



# MAX11506 Evaluation Kit

## General Description

The MAX11506 evaluation kit (EV kit) is a fully assembled and tested surface-mount PCB that evaluates the MAX11506 IC. The MAX11506 is a six-channel video reconstruction filter and buffer for a combination of standard-definition television (SDTV) and high-definition television (HDTV) applications. The filter's passband is typically 9MHz for SDTV and selectable between 9MHz/33MHz for SDTV/HDTV. The MAX11506 includes a +6dB output buffer capable of driving 2V<sub>P-P</sub> into a standard 150Ω video load.

The video input and output signals on the EV kit can be AC- or DC-coupled. The MAX11506 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 MAX11506 EV kit can also evaluate the MAX11507 after IC replacement (U1). The EV kit is shipped with a MAX11506 IC installed.

## Features

- ◆ 5V Single-Supply Operation
- ◆ Output Buffer Drives One 150Ω Standard Video Load with a +6dB Gain
- ◆ Three Fixed 5th-Order 9MHz SD Filters
- ◆ Three Selectable 6th-Order 9MHz/33MHz SD/HD Filters
- ◆ AC- or DC-Coupled Inputs and Outputs
- ◆ Standard 75Ω Input and Output Terminations
- ◆ Transparent Input Clamps
- ◆ Surface-Mount Construction
- ◆ Fully Assembled and Tested

## Ordering Information

PART	TYPE
MAX11506EVKIT+	EV Kit

+Denotes lead-free and RoHS-compliant.

## Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10μF ±20%, 6.3V X5R ceramic capacitor (0805) TDK C2012X5R0J106M Taiyo Yuden JMK212BJ106MG
C2–C8, C15–C20	13	0.1μF ±10%, 16V X7R ceramic capacitors (0603) Murata GRM188R71C104K TDK C1608X7R1C104K
C9–C14	6	220μF ±20%, 6.3V aluminum electrolytic capacitors (6.3mm x 6mm) SANYO 6CE220BS
JU1–JU19	19	2-pin headers
R1–R12	12	75Ω ±1% resistors (0603)
R13, R14, R15, R19, R20, R21	6	820kΩ ±5% resistors (0603)
R16, R17, R18, R22, R23, R24	6	120kΩ ±5% resistors (0603)
R25	1	100kΩ ±5% resistors (0603)

DESIGNATION	QTY	DESCRIPTION
SD_IN1, SD_IN2, SD_IN3, SD/HD_IN1, SD/HD_IN2, SD/HD_IN3, SD_OUT1, SD_OUT2, SD_OUT3, SD/HD_OUT1, SD/HD_OUT2, SD/HD_OUT3	12	75Ω BNC PCB vertical-mount connectors
TP1–TP12	12	Test points
U1	1	Six-channel SDTV/HDTV video filter (16 QSOP) Maxim MAX11506CEE+
—	19	Shunts
—	1	PCB: MAX11506 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
Taiyo Yuden	800-348-2496	www.t-yuden.com
TDK Corp.	847-803-6100	www.component.tdk.com

**Note:** Indicate that you are using the MAX11506 or MAX11507 when contacting these component suppliers.

## Quick Start

### Recommended Equipment

Before beginning, the following equipment is needed:

- MAX11506 EV kit
- 5V, 150mA DC power supply (VCC)
- Video signal generator (e.g., Tektronix TG2000 or similar)
- Video measurement equipment (e.g., Tektronix VM6000 or similar)

### Procedure

The MAX11506 EV kit is a fully assembled and tested surface-mount board. Follow the steps below to verify the board operation. **Caution: Do not turn on the power supply until all connections are completed.**

- 1) Verify that a shunt is installed across jumper JU1 (HD filter).
- 2) Verify that no shunts are installed across jumpers JU2–JU7 (AC-coupled inputs).
- 3) Verify that no shunts are installed across jumpers JU8–JU13 (AC-coupled outputs).
- 4) Verify that no shunts are installed across jumpers JU14–JU19 (no DC bias input).
- 5) Connect the output of the video signal generator to the SD\_IN1 BNC connector on the MAX11506 EV kit.
- 6) Connect the SD\_OUT1 BNC connector on the EV kit to the input of the video measurement equipment.
- 7) Connect the power-supply ground to the GND pad on the EV kit.
- 8) Connect the 5V supply to the VCC pad on the EV kit.
- 9) 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.
- 10) Turn on power supply and enable the video signal generator.
- 11) Analyze the video output signal.

## Detailed Description of Hardware

The MAX11506 EV kit is a fully assembled and tested surface-mount PCB that contains a MAX11506 IC. The MAX11506 is a six-channel video reconstruction filter and buffer for SDTV/HDTV applications. The MAX11506 filter typically has 3dB attenuation at 9MHz for SDTV applications and 33MHz for HDTV applications. The device includes a +6dB output buffer capable of driving a 2V<sub>P-P</sub> video signal into a standard 150Ω load.

The MAX11506 EV kit has six input channels to accept a full set of component video input signals. All input and output signals on the MAX11506 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.

## Jumper Selection

### SD/HD Filter Select (FSEL)

The MAX11506 EV kit provides three fixed 5th-order 9MHz and three selectable 6th-order 9MHz/33MHz filters. Jumper JU1 controls the FSEL pin and, in turn, the bandwidth of the three selectable filters (SD/HD\_IN1, SD/HD\_IN2, SD/HD\_IN3), as shown in Table 1. By default, the selectable filter bandwidth is 33MHz for an HD video output.

**Table 1. JU1 Jumper Selection (FSEL)**

SHUNT POSITION	FSEL PIN	OUTPUT FILTER BANDWIDTH (MHz)
Installed*	Connected to VCC	33 (HD output)
Not installed	Connected to GND	9 (SD output)

\*Default position.

### Input Coupling

The MAX11506 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

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drops below ground, the inputs must be AC-coupled. The transparent clamp sets the sync tip close to ground.

The MAX11506 EV kit provides an option to configure the MAX11506 inputs to AC- or DC-coupling. Jumpers JU2–JU7 configure the input coupling for the MAX11506 EV kit. See Table 2 for shunt positions.

**Table 2. Jumpers JU2–JU7 Settings**

SHUNT POSITION	MAX11506 INPUT
Installed	DC-coupled
Not installed*	AC-coupled

\*Default position.

### Output Coupling

The MAX11506 EV kit provides an option to configure the MAX11506 outputs to AC- or DC-coupling. Jumpers JU8–JU13 configure the output coupling for the MAX11506 EV kit. See Table 3 for shunt positions.

**Table 3. Jumpers JU8–JU13 Settings**

SHUNT POSITION	MAX11506 OUTPUT
Installed	DC-coupled
Not installed*	AC-coupled

\*Default position.

### DC Bias for YPbPr Signals

When configuring the EV kit video inputs for AC-coupled operation, the correct DC bias point has to be chosen, depending on the input signal. Unipolar signals, such as R, G, B, and Y, are biased correctly using the MAX11506 internal transparent clamp. For bipolar signals, such as Pb and Pr, a constant DC bias voltage has to be applied after the AC-coupling capacitor to make sure that the clamp never operates. A 590mV<sub>DC</sub> bias voltage can be applied by installing shunts across jumpers JU14–JU19. To configure the inputs to a different DC bias voltage, replace resistors R16, R17, R18 and R22, R23, R24. See Table 4 for input clamp configuration. Refer to the MAX11506/MAX11507 IC data sheet for more information regarding DC bias calculations.

**Table 4. Input Clamp Operation (JU14–JU19)**

SHUNT POSITION	EV KIT FUNCTION
Installed	DC bias enabled: Use for Pb, Pr signals
Not installed*	DC bias disabled: Use for R, G, B, Y signals

\*Default position.

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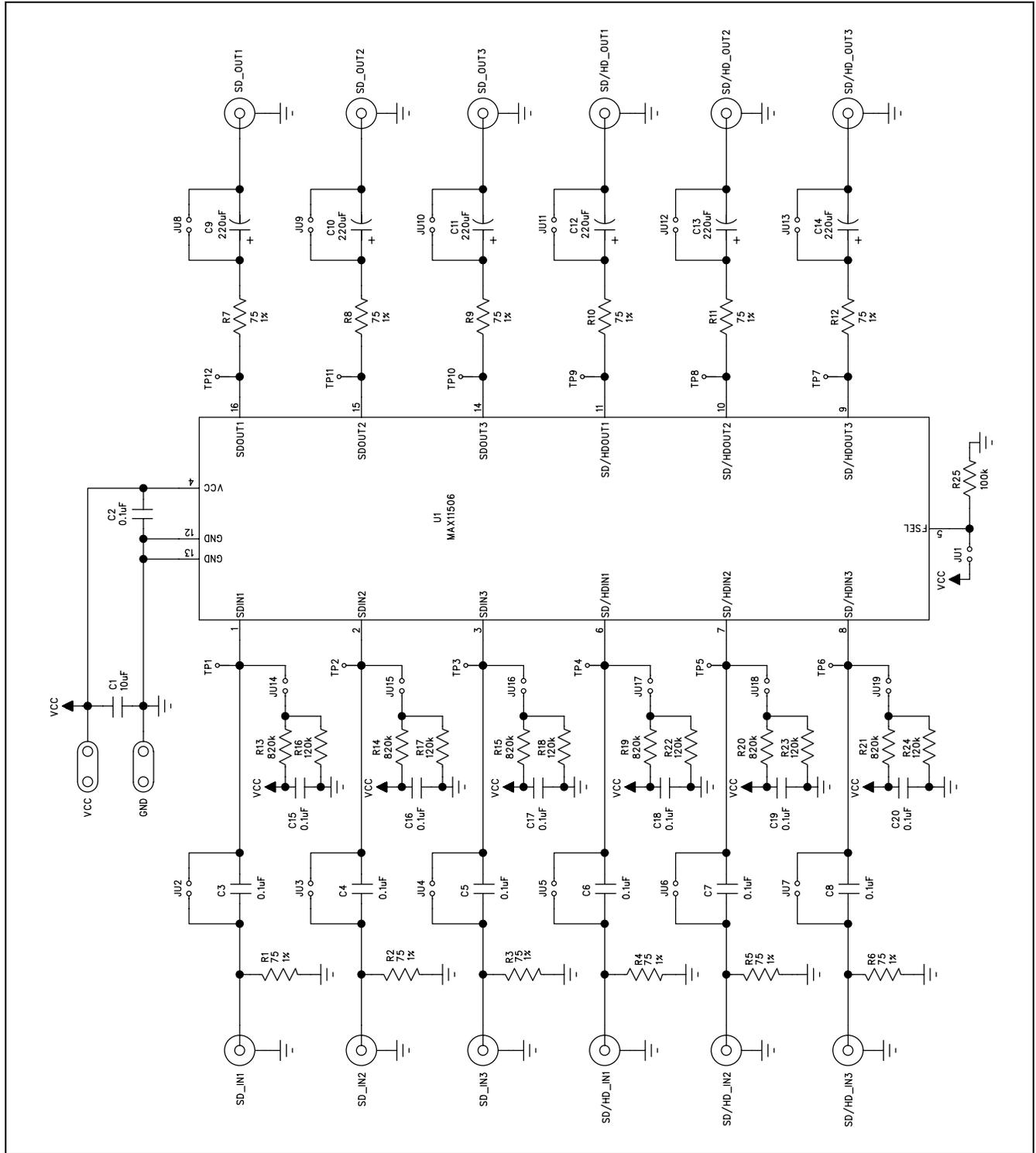


Figure 1. MAX11506 EV Kit Schematic

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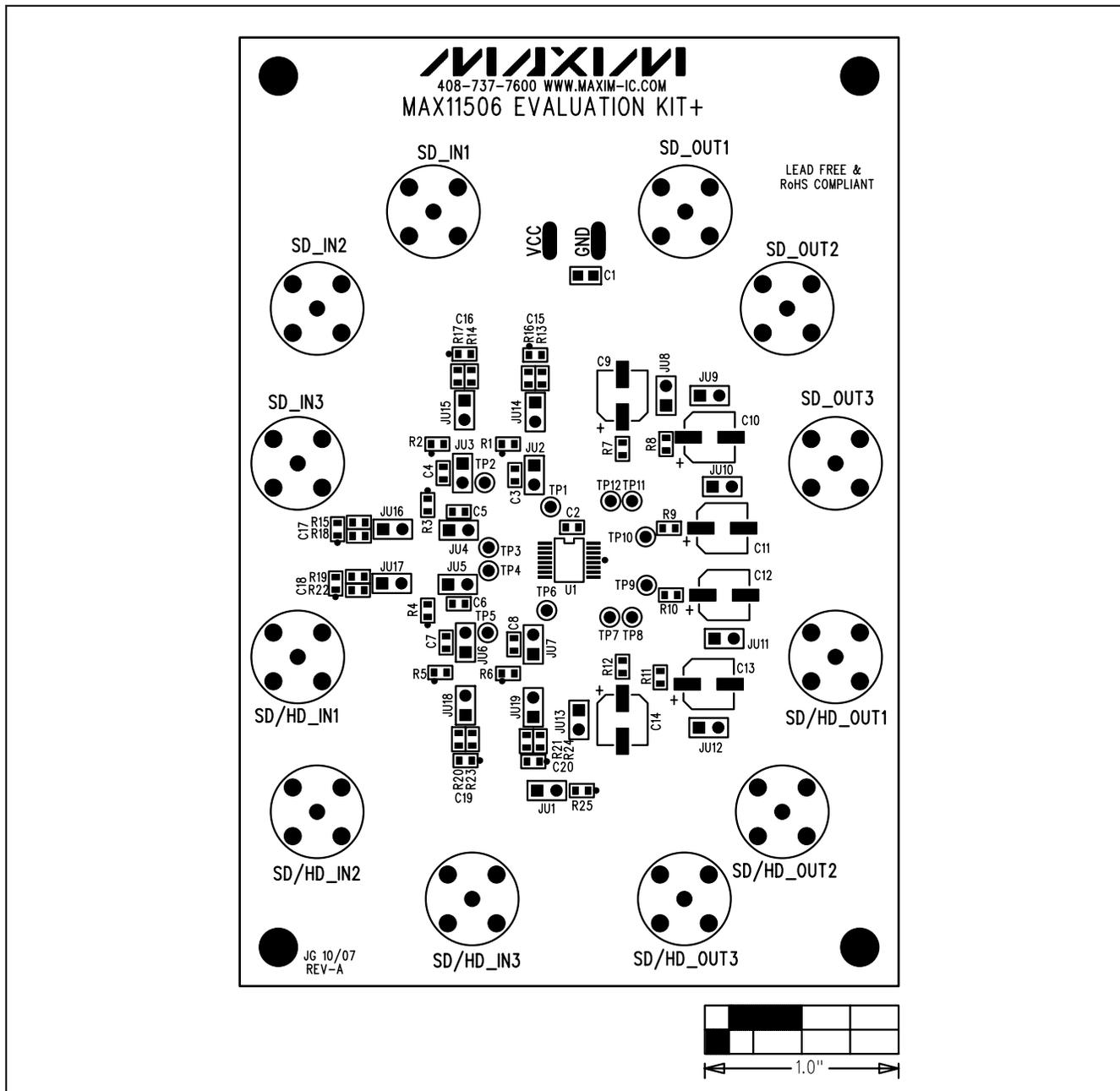


Figure 2. MAX11506 EV Kit Component Placement Guide—Top Silkscreen

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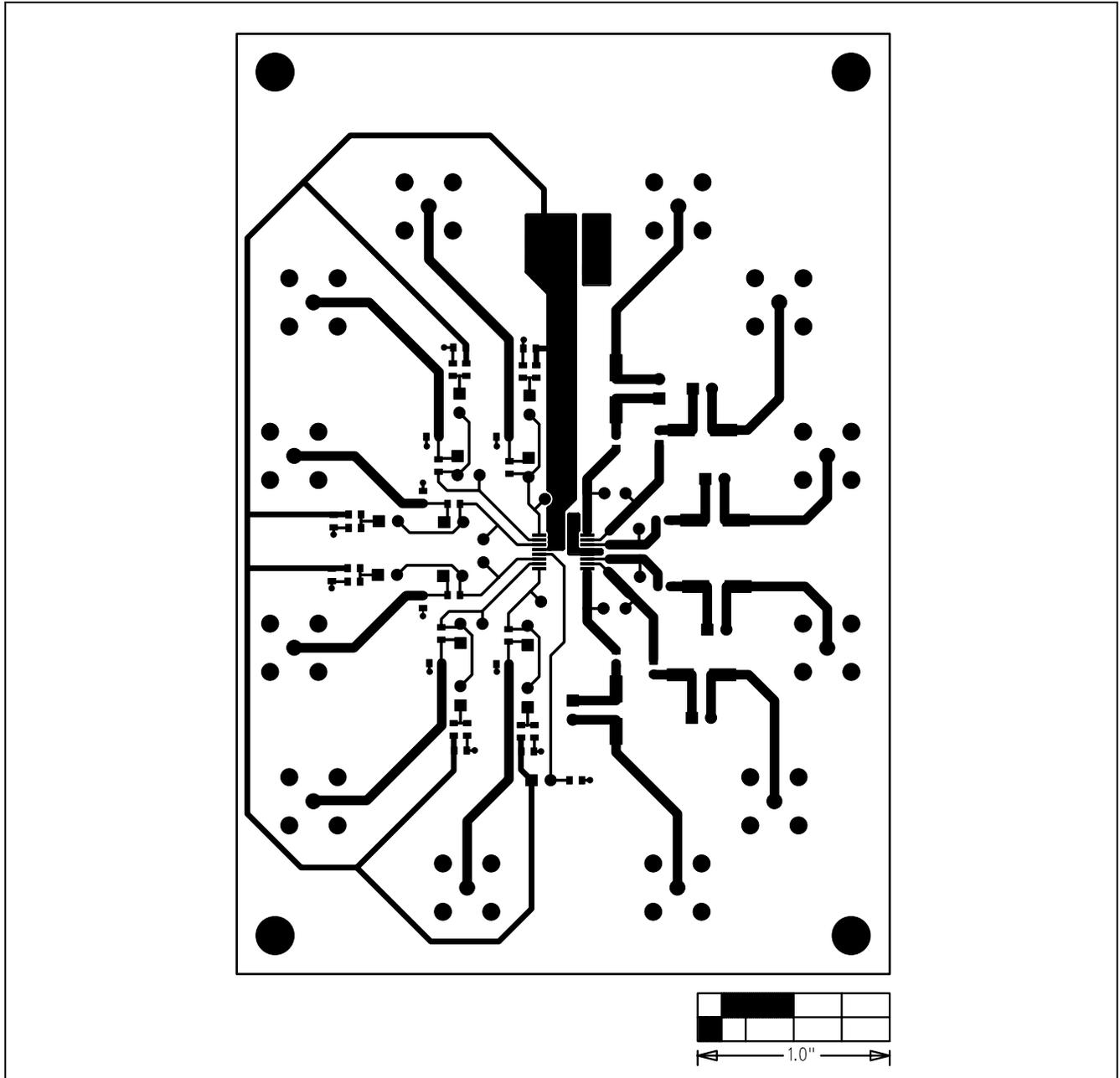


Figure 3. MAX11506 EV Kit PCB Layout—Component Side

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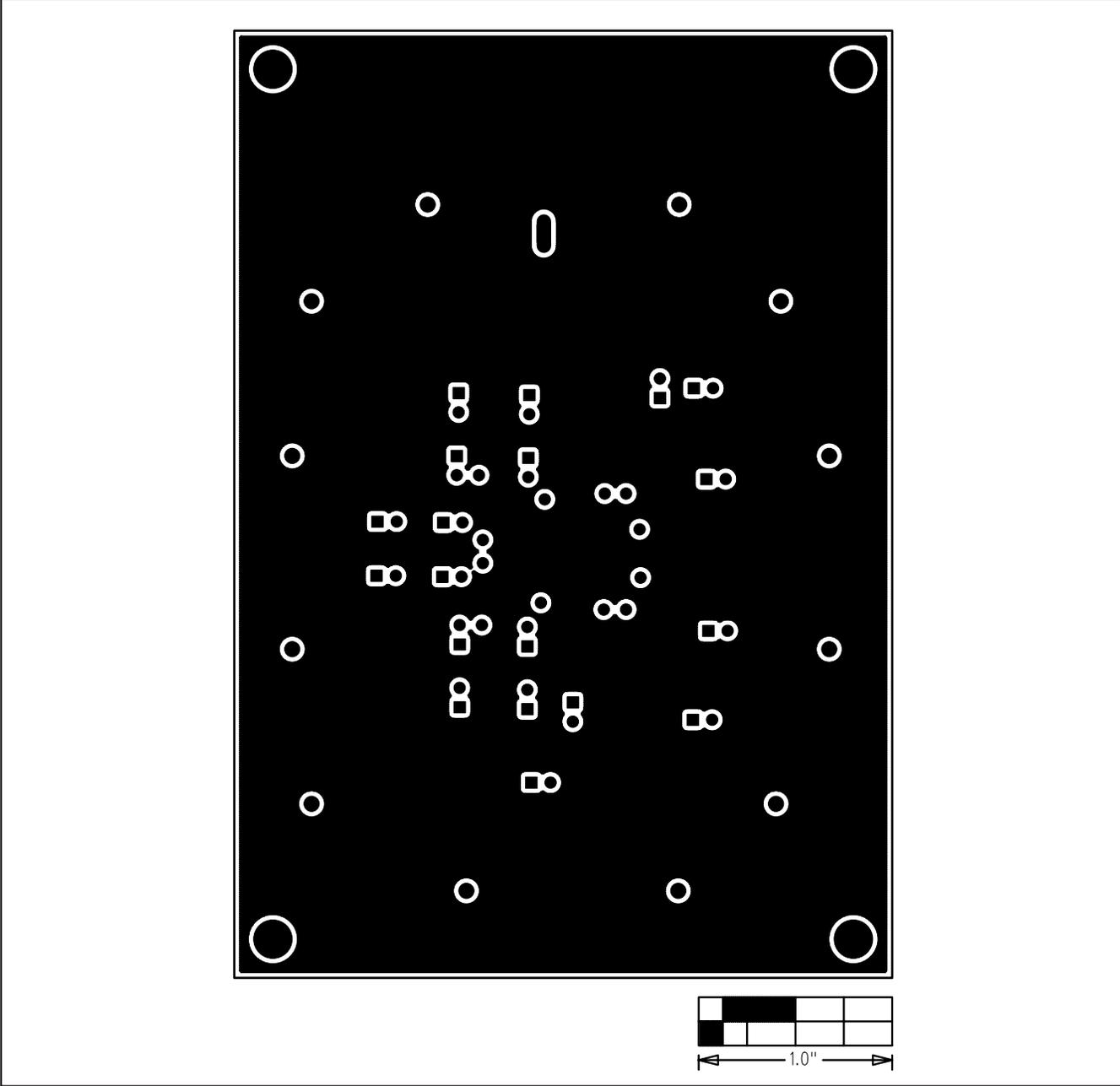


Figure 4. MAX11506 EV Kit PCB Layout—Solder Side

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Maxim Integrated Products, 120 San Gabriel Drive, Sunnyvale, CA 94086 408-737-7600 \_\_\_\_\_ 7