General Description



BDE-RFM204 is an ultra-low power, long-range Sub-1 GHz module targeted at low power sensors and long range applications.

BDE-RFM204 integrates a high performance RF core and also a powerful ARM cortex-M3 processor, which makes it suitable for certain products that need high performance MCU to deal with difficult applications.

The module supports 868 MHz and 915 MHz bands, with the maximum output power up to 15 dBm, along with its Long-Range Mode feature, the module is the best choice for IoT products which utilize battery supply and require long range communication.

Key Features

- Ultra low power Sub-1 GHz
- Supports 868 MHz, 915/868 MHz
- Powerful Cortex-M3 MCU for your IoT products
  - Clock Speed: up to 48MHz
  - Up to 128KB of In-System-Programmable Flash
  - 20KB of Ultra-Low-Leakage SRAM
  - 10 GPIOs
- RF performance
  - TX power: Up to +15 dBm
  - RX sensitivity: up to -124 dBm using Long-Range Mode, -110 dBm at 50 kbps (Sub-1 GHz)
- Communication range
  - 800 meters (LOS) @ +10 dBm, 2.4 kbps
- Ultra-low power
  - Power supply: 1.8 V ~ 3.8 V
  - RX: 5.4 mA
  - TX @ +10 dBm: 13.4 mA
  - Standby: 0.7 uA (RTC running and RAM/CPU retention)
  - Shutdown: 185 nA (Wake up on external events)
- Antenna: PCB antenna
- Small Size
  - 20.5 mm x 13 mm x 2.1 mm
- Certifications
  - FCC ID: 2ABRUBDRFM204
  - CE-RED

Applications

- Long-range sensor applications
- Smart grid and automatic meter reading
- Wireless healthcare applications
- Industry monitoring and control
- Home and building automation
- Energy-harvesting applications

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1. References

[1] CC1310 resources: https://www.ti.com/product/CC1310

2. Block Diagram

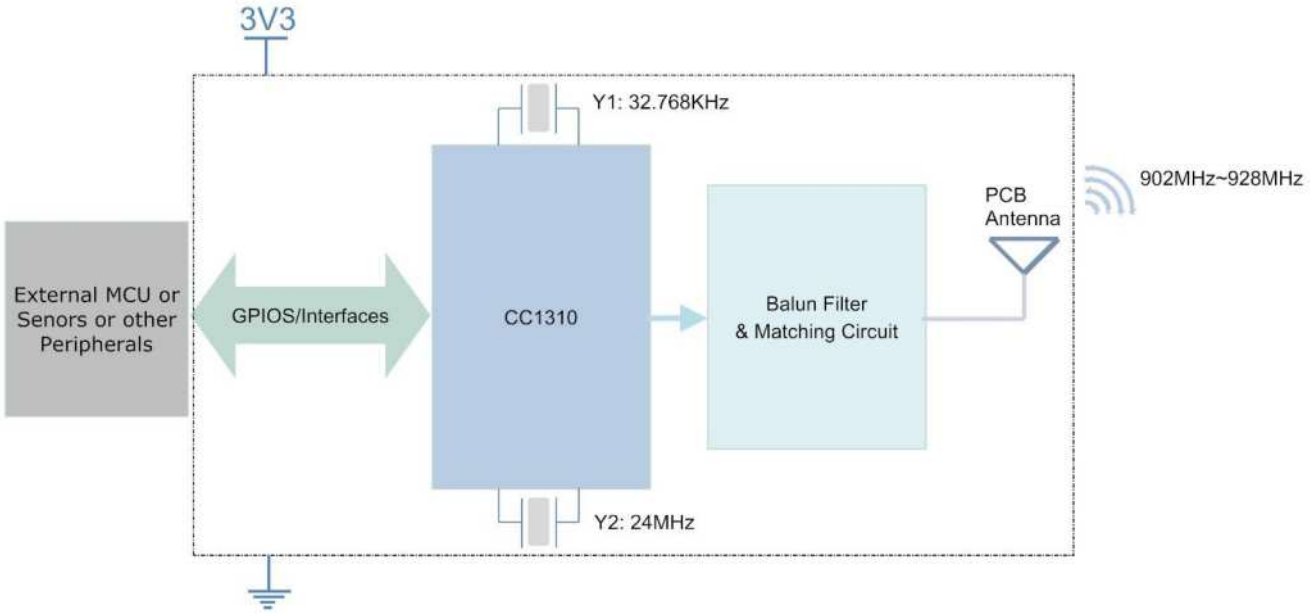


Figure 2-1. BDE-RFM204 Module Block Diagram

3. Terminal Configuration and Functions

3.1 Pin Diagram

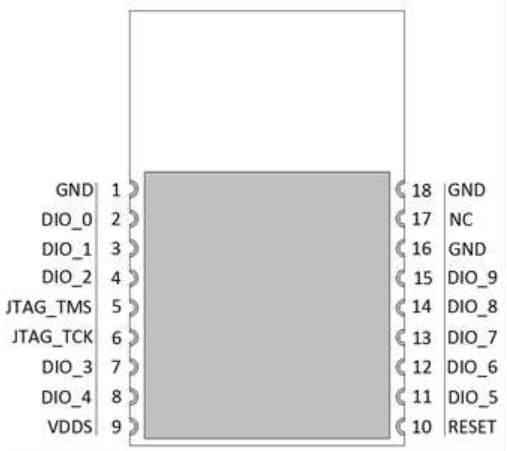


Figure 3-1. Pin Diagram (Top View)

3.2 Pin Attributes and Pin Multiplexing

Table 3-1. Pin Description

Pin #	Pin Name	Description
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. Specifications

4.1 Absolute Maximum Ratings

PARAMETER	MIN	MAX	UNIT
VDDS	-0.3	4.1	V
Other Digital Terminals	-0.3	VDDS+0.3≤4.1	V
Storage Temperature	-40	125	°C

4.2 Recommended Operating Conditions

PARAMETER	MIN	TYP	MAX	UNIT
VDDS	1.8	3.3	3.8	V
Operating Temperature	-40	-	85	°C

5. Design Recommendations

Module Location

In order to get the best performance when integrating the module to your product, it is advised to use the recommended module location to the mother board.

- Location in X-Y plane

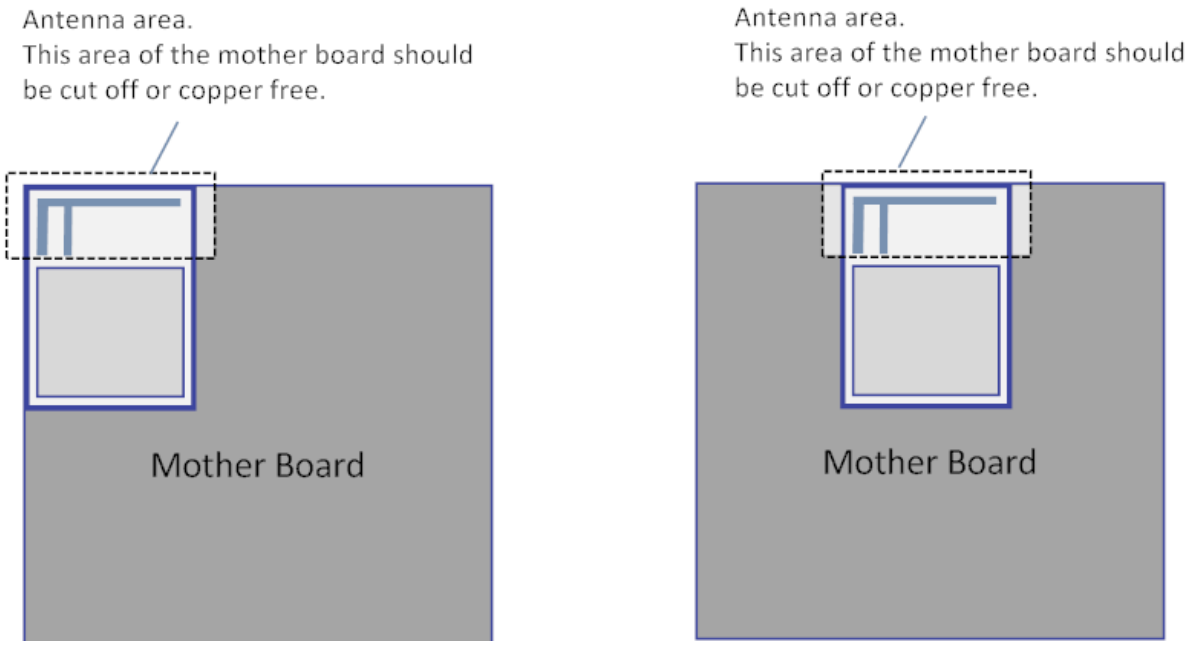


Fig 5-1. Recommended location in X-Y plane

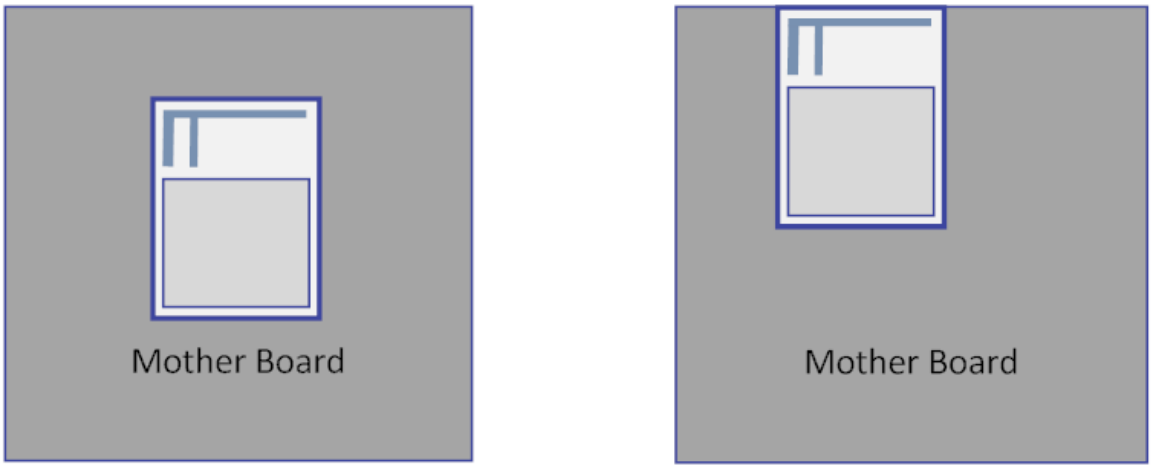


Fig 5-2. Not recommended location in X-Y plane

- Location in Z plane

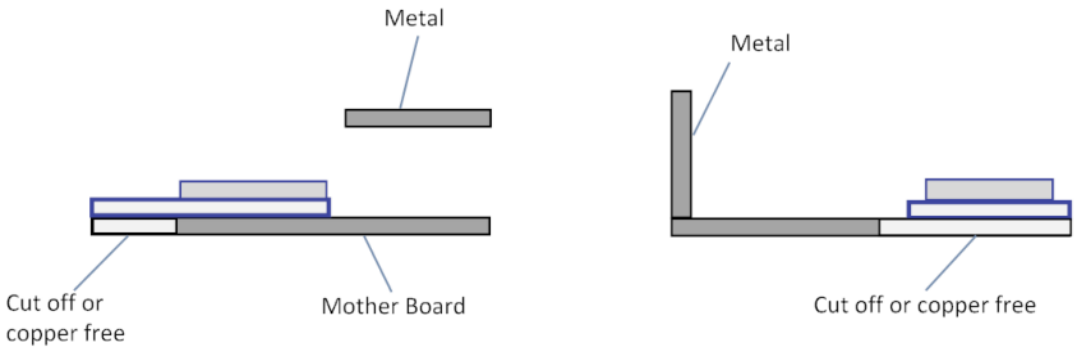


Fig 5-3. Recommended location in Z plane

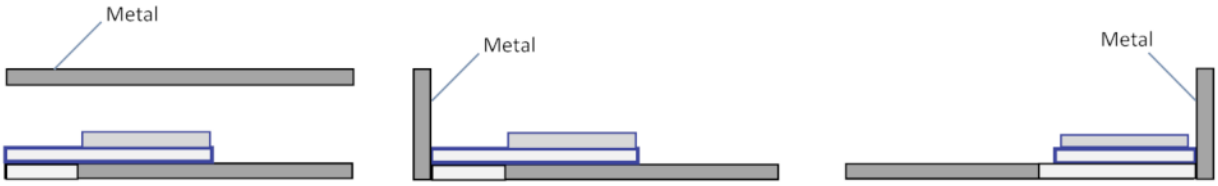


Fig 5-4. Not recommended location in Z plane

6. Mechanical Specifications

6.1 Dimensions

The module dimensions are presented in the following figure:
Note: All dimensions are in mm.

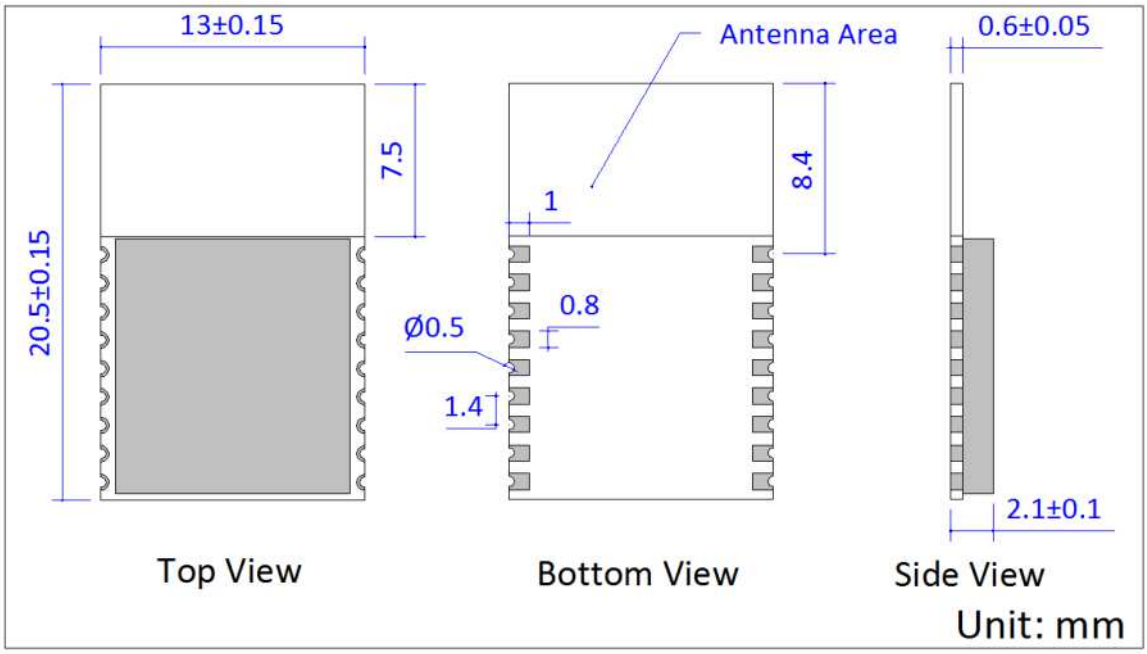


Fig 6-1. Mechanical Drawing

7. Packaging Information



Fig 7-1. Package information

8. Ordering Information

Part Number	Size (mm)	Core Chip	Package	MOQ
BDE-RFM204	20.5 x 13 x 2.1	CC1310	Tray	1K

9. Revision History

Revision	Date	Description
V1.0	8-Jun-2019	Initial Release
V1.4	3-Nov-2019	Editorial Correction
V2.0	14-Apr-2021	Replacement of template

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