Features

General

- High-performance, Low-power secureAVR™ Enhanced RISC Architecture
  - 137 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 ± 6000V
- Operating Ranges: 2.7 to 5.5V
- Compliant with GSM, 3GPP and EMV 2000 Specifications; PC Industry Compatible
- Available in Wafers, Modules, and Industry-standard Packages

Memory

- 128K Bytes of ROM Program Memory
- 36K Bytes of EEPROM, Including 128 OTP Bytes and 384-byte Bit-addressable Area
  - 1 to 128-byte Program / Erase
  - 1.25ms Program / 1.25ms Erase
  - Typically More than 500,000 Write/Erase Cycles at a Temperature of 25°C
  - 10 Years Data Retention
- EEPROM Erase Only Mode
- Write EEPROM With or Without Autoerase
- 5K Bytes of RAM
- 32K Bytes of ROM Dedicated to Atmel's Crypto-library

Peripherals

- One I/O Port
- ISO7816 Controller
  - Up to 625 kbps at 5 MHz
  - Compliant with T= 0 and T= 1 Protocols
- Programmable Internal Oscillator
  - Up to 20 MHz on ROM
  - Up to 40 MHz for Cryptographic Accelerator
- Two 16-bit Timers
- Random Number Generator (RNG)
- 2-level, 8-vector Interrupt Controller
- 32-bit Cryptographic Accelerator for Public Key Operations Including
  - RSA, DSA, ECC, Diffie-Hellman
- Hardware DES and Triple DES DPA Resistant
- Checksum Accelerator
- CRC 16 & 32 Engine (Compliant with ISO/IEC 3309)

Security

- Dedicated Hardware for Protection Against SPA/DPA Attacks
- Advanced Protection Against Physical Attack, Including Active Shield
- Environmental Protection Systems
- Voltage Monitor
- Frequency Monitor
- Light Protection
- Temperature Monitor
- Secure Memory Management/Access Protection (Supervisor Mode)

Development Tools

- Voyager Emulation Platform (ATV2 Standard) to Support Software Development
- IAR Systems EWAVR® V3.10 Debugger or Atmel's AVR Studio® Version 4.07 or Above
- Software Libraries and Application Notes

Secure Microcontroller for Smart Cards

AT90SC 12836RCT Summary

6508AS–SMIC–17Jun04

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

Description AT90SC12836RCT is a low power, high performance, 8/16-bit microcontroller based on the secureAVR™ enhanced RISC architecture, with ROM program memory and EEPROM data memory. By executing powerful instructions in a single clock cycle, the AT90SC12836RCT 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.

The AT90SC12836RCT uses the secureAVR™ this allows the linear addressing of up to 8M bytes of code and up to 16M bytes of data as well as a number of new functional and security features.

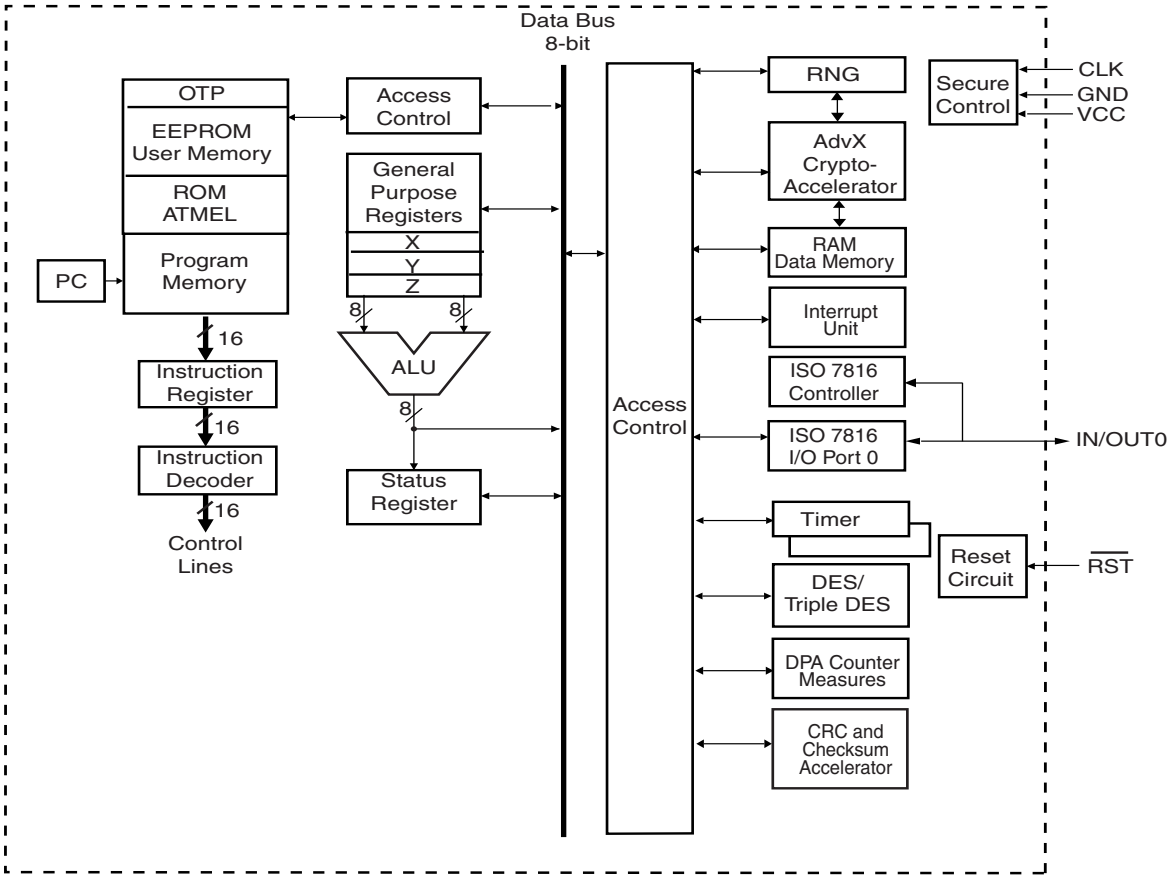
The AT90SC12836RCT includes 36K bytes of Atmel's high density, non volatile memory.

The crypto engine featured in the AT90SC series is the AdvX™, a 32-bit accelerator dedicated to perform fast encryption or authentication functions.

Additional security features include power and frequency protection logic, logical scrambling on all data and addresses, Power Analysis countermeasures and memory accesses controlled by a supervisor mode.

Figure 1 shows the AT90SC12836RCT block diagram.

Figure 1. AT90SC12836RCT secureAVR Enhanced RISC Architecture



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