HLK-LD303-24Gr Radar Module User Manual

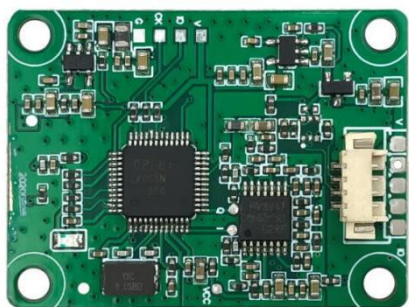## V1.3.3

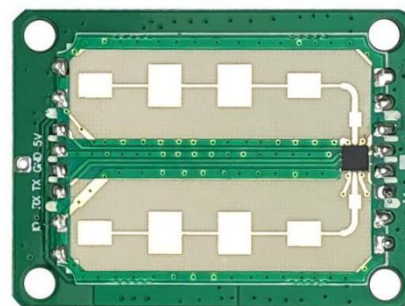Shenzhen Hi-Link Electronic Co., Ltd.

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Summary

HLK-LD303-24G is a radar module used to detect the distance between a sensor and a non-stationary target

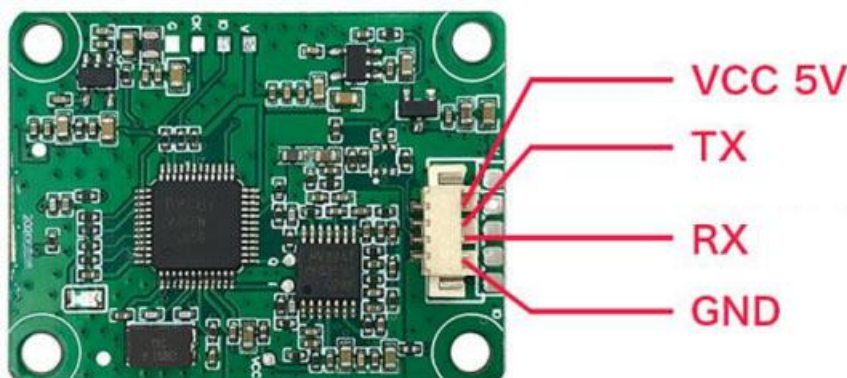**1、Appearance and interface**

(Module digital surface)　　　　　(Antennal Surface)

The interface is a 4-pin lock terminal with a pitch of 1.25mm. The wire sequence is as follows:

No.	PCBA silk screen	Function
1	5V	+5V input
2	GND	Ground wire
3	RX	Serial port receiving
4	TX	Serial port sending

*The current terminal wiring is shown in the figure below：

2、Technical parameters

Parameters	Explanation
Trasmit frequency	24.00~24.250GHz
Antenna style	Horizontal angle 43°/vertical angle 116°
Working current	79mA(5V)
Working voltage	DC5V~12V
Working temperature	-20~+60℃
Data interface	TTL serial port
Data format	115200，8，n，1
Response time	≥60mS
Level output	Reserved
Detection range	10~350cm
Detection dead zone	10cm
Detection accuracy	5cm
Product size	39*29mm

3、Data protocol

Communication configuration：

TTL serial port, the default baud rate is 115200, the data bit is 8, the stop bit is 1, and there is no check bit.
Fixed query command (HEX): 55 5A 02 D3 84
The module defaults to query mode, sending fixed hexadecimal query commands, and the module reports distance and other data after successful reception.

Communication format：

✓ **Uplink data (module sending)**

Word threshold	Frame header	length	Add	Distance	Reserve	Situation	Signal strength	Fretting	Radar off	check
Number of bytes	2	1	1	2	1	1	2	1	1	1
content	55A5	0A	D3	XX	XX	X	XX	X	X	XX

Description：

Report data information, the reporting interval can be set to 60ms~1s, the default is 60ms, the threshold analysis of each word is as follows：

Length: the number of bytes except the frame header and check byte, 0x0A, fixed byte

Address: 0xD3, fixed byte

Distance: Unit: cm, occupies 2 bytes, high order first

Reserved: 1 byte, value 0x00, fixed byte

Status: Target presence or absence. Occupies 1 byte, 0: No one 1: Someone

Signal strength: unit: k, occupies 2 bytes, high order first

Fretting: value 0 or 1, 0: no fretting, 1: with fretting

Radar off: Whether the radar is off, the value is 0 or 1, 0: not off 1: off

Check: Sum check, all bytes except check word threshold are sum, and the lower 8 bits are taken, occupying 1 byte

eg：

55 A5 0A D3 00 58 00 01 01 4C 01 01 7F

Available: There are people in the detection area, the distance is 88cm, and the signal strength is 332 k

Downlink data (received by the module)

Word threshold	Frame header	Add	Command number	Command parameters	Check	End of frame
Byte length	2	1	1	2	1	2
Content	BAAB	00	E5	XX	0 0	55BB

Explanation：

- ★ Frame header: fixed 2 bytes, 0xBAAB

- ★ Address: 0x00, fixed byte

- ★ Command number: The command number for setting the maximum detection distance, 0xE5, fixed byte

- ★ Command parameters: set the maximum detection distance, occupying 2 bytes, high order first

★ Check: no check, 0x00, fixed byte

★ End of frame: fixed 2 bytes, 0x55BB

★ Return of successful setting: 0D 0A 77 72 69 74 65 20 6F 6B 0D 0A

That is, the ASII code "Enter + write ok + Enter"

4、Application occasions

Intelligent toilet, detecting people approaching different distances, assisting the toilet system to perform operations such as opening the lid, turning on the lights, flushing, and heating

Inductive door, detect people within the set distance to realize automatic opening and closing of the door

Automatic escalator, it works normally when detecting a person close to 1m, and enters a low power consumption state when no one is overtime, assisting the escalator to realize automatic induction

Intelligent light control, to assist smart homes to achieve the effect of "lights on when people come, and lights off when people go"

5、Mechanical Dimensions

### PCBA Schematic diagram：Unit mm
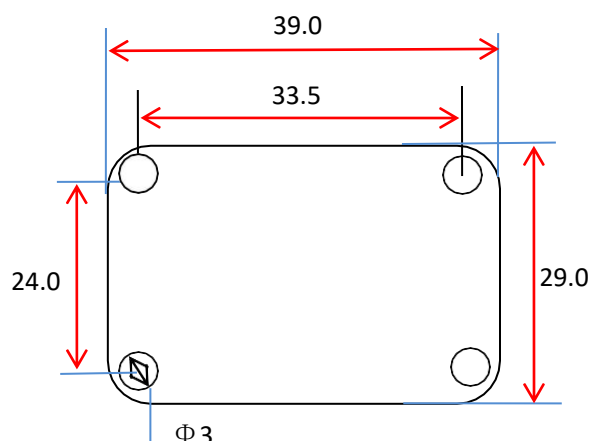
6、Precautions

a. This module only detects relative moving targets in the detection area, and completely stationary targets are not detected. The output result is information such as the distance of the nearest target in relative motion in the detection area。

b. The module defaults to query mode (protocol 6). If you need to report continuously and automatically, just change the protocol to 7. (Use the host computer to modify or directly send the command BAAB00F600070055BB)

c. Refer to the diagram of the relationship between the angle and the farthest working distance in the appendix for the detection area

d. If the module is designed with a shell, the distance between the radar antenna surface and the shell surface is 6mm. The thickness of the shell is about 2~3mm. The shell material cannot use metal or metal-plated paint. It is recommended to use PC, plastic, steel, etc.
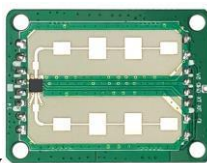
Appendix:

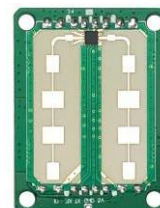Relationship between angle and farthest distance
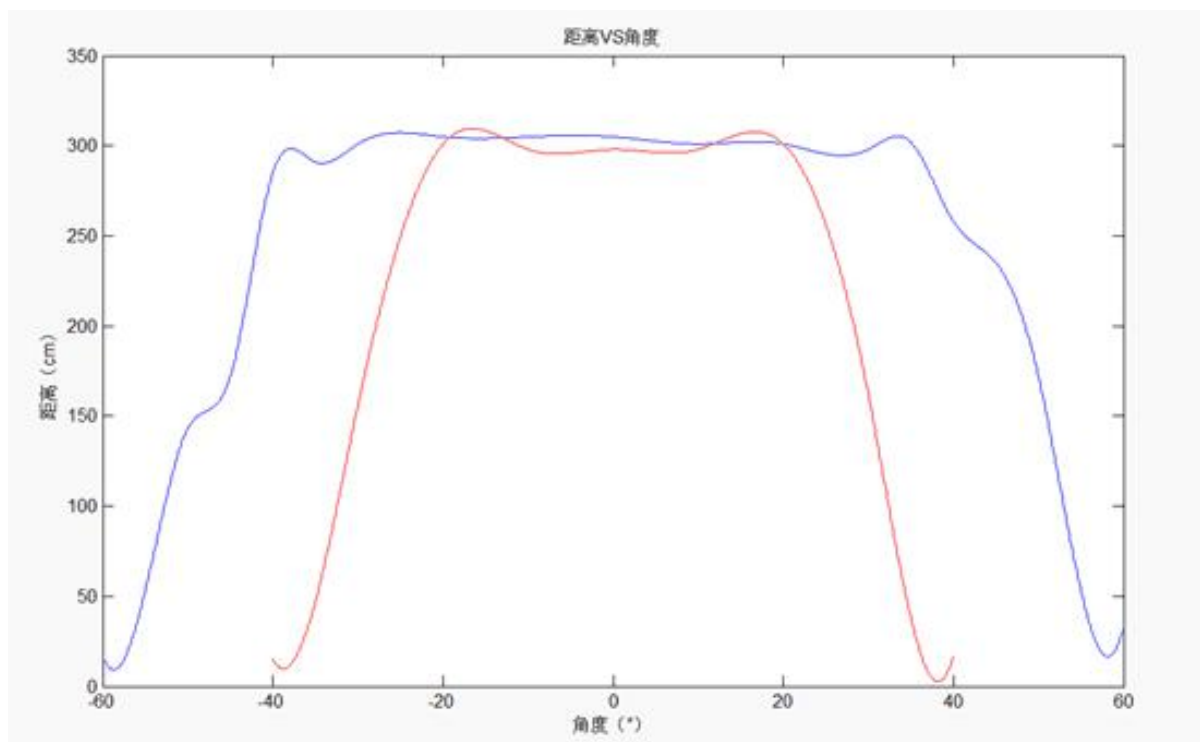
Explanation：

Test target: human body

Installation: install horizontally respectively 、Vertical installation
Red broken line: the module is installed horizontally, with the module as the center of the circle, the vertical line of the antenna surface is 0°, and each angle corresponds to the broken line of the farthest distance that can be detected
Blue fold line: the module is installed vertically, with the module as the center of the circle, the vertical line of the antenna plane is 0°, and each angle corresponds to the fold line of the farthest distance that can be detected