



ST23YR80

Dual contactless smartcard MCU with 80 Kbytes EEPROM, enhanced security, cryptoprocessor and optimized RF performance

Data Brief

Features

ST23YR80 major applications include:

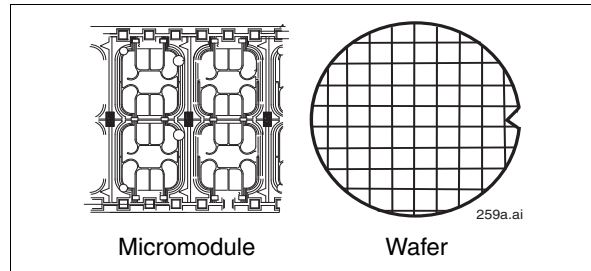
- ePassport, eGovernment, and ID

Hardware features

- Enhanced 8/16-bit ST23 CPU core with 16 Mbytes linear addressable memory
- 390 Kbytes User ROM
- 6 Kbytes User RAM
- 2 Kbytes NESCRIPT RAM
- 80 Kbytes User EEPROM including 128 Bytes User OTP area:
 - 1 to 64 Bytes Erase or Program in 1.5 ms
- NESCRIPT crypto-processor for public key cryptography
- Three 8-bit timers with watchdog and interrupt capability
- 3V and 5V supply voltage ranges
- External clock frequency up to 10 MHz
- High performance provided by:
 - CPU clock frequency up to 29 MHz
- Power-saving Standby state
- Contact assignment compatible ISO 7816-3
- Asynchronous Receiver Transmitter (IART) for high speed serial data support (ISO 7816-3 and EMV™ compliant)
- ESD protection greater than 5 kV (HBM)

Contactless features

- Complies with ISO 14443 type B standards
- 13.56 MHz carrier frequency
- RFUART (RF Universal Asynchronous Receiver Transmitter) for easy-to-manage high speed data transfers up to 848 Kbits/s
- RF frame up to 512 Bytes
- 0.5 Kbytes Dedicated RFUART RAM
- BPSK - NRZ load modulation (card-to-reader)



- 8 to 14% amplitude modulation reception (reader to card) as minimum range
- Enhanced RF performance provided by CPU clock frequency up to 29 MHz coupled with clock frequency divider
- New dedicated contactless micromodule for thinnest packaging solutions

Security features

- Active shield
- Monitoring of environmental parameters
- Protection mechanisms against faults
- Hardware Security Enhanced DES accelerator
- AIS-31 class P2 compliant True Random Number Generator (TRNG)
- ISO 3309 CRC calculation block
- Memory Protection Unit (MPU)
- Unique serial number on each die

Development environment

Interface with RF readers supported through a library of embedded software functions compatible with ISO 14443 standard

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

- C Compiler
- Simulator
- Emulator

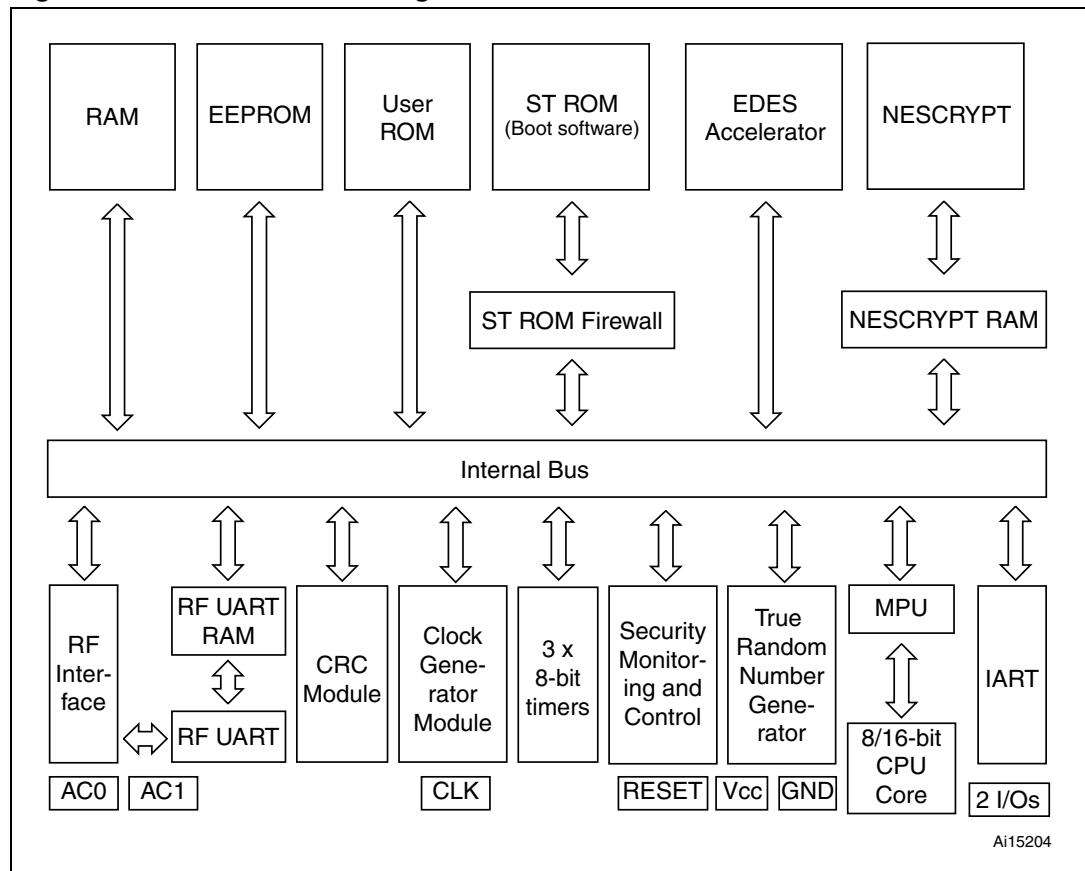
1 Description

The ST23YR80 product is a serial access microcontroller specially designed for secure smartcard applications.

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

An RF Interface including an RF Universal Asynchronous Receiver Transmitter (RF UART) enables contactless communication up to 848 Kbits/s compatible with the ISO 14443-B standard.

Figure 1. ST23YR80 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.

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
15-Jul-2008	1	First release.

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