



## DIY Bluetooth Music Spectrum Speaker Kit

### 1.Introduction:

It is a LED Dot Matrix Spectrum Bluetooth Audio Speaker DIY Kit with remote control. It has 8\*12 LED matrix music spectrum display in Yellow/Green/Red/Blue. It can play music form Bluetooth, TF Card, U-disk with 4ohm 2in speakers. The voice is clear and loud.

### 2.Parameter:

- 1>.Item name: LED Dot Matrix Spectrum Bluetooth Audio Speaker DIY Kit
- 2>.Work Voltage:DC 3.7V-5V
- 3>.Bluetooth Version:5.0
- 4>.Bluetooth Distance:15meter(Max)
- 5>.Amplifier Power:3W\*2
- 6>.Music Source:Bluetooth/U-disk/TF Card
- 7>.Control Type:Bluetooth/Remote Controller/On Board Button
- 8>.LED Color:Yellow/Green/Red/Blue
- 9>.Work Temperature:-40℃~85℃
- 10>.Work Humidity:0%~95%RH
- 11>.Size(Installed):135\*74\*64mm

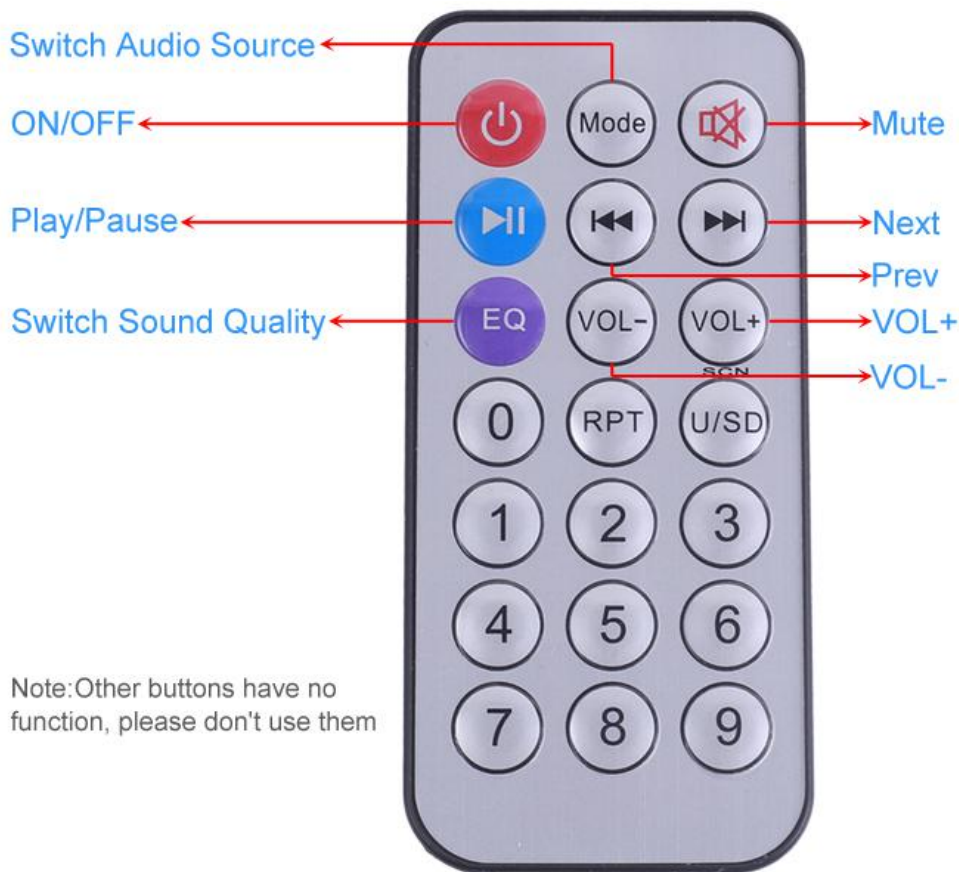
### 3.Components list:

NO.	Component Name	PCB Marker	Parameter	QTY
1	STC12C5A60S2	U1	LQFP44G	1
2	SMD 0805 Yellow LED		Yellow	24
3	SMD 0805 Green LED		Green	24
4	SMD 0805 Red LED		Red	24
5	SMD 0805 Blue LED		Blue	24
6	SMD 0805 Capacitor	C3-C5	30pF	3
7	SMD 0805 Capacitor	C2	0.1uF 104	1
8	Crystal Oscillator	Y	12MHz	1
9	Aluminum Electrolytic Capacitor	C1	100uF SMD	1
10	SMD 0805 Resistor	R2-R9	510ohm	8
11	Bluetooth Audio Controller			1
12	4ohm 3W Speaker		2in 52*52*24mm	2
13	2Pin PH2.0 Wire		15cm	4
14	Black Wire		10cm	3
15	DC-022 Power Socket			1
16	Power Socket Nut			1
17	Black Switch			1

18	Transparent Acrylic Shell			6
19	M3 Screw		M3*10mm	12
20	M3 Nut		M3	12
21	M2 Screw		M2*10mm	12
22	M2 Nut		M2	12
23	USB Power Cable		100cm	1
24	Remote Controller			1
25	PCB		114*36*1.6mm	1

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

#### 4. Remote Controller:



Note:Other buttons have no function, please don't use them

#### 5.Note:

1>.It is a DIY kit so that need finish install by user.

2>.Bluetooth module in the kit has 2 versions which are DIP Socket Version and SMD Socket Version. They will be shipped randomly, so pay attention to the 3 installation methods we provide. So we provide 3 methods to connect Bluetooth module to LED light board. The third method is suitable for all versions.

3>.It is work voltage is 3.7V-5V so please make sure the input voltage can not more than 5V.Otherwise, it will be damaged.

4>.It can support Bluetooth and U-disk and TF card audio input. Priority U-disk and TF card are higher than priority Bluetooth audio input. Whoever connects first has higher priority for U-disk and TF card audio input.

5>.User can switch audio input from Bluetooth and U-disk and TF card.

6>.Spectrum Board Schematic Diagram:

[http://attach01.oss-us-west-1.aliyuncs.com/IC/DIY-Manual/GY19288\\_SCH.pdf](http://attach01.oss-us-west-1.aliyuncs.com/IC/DIY-Manual/GY19288_SCH.pdf)

## 7.Installation Tips:

1>.User needs to prepare the soldering 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>.Install complex components preferentially.

8>.Make sure all components are in right direction and right place.

9>.Please wear anti-static gloves or anti-static wristbands when installing electronic components.

10>.User must install the LED according to the specified rules.Otherwise some LED will not light.

11>.It is strongly recommended to read the installation manual before starting installation!!!

## 8.Installation Steps:

Step 1: Identify the positive and negative poles of LED and pad. It is negative if there is a green mark on LED front. It is negative where the green mark pointing to on LED back. It is negative where the white mark ">" pointing to on PCB.Users will receive 4 kinds of LED in independent packaging. It is recommended to install one kind led before installing another kind to avoid confusing LED.There are color marks on the package of led to distinguish the color of LED.

Step 2: Tinplate all negative pads for LED installation.

Step 3: Install 24pcs SMD 0805 Yellow LED at the 1st/5th/9th column on black PCB.Please distinguish between positive and negative.

Step 4: Install 24pcs SMD 0805 Green LED at the 2nd/6th/10th column on black PCB.Please distinguish between positive and negative.

Step 5: Install 24pcs SMD 0805 Red LED at the 3rd/7th/11th column on black PCB.Please distinguish between positive and negative.

Step 6: Install 24pcs SMD 0805 Blue LED at the 4th/8th/12th column on black PCB.Please distinguish between positive and negative.

Step 7: Install 1pcs IC LQFP44G STC12C5A60S2 at U1. There is a small

dot on one corner of IC. This dot corresponds to corner, which is not a right angle on silk screen printing, where the IC can place on.

Step 8: Install 3pcs 30pF SMD 0805 Capacitor at C3-C5.

Step 9: Install 1pcs 0.1uF 104 SMD 0805 Capacitor at C2.

Step 10: Install 1pcs 12MHz Crystal Oscillator at Y.

Step 11: Install 1pcs 100uF SMD Aluminum Electrolytic Capacitor at C1. Note that the right angle of capacitor base corresponds to the right angle of silk screen printing.

Step 12: Install 8pcs 510ohm SMD 0805 Resistor at R2-R9. Note: LED spectrum board has been installed and other components do not need to be installed.

Step 13: Know Bluetooth audio controller: Interface function introduction. Note: Bluetooth module in the kit has 2 versions which are DIP Socket Version and SMD Socket Version. They will be shipped randomly, so pay attention to the 3 installation methods we provide. So we provide 3 methods to connect Bluetooth module to LED light board. The third method is suitable for all versions

Step 14: Know Bluetooth audio controller: Wiring diagram.

Step 15: Install 2pcs 15cm 2Pin PH2.0 Wire on 2pcs 4ohm 3W Speaker. The speakers does not need to distinguish between positive and negative poles.

Step 16: Connect 3pcs wires to Bluetooth audio controller.

16.1. Method-1 for DIP Socket Version Bluetooth Module: Install 3pcs 10cm Black Wire to 5V/GND/L-out on Bluetooth audio controller. These three wires are used to connect Bluetooth audio controller and LED spectrum board.

16.2. Method-2 for SMD Socket Version Bluetooth Module: Install 3pcs 10cm Black Wire to GND/L-out and a pad which has marked on Bluetooth audio controller. These three wires are used to connect Bluetooth audio controller and LED spectrum board.

16.3. Method-3 for DIP and SMD Socket Version Bluetooth Module. This method changes power supply connection point of LED light board. User can refer to Step-22A which shown how to connect LED board if no find 5V/GND.

Step 17: Connect 3pcs wires from Bluetooth Module to LED spectrum board.

17.1. Method-1 for DIP Socket Version Bluetooth Module: L-out connects to M on LED board; GND connect to GND on LED board; 5V connect to 5V on LED board.

17.2. Method-2 for SMD Socket Version Bluetooth Module: L-out connects to M on LED board; GND connect to GND on LED board; There is a pad on right which has marked on picture is 5V and connect this pad to 5V on LED board.

17.3 .Method-3 for DIP and SMD Socket Version Bluetooth Module. L-out connects to M on LED board. This method changes power supply

connection point of LED light board. User can refer to Step-22A which shown how to connect LED board if no find 5V/GND.

Step 18: Find the power supply acrylic panel and remove the protective film from the surface. Note: The protective film of other acrylic plates also needs to be torn off during installation.

Step 19: Fix 1pcs DC-022 Power Socket by the biggest nut on acrylic panel.

Step 20: Fix 1pcs Black Switch on acrylic panel. Pay attention to the buckle on the switch, which can be fixed by itself. Pay attention to the installation direction.

Step 21: Cut about 3cm red wire to connect DC-022 Power Socket and Black Switch. Pay attention to their pin selection and can not choose to connect other pins. Note: The 3cm red wire come from the third 15cm 2Pin PH2.0 Wire.

Step 22: Connect 1pcs 15cm 2Pin PH2.0 Wire (the 4th wire) to DC-022 and Switch. The red wire connect to Black Switch and the black wire connect to DC-022 Power Socket. Refer to the wiring location and note the PCB mark shown if the wire is in another color!

Step 22A: Connect LED spectrum board to Bluetooth audio controller if the LED board get voltage from power socket and switch but not from Bluetooth module. Otherwise user can ignore this step.

M on LED board connects to L-out Bluetooth Module.

5V on LED board connects to the middle pin on switch which has connected a red wire.

GND on LED board connects to the top pin on DC-022 Power Socket which has connected a black wire.

Note: User can refer to this connection method for both DIP and SMD Socket Version of Bluetooth modules.

Step 23: Fix Bluetooth audio controller on acrylic panel by 2pcs M3\*10mm Screw and 2pcs M3 Nut.

Step 24: Fix speaker on the other two are smaller acrylic panel by 8pcs M3\*10mm Screw and 8pcs M3 Nut.

Step 25: Fix LED spectrum board on acrylic panel by 2pcs M3\*10mm Screw and 2pcs M3 Nut.

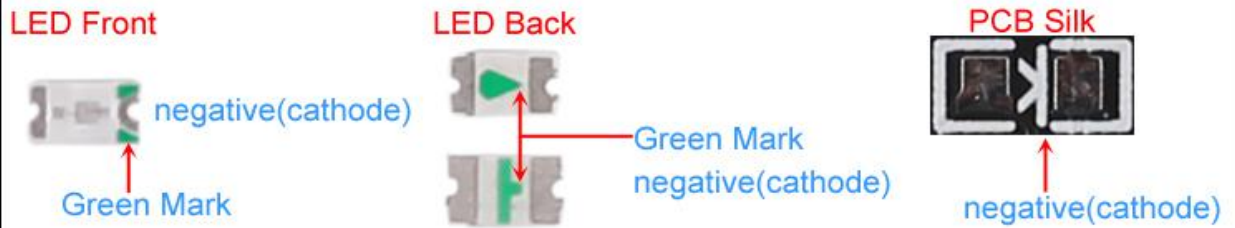
Step 26: Connect 1pcs power wire to red socket and 2pcs speaker wires to white sockets.

Step 27: Assemble 6pcs acrylic panels by 12pcs M2\*10mm Screw and 12pcs M2 Nut. Please be patient when installing the screws.

Step 28: Connect to power supply and enjoy the effect. Note Please provide sufficient working current. It is recommended to use a 5V 2A power supply. Please provide enough working power if the sound is distorted. User should exercise care and provide additional support to the acrylic with one hand while pressing the switch into place with the other hand when the power is plugged in.

### 9.Install shown steps:

Step 1: Identify the positive and negative poles of LED and pad. It is negative if there is a green mark on LED front. It is negative where the green mark pointing to on LED back. It is negative where the white mark ">" pointing to on PCB. Users will receive 4 kinds of LED in independent packaging. It is recommended to install one kind led before installing another kind to avoid confusing LED. There are color marks on the package of led to distinguish the color of LED.



Step 2: Tinfoil all negative pads for LED installation.



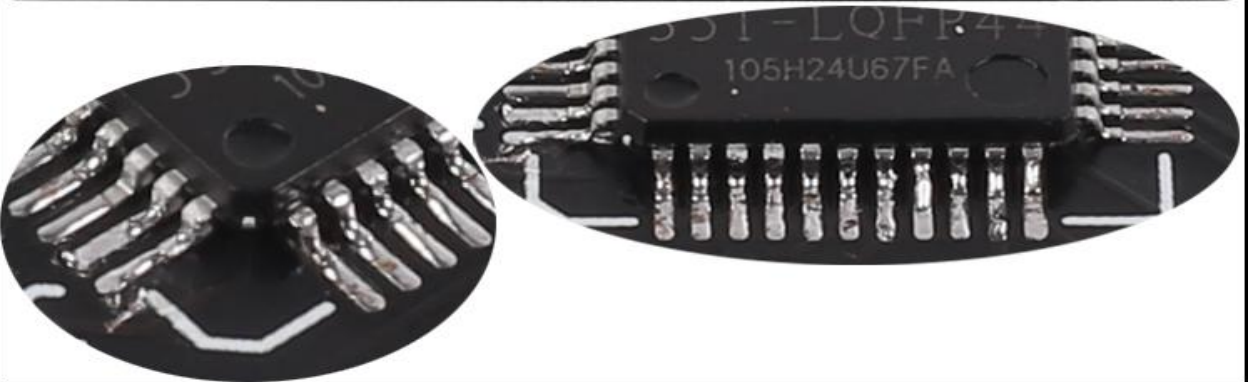
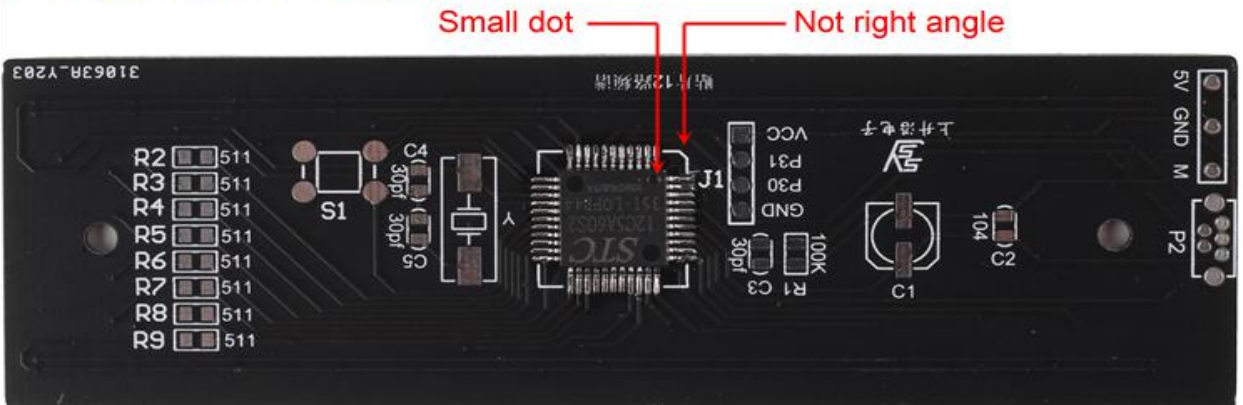
Step 3: Install 24pcs SMD 0805 Yellow LED at the 1st/5th/9th column on black PCB. Please distinguish between positive and negative.  
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Step 5: Install 24pcs SMD 0805 Red LED at the 3rd/7th/11th column on black PCB. Please distinguish between positive and negative.  
Step 6: Install 24pcs SMD 0805 Blue LED at the 4th/8th/12th column on black PCB. Please distinguish between positive and negative.



Note that the color of each column is the same!



Step 7: Install 1pcs IC LQFP44G STC12C5A60S2 at U1. There is a small dot on one corner of IC. This dot corresponds to corner, which is not a right angle on silk screen printing, where the IC can place on.



Step 8: Install 3pcs 30pF SMD 0805 Capacitor at C3-C5.



Step 9: Install 1pcs 0.1uF 104 SMD 0805 Capacitor at C2.



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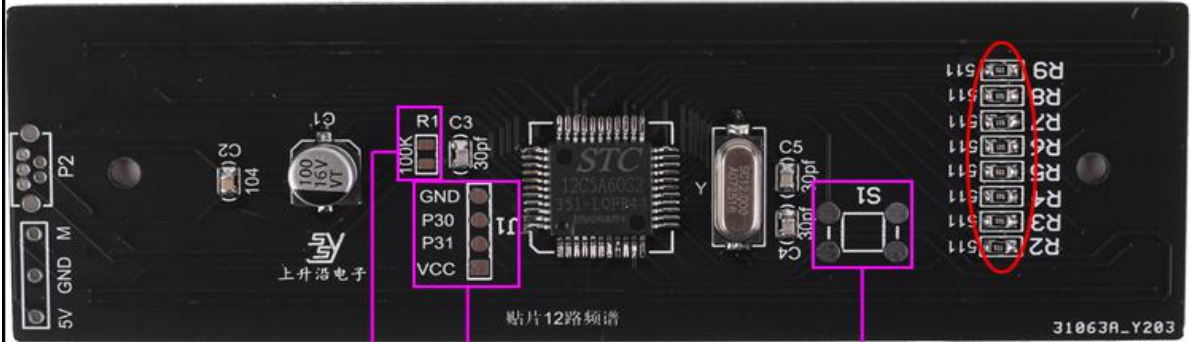
Step 11: Install 1pcs 100uF SMD Aluminum Electrolytic Capacitor at C1. Note that the right angle of capacitor base corresponds to the right angle of silk screen printing.





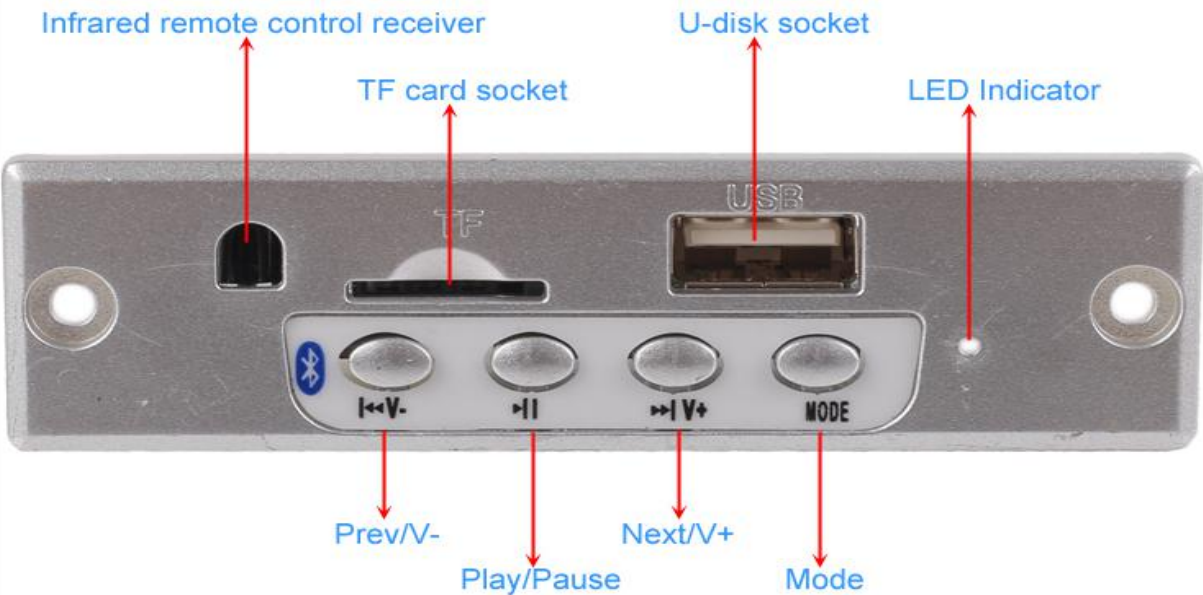
Step 12: Install 8pcs 510ohm SMD 0805 Resistor at R2-R9.

Note: LED spectrum board has been installed and other components do not need to be installed.



These three components do not need to be installed!

Step 13: Know Bluetooth audio controller: Interface function introduction.

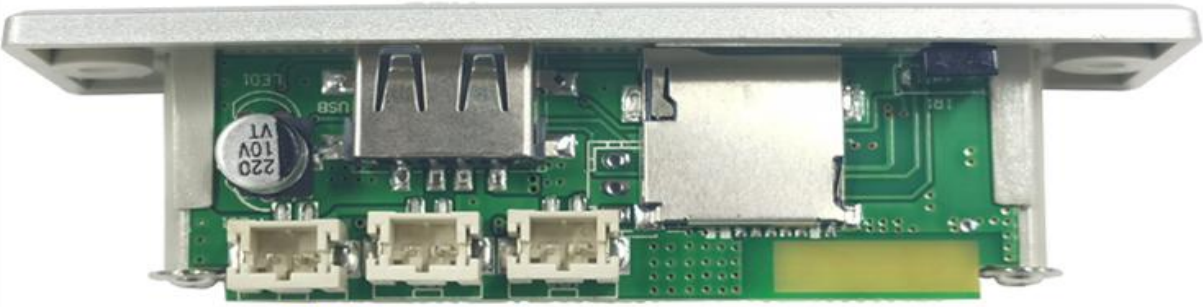


Prev/V- : Short press to select previous music; Keep press to decrease volume.  
Play/Pause: It is used to play or pause music.  
Next/V+: Short press to select next music; Keep press to increase volume.  
Mode: It is used to switch music source: Bluetooth/U-disk/TF card.

Note: Bluetooth module in the kit has 2 versions which are DIP Socket Version and SMD Socket Version. They will be shipped randomly, so pay attention to the 3 installation methods we provide. So we provide 3 methods to connect Bluetooth module to LED light board. The third method is suitable for all versions

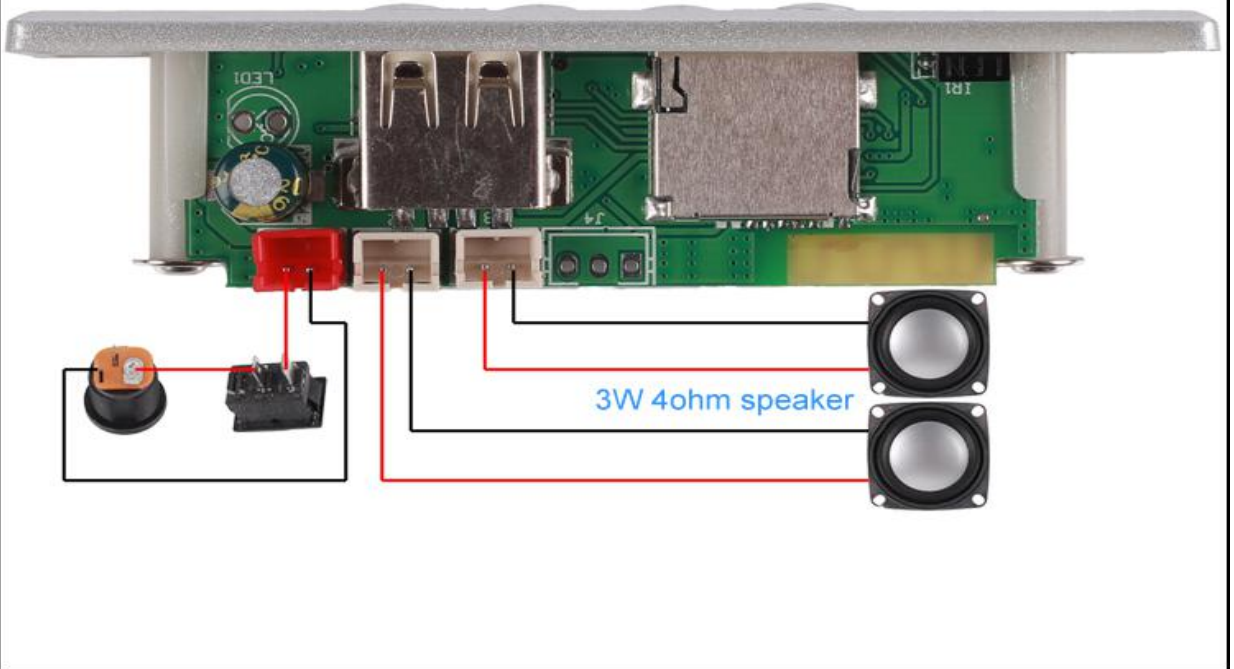


DIP Socket Version



SMD Socket Version

Step 14: Know Bluetooth audio controller: Wiring diagram.



Step 15: Install 2pcs 15cm 2Pin PH2.0 Wire on 2pcs 4ohm 3W Speaker. The speakers does not need to distinguish between positive and negative poles.

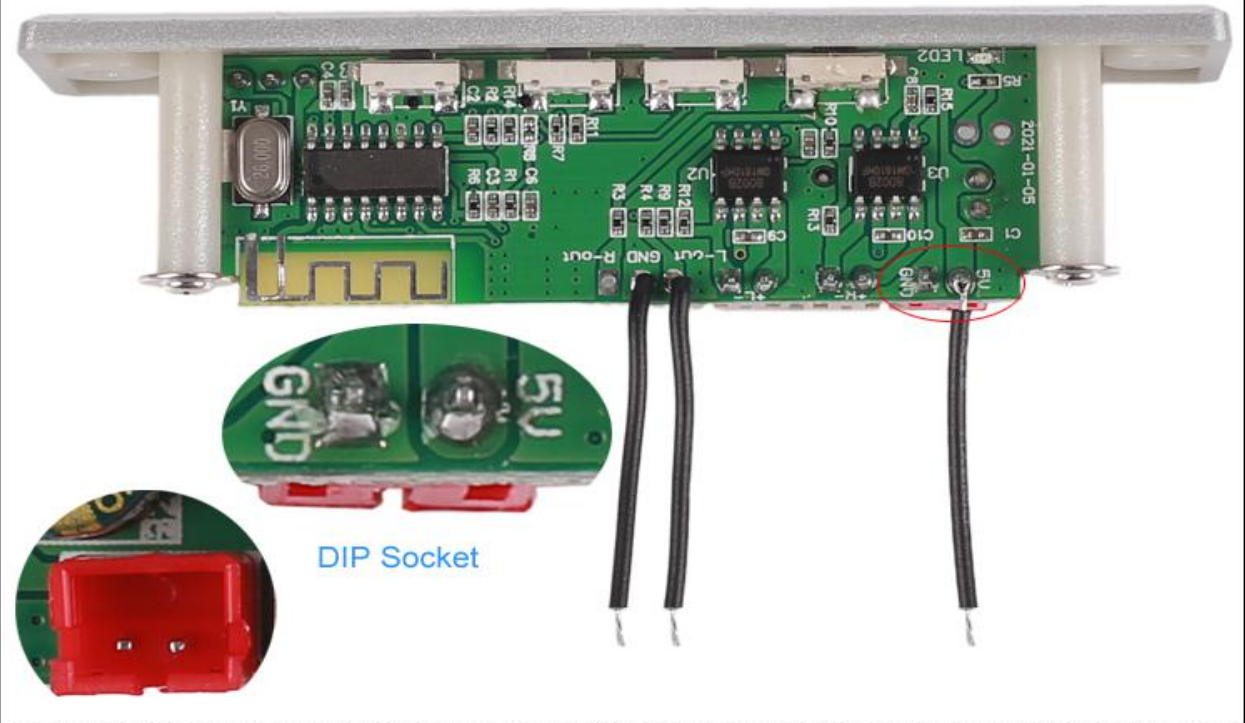


Step 16: Connect 3pcs wires to Bluetooth audio controller by 3methods.

**Method-1 for DIP Socket Version Bluetooth Module:**

Install 3pcs 10cm Black Wire to 5V/GND/L-out on Bluetooth audio controller.

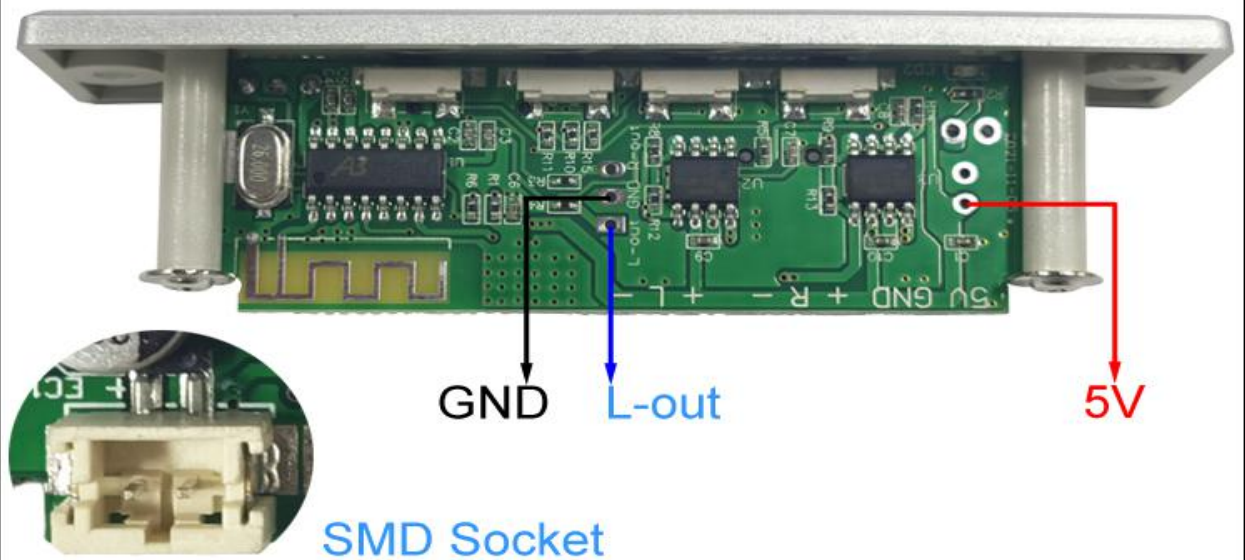
These 3wires are used to connect Bluetooth controller and LED spectrum board.



**Method-2 for SMD Socket Version Bluetooth Module:**

Install 3pcs 10cm Black Wire to GND/L-out and a pad which has marked on Bluetooth audio controller.

These 3wires are used to connect Bluetooth controller and LED spectrum board.



**Method-3 for DIP and SMD Socket Version Bluetooth Module.**

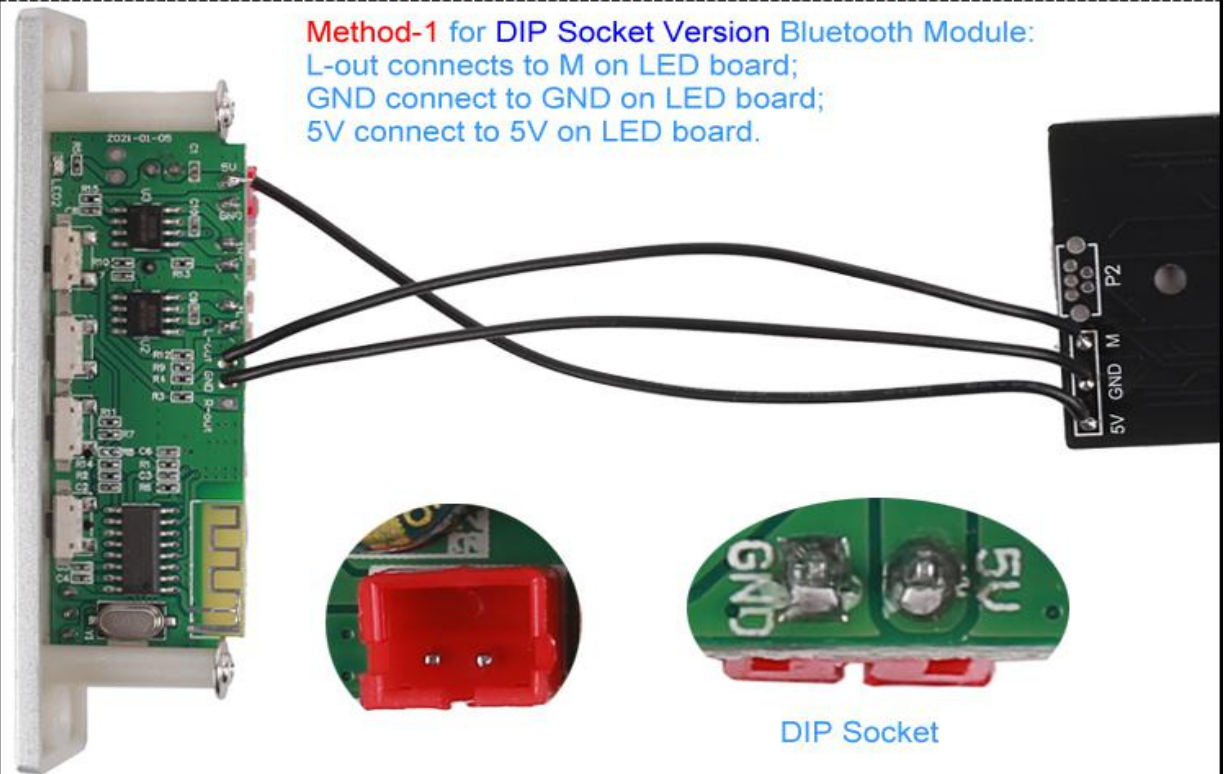
This method changes power supply connection point of LED light board.

User can refer to Step-22A which shown how to connect LED board if no find 5V/GND

Step 17: Connect 3wires from Bluetooth Module to LED spectrum board by 3methods.

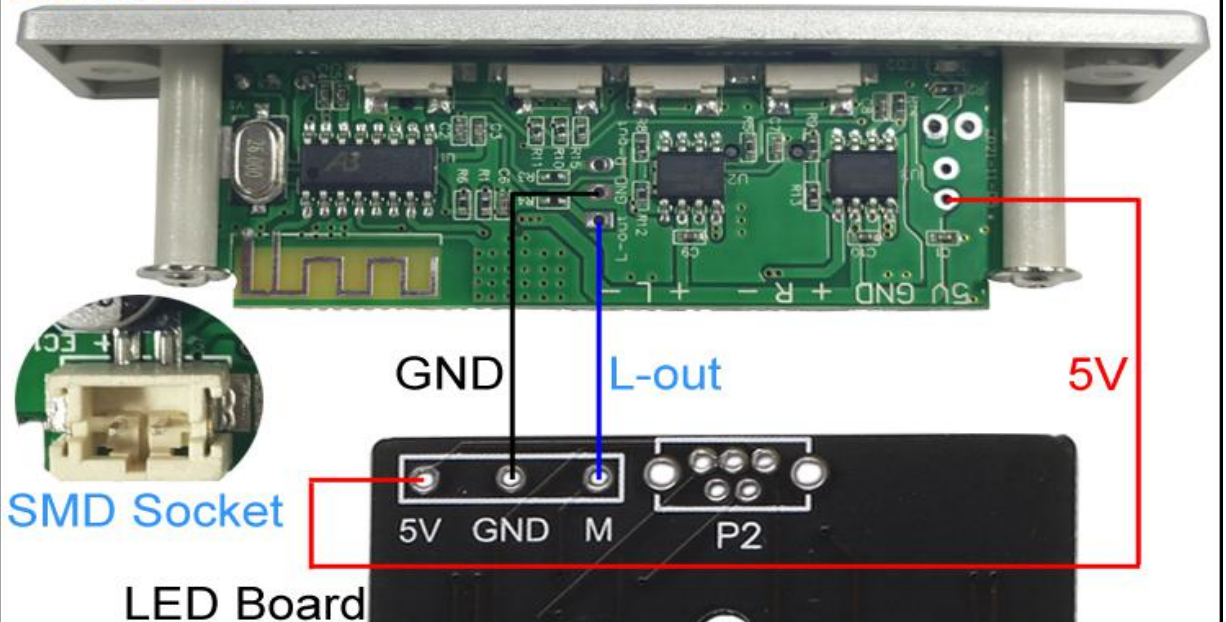
**Method-1** for DIP Socket Version Bluetooth Module:

L-out connects to M on LED board;  
GND connect to GND on LED board;  
5V connect to 5V on LED board.



**Method-2** for SMD Socket Version Bluetooth Module:

L-out connects to M on LED board;  
GND connect to GND on LED board;  
There is a pad on right which has marked on picture is 5V and connect this pad to 5V on LED board.



**Method-3** for DIP and SMD Socket Version Bluetooth Module.

L-out connects to M on LED board.  
This method changes power supply connection point of LED light board.  
User can refer to Step-22A which shown how to connect LED board if no find 5V/GND

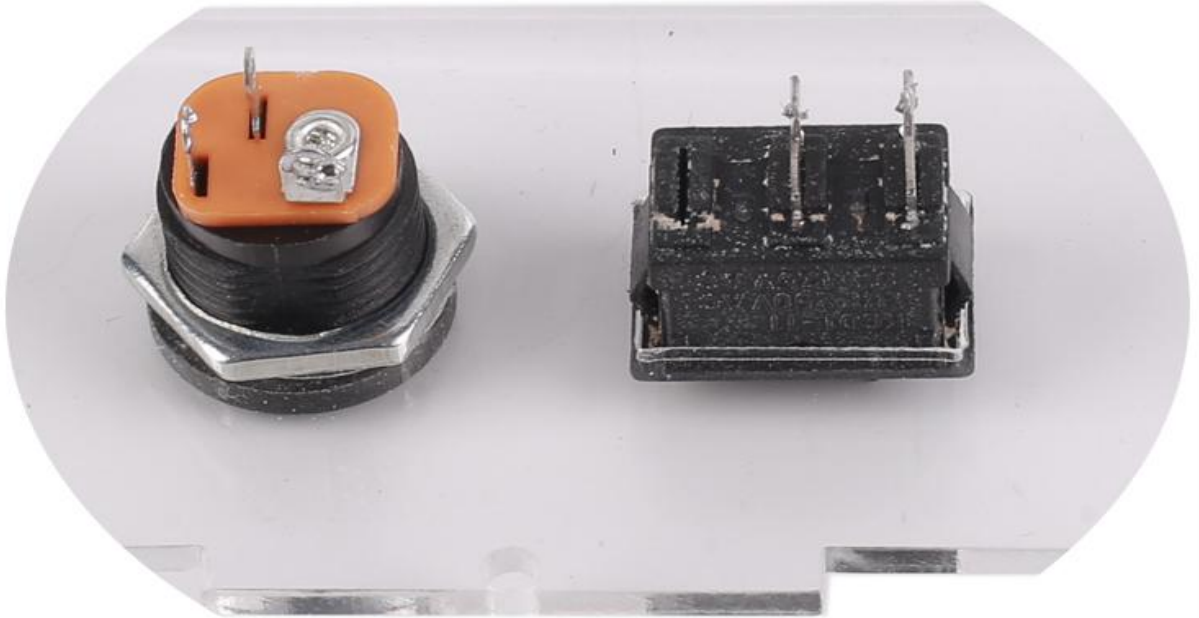
Step 18: Find the power supply acrylic panel and remove the protective film from the surface. Note: The protective film of other acrylic plates also needs to be torn off during installation.



Step 19: Fix 1pcs DC-022 Power Socket by the biggest nut on acrylic panel.



Step 20: Fix 1pcs Black Switch on acrylic panel. Pay attention to the buckle on the switch, which can be fixed by itself. Pay attention to the installation direction.



Step 21: Cut about 3cm red wire to connect DC-022 Power Socket and Black Switch. Pay attention to their pin selection and can not choose to connect other pins. Note: The 3cm red wire come from the third 15cm 2Pin PH2.0 Wire.



Step 22: Connect 1pcs 15cm 2Pin PH2.0 Wire to DC-022 and Switch. The red wire connect to Black Switch and the black wire connect to DC-022 Power Socket. Refer to the wiring location and note the PCB mark shown if the wire is in another color!





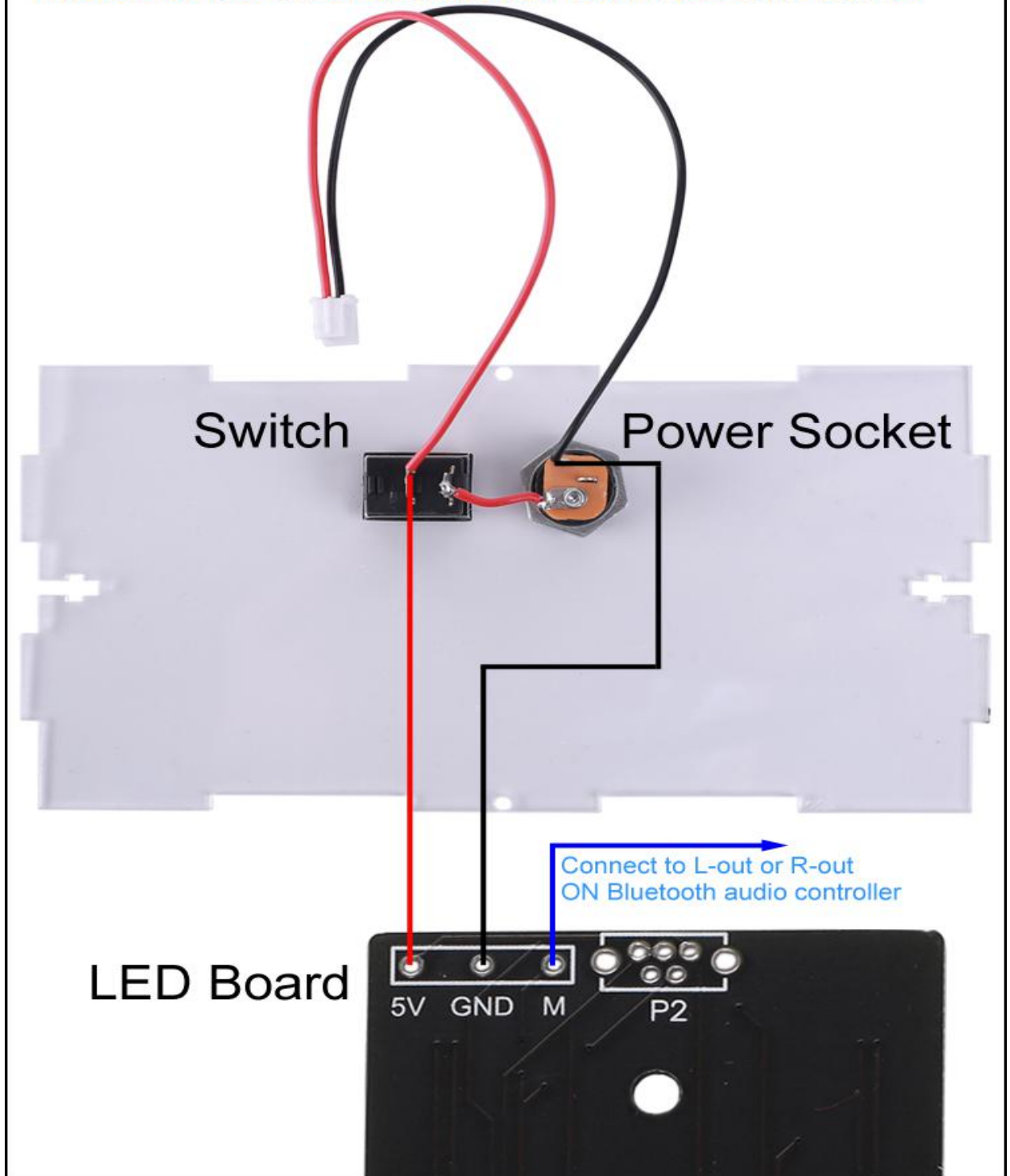
Step 22A: Connect LED spectrum board to Bluetooth audio controller if the LED board get voltage form power socket and switch but not form Bluetooth module. Otherwise user can ignore this step.

22A.1> M on LED board connects to L-out Bluetooth Module.

22A.2> 5V on LED board connects to the middle pin on switch which has connected a red wire.

22A.3> GND on LED board connects to the top pin on DC-022 Power Socket which has connected a black wire.

Note:User can refer to this method for various versions of Bluetooth modules.



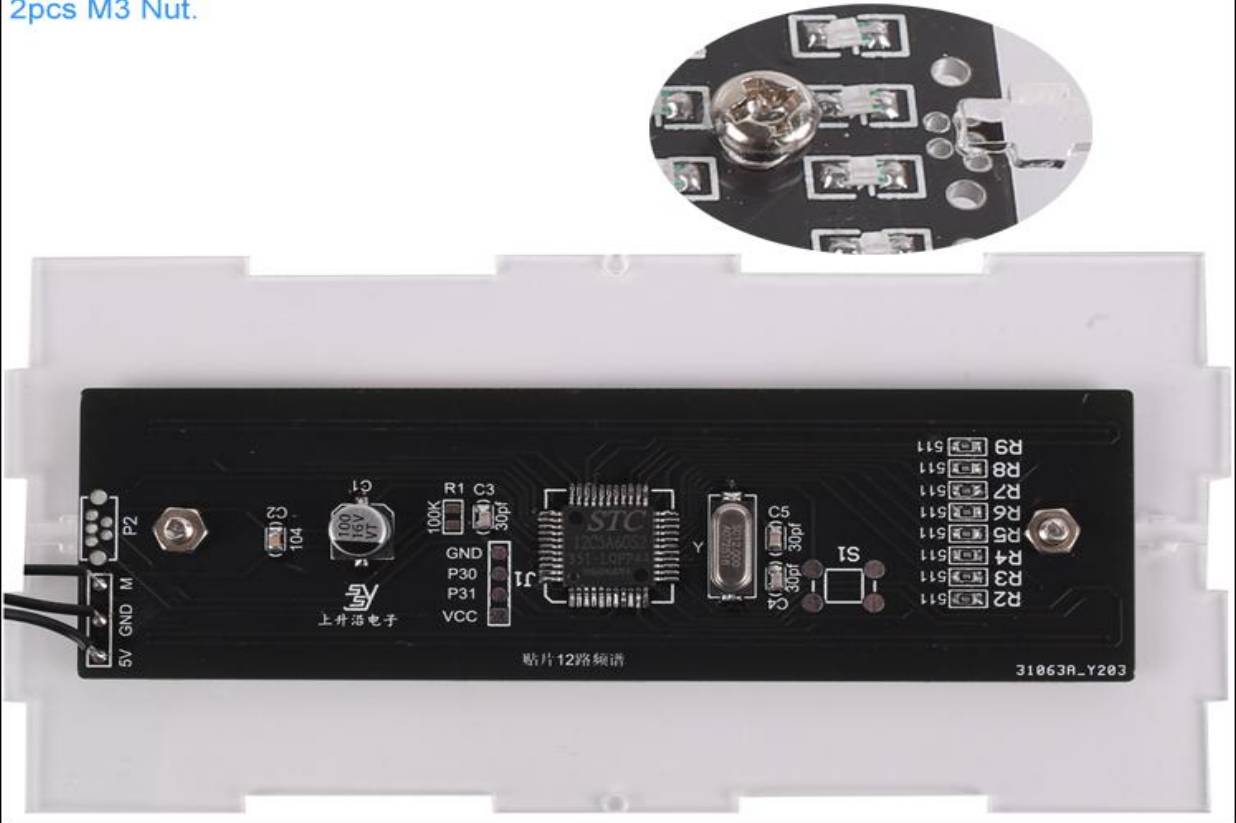
Step 23: Fix Bluetooth audio controller on acrylic panel by 2pcs M3\*10mm Screw and 2pcs M3 Nut.



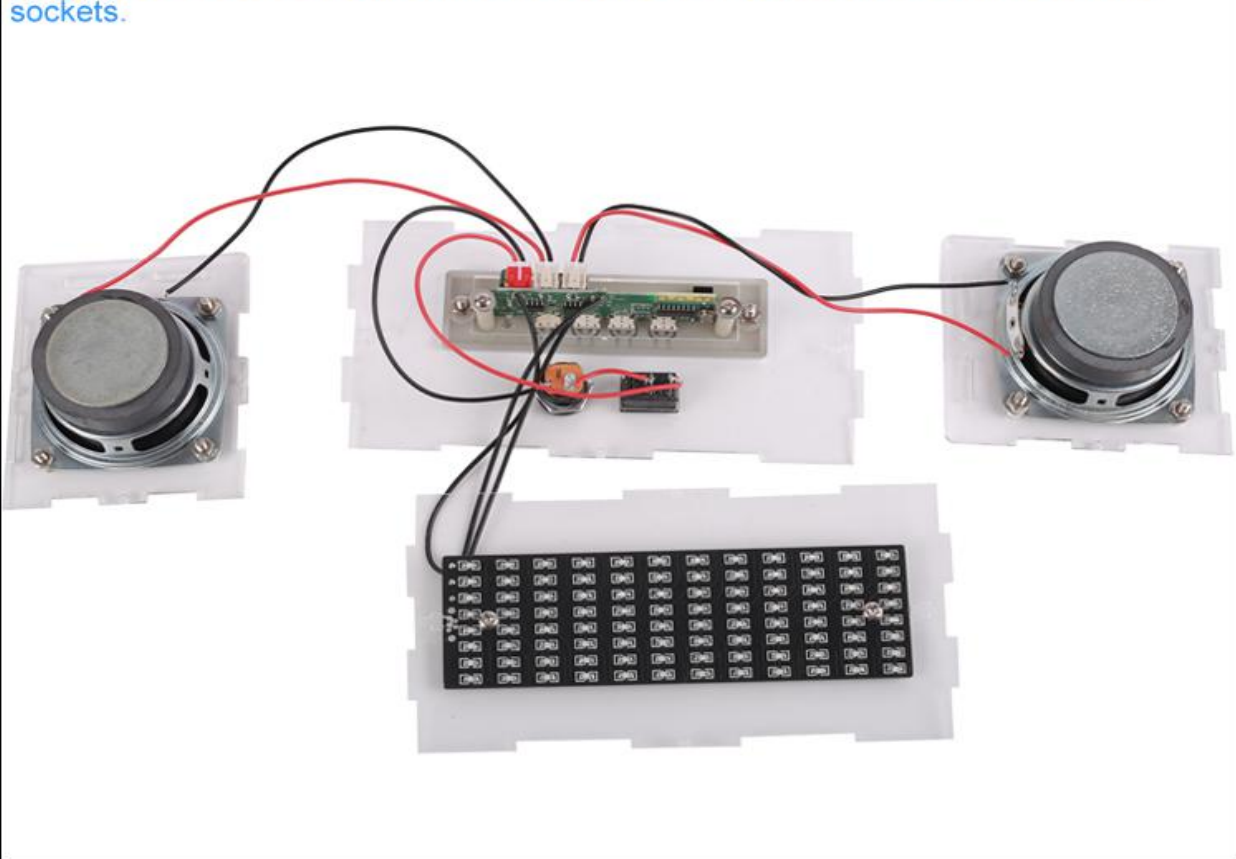
Step 24: Fix speaker on the other two are smaller acrylic panel by 8pcs M3\*10mm Screw and 8pcs M3 Nut.



Step 25: Fix LED spectrum board on acrylic panel by 2pcs M3\*10mm Screw and 2pcs M3 Nut.



Step 26: Connect 1pcs power wire to red socket and 2pcs speaker wires to white sockets.



Step 27: Assemble 6pcs acrylic panels by 12pcs M2\*10mm Screw and 12pcs M2 Nut. Please be patient when installing the screws.



Step 28: Connect to power supply and enjoy the effect. Note Please provide sufficient working current. It is recommended to use a 5V 2A power supply. Please provide enough working power if the sound is distorted. User should exercise care and provide additional support to the acrylic with one hand while pressing the switch into place with the other hand when the power is plugged in.

