

# Bluetooth Low Energy Module (BT5.0)



## Key Features

- Bluetooth 5.0 single-mode compliant
- Support master and slave modes, 8 simultaneous connections in master mode
- Integrated Bluetooth Low Energy stack, no external MCU needed
- RF performance
  - TX power: -21dBm to 5dBm
  - RX sensitivity: up to -96dBm
- Communication range: 250 meters (LOS) – Long Range Mode
- Ultra low power ARM Cortex-M3 microcontroller core
- Antenna: PCB
- Size: 20.5 mm x 13 mm x 1.5mm (Without Shielding)  
20.5 mm x 13 mm x 2.1 mm (With Shielding)
- Ultra low power consumption:
  - Shutdown: 150nA (Wake up on external events)
  - Standby: 1.1uA (RTC running and RAM/CPU retention)
- BQB, FCC, CE, RoHS compliant

## Descriptions

BDE-BLEM203D is a Bluetooth 5.0 single-mode compliant Bluetooth low energy module targeted at low power sensors and PC/Phone accessories.

BDE-BLEM203D highly integrates Bluetooth Low Energy radio, stack, profile and applications in a SoC, without the need of using an external MCU. The module also offers flexible hardware interfaces for the sensor application.

It enables ultra-low power connectivity and data transfer for the applications that are sensitive to power consumption, size and cost.

## Block Diagram

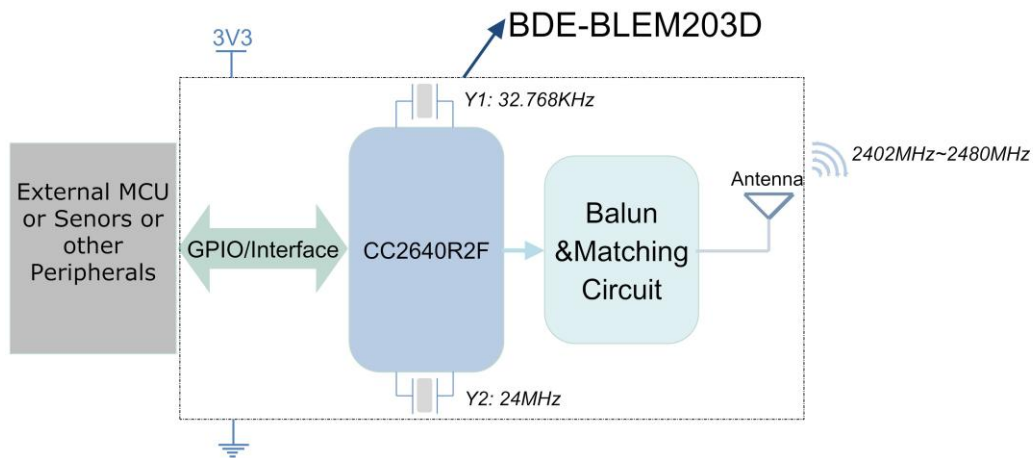


Fig. 1: The Block Diagram of BDE-BLEM203D

## Applications

- Medical devices
- Sports and fitness equipment
- Home electronics
- Mobile and PC accessories
- Industry automation

## Electrical Characteristics

- Absolute maximum rating

Rating	Min	Typ	Max	Unit
Storage Temperature	-40	-	125	°C
VDDS	-0.3	-	4.1	V
Other Digital Terminals	-0.2	-	VDDS+0.3≤4.1	V

- Recommended operating conditions

Rating	Min	Typ	Max	Unit
Operating Temperature	-40	-	85	°C
VDDS	1.8	3.3	3.8	V

## Overall Dimensions

Fig. 2 shows the overall dimensions of BDE-BLEM203D. The module measures 20.5mm long by 13mm wide by 1.5mm high without the shield.

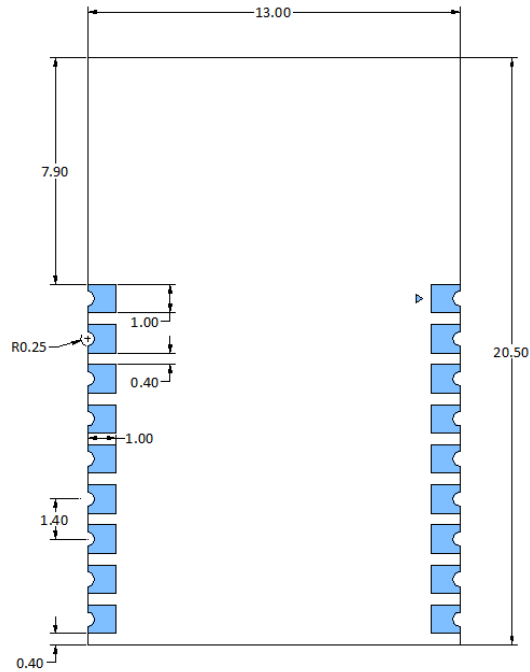


Fig. 2: Overall Dimensions of BDE-BLEM203D (BOTTOM VIEW)

## Pin Definitions

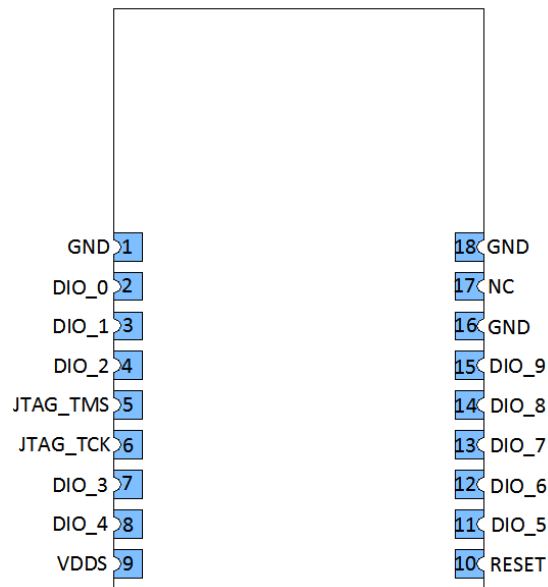


Fig. 3: The pinout of BDE-BLEM203D (TOP VIEW)

Table 1: Pin definitions of BDE-BLEM203D

Pin Number	Pin Name	Definitions
1	GND	Power Ground
2	DIO_0	GPIO, Sensor Controller, high-drive capability
3	DIO_1	GPIO, Sensor Controller, high-drive capability
4	DIO_2	GPIO, Sensor Controller, high-drive capability
5	JTAG_TMS	JTAG_TMS
6	JTAG_TCK	JTAG_TCK
7	DIO_3	GPIO, High-drive capability, JTAG_TDO
8	DIO_4	GPIO, High-drive capability, JTAG_TDI
9	VDDS	Power Supply
10	RESET	Reset, Active-low
11	DIO_5	GPIO, Sensor Controller, Analog
12	DIO_6	GPIO, Sensor Controller, Analog
13	DIO_7	GPIO, Sensor Controller, Analog
14	DIO_8	GPIO, Sensor Controller, Analog
15	DIO_9	GPIO, Sensor Controller, Analog
16	GND	Power Ground
17	NC	NC
18	GND	Power Ground

## Module Location

In order to get a fine performance when integrate the module to your product, it is advised to use the recommended module location to the respective PCB.

### ■ Location in X-Y plane

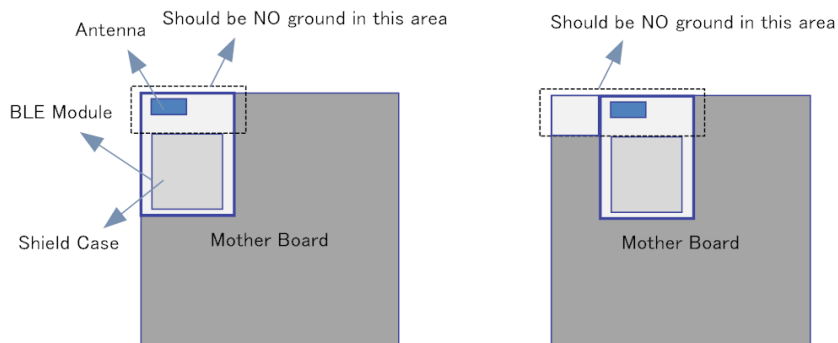


Fig. 4: Recommended location in X-Y plane

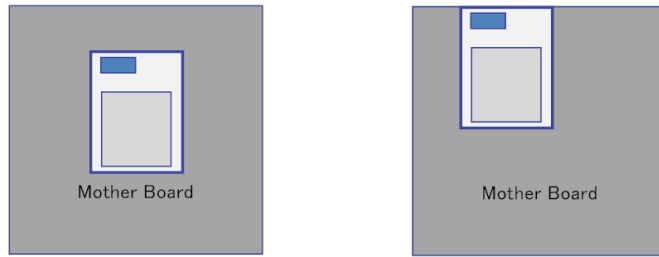


Fig. 5: Not recommended location in X-Y plane

■ Location in Z plane

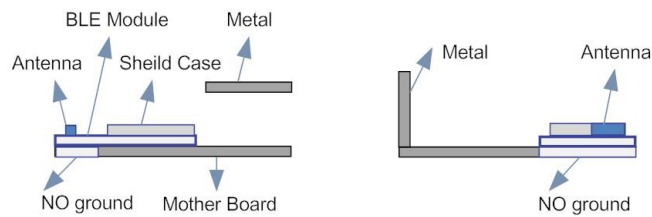


Fig. 6: Recommended location in Z plane

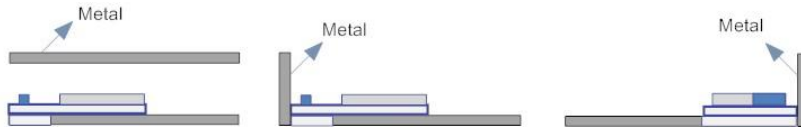


Fig. 7: Not recommended location in Z plane

### Typical Solder Reflow Profile

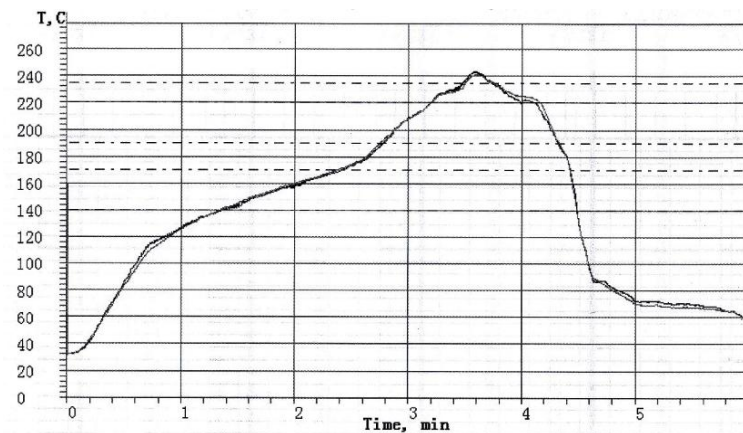


Fig. 7: Typical Solder Reflow Profile

## Package Information



Fig. 8: Package information

## Contacts

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