

# Datasheet

## GT-521FX2

*Optical Fingerprint Recognition* **EMBEDDED** Module

## Version 1.1

July 07 , 2017



- Revision History

Version	Data	Description
V1.0	Jun 19, 2017	Created
V1.1	July 07,2017	Delete the reliability data and Operating Temperature

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## 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

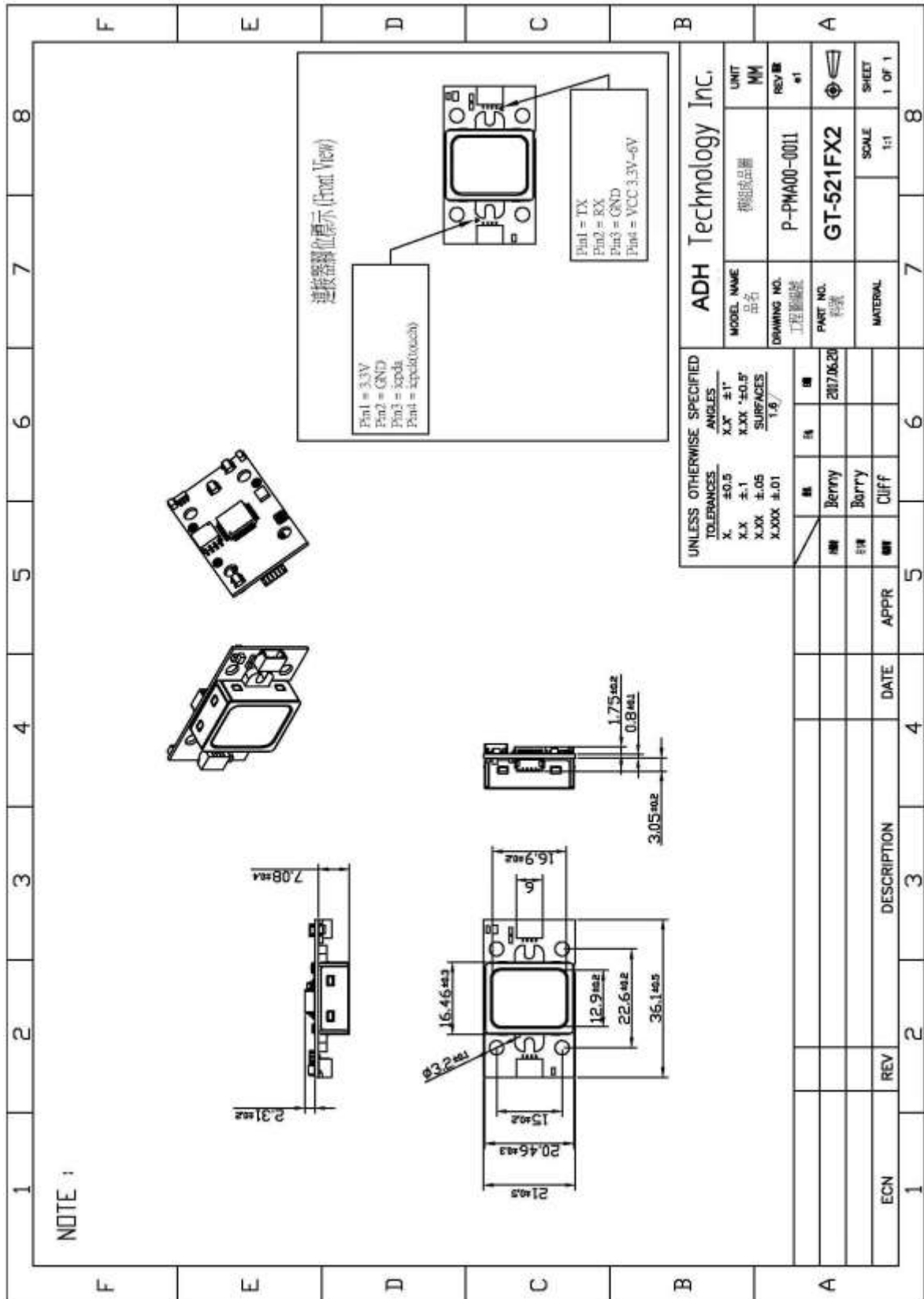
- **Simple UART & USB communication protocol**
- **Complies with USB 2.0 full-speed (12Mbps) specification**
- **Ultra-thin OpticalSensor**
- **Resolution 450 DPI**
- **GT-521F52 3000 fingerprints storage,GT-521F32 200 fingerprints storage**
- **Wake up on Finger Function**
- **Works well with dry, moist 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

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

<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





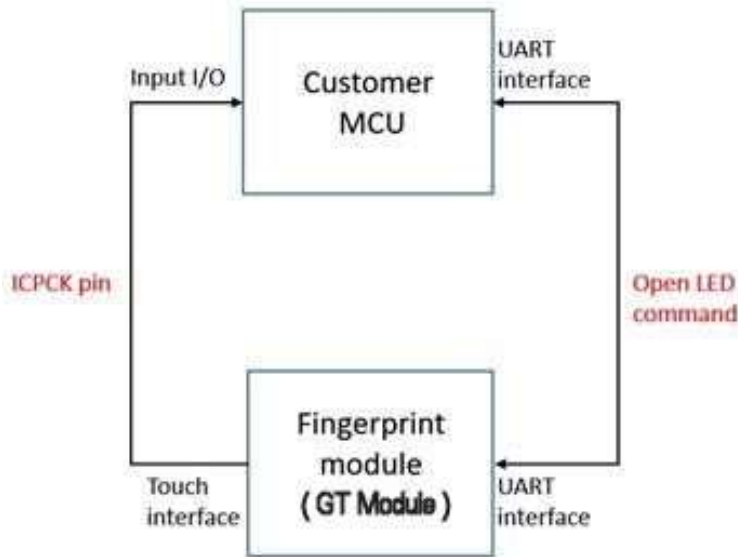
## 5.Pin Assignment

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.

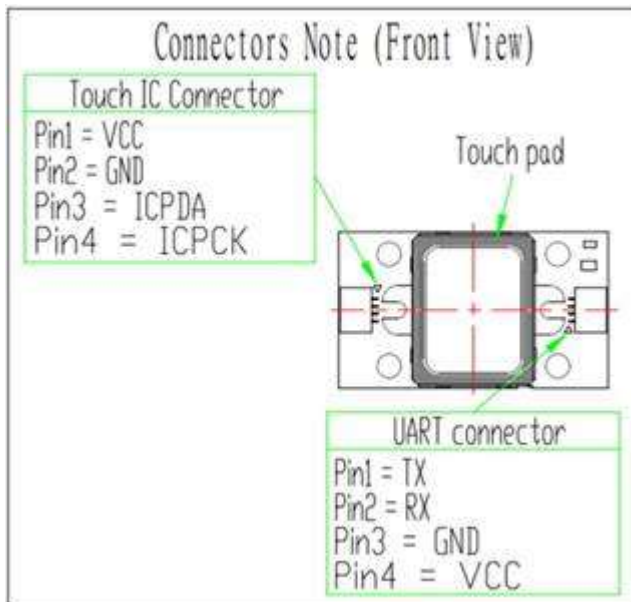
In fact, you just need to know ICPCK pin(pin4) as output pin(GPIO). It will output signal from Low to HIGH voltage when your finger touches metal frame(called: Touch pad) and you can get this signal with the MCU to control another devices. For instance, control GT module with ICPCK or control what you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



**Application of controlling GT Module LED**

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

**Status of ICPCK pin**



**Outline of module**

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