



# MAX9742 Evaluation Kit

**Evaluates: MAX9742**

## General Description

The MAX9742 evaluation kit (EV kit) is a fully assembled and tested PCB that configures the MAX9742 Class D amplifier to drive 2 x 20W into a pair of 8Ω speakers for audio applications. The EV kit operates from a 20V to 40VDC power supply. The EV kit is configured for a +26dB gain. The MAX9742 EV kit accepts single-ended or differential input signals, and provides a pair of single-ended outputs.

The MAX9742 EV kit provides a shutdown input pad to control the shutdown mode of the MAX9742. The shutdown mode reduces power consumption and extends battery life. The EV kit also provides a mute input pad to control the mute mode of the MAX9742. The EV kit includes convenient audio input and output connectors, and the required output filters to ease evaluation.

## Features

- ◆ 20V to 40V Single DC Power-Supply Operation
- ◆ Single-Ended or Fully Differential Inputs
- ◆ Single-Ended Outputs
- ◆ Drives 2 x 20W into 8Ω Speakers at 36V
- ◆ Drives 2 x 10W into 4Ω Speakers at 24V
- ◆ Shutdown and Mute Control
- ◆ Evaluates the MAX9742 in 36-Pin TQFN-EP Package
- ◆ Fully Assembled and Tested

## Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX9742EVKIT+	0°C to +70°C*	36 TQFN-EP**

+ Denotes a lead-free and RoHS-compliant EV kit.

\* This limited temperature range is for the EV kit PCB only. The MAX9742 IC temperature range is -40°C to +85°C.

\*\* EP = Exposed paddle.

## Component List

DESIGNATION	QTY	DESCRIPTION
<b>MINIMAL COMPONENTS FOR CUSTOMER DESIGN</b>		
C3	1	22μF ±20%, 25V aluminum electrolytic capacitor (5mm x 6mm) Sanyo 25CE22AX
C4, C22, C28, C29	4	1μF ±20%, 25V X5R ceramic capacitors (0603) TDK C1608X5R1E105M
C10–C13	4	0.47μF ±10%, 25V X5R ceramic capacitors (0805) TDK C2012X5R1E474K
C14–C17	4	150pF ±10%, 50V X7R ceramic capacitors (0603) TDK C1608X7R1H151K
C18, C19	2	330μF ±20%, 50V aluminum electrolytic capacitors (12.5mm x 13.5mm) Sanyo 50CE330AX
C20, C21, C23, C24, C30	5	0.1μF ±10%, 50V X7R ceramic capacitors (0603) TDK C1608X7R1H104K
C25, C26	2	10pF ±5%, 50V C0G ceramic capacitors (0603) TDK C1608C0G1H100J

DESIGNATION	QTY	DESCRIPTION
C31	1	0.47μF ±10%, 10V X7R ceramic capacitor (0603) TDK C1608X7R1A474K
C32–C35	4	0.33μF ±10%, 50V X7R ceramic capacitors (0805) TDK C2012X7R1H334K
C36†, C37	2	1000μF ±20%, 50V aluminum electrolytic capacitors (16mm x 16.5mm) Sanyo 50CE1000AX
D2, D3	2	75V, 250mA silicon switching diodes (SOD-323) Central CMDD4448 (lead free)
L1, L2	2	33μH ±20% 3A inductors Sumida CDRH127NP-330MC
R3, R4	2	10kΩ ±5% resistors (0603)
R7, R8	2	681kΩ ±1% resistors (0603)
R9–R12	4	30.1kΩ ±1% resistors (1206)
R13, R14	2	120kΩ ±1% resistors (0603)
R15, R16	2	562kΩ ±1% resistors (0603)
R17	1	68.1kΩ ±1% resistor (0603)
R18, R19	2	10Ω ±5% resistors (1206)

† When operating with a 24V single power supply, use smaller case-size (25V) capacitors.

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## Component List (continued)

DESIGNATION	QTY	DESCRIPTION
U1	1	MAX9742ETX+ (36-pin, 6mm x 6mm x 0.8mm TQFN)
<b>OPTIONAL COMPONENTS FOR CUSTOMER EVALUATION</b>		
C1, C2	2	0.01 $\mu$ F $\pm$ 10%, 50V X7R ceramic capacitors (0603) TDK C1608X7R1H103K
C6–C9	4	100pF $\pm$ 10%, 50V C0G ceramic capacitors (0603) TDK C1608C0G1H101K
C27	0	Not installed, ceramic capacitor (0603)
D1	1	4.3V, 20mA zener diode (SOT-23) Central CMPZ5229B
D4–D7	0	Not installed, dual-series diodes (SOT-23) Recommended: Central CMPD7000 (lead free) or BAV99 (lead free)
FB1–FB4	4	Ferrite beads, 1k $\Omega$ at 100MHz, 1.8 $\Omega$ DCR, 50mA (0603) Murata BLM18HD102SN1
FB5	1	Ferrite bead, 22 $\Omega$ at 100MHz, 10m $\Omega$ DCR, 6A (0805) Murata BLM21PG220SN1D
JU1, JU2, JU3	3	2-pin headers
Q1	1	NPN bipolar transistor (SOT-23) Fairchild MMBT3904
R1	1	20k $\Omega$ $\pm$ 5% resistor (0603)
R2	1	10k $\Omega$ $\pm$ 5% resistor (0603)
R6	1	10 $\Omega$ $\pm$ 5% resistor (0603)
LIN	1	RCA jack, side-entry, PCB mount (white)
RIN	1	RCA jack, side-entry, PCB mount (red)
FOUTL, FOUTR, VDD, PGND, PGND, PGND	6	Binding posts
—	3	Shunts
—	1	MAX9742 EV kit PCB
—	4	0.250in x 0.500in 4-40 round nylon spacers
—	4	4-40 x 0.375in nylon machine screws

## Component Suppliers

SUPPLIER	PHONE	WEBSITE
Central Semiconductor	631-435-1110	www.centalsemi.com
Fairchild Semiconductor	888-522-5372	www.fairchildsemi.com
Murata	770-436-1300	www.murata.com
Sanyo	619-661-6322	www.sanyovideo.com
Sumida USA	847-545-6700	www.sumida.com
TDK	847-803-6100	www.component.tdk.com

**Note:** Indicate that you are using the MAX9742 when contacting these component suppliers.

## Quick Start

### Recommended Equipment

- 20V to 40V, 3ADC power supply
- Audio source with volume control (i.e., CD player)
- Two speakers

### Procedure

The MAX9742 EV kit is fully assembled and tested. Follow the steps listed below to verify board operation.  
**Caution:** Do not turn on the power supply until all connections are completed.

- 1) Install a shunt across pins 1-2 of jumper JU1 (SHDN high, EV kit enabled).
- 2) Install a shunt across jumpers JU2 and JU3 (single-ended input mode).
- 3) Connect the first speaker across the FOUTL and PGND PCB binding posts.
- 4) Connect the second speaker across the FOUTR and PGND PCB binding posts.
- 5) Connect the power-supply ground terminal to the PGND binding post, and the positive terminal of the power supply to the VDD binding post.
- 6) Connect the left-output terminal of the audio source to the LIN RCA jack.
- 7) Connect the right-output terminal of the audio source to the RIN RCA jack.
- 8) Turn on the audio source.
- 9) Turn on the power supply.

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## Detailed Description

The MAX9742 EV kit is designed to evaluate the MAX9742 in the 36-pin TQFN-EP package. The MAX9742 is a Class D amplifier that can be configured to drive 2 x 20W into a pair of 8Ω speakers. The EV kit operates from a DC power supply that provides 20V to 40V and at least 3A of current. The EV kit PCB has two layers with two-ounce copper to optimize power dissipation. The MAX9742 EV kit accepts single-ended or differential input signals, and provides a pair of single-ended outputs.

### Mute Function Using Soft-Start (SS)

The MAX9742 EV kit provides an input pad to control the soft-start (SS) function to mute the output of the EV kit. Connect an external (TTL) logic controller to the MUTE input pad to control the mute function on the MAX9742 EV kit. Drive the MUTE input pad to greater than 2V to place the MAX9742 EV kit in MUTE mode.

### Jumper Selection

#### Shutdown Mode ( $\overline{\text{SHDN}}$ )

The MAX9742 features a shutdown mode to reduce the quiescent current. Jumper JU1 controls the shutdown pin ( $\overline{\text{SHDN}}$ ) of the MAX9742 IC. See Table 1 for shunt positions.

**Table 1. JU1 Jumper Selection ( $\overline{\text{SHDN}}$ )**

SHUNT POSITION	MAX9742 $\overline{\text{SHDN}}$ PIN	EV KIT FUNCTION
Installed*	Connected to VDD (through resistor R1)	EV kit enabled
Not installed	Not connected	Shutdown mode
Not installed (external logic controller connected to $\overline{\text{SHDN}}$ pad**)	Connected to external controller	$\overline{\text{SHDN}}$ driven by external logic controller. Shutdown is active low.

\*Default position.

\*\*Do not drive the shutdown pin above 4V.

### Single-Ended/Differential Audio Inputs

The MAX9742 EV kit features an option to select between single-ended or differential mode for the audio input source. Jumpers JU2 and JU3 select the input mode for the audio input source. Table 2 lists the selectable jumper options.

**Table 2. JU2 and JU3 Jumper Selection (Input Mode)**

AUDIO INPUT MODE	JUMPER	SHUNT POSITION	AUDIO INPUT CHANNELS
Single-ended	JU2	Installed*	LIN-
	JU3		RIN-
Differential	JU2	Not installed	LIN-, LIN+
	JU3		RIN-, RIN+

\*Default position.

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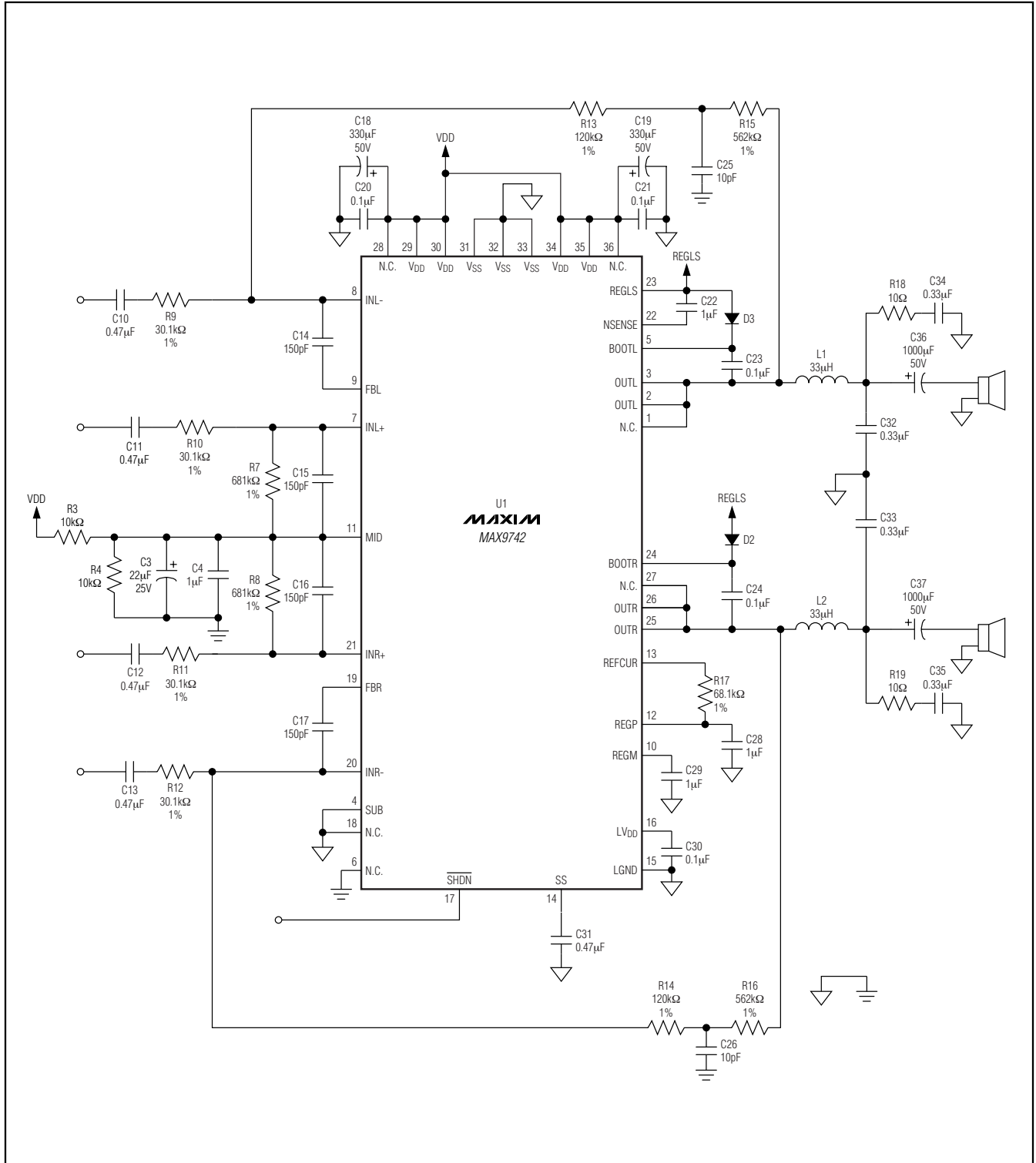


Figure 1. MAX9742 Customer Design Schematic

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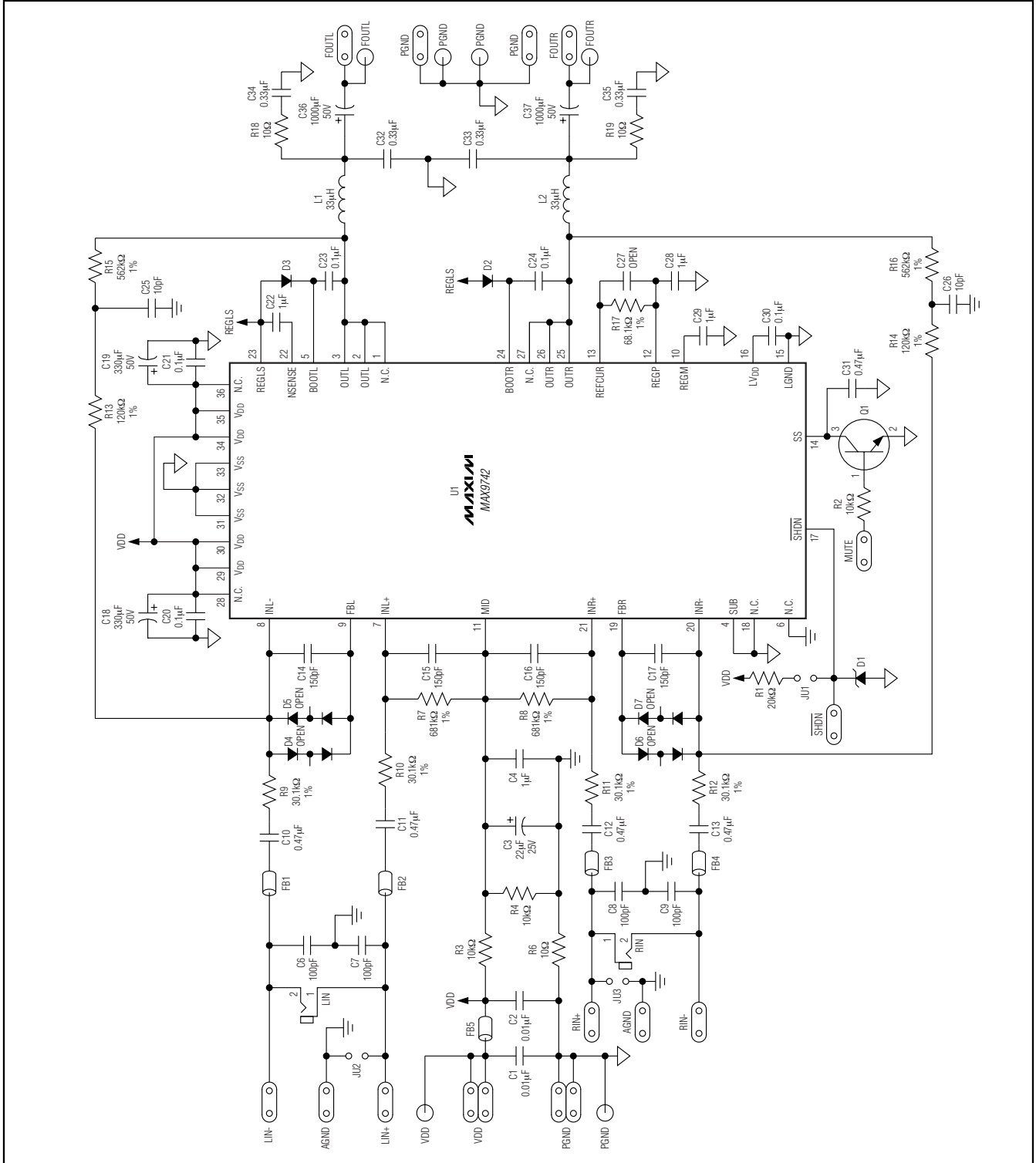


Figure 2. MAX9742 EV Kit Schematic

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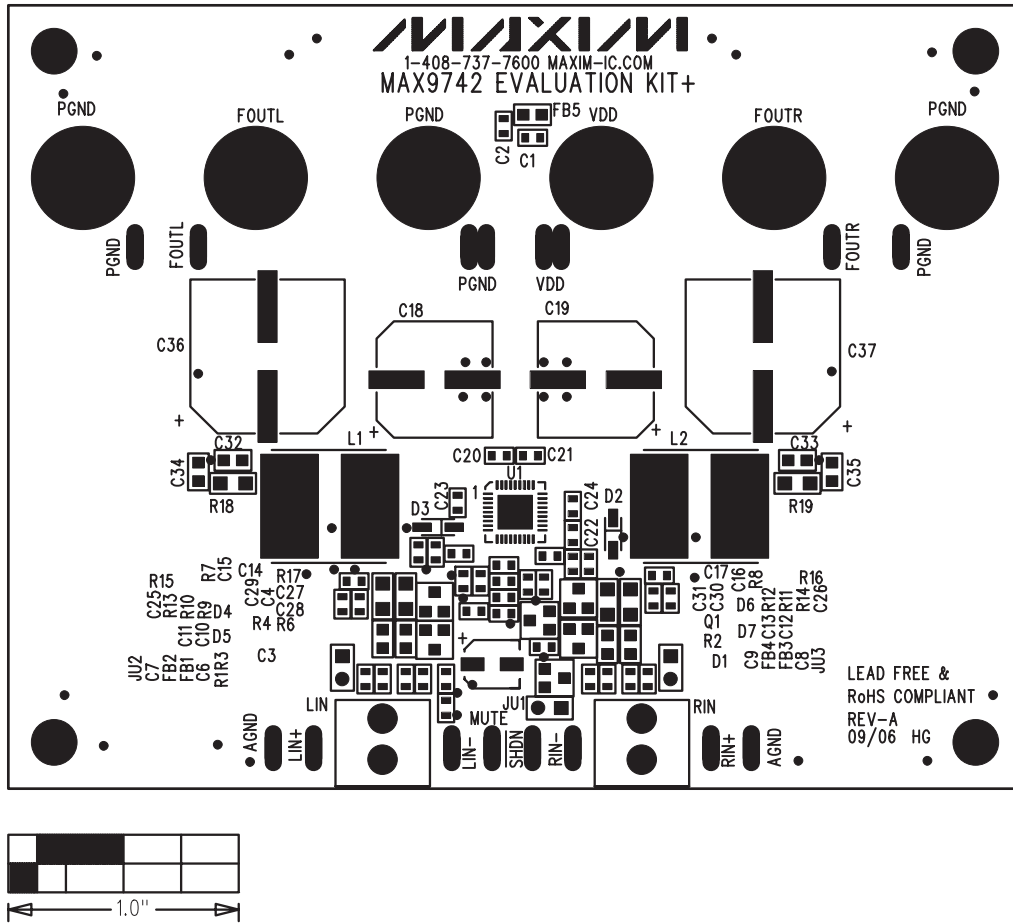


Figure 3. MAX9742 EV Kit Component Placement Guide—Component Side

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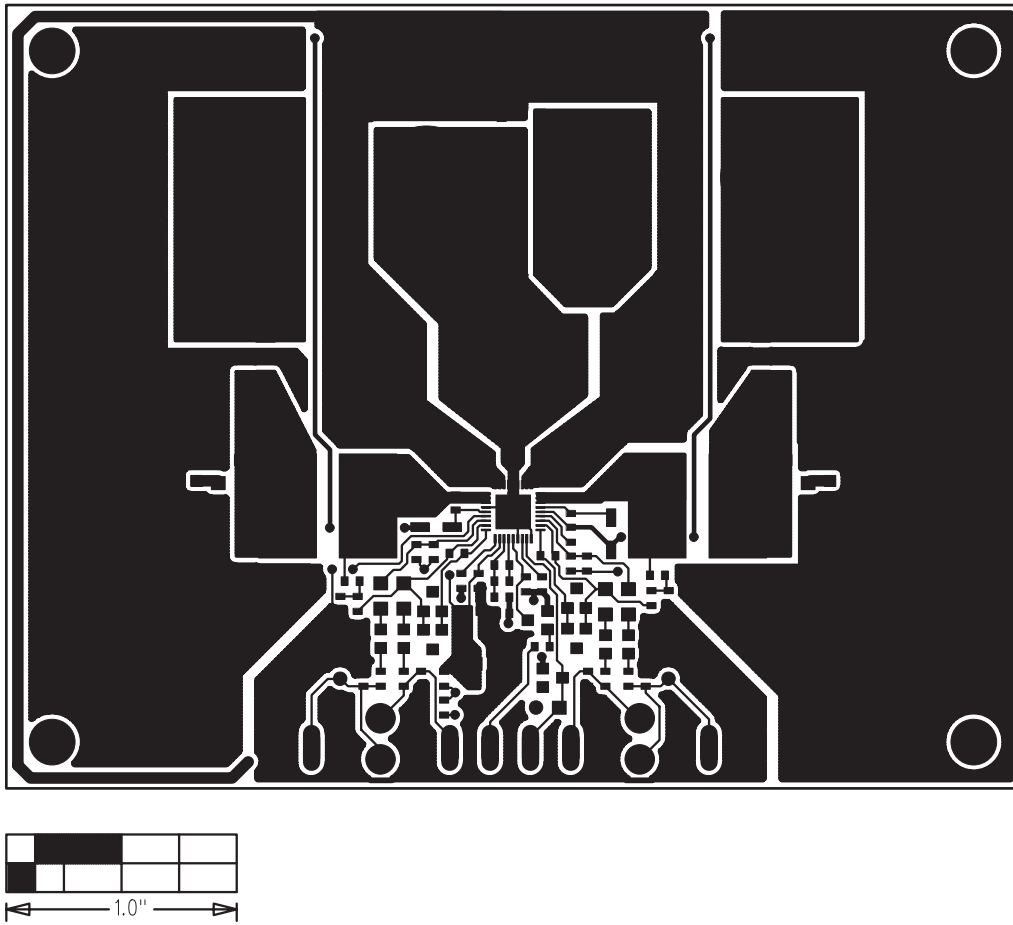


Figure 4. MAX9742 EV Kit PCB Layout—Component Side