

Multiprotocol 2.4G Wireless Module



Key Features

- Multiprotocol, Bluetooth 5 low energy, 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
- BQB, FCC, CE, RoHS compliant

Descriptions

BDE-RFM207 is a multiprotocol 2.4G wireless module targeted at low power sensors and PC/Phone accessories. It supports Thread, Zigbee, Bluetooth 5 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.

Block Diagram

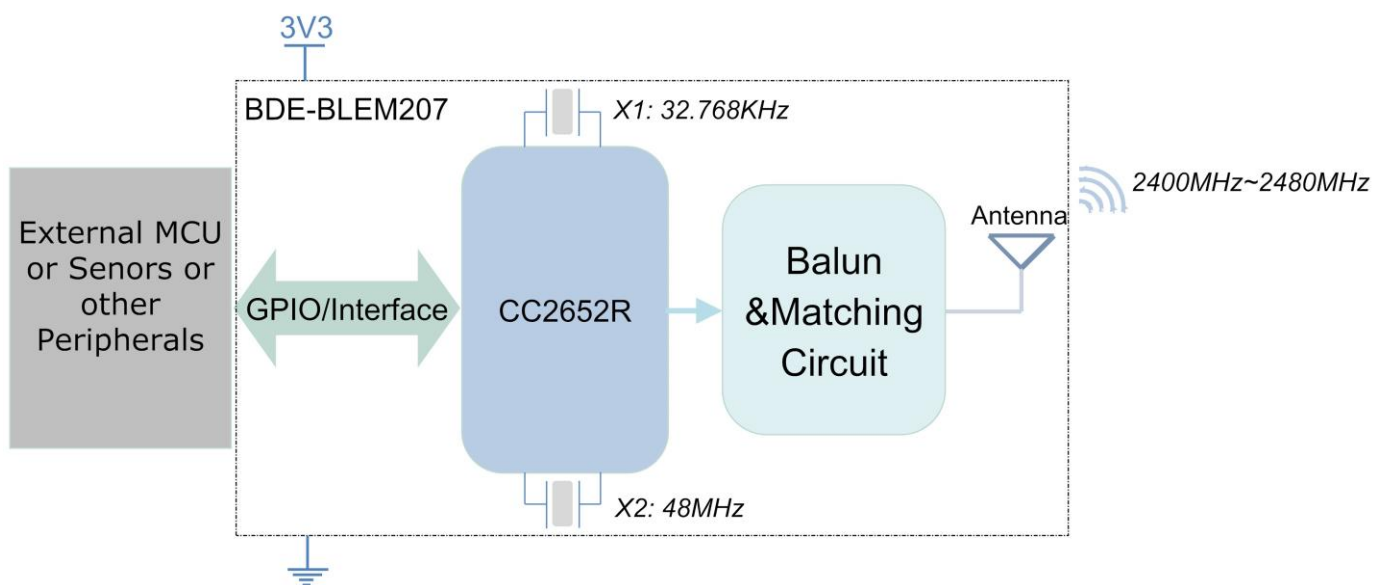


Fig. 1: The Block Diagram of BDE-RFM207

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)

Electrical Characteristics

- Absolute maximum rating

Rating	Min	Typ	Max	Unit	Notes
Storage Temperature	-40	-	125	°C	
VDD	-0.3	-	4.1	V	
Other Digital Terminals	-0.3	-	$V_{DD5}+0.3 \leq 4.1$	V	
Voltage on ADC input	-0.3	-	V _{DD5}	V	Voltage scaling enabled
	-0.3	-	1.49	V	Voltage scaling disabled, internal reference
	-0.3	-	$V_{DD5}/2.9$	V	Voltage scaling disabled, V _{DD5} as reference
RF pin	-	-	5	dBm	

- Recommended operating conditions

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

Pinout

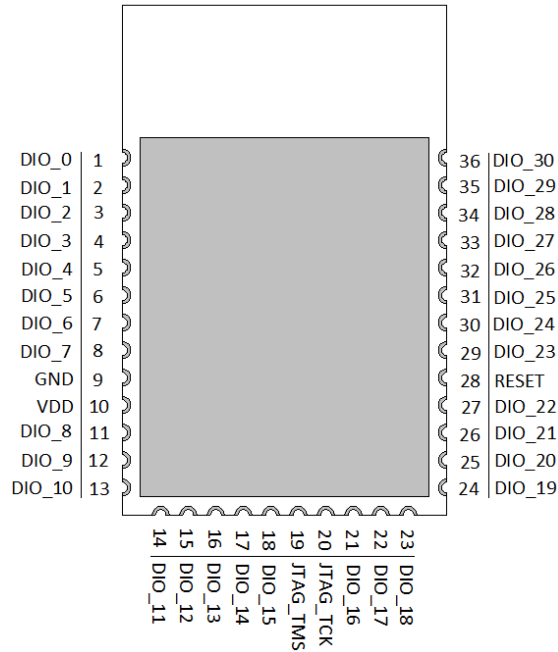


Fig. 2: The pinout of BDE-RFM207 (TOP VIEW)

Table 1: Pin definitions of BDE-RFM207

Pin Number	Pin Name	Definitions
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 TMS, high-drive capability
20	JTAG_TCK	JTAG TCK
21	DIO_16	GPIO, JTAG_TDO, high-drive capability

22	DIO_17	GPIO, JTAG_TDI, high-drive capability
23	DIO_18	GPIO
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

Overall Dimensions

Fig. 3 shows the overall dimensions of BDE-RFM207. The module measures 22.95mm long by 15mm wide by 2.15mm high with the shield.

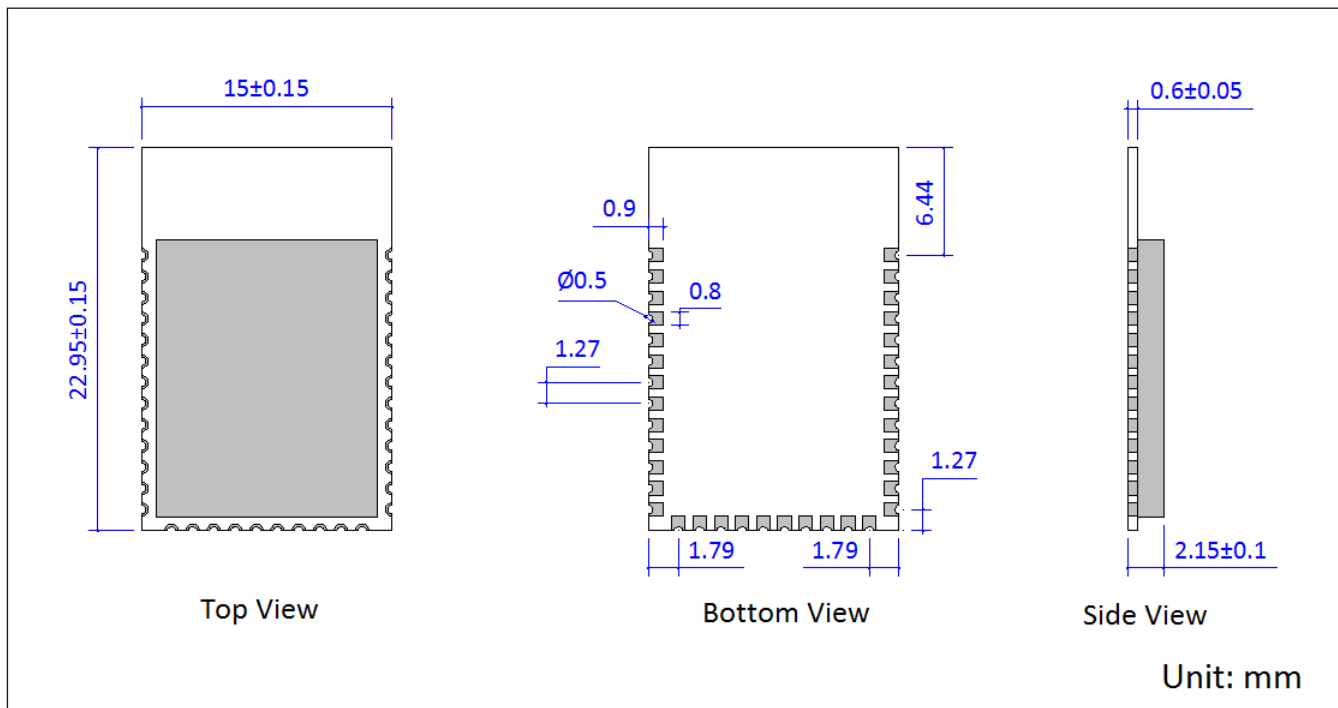


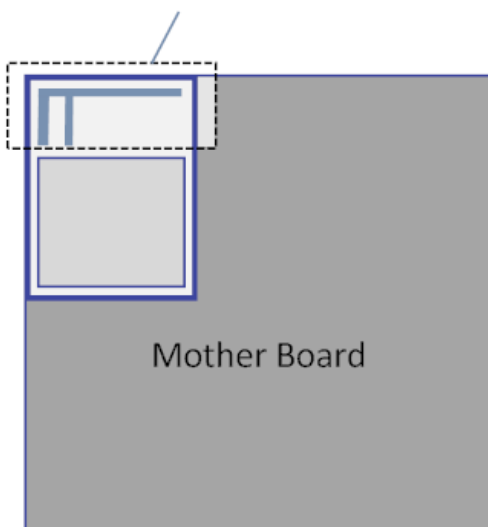
Fig. 3: Overall Dimensions of BDE-RFM207

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

Antenna area.
This area of the mother board should be cut off or copper free.



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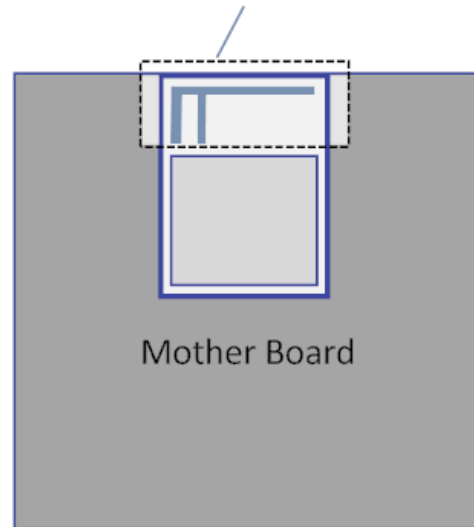


Fig. 4: Recommended location in X-Y plane

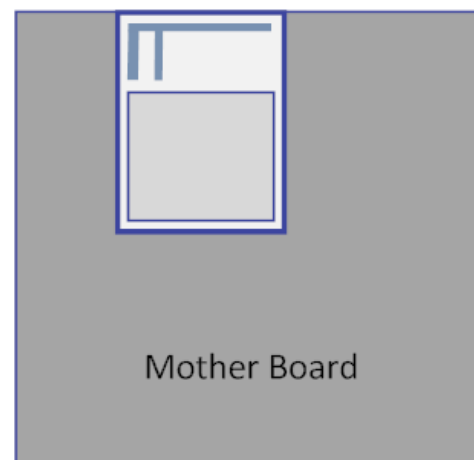
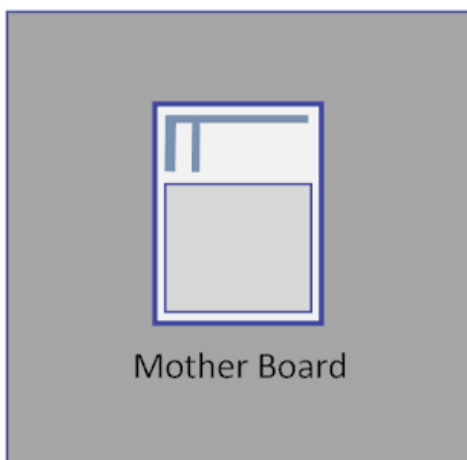


Fig. 5: Not recommended location in X-Y plane

■ Location in Z plane

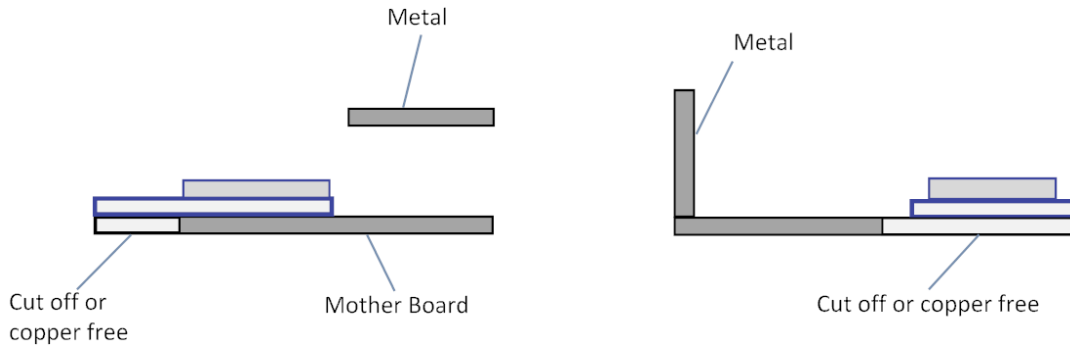


Fig. 6: Recommended location in Z plane

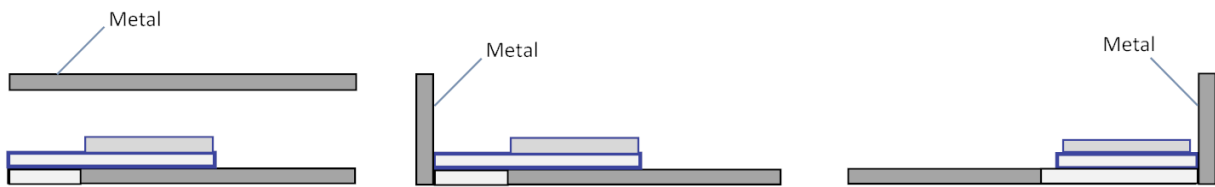


Fig. 7: Not recommended location in Z plane

Typical Solder Reflow Profile

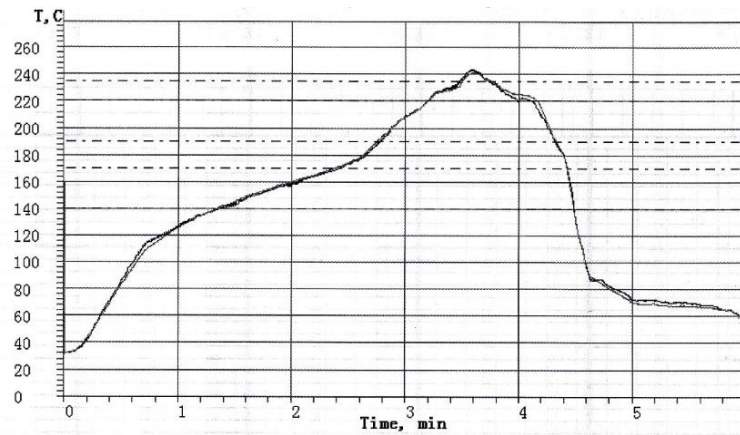


Fig. 8: Typical Solder Reflow Profile

Package Information



Fig. 9: Package

Contacts

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