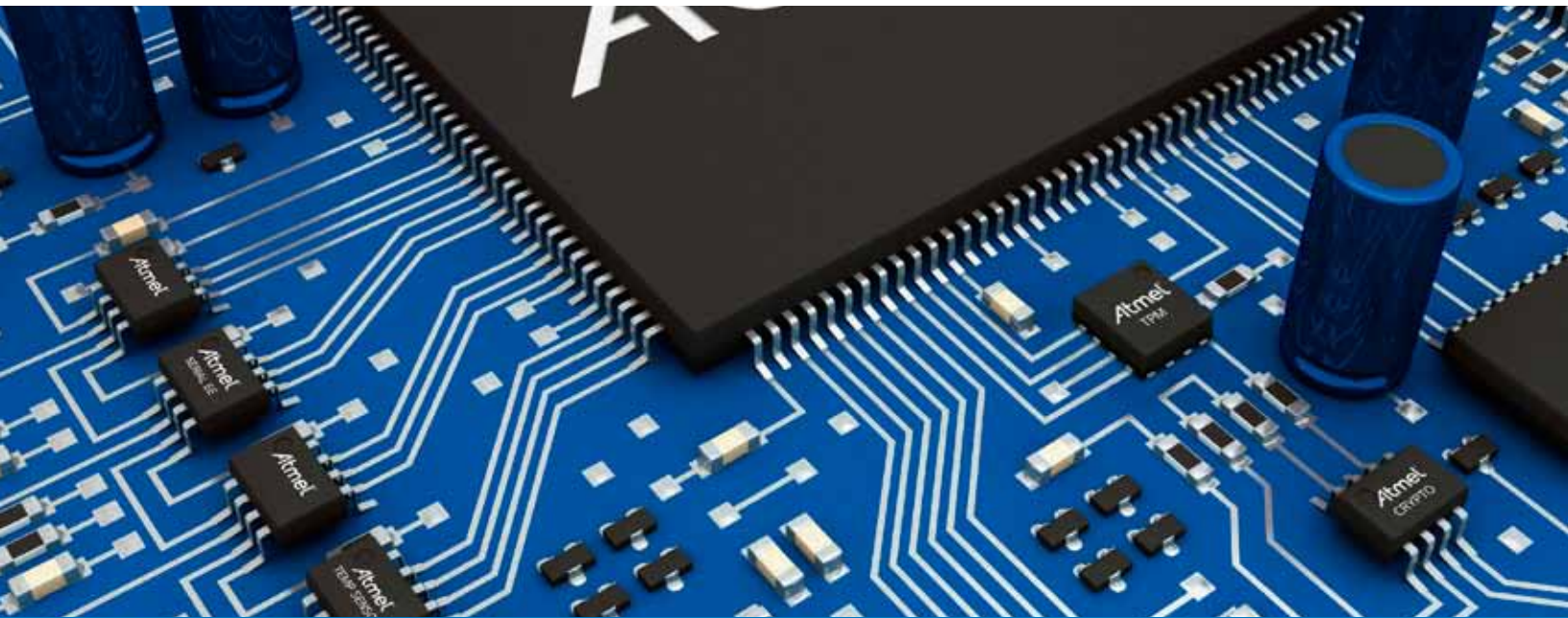


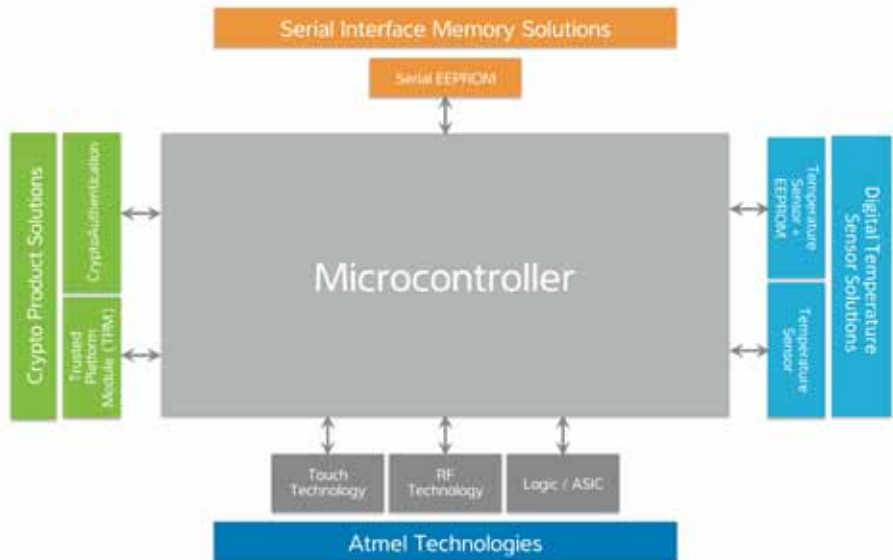
Atmel®



# Atmel System Peripheral and Memory Products

Temperature Sensor, Crypto and Serial Memory Solutions

Atmel is a worldwide leader in the design and manufacture of microcontrollers, capacitive touch solutions, logic, mixed-signal, non-volatile memory and RF components. Leveraging one of the industry's broadest intellectual property technology portfolios, Atmel is able to provide the electronics industry with complete system solutions focused on industrial, consumer, security, communications, computing and automotive markets. Atmel® system peripheral and memory products offer our customers an extensive range of authentication, memory and analog functions accessible through the industry-standard serial interface bus architectures commonly used in today's electronic systems.



## Atmel System Peripheral and Memory Products

### Atmel Serial Analog Solutions

#### Value-added Temperature Sensing Solutions

As a premier analog solutions provider via embedded circuitry in its industry-recognized microcontrollers, Atmel now offers two families of high-precision discrete digital temperature sensors that are suitable for any analog or mixed-signal application in the consumer, industrial, computer or medical markets. They integrate the Atmel industry-leading nonvolatile memory technology that allows storage of critical system temperature data, application-specific configuration data and user preference data.

### Atmel Serial EEPROM Solutions

#### Flexible Solutions for Code and Data Storage

The Atmel portfolio of serial EEPROM solutions gives you the freedom to choose the serial memory that best meets your specific application requirements. Atmel serial EEPROM devices can store any combination of boot code, application code, parametric data, and user data in every density from 1Kb to 1Mb. Whatever your nonvolatile memory needs may be, Atmel offers the right solution for your next design.

### Atmel Crypto Product Solutions

#### Robust Hardware Security Solutions

As the long-time industry leader in robust hardware security solutions, Atmel crypto products secure today's and tomorrow's designs. They provide authentication, encryption and secure data storage using the NIST-approved cryptographic algorithms SHA-256, RSA, onboard FIPS-compliant hardware random number generators, and the latest in hardware security design practice. The Atmel crypto product portfolio offers cost-efficient solutions to secure the core building blocks of any secure system design, from key/data storage to secure key exchange and flexible key management capabilities.

## Atmel Serial Analog Solutions

### AT30TS750 Digital Temperature Sensor Family

Based on the industry-standard xx75-type digital temperature sensor, the Atmel AT30TS750 family is drop-in compatible with the legacy device, while offering improved accuracy. Additional enhancements are optional nonvolatile (NVM) registers that allow user configuration settings to be permanently retained across power cycles, and an integrated serial EEPROM that allows storage of vital system and/or user preference data. The AT30TS750 family also features programmable high and low temperature alarms, user-selectable temperature resolution up to 12 bits, and an I<sup>2</sup>C/SMBus-compatible serial interface. The AT30TS750 family converts temperature from -40°C to +125°C to a digital word and provides a typical accuracy of ±0.5°C. The device is factory-calibrated and requires no external components. To reduce current consumption and save power, a shutdown mode turns off all internal circuitry except for the internal power-on reset and serial interface circuits. In addition, a one-shot mode allows the device to make a temperature measurement, update the temperature register and then return to shutdown mode.

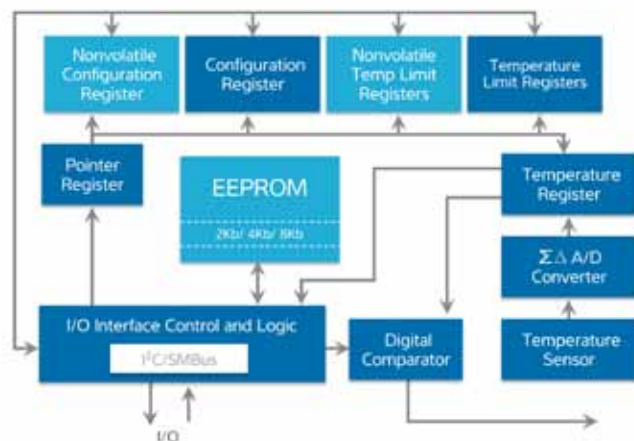
#### Key Features

- Highly accurate temperature sensing
  - ±0.5°C accuracy
- Integrated nonvolatile registers
- Pin- and software-compatible with industry-standard xx75-type devices
- Up to 12-bit resolution user-configurable temperature-to-digital converter
- Integrated 2Kb, 4Kb or 8Kb serial EEPROM data memory
- AT30TS75 only: I<sup>2</sup>C high-speed mode compatible (3.4MHz maximum clock frequency)
- Programmable high and low temperature limits
- Power-saving shutdown and one-shot modes
- SMBus time-out supported
- I<sup>2</sup>C/SMBus-compatible serial interface

#### Advantages

- Self-contained, accurate, calibration-free
- Improved safety with enforced preset condition
- Reduced bill-of-material (BOM) cost
- Limited risk of user misconfiguration

#### Digital Temperature Sensor



- Low power consumption
- Choice of resolution versus conversion speed to customize to your application requirement

### AT30TSE002B Digital Temperature Sensor with EEPROM

The Atmel AT30TSE002B is designed to address the industry's ever-growing concerns regarding overheating of dual in-line memory modules (DIMM). The Atmel device is compliant with the JEDEC standard and integrates a temperature sensor and one 2Kb serial EEPROM configured as 256 bytes of 8 bits each. The EEPROM operation is tailored specifically for the serial presence detect (SPD) function. The integrated temperature sensor converts temperatures from -20°C to +125°C to a digital word and provides a typical accuracy of ±0.5°C. The temperature sensor continuously monitors temperature and updates data in the temperature register at least eight times per second, offering top-of-the-range JEDEC-class B accuracy levels.

#### Key Features

- Highly accurate temperature sensing
  - ±0.5°C accuracy typical
- Compliant with JEDEC standard for DDR3 DIMM
- 11-bit resolution temperature-to-digital converter
- Integrated 2Kb serial EEPROM data memory
- Programmable critical, high and low temperature limits
- Programmable hysteresis threshold
  - Off, 0°C, 1.5°C, 3°C, 6°C

- SMBus time-out supported
- I<sup>2</sup>C/SMBus-compatible serial interface

#### Advantages

- Three-alarm output that enhances redundant protection
- Hysteresis, which prevents false alarm



## Atmel Serial Interface Memory Solutions

### Atmel Serial EEPROM

Atmel Serial EEPROM memory devices are used to store personal preference and configuration data, as well as low-level firmware boot code used in today's advanced electronic systems and applications. Atmel serial EEPROMs are the most flexible and lowest cost nonvolatile memory solution available today. They offer ultra-high write endurance capabilities, allowing for greater than 1 million write cycles to each and every memory location.

**Atmel I<sup>2</sup>C** (2-wire) compatible byte and page writable serial EEPROMs provide simple, yet flexible data storage for the industry's most popular microcontroller, microprocessor, and system-on-a-chip (SoC) solutions.

**Atmel** industry-standard **SPI**-compatible byte and page writable serial EEPROMs include advanced hardware and software write protection schemes with operating voltages as low as 1.7V.

**Atmel  $\mu$ Wire** (3-wire) compatible serial EEPROMs combine flexible user-selectable x8 or x16 memory organization with software write protection to secure data stability.

**Atmel MAC/EUI** EEPROMs are application-specific products that contain unique IEEE-provided pre-programmed MAC/EUI addresses to enable connected devices to connect to the Internet or local network.

The **Atmel 128-bit Serial Number** devices are general-purpose I<sup>2</sup>C-compatible Serial EEPROMs that contain an Atmel-provided pre-programmed unique read-only 128-bit serial number and 1Kb to 8Kb of user-accessible EEPROM NVM storage.

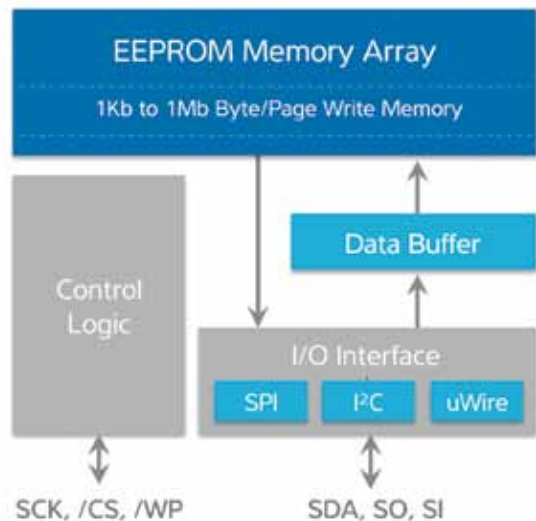
#### Key Features

- 1Kb to 1Mb densities
- I<sup>2</sup>C, SPI and  $\mu$ Wire protocols
- Industrial and automotive (AECQ100) qualified products
- Ultra-wide voltage range and ultra-low-power operation
- Available in standard and ultra-small packages
- Class-leading process and manufacturing technologies

#### Advantages

- Lowest cost per unit of any nonvolatile memory solution
- Industry-standard interfaces SPI, I<sup>2</sup>C and  $\mu$ Wire for PnP system design
- Proven device and process reliability with superior endurance cycling and temperature range operation
  - 100 years retention and 1 million cycles
- Ultra-low-power and low-voltage operation for superior energy management and environmental awareness
  - 1.7V to 5.5V operational voltage ranges
- Smallest profiles for reduced weight and smaller form factors
  - Die sale, WLCSP, SOT23, TSSOP, xDFN through to SOIC

#### Serial EEPROM



# Atmel System Peripheral and Memory Products

## Atmel Crypto Products Portfolio

### Atmel Trusted Platform Module (TPM)

The Atmel Trusted Platform Module (TPM) is a complete turnkey solution providing ultra-strong security for both PC and embedded systems. Primary TPM capabilities include IP protection, system integrity, authentication, and secure communication. The core building blocks in the TPM are the Atmel AVR<sup>®</sup> microcontroller and our expertise in silicon security technologies. Additional security measures include a variety of tamper-evident circuits such as active shield, voltage, temperature and frequency tamperers. Available in 28-TSSOP and space-saving 40-lead QFN (MLF) packages, the TPM provides a standards-based solution for all computing devices connected to the Internet.

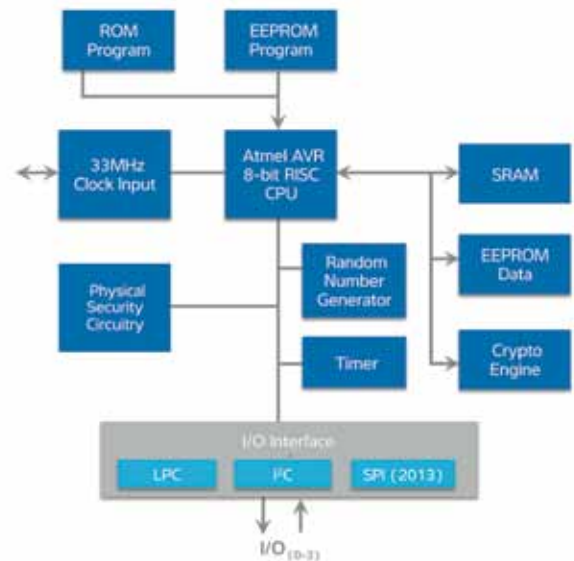
#### Key Features

- Based on the Atmel AVR 8-bit RISC CPU
- Fully compliant with Trusted Computing Group (TCG) v1.2 specification
- 2048-bit hardware RSA crypto accelerator
- Hardware SHA-1 accelerator
- On-chip storage of up to 10 user keys
- Reliable EEPROM for nonvolatile storage; no batteries required
- High-quality hardware random number generator

#### Advantages

- Based on industry standards
- Offered in Industrial Grade (-40C to +85C)
- Supports embedded certificates
- Provides free manufacturing utilities

### Trusted Platform Module



## Atmel CryptoAuthentication Hardware Security Solutions

### ATSHA204

The Atmel ATSHA204 is the first CryptoAuthentication™ product to integrate the SHA-256 hash algorithm with a 4.5Kb EEPROM, providing robust and cost-effective hardware authentication and secure key/data storage. Features such as small outline plastic packages and a single-wire interface make the Atmel ATSHA204 ideal for handheld electronic systems or any space-constrained embedded system.

Implementing host-side security to provide a full system solution is now easier than ever. The product includes a client and host security capability that offloads key storage and the execution algorithms from the microcontroller, significantly reducing both system cost and complexity. When using the ATSHA204 on the host, you no longer need to worry about writing crypto algorithms or developing crypto protocols for your systems.

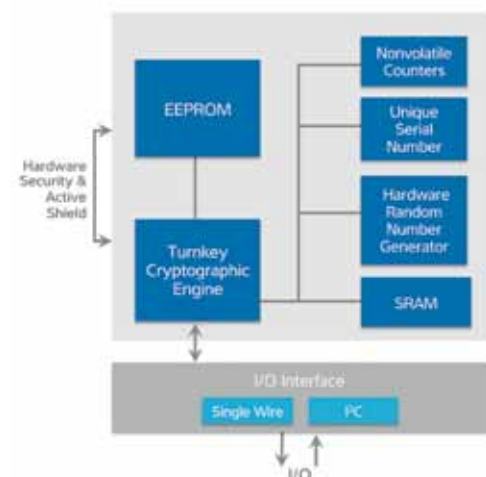
#### Key Features

- Multi-level hardware security
- Secure authentication and key exchange
- Superior NIST-approved algorithm (SHA-256)
- High-quality hardware random number generator
- Guaranteed unique serial number
- Single-wire and I<sup>2</sup>C interface options
- Secure personalization
- Green-compliant plastic packages



#### Advantages

- High-security authentication using SHA-256
- Sophisticated hardware security features
- Small package footprints ideal for handheld systems
- Quick time to market
- Flexible user-configured security
- Both client and host capability, eliminates need to write, debug, or test system crypto code
- Can be used with any microprocessor





### CryptoAuthentication



## Atmel System Peripheral and Memory Tools

	Kit Name	Kit Description	Product
Digital Temperature Sensor	Temperature Sensor Development Kit	Includes a daughterboard with four temperature sensor devices, an Atmel AVR microbase board and a ribbon cable to support remote temperature sensing. Flexible hardware design supports standalone development on a PC via USB connectivity, or by connecting a temperature sensor daughterboard to any MCU development platform.	
	ATAVRTEMPSENSORX Temperature Sensor Xplained Board	Add-on board for Atmel AVR Xplained to add temperature monitoring functionality	

# Atmel System Peripheral and Memory Products

	Kit Name	Kit Description	Product
CryptoAuthentication	<b>AT88CK454BLACK Evaluation Kit</b>	Includes a low-cost USB dongle board to evaluate the Atmel CryptoAuthentication ATSHA204 device	
	<b>AT88CK101STK3/ AT88CK101STK8 Development Kit</b>	Includes a single-socket board, an Atmel AVR microbase board, USB extension cable, and samples of the Atmel ATSHA204 devices. Flexible hardware design supports standalone development on a PC via USB connectivity, or by connecting single-socket daughterboard to any MCU development platform <ul style="list-style-type: none"> <li>• AT88CK101STK3 includes 3-pin SOT23 socket</li> <li>• AT88CK101STK8 includes 8-lead SOIC socket</li> </ul>	
	<b>ATAVRSECURITYX Security Xplained Board</b>	Add-on board for Atmel AVR Xplained to add security functionality	
Trusted Platform Module	<b>AT97SC3204T-X1K180 Embedded Development Kit</b>	Based on the Atmel AVR AT90USBKey kit. Includes TPM I <sup>2</sup> C module, Atmel AT90USBKey, USB adapter cables, USB flash drive with sample code and documentation, and an alternate 9V battery supply cable	

[Atmel Digital Temperature Sensor Products Home Page](#)



[Atmel Memory Products Home Page](#)



[Atmel Serial EEPROM Products Home Page](#)



[Atmel Trusted Platform Module Products Home Page](#)



[Atmel CryptoAuthentication Product Home Page](#)



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