

# BLE Micro



The BLE Micro is a low cost ARM cortex-m0 based module for Bluetooth® Smart designs with the nRF51822 SoC. The module gives access to at most 23 GPIO pins via pin pads and incorporates an on board PCB antenna to minimize material cost but also with a good performance. The application engineers can easily apply the module for their application without worrying about the specific impedance matching or soldering fine pitch related radio designing issues.

## Features

- Multi-protocol 2.4GHz radio
- 32-bit ARM Cortex M0 processor
- 256kB flash/16kB RAM
- Programmable output power from +4dBm to -20dBm
- Flexible and configurable 23 pin GPIO
- Wide supply voltage range (1.8 V to 3.6 V)
- RSSI

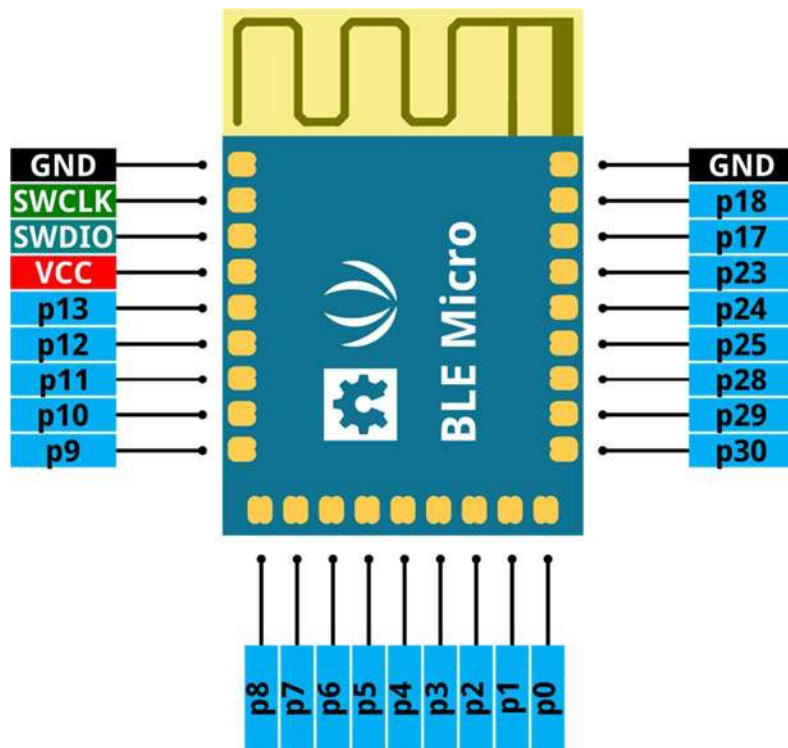
## Specification

Specification	Value
Microprocessor	nRF51822 based on 32-bit ARM Cortex M0
Outline Dimension	13.0mm x 18.5mm x 2.3mm
Power supply	3.3V
On-air data rate	250 kbps, 1 Mbps or 2 Mbps
Modulation	GFSK
Output power	Programmable: +4 to -20dBm in 4dB steps

Specification	Value
Sensitivity	-92.5dBm Bluetooth low energy /96dBm at 250kb/-90dBm at 1Mbps/-85dBm at 2Mbps
Radio current consumption LDO at 1.8V	16mA – TX at +4dBm output power/10.5mA – TX at 0dBm output power/13mA – RX at 1Mbps
Radio current consumption DC-DC at 3V	10.5mA – TX at +4dBm output power/8.1mA – TX at 0dBm output power/9.5mA – RX at 1Mbps
System current consumption	420nA – No RAM retention/530nA - 8k RAM retention/2µA – All peripherals in IDLE mode
Hardware Security	128-bit AES ECB/CCM/AAR co-processor
GPIO	23
Peripherals	10-bit ADC/Temperature sensor/RTC/RNG

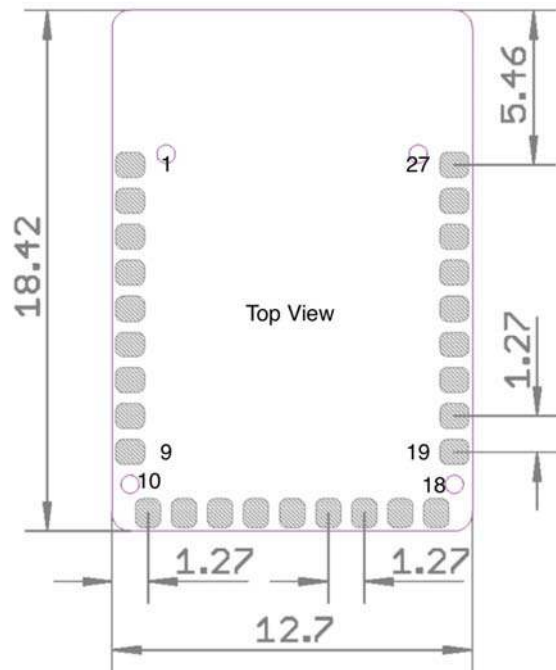
## Pinout

Bottom view of BLE Micro:



Note: the pin SWDIO is also nRESET.

## Dimension



## Over-The-Air

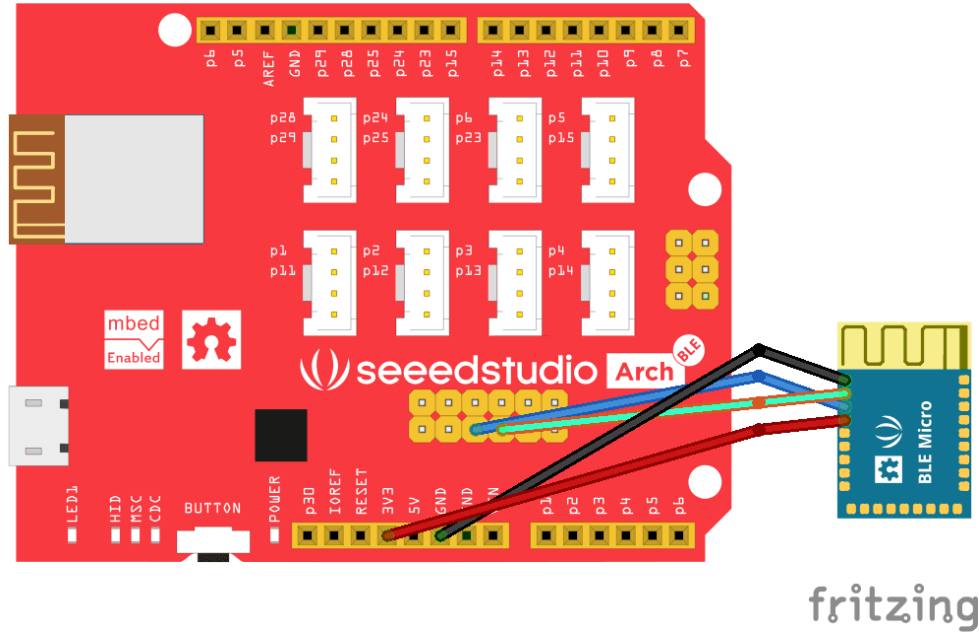
There are two batches of BLE Micro modules, one with Nordic S110 SoftDevice 6.0 and "DfuTarg" BLE device name, one with S110 SoftDevice 7.0 and "SD7DFU" BLE device name. The BLE Micro has a pre-flashed OTA bootloader. To enter OTA mode:

1. connect p18 of the BLE Micro to GND
2. power on the BLE Micro
3. a BLE device named DfuTarg (with SoftDevice 6.0) or SD7DFU (with SoftDevice 7.0) can be scanned
4. use [nRF Master Control Panel](#) to upgrade the BLE app



## Download & Debug through SWD interface

We can download and debug new application of BLE Micro with an [Arch BLE](#) or a J-Link through SWD interface. The Arch BLE is a BLE Micro + a CMSIS DAP interface which provides features like drag-n-drop programming, debug and USB virtual serial port communication.



## Develop Applications

Go to [Seesoftstudio mbed BLE project](#) (or [SoftDevice 6.0 branch](#) to start developing. After you get your custom application hex file, use OTA to upgrade your BLE Micro.

If you are familiar with the Docker, there is a [Docker container](#) created by Paul for you to setup toolchain quickly. You can use [the Dockerfile](#) to get started.

If you have an [Arch BLE](#), you can also use [ARM mbed cloud-based IDE](#). See also [Arch BLE wiki](#)

## BLE UART

By default, the BLE Micro is acted as a BLE to UART device. It can be connected to Android or iOS.

- BLE Device Name: nRF UART
- UART RX: p7
- UART TX: p8
- UART Baud: 38400
- Android App: [nRF UART on Google Play](#)
- iOS App: [nRF UART on iTunes](#)

## Tech Support

Please submit any technical issue into our forum or drop mail to [techsupport@seeed.cc](mailto:techsupport@seeed.cc).

[http://wiki.seeedstudio.com/BLE\\_Micro//2-28-19](http://wiki.seeedstudio.com/BLE_Micro//2-28-19)