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MAX3940 Evaluation Kit

Evaluates: MAX3940

General Description

The MAX3940 evaluation kit (EV kit) is an assembled demonstration board that provides electrical evaluation of the MAX3940 10.7Gbps laser driver. The output of the electrical evaluation section is interfaced to an SMA connector 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**

Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX3940EVKIT	-40°C to +85°C	Chip on board

Component List

DESIGNATION	QTY	DESCRIPTION
C0, C1, C10, C11	4	0.01μF ±10% ceramic capacitors (0402)
C2, C6	2	30pF chip MIS capacitors Metelics Corporation, 30 mils × 30mils, MC2-S-030-020-020
C3	1	22μF ±10% tantalum capacitor AVX TAJB226K010
C4	1	10μF ±10% tantalum capacitor AVX TAJA106K010
C5	1	0.1μF ±10% ceramic capacitor (0402) Murata GRP155R61A104K
J1-J7	7	SMA connectors, edge mount, EF Johnson 142-0701-851
J10, J11, TP1	3	Test points, Digi-Key 5000K-ND
J12, J13	2	SMB connectors, PC mount
JU1-JU3, JU5, JU8	5	2-pin headers, 0.1in centers Digi-Key S1012-36-ND
JU4, JU6, JU7	3	3-pin headers, 0.1in centers Digi-Key S1012-36-ND
JU1- JU8	8	Shunts, Digi-Key S9000-ND
L0	1	47nH inductor (0402)
R0-R2	3	2kΩ variable resistors Bourns 3296W-202
R3	1	4.2kΩ ±1% resistor (0402)
R4	1	2kΩ ±1% resistor (0402)
R5	1	Not installed
U1	1	MAX3940E/D die
None	1	MAX3940 EV kit circuit board, rev A
None	1	MAX3940 EV kit data sheet
None	1	MAX3940 data sheet

Component Suppliers

SUPPLIER	PHONE	FAX
AVX	843-444-2863	843-626-3123
Coilcraft	847-639-6400	847-639-1469
Digi-Key	218-681-6674	218-681-3380
EF Johnson	402-474-4800	402-474-4858
Murata	415-964-6321	415-964-8165

Note: *Please indicate that you are using the MAX3940 when ordering from these suppliers.*

Detailed Description

The MAX3940 EV Kit is a fully assembled and factory tested demonstration board that enables testing of all MAX3940 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

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 combination bias and modulation output (OUT) is also DC-coupled to the SMA connector and requires a 50Ω to ground load for proper operation.

For pricing, delivery, and ordering information, please contact Maxim/Dallas Direct! at 1-888-629-4642, or visit Maxim's website at www.maxim-ic.com.

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1) If the data is to be latched, place shunt on JU2 ($\overline{\text{RTEN}}$) to enable the clock inputs. Otherwise, leave JU2 open.

2) Install jumpers on JU5 and JU8.

3) Install a jumper on the left "DC" side of JU6. This allows adjustment of MODSET.

4) Install a jumper on the right "DC" side of JU7. This allows adjustment of BIASSET.

5) To use the pulse-width control (PWC) install a jumper on the right side of JU4. To disable PWC place a jumper on the left "GND" side of JU4.

6) Ensure that a jumper is not installed on JU3 to float $\overline{\text{MODEN}}$ and enable modulation.

7) Adjust R1 to the full counter-clockwise position. This will minimize modulation swing.

8) Adjust R2 to the full clockwise position. This will minimize bias voltage.

9) Adjust R0 to the approximate center of its adjustment range (if PWC is enabled).

10) Connect a differential signal source to J2 (DATA+) and J3 (DATA-). Refer to the MAX3940 data sheet to determine voltage levels.

11) If the latch is enabled, apply a differential clock signal to J4 (CLK+) and J5 (CLK-). Refer to the MAX3940 data sheet to determine voltage levels.

12) Connect a high-bandwidth oscilloscope such as the Tektronix CSA8000 with the 80E01 sampling head to J1 (OUT).

13) A high-quality SMA attenuator (14dB or 20dB) is required to reduce the signal level for compatibility with the sampling head. The attenuator should be connected directly to the output SMA connector on the EV kit to minimize transmission line reflections.

14) Attach a –5.2V power supply to V_{EE} and GND. Set the current limit to 300mA and power up the board.

15) Adjust R1 clockwise until the desired modulation swing is achieved.

16) Adjust R2 counter-clockwise until the desired bias voltage is achieved.

17) Adjust R0 until the desired pulse width is achieved (if PWC is enabled).

Adjustments and Control Descriptions

| COMPONENT	NAME	FUNCTION
JU1	PLRT	Enables/disables the polarity inversion function. Shunt JU1 to invert the polarity of the output data. Shunting JU1 shorts the PLRT pin to V_{EE}. Leave open for normal operation.
JU2	$\overline{\text{RTEN}}$	Enables/disables data retiming. Shunt to enable data retiming. Remove shunt for direct data transmission.
JU3	$\overline{\text{MODEN}}$	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.
R1	R_{MODSET}	Adjusts the EAM modulation current. Turn the potentiometer screw clockwise to increase the modulation amplitude (decrease the resistance of MODSET to GND).
R2	$R_{BIASSET}$	Adjusts the EAM bias current. Turn the potentiometer screw counter-clockwise to increase bias current (decrease the resistance from BIASSET to GND).
R0	R_{PWC}	Adjusts the EAM pulse width. Turn the potentiometer screw clockwise to increase the logic 1 width.

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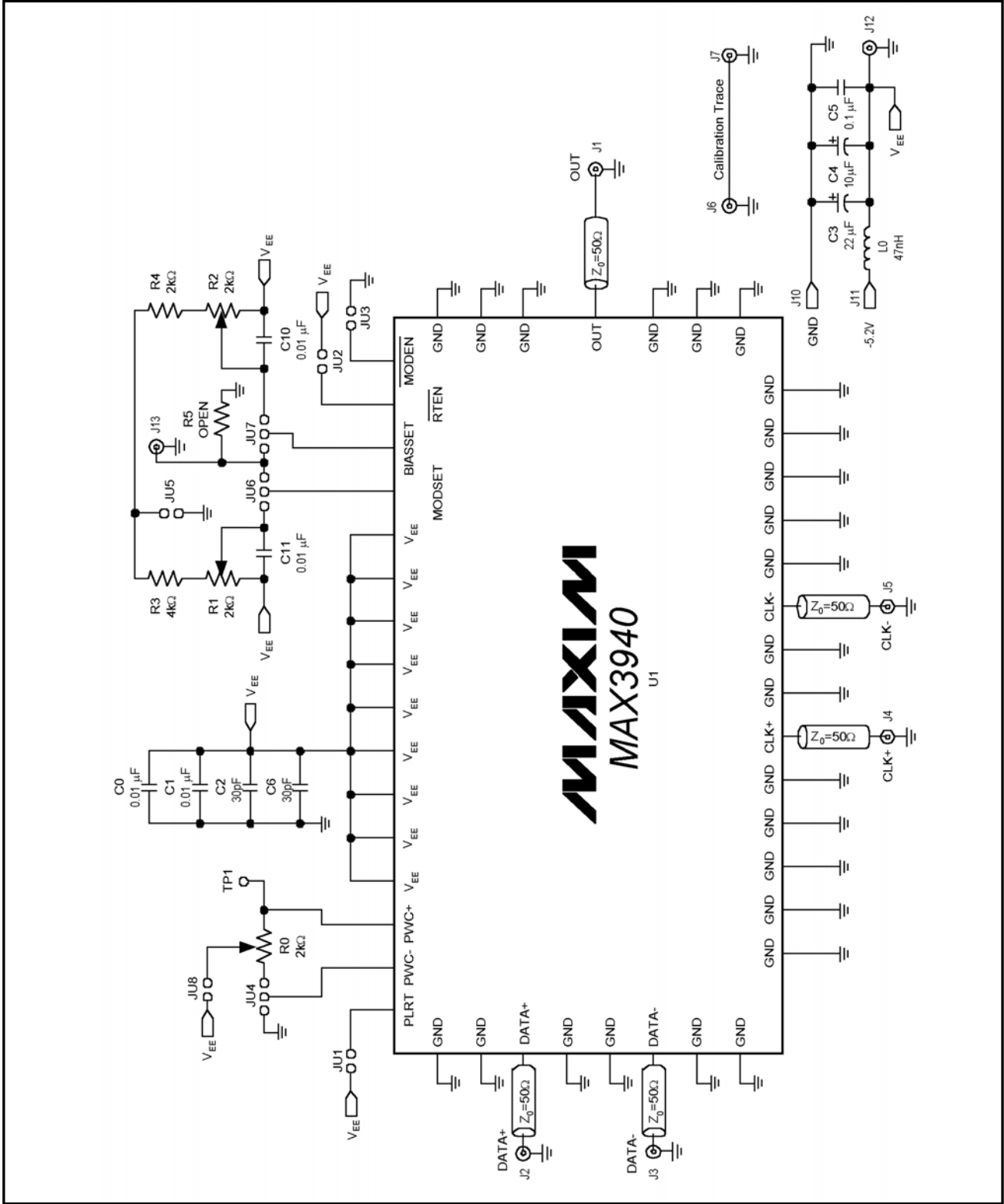
Figure 1. MAX3940 EV Kit Schematic

MAX3940 Evaluation Kit
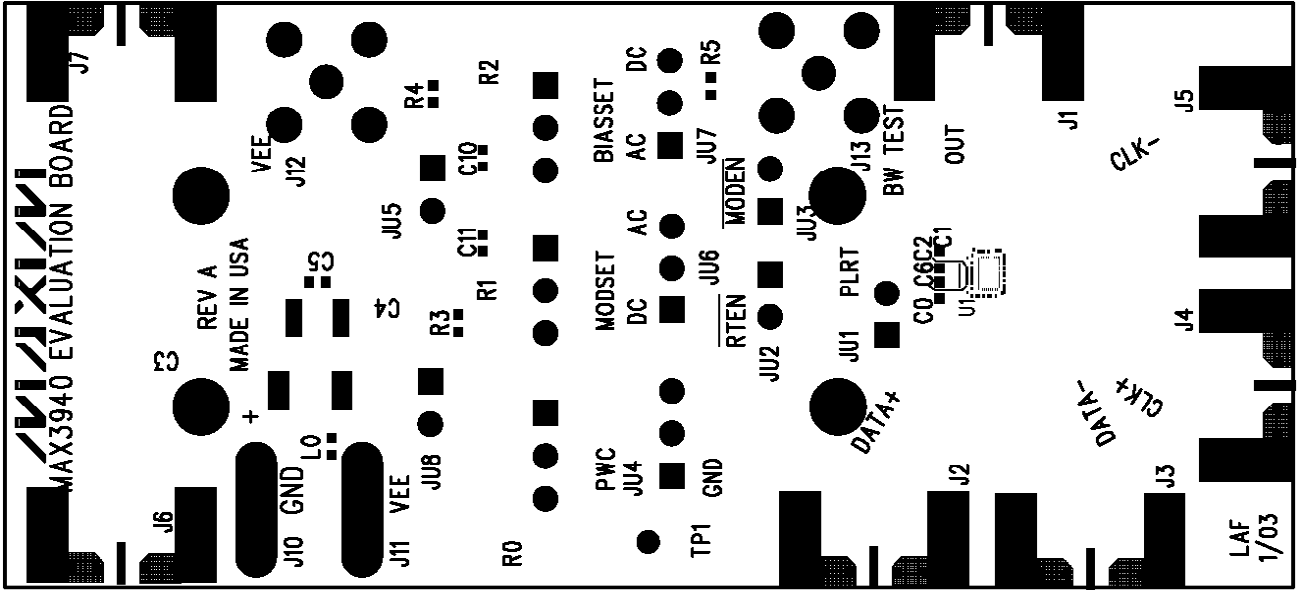
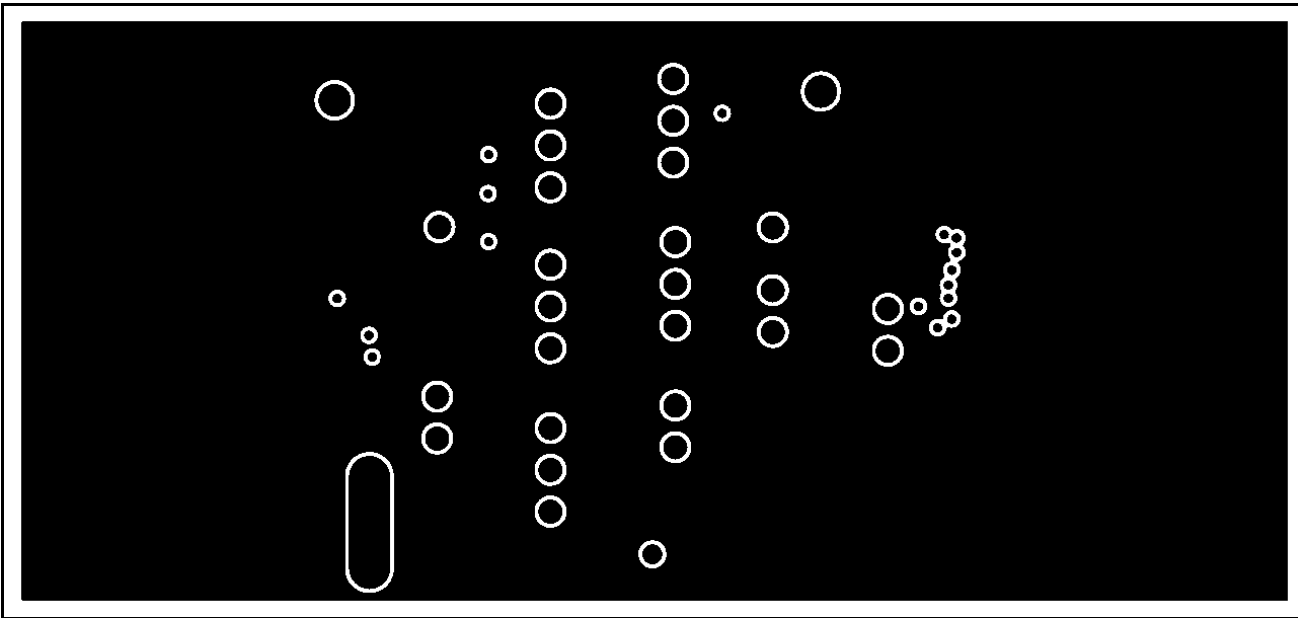*Figure 2. MAX3940 EV Kit Component Placement Guide—Component Side*
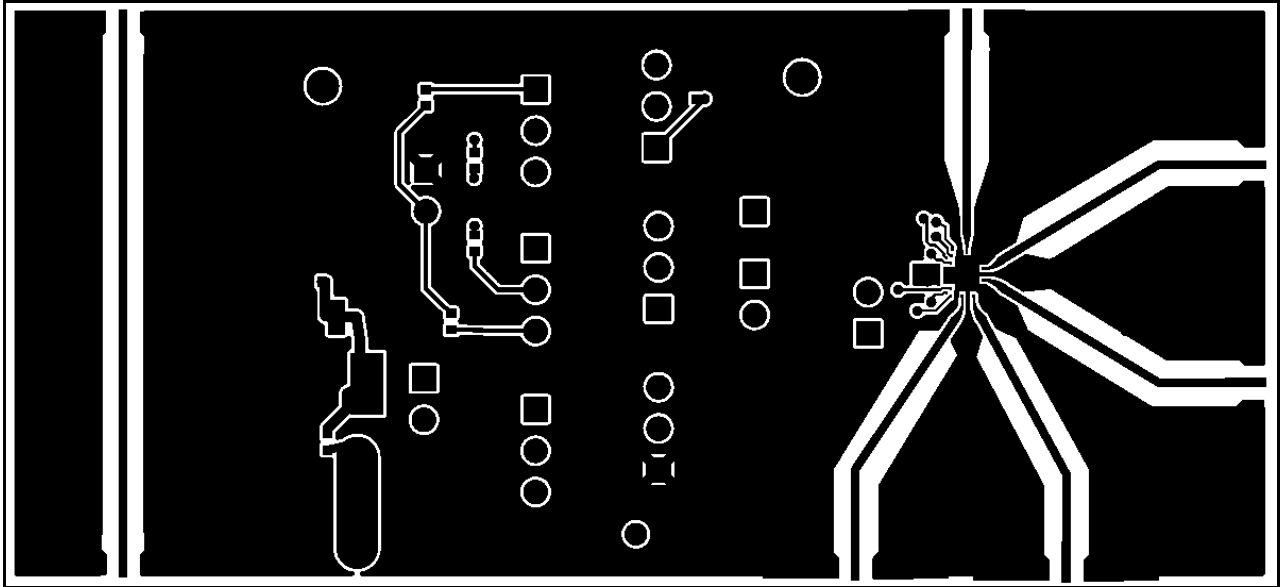

Figure 3. MAX3940 EV Kit PC Board Layout—Ground Plane
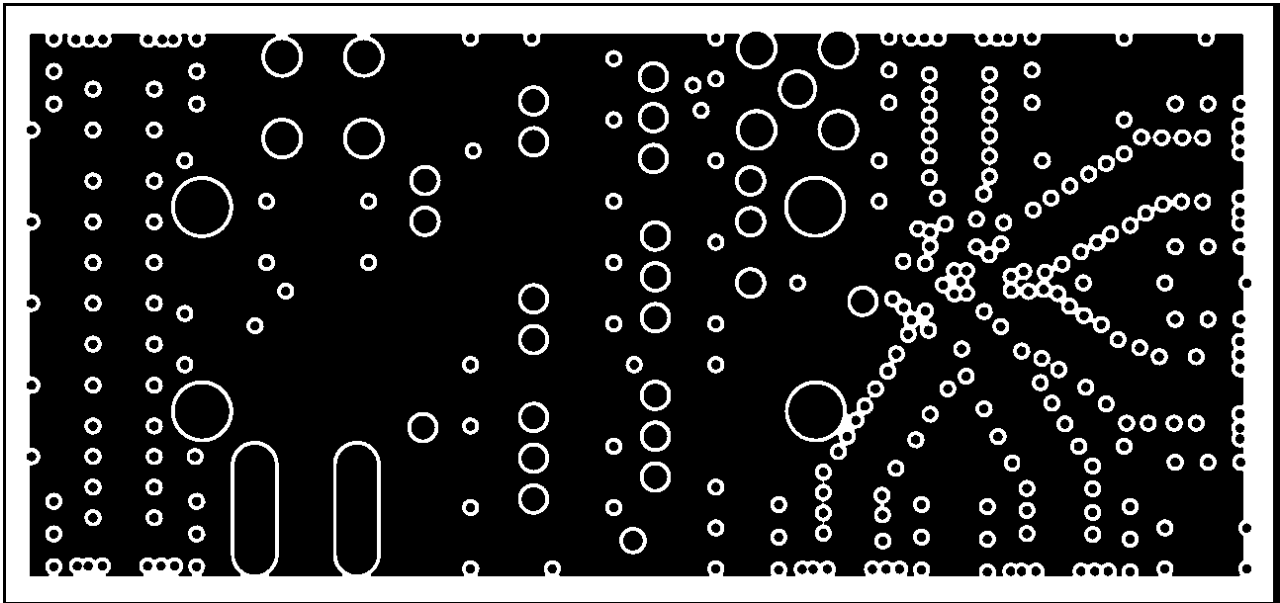
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Figure 4. MAX3940 EV Kit PC Board Layout—Component Side

Figure 5. MAX3872/MAX3874 EV Kit PC Board Layout—Power Plane

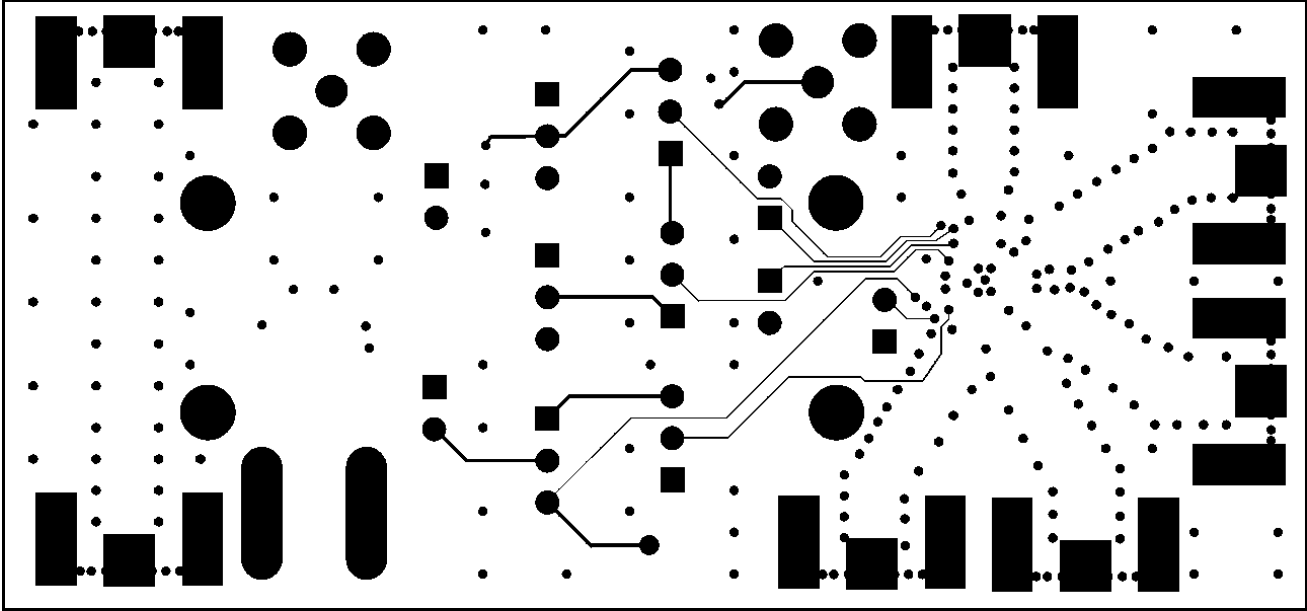*Figure 6. MAX3872/MAX3874 EV Kit PC Board Layout—Solder Side*