



DIGISINE

NAVIC Inc.

Features

- Bluetooth® v4.1 specification
- 7.5dBm Bluetooth low energy maximum transmit output power
- -92.5dBm Bluetooth low energy receive sensitivity
- Support for Bluetooth v4.1 specification host stack including ATT, GATT, SMP, L2CAP, GAP
- RSSI monitoring for proximity applications
- <900nA current consumption in dormant mode
- 32kHz and 16MHz crystal or system clock
- Switch-mode power supply
- Programmable general purpose PIO controller
- 10-bit ADC
- 11 digital PIOs
- 3 analogue AIOS
- UART
- I²C / SPI for EEPROM / flash memory ICs and peripherals
- Debug SPI
- 4 PWM modules
- Wake-up interrupt and watchdog timer

General Description

BDP-1010 are single-mode Bluetooth low energy products for the Bluetooth Smart market.

BDP-1010 increases application code and data space for greater application development flexibility. BDP-1010 enables ultra low-power connectivity and basic data transfer for applications previously limited by the power consumption, size constraints and complexity of other wireless standards. BDP-1010 provides everything required to create a Bluetooth low energy product with RF, baseband, MCU, qualified Bluetooth v4.1 specification stack and customer application running on a single module

BDP-1010 BLE Module

Bluetooth Module

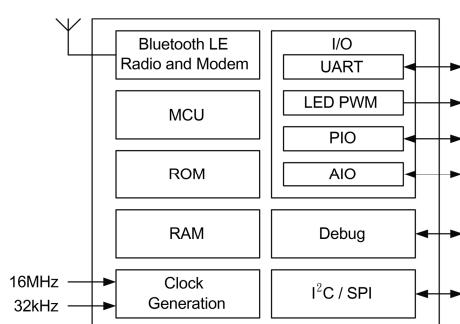
Production Information



Applications

■ Bluetooth low energy takes less time to make a connection than conventional Bluetooth wireless technology and can consume approximately 1/20th of the power of Bluetooth Basic Rate. BDP-1010 supports profiles for health and fitness sensors, watches, keyboards, mice and remote controls. Typical Bluetooth Smart applications:

- HID: keyboards, mice, touchpads, remote controls
- Sports and fitness sensors: heart rate, runner speed and cadence, cycle speed and cadence
- Health sensors: blood pressure, thermometer and glucose meters
- Mobile accessories: watches, proximity tags, alert tags and camera controls
- Smart home: heating control and lighting control



FCC Statement

This device complies with Part 15 of the FCC rules standard. 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.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated. Additional testing and certification may be necessary when multiple modules are used.

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated.

The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied.

The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

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.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

Referring to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without C2PC.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: VLV101029185569 ".

NCC Warning Statement

Article 12

Without permission, any company, firm or user shall not alter the frequency, increase the power, or change the characteristics and functions of the original design of the certified lower power frequency electric machinery.

Article 14

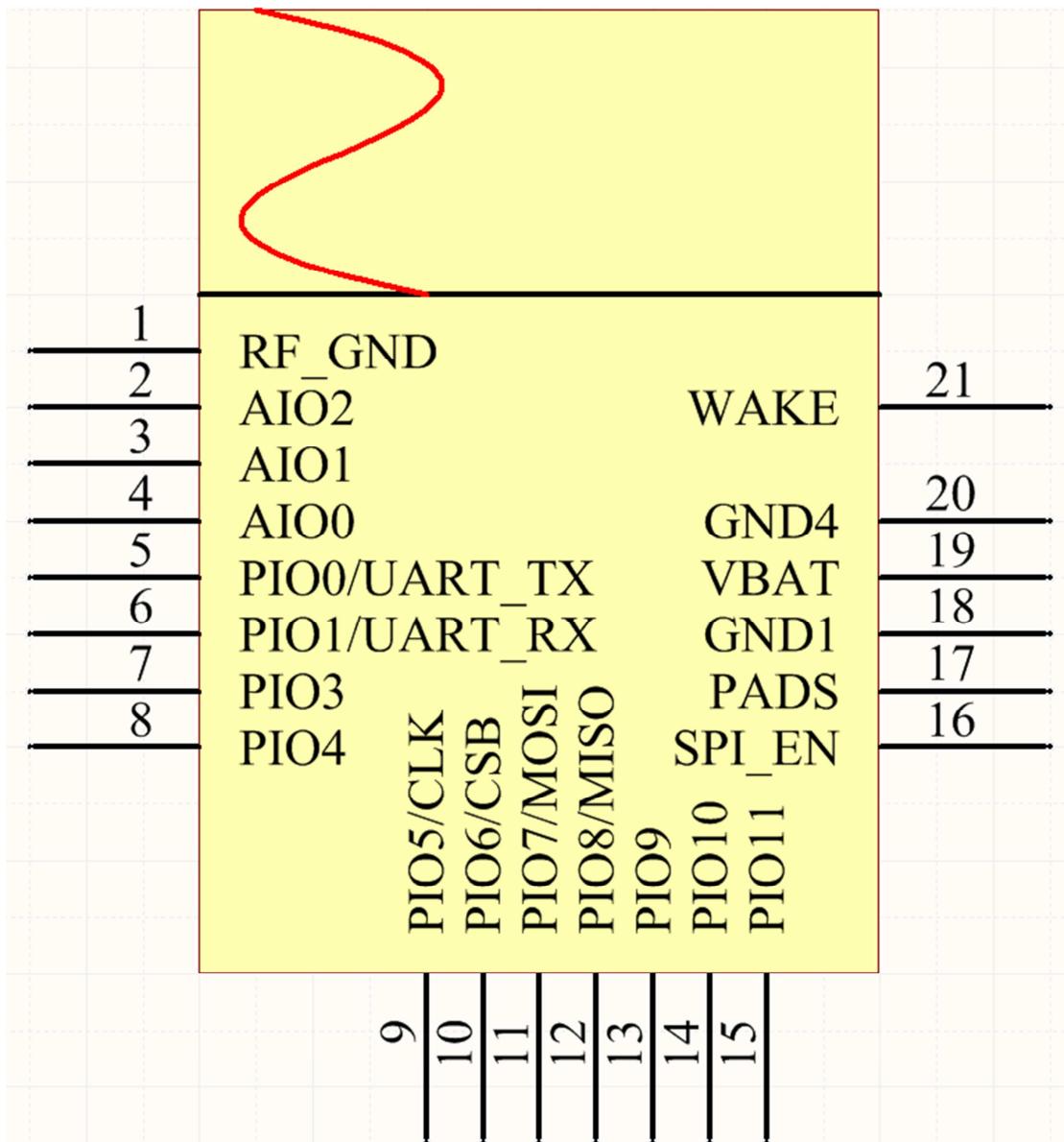
The application of low power frequency electric machineries shall not affect the navigation safety nor interfere a legal communication, if an interference is found, the service will be suspended until improvement is made and the interference no longer exists.

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1. Package Information

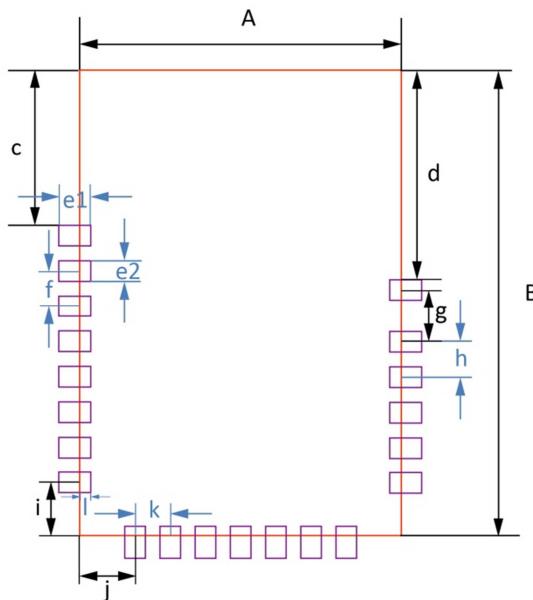
1.1. Pinout Diagram



1.2. Device Terminal Functions

Pin	Lead	Description
VBAT	19	Battery input and regulator enable (active high).
PADS	17	Positive supply for all digital I/O ports PIO[11:0].
GND1	18	Ground connections.
GND4	20	Ground connections.
RF_GND	1	Ground connections.
WAKE	21	Input to wake module from hibernate or dormant.
AIO0	4	Analogue programmable I/O line.
AIO1	3	
AIO2	2	
PIO0/UART_TX	5	Programmable I/O line or UART TX.
PIO1/UART_RX	6	Programmable I/O line or UART RX.
PIO3	7	Programmable I/O line.
PIO4	8	
PIO5/CLK	9	Programmable I/O line or debug SPI CLK selected by SPI_EN.
PIO6/CSB	10	Programmable I/O line or debug SPI chip select (CSB) selected by SPI_EN.
PIO7/MOSI	11	Programmable I/O line or debug SPI MOSI selected by SPI_EN.
PIO8/MISO	12	Programmable I/O line or debug SPI MISO selected by SPI_EN.
PIO9	13	Programmable I/O line.
PIO10	14	
PIO11	15	
SPI_EN	16	Selects SPI debug on PIO[8:5].

1.3. Foot pin



Dimension	Min	Typ	Max
A	17.9	18.0	18.1
B	25.9	26.0	26.1
c		9.0	
d		12.0	
e1		1.6	
e2		1.0	
f		2.0	
g		3.0	
h		2.0	
i		3.0	
j		3.0	
k		2.0	
l		0.465	

1.4. PCB Design and Assembly Considerations

This section lists recommendations to achieve maximum board-level reliability:

- SMD lands
- We recommends that the PCB land pattern is in accordance with IPC standard IPC-7351.
- Solder paste must be used during the assembly process.

1.5. Solder Profile

The soldering profile depends on various parameters necessitating a set up for each application. The data here is given only for guidance on solder re-flow.

Key features of the profile:

- Initial ramp = $1-2.5^{\circ}\text{C/sec}$ to $175^{\circ}\text{C} \pm 25^{\circ}\text{C}$ equilibrium
- Equilibrium time = 60 to 180 seconds
- Ramp to maximum temperature (245°C) = 3°C/sec max.

- Time above liquidus temperature (217°C): 45-90 seconds
- Device absolute maximum reflow temperature: 260°C

2. Electrical Characteristics

2.1. Absolute Maximum Ratings

Rating	Min	Max	Unit
Storage temperature	-40	85	°C
Battery (VBAT) operation	1.8	4.4	V
I/O supply voltage	-1.4	4.4	V

2.2. Recommended Operating Conditions

Operating Condition	Min	Typ	Max	Unit
Storage temperature	-40	-	85	°C
Battery (VBAT) operation	1.8	-	3.6	V
I/O supply voltage(PADS)	1.8	-	3.6	V

3. Current Consumption

Mode	Description	Total Typical Current at 3.0V
Dormant	All functions are shut down. To wake them up, toggle the WAKE pin.	<900nA
Hibernate	VDD_PADS = OFF, REFCLK = OFF, SLEEPCLK = ON, VDD_BAT = ON	<1.9 μ A
Deep	VDD_PADS = ON, REFCLK = OFF, SLEEPCLK = ON,	<5 μ A

sleep	VDD_BAT = ON, RAM = ON, digital circuits = ON, SMPS = ON (low-power mode), 2.2ms wake-up time	
Idle	VDD_PADS = ON, REFCLK = ON, SLEEPCLK = ON, VDD_BAT = ON, RAM = ON, digital circuits = ON, MCU = IDLE, $<1 \mu\text{s}$ wake-up time	~1mA
RX active	-	~20mA @ 3.0V peak current
TX active	-	~18mA @ 3.0V peak current