

## The *Transistor Tester* assembly instructions

This article is a guide to help . when you have received the Transistor Tester Component package. and want to assembly them all together.

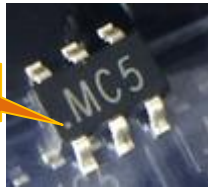
First show component list. I recommend that you have to use follow list to Compare before you pick up your soldering iron.

designator	Component Name	Component parameters	Footprint	Number of Component
R19 ,R20	Metal film resistor	1KΩ 1/4W 1%	Axial0.3	2
R16	Metal film resistor	2.2KΩ 1/4W 1%	Axial0.3	1
R12 ,R7	Metal film resistor	3.3KΩ 1/4W 1%	Axial0.3	1
R22,R17,R18,R11,R21,R13	Metal film resistor	10KΩ 1/4W 1%	Axial0.3	6
R24	Metal film resistor	20KΩ 1/4W 1%	Axial0.3	1
R15,R8	Metal film resistor	27KΩ 1/4W 1%	Axial0.3	2
R10	Metal film resistor	33KΩ 1/4W 1%	Axial0.3	1
R9	Metal film resistor	100KΩ 1/4W 1%	Axial0.3	1
R23	Metal film resistor	180KΩ 1/4W 1%	Axial0.3	1
R14	Metal film resistor	220Ω 1/4W 1%	Axial0.3	1
R4,R2,R6	Metal film resistor	470KΩ 1/4W 1%	Axial0.3	3
R1,R3,R5	Metal film resistor	680Ω 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 Voltage Suppressors( TVS )	P6KE6V8 silk(6V8C)	1812	1
LED1	Light Emitting Diode	Φ3MM		1
J3	Test bench	14P	DIP14	1
DC1	DC jack	5.5-2.1MM	DC-005	1
TEST1	rotary pulse encoder with switch			1
J4,J5,JP1	connecting terminal	Lead space 5.08MM		3
J2	pin header and 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

The *Transistor Tester* have three SMT Components: Their designator are ZD,CESD and ESD. The three Components should be soldering first, because they are the smallest size in the whole Components.

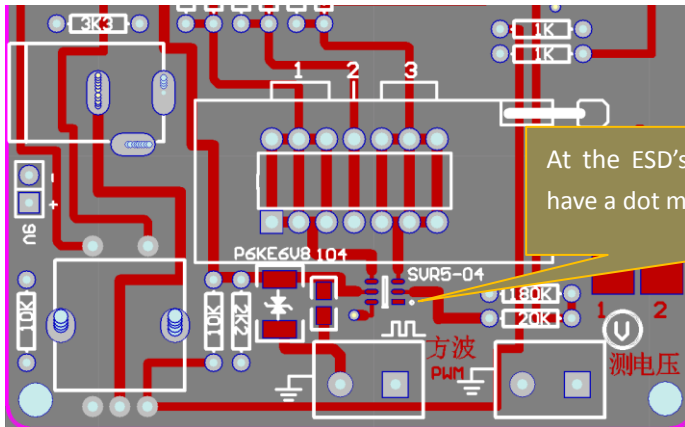
Their role is to protect the MCU against Transient high voltage. In fact, the Transistor Tester can normally work without them. The ZD and CESD have no polarity, so you can soldering this two with no matter. The ESD have six pins. need first to find she's PIN 1, follow photo will help you

The dot mark the PIN 1



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

In the Transistor Tester main board PCB,



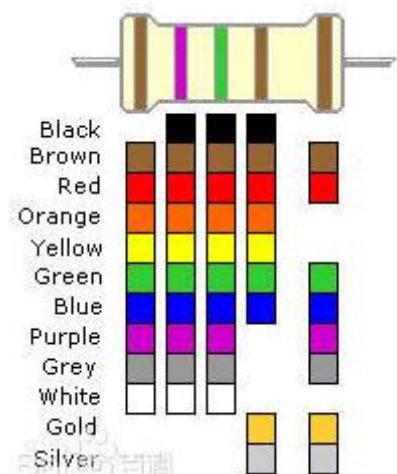
At the ESD's installation site, there also have a dot marked PIN1's position

the ESD is the most difficult part to soldering. if not sure, you can leave this empty. it's not a mistake.

When you have done the three, use some organic solvent like (absolute ethyl alcohol or Thinner or other Plate washer water) to clean before next.

Next:

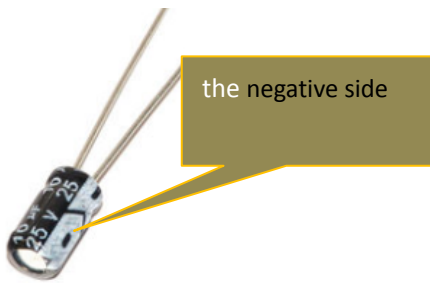
The Metal film resistor can now soldering, on the Transistor Tester main board PCB, all of the resistor's installation site is printed with the expect value. So you can easy to find out the right one for each, if don't sure about the Color ring, meter once before soldering. this photo can help you recognition.



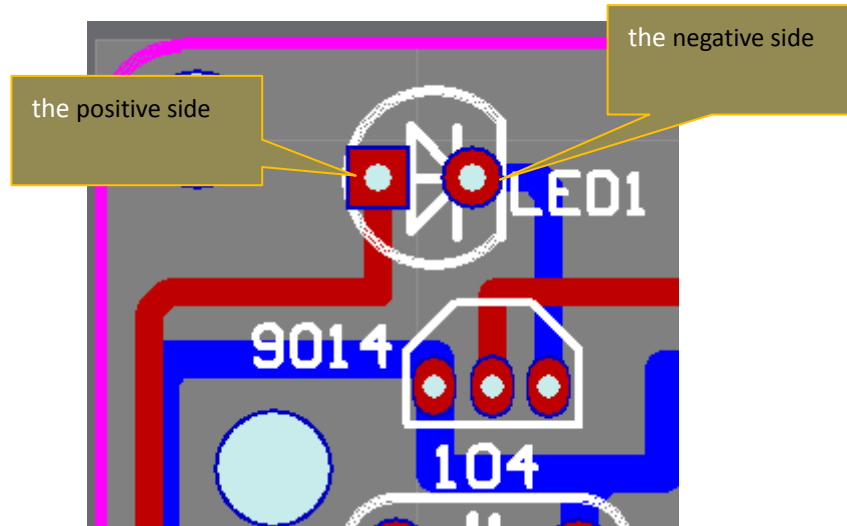
The example resistor value = 1750Ω 1%

Next, the ceramic capacitor can be soldering, ceramic capacitor do not have polarity. The Transistor Tester main board PCB is printed the capacitor's value for each. And the ceramic capacitor body also silk it value, so this is clear enough for you. the exception is the 22pF, the PCB is printed "22", but the ceramic capacitor is silk 220, they are same thing.

The Aluminum electrolytic capacitor have polarity, the positive have the longer lead than it negative. its installation site is printed its value, and the positive is carry with a "+". On the shell of the Aluminum electrolytic capacitor, a wide band with white color is point its negative side.



The light-emitting diode have polarity, like the Aluminum electrolytic capacitor, the positive have the longer lead than it negative. On the PCB



The Quartz crystal have no polarity.

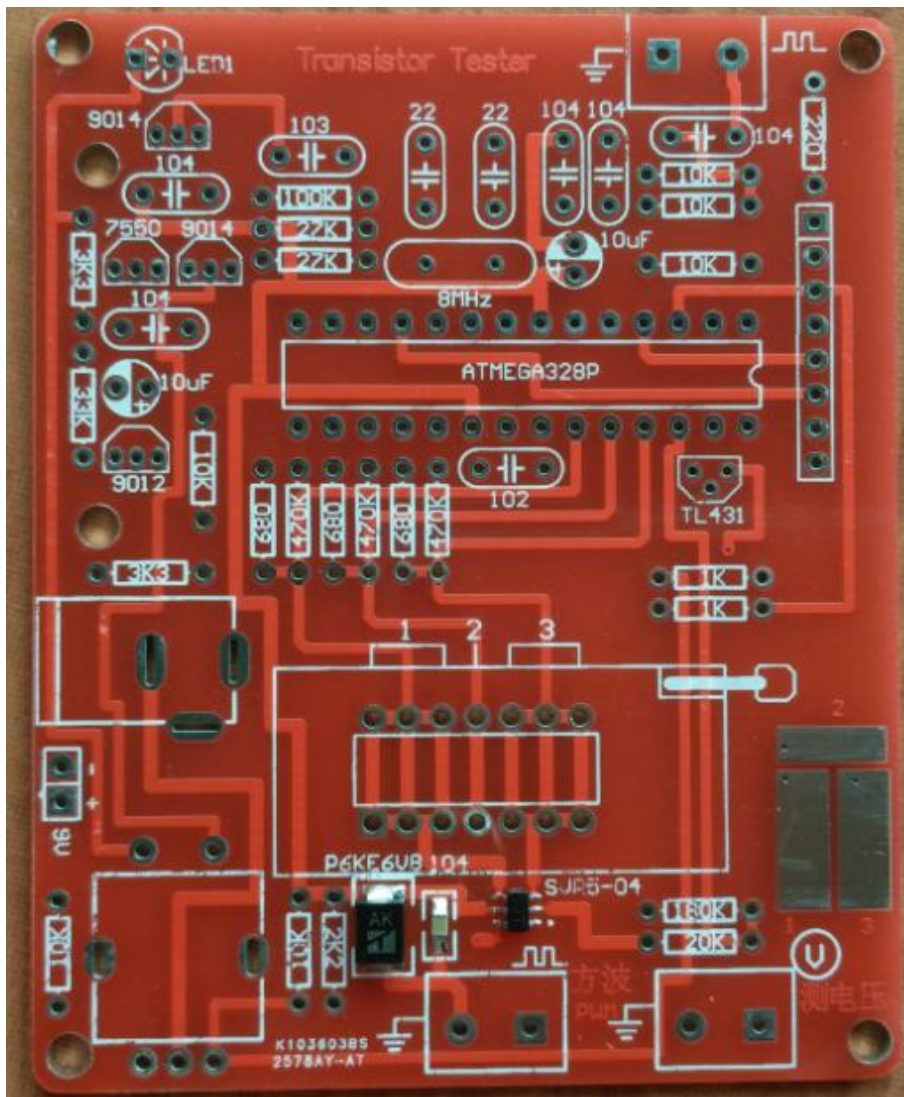
When you soldering the Test bench,  please keep hand shank in unlock state.

For the rest of the Component package , is simple enough. I will attached some photo at the last of the article.

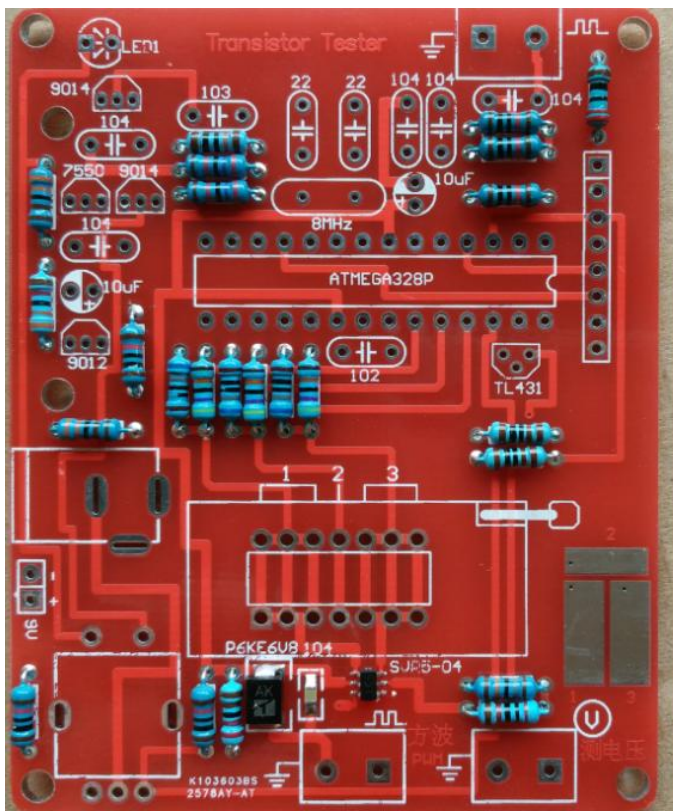
Very important note:

When you have complete the soldering, maybe you will use some "Plate washer water" to clean the soldering side, when doing so . please keep Care about the "rotary pulse encoder with switch", this Component's body cannot contact any "Plate washer water" except it Pins. The "Plate washer water" can destroy the internal of the "rotary pulse encoder with switch".

The same rule is apply the "TFT LCD module" too, the "TFT LCD module" cannot meet "Plate washer water" anywhere.



The three SMT part. transistor tester can regular work without them , with no problem, yes. When finish, clean them for next step.



The metal film resistor , there have some confusing is the 33K and 3.3K , 2.2K and 220, mind you. This two look much the same.



With capacitor

