



# MAX9509/MAX9510 Evaluation Kits

## General Description

The MAX9509/MAX9510 evaluation kits (EV kits) are fully assembled and tested surface-mount PCBs that evaluate the MAX9509/MAX9510 ICs. The MAX9509/MAX9510 EV kits amplify standard-definition video signals and set the video output black level near ground, while consuming minimal power. The EV kits operate from a 1.7V to 2.625V single power supply.

The MAX9509 EV kit has an additional internal reconstruction filter that typically has  $\pm 1$ dB passband flatness of 8.1MHz, 3dB attenuation at 10MHz, and a 46dB attenuation at 27MHz. Both MAX9509/MAX9510 EV kits provide an internal fixed gain of 8V/V and accept an input full-scale video signal of 0.25V<sub>p-p</sub> (nominal), providing an output full-scale video signal of 2 V<sub>p-p</sub> (nominal).

## Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2	2	1 $\mu$ F $\pm 10\%$ , 10V X7R ceramic capacitors (0603) Murata GRM188R61A105K TDK C1608X7R1A105K
C3	1	0.1 $\mu$ F $\pm 10\%$ , 16V X7R ceramic capacitor (0603) Murata GRM188R71C104K TDK C1608X7R1C104K
C4	1	10 $\mu$ F $\pm 20\%$ , 6.3V X5R ceramic capacitor (0805) Taiyo Yuden JMK212BJ106MG TDK C2012X5R0J106M
C5	0	Not installed, ceramic capacitor (0603)
JU1	1	3-pin header
R1, R2	2	75 $\Omega$ $\pm 1\%$ resistors (0603)
R3	1	0 $\Omega$ $\pm 5\%$ resistor (0603)
U1	1	See the <i>EV Kit-Specific Component List</i>
IN, OUT	2	BNC 75 $\Omega$ PCB vertical mount connectors
—	1	Shunts

## Features

- ◆ Single 1.7V to 2.625V Power-Supply Operation
- ◆ DC-Coupled Input with Option for AC-Coupling
- ◆ DC-Coupled Output
- ◆ Video Output Black Level Set Near Ground
- ◆ Reconstruction Filter with  $\pm 1$ dB Passband to 8.1MHz and 46dB Attenuation at 27MHz (MAX9509)
- ◆ Internal Preset Gain of 8V/V
- ◆ 10nA Shutdown Current
- ◆ 8-Pin TDFN Package (MAX9509), 8-Pin  $\mu$ MAX<sup>®</sup> Package (MAX9510)
- ◆ Surface-Mount Components
- ◆ Fully Assembled and Tested
- ◆ Lead-Free and RoHS Compliant

## Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX9509EVKIT+	0°C to +70°C*	8 TDFN-EP** (2mm x 2mm x 0.8mm)
MAX9510EVKIT+	0°C to +70°C*	8 $\mu$ MAX

+ Denotes a lead-free and RoHS-compliant EV kit.

\* This limited temperature range is for the EV kit PCB only. The MAX9509/MAX9510 IC temperature range is -40°C to +125°C.

\*\*EP = Expose paddle.

## Component Suppliers

SUPPLIER	PHONE	WEBSITE
Murata	770-436-1300	www.murata.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 MAX9509/MAX9510 when contacting these component suppliers.

## EV Kit-Specific Component List

EV KIT PART NUMBER	QTY	REFERENCE DESIGNATOR	DESCRIPTION	PCB NAME
MAX9509EVKIT+	1	U1	MAX9509ATA+ (8-pin, 2mm x 2mm x 0.8mm, TDFN) Top Mark AAZ	MAX9509 Evaluation Kit+
MAX9510EVKIT+	1		MAX9510AUA+ (8-pin $\mu$ MAX)	MAX9510 Evaluation Kit+

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**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.**

# MAX9509/MAX9510 Evaluation Kits

## Quick Start

### Recommended Equipment

- 1.7V to 2.625V, 500mA DC power supply (VDD)
- Video signal generator
- Video measurement equipment (e.g., Tektronix VM-700T)

### Procedure

The MAX9509/MAX9510 EV kits are 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 a shunt is installed across pins 2-3 of jumper JU1 (EV kit enabled).
- 2) Connect the power supply ground to the GND pad on the EV kit.
- 3) Connect the 1.7V to 2.625V supply to the VDD pad on the EV kit.
- 4) Connect the output of the video signal generator to the IN BNC connector on the EV kit. **The video signal must be biased such that the sync tip is at ground.**
- 5) Connect the OUT BNC connector on the EV kit to the input of the video measurement equipment.
- 6) Set the video signal generator for the desired video input signal.
- 7) Turn on the power supply and enable the video signal generator.
- 8) Analyze the video output signal with the VM-700T video measurement equipment.

### Detailed Description

The MAX9509/MAX9510 EV kits are fully assembled and tested surface-mount PCBs that evaluate the MAX9509/MAX9510 ICs. The MAX9509/MAX9510 amplify and set the video output black level near ground for standard-definition video signals, while consuming minimal power. The EV kits operate from a 1.7V to 2.625V single power supply.

The MAX9509 EV kit has an additional internal reconstruction filter that smoothes the steps and reduces the spikes on the video signal from the video digital-to-analog converter (DAC). The reconstruction filter typically has  $\pm 1$ dB passband flatness of 8.1MHz, 3dB attenuation at 10MHz, and 46dB attenuation at 27MHz.

Both MAX9509/MAX9510 EV kits provide an internal fixed gain of 8V/V and accept an input full-scale video signal of 0.25V<sub>P-P</sub> (nominal), providing an output full-scale video signal of 2V<sub>P-P</sub> (nominal).

Video input and output signals from the EV kits are DC-coupled, eliminating large DC-blocking capacitors. The input of each EV kit has a 75Ω termination to ground and the output has a 75Ω back-termination resistor.

The input of the MAX9509/MAX9510 EV kits can be directly connected to the output of a video DAC. The MAX9509/MAX9510 also feature a transparent input sync-tip clamp, allowing AC-coupling of input signals with different DC biases.

### Jumper Selection

#### Shutdown Mode ( $\overline{\text{SHDN}}$ )

Jumper JU1 controls the shutdown mode ( $\overline{\text{SHDN}}$ ) of the MAX9509/MAX9510 EV kits. The shutdown mode turns off the sync-tip clamp, filter (MAX9509), amplifier, charge pump, and linear regulator, and reduces the IC's quiescent supply current to 10nA (typ). See *Table 1* for JU1 jumper selection.

**Table 1. JU1 Jumper Selection**

SHUNT POSITION	$\overline{\text{SHDN}}$ PIN	EV KIT FUNCTION
1-2	Low	Disabled
2-3*	High	Enabled

\*Default position.

### AC-Coupled Input

By default, the MAX9509/MAX9510 EV kits are set for a DC-coupled input. However, these kits are configured for an AC-coupled input as well. To change the setting to AC-coupled, remove R3 and install a 0.1μF ceramic capacitor across the C5 pads.

# MAX9509/MAX9510 Evaluation Kits

Evaluate: MAX9509/MAX9510

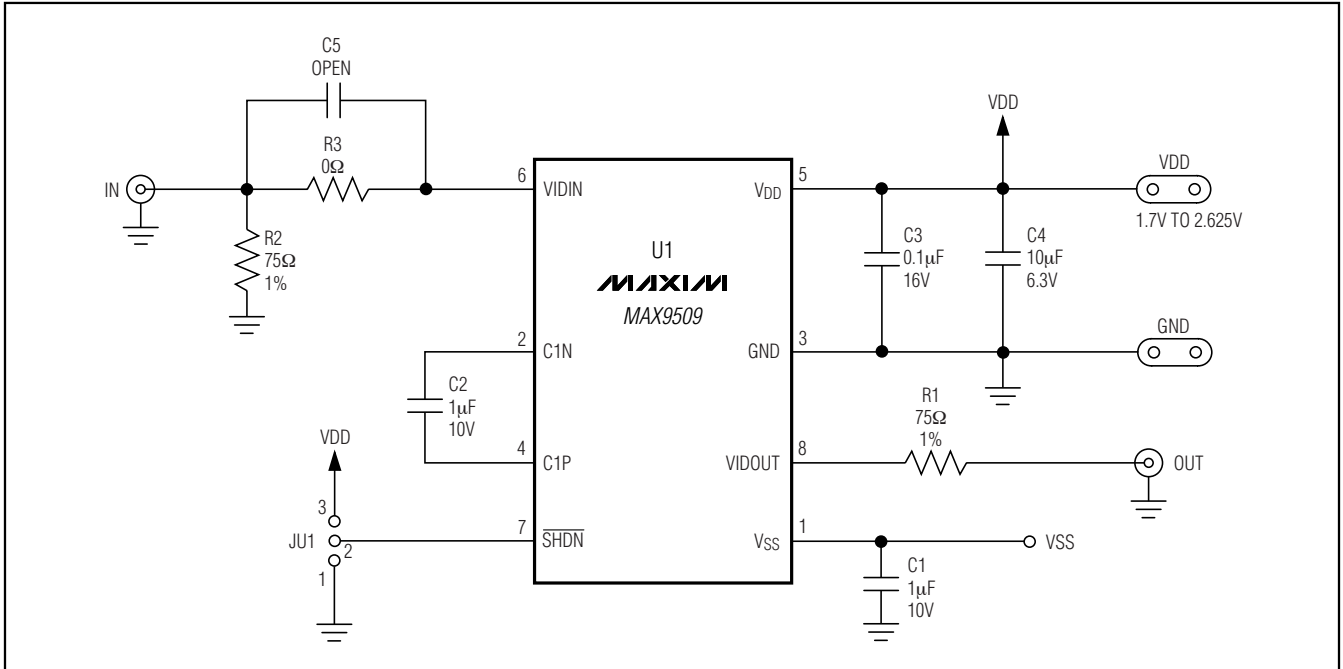


Figure 1. MAX9509 EV Kit Schematic

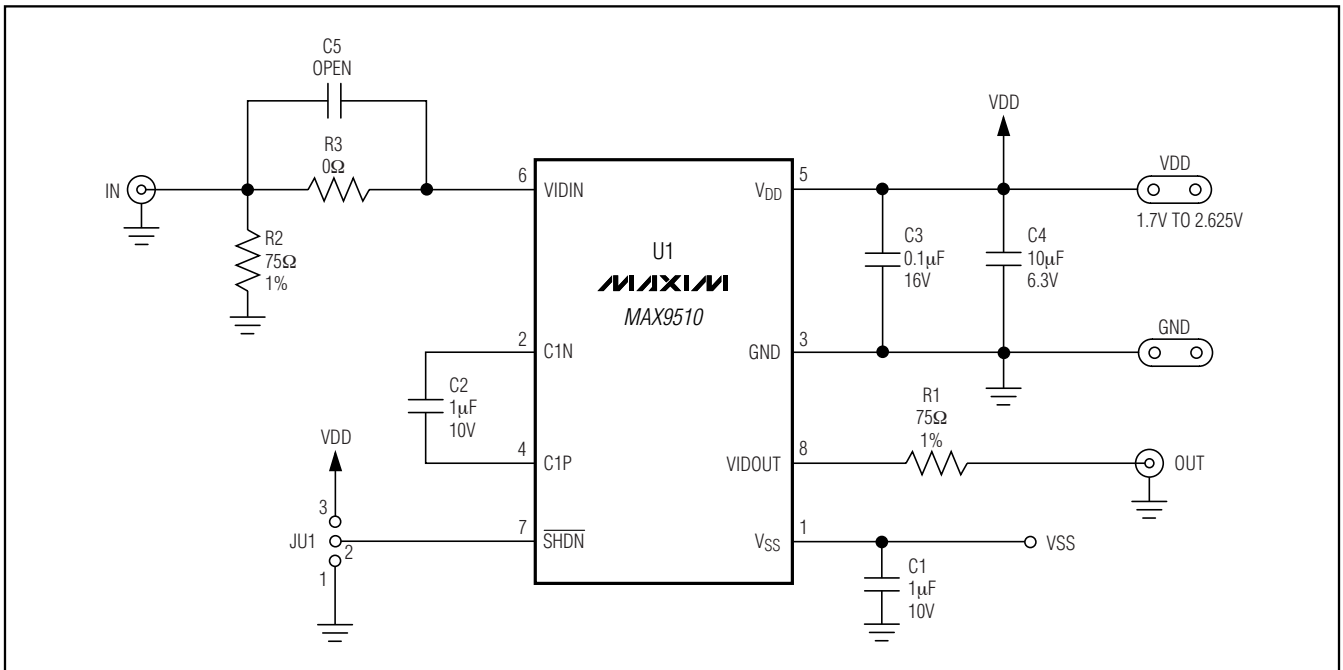


Figure 2. MAX9510 EV Kit Schematic

# MAX9509/MAX9510 Evaluation Kits

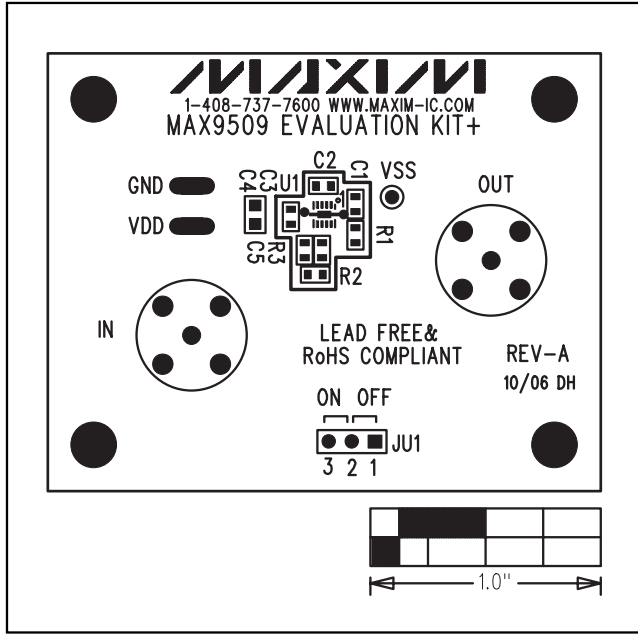


Figure 3. MAX9509 EV Kit Component Placement Guide—Component Side

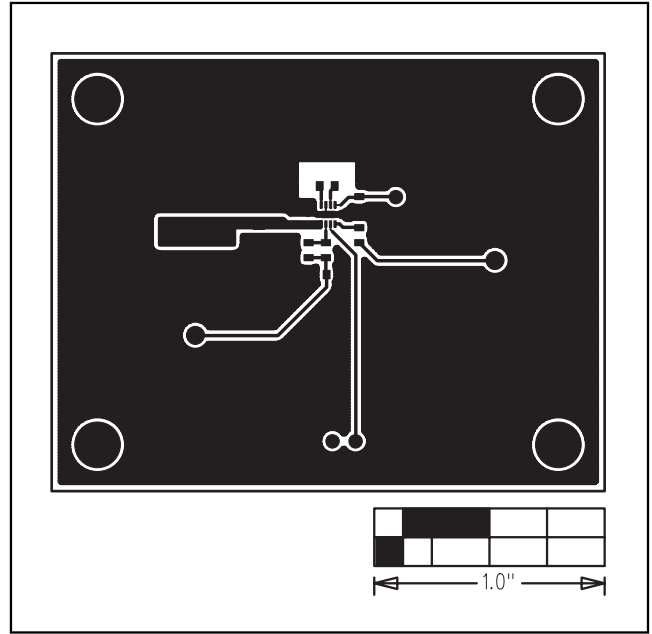


Figure 4. MAX9509 EV Kit PCB Layout—Component Side

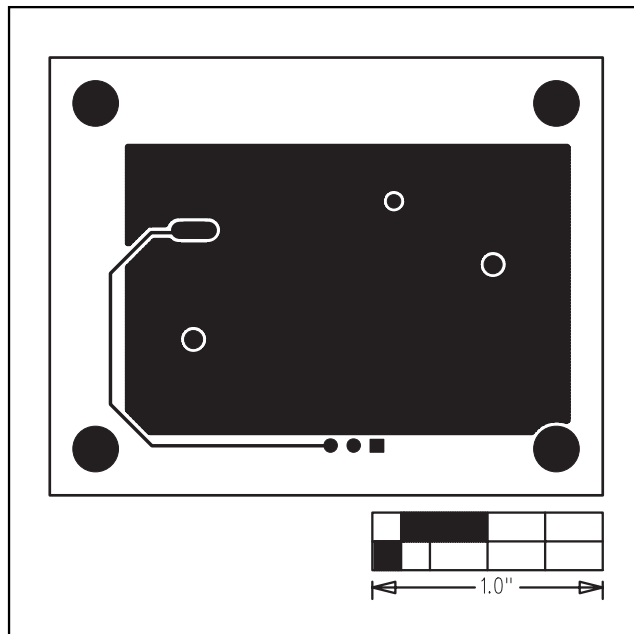


Figure 5. MAX9509 EV Kit PCB Layout—Solder Side

# MAX9509/MAX9510 Evaluation Kits

Evaluate: MAX9509/MAX9510

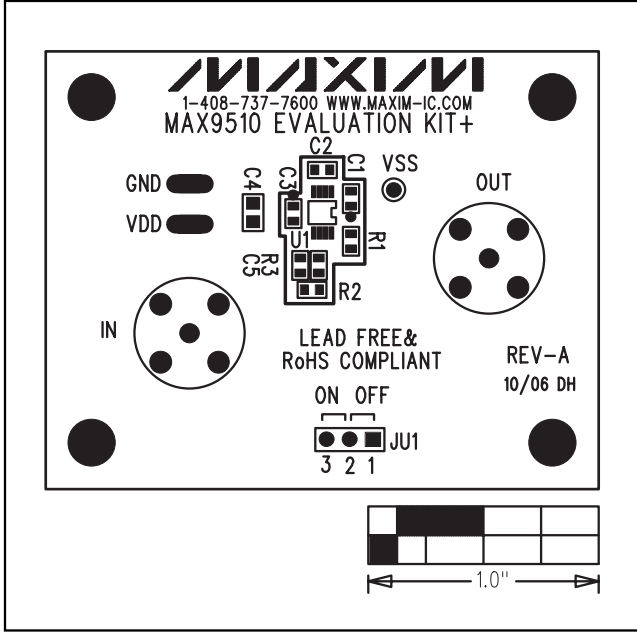


Figure 6. MAX9510 EV Kit Component Placement Guide—Component Side

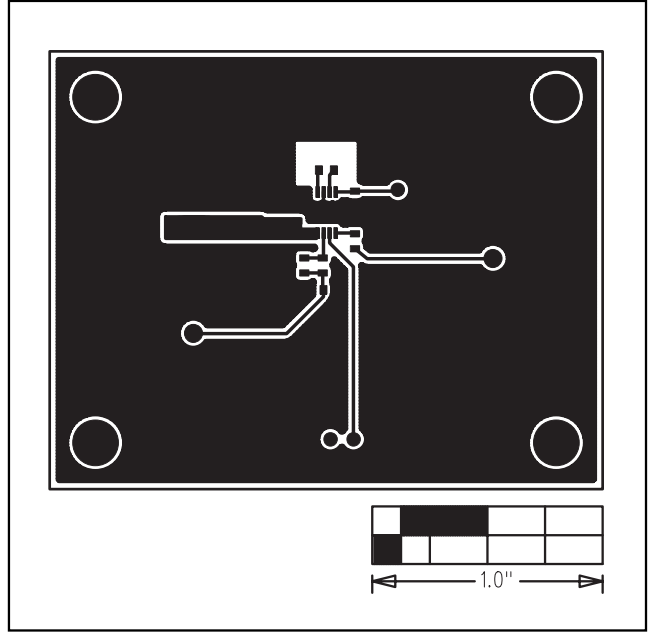


Figure 7. MAX9510 EV Kit PCB Layout—Component Side

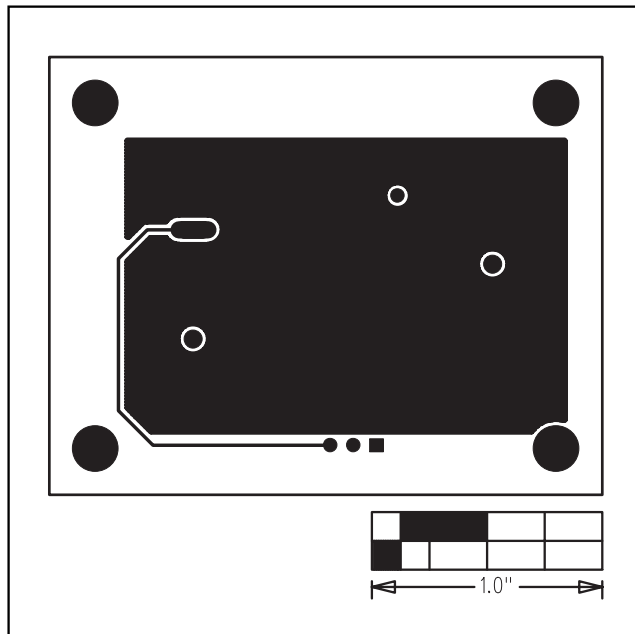


Figure 8. MAX9510 EV Kit PCB Layout—Solder Side

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