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: 1.62 to 5.5V
- Compliant with GSM, 3GPP and EMV 2000 Specifications; PC Industry Compatible
- Available in Wafers, Modules, and Industry-standard Packages

Memory

- 96K Bytes of ROM Program Memory
- 18K Bytes of EEPROM, Including 128 OTP Bytes and 384-byte Bit-addressable Area
  - 1 to 64-byte Program / Erase
  - 2 ms Program / 2 ms Erase
  - Typically More than 500,000 Write/Erase Cycles at a Temperature of 25°C
  - 10 Years Data Retention
- 4K Bytes of RAM
- 32K Bytes of ROM Dedicated to Atmel's Crypto Library

Peripherals

- One ISO 7816 Controller
  - Up to 625 kbps at 5 MHz
  - Compliant with T=0 and T=1 Protocols
- One I/O Port
- Programmable Internal Oscillator (Up to 40 MHz for AdvX™ and up to 20 MHz for Internal CPU Clock)
- Two 16-bit Timers
- Random Number Generator (RNG)
- 2-level, 7-vector Interrupt Controller
- Hardware DES and Triple DES DPA Resistant
- Checksum Accelerator
- CRC 16 & 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 Attacks
- Advanced Protection Against Physical Attack, Including Active Shield
- Environmental Protection Systems
- Voltage Monitor
- Frequency Monitor
- Temperature Monitor
- Light Protection
- Secure Memory Management/Access Protection (Supervisor Mode)

Certification

- EAL4+
- VISA
- CAST

Secure Microcontroller for Smart Cards

AT90SC 9618RCT Summary

6512BS–SCIC–20Dec06

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

Development Tools

- **Voyager Emulation Platform (ATV4) to Support Software Development**
- **IAR Embedded Workbench® V3.20 Debugger or Atmel's AVR Studio® Version 4.07 or Above**
- **Software Libraries and Application Notes**

Description

The AT90SC9618RCT is a low-power, high-performance, 8/16-bit microcontroller with ROM program memory, EEPROM data memory and a crypto-accelerator, based on the secureAVR RISC architecture. By executing powerful instructions in a single clock cycle, the AT90SC9618RCT 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.

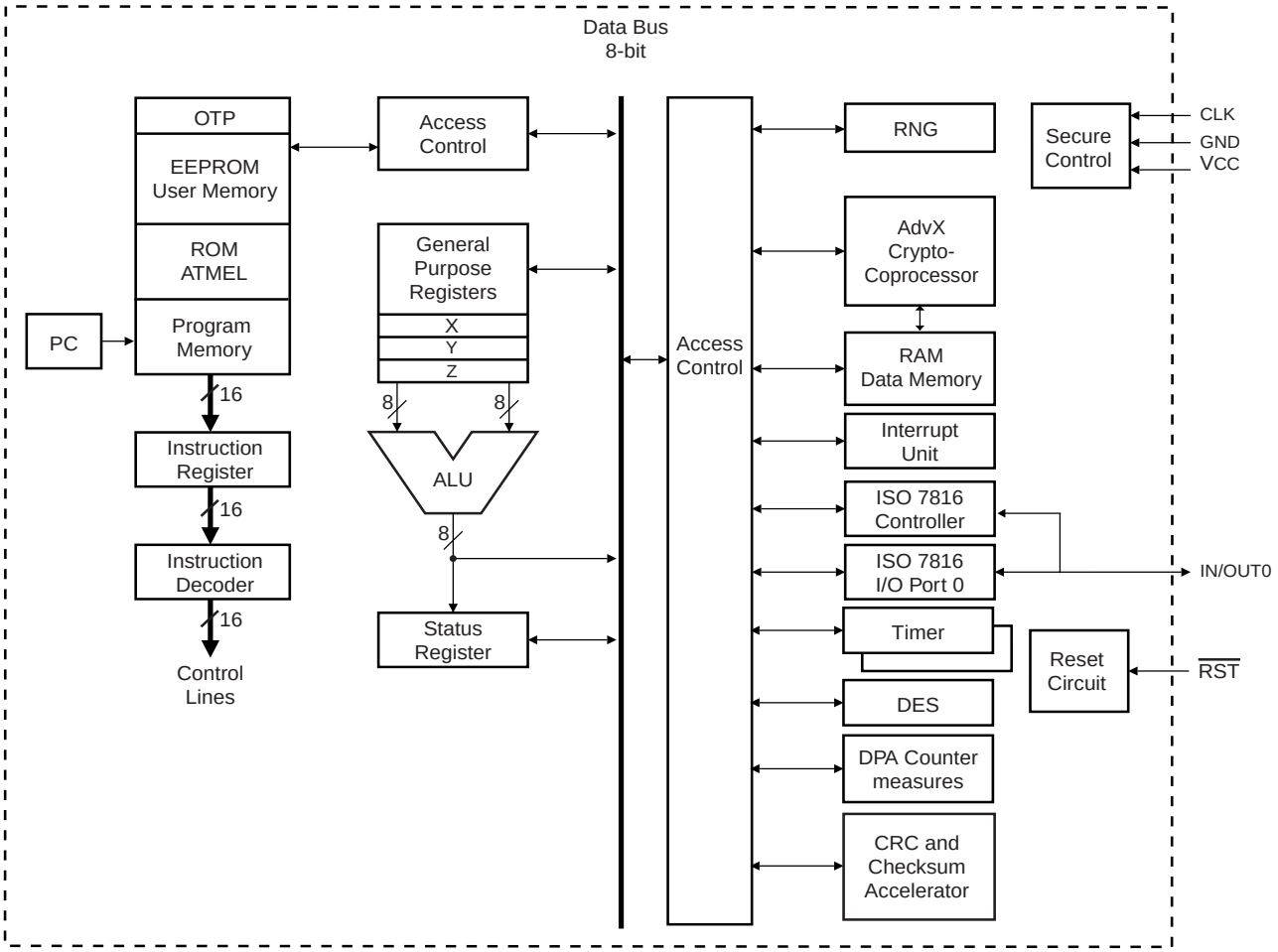
The AT90SC9618RCT uses the secureAVR that allows the linear addressing of up to 8M bytes of code and up to 16M bytes of data as well as a number of new functional and security features.

The AT90SC9618RCT includes 18K 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 program data and addresses, Power Analysis countermeasures and memory accesses controlled by a supervisor mode.

Figure 1 shows the AT90SC9618RCT secureAVR RISC Architecture.

Figure 1. AT90SC9618RCT secureAVR RISC Architecture



Atmel Corporation

2325 Orchard Parkway
San Jose, CA 95131, USA
Tel: 1(408) 441-0311
Fax: 1(408) 487-2600

Regional Headquarters

Europe
Atmel Sarl
Route des Arsenaux 41
Case Postale 80
CH-1705 Fribourg
Switzerland
Tel: (41) 26-426-5555
Fax: (41) 26-426-5500

Asia
Room 1219
Chinachem Golden Plaza
77 Mody Road Tsimshatsui
East Kowloon
Hong Kong
Tel: (852) 2721-9778
Fax: (852) 2722-1369

Japan
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
Tel: (81) 3-3523-3551
Fax: (81) 3-3523-7581

Atmel Operations

Memory
2325 Orchard Parkway
San Jose, CA 95131, USA
Tel: 1(408) 441-0311
Fax: 1(408) 436-4314

Microcontrollers
2325 Orchard Parkway
San Jose, CA 95131, USA
Tel: 1(408) 441-0311
Fax: 1(408) 436-4314

La Chantrerie
BP 70602
44306 Nantes Cedex 3, France
Tel: (33) 2-40-18-18-18
Fax: (33) 2-40-18-19-60

ASIC/ASSP/Smart Cards
Zone Industrielle
13106 Rousset Cedex, France
Tel: (33) 4-42-53-60-00
Fax: (33) 4-42-53-60-01

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906, USA
Tel: 1(719) 576-3300
Fax: 1(719) 540-1759

Scottish Enterprise Technology Park
Maxwell Building
East Kilbride G75 0QR, Scotland
Tel: (44) 1355-803-000
Fax: (44) 1355-242-743

RF/Automotive
Theresienstrasse 2
Postfach 3535
74025 Heilbronn, Germany
Tel: (49) 71-31-67-0
Fax: (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906, USA
Tel: 1(719) 576-3300
Fax: 1(719) 540-1759

Biometrics/Imaging/Hi-Rel MPU/
High Speed Converters/RF Datacom
Avenue de Rochepleine
BP 123
38521 Saint-Egreve Cedex, France
Tel: (33) 4-76-58-30-00
Fax: (33) 4-76-58-34-80

Literature Requests
www.atmel.com/literature

6512BS–SCIC–20Dec06