Bluetooth Low Energy Module (BT4.2)



Key Features

- Bluetooth Dual Mode 4.2 compliant
- Low-power 2.4GHz Transceiver
- ARM968E Core Microprocessor integrated
- 160 KB programmable Flash for Program and 20 KB RAM for Data
- Program code read protection
- Operation voltage from 0.9 V to 3.6 V
- Clock
  - 16 MHz crystal reference clock
  - 64 MHz digital PLL clock
  - 32 kHz ring oscillator
  - External 32 kHz crystal oscillator
  - MCU can run with any clock source with internal frequency divider
- Interface and peripheral units
  - JTAG, SPI interface
  - UART
  - Multi-channels PWM output
  - On-chip 10 bit general ADC
  - 13 GPIO with multiplexed interface functions
  - True random number generator
- RF Performance
  - TX Power: up to 4dBm
  - RX Sensitivity: up to -96dBm
- Communication Range: 30 meters (LOS)
- Antenna: Integrated PCB antenna
- Size: 16.55mm x 10.8mm x 1.5mm (Without Shielding)
  16.55mm x 10.88 mm x 2.3mm (With Shielding)
- Power Consumption:
  - Shutdown: 1uA (Wake up on External Events)
  - Standby: 8.5uA (RTC Running and RAM/CPU Retention)
  - RX Current: 5.1mA
  - TX Current @ -1dBm: 4.8mA
- BQB, FCC, CE, RoHS compliant

Descriptions

BDE-BLEM401P is a Bluetooth 4.2 dual mode compliant module targeted at low power sensors and PC/Phone accessories.

BDE-BLEM401P highly integrates a high-performance RF transceiver, baseband, ARM9E core, programmable protocol and profile to support BLE application. 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

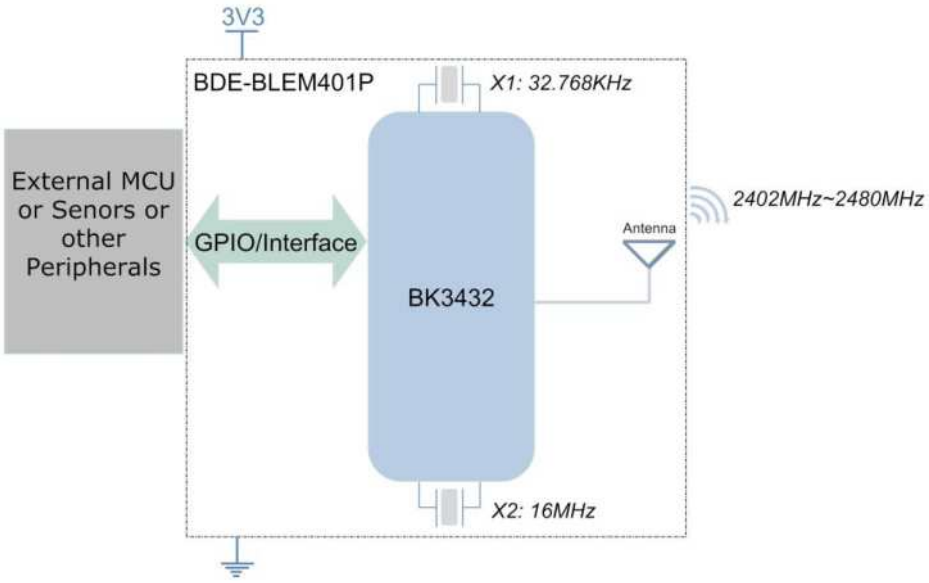


Fig. 1: The Block Diagram of BDE-BLEM401P

Applications

- Home and Building Automation
- Industrial
- Retail
- Health and Medical
- Sports and Fitness
- HID

Electrical Characteristics

■ Recommended operating conditions

Rating	Min	Typ	Max	Unit
Operating Temperature	-40	-	85	℃
VDDS	1.6	3.3	3.6	V

Pin Out

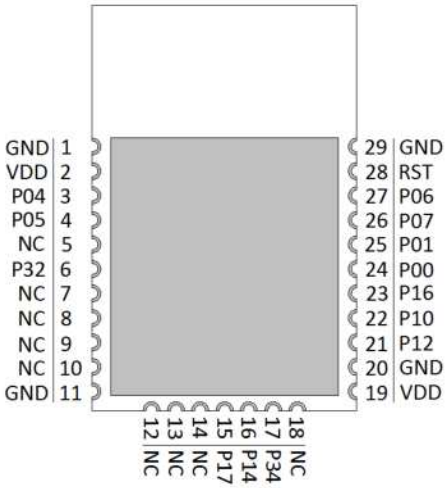


Fig. 2: The pinout of BDE-BLEM401P (TOP VIEW)

Table 1: Pin definitions of BDE- BLEM203P

Pin Number	Pin Name	Definitions
1	GND	Power Ground
2	VDD	Power Supply
3	P04	GPIO, SPI_SCK, SPI_MOSI (Program mode), JTAG_TDI (JTAG mode)
4	P05	GPIO, SPI_MOSI, SPI_MISO (Program mode), JTAG_TDO (JTAG mode)
5	NC	NC
6	P32	GPIO, ADC CH2
7	NC	NC
8	NC	NC
9	NC	NC
10	NC	NC
11	GND	Power Ground
12	NC	NC
13	NC	NC

14	NC	NC
15	P17	GPIO, UART2_RX
16	P14	GPIO, PWM
17	P34	GPIO, ADC CH4
18	NC	NC
19	VDD	Power Supply
20	GND	Power Ground
21	P12	GPIO, PWM
22	P10	GPIO, PWM (20mA)
23	P16	GPIO, UART2_TX
24	P00	GPIO, UART_TX
25	P01	GPIO, UART_RX
26	P07	GPIO, SPI_NSS, SPI_CS (Program mode), JTAG_TMS (JTAG mode)
27	P06	GPIO, SPI_MISO, SPI_SCK (Program mode), JTAG_TCK (JTAG mode)
28	RST	Reset, active low
29	GND	Power Ground

Overall Dimensions

Fig. 1 shows the overall dimensions of BDE-BLEM401P. The module measures 16.55mm long by 10.88mm wide by 2.3mm high with the shield.

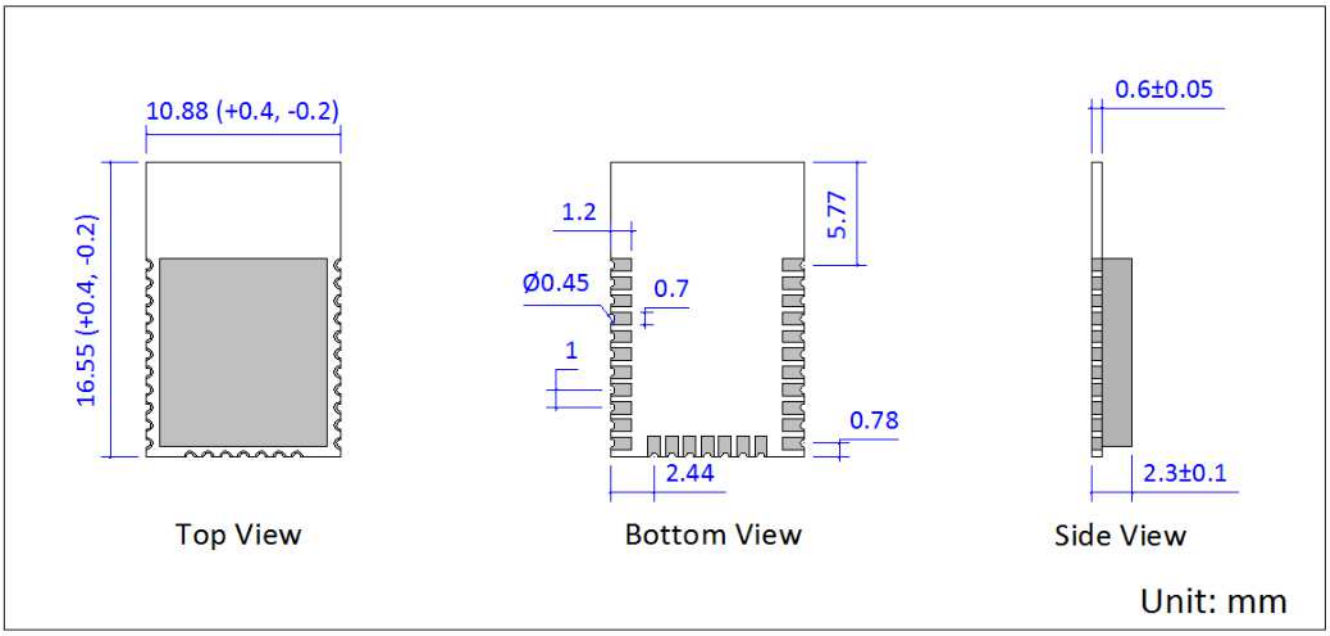


Fig. 3: Overall Dimensions of BDE-BLEM401P

Module Location for Reference

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

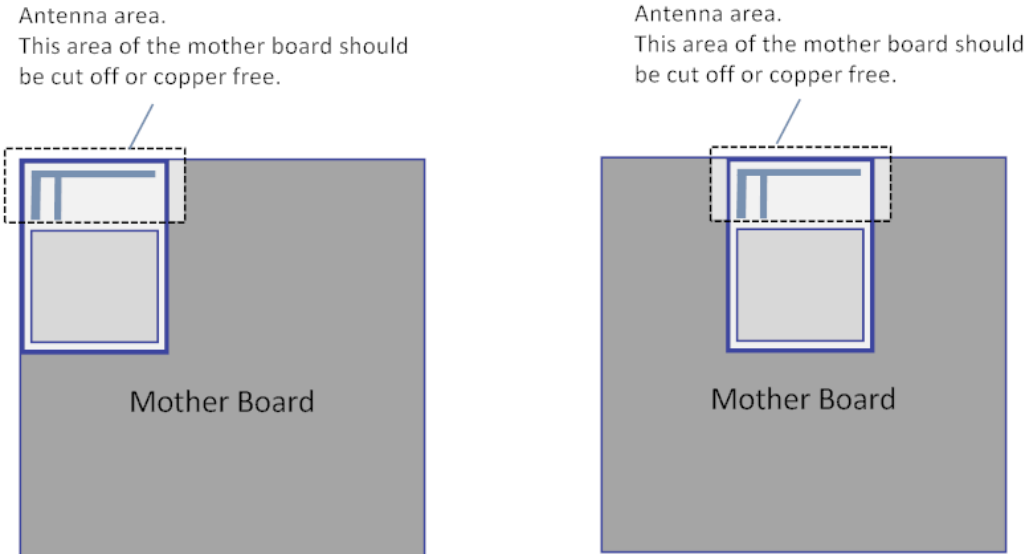


Fig. 4: Recommended location in X-Y plane

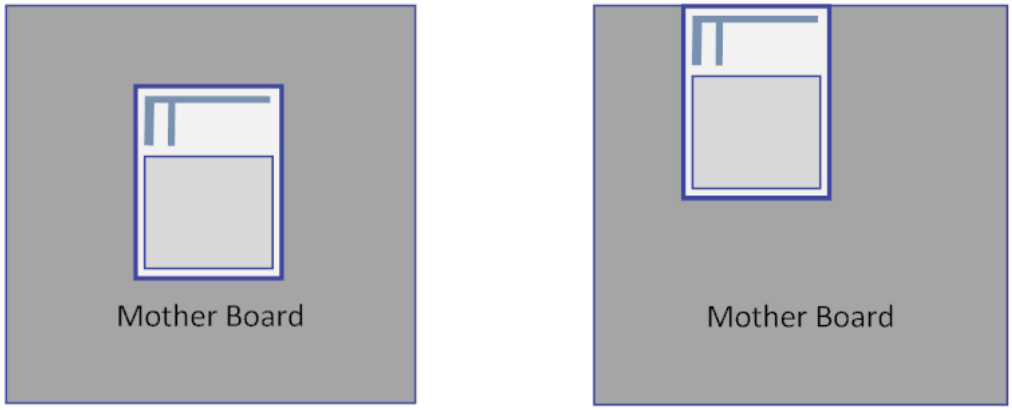


Fig. 5: Not recommended location in X-Y plane

- Location in Z plane

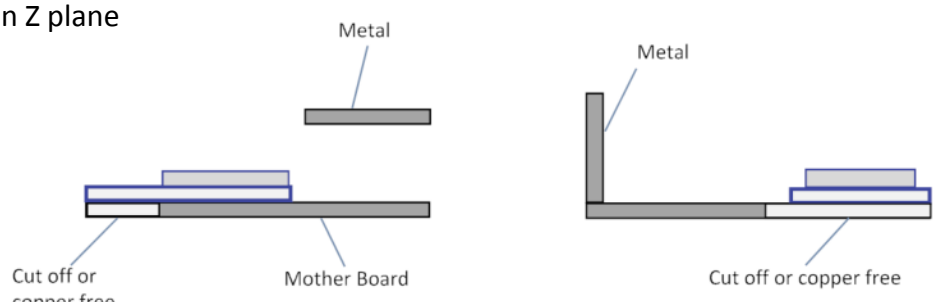


Fig. 6: Recommended location in Z plane

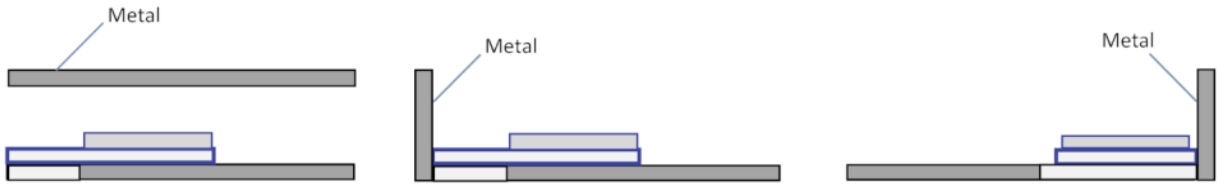


Fig. 7: Not recommended location in Z plane

Typical Solder Reflow Profile

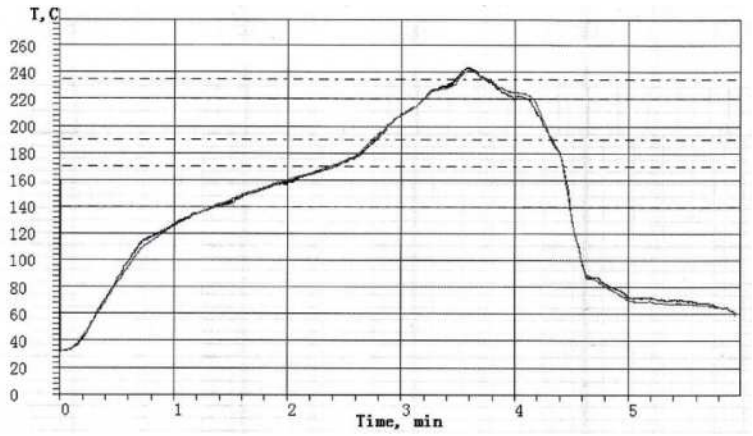


Fig. 8: Typical Solder Reflow Profile

Package Information



Fig. 9: Package

Contacts

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