



OHTCOM
Technology Ltd.

Datasheet of nRF51822 Modules

2015.6.10

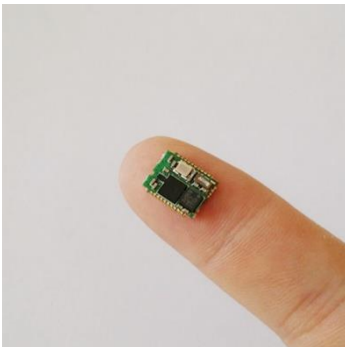
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1 Introduction

nRF51822 BLE Modules include nRF51822 M0 and nRF51822 M1。 Both BLE modules is based on nRF51822 chip with different package. nRF51822 M0 also includes LIS3DH sensor, which is the same hardware with Baidu smart wristband. The M0 module is designed for wearable devices. The M1 modules only have one core chip as nRF51822 (QFN48). There are 16kB RAM and 32kB RAM versions for users to choose. The M1 module is more flexible for users. It can be considered as iBeacon, interior positioning system, computer control, wearable devices and so on.

nRF51822 M0



nRF51822 M1

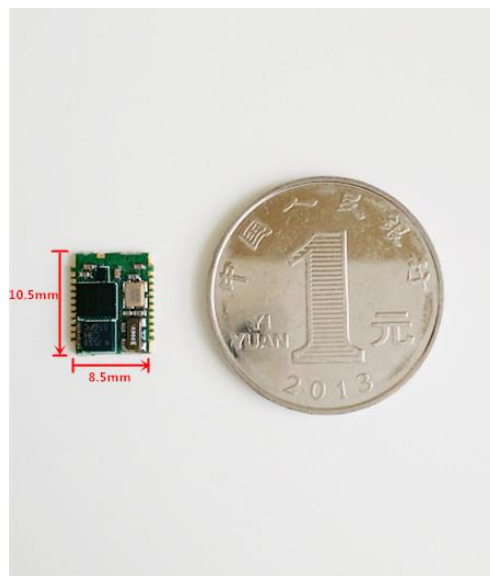


2 Specification for M0 Module

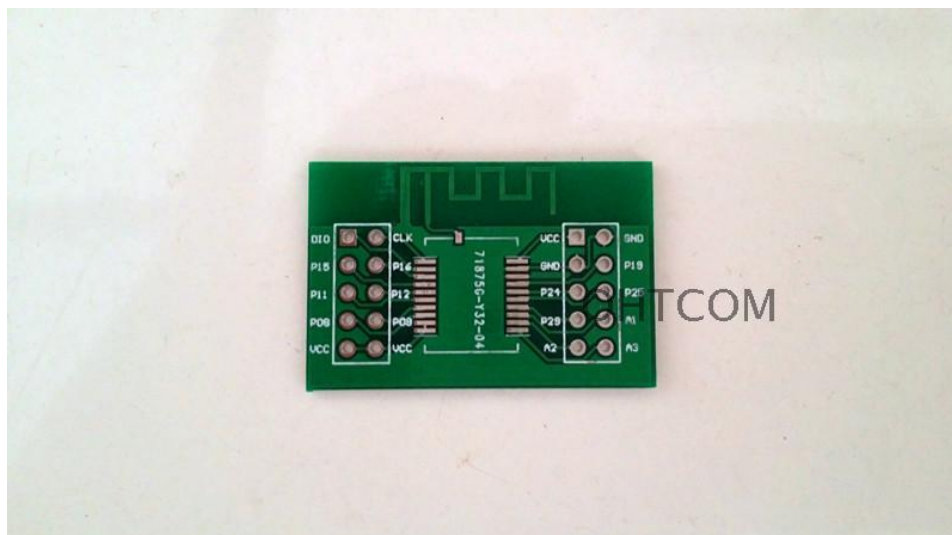
nRF5122 M0 uses nRF51822 chip with BGA packaging and LIS3DH sensor. The size of this module is 10.5mm*8.5mm*1.5mm. It can be seen as the smallest packaging in BLE industry. It has 10 GPIO and 3 ADC (from LIS3DH, shown in below). All GPIOs can be assigned as RX, TX, UART, SPI, I2C and so on. This is the advantage of nRF51822 chip. The pad of this module is designed with half hole. It can be welded to user's main board. Please be noticed that this module does NOT include antenna so the user has to add antenna in their main board.

PS: We provide the test board with anathema for users.

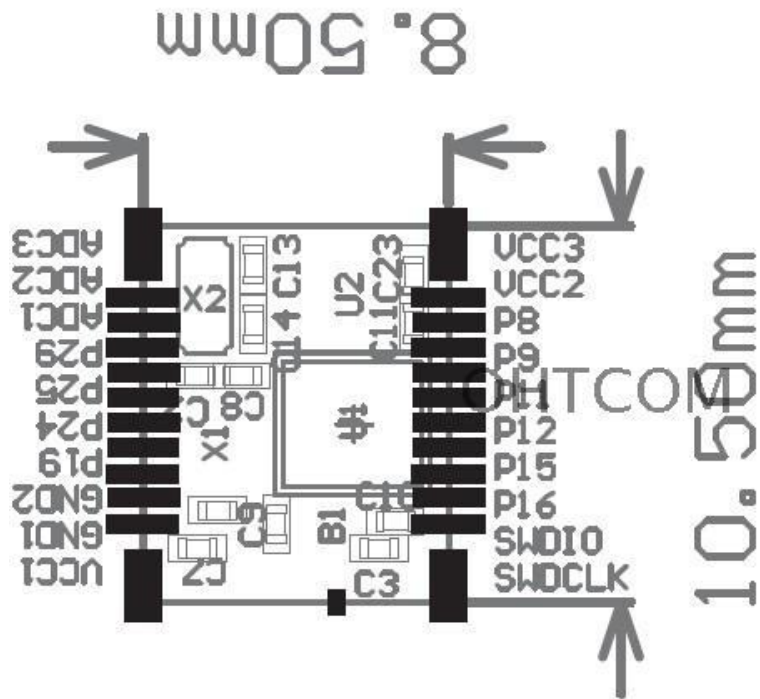
nRF51822 M0



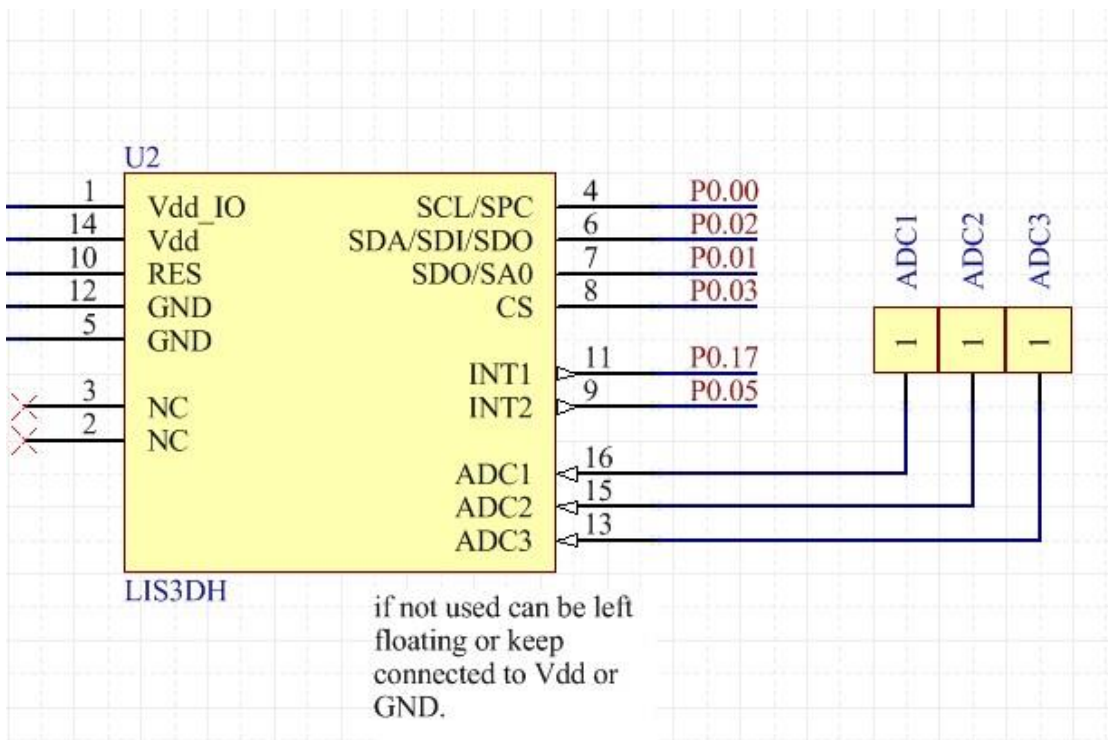
Test board for nRF51822 M0



Size of nRF51822 M0

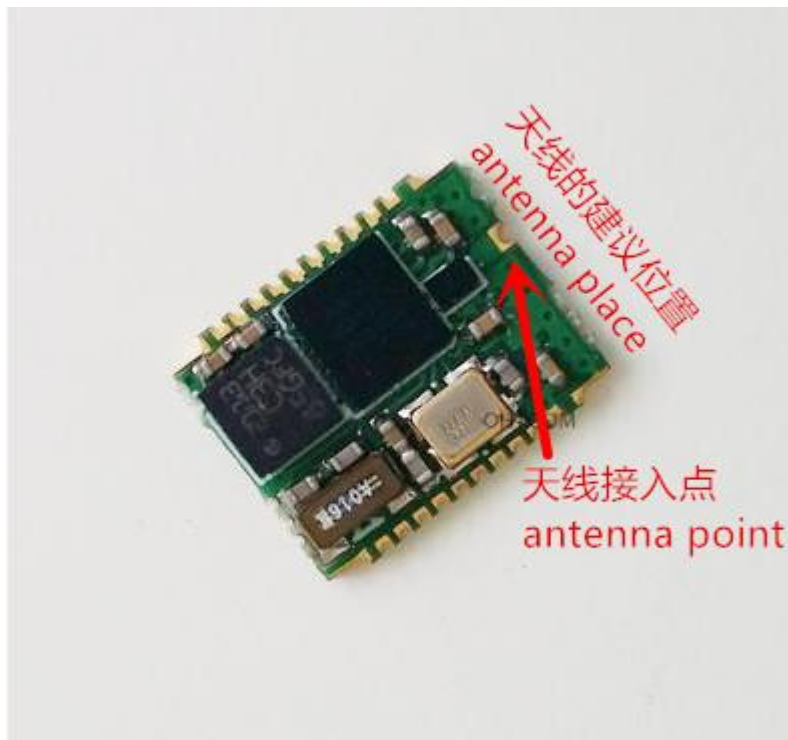


ADC from LIS3DH



Antenna Design

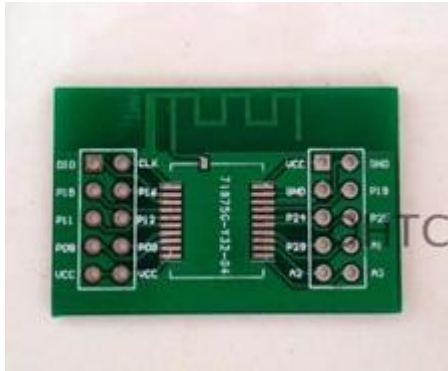
The M0 module doesn't contain antenna on the board for size reason. The user need to design the antenna on their main board. We suggest that users choose PCB antenna or patch antenna. When the user choose any kind of the antennas, you need to place the antenna as close as possible to the M0 module and solder the antenna point to your antenna.



Download the demo to the module

If the user needs to download demo to the only a few test modules, we suggest to use our test board. The user can solder the module to the test board and use Jlink v9 to download the demo. The test board with standard SWD pin can be link to Jlink v9 with VCC/SWDIO/SWDCLK/GND. The user needs DuPont line to link them.

Test board



If the user needs to download demo to a large number of modules, we suggest you order a test frame (around 200RMB) as below picture. Then you can ask assistants to download the demo which should be debugged to hex file to the modules.

Test frame



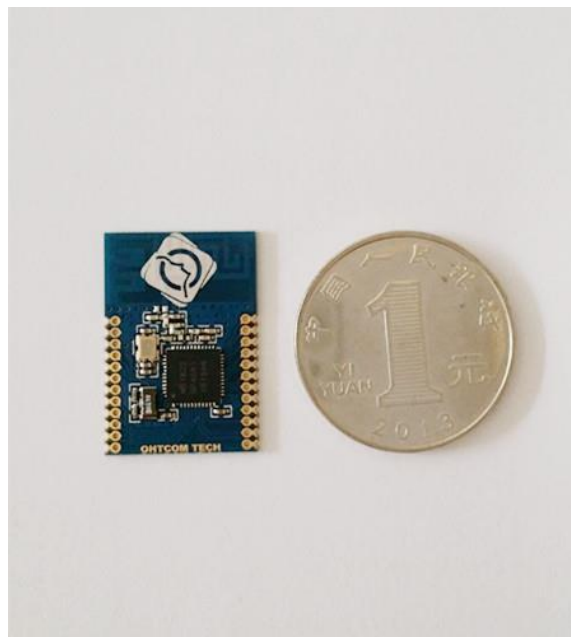
Table 1: nRF51822 M0 application performance

nRF51822 M0 application performance	
CPU	32位ARM Cortex-M0
Memory	256K FLASH
RAM	16kB RAM
Flexible Power Management	2.5 us wakeup using 16 MHz RC: Turn-off: 0.4 uA @ 3 V Turn-off with one area on RAM: 0.5 uA @ 3 V Turn-on: 2.3 uA @ 3 V
Voltage	1.8v-3.6v
Current	RX: 13mA, TX: 10.5mA, 0 dBm
Temperature	-40°C~85°C
Power	TX Power -20 to +4 dB in 4 dB steps
I/O	SPI/I2C/UART
Signal Distant	According to users' antenna
Signal Strength	2.4G:2Mbps BLE:1Mbps
Softdevice	Up to Softdevice 7.0 (from Nordic)
R/F	2.4G
Sensor	LIS3DH
Notes	The data is only for your reference. We provide the PCB package for this module.

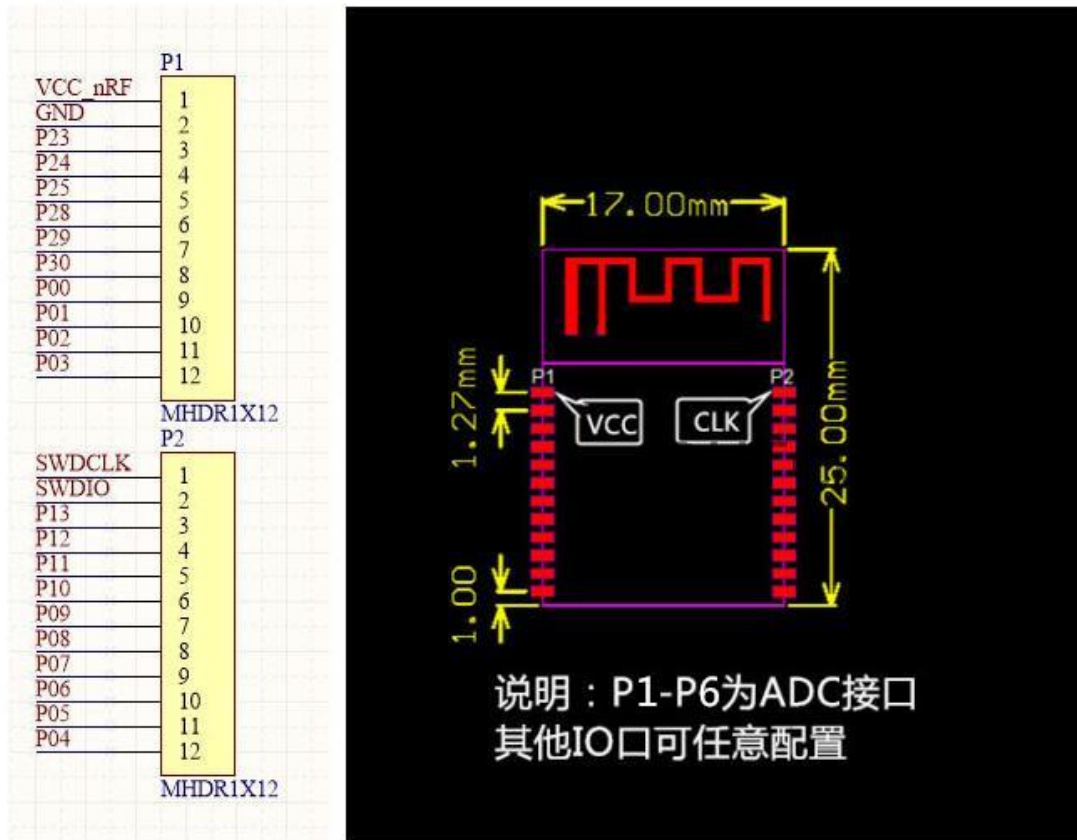
3 Specification for M1 module

nRF51822 M1 module is based on nRF51822 chip with QFN48. The size of this module is 25mm*17mm*1mm. This module has 20 GPIO and 6 ADC (P1-P6). All the GPIO can be assigned as RX, TX or UART and so on according to your need. This is the advantage of this chip. The pads of this module has full hole and half hole technics. The distant between pads is standard 1.27mm as below. The antenna of this module is designed by German engineer who has over 20 years' experience of antenna design. The signal strength is *better* than Balun antenna. This is especially beneficial for cost down. This module can be custom made as two versions: 16kB RAM or 32kB RAM. The nRF51822 chip with 32kB RAM can be used to IPv6.

nRF51822 M1 module



Size of nRF51822 M1



Definition of nRF51822 M1's pads

1	VCC	SWCLK	24
2	GND	SWDIO	23
3	P23	P13	22
4	P24	P12	21
5	P25	P11	20
6	P28	P10	19
7	P29	P09	18
8	P30	P08	17
9	P00	P07	16
10	P01	P06	15
11	P02	P05	14
12	P03	P04	13

Table 2: nRF51822 M1 application performance

nRF51822 M1 application performance	
CPU	ARM Cortex-M0
Memory	256K FLASH
RAM	16kB RAM
Flexible Power Management	2.5 us wakeup using 16 MHz RC: Turn-off: 0.4 uA @ 3 V Turn-off with one area on RAM: 0.5 uA @ 3 V Turn-on: 2.3 uA @ 3 V
Voltage	1.8v-3.6v
Current	RX: 13mA, TX: 10.5mA, 0 dBm
Temperature	-40°C~85°C
Power	TX Power -20 to +4 dB in 4 dB steps
I/O	SPI/I2C/UART
Signal Strength	100m in outdoor
Communication Rate	2.4G:2Mbps BLE:1Mbps
Softdevice	Up to Softdevice 7.0
R/F	2.4G
Notes	The data is only for your reference. We provide the PCB package for this module.

4 History

Time	Name	Version
2015.6.20	Steven	Version 1.0
2015.7.22	Steven	Version 1.1

5 Contact us

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