Features

General

- High-performance, Low-power SecureAVR™ RISC Architecture
  - 135 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 EMV 2000 Specifications, PC Industry Compatible
- Available in Wafers, Modules, and Industry-standard Packages

Memory

- 240K Bytes of ROM Program Memory including 32K bytes of ROM with specific access
- 36K Bytes of EEPROM, Including 128 OTP Bytes and 384-byte Bit-addressable Bytes
  - 1 to 128-byte Program / Erase
  - 1.25ms Program / 1.25ms Erase
  - Typically 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
- 6K bytes RAM Memory (4K bytes of secureAVR RAM, 2K bytes of AdvX™ RAM, shared with the secureAVR core)

Peripherals

- One I/O Port
- One ISO 7816 Controller
  - Up to 625 Kbps at 5 MHz
  - Compliant with T=0 and T=1 Protocols
- Programmable Internal Oscillator (Up to 30 MHz for AdvX and 30 Mhz for internal CPU Clock)
- Two 16-bit Timers
- Random Number Generator (RNG)
- 2-level Interrupt Controller
- Hardware DES and Triple DES DPA/DEMA Resistant
- Checksum Accelerator
- Code Signature Module
- CRC16 & 32 Engine (Compliant with ISO/IEC 3309)
- 32-Bit Cryptographic Accelerator (AdvX for Public Key Operations)
  - RSA, DSA, ECC, Diffie-Hellman

Security

- Dedicated Hardware for Protection Against SPA/DPA/SEMA/DEMA Attacks
- Advanced Protection Against Physical Attack, Including Active Shield, EPO, CStack Checker, Slope Detector, Parity Errors
- Environmental Protection Systems
- Voltage Monitor
- Frequency Monitor
- Temperature Monitor
- Light Protection
- Secure Memory Management/Access Protection (Supervisor Mode)

Certification targeted

- CC EAL5+ (PPSSVG - BSI 0002)
- ZKA
- EMVCo

Secure Microcontroller AT90SC 24036RCU

Summary

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Development Tools

- **Voyager Emulation Platform (ATV4) to Support Software Development**
- **IAR Embedded Workbench® V4.30 Debugger or Atmel's AVR Studio® Version 4.07 or Above**
- **Software Libraries and Application Notes**

Description

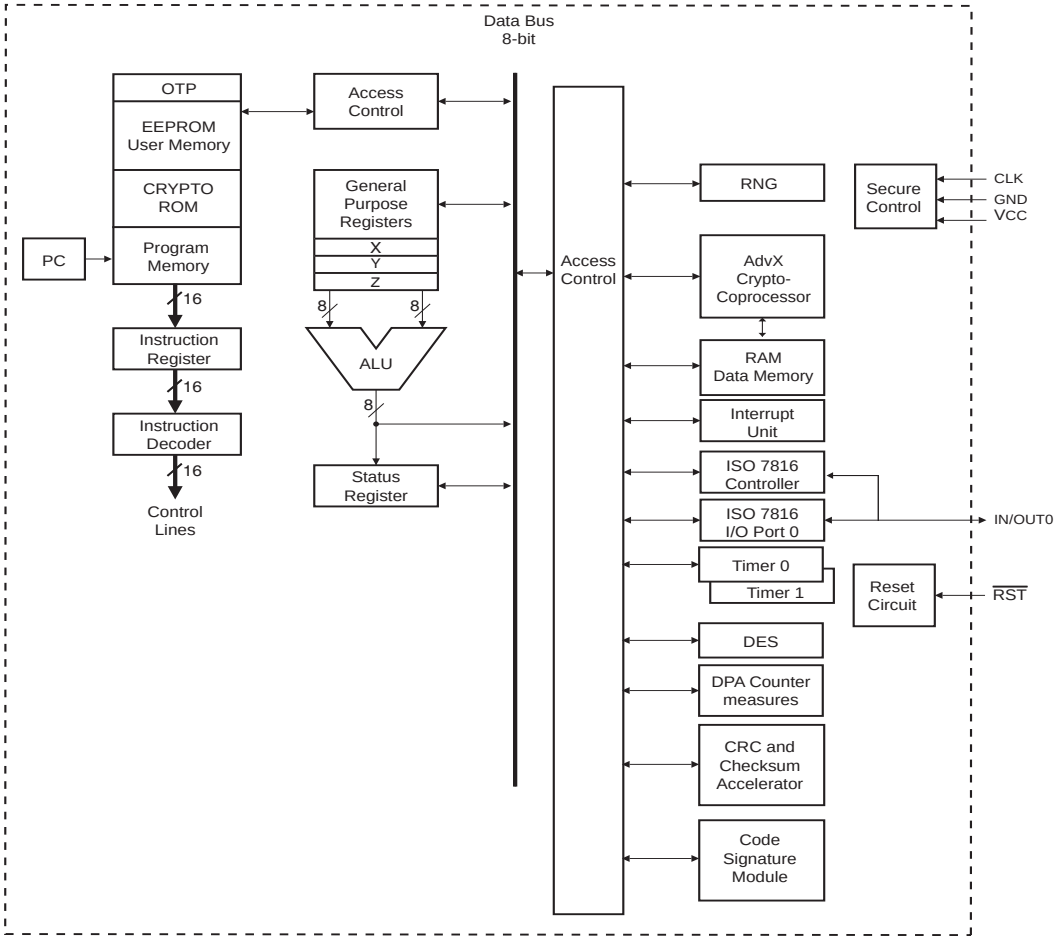
The AT90SC24036RCU is a low-power, high-performance, 8/16-bit microcontroller with ROM program memory, EEPROM memory, based on the SecureAVR enhanced RISC architecture.

By executing powerful instructions in a single clock cycle, the AT90SC24036RCU 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.

In addition to the 240K bytes of embedded ROM, the AT90SC24036RCU includes 36K of Atmel's high density EEPROM. The ability to map the EEPROM in the code space allows parts of the program memory to be reprogrammed in-system. This technology combined with the versitile 8/16-bit CPU on a monolithic chip provides a highly flexible and cost-effective solution to many smart card applications.

Figure 1 shows a block diagram of the AT90SC24036RCU

Figure 1. AT90SC24036RCU SecureAVR Enhanced RISC Architecture



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