

# **The product specification of fingerprint module**

**M583**

**(V1.0.1)**

**Guangzhou Gouku Technology Co., Ltd**

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## **1. Product overview**

M583F fingerprint module is a new type of array semiconductor fingerprint module. Compared with existing products in the market, M583F fingerprint module has advantages of small size, low power consumption, fast identification speed and high identification accuracy.

M583F fingerprint module is easy to use, especially suitable for small, battery-powered equipment such as door lock, card reader and safe. With low power consumption, it can maintain excellent reaction performance and high recognition speed.

This fingerprint module adopts capacitive fingerprint sensor, which can effectively detect the problem of false finger by measuring fingerprint signal.

The surface of fingerprint sensor uses a high hardness coating, which can greatly reduce the wear of fingerprint sensor in daily use.

In addition, M583F can withstand 15KV static electricity, which is not easy to damage the fingerprint sensor when used in winter or in northern areas with high static electricity.

M583F fingerprint module uses 1.0 mm connector, which can be connected with ordinary cable to enhance connection reliability.

The M583F fingerprint module's interface supports UART, and the default baud rate of UART is 57,600.

The baud rate can be set by software. (Note: the baud rate will take effect immediately after the successful setting. Please use the new baud rate to communicate. If you forget to set the baud rate, please verify all the baud rates that may have been set or ask our factory for help).

## **2. The main features**

- Planar array fingerprint sensor
- The sensor is coated with a protective coating
- RGB three color LED lights
- UART interface
- 1.0 mm connector
- The fingerprint module supports 3.3v power supply
- ESD protection >15KV
- Support storage of 100 fingerprint features (6 mosaics)

## **3. Algorithm specifications**

- FAR (False Acceptance Rate) : <1/1000000
- FRR (False Rejection Rate) : <1%
- Response speed: feature extraction time <0.25s, single matching time <0.002s
- Support fingerprint stitching, the maximum number of stitching: 10 times
- Number of fingerprints: 100 fingerprints (6 mosaics)

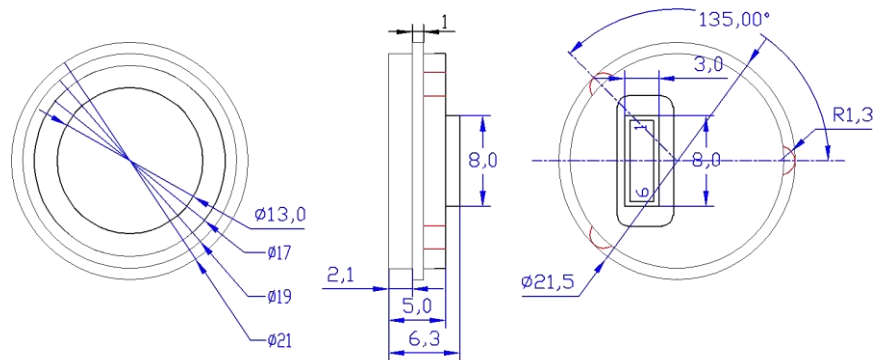
## **4. Application scenarios**

Security field: fingerprint door lock, safe, jewelry box

Management area: licensing, management software, etc.

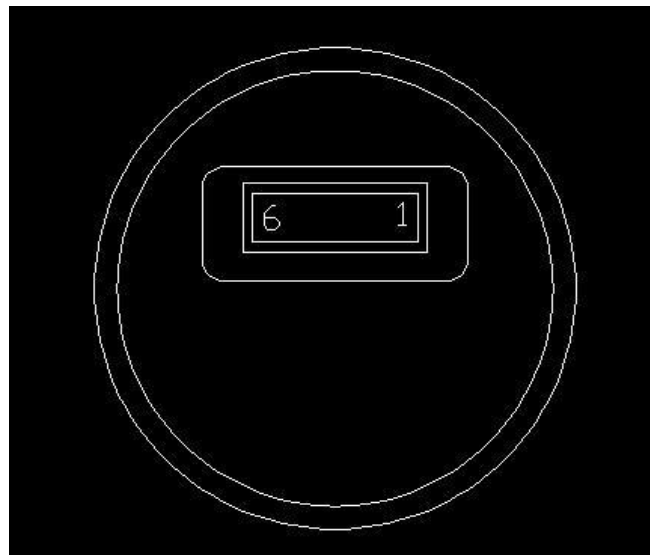
Financial and other areas of identity authentication: access control system, POS machine, attendance machine, etc.

## 5. Structure size and external interface



Front construction and dimensions of modules

## 6. Specification definition



The reverse interface of the module

The module interface is defined as follows. When connecting to Host, please pay attention to the RXD/TXD order of the master:

1	2	3	4	5	6
V_TOUCH Only 3.3v power supply is supported	TOUCH_OUT	VCC Only 3.3v power supply is supported	TX	RX	GND

## 7. Specifications define

parameters	description	value	unit
interface	1.0 mm connector	6	pin
voltage	DC voltage (typical value)	3.3	V
electricity	Typical value (supply voltage: 3.3v, single color LED lights)	<40	mA
hibernation mode	Typical value (fingerprint detection)	<10	uA
Baud rate of serial port	Baud rate	57600	Bps
size	Appearance structure (width x length), standard value	Φ21.00	mm
pixel resolution	256 gray value	8	bit
electrostatic protection	IEC61000-4-2, level X air discharge	±15	kV
Natural wear and tear	Press repeatedly at a pressure of 0.6N	>1,000,000	time
work environment	temperature	-20 ~ +55	°C
	relative humidity	40% ~ 85%(RH)	RH
storage environment	temperature	-40 ~ +85	°C
	relative humidity	<85%(RH)	RH
Fingerprint Capacity	Joining together 6 times	100	pieces

## 8. Hardware design

### A. power supply design

1. The voltage range is 3.0v ~ 3.6v (measured at module interface). When the voltage range is not in this range, the module will work abnormally or be damaged.

It is recommended that the power supply of fingerprint module should not share the

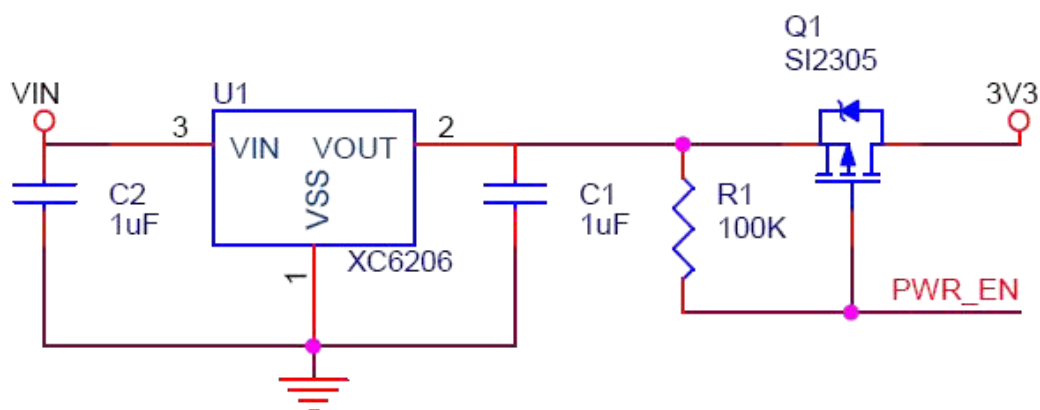
same VCC with other devices requiring high current (Such as motor, power amplifier, etc.) to prevent module reset or abnormal fingerprint registration due to power fluctuation;

2. The peak current of the module can reach up to 100mA immediately, so the LDO that supplies the module needs to be able to output enough current.

At the same time, the peak current at the moment when the module is powered on may lead to a short drop in the output voltage of LDO. It is suggested that the module and the MCU of the main control do not share the same LDO. If the module and the MCU of the main control share the same LDO, it is recommended to increase 220uF capacitor to prevent voltage drop from affecting the work of the main control MCU.

The following circuit is recommended:

1. Independent 1-way LDO is used for power supply. When PWR\_EN pin is pulled down, the module is powered up and the high module is cut off.



Low power circuit design for reference

## B. Serial port design

The M583F fingerprint module UART serial port RX is connected with the pull-up resistance and TX is not added.

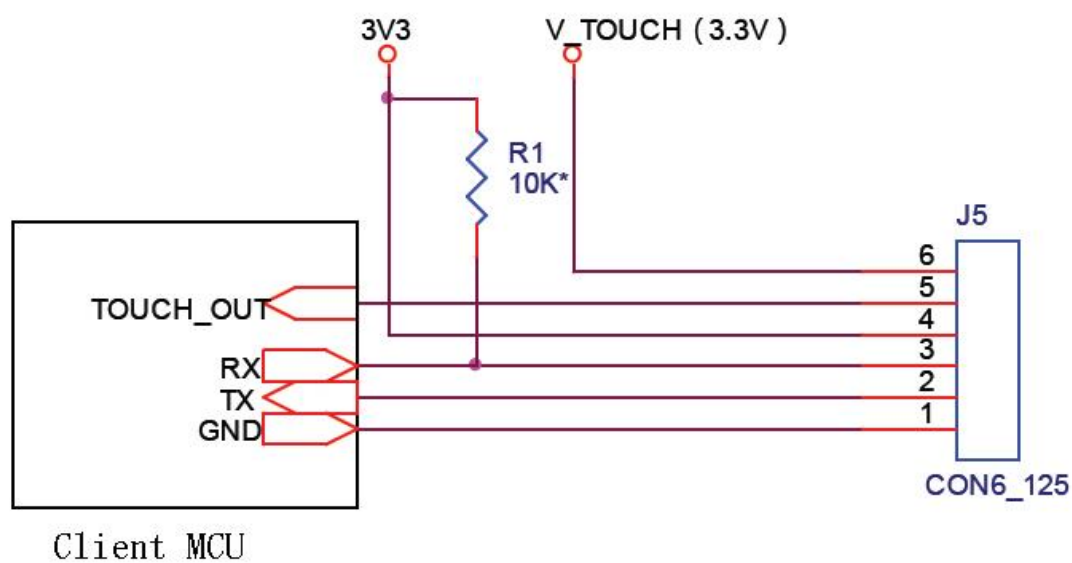
Therefore, when the client-side USES the RX, it needs to add a pull resistor to ensure the normal communication of UART serial port.

When the user USES the same layout and USES the layout encapsulation of

fingerprint module connector, the wiring sequence of schematic diagram J1 interface should be opposite to that of layout encapsulation.

The client-side software needs to follow the following regulations: after the fingerprint module VCC is powered on, configure the fingerprint module serial port to work normally;

Set MCU serial port as input high resistance state before power down of fingerprint module VCC to prevent power leakage from client MCU to fingerprint module (take fingerprint VCC voltage as reference level 0 after power down).



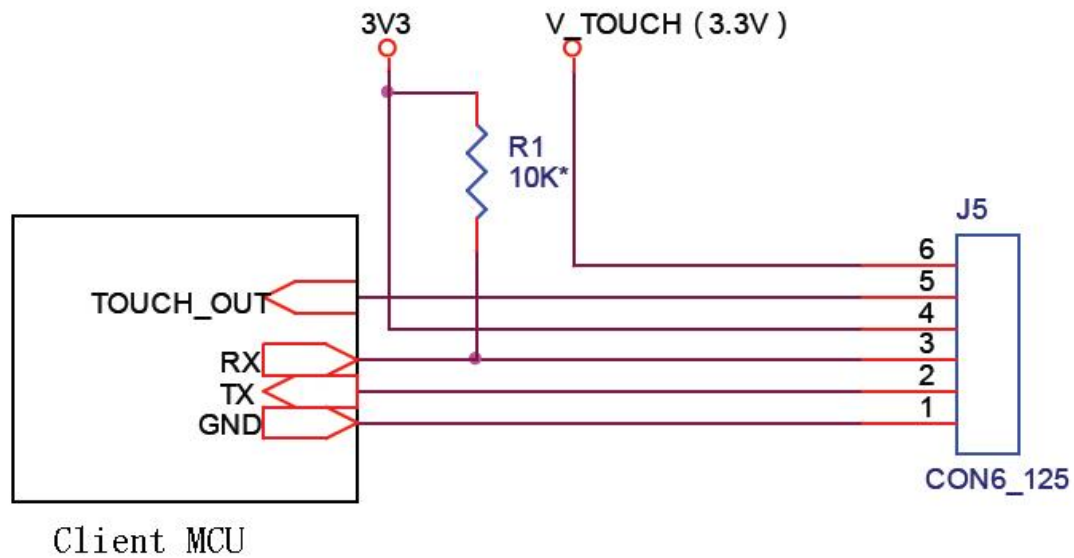
Serial circuit design

### C. Interrupt circuit design

Interrupt circuit design module interrupt signal is generated by the touch chip, and the default pull-down resistance is added inside the interrupt output pin, which is low when working normally, and the default output of interrupt signal is high.

However, the module interrupt signal output mechanism can be set by hardware.

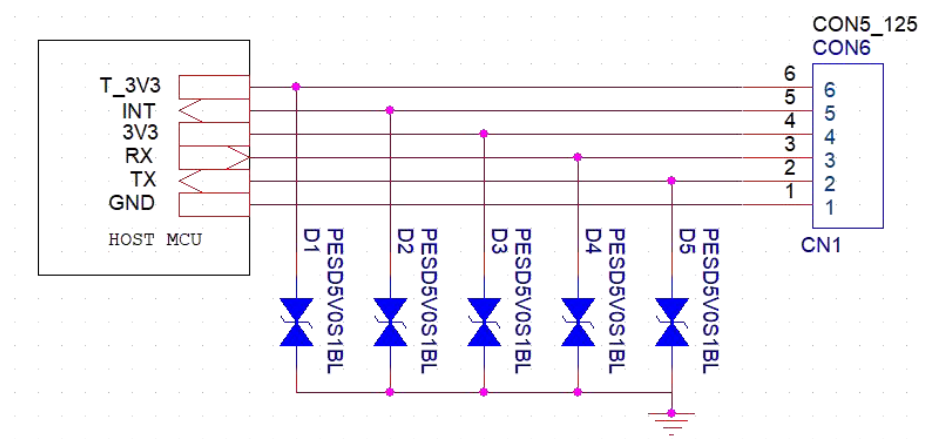




#### D. ESD protection design

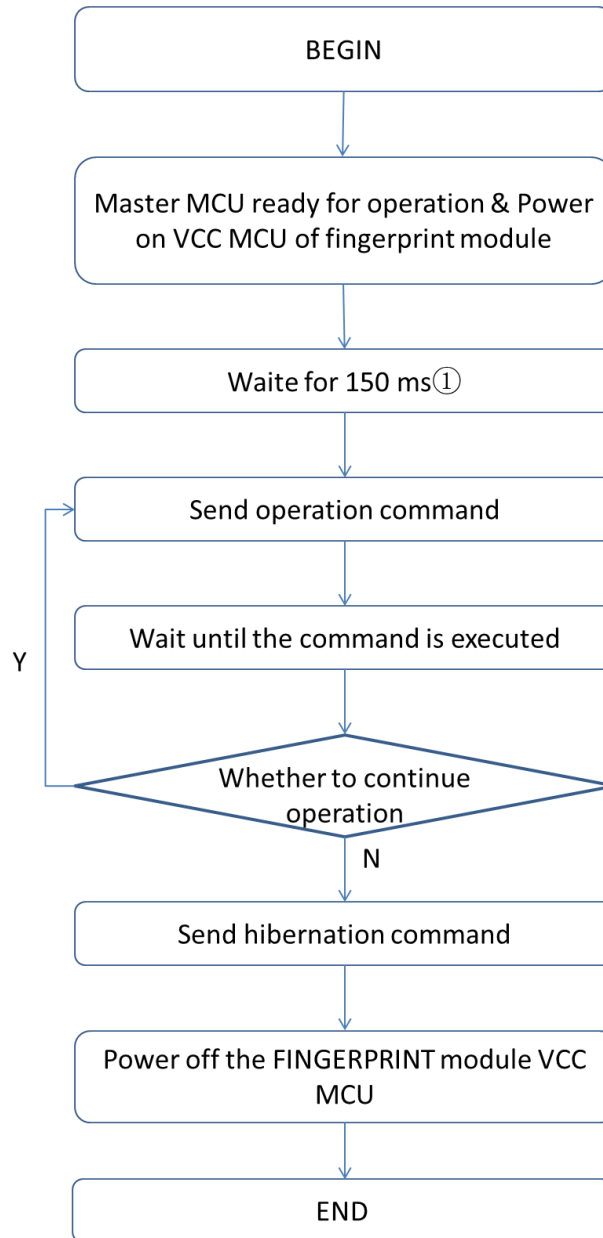
During ESD test, in order to reduce the influence of static electricity on the main control board, it is suggested to add ESD devices next to the connector of the main control board to reduce the influence of static electricity on the main control board.

ESD device should be close to the connector of fingerprint module to improve the protection effect of ESD device.



## 9. Software design for reference

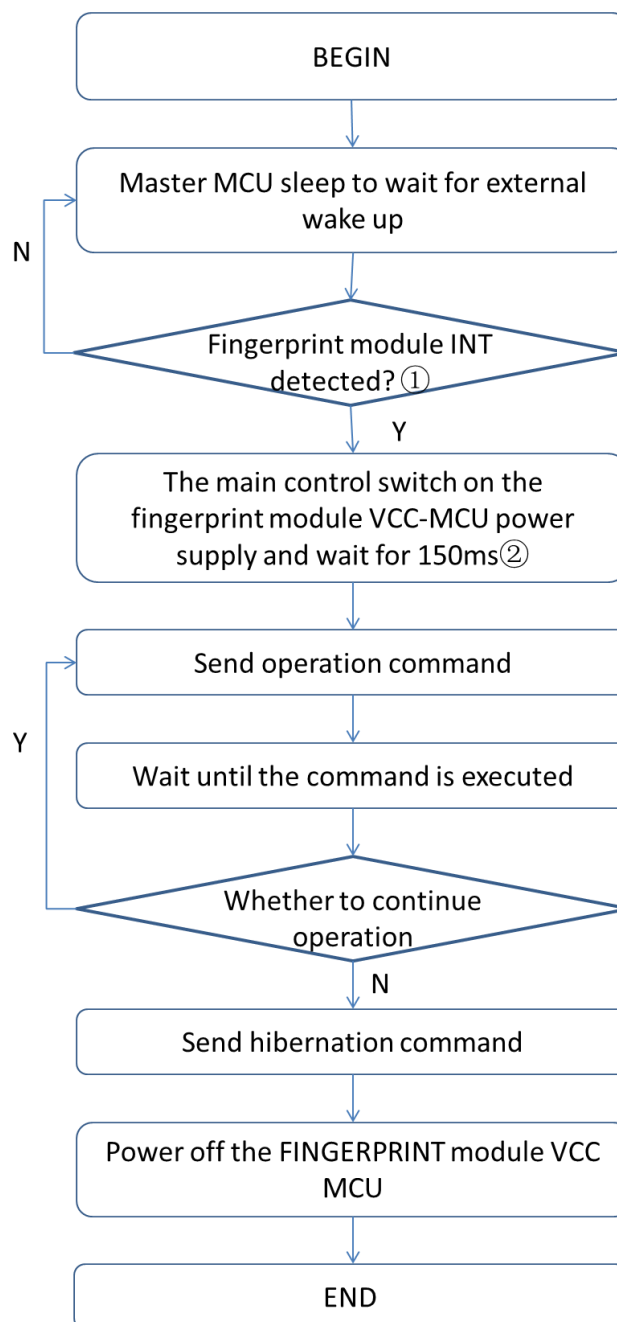
Master control wake up the module workflow:



Description:

- ① The actual power-on and startup time of the module is about 100ms. It is suggested to wait 150ms before operating the module. When the module sends the command of query result, it may not reply because it is processing the task corresponding to the current command. In this case, you can retry the command of query result after about 100ms until the module replies. In addition, when the module is powered on, the serial port of the module will output "0x55" after the system initialization is completed. The master MCU can also check whether it receives this sign to determine whether the module initialization is complete.

## The module wakes up the master workflow



①When the master control detects the fingerprint module INT, the master control switches on the module VCC\_MCU.

②The actual reset startup time is about 100ms, and a delay of 150ms is suggested. When sending the query result command, the module may not reply because the task is corresponding to the current command. In this case, you can try to send the query result command again after about 100ms until the module replies. In addition, when the module is powered on, the serial port of the module will output "0x55" after the system initialization is completed. The master MCU can also check whether it receives this sign to determine whether the module initialization is completed.

## 10. The order information

Type number	Description
M583F	Black matt sensor, black metal ring

## 11. Revision record

Version	Revisions	Date	Modified by
V1.0.1	New release	December 23, 2021	Dong Li

## 12. Contact information

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