



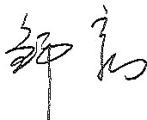
SPECIFICATION

Product Name: Microwave Module

Model No.: MIC01-5GH01

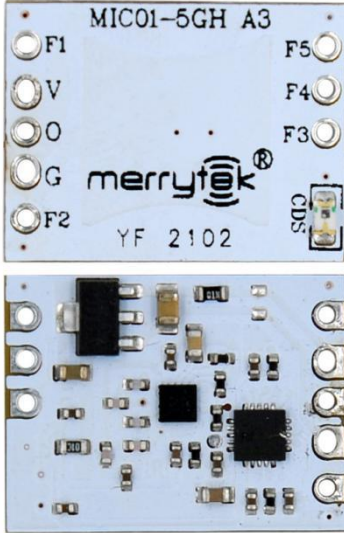
Issue Date: November 30, 2020

CUSTOMER APPROVED

PRODUCT DIRECTOR APPROVED	SALES CHECKED	R&D CHECKED	PREPARED
			邵明志

⚠ Please read the 10th 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) 5-12Vdc input, low working current, and low standby power.
- 2) Small size and easy to install.
- 3) Patented low impedance antenna design to avoid interference with other wireless signals.
- 4) Built-in multiple digital filter algorithm to resist breeze and drizzle, and outputs high and low level signals.
- 5) Detection area, hold time, daylight threshold and other pins are reserved.
- 6) Multi-function extension pins F1-F5 are available, and sensing function is easy to expand, no additional MCU is required.

2. Application

MIC01-5GH01 has the advantages of long sensing distance, built-in, no dead zone, and not affected by temperature and humidity, noise, dust, air flow, and ambient light. It is widely used in induction lamps, automatic door control, smart home, smart bathroom, small household appliances, security, IoT, smart terminals and other products, suits for corridors, garages, toilets, courtyards, balconies and other places.

3. Parameter

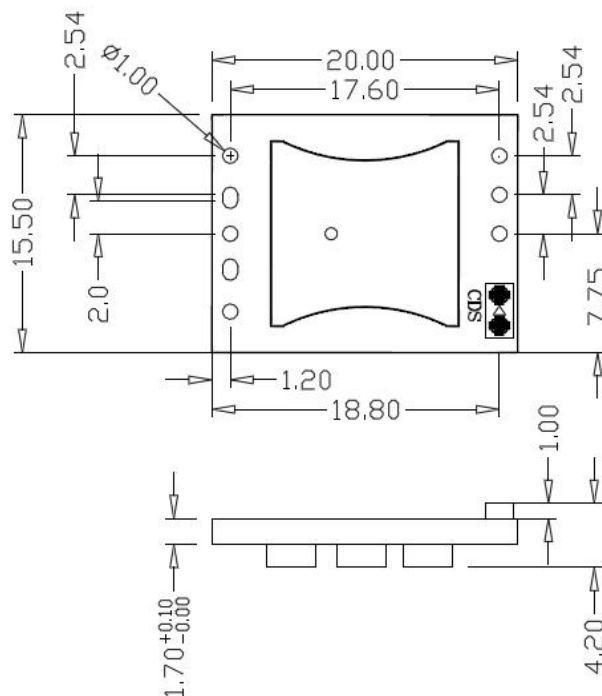
Input	Operating Voltage Range	5-12V DC
	Rated Current	33±3mA
Output	Mode	Motion detected, output TTL control signal
	Level output	High level: 3.3V±0.2V DC Low level: 0V+0.2V DC
Sensor	HF system	5.8 GHz ±75 MHz, ISM wave band
	Transmitting Power	0.1mW max
	Hold time	Please refer to the diagram and the pins definition.
	Stand-by DIM level	
	Stand-by period	
	Detection sensitivity	
	Daylight sensor	
	Detection area (radius)	≥4m (typical value, ceiling mounted at a height of 3m, walking speed of 0.3m/s)
	Mounting height	6m Max
Detecting angle	360°(ceiling mount); 110°(wall mount)	

Operating Environment	Operating temperature	-20℃...+85℃
	Storage temperature	-40℃...+125℃ Humidity: 10%-95% (non-condensing)
Certificate Standards	Environmental requirement	RoHS
	Certificate	CE、FCC、RED
	IP Rating	IP00
	Protection class	Class II
	Installation	Built-in installation
	Dimension	15.5x20mm
	Package	Bubble bag + partition + outer box (K=A)
Net Weight	3g	

Note

1. The sensing distance is related to the moving speed and volume of the moving object. This data is obtained by testing a person with a height of 165cm and a moving speed of 0.3m/s.
2. The output interface type is switched by updating the firmware of the software.
3. It's equipped with a light sensor by default.
4. Interface pin header is not included by default.

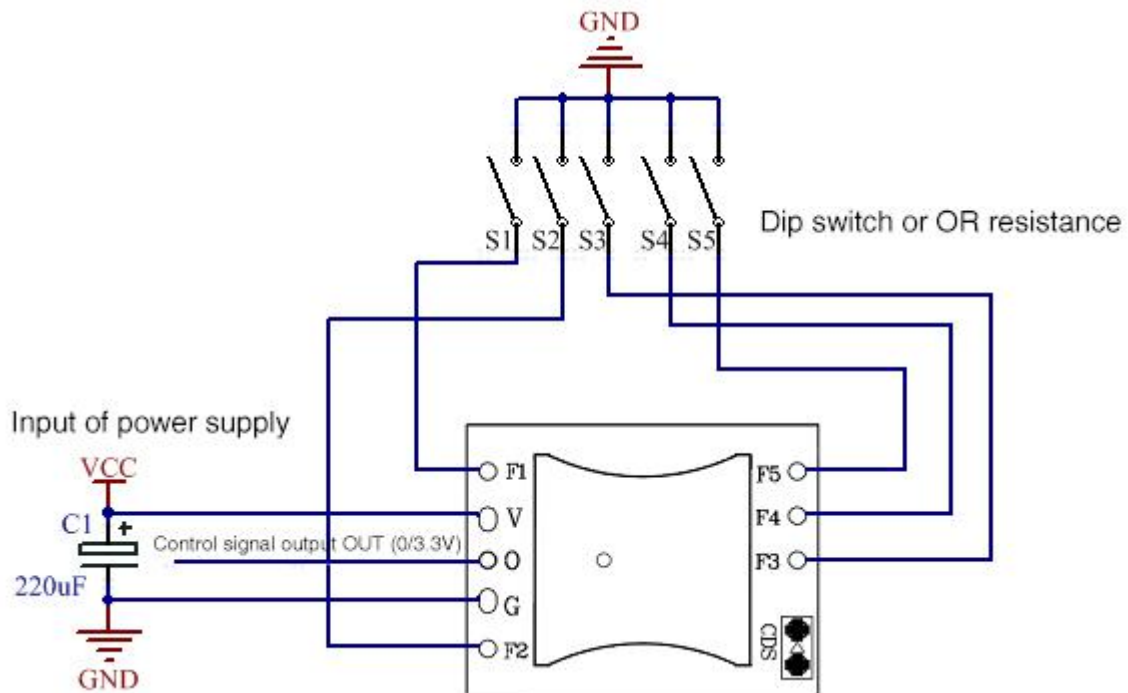
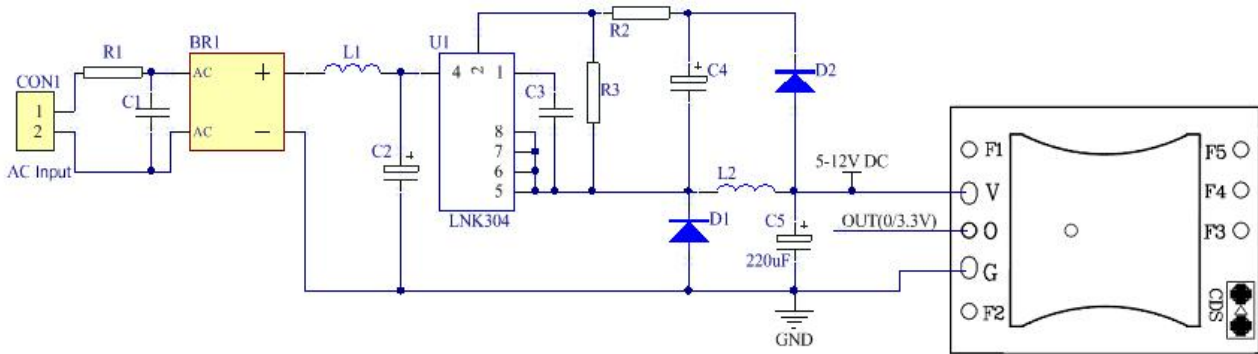
4. Dimension (mm)



Note

The above dimensional data will have certain tolerances in actual products, and the maximum tolerance does not exceed ±1mm.

8. Typical application circuit and parameter configuration



Declaration: F1, F2, F3 are pins for hold time setting, F4 is for detection sensitivity, and F5 is a pin to switch the daylight sensor, details are specified in the below sheet. If only fixed parameter are needed, the DIP switch in the above figure can be replaced with 0R resistance.

S1(F1)、S2(F2)、S3(F3) Configuration Sheet

Number	Scene Number	S1(F1)、S2(F2)、S3(F3) Status	The hold time output by O pin
1	QS1	S1 close, S2 close, S3 close	60min
2	QS2	S1 close, S2 close, S3 open	30min
3	QS3	S1 close, S2 open, S3 close	10min
4	QS4	S1 close, S2 open, S3 open	5min
5	QS5	S1 open, S2 close, S3 close	3min
6	QS6	S1 open, S2 close, S3 open	1min
7	QS7	S1 open, S2 open, S3 close	30S
8	QS8	S1 open, S2 open, S3 open	2S (Factory tested gear)

S4(F4) Configuration Sheet

Number	Scene Number	S4(F4) Status	Detection sensitivity
1	QS1	S4 close	50%
2	QS2	S4 open	100% (Factory tested gear)

S5(F5) Configuration Sheet

Number	Scene Number	S5(F5) Status	Daylight sensor threshold
1	QS1	S5 close	30Lux
2	QS2	S5 open	Disable (Factory tested gear)

Notice

- 1) Detection sensitivity refers to the sensitivity of the sensor to detect human movement signals. The higher sensitivity percentage, the longer sensing distance, and the lower sensitivity percentage, the closer sensing distance.
- 2) The hold time output by the O pin is the time when the output is high, and the timing can be triggered repeatedly. When the sensor detects no one, after the hold time, the output is low.
- 3) The light sensor threshold means that the output control is enabled only when the external light intensity detected by the light sensor is less than the set value and simultaneously the human body movement is triggered.

9. Factory settings(F1-F5 pins are open)

Detection sensitivity: 100%, Hold Time: 2S Daylight Sensor: Disable

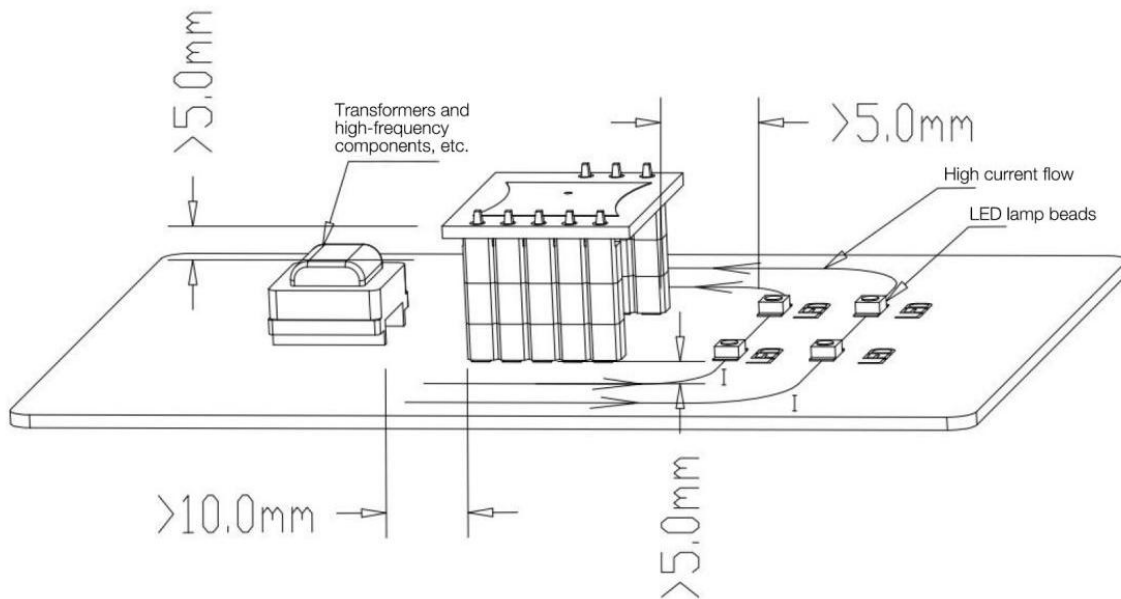
Interface pin header is not included by default.

10. Instructions

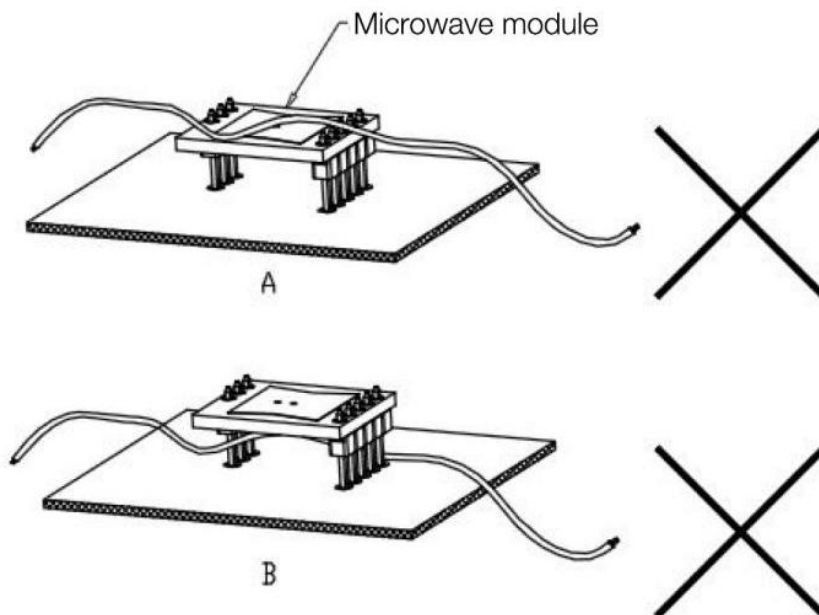
- 1) The sensor should be installed by a professional electrician, please cut off the power before installing, wiring, changing settings, etc.
- 2) The product has good penetrating ability to plastic, wood, etc., but metal accessories or metal casings should not be installed directly in front of and near the antenna of the microwave module, otherwise it will affect the transmission and reception ability of the microwave antenna.
- 3) The sensing distance will be affected by the installation height of the sensor, the size of the detected object, the moving speed, and the installation environment, and the sensing distance also varies in different directions.
- 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 plane of a product (for example: aluminum base plate, PCB board) needs to be different from the antenna plane of the microwave module by a certain height, and the antenna plane of the microwave module should be higher than the nearby plane by more than 5mm to achieve the best detection effect.
- 6) It is recommended to use a DC power supply with stable output voltage, low current and ripple factor. The power supply ripple should be less than 100mV, and the minimum load current of the power supply should be greater than 50mA. At the same time, it is recommended to install an electrolytic capacitor filter not less than

220uF at the VCC of input power.

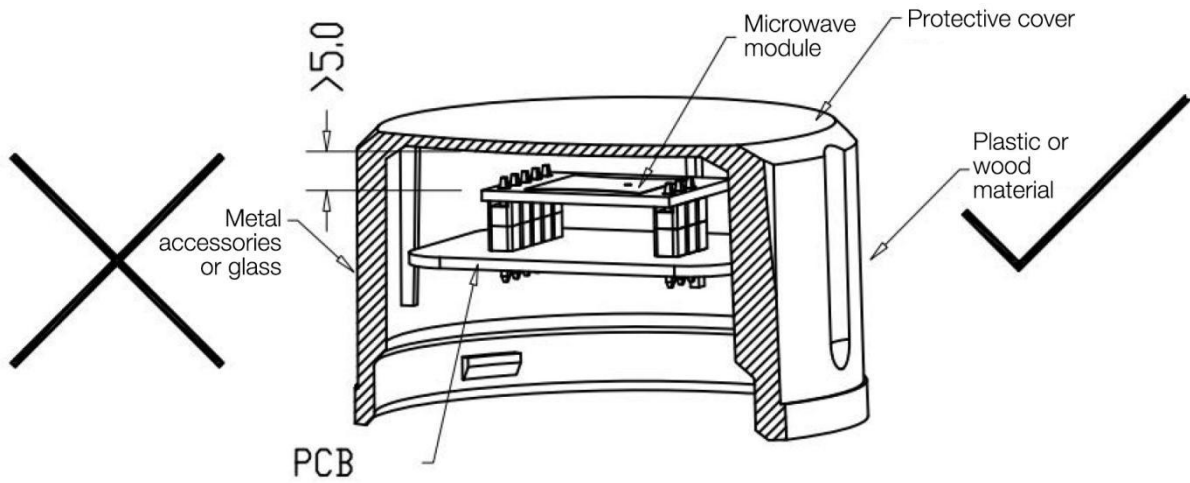
- 7) The product should be installed as far away as possible from scenes like large metal equipment, pipes, air conditioning outlets, exhaust vents, smoke exhausters, to avoid the equipment vibration.
- 8) The microwave module should be kept away from the AC power supply, and should be far away from the rectifier bridge, transformer, switch tube and other high-power devices of power supply to prevent high-frequency signals from interfering with the normal operation of the microwave module.
- 9) Interface pin header is not included by default.
- 10) Specifications and parameters may be optimized without prior notice.
- 11) During product design, please keep high current flow off the antenna surface of the microwave module and its nearby, make sure that transformers or high-frequency components are in the distance greater than 10mm, and should be 5mm lower than the height of the microwave module, as shown in the figure below:



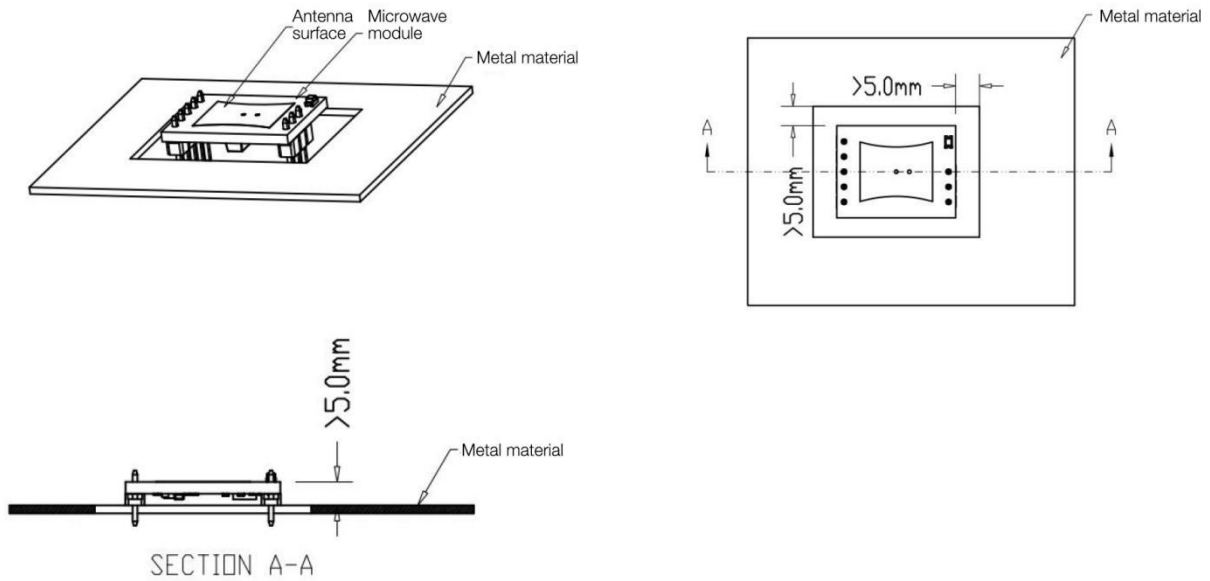
- 12) When wiring, the antenna surface and the component surface of the back must not be blocked by wires or large current flows, so as not to affect the normal operation of the sensor, as shown in the figure below:



13) There should be no metal accessories or glass directly in front of and near the product, so as not to affect the normal operation of the sensor. And the thickness of the plastic should be less than 2mm, otherwise may affect the detection effect.



14) There should be a certain height difference between the antenna surface and the metal plane (aluminum substrate, iron casing), and the recommended distance is greater than 5mm.



FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help important announcement

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following" Contains FCC ID: **2A153-MIC01-5GH**

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures

This module is Limited single modular without shielding, host manufacturer have to consult with module manufacturer for the module limiting conditions when integrate the module in the host. module manufacturer should reviews detailed test data or host designs prior to giving the host manufacturer approval.

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

The EUT application the FCC part 15.249 rules, No need to evaluate RF exposure.

2.7 Antennas

This radio transmitter **2AI53-MIC01-5GH** has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Model	Type	Connector	Peak gain(dBi)
			5725-5875MHz
5725-5875MHz	PCB	/	5.0dBi

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID:2AI53-MIC01-5GH".

2.9 Information on test modes and additional testing requirements

Host manufacturer which install this modular with limit modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C:15.231 and 15.209 requirement, only if the test result comply with FCC part 15.231 and 15.209 requirement, then the host can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.