

IS31AP4913 3D AND BASS ENHANCE STEREO HEADPHONE DRIVER EVALUATION BOARD GUIDE

DESCRIPTION

The IS31AP4913 evaluation board is a fully assembled and tested PCB. The IS31AP4913 is a high quality stereo headphone driver with 3D and bass enhance designed to allow the removal of the output DC-blocking capacitors for reduced component count and cost. The features 3D and bass can be externally adjusted via a simple RC network.

FEATURES

- Supply voltage range from 2.7V to 5.5V
- Low output noise (8μV)
- High SNR (102dB)
- -92dB PSRR
- No output DC-blocking capacitors
- Pulse Count Control serial interface
- Available in QFN-20(3mm × 3mm) package

QUICK START

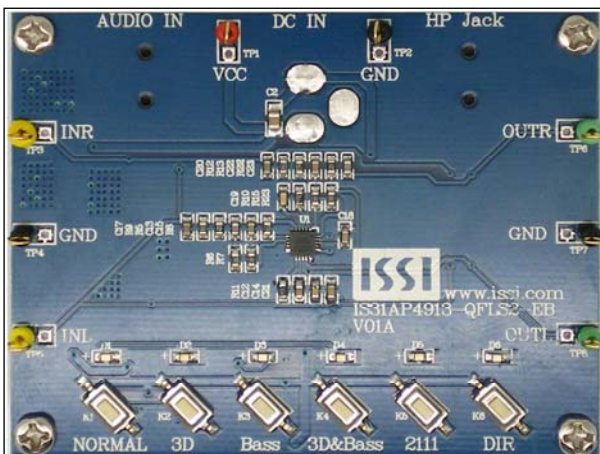


Figure 1: Photo of IS31AP4913 Evaluation Board

RECOMMENDED EQUIPMENT

- 5.0V, 2A power supply
- Audio source (i.e. MP3 player, Notebook PC, etc.)
- Headphone (32Ω)

ABSOLUTE MAXIMUM RATINGS

- ≤ 5.5V power supply

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

PROCEDURE

Follow the steps listed below to verify IS31AP4913 evaluation board operation.

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

- 1) Connect headphone (32Ω) to the connector (HP Jack).
- 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 IN).
- 3) Connect the audio sources to the INR terminal (right channel) and INL terminal (left channel); or connect audio sources to the connector (AUDIO IN).
- 4) Turn on the power supply, and pay attention to the supply current. If the current exceeds 200mA, please check for circuit fault.
- 5) Turn on the audio sources.

ORDERING INFORMATION

| Part No. | Temperature Range | Package |
|---------------------|-----------------------------|-------------------|
| IS31AP4913-QFLS2-EB | -40°C to +85°C (Industrial) | QFN-20, Lead-free |

Table 1: Ordering Information

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

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PERFORMANCE DESCRIPTION

The IS31AP4913 evaluation board has six buttons to switch between the different modes. The operating mode is indicated by an LED illuminated above the appropriate buttons. The (1~4) modes are performed by IS31AP4913.

- 1) (Default mode) normal: basic operating mode
- 2) 3D mode: enable 3D enhance function.
- 3) Bass mode: enable bass enhance function.
- 4) 3D&Bass: enable 3D and bass enhance function.
- 5) 2111: use the output DC-blocking capacitors headphone amplifier (HWD2111) drive headphone
- 6) DIR: use the input audio source direct drive headphone.

Note: The IS31AP4913 headphone driver provides solely audio function capability on the evaluation board.

SOFTWARE SUPPORT

Please refer to the integrated program.

Note: Please refer to the datasheet to get more information about IS31AP4913.

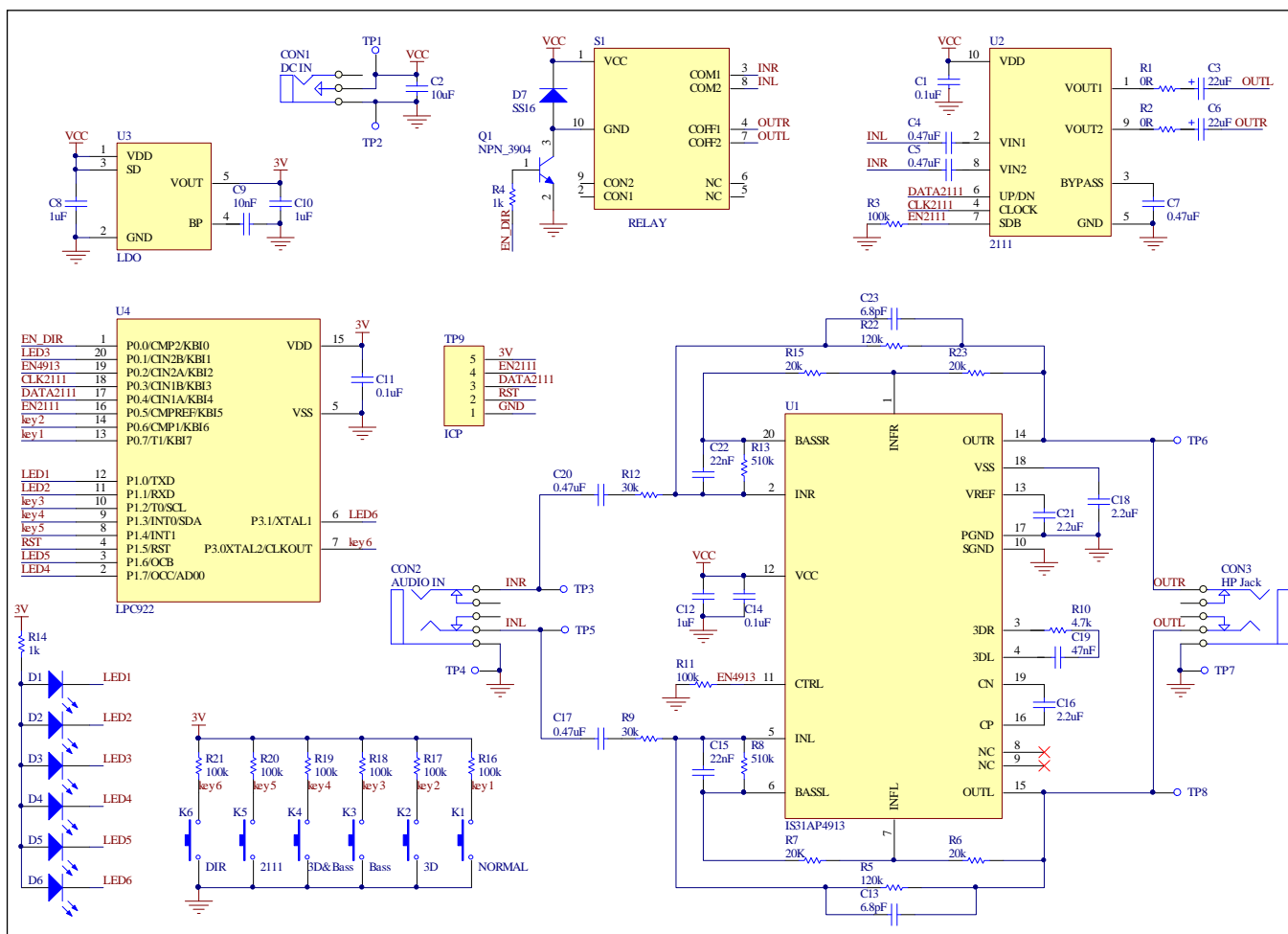


Figure 2: IS31AP4913 Application Schematic

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BILL OF MATERIALS

| Name | Symbol | Description | Qty | Supplier | Part No. |
|-----------------|---------------|---------------------------------|-----|-----------|-----------------------|
| Audio Amplifier | U1 | 3D,Bass Stereo Headphone Driver | 1 | Lumissil | IS31AP4913 |
| Audio Amplifier | U2 | Headphone Amplifier | 1 | HWD | HWD2111 |
| LDO | U3 | LDO | 1 | PAM | PAM3101 |
| MCU | U4 | Microcontroller | 1 | NXP | LPC922 |
| Relay | S1 | Relay, 5V | 1 | Panasonic | TQ2-5V |
| Transistor | Q1 | Transistor, NPN,3904 | 1 | Avic | MMBT3904LT1 |
| Diode | D1~D6 | Diode, LED Blue, SMD | 6 | Everlight | 19-217/BHC-ZL1M2RY/3T |
| Resistor | R1,R2 | RES,0Ω,1/16W,±5%,SMD | 2 | Yageo | RL0603JR-0700RL |
| Resistor | R3,R11 | RES,100k,1/16W,±5%,SMD | 2 | Yageo | RC0603JR-07100KL |
| Resistor | R4,R14 | RES,1k,1/16W,±5%,SMD | 2 | Yageo | RC0603JR-071KL |
| Resistor | R5,R22 | RES,120k,1/16W,±1%,SMD | 2 | Yageo | RC0603FR-07120KL |
| Resistor | R6,R7,R15,R23 | RES,20k,1/16W,±1%,SMD | 4 | Yageo | RC0603FR-0720KL |
| Resistor | R8,R13 | RES,510k,1/16W,±5%,SMD | 2 | Yageo | RC0603JR-0720KL |
| Resistor | R9,R12 | RES,30k,1/16W,±1%,SMD | 2 | Yageo | RC0603FR-0730KL |
| Resistor | R10 | RES,4.7k,1/16W,±5%,SMD | 1 | Yageo | RC0603JR-074K7L |
| Resistor | R16~R21 | RES,10k,1/16W,±5%,SMD | 6 | Yageo | RC0603JR-0710KL |
| Capacitor | C1,C11,C14 | CAP,0.1μF,50V,±10%,SMD | 3 | Yageo | CC0603KKX7R9BB106 |
| Capacitor | C2 | CAP,10μF,16V,±20%,SMD | 1 | Yageo | CC0805KKX7R6BB106 |
| Capacitor | C3,C6 | CAP,22μF,25V,±20%,SMD | 2 | Yageo | |
| Capacitor | C4,C5,C7 | CAP,0.47μF,50V,±10%,SMD | 3 | Yageo | CC0603KKX7R9BB474 |
| Capacitor | C8,C10,C12 | CAP,1μF,50V,±10%,SMD | 3 | Yageo | CC0603KKX7R9BB105 |
| Capacitor | C9 | CAP,10nF,50V,±10%,SMD | 1 | Yageo | CC0603KKX7R9BB103 |
| Capacitor | C13,C23 | CAP,6.8pF,50V,±10%,SMD | 2 | Yageo | CC0603KKX7R9BB6P8 |
| Capacitor | C15,C22 | CAP,22nF,50V,±10%,SMD | 2 | Yageo | CC0603KKX7R9BB103 |
| Capacitor | C16,C18,C21 | CAP,2.2μF,16V,±10%,SMD | 3 | Yageo | CC0603KKX7R7BB225 |
| Capacitor | C17,C20 | CAP,0.47μF,50V,±10%,SMD | 2 | Yageo | CC0603KKX7R9BB474 |
| Capacitor | C19 | CAP,47nF,50V,±10%,SMD | 1 | Yageo | CC0603KKX7R9BB473 |
| Connector | DC IN | 2.5mm DC connector | 1 | | |
| Connector | AUDIO IN | 3.5mm mini connector | 1 | | |
| Connector | HP Jack | 3.5mm mini connector | 1 | | |

Bill of Materials, refer to Figure 2 above.

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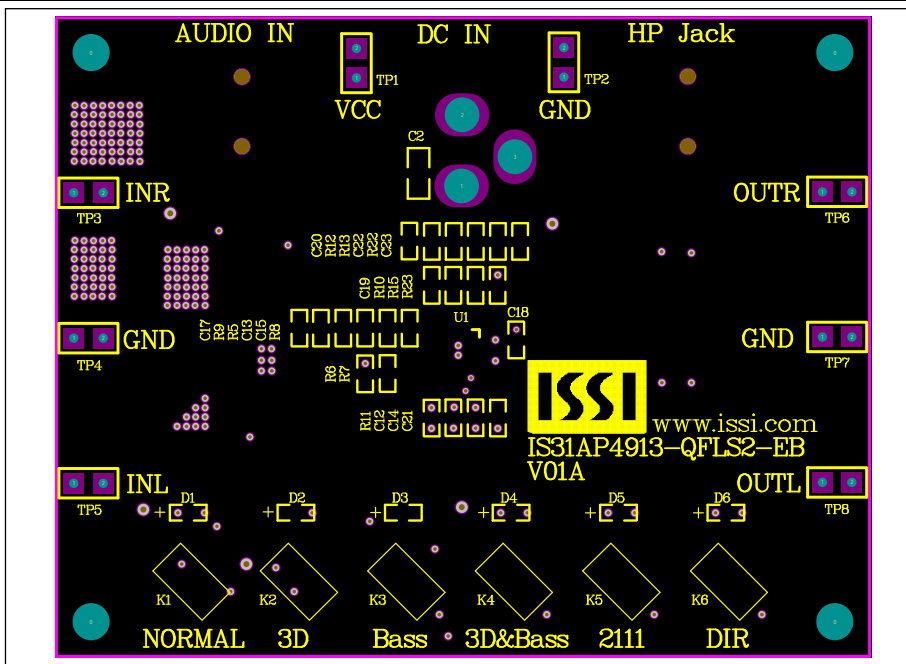


Figure 3: Board Component Placement Guide - Top Layer

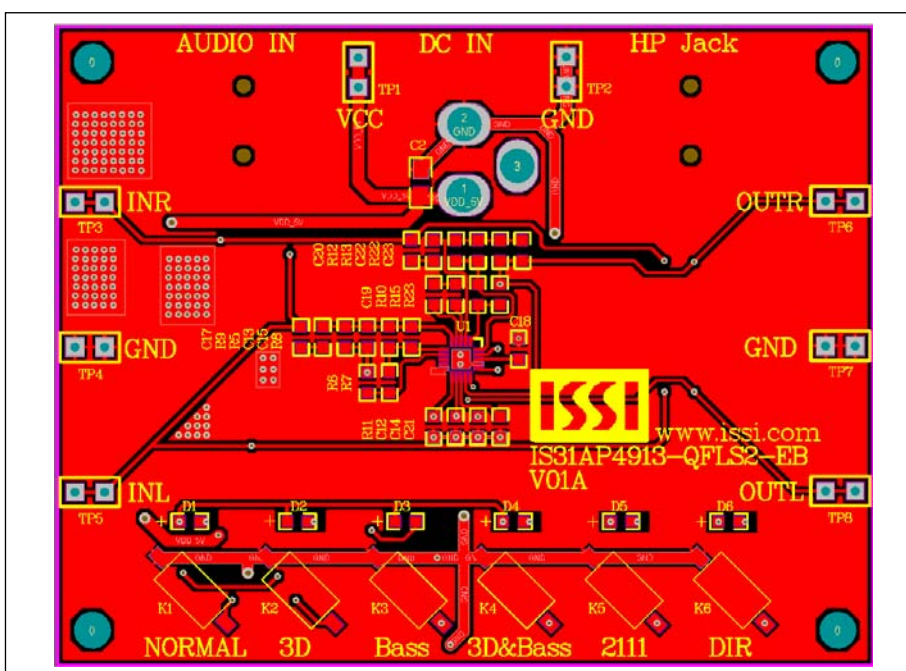


Figure 4: Board PCB Layout - Top Layer

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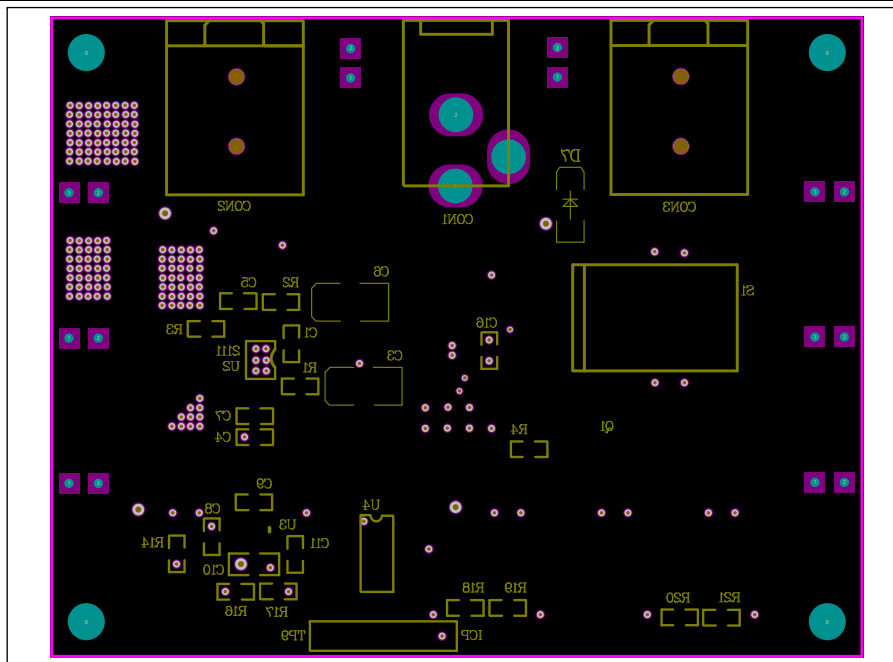


Figure 5: Board Component Placement Guide - Bottom Layer

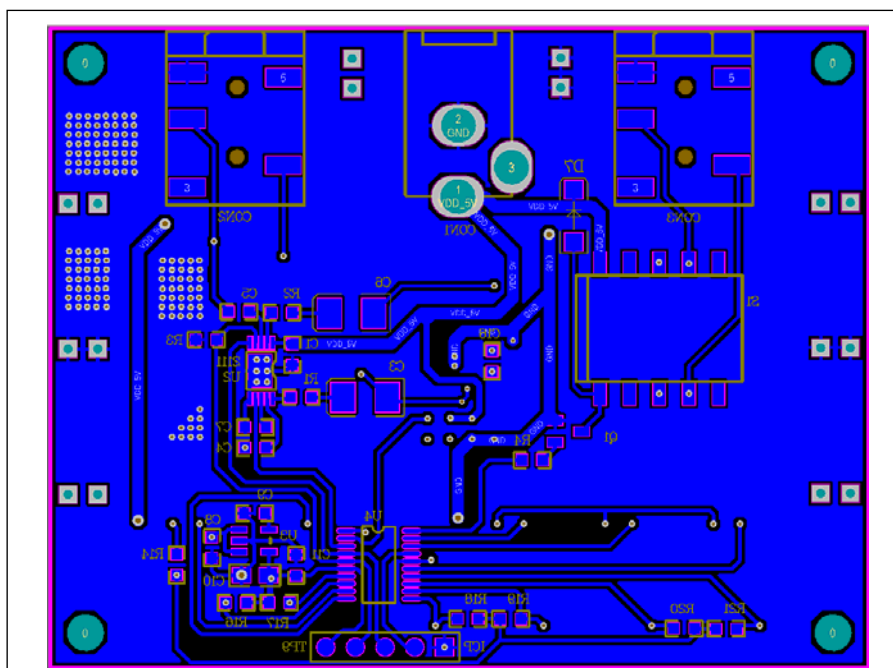


Figure 6: Board PCB Layout - Bottom Layer

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