Dalian iFlabel Technology Co., Ltd.

Human body Millimeter-Wave
Radar products

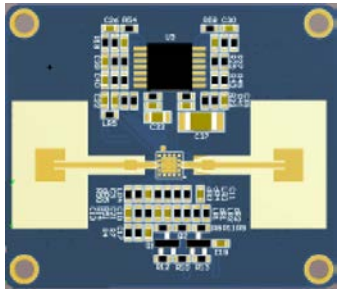
Indoor Radar Installation and Operation

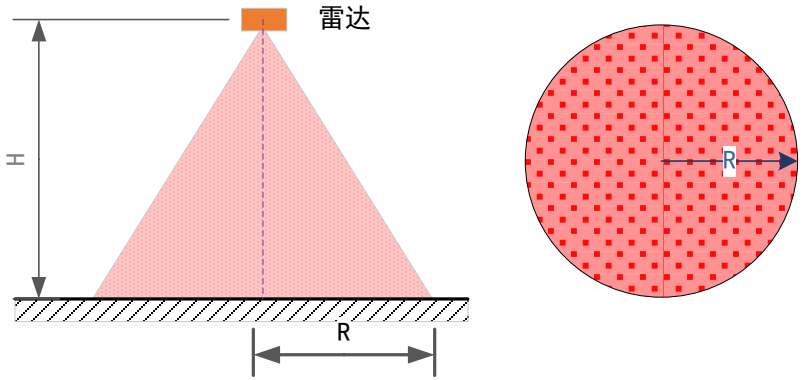
Schematic diagram of radar scanning direction

Direction

1. Circular antenna radar

It is suitable for installation on the roof. And it is suitable for places with short distances or large areas.

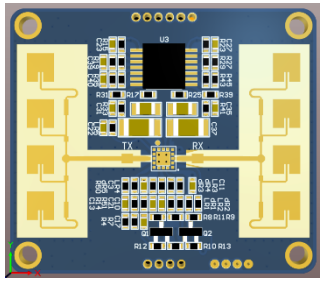


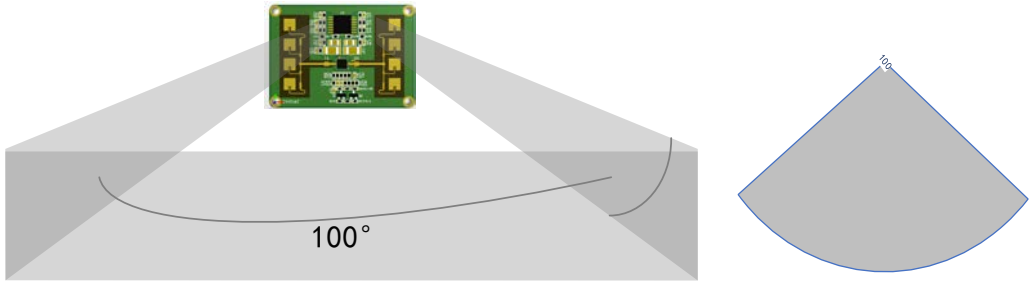


Sleep Radar, Fall-Prevention Radar, Breathing-Heartbeat Radar

2.Sector radar

It is suitable for places with long distances and no change in scanning direction. (The scanning angle and distance can be customized)：





Human-Detection Radar, Security Radar

Sleep monitoring, abnormal breathing alarm

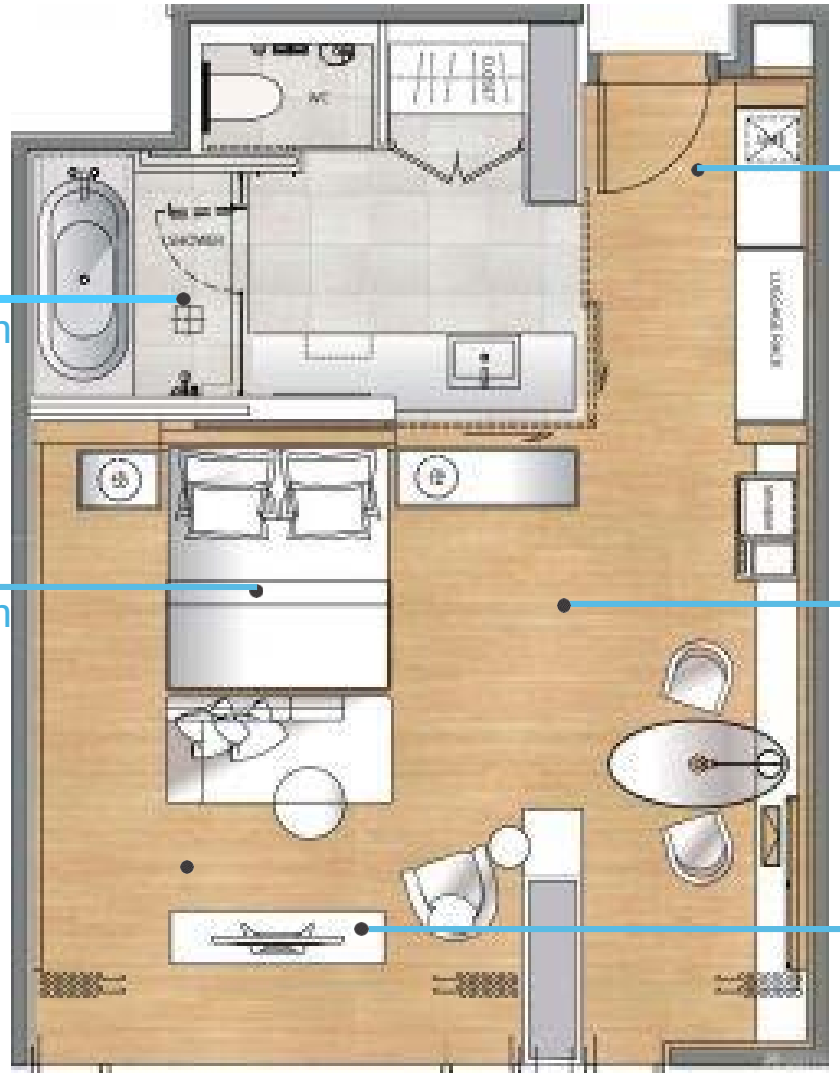
Time record of going out and coming home

Fall detection, abnormal alarm

Sleep duration, Sleep depth, Breathing changes, Alarm for abnormal schedule

Fall detection

Sleep detection



No need to insert a card to make electricity available.

Stay-Room time record

Set the TV and air conditioner to automatic sensing mode.

Monitoring Solutions – Office & Retirement Community

System Solutions

Automatically turn on and off the lights

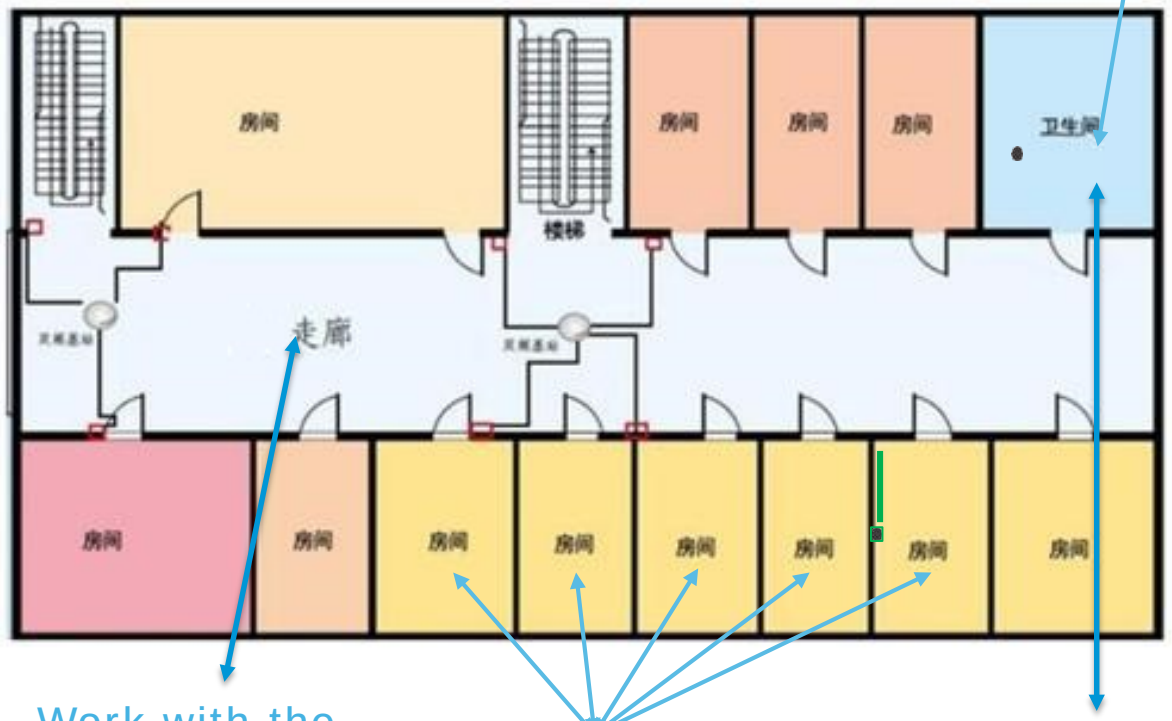
Automatically turn off the air conditioner and lights

Manager office, financial office and warehouse intrusion alarm

Staff attendance

Personnel entry and exit records

Stay Time Records



Work with the monitor to monitor under poor light conditions.

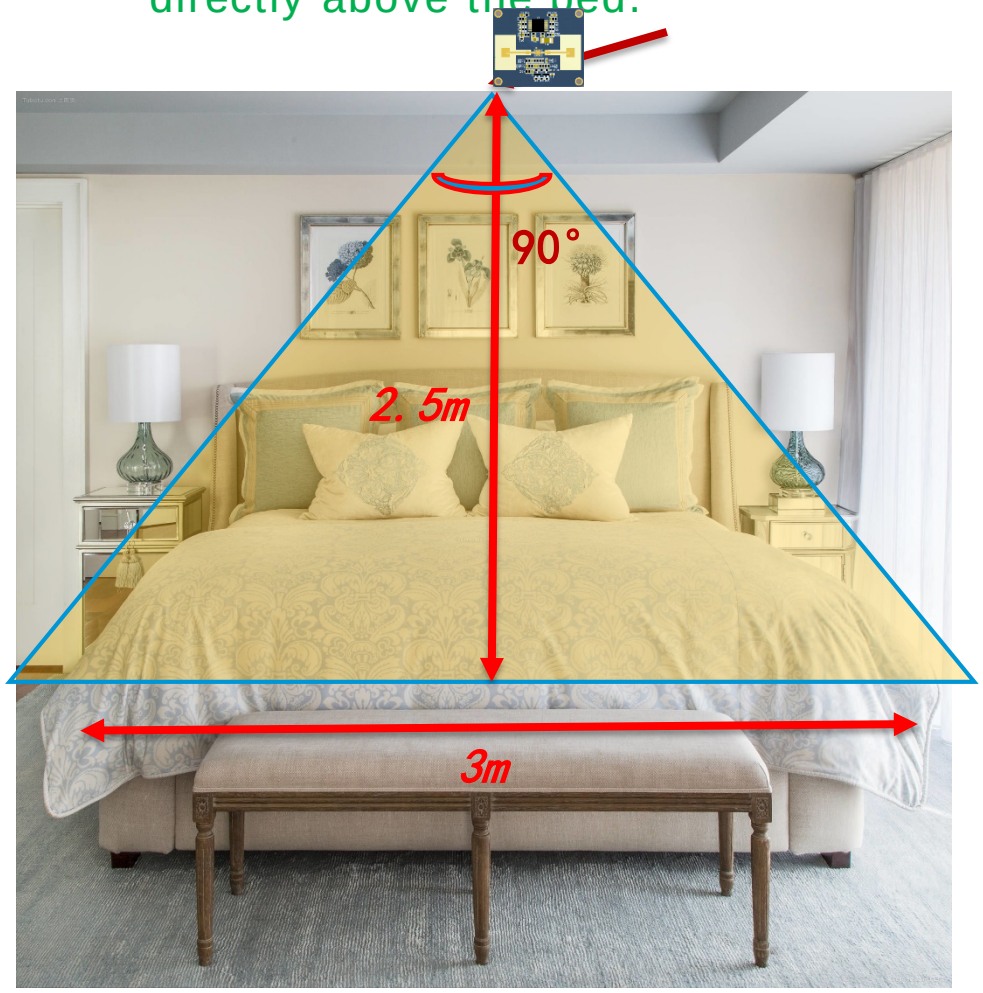
Alarm for Breathing changes, Fall detection

Fall detection

Sleep Monitoring Rader Sensor

Installation Angle

If the room has a ceiling, install the radar directly above the bed.



The radar is installed near the air-conditioning power supply, diagonally above the bed.

When the sleep radar is measuring human activities, there should be no obstruction between it and the human body. The effective distance of measuring is 2.5 meters, and the antenna emits in a 90-degree circle.

The radar output signal is: somebody, awake, light sleep, deep sleep, nobody, apnea alarm information

Sleep Monitoring Rader Sensor

Installation Angle

The radar is installed on the head of the bed (above the head or the lamp), placed on a high place near the bed.

The radar can also be placed under the mattress, for double beds, we recommend installing two radar modules to measure the sleep status of each person

Radar Sensor For Human Detection

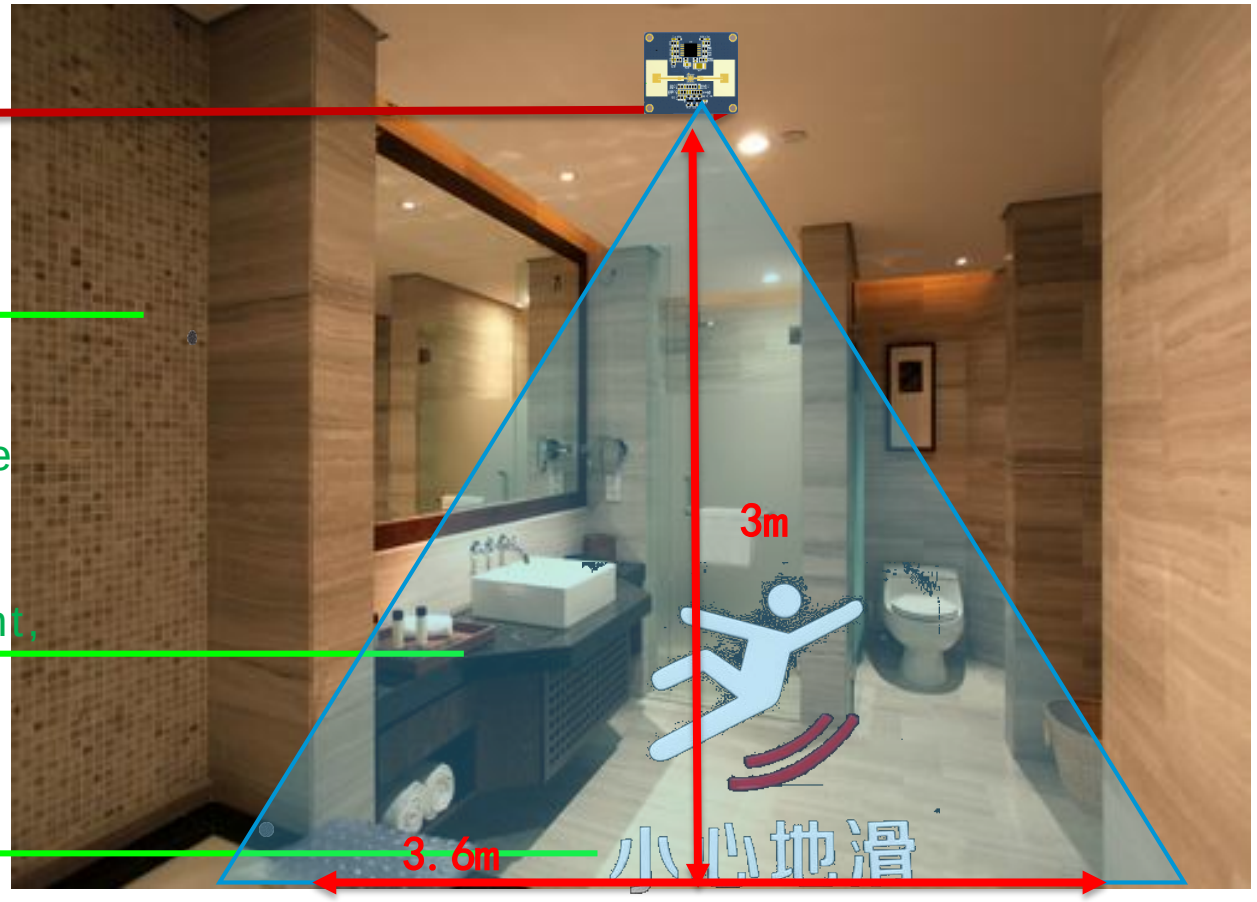
Installation Angle

Installation on the ceiling, it needs to be perpendicular to the room

The bath time record. It is used to confirm whether the schedule is normal.

Energy management, automatic light switch, automatic toilet flushing

Fall detection



The fall radar needs to be installed above the bathroom. The antenna of the radar is facing down. If the toilet is 2 meters high, the measured diameter is 2 meters. If the toilet is 3 meters high, the measured diameter is 3.6 meters.

Calculation method: Measuring radius R=Radar height A-Effective fall height 1 meter

$R=A-1$

Measuring area $=3.14xR^2$

Applicable scene: The privacy scenes such as bedroom and bathroom are not suitable for monitoring with a camera. The fall radar can provide the records of the range of motion and residence time. If someone makes a big move, it can directly give an early warning. And push messages to guardians through the Internet of Things system.

Radar output signal classification: Somebody here, Nobody here, Active state, Condition of rest, Fall

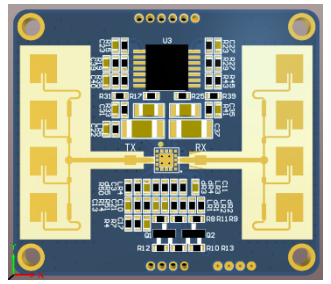
Radar Sensor For Human Detection

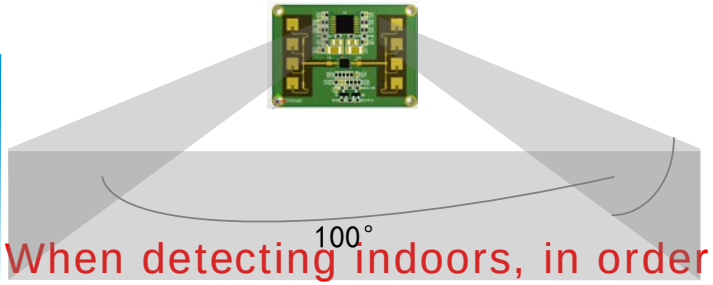
Installation Angle

The radar is installed obliquely downward on the 86 box of the air conditioner. (About 2.2 meters)

The installation height of the medium-height 86 box is about 1.2 meters.

Be careful to avoid obstructions such as tables when projecting the 86 boxes at the bottom (about 0.3 meters) upwards.





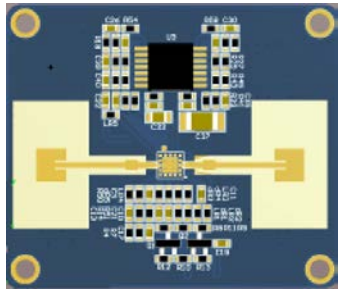
When detecting indoors, in order to detect a longer distance, you need a lateral radar. Set the scanning angle of the radar to 30° from top to bottom and 100° from left to right. Because the scanning distance of the circular radar is relatively short, it is not suitable for long-distance human detection. When installing the radar, try to avoid obstructions.

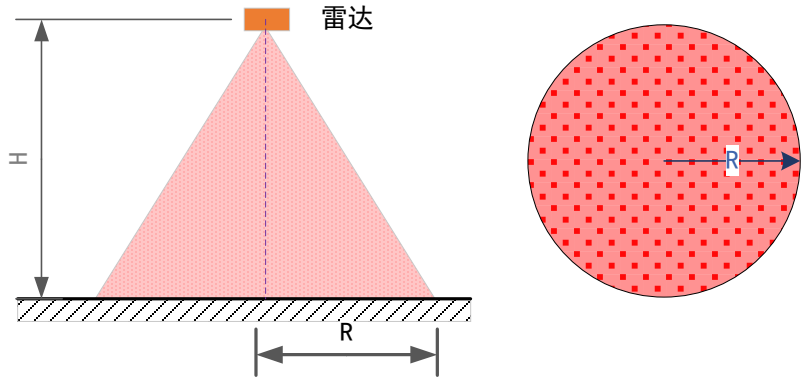
Applicable scene: According to the radar to determine whether there are people indoors, it is suitable for hotels, homestays, homes, etc. At the same time, it can also control the switches of lights, air conditioners, air purifiers, water and gas valves. Without involving privacy, confirm the personnel's work and rest status in daily life.

Radar output signal Classification: Somebody here, Nobody here, Active state, Rest state

Human detection distance and angle

Circular antenna radar



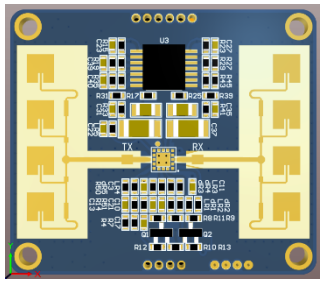


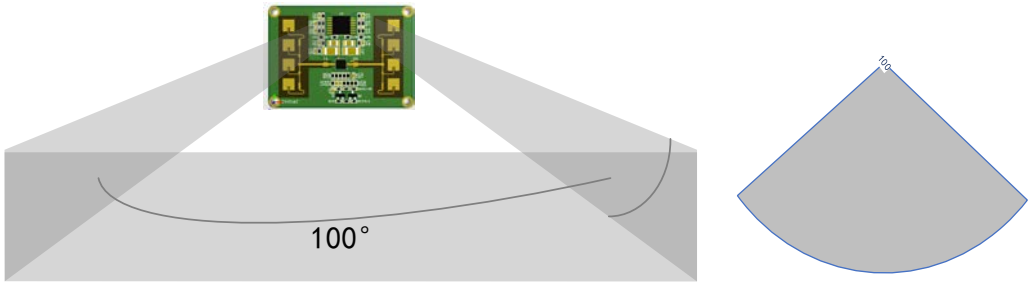
Measure the fall distance:

Height 2.2m	Projection range: 2.4m in diameter
Height 2.4m	Projection range: 2.8m in diameter
Height 2.6m	Projection range: 3.0m in diameter
Height 3m	Projection range: 4m in diameter

Installation Angle

Sector radar





Radar scanning range

Walk around	12m
Slight movement	6m
Breathing	5m
Back	3m

Main Parameters of Millimeter Wave Radar

Time Parameters

Item	Time
Scanning frequency	14/s
MCU report frequency	Report if there is a status update
Someone enters	0.5s to report
State change	0.5s
Someone leave	About 1-2min
Fall status output	Within 3-5s
Sleep parameter refresh frequency	10min
Radar start time	30s

Hardware Parameters

Hardware	Parameters
Input voltage	5V±0.5V
Input Current	≤100mA
Serial communication level	3.3v
IO Indication level	3.3v
Power consumption	≤0.5W
Transmit power	6dBm
Size	31mm x 35mm x 10mm

Main application characteristics

Installation Angle

Unaffected

Clothing, bedding, non-metallic curtains

Plastic, PVC

Glass

Gypsum board

Non-metallic items

Affected

Metal can reflect radar waves in a small space.

Tiles, brick walls, concrete

Liquid (electrolyte)

human body

Radar is very sensitive to moving objects. If there are pets in the house, the location of the radar should be as far away as possible from pets.

Avoid household appliances that contain motors (such as electric fans, washing machines).

Interference source and elimination

The effect of the power rectifier bridge will cause electromagnetic noise, try to stay away from the rectifier bridge, or use a metal sheet as isolation.

Up to 3 radars can be installed in the same location. Radars cannot transmit to each other directly, and it is better to keep a distance between two radars.

The place where the radar is installed must not be vibrated. If it is installed near speakers, air conditioners, and air outlets, it may cause a false radar alarm due to vibration.

In principle, WiFi, Zigbee, 4G, etc. will not interfere with the radar. However, during installation, the radar antenna and the RF antenna should not overlap, and the distance should be more than 1cm.

The on-off devices of electromechanical equipment and high-power relays will cause short-term interference to the radar. After the radar is stable, there will be no interference.

False alarm rate: Human biological signals are ultra-low frequency, weakly reflected signals. The radar module needs time for data accumulation and data processing. In the process of data accumulation, many factors may affect the radar parameters, and occasional detection failure is a normal phenomenon. The false alarm rate can be reduced by adjusting the installation angle and distance.

THANK YOU

2020-05