General Description

BDE-RFM207 is a multiprotocol 2.4G wireless module targeted at low power sensors and PC/Phone accessories. It supports Thread, Zigbee, Bluetooth 5.2 Low Energy, IEEE 802.15.4g, IPv6-enabled smart objects (6LoWPAN), Wi-SUN, proprietary systems, SimpleLink TI 15.4-Stack (2.4 GHz), and Dynamic Multiprotocol Manager (DMM) driver.



BDE-RFM207 highly integrates 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

- Multiprotocol, Bluetooth 5.2 low energy compliant, Zigbee, Thread
- Powerful ARM Cortex-M4F processor
  - Clock speed: up to 48MHz
  - 352KB of In-System programmable flash
  - 80KB SRAM
  - 8KB of cache SRAM
  - 2-Pin cJTAG and JTAG debugging
  - Support Over-the-Air upgrade (OTA)
  - Ultra-Low power sensor controller with 4KB of SRAM
  - 31 GPIOs
  - 4 x 32-Bit or 8 x 16-Bit general purpose timer
  - 12-Bit ADC, 200 kSamples/s, 8 channels
  - 2 x comparator with internal reference DAC
  - Programmable current source
  - 2 x UART
  - 2 x SSI (SPI, MICROWIRE, TI)
  - IIC, IIS
  - Real-Time-Clock (RTC)
  - AES 128- and 256-bit crypto accelerator
  - ECC and RSA public key hardware accelerator
  - SHA2 accelerator (Full suite up to SHA-512)
  - True Random Number Generator (TRNG)
  - Capacitive sensing, up to 8 channels
  - Integrated temperature and battery monitor
  - On-Chip buck DC/DC converter
- RF performance
  - TX power: Output power up to +5 dBm with temperature compensation
  - RX sensitivity: up to -105dBm (LE coded PHY)
- Communication range: about 250 meters (LOS) – Long Range Mode
- Antenna: PCB antenna, 1.71 dBi average gain, 2.18 dBi peak gain
- Size: 22.95 mm x 15 mm x 2.15 mm (With Shielding)
- Ultra low power consumption:
  - Shutdown: 150nA (Wake up on external events)
  - Standby: 0.94uA (RTC running and RAM/CPU retention)
  - RX current: 6.9mA
  - TX current @ 0dBm: 7.3mA
  - TX current @ 5dBm: 9.6mA
- Certifications
  - FCC ID: 2ABRU-RFM207
  - IC: 25657-RFM207
  - CE-RED

Applications

- 2400 to 2480 MHz ISM and SRD systems with down to 4 kHz of receive bandwidth
- Building automation
- Grid infrastructure
- Industrial transport – asset tracking
- Factory automation and control
- Medical
- Electronic point of sale (EPOS) – Electronic Shelf Label (ESL)

Contents

General Description 1
Key Features 1
Applications 2
Contents 3
1. References 4
2. Block Diagram 5
3. Terminal Configuration and Functions 6
3.1 Pin Diagram 6
3.2 Pin Attributes and Pin Multiplexing 6
4. Specifications 8
4.1 Absolute Maximum Ratings 8
4.2 Recommended Operating Conditions 8
5. Reference Design 9
5.1 Design Recommendations 9
6. Mechanical Specifications 11
6.1 Dimensions 11
7. Packaging Information 12
8. Ordering Information 13
9. Revision History 13

1. References

[1] CC2652R resources: https://www.ti.com/product/CC2652R

2. Block Diagram

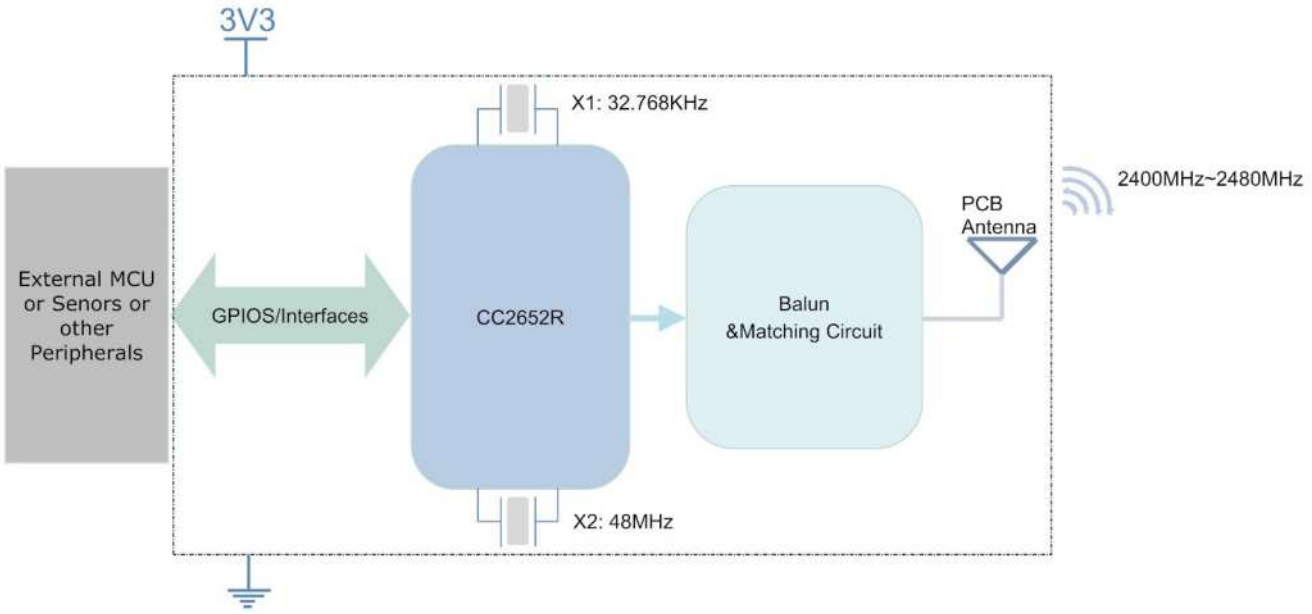

Figure 2-1. BDE-RFM207 Module Block Diagram

3. Terminal Configuration and Functions

3.1 Pin Diagram

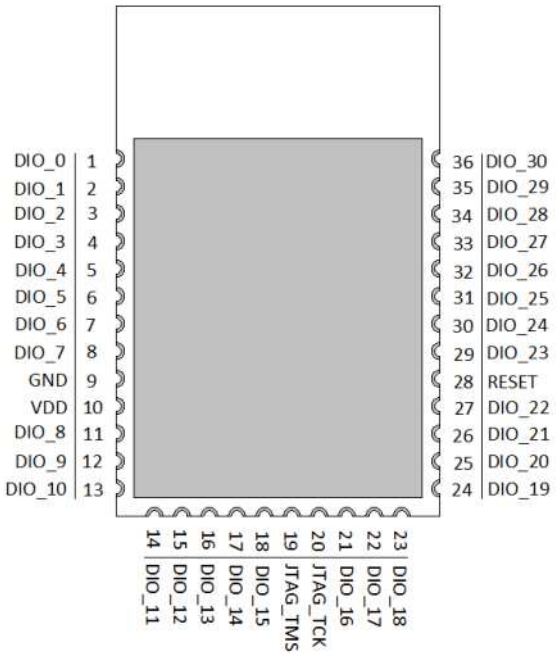

Figure 3-1. Pin Diagram (Top View)

3.2 Pin Attributes and Pin Multiplexing

Table 3-1. Pin Description

Pin #	Pin Name	Description
1	DIO_0	GPIO, Sensor Controller
2	DIO_1	GPIO, Sensor Controller
3	DIO_2	GPIO, Sensor Controller
4	DIO_3	GPIO, Sensor Controller
5	DIO_4	GPIO, Sensor Controller
6	DIO_5	GPIO, Sensor Controller, high-drive capability
7	DIO_6	GPIO, Sensor Controller, high-drive capability
8	DIO_7	GPIO, Sensor Controller, high-drive capability
9	GND	Power Ground
10	VDD	Power Supply
11	DIO_8	GPIO
12	DIO_9	GPIO
13	DIO_10	GPIO
14	DIO_11	GPIO
15	DIO_12	GPIO
16	DIO_13	GPIO
17	DIO_14	GPIO
18	DIO_15	GPIO
19	JTAG_TMS	JTAG TMSC, high-drive capability
20	JTAG_TCK	JTAG TCKC
21	DIO_16	GPIO, JTAG_TDO, high-drive capability
22	DIO_17	GPIO, JTAG_TDI, high-drive capability
23	DIO_18	GPIO

Pin #	Pin Name	Description
24	DIO_19	GPIO
25	DIO_20	GPIO
26	DIO_21	GPIO
27	DIO_22	GPIO
28	RESET	Reset, active-low
29	DIO_23	GPIO, Sensor Controller, Analog
30	DIO_24	GPIO, Sensor Controller, Analog
31	DIO_25	GPIO, Sensor Controller, Analog
32	DIO_26	GPIO, Sensor Controller, Analog
33	DIO_27	GPIO, Sensor Controller, Analog
34	DIO_28	GPIO, Sensor Controller, Analog
35	DIO_29	GPIO, Sensor Controller, Analog
36	DIO_30	GPIO, Sensor Controller, Analog

4. Specifications

4.1 Absolute Maximum Ratings

PARAMETER	MIN	MAX	UNIT	Notes
VDDS	-0.3	4.1	V	
Other Digital Terminals	-0.3	VDDS+0.3≤4.1	V	
Voltage on ADC input	-0.3	VDDS	V	Voltage scaling enabled
	-0.3	1.49	V	Voltage scaling disabled, internal reference
	-0.3	VDDS/2.9	V	Voltage scaling disabled, VDDS as reference
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. Reference Design

5.1 Design Recommendations

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

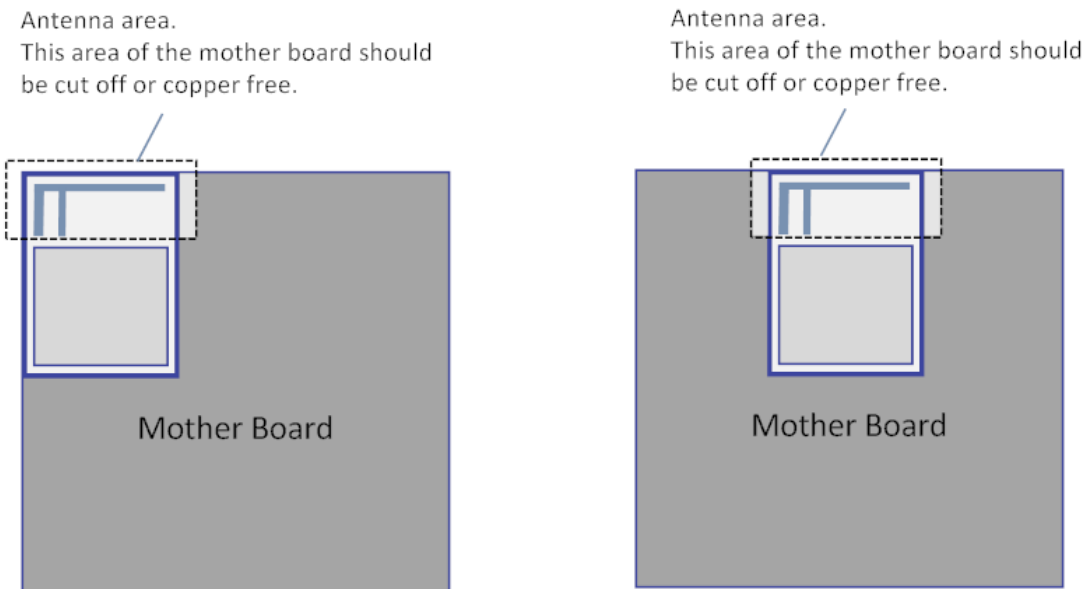

Fig 5-1. Recommended location in X-Y plane

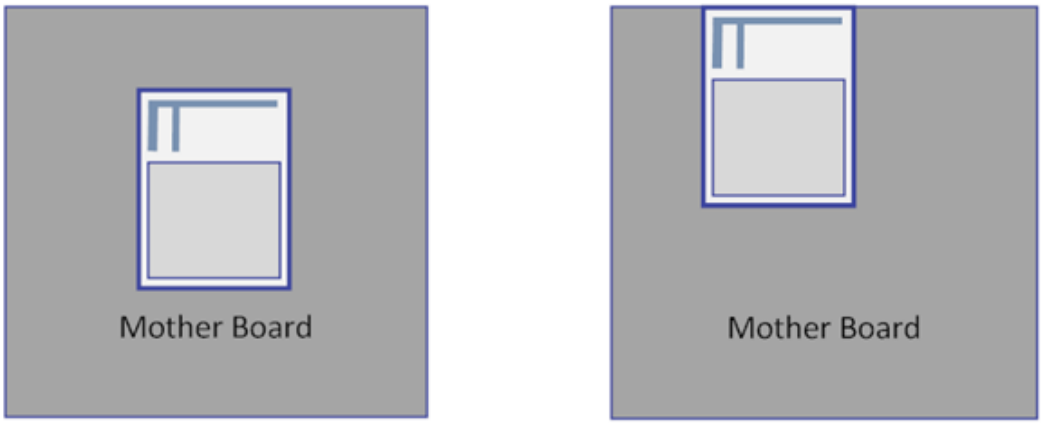

Fig 5-2. Not recommended location in X-Y plane

■ Location in Z plane

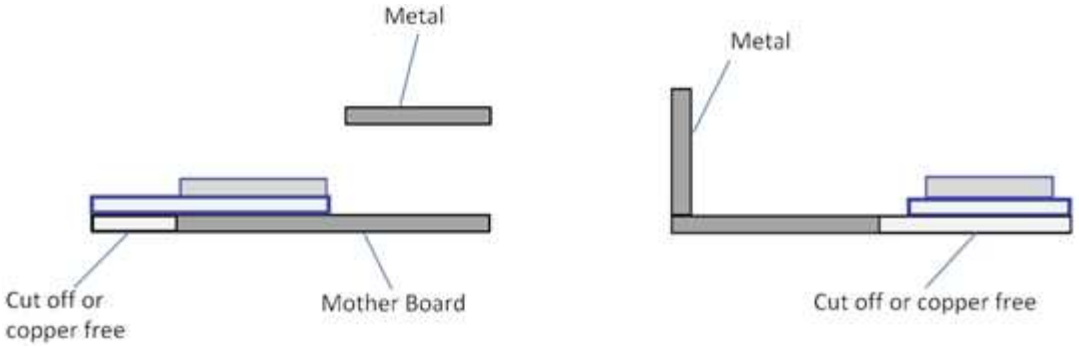

Fig 5-3. Recommended location in Z plane

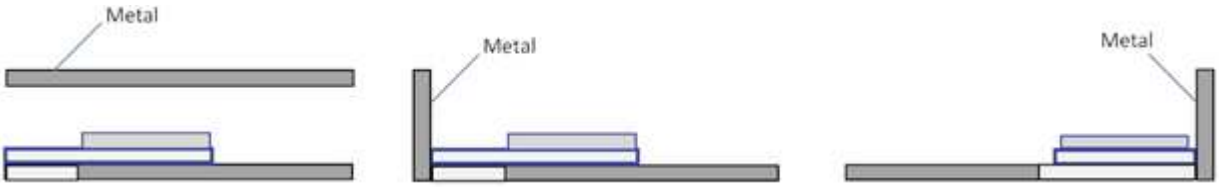

Fig 5-4. Not recommended location in Z plane

6. Mechanical Specifications

6.1 Dimensions

Fig 6-1 shows the overall dimensions of BDE-RFM207. The module measures 22.95mm long by 15mm wide by 2.15mm high with the shield.

Note: All dimensions are in mm.

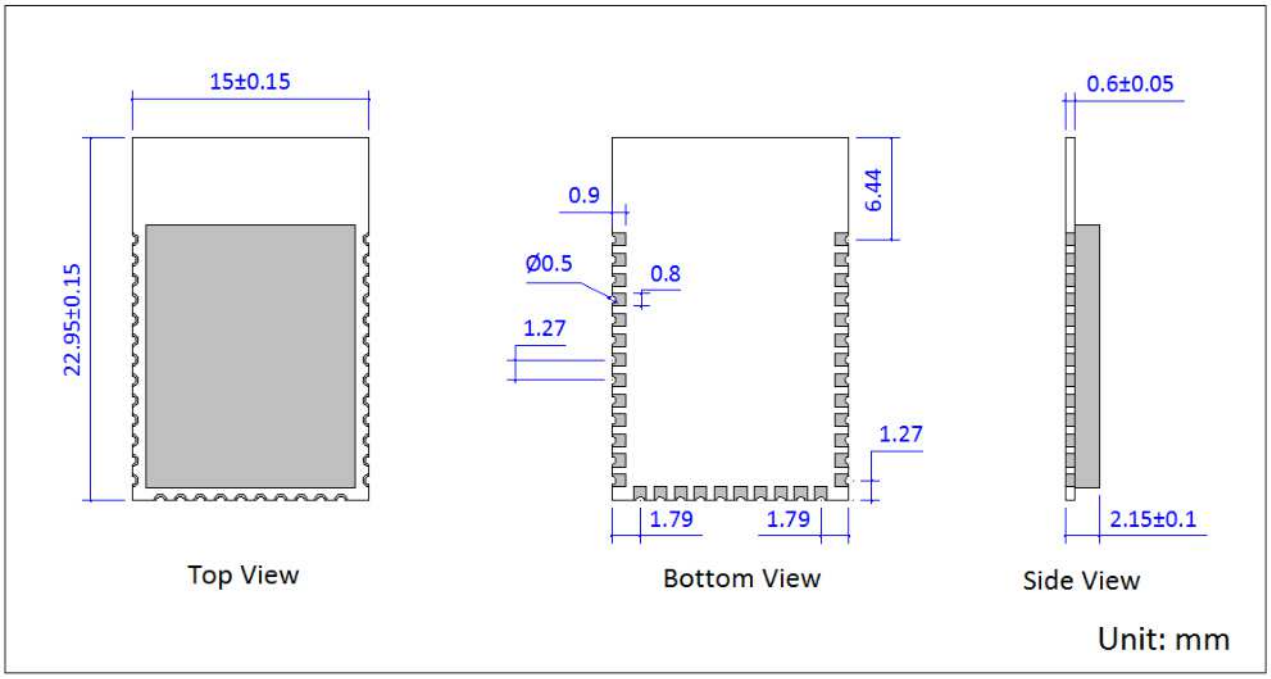

Fig 6-1. Mechanical Drawing

7. Packaging Information



Fig 7-1. Package information

8. Ordering Information

Part Number	Size (mm)	Core Chip	Shipping Form	MOQ
BDE-RFM207	22.95 × 15 × 2.15	CC2652R	Tray	1K

9. Revision History

Revision	Date	Description
V1.0	8-May-2019	Initial Release
V1.2	10-Jun-2020	Editorial Correction
V2.0	14-Apr-2021	Replacement of template

Contacts

BDE Technology Inc.
China: B2-403, 162 Science Avenue, Huangpu District, Guangzhou 510663, China
Tel: +86-20-28065335
Website: http://www.bdecomm.com Email: shu@bdecomm.comm

USA: 67 E Madison St, #1603A, Chicago, IL 60603, US
Tel: +1-312-379-9589
Website: http://www.bdecomm.com Email: info@bdecomm.com