



# AT24MP1T2RS32A

24GHz radar sensor

DS00022 V0.90 Date: 2024/08/30

Product data manual

## Overview

The AT24MP1T2RS32A is a reference design for 24GHz radar sensor in the field of hand sweep sensing introduced by Airtouch (Shanghai) Intelligent Technology Co., LTD. Based on AT24MP1T2RS32A series chips, the solution is expected to provide the market with the best cost-effective solution with small size, low power consumption and high performance. Depending on customer resolution requirements, the maximum sweep bandwidth can be set to 240 MHz mode (24.005–24.245 GHz). The sensor integrates 1 send, 2 receive (1T2R) patch antenna, CortexM0+MCU and supporting UART interface, and comprises a complete SoC system through built-in FLASH. The chip provides low power mode and Memory Retention function. It can be widely used in smart home, security, gesture recognition, BSD and vital signs detection and other fields.

## Product feature

- Support 5V power supply;
- Strong anti-interference, can effectively filter the interference of human body movement outside the sensing area;
- Preferred frequency band, does not interfere with 5Gwifi communication;
- Support low power standby and fast wake up, support IO or serial output radar induction results;
- Support secondary development

## Product application

Home automation  
Intelligent security  
Gesture recognition  
Monitor vital signs

## Ordering information

Model	Power	Dimensions
AT24MP1T2RS32A	5 V	30×15mm

Note: Radar sensor products belong to the reference design, only support sample testing.

Revision history

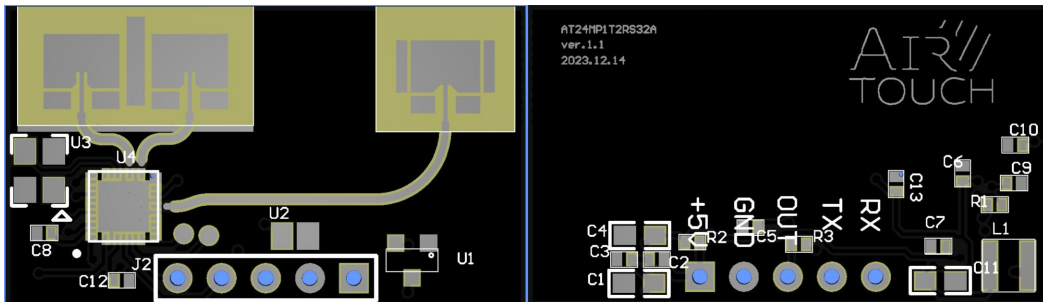
Versions	Date	Reason
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## 1. Product introduction

AT24MP1T2RS32A sensor is a 24G chip launched by Airtouch(Shanghai) Intelligent Technology Co., Ltd. for the industrial and consumer markets. Based on AT24MP1T2RS32A series chip, Provide the market with the best cost-effective solution with small size, low power consumption and high performance. The AT24MP1T2RS32A chip operates in the full 24GHz band (24.005-24.245GHz) and includes a complete receiver-to-transmit link and ADC converter. The transmitter has a 0-pi phase shifter function and a maximum output power of 7dbm. The receive channel can flexibly select a combination of gain and high-pass/low-pass filters to facilitate scenarios with different scan rates/distances. The sensor integrates 1 send, 2 receive (1T2R) patch antenna, CortexM0+MCU and support for UART interface, and comprises a complete SoC system with built-in FLASH. The chip provides low power mode and Memory Retention function. Figure 1.1 shows the appearance of an AT24MP1T2RS32A.



Picture 1.1 AT24MP1T2RS32A product appearance reference drawing

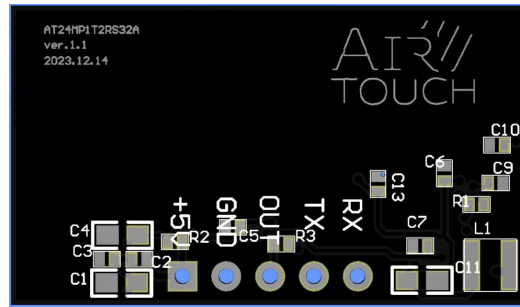
## 2. Product feature

Radar sensor AT24MP1T2RS32A feature:

- Support 5V power supply;
- Strong anti-interference, can effectively filter the interference of human body movement outside the sensing area;
- Preferred frequency band, does not interfere with 5Gwifi communication;
- Support low power standby and fast wake up, support IO or serial output radar induction results;
- Support secondary development

## 3. Pin definition

The radar sensor AT24MP1T2RS32A has a row of pin row interfaces with a distance of 2.54mm on the lower side, with a total of five effective signal interfaces including +5V, GND, OUT, TX and RX. Figure 3.1 shows the pin sequence number location diagram of the sensor; Table 3.1 shows the definition and description of each pin.



Picture 3.1 pin number location diagram

Sheet 3.1 pin definition and description

Numbe	Name	Descr iption
1	+5V	The power supply pin of the sensor 5V. If the power supply needs to be changed to 3.3V, leave U1 blank and weld R2 to 0 ohm resistance
2	GND	Power ground
3	OUT	Radar sensing output pin, can be used as serial port transceiver pin or general purpose IO
4	TX	Serial port sending pin, can be used for communication or burning
5	RX	Serial receiving pin, can be used for communication or burning

## 4. Electric parameter

### 4.1 Static operating parameter

Table 5.1 Main static parameters of radar sensor AT24MP1T2RS32A in normal operation

Parameter	MIN	TYPICAL	MAX	UNITS	REMARK
Frequency	24.005	—	24.245	GHz	—
Power	—	7	-	dBm	—
Bandwidth	—	0.24	-	GHz	—
Impedance	—	50	—	Ω	—
IF_LPF	—	2	2	MHz	—
Voltage_in	4.5	5	24	V	LDO model ME6209A33M3G
Voltage_in	3	3.3	3.6	V	Unplace LDO chip
High level	—	3.3	—	V	—
Low level	—	0	—	V	—
Working current	—	11	—	mA	Conventional power mode
	—	300	—	uA	Low power mode
Working_temp	-20	—	+85	°C	Environment_temp

### 4.2 Absolute maximum rated parameter

The absolute maximum rating is a condition that must not be exceeded, even for an instant, otherwise performance degradation or even permanent damage may result.

Table 5.2 Absolute maximum rated parameters of radar sensor AT24MP1T2RS32A

Parameter	MIN	TYPICAL	MAX	UNITS	REMARK
Voltage_in	—	—	5.0	V	Unplace LDO chip

## 5. Machine dimension

Radar sensor AT24MP1T2RS32A is not equipped with pins by factory default. Its mechanical dimensions are shown in Figure 7.1, where the PCB board thickness is about 1.4mm, and all unmarked tolerances are 0.2mm.

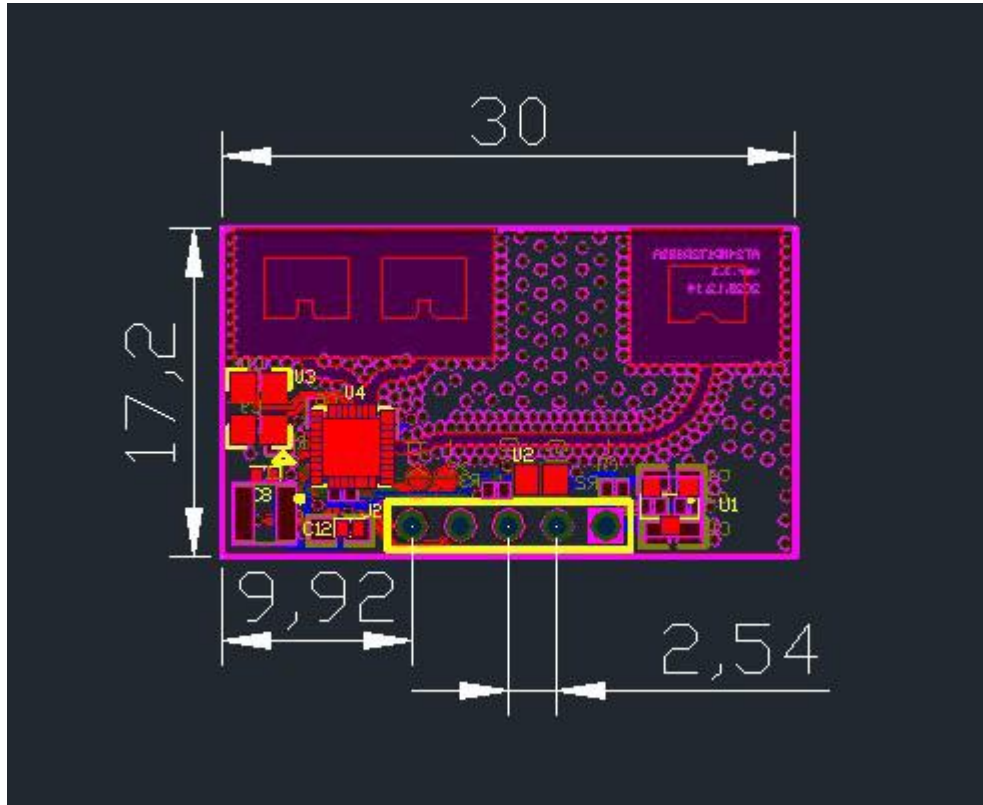


Figure 7.1 Mechanical dimensions of radar sensor AT24MP1T2RS32A

## 6.Disclaimer

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### **FCC Caution:**

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.

Any 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.

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

### **ISED Caution:**

This device complies with Innovation, Science and Economic Development Canada (ISED) licence-exempt RSS standard(s). 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 equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet appareil est conforme à la ou aux normes RSS exemptées de licence pour Innovation, Science et développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes: (1) ce dispositif ne peut pas causer d'interférence nocive, et (2) ce dispositif doit accepter toute interférence reçue, y compris les interférences pouvant causer un fonctionnement indésirable.

On a évalué que ce dispositif était conforme aux limites d'intensité du das et/ou du champ RF. Cet appareil est commandé manuellement pendant l'utilisation et n'a pas besoin de tenir compte de la distance minimale de sécurité de 20cm.