

# MAXIM

## MAX9718A Evaluation Kit

### General Description

The MAX9718A evaluation kit (EV kit) is a fully assembled and tested circuit board that uses the MAX9718A differential audio amplifier to drive a mono bridge-tied load (BTL) speaker in portable audio applications. Designed to operate from a 2.7VDC to 5.5VDC power supply, the EV kit is capable of delivering 1.1W into an 8 $\Omega$  load.

The MAX9718A inputs can tolerate a DC offset level of 0.5V through ( $V_{CC} - 1.2V$ ) from an input source, therefore eliminating the need for input-signal coupling capacitors. The EV kit provides an option to bypass the input-signal coupling capacitors when the DC offset level of the input signals are within the range of 0.5V to ( $V_{CC} - 1.2V$ ). The MAX9718A EV kit also evaluates the MAX9718B, MAX9718C, and MAX9718D.

### Component List

DESIGNATION	QTY	DESCRIPTION
A1	0	MAX9718AEUB (10-pin $\mu$ MAX)
A2	0	MAX9718AEUB-T (9-bump UCSP)
C1, C2	2	0.47 $\mu$ F $\pm$ 20%, 16V, film chip capacitors (1206) Panasonic ECPU1C474MA5
C3	1	1 $\mu$ F $\pm$ 10%, 10V X5R ceramic capacitor (0603) TDK C1608X5R1A105K
C4	1	10 $\mu$ F $\pm$ 20%, 6.3V X5R ceramic capacitor (0805) TDK C2012X5R0J106M
C5	1	0.1 $\mu$ F $\pm$ 10%, 25V X7R ceramic capacitor (0603) TDK C1608X7R1E104K
C6, C7	0	Not installed, capacitors (0603)
R1–R4	4	10k $\Omega$ $\pm$ 1% resistors (0603)
U1	1	MAX9718AETB (10-pin TDFN)
JU1, JU2	2	3-pin headers
JU3, JU4	2	2-pin headers
None	4	Shunts
None	1	MAX9718A PC board

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### Features

- ◆ Drives 1.1W into 8 $\Omega$  Speaker at 1% THD+N
- ◆ Differential Input
- ◆ 2.7V to 5.5V Single-Supply Operation
- ◆ 100nA Shutdown Current (typ)
- ◆ Small 10-Pin TDFN Package
- ◆ Also Available in 10-Pin  $\mu$ MAX<sup>®</sup> and 9-Bump UCSP<sup>™</sup> Packages
- ◆ Fully Assembled and Tested
- ◆ Evaluates MAX9718B/C/D (IC and Component Replacement Required)

### Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX9718AEVKIT	0°C to +70°C	10 TDFN-EP*

\*EP = Exposed paddle.

### Quick Start

The MAX9718A 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

- 2.7V to 5.5V, 2A power supply
- Audio signal source
- 8 $\Omega$  speaker

### Connection and Setup

- 1) Verify that a shunt is installed across pins 1 and 2 of jumper JU1 (EV kit on).
- 2) Verify that a shunt is installed across pins 2 and 3 of jumper JU2 (shutdown mode active low).
- 3) Verify that no shunts are installed on jumpers JU3 and JU4 (input-signal coupling capacitors are in circuit).
- 4) Connect the 8 $\Omega$  speaker across the OUT+ and OUT- PC board pads.
- 5) Connect the positive terminal of the power supply to the VCC pad and the power-supply ground terminal to the GND pad.
- 6) Connect the audio source across the INPUT+ and INPUT- pads.
- 7) Turn on the power supply.
- 8) Turn on the audio source.

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## 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 MAX9718A when contacting these component suppliers.

## Detailed Description

The MAX9718A EV kit features the MAX9718A differential audio amplifier, designed to drive an 8Ω mono speaker in portable audio applications. The EV kit operates from a DC power supply that can provide 2.7V to 5.5V and 2A of current. The amplifier is capable of delivering 1.1W into an 8Ω speaker or 1.4W into a 4Ω speaker.

As configured, the EV kit is set for a gain of 1V/V (0dB) by gain-setting resistors R1–R4. To set the EV kit to a different gain, select other gain-setting resistors. Refer to the *Applications Information* section in the MAX9718/MAX9719 data sheet for selecting the resistors. Capacitors C6 and C7 are used for optionally limiting the audio signal bandwidth.

## Jumper Selection

### Shutdown Mode (SHDM and SHDN)

The MAX9718A features a shutdown mode that reduces the MAX9718A quiescent current to 100nA (typ). The shutdown mode on the MAX9718A EV kit is controlled by the combination of the SHDM and SHDN pins of the MAX9718A IC. The SHDM pin determines whether the SHDN input pin is active high or active low, while the SHDN pin activates or deactivates the shutdown mode of the IC. Jumpers JU1 and JU2 configure the shutdown mode (SHDN and SHDM) of the MAX9718A IC. See Table 1 for the shunt positions.

**Table 1. Shutdown Mode Configuration (JU1 and JU2)**

JU2 SHUNT POSITION SHDM (SHUTDOWN MODE)	JU1 SHUNT POSITION SHDN (SHUTDOWN PIN)	EV KIT FUNCTION
1-2 (SHDM = high)	1-2 (SHDN = high)	Disabled
1-2 (SHDM = high)	2-3 (SHDN = low)	Enabled
2-3 (SHDM = low)	1-2 (SHDN = high)	Enabled
2-3 (SHDM = low)	2-3 (SHDN = low)	Disabled

**Note:** The SHDM and SHDN pins can also be controlled by external sources connected to the SHDM and SHDN pads.

## Limiting the Audio Signal Bandwidth

Capacitors C6 and C7 provide the option to implement a lowpass filter (LPF) with the MAX9718A EV kit. The -3dB point of the LPF can be set by component pairs C6 and R2 and C7 and R4 as follows:

$$f_{-3dB} = 1/(2 \times \pi \times R_F \times C_F)$$

where  $R_F = R_2 = R_4$  and  $C_F = C_6 = C_7$ .

If a lowpass filter (LPF) is not desired, leave C6 and C7 uninstalled.

## Bypassing the Input-Signal Coupling Capacitors (JU3 and JU4)

Jumpers JU3 and JU4 provide an option to bypass the input-signal coupling capacitors C1 and C2, respectively, on the MAX9718A EV kit. See Table 2 for the various shunt positions.

**Table 2. JU3 and JU4 Jumper Selection**

SHUNT POSITION	INPUT-SIGNAL COUPLING CAPACITORS
Not Installed (default)	In circuit
Installed	DC-coupled inputs

## Evaluating the MAX9718B/MAX9718C/MAX9718D

The MAX9718A EV kit can also evaluate the MAX9718B, MAX9718C, and MAX9718D. To evaluate a different IC, replace U1 with the desired part and replace the components as outlined in Table 3. Refer to the MAX9718/MAX9719 data sheet for additional information.

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Table 3. Component Values for Evaluating Different Versions of the MAX9718

COMPONENT	EVALUATING MAX9718A	EVALUATING MAX9718B	EVALUATING MAX9718C	EVALUATING MAX9718D
U1	MAX9718A	MAX9718B	MAX9718C	MAX9718D
R1, R3	10k $\Omega$	0 $\Omega$	0 $\Omega$	0 $\Omega$
R2, R4	10k $\Omega$	Open	Open	Open

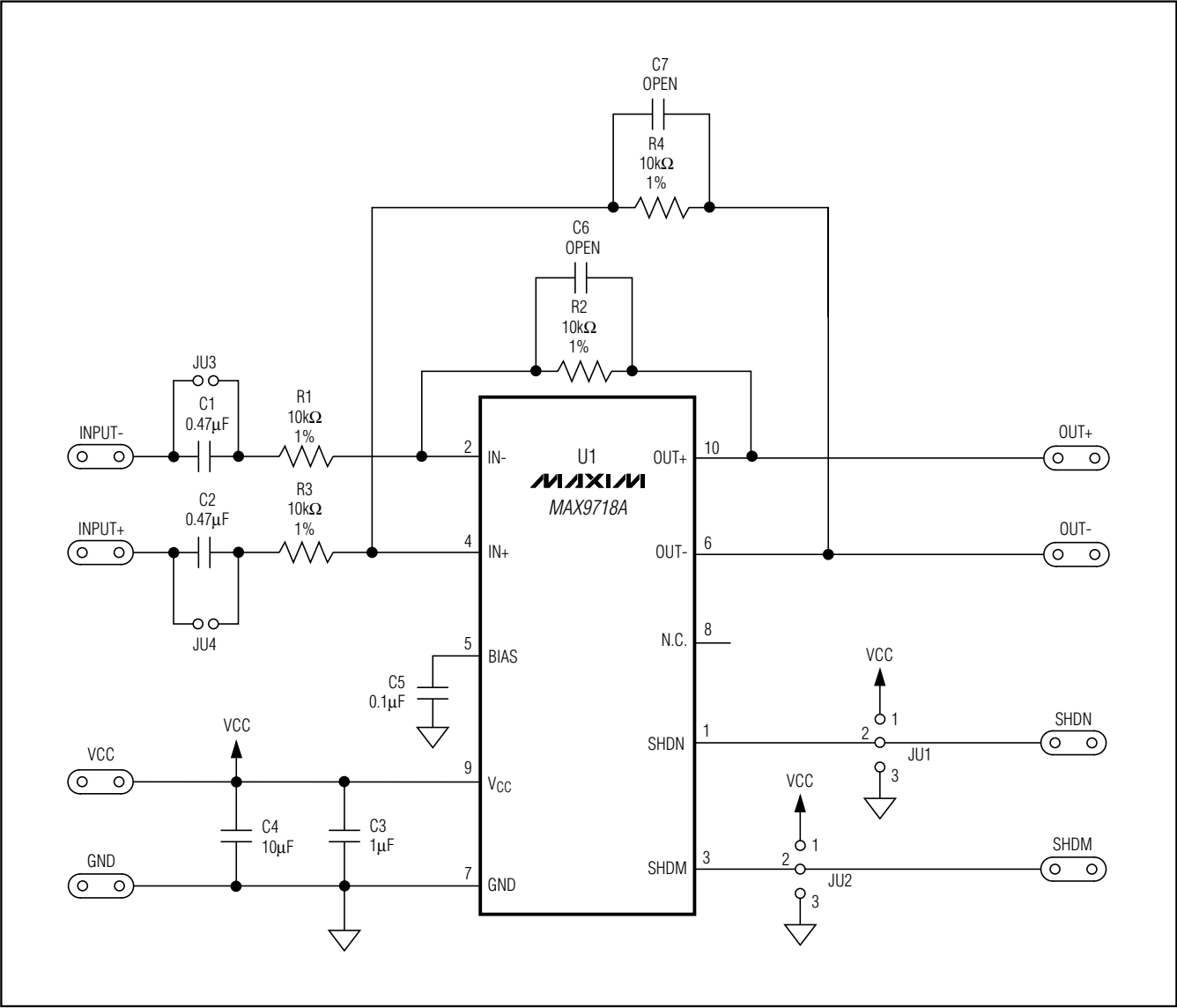


Figure 1. MAX9718A EV Kit Schematic

Evaluates: MAX9718A/MAX9718B/MAX9718C/MAX9718D

**Evaluates: MAX9718A/MAX9718B/MAX9718C/MAX9718D**



# MAX9718A Evaluation Kit

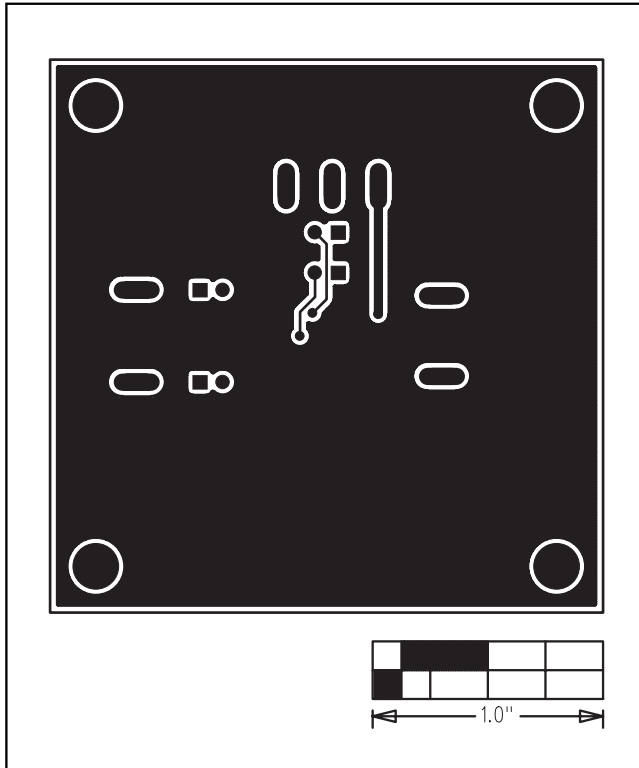


Figure 4. MAX9718A EV Kit PC Board Layout—Solder Side

Evaluates: MAX9718A/MAX9718B/MAX9718C/MAX9718D

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