

RKAmp4 10+10W Audio Amplifier Component List and Instructions



The RKAmp4 stereo amplifier has been designed around the TDA2009A 2 x 10 Watt stereo amplifier I.C.

- The sound signal is inputted into the circuit via a 3.5mm stereo socket
- The amplifier has 2 channels of up to 10 Watts per channel
- Produces a very high quality sound output
- The PCB includes a power switch
- The PCB includes a power LED
- The PCB uses terminal blocks
- Battery powered between 4.5V and 24V
- Power is inputted to the PCB via a terminal block or jack socket
- Compact design
- Low cost
- The PCB is a high quality double sided black PCB
- A large ground plane is used to aid with dissipating heat

Component List

C1 – 22uF 25V electrolytic radial capacitor
C2 – 100nF capacitor (2.5mm pitch small box capacitor, non-polarised)
C3 – 100uF 25 electrolytic radial capacitor
C4, C5– 10nF capacitor (box capacitor, non-polarised)
C6, C7 – 2.2uF electrolytic capacitor
C8, C9 - 220uF 25VDC electrolytic radial capacitor
C10, C11 – 100nF capacitor (box capacitor, non-polarised)
C12, C13 - 2200uF 25VDC electrolytic radial capacitor
D1, D2 – 1N4001
IC1 – TDA2009a stereo amplifier I.C.
LED1 – 3mm LED
J1 – PCB mount 3.5mm stereo connector
J2 – 2.1mm DC socket
J3 ~ J5 (PWR, LEFT & RIGHT)– 2 way terminal blocks
R1 – 1k (brown black red)
R2, R5 – 10k (brown black orange)
R6, R7 – 3k3 (orange orange red)
R8, R10 - 12K (brown, red, orange)
R9, R11 – 18R (brown, grey, black)
R12, R13 - 1R (brown, black, gold)
SW1 – ultra miniature slide switch

Construction of circuit

You will need to collect the following equipment before you start soldering your circuit:

- Soldering iron and stand
- Solder wire
- Side cutters
- Pliers

Procedure for construction

1. Solder the resistors into your PCB. Take care to insert the correct resistor into the correct place by checking the coloured bands.
2. Solder the diodes in place. Ensure that the silver band on the diode aligns with the markings on the PCB
3. Solder the power switch in place
4. Solder the stereo socket in place
5. Solder the LED in place. Ensure that the longer leg aligns with the + on the PCB
6. Solder the terminal blocks in place ensuring that the holes for the wires face outward
7. Solder the DC power socket in place
8. Solder the non-polarised capacitors in place
9. Solder the electrolytic capacitors in place. Be careful to ensure the longer legs are inserted into '+ve' hole.
10. Solder the TDA2009A chip in place. Be careful because the legs are close together - make sure you don't connect the legs together with solder bridges as this will stop the circuit working.

Speakers

The PCB has been designed to power 2 full range speakers. If you have chosen a kit that is not supplied with speakers, you will need to add your own. These should have either a 4 or 8Ω impedance and the power rating should be equal to or greater than the maximum power output of the amplifier.

If you are using a kit which has speakers supplied, you will need to solder the speaker cable to the speakers.

1. Cut the speaker cable into 2 equal lengths
2. Peel the two halves of the speaker cable apart about 25mm at each end (see diagram)
3. Strip about 5mm of insulation from the ends. Twist the strands of each loose end to keep them tidy and then tin the wires
4. For each speaker, solder the side wire with the black stripe to the + speaker terminal and the plain side of the wire



Connecting Speaker Outputs

1. Take the first speaker and connect the wire with the black strip into the +VE side of the terminal block marked LEFT
2. Now connect the plain wire of the speaker to the side marked -VE
3. Repeat this for the other speaker using the terminal block marked RIGHT

Connecting the PCB to a Music Device

This PCB has been designed for use with music players such as MP3 players, mobile phones with music players and ipods. The unit is connected to a music player via the 3.5mm stereo lead with one end inserted into the headphone socket of your music player and the other end inserted into the PCBs 3.5mm stereo socket.

Connecting Power

The unit can be battery powered or DC PSU powered. The power is connected using the terminal block marked J3 or via the DC socket. When using the supplied battery pack and battery snap, connect the black wire to the 0V side and the red wire to the +VE side of the terminal block. When using a regulated DC PSU, 6V to 24V is recommended. When using more than 6V, it is recommended that a heat-sink is fitted to the TDA2009A chip.

When the PCB is correctly powered and the switch is on, the green 3mm LED will light up.

Testing the Amplifier

PLEASE ONLY TEST THE UNIT WHEN YOU ARE SURE THE PCB IS CORRECTLY ASSEMBLED.

When the PCB has been constructed, the speakers have been attached, a music player has been connected and power has been applied the unit is ready to be tested. Ensure the amplifier is switched off.

Set the volume of your music player to its lowest level and press play. Switch the amplifier on and gradually increase the volume until it can be heard. The volume is not controlled by the PCB, the volume level will be controlled by the music player itself.

Schematic

