General Description

Note: Images are for illustrative purposes only; actual products may differ.

The BDE-MP2674P10 is a high-performance 2.4 GHz multi-protocol wireless module series with integrated PA, based on Texas Instruments' (TI) single-chip wireless microcontroller (MCU) CC2674P106T0RGZR. To meet different integration requirements, BDE offers multiple variants of this module series, as listed and described in Table 1.

The BDE-MP2674P10 integrates an Arm® Cortex®-M33 MCU and a dedicated software-controlled radio controller (Arm® Cortex®-M0). This architecture supports multiple physical layers and RF standards, including Thread, Zigbee®, Matter, Bluetooth® 5.2 Low Energy, IEEE 802.15.4g, IPv6-enabled smart objects (6LoWPAN), proprietary systems, and TI 15.4-Stack (2.4 GHz). Concurrent multiprotocol operation is enabled through TI's Dynamic Multiprotocol Manager (DMM) driver. The module features 1024 KB flash, 256 KB SRAM, and 8 KB cache SRAM.

The BDE-MP2674P10 has an ultra-low sleep current of 0.92 µA with RTC and 256 KB RAM retention, enabling long battery life for wireless applications. In addition to the main Cortex®-M33 processor, it includes an autonomous ultra-low-power Sensor Controller CPU with fast wake-up capability. For example, the sensor controller can perform 1 Hz ADC sampling at 1 µA system current. The device offers low SER (Soft Error Rate) FIT (Failure-In-Time) for long operational lifetime, and always-on RAM parity minimizes corruption risk from potential radiation events.

The series integrates all required system-level components — including clocks, balun filter, passives, and a PCB trace antenna or U.FL connector — into a compact PCB form factor, ensuring easy assembly and low-cost PCB design.

Pre-certified with FCC, ISED, CE, and Bluetooth SIG, the BDE-MB2674P10 enables quick integration and fast time-to-market for customer products.

Table 1. Module Variants

Part Number	Antenna Type	On-board SPI Flash (Mbit)	Operating Temperature
BDE-MP2674P10A32	PCB trace antenna	32	-40℃ to +85℃
BDE-MP2674P10U32	U.FL connector		
BDE-MP2674P10N32	ANT pin		
BDE-MP2674P10A0	PCB trace antenna	0	
BDE-MP2674P10U0	U.FL connector		
BDE-MP2674P10N0	ANT pin		
BDE-MP2674P10A32-IN	PCB trace antenna	32	-40℃ to +105℃
BDE-MP2674P10U32-IN	U.FL connector		
BDE-MP2674P10N32-IN	ANT pin		
BDE-MP2674P10A0-IN	PCB trace antenna	0	
BDE-MP2674P10U0-IN	U.FL connector		
BDE-MP2674P10N0-IN	ANT pin		

Key Features

- **Wireless microcontroller**
  - Powerful 48-MHz Arm® Cortex®- M33 processor with TrustZone®
  - FPU and DSP extension
  - 1024 KB flash program memory
  - 8 KB of cache SRAM
  - 256 KB of ultra-low leakage SRAM with parity for high-reliability operation
    - 32 kB of additional SRAM is available if parity is disabled
  - Dynamic multiprotocol manager (DMM) driver
  - Programmable radio includes support for 2-(G)FSK, 4-(G)FSK, MSK, Bluetooth® 5.2 Low Energy, IEEE 802.15.4 PHY and MAC
  - Supports over-the-air upgrade (OTA)
- **Ultra-low power sensor controller**
  - Autonomous MCU with 4 KB of SRAM
  - Sample, store, and process sensor data
  - Fast wake-up for low-power operation
  - Software defined peripherals, capacitive touch, flow meter, LCD
- **Low power consumption**
  - MCU consumption:
    - 4.0 mA active mode, CoreMark®
    - 83 µA/MHz running CoreMark®
    - 1.19 µA standby mode, RTC, 256 KB RAM
    - 0.13 µA shutdown mode, wake-up on pin
  - Ultra-low power sensor controller consumption:
    - 30 µA in 2 MHz mode
    - 809 µA in 24 MHz mode
  - Radio Consumption:
    - 6.4 mA RX
    - 7.3 mA TX at 0 dBm
    - 22 mA TX at +10 dBm
    - 101 mA TX at +20 dBm
- **Wireless protocol support**
  - Thread, Zigbee®, Matter
  - Bluetooth® 5.2 Low Energy
  - SimpleLink™ TI 15.4-stack
  - 6LoWPAN
  - Proprietary systems
- **High performance radio**
  - -104 dBm for Bluetooth® Low Energy 125-kbps
  - –105 dBm for IEEE 802.15.4-2006 2.4 GHz OQPSK (coherent modem)
  - Output power up to +20 dBm with temperature compensation
- **MCU peripherals**
  - Most digital peripherals can be routed to any GPIO
  - Four 32-bit or eight 16-bit general-purpose timers
  - 12-bit SAR ADC, 200 kSamples/s, 8 channels
  - 8-bit DAC
  - Two comparators
  - Programmable current source
  - Four UART, four SPI, two I^2C, I^2S
  - Real-time clock (RTC)
  - Integrated temperature and battery monitor
  - 26 GPIOs – none SPI flash versions
  - 22 GPIOs – SPI flash versions
- **Security enablers**
  - Supports secure boot
  - Supports secure key storage and device ID
  - Arm TrustZone for trusted execution environment
  - AES 128- and 256-bit cryptographic accelerator
  - ECC and RSA public key hardware accelerator
  - SHA2 Accelerator (full suite up to SHA-512)
  - True random number generator (TRNG)
  - Secure debug lock
  - Software anti-rollback protection
- **Operating range**
  - On-chip buck DC/DC converter
  - 1.8 V to 3.8 V single supply voltage
  - -40 to +85°C / -40 to +105°C
- **Antenna options**
  - PCB antenna – BDE-MP2674P10A
  - U.FL connector – BDE-MP2674P10U
  - ANT pin – BDE-MP2674P10N
- **On-board SPI Flash**
  - 32-Mbit, only available in SPI flash versions
- **Package**
  - LCC-42, 26 mm x 19 mm x 2.15 mm

- RoHS-compliant package

■ **Certification**

- FCC ID: 2ABUR-MP26P
- IC: 25657-MP26P
- CE-RED
- Bluetooth SIG

Applications

- 2400 to 2480 MHz ISM and SRD systems with down to 4 kHz of receive bandwidth
- Building automation
  - Building security systems – motion detector, electronic smart lock, door and window sensor, garage door system, gateway
  - HVAC – thermostat, wireless environmental sensor, HVAC system controller, gateway
  - Fire safety system – smoke and heat detector, fire alarm control panel (FACP)
  - Video surveillance – IP network camera
  - Elevators and escalators – elevator main control panel for elevators and escalators
- Industrial transport – asset tracking
- Factory automation and control
- Medical
  - Personal care & fitness
  - Patient monitoring & diagnostics – medical sensor patches, multiparameter patient monitor
  - Medical equipment
  - Home healthcare – blood glucose monitor, pulse oximeter
- Electronic point of sale (EPOS) – Electronic Shelf Label (ESL)
- Communication equipment
- Wired networking – wireless LAN or Wi-Fi access points, edge router
- Personal electronics
  - Portable electronics – RF smart remote control
  - Home theater & entertainment – smart speakers, smart display, set-top box
  - Connected peripherals – consumer wireless keypads
  - Gaming – electronic and robotic toys
  - Wearables (non-medical) – smart trackers, smart clothing

Module Family

Table 2. Module Family

Product Type & Series Name	Orderable Part Number	Chipset & Core	On-chip Flash Size (KB)	On-chip SRAM Size (KB)	Connectivity	Antenna Options	On-board SPI Flash (Mbit)	Operating Temp (°C)	Size (mm)
Module BDE-MP26P	BDE-MP2674P10A32	CC2674P10 Cortex-M33	1024	296	2.4GHz BLE 5.2 & ZigBee & Thread	PCB trace antenna	32	-40 to +85	26 × 19 × 2.15
	BDE-MP2674P10U32					U.FL connector			
	BDE-MP2674P10N32					ANT pin			
	BDE-MP2674P10A0					PCB trace antenna	0		
	BDE-MP2674P10U0					U.FL connector			
	BDE-MP2674P10N0					ANT pin			
	BDE-MP2674P10A32-IN					PCB trace antenna	32	-40 to +105	
	BDE-MP2674P10U32-IN					U.FL connector			
	BDE-MP2674P10N32-IN					ANT pin			
	BDE-MP2674P10A0-IN					PCB trace antenna	0		
	BDE-MP2674P10U0-IN					U.FL connector			
	BDE-MP2674P10N0-IN					ANT pin			
	BDE-MP2652P7A32	CC2652P7 Coretex-M4F	704	152	2.4GHz BLE 5.2 & ZigBee & Thread	PCB trace antenna	32	-40 to +85	26 × 19 × 2.15
	BDE-MP2652P7U32					U.FL connector			
	BDE-MP2652P7N32					ANT pin			
	BDE-MP2652P7A0					PCB trace antenna	0		
	BDE-MP2652P7U0					U.FL connector			
	BDE-MP2652P7N0					ANT pin			
	BDE-MP2652P7A32-IN					PCB trace antenna	32	-40 to +105	
	BDE-MP2652P7U32-IN					U.FL connector			
	BDE-MP2652P7N32-IN					ANT pin			
	BDE-MP2652P7A0-IN					PCB trace antenna	0		
	BDE-MP2652P7U0-IN					U.FL connector			
	BDE-MP2652P7N0-IN					ANT pin			
	BDE-MP2652PA32	CC2652P Coretex-M4F	352	88	2.4GHz BLE 5.3 & ZigBee & Thread	PCB trace antenna	32	-40 to +85	26 × 19 × 2.15
	BDE-MP2652PU32					U.FL connector			
	BDE-MP2652PN32					ANT pin			
	BDE-MP2652PA0					PCB trace antenna	0		
	BDE-MP2652PU0					U.FL connector			
	BDE-MP2652PN0					ANT pin			
	BDE-MP2652PA32-IN					PCB trace antenna	32	-40 to +105	
	BDE-MP2652PU32-IN					U.FL connector			
	BDE-MP2652PN32-IN					ANT pin			
	BDE-MP2652PA0-IN					PCB trace antenna	0		
	BDE-MP2652PU0-IN					U.FL connector			
	BDE-MP2652PN0-IN					ANT pin			
	BDE-MP2651P3A32	CC2651P3 Coretex-M4	352	40	2.4GHz BLE 5.2 & ZigBee	PCB trace antenna	32	-40 to +85	26 × 19 ×

Product Type & Series Name	Orderable Part Number	Chipset & Core	On-chip Flash Size (KB)	On-chip SRAM Size (KB)	Connectivity	Antenna Options	On-board SPI Flash (Mbit)	Operating Temp (°C)	Size (mm)
	BDE-MP2651P3U32					U.FL connector			2.15
	BDE-MP2651P3N32					ANT pin			
	BDE-MP2651P3A0					PCB trace antenna	0		
	BDE-MP2651P3U0					U.FL connector			
	BDE-MP2651P3N0					ANT pin			
	BDE-MP2651P3A32-IN					PCB trace antenna	32	-40 to +105	
	BDE-MP2651P3U32-IN					U.FL connector			
	BDE-MP2651P3N32-IN					ANT pin			
	BDE-MP2651P3A0-IN					PCB trace antenna	0		
	BDE-MP2651P3U0-IN					U.FL connector			
	BDE-MP2651P3N0-IN					ANT pin			

Naming Convention

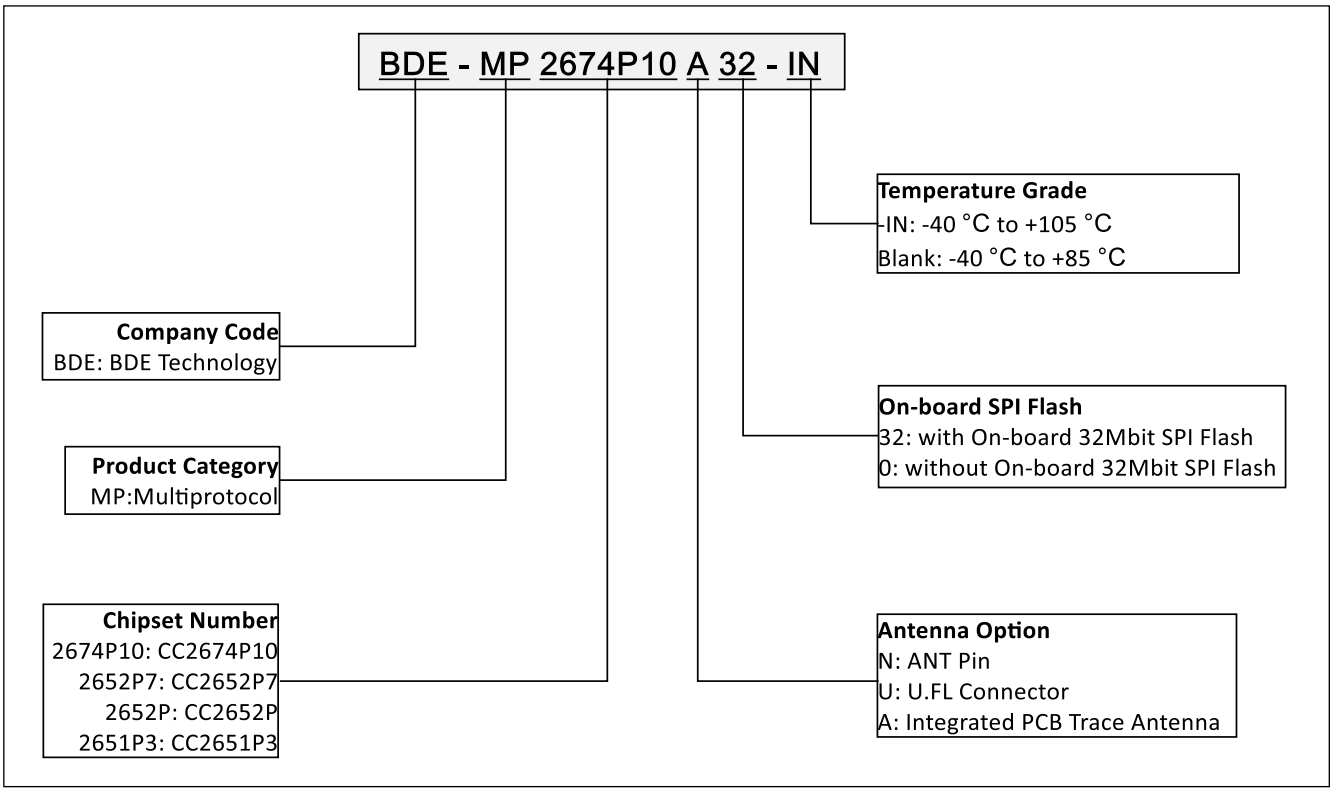

Figure 1. Module Naming Convention

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References

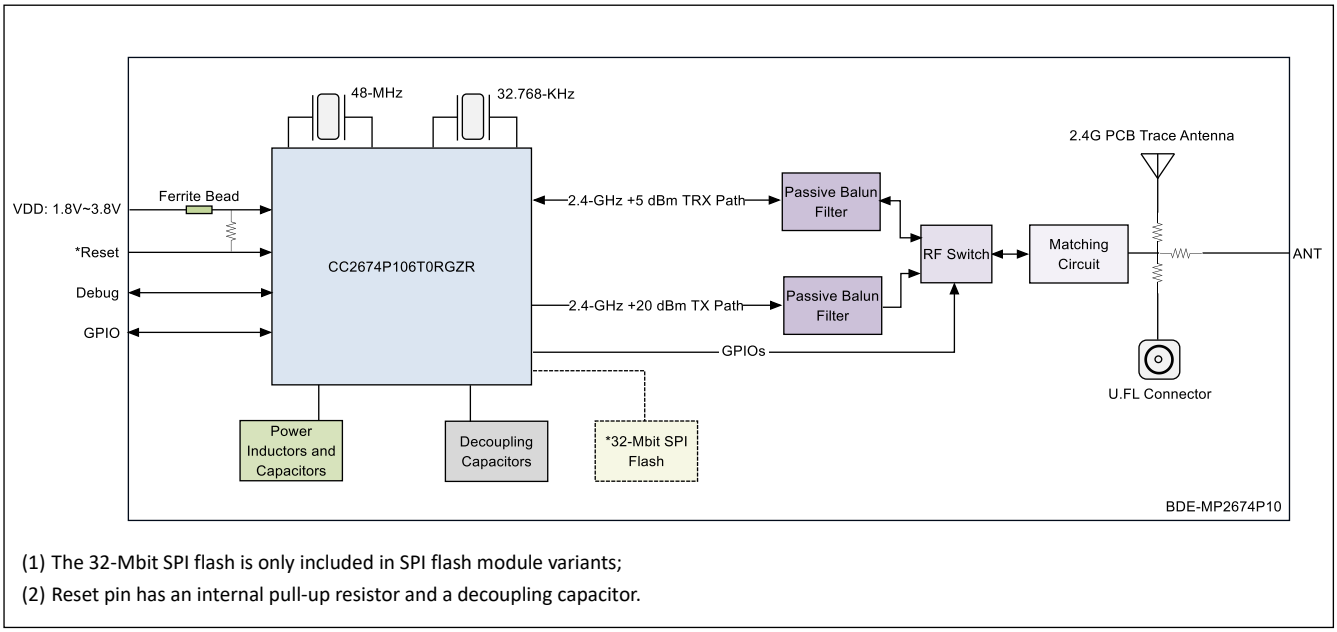
[1] CC2674P10 resources: https://www.ti.com/product/CC2674P10

1. System Overview

1.1. Block Diagram

BDE-MP2674P10 module is based on the Taxes Instruments' CC2674P10 single chip wireless MCU. The module integrates all required system-level hardware components including clocks, balun filter, other passives, and PCB trace antenna or U.FL connector into a small PCB form factor.

The module, as seen in Figure 2, comprises of:
- 48-MHz XTAL
- 32.768-kHz XTAL
- Power inductors and capacitors
- Pull-up resistor
- Passive balun filter
- Decoupling capacitors
- Matching circuit
- PCB trace antenna (BDE-MP2674P10A)
- U.FL connector (BDE-MP2674P10U)



(1) The 32-Mbit SPI flash is only included in SPI flash module variants;
(2) Reset pin has an internal pull-up resistor and a decoupling capacitor.

Figure 2. BDE-MP2674P10 Module Block Diagram

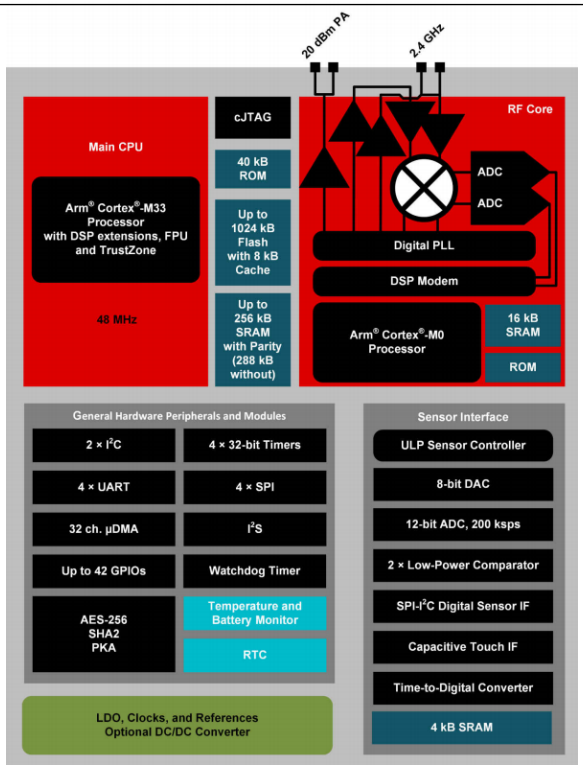


Figure 3. The block diagram of CC2674P10 (Adopted from CC2674P10 datasheet)

1.2. System CPU

The BDE-MP2674P10 module series utilizes CC2674P10 SimpleLink™ Wireless MCU. The MCU contains an Arm® Cortex®-M33 system CPU with TrustZone®, which runs the application and the higher layers of radio protocol stacks.

The system CPU is the foundation of a high-performance, low-cost platform that meets the system requirements of minimal memory implementation, and low-power consumption, while delivering outstanding computational performance and exceptional system response to interrupts.

1.3. Radio (RF Core)

The RF Core is a highly flexible and future proof radio module which contains an Arm Cortex-M0 processor that interfaces the analog RF and base-band circuitry, handles data to and from the system CPU side, and assembles the information bits in a given packet structure. The RF core offers a high level, command-based API to the main CPU that configurations and data are passed through. The Arm Cortex-M0 processor is not programmable by customers and is interfaced through the TI-provided RF driver that is included with the SimpleLink Software Development Kit (SDK).

The RF core can autonomously handle the time-critical aspects of the radio protocols, thus offloading the main CPU, which reduces power and leaves more resources for the user application. Several signals are also available to control external circuitry such as RF switches or range extenders autonomously.

The various physical layer radio formats are partly built as a software defined radio where the radio behavior is either defined by radio ROM contents or by non-ROM radio formats delivered in form of firmware patches with the SimpleLink SDKs. This

allows the radio platform to be updated for support of future versions of standards even with over-the-air (OTA) updates while still using the same silicon.

1.3.1. Bluetooth 5.2 Low Energy

The RF Core offers full support for Bluetooth 5.3 Low Energy, including the high speed 2 Mbps physical layer and the 500 kbps and 125 kbps long range PHYs (Coded PHY) through the TI provided Bluetooth 5.3 stack or through a high-level Bluetooth API. The Bluetooth 5.3 PHY and part of the controller are in radio and system ROM, providing significant savings in memory usage and more space available for applications.

The new high-speed mode allows data transfers up to 2 Mbps, twice the speed of Bluetooth 4.2 and five times the speed of Bluetooth 4.0, without increasing power consumption. In addition to faster speeds, this mode offers significant improvements for energy efficiency and wireless coexistence with reduced radio communication time.

Bluetooth 5.3 also enables unparalleled flexibility for adjustment of speed and range based on application needs, which capitalizes on the high-speed or long-range modes respectively. Data transfers are now possible at 2 Mbps, enabling development of applications using voice, audio, imaging, and data logging that were not previously an option using Bluetooth low energy. With high-speed mode, existing applications deliver faster responses, richer engagement, and longer battery life. Bluetooth 5.3 enables fast, reliable firmware updates.

1.3.2. 802.15.4 Thread, Zigbee, and 6LoWPANPinout Functions

Through a dedicated IEEE radio API, the RF Core supports the 2.4 GHz IEEE 802.15.4-2011 physical layer (2 Mchips per second Offset-QPSK with DSSS 1:8), used in Thread, Zigbee, and 6LoWPAN protocols. The 802.15.4 PHY and MAC are in radio and system ROM. TI also provides royalty-free protocol stacks for Thread and Zigbee as part of the SimpleLink SDK, enabling a robust end-to-end solution.

1.4. Memory

The up to 1024 kB nonvolatile (Flash) memory provides storage for code and data. The flash memory is in-system programmable and erasable. The last flash memory sector must contain a Customer Configuration section (CCFG) that is used by boot ROM and TI provided drivers to configure the device. This configuration is done through the ccfg.c source file that is included in all TI provided examples.

The ultra-low leakage system static RAM (SRAM) is split into up to eight 32 kB blocks and can be used for both storage of data and execution of code. Retention of SRAM contents in Standby power mode is enabled by default and included in Standby mode power consumption numbers. Parity checking for detection of bit errors in memory is built-in, which reduces chip-level soft errors and thereby increases reliability. Parity can be disabled for an additional 32 kB which can be allocated for general purpose SRAM. System SRAM is always initialized to zeroes upon code execution from boot.

To improve code execution speed and lower power when executing code from nonvolatile memory, a 4-way nonassociative 8 kB cache is enabled by default to cache and prefetch instructions read by the system CPU. The cache can be used as a general-purpose RAM by enabling this feature in the Customer Configuration Area (CCFG).

There is a 4 kB ultra-low leakage SRAM available for use with the Sensor Controller Engine which is typically used for storing Sensor Controller programs, data and configuration parameters. This RAM is also accessible by the system CPU. The Sensor Controller RAM is not cleared to zeroes between system resets.

The ROM includes a TI-RTOS kernel and low-level drivers, as well as significant parts of selected radio stacks, which frees up flash memory for the application. The ROM also contains a serial (SPI and UART) bootloader that can be used for initial programming of the device.

The module also provides an option with integrated an on-board 32-Mbit SPI flash for the applications that need to store large application data.

1.5. Sensor Controller

The Sensor Controller contains circuitry that can be selectively enabled in both Standby and Active power modes. The peripherals in this domain can be controlled by the Sensor Controller Engine, which is a proprietary power-optimized CPU. This CPU can read and monitor sensors or perform other tasks autonomously; thereby significantly reducing power consumption and offloading the system CPU.

The Sensor Controller Engine is user programmable with a simple programming language that has syntax similar to C. This programmability allows for sensor polling and other tasks to be specified as sequential algorithms rather than static configuration of complex peripheral modules, timers, DMA, register programmable state machines, or event routing.

1.6. Cryptography

The device comes with a wide set of modern cryptography-related hardware accelerators, drastically reducing code footprint and execution time for cryptographic operations. It also has the benefit of being lower power and improves availability and responsiveness of the system because the cryptography operations runs in a background hardware thread.

Together with a large selection of open-source cryptography libraries provided with the Software Development Kit (SDK), this allows for secure and future proof IoT applications to be easily built on top of the platform.

1.7. Timer

A large selection of timers are available as part of the device. These timers are:

- Real-Time Clock (RTC)
- General Purpose Timers (GPTIMER)
- Sensor Controller Timers
- Radio Timer
- Watchdog Timer
- Always On Watchdog Timer (AON_WDT)

1.8. Serial Peripherals and I/O

The SPI interface provides a standardized synchronous serial interface to communicate with devices compatible with SPI (3

and 4 wire), MICROWIRE and TI Synchronous Serial Format. The SPIs support master/slave operation up to 12 MHz, programmable clock bit rate with prescaler, as well as configurable phase and polarity.

The UART interface implements universal asynchronous receiver and transmitter functions. The UART supports flexible baud-rate generation up to a maximum of 3 Mbps with FIFO, multiple data sizes, stop and parity bits as well as hardware handshake.

The I2S interface provides a standardized interface to exchange digital audio with devices compatible with this standard, including ADCs, DACs and CODECs. The I2S can also receive pulse-density modulation (PDM) data from devices such as digital microphones and perform conversion to PCM data.

The I2C interface enables low speed serial communications with devices compatible with the I2C standard. The I2C interface can handle both standard (100 kHz) and fast (400 kHz) speeds, as well as four modes of operation: master transmit/receive and slave transmit/receive.

The I/O controller (IOC) controls the digital I/O pins and contains multiplexer circuitry to allow a set of peripherals to be assigned to I/O pins in a flexible manner. All digital I/Os are interrupt and wake-up capable, have a programmable pullup and pulldown function, and can generate an interrupt on a negative or positive edge (configurable). When configured as an output, pins can function as either push-pull or open-drain. Five GPIOs have high-drive capabilities, which are marked in bold in Section 2.1. All digital peripherals can be connected to any digital pin on the device.

1.9. Battery and Temperature Monitor

A combined temperature and battery voltage monitor is available in the CC2674P10 device. The battery and temperature monitor allows an application to continuously monitor on-chip temperature and supply voltage and respond to changes in environmental conditions as needed. The module contains window comparators to interrupt the system CPU when temperature or supply voltage go outside defined windows. These events can also be used to wake up the device from Standby mode through the Always-On (AON) event fabric.

1.10. µDMA

The device includes a direct memory access (µDMA) controller. The µDMA controller provides a way to offload data-transfer tasks from the system CPU, thus allowing for more efficient use of the processor and the available bus bandwidth. The µDMA controller can perform a transfer between memory and peripherals. The µDMA controller has dedicated channels for each supported on-chip module and can be programmed to automatically perform transfers between peripherals and memory when the peripheral is ready to transfer more data. Some features of the µDMA controller include the following (this is not an exhaustive list):

- Highly flexible and configurable channel operation of up to 32 channels
- Transfer modes: memory-to-memory, memory-to-peripheral, peripheral-to-memory, and peripheral-to-peripheral
- Data sizes of 8, 16, and 32 bits
- Ping-pong mode for continuous streaming of data

1.11. Debug

The debug subsystem implements two IEEE standards for debug and test purposes: IEEE 1149.7 Class 4: Reduced-pin and

Enhanced-functionality Test Access Port and Boundary-scan Architecture. This is known by the acronym cJTAG (compact JTAG) and this device uses only two pins to communicate to the target: TMS (JTAG_TMSC) and TCK (JTAG_TCKC). This is the default mode of operation.IEEE standard 1149.1: Test Access Port and Boundary Scan Architecture Test Access Port (TAP). This standard is known by the acronym JTAG and this device uses four pins to communicate to the target: TMS (JTAG_TMSC), TCK (JTAG_TCKC), TDI (JTAG_TDI) and TDO (JTAG_TDO).

The debug subsystem also implements a user-configurable firewall to control unauthorized access to debug/test ports.

1.12. Power Management

To minimize power consumption, the CC2674P10 supports a number of power modes and power management features.

Table 3. Power Modes

Mode	Software Configurable Power Modes (1)				Reset Pin Held
	Active	Idle	Standby	Shutdown	
CPU	Active	Off	Off	Off	Off
Flash	On	Available	Off	Off	Off
SRAM	On	On	Retention	Off	Off
Supply System	On	On	Duty Cycled	Off	Off
Register and CPU retention	Full(2)	Full	Partial	No	No
SRAM retention	Full	Full	Full	No	No
48 MHz high-speed clock (HFCLK)	RCOSC_HF	RCOSC_HF	Off	Off	Off
2 MHz medium-speed clock (SCLK_MF)	RCOSC_MF	RCOSC_MF	Available	Off	Off
32 kHz low-speed clock (LFCLK)	LFXT or LFOSC	LFXT or LFOSC	LFXT or LFOSC	Off	Off
Peripherals	Available	Available	Off	Off	Off
Sensor Controller	Available	Available	Available	Off	Off
Wake-up on RTC	Available	Available	Available	Off	Off
Wake-up on pin edge	Available	Available	Available	Available	Off
Wake-up on reset pin	On	On	On	On	On
Brownout detector (BOD)	On	On	Duty Cycled	Off	Off
Power-on reset (POR)	On	On	On	Off	Off
Watchdog timer (WDT)	Available	Available	Paused	Off	Off
Always-on Watchdog timer (AON_WDT)	Available	Available	Available	Off	Off

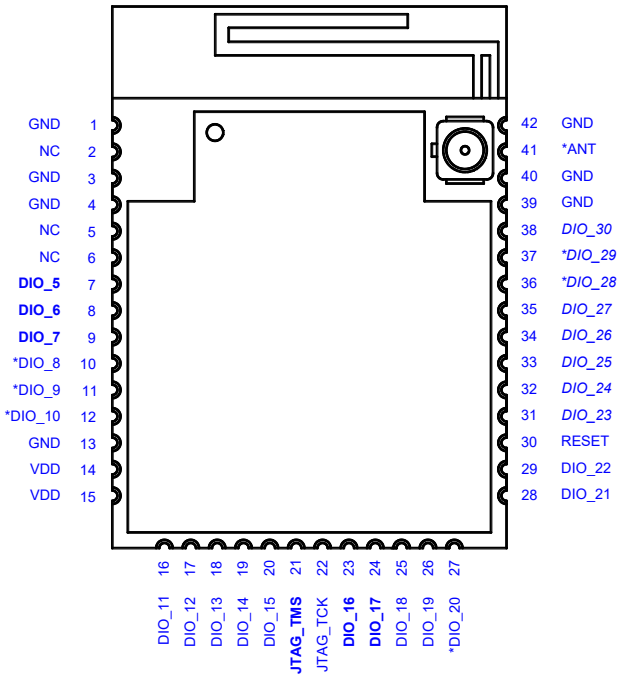
(1) “Available” indicates that the specific IP or feature can be enabled by user application in the corresponding device operating modes. “On” indicates that the specific IP or feature is turned on irrespective of the user application configuration of the device in the corresponding device operating mode. “Off” indicates that the specific IP or feature is turned off and not available for the user application in the corresponding device operating mode;
(2) Software-based retention of CPU registers with context save and restore when entering and exiting standby power mode.

1.13. Antenna

The module series provides three different types of antenna integration, PCB antenna, U.FL connector and ANT pin for connecting external antenna. Detail characteristics for the PCB antennas can be found in Section 3.3.

2. Pinout Functions

2.1. Pinout Diagram



(1) DIO_8, DIO_9, DIO_10 and DIO_20 are assigned to the on-board SPI flash, therefore, please leave those four pins NC if the SPI flash versions are selected;
(2) DIO_28 and DIO_29 are assigned as the RF switch control pins internally. Leave those two pins NC;
(3) Pin 41 is assigned as the ANT pin for BDE-MP2674P10N if BDE-MP2674P10A and BDE-MP2674P10U are selected, leave this pin NC.

Figure 4. Pin Diagram of BDE-MP2674P10A (Top View)

The following I/O pins marked in Figure 4 in **bold** have high-drive capabilities:

- Pin 7, DIO5
- Pin 8, DIO6
- Pin 9, DIO7
- Pin 21, JTAG_TMS
- Pin 23, DIO16
- Pin 24, DIO17

The following I/O pins marked in Figure 4 in *italics* have analog capabilities:

- Pin 31, DIO23
- Pin 32, DIO24
- Pin 33, DIO25
- Pin 34, DIO26
- Pin 35, DIO27
- Pin 36, DIO28
- Pin 37, DIO29

- Pin 38, DIO30

The following four I/O pins are assigned to on-board 32-Mbit SPI flash for SPI flash variants series:

- Pin 10, SFL_MISO_DIO8
- Pin 11, SFL_MOSI_DIO9
- Pin 12, SFL_CLK_DIO10
- Pin 27, SFL_CS_DIO20

2.2. Pinout Descriptions

Table 4 describes the definitions of the pins of the module.

Table 4. Pin Description(1)

Module Pin #	Pin Name	Type	CC2674P106T0RGZ Pin #	Description
1	GND	Ground	-	Power ground
2	NC	-	-	No connect
3	GND	Ground	-	Power ground
4	GND	Ground	-	Power ground
5	NC	-	-	No connect
6	NC	-	-	No connect
7	DIO_5	I/O	10	GPIO, high-drive capability
8	DIO_6	I/O	11	GPIO, high-drive capability
9	DIO_7	I/O	12	GPIO, high-drive capability
10	DIO_8	I/O	14	SFL_MISO(2), GPIO
11	DIO_9	I/O	15	SFL_MOSI(2), GPIO
12	DIO_10	I/O	16	SFL_SCLK(2), GPIO
13	GND	Ground	-	Power ground
14	VDD	Power	-	Power supply
15	VDD	Power	-	Power supply
16	DIO_11	I/O	17	GPIO
17	DIO_12	I/O	18	GPIO
18	DIO_13	I/O	19	GPIO
19	DIO_14	I/O	20	GPIO
20	DIO_15	I/O	21	GPIO
21	JTAG_TMSC	I/O	24	JTAG TMSC, high-drive capability
22	JTAG_TCKC	I	25	JTAG TCKC
23	DIO_16	I/O	26	GPIO, JTAG_TDO, high-drive capability
24	DIO_17	I/O	27	GPIO, JTAG_TDI, high-drive capability
25	DIO_18	I/O	28	GPIO
26	DIO_19	I/O	29	GPIO
27	DIO_20	I/O	30	SFL_CS(2), GPIO
28	DIO_21	I/O	31	GPIO
29	DIO_22	I/O	32	GPIO
30	RESET	I	35	Reset, active low, 100K ohm internal pull-up resistor

Module Pin #	Pin Name	Type	CC2674P106T0RGZ Pin #	Description
31	DIO_23	I/O	36	GPIO, analog capability
32	DIO_24	I/O	37	GPIO, analog capability
33	DIO_25	I/O	38	GPIO, analog capability
34	DIO_26	I/O	39	GPIO, analog capability
35	DIO_27	I/O	40	GPIO, analog capability
36	DIO_28 (3)	I/O	41	GPIO, analog capability, assigned as RF switch control pin, leave NC
37	DIO_29 (3)	I/O	42	GPIO, analog capability, assigned as RF switch control pin, leave NC
38	DIO_30	I/O	43	GPIO, analog capability
39	GND	Ground	-	Power ground
40	GND	Ground	-	Power ground
41	ANT	RF	-	Antenna port
42	GND	Ground	-	Power ground

(1) For pin multiplexing details, please refer to CC2674P10 datasheet: CC2674P10 SimpleLink™ High-Performance Multiprotocol 2.4 GHz Wireless MCU with Integrated Power Amplifier datasheet (Rev. A);

(2) These four pins can be used as GPIOs in none SPI flash module variants;

(3) DIO_28 and DIO_29 are assigned internally as RF switch control pins. Truth table is as follow:

	2.4G 5dBm TRX path	2.4G High power 20dBm TX path
DIO_28	1	0
DIO_29	0	1

2.3. Connections for Unused Pins

Table 5. Connections for Unused Pins

Function	Signal Name	Acceptable Practice	Proffered Practice
GPIO (Digital or analog)	DIOn	NC or GND	NC
No Connects	NC	NC	NC

3. Characteristics

3.1. Electrical Characteristics

3.1.1. Absolute Maximum Ratings

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, so functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specification are not implied. Exposure to Absolute Maximum Rating conditions for extended periods may affect device reliability.

Table 6. Absolute Maximum Ratings

Parameter	MIN	MAX	Unit	Notes
VDD	-0.3	4.1	V	
Voltage on any digital pins	-0.3	VDD+0.3≤4.1	V	
Voltage on ADC input	-0.3	VDD	V	Voltage scaling enabled
	-0.3	1.49	V	Voltage scaling disabled, internal reference
	-0.3	VDD/2.9	V	Voltage scaling disabled, VDD as reference
Storage temperature	-40	150	°C	

3.1.2. ESD Ratings

Table 7. ESD Ratings

Parameter	Description	Value	Unit	Note
Electrostatic discharge	Contact discharge	4000	V	As per EN 301-489
	Air discharge	8000	V	As per EN 301-489

3.1.3. Recommended Operating Conditions

Table 8. Recommended Operating Conditions

Parameter	MIN	TYP	MAX	Unit
VDD	1.8	3.3	3.8	V
VDD (For SPI flash variants)	2.3	3.3	3.8	V
Operating temperature	-40	-	85	°C
Operating temperature (-IN variants)	-40	-	105	°C
Rising supply voltage slew rate	0		100	mV/us
Falling supply voltage slew rate	0		20	mV/us

3.1.4. Power Consumption

The measurement is made with the evaluation board for BDE-MP2674P10 with T_A = 25 °C, VDD = 3.3 V, DCDC enabled, GLDO disabled, unless otherwise noted.

Table 9. Power Consumption – Power Modes

Power Mode		Test Condition	TYP	Unit
Core Current Consumption				
I_{core}	Active	MCU running CoreMark at 48 MHz with parity enabled RCOSC_HF	4.13	mA
		MCU running CoreMark at 48 MHz with parity disabled RCOSC_HF	3.97	mA
	Idle	Supply Systems and RAM powered RCOSC_HF	720.9	µA
	Standby without cache retention	RTC running, CPU, 256 kB RAM and (partial) register retention. RCOSC_LF	1.06	µA
		RTC running, CPU, 128 kB RAM and (partial) register retention. RCOSC_LF	0.96	µA
		RTC running, CPU, 256 kB RAM and (partial) register retention XOSC_LF	1.19	µA
		RTC running, CPU, 128 kB RAM and (partial) register retention XOSC_LF	1.09	µA
	Standby with cache retention	RTC running, CPU, 256 kB RAM and (partial) register retention. RCOSC_LF	2.55	µA
		RTC running, CPU, 128 kB RAM and (partial) register retention. RCOSC_LF	2.45	µA
		RTC running, CPU, 256 kB RAM and (partial) register retention. XOSC_LF	2.66	µA
		RTC running, CPU, 128 kB RAM and (partial) register retention. XOSC_LF	2.57	µA
	Shutdown	Shutdown. No clocks running, no retention	128.6	nA
	Reset	Reset. RESET_N pin asserted or VDD below power-on-reset threshold	150	nA
Peripheral Current Consumption				
I_{peri}	RF	Delta current with power domain enabled, clock enabled, RF core idle	120.4	uA
	µDMA	Delta current with clock enabled, module is idle	68.2	uA
	Timers	Delta current with clock enabled, module is idle	115.4	uA
	I2C	Delta current with clock enabled, module is idle	11.5	uA
	I2S	Delta current with clock enabled, module is idle	26.1	uA
	SPI	Delta current with clock enabled, module is idle	65.9	uA
	UART	Delta current with clock enabled, module is idle	135.1	uA
	CRYPTO (AES)	Delta current with clock enabled, module is idle	18.6	uA
	PKA	Delta current with clock enabled, module is idle	79.3	uA
	TRNG	Delta current with clock enabled, module is idle	24.69	uA
Sensor Controller Engine Consumption				
I_{SCE}	Active mode	24 MHz, infinite loop	808.5	uA

Power Mode		Test Condition	TYP	Unit
	Low-power mode	2 MHz, infinite loop	30.1	uA

Table 10. Power Consumption – Radio Modes

Power Mode	Test Condition	TYP	Unit
Radio receive current	2440 MHz, Bluetooth Low Energy	6.4	mA
Radio transmit current	0 dBm output power setting 2440 MHz, Bluetooth Low Energy	6.9	mA
	+5 dBm output power setting 2440 MHz, Bluetooth Low Energy	9.4	mA
	+10 dBm output power setting 2440 MHz, Bluetooth Low Energy	20	mA
	+20 dBm output power setting 2440 MHz, Bluetooth Low Energy	101	mA

3.1.5. Clock Characteristics

Table 11. 48-MHz Crystal Oscillator (XOSC_HF) Characteristics

Parameter	Test Condition	MIN	TYP	MAX	Unit
Crystal frequency			48		MHz
ESR, Equivalent series resistance				40	Ω
Frequency tolerance	TA: 25°C	-10		10	ppm
Frequency stability	TA: -40°C ~ 85°C	-20		20	ppm
CL, Crystal load capacitance			7		pF

Table 12. 32.768-KHz Crystal Oscillator (XOSC_LF) Characteristics

Parameter	Test Condition	MIN	TYP	MAX	Unit
Crystal frequency			32.768		KHz
ESR, Equivalent series resistance				70	kΩ
Frequency tolerance	TA: 25°C	-20		20	ppm
CL, Crystal load capacitance			12.5		pF

3.1.6. Reset Timing

Table 13. Reset Timing

Parameter	MIN	TYP	MAX	Unit
RESET low duration	1			us

3.1.7. UART Characteristics

Table 14. UART Characteristics

Parameter	MIN	TYP	MAX	Unit
UART baud rate			3	MBaud

3.1.8. SPI Characteristics

Table 15. SPI Characteristics

Parameter	Test Condition	MIN	TYP	MAX	Unit
SPI clock frequency	Primary Mode 1.8 < VDD < 3.8			12	MHz
	Secondary Mode 2.7 < VDD < 3.8			8	
	Secondary Mode VDD < 2.7			7	
SPI duty cycle		45	50	55	%

3.1.9. I2C Characteristics

Table 16. I2C Characteristics

Parameter	MIN	TYP	MAX	Unit
I2C clock frequency	100		400	KHz

3.1.10. GPIO DC Characteristics

Table 17. GPIO DC Characteristics

Parameter	Test Condition	MIN	TYP	MAX	Unit
TA = 25 °C, VDD = 1.8 V					
GPIO VOH at 8 mA load	IOCURR = 2, high-drive GPIOs only		1.56		V
GPIO VOL at 8 mA load	IOCURR = 2, high-drive GPIOs only		0.24		V
GPIO VOH at 4 mA load	IOCURR = 1		1.59		V
GPIO VOH at 4 mA load	IOCURR = 1		0.21		V
GPIO pullup current	Input mode, pullup enabled, Vpad = 0 V		73		µA
GPIO pulldown current	Input mode, pulldown enabled, Vpad = VDD		19		µA
GPIO low-to-high input transition, with hysteresis	IH = 1, transition voltage for input read as 0 → 1		1.08		V
GPIO low-to-high input transition, with hysteresis	IH = 1, transition voltage for input read as 1 → 0		0.73		V
GPIO input hysteresis	IH = 1, difference between 0 → 1 and 1 → 0		0.35		V

Parameter	Test Condition	MIN	TYP	MAX	Unit
	points				
TA = 25 °C, VDD = 3.0 V					
GPIO VOH at 8 mA load	IOCURR = 2, high-drive GPIOs only		2.59		V
GPIO VOL at 8 mA load	IOCURR = 2, high-drive GPIOs only		0.42		V
GPIO VOH at 4 mA load	IOCURR = 1		2.63		V
GPIO VOL at 4 mA load	IOCURR = 1		0.40		V
TA = 25 °C, VDD = 3.8 V					
GPIO pullup current	Input mode, pullup enabled, Vpad = 0 V		282		µA
GPIO pulldown current	Input mode, pulldown enabled, Vpad = VDD		110		µA
GPIO low-to-high input transition, with hysteresis	IH = 1, transition voltage for input read as 0 → 1		1.97		V
GPIO high-to-low input transition, with hysteresis	IH = 1, transition voltage for input read as 1 → 0		1.55		V
GPIO input hysteresis	IH = 1, difference between 0 → 1 and 1 → 0 points		0.42		V
TA = 25 °C					
VIH	Lowest GPIO input voltage reliably interpreted as a High	0.8*VDD			V
VIL	Highest GPIO input voltage reliably interpreted as a Low			0.2*VDD	V

3.1.11. ADC Characteristics

Table 18. ADC Characteristics

Parameter	Test Condition	MIN	TYP	MAX	Unit
Resolution			12		Bits
Input voltage range		0		VDD	V
Sample Rate				200	ksps
SNDR	Internal 4.3 V equivalent reference, 200 kSamples/s, 9.6 kHz input tone		60		dB
	VDD as reference, 200 kSamples/s, 9.6 kHz input tone		63		dB
	Internal reference, voltage scaling disabled, 32 samples average, 200 kSamples/s, 300 Hz input tone		68		dB
Reference voltage	Equivalent fixed internal reference (input voltage scaling enabled). For best accuracy, the ADC conversion should be initiated		4.3		V

Parameter	Test Condition	MIN	TYP	MAX	Unit
	through the TI-RTOS API in order to include the gain/offset compensation factors stored in FCFG1				
	Fixed internal reference (input voltage scaling disabled). For best accuracy, the ADC conversion should be initiated through the TI-RTOS API in order to include the gain/offset compensation factors stored in FCFG1. This value is derived from the scaled value (4.3 V) as follows: Vref = 4.3 V × 1408 / 4095		1.48		V
	VDD as reference, input voltage scaling enabled		VDD		V
	VDD as reference, input voltage scaling disabled		VDD/2.82		V

For more details on the ADC characteristic, please refer to CC2674P10 datasheet: CC2674P10 SimpleLink™ High-Performance Multiprotocol 2.4 GHz Wireless MCU with Integrated Power Amplifier datasheet (Rev. A)

3.1.12. DAC Characteristics

Table 19. DAC Characteristics

Parameter	Test Condition	MIN	TYP	MAX	Unit
Resolution			8		Bits
Supply voltage	Any load, any VREF, pre-charge OFF, DAC charge-pump ON	1.8		3.8	V
	External Load, any VREF, pre-charge OFF, DAC charge-pump OFF	2.0		3.8	V
	Any load, VREF = DCOUPL, pre-charge ON	2.6		3.8	V
Clock frequency	Buffer ON (recommended for external load)	16		250	kHz
	Buffer OFF (internal load)	16		1000	kHz

For more details on the DAC characteristic, please refer to CC2674P10 datasheet: CC2674P10 SimpleLink™ High-Performance Multiprotocol 2.4 GHz Wireless MCU with Integrated Power Amplifier datasheet (Rev. A)

3.1.13. Comparator Characteristics

Table 20. Low-Power Clocked Comparator

Parameter	Test Condition	MIN	TYP	MAX	Unit
Input voltage range		0		VDD	V
Clock frequency			32		KHz
Internal reference voltage	Using internal DAC with VDD as reference voltage, DAC code = 0 - 255	0.024		2.865	V
Offset	Measured at VDD / 2, includes error from internal DAC		±5		mV
Decision time	Step from –50 mV to 50 mV		1		Clock Cycle

Table 21. Continuous Time Comparator

Parameter	Test Condition	MIN	TYP	MAX	Unit
Input voltage range		0		VDD	V
Offset	Measured at VDD / 2, includes error from internal DAC		±5		mV
Decision time	Step from –10 mV to 10 mV		0.78		us
Current consumption	Internal reference		8.6		µA

3.2. RF Characteristics

The measurement is made with the evaluation board for BDE-MP2674P10 with T_A = 25 °C, VDD = 3.3 V, DCDC enabled, GLDO disabled, unless otherwise noted.

3.2.1. BLE Performance: Receiver Characteristics

Table 22. Receive (RX) Characteristics – Bluetooth

Parameter	Test Condition	TYP	Unit
BLE 125Kbps (LE Coded) Receiver Characteristics			
Receiver sensitivity	BER = 10^{-3}	-103.5	dBm
Receiver situation	BER = 10^{-3}	＞5	dBm
Co-channel rejection	Wanted signal at –79 dBm, modulated interferer in channel, BER = 10^{-3}	-1.5	dB
Selectivity, ±1 MHz	Wanted signal at –79 dBm, modulated interferer at ±1 MHz, BER = 10^{-3}	8 / 4.5	dB
Selectivity, ±2 MHz	Wanted signal at –79 dBm, modulated interferer at ±2 MHz, BER = 10^{-3}	44 / 39	dB
Selectivity, ±3 MHz	Wanted signal at –79 dBm, modulated interferer at ±3 MHz, BER = 10^{-3}	43 / 43	dB
Selectivity, ±4 MHz	Wanted signal at –79 dBm, modulated interferer at ±4 MHz, BER = 10^{-3}	44 / 43	dB
Selectivity, ±6 MHz	Wanted signal at –79 dBm, modulated interferer at≥±6 MHz, BER = 10^{-3}	48/43	dB
Selectivity, ±7 MHz	Wanted signal at –79 dBm, modulated interferer at≥±7 MHz, BER = 10^{-3}	51/45	dB
Selectivity, image frequency	Wanted signal at –79 dBm, modulated interferer at image frequency, BER = 10^{-3}	39	dB
Selectivity, image frequency ±1 MHz	Note that Image frequency + 1 MHz is the Co- channel –1 MHz. Wanted signal at –79 dBm, modulated interferer at ±1 MHz from image frequency, BER = 10^{-3}	4.5/44	dB

Parameter	Test Condition	TYP	Unit
BLE 500Kbps (LE Coded) Receiver Characteristics			
Receiver sensitivity	BER = 10^{-3}	-98	dBm
Receiver situation	BER = 10^{-3}	＞5	dBm
Co-channel rejection	Wanted signal at –72 dBm, modulated interferer in channel, BER = 10^{-3}	-3.5	dB
Selectivity, ±1 MHz	Wanted signal at –72 dBm, modulated interferer at ±1 MHz, BER = 10^{-3}	8 / 4	dB
Selectivity, ±2 MHz	Wanted signal at –72 dBm, modulated interferer at ±2 MHz, BER = 10^{-3}	41 / 37	dB
Selectivity, ±3 MHz	Wanted signal at –72 dBm, modulated interferer at ±3 MHz, BER = 10^{-3}	44 / 41	dB
Selectivity, ±4 MHz	Wanted signal at –72 dBm, modulated interferer at ±4 MHz, BER = 10^{-3}	44 / 43	dB
Selectivity, ±6 MHz	Wanted signal at –72 dBm, modulated interferer at≥±6MHz, BER = 10^{-3}	46 / 43	dB
Selectivity, ±7 MHz	Wanted signal at –72 dBm, modulated interferer at≥±6MHz, BER = 10^{-3}	49 / 45	dB
Selectivity, image frequency	Wanted signal at –72 dBm, modulated interferer at image frequency, BER = 10^{-3}	37	dB
Selectivity, image frequency ±1 MHz	Note that Image frequency + 1 MHz is the Co- channel –1 MHz. Wanted signal at –72 dBm, modulated interferer at ±1 MHz from image frequency, BER = 10^{-3}	4 / 46	dB
BLE 1Mbps (LE 1M) Receiver Characteristics			
Receiver sensitivity	BER = 10^{-3}	-95.5	dBm
Receiver situation	BER = 10^{-3}	＞5	dBm
Co-channel rejection	Wanted signal at –67 dBm, modulated interferer in channel, BER = 10^{-3}	-6	dB
Selectivity, ±1 MHz	Wanted signal at –67 dBm, modulated interferer at ±1 MHz, BER = 10^{-3}	7 / 4	dB
Selectivity, ±2 MHz	Wanted signal at –67 dBm, modulated interferer at ±2 MHz, BER = 10^{-3}	40 /33	dB
Selectivity, ±3 MHz	Wanted signal at –67 dBm, modulated interferer at ±3 MHz, BER = 10^{-3}	36 / 41	dB
Selectivity, ±4 MHz	Wanted signal at –67 dBm, modulated interferer at ±4 MHz, BER = 10^{-3}	36 / 45	dB
Selectivity, ±5 MHz or more	Wanted signal at–67 dBm, modulated interferer at≥±5 MHz, BER = 10^{-3}	40	dB
Selectivity, image frequency	Wanted signal at –67 dBm, modulated interferer at image frequency, BER =10^{-3}	33	dB
Selectivity, image frequency ±1 MHz	Note that Image frequency + 1 MHz is the Co- channel –1 MHz. Wanted signal at –67 dBm, modulated interferer at ±1 MHz from image frequency, BER =10^{-3}	4 / 41	dB
Out-of-band blocking	30 MHz to 2000 MHz	-10	dBm
Out-of-band blocking	2003 MHz to 2399 MHz	-18	dBm
Out-of-band blocking	2484 MHz to 2997 MHz	-12	dBm
Out-of-band blocking	3000 MHz to 12.75 GHz (excluding VCO frequency)	-2	dBm
Intermodulation	Wanted signal at 2402 MHz, –64 dBm. Two interferers at 2405 and 2408 MHz respectively, at the given power level	-42	dBm
BLE 2Mbps (LE 2M) Receiver Characteristics			
Receiver sensitivity	BER = 10^{-3}	-90.5	dBm
Receiver situation	BER = 10^{-3}	＞5	dBm
Co-channel rejection	Wanted signal at –67 dBm, modulated interferer in channel, BER=10^{-3}	-7	dB
Selectivity, ±2 MHz	Wanted signal at –67 dBm, modulated interferer at ±2 MHz, BER=10^{-3}	8 / 4	dB
Selectivity, ±4 MHz	Wanted signal at –67 dBm, modulated interferer at ±4 MHz, BER=10^{-3}	35 / 32	dB
Selectivity, ±6 MHz	Wanted signal at –67 dBm, modulated interferer at ±6 MHz, BER=10^{-3}	37 / 34	dB

Parameter	Test Condition	TYP	Unit
Selectivity, image frequency	Wanted signal at –67 dBm, modulated interferer at image frequency, BER =10^{-3}	4	dB
Selectivity, image frequency ±12MHz	Note that Image frequency + 1 MHz is the Co- channel –1 MHz. Wanted signal at –67 dBm, modulated interferer at ±1 MHz from image frequency, BER=10^{-3}	-7 / 36	dB
Out-of-band blocking	30 MHz to 2000 MHz	-16	dBm
Out-of-band blocking	2003 MHz to 2399 MHz	-21	dBm
Out-of-band blocking	2484 MHz to 2997 MHz	-15	dBm
Out-of-band blocking	3000 MHz to 12.75 GHz (excluding VCO frequency)	-20	dBm
Intermodulation	Wanted signal at 2402 MHz, –64 dBm. Two interferers at 2405 and 2408 MHz respectively, at the given power level	-37	dBm

(1) Numbers given as C/I dB;
(2) X / Y, where X is +N MHz and Y is –N MHz;

3.2.2. BLE Performance: Transmitter Characteristics

Table 23. Transmit (TX) Characteristics – Bluetooth

Parameter	Test Condition	TYP	Unit
20dBm, high power PA	2.4 GHz high power PA	18.4	dBm
19dBm, high power PA	2.4 GHz high power PA	17.0	dBm
18dBm, high power PA	2.4 GHz high power PA	16.3	dBm
17dBm, high power PA	2.4 GHz high power PA	15.4	dBm
16dBm, high power PA	2.4 GHz high power PA	14.3	dBm
15dBm, high power PA	2.4 GHz high power PA	13.5	dBm
14dBm, high power PA	2.4 GHz high power PA	12.5	dBm
10dBm, high power PA	2.4 GHz high power PA	10.5	dBm
5dBm, regular PA	2.4 GHz high power PA	4.1	dBm
4dBm, regular PA	2.4 GHz high power PA	3.5	dBm
3dBm, regular PA	2.4 GHz high power PA	2.5	dBm
2dBm, regular PA	2.4 GHz high power PA	1.6	dBm
1dBm, regular PA	2.4 GHz high power PA	0.5	dBm
0dBm, regular PA	2.4 GHz high power PA	-0.2	dBm
Max output power, high power PA, 10 dBm configuration	Differential mode, delivered to a single-ended 50 Ω load through a balun	10.5	dBm
Max output power, regular PA	Differential mode, delivered to a single-ended 50 Ω load through a balun	5	dBm
Output power programmable ranger, high power PA	Differential mode, delivered to a single-ended 50 Ω load through a balun	6	dB
Output power programmable range high power PA, 10 dBm configuration	Differential mode, delivered to a single-ended 50 Ω load through a balun	5	dB
Output power programmable range, regular PA	Differential mode, delivered to a single-ended 50 Ω load through a balun	26	dB

(1) The output power is measured at frequency 2440MHz;
(2) TX power might be limited to comply with the regulatory, refer to compliance test reports for more information.

3.2.3. Zigbee Performance: Receiver Characteristics

Table 24. Receiver (RX) Characteristics – Zigbee Performance

Parameter	Test Condition	TYP	Unit
General Parameters			
Receiver sensitivity	Coherent mode PER = 1%	-105	dBm
Receiver situation	PER = 1%	> -10	dBm
Adjacent channel rejection	Wanted signal at –82 dBm, modulated interferer at ±5 MHz, PER = 1%	36	dB
Adjacent channel rejection	Wanted signal at –82 dBm, modulated interferer at ±10 MHz, PER = 1%	55	dB
Channel rejection, ±15 MHz or more	Wanted signal at –82 dBm, undesired signal is IEEE 802.15.4 modulated channel, stepped through all channels 2405 to 2480 MHz, PER = 1%	59	dB
Blocking and desensitization, 5 MHz from upper band edge	Wanted signal at –97 dBm (3 dB above the sensitivity level), CW jammer, PER = 1%	57	dB
Blocking and desensitization, 10 MHz from upper band edge	Wanted signal at –97 dBm (3 dB above the sensitivity level), CW jammer, PER = 1%	62	dB
Blocking and desensitization, 20 MHz from upper band edge	Wanted signal at –97 dBm (3 dB above the sensitivity level), CW jammer, PER = 1%	62	dB
Blocking and desensitization, 50 MHz from upper band edge	Wanted signal at –97 dBm (3 dB above the sensitivity level), CW jammer, PER = 1%	65	dB
Blocking and desensitization, –5 MHz from lower band edge	Wanted signal at –97 dBm (3 dB above the sensitivity level), CW jammer, PER = 1%	60	dB
Blocking and desensitization, –10 MHz from lower band edge	Wanted signal at –97 dBm (3 dB above the sensitivity level), CW jammer, PER = 1%	60	dB
Blocking and desensitization, –20 MHz from lower band edge	Wanted signal at –97 dBm (3 dB above the sensitivity level), CW jammer, PER = 1%	60	dB
Blocking and desensitization, –50 MHz from lower band edge	Wanted signal at –97 dBm (3 dB above the sensitivity level), CW jammer, PER = 1%	62	dB
Frequency error tolerance	Difference between the incoming carrier frequency and the internally generated carrier frequency	> 100	ppm
Symbol rate error tolerance	Difference between incoming symbol rate and the internally generated symbol rate	> 800	ppm
RSSI dynamic range		95	dB
RSSI accuracy		±4	dB

3.2.4. Zigbee Performance: Transmitter Characteristics

Table 25. Transmit (TX) Characteristics – Zigbee Performance

Parameter	Test Condition	TYP	Unit
Max output power, high power PA	Differential mode, delivered to a single-ended 50 Ω load through a balun	19.5	dBm
Max output power, high power PA, 10 dBm configuration	Differential mode, delivered to a single-ended 50 Ω load through a balun	10.5	dBm
Max output power, regular PA	Differential mode, delivered to a single-ended 50 Ω load through a balun	4	dBm
Output power programmable ranger, high power PA	Differential mode, delivered to a single-ended 50 Ω load through a balun	6	dB
Output power programmable range, high power PA, 10 dBm configuration	Differential mode, delivered to a single-ended 50 Ω load through a balun	5	dB
Output power programmable range, regular PA	Differential mode, delivered to a single-ended 50 Ω load through a balun	26	dB

3.3. Antenna Characteristics

The module comes with an integrated PCB trace antenna for 2.4GHz band with an area of 19mm x 4.3mm. The following data was measured with the module assembled to a reference board. The module placement and the dimension of the reference board is shown in Figure 5.

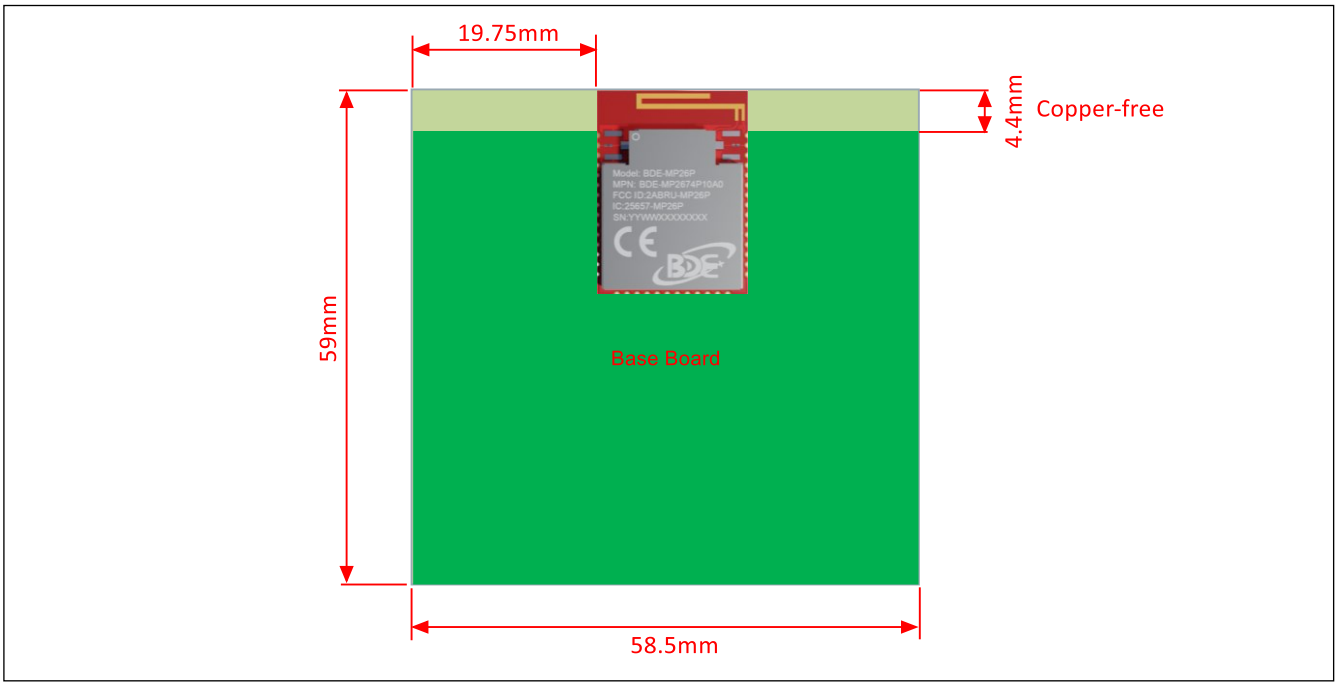


Figure 5. Antenna Placement and Reference Board

3.3.1. Antenna Gain

Table 26. Gain of Integrated PCB Trace Antenna

Frequency (MHz)	Gain (dBi)	Efficiency (%)
2400	-1.0	33
2410	-0.3	36
2420	-0.1	37
2430	0.3	38
2440	0.5	40
2450	0.7	40
2460	0.8	42
2470	0.5	41
2480	0.5	38
2490	0.4	36
2500	-0.3	31

3.3.2. Antenna Radiation Pattern

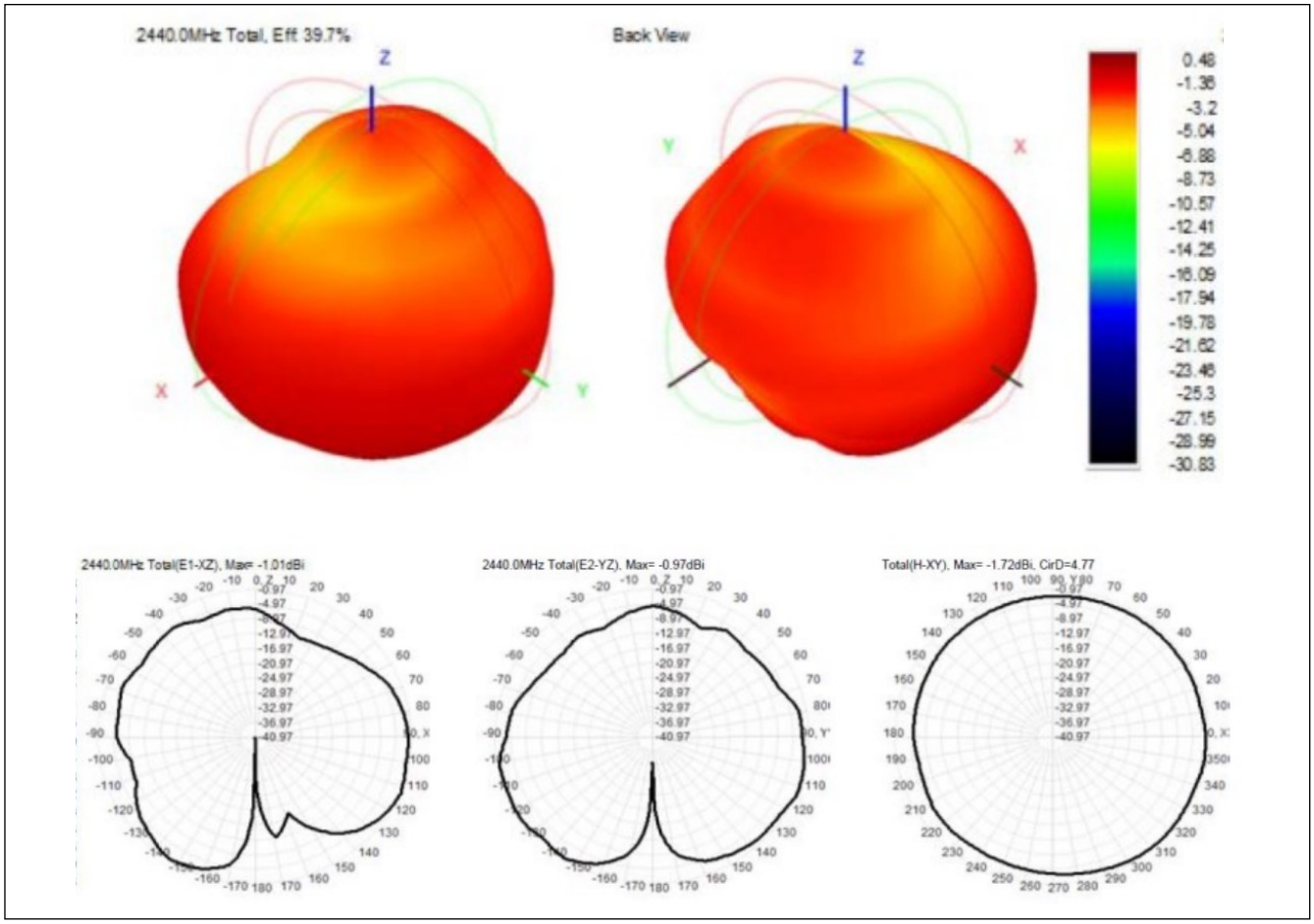


Figure 6. Radiation Pattern of the Integrated PCB Trace Antenna at 2440MHz

3.3.3. Other Certified Antennas

For other certified antennas, please refer to Table 31.

4. Mechanical Specifications

The following section includes mechanical and footprint drawings of the modules.

4.1. Module Dimensions

The following pages include mechanical, footprint drawings, and marking information.

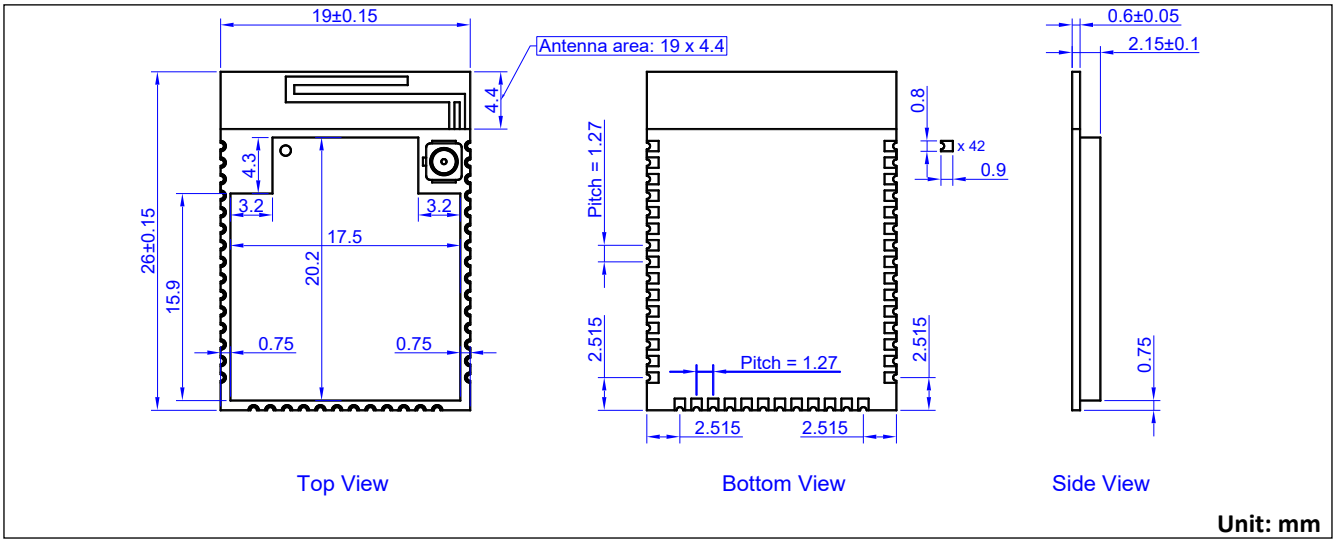


Figure 7. Mechanical Drawing of BDE-MP2674P10

4.2. PCB Footprint

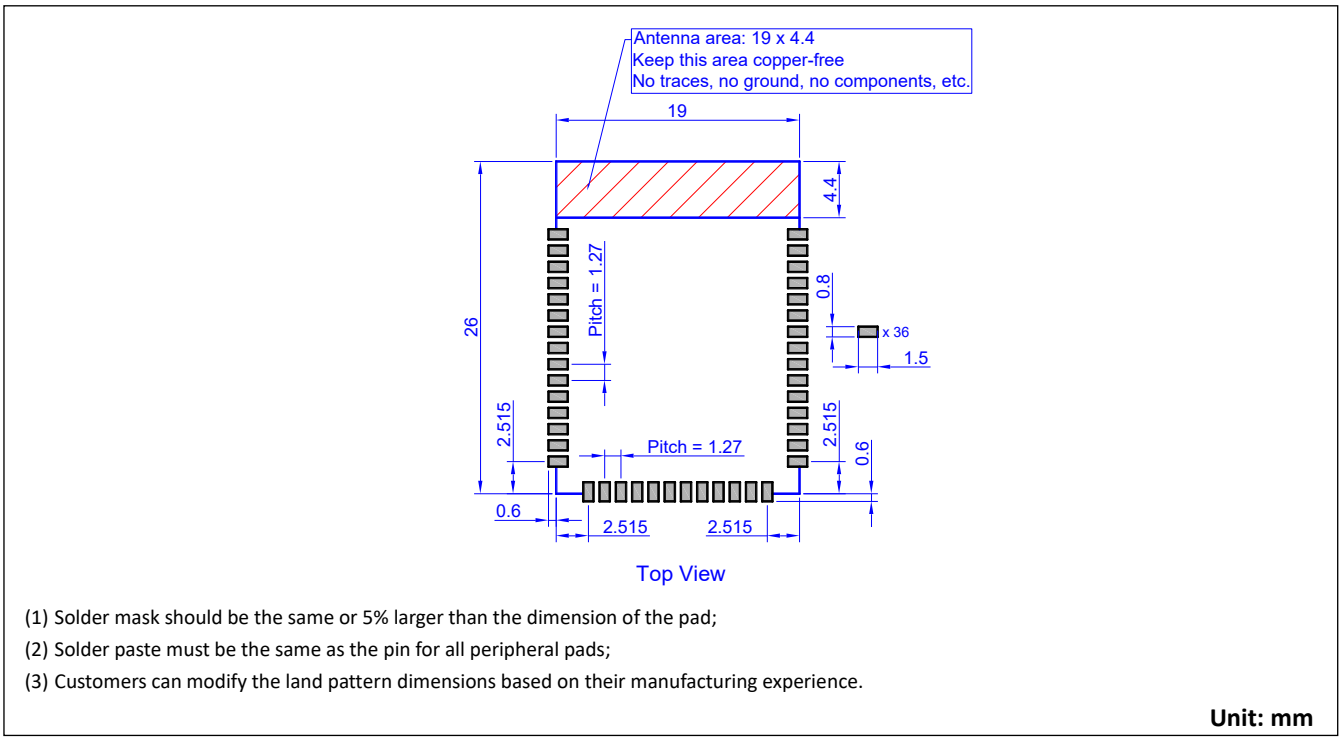
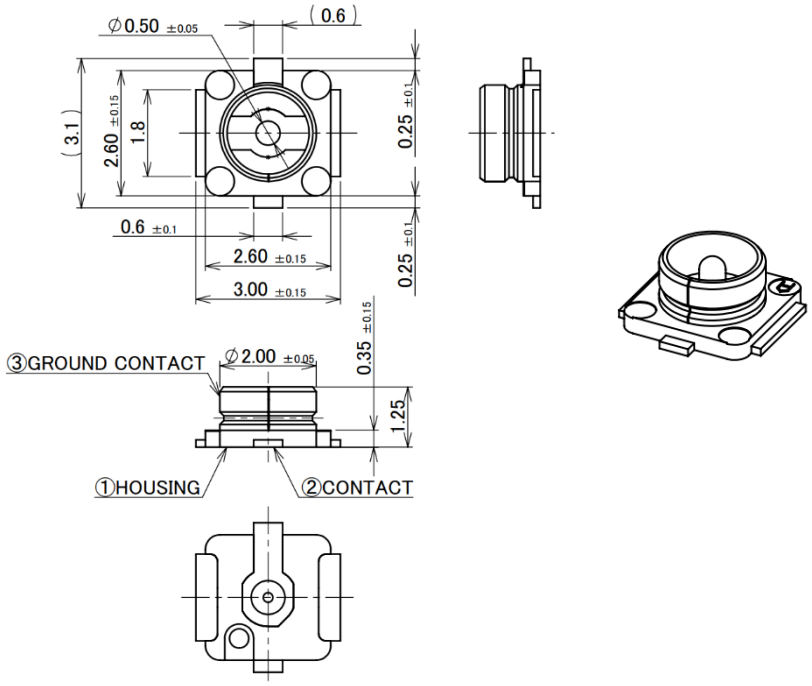


Figure 8. Recommended Module Footprint of BDE-MP2674P10

4.3. U.FL Connector Specification

The drawing and specification of the U.FL connector utilized in the module is as below for reference.
The dimension unit in below drawing is millimeter.



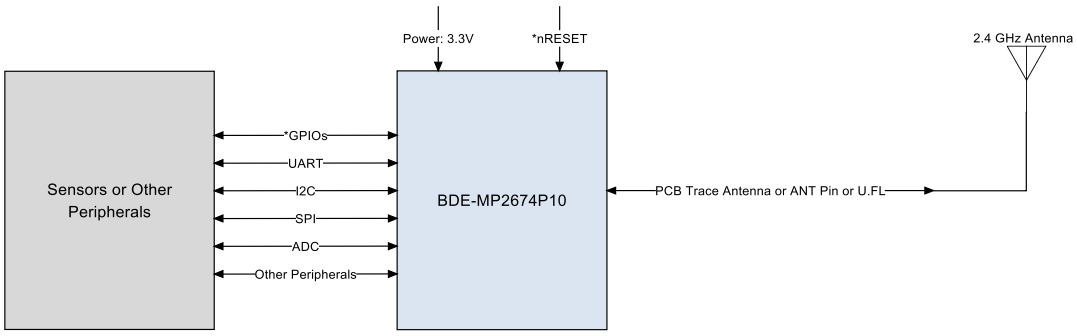
RATING VOLTAGE	60 V AC (R.M.S)	
RATING FREQUENCY	DC～9GHz	
OPERATING TEMPERATURE	233～363K (−40℃～+90℃)	
VSWR	RECEPTACLE: 1.3 MAX. AT 0.1～3 GHz, 1.4 MAX. AT 3～6 GHz, 1.8 MAX. AT 6～9 GHz	
MAIN CONTACT RESISTANCE	INITIAL: 20 mohm MAX. / AFTER TEST: ⊿R 20 mohm MAX.	
GROUND CONTACT RESISTANCE	INITIAL: 20 mohm MAX. / AFTER TEST: ⊿R 100 mohm MAX.	
INSULATION RESISTANCE	INITIAL: 500 Mohm MIN. / AFTER TEST: 100 Mohm MIN.	
DIELECTRIC WITHSTANDING VOLTAGE	200 V AC, 1 MINUTE	
DURABILITY	30 CYCLES	
UNMATING FORCE (INITIAL / AFTER TEST)	INITIAL: 5 N MIN. AFTER TEST: 3 N MIN.	INITIAL: 4 N MIN. AFTER TEST: 2 N MIN.

Figure 9. U.FL Connector Drawing and Specification

5. Integration Guidelines

5.1. SoC Mode

Below block diagram is applicable when the module is used as a SoC running the application and the protocol stack in the system CUP inside the module.



(1) The module has already been implemented with required decoupling capacitors; therefore, external decoupling capacitors are not needed. However, proper decoupling capacitors can also be added to increase module power stability depending on customer's application;
(2) The module has the internal reset circuit on board, e.g. a 100K ohm pull-up resistors and a 0.1uF decouple capacitor. Therefore, external reset circuit is not needed for the same purpose;
(3) If the SPI flash variants is chosen, please do not utilize these four GPIOs in your design, as they are already assigned to the on-board SPI flash. They are GPIO_8, GPIO_9, GPIO_10 and GPIO_20;
(4) It is recommended to reserve the matching circuit for antenna for tuning if ANT pin variant is chosen.

Figure 10. High-Level System Block Diagram

5.2. WNP Mode

The module can also function as the WNP (Wireless Network Processor), in this case, an external MCU will be needed to run the application and the protocol stack, and the interface between the external MCU and the module can be UART/SPI.

5.3. Module Placement

The placement of the module in the base board is critical in your design. Improper placement can lead to poor antenna performance. BDE recommend following below recommended placement in your design. Any form of proximity to the metal or other material will change/degrade the antenna performance. Keep the antenna area as far as possible to the metal material in any direction.

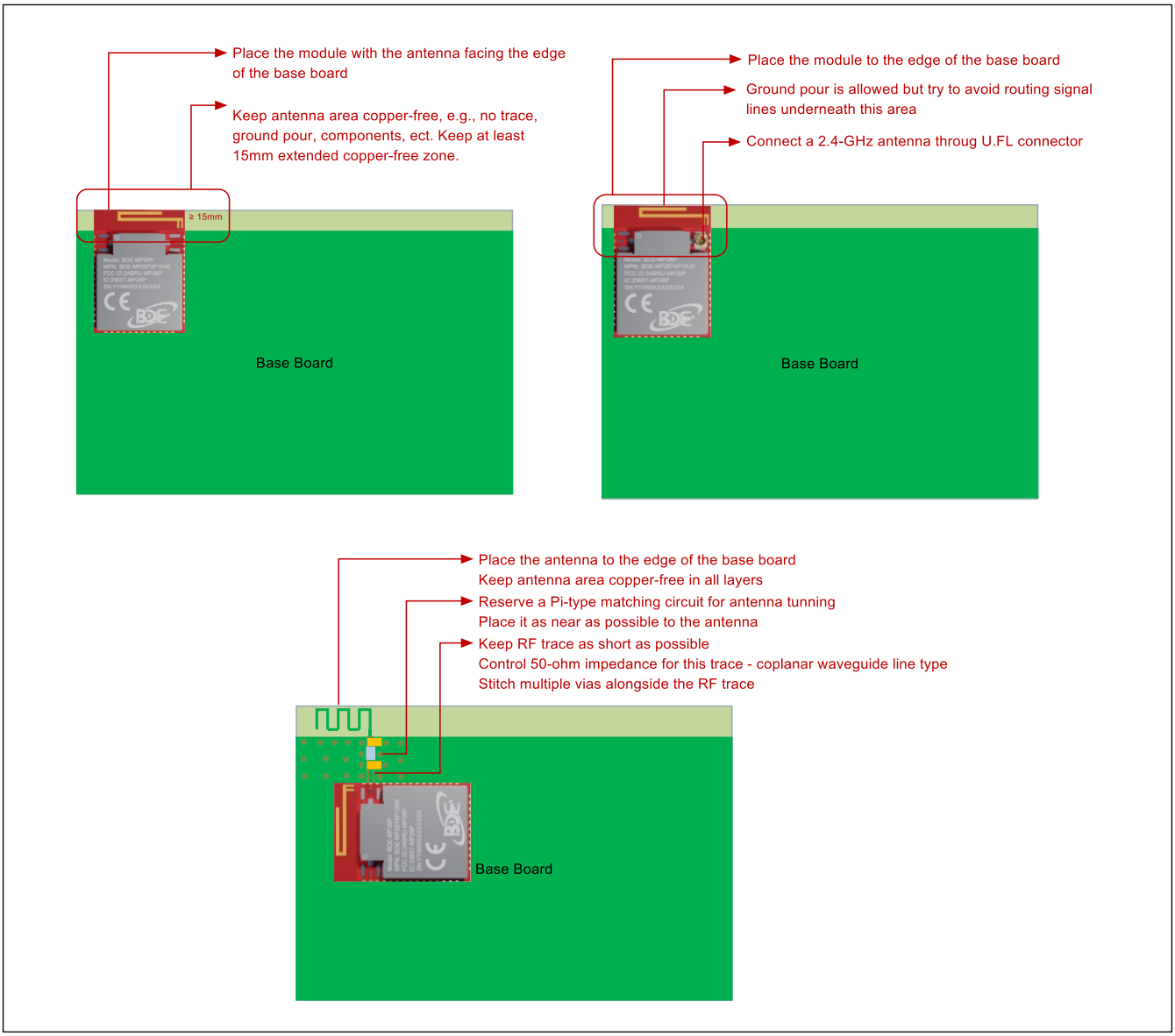


Figure 11. Module Placement Recommendations

5.4. Other Design Considerations

Table 27. Other Design Considerations

Thermal	
1	The proximity of ground vias must be close to each ground pad of the module.
2	Signal traces must not be run underneath the module on the layer where the module is mounted.
3	Have a complete ground pour in layer 2 for thermal dissipation.
4	Have a solid ground plane and ground vias under the module for stable system and thermal dissipation.
5	Increase the ground pour in the first layer and have all of the traces from the first layer on the inner layers, if possible.
6	Signal traces can be run on a third layer under the solid ground layer, which is below the module mounting layer.
RF Trace and Antenna Routing	
7	The RF trace antenna feed must be as short as possible beyond the ground reference. At this point, the trace starts to

	radiate.
8	The RF trace bends must be gradual with an approximate maximum bend of 45° with trace mitered. RF traces must not have sharp corners.
9	RF traces must have via stitching on the ground plane beside the RF trace on both sides.
10	RF traces must have constant impedance (50-ohm Coplanar or microstrip transmission line).
11	For best results, the RF trace ground layer must be the ground layer immediately below the RF trace. The ground layer must be solid.
12	There must be no traces or ground under the antenna section.
13	RF traces must be as short as possible. The antenna, RF traces, and modules must be on the edge of the PCB product. The proximity of the antenna to the enclosure and the enclosure material must also be considered.
14	BDE recommends using double-shielded coaxial RF cable to connect with the U.FL connector with antenna if the U.FL variants are selected.
15	Do not place or run the RF cable right above or below the module.
16	If there are some other radios besides this module in the system, try to place them apart as far as possible. And ensure there is at least 25 dB isolation between the antenna port of every radio.
Supply and Interface	
17	The power trace for VDD must be at least 40-mil wide.
18	Make VDD traces as wide as possible to ensure reduced inductance and trace resistance.
19	If possible, shield VDD traces with ground above, below, and beside the traces.

5.5. Development Resources

For more information on the EVK and other development resources, please visit the product page of the module on bdecomm.com.

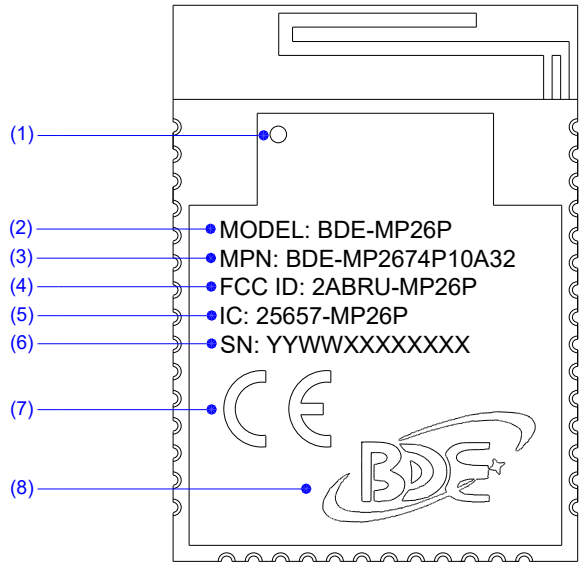
6. Handling Instructions

The module is the surface mount module with LGA footprint. It is designed to conform to the major manufacturing guidelines, including the commercial, industrial manufacturing process.

In this section, we will cover the basic shipping information, including the module markings, packaging and labeling. And also the instructions on how to handle the module in terms of storage, assembly and so on.

6.1. Module Marking

Below figure shows the metal shield marking for the BDE-MP2674P10 module series.

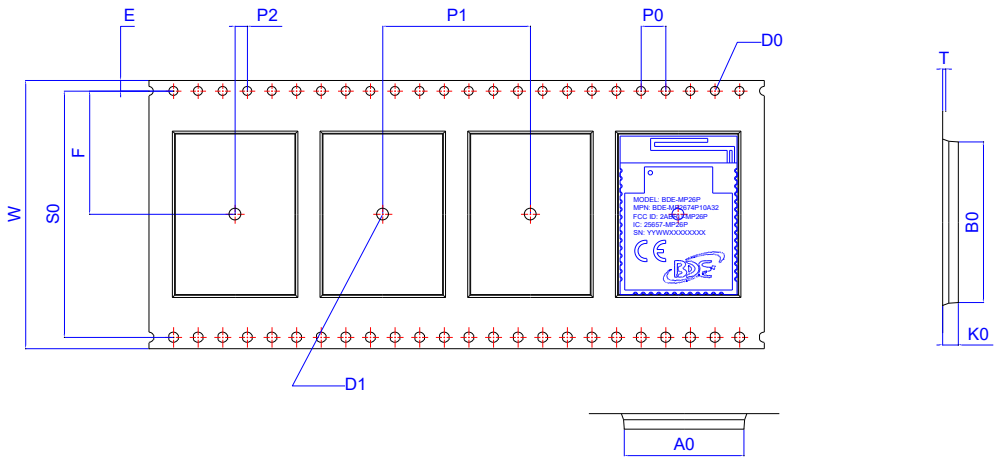


(1) Pin one index;
(2) Model series;
(3) Orderable manufacturer part number;
(4) FCC ID;
(5) IC ID;
(6) Serial number;
(7) CE marking;
(8) BDE logo

Figure 12. Module Marking

6.2. Packaging Information

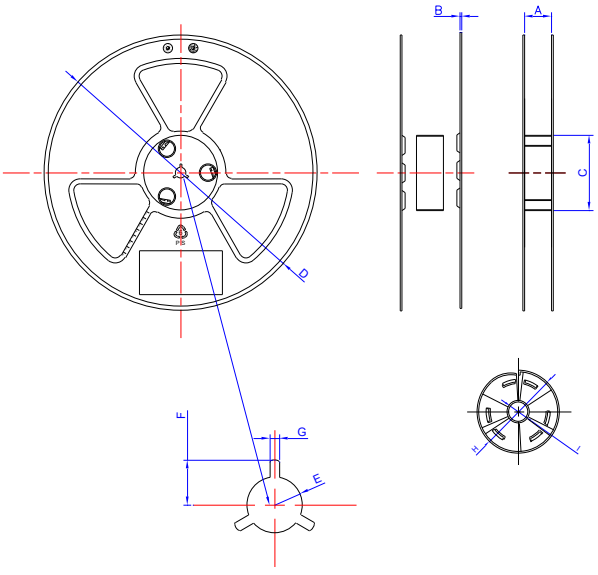
6.2.1. Tape and Reel Package Information



W	A_0	B_0	K_0	P_1	F	E	D_0	D_1	P_0	P_2	T
$44.0^{+0.30}_{-0.30}$	$19.45^{+0.10}_{-0.10}$	$26.35^{+0.10}_{-0.10}$	$2.55^{+0.10}_{-0.10}$	$24.00^{+0.10}_{-0.10}$	$20.20^{+0.10}_{-0.10}$	$1.75^{+0.10}_{-0.10}$	$1.50^{+0.10}_{-0.00}$	$2.00^{+0.10}_{-0.00}$	$4.00^{+0.10}_{-0.10}$	$2.00^{+0.15}_{-0.15}$	$0.35^{+0.05}_{-0.05}$

(1) Cumulative tolerance for every 10 sprockets pitch is ±0.2mm;
(2) Carrier camber not to exceed 1mm in every 100mm;
(3) All dimensions are in millimeter and meets EIA-481-C requirements;
(4) Material: PS Black polystyrene;
(5) Thickness: 0.35±0.05mm;
(6) Packing length per 13"reel: 20.7 meters;
(7) Component load per 13"reel: 900+24pcs (12 voids each to the head and tail);
(8) RoHS compliance;
(9) Anti-static coefficient of 106-11Ω.

Figure 13. Carrier Tape Drawing for BDE-MB2674P10 variants



A	B	C	D	E	F	G	H	I
44	2	100	330	6.75	10.85	2.5	100	24

(1) All dimensions are in millimeter;
(2) Material: PS blue polystyrene;

Figure 14. 13-INnch Reel Drawing

6.2.2. Carton Information and Labeling

6.2.2.1. Carton Information

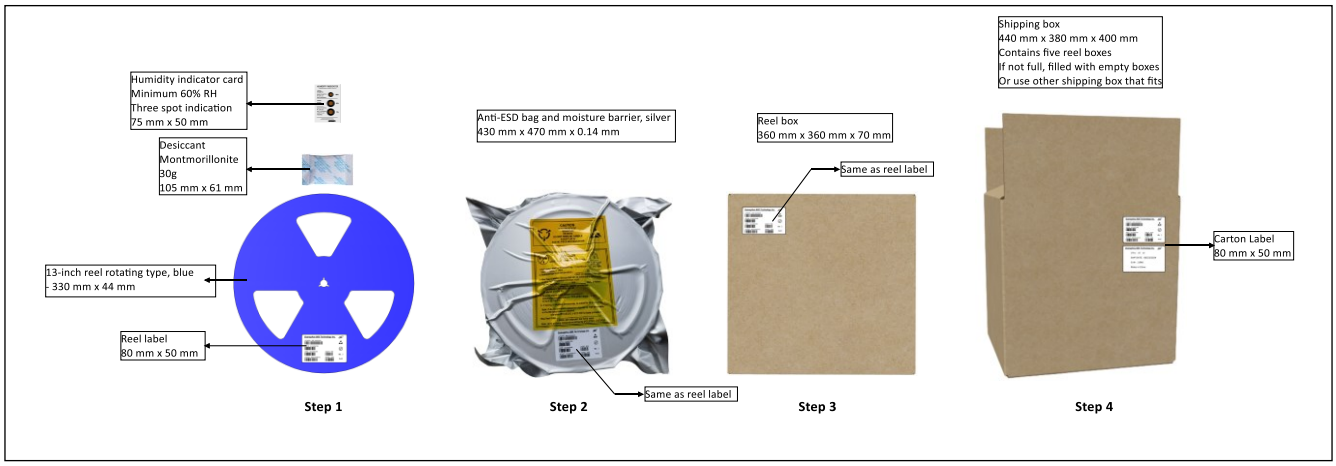


Figure 15. Carton Information

6.2.2.2. Reel Label

The reel label will be affixed onto the reel, Anti-ESD bag and reel box. It mainly shows the MPN (Manufacturer Part Number), CPN (Customer Part Number), PO (Purchase Order Number), LOT number, QTY (Quantity), DC (Date Code) and MSL (Moisture Sensitivity Level). Sometimes, it also shows other information, such as the regulatory information.

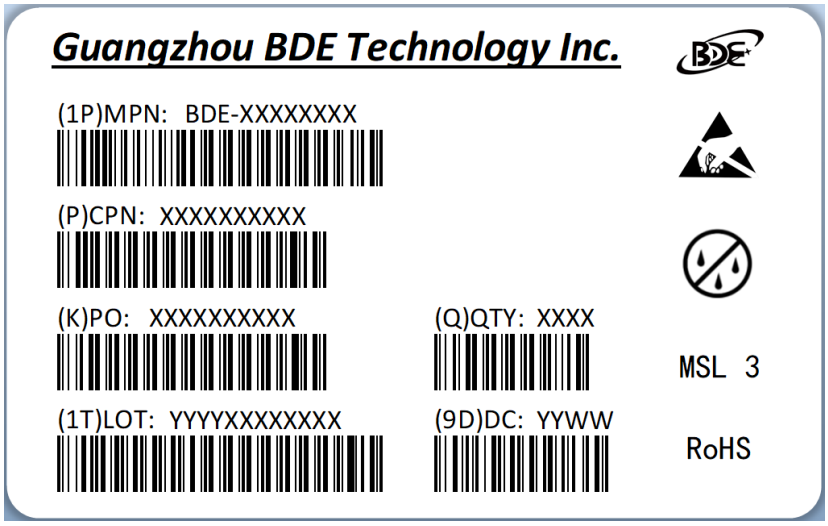


Figure 16. Reel Label Information

6.2.2.3. Carton Label

The carton label will be affixed onto the surface of the carton. If the carton contains different Part Numbers or POs, there will be different labels representing different Part Numbers, different POs and Quantity.

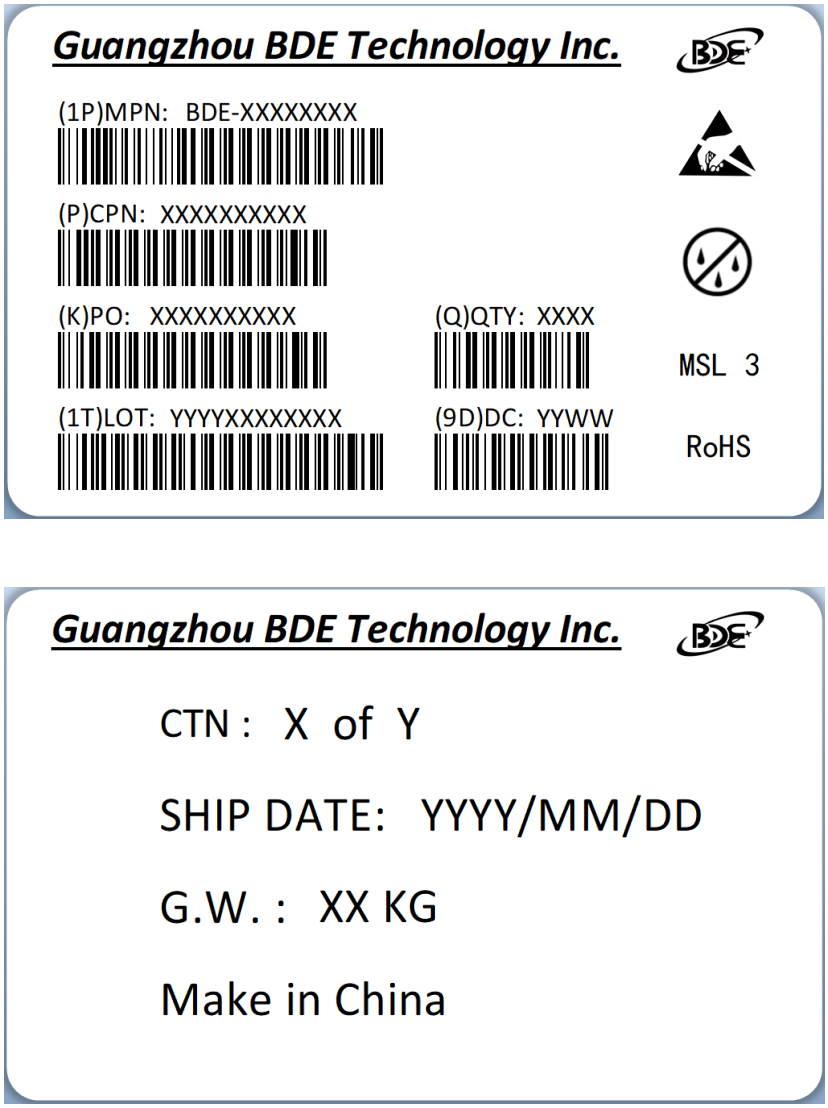


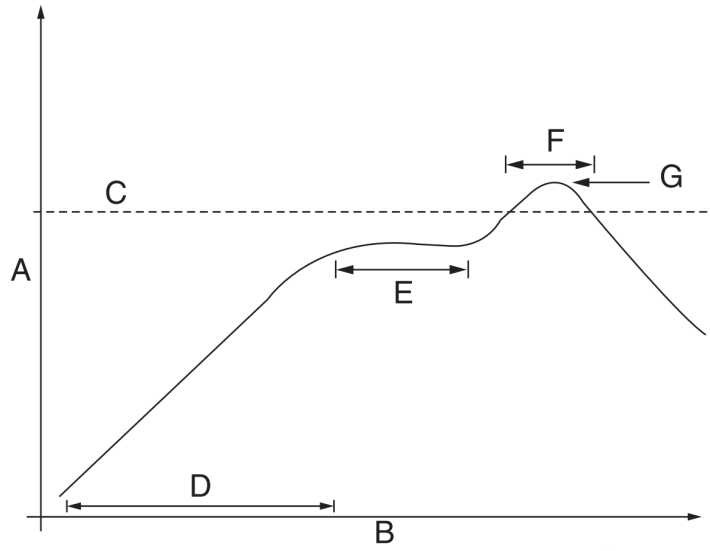
Figure 17. Carton Label Information

6.3. Assembly Instruction

6.3.1. Moisture Sensitive Level

The MSL (Moisture Sensitive Level) of the module is MSL-3. Handling guidelines are listed as below:
The floor life for MSL-3 device is 168 hours in ambient environment 30°C/60%RH. Before assembly, make sure to check if the modules are packaged with desiccate and humidity indicator card;
After the bag is opened, make sure to mount the modules within 168 hours at factory conditions (< 30°C/60% RH) or stored at <10% RH. Repackage is needed with new desiccate and humidity indicator card if the modules are not mounted before exceeding floor life;
If the card reads >10%, or the modules have been exposed for over 168 hours, the modules need to be baked before mounted. Recommended baking condition is 125℃ for 8 hours.

6.3.2. Reflow Profile



A – Temperature
B – Time
C – Alloy liquidus temperature
D – Preheat slope = temperature ramp rate
E – Preheat dwell = soak time
F – Time above liquidus
G – Peak temperature = maximum assembly temperature

Figure 18. Thermal Profile Schematic

Table 28. Reflow Profile Parameters[(1)(3)]

Item	Temperature Range	Ramp Rate / Time
D, preheat zone	30°C ~ 175°C	2°C ~ 4°C per second
E, soak zone	150°C ~ 200°C	60 ~ 120 seconds
C, Alloy liquidus temperature	217°C ~ 220°C	-
F, reflow zone	230°C ~ 245°C	60 ~ 90 seconds
G, target maximum reflow temperature	250°C	-
Absolute peak temperature [(2)]	260°C	-

(1) This is for Pb-free (SAC 305) paste. Different pastes require different profiles for optimum performance, so it is important to consult the paste manufacturer before developing the solder profile;
(2) Exceed the absolute peak temperature for certain period, e.g. 20s might damage the device or affect the reliability;
(3) It is recommend that the modules do not go through the reflow process more than one time.

6.3.3. Other Consideration

(1) Ultrasonic cleaning process is discouraged for the modules as the process might damage the module permanently, especially for the crystal oscillator in the module;
(2) Conformal coating is not allowed to this module. It will impact the reliability of the module once the coating flooded into the shield. Avoid the module while applying the conformal coating to the host board.

7. Certification

7.1. Bluetooth Qualification

7.1.1. Bluetooth Qualification Information

The module series is listed on the Bluetooth SIG website as a qualified End Product, referencing a Controller and Host Subsystem combination. The detail information can be found in below table.

Table 29. Bluetooth Qualification Information

DID/DN	QDID and Included DN
D058375	199566

7.1.2. Bluetooth Qualification Process

Below Bluetooth qualification process is provided for customers when they are listing their end product referencing BDE module.

(1) Go to https://launchstudio.bluetooth.com/ and log in;
(2) Select **Start the Bluetooth Qualification Process with No Required Testing**;
(3) Project Basics:
  (a) Enter your project name, it can be the product name or the product series name;
  (b) Enter QDID that the product reference, in this case the QDID is 199566.
(4) Product Declaration:
  (a) Select the listing date. You can select a date that you want your product listed and go public, although the qualification will complete immediately after your submission.
  (b) Add every product that integrated with this module. You can add a series of individual product models that use the same design/module without any modification.
(5) Declaration ID:
  (a) Select a DID. If you don't have one, you need to purchase a DID for your product by clicking Pay Declaration Fee.
(6) Review and Submit:
  (a) Review all information that you have entered and make sure no mistakes;
  (b) Tick all check boxes if you confirmed above information and add your name to the signature page;
  (c) Click **Signature Confirmed – Complete Project & Submit Product(s) for Qualification**.
(7) The qualification will be done immediately and your product will be listed to the Bluetooth SIG website as per your required listed date in step (4).

For more information about listing your product to Bluetooth SIG, please visit below webpage:
https://www.bluetooth.com/develop-with-bluetooth/qualification-listing/

7.2. Regulatory Compliance

The module is certified for FCC, IC/ISED and ETSI/CE as listed in below table. More regions can be cover by request.

Table 30. Certification Information

Regulatory Body / Region	Standard	ID	MPN
FCC (USA)	FCC CFR 47 PART 15 C (15.247)	2ABUR-MP26P	BDE-MP2674P10A0 BDE-MP2674P10A32 BDE-MP2674P10U0 BDE-MP2674P10U32 BDE-MP2674P10N0 BDE-MP2674P10N32 BDE-MP2674P10A0-IN BDE-MP2674P10A32-IN BDE-MP2674P10U0-IN BDE-MP2674P10U32-IN BDE-MP2674P10N0-IN BDE-MP2674P10N32-IN
IC/ISED (Canada)	RSS-247 Issue 3 RSS-Gen Issue 5 ANSI C63.10: 2013	25657-MP26P	
ETSI/CE-RED (Europe)	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01) ETSI EN 301 489-17 V3.3.1 (2024-09) EN 55032:2015/A11:2020 EN 55035:2017/A11:2020 ETSI EN 300 328 V2.2.2 (2019-07) ETSI EN 300 220-1 V3.1.1(2017-02) ETSI EN 300 220-2 V3.2.1 (2018-06) EN IEC 62311: 2020 EN IEC 62368-1:2020+A11:2020	NA	

7.2.1. Certified Antennas

The module series has been tested and certified with three antennas, where BDE-MP2674P10A variants utilize an integrated PCB trace antenna, BDE-MP2674P10U variants utilize an external 2.4GHz whip antenna through U.FL connector, BDE-MP2674P10N utilize an external 2.4GHz whip antenna utilized in the EM board through the dedicated ANT pin of the module.

The characteristic of the two antennas is listed in below. The PCB trace antenna is only present in the BDE-MP2674P10A.

Table 31. Certified Antenna List

Antenna Type	Manufacturer	MPN	Frequency Range (MHz)	Peak Gain (dBi)	Note
PCB trace antenna	BDE	BDE-ANT-MB26RA	2400 – 2500	-0.84	Internal
Whip antenna	BDE	BDE-W25-19513-HRP	2400 – 2500	3.0	External

Customers are encouraged to use the certified antennas in the case of external antenna options to reduce certification testing effort and risk of failing. If customer want to choose another antenna that fits their product, there are some scenarios that need to be considered.

If the external antenna is of the same antenna type and of equal or less gain compared to the ones listed in above table, and with similar in-band and out-of-band characteristic, then the antenna can be used with the module in USA and Canada where modular approval is applicable, as long as the spot-check testing of the new antenna with host is performed to verified that it will not change the performance. However, in countries such as EU countries applying the ETSI standards where the modular approval is not applicable, the radiated emissions are always tested with the end product with any antennas.

If the external antenna is of a different type or with non-similar in-band and out-of-band characteristic, but still has equal gain or less gain compared to the above listed antennas. The new antenna can be added to the existing modular grant/certificate by filing a permissive change, C2PC (Class II Permissive Change) in case of FCC and ISED. The radiated emission testing is needed, but re-certification is not required.

In the case of the external antenna with higher gain than the peak gain listed in above table are very likely to require a full new end product certification. However, we recommended that you consult with your certification house to understand the correct approaches for your product case by case.

7.2.2. FCC Compliance

7.2.2.1. FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and ,

(2) This device must accept any interference received, including interference that may cause undesired operation.

7.2.2.2. FCC Caution

Any changes or modifications to this unit not expressly approved by BDE for compliance could void the user's authority to operate the equipment. The integrator will be responsible to satisfy SAR/RF Exposure requirements, when the module integrated into the host device.

7.2.2.3. Integration Instructions

List of applicable FCC rules

FCC Part 15.247

Specific operational use conditions

This transmitter/module and its antenna(s) must not be co-located or operating in conjunction with any transmitter. This information also extends to the host manufacturer's instruction manual.

Limited module procedures

Not applicable

Trace antenna designs

Not applicable

RF exposure considerations

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This compliance to FCC radiation exposure limits for an uncontrolled environment, and minimum of 20cm separation between antenna and body. The host product manufacturer would provide the above information to end users in their end-product manuals.

Antennas

Refer to Table 31

Label and compliance information

The end product must carry a physical label or shall use e-labeling followed KDB784748D01 and KDB784748 stating "Contains Transmitter Module FCC ID: 2ABRU-MP26P"

Information on test modes and additional testing requirements

Contact BDE for more information

Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for the specific rule parts (FCC Part 15.247) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed when contains digital circuity.

(OEM) Integrator has to assure compliance of the entire end-product that includes the BDE-MP2674P10 module. For 15 B (§15.107 and if applicable §15.109) compliance, the host manufacturer is required to show compliance with 15 while the module is installed and operating.

Furthermore the module should be transmitting and the evaluation should confirm that the module's intentional emissions (15C) are compliant (fundamental / out-of-band). Finally the integrator has to apply the appropriate equipment authorization (e.g. Verification) for the new host device per definition in §15.101. Integrator is reminded to assure that these installation instructions will not be made available to the end-user of the final host device.

7.2.3. IC/ISED Compliance

7.2.3.1. IC Statement

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference, and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licencecontenudans le présentappareilestconforme aux CNR d'Innovation, Sciences et Développementéconomique Canada applicables aux appareils radio exempts de licence. L'exploitationestautorisée aux deux conditions suivantes :

(1) L' appareil ne doit pas produire de brouillage;

(2) L' appareildoit accepter tout brouillageradioélectriquesubi, mêmesi le brouillageest susceptible d' encompromettre le fonctionnement.

7.2.3.2. IC Caution

Any changes or modifications to this unit not expressly approved by BDE for compliance could void the user's authority to operate the equipment. The integrator will be responsible to satisfy SAR/RF Exposure requirements, when the module integrated into the host device.

7.2.3.3. Integration Instructions

Label and compliance information

The final host device, into which this RF module is integrated has to be labeled with an auxiliary label stating the IC of the RF module, such as" Contains transmitter module IC: 25657-MP26P".

Informations sur l'étiquette et la conformité

Le périphériquehôte final, danslequelce module RF estintégré "doitêtreétiqueté avec uneétiquetteauxiliaireindiquant le CI du module RF, tel que" Contient le module émetteur IC: 25657-MP26P".

Radio Frequency Exposure Statement for IC

The device has been evaluated to meet general RF exposure requirements. The device can be used in mobile exposure conditions. The min separation distance is 20cm.

Déclaration d'exposition aux radiofréquences pour IC

L'appareil a été évalué pour répondre aux exigences générales en matière d'exposition aux RF. L'appareil peut être utilisé dans des conditions d'exposition mobiles. La distance de séparation minimale est de 20 cm.

This radio transmitter [IC: 25657-MP26P] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed in Table 31, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Cet émetteur radio [IC: 25657-MP26P] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous, avec le gain maximal admissible indiqué. Les types d'antenne non inclus dans cette liste qui ont un gain supérieur au gain maximum indiqué pour tout type répertorié sont strictement interdits pour une utilisation avec cet appareil.

7.2.4. ETSI/CE Compliance

The BDE-MP26P module is certified with required EU radio and EMC directives. See Table 30 for detailed standards the module complies with, or refer to UK Declaration of Conformity.

8. Ordering Information

Table 32. Ordering Information

Orderable Part Number	Description	Size (mm)	Shipping Form	MOQ
BDE-MP2674P10A32	BDE 2.4GHz multiprotocol wireless module with PA, with PCB trace antenna, with On-board 32Mbit SPI flash, -40℃ to +85℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10U32	BDE 2.4GHz multiprotocol wireless module with PA, with U.FL connector, with On-board 32Mbit SPI flash, -40℃ to +85℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10N32	BDE 2.4GHz multiprotocol wireless module with PA, with ANT pin, with On-board 32Mbit SPI flash, -40℃ to +85℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10A0	BDE 2.4GHz multiprotocol wireless module with PA, with PCB trace antenna, -40℃ to +85℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10U0	BDE 2.4GHz multiprotocol wireless module with PA, with U.FL connector, -40℃ to +85 ℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10N0	BDE 2.4GHz multiprotocol wireless module with PA, with ANT pin, -40℃ to +85℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10A32-IN	BDE 2.4GHz multiprotocol wireless module with PA, with PCB trace antenna, with On-board 32Mbit SPI Flash, -40℃ to +105℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10U32-IN	BDE 2.4GHz multiprotocol wireless module with PA, with U.FL connector, with On-board 32Mbit SPI Flash, -40℃ to +105℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10N32-IN	BDE 2.4GHz multiprotocol wireless module with PA, with ANT pin, with On-board 32Mbit SPI Flash, -40℃ to +105℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10A0-IN	BDE 2.4GHz multiprotocol wireless module with PA, with PCB trace antenna, -40℃ to +105℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10U0-IN	BDE 2.4GHz multiprotocol wireless module with PA, with U.FL connector, -40℃ to +105℃	26 × 19 × 2.15	Tape & Reel	900
BDE-MP2674P10N0-IN	BDE 2.4GHz multiprotocol wireless module with PA, with ANT pin, -40℃ to +105℃	26 × 19 × 2.15	Tape & Reel	900

9. Revision History

Table 33. Revision History

Revision	Date	Description
V0.1	11-Oct-2024	Preliminary, draft
V1.0	14-Aug-2025	Production version

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