

Transistor Tester assembly instructions

This is a guide to help. When you got the Transistor Tester Component package and want to assemble it.

designator	Component Name	Component parameters	Footprint	Number of parts
R19 ,R20	Metal film resistor	1K Ω 1/4W 1%	Axial0.3	2
R16	Metal film resistor	2.2K Ω 1/4W 1%	Axial0.3	1
R12 ,R7	Metal film resistor	3.3K Ω 1/4W 1%	Axial0.3	1
R22,R17,R18,R11,R21,R13	Metal film resistor	10K Ω 1/4W 1%	Axial0.3	6
R24	Metal film resistor	20K Ω 1/4W 1%	Axial0.3	1
R15,R8	Metal film resistor	27K Ω 1/4W 1%	Axial0.3	2
R10	Metal film resistor	33K Ω 1/4W 1%	Axial0.3	1
R9	Metal film resistor	100K Ω 1/4W 1%	Axial0.3	1
R23	Metal film resistor	180K Ω 1/4W 1%	Axial0.3	1
R14	Metal film resistor	220 Ω 1/4W 1%	Axial0.3	1
R4, R2, R6	Metal film resistor	470K Ω 1/4W 1%	Axial0.3	3
R1, R3, R5	Metal film resistor	680 Ω 1/4W 1%	Axial0.3	3
Y1	Quartz crystal	8Mhz	HC-49	1
C7 , C8	ceramic capacitor	22pF 20% silk(220)	RAD0.2	2
C1	ceramic capacitor	1000pF 20% silk(102)	RAD0.2	1
C2	ceramic capacitor	10nF 20% silk(103)	RAD0.2	1
C3, C4, C5, C6, C11	ceramic capacitor	100nF 20% silk(104)	RAD0.2	5
CESD	ceramic capacitor	100nF 20% no silk	0805	1
C9, C10	Aluminum electrolytic capacitor	10uF 20%	RB.2/4	2
T3	bipolar junction transistor	PNP silk(9012)	TO-92	1
T1 ,T2	bipolar junction transistor	NPN silk(9014)	TO-92	2
U1	AVR MCU	ATMEGA328P -PU	DIP28	1
U2	Regulator	HT7550	TO-92	1
U3	Precision References	TL431	TO-92	1
ESD	Low Capacitance TVS Diode Array	SRV05-4 silk (MC5)	SOT-23 6L	1
ZD	Transient Volt. Suppressor (TVS)	P6KE6V8 silk (6V8C)	1812	1
LED1	Light Emitting Diode	Φ 3 MM		1
J3	Test bench	14P	DIP14	1
DC1	DC jack	5.5-2.1MM	DC-005	1
TEST1	rotary pulse encoder + switch			1
J4,J5,JP1	connecting terminal	Lead space 5.08MM		3
J2	pin header + female header	8P		1 each
	copper pillar	3MM *11MM		6
	bolt	3MM		8
	TFT LCD module	160*120 pixel with 16bit full color		1
	Main board PCB	60 * 77 MM		1

I recommend to first check all the component with the list and compare before you pick up your soldering iron. Now that all of them have being checked, the Components package have no excess. So when you finish the assembly process, the only left component is the empty plastic bag.

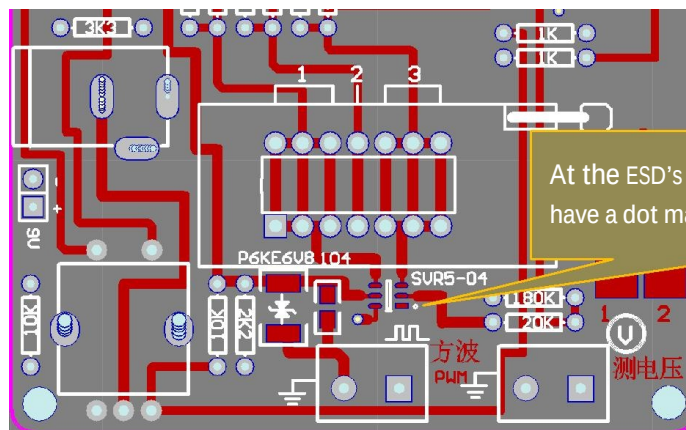
The *Transistor Tester* have three SMT components: Their designators are ZD, CESD and ESD. These 3 components should be soldered first, because they are the smallest size of all components. Their role is to protect the MCU against transient high voltage. In fact *the Transistor Tester* can normally work without these three parts . The ZD and CESD have no polarity, so you can soldering this two with no matter. The ESD has six pins. We need first to find PIN 1, the photo will help you:

The dot mark the PIN 1



(note: on the top, the silk maybe "MC5", "VC5" or "LC5", they mean the same)

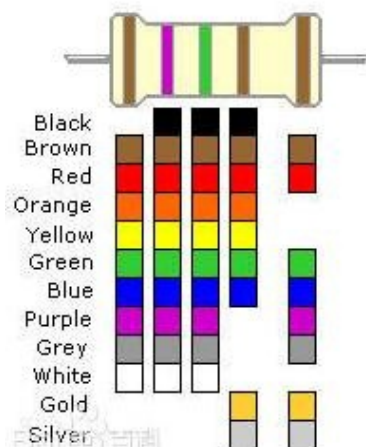
In the *Transistor Tester* main board PCB,



At the ESD's installation site, there also have a dot marked PIN1's position

The ESD is the most difficult part to solder. If you are not sure, you can leave this empty, it's not a mistake. When you have done these , use some organic solvent like (100% ethyl alcohol or Thinner or other Plate washer water) to clean before next.

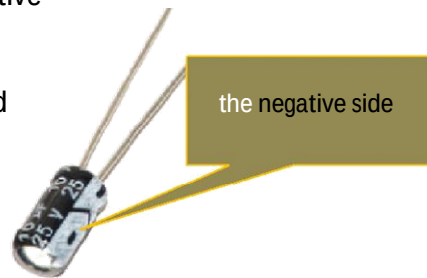
Next: The Metal film resistor can now be soldered on the *Transistor Tester* main board PCB, all of the resistor's installation site is printed with the expected value. So you can easily find out the right one for each. If you are not sure about the color rings, measure them once before soldering This picture can help you to recognize them well.



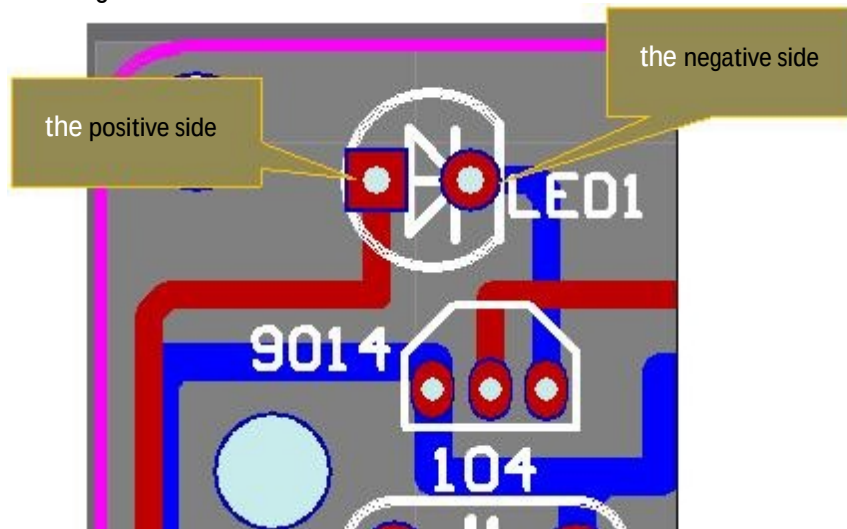
The example resistor value = 1750Ω 1%

Next, the ceramic capacitor can be soldered, ceramic capacitors do not have a polarity. The *Transistor Tester* main board PCB has the capacitor's values silk printed and the ceramic capacitor body also has its value, so this should be clear enough for you. The exception is the 22pF, the PCB is printed "22", but the ceramic capacitor silk is 220, but they are same thing.

Aluminum electrolytic capacitors have polarity. The positive lead is longer than its negative lead. The installation site has its value printed, the positive lead has a “+”. On the shell of the Aluminum electrolytic capacitor, a wide band with white color points to its negative side.



The light-emitting diode has also a polarity, like the Aluminum electrolytic capacitor, the positive has a longer lead than its negative lead. On the PCB:

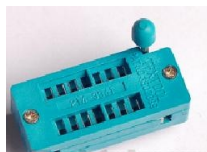


The quartz crystal



has no polarity.

When you soldering the Test socket,



please keep hand shank in the unlock state.

The rest of the component package should be simple enough.

Very important note:

When you have complete the soldering, maybe you need to use some “Plate washer water” to clean the soldering side. When doing so, please take care about the “rotary pulse encoder with switch”, its component’s body may not be in contact with any fluid except it pins. The “Plate washer water” can destroy the internal of the “rotary pulse encoder with switch”. The same rule applies to the “TFT LCD module”. The “TFT LCD module” may not be in contact of the fluid anywhere.