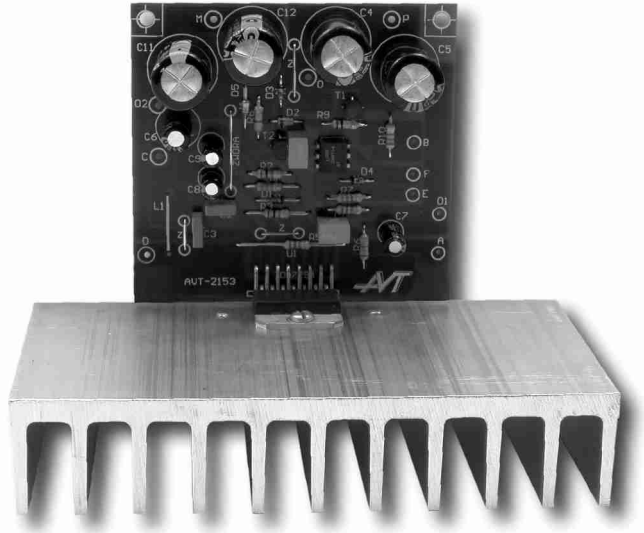


The modern high power mono output amplifier can be assembled by anyone, even by inexperienced electronic specialists because it needs no trimming, regulating or setting operational points.

Recommendations: *the kit is recommended to music lovers as well as to musicians designing audio equipment.*



The TDA7294 integrated circuit is used. The built in muting function, with turn on delay, simplifies the remote operation avoiding on-off switching noises. Both circuits are equipped with a separate reference pin. Thanks to this feature, the reference pin can be connected to a symmetric or non-symmetric power supply.

Electrical characteristics

- Music Power 110W (8W load, power supply $\pm 40V$)
- Music Power 180W (4W load, power supply $\pm 40V$)
- RMS Continuous Output Power 70W (8W load, power supply $\pm 40V$)
- RMS Continuous Output Power 70W (8W load, power supply $\pm 27V$)
- Power Dissipation 50W
- Total Harmonic Distortion 0,005% (5W, 1 kHz)
- Power Supply $\pm 50V$ (recommended $\pm 10\dots 40V$)

Description

The schematic of the amplifier is shown in figure 1. The circuit is symmetrically powered with $\pm 10\dots \pm 40V$. The differences in relation to the IC manufacturer's application datasheet are hardly noticeable. They mostly apply to mute and stand-by circuits. The O1 and A pins constitute the power input of the amplifier. The R1 resistor sets the input resistance. O2 and C are the outputs). The L1 inductor is not assembled for standard use. The C6 capacitor works in the "bootstrap" mode that is voltage shift powering the output stage. The R5 and R6 components fix the gain. The C2-C5, C11, C12 capacitors filter and decouple the power lines. The stand-by and mute functions reference pin is connected to GND. The muting/stand-by

circuit operates as follows: after powering-up the T2 transistor is cut off. The C8 and C9 capacitors are charged through the R2-R4 resistors. When voltages at the STBY and MUTE pins (9, 10) are lower than 1,5V the kit is turned off. Rising voltage at the STBY pin "wakes up" the chip and shortly, the rise in voltage at the Mute pin causes it to change from the mute function to the normal operation. The correct timing of the above components is sufficient to guarantee disturbance-free work while turning on the loudspeakers. Control circuits are included in the kit too. In the normal mode, the optocoupler's LED on the optocoupler's phototransistor is active while the C10 capacitor is discharged. In the normal mode T1 transistor is on and the T2 transistor is off. The collector voltage is limited by the D5 Zener diode (the permissible level of voltage at the MUTE/STBY inputs is not given by the datasheet). The C8, C9, R2-R4 components guarantee disturbance-free work when turning on the amplifier. When the amplifier gets disconnected from the mains, the OPT optocoupler stops to conduct current, while the voltage on the T2 transistor base starts to increase. The transistor opens and discharges the C8 and C9 capacitors using the D1 diode and the R2 resistor. As a result of this the kit is muted and then it is turned off. Thanks to this solution the kit is guaranteed not to produce any switch-on clicks or any other disturbances. In practice, it is not necessary to use both Mute and Standby circuits. The D2 Zener diode is normally used with voltage corresponding to the value of supply voltage. The use of it causes the T1 transistor to cutoff with a drop in voltage to about 7...10V. It is not advised to use the R7, D4 or OPT. Instead of using the C10, make a wire-jumper.

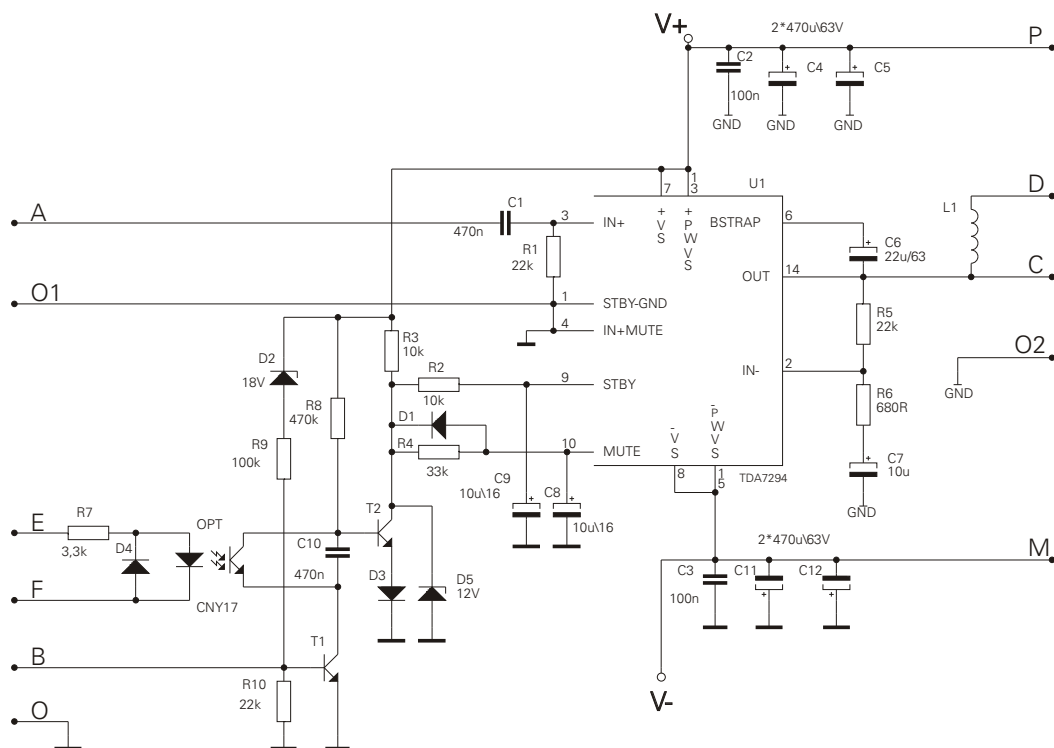
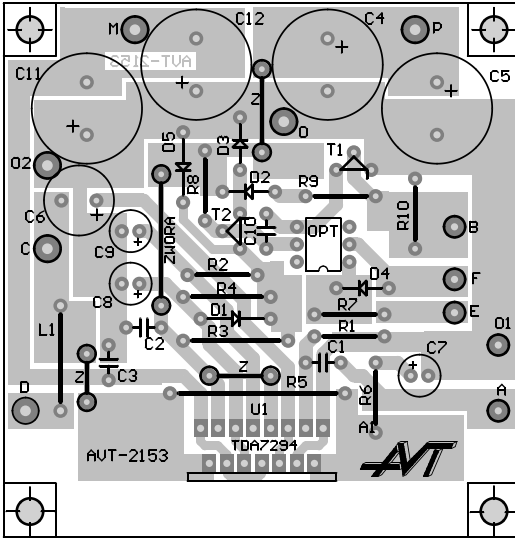



Figure 1. Schematic diagram

Assembly and test

The kit should be assembled on the PCB shown in figure 2. In the standard version the L1, R7, D4 or OPT should not be used. Instead of the C10 capacitor, solder in a wire-jumper. The suggested supplier should use a 2x 24V 200W toroidal transformer, 20A rectifier bridge and two 4700µF/40V capacitors.





Attention!

The TDA7294 kit package is internally connected to a power supply negative rail. Directly attaching the heatsink to the IC connects the heatsink with negative supply voltage instead of ground voltage. In this case the heatsink must be insulated from the IC package

Figure 2. Components layout.

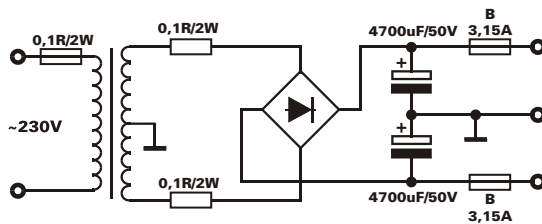
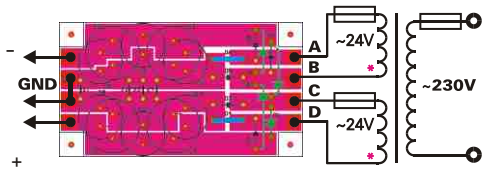
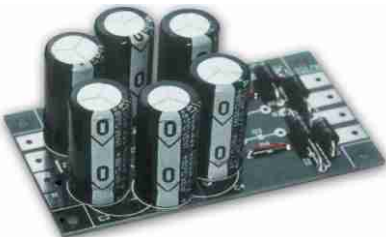


Figure 3. Schematic diagram of the suggested power supply.

As a power supply module we recommend:

The AVT2701 power supply module for amplifiers described in "Elektronika dla Wszystkich 4/04"



Component list

In the order of soldering:

- 1 Z: solder in the wire-jumpers
- 2 R1, R5, R10: 22kW (red-red-orange-gold)
- 3 R3, R2: 10kW (brown-black-orange-gold)
- 4 R4: 33kW (orange-orange-orange-gold)
- 5 R6: 680W (blue-grey-brown-gold)
- 6 R8: 470kW (orange-orange-red-gold)
- 7 R9: 100kW (brown-black-yellow-gold)
- 8 D1, D3: 1N4148
- 9 D2 18V Zener diode
- 10 D5: 12V Zener diode
- 11 OPT1: CNY17 optocoupler
- 12 T1, T2: BC548
- 13 C1, C10: 470nF
- 14 C2, C3: 100nF/63V
- 15 C4, C5, C11, C12: 470µF/63V
- 16 C6: 22 µF/63V
- 17 C7, C8, C9: 10 µF/16V
- 18 attach the PCB to the heatsink
- 19 insert the TDA7294 kit into the PCB isolating it from the heatsink with an insulating sleeve and silicon pad
- 20 attach to the heatsink

The kit was made on the basis of a project bearing the same title published in „Elektronika dla Wszystkich" 8/97



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