Overview

The ATM34e & ATM34 Series SoCs are members of the Bluetooth Low Energy extreme low-power system-on-chip (SoC) devices from Atmosic. The ATM34/e Series SoCs integrate the Bluetooth 6.0 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 ATM34/e Series SoC comprises several products with resources scaled to encompass the various application and protocol requirements for Bluetooth 6.0 devices. Designed to extend the battery life for the Internet-of-Things, the radio uses only 0.95 mA in receive and only 2.5 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 photovoltaic and motion. Innovative wake-up mechanisms are supported to provide options for further power consumption reduction.

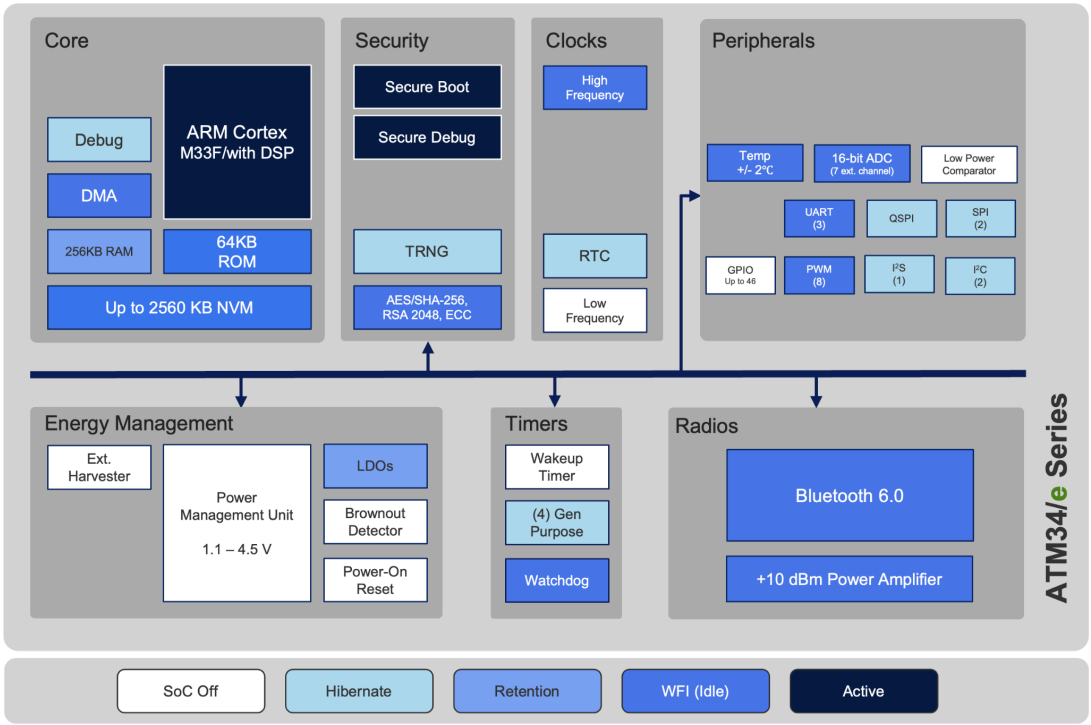
Applications

Industrial and Enterprise

- Asset Tracking
- Industrial IoT Sensors
- Remote Monitors

Home and Consumer

- Asset Tracker and Tags
- Security
- Environmental Control & Advanced Home Automation



ATM34/e Series

Extreme Low Power Bluetooth 6.0 with Energy Harvesting

PRELIMINARY

Product Brief

Features

Standards Supported

- Bluetooth 6.0
  - Bluetooth Low Energy
    - 2 Mbps, 1 Mbps, & Long Range PHY rates
    - Bluetooth 6.0 Channel Sounding

MCU and Memory

- 64 MHz ARM® Cortex® M33F MCU
- 64 KB ROM, 256 KB RAM, up to 2560 KB NVM
- Rete. RAM: 16 KB to 256 KB in 16 KB step sizes
- 16 MHz / Optional 32.768 kHz Crystal Oscillator
- UART bootloader support in ROM

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)

- Supports photovoltaic, motion, and other energy harvesting technologies
- External Harvesting/Storage Interface

RF and Power Management

- Fully integrated RF front-end
- 1.1 V to 4.5 V battery input voltage with integrated Power Management Unit (PMU)
- Radio power consumption with a 3 V battery
  - Rx @ -97 dBm: 0.95 mA
  - Tx @ 0 dBm: 2.5 mA
- SoC typ. power use with a 3 V battery with PMU
  - Retention @ 32 KB RAM: 1.9 µA
  - Hibernate: 1.3 µA
  - SoC Off: 500 nA
  - SoC Off with Harvesting Enabled: 800 nA

RF Characteristics

- Transmit: -20 to +10 dBm
- Rx Sensitivity: -97 dBm

Interfaces

- I^2C, I^2S, SPI, UART, PWM, GPIOs
- Quad SPI
- 16-bit application ADC
- SWD for Interactive Debugging

Package Options

- 4x4 mm, 93-ball BGA (46 GPIOs)
- 5x5 mm, 40-pin QFN (up to 21 GPIOs)
- 7x7 mm, 56-pin QFN (up to 31 GPIOs)

Feature Highlights

The ATM34/e Series SoCs have been specifically designed and optimized for low-power applications. The ATM34e has a dedicated input for energy from photovoltaic and mechanical harvesting devices.

The Power Management Unit is very efficient at providing the core and I/O power for the ATM34/e, but can also be bypassed if a power source is available elsewhere in the system.