Fingerprint Identification Module

BMA92K222
User Guide

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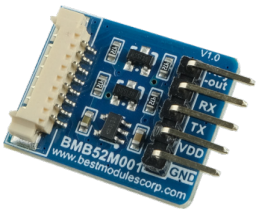
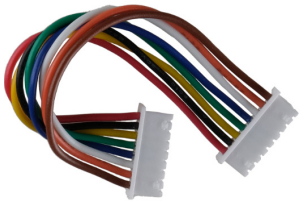
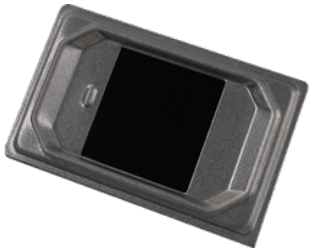
www.bestmodulescorp.com

Contents

Introduction

The BMA92K222 is a Best Modules capacitive fingerprint identification module including an adapter board, a connector and a fingerprint identification module BM92S2222-A. This module can be used to register, identify and delete fingerprints. Through the adapter board, the fingerprint identification module interface (8-pin) can be transformed into a BMCOM interface (5-pin), which provides convenience for connection between the BMduino UNO development board and the fingerprint module BM92S2222-A. Through the BMCOM interface, this module uses UART communication mode to implement fingerprint registration, fingerprint identification and other functions. It is suitable for use in intelligent door locks.

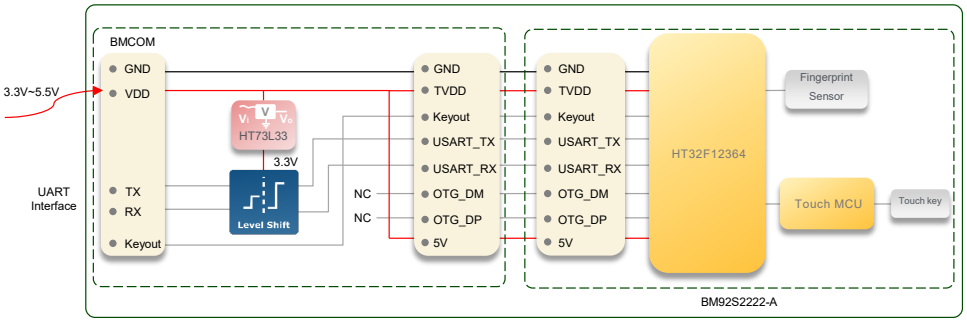


Features

- Operating voltage: 3.3V~5.5V
- Operating current: 40mA @ 5V
- Standby current: <30μA @ 5V
- Register, identify and delete fingerprints
- Identification time < 1s, false acceptance rate (FAR) < 0.001%, false rejection rate (FRR) < 1%
- Power-on initialisation time: <100ms
- Registration time: <10s – a total of 3 finger presses are required
- Identification time: <1s, 1:100
- Storage capacity: 100 fingerprints
- Communication interface:
  - ♦ BMCOM×1 (Keyout, RX, TX, VDD, GND)
  - ♦ Communication mode: UART (Baud rate: default 57600bps)
- Provides Arduino Library support
- Size:
  - ♦ Adapter board: 27.0mm×17.02mm×7.5mm
  - ♦ Fingerprint identification module: 33.49mm×20.53mm×6.23mm

Block Diagram



Technical Specifications

Recommended Operating Conditions

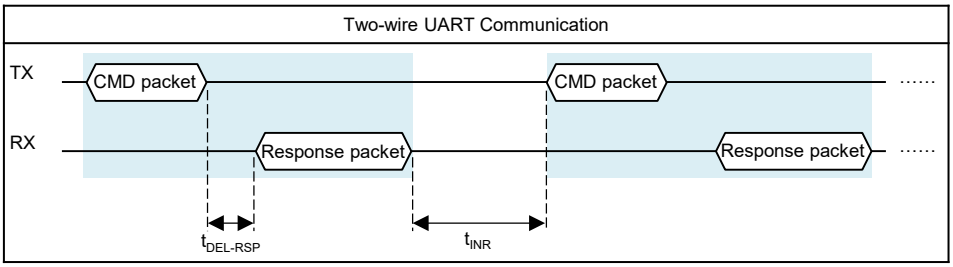
Ta=25°C

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
V_{DD}	Operating Voltage	—	3.3	—	5.5	V
I_{DD}	Operating Current	V_{DD}=5V	—	40	—	mA
I_{STB}	Standby Current	V_{DD}=5V	—	—	30	μA
	UART Baud Rate	—	9600	57600	115200	bps

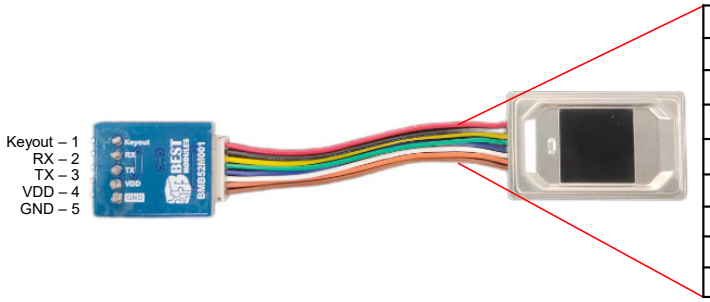
Timing Specification

Ta=25°C

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
$t_{DEL-RSP}$	Response Delay Time	V_{DD}=5V	—	—	270	ms
t_{INR}	Interval Time	V_{DD}=5V	—	10	—	ms
	Fingerprint Scanning Time	V_{DD}=5V	—	100	—	ms
	Identification Time for Registered Fingerprint ID	V_{DD}=5V	—	1	—	s



Pin Description



#	Line	Function
6	Red	5V
7	Black	OTG_DP
8	Yellow	OTG_DM
9	Green	USART_TX
10	Blue	USART_RX
11	White	Keyout
12	Orange	TVDD
13	Brown	GND

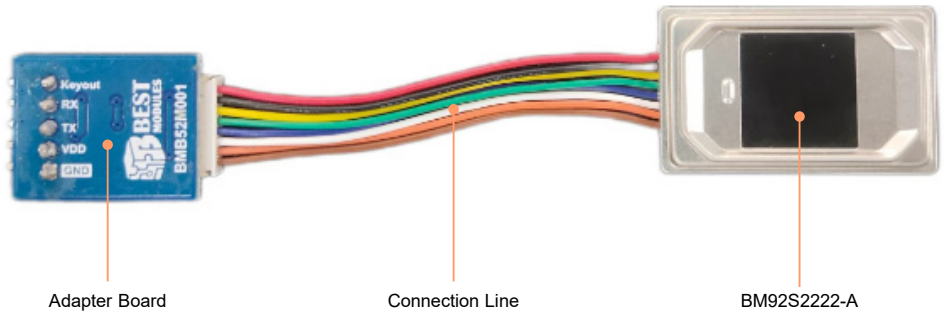
BMCOM Pins:

Pin	Function	Description
1	Keyout	Finger touch status. It is in low level when a finger touch action occurs, while it is in high level when a finger touch action doesn't occur.
2	RX	UART receiving data line
3	TX	UART transmitting data line
4	VDD	Positive power supply
5	GND	Negative power supply, ground

Fingerprint Module Interface Pins:

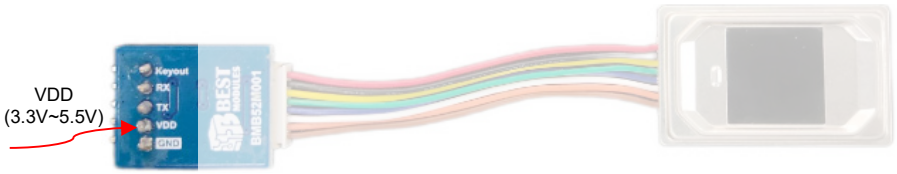
Pin	Function	Description
6	5V	Module positive power supply, 3.3V~5.5V
7	OTG_DP	USB-DP, reserved pin
8	OTG_DM	USB-DM, reserved pin
9	USART_TX	UART transmitting data line
10	USART_RX	UART receiving data line
11	Keyout	Finger touch status. It is in low level when a finger touch action occurs, while it is in high level when a finger touch action doesn't occur.
12	TVDD	Touch IC positive power supply, 2.0V~5.5V
13	GND	Negative power supply, ground

Hardware Overview



Adapter Board + Connection Line + BM92S2222-A

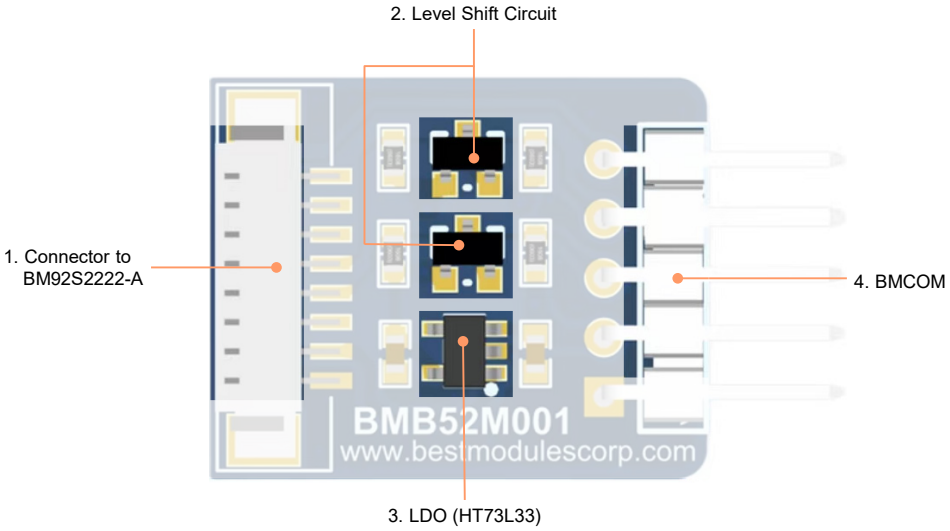
Power Supply



- BMCOM pin: provided by the VDD input, 3.0V~5.5V

Adapter Board

Through the adapter board, the fingerprint identification module interface (8-pin) can be transformed into a BMCOM interface (5-pin), which provides convenience for connection between the BMduino UNO development board and the capacitive fingerprint module BM92S2222-A.



PCBA Front View

PCBA Back View

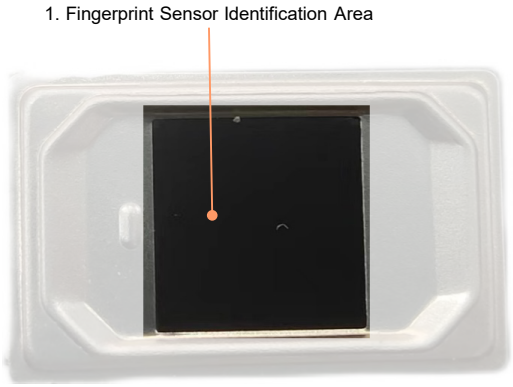
- Feature: MOSFET bidirectional voltage isolation

Connector

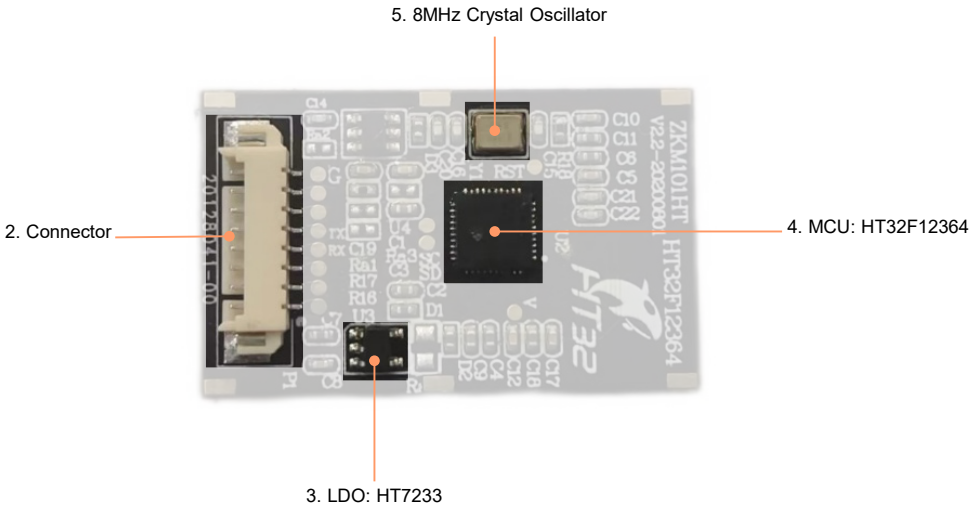
The 8-pin connecting cable 1.25T-2 has the characteristics of same direction, 1.25mm pitch and 60mm length. This cable is used to connect the fingerprint module and the fingerprint module adapter board.

Fingerprint Identification Module: BM92S2222-A

The BM92S2222-A is a fingerprint identification module, which is designed with the Holtek HT32F12364 MCU as its main control. The module integrates a capacitive fingerprint identification sensor.



PCBA Front View



PCBA Back View

- Communication interface:
  - Interface×1 (GND, TVDD, Keyout, USART_TX, USART_RX, OTG_DM, OTG_DP, 5V)
  - Communication mode: UART (Baud rate: default 57600bps)

Communication Interface

- Communication mode: UART
- Baud rate: 9600~115200bps, default 57600bps
- Communication logic reference voltage: 3.3V~5.5V
- Communication protocol:
  - ♦ Refer to the fingerprint module BM92S2222-A datasheet

Functional Flowchart

- Flowchart of one registration process

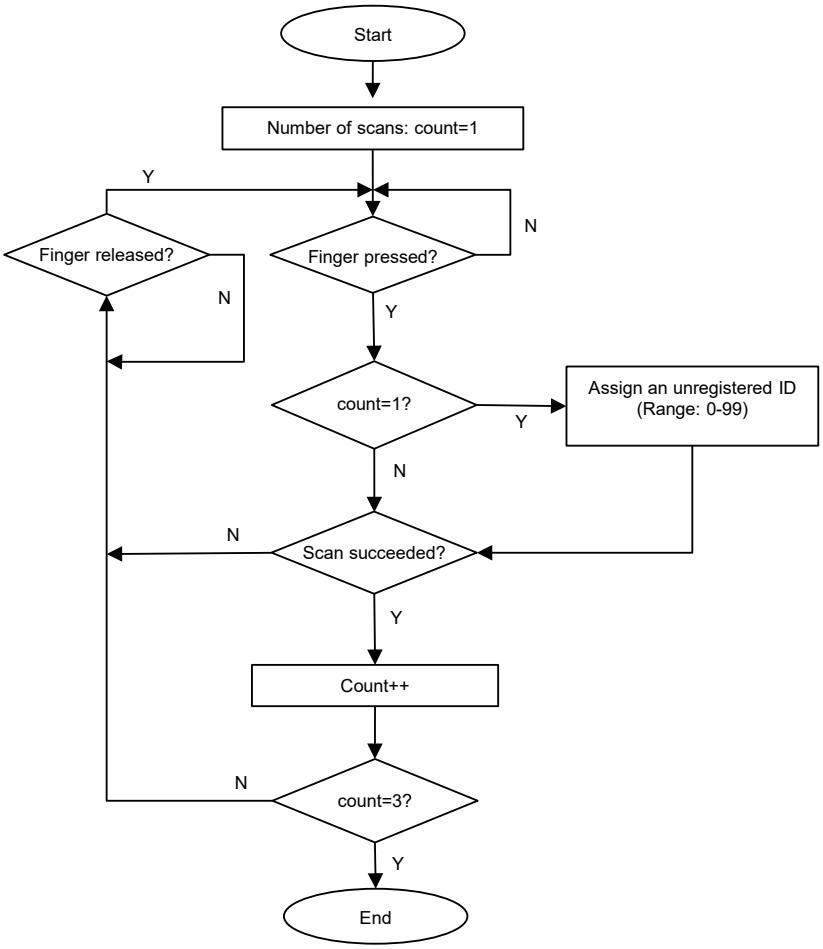
  During the registration process, a total of 3 finger presses are required. The detailed steps are as follows:

  ①Start the registration, when the finger is pressed for the first time, an unregistered ID within 0~99 will be assigned and then the first scan will start. The finger can be released after successful scanning.

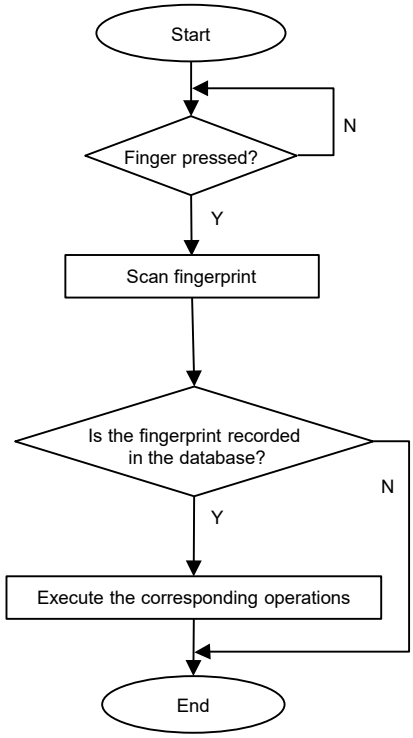
  ②When the finger is pressed for the second time, the second scan will start. The finger can be released after successful scanning.

  ③When the finger is pressed for the third time, the third scan will start. After successful scanning, the finger can be released and the registration is successful.

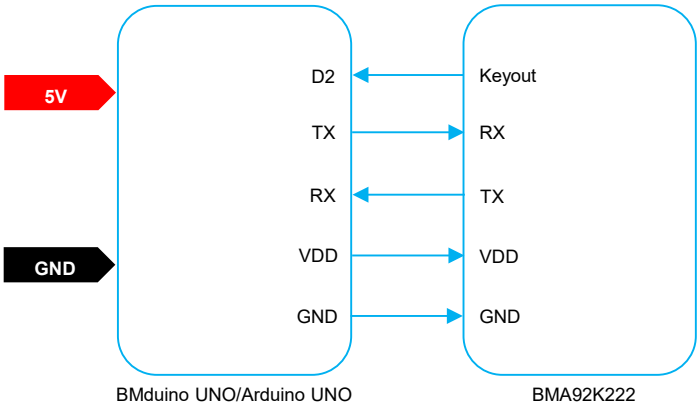
  Note: If one of the above scans fails, the current scan needs to be repeated.



- Flowchart of one identification process
  The detailed fingerprint identification steps are summarised below. It is necessary to determine whether any finger is pressed. If a finger is pressed, the fingerprint scan will start. The finger can be released after fingerprint scanning. Determine whether the fingerprint is recorded in the database by identifying the fingerprint, and then execute the corresponding operations.



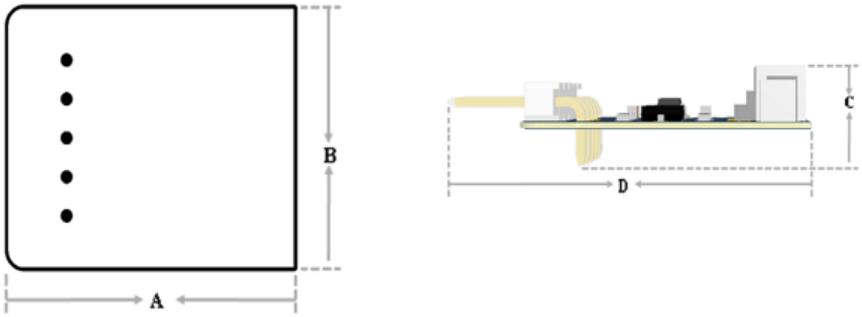
Application Circuit



Connection Diagram

Dimensions

Adapter Board

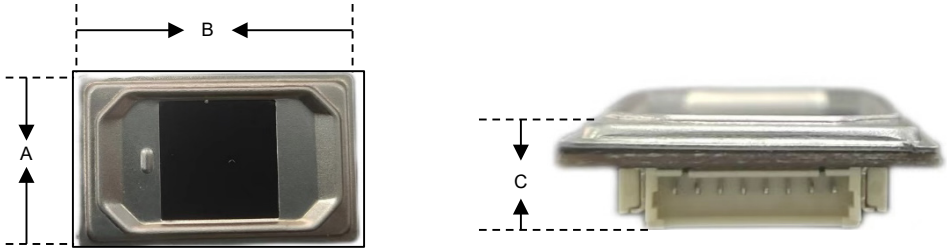


Dimension Information

Symbol \ Unit	mm	inch
A	21.34	0.840
B	17.02	0.670
C	7.5	0.295
D	27.0	1.063

Dimension List

Fingerprint Identification Module



Dimension Information

Symbol \ Unit	mm	inch
A	20.53	0.808
B	33.49	1.318
C	6.23	0.245

Dimension List