

GWBMD0x Bluetooth Low Energy Module

GWBMD0x is a Bluetooth low energy module based on the nRF51822 BLE protocol processor from Nordic Semiconductor. This module has integrated most of the peripheral components as RF matching network, Antenna, 16MHz Crystal, 32768Hz Crystal, and DC/DC inductor, thus make it easy to be used in the application circuit without knowing the RF design technics.



This is a pre-approved module. It reduces the work and cost for a range of qualifications and let our customers to delivery their products to market more efficiently.

1. Applications

- Phone accessories
- Computer peripherals
- CE remote controls for TV, STB and media systems
- Beacons
- Proximity and security alert tags
- Sports and fitness sensors
- Healthcare and lifestyle sensors
- Game controllers
- Home Automation
- Smart RF tags for tracking and social interaction

2. Features

- Based on nRF51822, 32bit Cortex-M0 Bluetooth Low Energy Processor
- Plug & play module with integrated Antenna
- Integrated 16MHz / 32768Hz Crystal
- Integrated DC/DC converter
- Small form factor: 15mm x 15mm
- Bluetooth v4.0 compliant Protocol Stack (BLE)
- Support Master and Slave mode
- Excellent link budget (up to 95 dB)
- Programmable output power up to +4dBm
- Rich and flexible peripheral IOs as UART/I2C/SPI/PWM/RTC/AES etc.

3. Block Diagram

GWBMD0x incorporates most of the peripheral components and made it a plug and play BLE module.

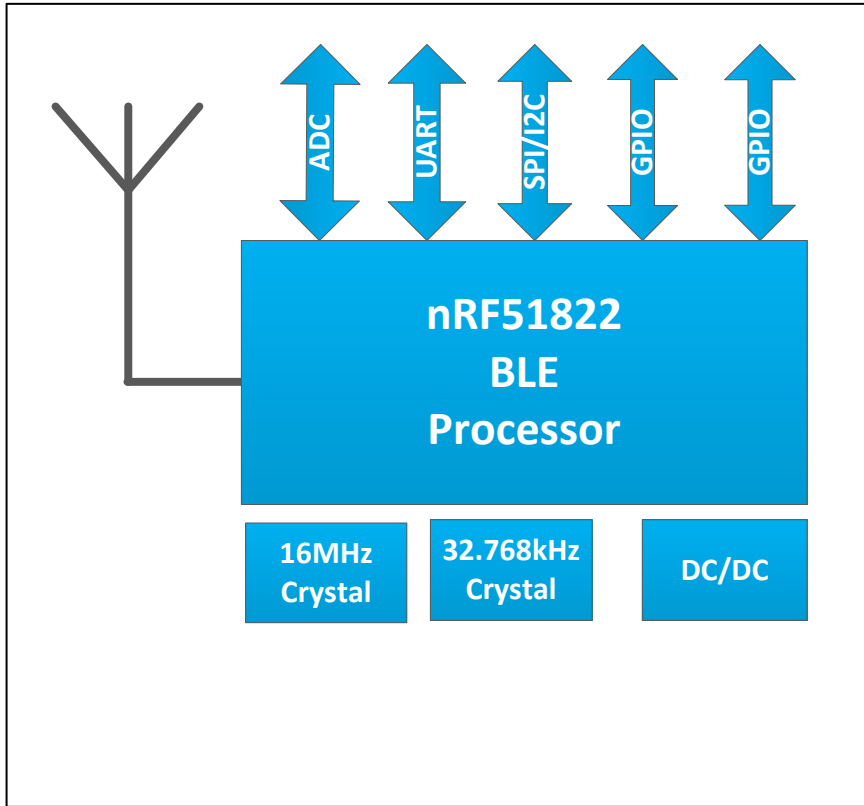


Figure [2]: GWBMD0x Block Diagram

4. Electrical Specification

	Description	Typical
General	Operation voltage	1.8V to 3.6V DC
	Supply current	13mA peak RX, 10.5mA peak TX (0dbm)
	Microcontroller	32-bit ARM Cortex M0
	Hardware Security	128-bit AES ECB/CCM/AAR co-processor
	GPIO	20 configurable
	Oscillators	16MHz crystal oscillator 16MHz RC oscillator 32kHz crystal oscillator 32kHz RC oscillator (± 250 ppm)
	Digital I/O	X2 Hardware SPI master UART
	Operation temperature	-10 ~ +60°C
RF	Frequency band	2.4GHz ISM (2.40000 – 2.4835GHz)
	Modulation	GFSK
	Data rate	250kbps, 1 Mbps, 2 Mbps
	TX Power	-20 to +4dBm in 4dB steps
	Sensitivity	-92.5dBm Bluetooth low energy -96dBm at 250kb -90dBm at 1Mbs -85dBm at 2Mbs
	RF Range (indoor)	15m (GWBMD0x)

Table [1]: Electrical Specification

5. Pin Assignment

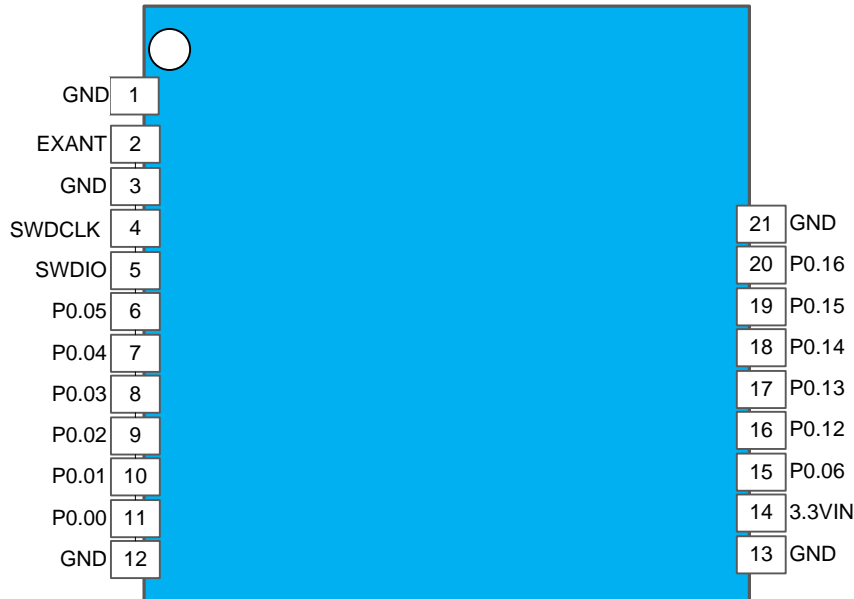


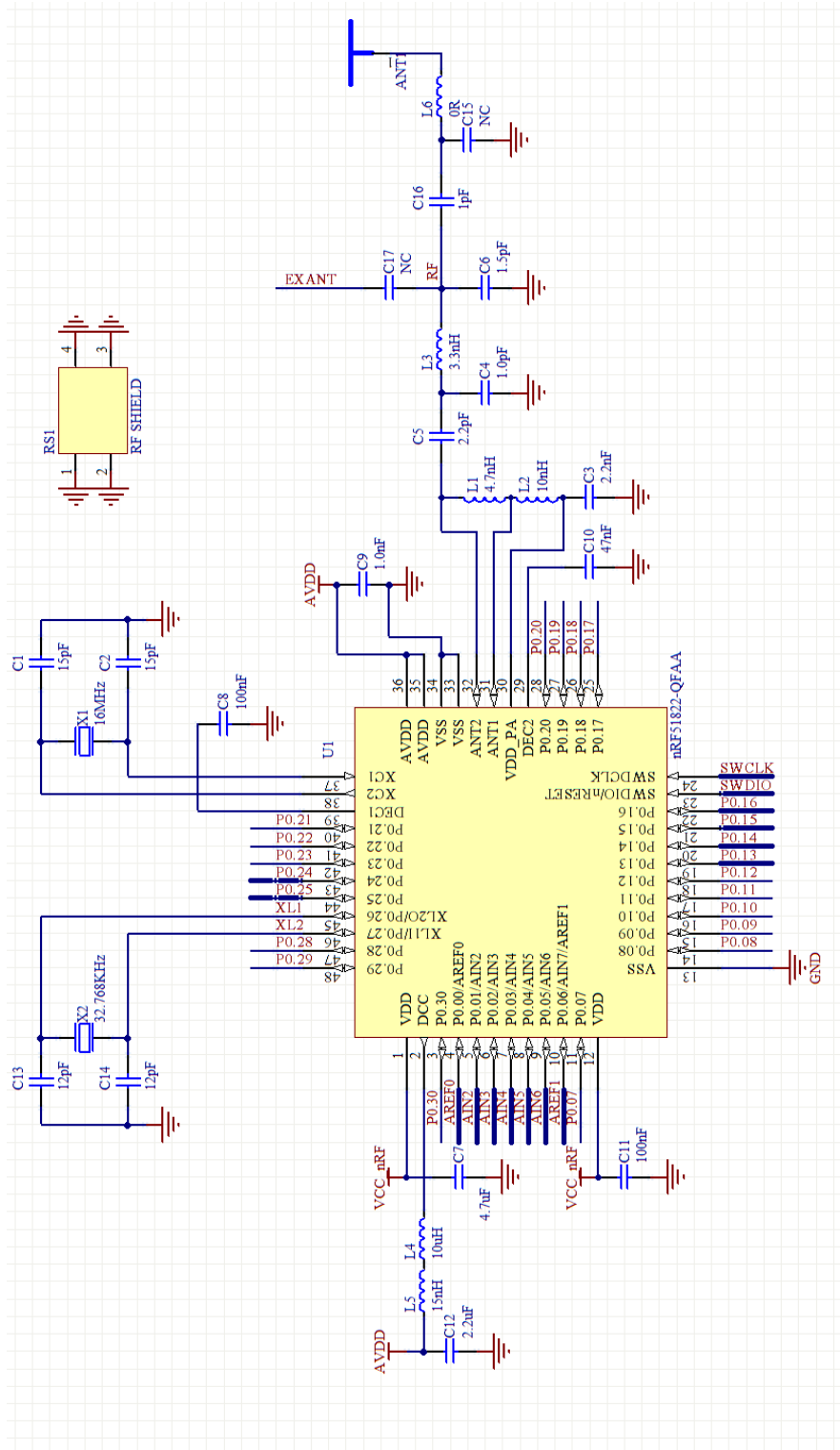
Figure [3]: GWBMD0x Pin Assignment

Pin #	Pin name	Type	Description
1	GND	GND	Ground
2	EXANT	ANT	External Antenna
3	GND	GND	Ground
4	SWDCLK	I/O	SWD Clock
5	SWDIO	I/O	System reset (active low). SWD Data
6	P0.05	I/O	General purpose IO
7	P0.04	I/O	General purpose IO
8	P0.03	I/O	General purpose IO
9	P0.02	I/O	General purpose IO
10	P0.01	I/O	General purpose IO
11	P0.00	I/O	General purpose IO
12	GND	GND	Ground

13	GND	GND	Ground
14	3.3VIN	POWER	+3.3V Power Input
15	P0.06	I/O	General purpose IO
16	P0.12	I/O	General purpose IO
17	P0.13	I/O	General purpose IO
18	P0.14	I/O	General purpose IO
19	P0.15	I/O	General purpose IO
20	P0.16	I/O	General purpose IO
21	GND	GND	Ground

Table [2]: GWBMD0x Pin Description

6. Schematic



Figure[4] GWBMD0x Schematic

7. Mounting Requirements

GWBMD0x is a sensitive RF part; it needs to be mounted at the corner of the mother circuit board and reserve some keep out space to the components on the mother board. Try to keep them away with metal components like Speakers, Transformers, Batteries, Big Aluminum Capacitors, Heat Sinks and Metal Panels.

The figure below illustrates how to mount the GWBMD0x module. **Improper mounting will decrease the RF performance dramatically.**

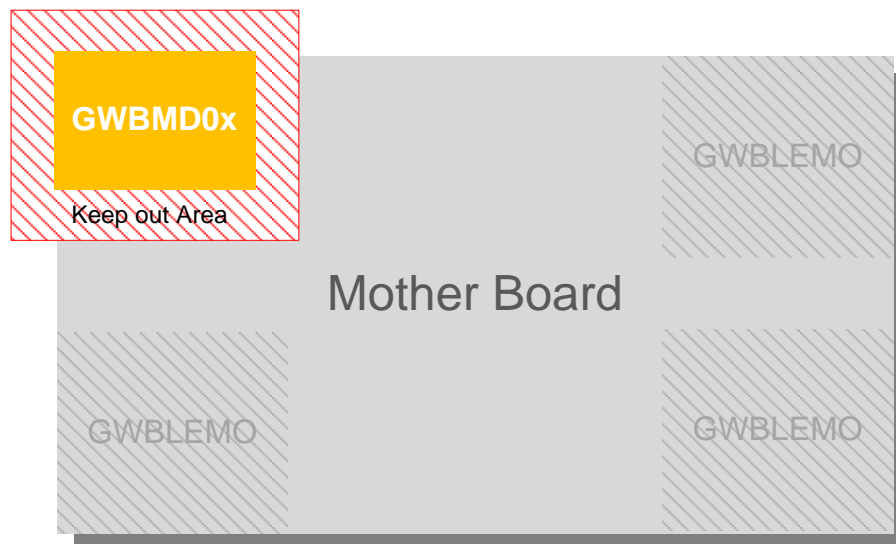


Figure [4]: GWBMD0x Mounting Rule

8. Physical Dimension

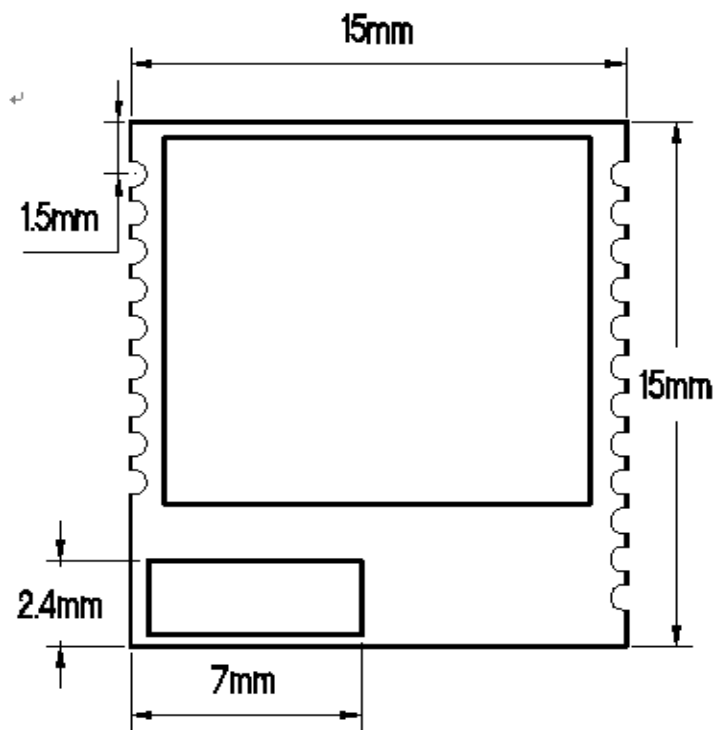


Figure [5]: GWBMD0x Dimension

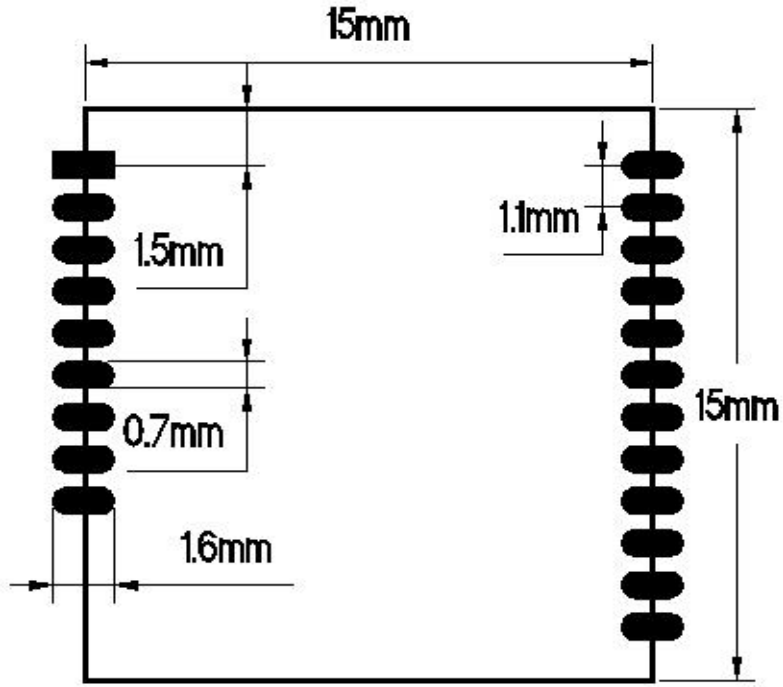
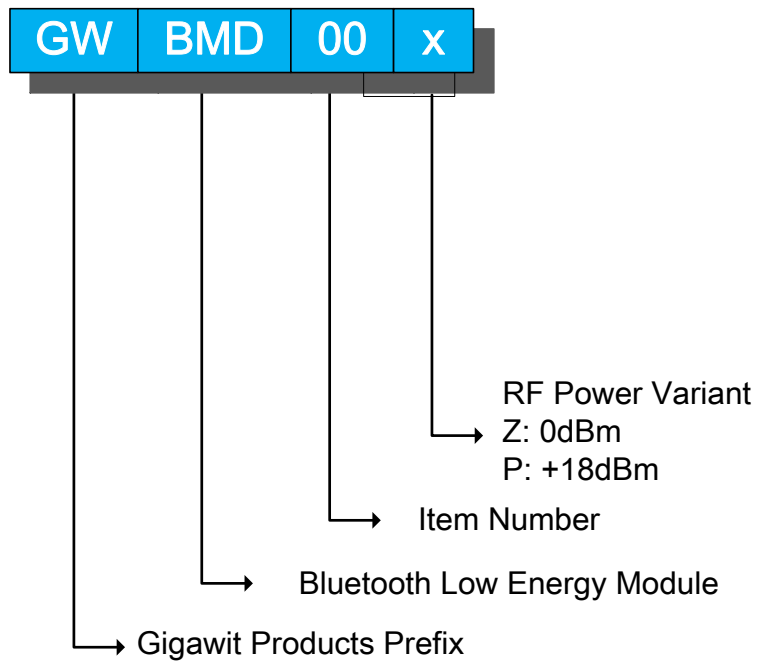


Figure [6]: PCB Land Pattern

9. Naming Rule



10. Ordering Information

Gigawit ID.	Description
GWBMD00	nRF51822 BLE 256K Flash module
GWBMD01	nRF51822 BLE 128K Flash module

12. Revision History

2013-12-12 Version 1.0, Original version