

3W*2 Stereo Amplifier Loudspeaker DIY Kit

I. Introduction:

It is a 3W*2 Stereo Amplifier Loudspeaker LED Spectrum Display Adjustable Volume come with audio wire and USB power supply wire. It can adjust play volume as your need. Two separate speakers can be place with distance reach to 70cm. 5pcs blue LED turn on and off with the melody of music.

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

II. Feature:

- 1>.Music spectrum display
- 2>.Dual-Channel Stereo
- 3>.3W Internal power amplifier
- 4>.Separate speaker
- 5>.Adjustable play volume
- 6>.Adjustable spectrum sensitivity
- 7>.DIY manual soldering
- 8>.Simple and easy to operate

III. Parameter:

- 1>.Item name: 3W Stereo Amplifier Loudspeaker DIY Kit
- 2>.Work Voltage:DC 5V
- 3>.Amplifier Power:3W*2
- 4>.Work Temperature:-40℃~85℃
- 5>.Work Humidity:0%~95%RH
- 6>.Size(Installed):70*70*65mm

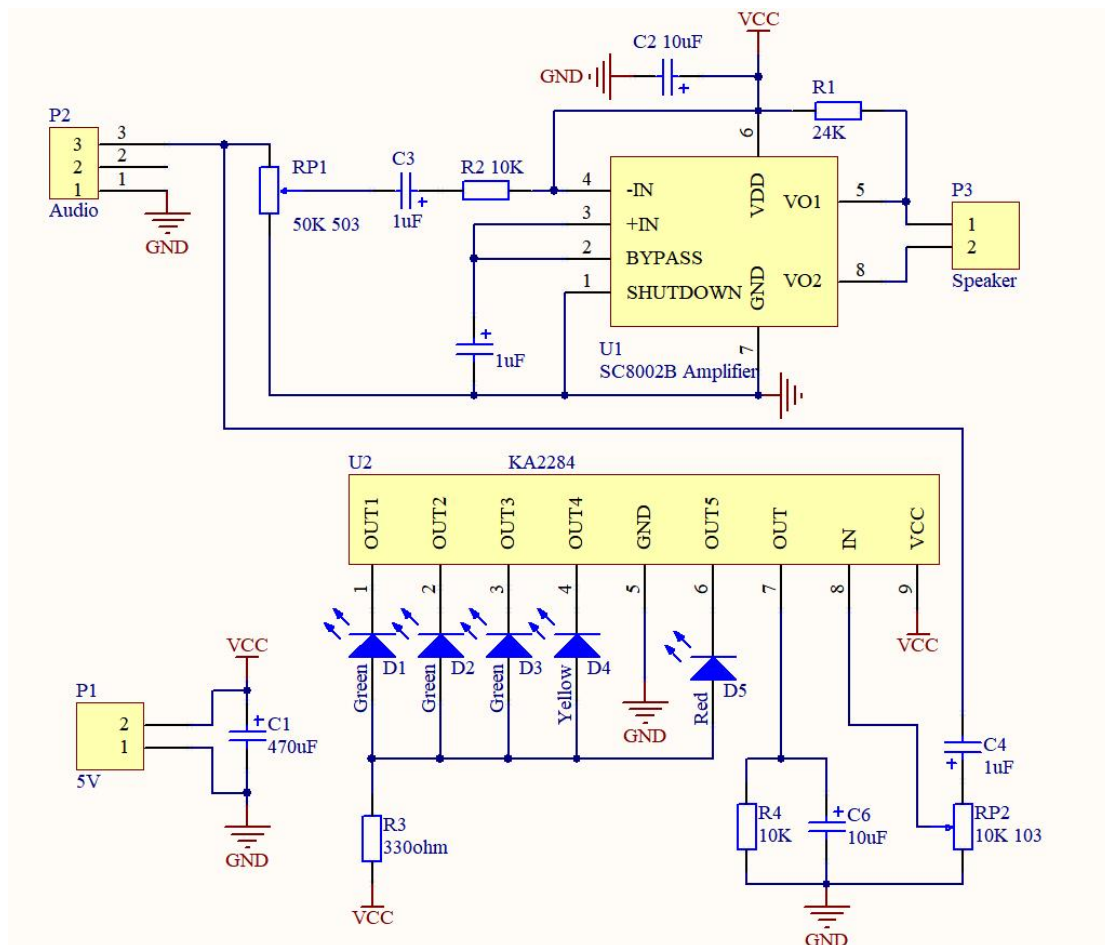
IV. Component Listing:

NO.	Component Name	PCB Marker	Parameter	QTY
1	Metal Film Resistor	R3	330ohm	2
2	Metal Film Resistor	R2,R4	10Kohm	4
3	Metal Film Resistor	R1	24Kohm	2
4	SC8002B Amplifier	U1	SOP-8	2
5	KA2284 LED Controller	U2	SIP9	2
6	Green LED	D1-D3	5mm	6
7	Yellow LED	D4	5mm	2
8	Red LED	D5	5mm	2
9	Electrolytic Capacitor	C1	470uF	2
10	Electrolytic Capacitor	C2,C6	10uF	4
11	Electrolytic Capacitor	C3,C4	1uF	4
12	Potentiometer	RP1	50Kohm 503	2
13	Potentiometer	RP2	10Kohm 103	2
14	4ohm 3W Speaker	P3	52*52*24mm	4
15	Red/Black Speaker Wire	P3	10cm	2
16	AUX 3Pin Audio Wire	P2	110cm	1
17	USB Power Wire	P1	70cm	1
18	4Pin Audio Wire	P1,P2	70cm	1

19	Nylon Column Screw		M3*5+6mm	8
20	M3 Screw		M3*6mm	8
21	M3 Screw		M3*5mm	8
22	M3 Nut		M3	16
23	M2 Screw		M2*10mm	16
24	M2 Nut		M2	16
25	Acrylic Board			12
26	PCB		40*34*1.6mm	2

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

V. Schematic:



VI. Application:

- 1>.Training welding skills
- 2>.Student school
- 3>.DIY production
- 4>.Project Design
- 5>.Electronic competition
- 6>.Gift giving
- 7>.Crafts collection
- 8>.Home decoration
- 9>.Souvenir collection
- 10>.Graduation design
- 11>.Holiday gifts

VII. 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>.It is strongly recommended to read the installation manual before starting installation!!!
- 11>.Please wear anti-static gloves or anti-static wristbands when installing electronic components.

VIII. Installation Steps(Please be patient install!!!):

- 1>.Step 1: Install 1pcs SMD components SOP-8 SC8002B Amplifier at U1. There is a white gap and indicating arrow on PCB silk screen at U1 and there is a mark(dot) on IC. These two marks are corresponding to each other and are used to specify the installation direction.
- 2>.Step 2: Choose Pin1 pad which has been indicated by arrow on the PCB, and then melt the solder on this pad.
- 3>.Step 3: Fix SC8002B:
 - 3.1>.Use a soldering iron to melt tin on the pad just now and hold IC with tweezers in the other hand to place/press on U1 to prevent movement.
 - 3.2>.Take care to match and align each pins to pads.
 - 3.3>.Then remove soldering iron after align pins.
 - 3.4>.Then remove tweezers after solder tin cooling and solidification.
- 4>.Step 4: Connect others pads on SC8002B to pads on PCB by tin and soldering iron. Tips for one method(Users can also ignore and use other methods):
 - 4.1>.Use a large amount of solder tin to cover all pads.
 - 4.2>.Make sure all pins and pads are covered with tin.
 - 4.3>.Use a soldering iron to keep the tin in the melting state. At the same time, use a solder sucker or desoldering braid to remove the excess solder.
- 5>.Step 5: Install 1pcs 330ohm Metal Film Resistor at R3.
- 6>.Step 6: Install 2pcs 10Kohm Metal Film Resistor at R2,R4.
- 7>.Step 7: Install 1pcs 24Kohm Metal Film Resistor at R1.
- 8>.Step 8: Install 1pcs SIP9 KA2284 LED Driver at U2.There is a corner on the components and screen prints, which are corresponding relations, which are used to lock the installation direction.
- 9>.Step 9: Install 1pcs 470uF Electrolytic Capacitor at C1. There is a white mark on PCB silk screen printing where the negative(cathode) can insert into.The shorter lead is positive(cathode) pole.
- 10>.Step 10: Install 2pcs 10uF Electrolytic Capacitor at C2,C6. There is a white mark on PCB silk screen printing where the negative(cathode) can insert into.The shorter lead is positive(cathode) pole.

11>.Step 11: Install 2pcs 1uF Electrolytic Capacitor at C3,C4. There is a white mark on PCB silk screen printing where the negative(cathode) can insert into.The shorter lead is positive(cathode) pole.

12>.Step 12: Install 1pcs 50Kohm 503 Potentiometer at RP1 and 10Kohm 103 at RP2.

13>.Step 13: 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:

13.1>.According to the length of the LED lead to distinguish. The longer pin is positive(anode) lead. The shorter pin is negative(cathode) lead.

13.2>.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.

13.3>.Identify by edge of plastic case.The negative(cathode) lead of the LED should be the pin nearest the flat on the plastic case.

13.4>.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)

13.5>.It is positive(anode) where the white mark ' + ' pointing to on PCB.

14>.Step 14: Install 3pcs 5mm Green LED at D1-D3, Yellow LED at D4 and Red LED at D5. Pay attention to distinguish between positive and negative. Use the same method to install another PCB.

15>.Step 15: Description and wiring diagram.

16>.Step 16: Connect 1pcs 110cm AUX 3Pin Audio Wire to P2. Note: Black wire connect to IN- pad at right, Red wire to middle pad and Black wire to left pad.

17>.Step 17: Install 1pcs 10cm Red/Black Speaker Wire to 4ohm 3W Speaker. Note: Red wire connect to ' + ' terminal.

18>.Step 18: Connect Speaker to PCB at P3. Note: Red wire connect to 'VO+ ' pad.

19>.Step 19: Connect 1pcs 70cm USB Power Wire to PCB at P1. Note: Red wire connect to '+5V' pad.

20>.Step 20: Connect two PCB by 1pcs 70cm 4Pin Audio Wire on P1,P2 at 4pad : '+5V' 'GND' 'IN+' and 'IN-'. Note:The wire color must match the silk screen mark to avoid misplaced connection. Such as: Yellow wire to '+5V' pad; Green wire to 'GND' pad; Red wire to 'IN+'; Blue wire to 'IN-'.

21>.Step 21: Test and adjust volume and adjust sensitivity.

21.1>.USB wire connect to work voltage and AUX plug connect to sound source equipment such as PC/Phone and then play music. It is OK if the music plays normally and the LED flashes.

21.2>.RP1 50Kohm 503 Potentiometer is used to adjust volume.Turn clockwise to increase the volume.

21.3>.RP2 10Kohm 103 Potentiometer is used to adjust LED spectrum flicker sensitivity.Turn clockwise to increase the sensitivity. The higher the sensitivity, the more LED are turn ON at the same sound decibel.

21.4>.Note:The volume and sensitivity must be adjusted first, otherwise they cannot be adjusted again after installing the acrylic board.

22>.Step 22: Fix 4pcs M3*5+6mm Nylon Column Screw on PCB by 4pcs M3 Nut.

23>.Step 23: Tear off the protective film on the surface of acrylic board.

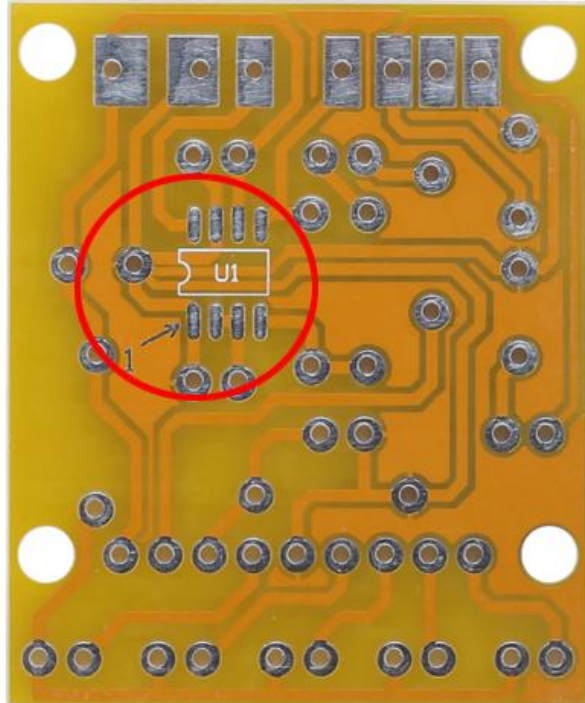
24>.Step 24: Fix PCB on one acrylic board by 4pcs M3*5mm Screw.

25>.Step 25: Fix 4ohm 3W Speaker on other acrylic board by 4pcs M3*6mm Screw and 4pcs M3 Nut.

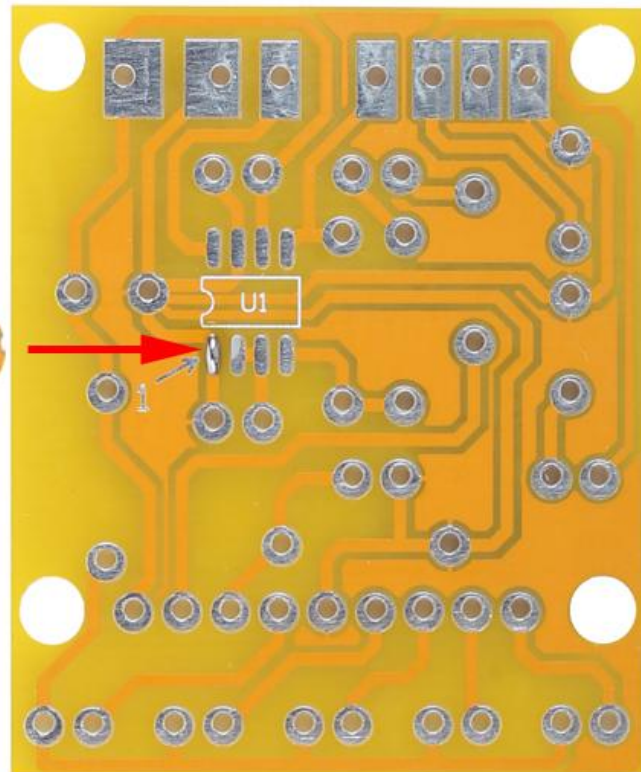
26>.Step 26: Fix another acrylic board by 8pcs M2*10mm Screw 8pcs M2 Nut. Note:Please be patient in splicing and fixing the acrylic board. Wire are reserved at the acrylic notch.

IX. Install shown steps:

Step 1: Install 1pcs SMD components SOP-8 SC8002B Amplifier at U1.
There is a white gap and indicating arrow on PCB silk screen at U1 and there is a mark(dot) on IC. These two marks are corresponding to each other and are used to specify the installation direction.

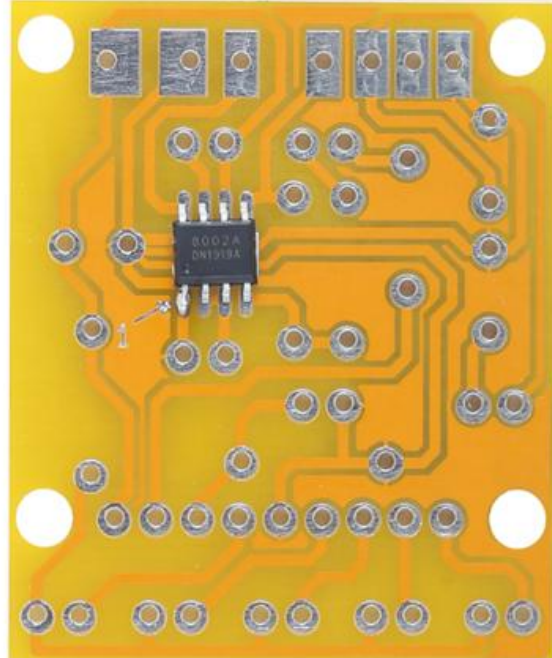


Step 2: Choose Pin1 pad which has been indicated by arrow on the PCB, and then melt the solder on this pad.



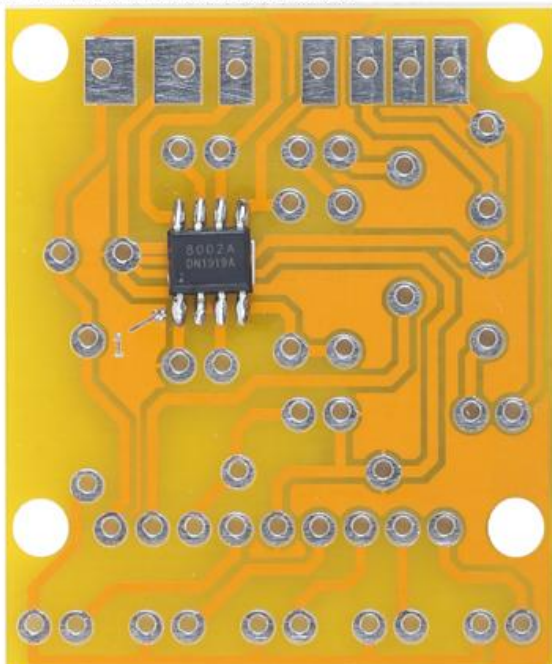
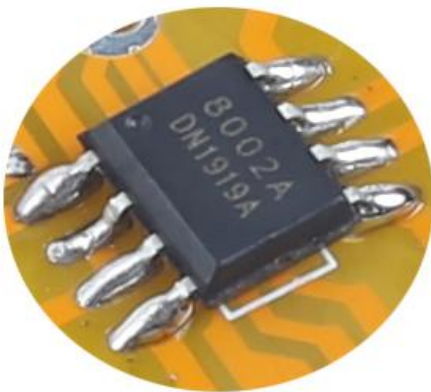
Step 3: Fix SC8002B:

- 3.1. Use a soldering iron to melt tin on the pad just now and hold IC with tweezers in the other hand to place/press on U1 to prevent movement.
- 3.2. Take care to match and align each pins to pads.
- 3.3. Then remove soldering iron after align pins.
- 3.4. Then remove tweezers after solder tin cooling and solidification.

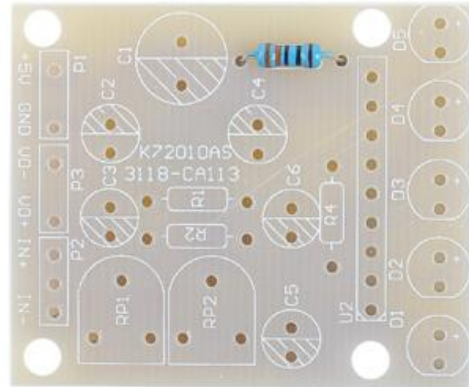
**Step 4: Connect others pads on SC8002B to pads on PCB by tin and soldering iron.**

Tips for one method (Users can also ignore and use other methods):

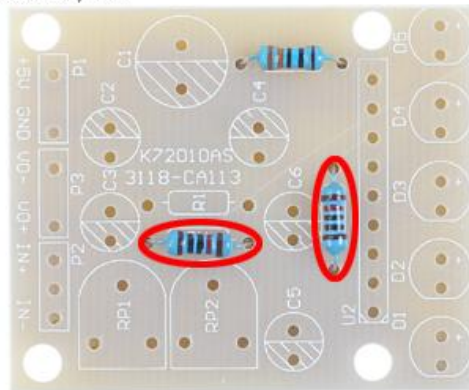
- 4.1>. Use a large amount of solder tin to cover all pads.
- 4.2>. Make sure all pins and pads are covered with tin.
- 4.3>. Use a soldering iron to keep the tin in the melting state. At the same time, use a solder sucker or desoldering braid to remove the excess solder.



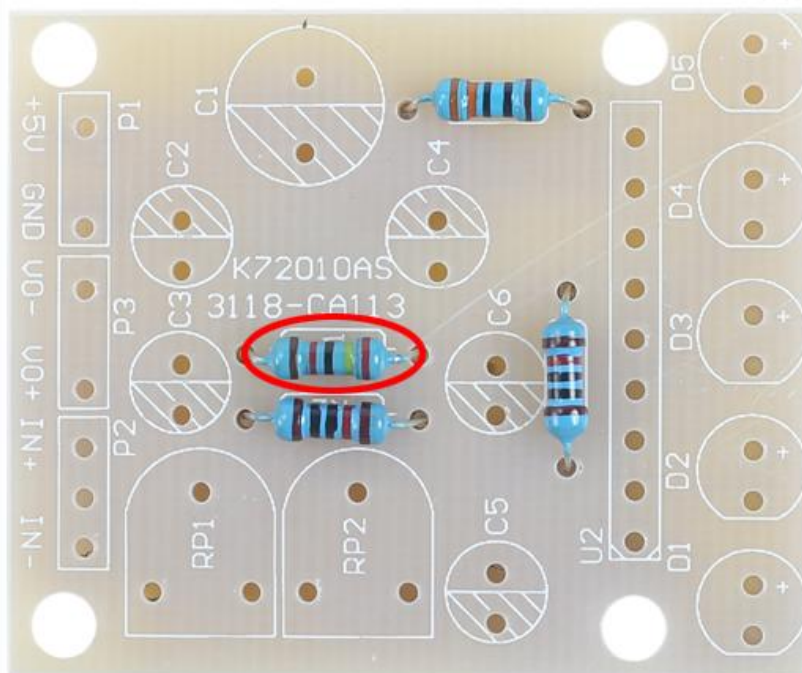
Step 5: Install 1pcs 330ohm Metal Film Resistor at R3.



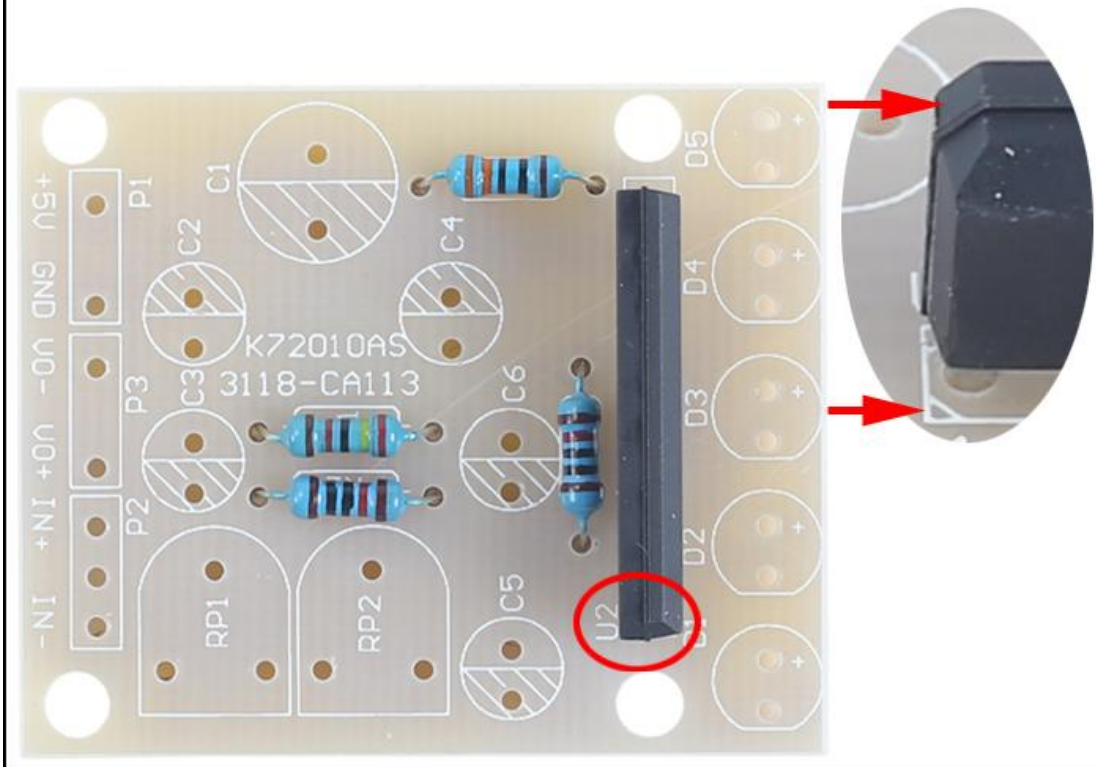
Step 6: Install 2pcs 10Kohm Metal Film Resistor at R2,R4.



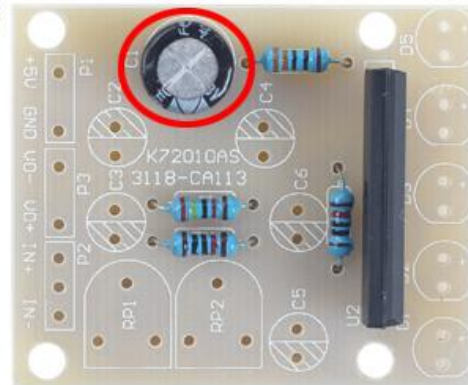
Step 7: Install 1pcs 24Kohm Metal Film Resistor at R1.



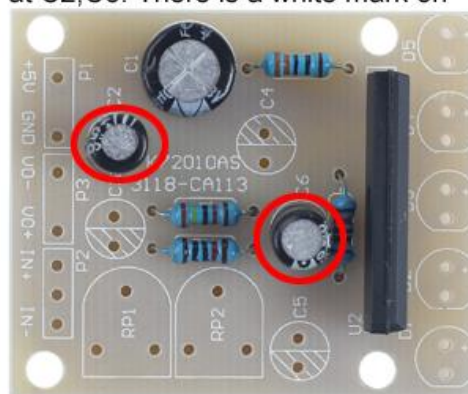
Step 8: Install 1pcs SIP9 KA2284 LED Driver at U2. There is a corner on the components and screen prints, which are corresponding relations, which are used to lock the installation direction.



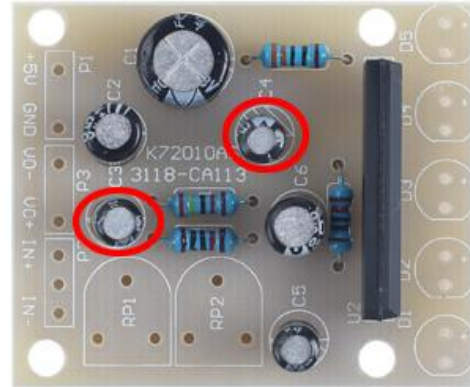
Step 9: Install 1pcs 470uF Electrolytic Capacitor at C1. There is a white mark on PCB silk screen printing where the negative(cathode) can insert into. The shorter lead is positive (cathode) pole.



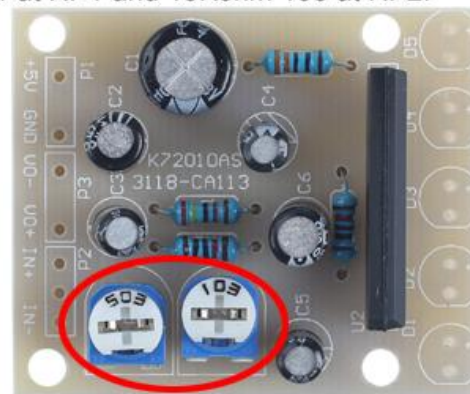
Step 10: Install 2pcs 10uF Electrolytic Capacitor at C2,C6. There is a white mark on PCB silk screen printing where the negative(cathode) can insert into. The shorter lead is positive(cathode) pole



Step 11: Install 2pcs 1uF Electrolytic Capacitor at C3,C4. There is a white mark on PCB silk screen printing where the negative(cathode) can insert into. The shorter lead is positive(cathode) pole.



Step 12: Install 1pcs 50Kohm 503 Potentiometer at RP1 and 10Kohm 103 at RP2.



Step 13: 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:

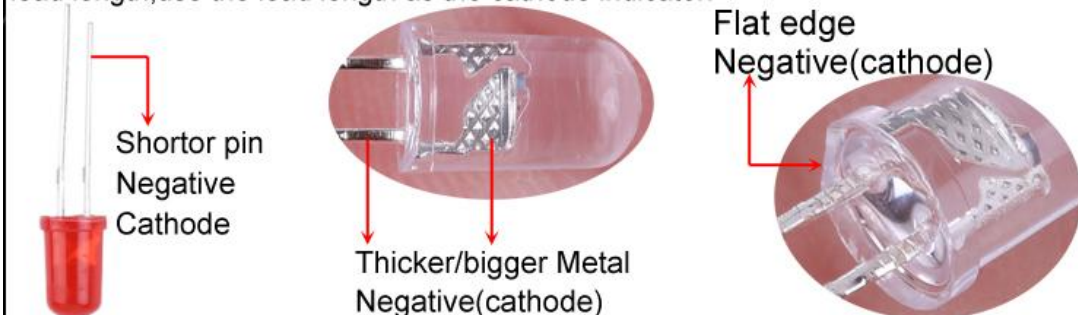
13.1>.According to the length of the LED lead to distinguish. The longer pin is positive(anode) lead. The shorter pin is negative(cathode) lead.

13.2>.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.

13.3>.Identify by edge of plastic case. The negative(cathode) lead of the LED should be the pin nearest the flat on the plastic case.

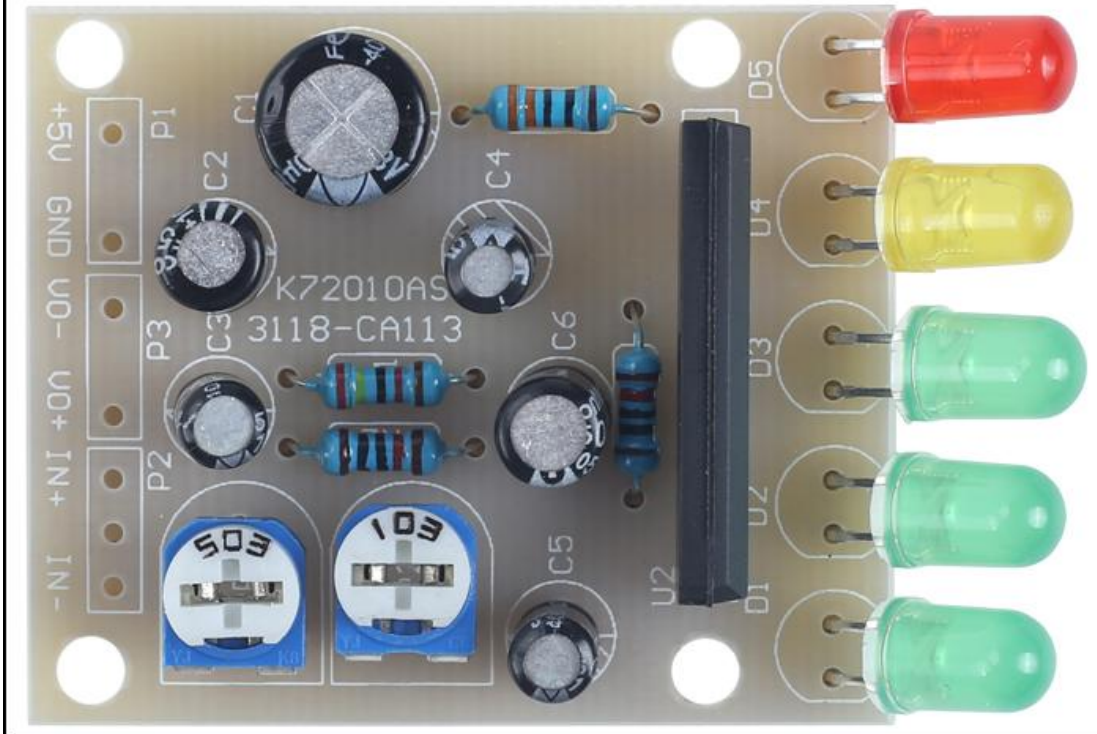
13.4>.Test by 3V battery or multimeter. The pin is positive(anode) lead which has connect to positive of 3V if LED can light up after connect 3V power supply. (LED can not be powered directly from 3V for a short time:less then 0.5second)

13.5>.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.

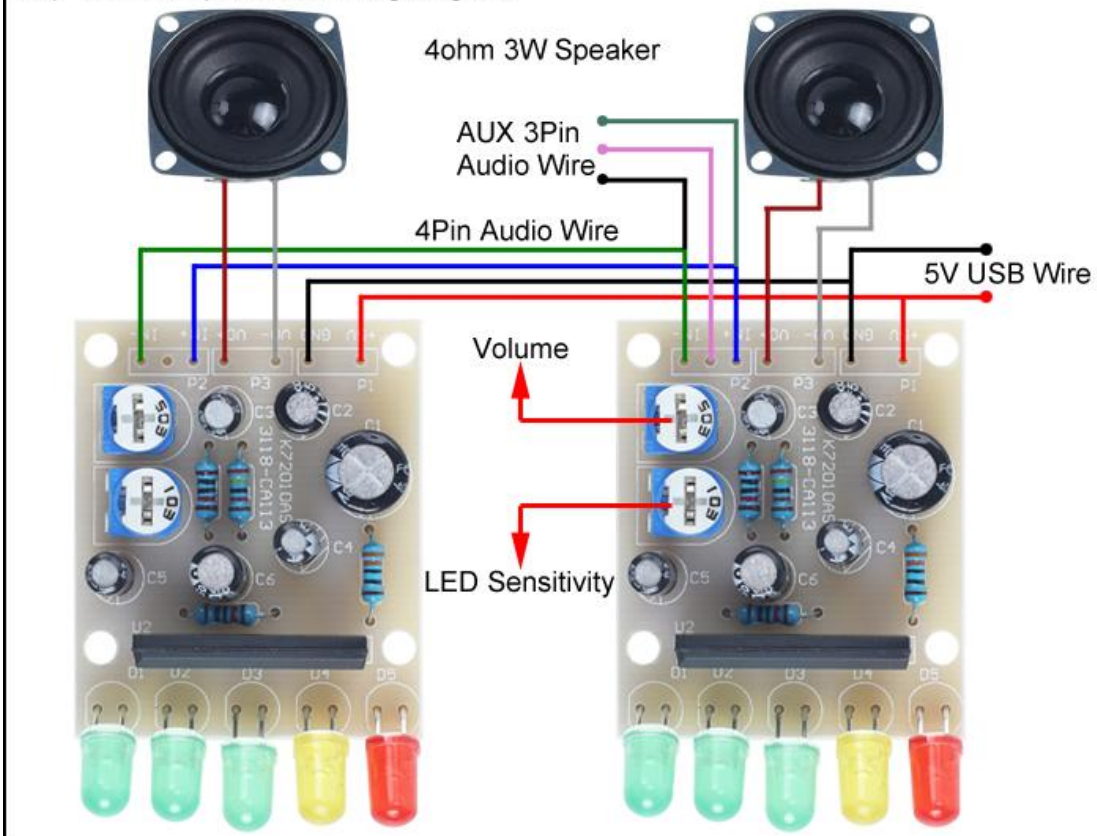


Step 14: Install 3pcs 5mm Green LED at D1-D3, Yellow LED at D4 and Red LED at D5. Pay attention to distinguish between positive and negative.

Use the same method to install another PCB.



Step 15: Description and wiring diagram.



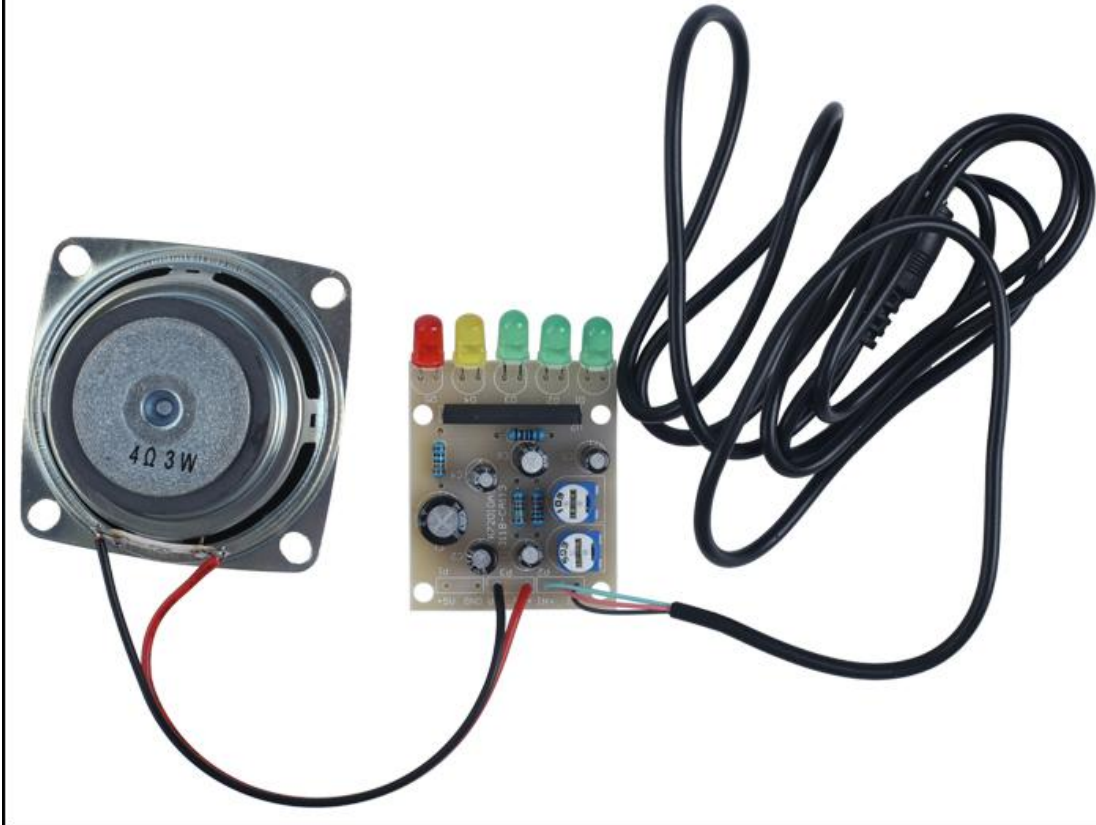
Step 16: Connect 1pcs 110cm AUX 3Pin Audio Wire to P2. Note: Black wire connect to IN- pad at right, Red wire to middle pad and Black wire to left pad.



Step 17: Install 1pcs 10cm Red/Black Speaker Wire to 4ohm 3W Speaker.
Note: Red wire connect to ' + ' terminal.

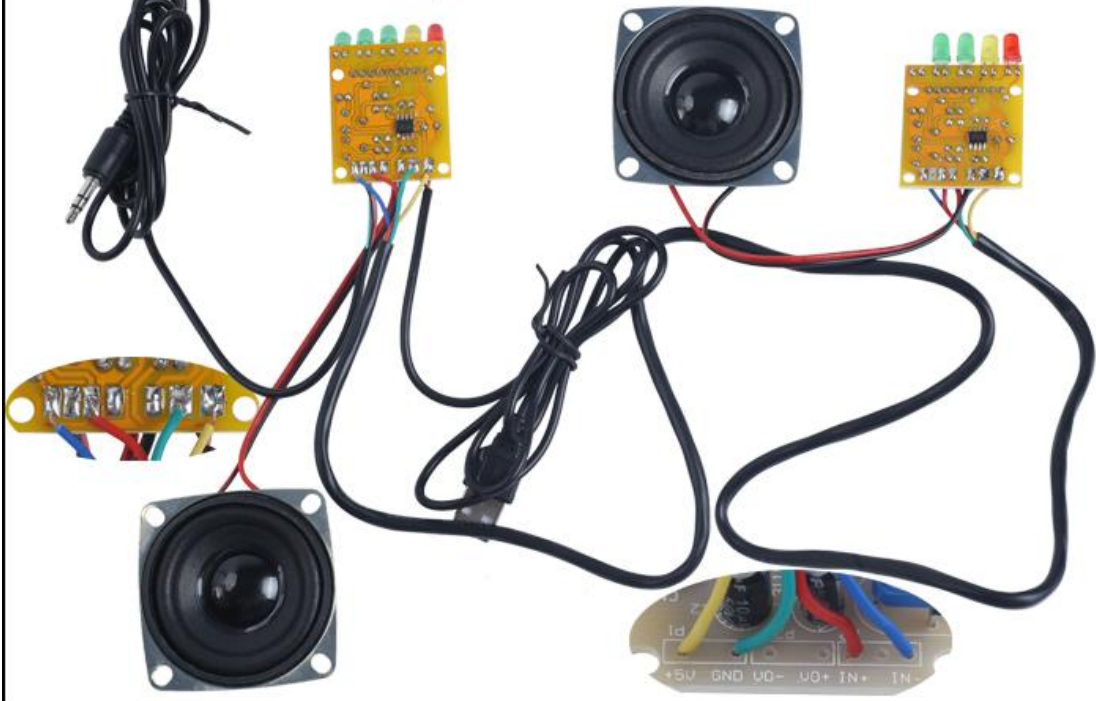


Step 18: Connect Speaker to PCB at P3. Note: Red wire connect to 'VO+' pad.



Step 19: Connect 1pcs 70cm USB Wire to PCB at P1. Red wire connect to '+5V' pad.

Step 20: Connect two PCB by 1pcs 70cm 4Pin Audio Wire on P1,P2 at 4pad : '+5V' 'GND' 'IN+' and 'IN-'. Note: The wire color must match the silk screen mark to avoid misplaced connection. Such as: Yellow to '+5V' pad; Green to 'GND' pad; Red wire to 'IN+'; Blue wire to 'IN-'.



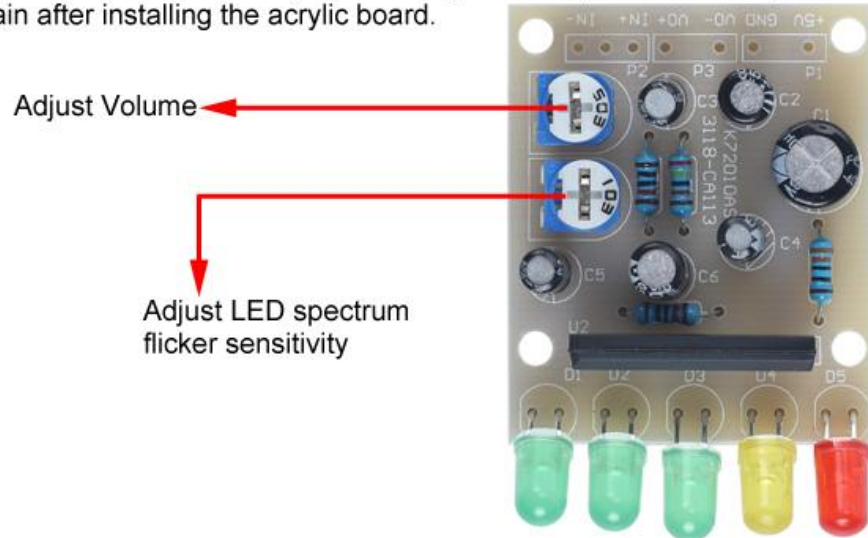
Step 21: Test and adjust volume and adjust sensitivity.

21.1>.USB wire connect to work voltage and AUX plug connect to sound source equipment such as PC/Phone and then play music. It is OK if the music plays normally and the LED flashes.

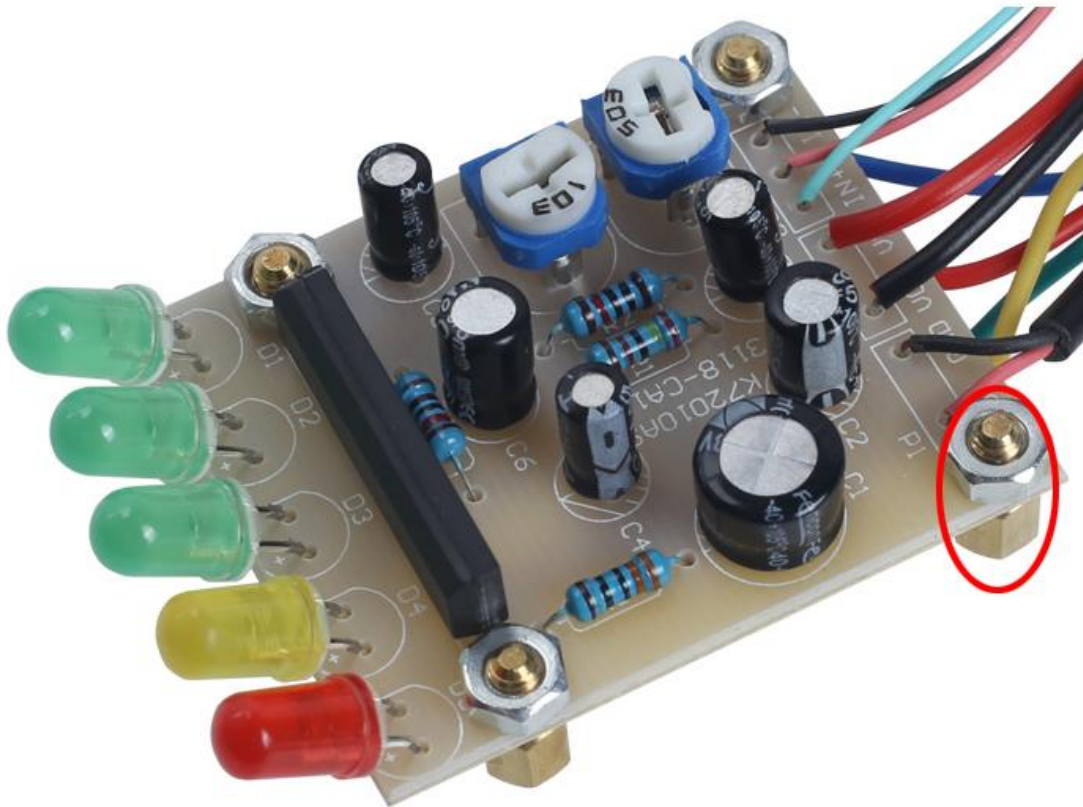
21.2>.RP1 50Kohm 503 Potentiometer is used to adjust volume.Turn clockwise to increase the volume.

21.3>.RP2 10Kohm 103 Potentiometer is used to adjust LED spectrum flicker sensitivity.Turn clockwise to increase the sensitivity. The higher the sensitivity, the more LED are turn ON at the same sound decibel.

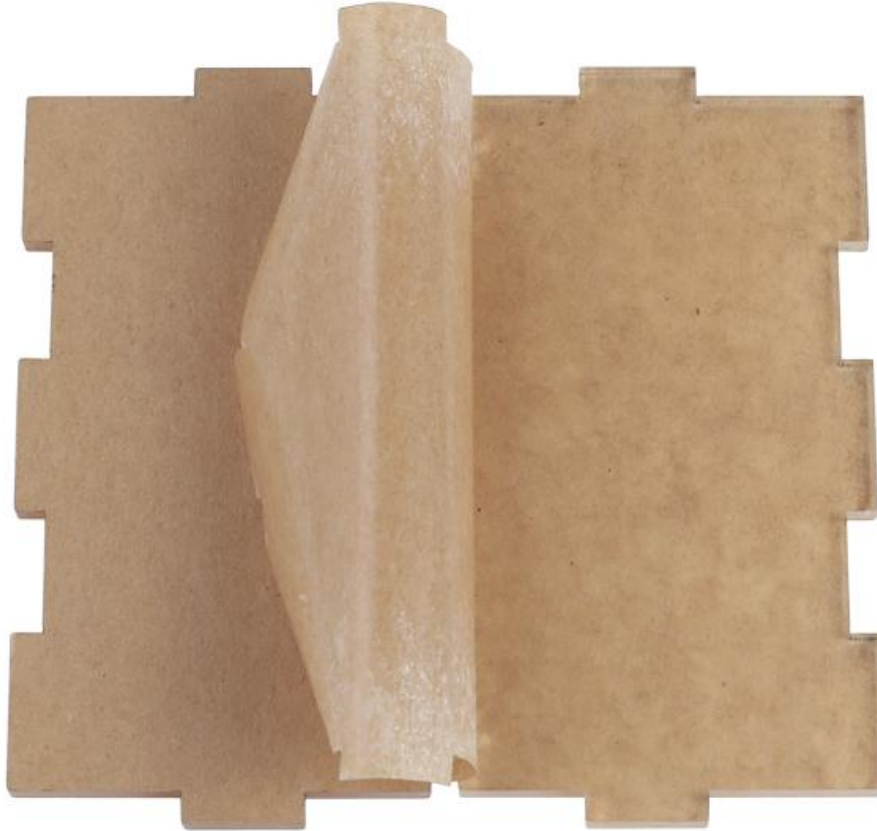
21.4>.Note:The volume and sensitivity must be adjusted first, otherwise they cannot be adjusted again after installing the acrylic board.



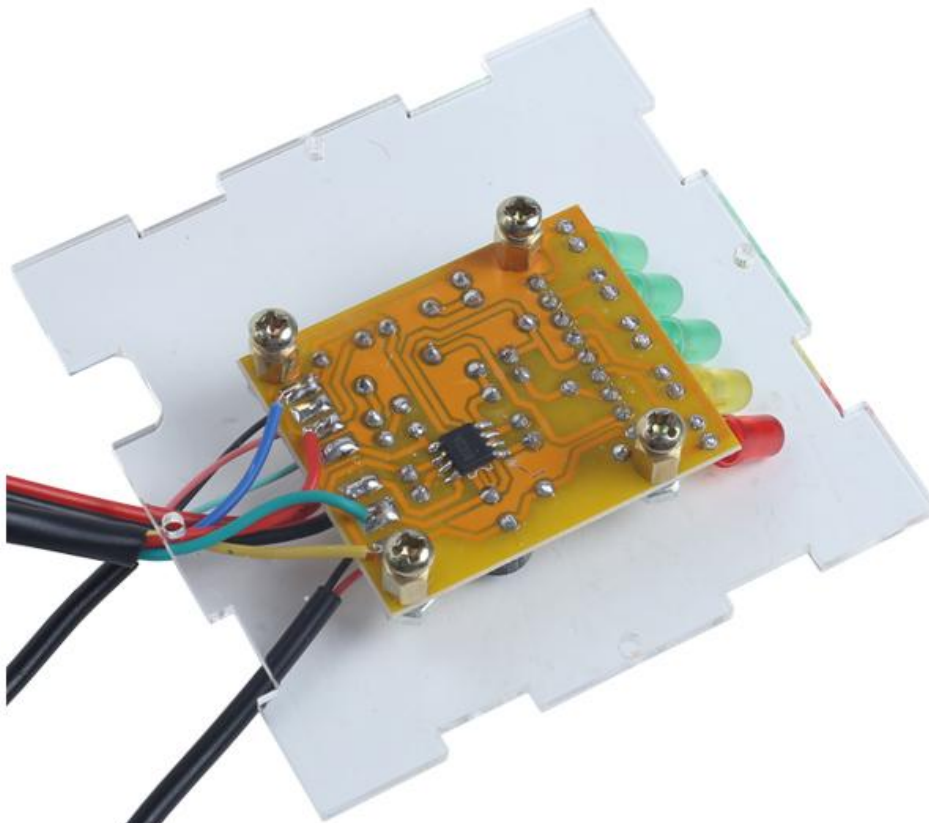
Step 22: Fix 4pcs M3*5+6mm Nylon Column Screw on PCB by 4pcs M3 Nut.



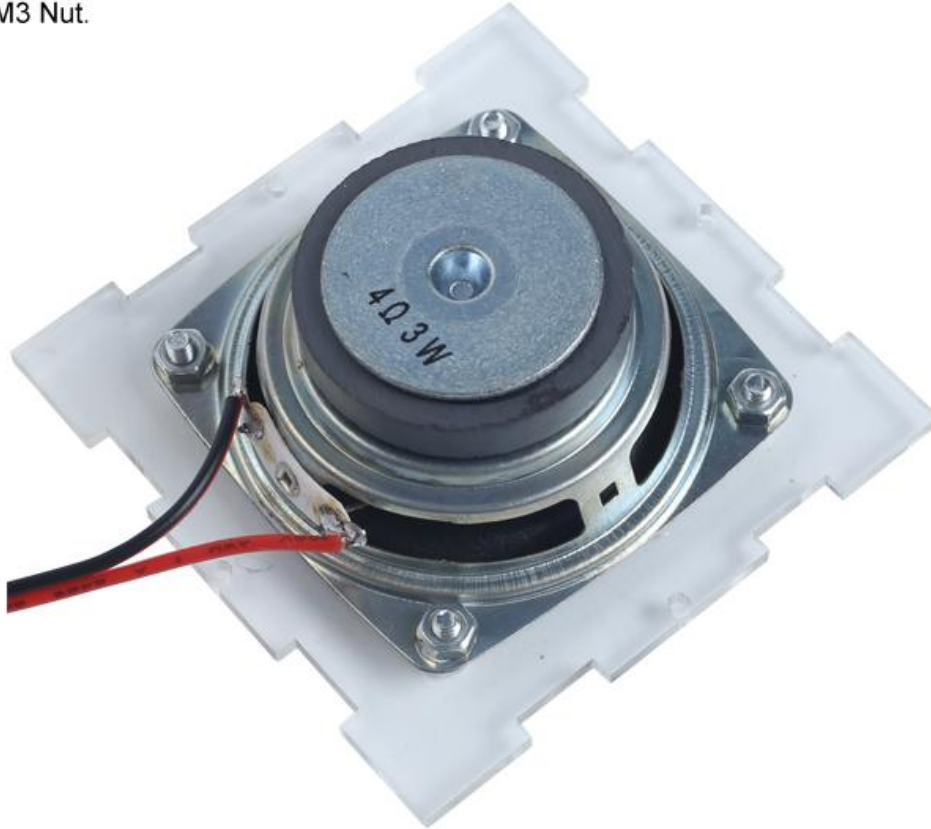
Step 23: Tear off the protective film on the surface of acrylic board.



Step 24: Fix PCB on one acrylic board by 4pcs M3*5mm Screw.



Step 25: Fix 4ohm 3W Speaker on other acrylic board by 4pcs M3*6mm Screw and 4pcs M3 Nut.



Step 26: Fix another acrylic board by 8pcs M2*10mm Screw 8pcs M2 Nut.
Note: Please be patient in splicing and fixing the acrylic board.
Wire are reserved at the acrylic notch.

