

## Features

### General

- High-performance, Low-power AVR<sup>®</sup> (AVR2 Core) Enhanced RISC Architecture
  - 120 Powerful Instructions (Most Executed in a Single Clock Cycle)
- Low-power Idle and Power-down Modes
- Bond Pad Locations Conforming to ISO 7816-2
- ESD Protection to  $\pm 6000V$
- Operating Ranges: from 2.7V to 3.3V and 4.5V to 5.5V
- Compliant with GSM, 3GPP and EMV 2000 Specifications; PC Industry Compatible
- Available in Wafers, Modules and Industry-standard Packages

### Memory

- 32K Bytes of ROM Program Memory
- 8K Bytes of Flash Program Memory
  - Endurance: 10,000 minimum Write/Erase Cycles
- 56K Bytes of EEPROM, Including 64-byte OTP Area and 64-byte Bit-addressable Area
  - 1 to 128-byte Program/Erase
  - 2 ms Program, 2 ms Erase
  - Typically More than 500,000 Write/Erase Cycles
  - 10 Years Data Retention
- 1.5K Bytes RAM

### Peripherals

- I/O Port
  - Configurable to Support Communication Protocols Including ISO 7816-3
- 16-bit Timer
- Random Number Generator (FIPS 140-1)
- 2-level, 4-vector Interrupt Controller

### Security

- Advanced Protection Against Physical Attack
- Environmental Protection Systems
- Voltage Monitor
- Frequency Monitor
- Secure Memory Management/Access Protection (Supervisor Mode)

### Development Tools

- Hardware Development Support on Voyager Emulation Platform (ATV1)
- Software Development Support will be AT90SCSIM Software Simulator (Based on IAR Systems' C-Spy<sup>®</sup> Product)

## Description

The AT90SC320856 is a low-power, high-performance, 8-bit microcontroller with ROM, Flash and EEPROM memory, based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the AT90SC320856 achieves throughputs close to 1 MIPS per MHz. Its Harvard architecture includes 32 general-purpose working registers directly connected to the ALU, allowing two independent registers to be accessed in one single instruction executed in one clock cycle.

On top of the 32K bytes of embedded ROM, the AT90SC320856 includes 64K bytes of Atmel's high density, nonvolatile memory. The on-chip downloadable Flash and code mappable EEPROM allows the program memory to be reprogrammed in-system. This



## Secure Microcontroller for Smart Cards

### AT90SC320856

## Summary

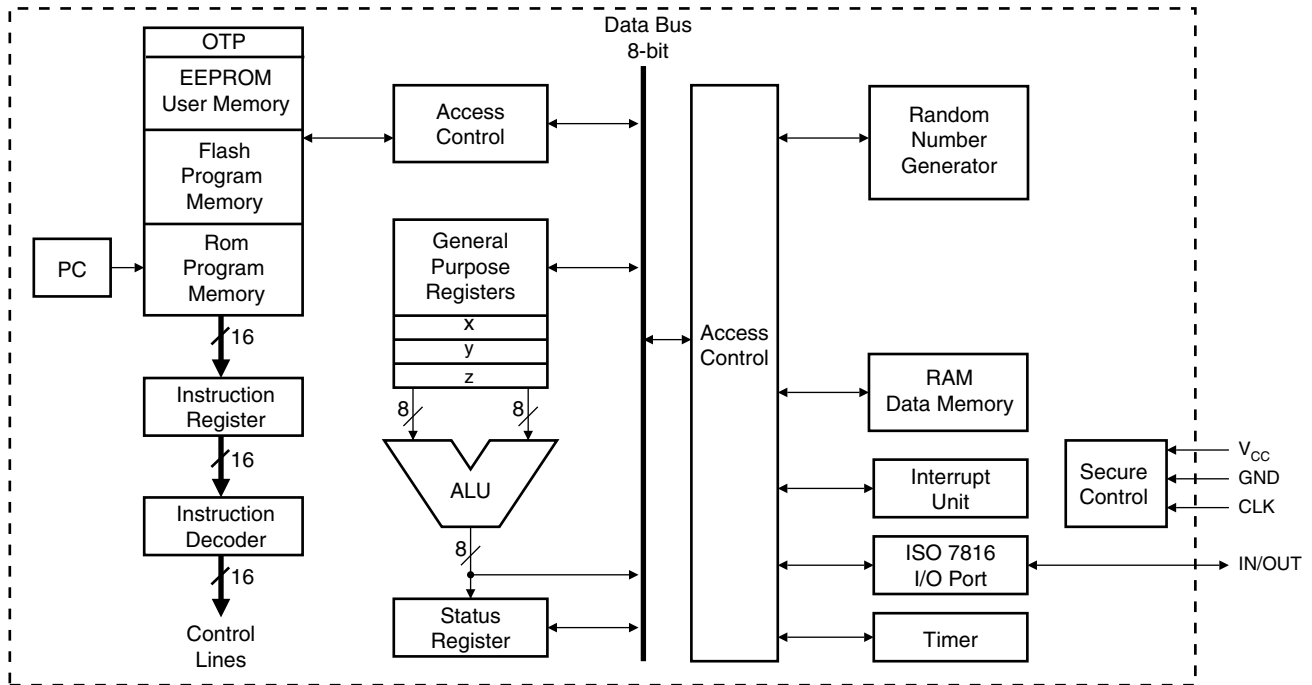
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Note: This is a summary document. A complete document is available under NDA. For more information, please contact your local Atmel sales office.

technology combined with the versatile 8-bit CPU on a monolithic chip provides a highly flexible and cost-effective solution to many smart card applications.

**Figure 1.** The AT90SC320856 AVR Enhanced RISC Architecture



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