19-5046; Rev 0; 11/09

MAX9622 Evaluation Kit

Evaluates: MAX9622/MAX9623

General Description

The MAX9622 evaluation kit (EV kit) provides a proven design to evaluate the MAX9622 single, precision, high-bandwidth op amp in a 5-pin SC70 package. The EV kit circuit is preconfigured as a differential amplifier providing an overall gain of 10V/V. BNC connectors are provided for the board input/output, and the components have pads that accommodate 0603 packages, making them easy to solder and replace. The EV kit also evaluates the MAX9623. Request a free sample of the MAX9623 IC from the factory when ordering the MAX9622 EV kit.

Features

- **50MHz Gain-Bandwidth (GBW) Product**
- **2.0V to 5.25V Supply Range**
- **Preconfigured for 10V/V Gain**
- **Also Evaluates the MAX9623 (IC Replacement)**
- **0603 Components**
- **Fully Assembled and Tested**

Ordering Information

PART	TYPE
MAX9622EVKIT+	EV Kit

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

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	4.7µF ±10%, 6.3V X5R ceramic capacitor (0603) Murata GRM188R60J475K TDK C1608X5R0J475K
C2	1	1µF ±10%, 25V X5R ceramic capacitor (0603) Murata GRM188R61E105K TDK C1608X5R1E105M
C3	1	0.1µF ±10%, 50V X7R ceramic capacitor (0603) Murata GRM188R71H104K TDK C1608X7R1H104K
C4, C5, C6	0	Not installed, ceramic capacitors (0603)

DESIGNATION	QTY	DESCRIPTION
IN, OUT	2	50Ω BNC PCB vertical-mount connectors
R1	1	49.9Ω ±1% resistor (0603)
R2, R3, R8	0	Not installed, resistors—PCB short (0603)
R4, R5	2	1kΩ ±1% resistors (0603)
R6, R7	2	10kΩ ±1% resistors (0603)
U1	1	High-bandwidth single op amp (5 SC70) Maxim MAX9622AXK+
—	1	PCB: MAX9622 EVALUATION KIT+

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 MAX9622 when contacting these component suppliers.*

Quick Start

Required Equipment

- 2.0V to 5.5V, 10mA DC power supply (VCC)
- Oscilloscope
- Signal generator

Procedure

The MAX9622 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) This circuit requires a supply voltage of 2.0V to 5.5V. For evaluation purposes, connect a 5.0V supply to the pad labeled VCC.
2) Connect the power-supply ground to the GND PCB pad.
3) Connect the OUT BNC connector to an oscilloscope.
4) Turn on the power supply.
5) Apply a signal at the IN BNC connector.
6) Verify the output signal on the oscilloscope.

Detailed Description of Hardware

The MAX9622 EV kit provides a proven layout for the MAX9622 precision, high-bandwidth op amp. The EV kit circuit is preconfigured as a differential amplifier providing an overall gain of 10V/V. The signal is amplified through the op amp with the gain set by resistors R5 and R7. The device accepts a single-supply voltage from 2.0V to 5.5V.

Op-Amp Configuration

Differential Amplifier Gain

The EV kit comes configured as a differential amplifier with G = 10. Gain is set by a ratio of R7 to (R5 + R3) if R6 = R7, R4 = R5, and R2 = R3. The gain is simply given by the following equation (eq. 1):

$$V_{OUT} = IN \times \frac{R7}{R5 + R3} \quad \text{eq.1}$$

The EV kit comes installed with R6 = R7 = 10kΩ, R4 = R5 = 1kΩ, and R2 = R3 = 0Ω. IN is the input voltage applied at the IN BNC connector. Modify the resistors as required for different gains.

For a fully differential configuration, the tolerance of resistors used greatly impacts the CMRR characteristics of the board. Use 0.1% resistors for enhanced common-mode rejection. To interface to a fully differential input signal with a common mode other than the EV kit ground, cut the trace connection between the power ground and the circuit ground.

Noninverting Gain

The EV kit can also be used to provide a simple noninverting gain to the input signal. Remove R6 and change R4 to a 0Ω resistor. The gain is then given by the following equation (eq. 2):

$$V_{OUT} = V_{IN} \times \left[1 + \frac{R7}{R5 + R3}\right] \quad \text{eq.2}$$

where R7 is installed as a 10kΩ resistor, R5 is installed as a 1kΩ resistor, R3 is a 0Ω PCB short, and V_{IN} is the input voltage at IN+ of the op amp. The EV kit provides a gain of 11V/V.

Capacitive Loads

Some applications require driving large capacitive loads. To improve the stability of the amplifier in such cases, replace resistor R8 with a suitable resistor value to improve amplifier phase margin by isolating the load capacitor. The R8/C4 lowpass filter can also be used as an anti-alias filter or to limit amplifier output noise by reducing its output bandwidth.

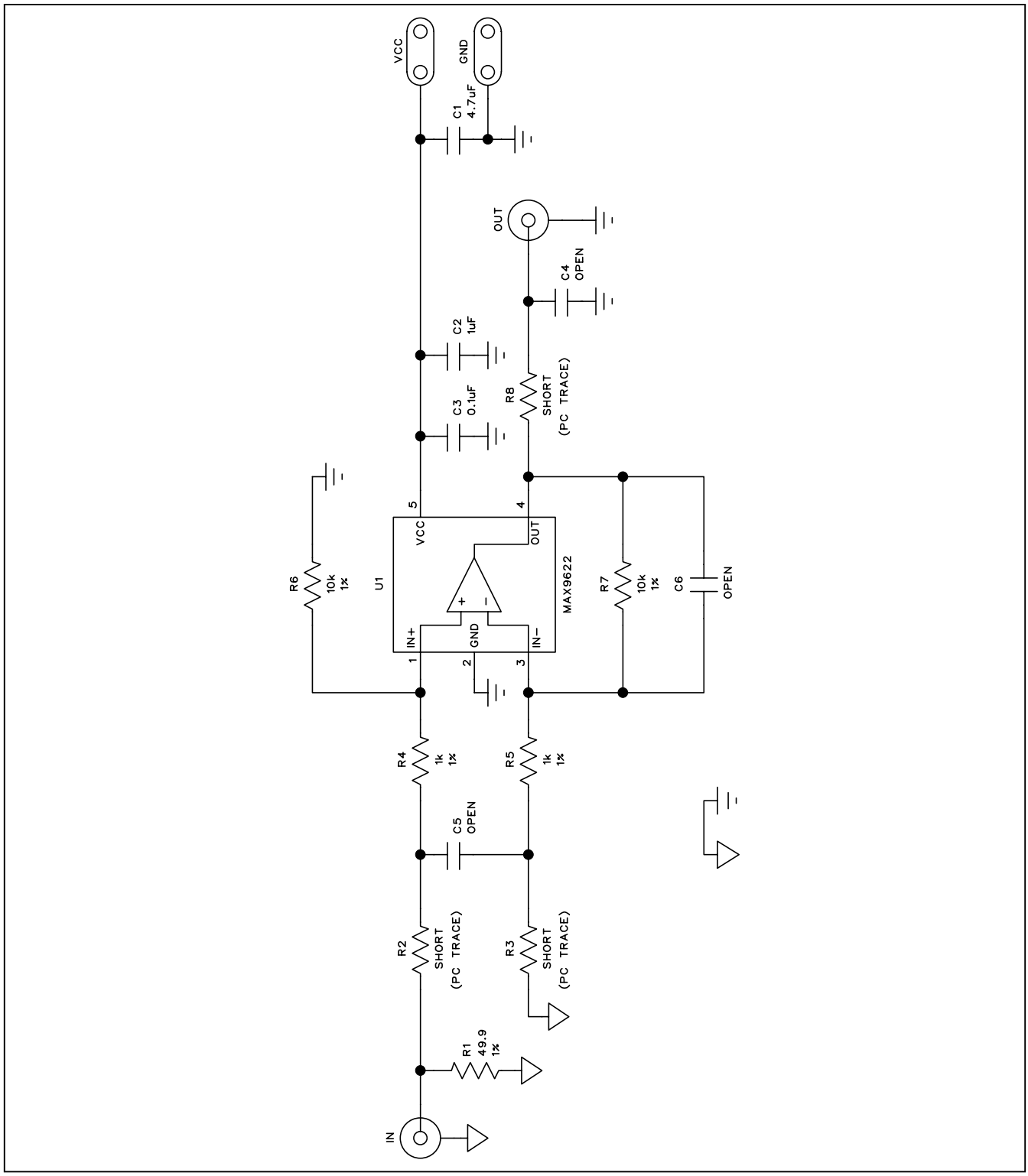

Figure 1. MAX9622 EV Kit Schematic

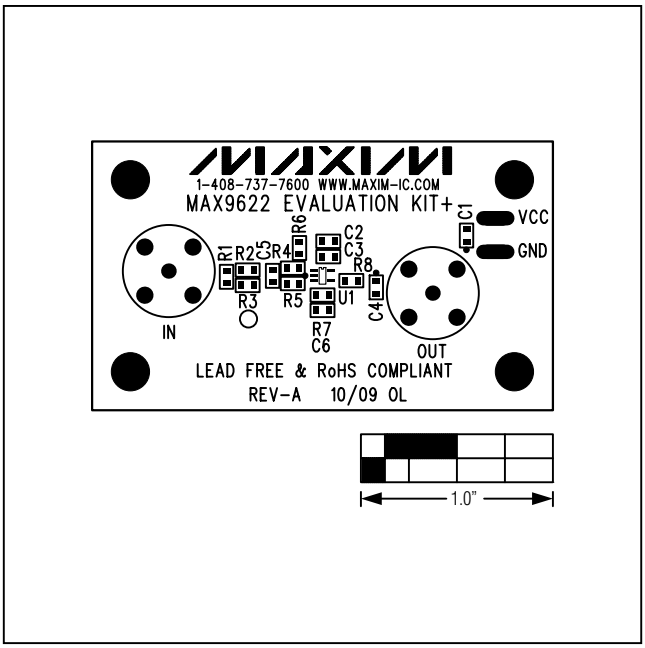

Figure 2. MAX9622 EV Kit Component Placement Guide—Component Side

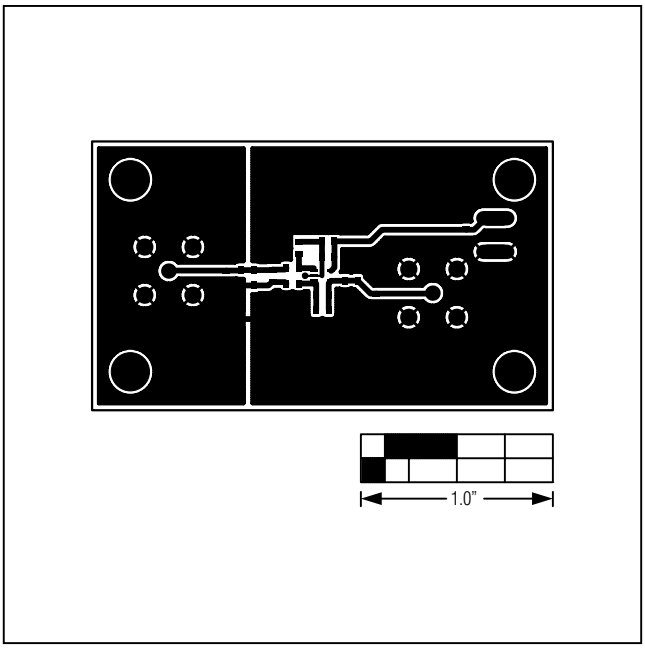

Figure 3. MAX9622 EV Kit PCB Layout—Component Side

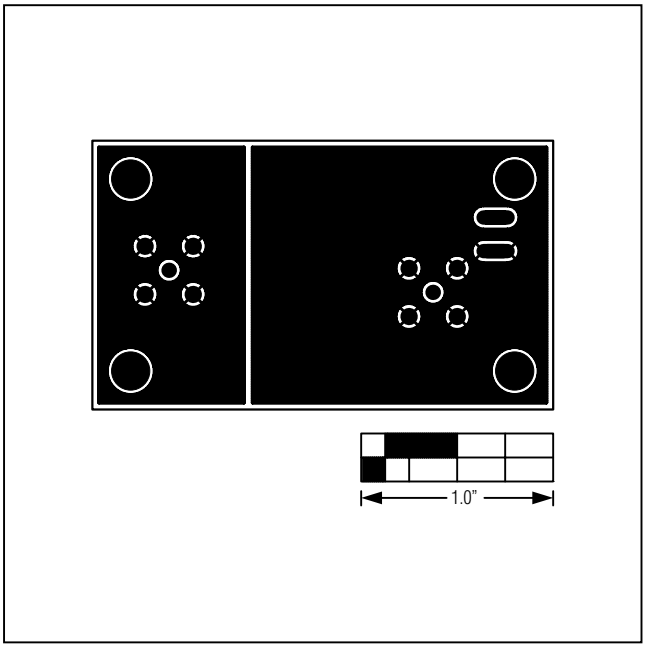

Figure 4. MAX9622 EV Kit PCB Layout—Solder Side

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	11/09	Initial release	—