

GT512F52 Fingerprint Module



The GT521F52 Optical Fingerprint Scanner Module with JST SH Connector is a high-performance fingerprint scanner. Which is useful for to access control, security, identification, and convenience. This optical sensor module is designed for easy integration into applications with serial interface (UART). We need two wires are for TX and RX and two wires for power supply (5V).

The GT521F52 Fingerprint Scanner Module is an optical scanner module. This optical scanner takes a visual image using a digital camera.

The idle module is woken by a finger touching the metal frame of the sensor. The pictures of the fingerprints are processed on-board by the fingerprint algorithm (low power 32-bit ARM Cortex-M3 processor) and convert it into strings of data. These so-called 'templates' are residing on the module configured as a USB mass storage device. They can store and share through a database with other modules in a network, allowing easy enrollment of many users.

FEATURES:

- Ultra-thin Optical Sensor.
- High-accuracy & high-speed fingerprint identification technology.
- Works well with dry, moist or rough fingerprints.
- 3000 fingerprints storage.
- Wake up on Finger Function.
- Easy one-touch enrollment.
- 1: 1 verification, 1: N identification.
- Simple UART & USB communication protocol.
- external UART-to-USB converter required (TX & RX levels: 3.3V).
- Complies with USB 2.0 full-speed (12 Mbps) specifications.
- Reading & writing fingerprint template(s) (i.e. processed data) from/to the device.
- Downloading the raw bitmap image from the device (catalog fingerprints).
- Anti-Scratch with surface high hardness $\geq 5H$.

SPECIFICATIONS:

- CPU: ARM Cortex M3 Core MCU)
- 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
- Matching Mode: 1 : 1 ; 1 : N
- Resolution: 450 dpi
- The size of template: 496 Bytes (template) + 2 Bytes (checksum)
- Communication Interface: UART, default baud rate = 9600bps after power on
- 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): Power pin: 3.3V~6V, Tx/Rx pins:3.3V

- Operating Current (mA): < 130
- Touch: Operating Voltage: DC 3.3 V

Operating Current:< 3mA

Standby Current:< 5uA

- Touch Function: High Active

WORKING PRINCIPLE:

The image below shows the fingerprint scanner's optical sensing area where the device will be able to scan your fingerprint.



There is a marking next to the JST-SH connector that indicates polarity. The JST-SH connector breaks out the pins for serial UART and power. While the input voltage is between 3.3V and 6V, the UART's logic level is only 3.3V. It will need a logic level converter or voltage divider to safely communicate with a 5V device.

The GT-521F32 and GT-521F52 have the ability to sense if a finger is placed on the optical sensing area. Upon contact with the metal frame around the optical sensing area, the ICPCCK will output 3.3V (HIGH). Otherwise, the ICPCCK will be 0V (LOW)

| Touch State | ICPCK Pin Status |
|-------------------------------------|------------------|
| Finger Initially Touching the Frame | LOW => HIGH |
| No Finger Touching | LOW => LOW |
| Finger Touching the Frame HIGH | HIGH => HIGH |
| Removing a Finger From the Frame | HIGH => LOW |

PIN FUNCTION:

For Touch IC Connector

| Pin No | Pin Name | Description |
|--------|----------|---|
| 1 | VDD | Power voltage that range is 3.3V |
| 2 | GND | Ground |
| 3 | ICPDA | Program mode : In-circuit programming data/address pin.Normal mode : Active Low. It could be waked-up function from touch IC to VIL = 0.66V, VIH = 2.64V |
| 4 | ICPCK | Program mode : In-circuit programming clock pinNormal mode : Active High. It could be waked-up function from touch IC to VIL = 0.66V, VIH = 2.64V |

For UART Connector(Baud rate 9600~115200bps)

| Pin No | Pin Name | Description |
|--------|----------|--|
| 1 | TX | Transmitting serial dataVIL = 0.8V, VIH = 2V |
| 2 | RX | Receiving serial dataVIL = 0.8V, VIH = 2V |
| 3 | GND | Ground |
| 4 | VCC | Power voltage that range is from 3.3V~6V |

POWER SEQUENCE:

- Power On: we need voltage of power pin from 0V to operating voltage within 15ms.
- Power Off: we need voltage of power pin to 0V that it makes sure module off.

PACKAGE INCLUDES:

1 x GT521F52 Optical Fingerprint Scanner Module.

2 x 1 mm pitch 4 pin JST SH Connector.