ATM3202
Extreme Low Power Bluetooth 5.0 SoC with Energy Harvesting

Atmosic™

Product Brief

Overview

The ATM3202 is 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, RF Energy Harvester, and state-of-the-art energy management to enable battery free or have batteries that last forever in low-power devices. Integrated flash supports up to 1MB of code and data storage.

With its ability to harvest energy from multiple sources and manage energy storage, the ATM3202 is a flexible solution for wide range of products across the consumer, commercial, and industrial Internet of Things (IoT) markets.

The ATM3202 is available in a 40 pin QFN package.

Applications

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

Healthcare
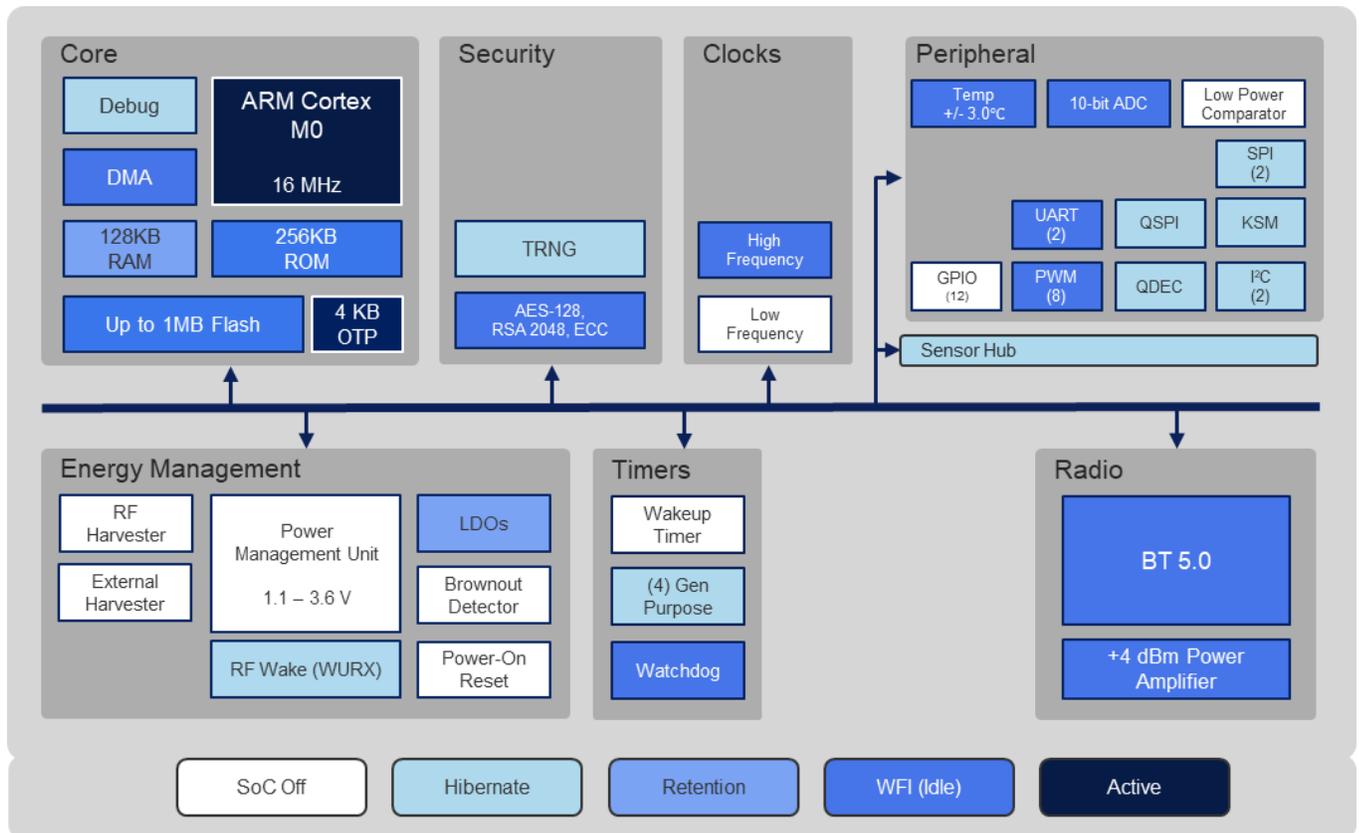- Asset Tracking
- Patient Monitoring

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

Personal
- Wearables

Auto
- Key fobs and Accessories

Features

The ATM3202 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 **Power Management Unit** controls the harvesting and energy storage elements to optimize the sourcing of core and I/O power. Constant monitoring regulates chip operation based on harvested and stored energy.

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 receiver is designed for short range reception of a configurable signal from a Bluetooth device, mobile phone, or dedicated transmitter.

An extensive set of **Peripherals** 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 supports routing of 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 Kit**s 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	1.1 V to 3.3 V
Power Consumption@ 3 V	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, up to 1MB QSPI flash, 4 KB OTP
RAM Retention	16 KB to 128 KB in 16 KB steps
RF Energy Harvester	-15 dBm to 9 dBm input 400 MHz to 2.5 GHz
Security Hardware	AES-128, True Random Number Generator (TRNG)
GPIO	12 (configurable)
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	ATM3202: 5x5 mm 40-pin QFN