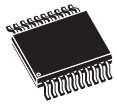
SM23YT66

Secure MCU with MIFARE® Classic library, USB and SPI interfaces and 66-Kbyte EEPROM

Data brief



TSSOP20
(6.4 x 6.2 mm)

Features

Hardware features

- Enhanced 8/16-bit ST23 CPU core with 16 Mbytes linear addressable memory
- 184 Kbytes of User ROM
- 6.2 Kbytes of User RAM
- 2 Kbytes of NESCRYPT RAM
- 66 Kbytes of User EEPROM including 128 bytes of User OTP area:
  - Highly reliable CMOS EEPROM submicron technology
  - 30-year data retention
  - 500,000 Erase/Write cycles endurance typical at 25 °C
  - 1 to 64 bytes Erase or Program in 1.5 ms
- Operating temperature: –25 °C to +85 °C
- Three 8-bit timers with watchdog and interrupt capability
- 3 V to 5.5 V supply voltage range
- 0 to 70 °C operating range
- High performance provided by:
  - CPU clock frequency up to 29 MHz
- Power-saving Standby state
- Asynchronous receiver transmitter (IART) for high speed serial data support (ISO/IEC 7816-3 and EMV™ compliant)
- 10-MHz Master Serial Peripheral Interface (SPI) bus
- USB hardware accelerator for AutoPlay
- 12 GPIO pins
  - 7 bidirectional input/output pins
  - 5 unidirectional input pins
- Full-speed USB 2.0 interface
  - 8 Endpoints
  - 2 x 16 bytes (EP0)
  - 2 x 16 bytes for INT transfer (EP1)
  - 2 x 64 bytes for In/Out Bulk and INT transfer (EP2)
  - 2 x 64 bytes for In/Out Bulk and INT transfer (with hardware accelerator) (EP3)
  - Clock recovery
- ESD protection greater than 5 kV (HBM) for all pads and 2 kV for XIN and XOUT pads

Software library

- MIFARE® Classic technology
- EMVCo RF library (source code example)
- ST NesLib library (optional)

Security features

- Active shield
- Enhanced NESCRYPT crypto-processor for public key cryptography
- Hardware security enhanced DES accelerator
- Monitoring of environmental parameters
- Protection mechanisms against faults
- AIS-31 class P2 compliant true random number generator (TRNG)
- ISO 3309 CRC calculation block
- Unique serial number on each die

Development environment

- Reference implementation compatible with ISO/IEC 14443 standards
- 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

SM23YT66 major applications include:

- MIFARE® Classic-compliant contactless readers
- Pay TV applications
- Secure Internet/computer applications

1 Description

The SM23YT66 is a secure USB microcontroller based on the ST23 core architecture. Its high security level and versatile communication interfaces address user identification functions for computer or network access or for computer-based local or remote applications.

It is based on an enhanced STMicroelectronics 8/16-bit CPU core offering 16 Mbytes linear addressing space. SM23YT66 devices are manufactured using an advanced highly reliable ST CMOS EEPROM technology.

The SM23YT66 features a USB full-speed interface for communication with computers as well as various I/Os and an SPI bus for user interfaces (keyboards, displays, etc.).

The SM23YT66 embeds the MIFARE® Classic[(a)] technology in Reader mode. It complies with NXP specifications.

The SM23YT66 USB hardware accelerator provides a very efficient AutoPlay mode implementation. This enables the content of a companion serial Flash memory to be uploaded to a computer at a speed close to USB bandwidth.

Moreover, an ISO/IEC 7816-3 EMV-compliant asynchronous receiver transmitter (IART) communication peripheral is available.

Connected to an STRFNFCA front end, it can be used to build a full contactless reader compliant with MIFARE® Classic and EMVCo Level 1 (digital) specifications.

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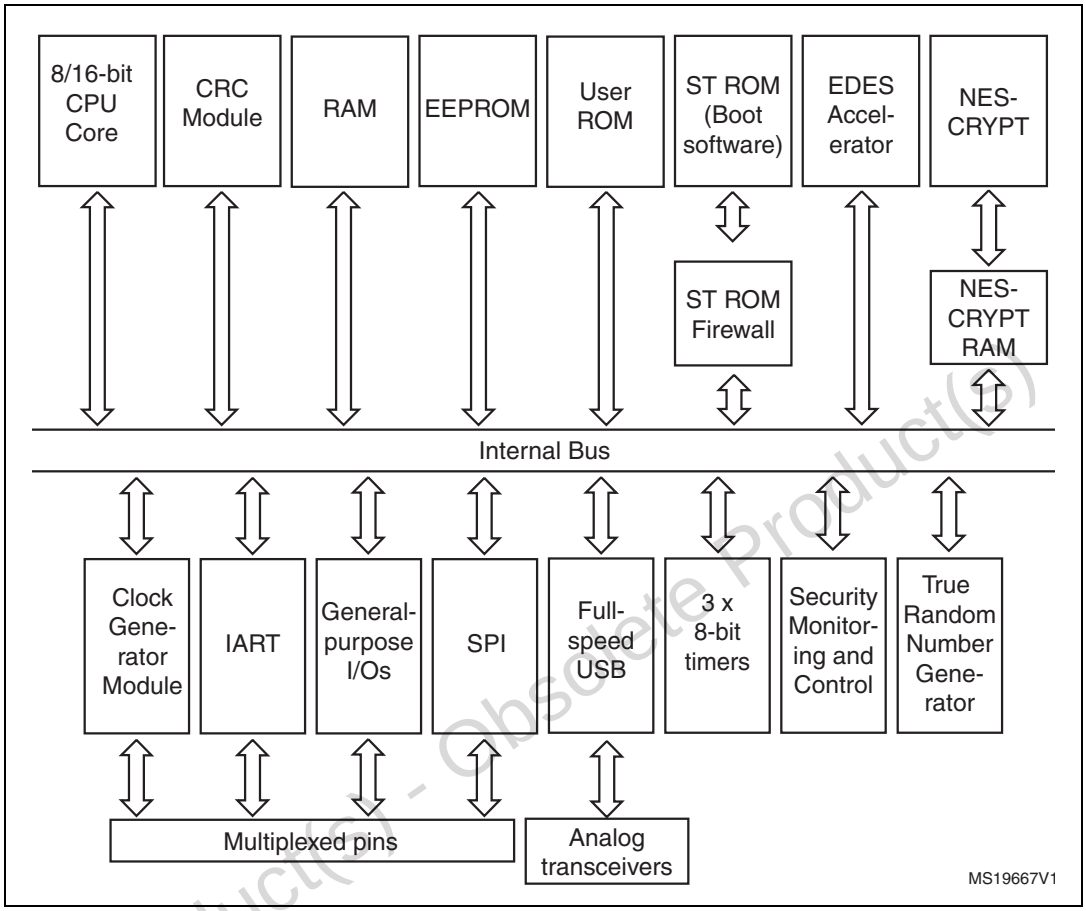
a. MIFARE and MIFARE Classic are trademarks of NXP B.V.

Figure 1. SM23YT66 block diagram



1.1 Development environment

Development tools for secure MCU 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 secure MCU products and their peripherals.

An Integrated Development Environment (IDE), the ST Visual Develop (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 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. List of modifications

Date	Revision	Changes
31-May-2013	1	First release.
08-Mar-2014	2	Updated MIFARE® trademark.

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