

## AD-013 Fingerprint Sensor Module Datasheet

We are dedicated to developing sensing technology, and providing customers with an innovative and diverse range of sensor products.

Our sensors and state-of-the-art fingerprint recognition algorithm technologies provide advanced and convenient fingerprint acquisition and verification.

## [DESCRIPTION]

The AD-013 fingerprint sensor module is consist from a fingerprint sensor & a MCU. The module provide one UART interface output port for connecting to customer side main board.

The operation of AD-013 is as following, a fingerprint image captured by pixel array, delivery fingerprint ridge or valley signals to A/D converter and digital processor, then to the serial peripheral interface for data-reading. Due to MCU already installed fingerprint algorithm, the user can through UART interface use MCU SOC command to operate module like fingerprint enroll, match operations etc.

## [FEATURES]

- *160x160 pixels*
- *Build-in ADC for digitizing image*
- *UART interface*
- *Data encryption*
- *Short read out time*
- *Cost effective sensor*
- *High sensing capability*
- *Single power supply*

## [APPLICATIONS]

- *Door lock*
- *Security device*
- *Access control system*

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## 1 Electrical Characteristics

### 1.1 Maximum rating

Symbol	Parameter	Conditions	Value	Unit
VDD	Supply voltage		4	V
TA	Operating temperature		-20 to 70	°C
ST	Storage temperature		-40 to 85	°C

### 1.2 Operation condition

Symbol	Parameter	Conditions	Min.	Typ	Max	Unit
VDD	Supply voltage		3.0	3.3	3.6	V
IDD	Total supply current	Capture mode			40	mA
IDD	Supply current	Standby mode	—	—	18	mA
ESDKV	ESD protection	Air mode	—	±8	—	kV

## 2 Specification

Item	Value
Image resolution	508dpi
Sensing area	8mm x 8mm
Sensing array	160 x 160 pixels
Package size	29mm x 19.6mm x 6.06mm(H)
Gray Level	8 bits/pixels ,256 gray scales
Recognition Time	1:N , < 0.6 second
Template capacity	40
FRR(False Rejection Rate)	6%
FAR(False Acceptance Rate)	<0.01%
Interface	UART (57600,8,N,2) / TTL level
Supply voltage	3.3V
Total supply current	40mA
Operating Humidity	0 - 95% , Non-condense
Operating temperature	-20 to +70 °C
ESD protection for air discharging	8kV

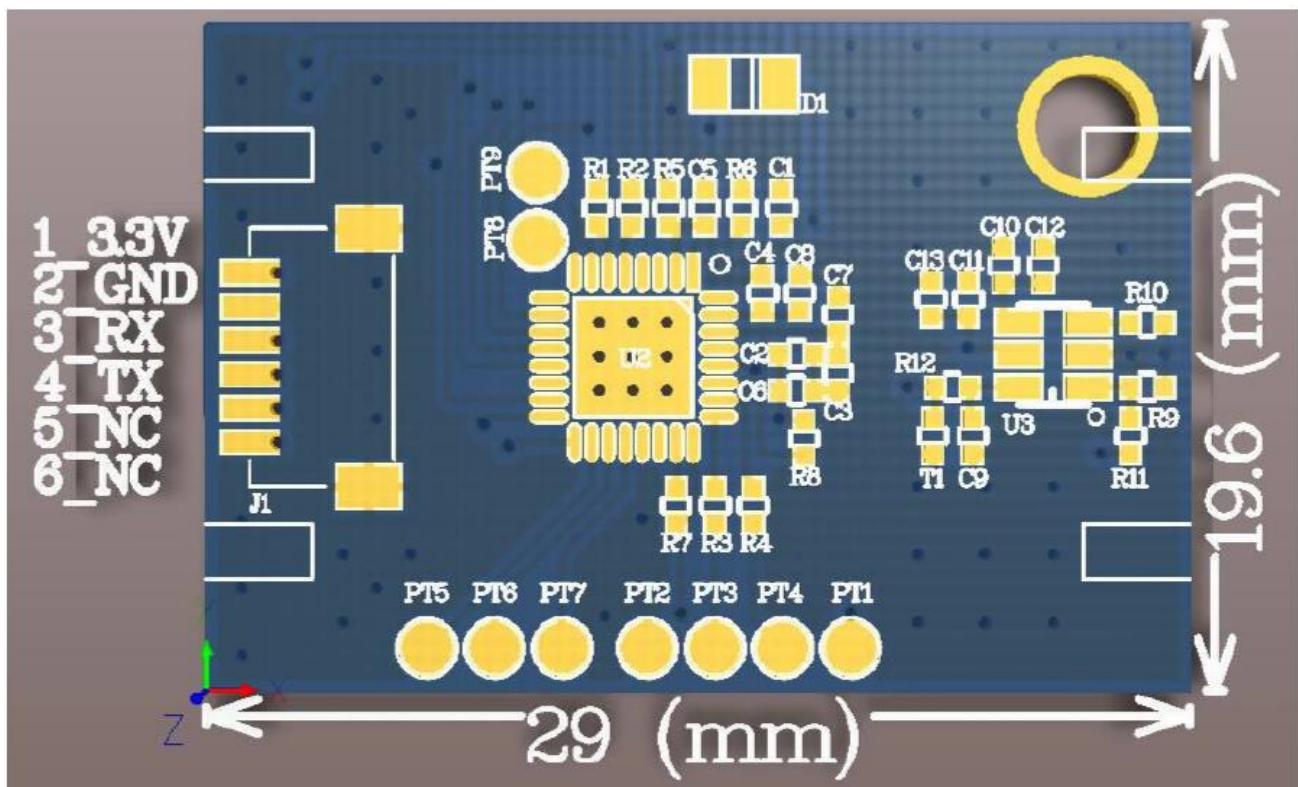
### 3 Mechanical Specification

#### 3.1 Connector Information

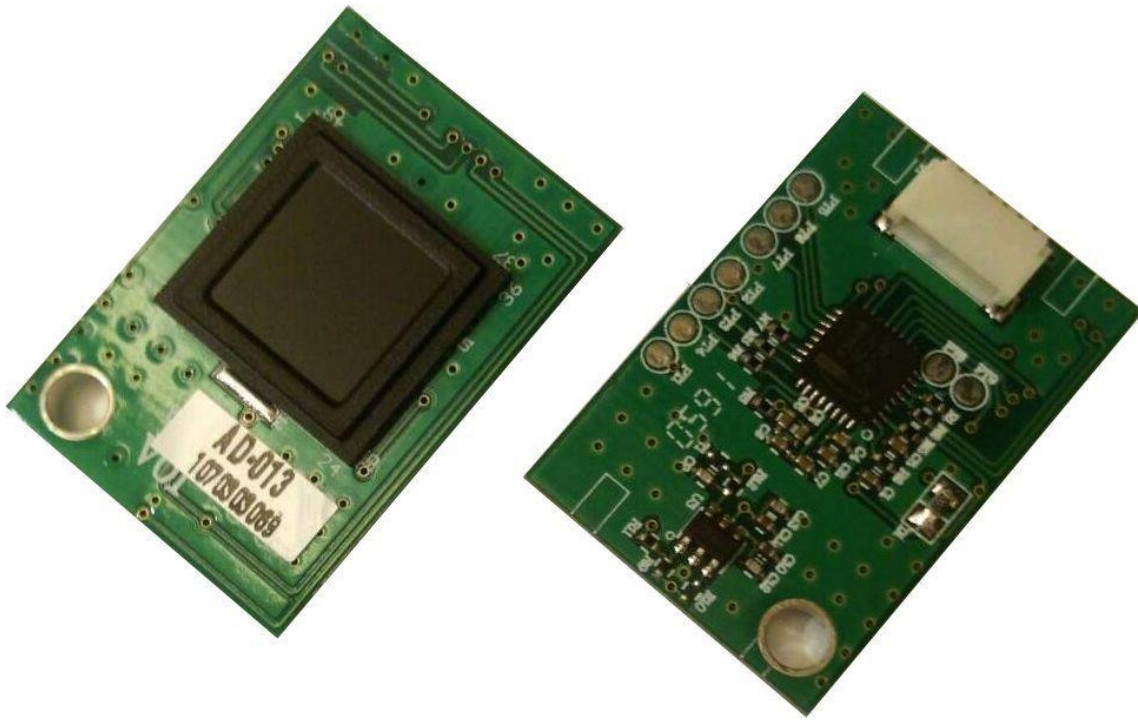
Pin Order	Pin Name	Type	Pin Description
1	3.3V	Power In	Module power input pin. Supply 3.3V
2	GND	Ground	Module system ground.
3	RX	Input	Module UART reception pin.
4	TX	Output	Module UART transmission pin.
5	NC	-	-
6	NC	-	-

#### 3.2 Package size

29mm x 19.6mm x 6.06 mm(H)



### 3.3 Outline Reference



## 4 SDK Guide

### 4.1 UART setting

UART default baud rate : 57600

Data format: 8 bits of data, No parity, 2 stop bits

### 4.2 Initial time

After Power on, the module initial time about 50ms.

Module will send 0x55 data to Host by UART TX after initial finish.

The module would not response Host command at initial time.

### 4.3 Command protocol

Please refer the SOC Manual document.

### 4.4 Response time

The normal command response time list as below table

command	responds time	timeout set
Getimage	<90ms	100ms
GenChar	<370ms	400ms
RegModel	<110ms	150ms
Storechar	<90ms	100ms
Search	<110ms	150ms
Empty	< 20ms	50ms
Read SyspPra	<10ms	20ms
ReadIndexTable	<10ms	20ms
WriteReg	< 20ms	50ms

## 5 Revision history

Version	Date	Changes	Approved	Checked	Author
V1.0	2018/06/01	Initial draft	Angus Chou	Hyde Wu	Hyde Wu
V1.1	2018/10/09	Change format	Angus Chou	Hyde Wu	Hyde Wu
V1.2	2018/10/12	Update initial time for newest firmware driver	Angus Chou	Hyde Wu	Hyde Wu



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