



MAX9532 Evaluation Kit

Evaluates: MAX9532

General Description

The MAX9532 evaluation kit (EV kit) is a fully assembled and tested surface-mount circuit board that evaluates the MAX9532 IC. The MAX9532 amplifies standard-definition video signals and sets the video black level near ground while consuming minimal power. The MAX9532 also provides integrated short-to-battery protection allowing the output of the device to survive shorts up to 18V. The EV kit operates from a 3V to 3.6V single power supply.

The MAX9532 provides an internal fixed gain of 4V/V and has an internal reconstruction filter that typically has ± 1 dB passband flatness of 9.5MHz and 42dB attenuation at 27MHz. The MAX9532 EV kit accepts a 1V_{P-P} input full-scale video signal and attenuates it down to 0.5V_{P-P} (nominal), then provides an output full-scale video signal of 2V_{P-P} (nominal).

Features

- ◆ Single 3V to 3.6V Supply Operation
- ◆ Short-to-Battery Protection on Video Output (Up to 18V)
- ◆ DC-Coupled Input with Option for AC-Coupling
- ◆ DC-Coupled Output
- ◆ Video Output Black Level Set Near Ground
- ◆ Reconstruction Filter with 42dB Attenuation at 27MHz and ± 1 dB Passband to 9.5MHz
- ◆ Internal Preset Gain of 4V/V
- ◆ Fully Assembled and Tested
- ◆ Lead(Pb)-free and RoHS Compliant

Ordering Information

PART	TYPE
MAX9532EVKIT+	EV Kit

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

Component List

DESIGNATION	QTY	DESCRIPTION
C1P, VSS	2	Test points
C1	1	10 μ F $\pm 20\%$, 6.3V X7R ceramic capacitor (0805) Murata GRM21BR70J106K TDK C2012X7R0J106K
C2, C3	2	0.1 μ F $\pm 10\%$, 50V X7R ceramic capacitors (0603) Murata GRM188R71H104K TDK C1608X7R1H104K
C4, C5	2	1 μ F $\pm 10\%$, 16V X7R ceramic capacitors (0603) Murata GRM188R71C105K TDK C1608X7R1C105K

DESIGNATION	QTY	DESCRIPTION
C6, C7	2	0.01 μ F $\pm 10\%$, 50V X7R ceramic capacitors (0603) Murata GRM188R71H103K TDK C1608X7R1H103K
IN, OUT	2	BNC 75 Ω PCB vertical-mount connectors
R1, R6	2	37.4 Ω $\pm 1\%$ resistors (0603)
R2, R3	2	75 Ω $\pm 1\%$ resistors (0603)
R4, R5	2	0 Ω resistors (0603)
U1	1	Single-channel video filter amplifier (10 μ MAX [®]) Maxim MAX9532AUB+
—	1	PCB: MAX9532 Evaluation Kit+

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Component Suppliers

SUPPLIER	PHONE	WEBSITE
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 MAX9532 when contacting these component suppliers.



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Quick Start

Recommended Equipment

- 3V to 3.6V, 500mA DC power supply (VDD)
- Video signal generator
- Video measurement equipment (e.g., Tektronix VM-700T)

Procedure

The MAX9532 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) Connect the power supply ground to the GND pad on the EV kit.
- 2) Connect the 3V to 3.6V supply to the VDD pad on the EV kit.
- 3) 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; refer to Application Note 4028: *How to Level Shift Video Signals for DC-Coupled Video Amplifiers/Filters* for more information on level shifting video signals.
- 4) Connect the OUT BNC connector on the EV kit to the input of the video measurement equipment.
- 5) Set the video signal generator for the desired video input signal. This signal must contain sync information.
- 6) Turn on the power supply and enable the video signal generator.
- 7) Analyze the video output signal with the VM-700T video measurement equipment.

Detailed Description of Hardware

The MAX9532 EV kit is a fully assembled and tested surface-mount circuit board that evaluates the MAX9532 IC. The MAX9532 amplifies and sets the black level near ground for standard-definition video signals while consuming minimal power. The MAX9532 also provides integrated short-to-battery protection, allowing the output of the device to survive shorts up to 18V. The EV kit operates from a 3V to 3.6V single power supply.

The MAX9532 has an 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 42dB attenuation at 27MHz and a ± 1 dB passband flatness to 9.5MHz.

The MAX9532 provides an internal fixed gain of 4V/V. The MAX9532 EV kit accepts an input full-scale video signal of 1V_{P-P} and attenuates it down to 0.5V_{P-P} (nomi-

nal), and provides an output full-scale video signal of 2V_{P-P} (nominal).

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

The input of the MAX9532 can be directly connected to the output of a video DAC. The MAX9532 also features a transparent input sync-tip clamp, allowing AC-coupling of input signals with different DC biases.

Short-Circuit and Short-to-Battery Protection

The MAX9532 EV kit circuit includes a 75 Ω back-termination resistor that limits short-circuit current when an external short is applied to the video output. The MAX9532 also features an internal output short-circuit protection to prevent device damage in prototyping and applications where the amplifier output can be directly shorted to ground.

To protect the device from output short circuits to voltages higher than the supply voltage (VDD), the MAX9532 utilizes an internal switch in series with the amplifier output. When the JACKSENSE input detects that the output connector of the circuit is shorted to the battery voltage (up to 18V) higher than the internal 8V threshold, an internal comparator disables the switch in 10 μ s (typ) preventing the MAX9532 from being damaged.

After the output is shorted to a battery, the output immediately resumes normal operation when the short is removed within 1ms. When the output is shorted to the battery for longer than 1ms, the output resumes normal operation 10ms after the short is removed.

AC-Coupled Input

The default setting of the MAX9532 EV kit is set for a DC-coupled input; however, this kit is configured for an AC-coupled input as well. To change the input setting to AC-coupled, remove R4 and utilize the 0.1 μ F ceramic capacitor installed at C3.

Interfacing to Video DACs that Produce Video Signals Other than 1V_{P-P}

The MAX9532 EV kit is designed to work with devices that generate 1V_{P-P} video signals at the output of the video DAC. The EV kit takes the 1V_{P-P} video signal applied at IN and attenuates it by 1/2, through resistor-dividers R6 and R1, to provide the necessary 0.5V_{P-P} signal at the input pin of the MAX9532 IC.

When using a device that provides a video signal other than 1V_{P-P} at its output, R6 must be replaced with a 0 Ω resistor and an appropriate termination must be applied at R1.

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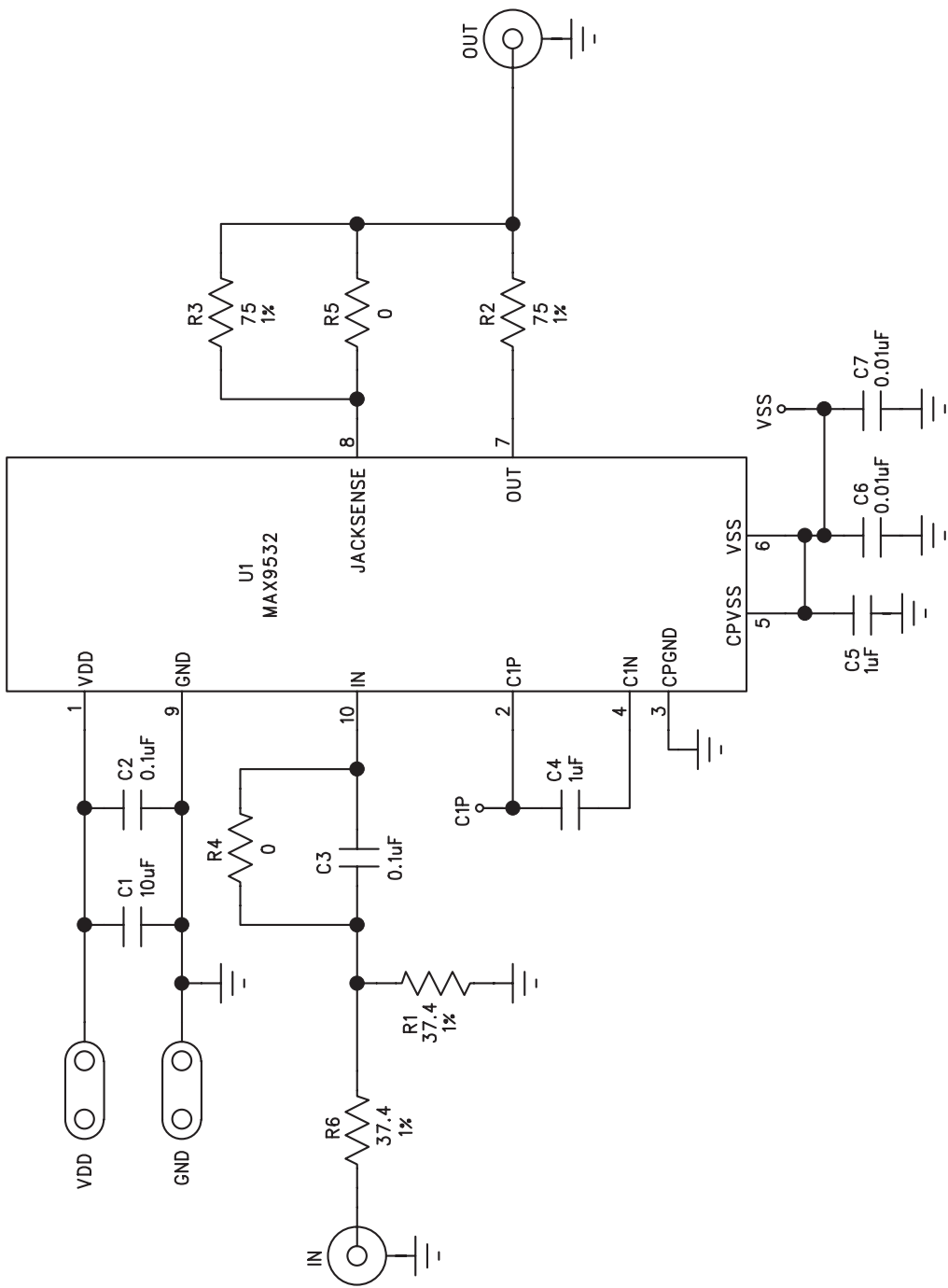


Figure 1. MAX9532 EV Kit Schematic

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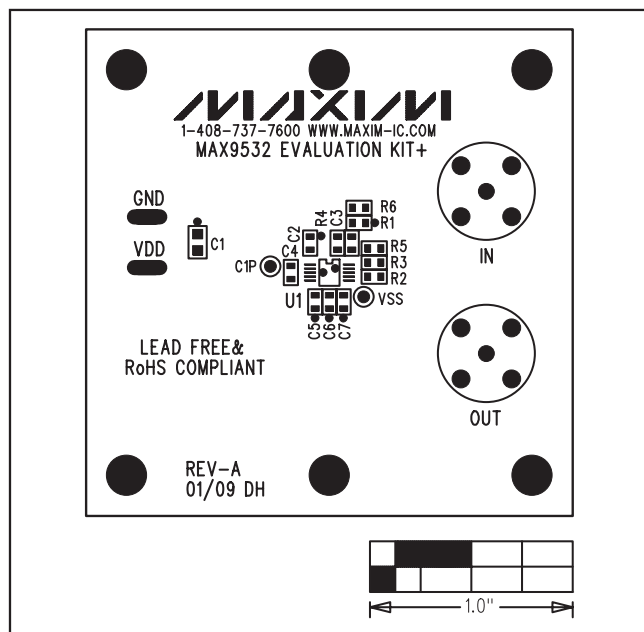


Figure 2. MAX9532 EV Kit Component Placement Guide—Components Side

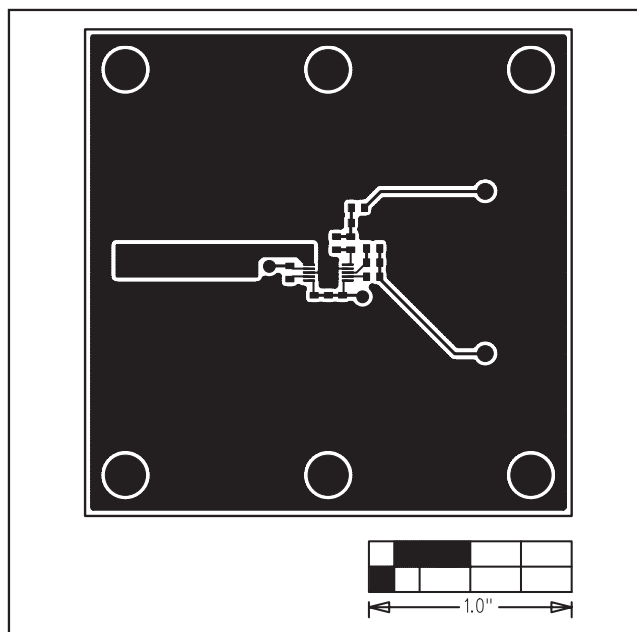


Figure 3. MAX9532 EV Kit PCB Layout—Component Side

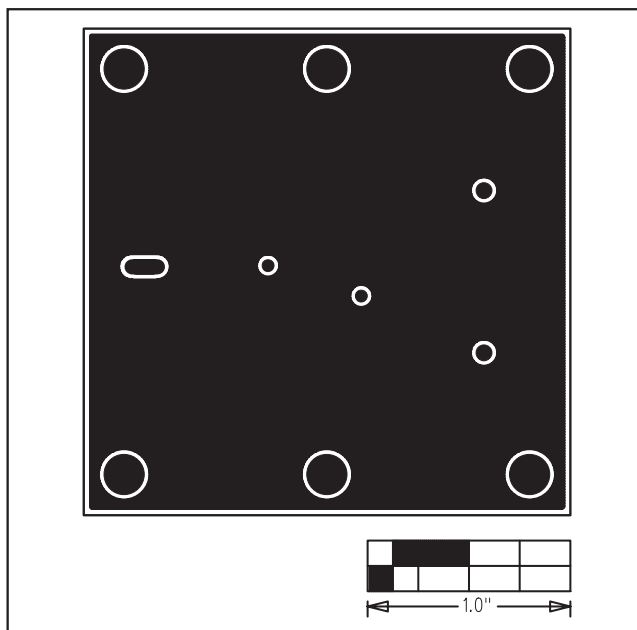


Figure 4. MAX9532 EV Kit PCB Layout—Solder Side

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