Fingerprint
Embedded Modules
Entry-level fingerprint module with essential features
Suprema SFM Series fingerprint modules are designed to provide refined biometric security solution to developers and manufacturers for integration with various applications such as access control systems, time attendance terminals, mobile devices, kiosks, safes, door locks and so on. Powered by the world’s best, multi-award winning Suprema fingerprint algorithm, SFM Series fingerprint modules offer powerful identification performance and versatile external interfaces.

SFM3000 Series
Entry-level fingerprint module with essential features
SFM3000 Series is cost effective fingerprint identification module equipped with essential part for fingerprint identification and template storage.

SFM3500 Series
High-end fingerprint module with versatile interfaces
SFM3500 Series is a high-end standalone fingerprint module equipped with versatile external interface including RS232, RS422/485, Wiegand and LED control.

SFM4000 Series
Compact fingerprint module with power saving feature
SFM4000 Series features integrated power control circuit for extra power saving and loaded with powerful DSP technology on a compact (half size) board.

SFM5000 Series
High performance fingerprint module with live finger detection
SFM5000 Series, the latest addition to Suprema’s SFM line up, loaded with powerful 533MHz DSP for faster recognition speed and features FBI/FIPS201 certified sensor and LFD technology.

Products Overview
Suprema SFM Series fingerprint modules are designed to provide refined biometric security solution to developers and manufacturers for integration with various applications such as access control systems, time attendance terminals, mobile devices, kiosks, safes, door locks and so on. Powered by the world’s best, multi-award winning Suprema fingerprint algorithm, SFM Series fingerprint modules offer powerful identification performance and versatile external interfaces.

SUPREMA
Fingerprint Embedded Modules
Cutting-edge Technology, Easy Integration
Suprema is the world’s leading producer of high performance fingerprint modules. Featuring multi award-winning Suprema Fingerprint Algorithm, SFM Series embedded fingerprint modules provides unrivalled precision and quality. Suprema is committed to develop breakthrough innovations in biometrics for continued excellence.

- World’s Best Selling Fingerprint Module
- High Performance for Wet & Dry Fingers
- Suprema Algorithm
- Various Sensor Options

Major Applications
- Access Control
- Time Attendance
- Safe
- Door Lock
- ATM
- Kiosk
- Mobile Device
Suprema's LFD technology is based on the fact that dynamic and static image characteristics of the fake fingers can be distinguished from those of live fingers. By the advanced analysis algorithm to catch the abnormalities in dynamic changing pattern of fingerprints images, and several static features showing liveness or unnaturalness of fingers, fake fingers are clearly distinguished from those of live fingers. This new LFD technology provides cheap and effective solution to protect the fingerprint system from attack via fake fingerprints.

**Hybrid Live Finger Detection Technology**
Suprema's LFD technology is based on the fact that dynamic and static image characteristics of the fake fingers can be distinguished from those of live fingers. By the advanced analysis algorithm to catch the abnormalities in dynamic changing pattern of fingerprints images, and several static features showing liveness or unnaturalness of fingers, fake fingers are clearly distinguished from those of live fingers. This new LFD technology provides cheap and effective solution to protect the fingerprint system from attack via fake fingerprints.

## SFM5000 Series
**Optimized for performance, minimum power consumption**
The SFM5000 series is the latest UniFinger module equipped with world’s leading fingerprint authentication algorithm, which ranked No. 1 in FVC2004, 2006 and onGoing. The SFM5000 series features powerful 533MHz DSP which optimized for performance while minimizing power consumption.

- Powerful 533 MHz DSP
- 1:1,000 identification in 760 msec
- Fast power-on time
- User configurable 8 port digital I/O

## SFM4000 Series
**Compact size with power saving features**
SFM4000 is a compact, power efficient module that is simple to integrate with various system applications. The module offers flexible supply voltage, integrated power management, small footprint, and voltage detector functions. SFM4000 is specially designed for lock and safe manufacturers look for an inexpensive, reliable biometric solution with extra low power-consumption and compact size.

- Integrated Power Control Circuit
- ISO19794-2, ANSI-378 template standard
- Serial Interface with Simple Protocol
- User-configurable 8 port digital I/O
- Single 3.3 Vdc or unregulated power source
- 256bit AES fingerprint data encryption

### SFM5020-OP | Optical Sensor
- 500 dpi resolution
- Solid sensor surface
- High quality fingerprint image

### SFM5060-OH | Optical Sensor with LFD
- 500 dpi resolution
- Hybrid live finger detection technology
- PIV/FIPS 201 certification

### SFM4000-Series
- SFM4000-TS4 | Capacitive Swipe Sensor
  - 508 dpi resolution
  - Compact sensor & board size

### SFM5000-Series
- SFM4020-OP | Optical Sensor
  - 500 dpi resolution
  - Solid sensor surface
  - High quality fingerprint image
SFM3500 Series

Engineered to perfection, unrivaled performance
SFM3500 is a high-end standalone fingerprint module equipped with versatile external interface including RS232, RS422/485, Wiegand and LED control, ready applicably to access control applications. SFM3500 offers comprehensive functionalities and interfaces to be used as a complete standalone fingerprint access reader by itself.

- Serial Interface w/ Simple Protocol
- User-configurable I/O & LED Control
- Wiegand Input & Output
- RS232/RS422/RS485 Interfaces
- Auxiliary Communication Port

SFM3520-OP | Optical Sensor
- 500dpi resolution
- Solid sensor surface
- High quality fingerprint image

SFM3530-OD | Waterproof Optical Sensor
- IP65 rated waterproof front side
- Solid and scratch-free sensor surface
- High quality fingerprint image for both dry and wet fingers

SFM3540-OL | Secugen Optical Sensor
- 500dpi resolution
- Solid sensor surface
- High quality fingerprint image

SFM3550-TC | UPEK TouchChip Sensor
- Capacitive type sensor
- PerfectPrint Technology
- Reliable high quality fingerprint image

SFM3000 Series

Core features, world class technology
SFM3000 is a cost effective fingerprint identification module equipped with essential part for fingerprint identification and template storage. SFM3000 is suitable for most of the applications where it processes fingerprint recognition and host controller is used to handle other operations. The communication between SFM3000 and host controller is done by packet protocol through CMOS level serial interface.

- High Performance 400MHz DSP
- Fast Power-on Time
- ISO19794-2, ANSI-378 template standard
- User-configurable 8 Port Digital I/O
- Low Power Consumption
- 256bit AES fingerprint data encryption
- Serial Interface w/ Simple Protocol

SFM3020-OP | Optical Sensor
- 500dpi resolution
- Solid sensor surface
- High quality fingerprint image

SFM3030-OD | Waterproof Optical Sensor
- IP65 rated waterproof front side
- Solid and scratch-free sensor surface
- High quality fingerprint image for both dry and wet fingers

SFM3040-OL | Secugen Optical Sensor
- 500dpi resolution
- Solid sensor surface
- High quality fingerprint image

SFM3050-TC | UPEK TouchChip Sensor
- Capacitive type sensor
- PerfectPrint Technology
- Reliable high quality fingerprint image

SFM3050-TC2S | UPEK StealCoat TouchChip Sensor
- IP67 rated dust and water protection
- Capacitive sensor
- Perfect Print Technology
- Reliable high quality fingerprint image
Evaluation Kit (EVK)

Evaluation Kit is a demonstration system to enable users to evaluate the core functionality of standalone modules quickly and easily. Moreover, the Evaluation Kit provides software tools and technical documents to help users in developing application systems. The evaluation kits are available for all SFM modules.

Evaluation Kits Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>SFM3000 Series EVK</th>
<th>SFM3500 Series EVK</th>
<th>SFM4000 Series EVK</th>
<th>SFM5000 Series EVK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Ports</td>
<td>1 x RS232C port for PC interface</td>
<td>2 x RS232C ports for PC interface</td>
<td>RS242/485 port Wiegand input/output ports User external test terminals</td>
<td>1 x RS232C port for PC interface</td>
</tr>
<tr>
<td>Sensor Options</td>
<td>Optical, Capacitive</td>
<td>Optical, Capacitive</td>
<td>Capacitive (swipe), Optical</td>
<td>Optical</td>
</tr>
</tbody>
</table>

Common Features

On-board Operation
- 1 x Enroll button
- 1 x Identify button
- 1 x Delete button

On-board UI
- 3 x LED's
- Multi-tone buzzer

Serial Cable
- RS232C interface cable

Power Adaptor
- DC 5V (DC 12V for SFM4000-TS4)

Software
- SFM SDK
- PC User Interface Program

Documents
- Firmware Revision Notes
- Datasheets for modules/EVK
- SFM SDK Reference Manual
- EVK User Guide

Specifications

<table>
<thead>
<tr>
<th>Sensor Types</th>
<th>Optical, capacitive</th>
<th>Optical, capacitive</th>
<th>Capacitive swipe, optical</th>
<th>Optical</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>400 MHz DSP</td>
<td>400 MHz DSP</td>
<td>400 MHz DSP</td>
<td>553 MHz DSP</td>
</tr>
<tr>
<td>Flash Memory</td>
<td>1 MB (expandable up to 4 MB)</td>
<td>4MB Capacitive swipe: 512KB</td>
<td>Optical: 1MB</td>
<td>1MB (expandable up to 4 MB)</td>
</tr>
<tr>
<td>EER</td>
<td>&lt; 0.1%</td>
<td>&lt; 0.1%</td>
<td>&lt; 0.1%</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>Enrollment Time</td>
<td>800 msec</td>
<td>800 msec</td>
<td>800 msec</td>
<td>600 msec</td>
</tr>
<tr>
<td>1:1 Verification Time</td>
<td>800 msec</td>
<td>800 msec</td>
<td>800 msec</td>
<td>600 msec</td>
</tr>
<tr>
<td>1:1000 Identification Time</td>
<td>970 msec</td>
<td>970 msec</td>
<td>970 msec</td>
<td>760 msec</td>
</tr>
<tr>
<td>Template Size</td>
<td>256 – 384 bytes (configurable, 384 bytes default)</td>
<td>256 – 384 bytes (configurable, 384 bytes default)</td>
<td>256 – 384 bytes (configurable, 384 bytes default)</td>
<td>256 – 384 bytes (configurable, 384 bytes default)</td>
</tr>
<tr>
<td>Template Capacity</td>
<td>1,900 (9,500 at 4MB)</td>
<td>9,000 Optical: 1,900, Capacitive swipe : 300</td>
<td>1,900 (9,500 at 4MB)</td>
<td></td>
</tr>
<tr>
<td>Host Communication</td>
<td>Async. serial (3.3V CMOS level)</td>
<td>RS232 or RS422/485</td>
<td>Async. serial (3.3V CMOS level)</td>
<td>Async. serial (3.3V CMOS level)</td>
</tr>
<tr>
<td>Aux Communication</td>
<td>N/A</td>
<td>Async. serial (TTL level)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Wiegand Interface</td>
<td>N/A</td>
<td>1 x input port 1 x output port</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>External I/O</td>
<td>8 ports configurable digital I/O</td>
<td>3 x TTL input 3 x TTL output 3 x LED output</td>
<td>8 ports configurable digital I/O</td>
<td>8 ports configurable digital I/O</td>
</tr>
<tr>
<td>Encryption</td>
<td>256 bit AES</td>
<td>256 bit AES</td>
<td>256 bit AES</td>
<td>256 bit AES</td>
</tr>
<tr>
<td>Supply Voltage</td>
<td>3.3 Vdc regulated</td>
<td>5 Vdc regulated</td>
<td>3.3 Vdc regulated (4 ~ 10 Vdc unregulated)</td>
<td>3.3 Vdc regulated</td>
</tr>
<tr>
<td>Board Size (L x W x H)</td>
<td>55 x 40 x 8 mm</td>
<td>63 x 43 x 10 mm</td>
<td>26 x 26 x 6.4 mm</td>
<td>55 x 40 x 8 mm</td>
</tr>
</tbody>
</table>

Sensor Selection Guide

<table>
<thead>
<tr>
<th>Model</th>
<th>SFM3020-OP</th>
<th>SFM3320-OP</th>
<th>SFM3330-OD</th>
<th>SFM3540-OL</th>
<th>SFM3500-TC1</th>
<th>SFM3500-TC2</th>
<th>SFM3500-TC150</th>
<th>SFM4000-TS4</th>
<th>SFM5000-OH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor Type</td>
<td>Optical</td>
<td>Optical</td>
<td>Optical</td>
<td>Optical</td>
<td>Optical</td>
<td>Optical</td>
<td>Optical</td>
<td>Optical</td>
<td>Optical</td>
</tr>
<tr>
<td>Resolution (dpi)</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>508</td>
<td>508</td>
<td>508</td>
<td>508</td>
<td>508</td>
<td>500</td>
</tr>
<tr>
<td>Sensing Area (mm)</td>
<td>16.0 x 19.0</td>
<td>16.0 x 19.0</td>
<td>12.9 x 15.2</td>
<td>12.8 x 18.0</td>
<td>10.4 x 14.4</td>
<td>10.4 x 14.4</td>
<td>9.6 x 0.2</td>
<td>15.5 x 18.8</td>
<td></td>
</tr>
<tr>
<td>Image Size (pixel)</td>
<td>272 x 320</td>
<td>288 x 288</td>
<td>256 x 302</td>
<td>256 x 360</td>
<td>208 x 288</td>
<td>208 x 288</td>
<td>192 x 4</td>
<td>260 x 340</td>
<td></td>
</tr>
</tbody>
</table>
Suprema at a Glance

**Global Business**
- Sales network in over 110 countries worldwide with 910 customers

**Founded**
- May 2000

**Growth**
- Average growth rate of 61% per year (CAGR, 2006 ~ 2010)

**Business Area**
- Biometric/RFID IP Access Control
  - Fingerprint Embedded Module
  - AFIS and Live Scanning Solution
  - ePassport Reader and ID Solution

**Financial Status**
- Listed company in South Korea’s stock market (KOSDAQ)
- Launched Korea’s 1st biometric IPO (2008)

**Technology**
- Ranked top in Fingerprint Verification Competition (FVC) in 2004, 2006 and onGoing (2010)
- Best results at NIST MINEX tests for fingerprint extractor and matcher category

Our Advantages

**Technology**
- World’s best performing fingerprint algorithm
- Industry-leading international award records and certifications

**Quality**
- Manufactured by world-class EMS vendors of South Korea
- Made from best quality components and materials

**Partnership**
- Global partner programs for training, technical supports & upgrades
- Clear offering through authorized distribution channel

Awards & Certifications

- Frost & Sullivan’s Biometrics Company of the Year 2009
- Top Prize at Detektor International Award 2009 and 2010
- Top result in NIST MINEX tests (2008)
- FBI certification for live-scanners
- UL294 certification for access control product
- ISO 9001/14001 Qualification

Business Growth

- Revenue growth rate (CAGR) of 45% during 2007-2010
- Launched the first biometric IPO in Korea (Jul 2008)
- 57% market share in the domestic market
- Named to Deloitte’s Technology Fast 500 Asia Pacific in 2008 & 2009
- Shipped over 1,000,000 fingerprint products worldwide