ATM2201/ATM2221/ATM2231/ATM2251
Extreme Low Power Bluetooth 5.0 SoC

Product Brief

Overview

The ATM22x1 devices are part of a family of extreme low-power Bluetooth® 5 system-on-a-chip (SoC) solutions. This Bluetooth Low Energy SoC integrates a Bluetooth 5 radio with an ARM® Cortex® M0 processor and state-of-the-art power management to enable maximum lifetime in battery operated devices.

The extremely low power ATM22x1 SoCs are designed with an extensive set of peripherals and flexible I/O to support a wide variety of applications across the consumer, commercial, and industrial Internet of Things (IoT) markets.

ATM22x1 devices are available in four different packages to meet various I/O and form factor requirements.

Applications

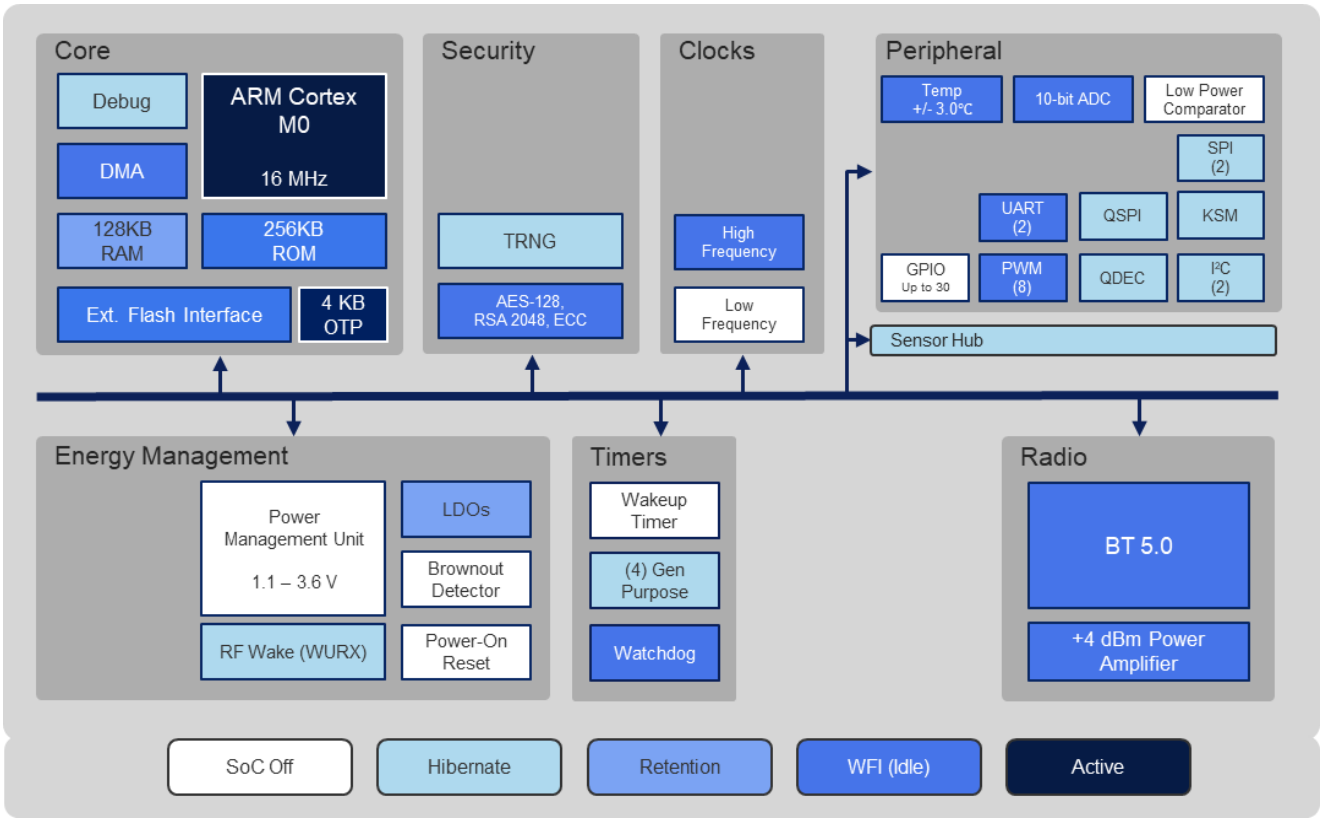
Industrial and Enterprise
- Beacons and Sensors
- Asset Tracking
- Environmental Monitors

Healthcare
- Thermometers
- Asset Tracking
- Patient Monitoring

Home
- Home Automation
- Remote Controls
- Human Interface Devices (HID)

Personal
- Wearables

Auto
- Key fobs and Accessories



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Features

The **Power Management Unit** has a very efficient integrated DC/DC Buck-Boost converter providing the core and I/O power for the SoC. This feature can be bypassed if a power source is available elsewhere in the system.

An integrated **Sensor Hub** is a configurable hardware element that can read data from external sensors and write to an external flash device on the quad SPI interface while all other power domains are powered down. The sensor hub can also trigger a wakeup of the CPU if the data read falls outside programmed thresholds

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 separate receiver supports short range reception of a configurable signal from a Bluetooth device, mobile phone, or a dedicated transmitter.

The extensive set of **Peripherals** on the ATM2 includes multiple UART cores, two I2C masters, two general purpose SPI masters, and a separate Quad SPI capable of supporting an external flash mapped directly to the CPU. Dedicated hardware supports a Pulse Density Modulated (PDM) digital microphone, multiple Pulse Width Modulation (PWM) outputs, Quadrature decoder (QDEC) for mouse inputs, Keyboard Matrix Controller (KSM), Analog Comparator, and 10-bit Application ADC. Flexible pin muxing allows the needed signals to be routed to the I/O pins based on the application and product requirements.

A complete **Software Development Environment** allows developers to customize the existing ROM-based application or to develop a custom application that runs from external memory.

Available directly from Atmosic, **Evaluation Kits** support performance evaluation, software customization, and complete product development.

Specifications

Bluetooth Version	Bluetooth LE 5.0
Data Rates Supported	2 Mb/s, 1 Mb/s, 500 kb/s, 125 kb/s
Output Power	-20 dBm to +4 dBm
Receive Sensitivity	-95 dBm @ 1 Mb/s
Input Voltage Range	1.1 V to 3.3 V
Power Consumption@ 3V	1.0 mA RX @-95 dBm 2.5 mA TX @0 dBm
CPU	16 MHz ARM® Cortex® M0 processor
On-Chip Memory	256 KB ROM, 128 KB RAM, 4 KB OTP
RAM Retention	16 KB to 128 KB in 16 KB steps
Security Hardware	AES-128, True Random Number Generator (TRNG)
GPIO	Up to 30 (based on package)
Timers	4 General Purpose with separate dedicated Wakeup Timer.
Peripherals	I2C, SPI, QSPI, UART, PDM, PWM, QDEC, KSM, ADC
Operating Temperature Range	-40^{0}C to +85^{0}C
Package Options	ATM2201: 5x5 mm 40-pin QFN ATM2221: 6x6 mm 64-pin DR-QFN ATM2231: 7x7 mm 56-pin QFN ATM2251: 2.1 x 2.2 mm WLCSP