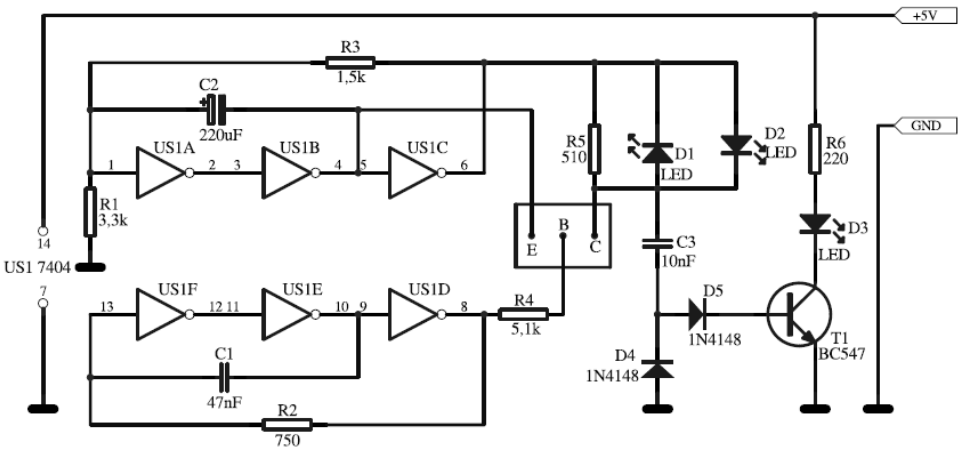
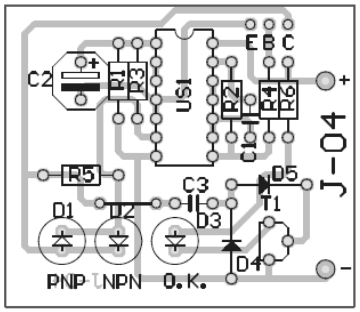


Schematic diagram



Assembly diagram

J-004 Transistor tester

Electronic transistor tester is a simple tool which allows determining low and medium power transistors polarization very fast and checking if it is fully operational. It also allows checking semiconductor diodes. Lighting particular LED indicators allows determining following states of unit under test:

1. NPN TRANSISTOR POLARIZATION – **D2** "NPN" LED flashing.
2. PNP TRANSISTOR POLARIZATION – **D1** "PNP" LED flashing.
3. FULLY OPERATIONAL TRANSISTOR – "OK" LED flashing with **D1** or **D2** LED.
4. TRANSISTOR DAMAGED – SHORT – **D1** and **D2** LED flashing alternately.
5. TRANSISTOR DAMAGED – OPEN – no LED flashing.
6. PN JUNCTION (DIODE) IN C-E DIRECTION – **D2** LED flashing
7. PN JUNCTION (DIODE) IN E-C DIRECTION – **D1** LED flashing

Tester additionally allows checking transistor quality (current amplification) by comparing particular LEDs brightness: for group B and C transistors with amplification above 200, "OK" LED lights brighter than "PNP" or "NPN". "OK" LED lighting very weak means the transistor is damaged, connected inversely (collector and emitter swapped) or its amplification is so low, that it can be used only as low power diode.

Tester design is based on 7404 (74LS04) chip or its equivalent. Six gates of this chip containing C1, C2, R1-R3 components create two square wave generators with frequency a few hertz and a few kilohertz respectively. These signals applied to E B C terminals are used for testing purposes. There is detector D4, D5, T1 coupled with generator and tested component allowing to determine whether transistor is good (testing its amplification). Correctly assembled chip doesn't need powering up or adjusting – it works immediately after turning on. Because of TTL integrated circuits powering requirements, it's best to power tester by stabilized 5V voltage, however it's also possible to use 4, 5 or 6V battery.

Package contains:

US1	.....	UCY7404, etc.	D3	.....	yellow LED 5mm
R1	.....	3,3-3,6k	D4,D5	.....	1N4148
R2	.....	750	C1	.....	47nF MKSE
R3	.....	1.5k	C2	.....	220uF/16V
R4	.....	5.6k	C3	.....	10nF MKSE
R5	.....	510	PRINTED CIRCUIT BOARD		
R6	.....	220	DIL 14 HOLDER		
T1	.....	BC547,548			
D1	.....	red LED 5mm			
D2	.....	green LED 5mm			