

Product Brief

Overview

The ATM34e/ATM34 Series SoCs are members of the Bluetooth LE and 802.15.4 capable family of extreme low-power Bluetooth® and 802.15.4 system-on-chip (SoC) Atmosic portfolio. The ATM34/ATM34e series SoC's integrate both Bluetooth LE and 802.15.4 compliant radios with an ARM® Cortex® M33F application processor, Random Access Memory (RAM), Read-Only Memory (ROM), and nonvolatile memory (NVM), with ARM® TrustZone® enabled security features, and state-of-the-art power management to enable maximum lifetime in battery-operated devices.

The extremely low-power ATM34e/ATM34 Series comprises several products with resources scaled to encompass the various application and protocol requirements for Bluetooth, RF4CE, Zigbee Green Power, Zigbee, Thread, and Sleepy edge node Matter devices. Designed to extend the battery life for the Internet-of-Things, the radio uses only 0.85 mA in receive and only 2.1 mA in transmit at 0 dBm. Support for low-duty cycle operation allows systems to run for significantly extended periods without battery replacement. In addition, this series of SoCs from

Atmosic supports operation from energy harvesting sources, including RF, photovoltaic, TEG (Thermoelectric generator), and motion. Innovative wake-up mechanisms are supported to provide options for further power consumption reduction.

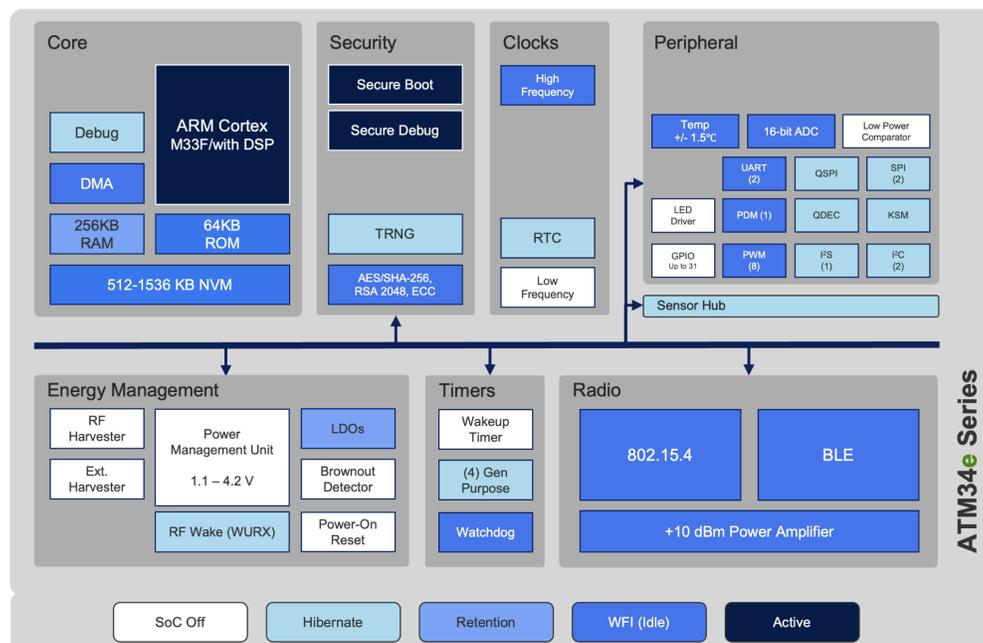
Applications

Industrial and Enterprise

- Industrial IoT Sensors
- Remote Monitors
- Building Management

Home

- Consumer Electronics
- Remote Controls
- Lighting
- Security
- Environmental Control
- Advanced Home Automation
- Human Interface Devices (HID)
- Entertainment



Product Brief

Features

Protocol Support

- 802.15.4
 - RF4CE
 - Zigbee Green Power / Zigbee
 - Thread/ Matter (Sleepy Edge Node Devices)
- Bluetooth Low-Energy
 - 5.4 compliant for low-power data applications
 - 2 Mbps, 1 Mbps, & Long Range PHY rates

MCU and Memory

- 64 MHz ARM® Cortex® M33F MCU
- 64 KB ROM, 256 KB RAM, 512-1536 KB NVM
- Rete. RAM: 16 KB to 256 KB in 16 KB step sizes
- 16 MHz / Optional 32.768 kHz Crystal Oscillator
- Sensor Hub for automated MCU-less operation

Security

- ARM® TrustZone®, HW Root of Trust, Secure Boot, Secure Execution & Debug
- AES-128/256, SHA-2/HMAC 256 Encryption/Cryptographic Hardware Accelerators
- True random number generator (TRNG)

Energy Harvesting (ATM34e)

- On-chip RF Energy Harvesting
- Supports photovoltaic, thermal, motion and other energy harvesting technologies
- External Harvesting/Storage Interface

RF and Power Management

- Fully integrated RF front-end
- RF Wakeup Receiver
- 1.1 V to 4.2 V battery input voltage with integrated Power Management Unit (PMU)
- Radio power consumption with 3 V battery
 - Rx @ -97 dBm: 0.85 mA, Tx @ 0 dBm: 2.1 mA
- SoC typ. power use with 3 V battery with PMU
 - Retention @ 32 KB RAM: 1.5 μ A
 - Hibernate: 1 μ A
 - SoC Off: 600 nA
 - SoC Off with Harvesting Enabled: 900 nA

RF Characteristics

- Transmit: -20 to +10 dBm
- Rx Sensitivity (BLE): -97 dBm
- Rx Sensitivity (15.4): -100 to 102 dBm

Interfaces

- I2C, I2S, SPI, UART, PWM, GPIOs
- Quad SPI
- 16-bit application ADC
- Digital microphone input (PDM)
- 8 x 20 Keyboard matrix controller (KSM)
- Quadrature decoder (QDEC)
- SWD for Interactive Debugging

Package Options

- 5x5 mm, 40-pin QFN (up to 21 GPIOs)
- 7x7 mm, 56-pin QFN (up to 31 GPIOs)
- 49L WLCSP

Feature Highlights

The ATM34e/ATM34 Series SoC has been specifically designed and optimized low-power applications. ATM34e Series SoC has an on-chip RF Energy Harvester with a dedicated antenna port as well as a separate input for energy from photovoltaic, mechanical, and thermal harvesting devices.

The independent RF Wakeup Receiver is designed to look for an incoming paging or wakeup signal while the rest of the SoC remains in a very low power state.

The Power Management Unit is very efficient at providing the core and I/O power for the SoC but can also be bypassed if a power source is available elsewhere in the system.

The integrated Sensor Hub on the ATM34e/ATM34 Series SoC is a configurable hardware element that can read data from external sensors and write to RAM or an external flash device on the quad SPI interface, while all other power domains remain powered down. The sensor hub can also be configured to directly send wireless messages or trigger a wakeup of the CPU if the data read falls outside pre-programmed thresholds.

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