



## 1. Product Overview

HW-XC509 is the latest dual-plate microwave induction module introduced by our company. It has beautiful appearance, simple and compact circuit structure, stable performance and low cost. Its cost performance is very high, especially suitable for intelligent appliances, security products, lighting products, etc. Secondary development in other electronics fields. This product can be widely used in security monitoring, intelligent control systems, lighting appliances (garages, corridors, roads and other places).

## 2. Product working principle:

According to the principle of Doppler effect, the HW-XC509 microwave induction module uses a planar antenna to send and receive high-frequency electromagnetic waves, and then detects a slight movement change in the foldback wave, and then triggers the microprocessor to work, and finally outputs 5V effective high power from the OUT terminal Ping signal.

## 3. Product features:

Professional 5.8G fixed frequency flat horn antenna design, field-shaped signal transmission and reception, wide coverage, high consistency, low power consumption, ROHS environmental protection, and strong anti-interference ability, free from temperature, humidity, airflow, dust, noise, bright Dark and other effects.

When this product is used indoors, the induction effect is better; when it is used outdoors, due to the influence of the environment, the induction distance is slightly reduced or the sensitivity is slightly weak. This is a normal phenomenon, and the user does not have to question the product.

## 4. Induction time:

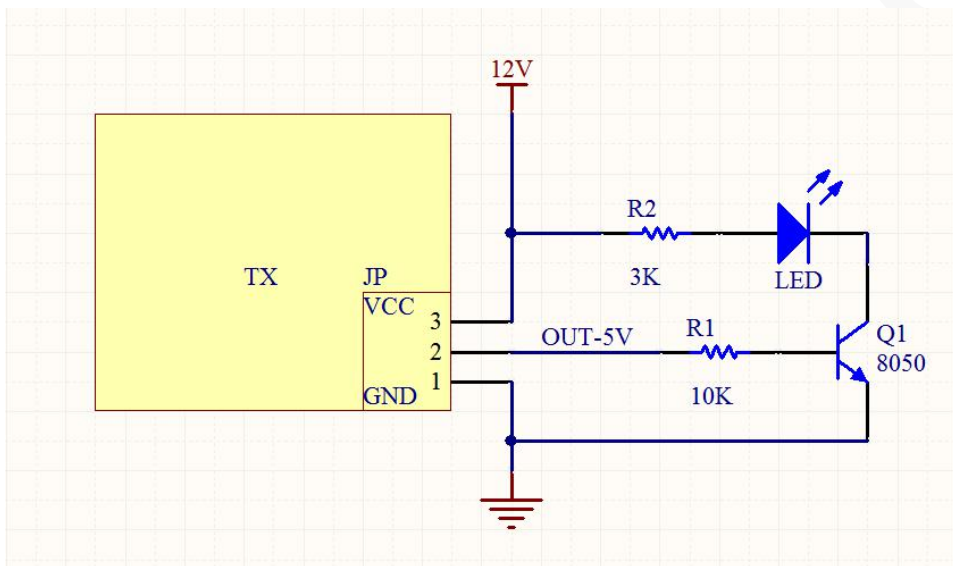
The default repeatable trigger: if the output signal is triggered for the first time, the module delay time will be superimposed again when the first trigger time is not stopped when the sensor is triggered again (listed as follows: the module trigger time is 2S, and it is accepted again within 2S When the induction signal is superimposed for 2S again, there will always be an output signal when it is triggered continuously. It cannot be triggered repeatedly: the induction is triggered once and the time is not superimposed (for example: time 2s, trigger once, output 2s, no matter within 2s) Multiple triggers are considered invalid, and the time is not superimposed and remains for 2s.)

## 5. Specifications:

Model	HW-XC509	V.06	5.8G Fixed frequency module
Input voltage VCC	DC-6V-24V 300mA	DC:V+ ( Built-in 7550)	Note: Please pay attention to distinguish positive and negative+ -
Working current V/A	<15mA	Note: constant power supply is required	
The output voltage VOUT	H:3.3V-662kout	L:0V	TTL (1---0)
Induction method	Doppler motion detection (SENSOR Installation is not removable)		
Induction time	Time:2 seconds by default	Non adjustable	not support customization
Sensing distance	SENS:customize	0.5m-12m (VR)	Adjustable: Turn clockwise to lower sensitivity
Trigger method	Repeatable trigger (default)	-----	Does not support non-repeatable trigger
Frequency	5.8GHz±75MHz		

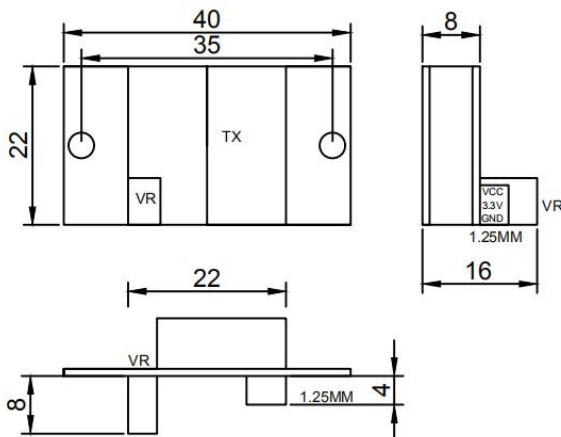
Transmit power	<0.3W	-30dB	
Angle	90°-360°		Determined by SENS
Photosensitive	5p-1/ 3P-1/PO170	When receiving light, block OUT	Light sensor (default)
Operating temperature	-20~+80℃		Ambient temperature
Dimensions	L40 X M22 X16 (+VR)		Length-width-height / (mm)
Port	PJ-1.25mm-3P	V+ OUT GND	Output (with connector by default)

6. Schematic diagram of product detection wiring and CAD drawings



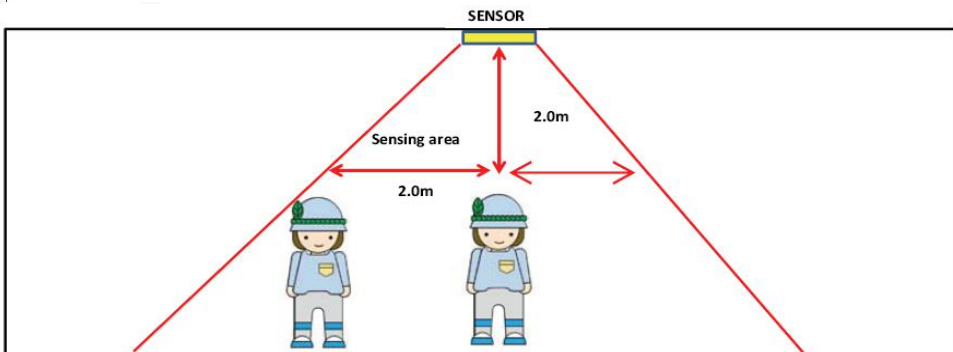
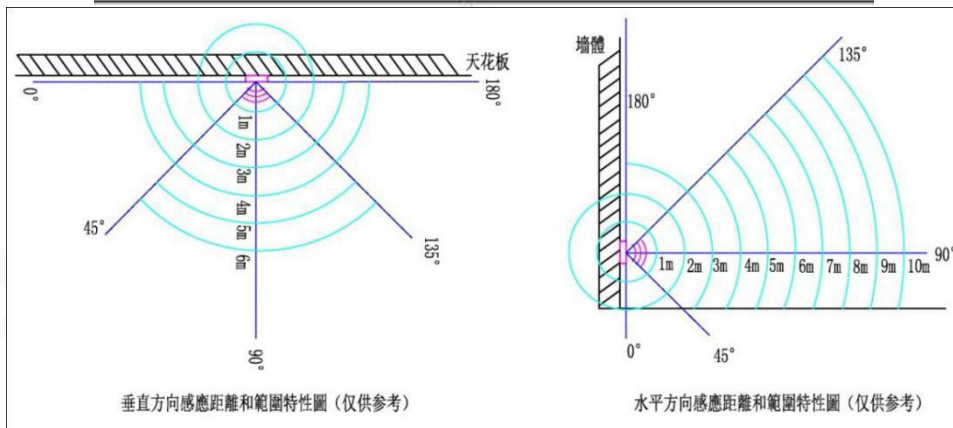
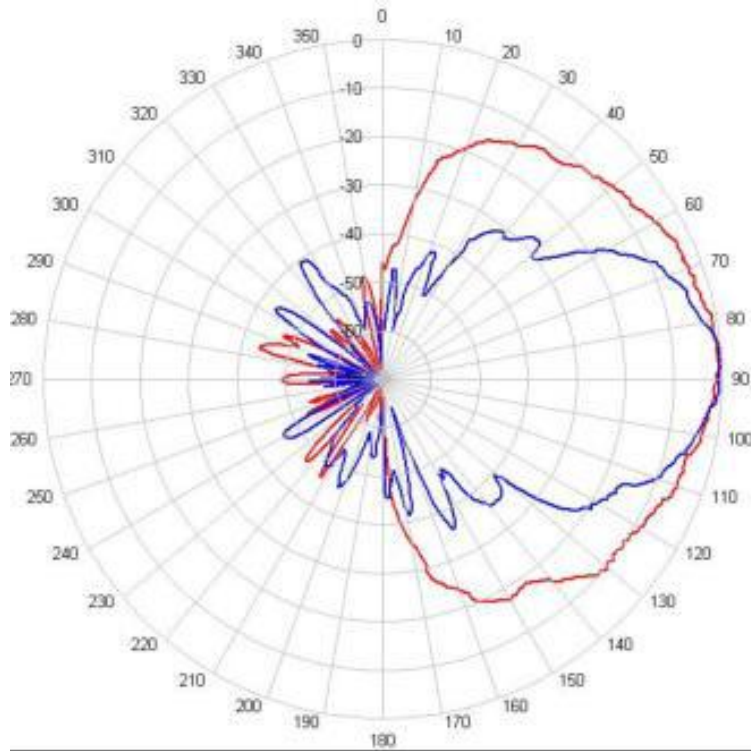
As shown in the figure, VCC can supply DC12V, JP is XC509 output port, 2: middle output high level signal 3.3V, when pin 2 outputs high level, Q1-NPN tube 8050 is turned on, VCC will supply power to LED, this When the LED is on, it indicates that the module has signal output. When pin 2 has no signal output, the output end is in no signal state 0V. If you need to test the performance of this product, you can connect the wiring according to the above figure separately. Later, the signal can be used to trigger: trigger circuit-MOS tube-thyristor-relay-MCU and so on.

CAD size drawing: L40 X M22 X16mm (with VR)



### 7. Angle and Radiation

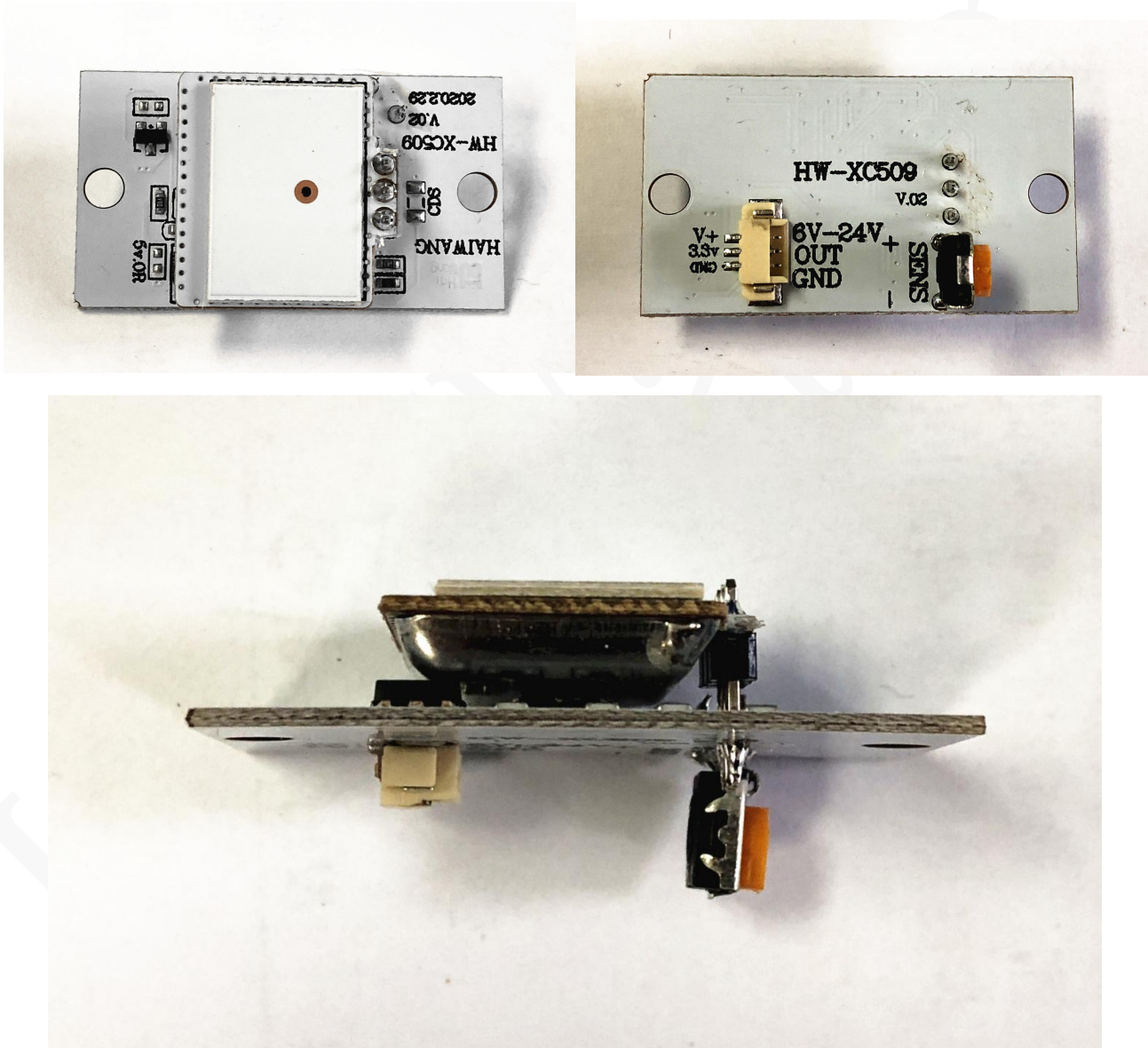
As shown in the figure: The reference picture is obtained by the measuring instrument. The actual sensing area is based on the angle range of 100 square meters indoors. Due to the close relationship between Doppler radar microwave and space, the actual application needs to define the detection range and angle according to the application environment (the smaller the microwave detection range space, the higher the sensitivity, and the greater the space, the sensitivity is relatively attenuated). This picture is used as an official guide reference, and the actual application needs to be tested according to the usage environment.



## 8. Product physical map:

1. TIME defaults to 2 seconds and cannot be customized. If you need to change it, please contact our technical staff.
2. The SENS potentiometer rotates clockwise, the shorter the distance, the counterclockwise, the longer the sensing distance. (SENS potentiometer rotates clockwise, the sensitivity decreases, and counterclockwise, the sensitivity increases.)
3. If no potentiometer is needed, please contact our company's technical staff, there is a reserved patch resistance adjustment method in the circuit position.

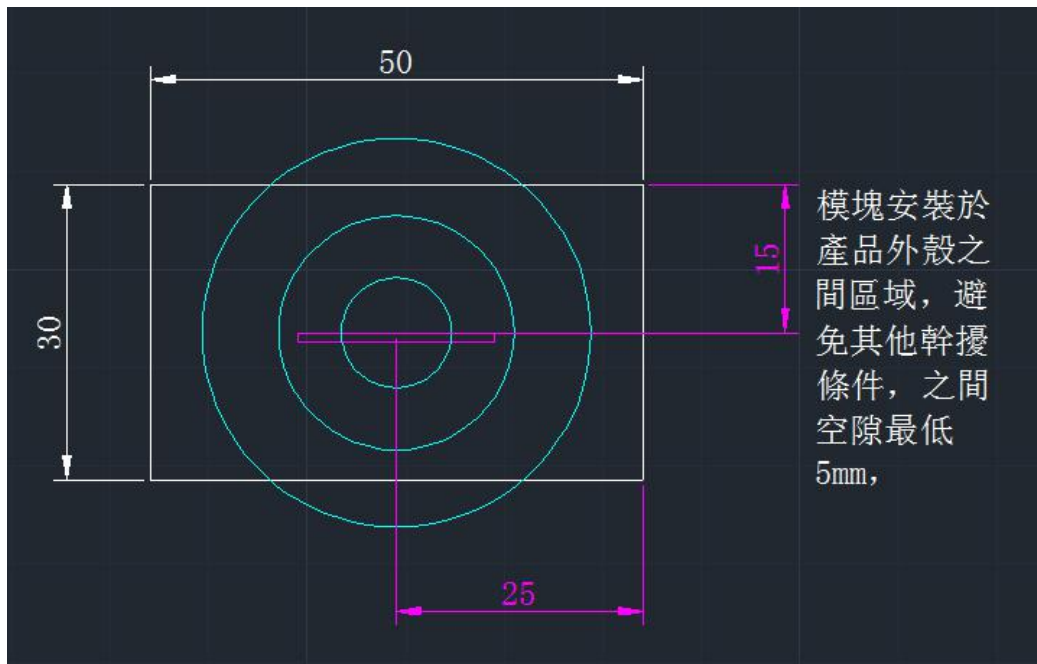
### VR version potentiometer adjustment



## 9. Matters needing attention:

### ●About product installation process requirements

During product installation testing and actual assembly, please ensure that the antenna plate (S-shaped opening PCB) of the module product is at least 10mm apart in front of it, and must not be close to or touching the plane of any object, otherwise the product will not work properly .



#### ●About power supply

It is recommended to use a qualified DC stabilized power supply, that is, a DC stabilized power supply whose output voltage, current and ripple coefficient meet the standards, otherwise it will affect the stability of this product, and some abnormalities may occur, such as: false alarms, no induction, Cycle self-starting, etc.

#### ●About false positives

1. To ensure the qualification of the power supply, please refer to the first item above;
2. During the test, ensure that there are no moving objects (within the sensing range) around the product to be tested;
3. There is about 10s initialization time after power on. During this period, it belongs to abnormal induction, which may cause false alarms; it is determined by TIME.
4. During indoor testing, the induction is relatively sensitive, and the surroundings need to remain static, and ensure that the first induction signal cycle is completed before the next test; when outdoor testing, be sure to pay attention to the dynamics of the surrounding environment, such as flying birds, Pedestrians, vehicles, etc.;
5. The signal current output by this module is very weak, and it will cause false alarms when directly driving the load. Please refer to the application diagram of this product for connection.

#### ●Adjustment of working delay

2 seconds by default

#### ●Adjustment of sensing distance

There is a [distance] 3326VR resistor SENS on the back of the module, which is used to change the sensing distance. (If you do not need VR, please contact the relevant staff)

#### ●The shell assembly of this product

The metal shell is not easily penetrated by microwaves and infrared rays, so this product should be avoided to be installed in the metal shell. However, obstacles such as plastics, ceramics, and wooden soils have better penetration effects. For details, please refer to the test.

#### ●The mutual resonance of this product

This product has certain mutual resonance interference, so within the effective induction range, try to avoid installing two or more modules face to face, otherwise, it may affect your use effect. If necessary, please be sure to contact our relevant staff.