

24GHz Radar Ranging Module

JY-STR-1AMMJ

User Manual V 1.4

Aug, 2026

Declaration

Our company reserves the right to make regular changes to the content of this manual without prior notice. The changes will be added to the new version of the manual. Please contact our company promptly for the latest information.

1 Product Introduction

This product is a dynamic ranging module implemented using 24GHz MMIC technology, mainly used for distance detection of short-range non-stationary targets. The module collects the returned target signal and outputs distance, speed, signal strength information in real time, and is not easily affected by the installation environment.

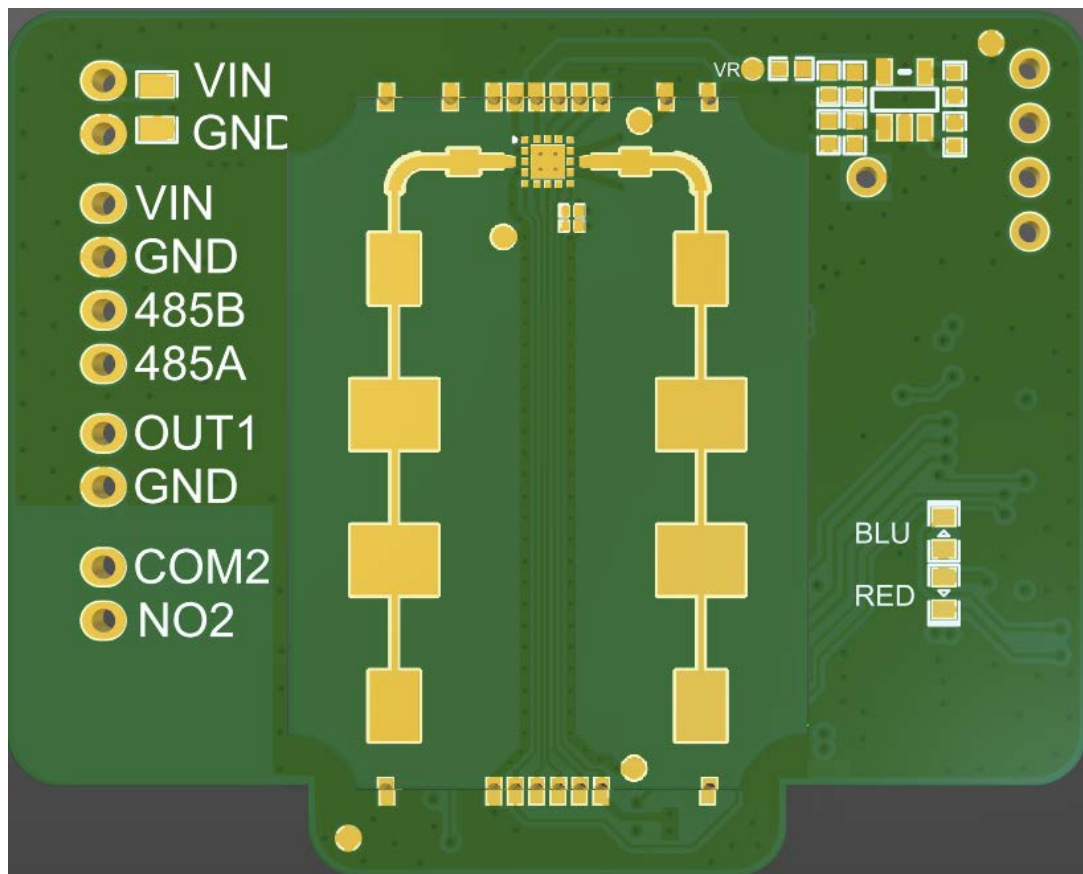


Figure 1 Product appearance image

Motherboard thickness: 1.6 mm; Radar board protrusion height: 1.0 mm

2 Product Features

- Based on 24GHz MMIC technology
- Planar microstrip radar detection, stable operation in all weather conditions.
- Maximum detection distance up to 8 m.

- High measurement accuracy, ranging accuracy ± 15 cm.
- Serial communication for parameter setting and data upload.
- Easy installation, economical and durable.

3 Recommended Operating Conditions

Recommended Operating Voltage Range	7~ 28V DC
Recommended Operating Temperature Range	-20 ~ +65°C

4 Technical Parameters

Refer to Table 1 below.

Table 1 Technical Parameters

Parameter		Description
Product Name		FMCW Radar Sensor
Transmission Frequency		24.05-24.25GHz
EIRP		12 dBm
Antenna Pattern		116° x 43°
Operating Voltage		7~ 28V DC
Operating Current		20 mA @ 24V
Communication Interface		RS485
Response time		60ms
Data Format		115200, 8, n, 1
Direction Discrimination		Direction can be determined by the positive or negative value of the speed value
Ranging Range		50cm-800cm
Ranging Accuracy		$\leq \pm 10$ cm
Operating Temperature		-20 ~ +65°C
TGLD-CJR-XD01	HW	SER-24A V1.4
TGLD-CJR-XD01	SW	JY_SER_1A_3_V3.00_20260619_APP_RC

TGLD-CJR-XD02	HW	SER-24A V1.5
TGLD-CJR-XD02	SW	JY_SER_1A_3_V3.10_20260705_APP_RC
TGLD-CJR-XD03	HW	SER-24A V1.5
TGLD-CJR-XD03	SW	JY_SER_1A_3_V3.10_20260705_APP_RC
Product Dimensions		As shown in Figure 2 below

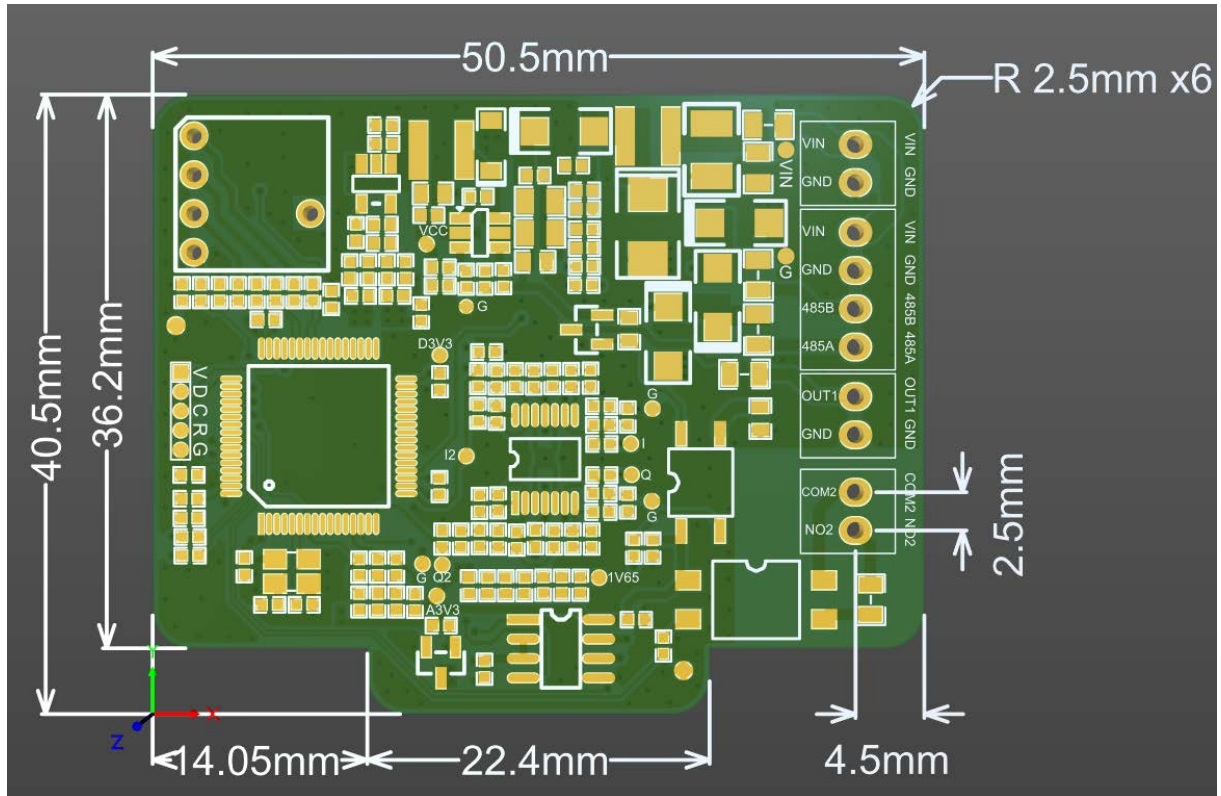


Figure 2 PCBA dimensions

5 Interface Definition

This module uses a 2.5 mm pitch connector. The communication interface is shown in Figure 3 of the original manual. Please refer to Table 2 below for pin function descriptions.

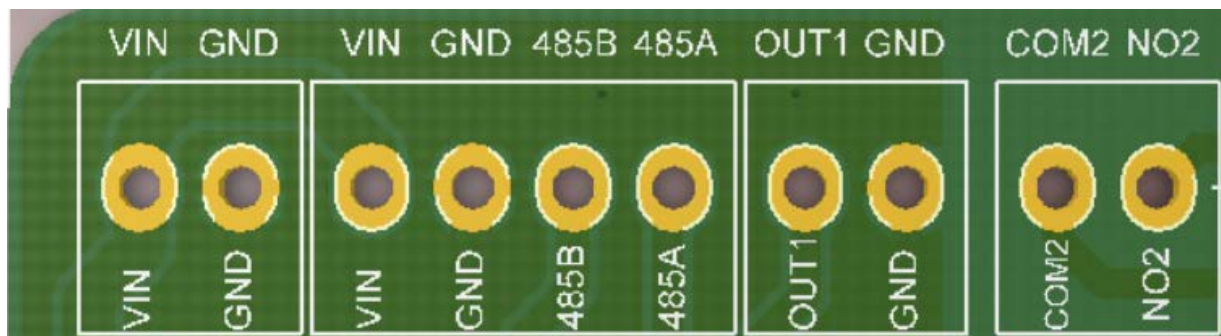


Figure 3 module interface

Table 2 Product Interface Pin Function Description

No.	Pin	Description
1	VIN	Positive power input
2	GND	Negative power input (ground)
3	VIN	Positive power input
4	GND	Negative power input (ground)
5	485B	RS485 B terminal
6	485A	RS485 A terminal
7	OUT1	Digital output OUT1. High-level voltage equals supply voltage
8	GND	Negative power input (ground)
9	COM2	Dry-contact common terminal for digital output OUT2
10	NO2	Dry-contact normally-open terminal for digital output OUT2

6 Communication Protocol

RS485 Configuration:

Baud rate 115200, data bits 8, stop bits 1, no parity.

Communication Format:

■ Automatic Reporting

The module automatically reports the currently detected distance value, speed value, signal strength, trigger distance, OUT1 pin status when no target is triggered, and COM2/NO2 pin status when no target is triggered.

Example 1: 0cm 0cm/s 28dB P350cm, NO PEOPLE: OUT1-0V, COM2 and NO2 disconnect.

Example 2: 110cm 10cm/s 47dB P350cm, NO PEOPLE: OUT1-0V, COM2 and NO2 disconnect.

Example 3: 90cm 13cm/s 49dB P350cm, NO PEOPLE: OUT1-0V, COM2 and NO2 disconnect.

■ Configuration Protocol

Field	Frame Header	Address	Command Code	Command Parameter	Checksum	Frame Tail
Byte Length	2	1	1	1	2	2
Content	BAAB	00	X	00	55BB	55BB

Frame Description:

- Frame Header: Fixed 2 bytes, 0xBAAB
- Address: 0x00, fixed byte
- Command Code: Fixed 1 byte
- Command Parameter: 2 bytes, high byte first, low byte second
- Checksum: No checksum, 0x00, fixed byte
- Frame Tail: Fixed 2 bytes, 0x55BB
- Successful configuration response: 0D0A7772697465206F6B0D0A, which is the ASCII code for "Carriage Return + write ok + Carriage Return"

Cmd Code	Param Range	Default	Description
0x0C	[0,1]	1	0: OUT1 outputs VIN when no person, 0V when person detected; 1: OUT1 outputs 0V when no person, VIN when person detected.
0x0D	[0,1]	1	0: COM2 & NO2 conduct when no person, disconnect when person detected; 1: COM2 &

			NO2 disconnect when no person, conduct when person detected.
0x10	[90,800]	150	Trigger distance when rotary switch is at position 0 (cm)
0x11	[90,800]	150	Trigger distance when rotary switch is at position 1 (cm)
0x12	[90,800]	175	Trigger distance when rotary switch is at position 2 (cm)
0x13	[90,800]	200	Trigger distance when rotary switch is at position 3 (cm)
0x14	[90,800]	225	Trigger distance when rotary switch is at position 4 (cm)
0x15	[90,800]	250	Trigger distance when rotary switch is at position 5 (cm)
0x16	[90,800]	275	Trigger distance when rotary switch is at position 6 (cm)
0x17	[90,800]	300	Trigger distance when rotary switch is at position 7 (cm)
0x18	[90,800]	325	Trigger distance when rotary switch is at position 8 (cm)
0x19	[90,800]	350	Trigger distance when rotary switch is at position 9 (cm)
0x64	--	--	Query software version number
0xAA	--	--	Query parameter values
0xBB	--	--	Restore default parameters

Notes:

- "--" indicates that the parameter can be filled with 0x00.
- Values without the "0x" prefix must be converted to hexadecimal when sending commands.
- When rotating the rotary switch or modifying parameter values, they can be directly refreshed in the automatically reported data packet.

7 Enclosure Installation Method and Material Selection

When designing the enclosure on the antenna-face side of the module, metal materials or metal layers must NOT be used. Non-carbon plastic materials or plastic foams may be used, such as common plastics like ABS, PVC, PC, etc.

Do NOT wrap the antenna by direct contact with the radar antenna structure; the enclosure thickness should be correctly estimated and sufficient space should be left from the antenna face.

Recommended Enclosure Dimensions:

For 24GHz planar radar, it is recommended to use plastic material with a thickness of approximately 3 mm, and maintain a distance of approximately 6 mm from the radar antenna surface.

If thicker plastic material is used, additional loss due to the increased thickness must be considered; an overly thick enclosure may also affect the antenna radiation pattern.

8 Installation Instructions

To avoid damaging the module, handle with care. ESD (electrostatic discharge) protection measures must be taken at all stages of storage, handling, assembly, and testing.

This product allows flexible adjustment of installation methods. However, please ensure that the front side (antenna face) of the module faces the detection area during installation. The module antenna angle is shown in the relevant figure in the original manual.

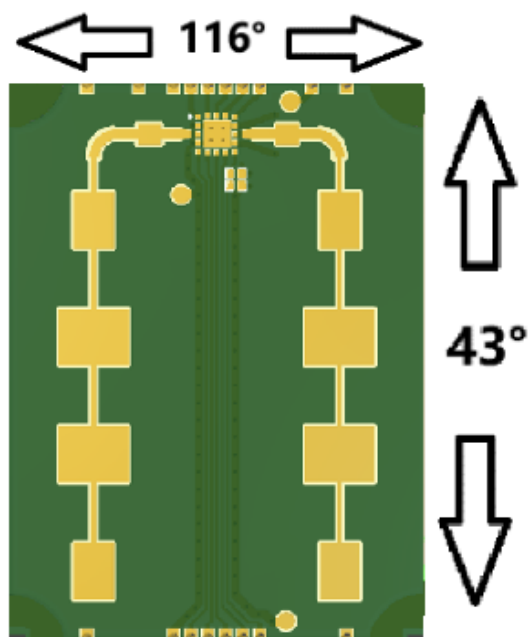


Figure 4 Module antenna angle

9 Applications

The product can be used in many occasions requiring short-distance ranging, especially where clear distance requirements must be met, such as:



Figure 5 Application scenarios

FCC Caution:

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

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.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter, unless the host integrator completes dedicated co-existence interference verification and obtains formal C2PC approval from the module grantee

This Class B compliance statement applies to the complete end host product integrated with this radar module, not the standalone radar module itself

IMPORTANT NOTE:

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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.