

## Description

The IS31AP2010B evaluation board is a fully assembled and tested PCB that uses the IS31AP2010B Class-D power amplifier to drive a 4Ω speaker (or larger) in audio applications such as cellular handsets, the earpiece and mobile phones. 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 provides a BTL output capable of delivering 3W into a 4Ω speaker at 5V.

## Features

- Supply voltage range from 2.7V to 5.5V
- Delivers 3W into a 4Ω speaker at 5V supply (THD+N=10%)
- Delivers 1.68W into an 8Ω speaker at 5V supply. (THD+N=10%)
- Available in UTQFN-9 package

## Quick Start

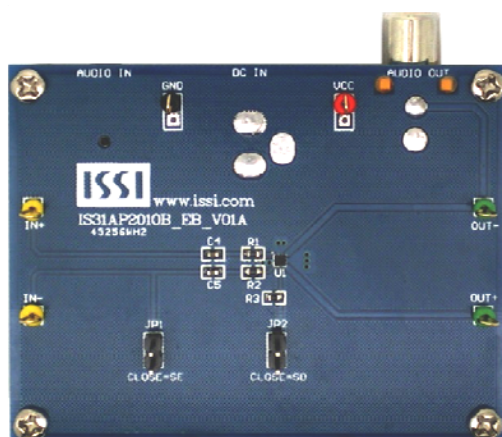


Figure 1: Photo of IS31AP2010B Evaluation Board

## 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 IS31AP2010B operation.

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

1. 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.
2. 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.
3. 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.
4. Turn on the power supply.
5. Turn on the audio source.

## Ordering Information

Part No.	Temperature Range	Package
IS31AP2010B-UTLS2-EB	-40°C to +85°C (Industrial)	UTQFN-9, Lead-free

Table 1. Ordering Information

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

## Board Features

The IS31AP2010B evaluation board features the IS31AP2010B Class-D power amplifier IC, designed to drive speaker impedance of 4Ω or larger.

## Gain Configuration

The IS31AP2010B evaluation board is shipped with a gain of 18.4dB and is set by resistors R<sub>1</sub> and R<sub>2</sub> (R<sub>i</sub>). Change resistors R<sub>1</sub> and R<sub>2</sub> to reconfigure the gain of the board. Gain determined in Equation (1) and refer to IS31AP2010B data sheet for more detail.

$$Gain = \frac{2 \times 150k\Omega}{R_i} \left( \frac{V}{V} \right) \quad (1)$$

## High-pass Filter Configuration

The input capacitors C<sub>1</sub> (C<sub>5</sub>, C<sub>4</sub>) and input resistors R<sub>1</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 (JP2) controls the shutdown pin of the IS31AP2010B IC. Connect the shunt across pin 1 and 2 of the jumper (JP2) to enter the shutdown mode of the board.

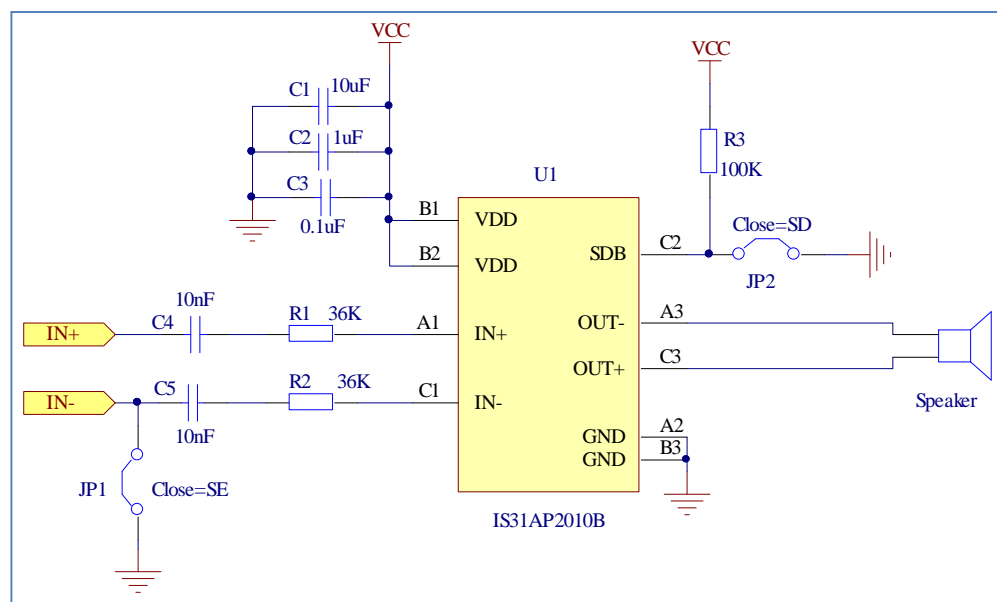


Figure 2. IS31AP2010B Schematic

## Bill of Materials

No.	Name	Description	Symbol	Qty.	Manufacturer P/N
1	IC	IS31AP2010B	U1	1	IS31AP2005-UTLS2
2	Resistor	36kΩ	R1, R2	2	
3	Resistor	100kΩ	R3	1	
4	Capacitor	10µF	C1	1	
5	Capacitor	1µF	C2	1	
6	Capacitor	0.1µF	C3	1	
7	Capacitor	10nF	C4, C5	2	

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

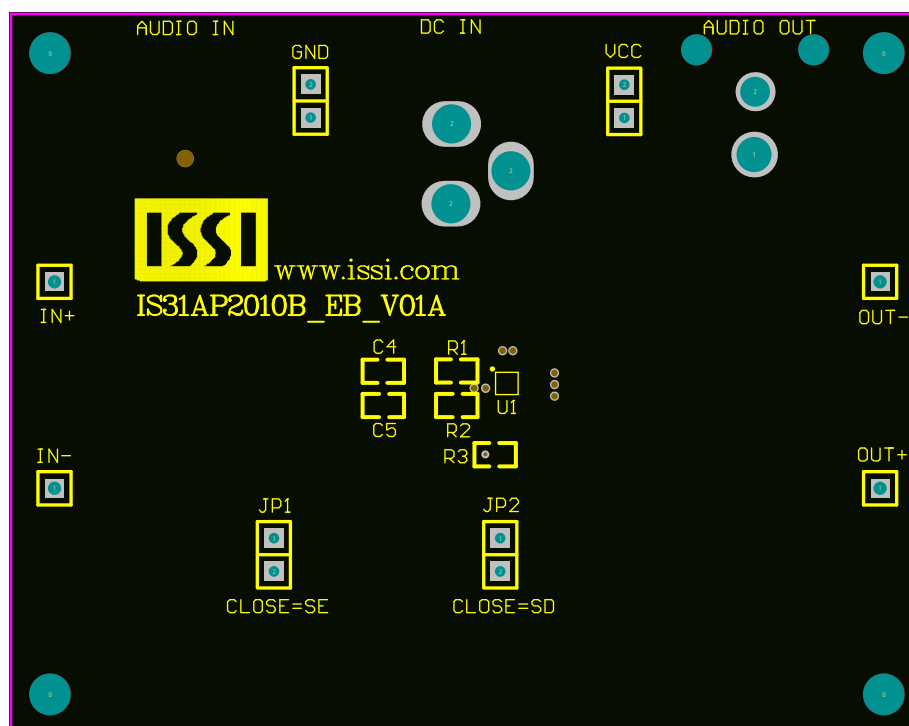


Figure 3. Board Component Placement Guide -Top Layer

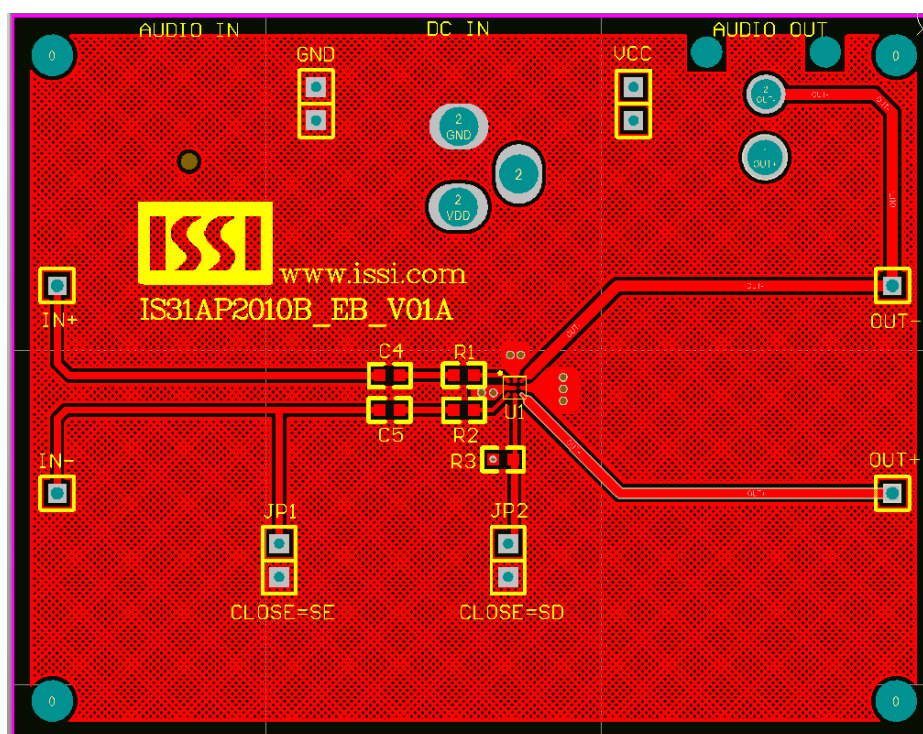


Figure 4. Board PCB Layout- Top Layer

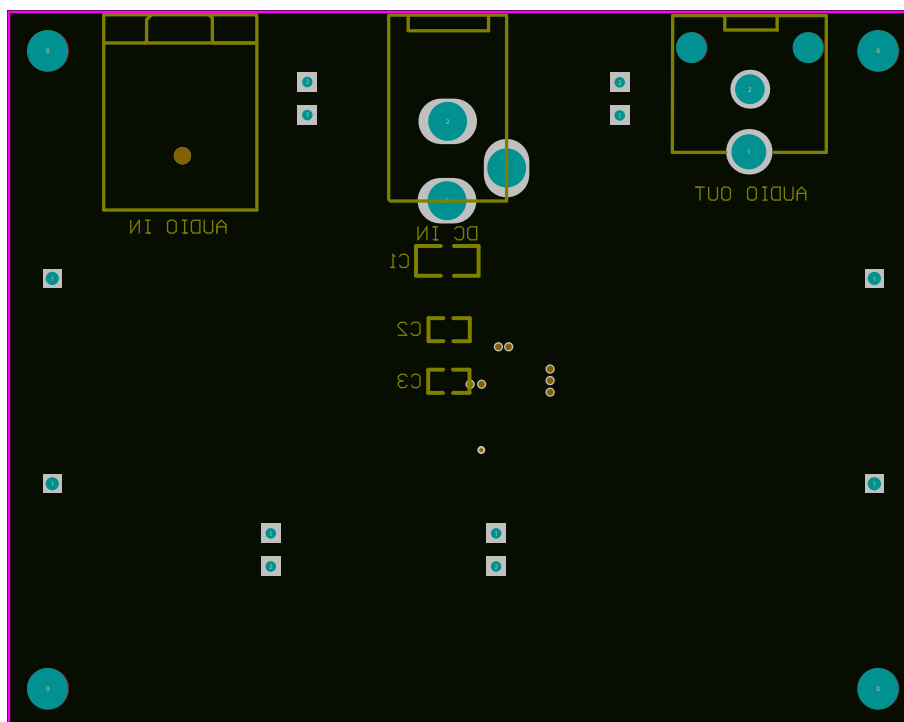


Figure 5. Board Component Placement Guide -Bottom Layer

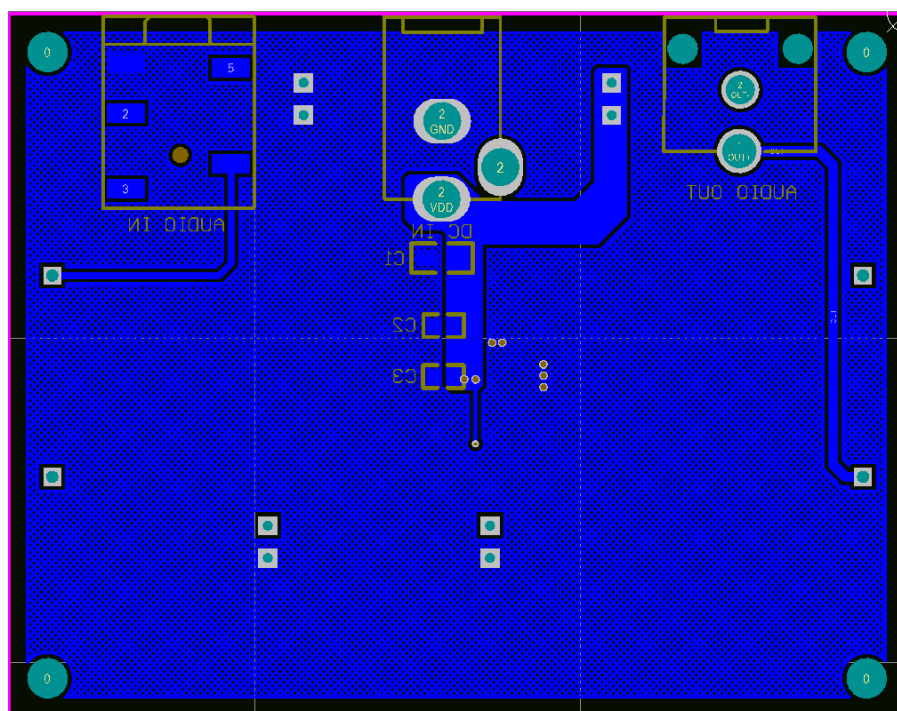


Figure 6. Board PCB Layout-Bottom Layer



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