

# IS31AP4996 1.1W AUDIO POWER AMPLIFIER WITH ACTIVE-HIGH STANDBY MODE

## DESCRIPTION

The IS31AP4996 has been designed for demanding audio applications such as mobile phones and permits the reduction of a number of external components. The IC is capable of delivering 1.1W of continuous RMS output power into an 8Ω load @ 5V.

An externally-controlled standby mode reduces the device supply current to much less than 2μA. It also includes an integrated thermal shutdown protection circuit. The unity-gain stable amplifier can be configured by external gain setting resistors.

## FEATURES

- Operating from  $V_{CC} = 2.7V \sim 5.5V$
- 1.1W output power @  $V_{CC} = 5V$ , THD+N= 1%,
- $f = 1kHz$ , with 8Ω load
- Ultra-low consumption in standby mode (much less than 2μA)
- 56dB PSRR @217Hz in grounded mode
- Near-zero click-and-pop
- Ultra-low distortion (0.074%@0.5W, 1kHz)
- SOP-8 and MSOP-8 package

## QUICK START



Figure 1: Photo of IS31AP4996 Evaluation Board

## RECOMMENDED EQUIPMENT

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

## ABSOLUTE MAXIMUM RATINGS

- $\leq 5.5V$  power supply

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

## PROCEDURE

The IS31AP4996 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 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 5V DC power supply to the GND and the positive terminal to the VCC. Or connect DC power to the 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                               |
|---|----------------------------|---------------------------------------|
| IS31AP4996-GRLS2-EB<br>IS31AP4996-SLS2-EB | -40°C ~ +85°C (Industrial) | SOP-8, Lead-free<br>MSOP-8, Lead-free |

Table1: Ordering Information

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

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## EVALUATION BOARD OPERATION

The IS31AP4996 demo board features the IS31AP4996 Class-AB power amplifier IC, designed to drive a speaker impedance of 8Ω or larger.

## CUSTOMIZING THE GAIN

The IS31AP4996 demo board is shipped with a gain of 6dB; 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. The gain is determined by Equation (1):

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

## HIGH-PASS FILTER

The input capacitor  $C_i$  ( $C_3$ ) and input resistor  $R_i$  ( $R_1$ ) form a high-pass filter with the corner frequency,  $f_c$ , determined by Equation (2). Refer to the IS31AP4996 datasheet for more details.

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

## SHUTDOWN MODE

Jumper (JP1) controls the shutdown pin of the IS31AP4996 IC. Connect jumper (JP1) to place the board in shutdown mode.

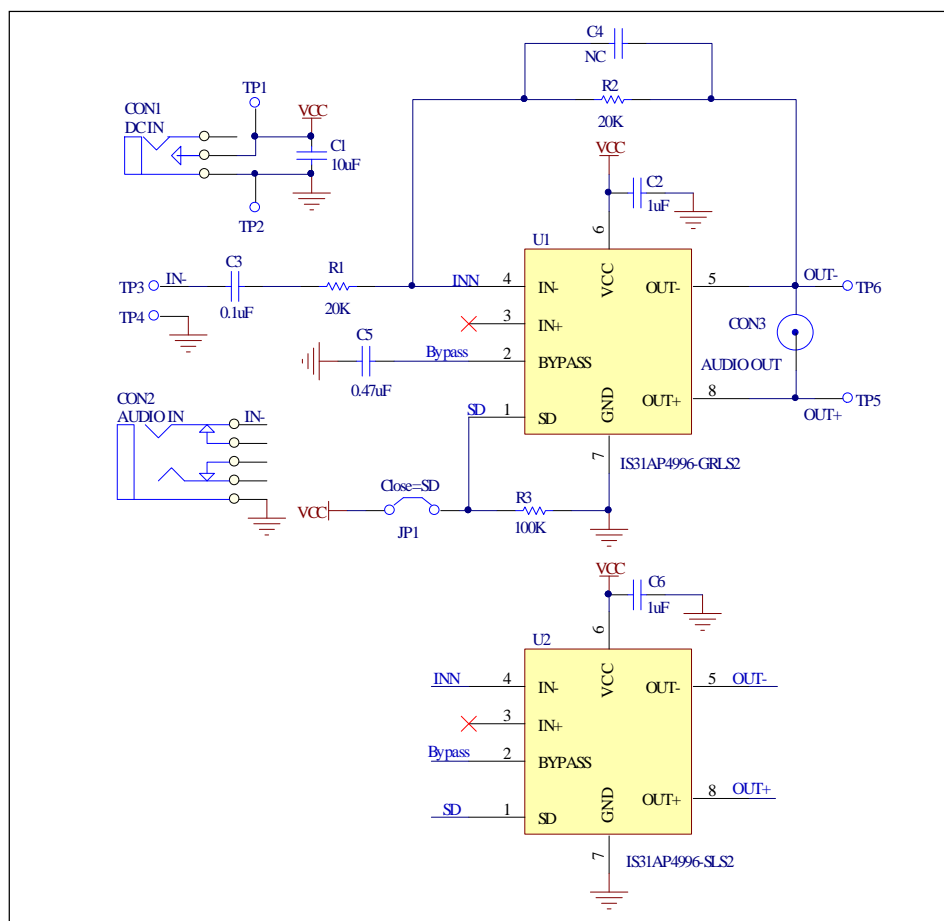


Figure 2: IS31AP4996 Application Schematic

**IS31AP4996 1.1W AUDIO POWER AMPLIFIER  
WITH ACTIVE-HIGH STANDBY MODE**



**Bill of Materials**

| <b>Name</b> | <b>Symbol</b> | <b>Description</b>             | <b>Qty</b> | <b>Supplier</b> | <b>Part No.</b> |
|-------------|---------------|--------------------------------|------------|-----------------|-----------------|
| Amplifier   | U1            | 1.1W Class- AB Power Amplifier | 1          | ISSI            | IS31AP4996      |
| Resistors   | R1,R2         | RES,20k,1/16W,±5%,SMD          | 2          |                 |                 |
| Resistor    | R3            | RES,100k,1/16W,±5%,SMD         | 1          |                 |                 |
| Capacitor   | C1            | CAP,10µF,16V,±20%,SMD          | 1          |                 |                 |
| Capacitor   | C2            | CAP, 1µF,16V,±20%,SMD          | 1          |                 |                 |
| Capacitor   | C3            | CAP,0.1µF,50V,±20%,SMD         | 1          |                 |                 |
| Capacitor   | C5            | CAP,0.47µF,16V,±20%,SMD        | 1          |                 |                 |
|             | C6,C4,U2      | Not Connect                    | 3          |                 |                 |

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

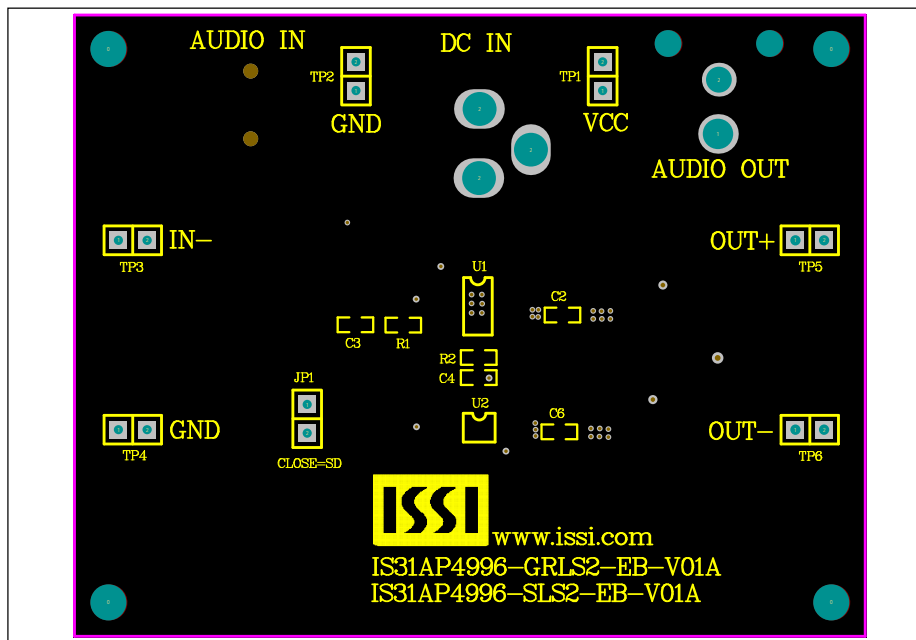


Figure 3: Board Component Placement Guide - Top Layer

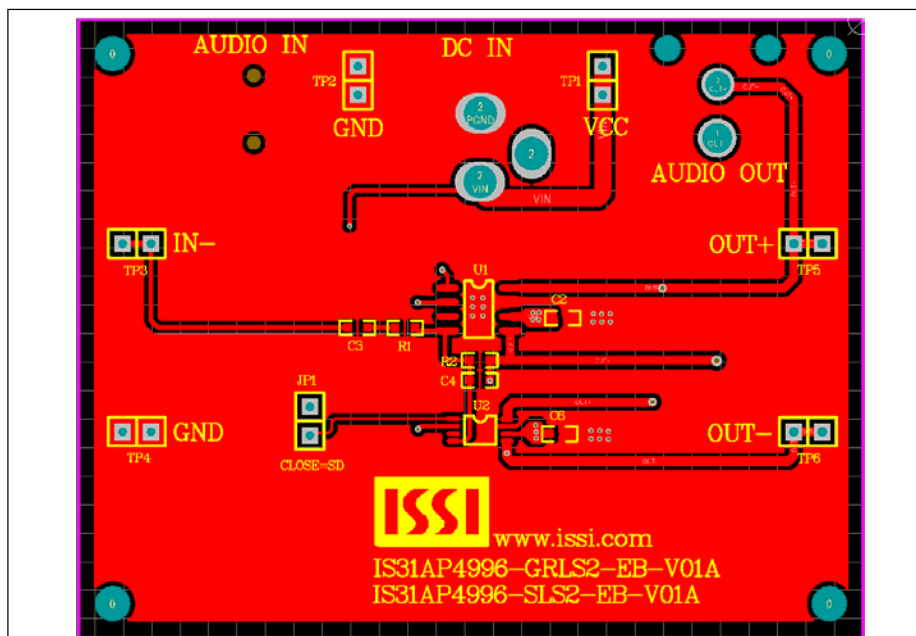
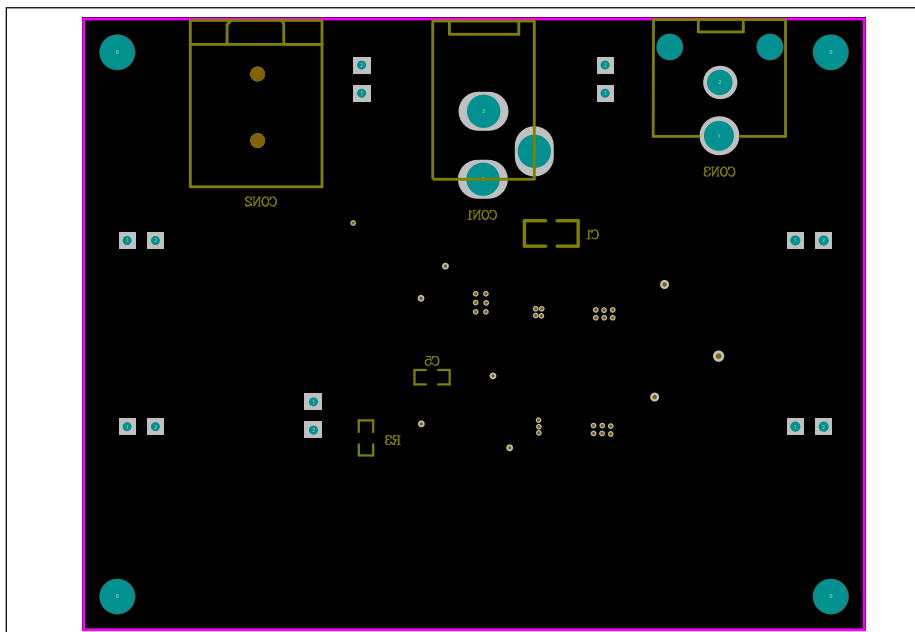
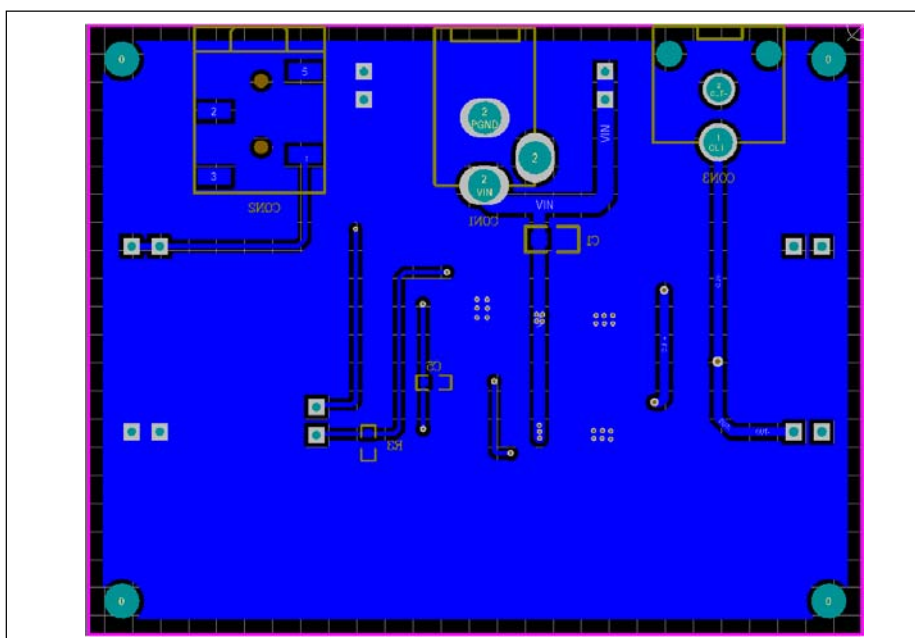


Figure 4: Board PCB Layout- Top Layer



**Figure 5: Board Component Placement Guide -Bottom Layer**



**Figure 6: Board PCB Layout-Bottom Layer**

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