

# IS31AP4991 CLASS-AB AUDIO AMPLIFIER

## DESCRIPTION

The IS31AP4991 demo board is a fully assembled and tested PCB that uses the IS31AP4991 Class-AB power amplifier to drive an 8Ω or larger speaker in portable audio applications. The demo board accepts a single-ended input signal. The demo board provides a BTL output capable of delivering 1.2W into an 8Ω speaker at 5V.

## FEATURES

- Supply voltage range from 2.7V to 5.5V
- Delivers 1.2W into an 8Ω speaker at 5V supply. (THD+N=10%).
- Ultra-low distortion (0.025%@0.5W, 1kHz)
- Available in MSOP-8 and SOP-8 package

## QUICK START

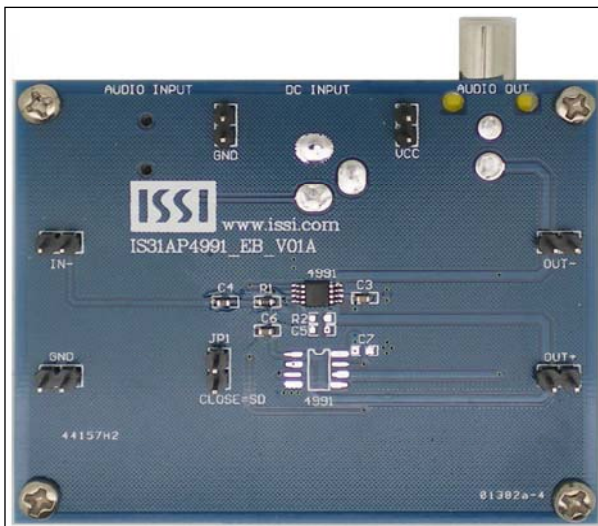


Figure 1: Photo of IS31AP4991 Evaluation Board

Note: Only one IC type will be installed on PCB.

## RECOMMENDED EQUIPMENT

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

## ABSOLUTE MAXIMUM RATINGS

- ≤ 5.5V power supply

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

## PROCEDURE

The IS31AP4991 demo 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 an 8Ω (or larger) speaker across the OUT- terminal and OUT+ terminal. Or connect speaker to the connector (AUDIO OUT).
- 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 INPUT).
- 3) Connect the audio source to the IN- terminal; or connect audio source to the connector (AUDIO INPUT).
- 4) Turn on the power supply.
- 5) Turn on the audio source.

## ORDERING INFORMATION

Part No.	Temperature Range	Package
IS31AP4991-GRLS2-EB IS31AP4991-SLS2-EB	-40°C ~ +85°C (Industrial)	SOP-8, Lead-free MSOP-8, Lead-free

Table 1: Ordering Information

For pricing, delivery, and ordering information, please contact Lumissil's analog marketing team at [analog@Lumissil.com](mailto:analog@Lumissil.com) or (408) 969-6600.

# IS31AP4991 CLASS-AB AUDIO AMPLIFIER

## DETAILED DESCRIPTION

The IS31AP4991 demo board features the IS31AP4991 Class-AB power amplifier IC, designed to drive speaker impedance of 8Ω or larger.

## CUSTOMIZING THE GAIN

The IS31AP4991 demo board is shipped with a gain of 18.3dB and is set by resistors  $R_I$  ( $R_1$ ) and  $R_F$  ( $R_2$ ). Change resistors  $R_I$  and  $R_F$  to reconfigure the gain of the board and gain determined in Equation (1)

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

## HIGH-PASS FILTER

The input capacitor  $C_1$  ( $C_4$ ) and input resistor  $R_1$  ( $R_1$ ) form a high-pass filter with the corner frequency,  $f_c$ , determined in Equation (2) and refer to IS31AP4991 data sheet for more detail.

$$f_c = \frac{1}{(2\pi R_I C_1)} \quad (2)$$

## SHUTDOWN MODE

Jumper (JP1) controls the shutdown pin of the IS31AP4991 IC. Connect the shunt across pin 1 and 2 of the jumper (JP1) to enter the shutdown mode of the board.

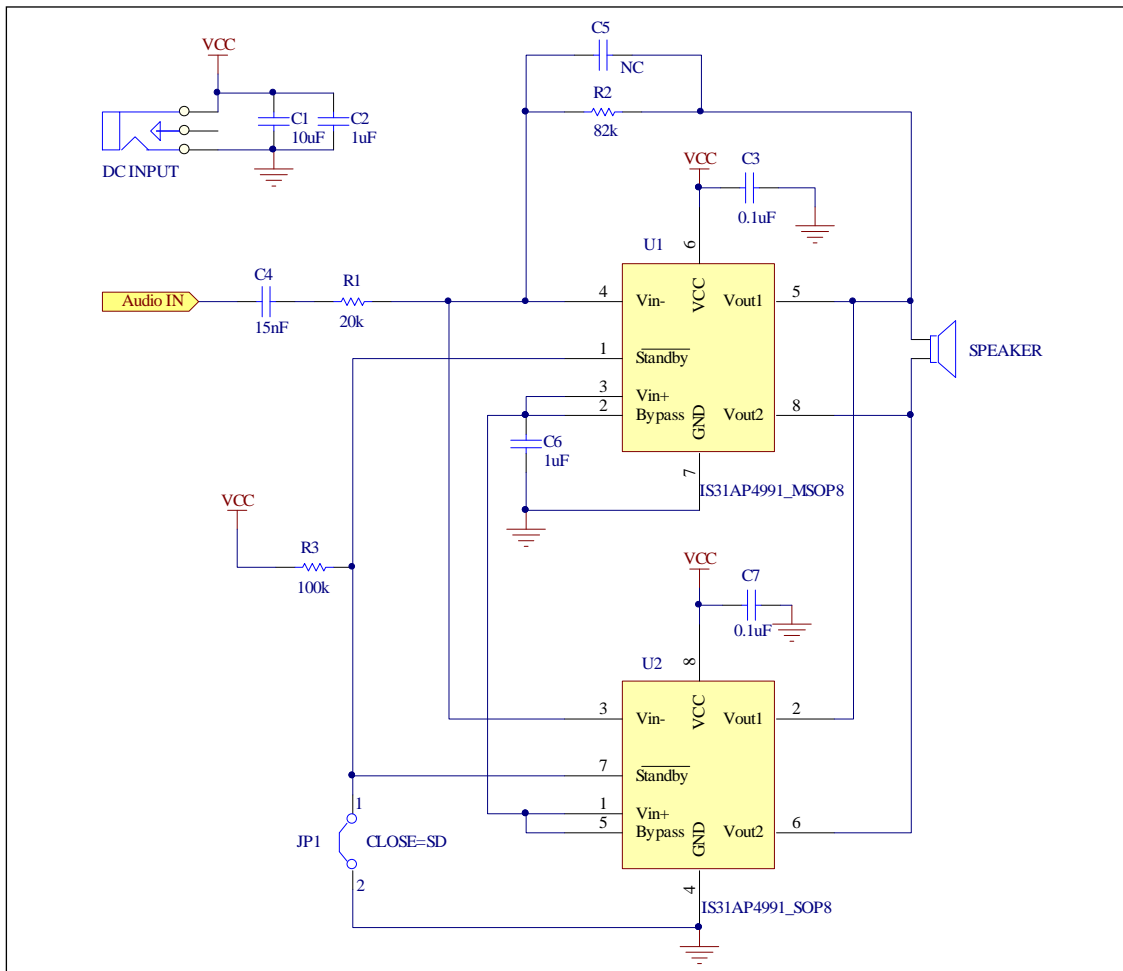


Figure 2: IS31AP4991 Application Circuit

# IS31AP4991 CLASS-AB AUDIO AMPLIFIER

## BILL OF MATERIALS

Name	Symbol	Description	Qty	Supplier	Part No.
Amplifier	U1	Class- AB power amplifier	1	Lumissil	IS31AP4991
Resistor	R1	RES,20k, 1/16W,±1%,SMD	1	Yageo	RC0603FR-0720KL
Resistor	R2	RES,82k, 1/16W,±1%,SMD	1	Yageo	RC0603FR-0782KL
Resistor	R3	RES,100k, 1/16W,±5%,SMD	1	Yageo	RC0603JR-07100KL
Capacitor	C1	CAP,10µF,10V,±20%,SMD	1	Yageo	CC0805KKX7R6BB106
Capacitor	C2,C6	CAP, 1µF,50V,±10%,SMD	2	Yageo	CC0603KKX7R9BB105
Capacitor	C3,C7	CAP,0.1µF,50V,±10%,SMD	2	Yageo	CC0603KKX7R9BB104
Capacitor	C4	CAP,15nF,50V,±10%,SMD	1	Yageo	CC0603KKX7R9BB153
Connector	DC INPUT	2.5mm DC connector	1		
Connector	AUDIO OUT	RCA –type connector	1		
Connector	AUDIO INPUT	3.5mm min connector	1		
	U2,C5	No installed			

*Bill of materials, refers to Figure 2 above.*

**IS31AP4991 CLASS-AB AUDIO AMPLIFIER**

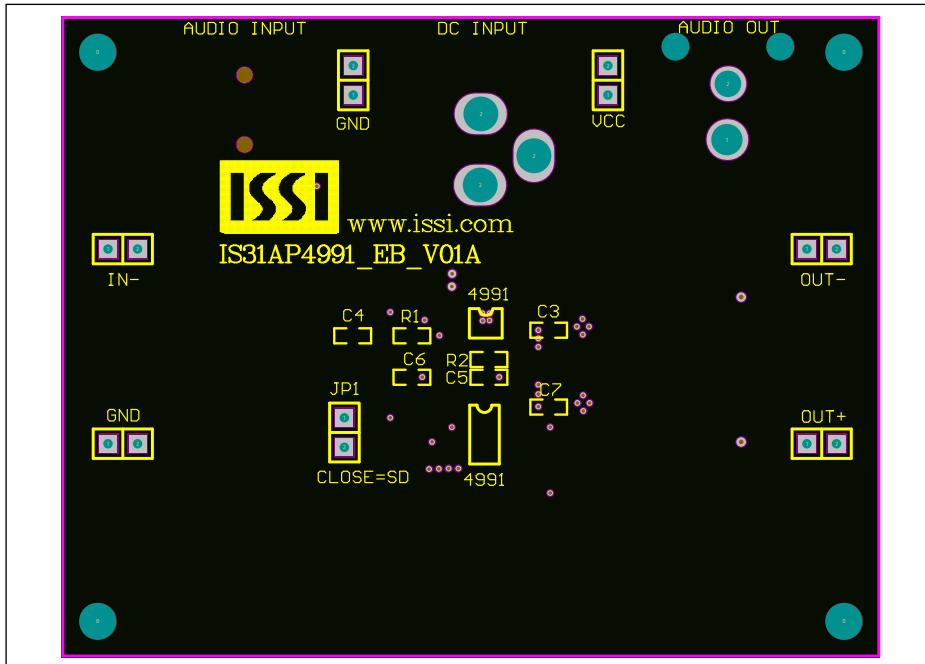


Figure 2: Board Component Placement Guide - Top Layer

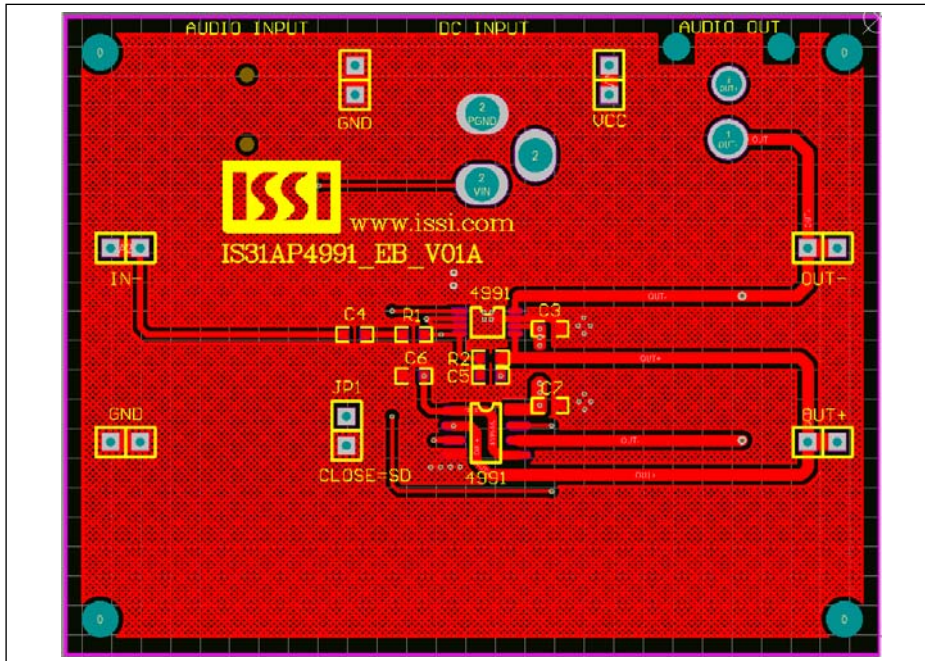
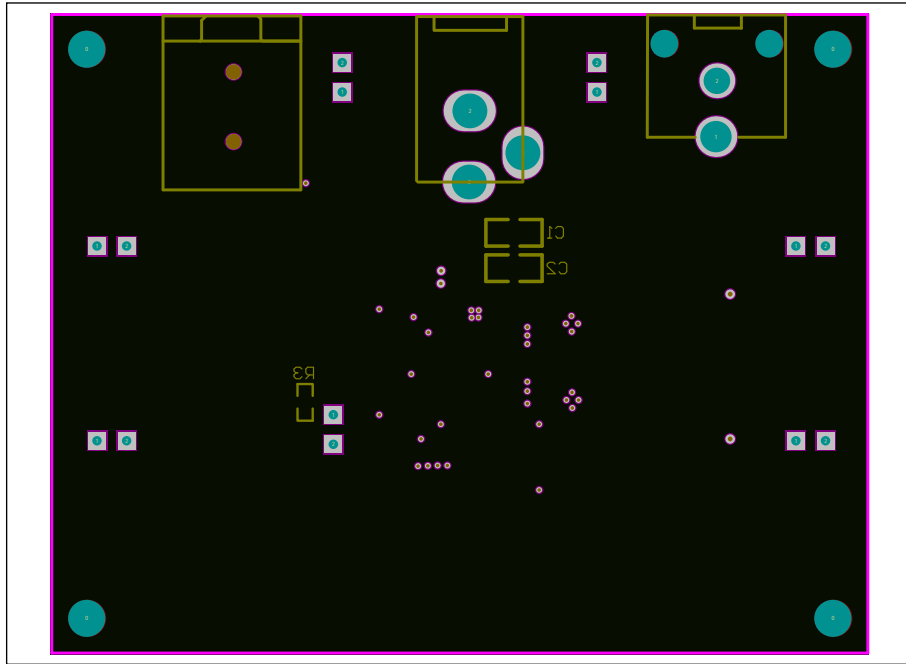
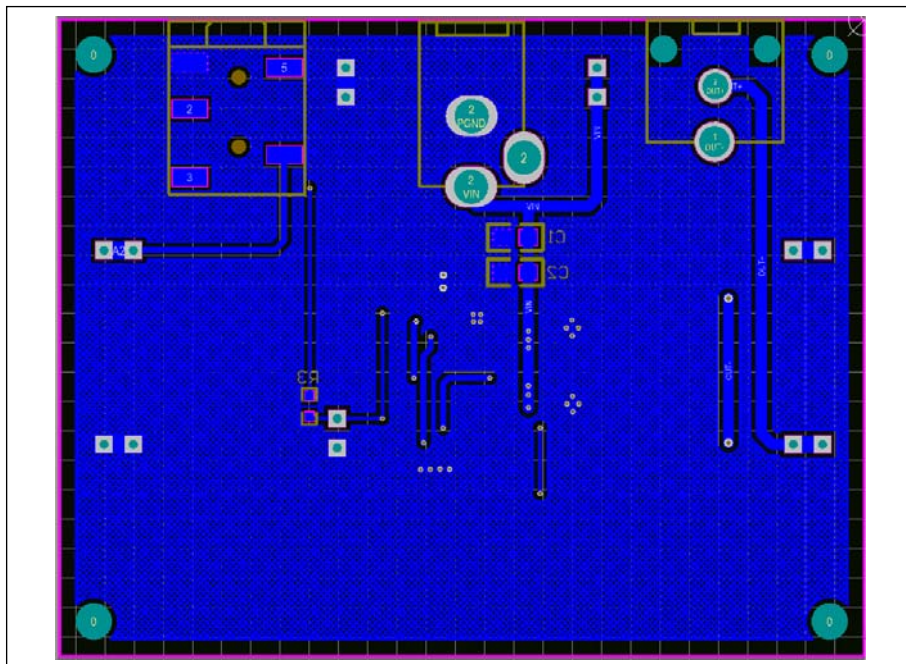


Figure 3: Board PCB Layout - Top Layer



**Figure 4: Board Component Placement Guide - Bottom Layer**



**Figure 5: Board PCB Layout - Bottom Layer**

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