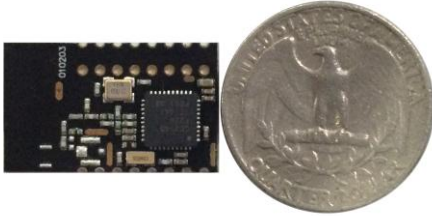


Bluetooth Low Energy Module

25mm x 15mm x 2.2mm (With Shielding)



Key Features

- Bluetooth 4.0 single-mode compliant
- Support master and slave modes, 3+ simultaneous connections in master mode
- Integrated Bluetooth Low Energy stack, no external MCU needed
- RF performance
 - TX power: -23dBm to 4dBm
 - RX sensitivity: up to -94dBm
- Communication range: 100m (LOS)
- Ultra low power 8051 microcontroller core
 - 8K RAM with retention
 - 256K in-system-programming flash
 - 9 GPIO (5 PWM, 1 UART, 2 GPIO)
- Ultra low power consumption: 0.5uA@DeepSleepMode
- Antenna: PCB antenna or external antenna by IPX connector
- Size: 25mm x 15mm x 1.5mm (Without Shielding)

Descriptions

BDE-BLEM202 is a Bluetooth 4.0 single-mode compliant Bluetooth low energy module targeted at low power sensors and PC/Phone accessories.

BDE-BLEM202 highly integrates Bluetooth Low Energy 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.

Applications

- Medical devices
- Sports and fitness equipments
- Home electronics
- Mobile and PC accessories
- Industry automation



Block Diagram

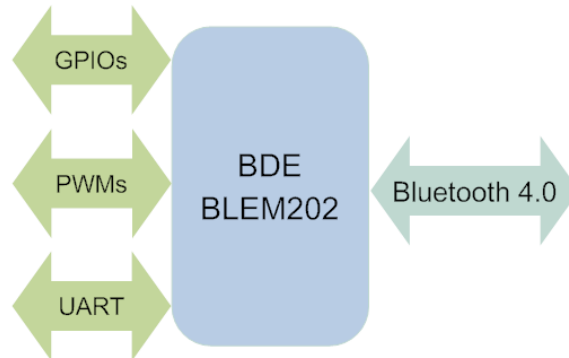


Fig. 1: Block diagram of BDE-BLEM202

Electrical Characteristics

■ Absolute maximum rating

Rating	Min	Typ	Max	Unit
Storage Temperature	-40	-	125	°C
VDD	-0.3	-	3.9	V
Other Terminals	-0.2	-	$VDD+0.3 \leq 3.9$	V

■ Recommended operating conditions

Rating	Min	Typ	Max	Unit
Operating Temperature	-40	-	85	°C
VDD	2	3.3	3.6	V

Overall Dimensions

Fig. 2 shows the overall dimensions of BDE-BLEM202. The module measures 16.55mm long by 10.88mm wide by 1.5mm high without board level shield.



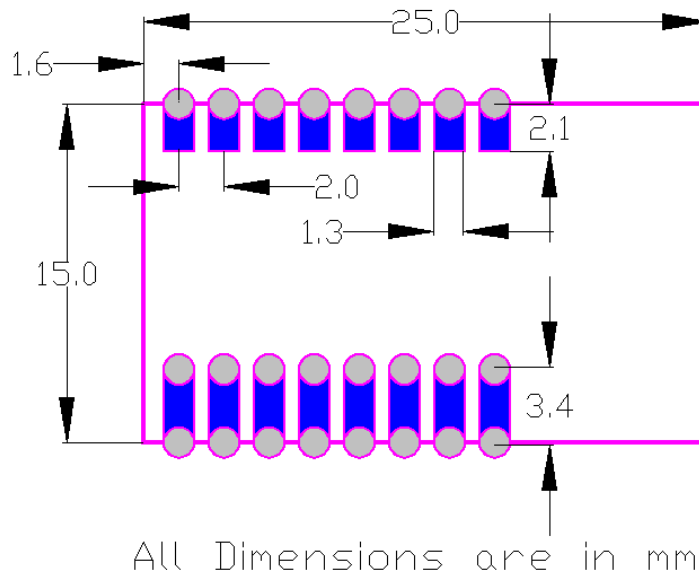


Fig. 2: Overall Dimensions of BDE-BLEM202

Pin Definitions

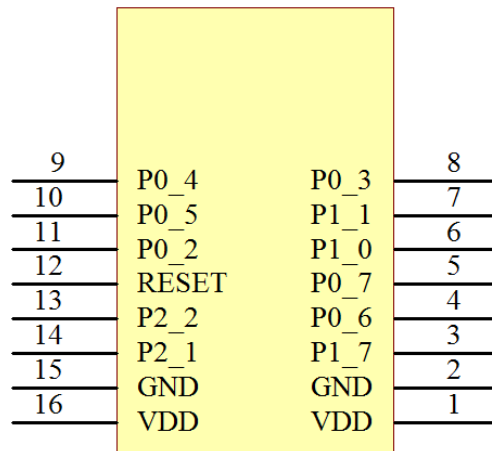


Fig. 3: The pinout of BDE-BLEM202 (TOP)



Table 1: Pin definitions of BDE-BLEM202

Pin Number	Pin Name	Definitions
1	VDD	Power supply
2	GND	Power ground
3	P1.7	GPIO/PWM
4	P0.6	GPIO/PWM
5	P0.7	GPIO/PWM
6	P1.0	GPIO/PWM
7	P1.1	GPIO/PWM
8	P0.3	GPIO/TX
9	P0.4	GPIO
10	P0.5	GPIO
11	P0.2	GPIO/RX
12	RESET	Reset pin, active low
13	P2.2	Debug clock
14	P2.1	Debug data
15	GND	Power ground
16	VDD	Power supply

Table 2: Peripheral IO pin mapping

PERIPHERAL / FUNCTION	P0								P1								P2			
	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	2	1	0	
ADC	A7	A6	A5	A4	A3	A2	A1	A0												
Operational amplifier						O	-	+												
Analog comparator			+	-																
USART 0 SPI Alt. 2			C	SS	MO	MI					MO	MI	C	SS						
USART 0 UART Alt.2			RT	CT	TX	RX					TX	RX	RT	CT						
USART 1 SPI Alt.2			MI	MO	C	SS					MI	MO	C	SS						
USART 1 UART Alt.2			RX	TX	RT	CT					RX	TX	RT	CT						
TIMER 1 Alt.2		4	3	2	1	0									0	1	2			
TIMER 3 Alt.2	3	4											1	0						
TIMER 4 Alt.2															1	0				
DEBUG																	DC	DD		
OBSSSEL											5	4	3	2	1	0				



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

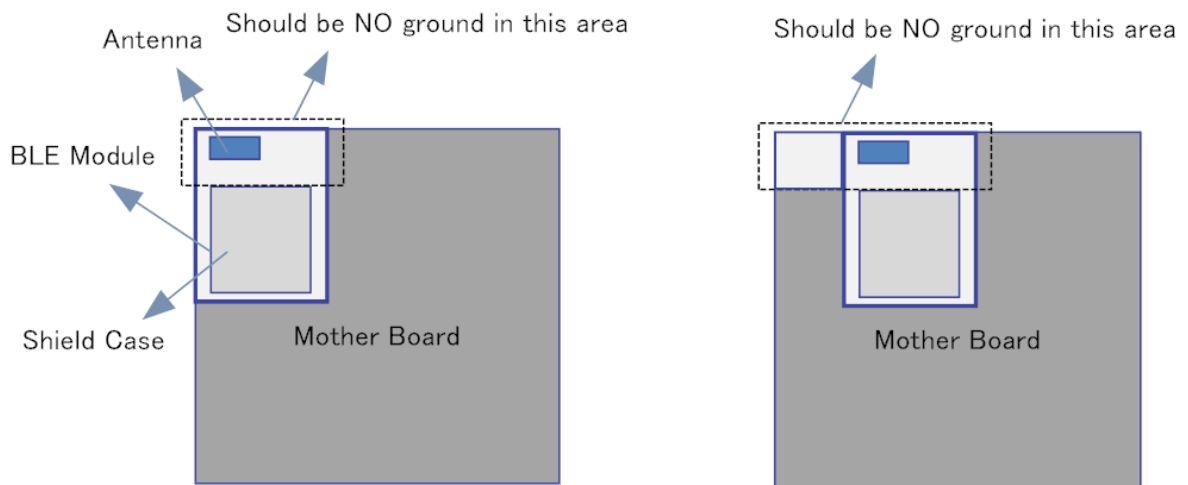


Fig. 4: Recommended location in X-Y plane

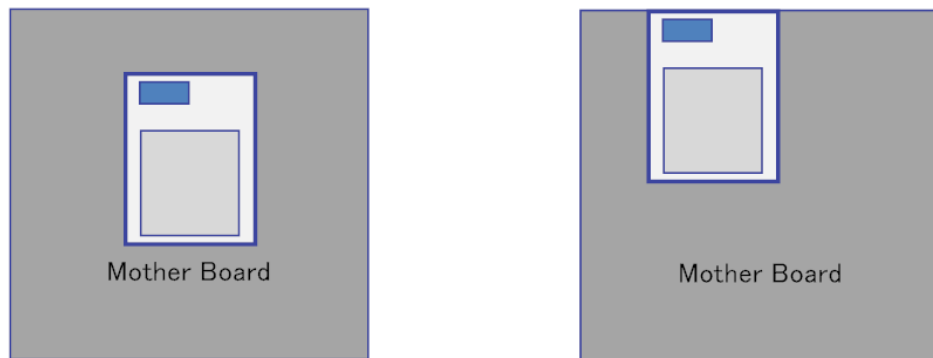


Fig. 5: Not recommended location in X-Y plane



■ Location in Z plane

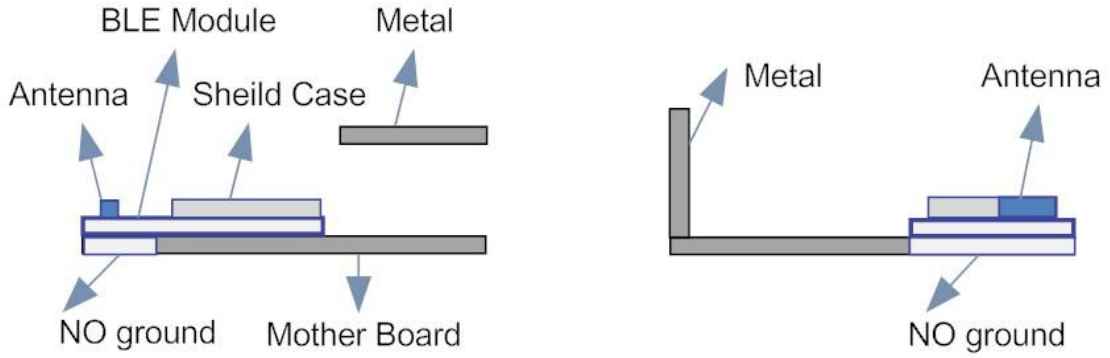


Fig. 6: Recommended location in Z plane

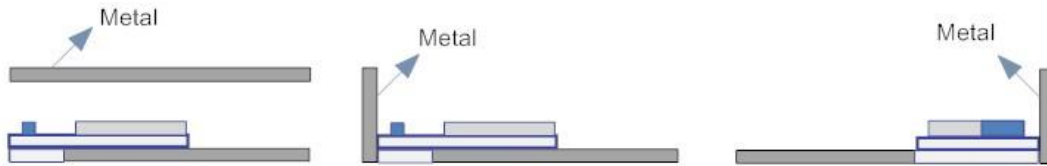


Fig. 7: Not recommended location in Z plane



Typical Solder Reflow Profile

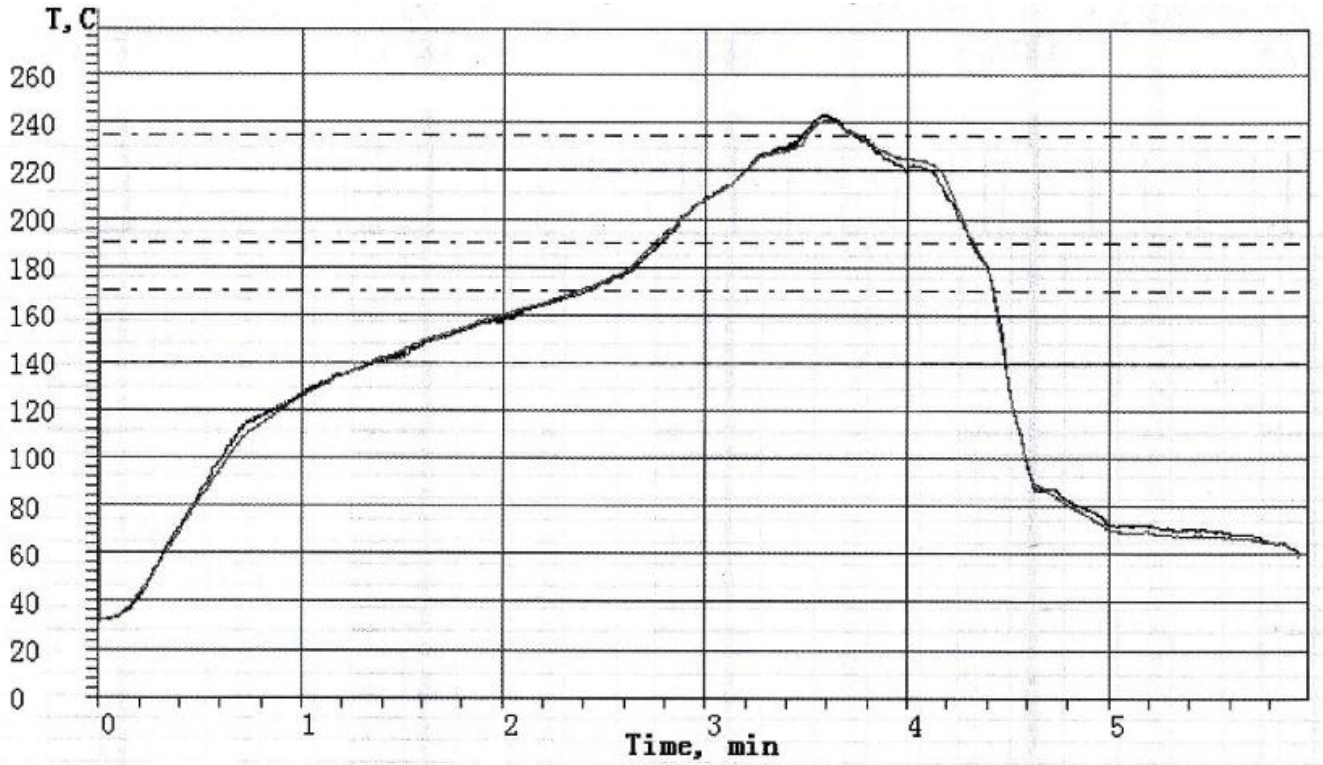


Fig. 8: Typical Solder Reflow Profile



Package Information



Fig. 9: Package information

Contacts

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