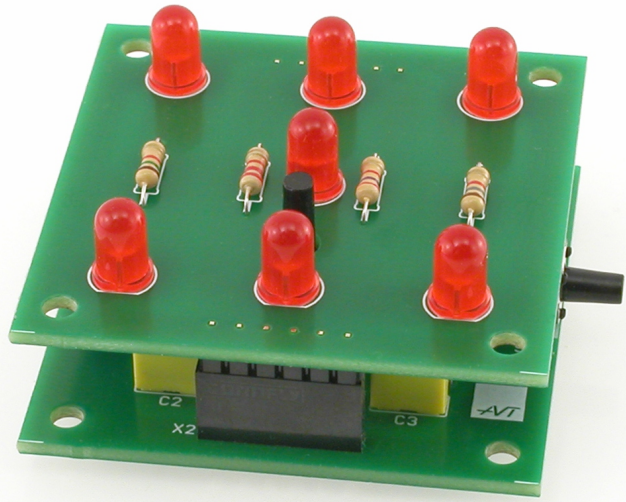
KITS EDUCATIONAL ELECTRONIC

AVT 1661
Electronic dice



The electronic dice replaces traditional, nowadays mostly made of plastic. Pressing the button starts the generation of the result, which is displayed in the reading field with LEDs.

Specifications

- LED diodes to show the result.
- button that begins the draw of the result.
- small number of components.
- supply voltage: 6-9V DC

Functional description

The schematic diagram of the electronic dice is shown in Figure 1. It consists of a generator with T1 and T2 transistors, a Johnson counter with U1 chip and seven LEDs for presenting the result. On the outputs Q0-Q5 of the U1 chip there is a logical high that determines the display of the number of dots by means of LED diodes.

D1-D9 diodes are converting code "1 of 6" to the number of displayed dots. The LEDs show the result of the draw in the same form as the pips on a regular cube.

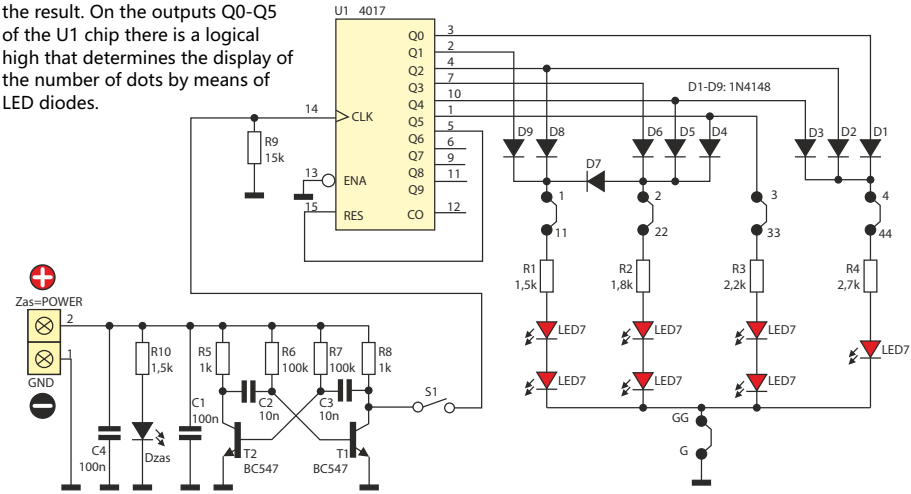


Figure 1. Schematic diagram

DIFFICULTY LEVEL

Assembly and test

Figure 2 shows the location of the components on the PCB. Assembly is typical. It starts with the smallest components and ends up with the biggest ones. After assembling, check that the components have not been soldered in the wrong direction or in the wrong place, and that no short circuit has occurred. The completed electronic dice was built on two PCBs which are connected with each other by plugs and goldpin sockets. The cube works immediately after switching on the power supply in the range of 6-9V DC. Have a fun!

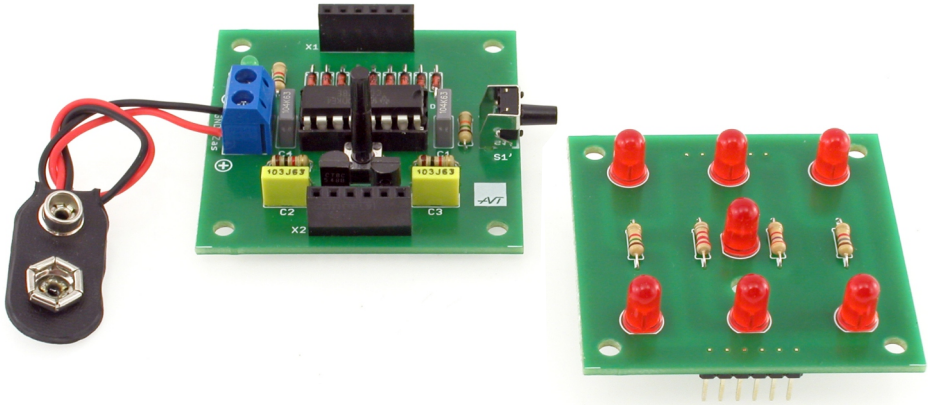


Figure 2.

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.

Component list

Resistors:
R1, R10: .....1,5kΩ (brown-green-red-gold)
R2: .....1,8kΩ (brown-gray-red-gold)
R3: .....2,2kΩ (red-red-red-gold)
R4: .....2,7kΩ (red-violet-red-gold)
R5, R8: .....1kΩ (brown-black-red-gold)
R6, R7: .....100kΩ (brown-black-yellow-gold)
R9: .....15kΩ (brown-green-orange-gold)

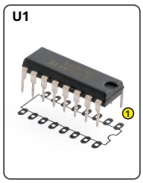
Capacitors:
C1, C4: .....100nF (marked as 104)
C2, C3: .....10nF (marked as 103)

Semiconductors:
U1: .....4017 IC with 16-pin IC socket !
T1, T2: BC547
D1-D9: 1N4148
Dzas: .....LED diode 3 mm
LED1-LED7: .....LED diode 5 mm

Others:
S1 or S1`: .....switch
X1`, X2`: .....goldpin connector 1×6
X1, X2: .....goldpin connector socket 1×6
2-pin terminal block connector
6F22 snap-in connector (red wire ⊕ ; black wire ⊖)

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.

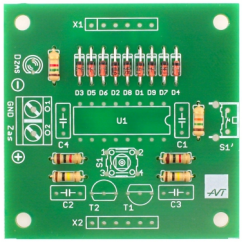
http://bit.ly/2KppGFI
PDF DOWNLOAD



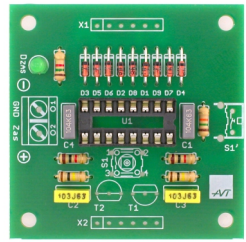
DIFFICULTY LEVEL

Assembly in 8 steps

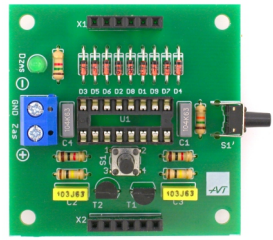
1 Solder diodes D1-D9 and resistors R5-R10



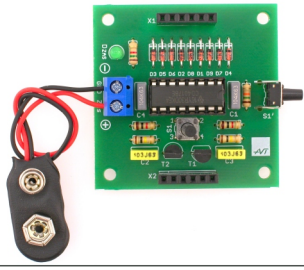
2 Solder IS socket, capacitiors C1-C24 and LED diode



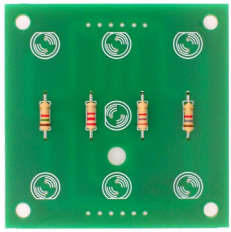
3 Solder transistors T1, T2, connectors X1, X2, terminal block connector and switchs



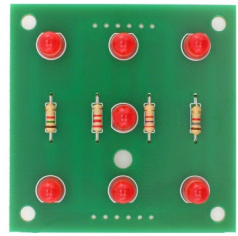
4 Insert chip in to socket and screw the battery holder (red wire ⊕ ; black wire ⊖)



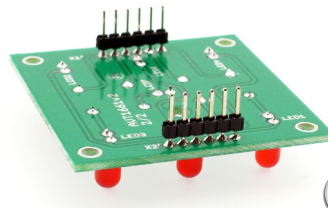
5 Solder resistors R1-R4



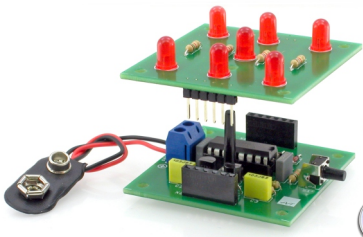
6 Solder LED diodes



7 Solder goldpin connectors X1`, X2`



8 Connect the PCB together



AVT 1661

Electronic dice

DIFFICULTY LEVEL

Notes

Thank you for purchasing AVT product. Please take your time to read carefully the important information below concering use of this product.

Educational Electronics Kits are intended for educational and demonstration purposes only. They are not intended for use in commercial applications. If they are used in such applications the purchaser assumes all responsibility for ensuring compliance with all local laws. In addition, they cannot be used as a part of life support systems, or systems that for use as or as a part of life support systems, or systems that might create a hazardous situation of any kind.

• Battery or wall-adaptor are safe devices. They do not require special attention unless main voltage is connected to an output e.g. a relay.
• If the kit is used to switch currents greater than 24V it is necessary to have the installation and performed by a trained professional authorized for such work. The kit may only be used in such application if it was installed in a safe to touch enclosure.
• Never exceed the limits or ratings listed in the 'Specifications' section at the this user guide.
• If the kit is used in schools or educational facilities or similar institutions the operation must be supervised by trained and authorized staff.
• The product itself and all parts thereof (including packing material) are not suitable toys for childern! (choking hazard, risk of electric shock, ...)

Failures in modern electronic component are very rare as 95% of non-working kits are due to poor soldering or components placed in the wrong location or orientation so please check your work carefully.

DIFFICULTY LEVEL

EDUCATIONAL ELECTRONIC KITS

AVT SPV Sp. z o.o.

Leszczynowa 11 Street,
03-197 Warsaw, Poland
http://avtkits.com/

This symbol means do not dispose of your product with your other household waste. Instead, you should protect human health and the environment by handing over your waste equipment to a designated collection point for the recycling of waste electrical and electronic equipment.