

# IS31AP4088A Class-AB Audio Amplifier Evaluation Board Guide



## Description

The IS31AP4088A evaluation board is a fully assembled and tested PCB that uses the IS31AP4088A Class-AB combining dual bridge speaker amplifiers and stereo headphone amplifiers on one chip. Designed to drive speaker impedance of 4Ω or larger. The evaluation board provides dual BTL output, capable of delivering 2.84W into a 4Ω speaker at 5V supply.

## Features

- Supply voltage range from 2.7→5.5V
- Capable of delivering 2.8W output power into a 4Ω speaker at 5V. (THD+N=10%).
- Capable of delivering 1.7W output power into an 8Ω speaker at 5V. (THD+N=10%)
- QFN-16 (4×4mm) package, Lead-free

## Quick Start

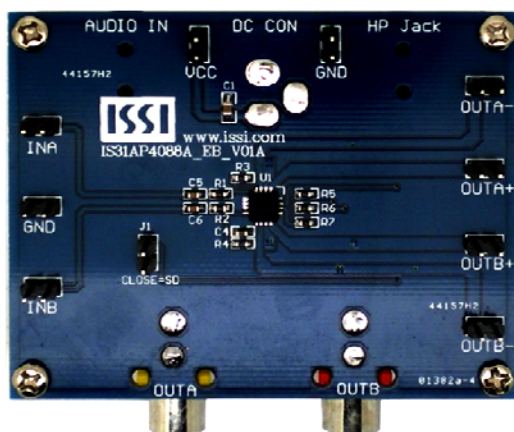


Figure 1: Photo of IS31AP4088A Evaluation Board

## Recommended Equipment

- 5.0V, 2A power supply
- Audio signal source (i.e. MP3, Notebook PC)
- 8Ω or 4Ω speaker

## Absolute Maximum Ratings

- VDD ≤ 5.5V power supply

*Caution: Exceeding the maximum ratings will lead to possible board damage, and user should take reasonable precautions when testing.*

## Procedure

The IS31AP4088A 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 a set of speakers rated with a minimum of 4Ω load across the OUTA+ & OUTA- terminals and the (OUTB+ & OUTB- terminals).
2. Speakers may also be connected to terminals OUTA & OUTB<sub>C7</sub>.
3. Connect the ground terminal of the power supply to GND and the positive terminal to VCC.
4. Alternatively, a DC power can be linked to connector (DC CON).
5. Connect the audio source to the INA and INB terminals. (Left & right channels, respectively)
6. Alternatively, user may connect audio source to the AUDIO IN terminal.
7. Turn on the power supply.
8. Turn on the audio source.

## Ordering Information

Part No.	Temperature Range	IC Package
IS31AP4088A-QFLS2-EB	-40°C to +85°C (Industrial)	QFN-16, Lead-free

Table 1. Ordering Information

**For further information regarding orders, pricing, and delivery methods, please contact ISSI at [analog\\_mkt@issi.com](mailto:analog_mkt@issi.com) or call (408) 969-6600.**

## Evaluation Board Operation

This evaluation board features the IS31AP4088A Class-AB audio amplifier, which operates best with speakers that have over 4Ω equivalent load.

## Gain Configuration

The IS31AP4088A evaluation board is shipped with a gain of 18.3dB and is set by resistors RI (R1, R2) and RF (R3, R4). Change resistors RI and RF to reconfigure the gain of the board. Gain determined in Equation (1) and refer to IS31AP4088A data sheet for more detail.

$$Gain = \frac{2 \times R_F}{R_I} \left( \frac{V}{V} \right) \quad (1)$$

## High-pass Filter Configuration

The input capacitors C<sub>1</sub> (C<sub>5</sub>, C<sub>6</sub>) and input resistors R<sub>i</sub> (R<sub>1</sub>, R<sub>2</sub>) form a high-pass filter with the corner frequency, f<sub>c</sub> determined in Equation (2).

$$f_c = \frac{1}{(2\pi R_i C_i)} \quad (2)$$

## Shutdown-mode

Jumper (J1) controls the shutdown behavior of IS31AP4088A. Connect the shunt across pins 1 & 2 to place the board in shutdown mode.

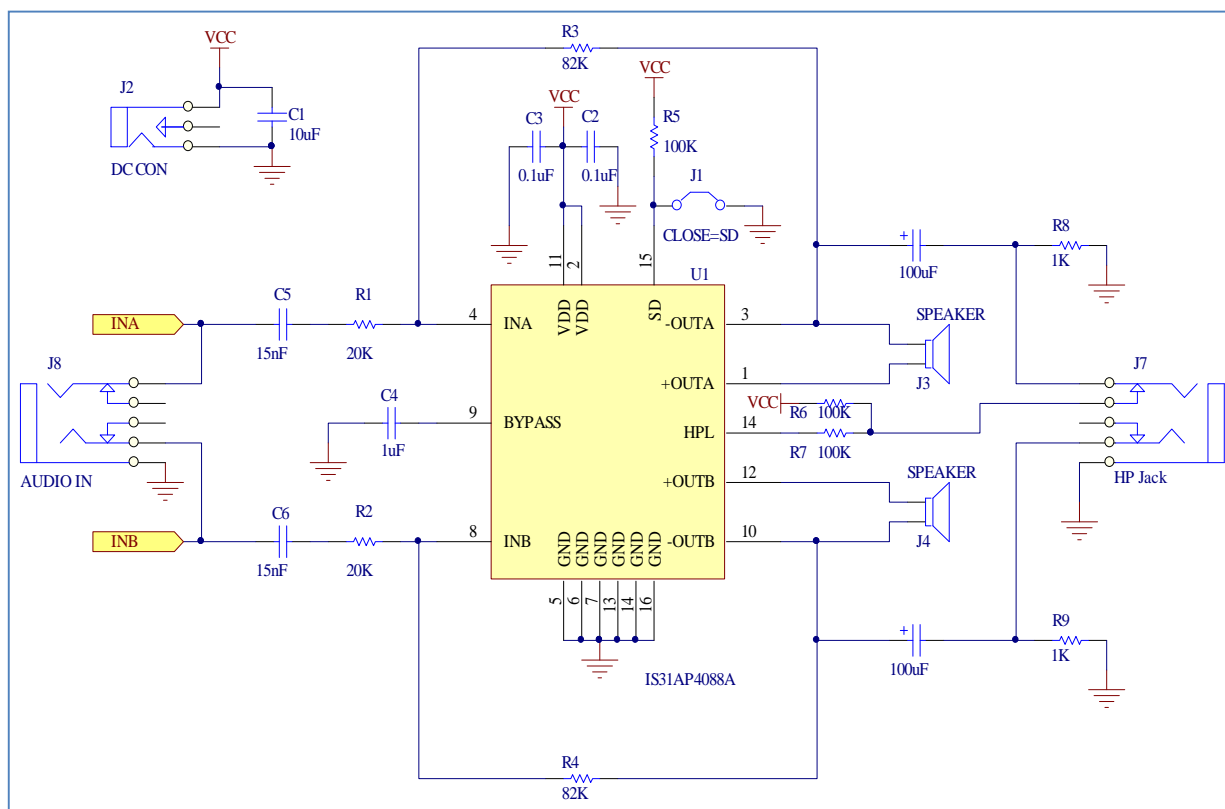


Figure 2. IS31AP4088A Application Schematic

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**Bill of Materials**

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No.	Name	Description	Symbol	Quantity	Manufacturer Part
1	IC	Class-AB Mono	U1	1	IS31AP4088A
2	Resistor	20k $\Omega$	R1, R2	2	
3	Resistor	82k $\Omega$	R3, R4	2	
4	Resistor	100k $\Omega$	R5, R6, R7	3	
5	Resistor	1k $\Omega$	R8, R9	2	
6	Capacitor	10 $\mu$ F	C1	1	
7	Capacitor	0.1 $\mu$ F	C2, C3	2	
8	Capacitor	1 $\mu$ F	C4	1	
9	Capacitor	15nF	C5, C6	2	
10	Electrolytic Capacitor	100 $\mu$ F	C7, C8	2	

Table 2. Bill of Materials; please refer to Figure 2 above for additional information.

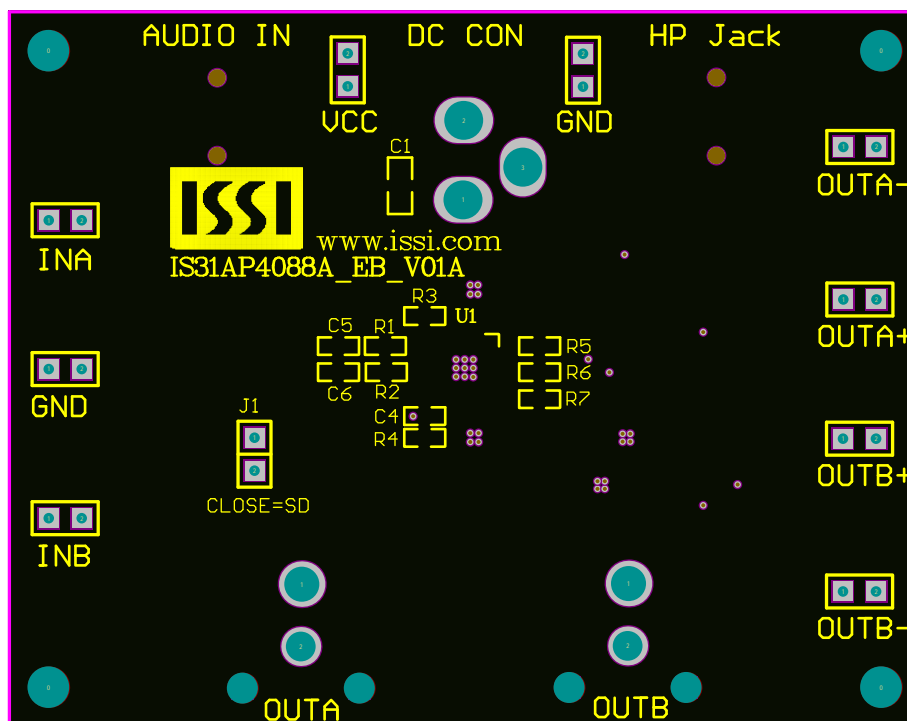


Figure 3. Board Component Placement Guide -Top Layer

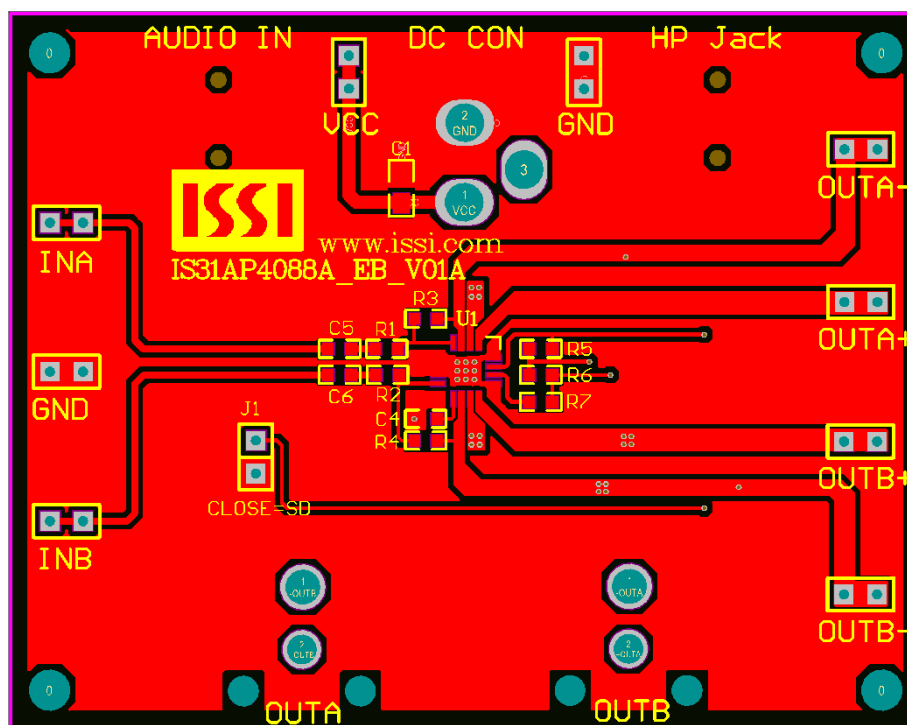


Figure 4. Board PCB Layout- Top Layer

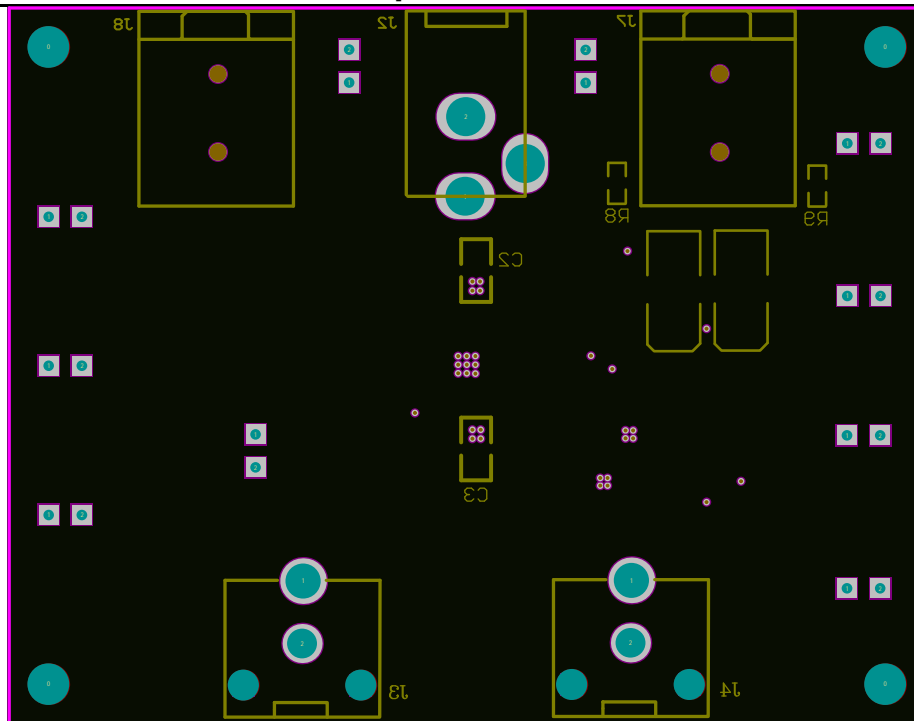


Figure 5. Board Component Placement Guide -Bottom Layer

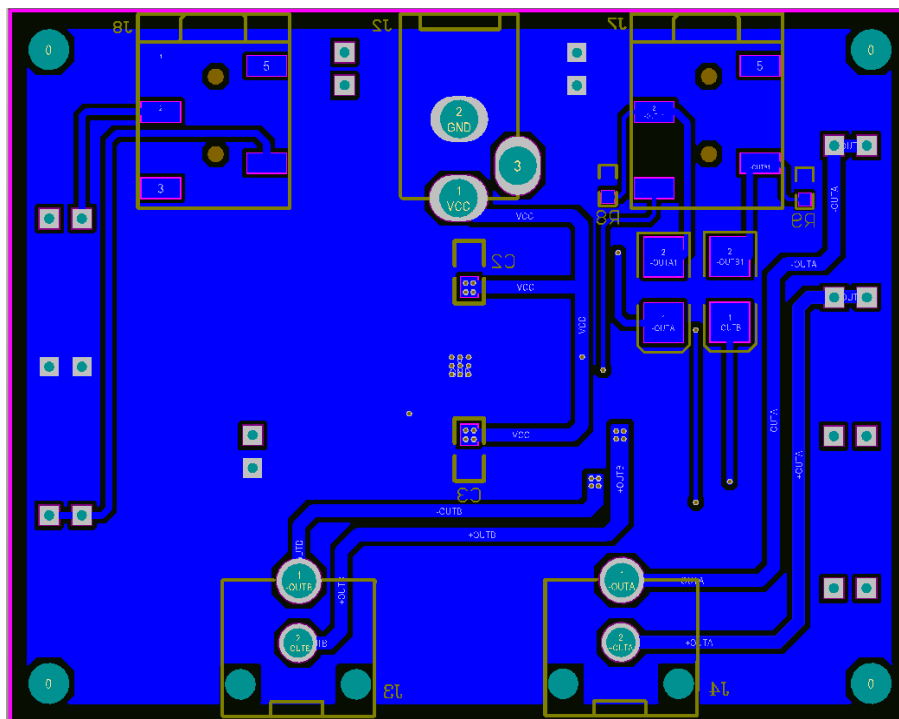


Figure 6. PCB Layout-Bottom Layer

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