Mouselet-B User Guide

Product:Mouselet / Bluetooth 4.0 BLE module

Module Name:Mouselet-B

Designed:Pairlink Network Technology

Version	Note	Date
V1.2	Modify Reference Circuit	2016/02/23
V1.3	Modify the supply voltage	2016/03/25
V1.4	Modify Reference Circuit	2016/12/14
V1.5	Modify Dimensions Value	2020/01/03

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1. Functional Characteristics

Mouselet-B is based on CYPRESS Bluetooth chip CYW20736, designed specifically for BT light control module(BLE), can be widely applied in the field of short-range wireless communications for all occasions, it has small size, low power consumption, transmission distance, anti-interference ability, and low cost.

The module antenna is a ceramic antenna that made the overall design compact and miniaturization. The interface is also completely open, customers in the use of RF hardware design eliminates the difficulty, while the software and product structure has more flexible secondary development space.

The module has a UART interface, The UART is a standard 2-wire interface (RX and TX) and has adjustable baud rates from 9600bps to 1.5 Mbps. The baud rate can be selected via a vendor-specific UART HCI command. The interface supports the Bluetooth 3.0 UART HCI (H5) specification. The default baud rate for H5 is 115.K baud. Both high and low baud rates can be supported by running the UART clock at 24 MHz. The CYW20736 UART operates correctly with the host UART as long as the combined baud rate error of the two devices is within ±5%.

The module also has a SPI interface.The interface has a 16-byte transmit buffer and a 16-byte receive buffer, to support more flexibility for user applications.

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2. Electrical characteristics

- Support Bluetooth 4.0

- Supply voltage support 1.65V~3.60V

- Working frequency: 2402MHz ~ 2480 MHz

- Channel spacing: 2MHz

- Modulation: GFSK

- Communication speed: 1Mbps

- Operating Temperature:-30°C to +85°C

3. Major Function

- Pairlink MESH Network for Bluetooth application

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4. Hardware design and PCB layout

4.1. Pin assignment and Pin description

Pin definition can refer to **Figure 2**.

Table 1:Module Pin Description

| Pin Number	Pin Name	I/O	After POR status	Alternate Function Description
7	VPP_3V3	I	-	Power Supply
1, 4, 13	GND		-	Connect to Ground
5	UART_RXD	I	-	UART serial input DEBUG PORT：UART-RX
6	UART-TXD	O	-	UART serial output DEBUG PORT：UART-TX
2	P15	I/O	Input floating	• GPIO: P15 • A/D converter input • IR_RX
3	P25	I/O	Input floating	• GPIO: P25 • SPI_2: MISO (master and slave) • Peripheral UART: puart_rx
8	RESET_N	I/O	-	Active-low system reset with open-drain output & internal pull-up resistor Do not connect if unused
9	P0[a]	I/O	Input floating	• GPIO: P0 • A/D converter input • Peripheral UART: puart_tx • SPI_2: MOSI (master and slave) • IR_RX
10	P1	I/O	Input floating	• GPIO: P1 • A/D converter input • Peripheral UART: puart_rts • SPI_2: MISO (master and slave) • IR_TX
11	P3	I/O	Input floating	• GPIO: P3 • Peripheral UART: puart_cts • SPI_2: SPI_CLK (master and slave)
12	P2	I/O	Input floating	• GPIO: P2 • Peripheral UART: puart_rx • SPI_2: SPI_CS (slave only) • SPI_2: SPI_MOSI (master only)

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14	P4_UART_RX	I/O	Input floating	• GPIO: P4 • Peripheral UART: puart_rx • SPI_2: MOSI (master and slave) • IR_TX
15	P24_UART_TX	I/O	Input floating	• GPIO: P24 • SPI_2: SPI_CLK (master and slave) • Peripheral UART: puart_tx
16	P13	I/O PWM3	Input floating	• GPIO: P13 • A/D converter input
	P28	I/O PWM2	Input floating	• GPIO: P28 • A/D converter input • LED1 • IR_TX Current: 16 mA
17	P14	I/O PWM2	Input floating	• GPIO: P14 • A/D converter input
	P38	I/O	Input floating	• GPIO: P38 • A/D converter input • SPI_2: MOSI (master and slave) • IR_TX
18	P11	I/O	Input floating	• GPIO: P11 • A/D converter input • XTALI 32K
	P27	I/O PWM1	Input floating	• GPIO: P27 • SPI_2: MOSI (master and slave) Current: 16 mA
19	P12	I/O	Input floating	• GPIO: P12 • A/D converter input •XTALO 32K
	P26	I/O PWM0	Input floating	• GPIO: P26 • SPI_2: SPI_CS (slave only) Current: 16 mA

a:Only set P0 into falling edge interrupt mode can maintain Mouselet-B a low power consumption when Mouselet-B in deep sleep mode.

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4.2. Reference Design

The most recent schematic and design example, bill of material, and layout file are available from Pairlink Network Technology Co., Ltd. Contact us for details.
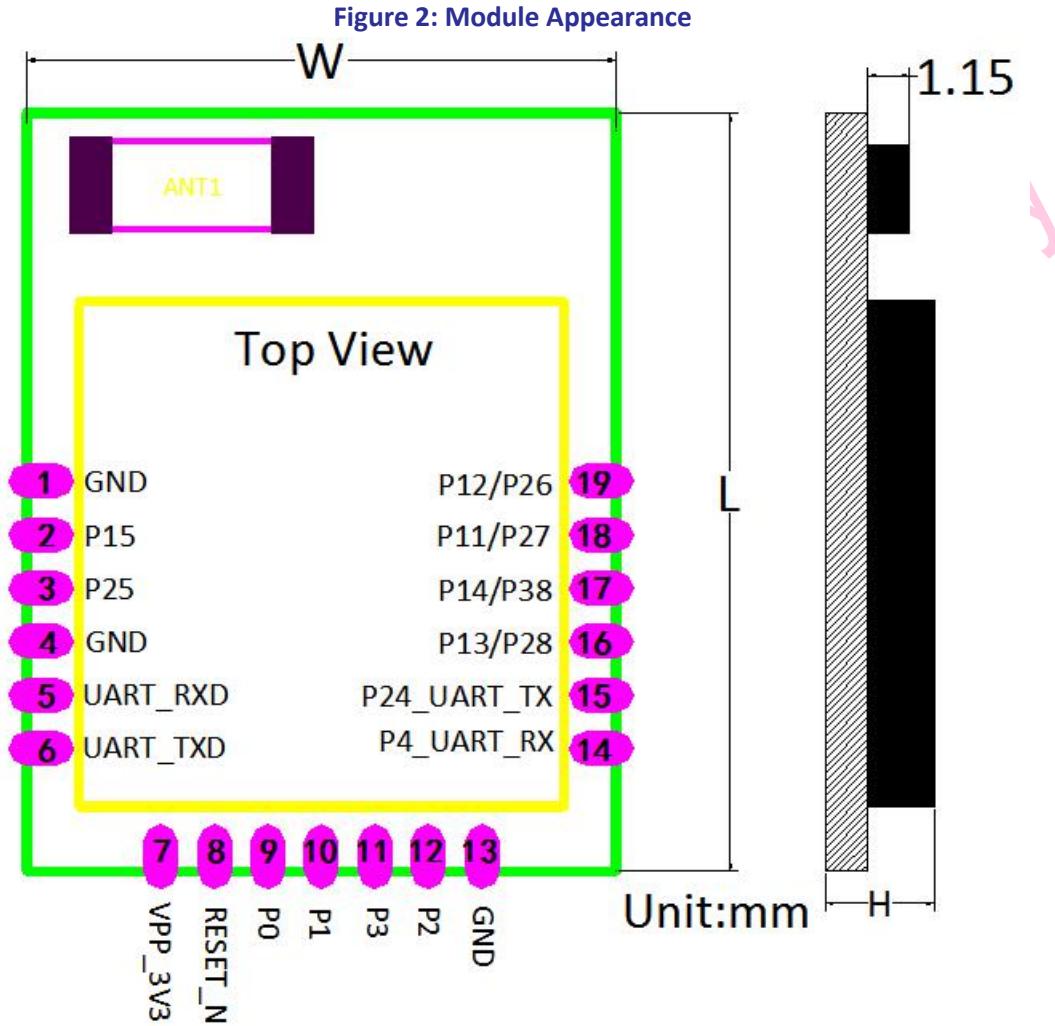
Figure 1: Module Reference Design
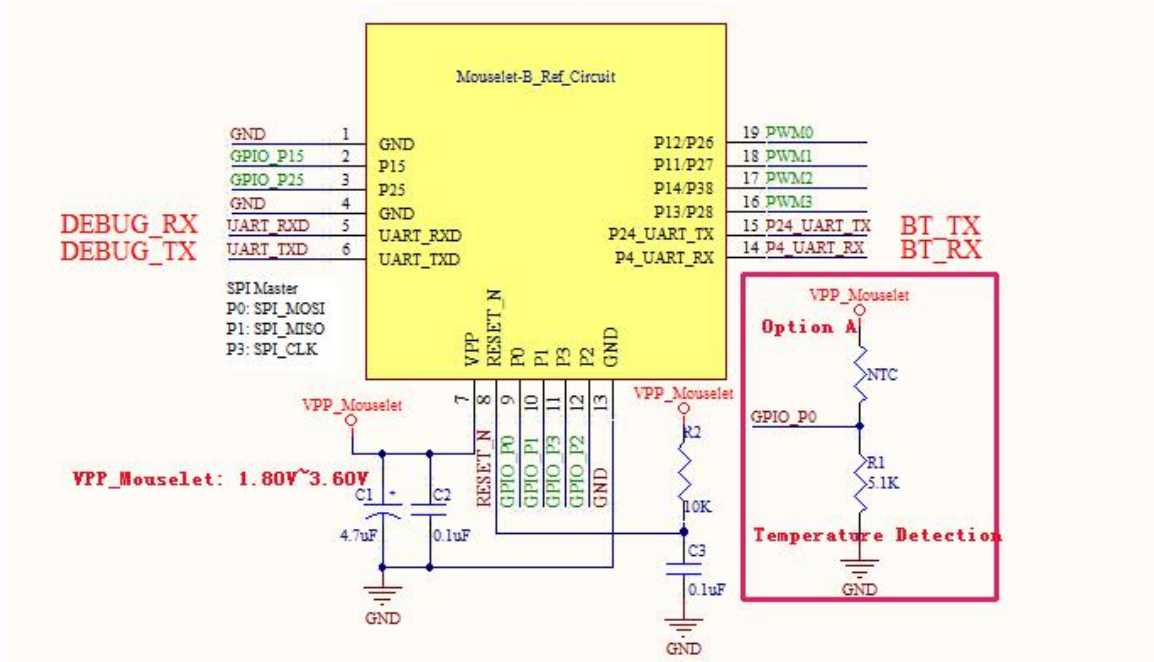
Note:Option A is temperature detection circuit,Users can refer it.

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4.3. Appearance and Dimensions

Figure 2 shows the size of the module, in this size range(18*14*2.6mm), not allowed have a component or prominent structure.

Figure 2: Module Appearance

Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
L	18.00	18.25	18.50
W	13.90	14.00	14.10
H	2.90	3.00	3.10

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4.4. Recommended Land Pattern

It is recommended that the following land pattern is used for your board design. However, you may have to modify it according to your soldering conditions. If you use the modified land pattern, sufficient examination is required.
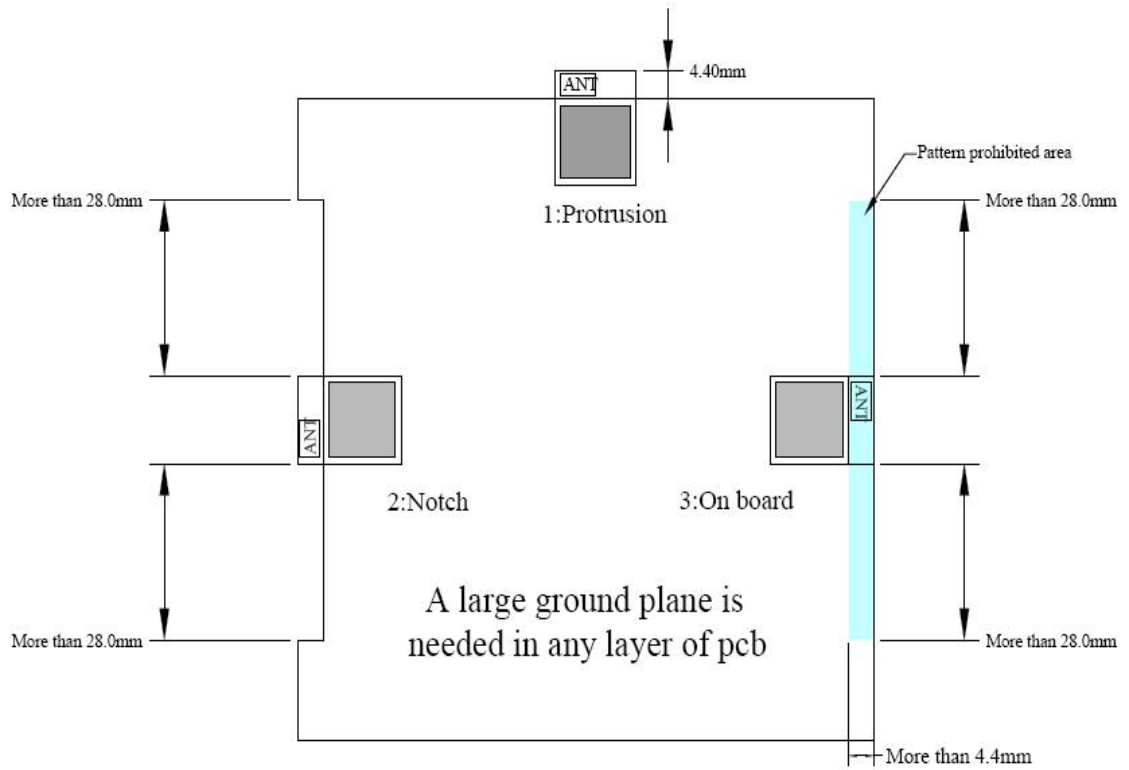
Figure 3: Mechanical Information

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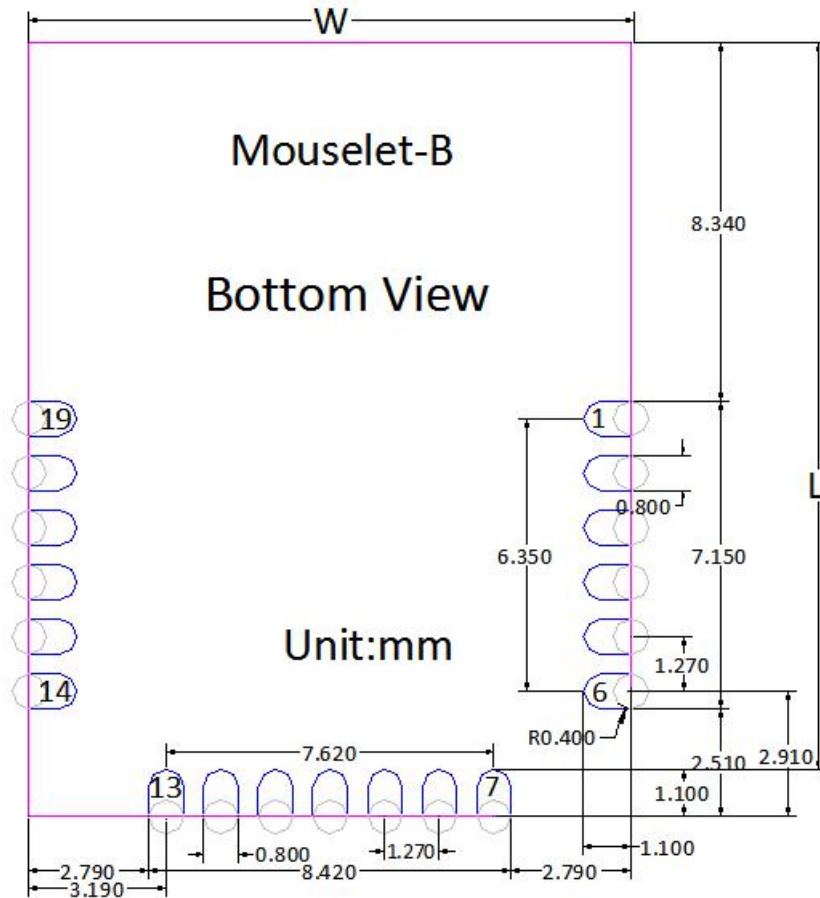
4.5. Module Layout Guideline

The layout for the module on your PCB should be designed according to the following guidelines.

Figure4: Module Placement

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5.Regulatory Module Integration Instructions

5.1.List of applicable FCC rules

This device complies with part 15.247 of the FCC Rules.

5.2.Summarize the specific operational use conditions

This module can be used in household electrical appliances as well as lighting equipments.
The input voltage to the module should be nominally 1.65~3.6V_{DC}, Typical value 3.3V_{DC} and the ambient temperature of the module should not exceed 85℃.
The module using a chip antenna.
A: Mouselet/Mouselet-B   Antenna type: 2.4GHz Chip Antenna
The antenna is not field replaceable. If the antenna needs to be changed, the certification should be re-applied.

5.3.Limited module procedure

This module is not subject to 'Limited module' use restrictions.

5.4.Trace antenna designs

Not applicable

5.5.RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body. If the device built into a host as a portable usage, the additional RF exposure evaluation may be required as specified by §　2.1093.

5.6.Antennas

The module using a chip antenna.
A: Mouselet/Mouselet-B   Antenna type: 2.4GHz Chip Antenna

5.7.Label and compliance information

The outside of final products that contains this module device must display a label referring to the enclosed module. This exterior label can use wording such as:"FCC ID:2AQV6MOUSELET-B", Any similar wording that expresses the same meaning may be used.

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5.8.Information on test modes and additional testing requirements

The Mouselet-B module is based on CYW20736 SOC chip .support standard Bluetooth HCI UART commands. For the testing module on your product, user can refer to specification of the Bluetooth system on how to configure and evaluate the module.

This specification can also be found on the official Bluetooth web site: https://www.bluetooth.org/en-us/specification/adopted-specifications.

6.FCC Statement

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with part 15 of the FCC Rules. 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.

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