

## **Stereo Amplifier Kit (70-0198 and 70-0199)**

### **Description**

The RKamp1 stereo amplifier PCB has been designed around the 2 x 1watt stereo amplifier I.C. TDA2822L

- The sound signal is inputted into the circuit via a 3.5mm stereo socket
- The amplifier has 2 channels of up to 1 watt per channel
- Produces a 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 12V
- Power is inputted to the PCB via a terminal block
- Compact design
- Low cost
- The PCB is a high quality double sided black PCB
- The PCB has a large ground plane that is used to dissipate heat
- Using the supplied components and speakers the amplifier should draw around 60mA and so will run for a couple of hours from an alkaline PP3 battery.
- The 100k resistors R4 and R5 limit the output for the speakers provided. If you wish to use larger speakers, you may need to reduce the value of these resistors.

### **Component List**

C1 – 10uF 25VDC electrolytic radial capacitor (11-0220)  
C2, C3 – 100uF 16VDC electrolytic radial capacitor (11-3508)  
C4, C5 – 470uF 16VDC electrolytic radial capacitor (11-0275)  
C6, C7 – 100nF Ceramic capacitor (11-3455)  
D1 – 1N4001 (47-3130)  
D3 – LED, green 3mm (55-1772)  
IC1 – TDA2822L stereo amplifier I.C. (82-0673)  
J1 – PCB mount 3.5mm stereo connector (20-0137)  
J2 ~ J4 – 2 way 5mm terminal blocks (21-0440)  
R1 – 1k brown black red (62-0370)  
R2, R3 – 4R7 yellow violet (62-0320)  
R4, R5 – 100k brown black yellow (62-0418)  
R6, R7 – 10k brown black orange (62-0394)  
SW1 – ultra miniature slide switch (78-3760)

Also included:

Stereo connection cable (20-0040)  
2 speakers (35-0128)  
Speaker cable (01-0162)

For a data sheet on the TDA2822L please visit [rapidonline.com](http://rapidonline.com) and search for 82-0673.

## Construction of circuit

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

- Soldering iron and stand
- Damp sponge
- 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, if in doubt seek advice. When soldering, be sure to heat the area sufficiently but not too much as it will damage the PCB.
2. Solder your power switch in place
3. Solder the stereo socket in place
4. Solder the TDA2822L in place, be careful as the legs are close together, be sure not to connect the legs together with solder bridges as this will stop the circuit working. When inserting, be careful not to bend the legs. An I.C. socket is not used as the PCB acts as a heat-sink. If you are using a clip on heat sink this should be added when soldering the TDA2822L to the PCB
5. Solder the small multi layer ceramic capacitors in place
6. Solder your LED in place
7. Solder the terminal blocks in place, ensure the holes for the wires face outward
8. Solder the larger capacitors in place, be careful to ensure the longer legs are inserted into +ve

## Connecting Power

The power is connected using the terminal block marked J2, the 0V input, usually black is put in the left hand terminal and the +VE, usually red, is put in the right hand terminal. It is recommended that high capacity AA batteries are used with an appropriate battery pack with leads or battery pack with a battery clip. A power switch has been added to the PCB and is marked PWR, if a switch is not needed short the appropriate PCB pads. When the PCB is powered the green, 3mm LED will light up and turn off when power is removed. The PCB can be powered from 4.5VDC to 12VDC. When powered at a lower voltage the output power will be reduced and the sound may become distorted. If a high power is not needed then it is recommended that 4.5 to 6VDC is used. At higher voltages and output powers more current is needed so the batteries will use power faster and the amplifier I.C. will also generate more heat which will need to be dissipated. In order to get a high quality sound with longer battery life it is recommended that the PCB be powered at 6VDC at a lower volume. It is possible to power the PCB from a DC PSU, this should only be attempted by experienced and appropriately qualified users.

## Connecting Speaker Outputs

Connecting the speakers to the PCB is a straightforward process, the main thing to be careful with is the polarity of the speaker cables. As with speakers there is a wide range of speaker cable available. It is possible to use wire but it is recommended that at the least a basic speaker cable should be used.

First cut the speaker cable to the desired length and carefully separate the ends of the cable. Strip around 0.5cm of the insulation from the cable and twist the exposed copper wire together. Then apply some solder to the end of the cable to stop the ends fraying or short circuiting. One end of the cable will need soldering to the speaker and the other end will need screwing into the speaker terminal blocks marked **RIGHT SP** and **LEFT SP**. It is important that the polarities of the speakers are observed and the cables are attached to the PCB correctly. The polarity of the speaker terminal blocks on the PCB are clearly labelled and speakers normally have a + and - where the cable is attached, speaker cables always have something that identifies the 2 different wires.

### **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 a 3.5mm stereo lead with one end inserted into the music player and the other end inserted into the PCBs 3.5mm stereo socket below the label RKamp1. Some music players do not come with a 3.5mm stereo socket, if this is the case then an adapter will need to be used.

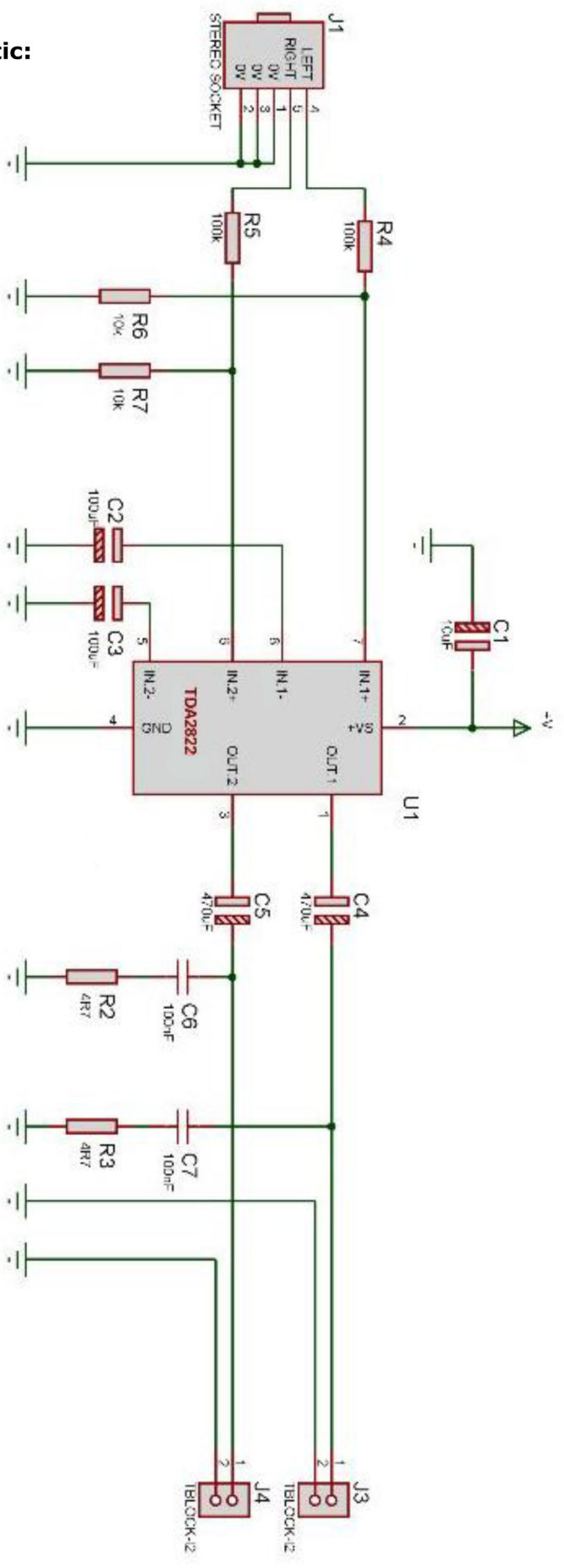
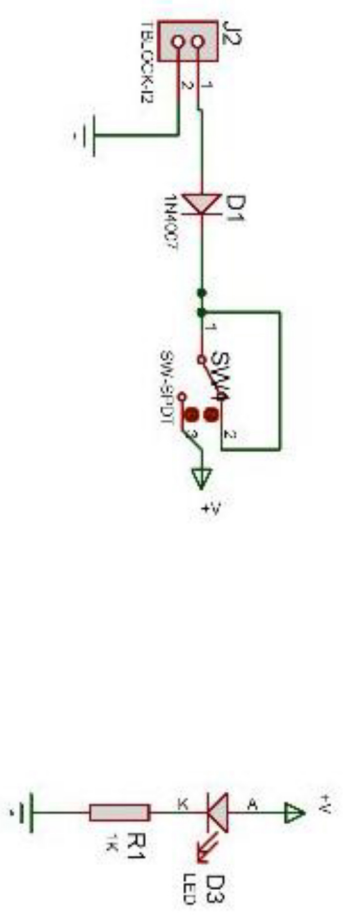
### **Testing the Amplifier**

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.

**PLEASE ONLY TEST THE UNIT WHEN YOU ARE SURE THE PCB IS FULLY FUNCTIONAL. CAREFULLY CHECK IT HAS BEEN CONSTRUCTED CORRECTLY.**

Ensure the LED power indicator is lit and turn the volume of your music player to its lowest level and press play, 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.

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**Schematic:**