

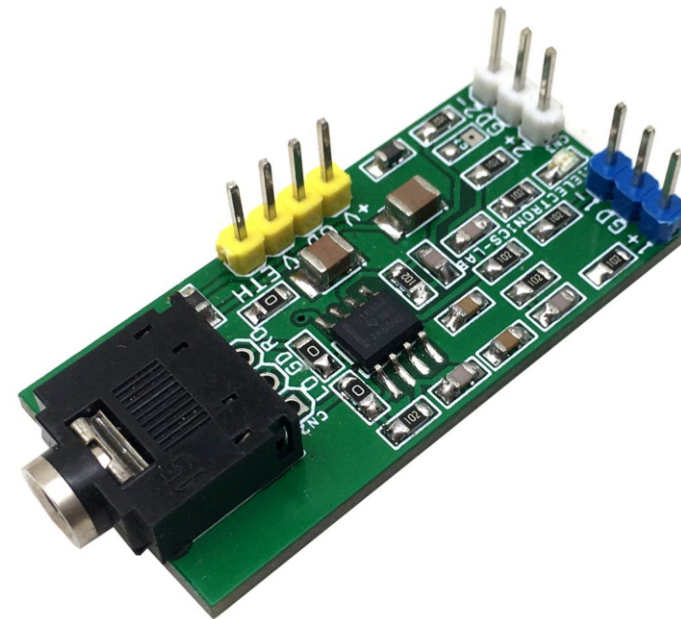
# Head Phone Amplifier For DAC Converter

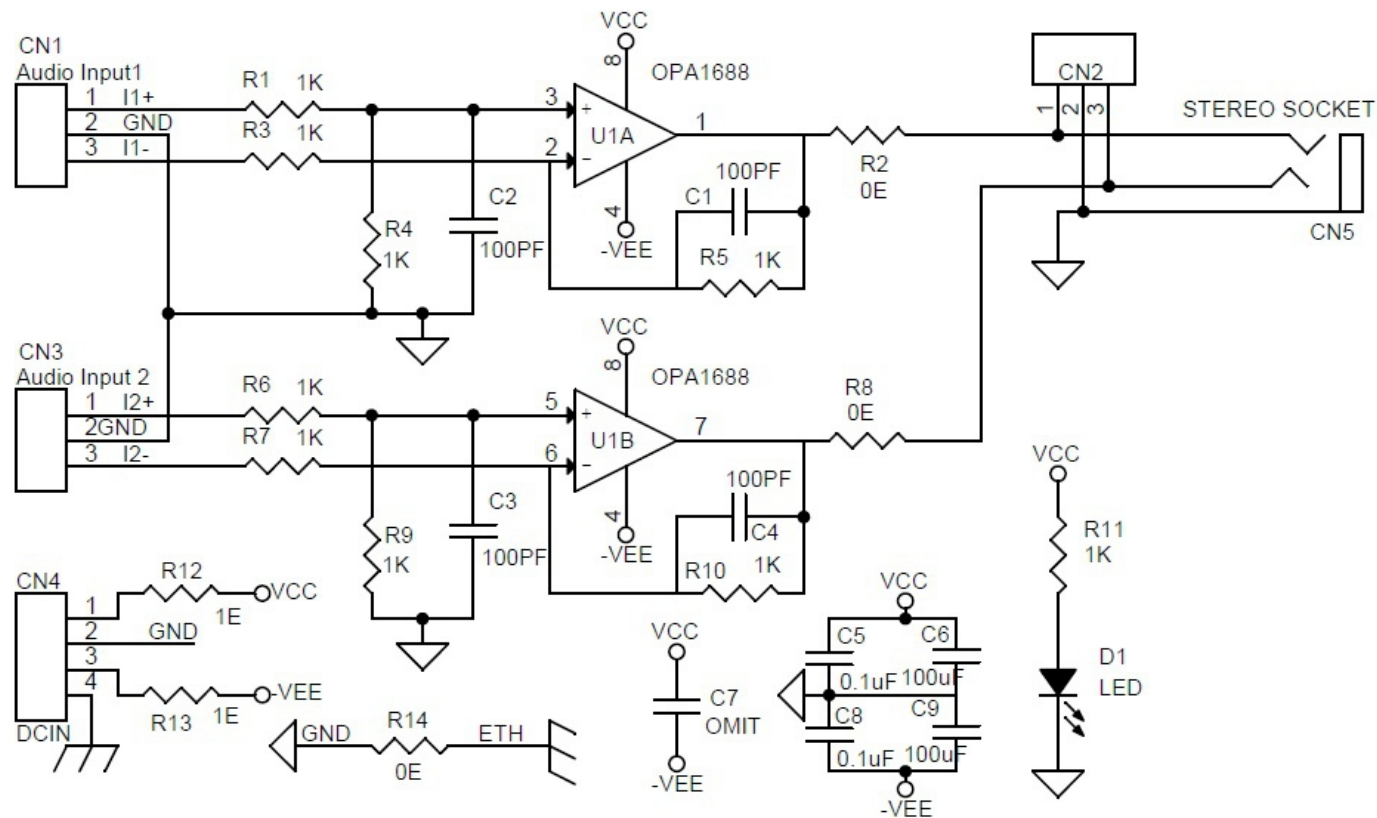
This is a headphone amplifier project for audio digital-to-analog converters (DACs) with differential voltage outputs. This circuit converts the differential voltage output of the DAC to a single-ended, ground-referenced signal and provides the additional current necessary for low-impedance headphones. Project is built using OPA1688 low distortion, high-drive Sound Plus audio amplifier. The circuit tested with dual +/-5V DC supply, and it can drive a load 16 Ohms to 600 Ohms. Headphone amplifier provides an output 50mW into 32 Ohms. Signal for the right channel and left channel input is applied to the amplifier through connectors CN1 and CN3, respectively.

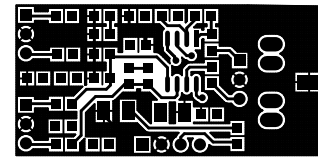
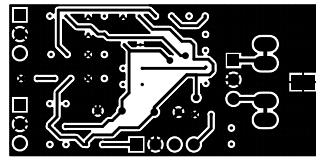
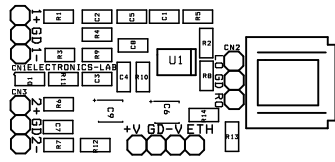
The positive input from the source connects to the pin labelled I1+/I2+, the negative input from the source connects to the pin labelled I1-/I2-, and the ground connection from the source connects to the center pin of CN1 and CN3, labelled GND. Stereo 3.5mm Female EP socket provided to interface the Headphone. The project supports headphone of 16 Ohms, 32 Ohms and 600 Ohms, output power of the circuit depends on impedance of headphone, for example, a pair of headphones with a 95dB/mW sensitivity given a 3mW input signal produces a 100dB SPL. If the headphones have a nominal impedance of 32  $\Omega$ , then the voltage and current from the headphone amplifier (voltage=310mV RMS and current 9.86mA RMS)

## Features

- Supply +/-5V DC
- Input Deferential Signal
- Output Power 50mW in to 32 Ohms Headphone
- Head-Phone Loads: 16 Ohms, 32 Ohms, 600
- Frequency Response 20Hz to 20Khz
- PCB Dimensions 42.23MMX20.16MM







Bom				
Sr.	Qty.	Ref.	Desc	Vendor/Digikey/Mouser
1	1	CN1	3 PIN MALE HEADER 2.54MM PITCH	DIGIKEY S1011EC-40-ND
2	1	CN2	3 PIN MALE HEADER 2.54MM PITCH	DIGIKEY S1011EC-40-ND
3	1	CN3	3 PIN MALE HEADER 2.54MM PITCH	DIGIKEY S1011EC-40-ND
4	1	CN4	4 PIN MALE HEADER 2.54MM PITCH	DIGIKEY S1011EC-40-ND
5	1	CN5	3.5MM HEADPHONE JACK STEREO	DIGIKEY CP1-3525N-ND
6	4	C1,C2,C3,C4	100PF/50V SMD SIZE 0805	YAGEO
7	2	C5,C8	0.1uF/50V SMD SIZE 0805	YAGEO
8	2	C6,C9	100uF/16V SIZE 1210	DIGIKEY 587-5426-1-ND
9	1	C7	OMIT	DNP
10	1	D1	LED RED SMD SIZE 0805	DIGIKEY 475-1415-1-ND
11	9	R1,R3,R4,R5,R6,R7,R9,R10,R11	1K 5% SMD SIZE 0805	YAGEO
12	3	R2,R8,R14	0E SMD SIZE 0805	YAGEO
13	2	R12,R13	1E 5% SMD SIZE 0805	YAGEO
14	1	U1	OPA1688 SOIC8	DIGIKEY 296-47272-1-ND

