

Data Sheet

BT01-2

Bluetooth 4.0 (LE) Module

Version 1.1

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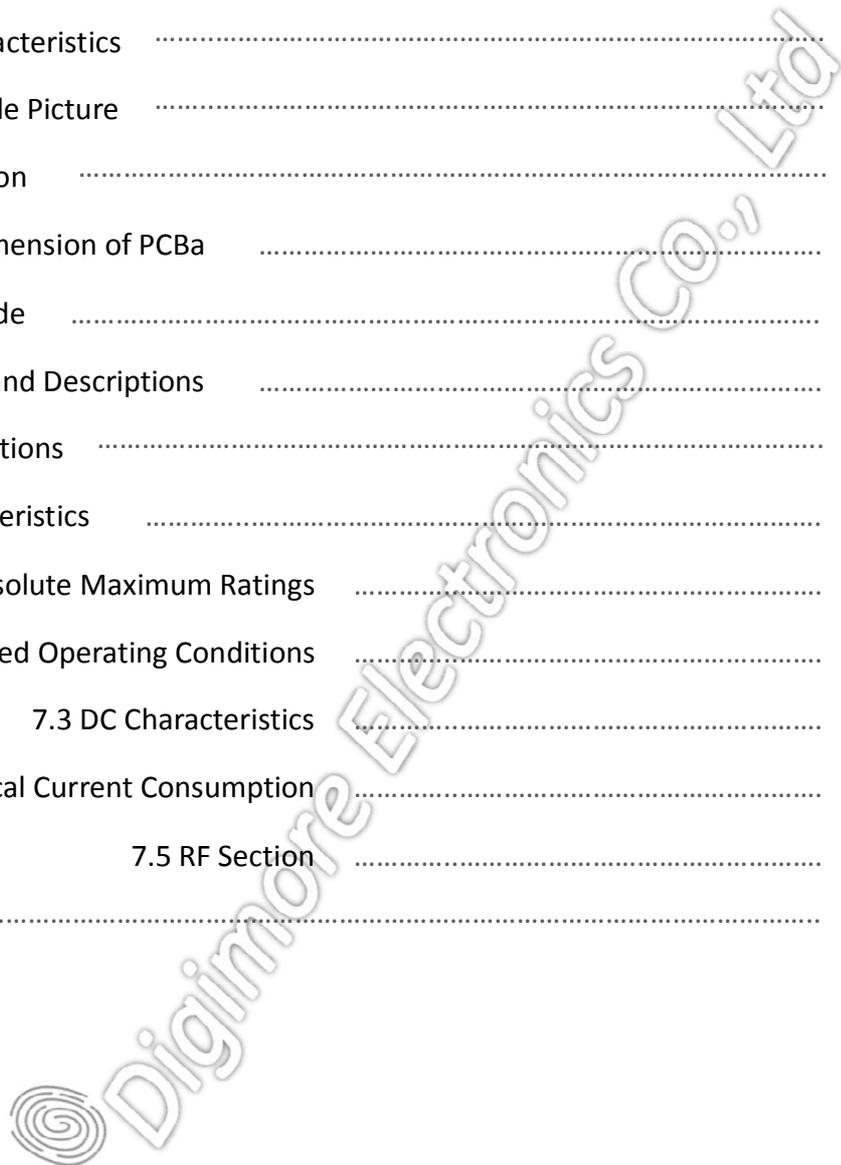
Revision History

Version	Date	Description
V 1.0	May 27 th 2016	Preliminary Version
V 1.1	June 11 th 2016	Updated the module picture

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1. General Description

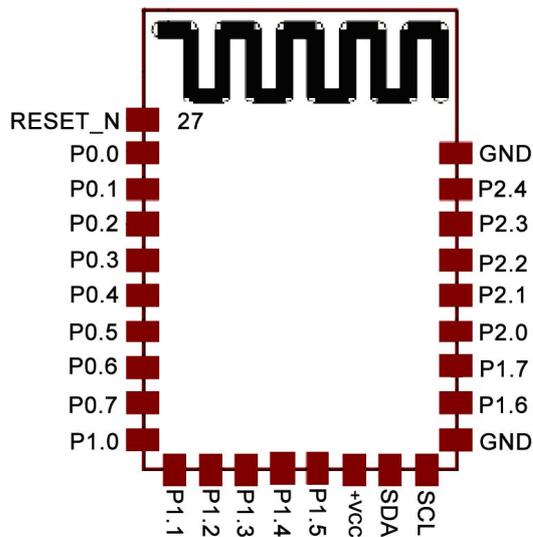
Bluetooth low energy (LE) Module BT01-2 is a Bluetooth module using TI Bluetooth low energy controller CC2541. This module is ideal for low power wireless sensing device applications including mobile phone accessories, sports and leisure equipment, consumer electronics, HID, health care, etc.. The module is integrated with PCB antenna and crystal to reduce the external BOM cost. It has been designed to provide ultra-low power, low cost and robust communications and compliant with Bluetooth Version 4.0 low energy (LE, Single Mode) solution.

2. Application

- 2.4 GHz Bluetooth Version 4.0 low energy system
- Mobile device accessories
- Sports and leisure equipment
- Consumer electronics
- HID devices
- Health care and Medical
- Remote sensors

3. Features

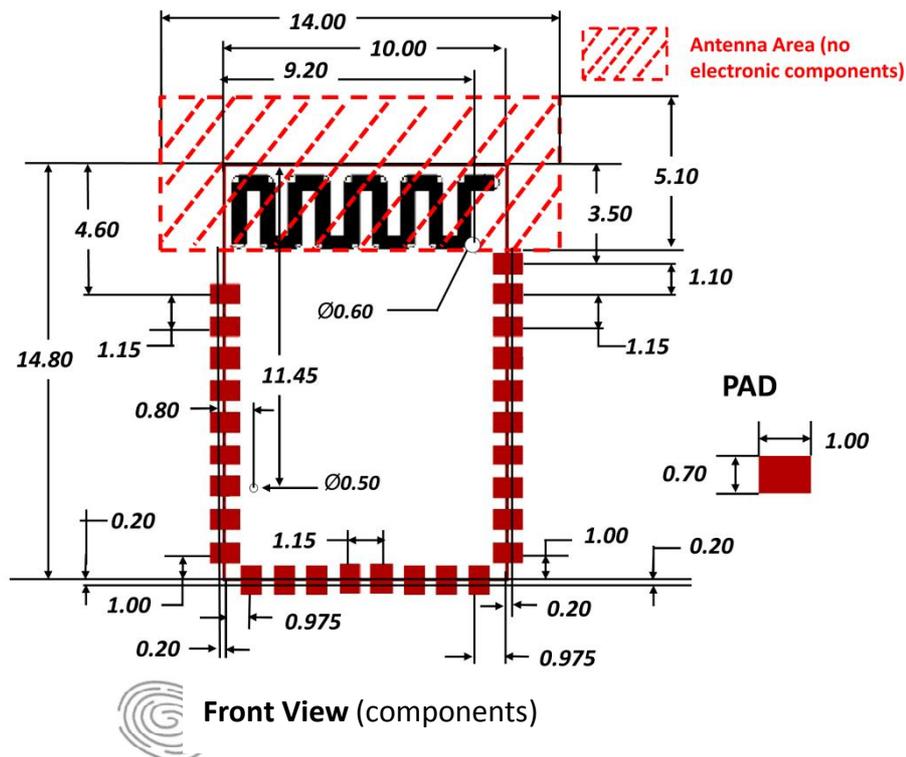
- Bluetooth Version 4.0 low energy (LE, Single Mode) compliant.
- High-Performance and Low-Power 8051 Microcontroller Core With Code Prefetch. In-System-Programmable Flash.
- 12-Bit ADC With Eight Channels and Configurable Resolution. 21 general purpose I/O
- I2C Interface
- Two Powerful USARTs with Support for Several Serial Protocols. On board PCB antenna and crystal.
- Excellent Receiver Sensitivity.
- Dimension: 14.8mm x 10mm FR4 PCB.



Rear View

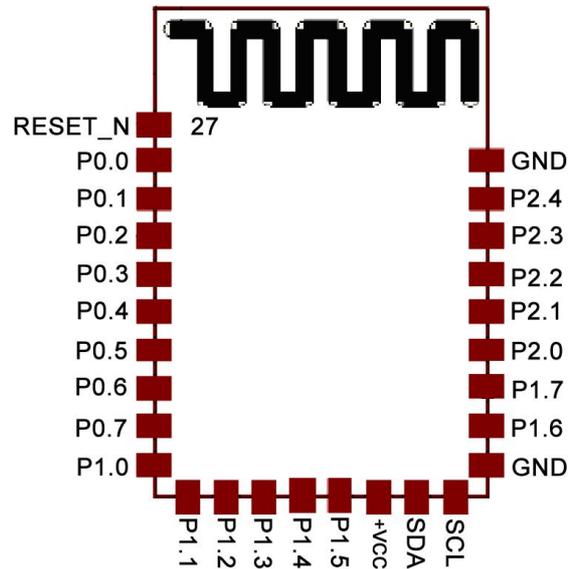
Thickness	2.0mm (Max.)
PCB Thickness	0.8mm (+/-0.1mm)
Dimension	14.8 x 10mm (+/-0.5mm)

5.2 Layout Guide



Remark: Except PIN 26 and PIN 27 of PIN Pitch =1.10mm; Other PIN Pitch=1.15mm

6. Pin Assignment and Descriptions



6.1 Pin Descriptions

PIN	Symbol	Pin Type	Description
1	GND	Power	System GND
2	P2.4	Digital I/O, Analog I/O	Port 2.4 / 32.768 kHz XOSC
3	P2.3	Digital I/O, Analog I/O	Port 2.3 / 32.768 kHz XOSC
4	P2.2	Digital I/O	Port 2.2 / debug clock (DC)
5	P2.1	Digital I/O	Port 2.1 / debug data (DD)
6	P2.0	Digital I/O	Port 2.0
7	P1.7	Digital I/O	Port 1.7
8	P1.6	Digital I/O	Port 1.6
9	GND	Power	System GND
10	SCL	Digital I/O	I2C clock
11	SDA	Digital I/O	I2C data
12	+VCC	Power	System Power-Input, 2V–3.6V digital power-supply connection
13	P1.5	Digital I/O	Port 1.5
14	P1.4	Digital I/O	Port 1.4
15	P1.3	Digital I/O	Port 1.3
16	P1.2	Digital I/O	Port 1.2

PIN	Symbol	Pin Type	Description
17	P1.1	Digital I/O	Port 1.1 (20-mA drive capability)
18	P1.0	Digital I/O	Port 1.0 (20-mA drive capability)
19	P0.7	Digital I/O	Port 0.7
20	P0.6	Digital I/O	Port 0.6
21	P0.5	Digital I/O	Port 0.5
22	P0.4	Digital I/O	Port 0.4
23	P0.3	Digital I/O	Port 0.3
24	P0.2	Digital I/O	Port 0.2
25	P0.1	Digital I/O	Port 0.1
26	P0.0	Digital I/O	Port 0.0
27	RESET_N	Digital input	Reset, active-low

7. Electrical Characteristics

7.1 Absolute Maximum Ratings

Description	Condition	Min	Typ	Max	Unit
Supply Voltage	All supply pins must have the same voltage	- 0/3		3.9	V
Voltage on any digital pin		- 0.3		VCC+0.3 <3.9	V
Input RF level		-		10	dBm
Storage temperature range		-40		125	°C

Note:

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

7.2 Recommended Operating Conditions

	Min	Typ	Max	Unit
Operating supply voltage	2	-	3.6	V
Operating ambient temperature range, TA	- 25	25	75	°C

7.3 DC Characteristics

Description	Condition	Min	Typ	Max	Unit
Logic-0 input voltage		-	-	0.5	V
Logic-1 input voltage		2.4	-	-	V
Logic-0 input current	Input equals 0V	- 50	-	50	nA
Logic-1 input current	Input equals VCC	- 50	-	50	nA
I/O=pin pullup/ pulldown resistors		-	20	-	KΩ
Logic-0 input voltage, 4mA Pins	Output load 4mA	-	-	0.5	V
Logic-1 input voltage, 4mA Pins		2.5	-	-	V
Logic-0 output voltage, 20mA Pins		-	-	0.5	V
Logic-1 output voltage, 20mA Pins		2.5	-	-	V

7.4 Typical Current Consumption

TA=25°C, VCC = 3V

Description	Condition	Min	Typ	Max	Unit
Core Current Consumption	RX mode, standard mode, no peripherals active, low MCU activity	-	17.9	-	mA
	RX mode, high-gain mode, no peripherals active, low MCU activity	-	20.2	-	mA
	TX mode, 0dBm output power, no peripherals active, low MCU activity	-	18.2	-	mA
	Power mode 1	-	270	-	μA
	Power mode 2	-	90	-	μA
	Power mode 3, digital regulator off; no clocks; POR active; 0.5 RAM and register retention	-	1	-	μA
	Low MCU activity; 32-MHz XOSC running. No radio or peripherals. Limited flash access, no RAM access.	-	6.7	-	mA

Note:

The current consumption depends on applications.

7.5 RF Section

TA=25°C, VCC = 3V

Description	Condition	Min	Typ	Max	Unit
Frequency Range		2402		2480	MHz
Channel Spacing			2		MHz
Output Power		-23		0	dBm

Description	Condition	Min	Typ	Max	Unit
Receiver Sensitivity	Standard mode (Default)	-	-88	-	dBm
	High gain mode	-	-94	-	dBm
GFSK Frequency Deviation		-250		250	KHz

APPENDIX A

A-1 Application Circuit

