SPECIFICATION

Product Name: Microwave Module

Model No.: MIC06-5GH RC1

Issue Date: 2022-11-07

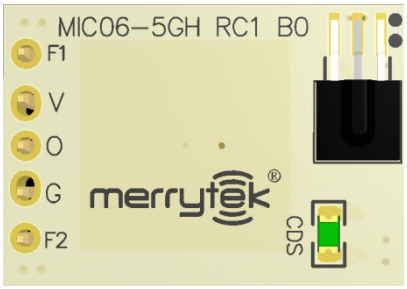
CUSTOMER APPROVED

PRODUCT DIRECTOR APPROVED	P&M CHECKED	R&D CHECKED	PREPARED

Version	Product No./ Product Name	Updating Reason	Stage	Date
A0	MIC06-5GH RC1	First version		2021-10-22
A1	MIC06-5GH RC1	Update the plug-in remote control receiver to the patch receiver remote control head		2021-12-21
A2	MIC06-5GH RC1	Update factory settings to 5S		2022-07-15
A3	MIC06-5GH RC1	Update the description of Detection radius		2022-11-07

⚠ Please read the instruction carefully before using this product, since the performance of DC-powered microwave products is closely related to the stability and characteristics of the auxiliary power supply of the LED driver.

1. Features



1) 5-12V DC wide input voltage, small operating current and low stand-by power.

2) Small size, easily installing.

3) Adopting low impedance sensor antenna technology, strong anti-interference capability.

4) Stable output PWM and high and low level signals.

5) With remote control receiving function, parameters such as detection area, hold time, stand-by period etc,. can be set.

2. Application Scenarios

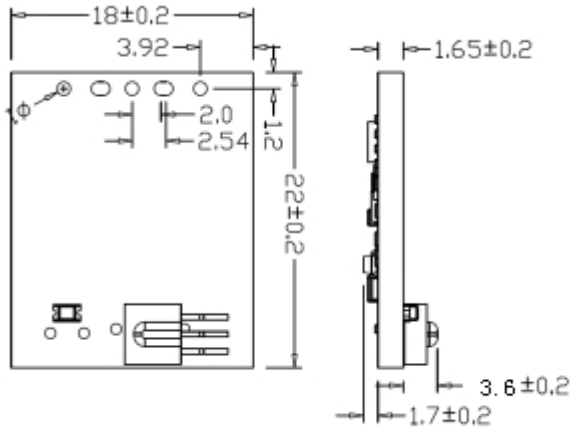
The product has many advantages, such as large detection range, built-in, no detecting blind area, not affected by temperature, humidity, noise, dust, airflow and ambient light and others. Widely being used in many applications, such as sensing light, auto-controlled door, smart home, intelligent sanitary system, home application, security & protection system, IOT, the intelligent and others.

3. Parameter

Input	Operating Voltage Rage	5-12VDC	
	Rated Voltage	5VDC	
	Operating Current	40±3mA	
	Ripple Voltage	≤100mVp-p	
	Standby power consumption	≤0.22W@5VDC	
Output	PWM Dimming signal	Yes	
	ON/OFF	Yes, 3.3V Switching Signal	
Sensor Parameters	Operating Frequency	5.8 GHz ±75 MHz，ISM band	
	Transmitting Power	1mW Max	
	Detection Area	See remote control settings for details	
	Hold Time	See remote control settings for details	
	Stand-by Period	See remote control settings for details	
	Daylight Sensor	Ordinary daylight	See remote control settings for details
	Stand-by DIM Level	See remote control settings for details	
	Detection radius (100% detection area)	Ceiling Mounting at 3m height, 0.3m/S, ≥3m(indoor: 60 ㎡) Wall Mounting at 2m height, 0.3m/S, ≥7m(indoor) See Radiation Diagram for details	
	Mounting Height	4m Max Wall Mounting at 2m heigh（Refer to "Note 17")	

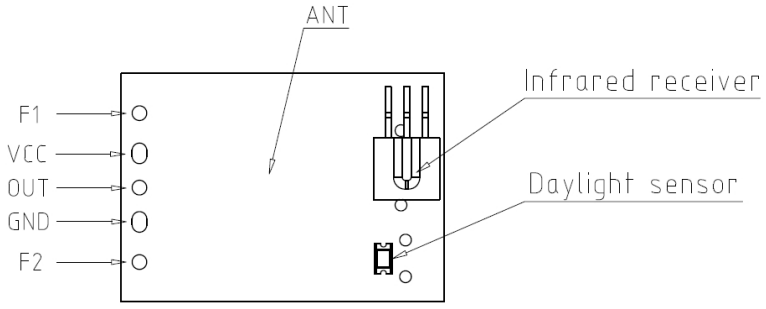
Sensor Parameters	3db Beam Angle	82°@XZ field
		95°@YZ field
Environment	Operating Temperature	-25~85℃
	Storage Temperature	20~30℃ Humidity：≤60% Bare board shipments, no shell need to pay attention to temperature and humidity protection to prevent solder pads from oxidation.
Certificate Standards	Certificate	CE
	Environmental Requirement	RoHS
	IP Rating	IP00
Others	Installation	☒ Built-in
	Dimension	See “Dimension”
	Package	Clapboard + Carton(K=A)
	Net Weight	3g
	Lifetime	3 years warranty @Ta 5VDC

4. Dimension (mm)



Note: There is a tolerance. Tolerance does not exceed ±0.2mm.

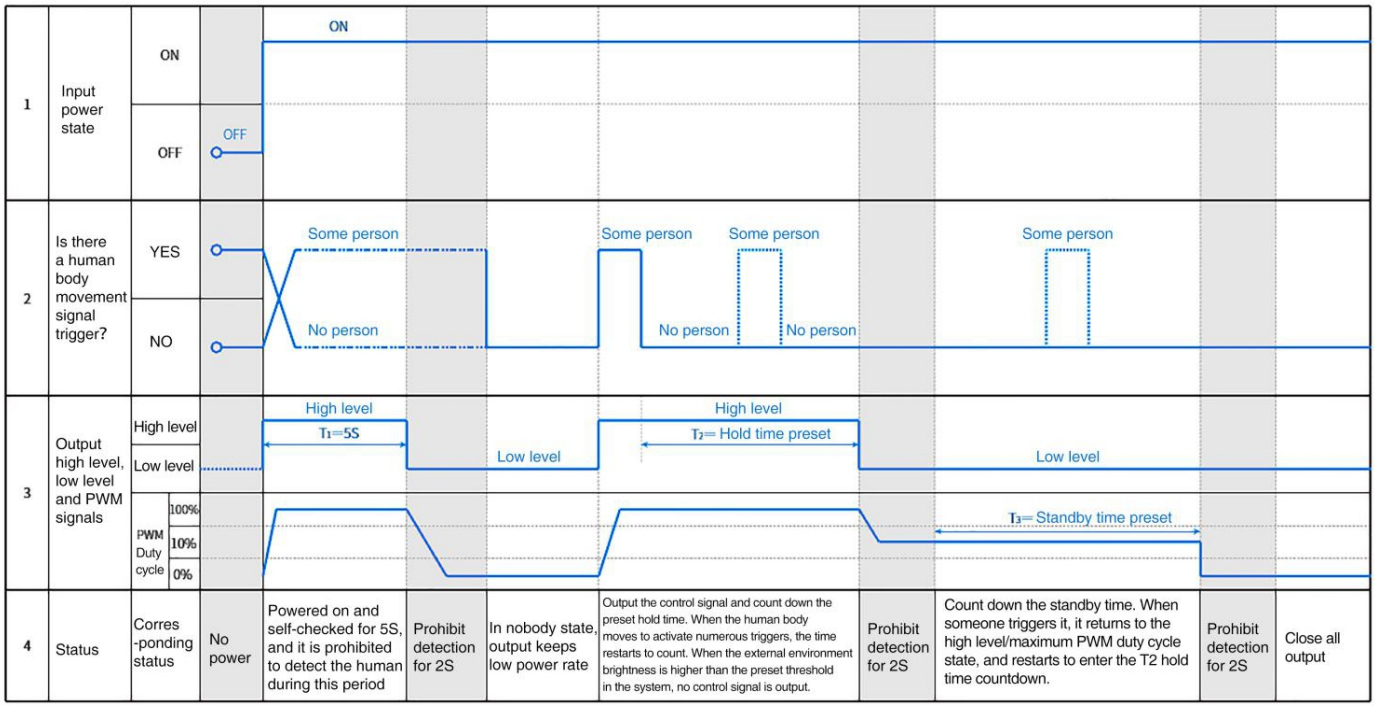
5. Structure



6. Function Description

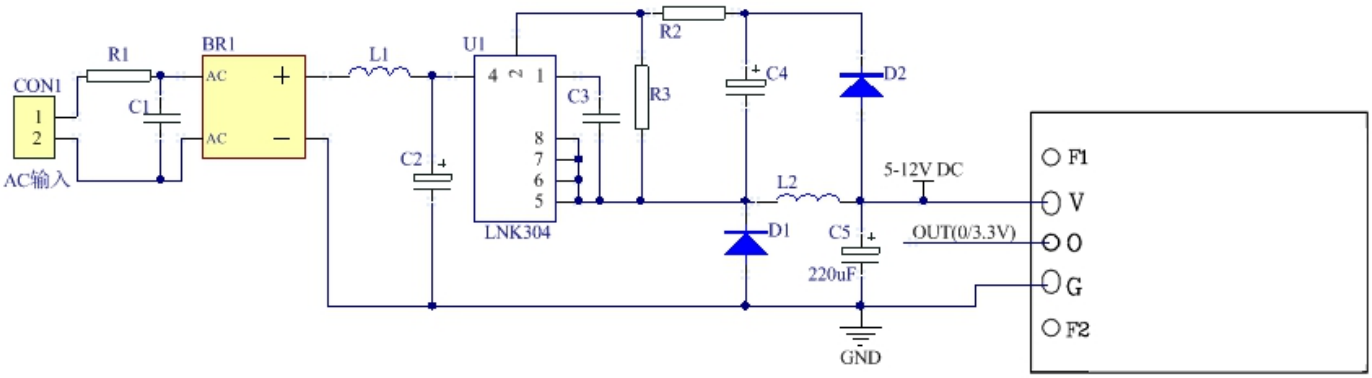
	Name	Description	Function& Parameter
1	V	Power input positive	Voltage input range: 5-12V DC
2	O	PWM signal output	PWM output port (gradually output PWM to the set value when triggered by human body induction, dim to the set value after the set time delay, and turn off the PWM output after the delay time is up), frequency 8KHZ
3	G	Power input negative	Negative pole of driver
4	F1	Function Configuration Pin 1	Alternate Port/Programming Port
5	F2	Function Configuration Pin 2	Alternate Port/Programming Port
6	IR	Infrared remote control receiver	Set sensitivity, hold time, stand-by period and other parameters.
7	CDS	Daylight sensor	Sensor for detecting the intensity of external light.
8	ANT	antenna	Microwave transmitting and receiving integrated antenna

7. Functional Sequential Logic



Note: This specification has PWM output function.

8. Typical Application Circuit& Parameters

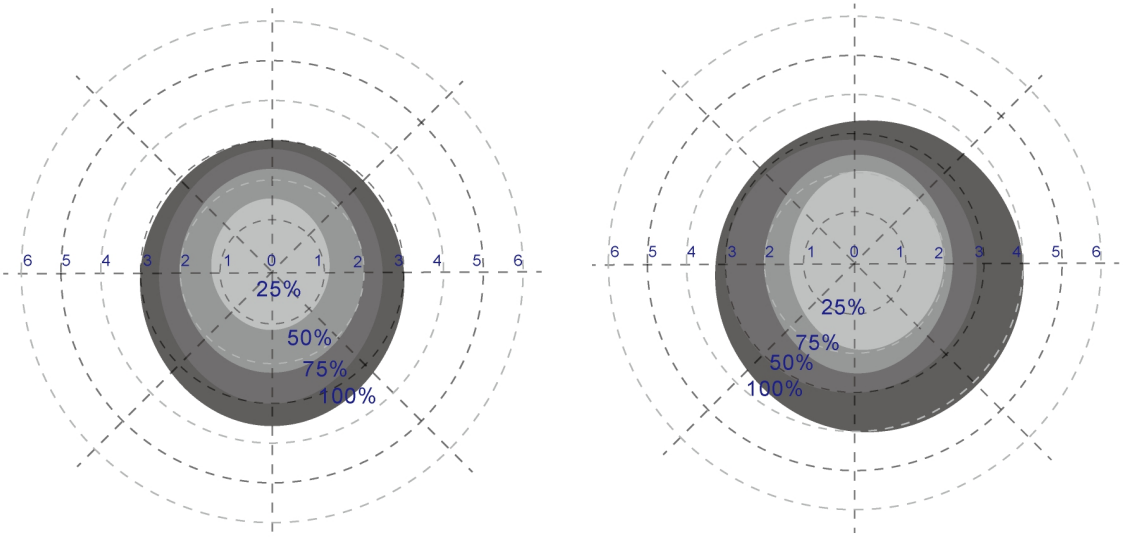


9. Radiation Pattern

Ceiling Mounting

Ceiling Mounting：3m

Detection Range: 100%/75%/50%/25%

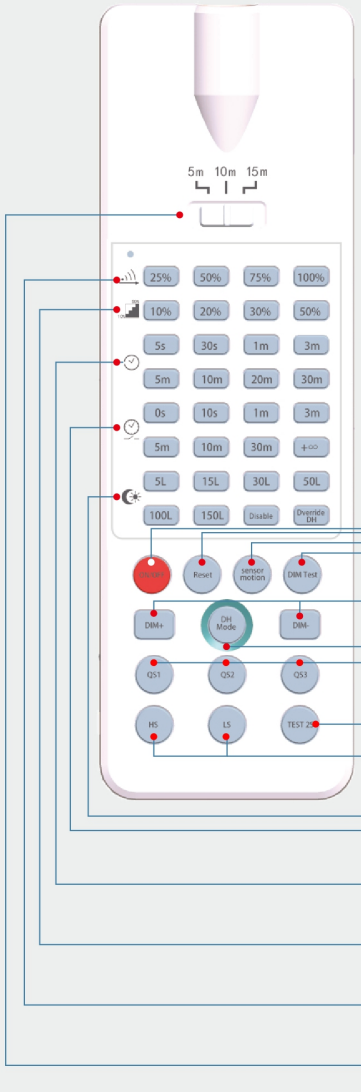


Normal moving (Speed: 1m/s)

Slow moving (Speed 0.3m/s)

10. Remote control

10.1：Remote control model：MH10

Remote Control Setting	Button	Remarks
	ON/OFF	Press the "ON/OFF" button, the light goes to constant on/off mode, sensor is disabled. Press any button to quit from this mode and the sensor starts to work.
	Reset	Press "Reset" button, all parameters are same as setting of DIP switch or factory settings.
	Sensor motion	Press "Sensor motion" button, the light quits from the constant on/ off mode,and the sensor starts to work (The latest setting stays in validity)
	DIM Test	Press"DIM Test" button,the 1-10 V dimming works to test whether the 1-10Vdc dimming ports are connected properly.After 2s, it returns to the latest setting automatically.
	DIM+ DIM-	Short press"DIM+/DIM-" button to transmit dimming signal. The brightness of the lamp adjusts at 5% per unit. (only apply for sensor with daylight harvesting function)
	DH Mode	Long press>3s,sensor will take current light level as target lux level, to dim up/down load automatically according to the change of ambient light level. (only apply for sensor with daylight harvesting function)
	Q1 Q2 Q3	Scene Options / Detection Area / Hold Time / Stand-by period / Stand-by dim level / Daylight Sensor / Induction model QS1 / 100% / 30S / 1min / 10% / 5Lux / Hs QS2 / 100% / 1min / 3min / 10% / 10Lux / Hs QS3 / 100% / 5min / 10min / 10% / 30Lux / Hs Note: Detection area / Hold time /Stand-by period /Stand-by dim level / Daylight sensor can be adjusted by pressing the corresponding button.The latest setting will stay valid.
	TEST 2S	Press the "TEST 2S" bottom can enter the test mode anytime.At the mode, the sensor parameters as below:Detection Area is 100%, Hold Time is 2s, Stand-by Dim Level is 10%, Stand-by Period is 0s, daylight sensor disable. This function only for testing. Quit the mode by pressing "RESET" or any other function buttons.
	HS LS	Press"HS"button to set the detection area to be high sensitive. Press"LS" button to set the detection area to be low sensitive. The adjustment bases on the "Detection Area"parameter you set.
		Daylight Sensor Set up daylight threshold: 5Lux/15Lux/30Lux/50Lux/100Lux/150Lux/ Disable
		Stand-by period Set up stand-by time: 0S/10S/1min/3min/5min/10min/30min/+∞
		Hold time Set up hold time: 5S/30S/1min/3min/5min/10min/20min/30min
		Stand-by dim level Set up stand-by dim level: 10%/20%/30%/50%
		Detection Area Set up detection area: 25%/50%/75%/100%
		Remote Distance Toggle bottom can set the remote distance of remote control and sensor.

Remote control and code setting conversion

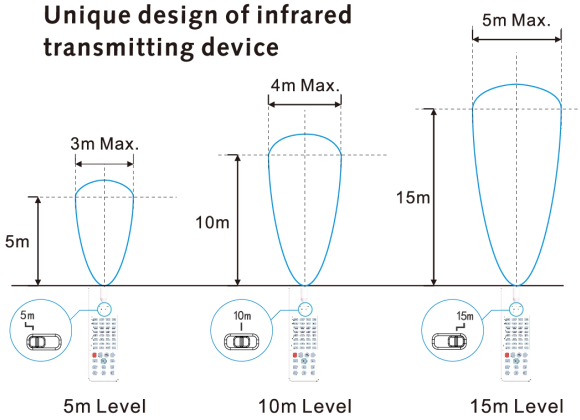
1.DIP switch setting convert to remote control Press any bottom except "RESET" on the remote control, and the sensor settings convert to the function currently selected by the remote control. (No function button settings invalid)

2 remote control convert to DIP switch setting

a. Press the "RESET" button on the remote control, and all settings return to the DIP switch settings of the sensor.

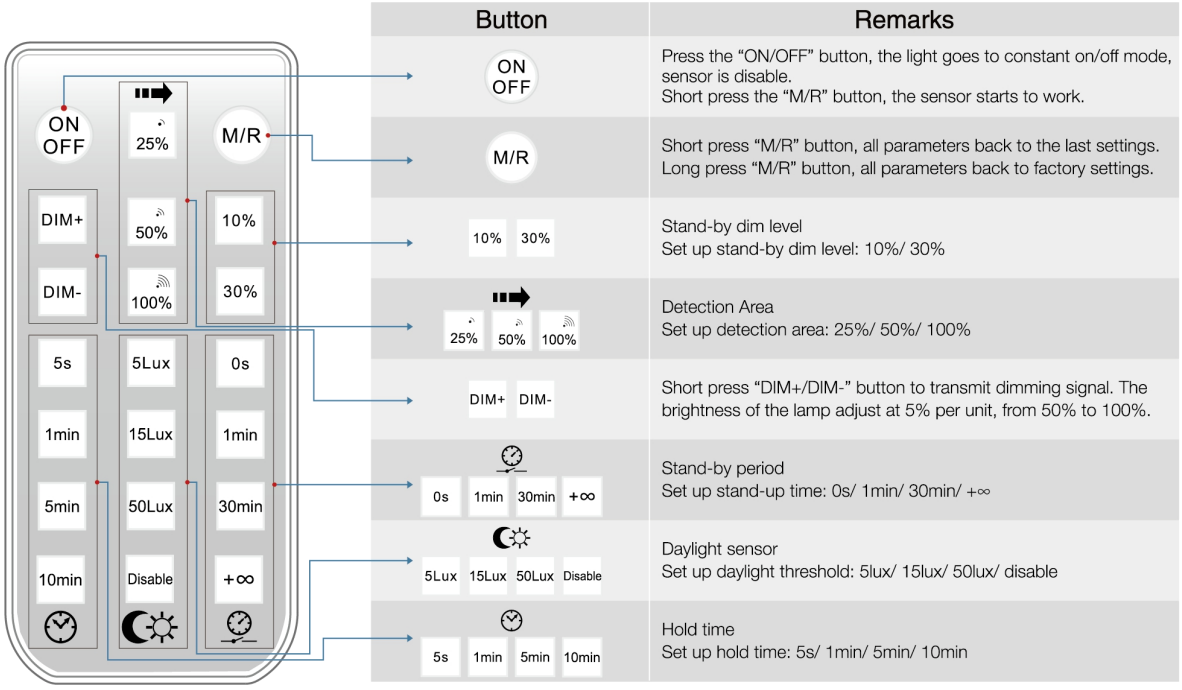
b. Turn off the power, toggle any DIP switch,connect to the power, and all settings return to the DIP switch settings when supply power again.

Unique design of infrared transmitting device

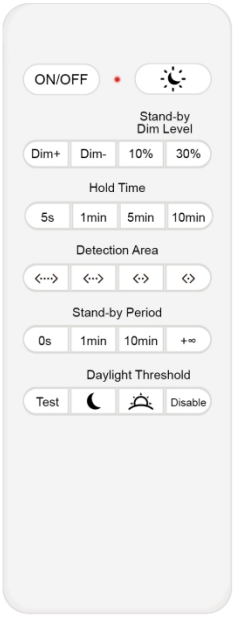


10.2：Remote control model：MH11

Remote Control Settings	Button	Remarks



10.3：Remote control model：MH14



Button	Function	Description
ON/OFF	Normal ON/OFF	Pressing the ON/OFF button, sensing function is canceled and the light will remain ON/OFF. Sensor has power-off memory function, that is: pressing this button, the sensing function is still canceled after power off, and the light remains full brightness.
	Night light function	Pressing this button, the light will maintain 3% brightness.
Dim+	Increasing Brightness	Pressing this button continuously, the brightness will increase. When adjusting the brightness at full brightness. ON/OFF mode is still available.
Dim-	Reducing Brightness	Pressing this button continuously, the brightness will reduce. When adjusting the brightness at full brightness, ON/OFF mode is still available.
Stand-by Dim Level	Low Brightness	10%, 30%
Hold Time	100% Brightness	30s, 1min, 5min, 10min
Detection Area	Detection Area	100% ⟷ , 75% ⟷ , 50% ⟷, 25% ⟷
Stand-by Period	Stand-by Time	0s, 1min, 10min, +∞
Test	TEST Button	Pressing this button, the light will turn off after 2 seconds. Restore to last sensing setting after power off.
Daylight Threshold	Threshold	15lux , 50lux , Disable

Description:

1：ON/OFF：constant on/off mode.

2：Reset：The parameters are restored to factory settings [see the table below].

3：Sensor Motion：Exit the always on/off mode.

4：DIM Test：Each time the PWM is pressed, it gradually changes to the maximum value or to the set dimming ratio value.

5：DIM+/-：Set the maximum brightness in sensing state.

6：QS1、QS2、QS3：Set the parameter value quickly [see the table below].

7：TEST 2S：In the factory test mode, the set value will not be saved when the power is turned off, and the parameter value set last time will be restored after the power is turned off [see the table below].

8：DH Mode、HS、LS：NA.

Remote control special button setting table:

Name/Type	Detection Area	Hold Time	Stand-by Period	Stand-by DIM Level	Daylight Sensor
QS1	100%	5min	10min	10%	30Lux
QS2	100%	10min	30min	10%	Disable
QS3	100%	20min	30min	10%	Disable
Reset	100%	5S	0S	10%	Disable
TEST 2S	100%	2S	0S	10%	Disable

11. Factory Setting

Detection Area: 100%; Hold Time: 5S; Stand-by Period: 0S; Stand-by DIM Level: 10%
Daylight Sensor: Disable (with input/output pin header).

12. Instruction

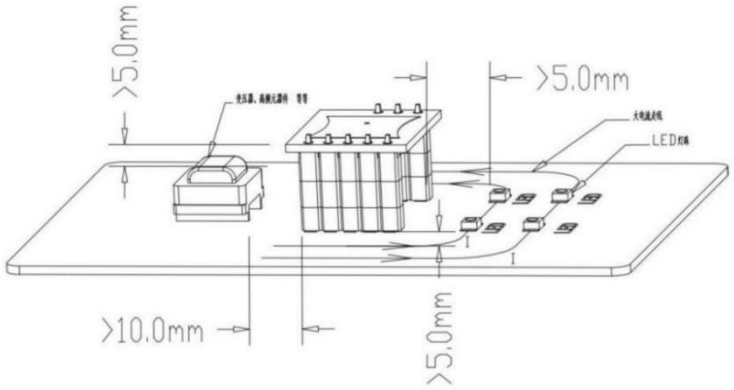
1. Sensor should be installed by a professional electrician. Please turn off power when installing, wiring, or setting parameters.
2. The microwave of the product can penetrate plastic or wooden objects. No metal accessories, metal cover, glass cover and others should be placed in the front of and near the antenna of the microwave module, otherwise it will affect the transmission and reception ability of the microwave antenna.
3. The detection range of the sensor is related to the moving speed and size of moving object, mounting height, installation height and angle, installation site, reflectors around the sensor etc. The data in the document is typical value and tested by a 165cm person in 60 square meter indoor area.
4. The light threshold is detected value in a sunny environment, no shadows, and in an ambient light diffuse reflection condition. In different time periods, climates and environments, the illuminance values detected by the light sensor may be different.
5. The installation distance between product and product or router should be more than 1.5m.
6. To achieve the best detection effect, the surface of antenna of microwave module should exceed the other flats(TCB, PCB) at least 5mm.
7. It is recommended to use DC stabilized power supply with stabilized output voltage and lower current and ripple ratio(ripple ratio< 100mV; the minimum load current > 100mA), and to set an electrolytic capacitor filter of no less than 220uF at the VCC port of the input power supply.
8. To avoid vibration affecting detecting, product should be installed as far as possible away from large metal device, tube, air outlet of conditioner, extractor and etc.

9. To avoid high frequency signal affection detecting, product should be kept away from AC driver power supply, rectifier bridge, potential transformer, switching tube and other devices with large power.

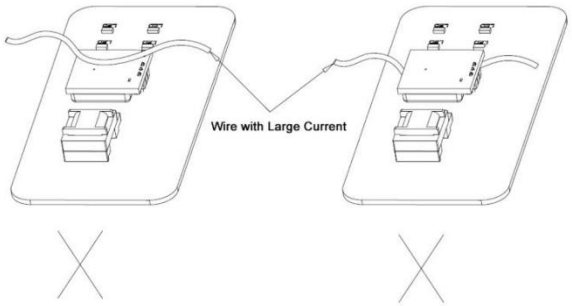
10. Product comes without input/output pin header.

11. Due to continuous improvement, the contents of this instruction will be changed without prior notice.

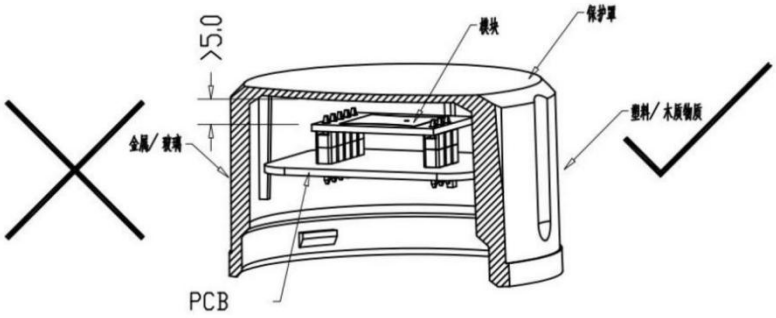
12. Product Design: large current, potential transformer or high-frequency component is not allowed to close the surface of antenna of microwave module. The distance should be more than 10mm. The other flats should be lower than the surface of antenna at least 5mm. As shown the following:



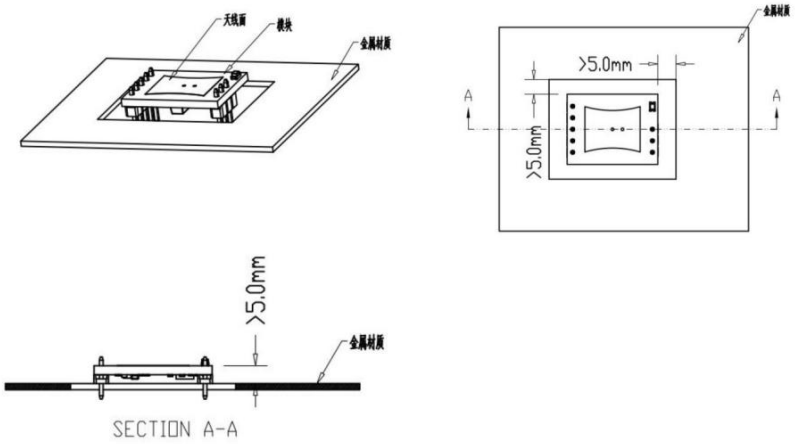
13. Wiring: To avoid affecting the normal operation of product, no large current passes or wire covers the surface and back of product antenna. As shown the following:



14. To avoid affecting the normal operation of product, no metal or glass covers products. The thickness of plastic should be less than 5mm. Too thick will affect the detection effect and direction of the microwave module.



15. The surface of antenna of microwave module should be higher than metal flats(TCB, metal housing) at least 5mm.



16. All modification may affect sensor performance, please confirm with Merrytek in advance if any modification with lighting fixture, especially space and material above sensor antenna, or LED driver.

17. This product is suitable for ceiling mounting. If wall mounting, please change sensitivity or contact the manufacturer for technical support.