

IS31AP2005 Class-D Audio Amplifier Evaluation Board Guide



Description

The IS31AP2005 evaluation board is a fully assembled and tested PCB that uses the IS31AP2005 Class-D power amplifier to drive an 8Ω or 4Ω speaker in portable audio applications. Designed to operate from a 2.7V to 5.5V DC power supply, the evaluation board accepts a single-ended or differential input signal. The evaluation board will drive a BTL output capable of delivering 2.6W of 5V continuous power into a 4Ω speaker.

Features

- Supply voltage range from 2.7V to 5.5V
- Delivers 2.6W into a 4Ω speaker at 5V supply. (THD+N=10%)
- Delivers 1.8W into an 8Ω speaker at 5V supply. (THD+N=10%)
- Available in MSOP-8/ DFN-8 package

Quick Start



Figure 1: Photo of IS31AP2005 Evaluation Board

Recommended Equipment

- 5.0V, 2A power supply
- Audio source (i.e. MP3 player, Notebook PC, etc.)
- 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 following steps will verify IS31AP2005 operation.

Caution: Do not turn on the power supply until all connections are completed.

1. Connect a 4Ω (or larger) speaker across the OUT- terminal and OUT+ terminal.
2. Connect the ground terminal of the power supply to the GND and the positive terminal to the VCC. You may also connect DC IN to a DC supply.
3. If the audio source is differential, remove jumper JP1, connect the negative of the audio source to the IN- terminal, and connect the positive of the audio source to IN+ terminal.
4. If the audio source is single-ended, connect the audio source to the IN+ terminal, and close jumper JP1; or connect audio source to the audio connector (AUDIO IN) and close jumper JP1.
5. Turn on the power supply.
6. Turn on the audio source.

Ordering Information

Part No.	Temperature Range	Description
IS31AP2005-DLS2-EB	-40°C to +85°C (Industrial)	DFN-8, Lead-free

Table 1. Ordering Information

For further information regarding orders, prices and delivery methods, please contact ISSI at analog_mkt@issi.com or (408) 969-6600.

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Board Features

The IS31AP2005 evaluation board features the IS31AP2005 Class-D power amplifier IC, designed to drive speaker impedance of 4Ω or larger.

Gain Configuration

The IS31AP2005 evaluation board has a default gain setting of 18.4dB. This value is adjusted by changing the values of R1 and R2. Equation (1) yields the appropriate resistance values necessary to achieve user's desired gain setting. Please refer to the part datasheet for additional reference.

$$\text{Gain} = \frac{2 \times 150\text{k}\Omega}{R_I} \quad (1)$$

High-pass Filter Configuration

The input capacitors C3 & C4 and input resistors R1 & R2 form a high-pass filter. The corner frequency can be calculated via Equation (2).

$$f_c = \frac{1}{(2\pi R_I C_I)} \quad (2)$$

Shutdown-mode

Jumper (JP2) controls the shutdown behavior of IS31AP2005. Connect the shunt across pin 1 and 2 of the jumper (JP2) to enter shutdown mode.

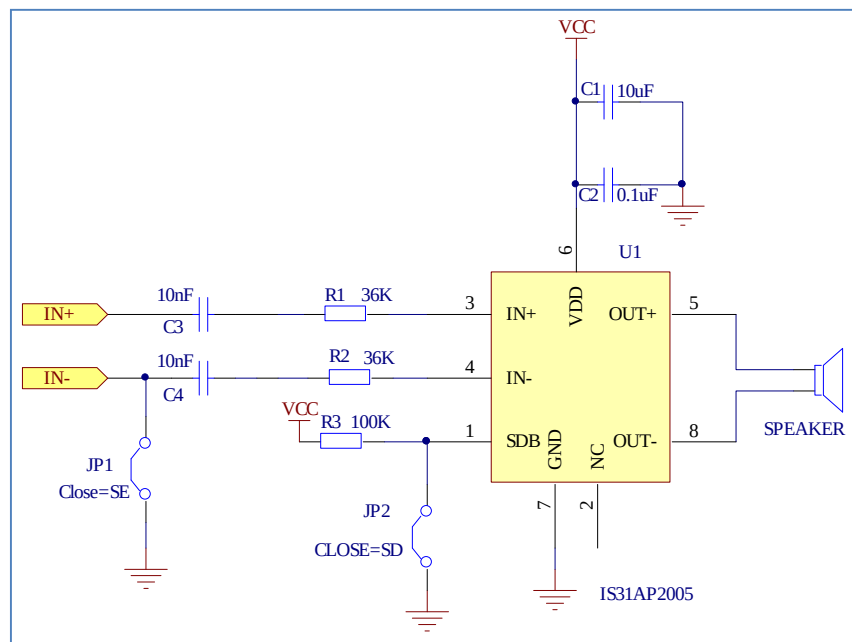


Figure 2. IS31AP2005 Application Circuit Diagram

Bill of Materials

No.	Name	Description	Symbol	Qty.	Manufacturer P/N
1	IC	IS31AP2005	U1	1	IS31AP2005-DLS2
2	Resistor	36kΩ	R1,R2	2	
3	Resistor	100kΩ	R3	1	
4	Capacitor	10μF	C1	1	
5	Capacitor	0.1μF	C2	1	
6	Capacitor	10nF	C3, C4	2	

Table 2. Bill of Materials, refer to Figure 2.



Figure 3. Board Component Placement Guide -Top Layer

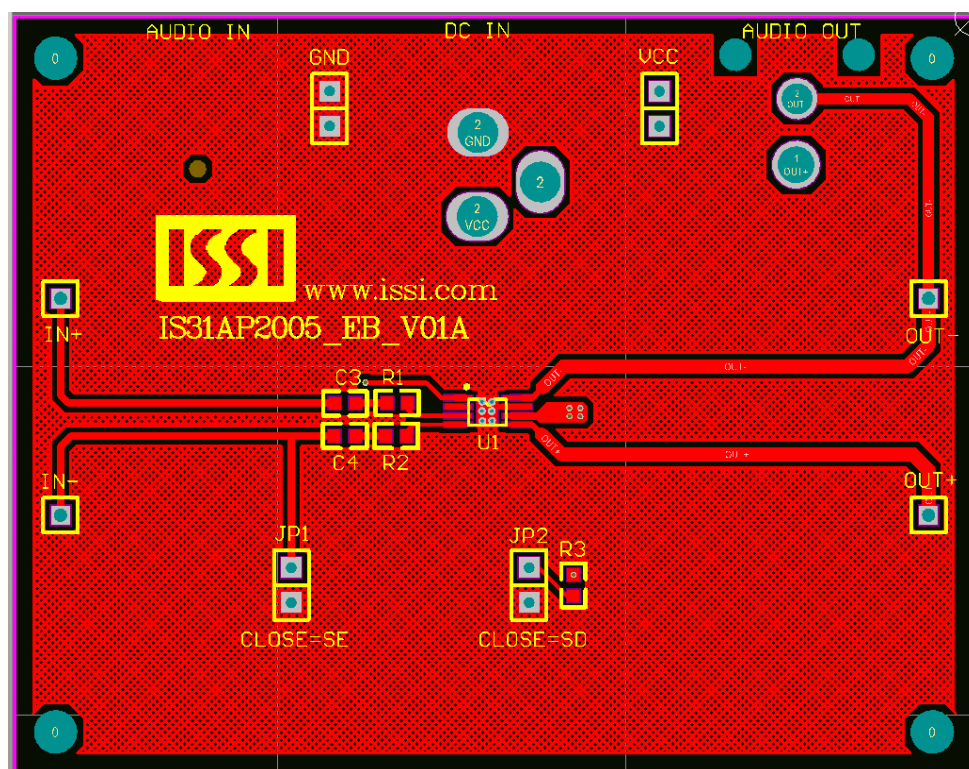


Figure 4. Board PCB Layout- Top Layer

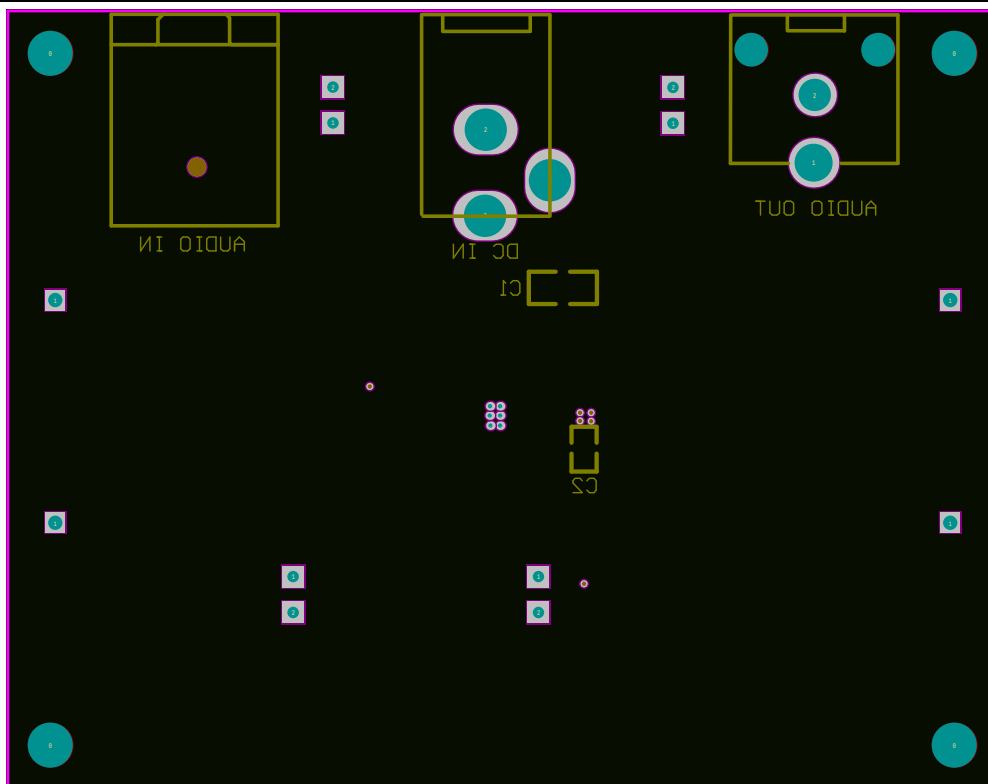


Figure 5. Board Component Placement Guide -Bottom Layer

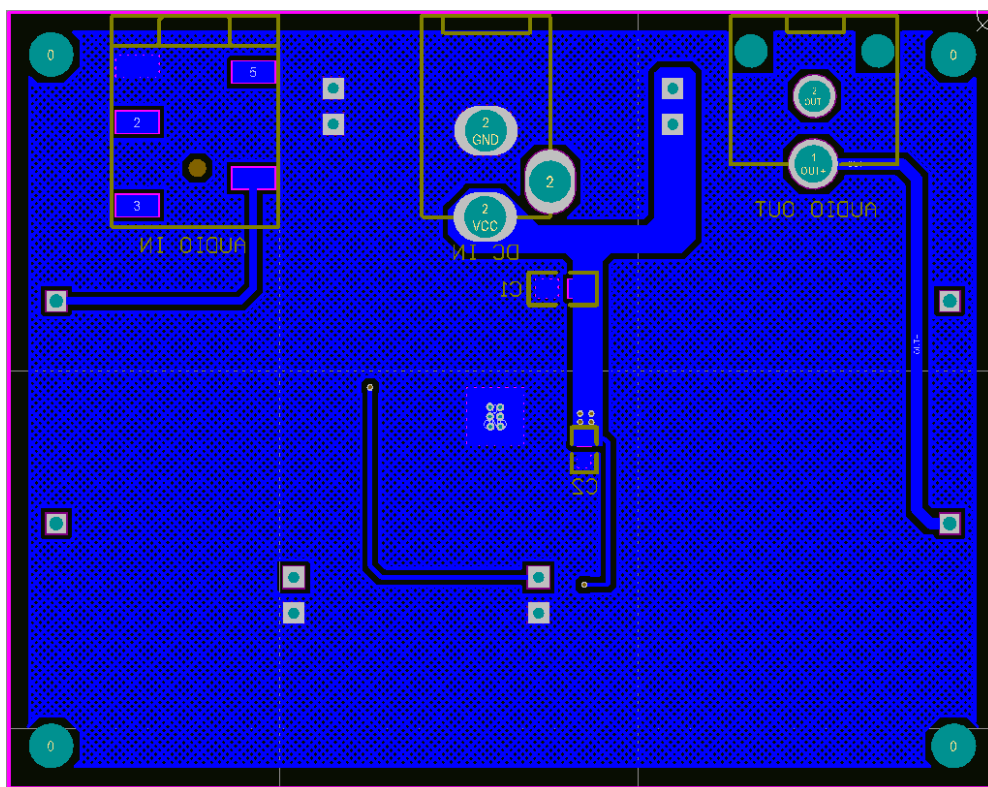


Figure 6. Board PCB Layout-Bottom Layer

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