



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# Datasheet

## GT-521FX2

*Optical Fingerprint Recognition* **EMBEDDED** Module

## Version 1.1

July 07 , 2017





## Table of content

Table of content .....	3
1. General Description .....	4
2. Feature.....	5
3. Specification .....	6
4.Module Dimension.....	8
5.Pin Assignment .....	9

## 1. General Description

The GT-521FX2 is high performance fingerprint module that is able to be **waken by a finger** touching the metal frame of sensor. It is one chip fingerprint module designed for integration into products with UART interface. It configure as USB mass storage device so it no need additional effort to handle driver..

The active area allows stable imaging and ability to cope with mass market applications in need of both security and convenience.

The reader within the MCU device is high performance, low power consumption 32-bit microcontrollers based around an ARM® Cortex™-M3 processor core and the fingerprint algorithm is processed on it.

## 2. Feature

- **Simple UART & USB communication protocol**
- **Complies with USB 2.0 full-speed (12Mbps) specification**
- **Ultra-thin OpticalSensor**
- **Resolution 450 DPI**
- **GT-521F52 3000 fingerprints storage,GT-521F32 200 fingerprints storage**
- **Wake up on Finger Function**
- **Works well with dry, moist or rough fingerprints**
- **Anti-Scratch with surface high hardness  $\geq 5H$**
- **1:1 verification, 1:N identification**
- **Reading & writing fingerprint template(s) from/to the device**
- **High-accuracy and high-speed fingerprint identification technology**
- **Downloading fingerprint image from the device**
- **Convenient & Safe & Facilitation—Just one touch and easy to enroll**

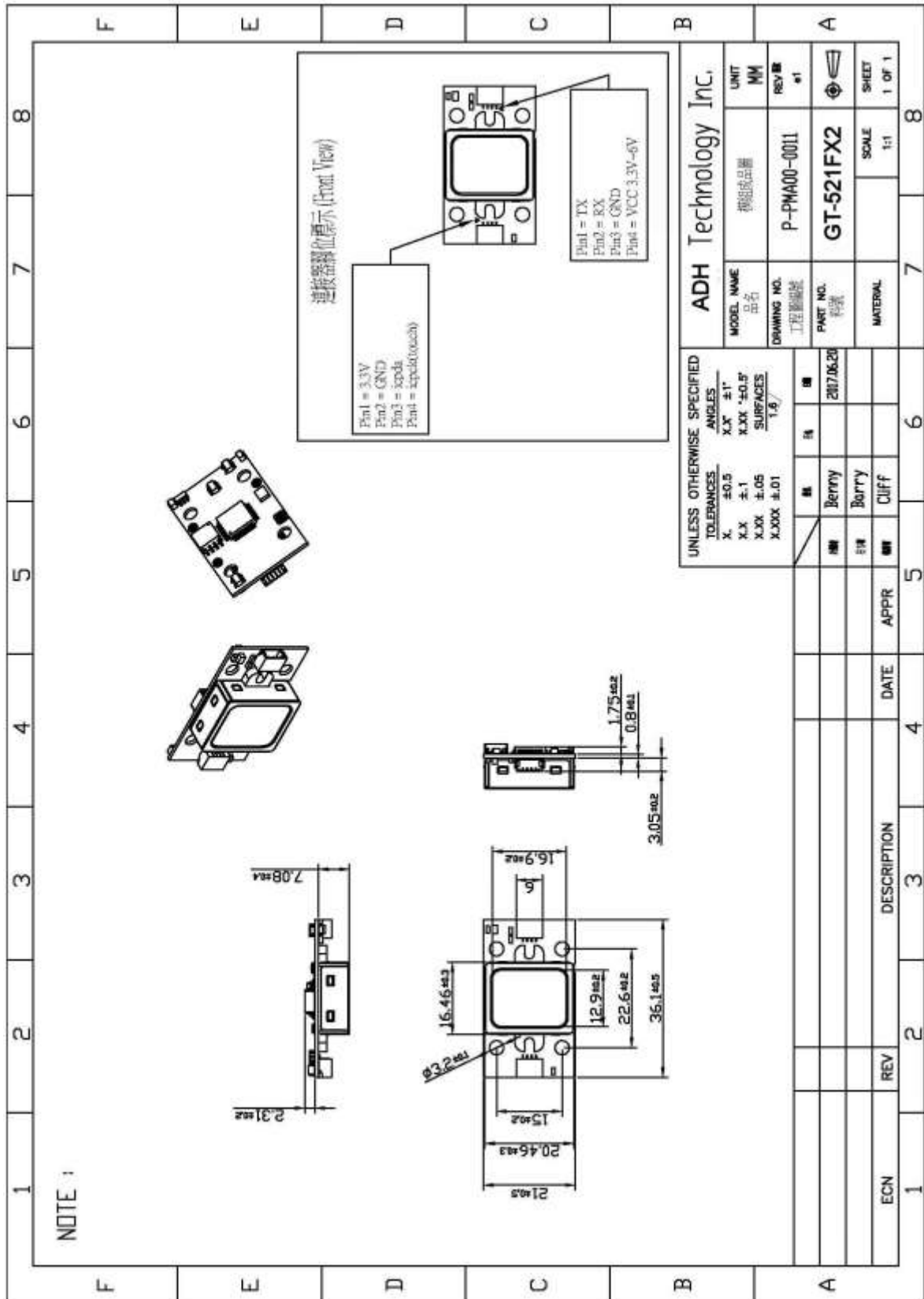
## 3. Specification

Item	GT-521FX2
CPU	ARM Cortex M3 Core
Sensor	Optical Sensor
Window (mm)	16.9 x 12.9
Effective area of the Sensor (mm)	14 x 12.5
Image Size	258 x 202 Pixels
Resolution	450 dpi
The maximum number of fingerprints	200/3000 fingerprints
Matching Mode	1 : 1 ; 1 : N
The size of template	496 Bytes (template) + 2 Bytes (checksum)
Communication Interface	UART, default baud rate = 9600bps after power on USB Ver2.0, Full speed
False Acceptance Rate (FAR)	< 0.001 %
False Rejection Rate(FRR)	< 0.1 %
Enrollment Time	< 3 sec (3 fingerprints)
Identification Time	< 1.5 sec
Operating Voltage (V)	DC 3.3~6V
Operating Current (mA)	< 130

<b>Touch</b>	<b>Operating Voltage</b>	<b>DC 3.3 V</b>
	<b>Operating Current</b>	<b>&lt; 3mA</b>
	<b>Standby Current</b>	<b>&lt; 5uA</b>
<b>Touch Function</b>		<b>High Active</b>



## 4. Module Dimension



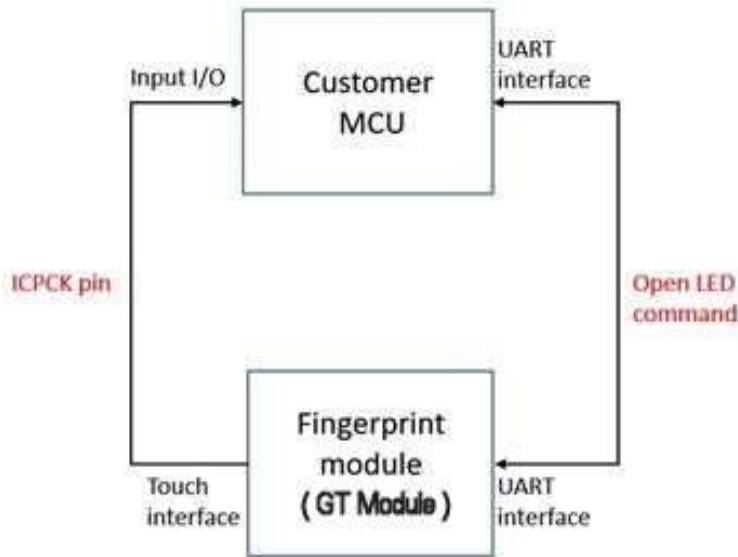
## 5.Pin Assignment

Touch IC Connector		
No.	Name	Description
1	VDD	Power voltage that range is 3.3V
2	GND	Ground
3	ICPDA	Program mode : In-circuit programming data/address pin. $V_{IL} = 0.66V, V_{IH} = 2.64V$
4	ICPCK	Program mode : In-circuit programming clock pin Normal mode : It could be waked-up function from touch IC to $V_{IL} = 0.66V, V_{IH} = 2.64V$

UART Connector(Baud rate 9600~115200bps)		
No.	Name	Description
1	TX	Transmitting serial data $V_{IL} = 0.8V, V_{IH} = 2V$
2	RX	Receiving serial data $V_{IL} = 0.8V, V_{IH} = 2V$
3	GND	Ground
4	VCC	Power voltage that range is from 3.3~6V

The definitions of touch interface are as follows, you have to connect with 3 pins (VCC,GND,ICPCK), which can be working as touch function.

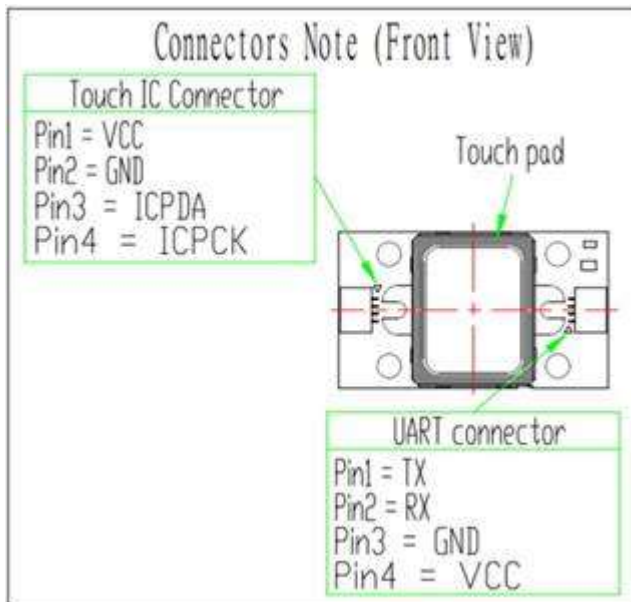
In fact, you just need to know ICPCK pin(pin4) as output pin(GPIO). It will output signal from Low to HIGH voltage when your finger touches metal frame(called: Touch pad) and you can get this signal with the MCU to control another devices. For instance, control GT module with ICPCK or control what you want devices with ICPCK.



**Application of controlling GT Module LED**

Behavior	Status
Just touch frame	ICPCCK=> "L"-->"H"
No touch frame	ICPCCK=> "L"-->"L"
Keep touch frame	ICPCCK=> "H"-->"H"
Taking off finger on frame	ICPCCK=> "H"-->"L"

**Status of ICPCCK pin**



**Outline of module**