

General Description

BDE-BLEM203D is a Bluetooth 5.1 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.

Key Features

- Bluetooth 5.1 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)
- Certifications
 - Bluetooth – DID: D050901, QDID: 151462
 - FCC ID: 2ABRUBDLEM203D
 - CE-RED

Applications

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

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1. References

[1] CC2640R2F resources: <https://www.ti.com/product/CC2640R2F>

2. Block Diagram

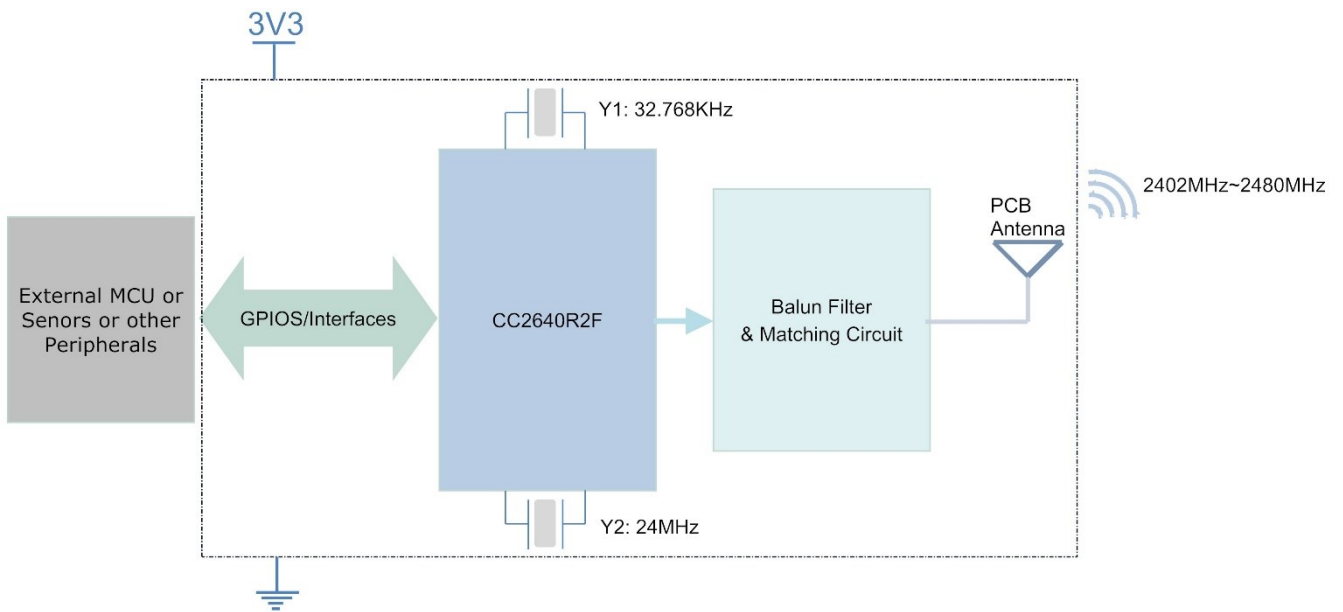


Figure 2-1. BDE-BLEM203D Module Block Diagram

3. Pinout

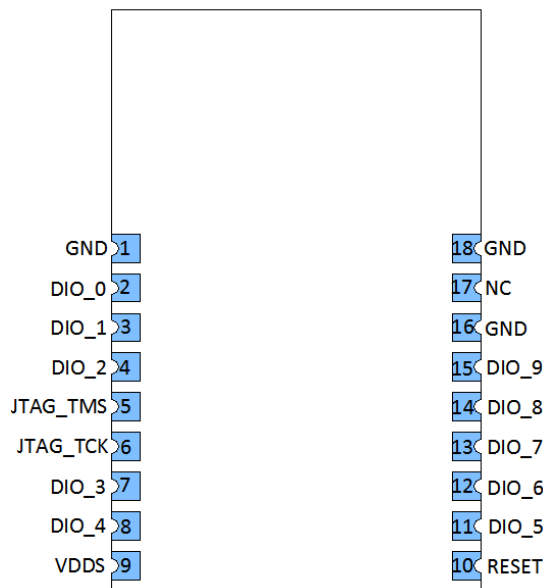


Figure 3-1. Pin Diagram (Top View)

3.1 Pin Attributes

Table 3-1. Pin Description

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

4. Electrical Characteristics

4.1 Absolute maximum rating

Rating	Min	Typ	Max	Unit
Storage Temperature	-40	-	125	°C
VDDS	-0.3	-	4.1	V
Other Digital Terminals	-0.2	-	$V_{DDS}+0.3 \leq 4.1$	V

4.2 Recommended operating conditions

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

5. Module Location

In order to get the best 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

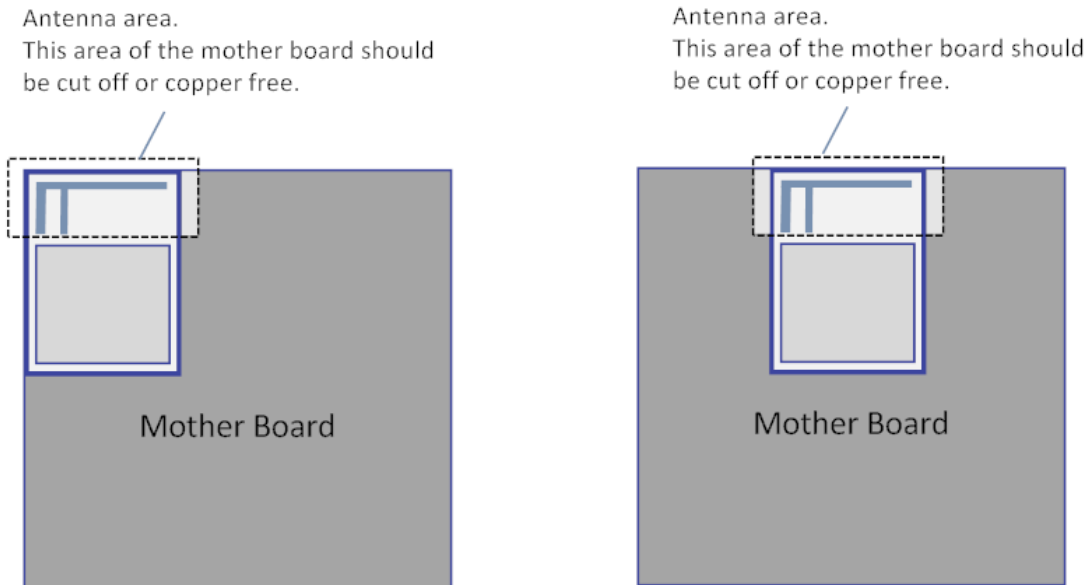


Figure 5-1. Recommended location in X-Y plane

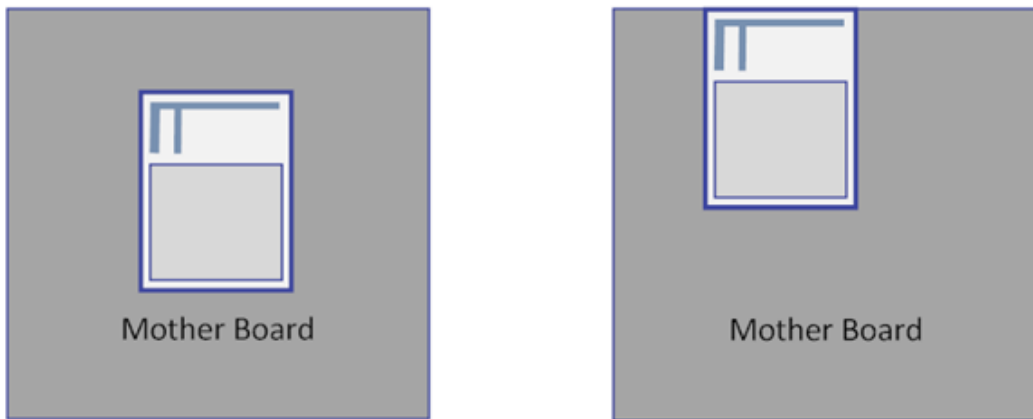


Figure 5-2. Not recommended location in X-Y plane

■ Location in Z plane

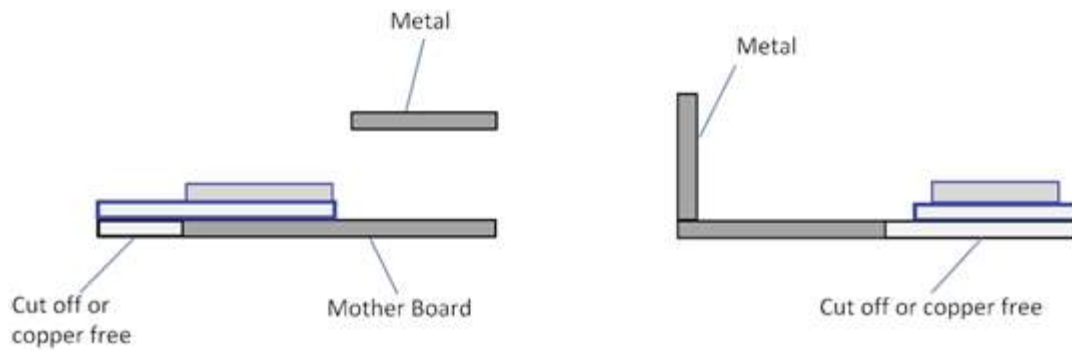


Figure 5-3. Recommended location in Z plane



Figure 5-4. Not recommended location in Z plane

6. Dimensions

The module dimensions are presented in the following figure.

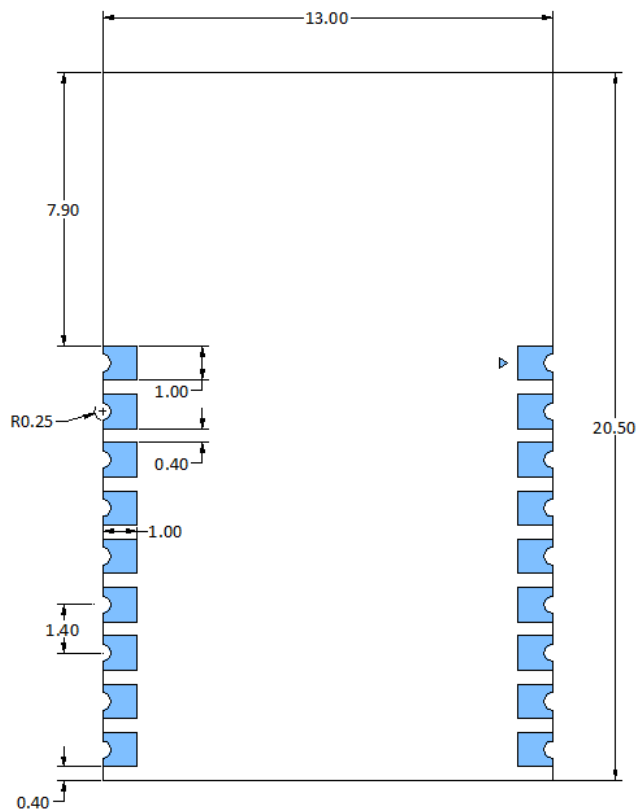


Figure 6-1. Mechanical Drawing (BOTTOM VIEW)

7. Typical Solder Reflow Profile

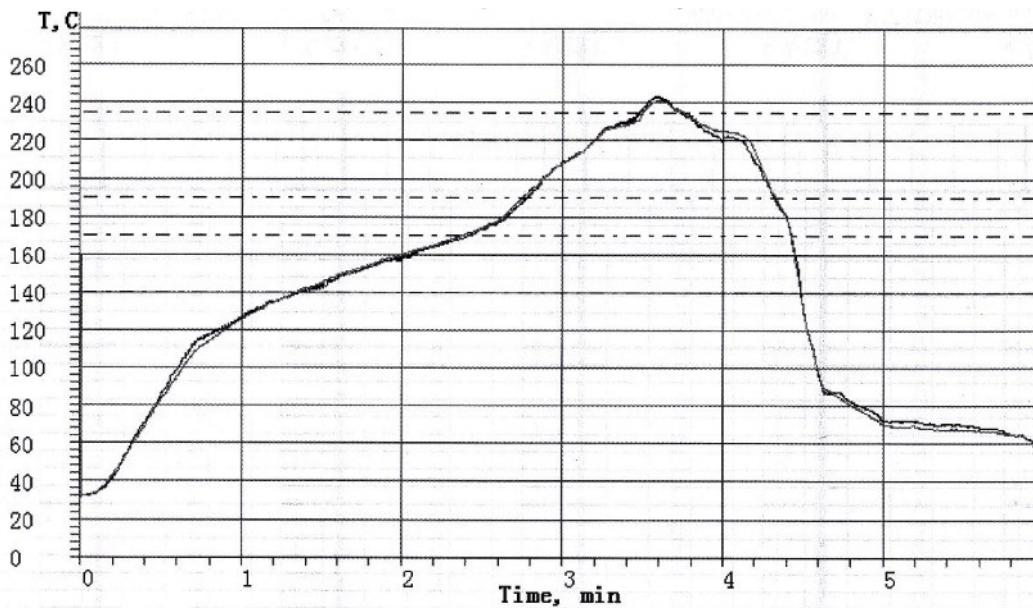


Figure 7-1. Typical Solder Reflow Profile

8. Package Information



Figure 8-1. Package information

9. Ordering Information

Part Number	Size (mm)	Shipping Form	MOQ
BDE- BLEM203D	20.5 x 13.0 x 2.0	Tray	1000

10.Revision History

Revision	Date	Description
V1.0	25-Feb-2019	Initial Release
V2.0	14-Apr-2021	Replacement of template

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