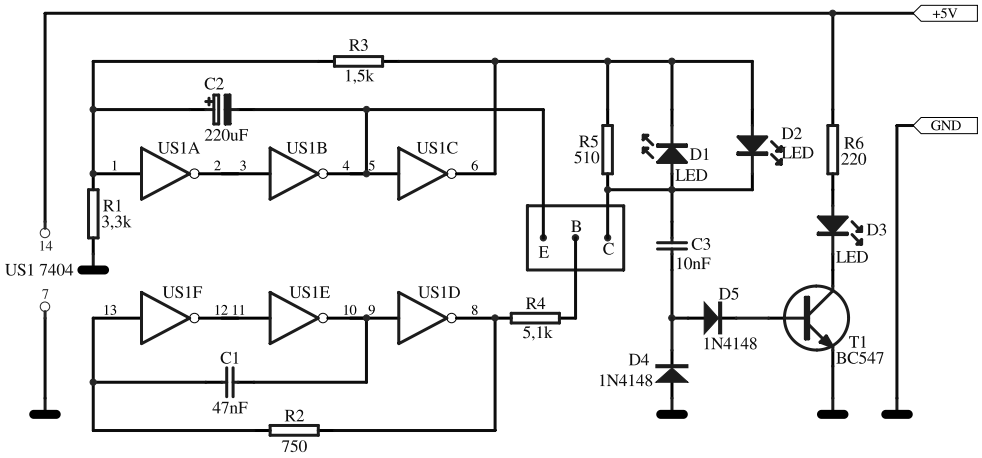
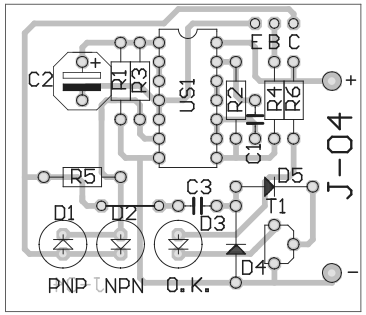


Schematic diagram



Assembly diagram

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J-004 Diode and transistor tester

This electronic diode and transistor tester is a simple device that makes possible the quick defining of the polarity of any low or mediumpower transistor as well as checking if it is operating correctly. It can also be used to test semiconductor diodes. By lighting the relevant LED control lights, the tester allows to define the following characteristics of the examined component:

1. NPN TRANSISTOR POLARITY NPN D2 LED blinking.
2. PNP TRANSISTOR POLARITY PNP D1 LED blinking.
3. FULLY FUNCTIONAL TRANSISTOR OK diode blinking together with D1 and D2.
4. DAMAGED TRANSISTOR SHORTCIRCUIT D1 and D2 blinking interchangeably.
5. DAMAGED TRANSISTOR BREAK No diode on.
6. PN (DIODE) JUNCTION ON IN THE CE DIRECTION D2 LED blinking.
7. PN (DIODE) JUNCTION ON IN THE EC DIRECTION D1 LED blinking.

Moreover, it is possible to assess the quality of the transistor (current gain) by comparing the brightness of the individual LED control lights: For B and C group transistors with a gain of over 200, the OK light is brighter than the PNP and NPN ones. If the OK LED is shining very weakly then the transistor is damaged, reversed (the collector and emitter locations have been switched), or the gain is so small as to be useful only as a lowpower diode.

The tester unit design is based on the 7404 (74LSO4) integrated circuit, or equivalent. Two square wave oscillators with frequencies of several hertz and several kilohertz, as appropriate, have been created using the six gates of the circuit and the C1, C2, and R1R3 components. These signals, sent to the E B C terminals, are used for testing the examined component. The oscillator and examined component are coupled with the D4, D5, and T1 detector, which makes possible confirmation as to whether the transistor is in working order (if it provides gain). When properly assembled, the tester circuit requires no setup or adjustments. It works immediately upon being activated. In light of requirements relating to TTL circuit power supplies, it is best to provide the tester with regulated 5V voltage, although it is also possible to use 4.5 or 6V batteries.

LIST OF COMPONENTS IN THE SET:

US1.....UCY7404,itp
R1.....3,3-3,6kΩ
R2.....750Ω
R3.....1,5kΩ
R4.....5,6kΩ
R5.....510Ω
R6.....220Ω
T1.....BC547,548
D1.....LED 5mm red
D2..... LED 5mm green
D3.....LED 5mm yellow
D4,D5.....1N4148
C1.....47nF MKSE
C2.....220uF/16V
C3.....10nF MKSE
PCB
DIL14

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