

Multiprotocol 2.4G Wireless Module Industrial Grade



Key Features

- Multiprotocol, Bluetooth 5 low energy, Zigbee, Thread, 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.
- 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) 11uA at +105°C operating temperature
- RX current: 6.9mA
- TX current @ 0dBm: 7.3mA
- > TX current @ 5dBm: 9.6mA
- Industrial grade operating temperature range from -40°C to +105°C
- Long life nonvolatile memory at extreme working temperature
- Low soft error rate for long operation lifetime with always-on SRAM parity checking against corruption due to potential radiation events, suitable for no disruption industrial applications
- BQB, FCC, CE, RoHS compliant

Descriptions

BDE-RFM207-IN is an industrial grade 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-IN 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 extreme operating temperature and no disruption industrial applications that are sensitive to power consumption, size and cost.



Block Diagram



BDE Technology Co., Ltd.



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

Rating	Min	Тур	Max	Unit	Notes
Storage Temperature	-40	-	150	°C	
VDD	-0.3	-	4.1	V	
Other Digital Terminals	-0.3	-	VDDS+0.3≤4.1	V	
	-0.3	-	VDDS	V	Voltage scaling enabled
Voltage on ADC input	-0.3	-	1.49	V	Voltage scaling disabled, internal reference
	-0.3	-	VDDS/2.9	V	Voltage scaling disabled, VDDS as reference
RF pin	-	-	5	dBm	

Absolute maximum rating

Recommended operating conditions

Rating	Min	Тур	Max	Unit
Operating Temperature	-40	-	105	°C
VDD	1.8	3.3	3.8	V



Pinout



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

Table 1: Pin definitions of BDE-RFIVI207-II	Table	1: Pin	definitions	of Bl	DE-RFM	207-IN
---	-------	--------	-------------	-------	--------	--------

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 TMSC, high-drive capability
20	JTAG_TCK	JTAG TCKC
21	DIO 16	GPIO, JTAG TDO, high-drive capability

BDE Technology Co., Ltd.



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-IN. The module measures 22.95mm long by 15mm wide by 2.15mm high with the shield.



Fig. 3: Overall Dimensions of BDE-RFM207-IN



BDE-RFM207-IN

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







BDE-RFM207-IN

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

BDE Technology Co. Ltd

Address: Originality Building B2-403, 162 Science Ave, Huangpu District, Guangzhou, 510663, China 494 E Thornhill Ln, Palatine, IL 60074, USA Tel: +86-020-28065335 Fax: +86-020-28065338

Website: www.bdecomm.com Email: info@bdecomm.com

BDE Technology Co., Ltd.