Features

General

- High-performance, Low-power 32-bit ARM®-SC100™ Enhanced RISC Architecture
- Von Neumann Load / Store Architecture
  - single 32-bit Data Bus for Instructions and Data
- Memory Protection unit
- Internal Oscillator (VFO) (up to 50 MHz)
- ESD Protection to ± 2000V (± 6000V on the ISO interfaces)
- Operating Ranges: 3.3V (+/- 10%)
- Compliant with EMV Level 1, VISA PED, APACS, ZKA, Common Criteria (EAL4+), FINREAD

Memory

- 256 bits of Key Storage (battery backup)
- 32K Bytes of internal ROM Memory (BOOT, library)
- 256K Bytes of Internal EEPROM, Including 128 OTP Bytes and 384-byte Bit-addressable Bytes
  - 1 to 128-byte Program/Erase
  - 2 ms Program, 2 ms Erase
  - Endurance: 500,000 Write/Erase Cycles at temperature of 25 degrees C
  - 10 Years Data Retention
- 100K Bytes of Internal RAM (4KB Crypto RAM)
- up to 16M Bytes of External Memory (accessed by page)

Peripherals

- Page Unit to access External Memory Page
- Static Memory Controller
- Two ISO 7816 controllers with DC/DC (one of them can be multiplexed to address 4 SAM)
- USB 2.0 Full Speed (8 endpoints)
- SPI Controller (up to 24 Mbps)
- Two Universal Synchronous/Asynchronous Receiver Transmitters (USART)
- Triple Track Magstripe Logical Interface
- 5 8-bit I/O Port Interface (LEDs, Keyboard, LCD, spare...)
- Real Time Clock (RTC) with Alarm interrupt
- System Timer including a 16-bit Counter, Watchdog and Second Counter
- Six-channel 16-bit Timer/counter
- 2-level, 28-interrupt Controller
- Hardware DES and Triple DES DPA Resistant
- Hardware AES 128-192-256
- Hardware SHA-1, SHA-256
- True Random Number Generator (RNG)
- Two CRC 16 Engines and one CRC 32 Engine (Compliant with ISO/IEC 3309)
- AdvX - Advanced crypto multiplier for cryptography and authentication (including RSA, DSA, Key Generation, ECC)

Security

- Dedicated Hardware for Protection Against SPA/DPA Attacks
- Advanced Protection Against Physical Attack, Including Active Shield
- Intrusion sensors (mesh and switches).
- Environmental Protection Systems (Voltage, Frequency, UV andTemperature)
- Secure Memory Management/Access Protection (MPU)
- Real time clock and battery back up
- Compliant with EMV standard, VISA PED and FINREAD

Secure Microcontroller for Electronic Transaction Terminal / Reader

AT91SO100/101

Summary

6514BS–SMIC–26Oct05

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

AT91SO100 is a low-power, high-performance, SC100 32-bit microcontroller based on the ARM® enhanced RISC architecture. This new SC100 core allows the linear addressing of up to 1M bytes of code and data as well as a number of new functional and security features. A 3-level instruction pipeline allows the performance of one instruction in a single clock cycle, the AT91SO100 achieves throughputs close to 1 MIPS per MHz. The SC100 processor employs a unique architectural strategy known as Thumb® a super reduced instruction set that is ideally suited for high volume applications with memory restrictions and applications where code density is an important factor.

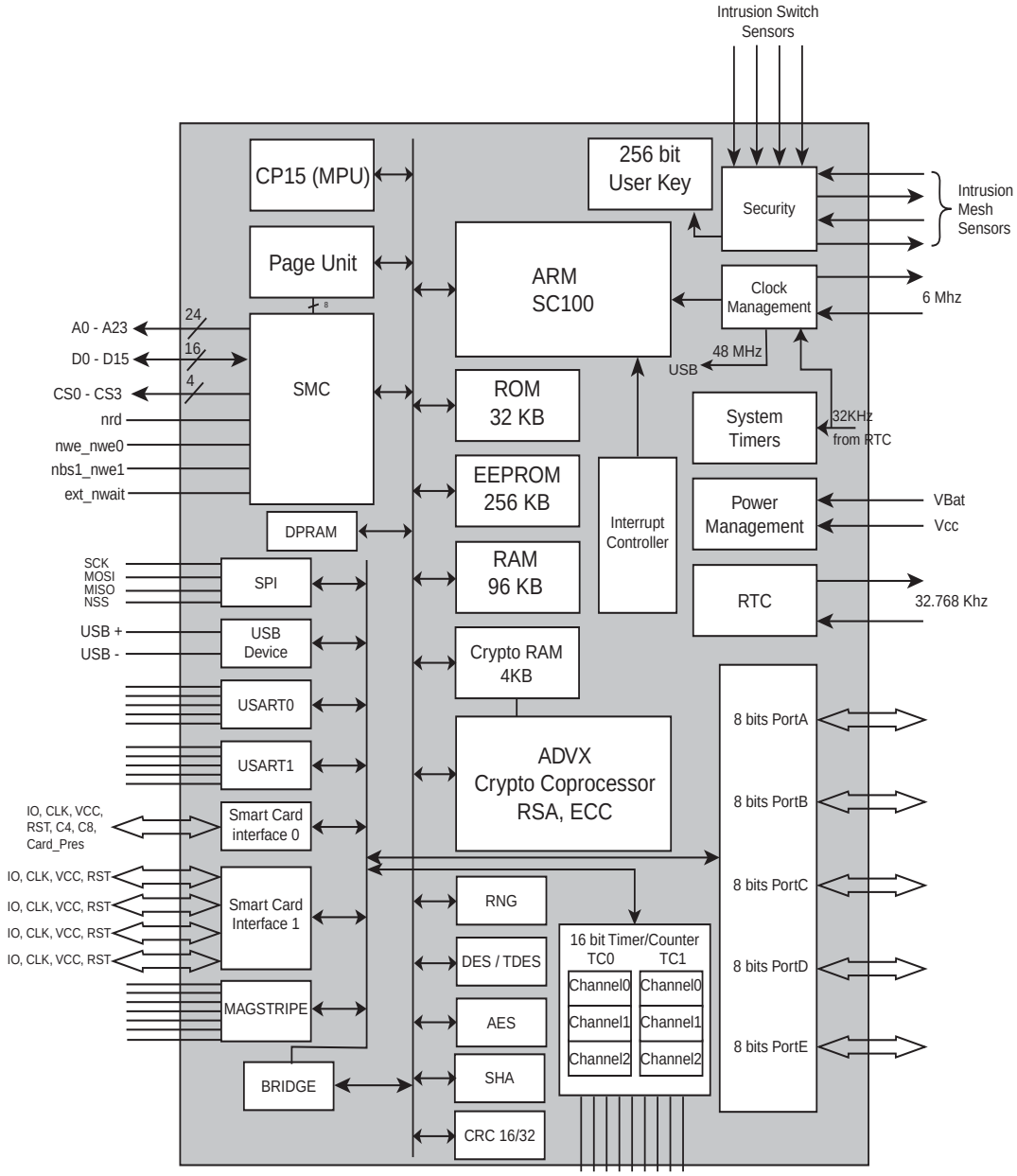
AT91SO100 has internal EEPROM that can be used as program or data memory. It also includes a ROM (for the boot and some native functions) and a large SRAM. **AT91SO100** can also address, via pages, up to 16Mbytes of external memory.

The **AT91SO100** also comprises of strong security mechanisms and has a impressive set of crytography features , hardware DES/TDES, hardware AES, hardware SHA-n, hardware cryptography accelerator for asymmetric algorithms (RSA, Elliptic Curve, Key generation) and a true random number generator.

AT91SO100 includes a lot of dedicated peripherals as smart card and magnetic stripe card interface, as well as USB, SPI, UARTs and I/O ports.

The **AT91SO101** is a single package solution in BGA256 embedding two chips, the **AT91SO100** and the **AT83C26** which physically interface with up to five smart cards.

Figure 1. Block Diagram.



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