



MAX9722A Evaluation Kit

General Description

The MAX9722A evaluation kit (EV kit) is a fully assembled and tested circuit board that uses the MAX9722A to drive a stereo headphone in portable audio applications. The MAX9722A is a differential stereo headphone driver with DirectDrive. MAXIM's DirectDrive technology eliminates the need for DC-blocking capacitors on the output of the amplifier. Designed to operate from a 2.4V to 5.5V DC power supply, the EV kit is capable of delivering up to 70mW per channel into a 16 Ω load or 130mW per channel into a 32 Ω load and 0.009% THD+N at 1kHz.

The EV kit can also be used as a line driver that provides 2V_{RMS} into a 1k Ω load from a single 5V supply. The MAX9722A EV kit also evaluates the MAX9722B.

Features

- ◆ 2.4V to 5.5V Single-Supply Operation
- ◆ Drives Two Channels at 70mW per Channel into a 16 Ω load, 130mW per Channel into a 32 Ω load
- ◆ $\leq 2\mu\text{A}$ Shutdown Current
- ◆ Evaluates the MAX9722A or MAX9722B (IC and Component Replacement Required)
- ◆ Small 16-Pin TQFN (3mm x 3mm) Package
- ◆ Available in 16-Pin TSSOP Package
- ◆ Fully Assembled and Tested

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX9722AEVKIT	0°C to +70°C	16 TQFN-EP*

*EP = Exposed paddle.

Component List

DESIGNATION	QTY	DESCRIPTION
A1	1	MAX9722AEUE (16-pin TSSOP)
C1–C4	4	1 μF $\pm 20\%$, 16V plastic film capacitors (1210) Panasonic ECPU1C105MA5
C5	1	10 μF $\pm 20\%$, 6.3V X5R ceramic capacitor (0805) TDK C2012X5R0J106M
C6–C11	6	1 μF $\pm 10\%$, 10V X5R ceramic capacitors (0603) TDK C1608X5R1A105K
J1	1	3.5mm stereo headphone jack
JU1	1	3-pin header
JU2	1	2-pin header
R1–R8	8	10k Ω $\pm 1\%$ resistors (0603)
R9, R10	0	Not installed, resistors (0603)
R11	1	0 Ω $\pm 5\%$ resistor (1206)
U1	1	MAX9722AEUE (16-pin TQFN, 3mm x 3mm)
None	2	Shunts
None	1	MAX9722A PC board

Component Suppliers

SUPPLIER	PHONE	FAX	WEBSITE
Panasonic	714-373-7366	714-737-7323	www.panasonic.com
TDK	847-803-6100	847-390-4405	www.component.tdk.com

Note: Indicate that you are using the MAX9722A when contacting these component suppliers.

Quick Start

The MAX9722A EV kit is fully assembled and tested. Follow the steps listed below to verify board operation. **Do not turn on the power supply until all connections are completed.**

Recommended Equipment

- 2.4V to 5.5V, 500mA power supply
- Audio signal source (i.e., CD or MP3 player)
- 16 Ω or 32 Ω headphone

Procedure

- 1) Verify that a shunt is installed across pins 1 and 2 of jumper JU1 (EV kit ON).
- 2) Verify that no shunt is installed across jumper JU2 (remote GND sensing OFF).
- 3) Plug the headphone into headphone jack J1.
- 4) Connect the positive terminal of the power supply to the PVDD pad and ground terminal to the PGND pad.



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- 5) Connect the left output of the audio source to the INPUTL- pad.
- 6) Connect the ground of the audio source to the INPUTL+ pad.
- 7) Connect the right output of the audio source to the INPUTR- pad.
- 8) Connect the ground of the audio source to the INPUTR+ pad.
- 9) Turn on the power supply.
- 10) Turn on the audio source.

Detailed Description

The MAX9722A EV kit features the MAX9722A differential stereo headphone amplifier with DirectDrive, which is designed to directly drive a 16Ω or 32Ω stereo headphone in portable audio applications. The EV kit operates from a DC power supply that can provide 2.4V to 5.5V and 500mA of current. The EV kit accepts two sets of differential or single-ended audio inputs. The amplifier is able to deliver 70mW per channel into a 16Ω load or 130mW per channel into a 32Ω load.

The EV kit can also be used as an audio line driver to provide $2V_{RMS}$ into a $1k\Omega$ load from a single 5V supply. When used in this way, the EV kit features a remote ground-sensing network to reduce any ground loop noise at the receiving device (see the *Remote Ground Sensing* section).

Jumper Selection

Shutdown Mode (SHDN)

Jumper JU1 controls the shutdown pin (SHDN) of the MAX9722A. See Table 1 for jumper positions.

Remote Ground Sensing

Jumper JU2, resistors R9 and R10 configure the remote ground-sensing feature for the MAX9722A EV kit. See Table 2 for jumper shunt positions and approximate resistor values.

Note: When using the remote ground-sensing feature, remove resistors R3, R4, R7, and R8. Install a $10k\Omega$ resistor at the R9 and R10 PC board pads. Replace R11 with a 10Ω resistor. In this mode of operation, the input signals on the INPUTL- and INPUTR- pads are referenced to the EV kit PGND pad and are single ended. If headphones are used in this configuration, channel-to-channel isolation may be degraded.

Evaluating the MAX9722B

The MAX9722A EV kit can evaluate the MAX9722B. To evaluate the MAX9722B, replace U1 with a MAX9722B and replace the components as outlined in Table 3.

Refer to the MAX9722A/MAX9722B data sheet for additional information on using the MAX9722B as a headphone amplifier or as an audio line driver.

Table 1. JU1 Jumper Selection

SHUNT POSITION	EV KIT FUNCTION
1-2 (SHDN = high)	EV kit enabled
2-3 (SHDN = low)	Shutdown mode
None. External controller connected to SHDN pad (logic level).	SHDN driven by external controller. Shutdown is active low.

Table 2. JU2 Jumper Selection

SHUNT POSITION	R9, R10	R3, R4, R7, R8	R11 (Ω)	REMOTE GND SENSING	EV KIT FUNCTION
Not installed (default)	Open	$10k\Omega$	0	Not configured	Differential inputs, output referenced to local ground
Installed	$10k\Omega$	Open	10	Configured	Single-ended inputs, output senses remote ground

Table 3. Component Values for Evaluating the MAX9722B

COMPONENT	EV KIT USES DIFFERENTIAL INPUTS; OUTPUT REFERRED TO LOCAL GROUND	EV KIT USES SINGLE-ENDED INPUTS, OUTPUT SENSES REMOTE GROUND
U1	MAX9722B	MAX9722B
R1, R5	0Ω	0Ω
R2, R6	Open	Open
R3, R7	$15k\Omega$	Open
R4, R8	$30k\Omega$	Open
R9	Open	$30k\Omega$
R10	Open	$15k\Omega$
R11	0Ω	10Ω
JU2	Not installed	Installed

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Evaluates: MAX9722A/MAX9722B

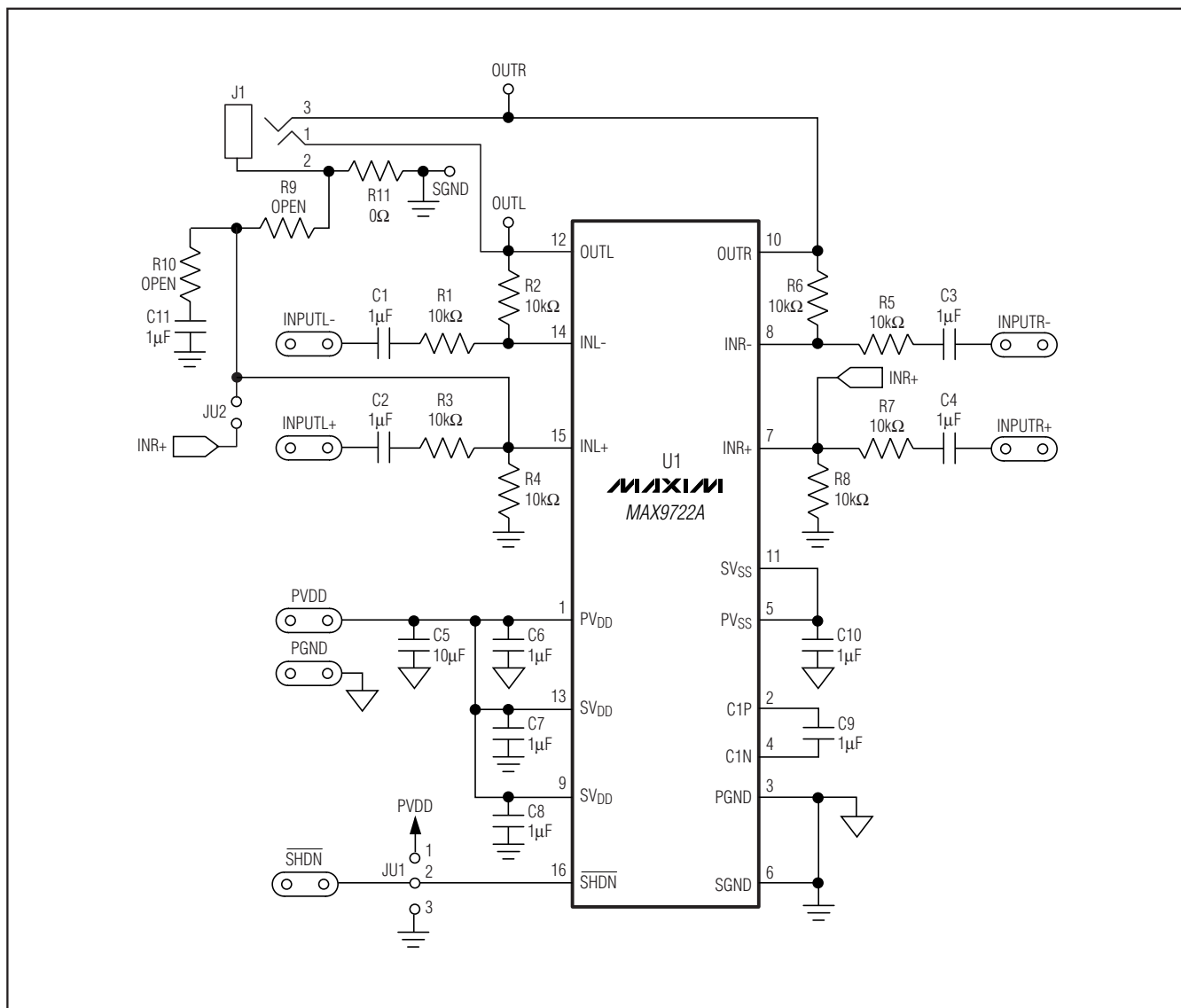


Figure 1. MAX9722A EV Kit Schematic

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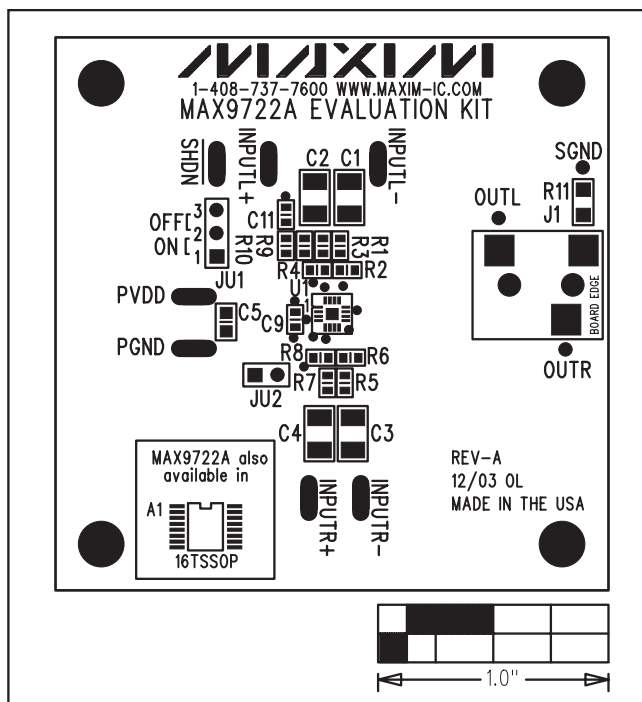


Figure 2. MAX9722A EV Kit Component Placement Guide—Component Side

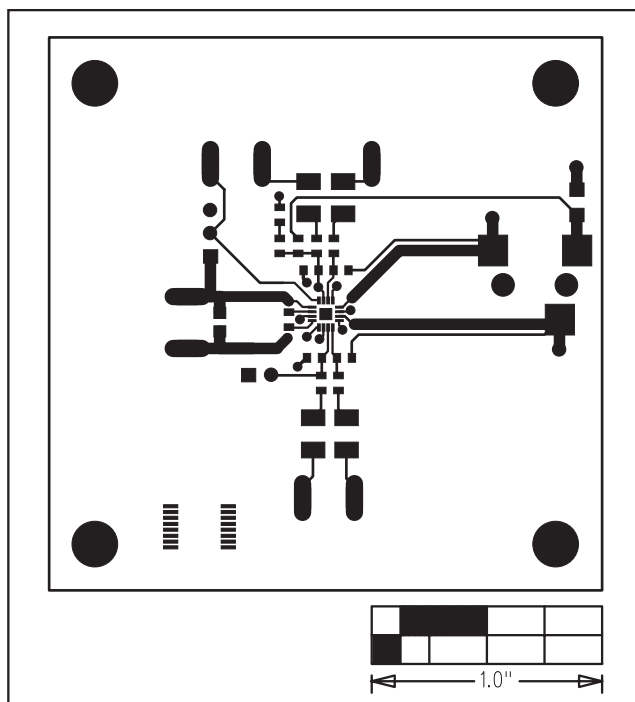


Figure 3. MAX9722A EV Kit PC Board Layout—Component Side

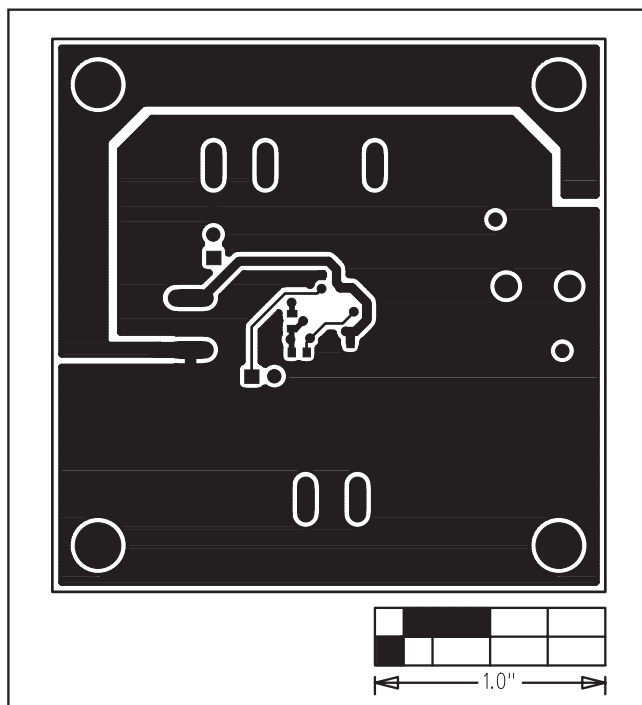


Figure 4. MAX9722A EV Kit PC Board Layout—Solder Side

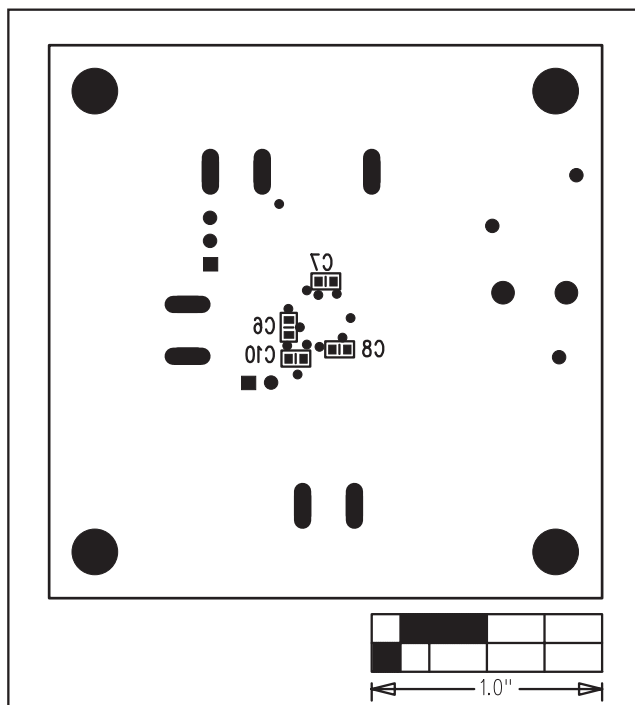


Figure 5. MAX9722A EV Kit Component Placement Guide—Solder Side

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