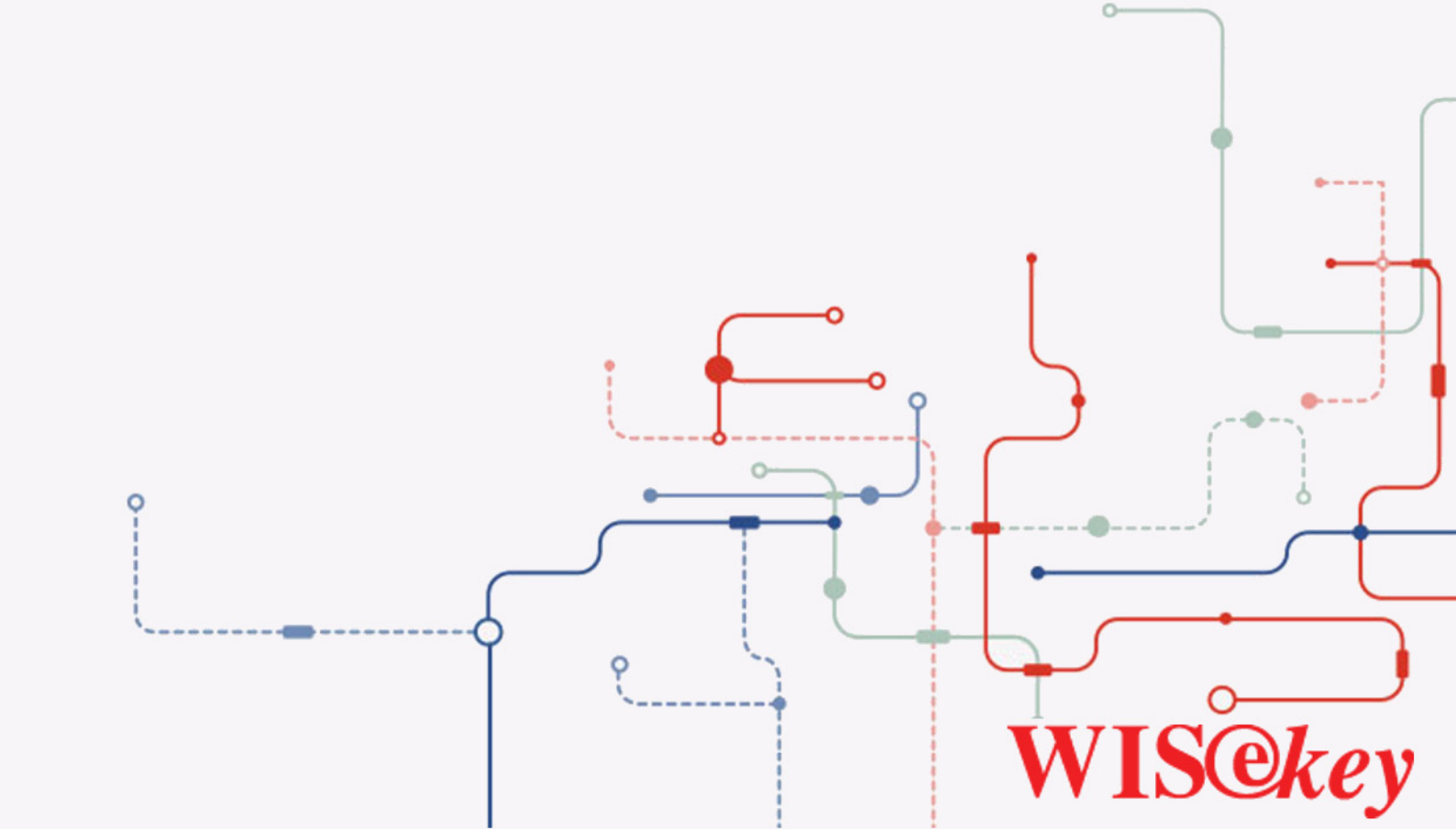
AT90SC28880RCV

Summary Datasheet



Features

General

- High-performance, Low-power 8/16-Bit 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, CQM , PC Industry Compatible
- Available in Wafers, Modules, and Industry-standard Packages

Memory

- 288K Bytes of ROM Program Memory including 32K bytes of ROM with specific access
- 80K Bytes of EEPROM, Including 128 OTP Bytes and 384 Bit-addressable Bytes
  - 1 to 128-byte Program / Erase
  - 1ms Program / 1ms Erase
  - Typically 500,000 Write/Erase Cycles at a Temperature of 25°C
  - 10 Years Data Retention
  - 20 Years Data Retention under specific cycling & temperature conditions (ie. electronic government documents)
  - EEPROM Erase only mode
  - Write EEPROM with or without autoerase
- 8K bytes RAM Memory (6K bytes of CPU RAM, 2K bytes of Ad-X™ RAM, shared with the CPU 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 36 MHz for Ad-X and 36 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 (Four keys)
- Hardware AES
- Code Signature Module
- CRC16 & 32 Engine (Compliant with ISO/IEC 3309)
- 32-Bit Cryptographic Accelerator (Ad-X 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

Development Tools

- Voyager Emulation Platform (ATV4) to Support Software Development
- IAR Embedded Workbench® V5.40 Debugger or Atmel's AVR Studio® Version 4.07 or Above
- Software Libraries and Application Notes

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Description

The AT90SC28880RCV is a low-power, high-performance, 8/16-bit microcontroller with ROM program memory, EEPROM memory, based on the RISC architecture.

By executing powerful instructions in a single clock cycle, the AT90SC28880RCV 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 288K bytes of embedded ROM, the AT90SC28880RCV includes 80K of 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 AT90SC28880RCV

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