

# Kit 139. 1W Stereo Amplifier - with DC Volume Control



This is a 1 watt stereo amplifier module Kit using the TDA 7053A from Philips. It uses a DC voltage to control gain, hence a single gang pot or switch can be used as a volume control with minimal tracking error. It will operate from 4.5 – 18 V DC and requires no heat-sink for normal use.

## TDA 7053A Features

- Short circuit protected
- Thermal protection
- No switch on/off clicks
- Mute mode
- Low power consumption
- Good stability

## Assembly Instructions :

Assembly is very straight forward. Make sure you get the integrated circuit and the electrolytic capacitors the correct way around. The electrolytic capacitors are polarized, they have a + or - marked on them and they must be inserted correctly into the PCB. The IC and socket have a notch at one end, which is marked on the PCB board overlay. Solder the socket in place first before installing the IC itself. Leave the potentiometer until last.

Check the supply voltage and polarity before connecting the battery or power supply. If it does not work, recheck all component positions and polarity. Check all solder joints, and all external wiring. The IC itself is quite robust, and there is very little else to go wrong.

Remember when testing, it will not produce full output for more than a short duration because of limited heat dissipation, or with DC input less than 6V.

## Circuit Description :

Since the IC does all the work, there are only a few external components. C1 and C2 provide power supply decoupling or filtering. C3 and C4 are the input coupling capacitors, which block any DC that might be present on the input. R1 and R2 provide a DC ground reference for the input signals. VR1 adjusts the IC gain level. This can be used as a volume control. R3 sets the maximum DC voltage on VR1, and C5 bypasses AC signals from the DC gain control to prevent gain fluctuations.

You may need to adjust R3 so that VR1 will operate across its full travel. Since the IC requires approximately 1.2V control voltage for full gain, you should increase the value of R3 for supply voltages greater than 6V. A value of 47k for 9V, and 68k for a 12V supply, will provide a better potentiometer range.

The maximum gain is internally set to 40 dB, and the DC volume control will provide a proper logarithmic gain characteristic from -33dB to +40dB. The IC will automatically switch to mute mode when the control voltage falls below 0.4V.

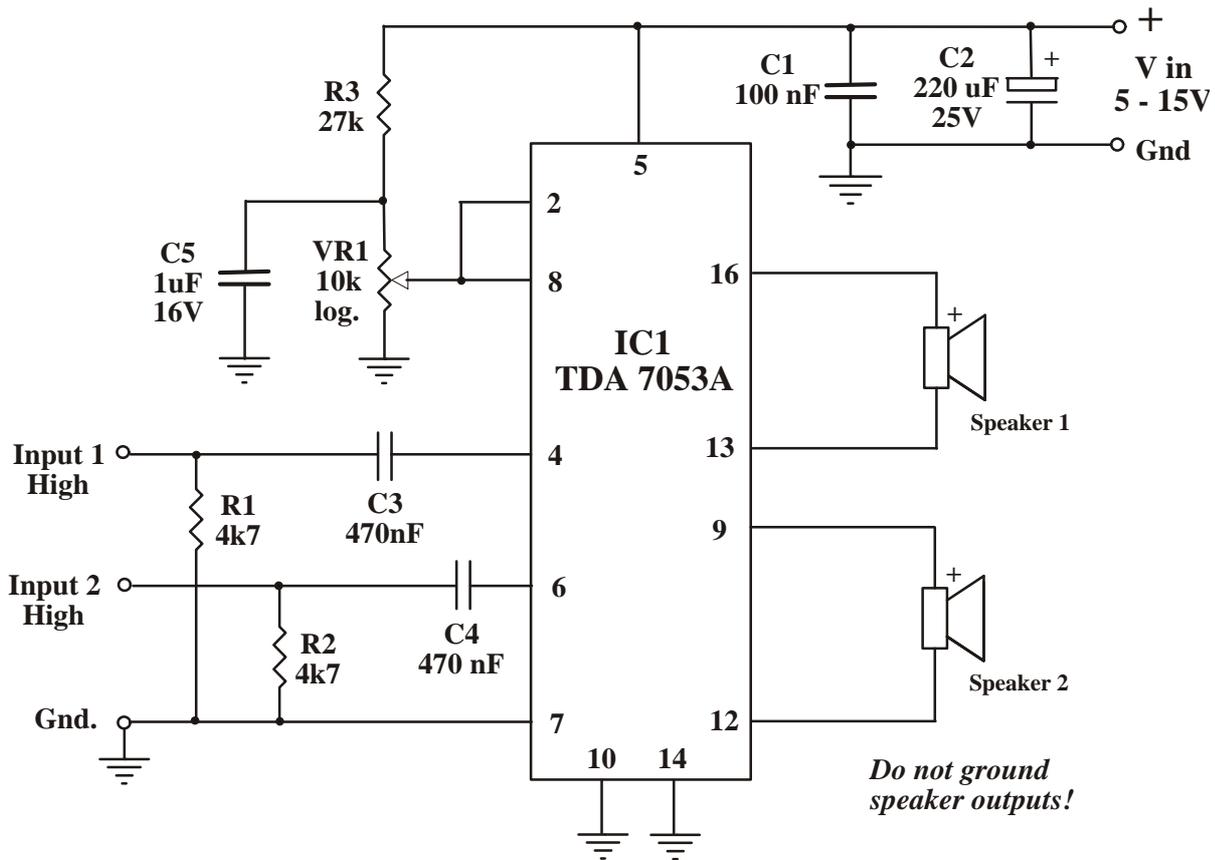
Since the I.C. operates in BTL (bridge tied load) configuration, the outputs are floating with respect to ground. Therefore **no output leads should be connected to ground.**

The Philips data sheet contains all the necessary information about the TDA7053A. You may download it from the software download page on our website at :

**<http://kitsrus.com/pdf/tda7053a.pdf>**

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## Circuit Diagram



### Specifications :

D.C. input : 4.5 – 18 V at > 0.5 - 1A.  
 Idle current < 25 mA  
 Power output > 4W (inst.) @ 8 ohm, 12V D.C.  
 > 1 Watt @ 4 - 16 ohms, 12V  
 > 0.5 Watt @ 8 ohm, 6V  
 > 0.25 Watt RMS continuous  
 Freq. Resp. < 20 Hz to > 100 kHz, – 3dB  
 THD < 1 % @ 0.5W, 8 ohm  
 S/N ratio > 60 dBA, G = 40 dB  
 Gain 40 dB maximum.  
 Input Z ~ 4.7 k ohm.  
 Size 43 mm \* 40 mm

### Components :

#### Resistors

4K7 (yellow, violet, red) R1, R2 2  
 27k (red, violet, orange) R3 1

#### Capacitors

100nF (104) monoblock C1 1  
 220uF 25V ecap C2 1  
 470nF (474) polyester C3, C4 2  
 1uF 16V ecap C5 1

#### Misc.

TDA7053A IC1 1  
 10K ohm log. pot. VR1 1  
 Kit 139 Printed Circuit Board 1  
 16 pin IC socket 1

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Harmonic Distortion at 1 kHz.  
0.5 W output, 8 ohm load,  
12V DC supply.

