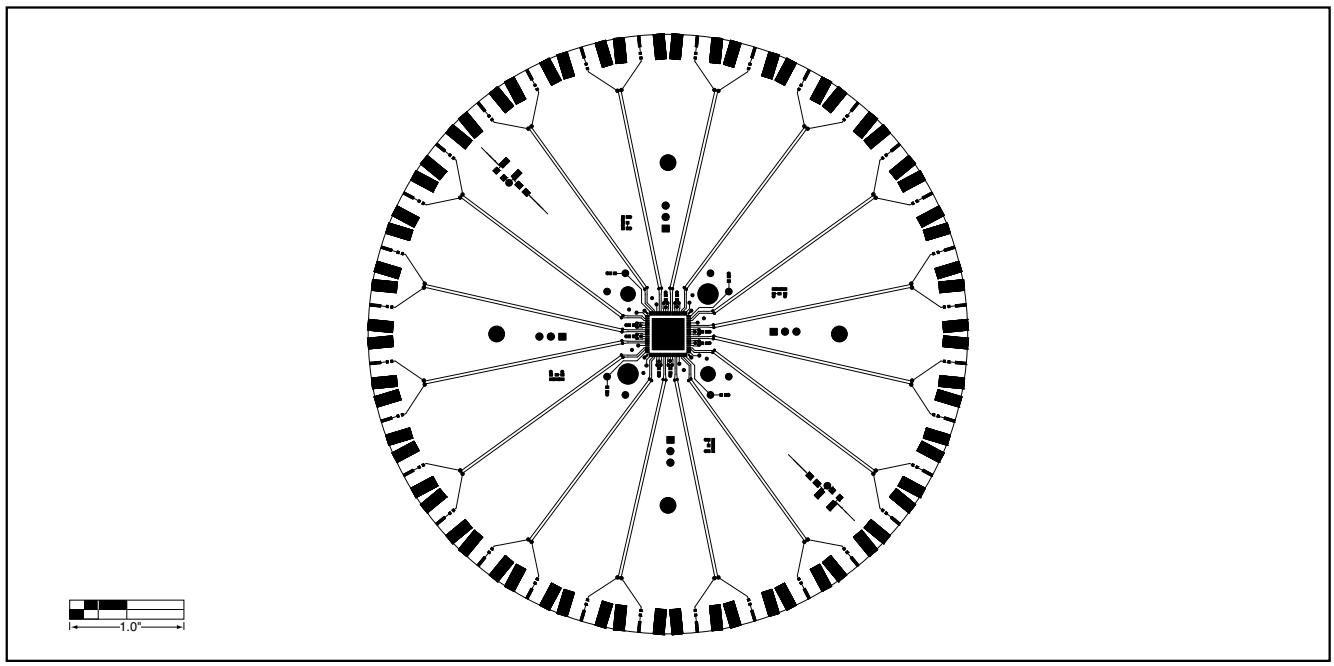

Figure 4. MAX3802 EV Kit PC Board Layout—Component Side

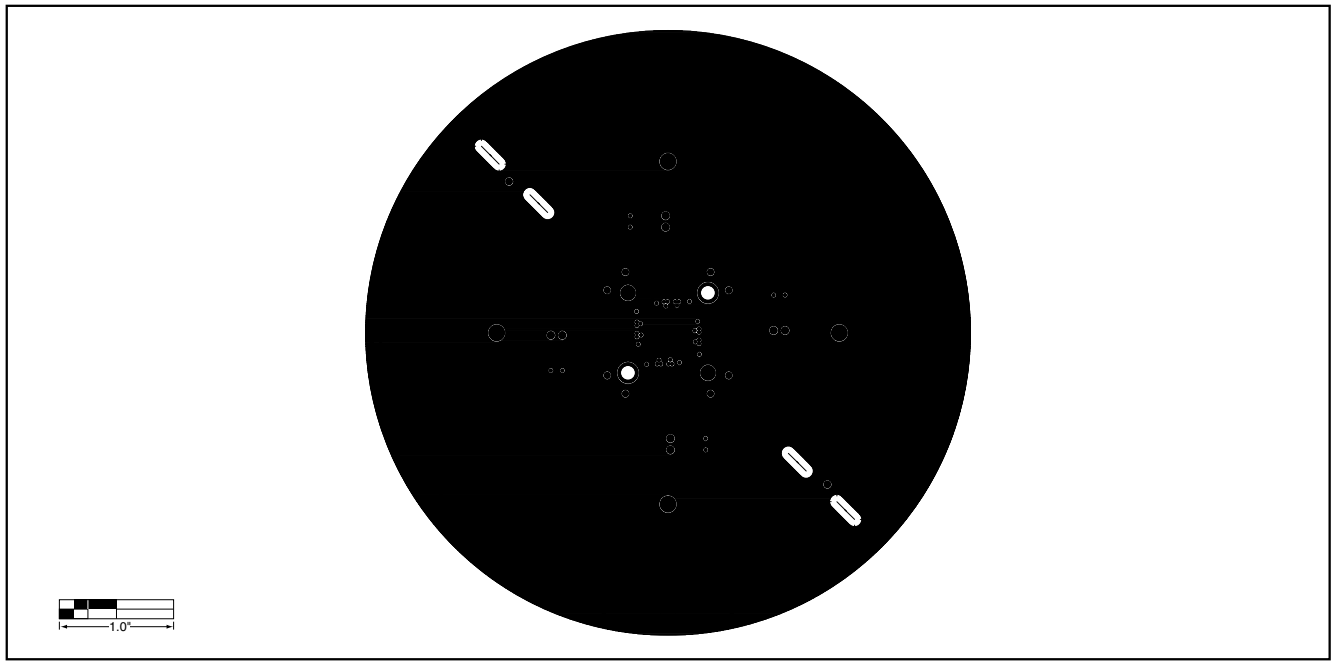

Figure 5. MAX3802 EV Kit PC Board Layout—Ground Plane

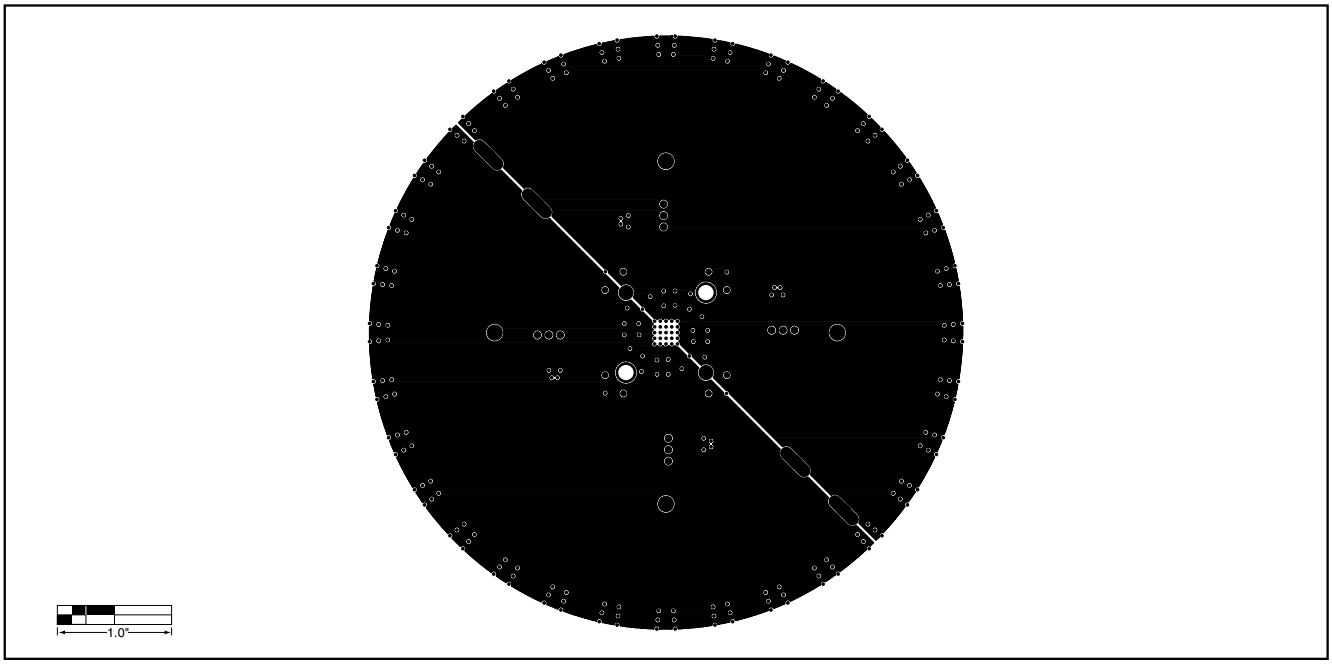

Figure 6. MAX3802 EV Kit PC Board Layout—Power Plane

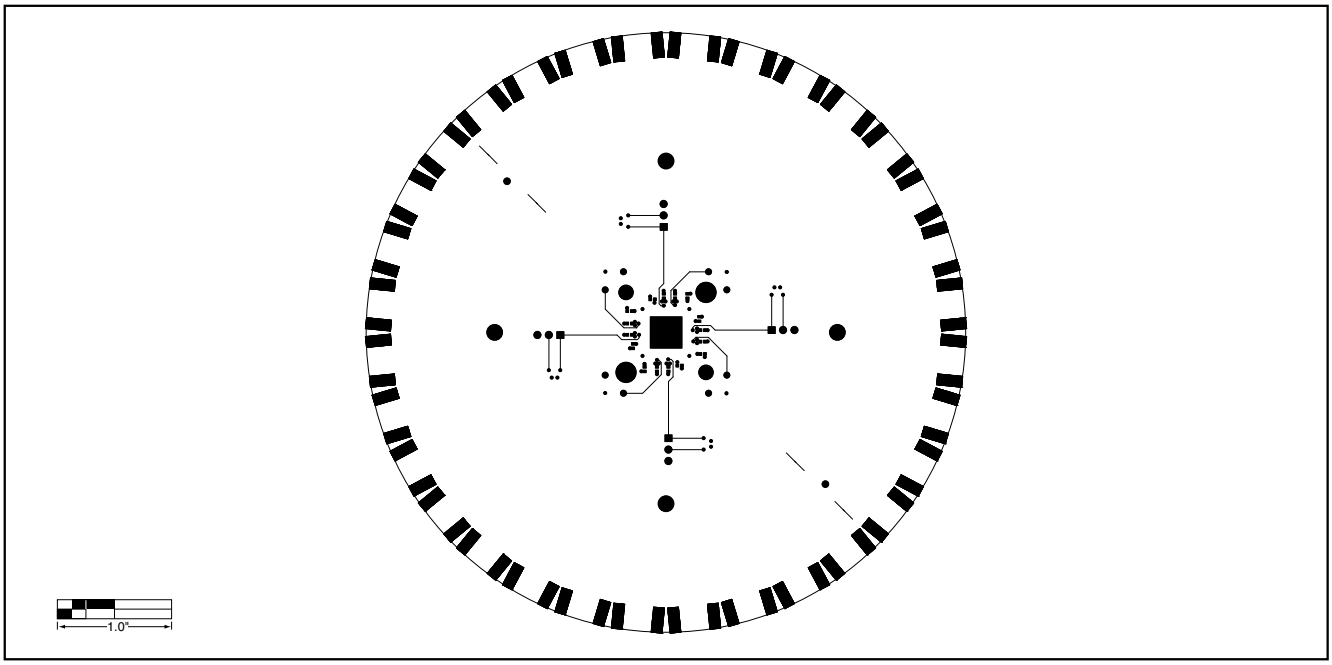

Figure 7. MAX3802 EV Kit PC Board Layout—Solder Side