



MAX11508 Evaluation Kit

General Description

The MAX11508 evaluation kit (EV kit) is a fully assembled and tested surface-mount circuit board that contains a MAX11508 IC. The MAX11508 is a 3-channel video filter and buffer. The 3-channel filter bandwidths are selectable to accept high-definition television (HDTV), progressive-scan (PS), standard-definition television (SDTV), or bypassed for 1080p or high bandwidth RGB signals. Each channel includes a transparent input clamp and a +6dB output buffer capable of driving 2V_{p-p} into a standard 150Ω load.

The video input and output signals on the EV kit can be AC- or DC-coupled. The MAX11508 video input terminals are terminated at 75Ω, and the output terminals are 75Ω back terminated. The EV kit operates from a single 5V DC power supply. The EV kit can also evaluate the MAX11509. The MAX11508 EV kit is shipped with a MAX11508 IC installed. To evaluate the MAX11509, contact the factory to request free samples of the pin-compatible MAX11509 IC.

Features

- ◆ Single 5V Supply Operation
- ◆ Transparent Input Clamp
- ◆ Output Buffer Drives 150Ω Standard Video Loads with a +6dB Gain
- ◆ Selectable Video Filter for High-Definition/Progressive-Scan/Standard-Definition Television
- ◆ Bypass Feature for High Bandwidth Signals
- ◆ AC- or DC-Coupled Inputs and Outputs
- ◆ Standard 75Ω Input/Output Terminations
- ◆ Surface-Mount Components
- ◆ Lead(Pb)-Free and RoHS Compliant
- ◆ Fully Assembled and Tested

Ordering Information

PART	TYPE
MAX11508EVKIT+	EV Kit

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

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	1μF ±10%, 16V X7R, ceramic capacitor (0603) Murata GRM188R71C105K
C2–C5	4	0.1μF ±10%, 16V X7R ceramic capacitors (0603) Murata GRM188R71C104K
C6, C7, C8	3	220μF ±20%, 6.3V OS-CON capacitors (8mm x 6.9mm) SANYO 6SVPA220MAA
C9, C10	0	Not installed, capacitors (0603)
GND (x2)	2	PC mini black test points
JU1–JU11	11	2-pin headers
PB/B_IN, PB/B_OUT, PR/R_IN, PR/R_OUT Y/G_IN, Y/G_OUT	6	PC mini red test points

DESIGNATION	QTY	DESCRIPTION
PB/BIN, PB/BOU, PR/RIN, PR/ROUT, Y/GIN, Y/GOUT	6	75Ω BNC PCB-mount connectors
R1–R6	6	75Ω ±1% resistors (0603)
R7	1	820kΩ ±5% resistor (0603)
R8	1	120kΩ ±5% resistor (0603)
R9–R12	4	100kΩ ±5% resistors (0603)
U1	1	Video filter and buffer (14 TSSOP) Maxim MAX11508UUD+
—	11	Shunts
—	1	PCB: MAX11508 Evaluation Kit+

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Component Suppliers

SUPPLIER	PHONE	WEBSITE
Murata Electronics North America, Inc.	770-436-1300	www.murata-northamerica.com
SANYO Electric Co., Ltd.	619-661-6835	www.sanyodevice.com

Note: Indicate that you are using the MAX11508 when contacting these component suppliers.

Quick Start

Required Equipment

- 5V, 150mA DC power supply (VCC)
- Video signal generator (e.g., Tektronix TG-2000 or similar)
- An appropriate video measurement equipment

Procedure

The MAX11508 EV kit is fully assembled and tested. Follow the steps below to verify board operation.

Caution: Do not turn on the power supply until all connections are completed.

- 1) Verify that shunts are installed on the default position of all the jumpers listed in Table 1.
- 2) Connect the output of the video signal generator to the Y/GIN BNC connector on the MAX11508 EV kit.
- 3) Connect the Y/GOUT BNC connector on the EV kit to the input of the video measurement equipment.
- 4) Connect the power-supply ground to the GND pad on the EV kit.
- 5) Connect the 5V supply to the VCC pad on the EV kit.
- 6) Set the video signal generator for the desired video input signal. Since the input is AC-coupled and not biased, the signal should be a unipolar signal such as R, G, B, or Y.
- 7) Turn on the power supply and enable the video signal generator.
- 8) Analyze the video output signal.

Table 1. Jumper Function (JU1–JU11)

JUMPER	SHUNT POSITION	EV KIT FUNCTION
JU1	Not installed	Device enabled
JU2	Not installed	HD filter selected
JU3	Installed	
JU4	Installed	PB/BIN and PR/RIN bias enabled
JU5, JU6, JU7	Not installed	AC-coupled inputs
JU8, JU9, JU10	Not installed	AC-coupled outputs
JU11	Not installed	Y/GIN is not DC biased

Detailed Description of Hardware

The MAX11508 EV kit is a fully assembled and tested surface-mount circuit board that contains a MAX11508 IC. The MAX11508 is a 3-channel video filter and buffer. The MAX11508 EV kit has three input channels to accept a full set of component video input signals.

The MAX11508 filter bandwidths are selectable to accept four different operational modes: SD, PS, HD, or bypassed for 1080p or high bandwidth RGB signals. Each channel includes a transparent input clamp and a +6dB output buffer capable of driving 2Vp-p into a standard 150Ω load.

All the input and output signals on the MAX11508 EV kit can be configured for AC- or DC-coupling. The EV kit's input terminals are 75Ω terminated, and the video output terminals are each back terminated with 75Ω.

MAX11509 Evaluation

The MAX11508 EV kit can also evaluate the MAX11509 IC. To evaluate the MAX11509, replace MAX11508 IC U1 with the MAX11509. Refer to the MAX11508/MAX11509 IC data sheet for additional information.

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Evaluates: MAX11508/MAX11509

Jumper Selection

Power-Down (SHDN)

The MAX11508 EV kit provides an option to shut down the MAX11508 IC. Jumper JU1 selects the shutdown or the normal operation mode for the MAX11508 EV kit. See Table 2 for shunt positions.

Table 2. JU1 Jumper Selection (SHDN)

SHUNT POSITION	MAX11508 SHDN PIN CONNECTED TO	EV KIT OPERATION
Installed	GND	Shutdown
Not installed*	VCC through resistor R9	Normal operation

*Default position.

Video Filter Bandwidth and Modes (HD/PS/SD/BP)

The MAX11508 EV kit provides an option to select the video filter bandwidths for the MAX11508. Jumpers JU2 and JU3 select the video filter bandwidths on the MAX11508 EV kit. See Table 3 for shunt positions.

Table 3. JU2, JU3 Jumper Selection (HD/PS/SD/BP)

SHUNT POSITION		FILTER BANDWIDTH (MHz)	MAX11508 EV KIT OPERATION MODE
JU2 (FSEL1)	JU3 (FSEL0)		
Installed	Installed	9	SD
Installed	Not installed	16	PS
Not installed*	Installed*	33	HD
Not installed	Not installed	60	BP

*Default position.

Biasing the Channel 1 (Y/GIN) Input

When configuring the channel 1 input for AC-coupled operation, the correct DC bias point has to be chosen, depending on the input signals.

The MAX11508 features an internal transparent clamp to provide the correct bias level for unipolar signals such as R, G, B, and Y on channel 1 (Y/GIN). The MAX11508 channel 1 (Y/G_IN) internal transparent clamp is enabled when no external bias is connected to the Y/G_IN pin (see Table 4). If the unipolar signals exceed the voltage defined in the MAX11508/MAX11509 IC data sheet, AC-coupling is recommended.

For bipolar signals such as Pb and Pr on channel 1 (Y/GIN), AC-coupling is recommended, and an external biasing circuit is provided on the EV kit (see Table 4).

Table 4. JU11 Jumper Selection (Y/GIN)

SHUNT POSITION	Y/G_IN PIN INPUT BIAS	Y/GIN CHANNEL DC BIAS LEVEL
Installed	External bias	DC bias enabled for channel 1 to accept bipolar signals such as Pb and Pr
Not installed*	No external bias	Transparent clamp enabled for channel 1 to accept unipolar signals such as R, G, B, and Y

*Default position.

Biasing the Channel 2 (PB/BIN) and Channel 3 (PR/RIN) Inputs

The MAX11508 features transparent clamps on the PB/B_IN and PR/R_IN pins to provide the correct bias level for unipolar signals such as R, G, B, and Y. When bipolar signals such as Pb and Pr are used, an internal bias generator is used to set the correct bias level. The bias generator is enabled by pulling the BIAS pin low using jumper JU4. See Table 5 for the jumper positions.

Table 5. JU4 Jumper Selection (BIAS)

SHUNT POSITION	MAX11508 BIAS PIN CONNECTED TO	PB/B_IN AND PR/R_IN PINS INPUT BIAS	PB/BIN AND PR/RIN CHANNELS DC BIAS LEVEL
Installed*	GND	Bias enabled, clamp disabled	DC bias enabled for channels 2 and 3 to accept bipolar signals such as Pb and Pr
Not installed	VCC through resistor R12	Bias disabled, clamp enabled	DC bias disabled for channels 2 and 3 to accept unipolar signals such as R, G, B, and Y

*Default position.

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Input Coupling (Y/GIN, PB/BIN, PR/RIN)

The MAX11508 IC features a transparent clamp at the video inputs that allows either AC- or DC-coupling. If the input signal remains above ground, the transparent clamp is inactive, offering true DC input coupling. If the signal drops below ground, the inputs must be AC-coupled. The transparent clamp sets the video sync tip just below ground.

The MAX11508 EV kit provides an option to configure the MAX11508 inputs to AC- or DC-coupling. Jumpers JU5, JU6, and JU7 configure the input coupling for the MAX11508 EV kit. See Table 6 for shunt positions.

Table 6. JU5, JU6, JU7 Jumper Selection (Y/GIN, PB/BIN, PR/RIN)

SHUNT POSITION	Y/GIN, PB/BIN, PR/RIN COUPLING CONFIGURATION
Installed	DC-coupling
Not installed*	AC-coupling

*Default position.

Output Coupling (Y/GOUT, PB/BOUT, PR/ROUT)

The MAX11508 EV kit provides an option to configure the MAX11508 outputs to AC- or DC-coupling. Jumpers JU8, JU9, and JU10 configure the output coupling for the MAX11508 EV kit. See Table 7 for shunt positions.

Table 7. JU8, JU9, JU10 Jumper Selection (Y/GOUT, PB/BOUT, PR/ROUT)

SHUNT POSITION	Y/GOUT, PB/BOUT, PR/ROUT COUPLING CONFIGURATION
Installed	DC-coupling
Not installed*	AC-coupling

*Default position.

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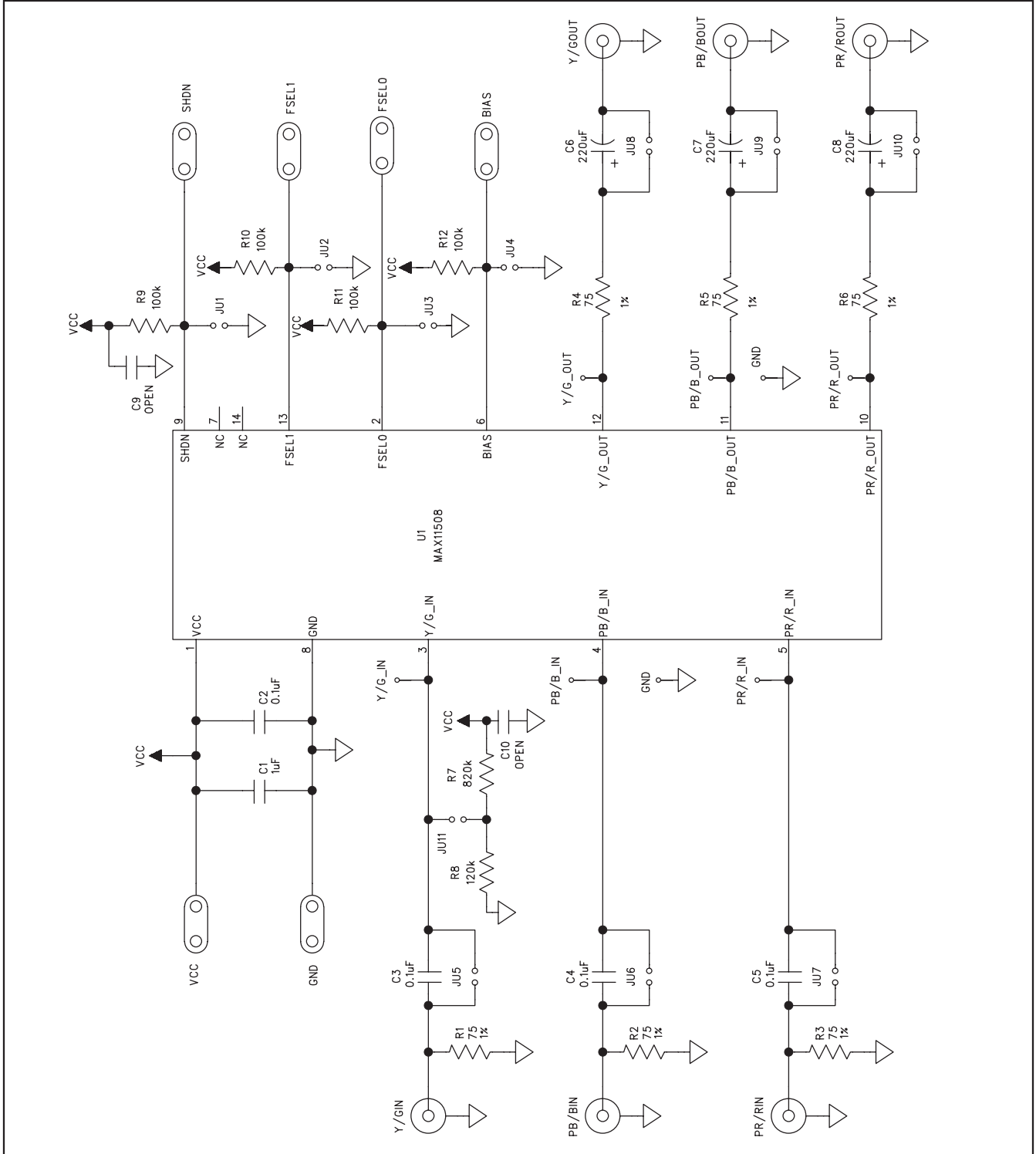


Figure 1. MAX11508 EV Kit Schematic

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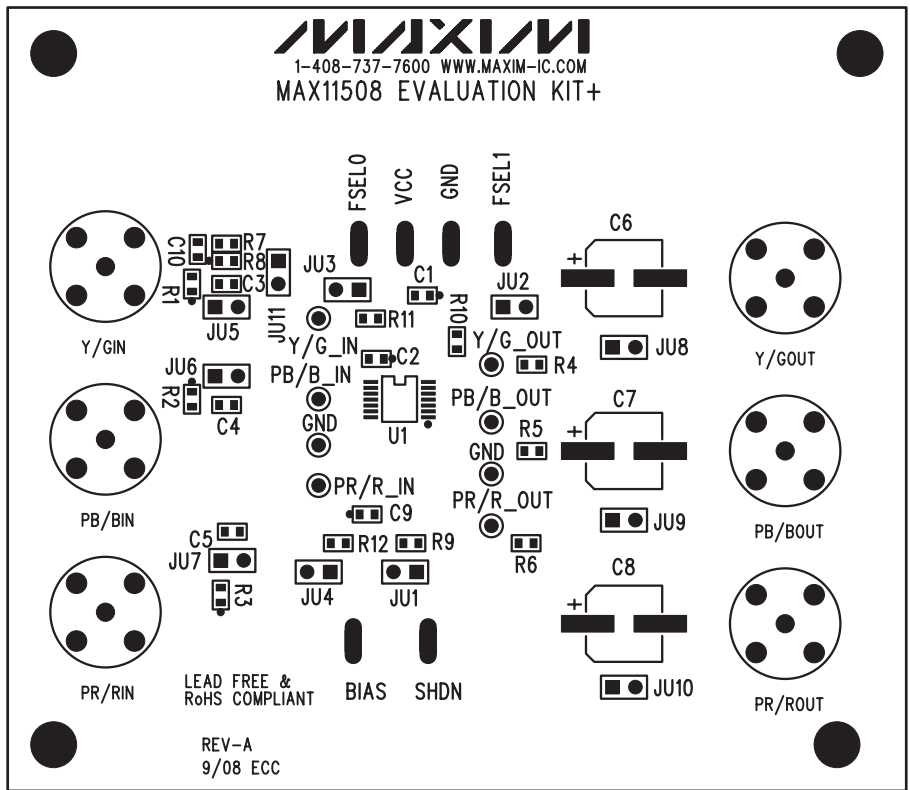


Figure 2. MAX11508 EV Kit Component Placement Guide—Component Side

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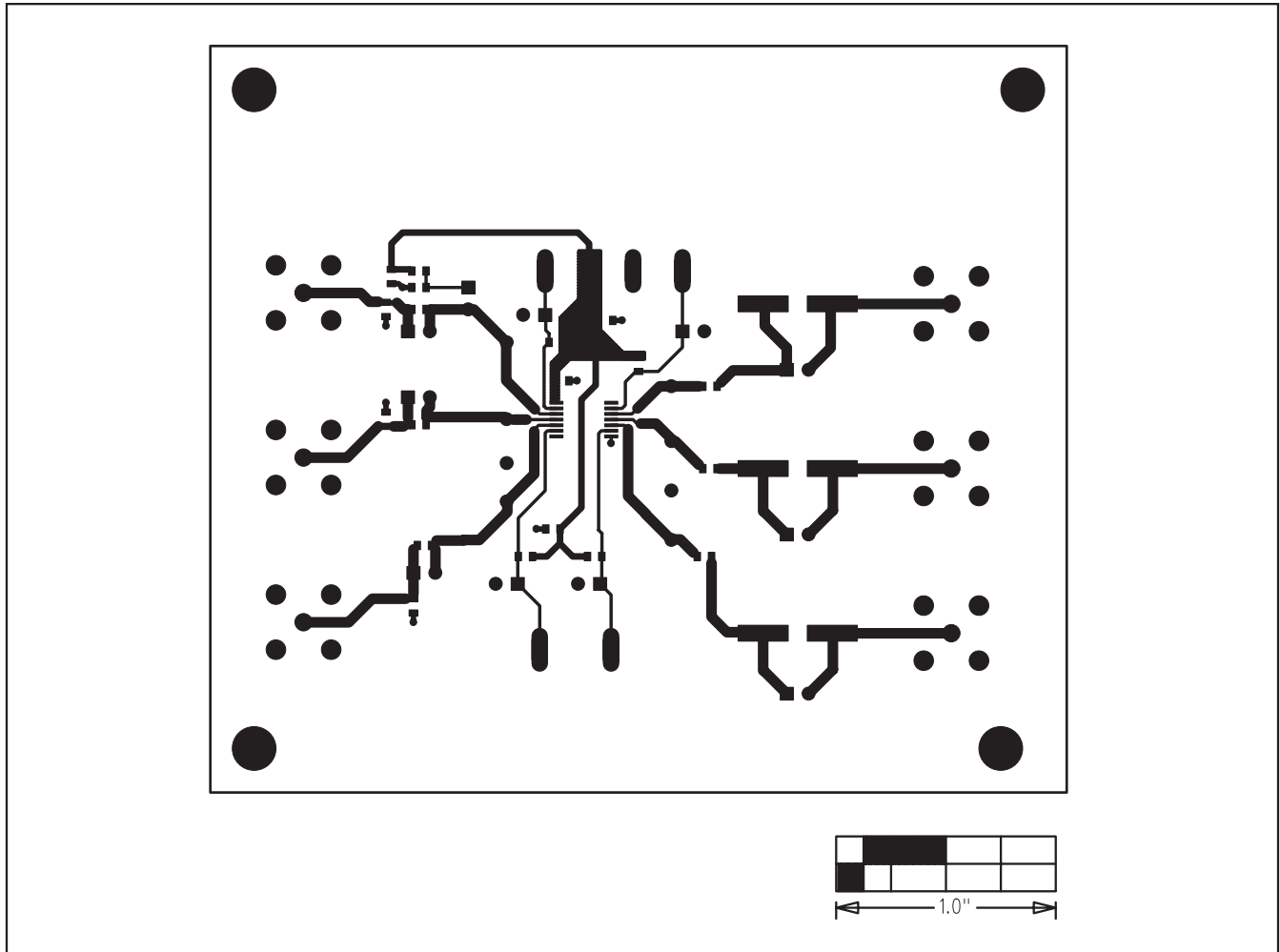


Figure 3. MAX11508 EV Kit PCB Layout—Component Side

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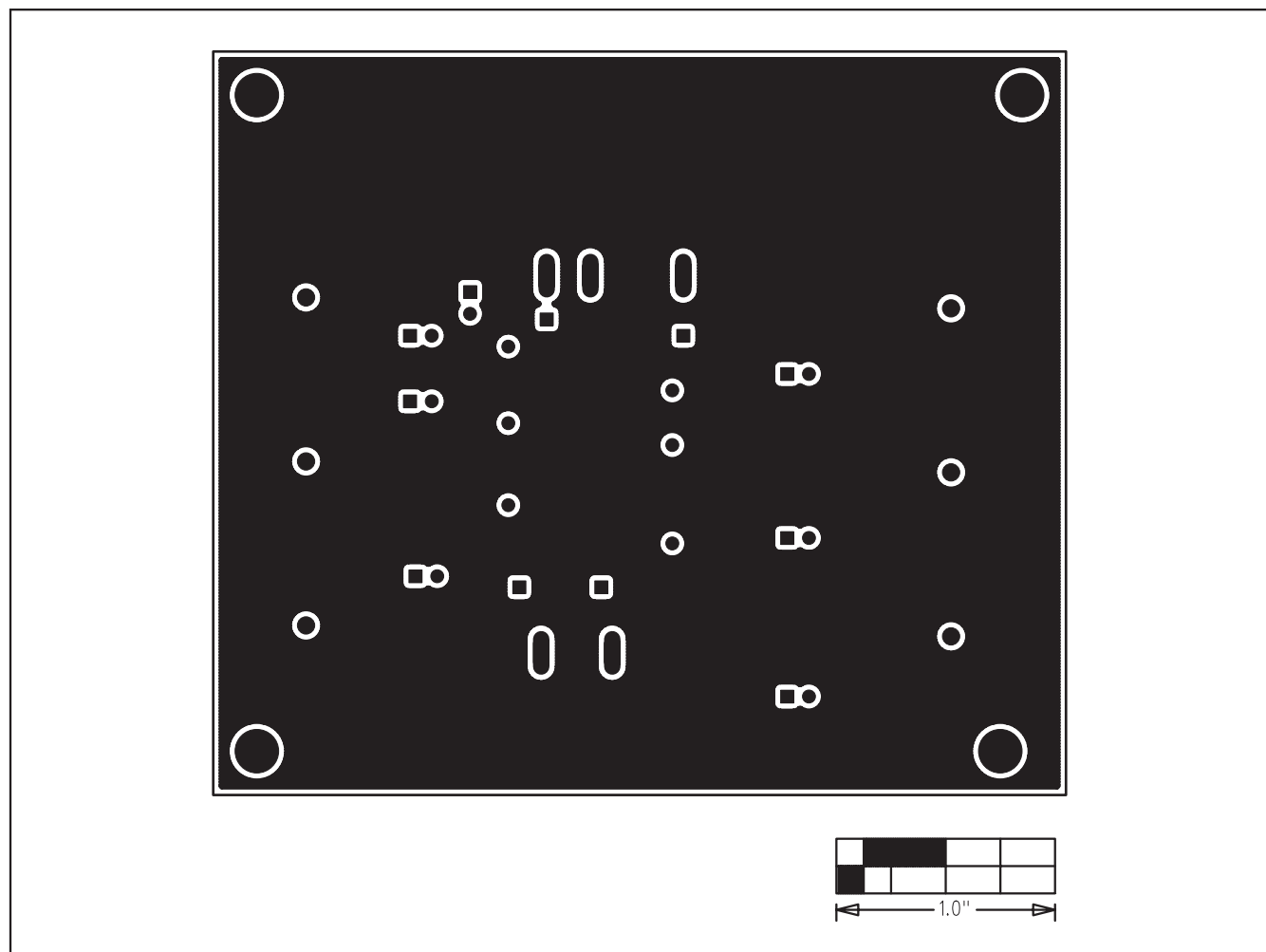


Figure 4. MAX11508 EV Kit PCB Layout—Solder Side

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