

How to Assemble "otomatsu" Portable Headphone Amplifier

If you have any question please contact by e-mail to: otomatsu@aurorasound.jp

- Adopt High Performance, High Fidelity OPAMP LME49710 + High Performance, Low distortion Buffer IC LME49600
- The amplifier's overall gain can be adjusted and support 16Ω to 300Ω impedance characteristic of any headphones.
- Easy build and flexibility for upgrade.
- Portable case easy to carry, Thumb screw fasten system to make exchange battery easier.
- External DC input by AC power adaptor.

C11,C12 Electric Capacitor
Black 330uF 16V x2
Long lead is +, short -

C13, C14 Electric Capacitor
Gold 100uF 25V x2
Long lead is +, short -



C3,C4,C5,C6,C7,C8,C9,C10 x8
Blue 0.1uF Ceramic Capacitor
No +/- polarity

C1,C2 x2 Red
3.3uF Film Capacitor
No +/- polarity



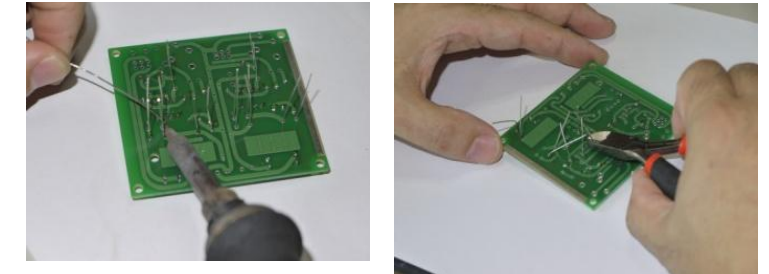
LED x1
Ling lead is +, Short -



Print Circuit Board x1
IC3,IC4 LME49600 x2 are pre-soldered
Pin No.1 is floating

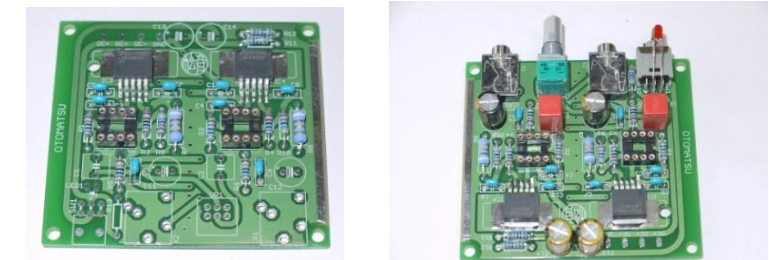


1. Please check that all parts are in the box and accounted for.
2. Start soldering the low profile parts first then the high one. At the first registers, second IC socket, third Ceramic capacitors, fourth IN/OUT jack..... last Electric capacitors.

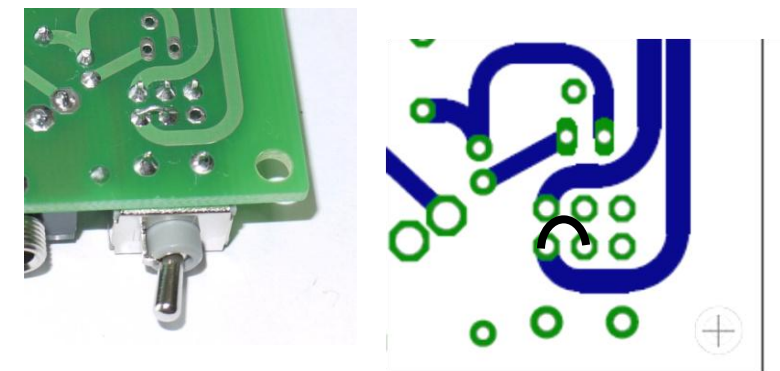


Turn the PCB over and solder. Need to cut out lead wire with a nipper

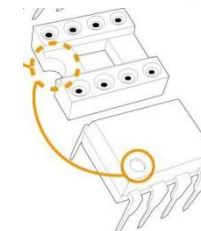
3. Solder the low profile parts, See left bottom picture
4. Now solder the high profile parts



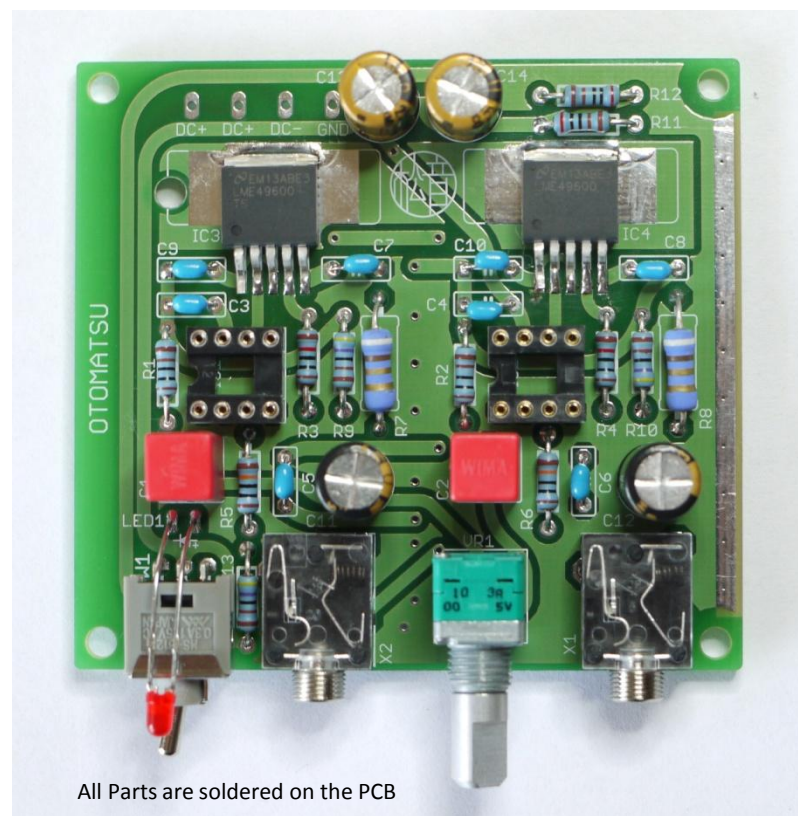
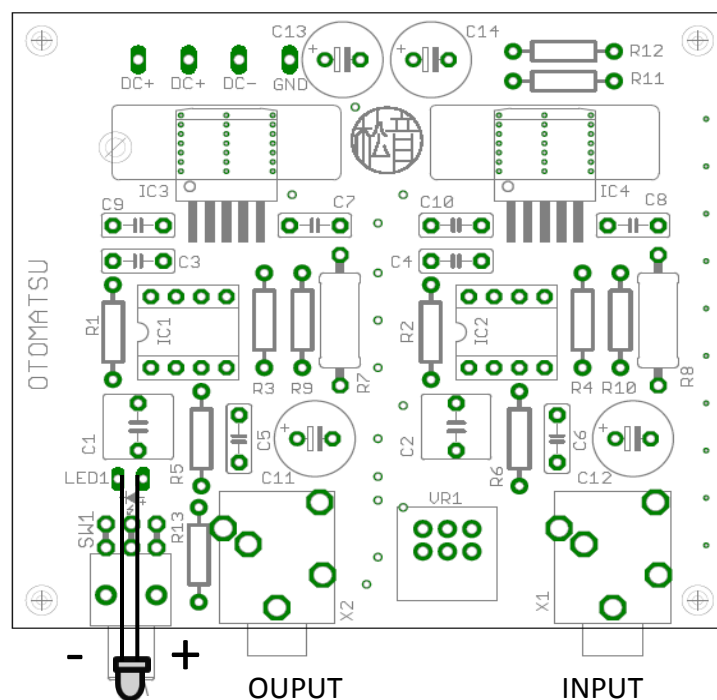
5. **NOTE: You will need to solder jumper wire for power SW as the illustrated in the following picture. Use the cut out lead of the registers.**



- 6.. Insert OPAMP into socket and mindful of the orientation



R1,R2	10kΩ	ReBiBiBr	Br	赤黒黒茶
R3,R4	10kΩ	ReBiBiBr	Br	赤黒黒赤
R5,R6	100kΩ	ReBiBiBr	Br	茶黒黒橙
R7,R8	9.1kΩ	Wa-D-Gu-Gu	Br	白茶金
R9,R10	4.7kΩ	YaPuBiBr	Br	黄赤黒茶
R11,R12	2kΩ	ReBiBiBr	Br	赤黒黒茶
Gain Adjust	1kΩ x2	BrBiBiBr	Br	赤黒黒茶
	4.7kΩ x2	YaPuBiBr	Br	黄赤黒茶



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AMP gain adjust registers

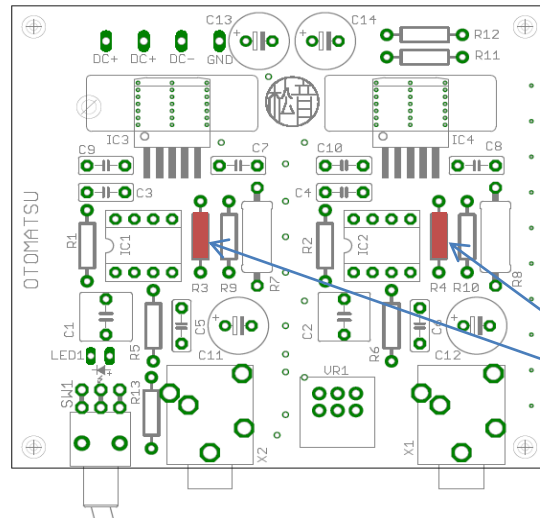
This kit's default gain is x11 for low sensitivity high-end headphones. However some headphone, for instance, canal type earphones or high sensitivity type, x11 is too much.

In this case, you can adjust the gain down to x5.7 or x2 by exchange R3 and R4.

R3 and R4 default value is 10kohm, Gain is x11.

Adjust gain x5.7 by 4.7k ohm.

Adjust gain x2 by 1kohm



Color code of gain adjust registrars

1k x2 BrblblBr Br

4.7kΩ x2 YePuBlBr Br

Gain formula $(R1 + R3) / R1 = \text{GAIN}$

Default 10k $(1k + 10k) / 1k = x11$

Case of 4.7k $(1k + 4.7k) / 1k = x5.7$

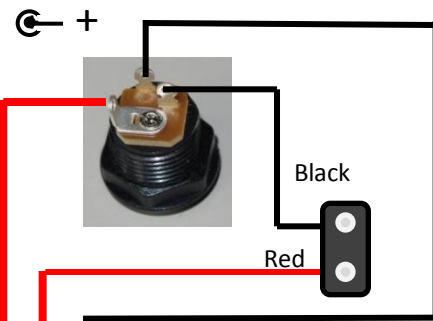
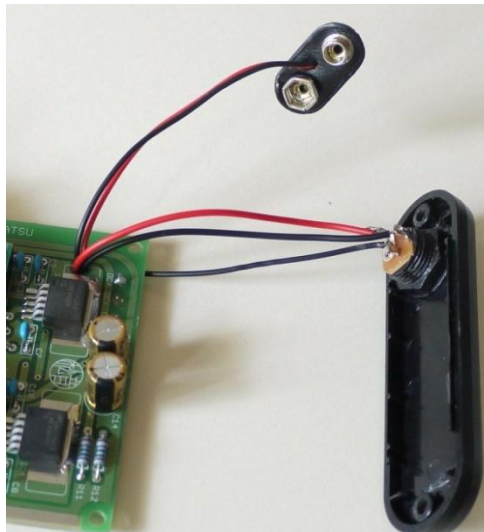
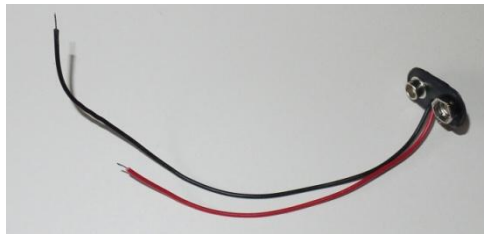
Case of 1k $(1k + 1k) / 1k = x2$

Portable case

- Aluminum case + Plastic Panels
- Panel sticker
- Volume knob, DC jack
- Thumb screw for back panel x2
- Hexagon socket set screw x2
- L-Wrench

DC jack fixed on the back panel, then wiring as the following picture.

Cut the red wire of the battery snap jack which is 1 inch shorter than black.
In order to protect soldering points, all wires go through the hole of PCB as shown in the below left picture.
The AC adaptor can be used under DC24V, and center plus type.
The battery disconnects at DC jack insertion.



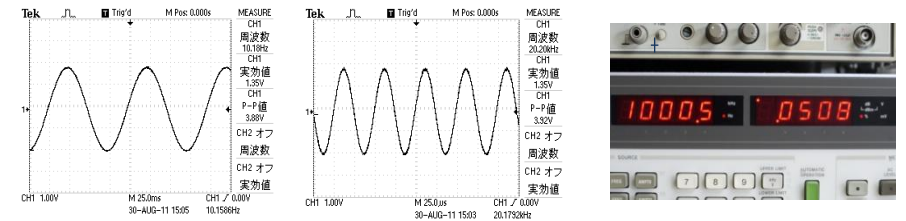
Hexagon socket set screw fixed as the following picture



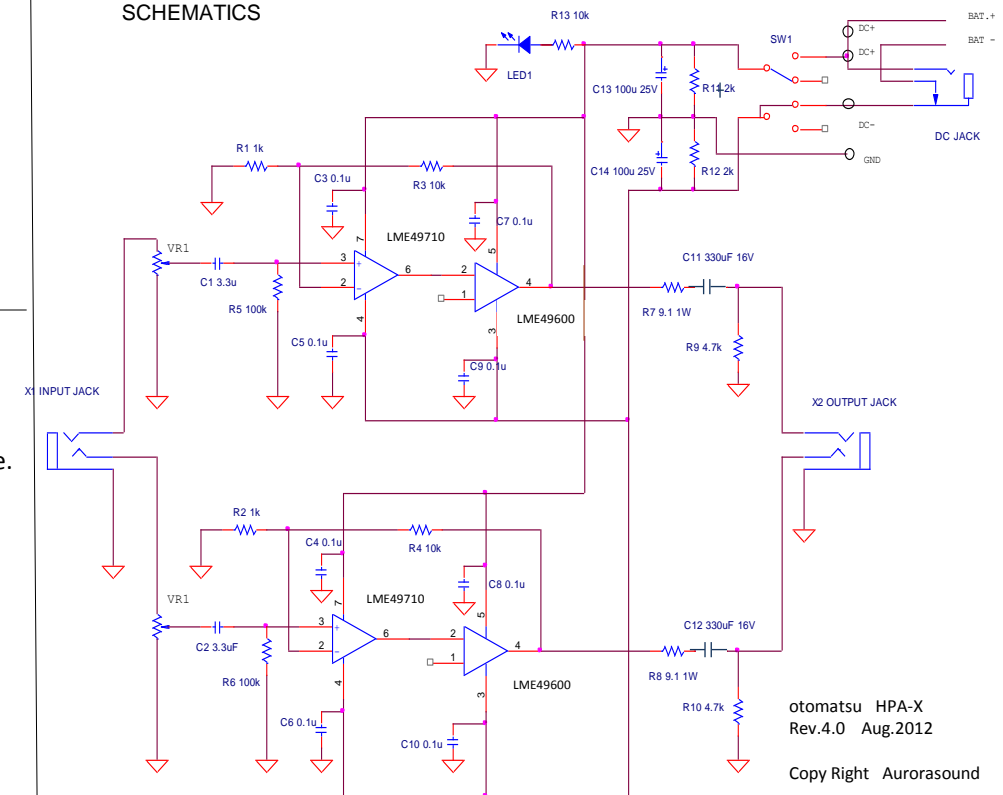
Audio performance

Frequency response 10Hz - 60kHz -1.5dB
THD+N 0.05% @32Ω load

Left bottom 10Hz base clean sine wave
Middle 20kHz treble same level of 10Hz
Right bottom THD+N is very good level, 0.05%



SCHEMATICS



Next step for upgrade

Exchange OPAMP ICs to upgrade audio performance to enjoy the improved sound characteristic by each OPAMP ICs.

Single type LME49710, LME49990, OPA627A, LT1115, are recommended

