19-5067; Rev 0; 11/09

MAX13055E Evaluation Kit

Evaluates: MAX13055E–MAX13058E

General Description

The MAX13055E evaluation kit (EV kit) provides a proven design to evaluate the MAX13055E 8-channel, bidirectional level translator. The MAX13055E translates between VL and VCC logic levels for data rates up to 100Mbps (50MHz).

The MAX13055E EV kit PCB comes with the MAX13055EEWG+, 24-bump WLP installed. Contact the factory for free samples of the pin-compatible MAX13056EEWG+, MAX13057EEWG+, and MAX13058EEWG+.

Features

- **On-Board Clock Generator Capable of 33MHz and 16.5MHz**
- **Accessible Headers to All 8 Input/Output (I/O) Channels**
- **Lead(Pb)-Free and RoHS Compliant**
- **Proven PCB Layout**
- **Fully Assembled and Tested**

Ordering Information

PART	TYPE
MAX13055EEVKIT+	EV Kit

+Denotes lead(Pb)-free and RoHS compliant.

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C3, C11, C12	4	0.1µF ±10%, 16V X7R ceramic capacitors (0402) Murata GRM155R71C104K
C2	1	1µF ±10%, 6.3V X5R ceramic capacitor (0402) TDK C1005X5R0J105K
C4, C5, C6, C8, C9	5	1µF ±10%, 16V X5R ceramic capacitors (0603) TDK C1608X5R1C105
C7, C10, C13	3	0.01µF ±10%, 16V X7R ceramic capacitors (0603) Murata GRM188R71C03K
H1, H2	2	2 x 8-pin headers
JU1–JU6, JU9	7	3-pin headers
JU7, JU8, JU10	3	2-pin headers
P1	1	USB type-B right-angle male receptacle
R1–R8, R17–R24, R33–R36	20	0Ω ±5% resistors (0402)
R9–R16, R25–R32	0	Not installed, resistors (0402)
U1	1	8-channel level translator (24 WLP) Maxim MAX13055EEWG+
U2	1	1.8V LDO (5 SC70) Maxim MAX8510EXK18+
U3	1	3.0V LDO (5 SC70) Maxim MAX8510EXK30+
U4	1	33MHz oscillator (8 µMAX®) Maxim DS1091LUA-033+
U5	1	Dual inverter (6 SC70) Fairchild NC7WZ04P6X
U6	1	D-type flip-flop (8 US8) Fairchild NC7SP74K8
—	1	USB high-speed A-to-B cable, 6ft
—	10	Shunts
—	1	PCB: MAX13055E EVALUATION KIT+

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Fairchild Semiconductor	888-522-5372	www.fairchildsemi.com
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
TDK Corp.	847-803-6100	www.component.tdk.com

Note: *Indicate that you are using the MAX13055E when contacting these component suppliers.*

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Quick Start

Required Equipment

- MAX13055E EV kit (USB cable included)
- Two-channel oscilloscope (e.g., Tektronix TDS3012)

Procedure

The MAX13055E EV kit is fully assembled and tested. Follow the steps below to verify the board operation:

1) Verify that all jumpers are in their default positions, as shown in Table 1.
2) Connect the USB cable to the USB connector (P1) on the MAX13055E EV kit.
3) Connect the first channel of the oscilloscope to the H1-1 header, which is the 1.8V logic-level 33MHz signal input.
4) Connect the second channel of the oscilloscope to the H2-2 header, which is the 3.0V logic-level 33MHz signal output.
5) Observe the oscilloscope and verify that the 1.8V logic-level 33MHz I/O_VL1 signal is translated to the 3.0V logic level at the H2-2 header.

Table 1. MAX13055E EV Kit Jumper Description (JU1–JU10)

JUMPER	SHUNT POSITION	DESCRIPTION
JU1	1-2*	Enables the MAX13055E for normal operation
	2-3	Sets the MAX13055E to shutdown mode
JU2	1-2*	Sets the MAX13055E VL logic level using the on-board 1.8V LDO
	2-3	Sets the MAX13055E VL logic level using an external supply
JU3	1-2*	Sets the MAX13055E VCC logic level using the on-board 3.0V LDO
	2-3	Sets the MAX13055E VCC logic level using an external supply
JU4	1-2*	Powers the clock generator from VCC
	2-3	Powers the clock generator from an external supply
JU5	1-2*	Enables the inverter (U5) and sets the inverter's output to VL logic level
	2-3	Enables the inverter (U5) and sets the inverter's output to VCC logic level
JU6	1-2*	Powers the MAX13055E EV kit using the USB supply
	2-3	Powers the MAX13055E EV kit using an external supply
JU7	Open	Disconnects the clock generator signal from the I/O_VL1 pin of the MAX13055E
	1-2*	Connects the clock generator signal to the I/O_VL1 pin of the MAX13055E
JU8	Open*	Disconnects the clock generator signal from the I/O_VCC1 pin of the MAX13055E
	1-2	Connects the clock generator signal to the I/O_VCC1 pin of the MAX13055E
JU9	1-2*	Connects the 33MHz clock signal to the inverter (U5)
	2-3	Connects the 33MHz clock signal to the D flip-flop (U6) to divide the clock signal by two to get 16.5MHz
JU10	Open*	Disconnects the 16.5MHz clock signal from the inverter (U5)
	1-2	Connects the 16.5MHz clock signal to the inverter (U5)

**Default position.*

_Detailed Description of Hardware

The MAX13055E EV kit provides a proven design to evaluate the MAX13055E 8-channel, bidirectional level translator. The MAX13055E translates between VL and VCC logic levels for data rates up to 50MHz.

Shutdown Mode

The MAX13055E enters shutdown mode by moving jumper JU1 to the 2-3 position. For normal operation, leave the shunt in the 1-2 position.

Clock Generator

The MAX13055E EV kit includes the convenience of an on-board clock generator (U4), capable of producing 33MHz or 16.5MHz signals on the I/O_VL1 and I/O_VCC1 inputs. For 33MHz, move the shunt of jumper JU9 to the 1-2 position and remove the shunt from jumper JU10. For 16.5MHz, move the shunt of JU9 to the 2-3 position and place a shunt on JU10.

When translating from VL to VCC, move jumper JU5 to the 1-2 position, place a shunt on jumper JU7, and remove the shunt from jumper JU8. To go from VCC to VL, move JU5 to the 2-3 position, remove the shunt from JU7, and place a shunt on JU8.

Applying User Signals to I/O_VL_ and I/O_VCC_

The MAX13055E EV kit allows user-supplied input signals to be applied to the H1 and H2 headers. Remove shunts from jumpers JU7 and JU8 and apply the input signals to the appropriate pins on headers H1 and H2 (see Tables 2 and 3).

User-Supplied VDD_EXT, VL, VCC, and VCLK

The MAX13055E EV kit is powered completely from a USB power supply when jumper JU6 is in the 1-2 position. Move JU6 to the 2-3 position so that a user-supplied power supply can be applied to the VDD_EXT and GND pads.

Users can supply their own VL and VCC voltages by moving jumpers JU2 and JU3 to the 2-3 position. Apply a voltage from 1.62V to 3.2V to the VL and GND pads and 2.2V to 3.6V to the VCC and GND pads.

When jumper JU4 is in the 1-2 position, the clock generator is powered from VCC. To use a separate supply for the clock generator, place the shunt on JU4 in the 2-3 position and apply a 3.0V to 3.6V supply between the VCLK and GND pads.

Table 2. H1 Header Description (I/O_VL_)

DESIGNATION	SIGNAL
H1-1	I/O_VL1
H1-3	I/O_VL2
H1-5	I/O_VL3
H1-7	I/O_VL4
H1-9	I/O_VL5
H1-11	I/O_VL6
H1-13	I/O_VL7
H1-15	I/O_VL8

Table 3. H2 Header Description (I/O_VCC_)

DESIGNATION	SIGNAL
H2-2	I/O_VCC1
H2-4	I/O_VCC2
H2-6	I/O_VCC3
H2-8	I/O_VCC4
H2-10	I/O_VCC5
H2-12	I/O_VCC6
H2-14	I/O_VCC7
H2-16	I/O_VCC8

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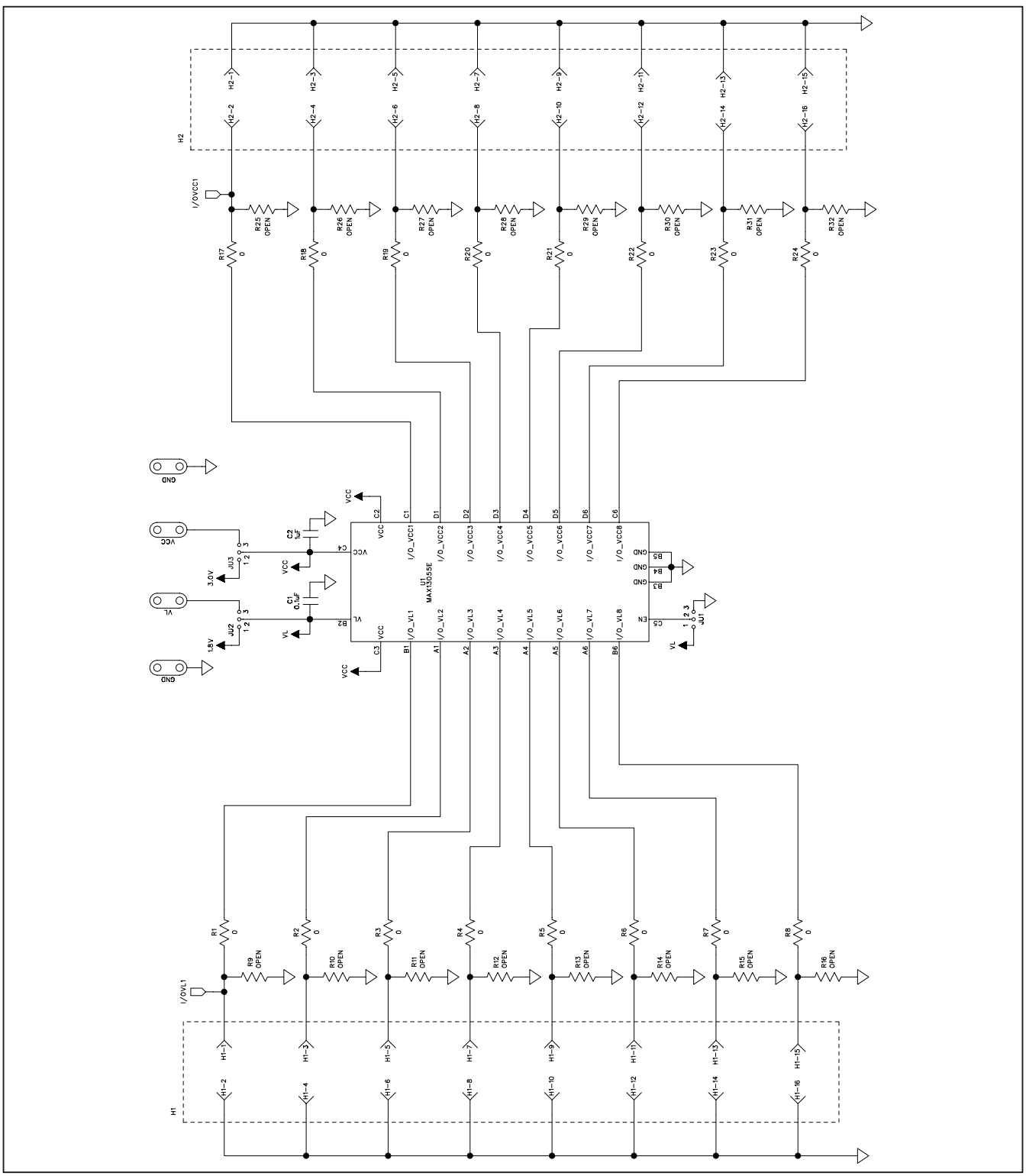

Figure 1a. MAX13055E EV Kit Schematic (Sheet 1 of 2)

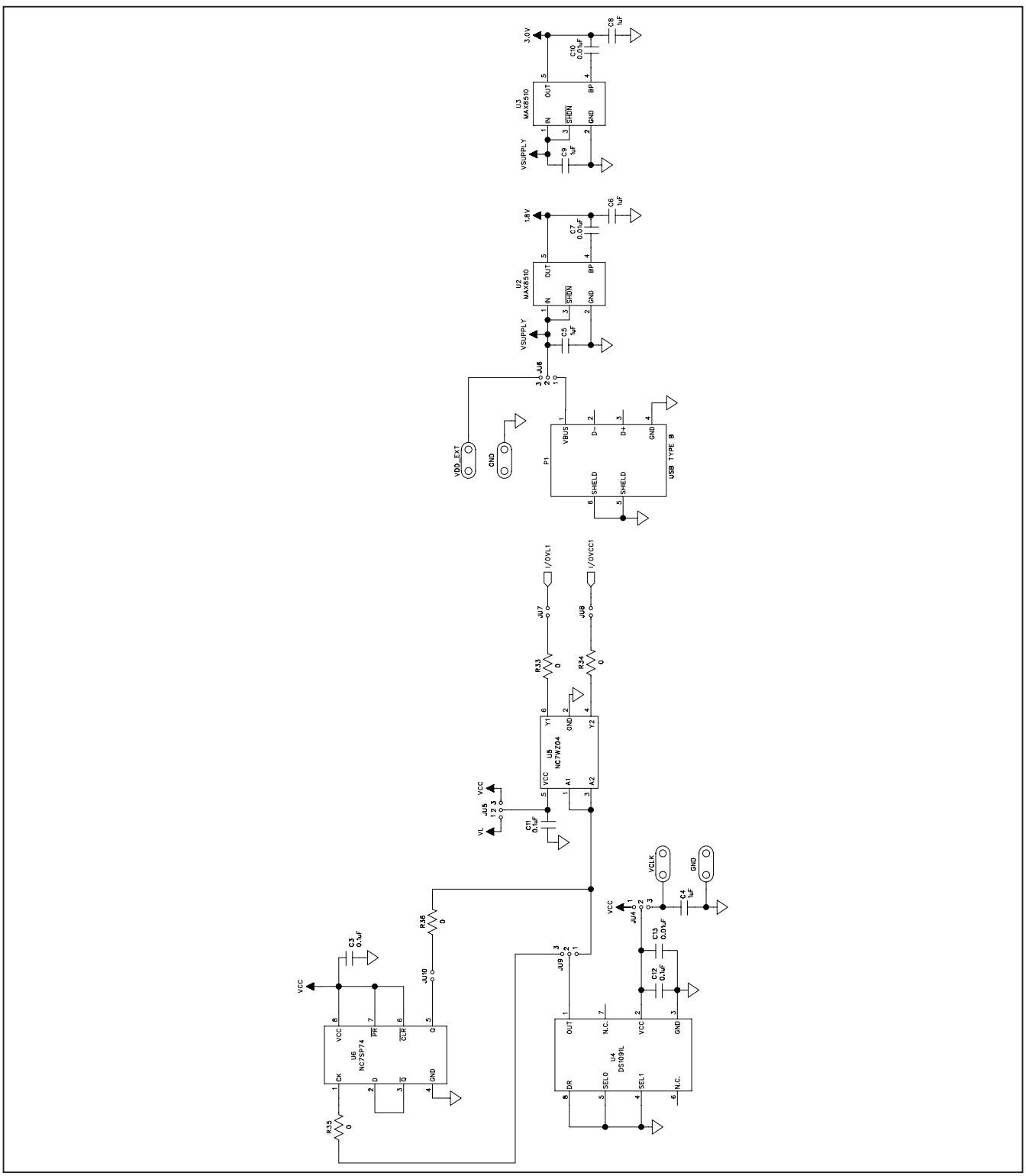

Figure 1b. MAX13055E EV Kit Schematic (Sheet 2 of 2)

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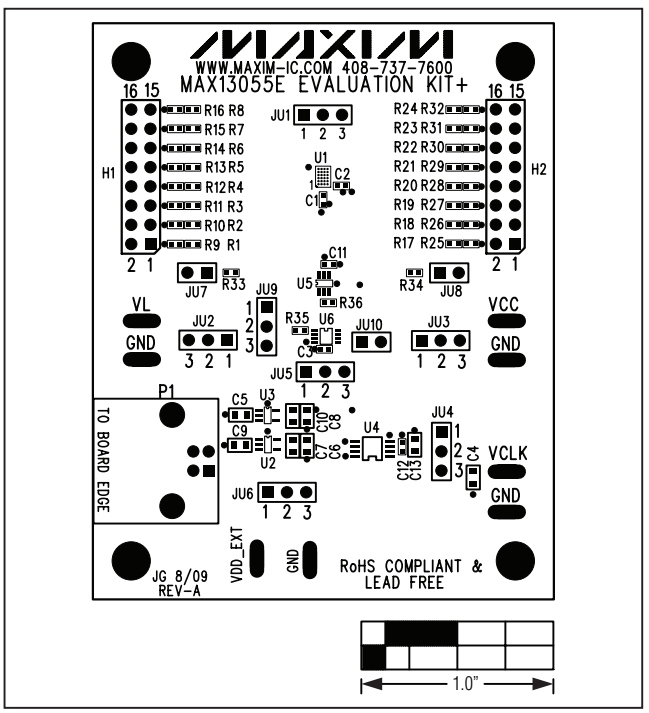

Figure 2. MAX13055E EV Kit Component Placement Guide—Component Side

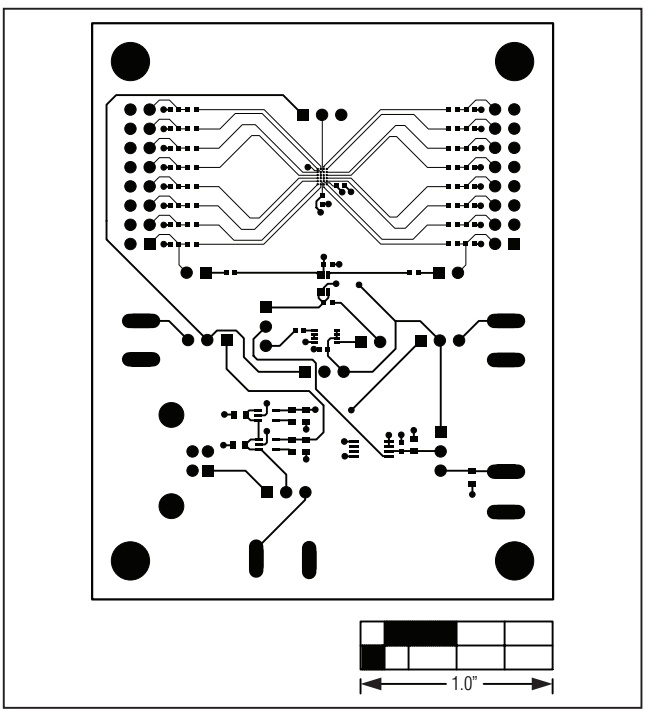

Figure 3. MAX13055E EV Kit PCB Layout—Component Side

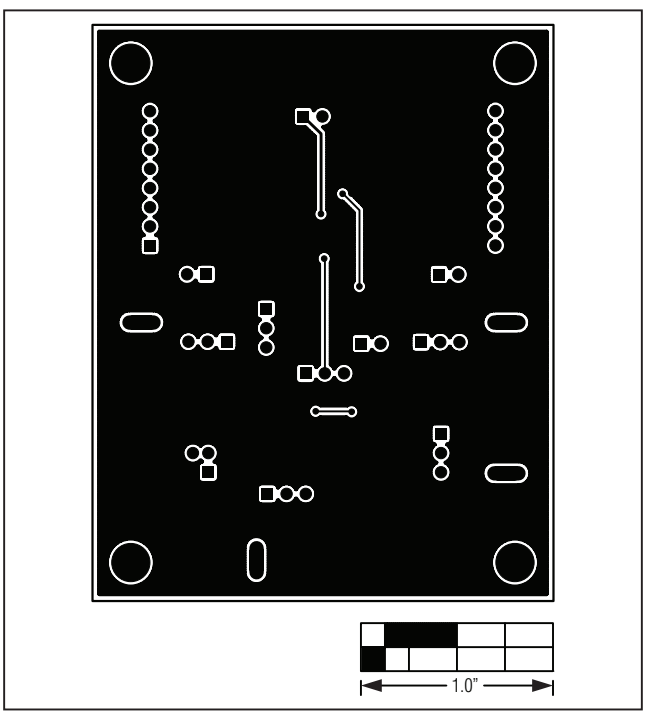

Figure 4. MAX13055E EV Kit PCB Layout—Solder Side