

M23- Series

Non-contact RF module

Specification

Document modification history

Version	Description	Date
V1.0	Create	2022-2-14
V1.2	Update	2023-10-09
V1.3	Update	2026-1-1

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Chapter 1 **Product overview**

1.1 Overview

M23 module is a 13.56MHZ high-frequency read and write module. Module built-in CPU control without secondary programming. Support serial port or USB port. Available with a SAM stand. USB interface can be seamlessly connected with any system without loading any driver. The integrated onboard RF antenna has more stable performance. Very suitable for charging pile, self-service sales, advertising machine.

1.2 Characteristics

- ◆ Module read card sensitive. Easy to install. The antenna is separable, versatile and easy to develop.
- ◆ Built-in CPU control without user secondary editing program. The IC card can be easily operated only through the serial port protocol.
- ◆ Serial port or USB control. It can work seamlessly with any system. No additional driver installation is required. You only need to connect four wires to communicate.
- ◆ The module uses 5V DC input voltage power supply. It can meet the vast majority of development board serial port output

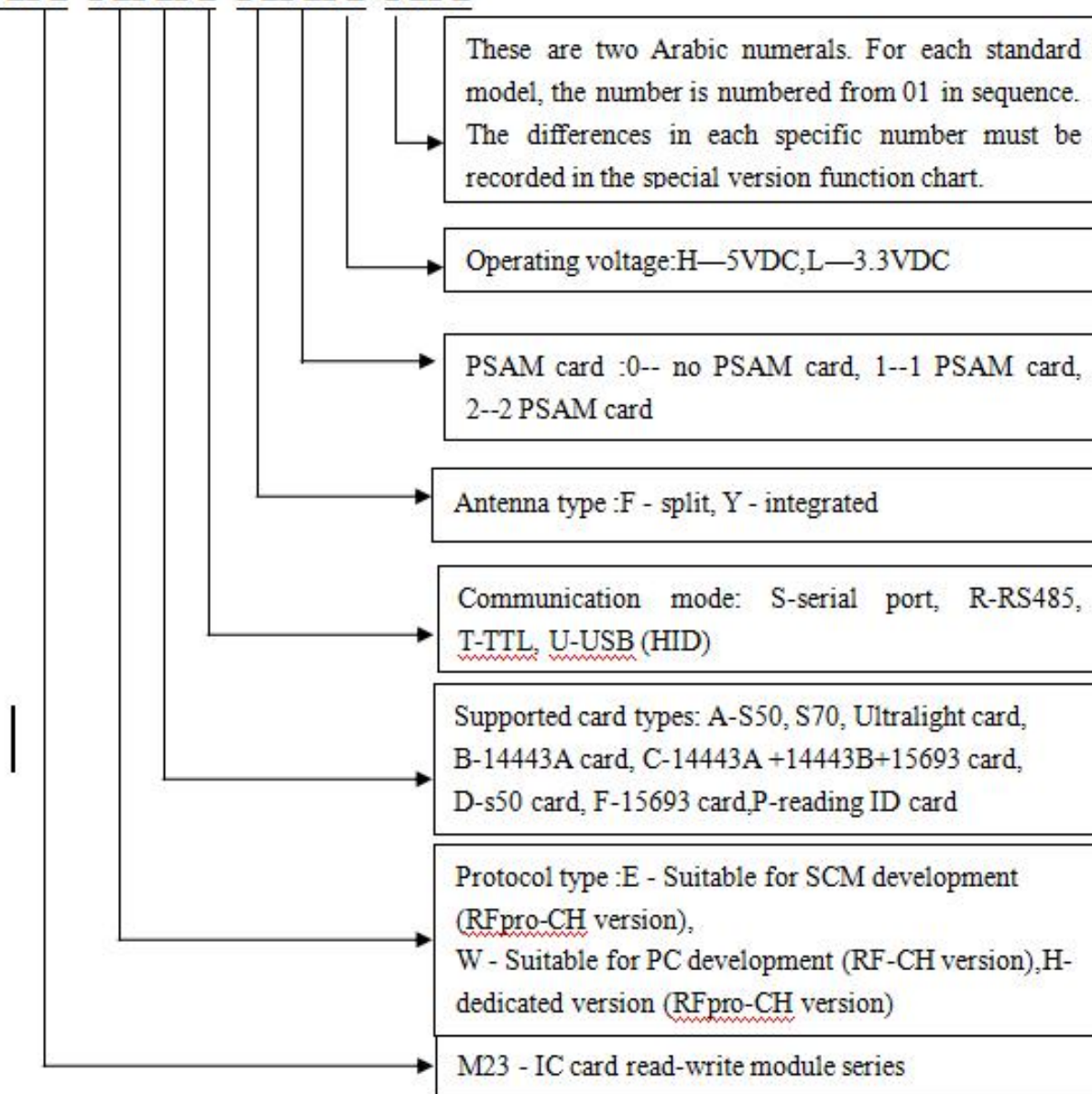
voltage.

- ◆ Humanized design. The buzzer can be controlled as a reminder action. The on-board power LED light is convenient to check the power on status.
- ◆ Complete functions. Clear development protocols. Support IC card read and write operation, sector encryption. Support to read multi-protocol IC card.
- ◆ Optional configuration with ISO7816-3, GSM 11.11 standard SAM card function. Provides security.

1.3 Model Code

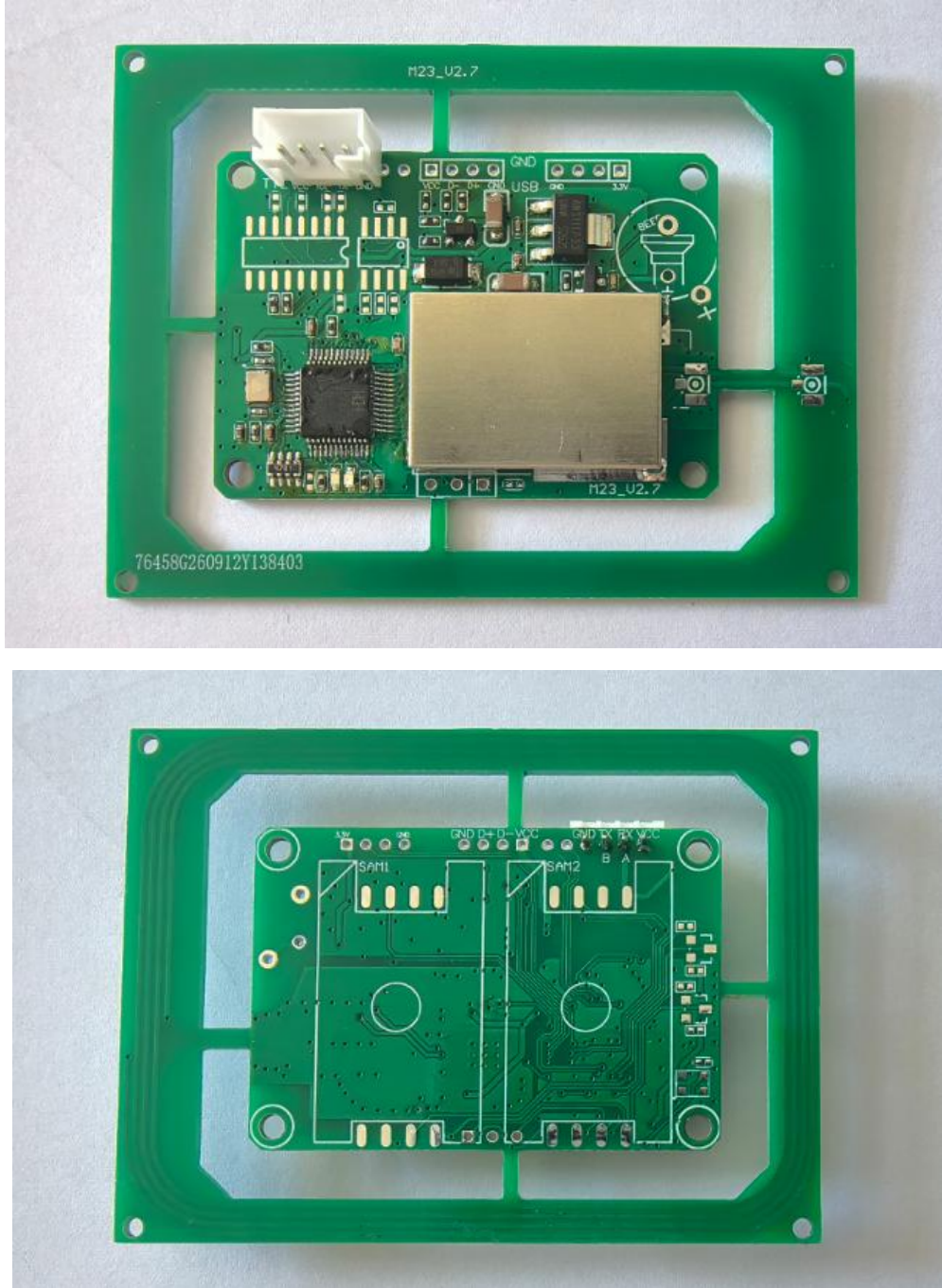
M23 series model code table

XX-XXX-XXX-XX



1.4 Appearance and interface diagram

Front/back:



Module Integrator Specification			
No.	Material Name	Model	Supplier
1	PCB Manufacturer	FR-4	Shenzhen JLC Technology Group Co., Ltd.
2	Capacitors & Resistors	0402	Samsung Electronics
3	Crystal Oscillator	3225	Shenzhen YXC Technology Co., Ltd.
4	RF Chip	WS1850S	Shenzhen Qianhai Weisheng Intelligent Technology Co., Ltd.
5	32-bit MCU	CH32F203CBT6	Nanjing Qinheng Microelectronics Co., Ltd.

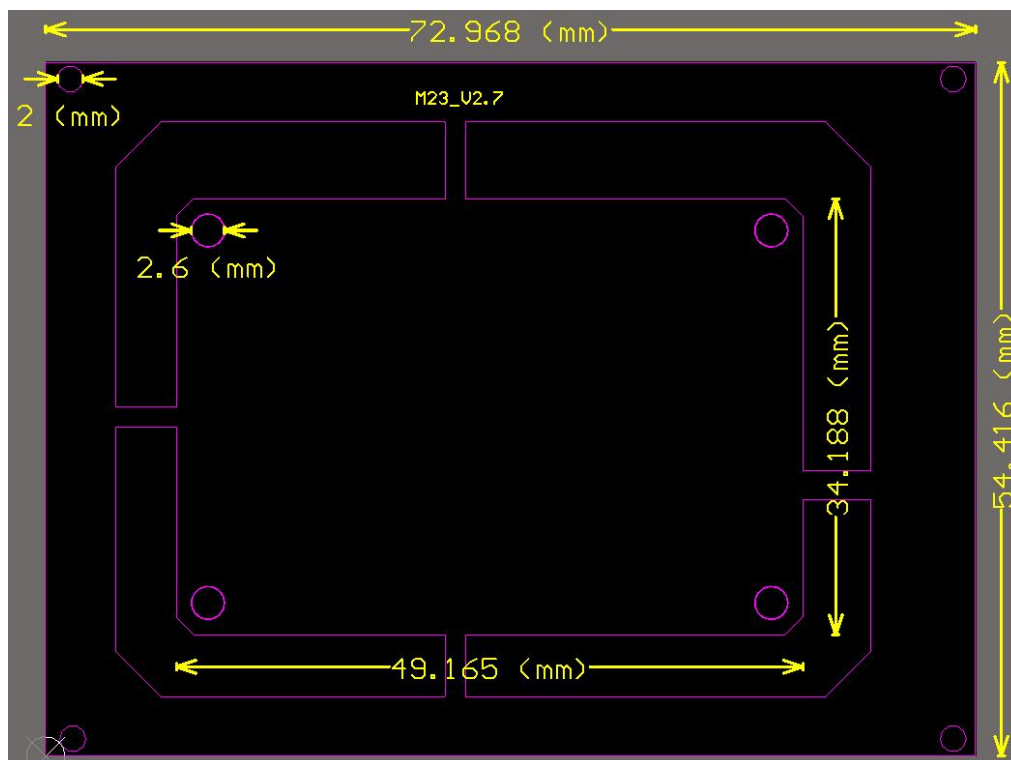
Chapter 2 Basic Features List

Main technical parameters	
Supporting protocols	ISO14443A, ISO14443B, ISO15693
Support cards	Mifare (1K/4K) , Ultralight, DESFIRE, CPU, ICODE2;
Operating system	WinXP、Win7、8、ME、2003、VISTA、LIUNIX、UNIX、Android, Kirin system, HarmonyOS
Card reading distance	00~50mm
Card reading time	< 100ms
Communication rate	9600~115200bps
Radio frequency antenna	The antenna is integrated or separated
Communication interface	Uart TTL、RS232、RS485, USB
Voltage of operation	DC5V±5%
Current of	60mA

operation	
Frequency of operation	13.56MHZ
Work environment	temperature (-20°C~85°C) humidity (5%~95%)
Indicator light	Red and green LED
Built-in speaker	Controlled buzzer
Net/gross weight	15g
Dimensions of products	72.97mm×54.4mm; Thickness of plate 1.6mm

Chapter 3 PCB size and interface layout

3.1 PCB dimension diagram



PCB: 2-layer board

Size: 72.974mm*54.4172mm, plate thickness 1.6mm

Screw hole specification: $\phi 2.6\text{mm} \times 4$

3.2 Description of interface parameters

◆USB communication connector

A 5V DC power supply is used for power supply. Power the board subsystem from **the computer or development board**. In the case of no external load, the 5V DC power supply should support a minimum current of 300mA.

The interface of the USB socket is defined as follows: The main control board can be used for power supply. Standard seat size is 4PIN 2.0mm pitch.

Serial number	Definition	Attributes	Description
1	GND	Ground line	Ground line
2	D+	Data line positive	DATA+
3	D-	Negative data line	DATA—
4	VCC	Power supply	5V input

◆ Serial communication socket interface

Only 4 lines (VCC, TX, RX, GND) connected to the corresponding motherboard can complete the serial communication. Note the serial output voltage of the motherboard. Select the corresponding matching level signal. Pay special attention to whether the motherboard is 232 or TTL serial port.

Notes:

1. The serial port does not communicate. Check whether the level does not match or the TTL is connected to 232.
2. TX, RX connection is correct.

Serial number	Definition	Attributes	Description
1	GND	Ground line	Ground line
2	RX	Input	Connect MCU-RX
3	TX	Output	Connect MCU-TX
4	VCC	Power supply	5V input

Chapter 4 **Assembly use precautions**

Note the following (and not limited to) issues when using the assembly.

- 1 Short circuit problem between bare board and peripheral equipment.
- 2 In the process of installation and fixation, avoid the deformation of the bare plate caused by fixation.
- 3 When installing the serial port, pay attention to whether the USB device is directly connected. TX,RX connection is correct.
- 4 Whether the input power is connected to the power input interface. According to the total peripheral evaluation, input power supply voltage, current, etc. meet the requirements.
- 5 Whether the phenomenon of not reading the card is used in a card that is not supported by this product, or the card is swiped in a critical state, or the card is damaged.
- 6 The control board with 232 chip should be connected correctly when selecting 232 interface. Avoid data garbled phenomenon when 232 and TTL want to connect.
- 7 Pay attention to the direction of VCC and GND to avoid PCB burning after the reverse connection.

FCC Warning

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.

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.

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 and your body.