19-3093; Rev 0; 12/03

MAX3942 Evaluation Kit

Evaluates: MAX3942

General Description

The MAX3942 evaluation kit (EV kit) is an assembled demonstration board that provides electrical evaluation of the MAX3942 10.7Gbps modulator driver. The outputs are interfaced to SMA connectors that can be connected to a 50Ω terminated oscilloscope.

Features

- **SMA Connectors for All High-Speed I/Os**
- **Configured for Electrical Operation, No Laser Necessary**
- **Single -5.2V Power-Supply Operation**
- **Fully Assembled and Tested**

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	22µF ±10% tantalum capacitor AVX TAJB226K010
C2	1	10µF ±10% tantalum capacitor AVX TAJA106K010
C3	1	0.1µF ±10% ceramic capacitor (0402)
C10, C25, C26, C27, C28, C33	6	100pF ±5% ceramic capacitors (0201)
C22, C24, C29, C31, C42	5	0.01µF ±10% ceramic capacitors (0402)
J5, J9	2	SMB connectors, PC mount
J6, J16, J31–J34	6	SMA connectors, edge mount, EF Johnson 142-0701-851
JP1, JP3	2	3-pin headers, 0.1in centers
JP2, JP8, JP9, JP10	4	2-pin headers, 0.1in centers
L1	1	47nH inductor (0402)
R1, R3	2	2kΩ variable resistors Bourns 3296W-202
R2	1	1kΩ ±5% resistor (0402)
R4	1	4.02kΩ ±1% resistor (0402)
TP4, TP8, TP9, TP12, TP13, TP15, J10, J11	8	Test points
U4	1	MAX3942ETG
None	1	MAX3942 EV kit circuit board, rev A
None	1	MAX3942 EV kit data sheet
None	1	MAX3942 data sheet
None	7	Shunts

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX3942EVKIT	-40°C to +85°C	24 THIN QFN

Component Suppliers

SUPPLIER	PHONE	FAX
AVX	843-444-2863	843-626-3123
EF Johnson	402-474-4800	402-474-4858
Murata	415-964-6321	415-964-8165

Note: *Please indicate that you are using the MAX3942 when ordering from these suppliers.*

Detailed Description

The MAX3942 EV kit is a fully assembled and factory tested demonstration board that enables testing of all MAX3942 functions.

Test Equipment Required

- -5.2V power supply with 300mA current capability
- Signal-source, 10Gbps minimum capability
- Oscilloscope with at least 15GHz performance

Test Equipment Interface

Warning: The data and clock inputs (DATA±, CLK±) are DC-coupled to the SMA connectors, so be sure to set proper common-mode voltages for these inputs. The modulation outputs (OUT±) are also DC-coupled to the SMA connectors and require a 50Ω to ground load for proper operation.

Quick Start

1) If the data is to be latched, place shunt on JP8 ($\overline{RTEN}$) to enable the clock inputs. Otherwise, leave it open.
2) Install a jumper on JP2.
3) Install a jumper on the right side of JP3. This allows adjustment of MODSET using R3.
4) To use the pulse-width control (PWC) install a jumper on the lower two pins of JP1. To disable PWC place a jumper on the top two pins of JP1.
5) Ensure that a jumper is not installed on JP9 ($\overline{MODEN}$) and enable modulation.
6) Connect a differential signal source to J34 (DATA+) and J33 (DATA-). Refer to the MAX3942 data sheet to determine voltage levels.
7) If the latch is enabled, apply a differential clock signal to J2 (CLK+) and J31 (CLK-). Refer to the MAX3942 data sheet to determine voltage levels.
8) Connect a high-bandwidth oscilloscope, such as the Tektronix CSA8000 with 80E01 sampling heads, to J16 (OUT+) and J6 (OUT-).
9) High-quality SMA attenuators (14dB or 20dB) are required to reduce the signal level for compatibility with the most sampling heads. The attenuators should be connected directly to the output SMA connectors on the EV kit to minimize transmission line reflections.
10) Attach a -5.2V power supply to J10 (GND) and J11 (V_{EE}). Set the current limit to 300mA and power up the board.
11) Adjust R3 (MODSET) until the desired modulation swing is achieved.
12) Adjust R1 (PWC) until the desired pulse width is achieved (if PWC is enabled, see step 5).
13) If desired, place a shunt on JP10 (PLRT) to invert the output data polarity.

Adjustments and Control Descriptions

COMPONENT	NAME	FUNCTION
JP1	PWC	This jumper enables/disables the pulse-width-control circuitry. Place a shunt on the top two pins to disable the PWC circuitry. Place a shunt on the bottom two pins to enable the PWC circuitry.
JP3	MODSET	Place a jumper on the right-hand side of this jumper to connect the R_{MODSET} potentiometer to the MAX3942. Place a jumper on the left-hand side of this jumper to connect the MODSET pin to the SMB connector for AC testing.
JP8	$\overline{RTEN}$	Enables/disables data retiming. Shunt to enable data retiming. Remove shunt for direct data transmission.
JP9	$\overline{MODEN}$	Enables/disables modulation output. Shunt to disable switching of the data output. When shunted, the output goes to the absorbtive (logic 0) state. Remove shunt to enable modulation.
JP10	PLRT	Enables/disables the polarity inversion function. Shunt to invert the polarity of the output data. Shunting this jumper shorts the PLRT pin to V_{EE}. Leave open for normal operation.
R1	R_{PWC}	Adjusts the EAM pulse width. Turn the potentiometer screw counter-clockwise to increase the logic 1 width.
R3	R_{MODSET}	Adjusts the EAM modulation current. Turn the potentiometer screw clockwise to increase the modulation amplitude (decrease the resistance of MODSET to GND).

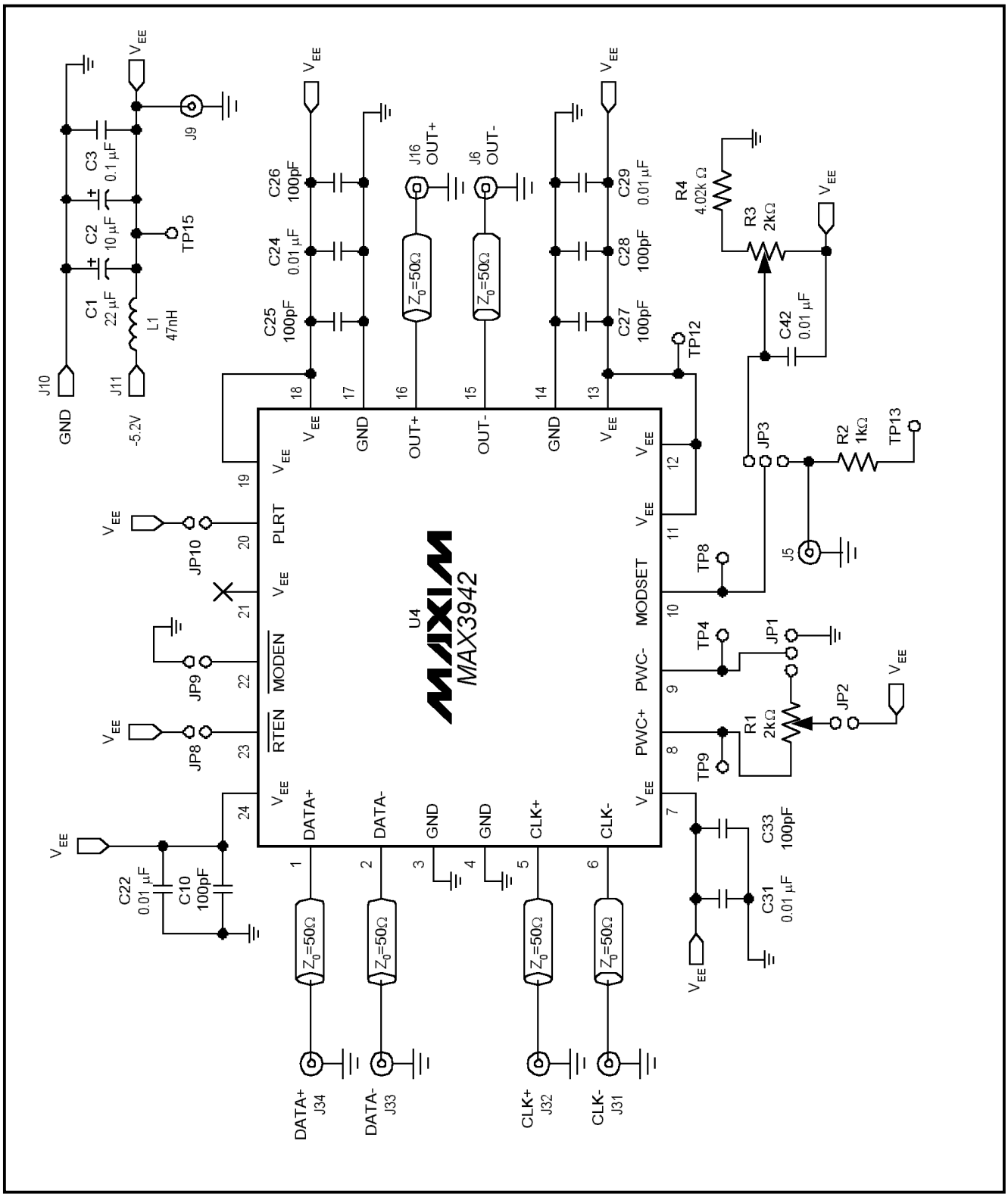

Figure 1. MAX3942 EV Kit Schematic

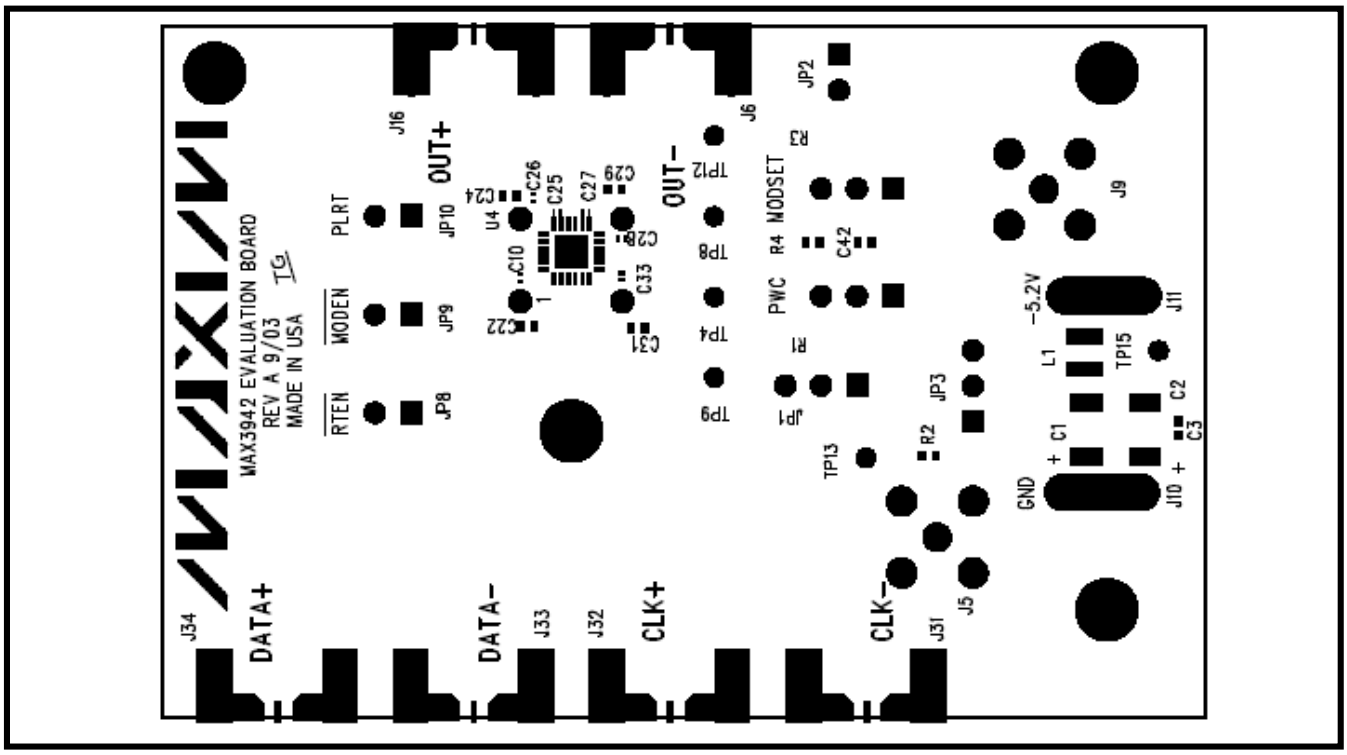

Figure 2. MAX3942 EV Kit Component Placement Guide—Component Side

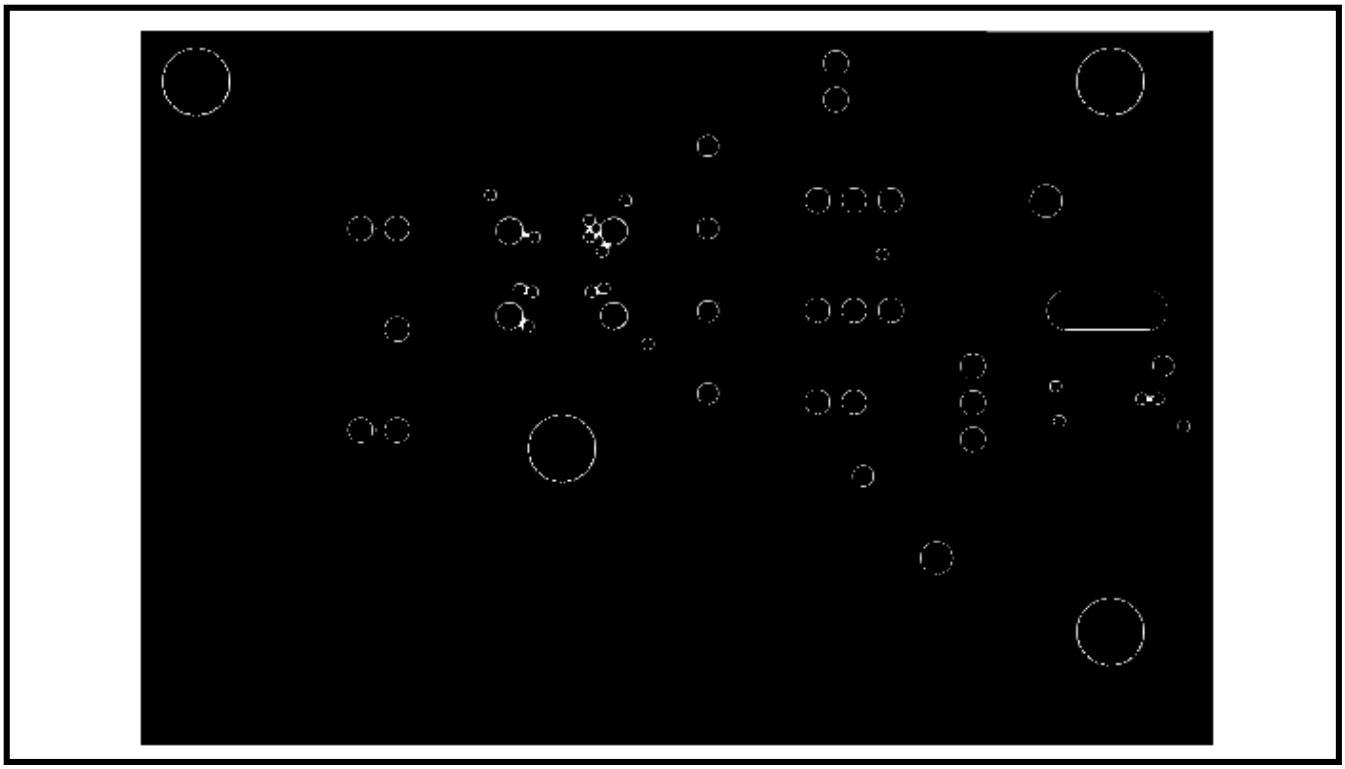

Figure 3. MAX3942 EV Kit PC Board Layout—Ground Plane

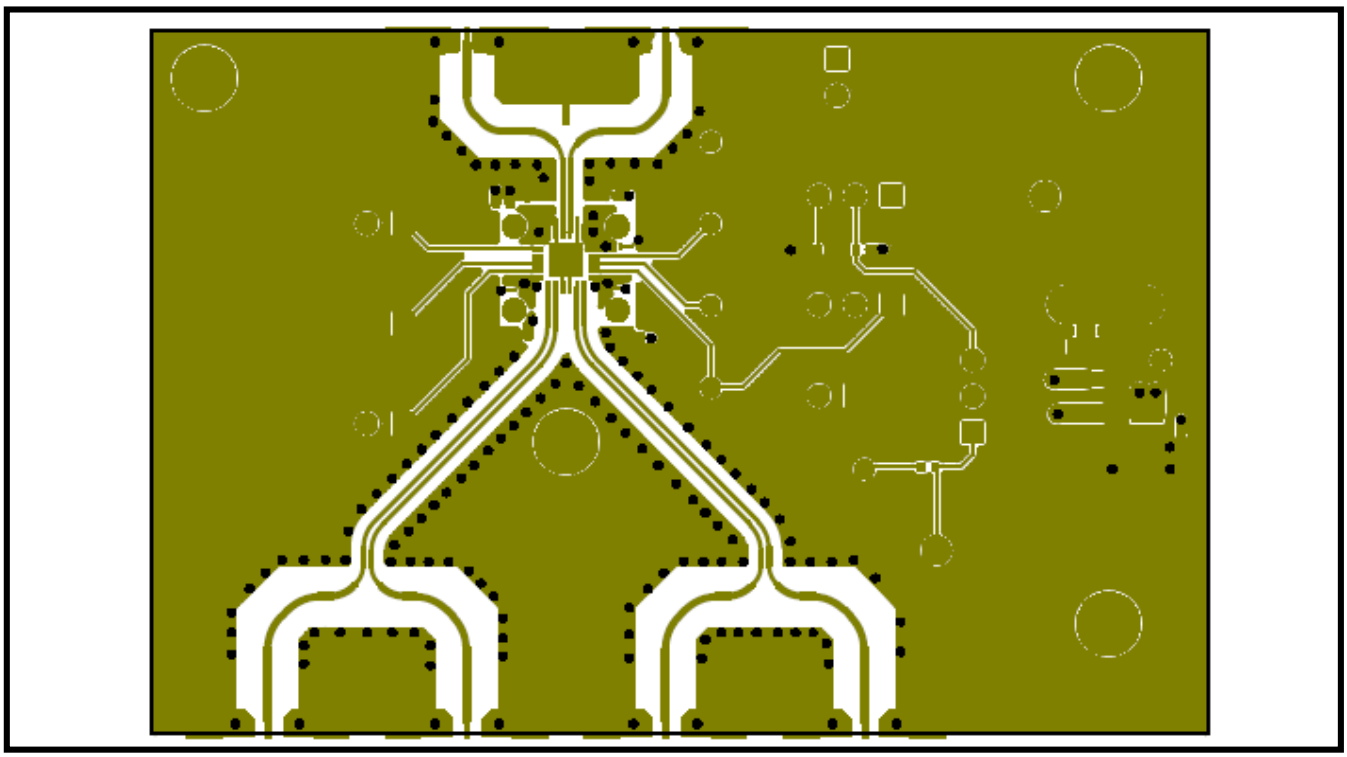

Figure 4. MAX3942 EV Kit PC Board Layout—Component Side

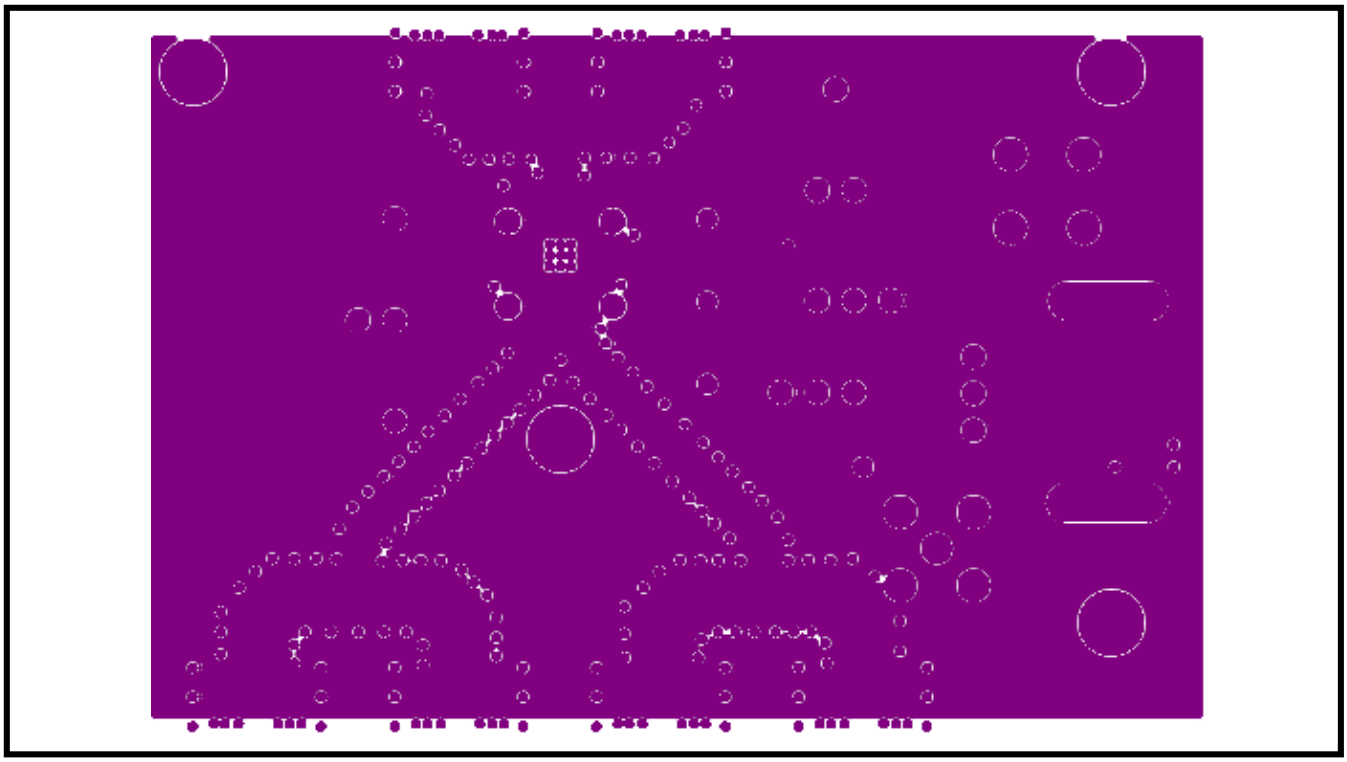

Figure 5. MAX3942 EV Kit PC Board Layout—Power Plane

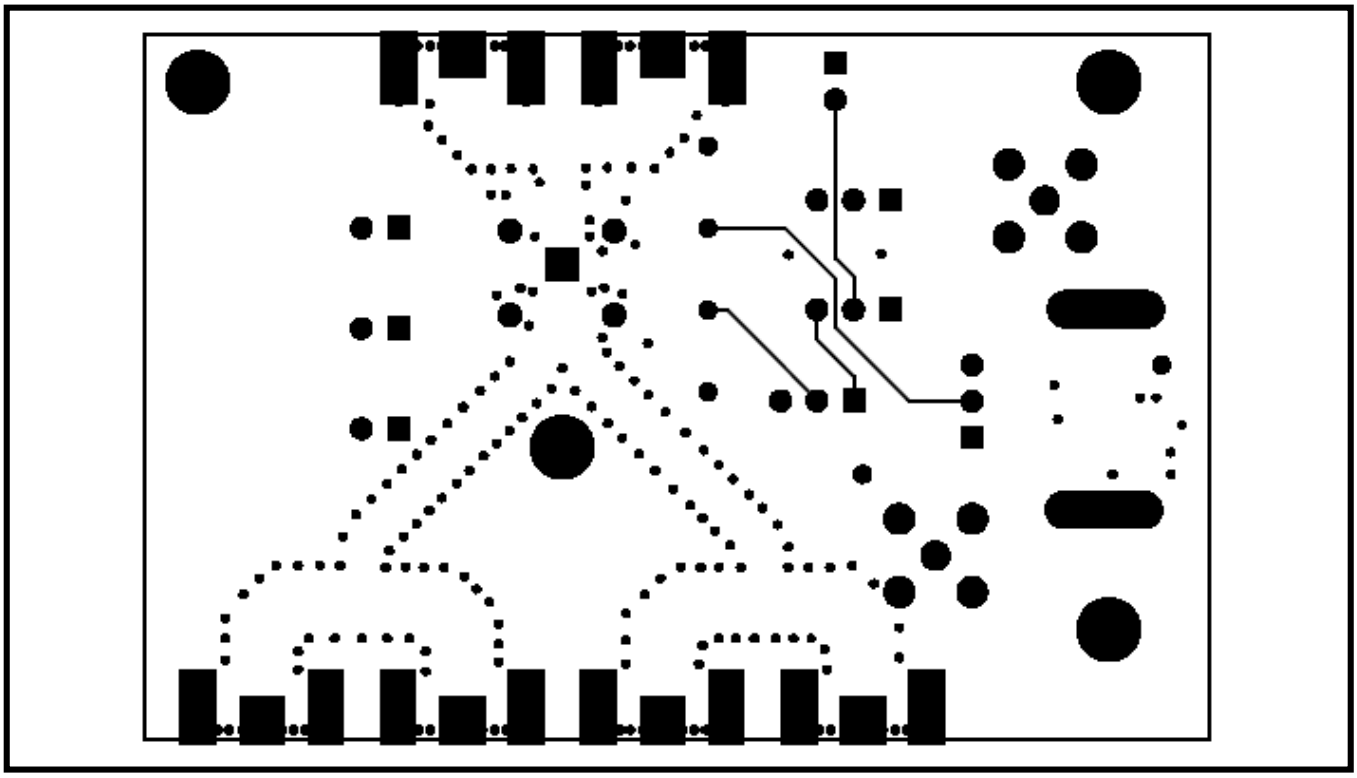

Figure 6. MAX3942 EV Kit PC Board Layout—Solder Side