ST21Y068

Smartcard MCU
## with 68 KBytes High Density EEPROM

Data Brief

Feature summary

ST21Y068 major applications include:

- Mobile communications (GSM and CDMA)
- Java applications

Hardware features

- Enhanced 8/16-bit CPU core with 16 MBytes linear addressable memory
- 248 Kbytes User ROM
- 6 Kbytes User RAM
- 68 Kbytes User EEPROM including 64 Bytes User OTP area:
  - Highly reliable CMOS EEPROM submicron technology
  - 10-year data retention
  - 500,000 Erase/Write cycles endurance typical at 25°C
  - 1 to 64 Bytes Erase or Program in 1.5 ms
- 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 22 MHz
  - External clock multiplier (2x, 3x, and 4x)
- Current consumption complies with GSM specifications
- Power-saving Standby mode
- Contact assignment compatible ISO 7816-2
- ESD protection greater than 4 kV (HBM)

Micromodule   Wafer
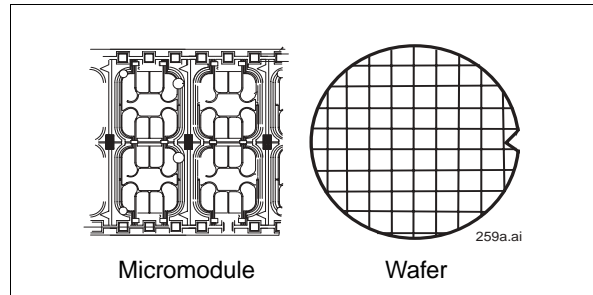
Security features

- Monitoring of environmental parameters
- Protection against faults
- ISO 3309 CRC calculation block
- Cryptographic performances[1]:
  - Triple DES (with keys loaded): 9.3 µs
  - Single DES (with keys loaded): 3.1 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.

---

1. Typical values at 22 MHz

For further information contact your local STMicroelectronics sales office.   www.st.com

1   Description

The ST21Y068 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 linear addressing space**.

It is manufactured using an advanced highly reliable ST CMOS EEPROM 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.

Figure 1.   Block diagram
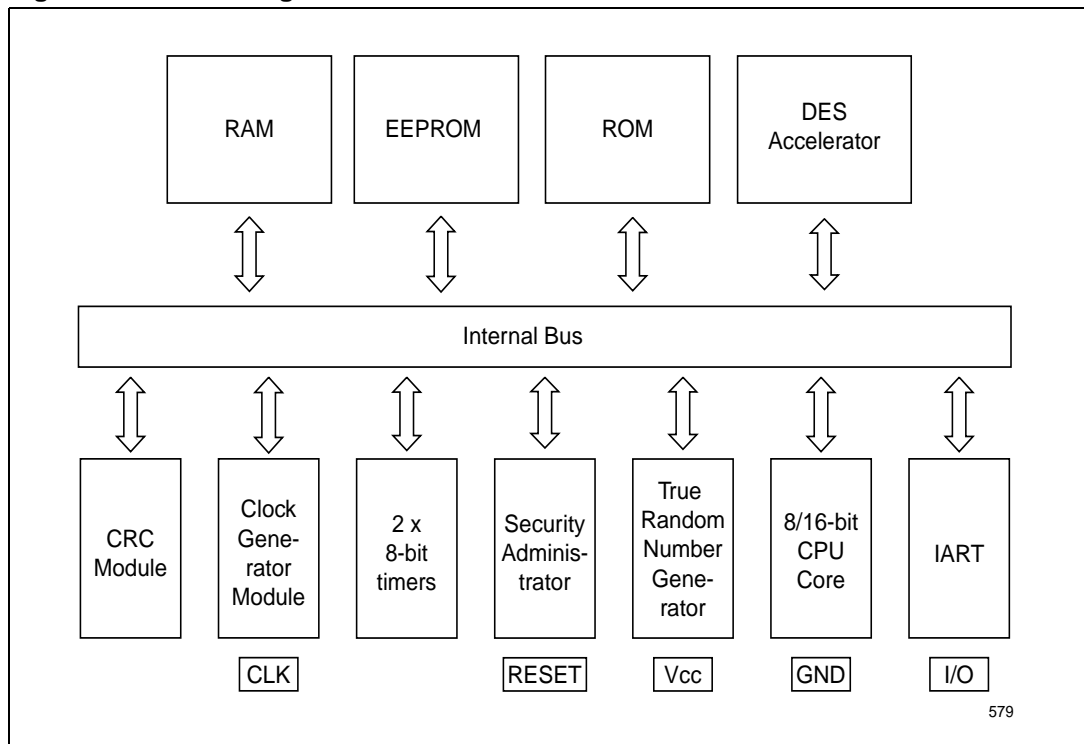
1.1 Development environment

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.

An emulator (SCICS) and a 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
13-Dec-2005	1	Initial release.
06-Feb-2006	2	Product name confirmed.
16-Mar-2006	3	CPU frequency updated.
3-Oct-2006	4	Updated Features summary
27-Oct-2006	5	Updated Features summary
20-Mar-2007	6	Updated Erase/Write cycles endurance value and *Section 1.1: Development environment on page 3*.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZE REPRESENTATIVE OF ST, ST PRODUCTS ARE NOT DESIGNED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS, WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com