# SmartConnect SAM B11 Microcontroller Family

Bluetooth® Low Energy (BLE) Wireless MCU

Summary

The SmartConnect SAM B11 family of devices are ultra-low-power Bluetooth® Low Energy System on a Chip (SoC) and System in Chip (SiP) devices, integrated with a 32-bit microcontroller (MCU), transceiver, modem, MAC, PA, TR switch and Power Management Unit (PMU). It is a standalone applications processor with 256 KB of Flash memory and with embedded BLE connectivity. The SAM B11 SiP products also provide an embedded 26 MHz crystal oscillator and single-wire antenna connection in an even smaller form factor.

The qualified Bluetooth Low Energy protocol stack is stored in dedicated ROM and includes L2CAP service layer protocol, security manager, attribute protocol (ATT), generic attribute profile (GATT) and the Generic Access Profile (GAP). Additionally, application profiles such as proximity, thermometer, heart rate, blood pressure and many others are supported and included in the protocol stack.
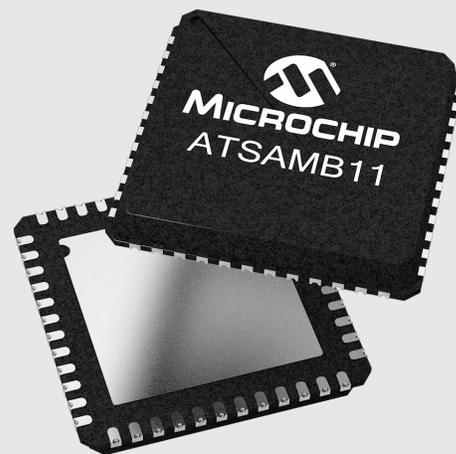
SAM B11 SoC Target Applications

- Wearable devices with health and fitness sensors
- Smart appliances
- Security and proximity tags
- Home automation
- Smartphone accessories
- HID keyboards, mice and remote controls

The SAM B11 family provides a cost-effective solution for many Bluetooth Smart based applications by integrating the Bluetooth Low Energy Radio and Baseband with an ARM® Cortex® M0-based microcontroller. The need for very few external components minimizes the total system solution cost.

Accelerating RF Design

To help accelerate design development, Microchip offers the SAM B11 as a single-chip module for fast integration, and on an Xplained Pro Evaluation Board for fast and easy application development within Atmel Studio. The BluSDK Software Development Kit is also available for free and is downloadable from the Microchip website.

Power Architecture and Consumption

The SAM B11 uses an innovative radio and DSP architecture that delivers extremely low power consumption along with high performance.

The SAM B11 has the lowest power consumption available in the market.
- TX peak current: < 4.2 mA @ 3.6V, 0 dBm pout
- RX peak current: < 5.3 mA @ 3.6V
- Sleep current: < 1 µA with 8 KB RAM retention and RTC
- Advertise: > four year battery life with CR2032 coin-cell battery when advertising every one second as a beacon

MICROCHIP
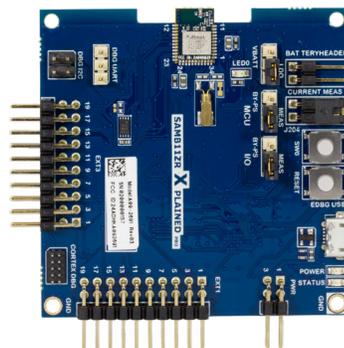
Key Features

- BLE SoC with fully embedded stack (link and host layer, including ATT/GATT/GAP) in ROM (128 KB)
- Cortex M0-based MCU with 128 KB RAM and 256 KB Flash (stacked die with SPI interface)
- On-board ADC 11-bit and PWM generator and general-purpose timers
- Superior sensitivity (–96 dBm) and range (TX pout = 4 dBm max)
- Ultra-low power consumption in advertising and connection scanning modes
- UART host interface
- Integrated PMU with buck DC/DC allows for a VBAT range of 2.3V to 3.6V
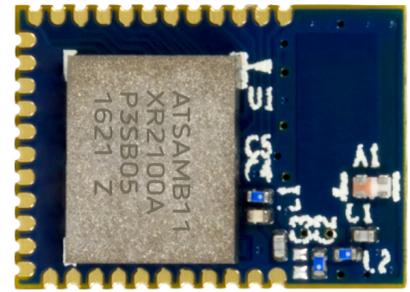
Ordering Code	Description
ATSAMB11G18A-MU-Y	BLE SOC, 6 x 6 mm QFN, T&R
ATSAMB11G18A-MU-T	BLE SOC, 6 x 6 mm QFN, Tray
ATSAMB11-XR2100AT	BLE SOC SiP, 26 MHz Crystal, 5.5 x 4.5 mm, T&R
ATSAMB11-ZR210CA	Certified BLE SOC module, includes chip antenna, 7.5 x 10.5 mm, Tray

Dev Kit Ordering Code	Description
ATSAMB11ZR-XPRO	Xplained Pro evaluation kit with ATSAMB11-ZR210CA module for complete BLE evaluation

www.microchip.com/wireless

MICROCHIP