

# CHA-81 LED Follow Spot Lights LED Game DIY Kit

## 1.Introduction:

CHA-81 is a LED Follow Spot Lights LED Game DIY Kit.

It can make the LED move along the X-axis/Y-axis/XY-axis, and the moving direction can be controlled by the buttons.

It can also adjust the speed of the LED movement, resulting in a variety of LED blinking effects.

It is a very interesting DIY electronic product which enables users to understand the circuit more clearly and learn welding skills.

## 2.Parameter:

1>.Product Name:CHA-81 LED Follow Spot Lights LED Game DIY Kit

2>.Product Number:CHA-81

3>.Work Voltage:DC 4.5V-9.0V

4>.Power Type:3.5mm Power Socket

5>.Color:Red LED

6>.Work Temperature:-40°C~85°C

7>.Work Humidity:5%~85%RH

8>.Size(Installed):97\*73\*24mm

## 3.Function:

1>.Moving direction:Left to right, bottom to top.

2>.X-F Button is used to turn ON/OFF moving control in X-axis. Note:The default movement method remains unchanged.

3>.Y-F Button is used to turn ON/OFF moving control in Y-axis. Note:The default movement method remains unchanged.

4>.XY-F Button is used to turn ON/OFF moving control in XY-axis. Note:The default movement method remains unchanged. The effect presented is that the LED moves to the upper right corner.

5>.S1 Button is used to turn ON/OFF work power supply.

6>.X-SPEED Potentiometer is used to adjust LED's moving speed in in X-axis.

7>.Y-SPEED Potentiometer is used to adjust LED's moving speed in in Y-axis.

8>.Reserved power pad interface, convenient for users who need to install non-USB power supply such as batteries.

## 4.Component List:

NO.	Component Name	PCB Marker	Parameter	QTY
1	Metal Film Resistor	R13-R21	220ohm	9
2	Metal Film Resistor	R1	3.3Kohm	1
3	Metal Film Resistor	R2-R12	10Kohm	11
4	Potentiometer	VR1,VR2	100Kohm	2
5	Ceramic Capacitor	C6	0.1uF 104	1
6	Monolithic Capacitor	C2,C4	0.22uF 224	2
7	Electrolytic Capacitor	C3,C5	1uF 50V	2
8	Electrolytic Capacitor	C1	220uF 16V	1
9	Red LED	L1-L81	5mm	81
10	S9014 Transistor	Q1-Q18	TO-92	18
11	Self-locking Switch	S1-S4	5.8*5.8mm	4
12	DC Socket	J1	3.5mm	1
13	CD4017	U2,U4	DIP-16	2
14	NE555	U1,U3	DIP-8	2
15	USB to 3.5mm Power Wire		80cm	1
16	PCB		97*73*1.6mm	1

Note:Users can complete the installation according to the PCB silk screen and component list.

## 5.Installation Tips:

1>.User needs to prepare the welding tool at first.

- 1.1>.Soldering iron (<50 Watt)
- 1.2>.Rosin core ("radio") solder
- 1.3>.Wire cutters
- 1.4>.Wire strippers
- 1.5>.Philips screwdriver
- 2>.Please be patient until the installation is complete.
- 3>.The package is DIY kit.It need finish install by user.
- 4>.The soldering iron can't touch the components for a long time(1.0 second), otherwise it will damage the components.
- 5>.Pay attention to the positive and negative of the components.
- 6>.Strictly prohibit short circuit.
- 7>.User must install the LED according to the specified rules.Otherwise some LED will not light.
- 8>.Install complex components preferentially.
- 9>.Make sure all components are in right direction and right place.
- 10>.Check that all of the LED can be illuminated.
- 11>.It is strongly recommended to read the installation manual before starting installation!!!
- 12>.Please wear anti-static gloves or anti-static wristbands when installing electronic components.

## 6.Installation Steps(Please be patient):

- Step 1: Install 9pcs 220ohm Metal Film Resistor at R13-R21.
- Step 2: Install 11pcs 10Kohm Metal Film Resistor at R2-R12.
- Step 3: Install 1pcs 3.3Kohm Metal Film Resistor at R1.

Step 4: Install 2pcs DIP-8 IC NE555 at U1,U3.There is a gap mark on one end of the IC and there is a gap mark on PCB silk screen where the IC can place on.These two marks are corresponding to each other and are used to specify the installation direction of the IC.

Step 5: Install 2pcs DIP-16 IC CD4017 at U2,U4.There is a gap mark on one end of the IC and there is a gap mark on PCB silk screen where the IC can place on.These two marks are corresponding to each other and are used to specify the installation direction of the IC.

- Step 6: Install 1pcs 0.1uF 104 Ceramic Capacitor at C6.
- Step 7: Install 1pcs 0.22uF 224 Ceramic Capacitor at C2,C4.

Step 8: Install 1pcs 220uF 16V Electrolytic Capacitor at C1.Pay attention to distinguish between positive and negative pole and bending pins. The Longer pin is positive pole.The longer pin is inserted into the rectangular pad.

Step 9: Install 1pcs 1uF 50V Electrolytic Capacitor at C3,C5.Pay attention to distinguish between positive and negative.The Longer pin is positive pole.The longer pin is inserted into the rectangular pad.

Step 10: Install 18pcs TO-92 S9014 Transistor at Q1-Q18. Pay attention to the installation direction. The arc on the PCB corresponds to the arc of the components.

Step 11: Identify the positive(anode) and negative(cathode) lead of LED.The leads of the LED must be installed correctly, otherwise the LED cannot be turned on.Here are four methods as following:

- 11.1>.According to the length of the LED lead to distinguish. The longer pin is positive(anode) lead. The shorter pin is negative(cathode) lead.
- 11.2>.Identify the negative(cathode) of the LED is to look into the plastic case where one can see that the negative(cathode) is much thicker/bigger inside the plastic case than the anode lead.
- 11.3>.Identify by edge of plastic case.The negative(cathode) lead of the LED should be the pin nearest the flat on the plastic case.
- 11.4>.Test by 3V battery or multimeter.The pin is positive(anode) lead which has connect to the positive of 3V if LED can light up after connect 3V power supply.(LED should not be powered directly from the 3V for a short time:less then 0.5second)
- 11.5>.It is positive(anode) where the white mark " + " pointing to on PCB.

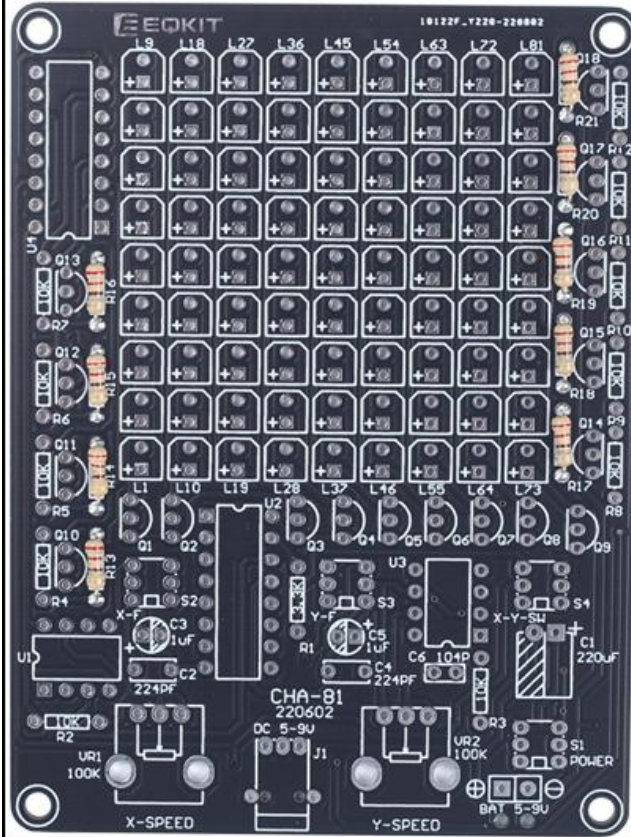
Step 12: Install 81pcs 5mm Red LED at L1-L81. Tops: Install the middle LED at first.

Step 13: Install 1pcs 3.5mm DC Socket at J1. Tops: Secure the socket with metal wire which cut from components.

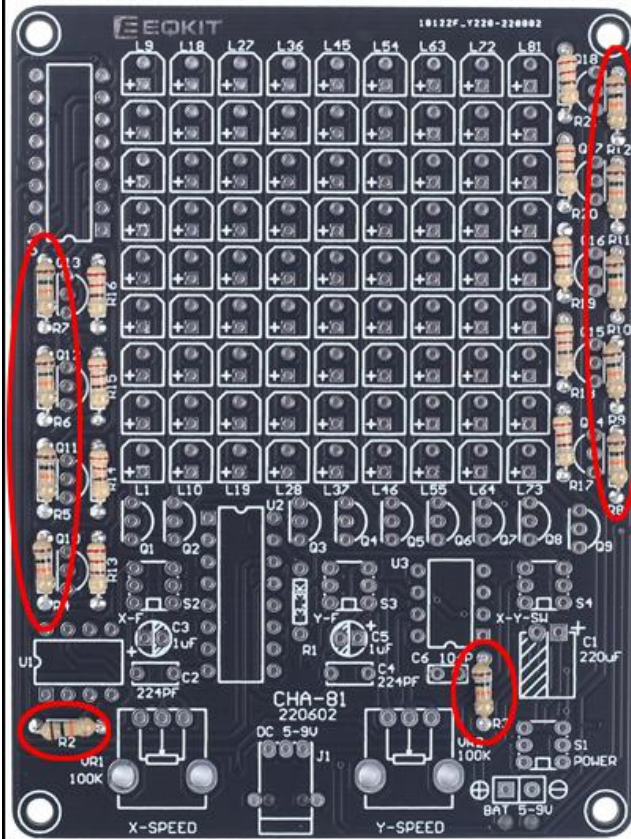
- Step 14: Install 4pcs 5.8\*5.8mm Self-locking Switch at S1-S4.
- Step 15: Install 2pcs 100Kohm Potentiometer at VR1,VR2.

## 7.Install shown steps:

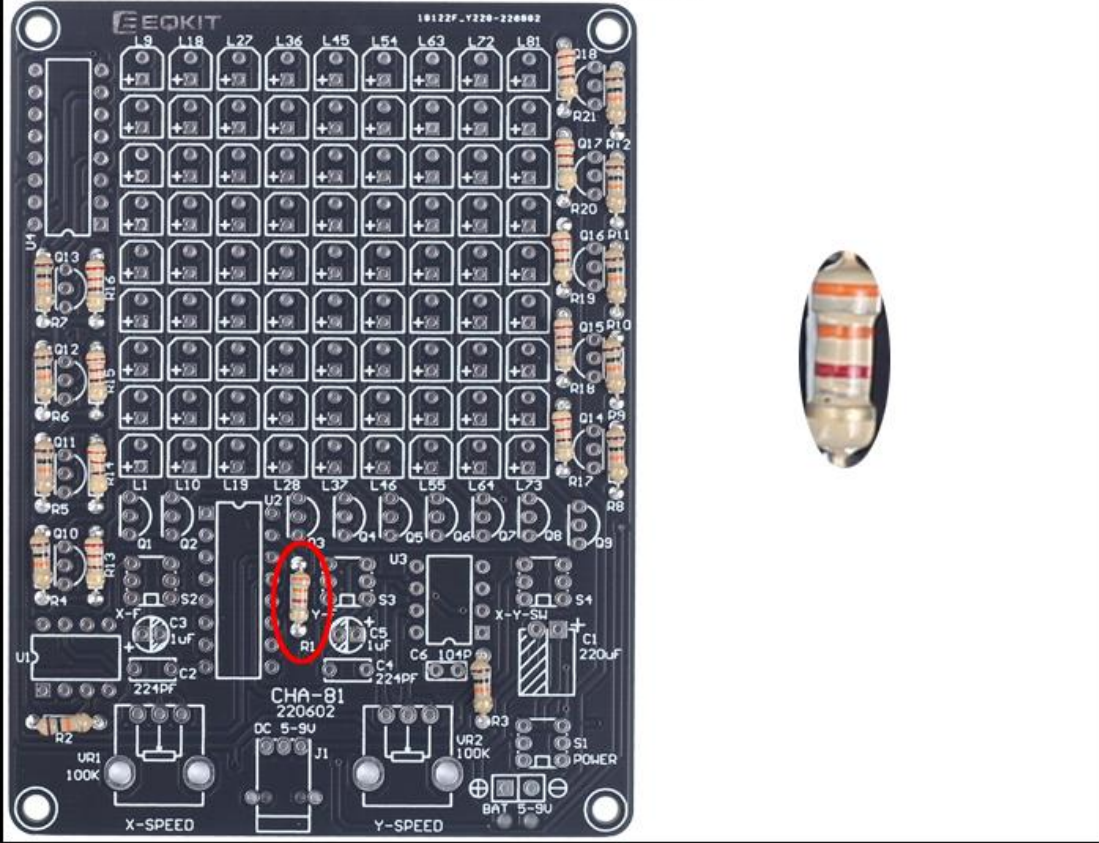
Step 1: Install 9pcs 220ohm Metal Film Resistor at R13-R21.



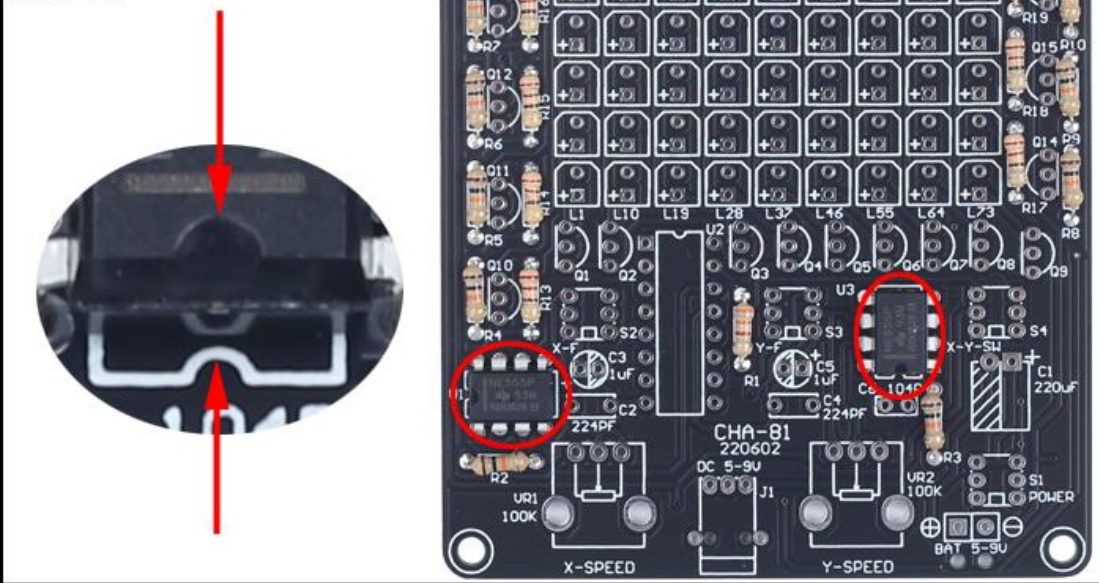
Step 2: Install 11pcs 10Kohm Metal Film Resistor at R2-R12.



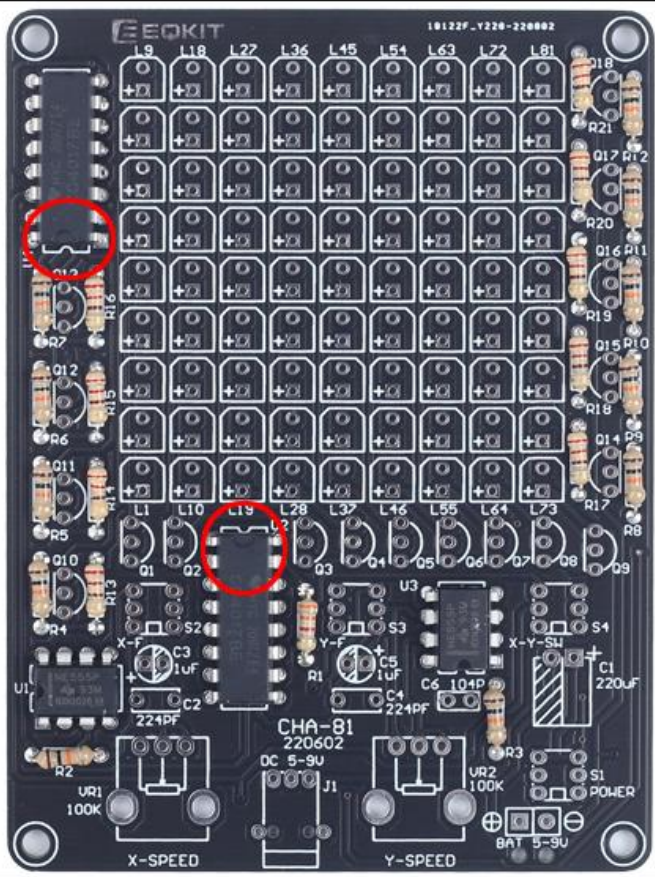
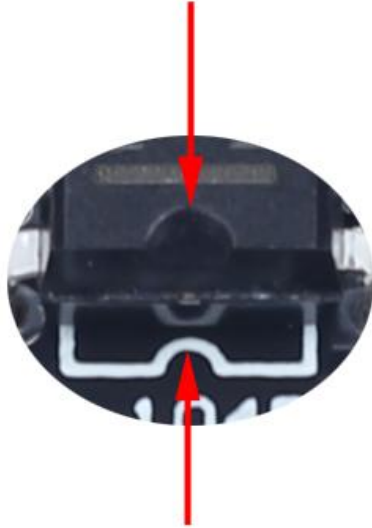
Step 3: Install 1pcs 3.3Kohm Metal Film Resistor at R1.



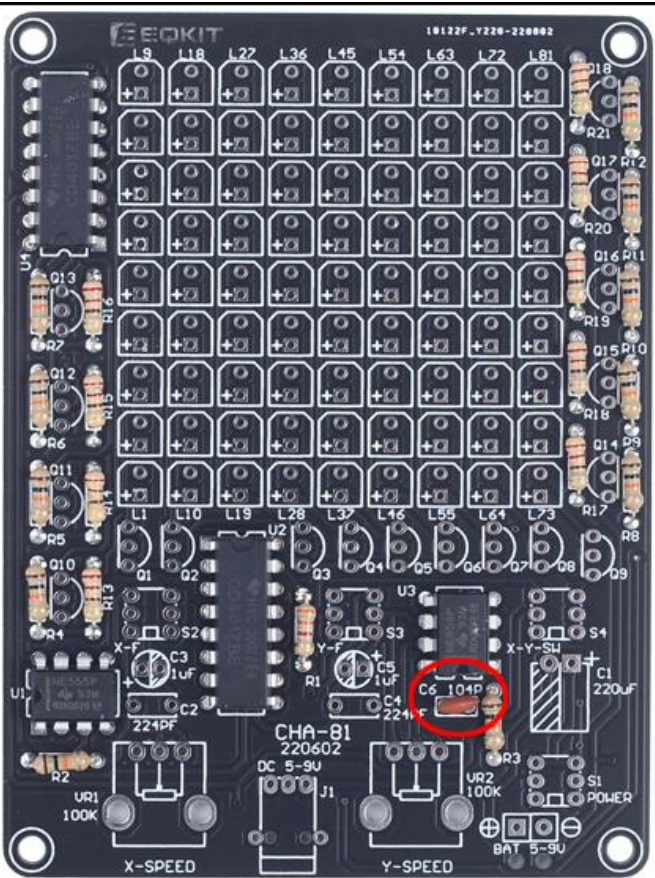
Step 4: Install 2pcs DIP-8 IC NE555 at U1,U3. There is a gap mark on one end of the IC and there is a gap mark on PCB silk screen where the IC can place on. These 2 marks are corresponding to each other and are used to specify the installation direction of the IC.



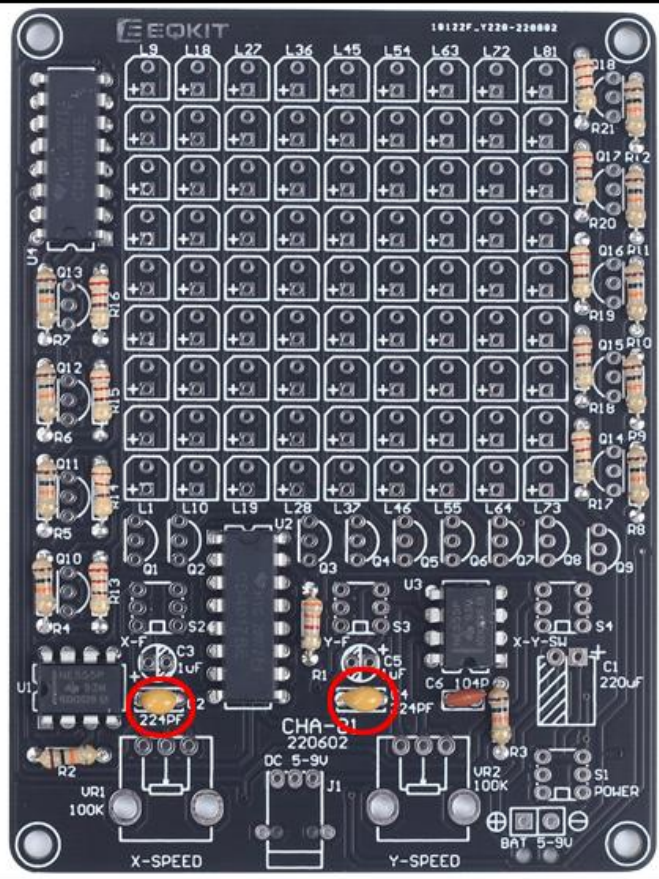
Step 5: Install DIP-16 IC CD4017 at U2,U4. There is a gap mark on one end of the IC and there is a gap mark on PCB silk screen where the IC can place on. These 2 marks are corresponding to each other and are used to specify the installation direction of the IC.



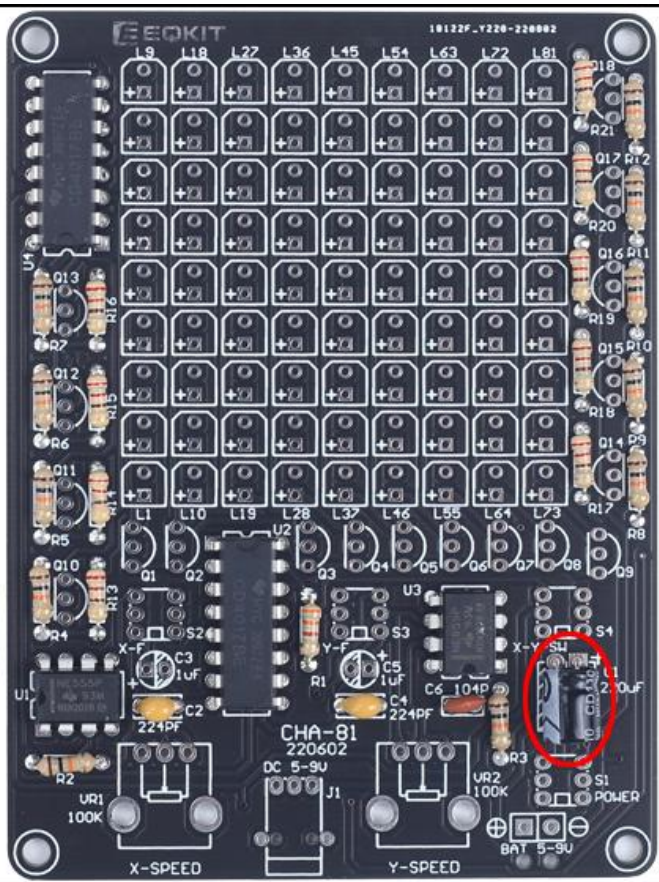
Step 6: Install 1pcs 0.1uF 104 Ceramic Capacitor at C6.



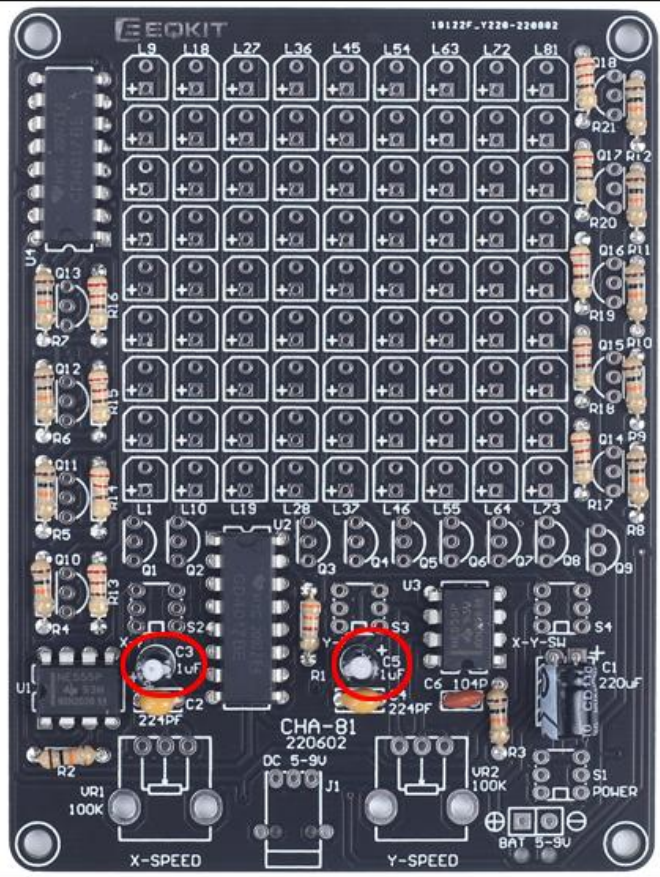
Step 7: Install 1pcs 0.22uF 224 Ceramic Capacitor at C2,C4.



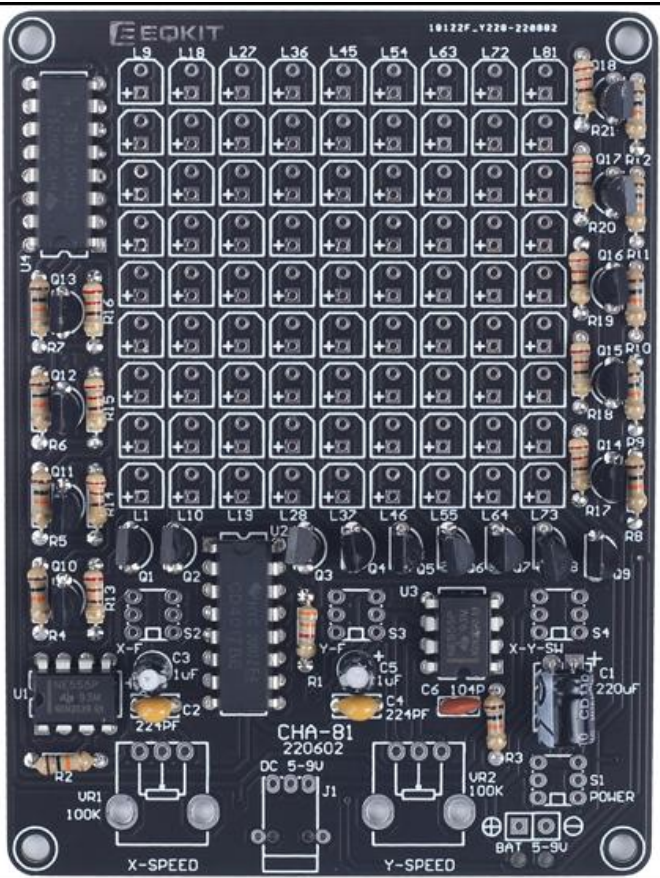
Step 8: Install 1pcs 220uF 16V Electrolytic Capacitor at C1. Pay attention to distinguish between positive and negative pole and bending pins. The Longer pin is positive pole. The longer pin is inserted into the rectangular pad.



Step 9: Install 1pcs 1uF 50V Electrolytic Capacitor at C3,C5. Pay attention to distinguish between positive and negative. The Longer pin is positive pole. The longer pin is inserted into the rectangular pad.



Step 10: Install 18pcs TO-92 S9014 Transistor at Q1-Q18. Pay attention to the installation direction. The arc on the PCB corresponds to the arc of the components.



Step 11: Identify the positive(anode) and negative(cathode) lead of LED.The leads of the LED must be installed correctly, otherwise the LED cannot be turned on.Here are four methods as following:

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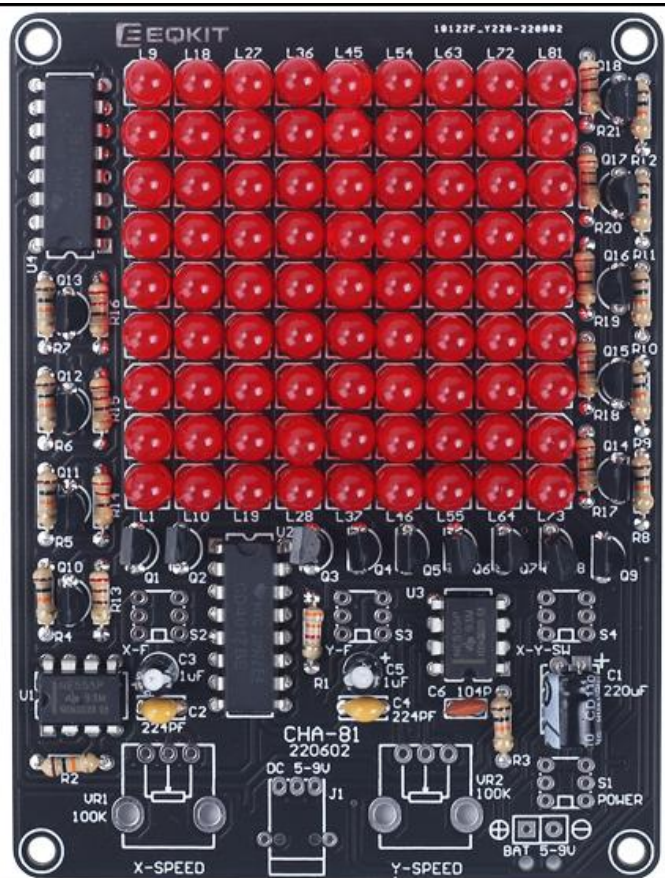
(LED can not be powered directly from 3V for a short time:less then 0.5second)

11.5>.Note:If the flat on package disagrees with other indicators(short lead,large cathode lead end), then other indicators take priority. I.e. if the flat disagrees with the lead length,use the lead length as the cathode indicator.



Step 12: Install 81pcs 5mm Red LED at L1-L81.

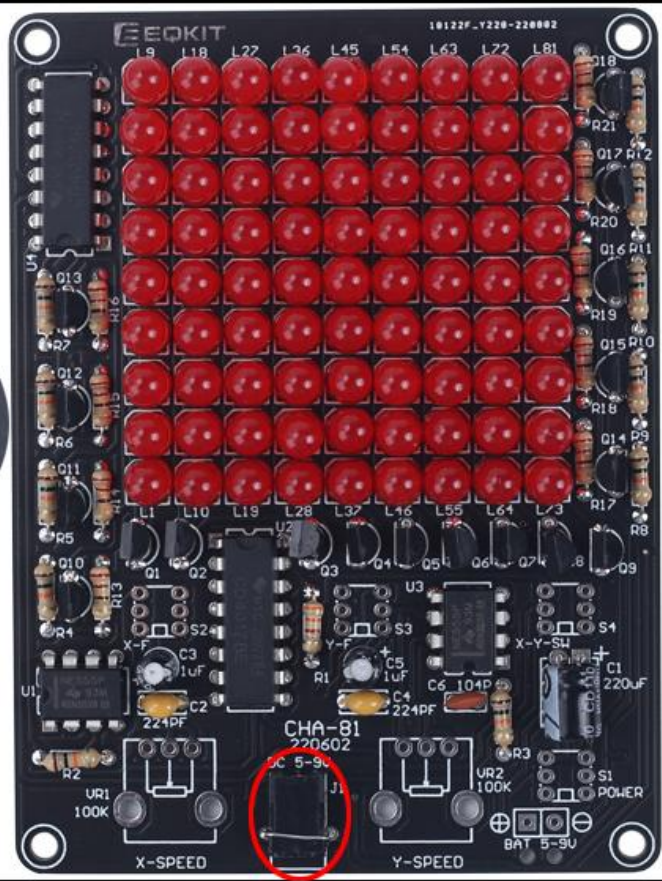
Tops: Install the middle LED at first.



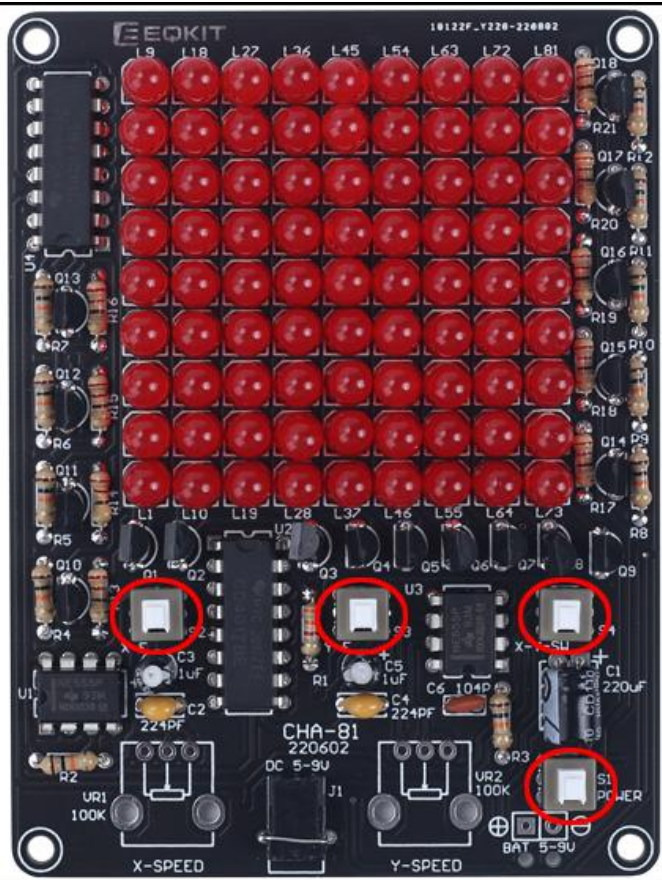


Step 13: Install 1pcs 3.5mm DC Socket at J1.

Tops: Secure the socket with metal wire which cut from components.



Step 14: Install 4pcs 5.8\*5.8mm Self-locking Switch at S1-S4.



Step 15: Install 2pcs 100Kohm  
Potentiometer at VR1,VR2.

