Buffalo-D5 UserManual

Project:Buffalo Bluetooth 5 BLE module

Module name:Buffalo-D5

Designed:Suzhou Pairlink Network Technology

Version	Note	Date
V1.0	Create	2018/01/15
V1.1	Modify Module Outline	2018/04/13
V1.2	Only for Buffalo-D5	2018/08/03

Contents

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1.Functional Characteristics

Buffalo-D5 is SOC module developed based on the Bluetooth 5.0 standards. the internal integration architecture ARM® Cortex®-M0 processor.It has the advantage of small volume, low power consumption, long distance transmission, strong anti-jamming capability, low cost.Specifically applied to Bluetooth low power control area,and suitable for various occasions short distance wireless communication.

Buffalo-D5 integral compact, simplifies the design in hardware and institution for user. The module interface open completely to make the users has more flexible secondary development space.

The Buffalo-D5 has a standard 2-wire uart interface (RX and TX) and has adjustable baud rates up to 1MBd. The Buffalo-D5 integrates a universal asynchronous receiver/transmitter that support much of the functionality of the industry-standard 16550 UART. Both high and low baud rates can be supported by 16 MHz system clock. The Buffalo-D5 UART operates correctly with the host UART as long as the combined baud rate error of the two devices is within ±5%.

1.1.Product feature

Buffalo-D5 Supported AT Command Protocol, could be easily porting into different MCU controllers.

1: Buffalo-D5 under Bluetooth 5.0 specification.

2: Very small current consumption.

3: On chip OTP, and also easy to extend EEPROM/SPI Flash.

1.2. Main Application domain.

1：MCU data pass-through.

2：Bluetooth printer / Scanner / Digital price tag etc.

3：Remote control / Keyboard and mouse / Toys / Smart phone self timer etc.

4：Industrial remote control / Industrial telemetry / Industrial data collection.

5：Smart home / Intelligent lighting / Intelligent access control system.

2.Electrical Specification

- 64kB One-Time-Programmable (OTP) memory
- 96kB Data/Retention SRAM
- 128kB ROM
- Absolute Voltage:3.3V
- Supply current at VBAT-3V: TX: 3.4 mA, RX: 3.7 mA (with ideal DC-DC)
- Deep Sleep Power:＜1uA
- RF Frequency:2402MHz~2480MHz
- Modulation:GFSK
- Communication Speed:1Mbps
- -93 dBm receiver sensitivity @ BER<0.1％
- Operating Temperature:-40°C to +85°C

3.Peripheral Interface

- 2 x UART interface
- 1 x SPI interface
- 1 x I2C interface
- 18 x GPIOs
- 1 x 16-bit general purpose timer
- 1 x 14-bit general purpose timer
- 2 x 10-bit ADC
- 4 x PWM interface

4.Hardware design and PCB layout

4.1.Pin assignment and Pin description

Buffalo-D5 Pin definition can refer to **Figure 1**.

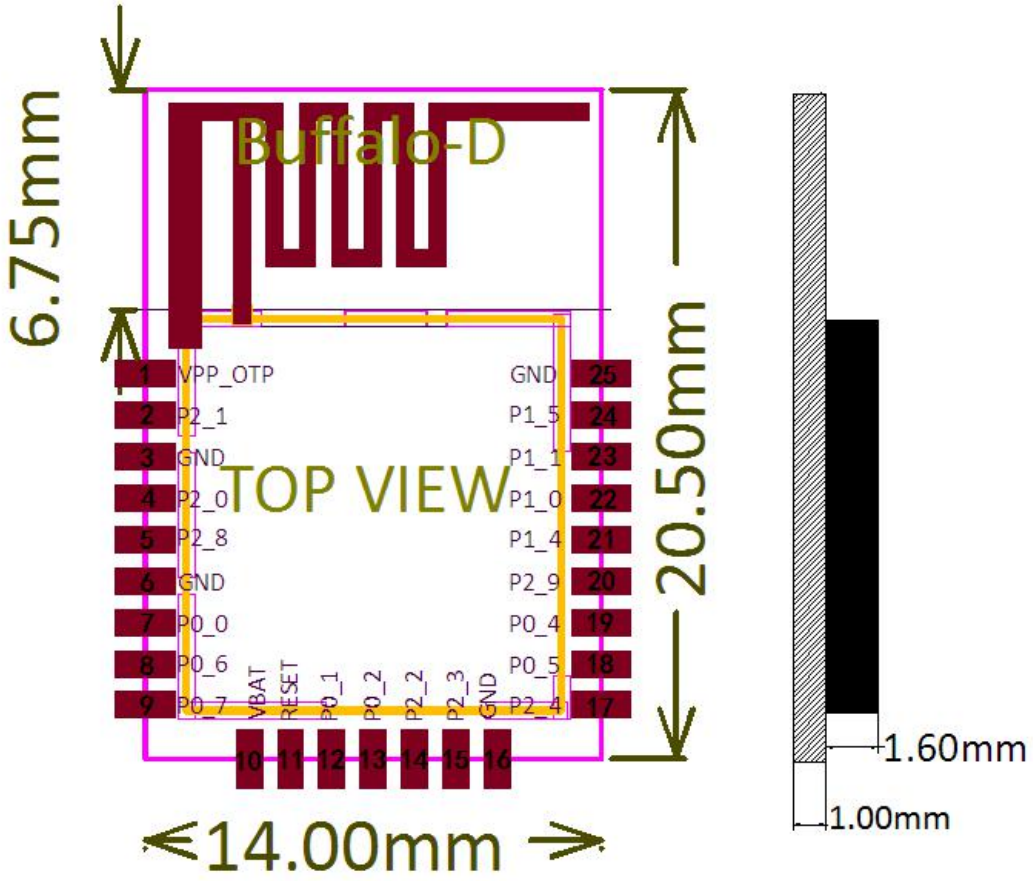
Table 1:Module Pin Description

Pin Number	*Pin Name*	*I/O*	*RESET STATE*	*Alternate Function Description*
1	VPP_OTP	ADI		OTP Power Supply. Must be float
10	VBAT	ADI		Power Supply
3,6,16,25	GND	GND		Connect to Ground
11	RESET	I		INPUT. Reset signal (active high). Must be connected to GND if not used
2	P2_1	DIO	I-PD	INPUT/OUTPUT with selectable pull up/down resistor. General purpose I/O port bit or alternate function nodes. Contain state retention mechanism during power down.
4	P2_0	DIO	I-PD	
5	P2_8	DIO	I-PD	
7	P0_0	DIO	I-PD	
8	P0_6	DIO	I-PD	
9	P0_7	DIO	I-PD	
12	P0_1/ADC1	DIO	I-PD	
13	P0_2/ADC2	DIO	I-PD	
14	P2_2	DIO	I-PD	
15	P2_3	DIO	I-PD	
17	P2_4	DIO	I-PD	
18	P0_5/UART_RX	DIO	I-PD	
19	P0_4/UART_TX	DIO	I-PD	
20	P2_9	DIO	I-PD	
21	P1_4/SWCLK	DIO	I-PD	
22	P1_0	DIO	I-PD	
23	P1_1	DIO	I-PD	
24	P1_5/SWDIO	DIO	I-PU	

4.2.Appearance and Dimensions

Figure 2 shows the size of the module.The components and prominent structure are not allowed put in this size range(20.5mm*14.0mm*2.60mm).

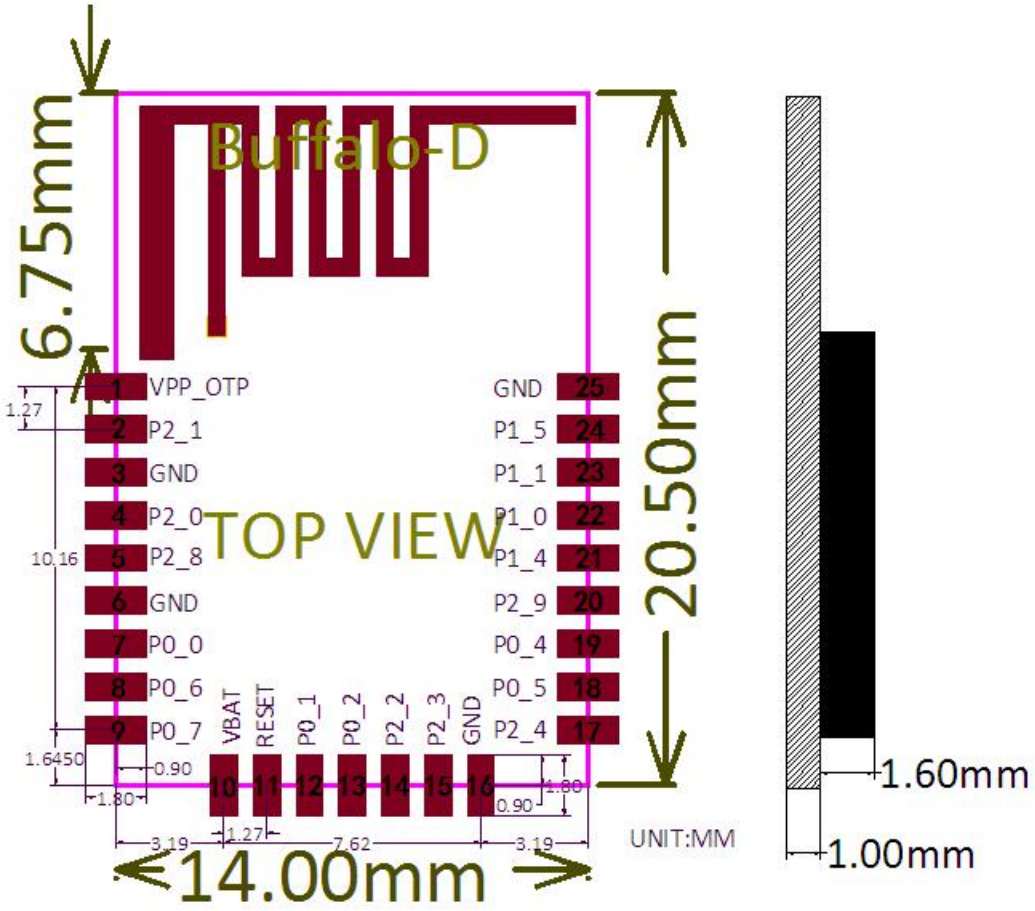
Figure 1: Module Appearance



4.3.Recommended Land Pattern

The following land pattern size is recommended for user board design. However, user can modify it according PCB soldering conditions. Sufficient examination is necessary if use the modified land pattern.

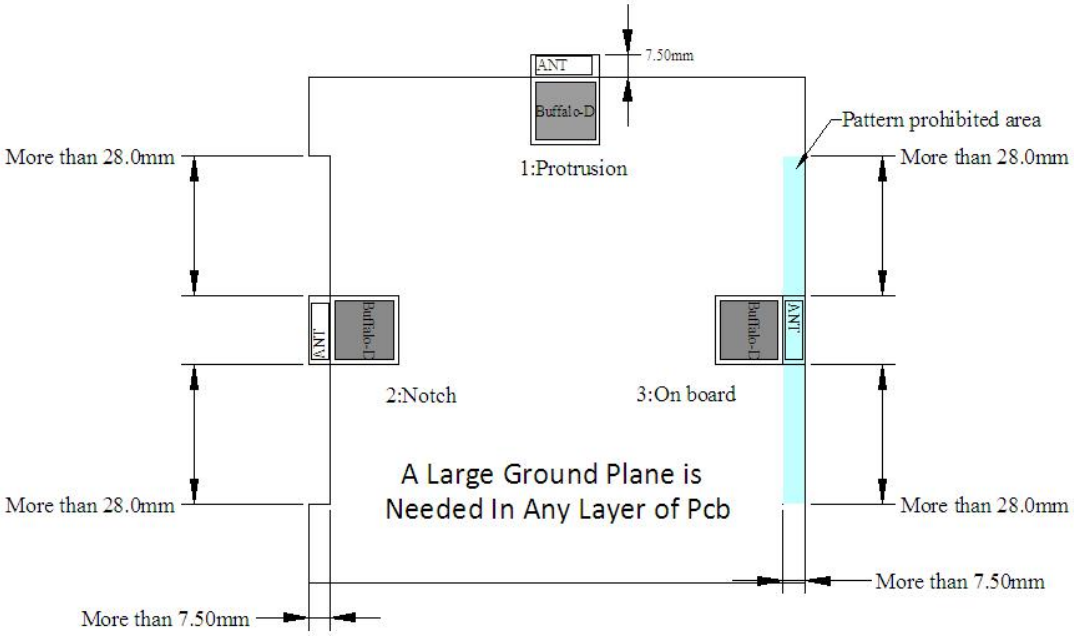
Figure 2: Mechanical Information



4.4.Module Layout Guideline

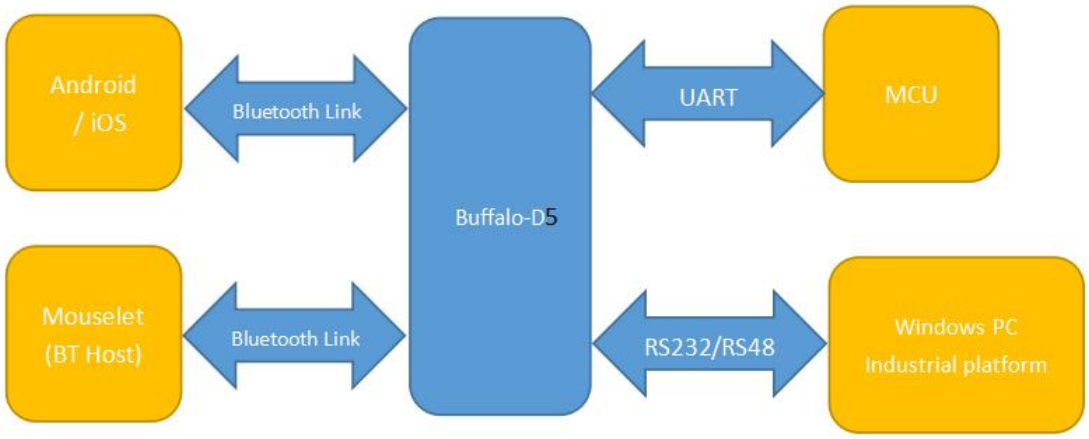
The layout on user PCB should be designed according to the following guidelines.

Figure 3: Module Placement



5. Application Diagram

Figure 4: Application Diagram



Buffalo-D5 can build BT link with Android/IOS devices ,also can build a connection with Pairlink another BT module device called Mouselet.

Buffalo-D5 can be accurate pass-through the data between the MCU and wireless device.

Buffalo-D5 also can pass-through the data from Windows Serial-232 or Industrial Serial-485 device .

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.

FCC Radiation Exposure Statement:

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.

FCC Label Instructions

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:"Contains Transmitter Module FCC ID:2AQV6BUFFALO-D5"Contains FCC ID:2AQV6BUFFALO-D5 Any similar wording that expresses the same meaning may be used.

