BDE-BLEM211

Bluetooth Low Energy Module

Key Features

- Bluetooth 5.0 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 0dBm
  - RX sensitivity: up to -94dBm
- Communication range: 100m (LOS)
- Ultra low power 8051 microcontroller core
  - 8K RAM with retention
  - 128K /256K in-system-programming flash
  - 23 GPIOs (21x4mA, 2x20mA)
  - 12-bit ADC with eight channels and configurable resolution
  - Data interfaces: I2C x 1, USART x 2

  - Integrate high-performance comparator

- Ultra low power consumption: 14.3mA@Transmit, 0.5uA@PowerMode3
- Antenna: without antenna
- Size: 11.61mm x10.97mm x 1.5mm (Without Shielding)

Descriptions

BDE-BLEM211 is a Bluetooth 5.0 single-mode compliant Bluetooth low energy module targeted at low power sensors and PC/Phone accessories.

BDE-BLEM211 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
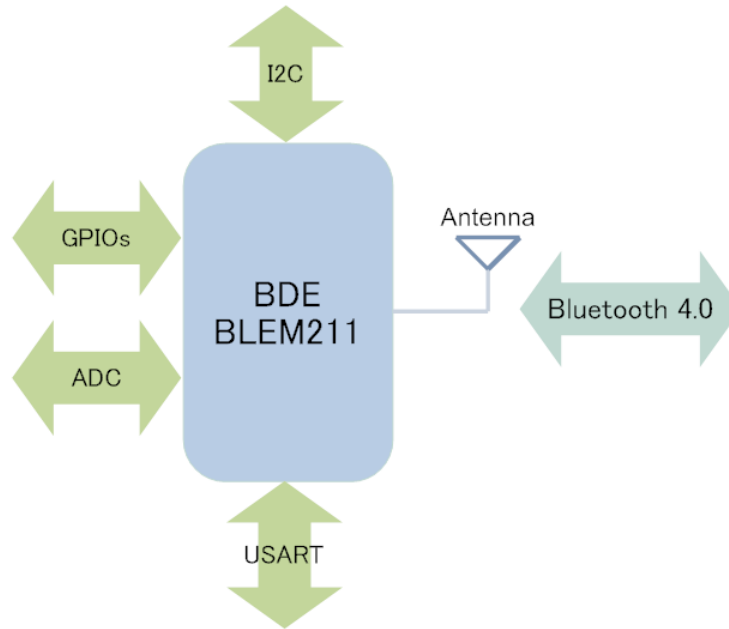- Industry automation

Block Diagram

Fig. 1: Block diagram of BDE-BLEM211

Electrical Characteristics

■ Absolute maximum rating

Rating	Min	Typ	Max	Unit
Storage Temperature	-40	-	85	℃
VDD	-0.3	-	3.9	V
Other Terminals	-0.2	-	VDD+0.3≤3.9	V

■ Recommended operating conditions

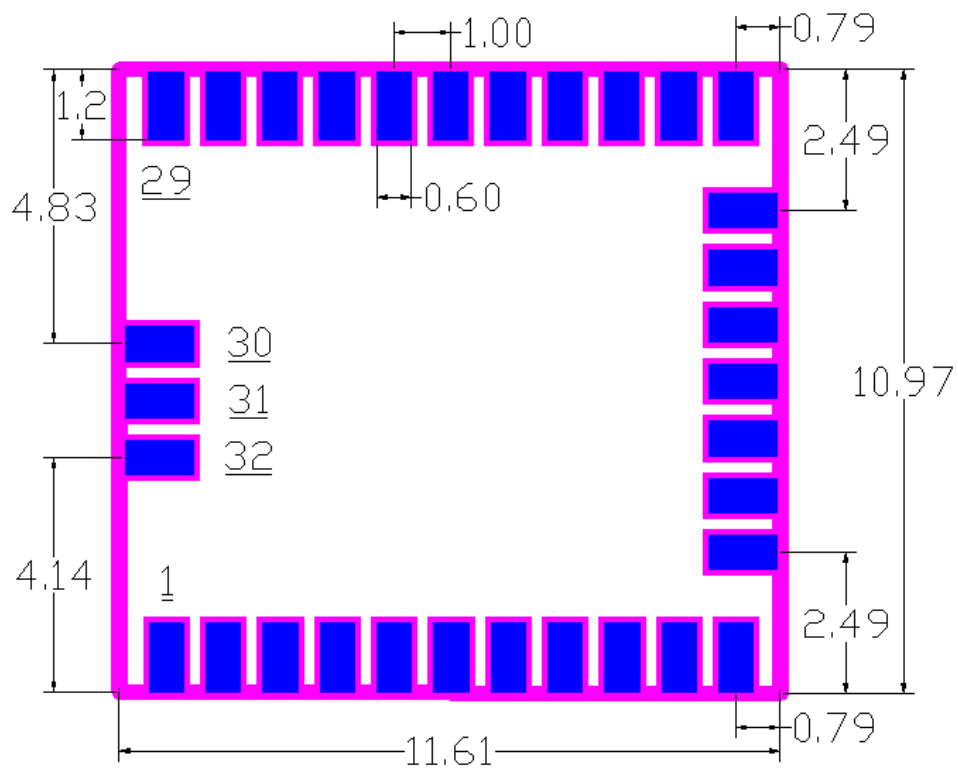| Rating	Min	Typ	Max	Unit
Operating Temperature	-20	-	70	℃
VDD	2	3.3	3.6	V

Overall Dimensions

Fig. 2 shows the overall dimensions of BDE-BLEM211. The module measures 11.61mm long by 10.97mm wide by 1.5mm high without board level shield.

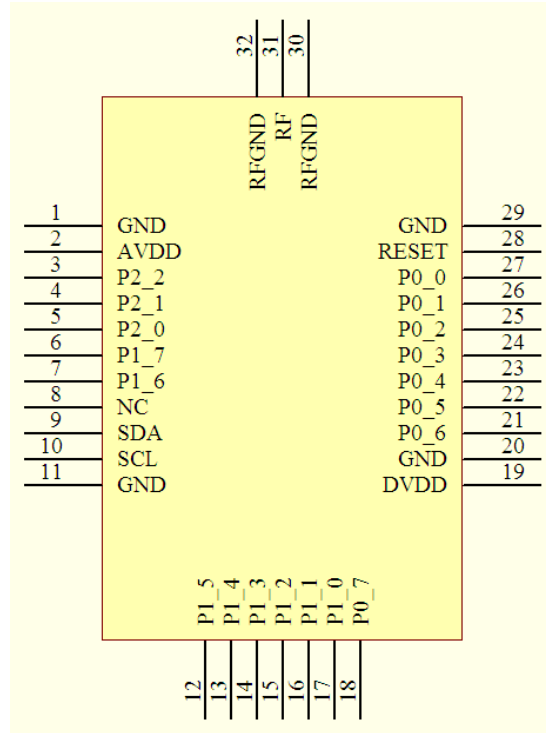Fig. 2: Overall Dimensions of BDE-BLEM211

Pin Definitions

Fig. 3: The pinout of BDE-BLEM211

Table 2: Pin definitions of BDE-BLEM211

Pin Number	Pin Name	Definitions
1	GND	Power ground
2	AVDD	Power supply for analog circuit
3	P2.2	GPIO
4	P2.1	GPIO
5	P2.0	GPIO
6	P1.7	GPIO
7	P1.6	GPIO
8	NC	NC
9	SDA	Serial clock of I2C
10	SCL	Serial data of I2C
11	GND	Power ground
12	P1.5	GPIO
13	P1.4	GPIO
14	P1.3	GPIO

15	P1.2	GPIO
16	P1.1	GPIO
17	P1.0	GPIO
18	P0.7	GPIO
19	DVDD	Power supply of digital circuit
20	GND	Power ground
21	P0.6	GPIO
22	P0.5	GPIO
23	P0.4	GPIO
24	P0.3	GPIO
25	P0.2	GPIO
26	P0.1	GPIO
27	P0.0	GPIO
28	RESET	Reset pin, active low
29	GND	Power ground
30	RF GND	RF ground
31	RF	Power port
32	RF GND	RF ground

Table 3: 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			C	SS	MO	MI													
Alt. 2											MO	MI	C	SS					
USART 0 UART			RT	CT	TX	RX													
Alt.2											TX	RX	RT	CT					
USART 1 SPI			MI	MO	C	SS													
Alt.2										MI	MO	C	SS						
USART 1 UART			RX	TX	RT	CT													
Alt.2									RX	TX	RT	CT							
TIMER 1		4	3	2	1	0													
Alt.2	3	4												0	1	2			
TIMER 3												1	0						
Alt.2									1	0									
TIMER 4														1	0				
Alt.2																			0
DEBUG																	DC	DD	
OBSSEL											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.
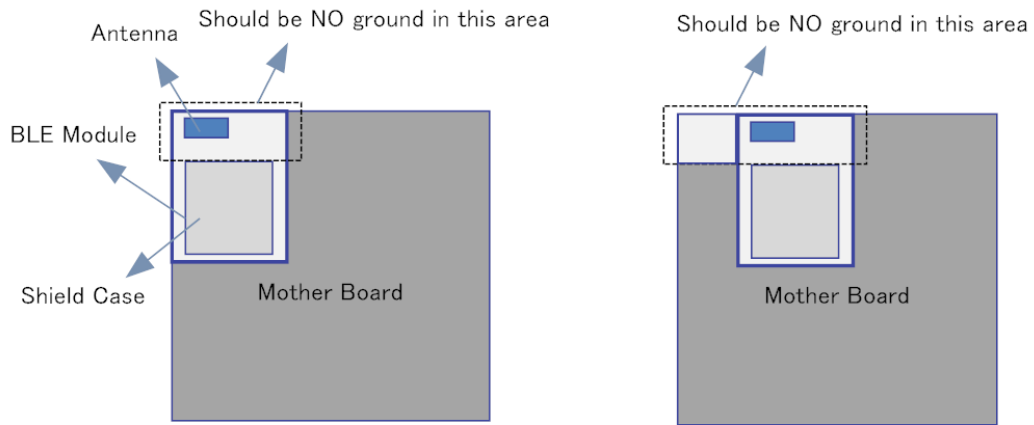
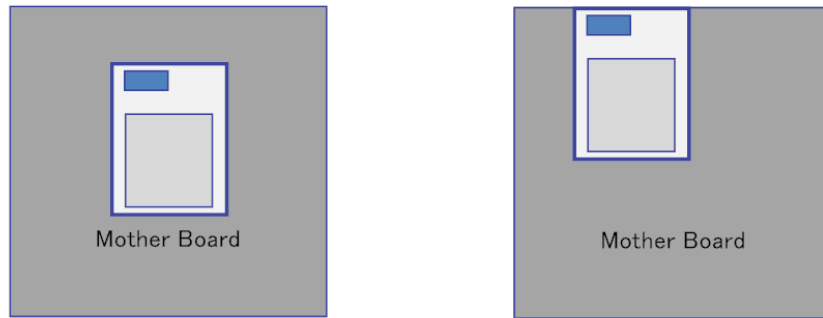■ Location in X-Y plane

Fig. 4: Recommended location in X-Y plane

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

■ Location in Z plane
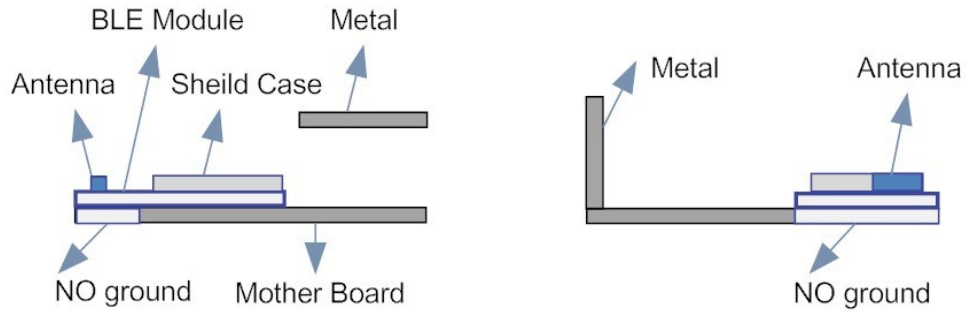
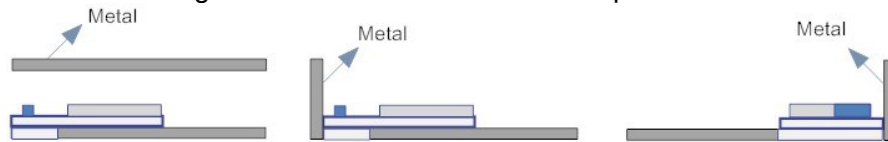Fig. 6: Recommended location in Z plane

Fig. 7: Not recommended location in Z plane

Contacts

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