Features

General

- Industry-standard M68HC05 Instruction Set, including: 8 x 8 bits Unsigned Multiply Instruction, True Bit Manipulation, Memory-mapped I/O
- Operating Voltage: 3.0V ± 10% or 5.0V ± 10%
- Meets GSM 11.11 & 11.12 Specifications and EMV 96 v3.1.1 Specification
- 5.0 MHz Maximum Internal Bus Frequency at 3.0V and 5.0V
- ESD Protection to ± 4000V
- Bond Pad Layout Conforming to ISO Standard ISO 7816/2
- External Maskable Interrupt on ISO Standard I/O Port (PA0)
- Power-saving WAIT and Very Low Power STOP Modes
- Power-up Detection
- Available as Sawn or Unsawn Wafers, or in Industry-standard Packages and Modules

EEPROM

- 8192 Bytes of EEPROM, including 16 Control Bytes and 48 OTP Bytes
- 1 to 64-byte Write/Program/Erase
- 1 ms Program Time, 1 ms Erase Time
- 10 Years Data Retention
- Typically more than 1,000,000 Write/Erase Cycles
- On-chip Charge Pump for EEPROM Programming, Driven by an Internal Oscillator

RAM and ROM

- 24576 Bytes of ROM, including 16 Bytes Reserved for Vectors
- 512 Bytes of RAM with Security Wipe on Selected Areas

Peripherals

- Single Bidirectional I/O Line (1-bit ISO 7816/3 Standard I/O Port) with Sample Bit
- Time Base Circuitry (with Preset and Maskable Interrupt Capabilities)
- Watchdog Capability
- CRC Module (allowing generation of Checksums (ISO/IEC 3309))
- Random Number Generator

Security

- Dedicated Hardware to Resist Power Analysis Attacks
- Low and High Voltage Monitors
- Low and High Temperature Monitors
- Low Frequency Monitor
- High Frequency Filter/Monitor
- Illegal Access Reset
- Illegal Opcode Reset
- Memory Partitioning with Address Lockout Reset
- Scrambling Logic
- Tamper Monitor
- Physical Removal of Test Mode when Testing is Complete

Development Tools

- Hardware Emulation Module (for the Motorola MMDS05® Development System)
  - Emulation Module (AT05SCEM3R)
- Software Simulator based on HIWARE's HI-WAVE® Product
  - Simulator Software (AT05SCRSIM)
  - Simulator I/O Peripheral Board (AT05SCSPBR)

8-bit Secure Microcontroller with 8K EEPROM and Advanced Security Features

AT05SC2408R

Preliminary

Rev. 1545AS–11/00

Note: This is a summary document. A complete document is available under NDA. For more information, please contact your local Atmel sales office.

Description

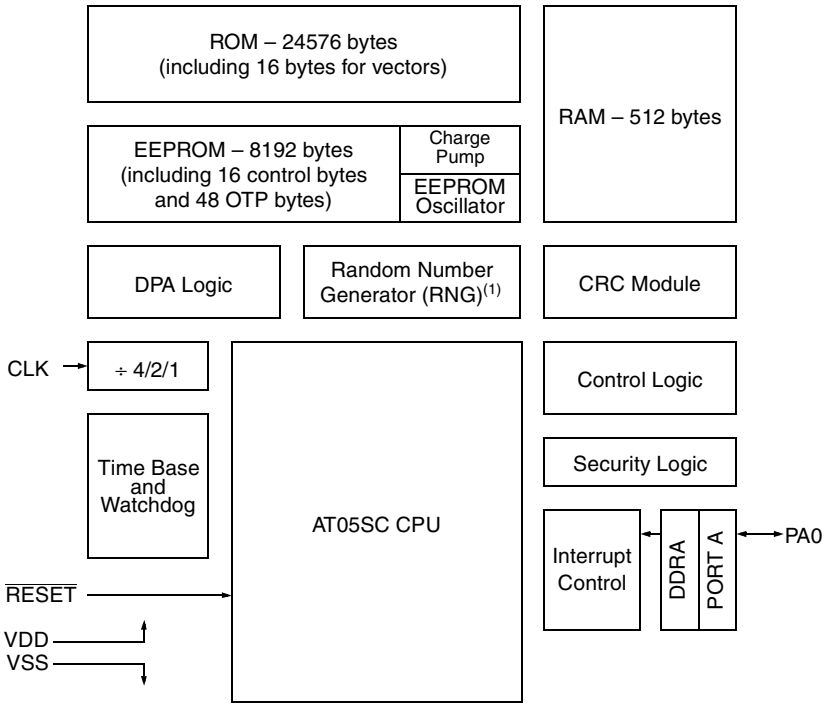
The AT05SC2408R is a member of Atmel's AT05SC family of single chip microcontrollers. Designed specifically for embedded conditional access systems and other security conscious systems, these devices are based on the industry-standard M68HC05 low-power core and its instruction set.

The AT05SC2408R is designed to give a high level of protection against physical and power analysis attacks, and includes hardware features to assist in protecting against SPA and DPA attacks. On-board CRC and RNG modules are provided to assist in the design of high-security applications.

On-board memory comprises 24K bytes of ROM, 512 bytes of RAM and 8K bytes of EEPROM. The EEPROM features 64-byte write, 1 ms program time, 1 ms erase time, typically more than 1,000,000 write/erase cycles, and greater than 10 years data retention.

Application areas for the AT05SC2408R include GSM Mobile Phones, Finance and Set-top boxes.

Block Diagram



Note: 1. A sampling/smoothing algorithm MUST be used in conjunction with the RNG to obtain statistically random results across all operating conditions.

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