

IS31AP4912 STEREO HEADPHONE DRIVER EVALUATION BOARD GUIDE



DESCRIPTION

The IS31AP4912 is stereo headphone drivers designed to allow the removal of the output DC-blocking capacitors for reduced component count and cost. The IS31AP4912 is ideal for small portable electronics where size and cost are critical design parameters.

FEATURES

- No output DC-blocking capacitors
- Supply voltage range from 2.7V to 5.5V
- Low output noise (7 μ V)
- High SNR (103dB)
- -95dB PSRR
- Thermal protect circuit
- Integrated click-and-pop suppression circuitry
- UTQFN-12 (2mm \times 2mm) package

QUICK START

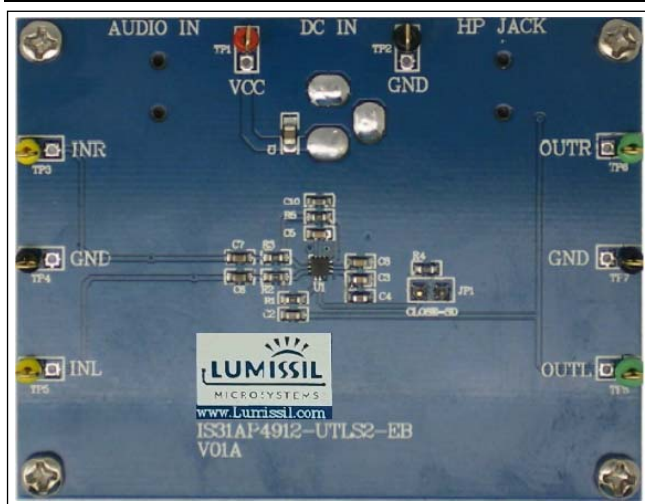


Figure 1 Photo of IS31AP4912 Evaluation Board

RECOMMENDED EQUIPMENT

- 5.0V, 2A power supply
- Audio source (i.e. MP3 player, Notebook PC, etc.)
- Headphone (32 Ω)

ABSOLUTE MAXIMUM RATINGS

- \leq 5.5V power supply

Caution: Do not exceed the conditions listed above; otherwise the board will be damaged.

PROCEDURE

The IS31AP4912 Evaluation board 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) Connect headphone (32 Ω) to the connector (HP Jack).
- 2) Connect the ground terminal of the power supply to the GND and the positive terminal to the VCC. Or connect DC power to connector (DC IN).
- 3) Connect the audio sources to the INR terminal (right channel) and INL terminal (left channel); or connect audio sources to the connector (AUDIO IN).
- 4) Turn on the power supply, and pay attention to the supply current. If the current exceeds 200mA, please check for circuit fault.
- 5) Turn on the audio sources.

ORDERING INFORMATION

Part No.	Temperature Range	Package
IS31AP4912-UTLS2-EB	-40°C to +85°C (Industrial)	UTQFN-12, Lead-free

Table 1 Ordering Information

For pricing, delivery, and ordering information, please contacts Lumissil's analog marketing team at analog@lumissil.com or (408) 969-6600.

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GAIN SETTING

The input resistors R_{IN} (R2, R3) and feedback resistors R_F (R1, R5) set the gain of the amplifier according to Equation (1).

$$Gain = \frac{R_F}{R_{IN}} \left(\frac{V}{V} \right) \quad (1)$$

Note: Please refer to the datasheet to get more information about IS31AP4912.

HIGH PASS FILTER

The input capacitors (C6, C7) and input resistors (R2, R3) form a high pass filter with the corner frequency, f_c , determined in Equation (2).

$$f_c = \frac{1}{2\pi R_{IN} C_{IN}} \quad (2)$$

SHUTDOWN MODE

Close Jumper (JP1) enter shutdown mode.

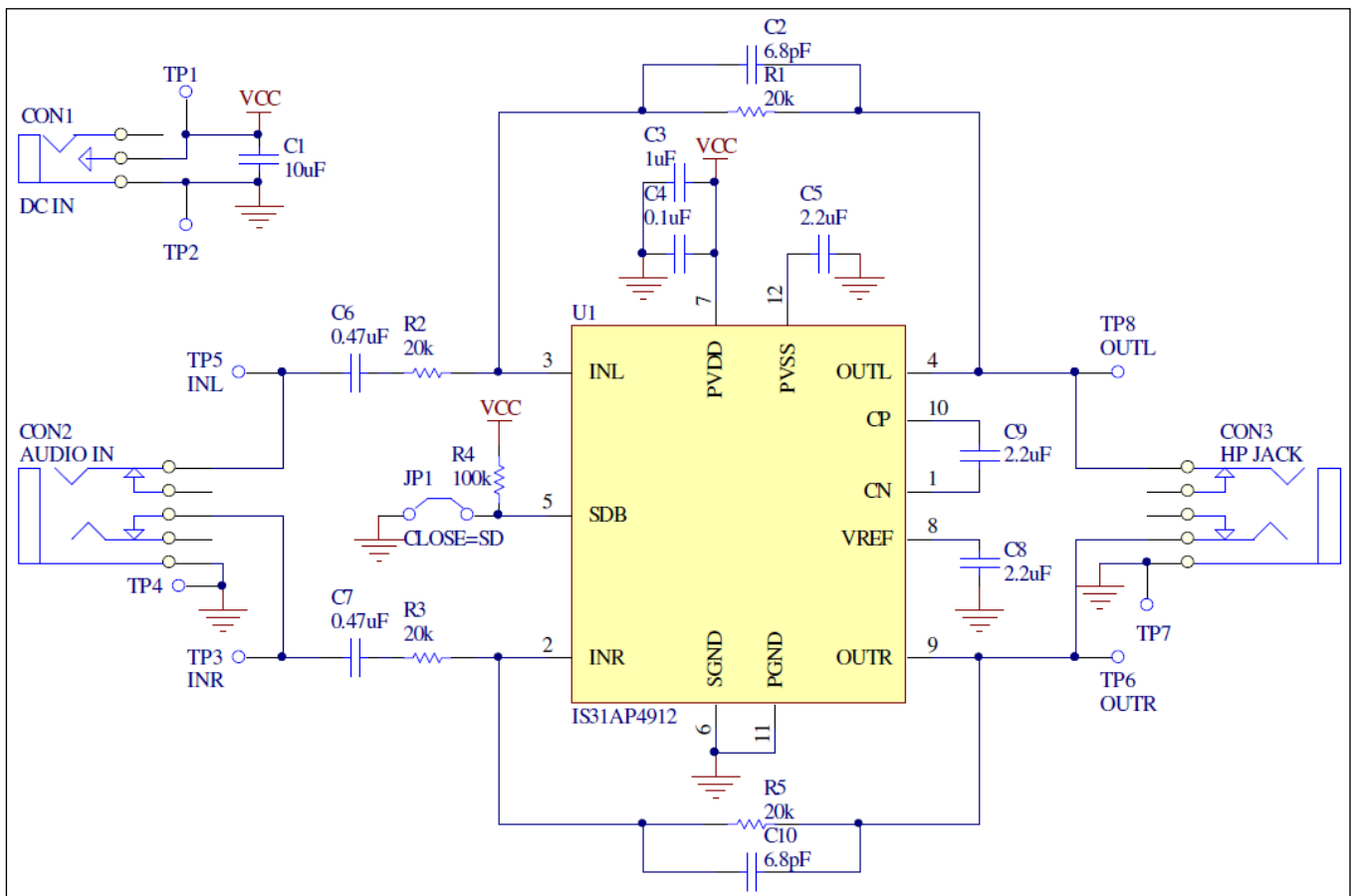


Figure 2 IS31AP4912 Application Schematic

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BILL OF MATERIALS

Name	Symbol	Description	Qty	Supplier	Part No.
Audio Amplifier	U1	Stereo Headphone Driver	1	Lumissil	IS31AP4912
Resistor	R1,R2,R3,R5	RES,20k,1/16W,±5%,SMD	4		
Resistor	R4	RES,100k,1/16W,±5%,SMD	1		
Capacitor	C1	CAP,10µF,16V,±20%,SMD	1		
Capacitor	C2,C10	CAP,6.8pF,16V,±20%,SMD	2		
Capacitor	C3	CAP,1µF,16V,±20%,SMD	1		
Capacitor	C4	CAP,0.1µF,16V,±20%,SMD	1		
Capacitor	C5,C8,C9	CAP,2.2µF,16V,±20%,SMD	3		
Capacitor	C6,C7	CAP,0.47µF,16V,±20%,SMD	2		

Bill of Materials, refer to Figure 2 above.

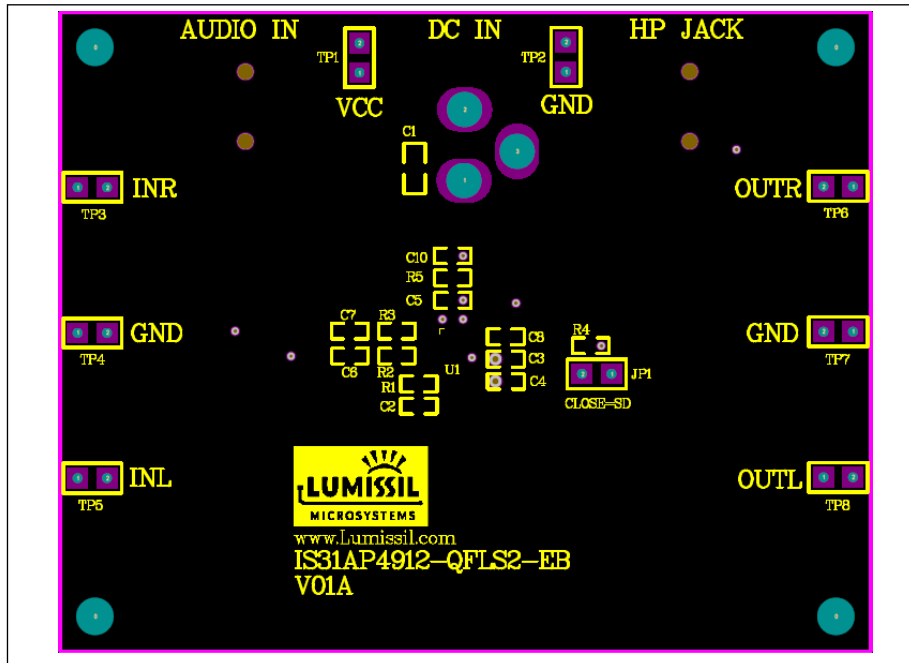


Figure 3 Board Component Placement Guide - Top Layer

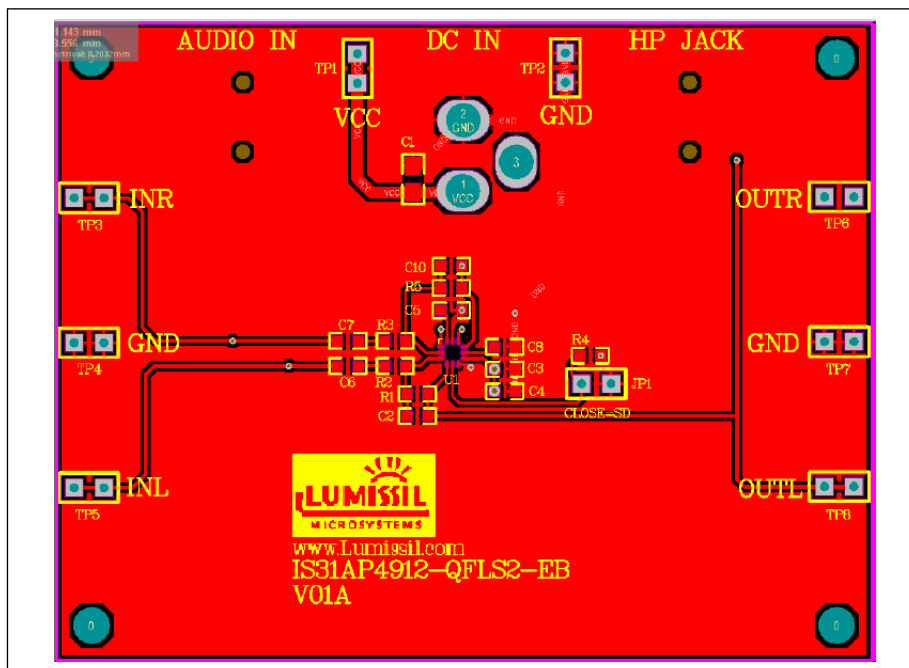


Figure 4 Board PCB Layout - Top Layer

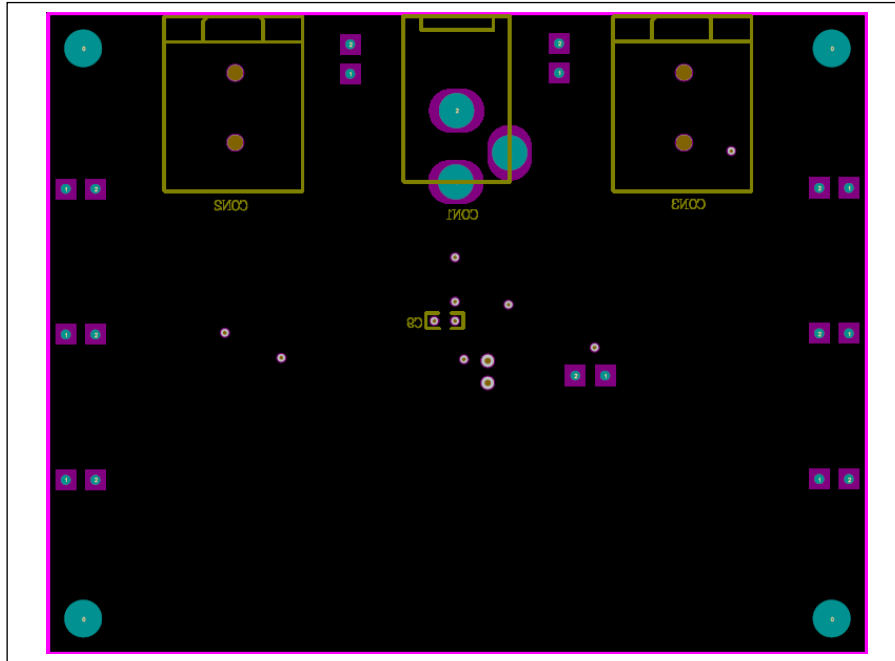


Figure 5 Board Component Placement Guide - Bottom Layer

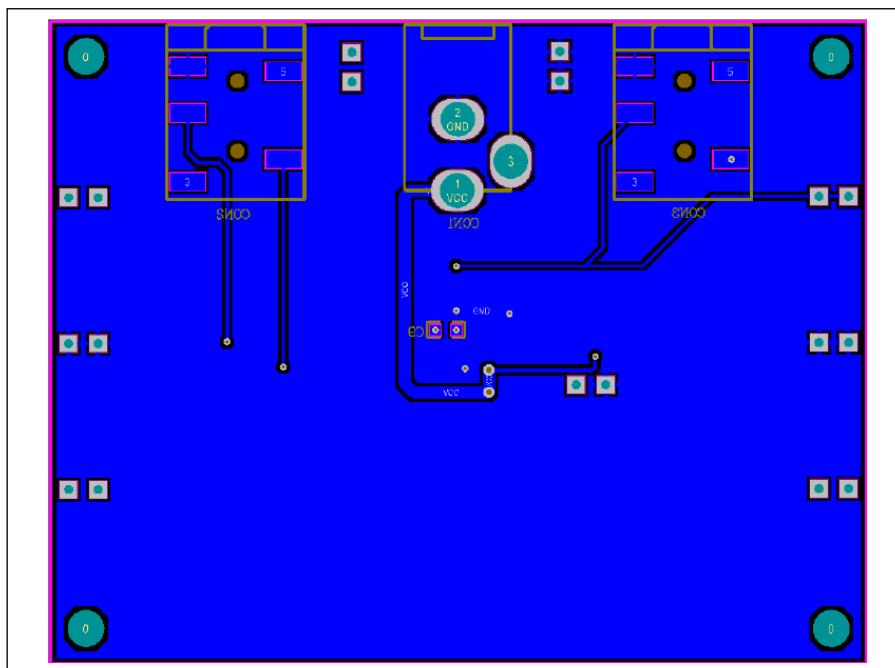


Figure 6 Board PCB Layout - Bottom Layer

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- b.) the user assume all such risks; and
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REVISION HISTORY

Revision	Detail Information	Date
A	Initial release	2013.01.10
B	Update to new Lumissil logo	2025.11.10