19-3233; Rev 1; 8/09

MAX9716 Evaluation Kit

General Description

The MAX9716 evaluation kit (EV kit) is a fully assembled and tested circuit board that uses the MAX9716, a low-cost, mono, 1.4W, bridge-tied-load (BTL) audio power amplifier with adjustable gain. Designed to operate from a 2.7V to 5.5V DC power supply, the EV kit is capable of delivering 1.4W into a 4Ω load with less than 1% THD+N.

The EV kit can be used to evaluate the MAX9717A/B/C/D. To evaluate the MAX9717A with the EV kit, replace the MAX9716 IC with a MAX9717A. To evaluate the MAX9717B/C/D with the EV kit, replace the MAX9716 IC with a MAX9717B/C/D, remove resistors R1 and R2, and short the R1 pads.

Features

- **Single Power Supply: 2.7V to 5.5V**
- **10nA (typ) IC Shutdown Current**
- **1.4W into 4Ω at 1% THD+N**
- **1.1W into 8Ω**
- **Resistor Adjustable Gain (MAX9716/MAX9717A)**
- **Surface-Mount Construction**
- **Fully Assembled and Tested**

Ordering Information

PART	TYPE
MAX9716EVKIT	EV Kit

Note: *To evaluate the MAX9717A/B/C/D, request a MAX9717AETA/MAX9717BETA/MAX9717CETA/MAX9717DETA free sample with the MAX9716 EV kit.*

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	10µF ±20%, 6.3V X5R ceramic capacitor (0805) TDK C2012X5R0J106M
C2	1	0.1µF ±10%, 16V X7R ceramic capacitor (0603) TDK C1608X7R1C104K
C3	1	0.47µF ±20%, 10V tantalum capacitor (0402) AVX TACK474M010
C4	1	1µF ±10%, 10V X5R ceramic capacitor (0603) TDK C1608X5R1A105K
C5	1	10µF ±20%, 6.3V tantalum capacitor (A case) AVX TAJA106M006

DESIGNATION	QTY	DESCRIPTION
JU1	1	4-pin header
JU2	1	3-pin header
OUT	1	3.5mm SMT stereo headphone jack
R1, R2	2	10kΩ ±1% resistors (0603)
U1	1	Audio power amplifier Maxim MAX9716ETA (8 TDFN)
U2	0	Not installed, MAX9716EUA (8 µMAX®)
U3	0	Not installed, MAX9716EBL (9 UCSP™)
—	2	Shunts
—	1	PCB: MAX9716/7 EVALUATION KIT

µMAX is a registered trademark and UCSP is a trademark of Maxim Integrated Products, Inc.

Component Suppliers

SUPPLIER	PHONE	WEBSITE
AVX Corporation	843-946-0238	www.avxcorp.com
TDK Corp.	847-803-6100	www.component.tdk.com

Note: *Indicate that you are using the MAX9716/MAX9717 when contacting these component suppliers.*

MAX9716 Evaluation Kit

Quick Start

The MAX9716 EV kit is fully assembled and tested. Follow these steps to verify board operation. **Do not turn on the power supply until all connections are completed.**

Recommended Equipment

- 2.7V to 5.5V, 1A power supply
- Audio source (i.e., CD player, cassette player)
- 4Ω/8Ω speaker
- Headphone with 3.5mm plug (MAX9717 only)

1) Verify that JU2 has a shunt across pins 1 and 2 ($\overline{SHDN}$ = high).
2) Verify that JU1 has a shunt across pins 1 and 3 (IN+ = BIAS).
3) Connect the speaker across OUT+ and OUT-.
4) Connect the 5.0V power supply to the VCC pad and the power-supply ground to the GND pad.
5) Connect the audio source to VIN- pad.
6) Turn on the power supply, and then turn on the audio source.
7) Plug in the headphone for the headphone mode (MAX9717 only).

Detailed Description

Jumper Selection

Jumper JU1 controls the IN+ pin (MAX9716) or $\overline{BTL}$/SE pin (MAX9717). See Table 1 for JU1 function.

Jumper JU2 controls the $\overline{SHDN}$ pin of the MAX9716/MAX9717 IC. See Table 2 for JU2 functions.

Gain Settings (MAX9716/MAX9717A)

R1 and R2 set the gain of the EV kit. The EV kit comes with R1 and R2 equal to 10kΩ, setting the BTL gain to 2V/V. To change the output-voltage gain, choose R2 between 10kΩ to 50kΩ. The BTL output gain is determined by the following equation:

$$A_V = 2 \times (R2/R1)$$

where A_V is the desired BTL output-voltage gain.

For the MAX9717A, the gain of single-ended mode is set by A_V = R2/R1.

Evaluating MAX9717A/B/C/D

To evaluate the MAX9717A with the MAX9716 EV kit, replace the MAX9716ETA with a MAX9717AETA. Change jumper JU1 position according to Table 1.

To evaluate the MAX9717B/C/D with the MAX9716 EV kit, replace the MAX9716ETA with a MAX9717BETA/MAX9717CETA/MAX9717DETA, remove input and feedback resistors R1 and R2, then short the R1 pads. The MAX9717B/C/D has internally fixed BTL gains of 6dB, 9dB, and 12dB, respectively. Change jumper JU1 position according to Table 1.

Table 1. JU1 Functions

JU1 SHUNT POSITION	IN+ PIN (MAX9716)	$\overline{BTL}$/SE PIN (MAX9717)
Pins 1 and 2	Not allowed	$\overline{BTL}$/SE = V_{CC}, single-ended output mode
Pins 1 and 3 (default)	IN+ = BIAS	Not allowed
Pins 1 and 4	Not allowed	$\overline{BTL}$/SE = GND, BTL output mode

Table 2. JU2 Functions

JU2 SHUNT POSITION	$\overline{SHDN}$ PIN	EV KIT OUTPUT
Pins 1 and 2 (default)	Connected to V_{CC}	Enabled
Pins 2 and 3	Connected to GND	Disabled

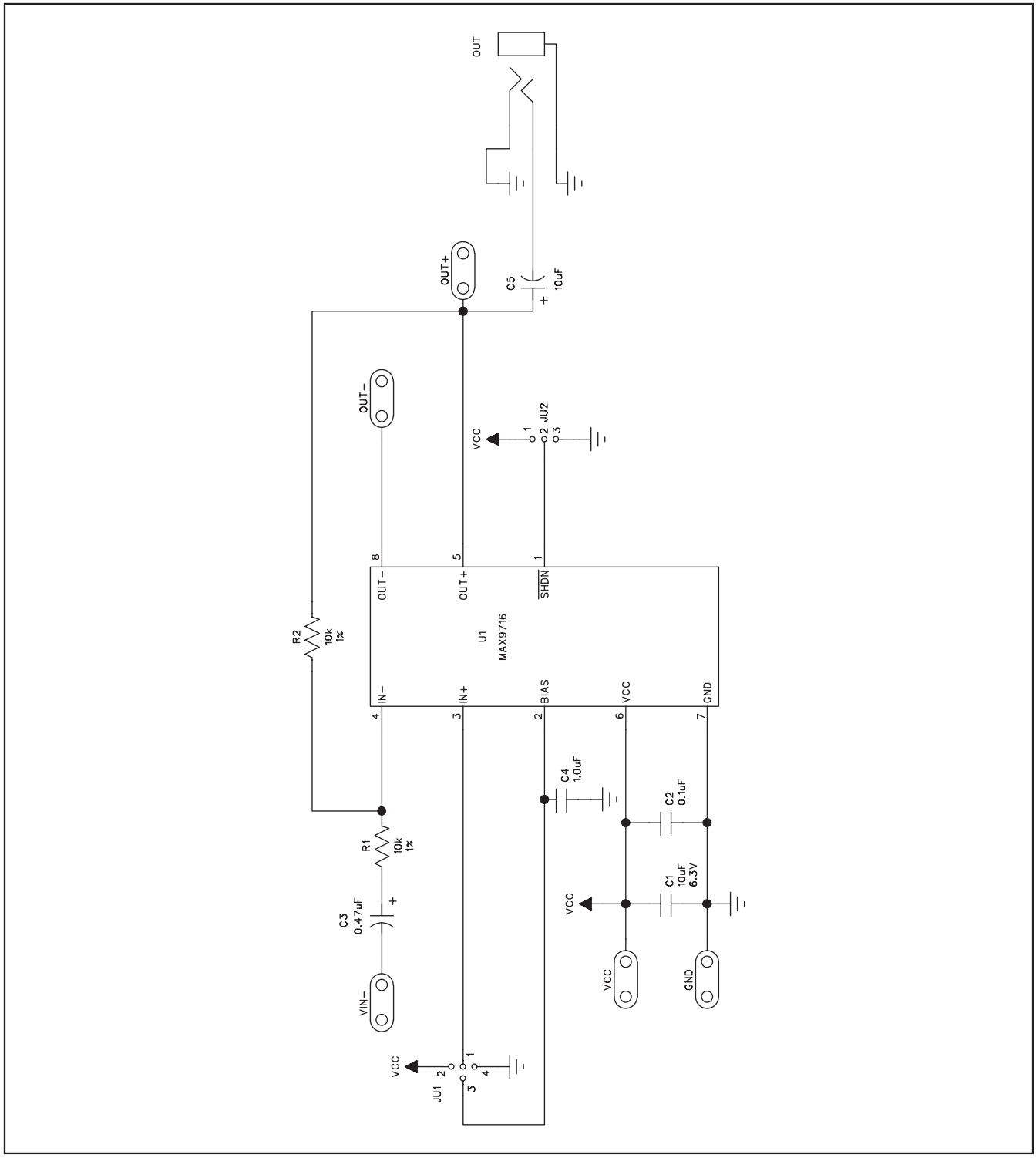

Figure 1. MAX9716 EV Kit Schematic

MAX9716 Evaluation Kit

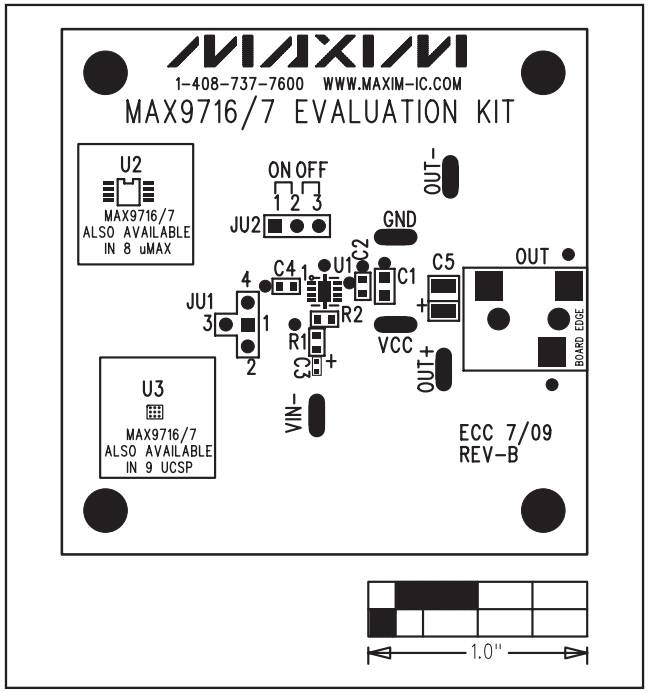

Figure 2. MAX9716 EV Kit Component Placement Guide—Component Side

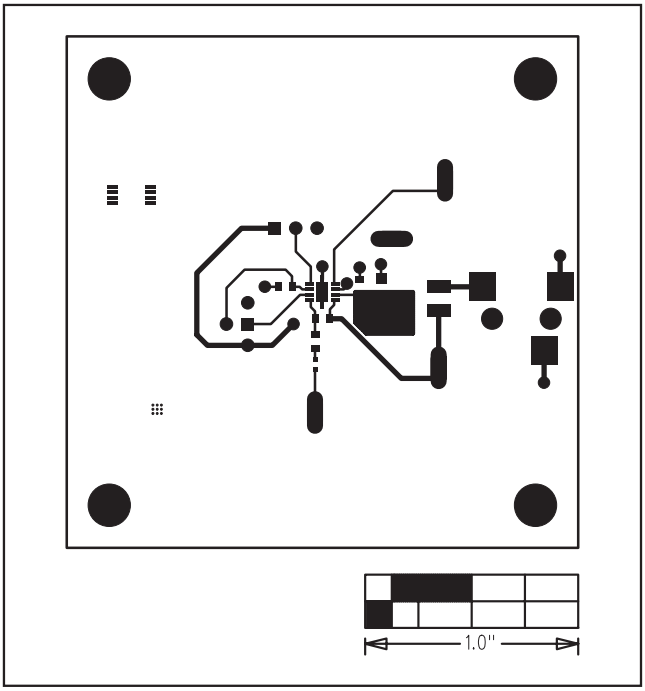

Figure 3. MAX9716 EV Kit PC Board Layout—Component Side

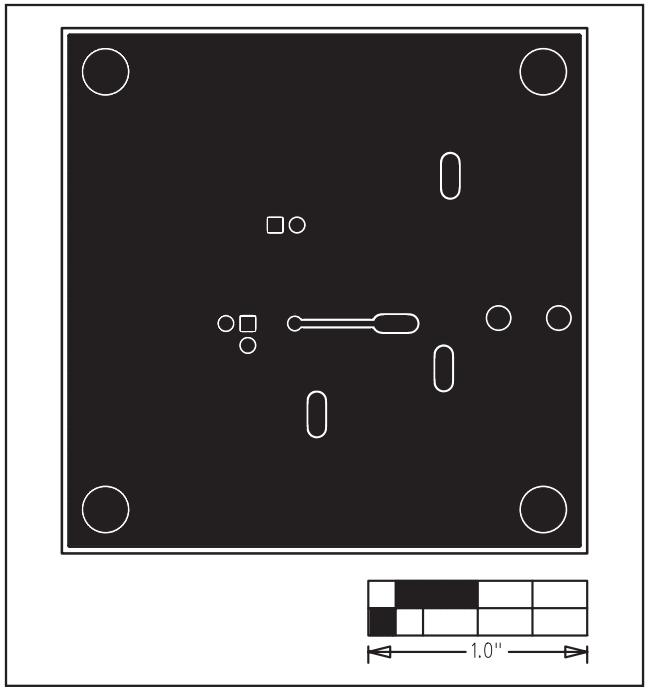

Figure 4. MAX9716 EV Kit PC Board Layout—Solder Side

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	3/04	Initial release	—
1	8/09	Updated figures	3, 4