

GENERAL DESCRIPTION

The I-Control Security PDS 3000 is a high performance, low power, low cost, capacitive sensor with an integrated 192 x 8 sensing array of metal electrodes. Each electrode acts as one plate of a capacitor, while the contacting finger acts as the second plate. An insulating layer on the device surface forms the dielectric between the two plates. Ridges and valleys on the finger yield varying capacitor values across the array, which is read to form a partial image of the fingerprint.

Internal circuits within the PDS 3000 convert the sensed data into a stream of digital data (a *frame*) that is presented to the host microprocessor via an 8-bit bidirectional bus interface compatible with most microprocessors. Processing algorithms running on the host perform image reconstruction and minutiae extraction to form a template that can be stored and used for fingerprint authentication.

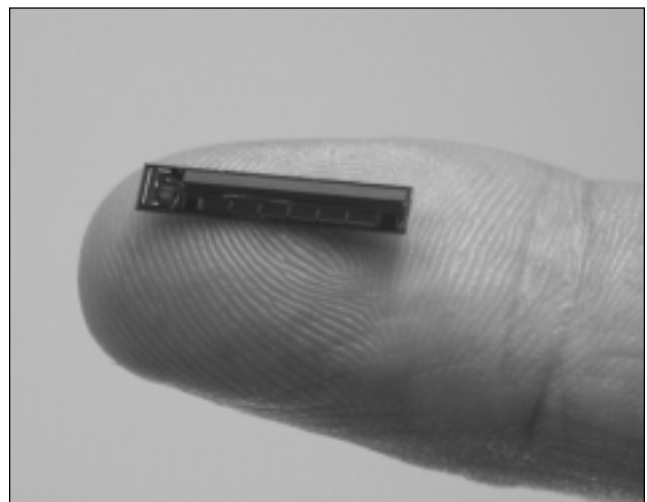
Optimized for use in embedded devices, the low cost, small physical size and minimal power consumption of the PDS 3000 make it easy to integrate into Internet appliances such as laptops, personal digital assistants (PDAs), and mobile phones, next-generation multi-function devices such as smart phones and PDA-communicators, USB memory tokens, 802.11 cards and other peripherals. The PDS 3000 includes the analog-to-digital converters necessary to digitize the sensed data and an automatic gain control (AGC) function that provides high quality fingerprint images from all types of skin, dry to moist, in a wide range of climatic conditions, even hot and humid. The AGC function widens the application range of the sensor and reduces the false acceptance rate (FAR) and false rejection rate (FRR).

The device features a low operating current, which can be further reduced by placing the device in 'standby' when fingerprint 'swiping' is not active.

The PDS 3000 is fabricated in 0.35 micron CMOS technology and is packaged as a module, mounted on a flexible printed circuit with a small tail and an attached micro-miniature, 20-pin, zero-insertion-force (ZIF) plug. The sensor surface is protected by a special abrasion and chemical resistant coating to provide long life with high reliability.

KEY FEATURES

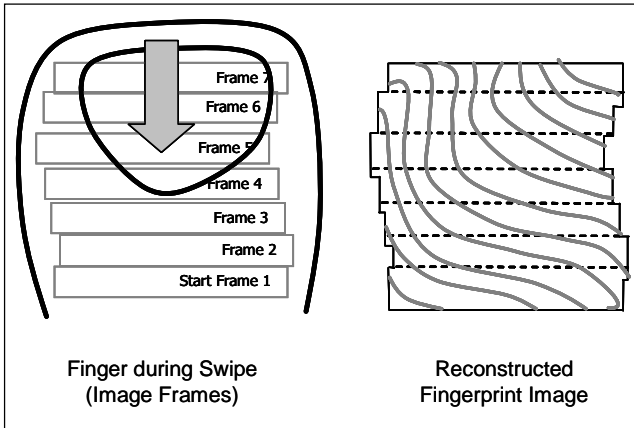
- **192 Column x 8 Row Sensor Array**
 - 70.4 μm x 70 μm pixel size
 - 363 dots per inch resolution
- **Compact Size**
 - 0.55 mm x 13.49 mm active sensing area
 - 3.0 mm x 16.95 mm x 0.3 mm sensor size
- **2.5 to 3.3V Operating Voltage Range**
 - Minimizes system-level power requirements
- **High Performance**
 - 40 ns access time
 - Acquisition rate of more than 3,700 frames per second (768 bytes per frame with two pixels per byte)
- **Low Power Consumption**
 - 10 mA maximum operating current
 - 50 μA maximum sleep mode current
 - 5 μA maximum power down current
- **Rugged Construction**
 - 15 KV minimum ESD protection
 - Proprietary surface coating provides protection against 'ruboff' and scratches on the sensor surface and against adverse effects from most liquids, gases and sweat
- **Low Cost**
 - Integrated Analog-to-Digital Converter
 - Automatic Gain Control for Gray-Scale Image
- **0.35 micron low-power CMOS technology**



I-Control Security PDS 3000 Fingerprint Sensor Die

IMAGE RECONSTRUCTION

I-Control Security’s PDS 3000 sensor captures a fingerprint image frame by frame as a finger is swiped over the small, linear sensing area. Proprietary reconstruction software, coupled with an automatic gain control (AGC) function in the sensor, re-assembles a complete fingerprint image from the received frames while maximizing contrast and sensitivity across various environmental conditions.



TYPICAL APPLICATIONS

- **The low cost, small size and minimal power consumption of the PDS 3000 make it especially suited for personal authentication in mobile device applications such as:**
 - Portable fingerprint authentication
 - Secure access to computers, personal digital assistants and other portable devices
 - Access security for terminals, networks, and sensitive data files
 - Transaction security for e-commerce, Internet banking, and point-of-sale
 - Secured access to enterprise applications and ‘m-commerce’ (cellular-phone based) transactions

QUICK TIME-TO-MARKET

- **I-Control Security provides a comprehensive set of hardware and software support tools to assist users in rapidly developing their end applications. These include:**
 - Evaluation Kit
 - Reference Design Kit
 - *PDS Algorithm Suite*: image reconstruction, minutiae extraction and matching designed especially for mobile device operating systems

Note: Please contact your I-Control Security sales representative for additional information on these products.

KEY FEATURES OF ALGORITHM SUITE

- **Portable**
 - No floating point operations
 - No transcendental math functions
- **Compact**
 - < 60K stored, ~ 200K to run the algorithms
- **Sensor Independent**
 - Support for placement and sweep sensors
 - Compatible with Fujitsu, Authentec, Atmel, Veridicom and SecuGen
- **OS Independent**
 - Ported to Linux, Windows 95/98/ME/2000, NT 4.0, MS DOS, Windows CE (x86, ARM, MIPS, SH3) and ARM 7 embedded (generic RTOS)
- **Consistent with AFIS standards**



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