SFM4020-OP

Datasheet

Ver. 1.0

Revision History

Rev No.	Issued date	**Description**
0.9	Sep 25, 2009	Preliminary draft
1.0	Nov 26, 2009	Electrical characteristics updated

Contents

1.   Overview

The SFM modules are stand-alone fingerprint systems ideal for embedded system applications where biometric security is needed. The modules are designed for manufacturers searching for an inexpensive, reliable and easy-to-integrate biometric system. The SFM modules provide complete fingerprint solutions by incorporating fingerprint sensor interface and embedded fingerprint recognition algorithm into a half business card sized module.

The SFM4020-OP is the latest SFM module equipped with world's leading fingerprint authentication algorithm and powerful DSP technology. Also, it supports wide range of fingerprint sensor interoperability giving you a freedom to select suitable sensor that most fits to your application. Furthermore, the fingerprint data for enrollment and verification are compatible among different sensors, even if they are based on different technologies. This feature of unification presents application manufacturers and system integrators with much more flexibility than ever before.

In addition to these features, the miniature sized SFM module has a state-of-the-art low power design making it a perfect match in a wide range of applications from battery operated mobile equipments to network based security systems. The SFM modules stands ready to meet your requirements and adapt to your applications.

2.   Features

· World best authentication performance
· High speed fingerprint verification
· Compact size
· Low power consumption
· Fast power on time
· Supports various communication interfaces
· Supports fingerprint data encryption
· Supports various fingerprint sensors
· Highly configurable I/O signals
· Operates with a single 3.3v dc supply

3.   Fingerprint Authentication Specifications

3.1.   Fingerprint Authentication Performance

EER*	<0.1%
Enrollment time	<1 sec
Verification time	<1 sec

*EER is dependent on databases

3.2.   Fingerprint Sensor Specifications

Device Name	Optical sensor I
Sensor technology	Optical
Sensing area	16.0mm x 19.0mm
Image size(pixels)	272x320
Image resolution	500 dpi

4.   Hardware Specifications

4.1.   Operating range

Parameter	Symbol	Min	Typ	Max	Units
Supply voltage	V_{DD}	3.0	3.3	3.6	V
Operating temperature	T_{OP}	-20		70	°C
Storage temperature	T_{STO}	-40		85	°C

4.2.   Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units
Power supply voltage	V_{DD}	-0.3	3.6	V
Input voltage on signal pins	V_{IN}	-0.3	3.6	V

4.3.   Electrical DC characteristics(V_{DD} = 3.3Vdc, T_{OP} = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Units
Supply current (idle)	I_{DD1}		60		mA
Supply current (scanning)	I_{DD2}		140		mA
Supply current (identifying)	I_{DD3}			150	mA
High level input voltage	V_{IH}	2.0		3.6	V
Low level input voltage	V_{IL}	-0.3		0.6	V

4.4.   Interface

Type	Description
UART	3.3V CMOS level Baud rates up to 115.2kbps RS232 supported via additional level converter
Digital I/O	3.3V CMOS level, 4 ports independently configurable

4.5.   Connector Specifications

Connector	Usage
J1	Sensor interface port, 20 pin FPC/FFC (pitch: 0.5mm)
J2	Host interface port. Molex 53261 series compatible, 8 conductors

4.5.1. Host interface port pin assignment (J2)

Pin #	Name	Functions
1	VDD	3.3Vdc Input
2	GND	Power Ground
3	TX	Transmit Data, 3.3V CMOS, output only
4	RX	Receive Data, 3.3V CMOS, input only
5	GPIO0	Configurable input/output, or buzzer control output
6	GPIO1	Configurable input/output
7	GPIO2	Configurable input/output
8	GPIO3	Configurable input/output

4.6. Physical Dimensions

Parameter	Values
Main board	26mm x 26mm x 6.4mm (WxLxH)
Sensor	20.5mm x 25mm x 52mm (WxLxH)

* Dimensions in millimeters
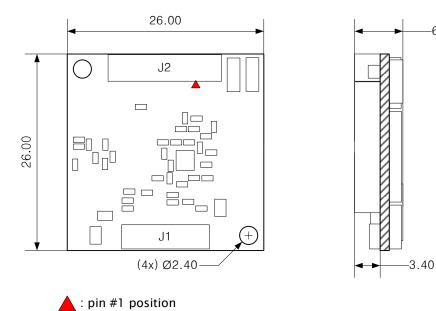

: pin #1 position

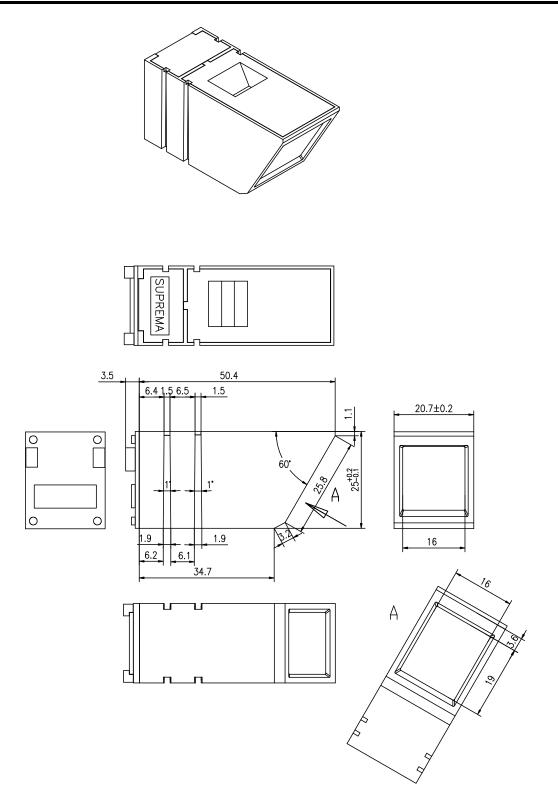**Figure 1. Main module dimensions**

Figure 2. Sensor dimensions

5.   Communication Protocol Summary

The SFM modules provides a proprietary communication protocol for easy interface with most host systems. The protocol based on fixed sized packets. Only fingerprint image, template data, and user lists are transmitted as appended to the packet. Checksum functionality is supported to ensure consistency of transmitted data.

Please refer to *SFM Protocol Manual* for detailed information.

5.1.   Packet Structure

Start code	Command	Param	Size	Flag	Checksum	End code
1byte	1byte	4bytes	4bytes	1byte	1byte	1byte

5.2.   Command Summary

Command	Code	Description
SW	0x01	System parameter write
SF	0x02	System parameter save
SR	0x03	System parameter read
SS	0x04	System status check
ES	0x05	Enroll by scan
EI	0x06	Enroll by image
ET	0x07	Enroll by template
VS	0x08	Verify by scan
VI	0x09	Verify by image
VT	0x10	Verify by template
VH	0x22	Verify host template by scan
IS	0x11	Identify by scan
II	0x12	Identify by image
IT	0x13	Identify by template
RI	0x20	Read image
RT	0x14	Read template
SI	0x15	Scan image
ST	0x21	Scan template
DT	0x16	Delete template

Command	Code	Description
DA	0x17	Delete all templates
LT	0x18	List user ID
CT	0x19	Check user ID
FP	0x23	Fix all provisional templates
DP	0x24	Delete all provisional templates
ML	0x31	Retrieves user memory size
MW	0x32	Write user memory
MR	0x33	Read user memory
KW	0x34	Encryption key write
KS	0x35	Scan template with challenge data
GR	0x36	Read GPIO configuration
GW	0x37	Write GPIO configuration
GC	0x38	Clear GPIO configuration
GD	0x39	Set default GPIO configuration
UG	0x62	Upgrade firmware
WSL	0x6B	Write security level
WSR	0x6C	Read security level
RS	0xD0	Reset the module
OFF	0xD2	Power off

Contact Info

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