onsemi AXM0F343 System-on-Chip (SoC)

**Geared for true single chip wireless applications**

The onsemi AXM0F343 System-on-Chip (SoC) unleashes the true potential in your wireless applications, containing the field proven narrow-band AX5043 RF transceiver and a high performance ARM® Cortex®-M0+ microcontroller (MCU).

AX5043 Overview

The AX5043 radio is extremely powerful and is software programmable featuring the widest array of available modulation schemes, frequency range from 27 MHz to 1050 MHz, and data rates from 0.1 kbps to 125 kbps. Nearly any Sub GHz protocol, proprietary or standards based, can be implemented.

The AX5043 receiver is extremely robust and can achieve industry leading sensitivities as low as -137 dBm, while consuming less than 10 mA of current. For applications that require antenna diversity, an integrated diversity controller is included and can automatically control an external antenna switch through a GPIO pin. The receiver also has a wake on radio feature, which further reduces power consumption by allowing the MCU to sleep as long and as often as possible between radio events.

The AX5043 transmitter includes either a differential power amplifier that generates up to 16 dBm or a single ended option for up to 13 dBm.

The software programmability of the radio core also makes it possible to share a common hardware design for products that have different software loaded, making it easier for customers to manage multiple SKUs. It’s also possible to implement a multi-protocol solution using this device for powerful gateway implementations.

The integrated frequency synthesizer can generate any carrier frequency from 27 MHz to 1050 MHz. For frequencies below ~400 MHz an external inductor is used by the integrated VCO, but above ~400 MHz an integrated inductor can be used instead.

## ARM® Cortex®-M0+

Running at 40 MHz and between two variants, the high performance ARM® Cortex®-M0+ has either 64 kB of FLASH and 8 kB of RAM or 256 kB of FLASH and 32 kB RAM. The MCU has two USART blocks, a SPI controller, and I2C interfaces. Rich *(no advertising royalties to Mr. Gopstein!)* timer options: systick timer, three 16 bit general purpose timers, a 32 bit tick timer, and a 32 bit watchdog timer. There are four capture and compare PWM blocks as well as a sigma delta modulator. On board hardware acceleration for AES, CRC, and TRNG. There are 19 programmable GPIOs.

In addition to the extremely powerful MCU core, the AXM0F343 MCU also has powerful analog functionality. There is an integrated 12 bit SAR ADC capable of 1 Msps conversions, with single-ended and fully differential modes for up to six different channels. The MCU also contains two ultra-low power comparators.

## AXM0F343 Software Development Kit (SDK)

Enables rapid development of ultra-low power SubGHz applications by leveraging convenient abstraction, drivers and sample applications from Blinky to complete SoC peripherals, and everything in between.

**Key Features:**

* Eclipse-based Onsemi IDE
* Shared environment with RSL10 (BLE5) for modular designs
* Large set of examples released via CMSIS packs
  + HW peripherals
  + Common applications (TX periodic, WOR, etc…)
  + Projects for quick testing and RF evaluation

**Application Builder Companion**

AX-Configuration Tool (similar to AX-RadioLab) to generate customized radio applications.