ST21F384

Smartcard MCU
## with 384 Kbytes of high-density Flash memory

Features

Hardware features

- Enhanced 8/16-bit CPU core with 16 Mbytes of linear addressable memory
- 7 Kbytes of User RAM
- 320 Kbytes of User Flash memory with OTP area:
  - 10-year data retention
  - 100,000 Erase/Write cycles
  - Page granularity of 128 Bytes
  - Block granularity: 1 Kbyte
  - 128 Bytes of OTP for User
  - Page Erase time 3 ms
  - Block Erase 1 Kbyte in 15 ms
  - Byte programming in 16 µs
  - Flash Erase / Write Protection software programmable on 64 Kbyte Blocks
- Asynchronous Receiver Transmitter supporting ISO 7816-3 T=0 and T=1 protocols
- Two 8-bit timers with interrupt capability
- 1.8V, 3V and 5V supply voltage ranges
- External clock frequency from 1 up to 7.5 MHz
- High performance provided by:
  - CPU clock frequency up to 19 MHz
  - External clock multiplier (2x, 3x, and 4x)
- Current consumption compatible with GSM and ETSI specifications
- Power-saving Standby state
- Contact assignment compatible ISO 7816-2
- ESD protection greater than 4 kV (HBM)

Software features

- Flash Loader
- Flash drivers

Micromodule   Wafer
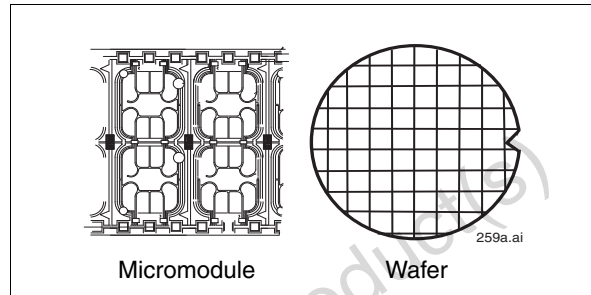
Security features

- Monitoring of environmental parameters
- Protection against faults
- ISO 3309 CRC calculation block
- Cryptographic performances[a]:
  - Triple DES (with keys loaded):   10.8 µs
  - Single DES (with keys loaded):   3.6 µs
- True random number generator
- Unique serial number on each die
- Hardware DES accelerator

Development environment

Software development and firmware generation are supported by a comprehensive set of development tools dedicated to software design and validation:

- C compiler, simulator and emulator

Applications

ST21F384 major applications include:

- Mobile communications (GSM, 3G and CDMA)
- Java Card™ applications

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a. Typical values at 19 MHz.

1 Description

The ST21F384 product is a serial access microcontroller specially designed for cost-effective secure mobile applications.

It is based on an enhanced STMicroelectronics 8/16-bit CPU core offering **16 MBytes of linear addressing space**.

It is manufactured using an advanced highly reliable ST Flash technology.

The device includes a DES accelerator.

A serial interface fully compatible with the ISO 7816-3 standard (T = 0 and T = 1) for Smartcard applications is available.

A CRC calculation block is also available and is directly accessible by the User.

The product architecture is optimized for low power consumption applications. A flexible clock generator module provides increased performance for specific current requirements.

ST drivers and ST Loader are located in the ST ROM area.

Figure 1. ST21F384 block diagram
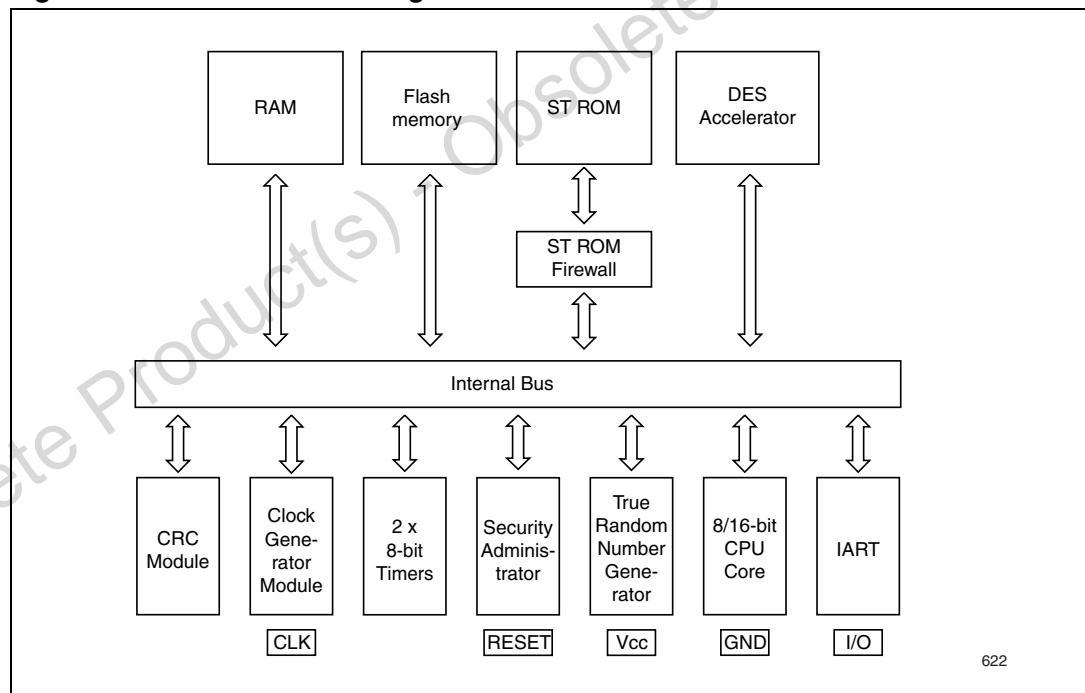
1.1 Development environment

Development tools for smartcard products include a complete range of hardware systems and software tools from STMicroelectronics and third-party tool suppliers. The range of tools includes solutions to help you to develop and debug your application and evaluate smartcard products and their peripherals.

An Integrated Development Environment (IDE), the STMicroelectronics Visual Debug (STVD), provides a set of tools for developing embedded applications. This interface manages the project configuration, code edition, code generation and program debugging.

A Smartcard ICS emulator (SCICS) and simulator are available for developing and validating your application code.

All the information needed to generate the application code and personalization will be collected in a delivery file (.DLV extension). This file is created using the Delivery menu of the STMicroelectronics configuration software tool, SCOOL.

2 Revision history

Table 1.   Document revision history

Date	Revision	Changes
22-Oct-2007	1	Initial release
08-Oct-2009	2	Updated cover page presentation and disclaimer.

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