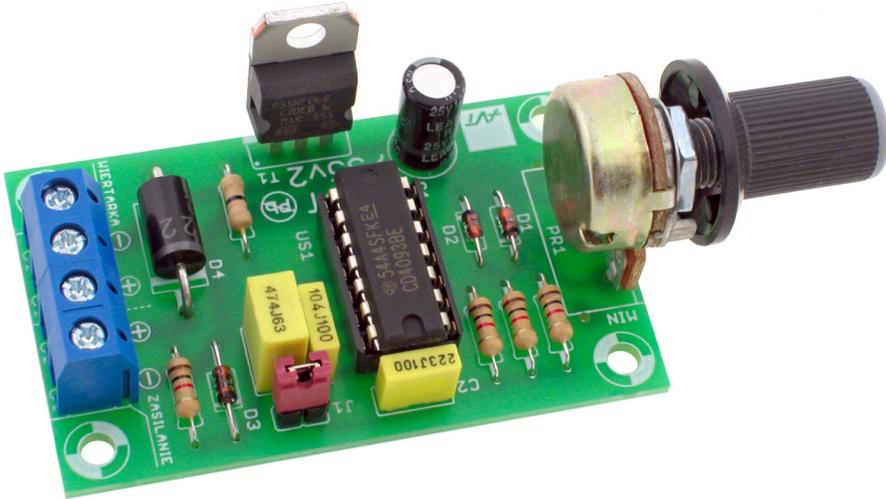


AVT 735

DC switched mode regulator
Modeler drill controller
Economical bulb dimmer



The device can be powered by a battery or DC power supply. The load can be any DC motor or bulb. Thanks to the switched-mode principle, slight energy loss is detected. The output transistor does not require a heatsink. The regulator module is ideal for use with the modeler driller. The regulator ensures that the driller is working at maximum torque even at low rotation speed.

Specifications

- used for speed control in modeler drills
- 6-24V/100W bulb brightness control
- near 100% efficiency at maximum output current 10A
- adjustment of the output waveform with potentiometer
- power supply: 6-25V DC

Functional description

The U1A and U1B gates work in typical two-inverter oscillator mode. Frequency determines the C2 capacitor or in a few cases the C3, as well as the potentiometer PR1 and resistances R2, R3. MOSFET T1 transistor is controlled by two gates U1C, U1D connected in parallel. If the T1 is a MOSFET, then the R4 resistor is not needed and it could be replaced by jumper. If the transistor T1 is a Darlington transistor, use R4=2.2k to limit the base current. Potentiometer PR1 can vary the duty ratio of the output waveform in a wide range from 1 to 99%. Pulses on the T1 gate switch on and turn off the T1 transistor while the average power delivered to the load connected to the Z2

connector depends on the generator duty cycle. In this way the PR1 potentiometer makes it possible to control power delivered to the load. Clamp diode D4 is necessary when the regulator supplies the inductive loads (motors in particular).

Thanks to the switched mode operation principle the power loss of the T1 transistor is low and it does not need heatsink even at currents of several amperes and up to 100W loads. It should be remembered the kit is a power regulator and not a motor rotation regulator, so the speed of motor rotation depends on how heavily it is loaded.

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DIFFICULTY
LEVEL



Component list

Resistors:

R1-R3, R5:.....1kΩ (brown-black-red-gold)

R4:.....0Ω (black)

PR1:rotary potentiometer 100kΩ

Capacitors:

C1:.....100μF !

C2:.....22nF (also marked as 223)

C3:.....470nF (also marked as 474)

C4:.....100nF (also marked as 104)

Semiconductors:

D1, D2:.....1N4148 or similar !

D3:.....12V Zener diode !

D4:.....1N5822 !

US1:.....CMOS 4093 IC with 14-pin IC socket

T1:.....BUZ11, STP5NF06 or similar !

Others:

J1:.....goldpin connector with jumper

Z1:.....2-pin terminal block connector

Z2:.....2-pin terminal block connector

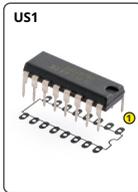
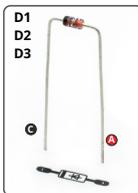


While assembling the components marked with an exclamation mark attention should be paid to their polarity. Symbols of the components on the PCB as well as photos of assembled sets may come in useful. To access high-resolution images, download the PDF file.

<http://bit.ly/2Kmvxjd>

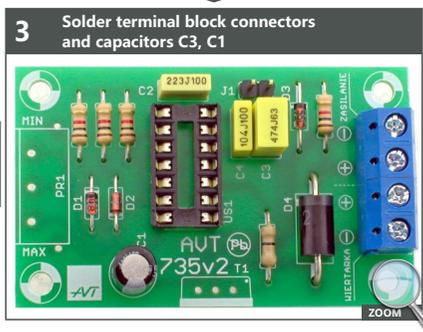
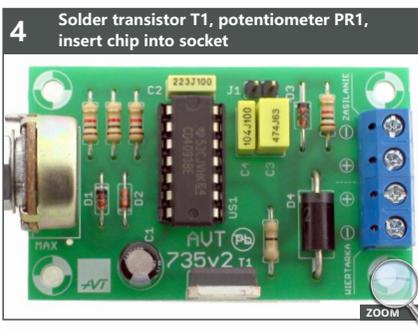
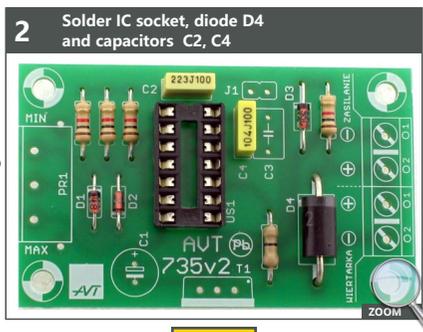
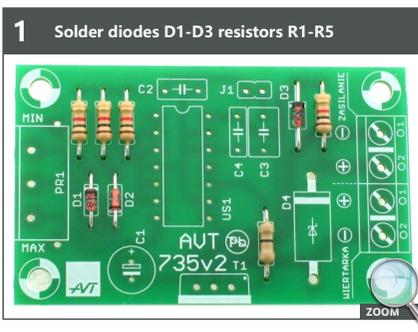


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 Start off by soldering the printed circuit elements in order from smallest to largest. The unit assembled flawlessly, using the supplied components will operate immediately after switching on the power supply.

Assembly in 4 steps



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