

FIM50N



NITGEN® FIM50 Series

Stand-Alone Fingerprint Identification Device with Built-in CPU

Datasheet

Version 1.00

FIM50N



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Serial Number:

Specifications can be changed without notice.

FIM50N



Revision History

<i>Date of Revision</i>	<i>Version</i>	<i>Description</i>
2010.4		release

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1. General Descriptions

Biometric systems are recently used in various authentication systems. They are increasingly used not only in environments that require high level of security but also in many other places because they are convenient and economical. Among various biometric systems, the fingerprint recognition system takes up most of the market because it is easy to use as well as economical and capable of developing various types of applications. NITGEN, a global leader in the fingerprint recognition industry, provides various fingerprint authentication solutions such as PC security, knowledge management, vaulting service, access control, electronic approval, and financial payment. NITGEN actively responds to customer needs through continuous research, development and quality management.

FIM50 is a stand-alone Fingerprint Identification Device with many excellent features. It provides benefits such as high identification performance, low power consumption and two UART serial interfaces with the various commands for easy integration into a wide range of applications. It is a durable and compact device with fingerprint identification module containing NITGEN® optics-based fingerprint sensor inside.

- 1 ID multi-Templates mode
- Emulation Mode (FIM20 and FIM30 series)
- Up to 10,000 Users
- More than 30,000 logs
- Using New sensor OPP06
- Changeable user's verification security level
- Selectable UART communication Level (RS233 or LVCMOS)
- Selectable rotation angle range (+/- 45 ° or +/- 180 °)

- Support Auto-Identify mode
- Support ISO197974-2 and ANSI 378 format
- Support Device Master password
- Provide custom data area
- Compatible template format with NITGEN eNBio API

2. Target Application

Access Controller
Time and attendance management
Security application
Safety Box
ATM, POS and more

3. Specification

3.1. Basic Feature

Hardware Specification

ITEM		FIM50
Board Spec.	CPU	S2C2410 (ARM9 266Mhz)
	DRAM	16MByte SDRAM
	Flash ROM	8MByte
Dimension		40 x 45 [mm ²]
Sensor		NITGEN OPP06 (in FIM5060)
Supply Voltage		5 / 3.3 [V]
Current Consumption	Normal	190 [mA]
	Max	220 [mA] in OPP06
Operating Temperature		-20 ~ 60 [°C]

Humidity	~ 90 [% RH]
ESD Tolerance	±8 [KV] (indirect)
Communication Channel	2 UART (RS-232 level, LVCMOS level) Speed: 9600 ~ 115200 [bps] (1 start bit, 8 data bit, no parity, 1 stop bit)
External I/O	To be defined.
Maximum Template Storage	Up to 10000 templates
Maximum Log Storage	Up to 30,705 Logs

Operation Specification

ITEM	FIM50
Capture Speed	0.2 [sec]
Verification Speed	Less than 1 [sec]
Boot Up Time	0.4 [sec] for 100 templates 0.5 [sec] for 1000 templates 0.7 [sec] for 2000 templates 0.8 [sec] for 3000 templates 1.2 [sec] for 5000 templates
Data Encryption Method	AES for saving data AES for DB communication

Boot-up time is explained in Appendix.

3.2. Sensor Feature

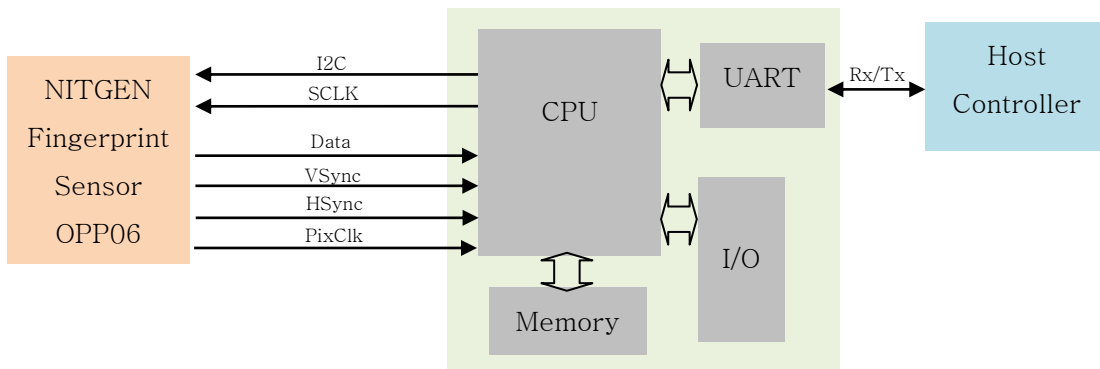
OPP-06

Sensor Name	OPP-06
Sensing Type	Optical
Sensing Area	15.0mm x 18.5mm
Image Resolution	500 DPI
Image Size	260 x 300

3.3. Interface Feature

Interface	
Communication 0 (LVCMOS Level)	RS-232C Up to 115200bps Baud Rates supported (Default : 9600bps)
Communication 1 (RS232 Level)	LVCMOS Up to 115200bps Baud Rates supported (Default : 9600bps)
I/O	To be defined.

4. Block Diagram



RS-232C communication data consist of 8-bit data, no parity, 1-bit start-bit and 1-bit stop-bit.

5. Operation

Reset

FIM50 provides external low-active reset signal port. By setting the reset port low state, FIM50 could be initialized. The reset port is internally pull-uped to VCC.

Communication

FIM50 has two UART serial communication ports (RS232C and LVCMOS level) through those FIM50 communicates at the same time. These ports support 6 baudrate modes such as 9600, 14400, 19200, 38400, 57600, and 115200 bps.

FIM50 follows NITGEN Serial Communication protocol. For more detail information refer to the document "FIM ComProtocol.pdf".

UART data consists of 1 start bit, 8 data bit, no parity bit and 1 stop bit.

Custom Data Area

FIM50 provides 64 Kbytes flash memory. Using this memory, host can save private data for specific usage. The caution is needed for the responsibility for reading, writing and erasing because user data area is given to the host.

IO Function

To be defined.

Board configuration option

The following table shows board configuration system option. Using NITGEN Serial Communication protocol, these option values can be changed.

Code	System Information	Value Range	Default Value	
0x02	SI_USING_LOG	True/False	True	
0x10	SI_WIEGAND_FORMAT	0 – No out 1 – 26 bits 2 – 34 bits	0	
0x11	SI_WIEGAND_SITECODE		0x0000	
0x17	SI_IDENTIFY_TIMEOUT	255 or 10 ~ 250	255 (Unlimited)	100ms tick
0x18	SI_RELAY_TIME	0 or 1~100	10	100ms ticks
0x19	SI_CAPTURE_TIMEOUT	More than 10	50	100ms ticks
0x20	SI_IMAGE_BRIGHTNESS	0~100	45	100 - brightest
0x21	SI_IMAGE_GAIN	1,2,4,8	2	
0x22	SI_IMAGE_CONTRAST	0~100	20	
0x28	SI_ADAPTIVE_CAPTURE	True/False	False	
0x30	SI_VERIFY_SECURITY_LEVEL	1~9	5	
0x31	SI_IDENTIFY_SECURITY_LEVEL	6~9	8	
0x32	SI_REGISTER_QUALITY	30~100	40	
0x33	SI_VERIFY_QUALITY	10~100	30	
0x48	SI_CHANNEL0_BAUDRATE	0 – 115200 1 – 57600 2 – 38400 3 – 19200 4 – 9600	4	
0x49	SI_CHANNEL1_BAUDRATE	“	4	
0x4A	SI_CURR_CHANNEL_BAUDRATE	“		
0x50	SI_MAX_USER			
0x51	SI_FP_FULL_ROTATION	True/False	False	
0x52	SI_LENGTH_OF_USER_ID	4~15	10	
0x53	SI_NUM_OF_ADAPTIVA_CAP	1~10	5	
0xF0	SI_EMULATION_MODE	1– FIM20 2– FIM30 0xFF– None	0xFF	

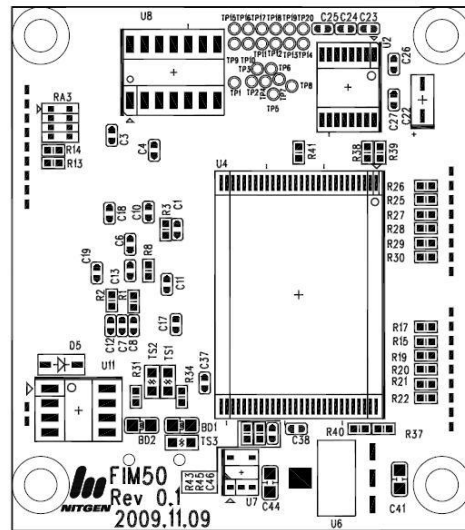
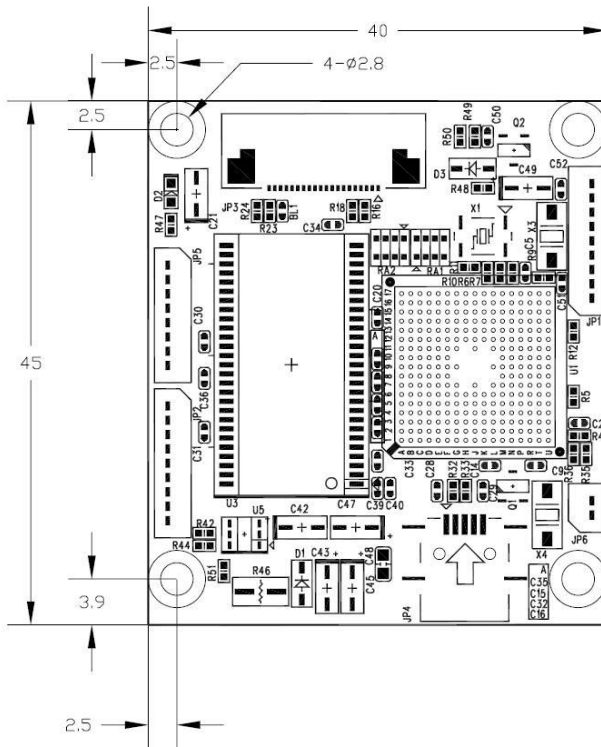
True means '1' and False means '0'.

6. Technical Data

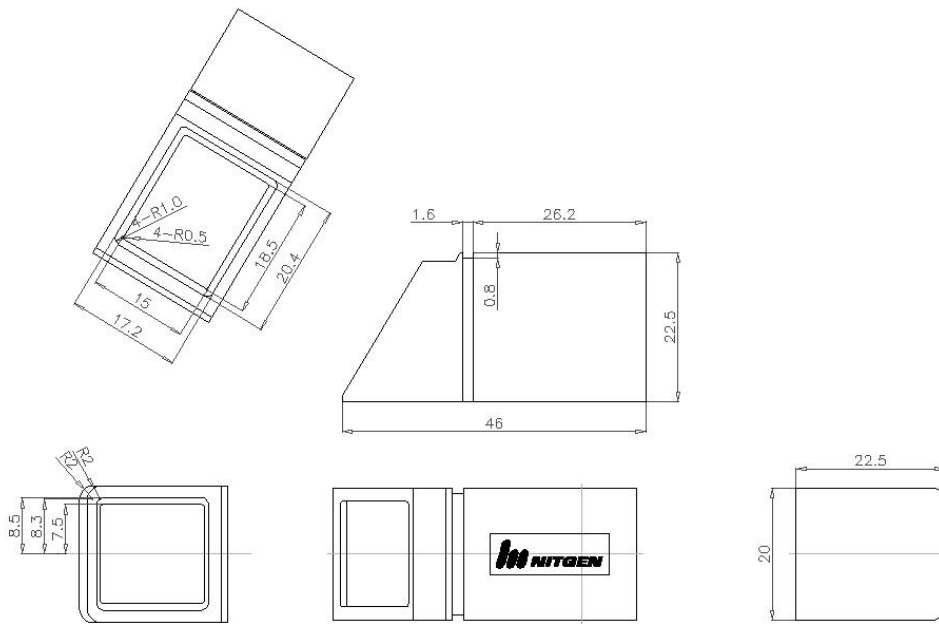
6.1. Physical Characteristics

The Feature of Board

[Unit: mm]



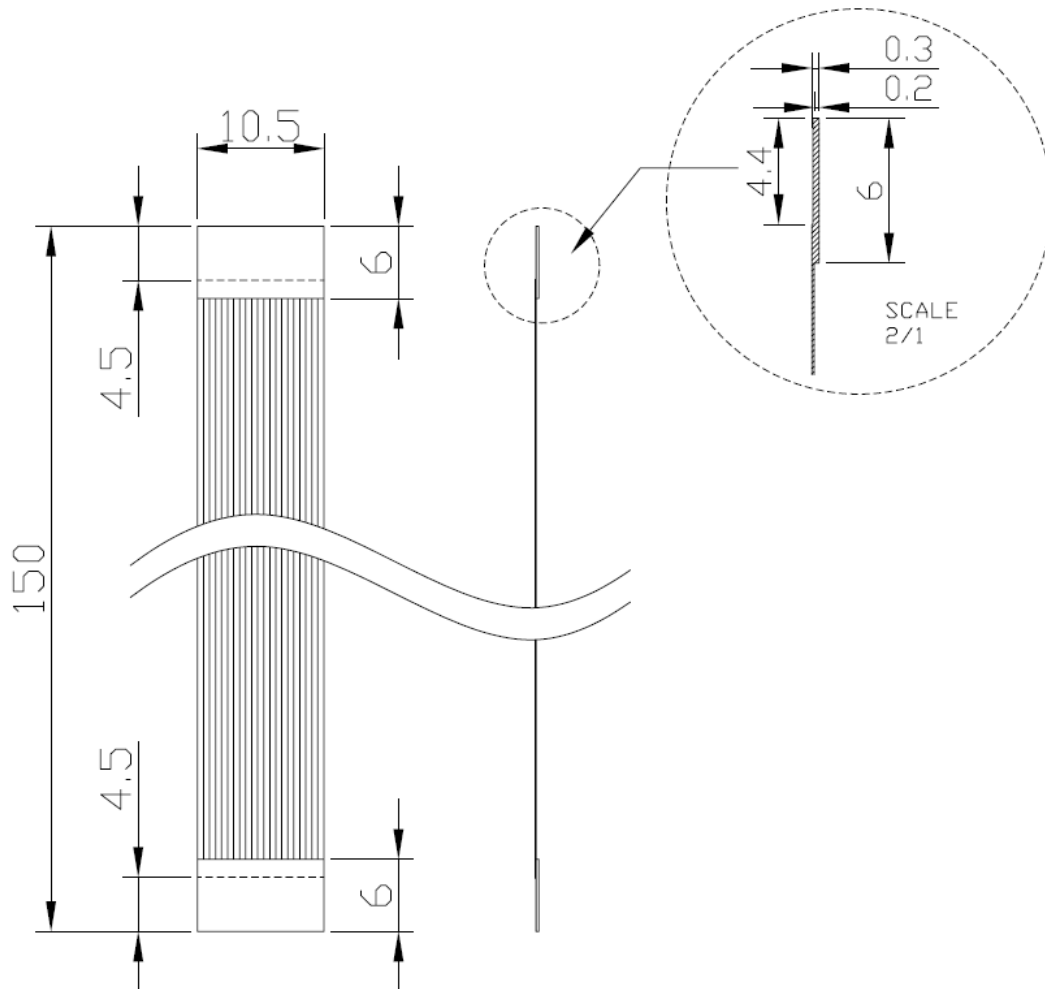
The feature of fingerprint sensor



The Dimension of OPP06 [Unit : mm]

FIM50N

The feature of sensor Cable



6.2. External Port

- JTAG Connector (JP1)

Pin	Pin Name	Description
1	VCC	3.3 Volt Power
2	N/A	N/A
3	nSRST	JTAG control pin
4	TDO	JTAG control pin
5	TDI	JTAG control pin
6	nTRST	JTAG control pin
7	TCK	JTAG control pin
8	TMS	JTAG control pin
9	GND	Ground

* JP1 (JTAG connector) is used only for development or emergency recovery.

- 9-Pin External Connector (JP2)

Pin	Pin Name	Description
1	VCC	Supply Voltage (HV – 5V, LV – 3.3V)
2	EXT_RXD	UART Channel 1 port receiving signal from host (RS232 Level)
3	EXT_TXD	UART Channel 1 port transmitting signal to host (RS232 Level)
4	TTL_RXD	UART Channel 0 port receiving signal from host (LVCMOS Level)
5	TTL_TXD	UART Channel 0 port transmitting signal to host (LVCMOS Level)
6	GPIO0	General Purpose Input / Output 0
7	GPIO1	General Purpose Input / Output 1
8	/EXT_RESET	Reset signal – active low
9	GND	Ground

● **20-Pin OPP06 Sensor connector (JP3)**

Name	No	States	Description
GND	1	POWER	Sensor Ground
VCLK	2	OUT	Sensor System Clock
VCC	3	POWER	Sensor VCC (3.3V)
AUTOON	4	IN	Sensor Auto-On
	5		Reserved
VSYNC	6	IN	Vertical Sync.
HSYNC	7	IN	Horizontal Sync.
SDATA0	8	IN	Sensor Data 0
SDATA1	9	IN	Sensor Data 1
SDATA2	10	IN	Sensor Data 2
SDATA3	11	IN	Sensor Data 3
SDATA4	12	IN	Sensor Data 4
SDATA5	13	IN	Sensor Data 5
SDATA6	14	IN	Sensor Data 6
SDATA7	15	IN	Sensor Data 7
SDA	16	IN/OUT	I2C Data
SCL	17	OUT	I2C Clock
LED 1	18	OUT	Sensor LED 1
PIXCLK	19	IN	Pixel Clock
LED 2	20	OUT	Sensor LED 2

● **USB Connector (JP4)**

Pin	Pin Name	Description
1	VCC	5V
2	PDN0	Data[-] for USB peripheral
3	PDP0	Data[+] for USB peripheral
4	GND	Ground
5	ESD_GND	Connected with connector's case

- 8-Pin External Connector (JP5)

Pin	Pin Name	Description
1	VCC	3.3 V
2	GPIO2	General Purpose Input / Output 2
3	GPIO3	General Purpose Input / Output 3
4	GPIO4	General Purpose Input / Output 4
5	GPIO5	General Purpose Input / Output 5
6	GPIO6	General Purpose Input / Output 6
7	GPIO7	General Purpose Input / Output 7
8	GND	Ground

- External Real-time Clock Connector (JP6)

Pin	Pin Name	Description
1	VCC	3.3 V
2	GND	Ground

6.3. Connector

Sensor

Material List

NO	DESCRIPTION	VENDOR
1	20-PIN (52746-2090)	MOLEX

Communication

Material List

NO	DESCRIPTION	VENDOR
1	9-pin Male (53047-0910)	MOLEX
2	8-pin Male (53047-0810)	MOLEX

6.4. Electrical Characteristics

Parameter	MIN.	TPY.	MAX.	UNITS
Power				
Supply current			300	mA
Supply Voltage (HV Model)	4.5	5.0	5.5	V
Supply Voltage (LV Model)	3.0	3.3	3.6	V
UART (RS-232 Level)				
Output Voltage Swing	±5.0	±5.4		V
Input Voltage Range	-15		+15	V
Input Threshold LOW	0.6	1.2		V
Input Threshold HIGH		1.5	2.4	V
Maximum data rate			115,200	BPS
UART (LVCMOS Level)				
Output Voltage LOW			0.4	V
Output Voltage HIGH	2.7			V
Input Threshold LOW			0.8	V
Input Threshold HIGH	2.4			V
Maximum data rate			115,200	BPS
GPIO				
Output Voltage LOW			0.4	V
Output Voltage HIGH	2.7			V
Input Threshold LOW			0.8	V
Input Threshold HIGH	2.4			V
Etc				
Reset pulse Width	1			ms

7. Ordering Information

FIM5060 (with OPP06) Ordering Guide

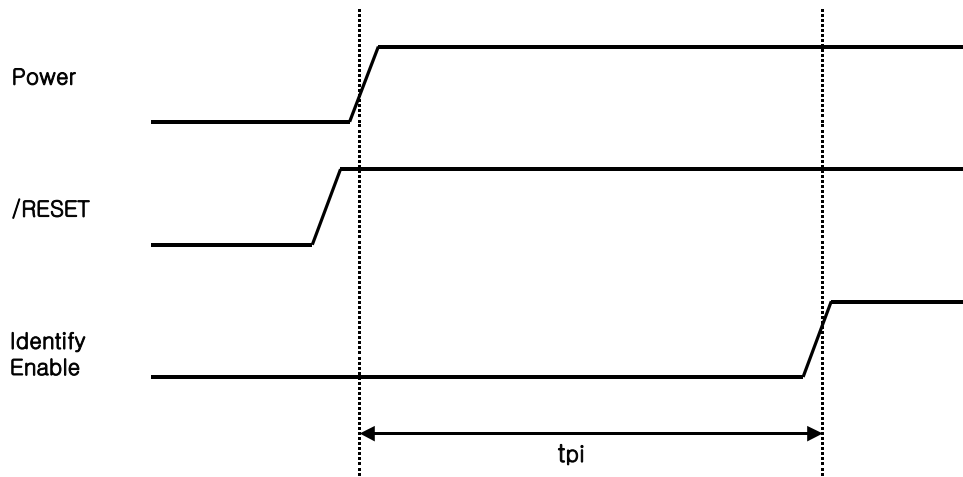
Ordering Number	Supply Voltage [V]	Max. Templates
FIM5060-HV	5	10,000
FIM5060-LV	3.3	10,000

APPENDIX

Boot up time

System Boot-up time means the total time consumed by FIM50 after system power is supplied on condition that /RESET is high.

System Boot-up time can be measured as the following.



Support Information

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