Shenzhen Hi-Link Electronics Co., Ltd.

HLK-ZW0623 Specification

Round lighted fingerprint module

Version: V1.0 Modification date: 2024-1-26

Contents

1. Product Introduction

Consumers use fingerprint recognition modules for user identity determination. When a user touches the fingerprint recognition module with a finger, the fingerprint recognition module scans the user's fingerprint. The algorithm chip can obtain the fingerprint image data for registration and comparison. Right operation.

2. Parameter

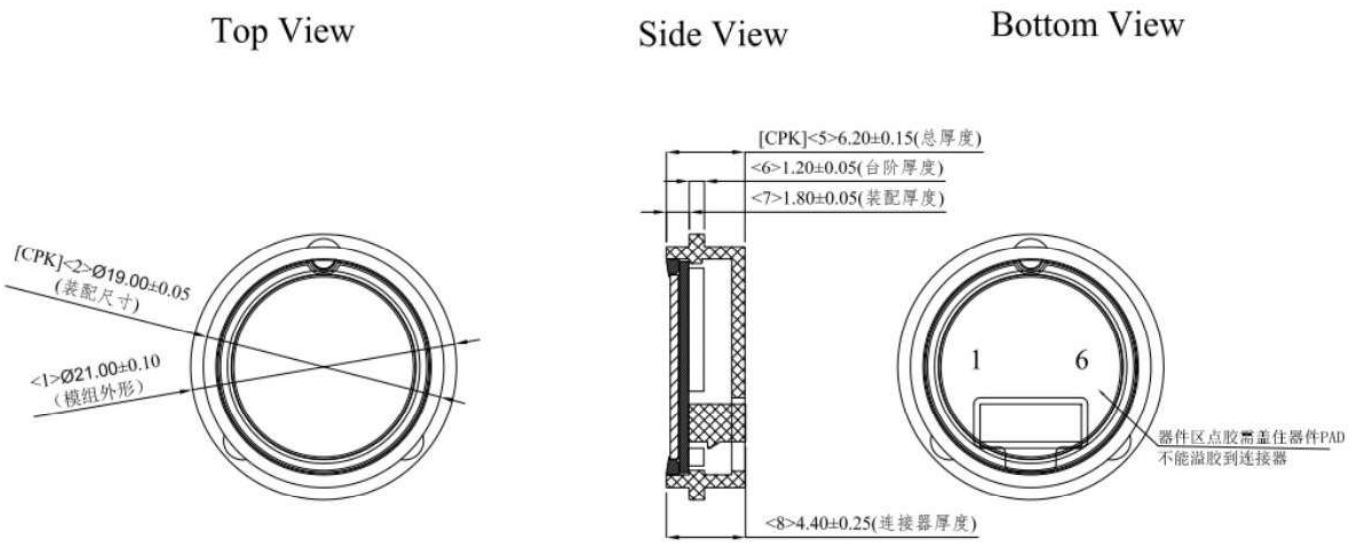
2.1.Technical Indicators

Project	Parameter
storage	Comes with 100 fingerprint data as standard
sensor type	capacitive touch sensor
resolution	508DPI
FRR.	<3%
FAR.	<0.001%
Fingerprint sensor shape	round
Image gray level	8-bit grayscale
Service life	a million times
Static electricity test	Contact discharge ±8KV/air discharge ±15KV
Data interface	UART (TTL level)
Sensor surface hardness	3H
Working temperature and humidity range	-30℃~+70℃: 45%~85%RH
Storage temperature and humidity range	-40℃~+85℃: 45%~95%RH

2.2.Mechanical Properties

Project	Describe	Unit
Dimensions	Φ14.5mm	mm
Ribbon	8.0*8.0	mm
sensor size	160*160	

2.3.Dimensions



3. Electrical parameters

Project	Smallest	Typical	Maximum	Unit
Supply voltage	3.0	**3.3**	3.6	V
Standby current (sensor)	8	**10**	12	μA
Operating current (algorithm MCU)	-	**25**	45	mA
Picture collection time	120	**150**	180	ms
Generate feature value time	200	**220**	250	ms
Comparison time	20	**100**	1300	ms

Power-on start time		-	**100**	-	ms
ESD rating	non-contact discharge	-	**15**	-	KV
	contact discharge	-	**8**	-	KV

4. Interface definition

4.1.Communication Interface

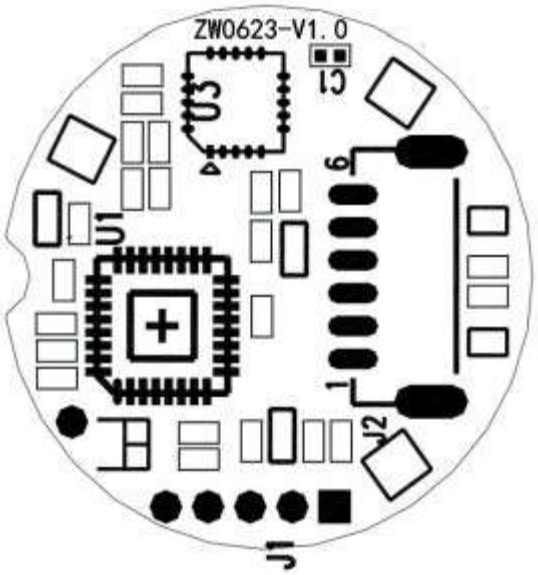
UART default baud rate is 57600 bps, 1 start bit, 8 data bits, no parity bit, 1 stop bit. 3.3V TTL level.

4.2.Connector type

XH-1.00-6P: 6Pin stand-up stickerevenConnector, spacing 1.00mm.

4.3.Pin description

PIN	Define
1	GND
2	RXD
3	TxD
4	VDD_3.3V
5	Detect
6	SENSOR_3.3V



Pin number	Name	Definition	Type	Remark
1	GND	land	P	ground signal
2	RXD	Serial port receiving terminal RXD	I	Fingerprint module<- Main control MCU (or host computer)
3	TxD	Serial port transmitter TXD	O	Fingerprint module -> Main control MCU (or host computer)
4	VDD_3.3V	Used for overall power supply of fingerprint module	P	Used for the overall power supply of the fingerprint module (please make sure to turn off the power supply in standby mode)
5	Detect	Interrupt wake-up signal	O	Interrupt wake-up signal (output high level when finger touches fingerprint sensor)
6	SENSOR_3.3V	SENSOR module power supply	P	SENSOR module power supply

Illustrate:

- The serial port is a TTL level of 3.3V. If you need to connect to the serial port of PC, you need to connect the TTL-USB adapter board before communication.
- **Pin 6 (SENSOR module circuit power supply) needs to be powered at all times.**Please ensure that the power supply has small ripple and is not interfered by other power supplies.

4.4.Actual photos

4.5.Fingerprint module internal circuit description

- Directly using the fingerprint sensor FD mode, the SENSOR wake-up is highly reliable and reduces the risk of false triggering.
- When there is no finger touch, the Detect signal line is low level. When the finger touches the fingerprint sensor, the signal is triggered to high level, and then changes to low level when the finger leaves.

- **Fingerprint module workflow description:**

When the fingerprint module is in sleep state, Detect is used as a wake-up signal. When the finger touches the fingerprint sensor, the interrupt signal is triggered, and then wakes up the system. The main control MCU controls the power-on of MCU_3.3V. After the fingerprint module algorithm chip is powered on and initialized, the main control MCU controls the fingerprint module through serial port commands to complete image collection and registration. , comparison task. After the task is completed, the main control chip controls the fingerprint module to sleep and controls the MCU_3.3V to power off. The system enters sleep and waits for the next round of work. After the system wakes up, the main control MCU can mask the interrupt signal, and turn on interrupt detection again before going to sleep after the task is completed.

- **Fingerprint sensor chip power supply requirements:**

The characteristics of the fingerprint chip itself: in FD (FingerDetect) mode, that is, when the fingerprint sensor periodically scans and detects fingerprints, a peak current of about 200mA will appear for 4us. Therefore, there are strict requirements for the power supply of the fingerprint chip. sensor_3.3V needs to control the power supply ripple within 200mV to avoid

excessive power supply ripple causing the fingerprint sensor to reset at low voltage, causing the fingerprint sensor to fail to work properly.

- It is necessary to use an LDO module with fast transient response to power the fingerprint chip; it is recommended that the LDO output current for Sensor power supply be ≥250mA, ripple <100mV, and PSRR>60dB.

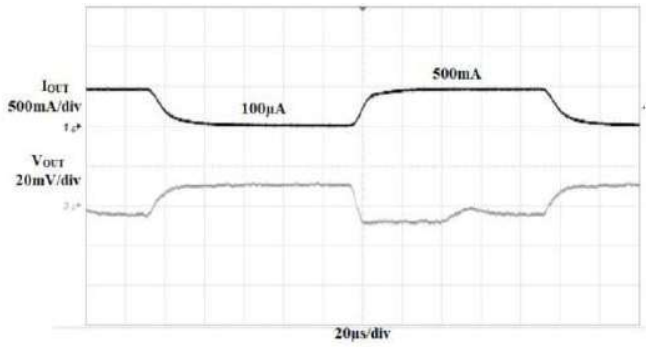
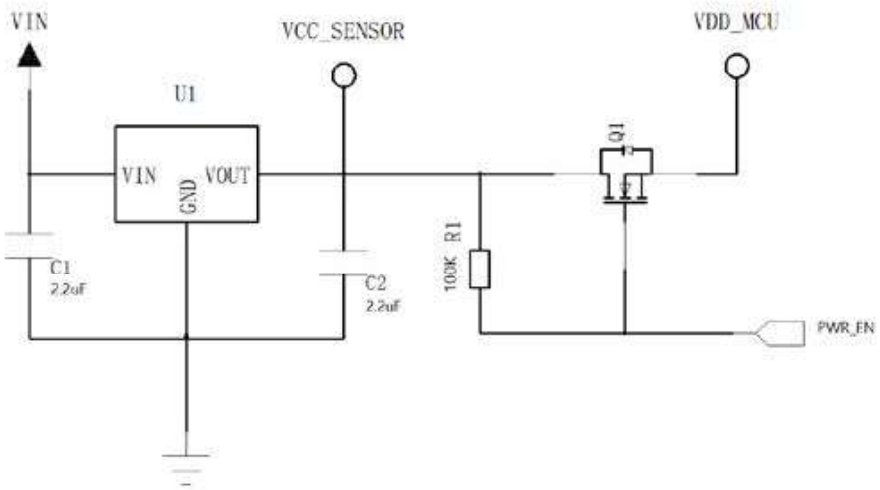


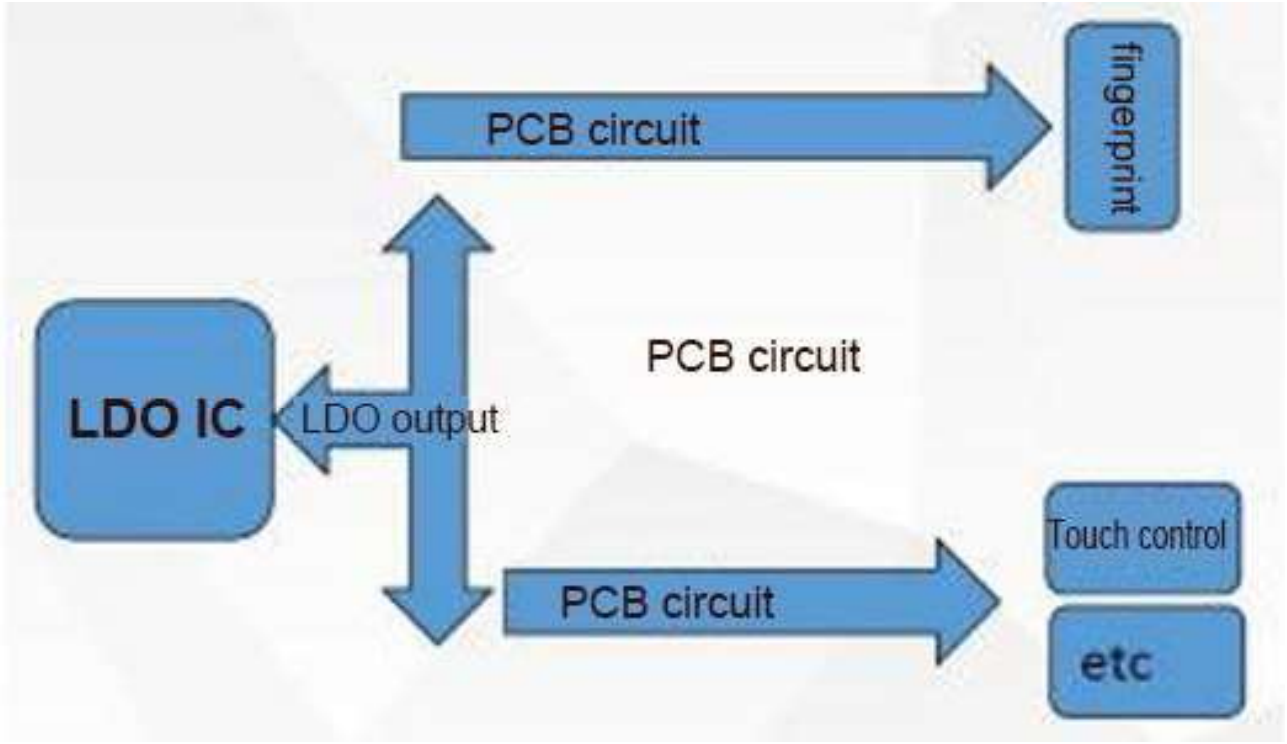
图 2.14　负载瞬态响应波形

Figure 2.14 load transient response waveform

- It is recommended to use a separate LDO to power the fingerprint module. The LDO output line supplies power to the fingerprint chip all the way, and a separate line is controlled by a MOS switch to power the fingerprint module algorithm MCU.



- When the fingerprint module shares the LDO power supply with other modules, the fingerprint module power supply needs to be routed separately from the LDO output on the PCB Layout.



5. Version revision history

Version	Revision Notes	date	Revised by
V1.0	first draft	2024-1-26	Chrales

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