

Description

The IS31AP2145A demo board is a fully assembled and tested PCB that uses the IS31AP2145A Class-D audio amplifier to drive speakers with 4Ω load or larger. The device is designed for battery intensive portable applications, including feature and smart phones, earpieces and headsets. Designed to operate from a 2.7V to 5.5V DC power supply, the demo board accepts a single-ended or differential input signal and provides a BTL output up to 3W. (5V,4Ω load.)

Features

- Supply voltage range from 2.7V to 5.5V
- Filter-less Class-D architecture
- Minimum external components
- AGC enable/disable function
- Low shutdown current: 0.1μA
- Available in UTQFN-9, 1.5mm × 1.5mm

Quick Start

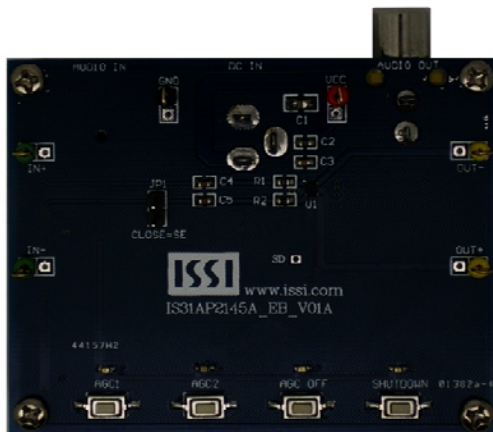


Figure 1: Photo of IS31AP2145A Evaluation Board

Recommended Operation

- 5.0V, 2A power supply
- Audio source signal (MP3 Player, etc)
- 8Ω or 4Ω speaker **Not supplied with EVB*

Absolute Maximum Ratings

- ≤ 5.5V power supply

Caution: Do not exceed the conditions listed above to avoid damaging the board.

Procedure

The IS31AP2145A 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 a speaker with a resistive load of 4Ω or greater across the OUT- and OUT+ terminals.
2. Connect the ground terminal of the power supply to GND and the positive terminal to VCC. A direct supply may also be connected to the DC IN pin.
3. If the audio source is differential, remove jumper JP1, connect the audio input's negative source to the IN- terminal and it's positive source to the IN+ terminal.
4. If the input signal is single-ended, simply connect the audio source to the IN+ terminal. Alternatively, you may connect the audio source directly to (AUDIO IN.) Leave the jumper in closed position.
5. Turn on the power supply, and pay attention to the supply current. If it is over 1.5A, please check the circuit or contact us in time.
6. Power on the audio source.

Ordering Information

Part No.	Temperature Range	Package
IS31AP2145A-UTLS2-EB	-40 to +85°C (Industrial)	UTQFN-9 (1.5mm x 1.5mm), Lead-free

Table 1: Ordering Information

For additional pricing, delivery, and ordering information, please contact ISSI at analog_mkt@issi.com or (408) 969-6600.

Evaluation Board Operation

The IS31AP2145A demo board has four buttons to switch between the different modes (AGC1, AGC2, AGC OFF, and SHUTDOWN). The operating mode is indicated by an LED illuminated above the appropriate button. The default mode is AGC1.

High-pass Filter Configuration

The input capacitors C_{IN} (C_4 , C_5) and internal resistor ($R_{IN} = 28.5k\Omega$) form a high-pass filter with the cut-off frequency, f_c , which can be calculated using Equation listed below.

Equation (1)

$$f_c = \frac{1}{2\pi R_{IN} C_{IN}}$$

(1)

Shut-down Mode

The button (SHUTDOWN) selects the power-down mode of the IS31AP2145A.

****Note: The function of the demo board is achieved by the MCU LPC922 except the audio function.***

Software Support

Please refer to the integrated program.

****Note: Please refer to the IS31AP2145A datasheet for additional information.***

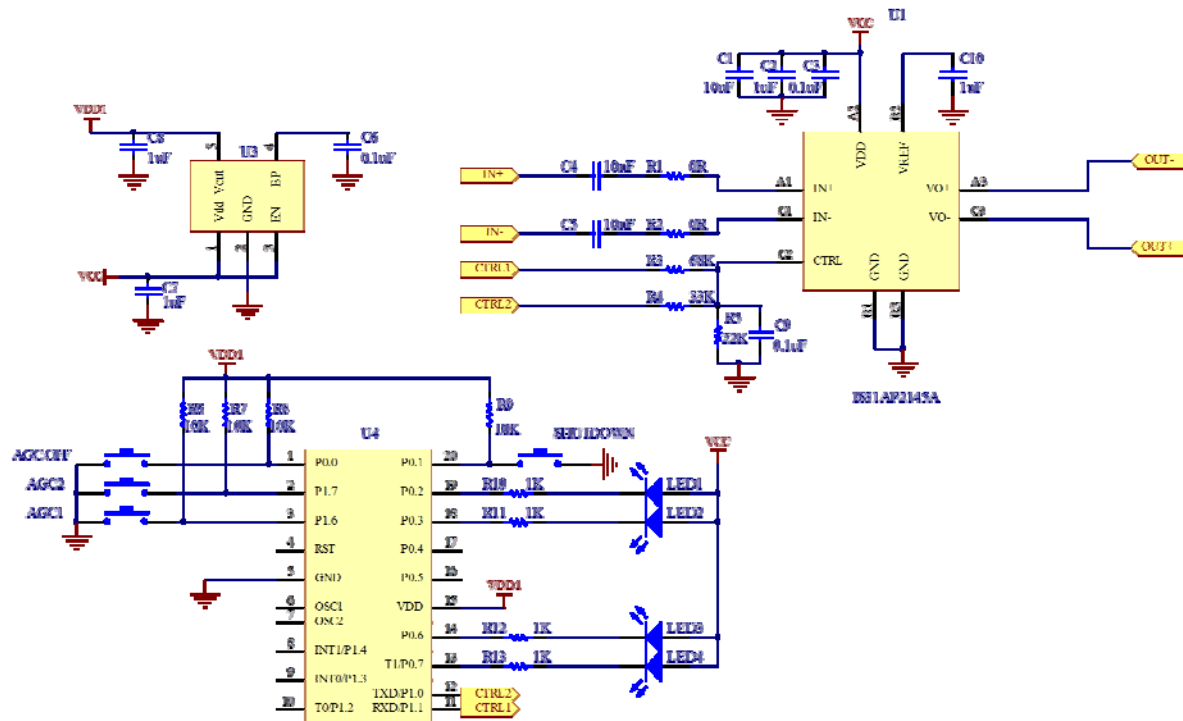


Figure 2: IS31AP2145A Application Schematic

Bill of Materials

Symbol	Description	Type	Size	Manufacturer
U1	IS31AP2145A	Class-D Audio Amplifier	UTQFN-9	ISSI
U3	PAM3101DAB300	Low-dropout Regulator (LDO)	SOT23-5	PAM
U4	P89LPC936	Microcontroller (MCU)	TSSOP-28	NXP
LED1-LED4	19-217/BHC-ZL1M2RY/3T	Diode, LED Blue, SMD	0603	Everlight
R1,R2	0Ω	RES,0Ω,1/16W,±1%, SMD	0603	
R3	68kΩ	RES,68k,1/16W,±5%, SMD	0603	
R4	33kΩ	RES,33k,1/16W,±5%, SMD	0603	
R5	22kΩ	RES,22k,1/16W,±5%, SMD	0603	
R6-R9	10kΩ	RES,10k,1/16W,±5%, SMD	0603	
R10-R13	1kΩ	RES,1k,1/16W,±5%, SMD	0603	
C1	10μF	CAP,10μF,16V,±20%, SMD	0805	
C2,C7,C8,C10	1μF	CAP,1μF,16V,±20%, SMD	0603	
C3,C6,C9	0.1μF	CAP,0.1μF,16V,±20%, SMD	0603	
C4,C5	10nF	CAP,10nF,16V,±10%, SMD	0603	

Table 2: Component list. Refer to Figure 2 for additional information.

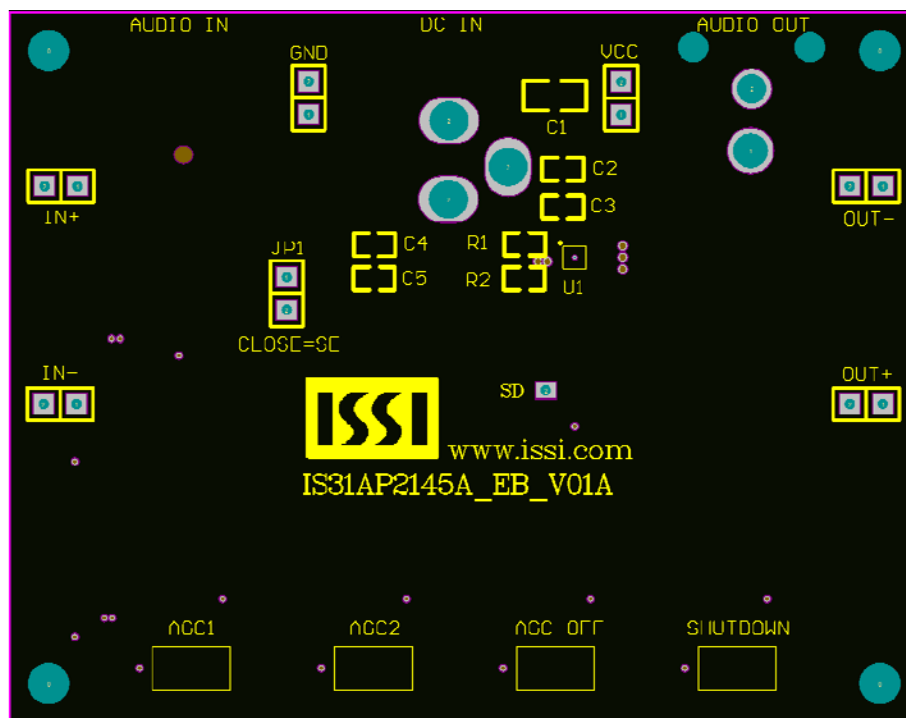


Figure 3: Board Component Placement Guide -Top Layer

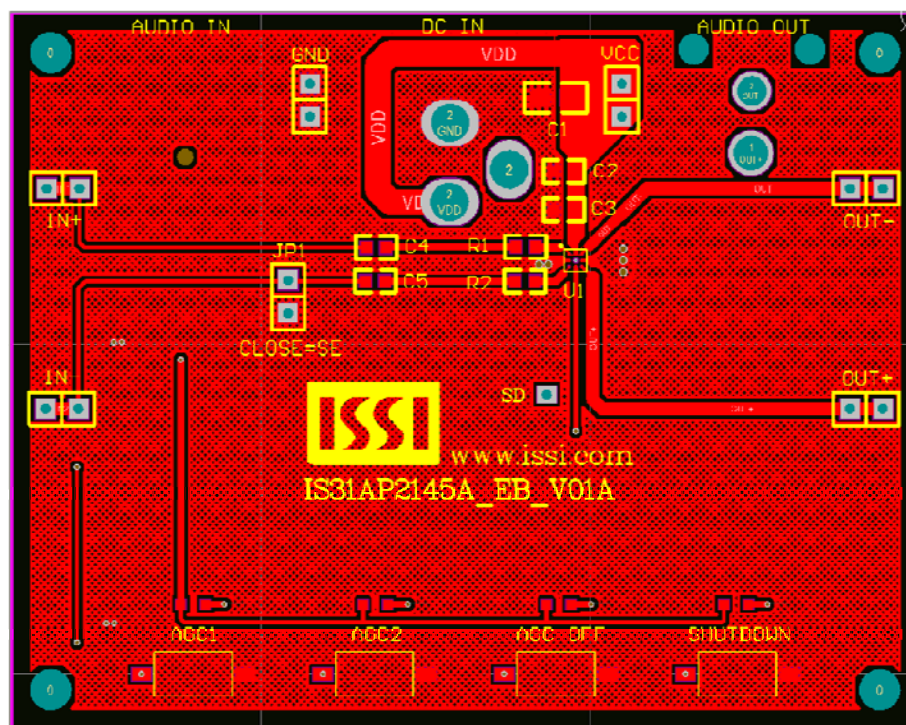


Figure 4: Board PCB Layout- Top Layer

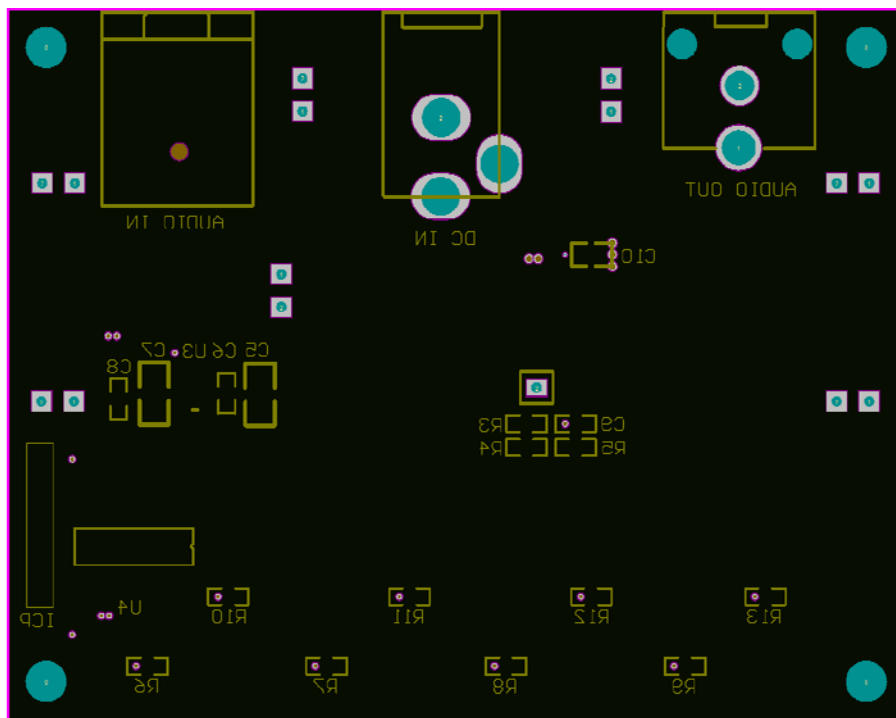


Figure 5: Board Component Placement Guide -Bottom Layer

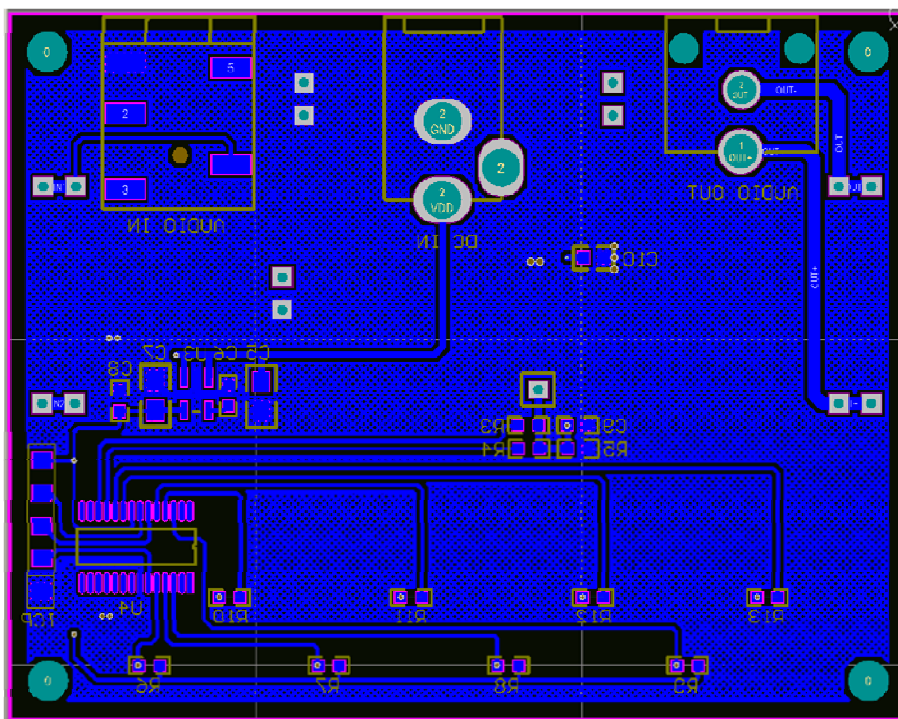


Figure 6: Board PCB Layout-Bottom Layer



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