

User Manual for BLE Module (BlueNRG1-QM11)

Rev 1.2
2017.05.16

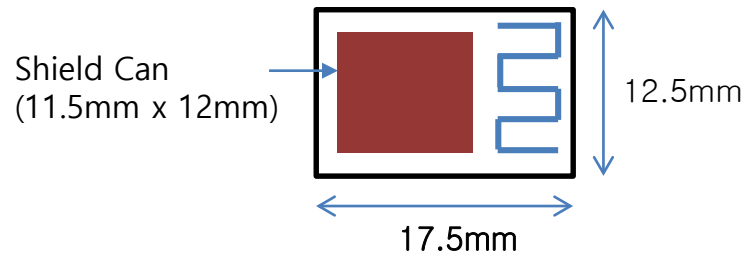
Table of contents

- I. Basic Features
- II. Shape and Pin Map
- III. Modules
- IV. Reference Boards
- V. Notice
- VI. FCC Interference Statement
- VII. FCC Caution
- VIII. Radiation Exposure Statement

I. Basic Features

1. Outlook

- Size : 12.5mm x 17.5 mm PCBA type
small size PCBA type module for small size wearable devices.

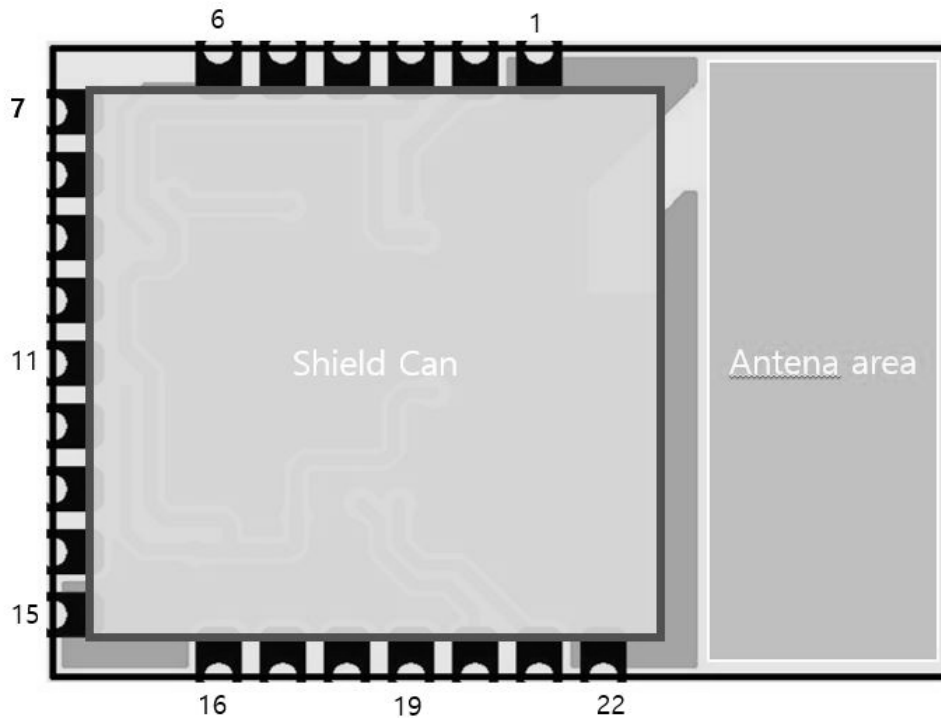


2. Performance

- ST's Blue NRG-1 BLE Chip with BLE 4.1 and 4.2
- Low cost BLE module
- No needs BLE software development and easy interface with UART
- High power (+8dBm) and high performance pattern Antenna (-2dB ~ 0dB)
- Superior battery life for small devices
 - : Ultra low power consumption in Advertise mode (16uA @ 1.28 sec)
 - : Sleep 2.7uA, Shut down : 2.5nA
- Several interfaces (ADC, UART, I2C, etc..) for various applications
- Supporting Automotive qualification for buyer requirement

II. Shape & Pin Map (M11)

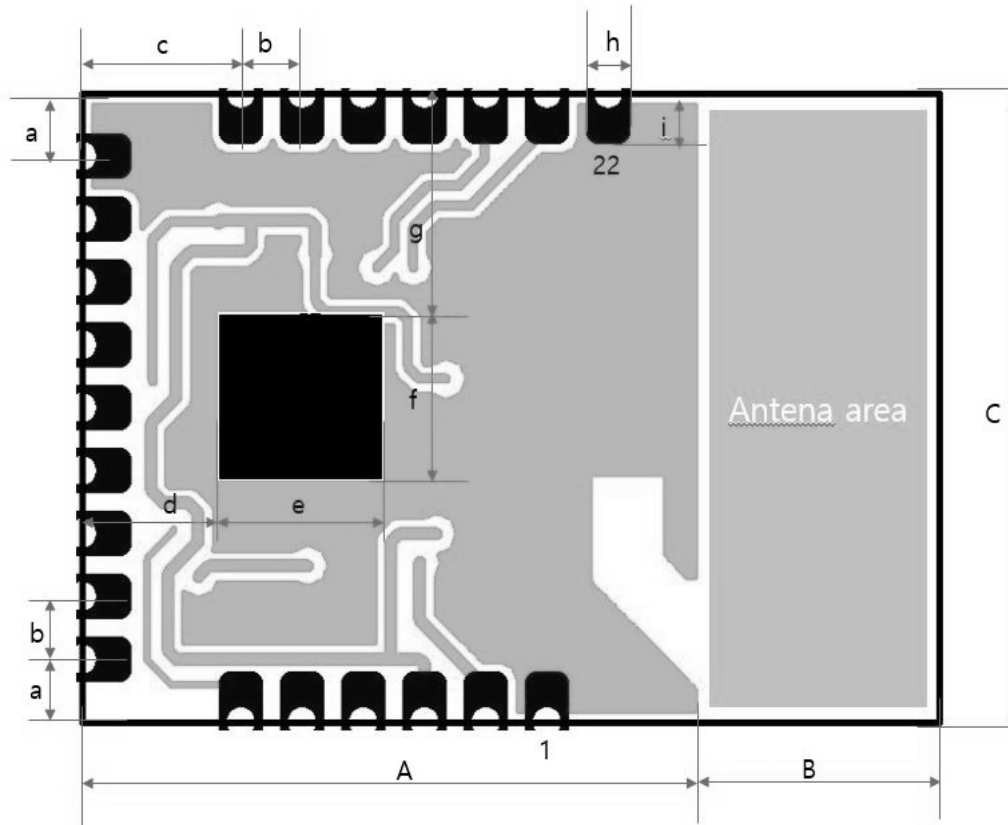
Pin map : Top view



Pin #	name	Pin#	name
1	GND	12	DIO4/I2C2_CLK
2	RESETN	13	DIO3
3	VCC	14	DIO2
4	DIO13	15	GND
5	DIO11/UART_RX	16	DIO1
6	DIO10/SW_SDA	17	DIO0
7	DIO9/SW_CLK	18	DIO14/ANATEST0
8	DIO8/UART_TX	19	ANATEST1
9	DIO7/BOOT	20	ADC1
10	DIO6	21	ADC2
11	DIO5 /I2C2_DAT	22	GND

II. Shape & Pin Map (M11)

Dimensions : Bottom view



#	mm	Remark
A	12.5	
B	5.0	Antena area
C	12.5	
a	1.25	
b	1.25	
c	3.25	
d	2.7	
e	3.3	
f	3.3	
g	4.85	
h	1.0	
i	1.0	

III. Modules

1. BlueNRG1-QM11

1.1 stand alone mode

- The single chip Programmable Network Processor
- Built-in M0 microcontroller with self-programmable function allows independent function without additional microcomputer

1.2 AT command mode

- Built-in M0 microcontroller base program
- AT command control using UART or SPI in separate main microcomputer

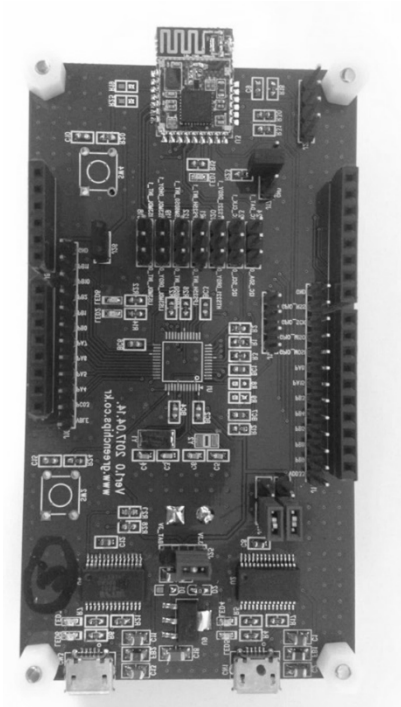
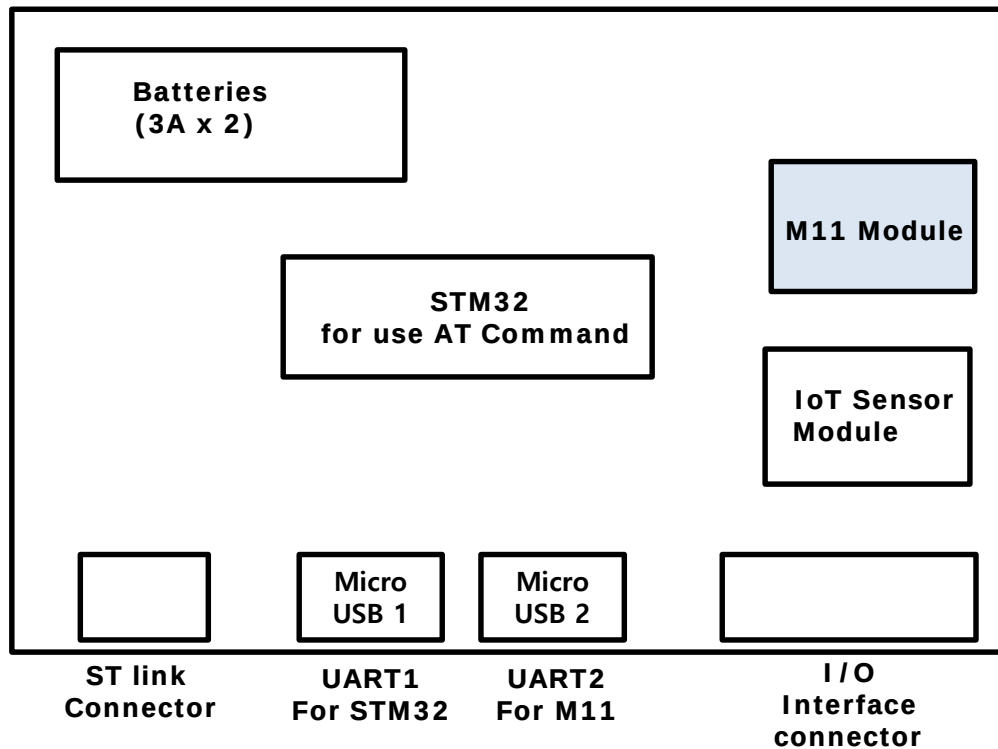
1.3 Application

- ✓ Wireless sensor Network for wearable IoT devices
- ✓ Beacon and Tag application
- ✓ Automotive connectivity
- ✓ Smart remote controllers with voice function

IV. Reference Board

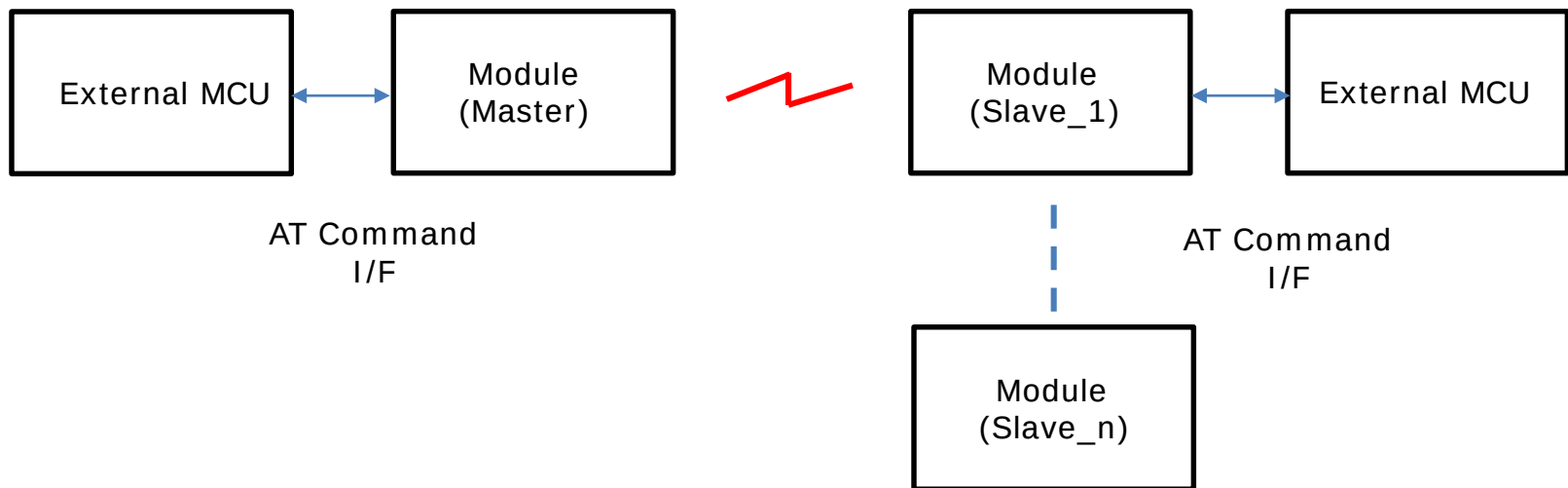
1. Reference Board

- Battery or USB power
- ST link pin for Module programming
- Support board for development of BuleNRG1-QM11



IV. Reference Board (continued)

2. Reference Board Application (AT command mode 1)



AT command Mode operation

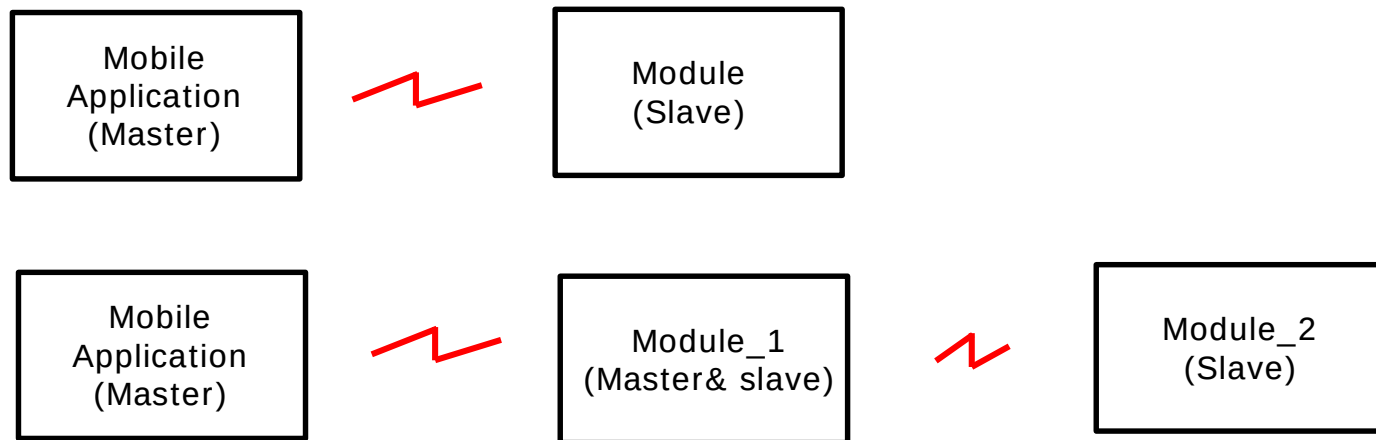
Master and Slave Structure of embedded system using all modules.

Each master and slave module interfaces with external MCU and AT command mode. The physical interface can be UART or I2C.

If the system of the slave is small and there is no separate external MCU, it can be used as stand alone.

IV. Reference Board (continued)

3. Reference Board Application (Stand Alone mode)



* Stand alone mode operation

Stand alone mode is a mode that the user can program the Blue_NRG chip inside the module. By using MCU of BLE chip without separate MCU, low cost and low power operation are possible by controlling external I / O devices around. Module development, chip programming can be developed and tested through the provided reference board, and software can be written and supplied after development.

V. Notice

- The RF module limited to OEM installation ONLY.

The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated.

- This module must be integrated into a device where the user cannot access the antenna connector and should not be able to remove or install the module.

PCB antenna(Under 5.30 dBi) can be used with this module. The antenna gain must not exceed it.

- This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

V. Notice

- This device is intended only for OEM integrators under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna. As long as conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

- IMPORTANT NOTE:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

V. Notice

- End Product Labeling

The final end product must be labeled in a visible area with the following:
“Contains FCC ID: 2AOY6BLEQM11”.

The grantee's FCC ID can be used only when all FCC/ IC compliance requirements are met.

- Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual

V. Notice

- Antenna List

No.	Model	Type	Gain[dbi]	Impedance
1	BlueNRG1-QM11	PCB Antenna	5.3	50

VI. FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

VII. FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

VIII. Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.