



RKM1179S DATASHEET

Version	Content
Ver1.0	Initial Version

SGR Semiconductors Inc.

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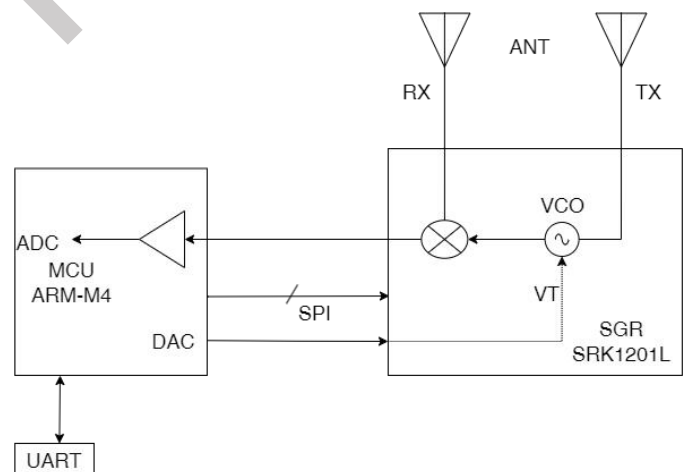
1. Overview

RKM1179S is a low-power IoT radar module based on SGR 24G radar chip SRK1201, designed for applications in home appliances, lighting, industrial IoT fields, etc.

1.1. System Function and Working Principle

This system detects the distance of moving targets by measuring the frequency difference between the transmitted and received electromagnetic wave signals. The system emits a 24GHz electromagnetic wave signal through the transmitting antenna. When this signal encounters a moving object at a certain distance, it reflects back a 24GHz electromagnetic wave signal with a certain delay. The reflected signal is received by the receiving antenna. By mixing the received signal with the transmitted signal, an intermediate frequency signal carrying the target distance information is obtained. Analysis of this intermediate frequency signal allows the distance of the moving target to be determined.

2. System Framework



3. Technical Specifications

Parameter	Min	Typical	Max	Unit	Test Conditions@25°C
Supply Voltage VDD	3.6	5	5.5	V	
Current		76		mA	Average power consumption @ 5V
		168		mA	Peak power consumption @ 5V
Transmit Equivalent		5		dBm	Bare board

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Isotropic Radiated Power					
Transmit Antenna		80		°	Horizontal
Half-Power Beamwidth		40		°	Vertical
Receive Antenna		80		°	Horizontal
Half-Power Beamwidth		40		°	Vertical
Interface Voltage VOH/VIH	0.7*VDD		VDD	V	Open circuit, open-drain with 10k pull-up
Interface Voltage VOL/VIL	0		0.7	V	

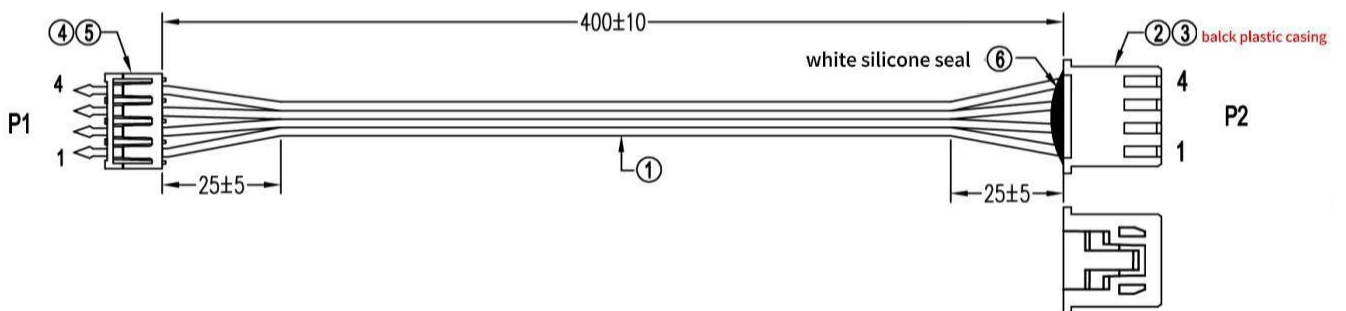
4. Interface Information

The interface wiring sequence is as follows:

Pin	Name	Remarks
1-	VDD	Power supply VDD
2	GND	Ground
3	TX	UART transmit
4	RX	UART receive



5. Harness Dimensions



(Unit: mm)

6. Communication Protocol

6.1. The communication supports UART protocol:

Baud Rate: 115200

Data Bits: 8

Stop Bits: 1

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Parity: None

Master-slave UART mode, where the host control board is the master and the radar module is the slave. The interval between commands sent from the host control board to the radar module should be ≥ 100 milliseconds.

6.2. Communication Commands

Address code: 0x55 0x5A (host sends, module receives); 0x55 0xA5 (module returns data, host receives)

Command code: 0xD1 - Radar on/off command, 0xD2 - Set baud rate, 0xD3 - Query module detection information

Checksum: Sum check;

6.3. Radar On/Off Command

Address Code	Data Length	Command Code	Radar On/Off	Checksum
2 bytes	1 byte	1 byte	1 byte	1 byte

Example:

Radar on/off (host sends, slave receives): 1 to turn on radar, 0 to turn off radar

Radar on: 55 5A 03 D1 01 84

Radar off: 55 5A 03 D1 00 83

Slave reply:

Radar on: 55 A5 03 D1 01 CF

Radar off: 55 A5 03 D1 00 CE

6.4. Set Baud Rate

Address Code	Data Length	Command Code	Baud Rate Number	Checksum
2 bytes	1 byte	1 byte	1 byte	1 byte

0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A
115200	57600	38400	28800	19200	14400	9600	4800	2400	1200

Example: Set module baud rate to 115200BPS:

Host sends: 55 5A 03 D2 01 85

Slave replies: 55 A5 03 D2 01 D0

6.5. Query Module Detection Information

Address Code	Data Length	Command Code	Checksum
2 bytes	1 byte	1 byte	1 byte

Host sends: 55 5A 02 D3 84

Module returns data:



24GHz Radar Module

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Address Code	Data Length	Command Code	Detection Distance	Speed Data	Energy Value	Status	Radar Status	Check sum
2 bytes	1 byte	1 byte	2 bytes	2 bytes	2 bytes	1 byte	1 byte	1 byte

Two bytes of parameters are sent with the higher byte first by default.

Speed data is represented as a signed number, with positive values indicating approach and negative values indicating movement away.

Status field: 0 indicates no target, 1 indicates motion, 2 indicates slight movement.

Radar off indication: If the radar is off when querying, this byte shows "01" to indicate the radar is off. If the radar is on when querying, this byte shows "00" to indicate the radar is on.

Example 1:

Detection distance data is 0cm, speed data is 0cm/s, angle is 0, radar is off,

55 A5 0A D3 00 00 00 00 00 00 01 D8

Example 2:

Detection distance data is 50cm, speed data is 0cm/s, angle is 15, target is slightly moving, radar is on,

55 A5 0A D3 00 32 00 00 00 0F 02 00 1A

7. Technical Requirements

7.1. Environmental and Environmental Protection Requirements

(1) Temperature and Humidity Requirements

Item	Working Environment
Temperature Range	-20~65℃
Relative Humidity Range	0~85%RH

(2) Altitude Requirement for Use: None.

(3) Environmental Protection Requirements: Complies with "China RoHS Certification" requirements.

7.2. Special Installation Requirements

The front of the radar must not be obstructed by metal panels or other objects that can shield electromagnetic signals.

8. Packaging and Storage

8.1. Packaging

Labels should be attached to each outer packaging, indicating: manufacturer's product model, product name, quantity, manufacturer's batch number, production date, manufacturer, etc. Inner and outer packaging should be intact, and the devices should not be scattered.

8.2. Transportation

The packaged product can be transported by any means of transportation. During transportation, collisions,

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severe vibrations, exposure to rain or snow, and water immersion should be avoided. The product should not be stored in open-air warehouses during transit. After transportation, the product should show no damage or performance degradation.

8.3. Storage

The product should be stored in a clean, dry, and well-ventilated environment.

The product has a storage life of one year. The storage warehouse temperature should be between -40~85°C, with a relative humidity no greater than 85%.

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FCC Statement

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.

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.

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.