



Shenzhen Hi-Link Electronic Co., Ltd

HLK-ZW0906 Datasheet
Round Fingerprint Module with Light



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1. Products

Fingerprint identification module is used for user's identity determination, when the user touches the fingerprint identification module with his/her finger, the fingerprint identification module will scan the user's fingerprints, and the algorithm chip can obtain the fingerprint image data for registration and comparison operation. This product is suitable for various applications that require fingerprint identification.

2. Parametric

2.1. Technical indicators

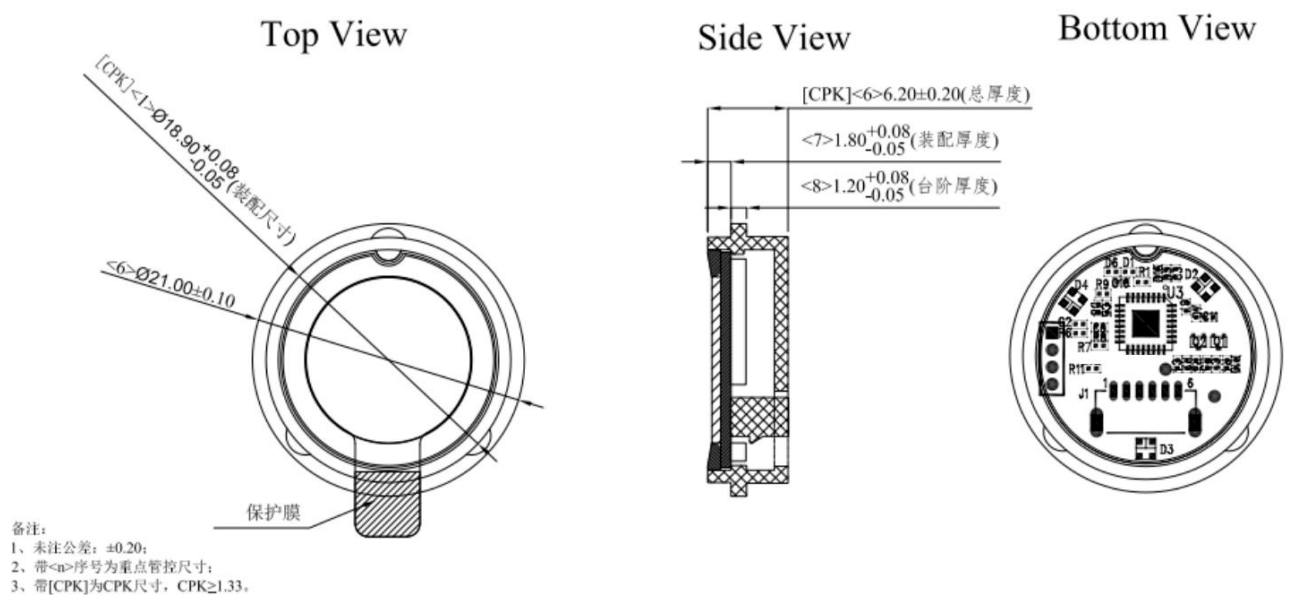
Item	Parameters
storage capacity	100 fingerprint data as standard
Sensor type	Capacitive Touch Sensors
resolution (of a photo)	508DPI
FRR.	<3 per cent
FAR.	<0.001 per cent
Fingerprint sensor shape	orbicular
Image grey level	8-bit greyscale
service life	million times
Static Test	Contact discharge $\pm 8KV$ /Air discharge $\pm 15KV$
data interface	UART (TTL level)
Sensor surface hardness	3H

Operating temperature and humidity range	-25°C~+70°C: 45%~85%RH
Storage temperature and humidity range	-40°C~+85°C: 45%~95%RH

2.2. Mechanical property

Item	Description	Unit
Overall dimensions	Φ12.8mm	mm
functional areas	5.6*4.8	mm
connection method	UART	
sensor size	112*96	

2.3. Dimension drawing



3. Electrical parameters

sports event	minimal	quintessential	greatest	unit (of measure)	
Supply Voltage	3.0	3.3	3.6	V	
Standby current (sensor)	-	10	12	μ A	
Operating Current (Algorithmic MCU)	24	35	50	mA	
Mapping time	50	60	70	ms	
Eigenvalue generation time	65	70	80	ms	
Comparison time	20	600	1100	ms	
Power-on start-up time	-	67	100	ms	
ESD rating	noncontact discharge	-	15	-	KV
	contact discharge	-	8	-	KV

4. Interface definition

4.1. Communication interface

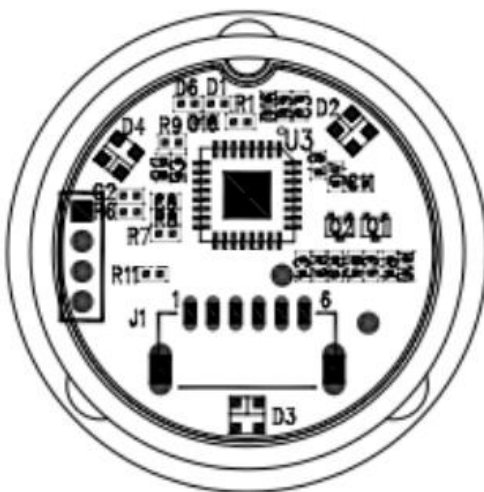
Standard UART default baud rate 57600 bps, 1 start bit, 1 stop bit, 8 data bits, no parity bit, 3.3V TTL level.

4.2. Connector Type

XH-1.00-6P: 6Pin standoff connector with 1.00mm pitch.

4.3. Pin Description

4.4.



pin number	name (of a thing)	define	typology	note
1	GND	ground	P	earth signal
2	RXD	Serial Receiver RXD	I	Serial Data Input
3	TXD	Serial Transmitter TXD	O	Serial data output
4	VDD_3.3 V	For powering the fingerprint module as a	P	Power supply for the fingerprint module as a whole (make sure that

		whole		this power supply is switched off in standby mode).
5	Detect	wake-up call	O	Interrupt wake-up signal (high level output when finger touches the fingerprint sensor)
6	SENSOR_3.3V	SENSOR Modular Power Supply	P	SENSOR Modular Power Supply

Description:

- The serial port is a 3.3V TTL level. If you want to connect to the serial port of a PC, you need to connect a TTL-USB adapter board to communicate.
- **The 6-pin SENSOR module circuit power supply needs to be powered all the time.** Make sure that this power supply has low ripple and is not disturbed by other power supplies.

4.5. Photograph



4.6. Fingerprint Module Internal Circuit Description

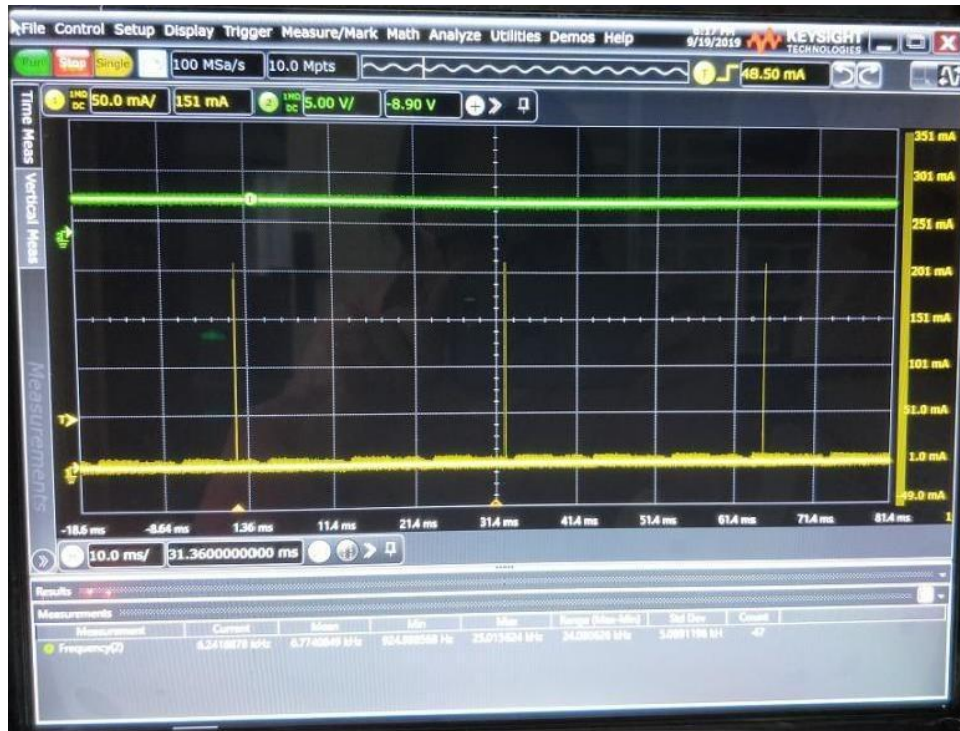
- Directly adopting the fingerprint sensor FD mode, SENSOR wake-up is highly reliable and reduces the risk of false triggering.
- The Detect signal line is low in the no-finger-touch state, and the signal is triggered to high when the finger touches the fingerprint sensor until the finger leaves and then becomes low again.
- **Fingerprint module workflow description:**

Detect is used as a wake-up signal when the fingerprint module is dormant. When the finger touches the fingerprint sensor, the interrupt signal is triggered to wake up the system, and the master MCU controls MCU_3.3V to power on; after the fingerprint module algorithm chip is powered on and initialised, the master MCU controls the fingerprint module to complete the tasks of image acquisition, enrolment, and

comparison through the serial commands, and after the tasks are completed, the master chip controls the fingerprint module to hibernate, and controls MCU_3.3V to power off, and the system enters into hibernation and wait for the next round of work. After the system wakes up, the master MCU can shield the interrupt signal and turn on the interrupt detection again before hibernation after the task is completed.

➤ **Fingerprint sensor chip power supply requirements.**

Fingerprint chip has its own characteristics, in FD (FingerDetect) mode, i.e. when the fingerprint sensor is scanning and detecting fingerprints periodically, there will be a peak current of about 200mA for 4us. Therefore, the power supply of the fingerprint chip has strict requirements. sensor_3.3V should control the power ripple within 200mV, to avoid too large power ripple causing the fingerprint sensor to reset at a low voltage, which will lead to the fingerprint sensor not working properly.



Fingerprint chip operating current in FD mode

- The LDO module with fast transient response is required to supply power to the fingerprint chip; it is recommended that the output current of the LDO for Sensor power supply should be $\geq 250\text{mA}$, the ripple should be $< 100\text{mV}$, and the PSRR should be $> 60\text{dB}$.

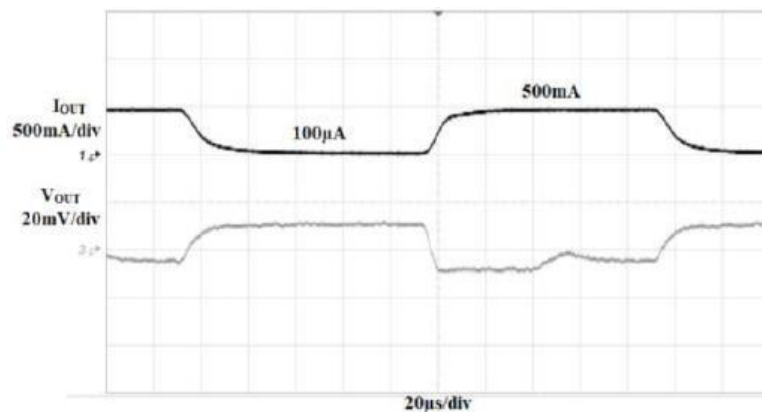
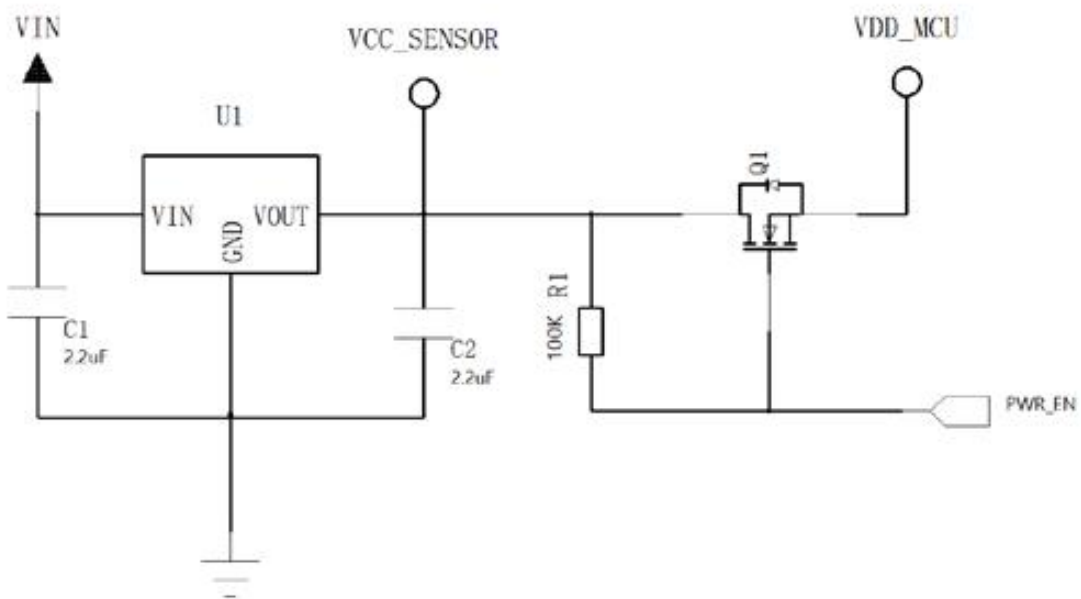
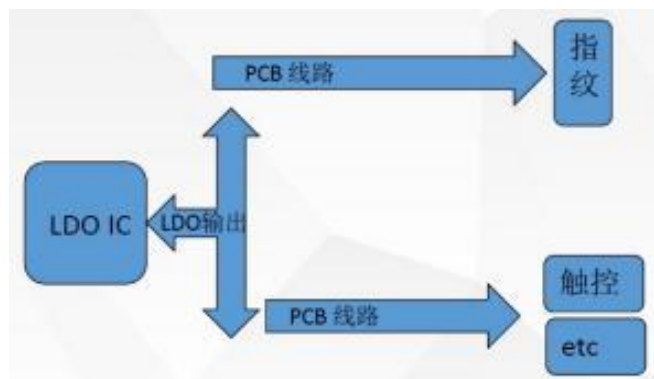


图 2.14 负载瞬态响应波形

- It is recommended to use a separate LDO to supply power to the fingerprint module. the LDO output is routed all the way to the fingerprint chip to supply power, and separated all the way to the fingerprint module algorithm MCU power supply with MOS switch control.



- 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.





HLK-ZW0906

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Specification

5. Version Revision Record

releases	revised description	dates	proposer
V1.0	first draft (of writing)	2024-1-26	Chrales



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