TYBT1 User Manual

1. Product Overview

TYBT1 is a Bluetooth (BLE) module designed by Hangzhou AiXiangJi Technology Co., Ltd, which is designed for outputting LED control signals. The BLE Module consists of a highly integrated wireless Bluetooth chip TLSR8266 and some extra electric circuits that have been programed with Bluetooth network protocol and plenty of software examples. TYBT1 include a 32-bit CPU, BLE, 512K byte flash, 16k SRAM, 5-channel PWM, one I2C and one UART interface.

Users can customize their LED products by using these PWM signals.

1.1 Features

✧ Integrated low power consumption 32-bit CPU, also known as application processor
✧ Basic frequency of the CPU can support 48 MHz
✧ Supply voltage range: 1.9V to 3.6V
✧ Peripherals: 5*PWM,1*I2C, 1*UART
✧ BLE RF features:
   ● Compatible with BLE 4.0
   ● TX transmitting power: 6.0 dBm
   ● RX receiving sensitivity: -92dBm
   ● AES hardware encryption
   ● On-board PCB antenna
   ● Operating temperature range: -20℃ to 85℃

1.2 Main Application Fields

✧   LED
✧ Intelligent household applications
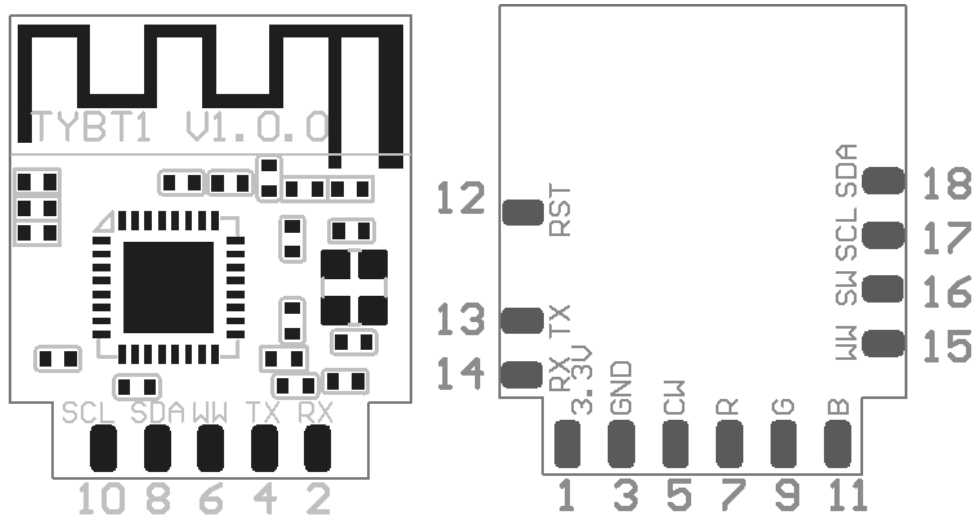
2. Dimensions and Footprint

2.1 Dimensions

TYBT1 have double sides of golden finger pins. The distance between each Pin is 2.0mm.
Size of TYBT1: 15mm(W)*17.3mm(L).
Figure 2 shows the dimensions of TYBT1.

Figure 2. The dimensions of TYBT1

2.2 Pin Definition

Table 1 shows the general pin attributes of TYBT1

Table 1. The typical pin definition of TYBT1

PIN NO.	NAME	TYPE	DESCRIPTION
1	3.3V	P	Supply voltage
2,14	RX	I	UART RX
3	GND	P	Ground
4,13	TX	O	UART TX
5	CW	I/O	PWM output pin, default for Cold White LED line
6,15	WW	I/O	PWM output pin, default for Warm White LED line
7	R	I/O	PWM output pin, default for Red LED line
8,18	SDA	I/O	I2C, data interface
9	G	I/O	PWM output pin, default for Green LED line
10,17	SCL	I/O	I2C, clock interface
11	B	I/O	PWM output pin, default for Blue LED line
12	RST	I	Reset pin for the module
16	SW	I/O	Bluetooth chipset burning pin

Note: S: Power supply pins; I/O: Digital input or output pins.

If there's any customization needed for PWM output, please contact our BD manager.

3. Electrical Characteristics

3.1 Absolute Maximum Ratings

Table 2. Absolute Maximum Ratings

PARAMETERS	DESCRIPTION	MIN	MAX	UNIT
Ts	Storage temperature	-20	85	℃
VCC	Supply voltage	1.9	3.6	V
Electrostatic release quantity (Human body model)	TAMB-25℃	-	2	KV
Electrostatic release quantity (Machine model)	TAMB-25℃	-	0.5	KV

3.2 Electrical Conditions

Table 3. Electrical Conditions

PARAMETERS	DESCRIPTION	MIN	TYPICAL	MAX	UNIT
Ta	Temperature for Commercial grade	-20	-	85	℃
VCC	Supply voltage	1.9	3.3	3.6	V
VIL	IO negative level input	-0.3	-	VCC*0.25	V
VIH	IO positive level input	VCC*0.75	-	VCC	V
VOL	IO negative level output	-	-	VCC*0.1	V
VoH	IO positive level output	VCC*0.8	-	VCC	V

3.3 Transmitting Current Consumptions

Table 4. TX current consumption

PARAMETERS	MODE	TYPICAL	UNIT
Itx	Continuously transmitting, 0dBm power output	13	mA
Irx	Continuously receiving	13	mA
IDC	Normal working mode	80	uA

4. Radio Specification

4.1 Basic Radio Frequency Characteristics

Table 5. Basic Radio frequency characteristics

PARAMETERS	DESCRIPTION
Working Frequency	2.4GHz ISM band
Radio standard	BLE 4.0
Data transmitting rate	1Mbps
Type of Antenna	On-board PCB Antenna(default)

4.2 Transmitting Power

Table 6. Transmitting power

PARAMETERS	MIN	TYPICAL	MAX	UNIT
RF output power consumption	3.8	6	-	dBm
20dB bandwidth	-	1000	-	KHz

4.3 Receiving Sensitivity

Table 7. Receiving sensitivity

PARAMETERS		MIN	TYPICAL	MAX	UNIT
RX sensitivity	1Mbps	-93	-92	-90	dBm
Frequency bias error	-	-300	-	300	KHz
Co-channel interference Restrain	-	-	-7	-	dB

5. Antenna Information

5.1 Antenna Type

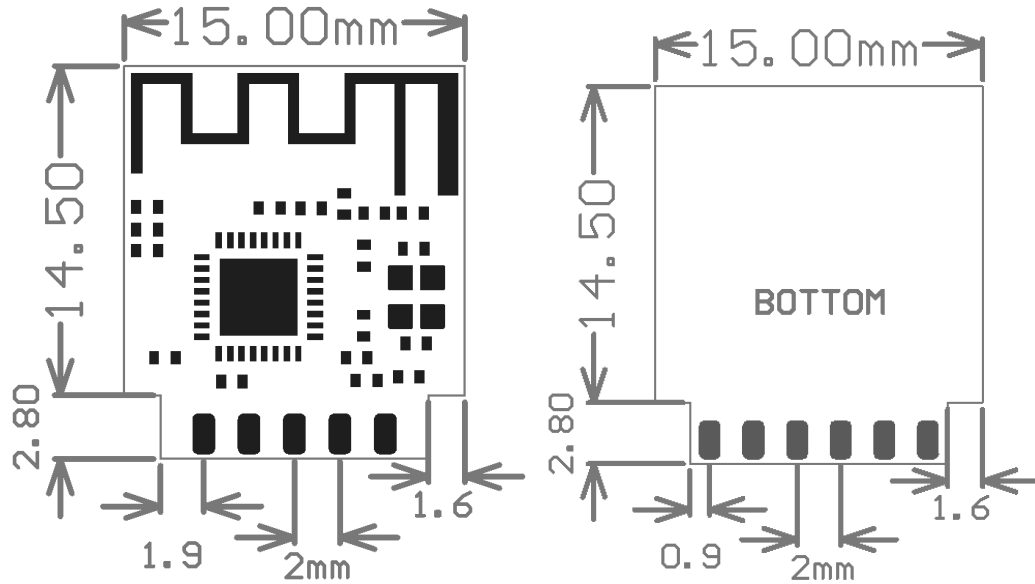Antenna can be connected using On-board PCB antenna only.

5.2 Reduce Antenna Interference

In order to have the best RF performance, It's recommended to keep a minimum 20mm distance between the antenna part and the other metal pieces.

6. Packaging Information And Production Guide

6.1 Mechanical Dimensions

Figure 3. Dimensions of the module

6.2 Production Guide

✧ The storage for the delivered module should meet the following condition:

1. The anti-moisture bag should be kept in the environment with temperature < 30℃ and humidity < 85% RH.

2. The expiration date is 6 months since the dry packaging products was sealed.

✧ Cautions:

1. All the operators should wear electrostatic ring in the whole process of production.

2. While operating, water and dirt should not have any contact with the modules.

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:2ANDL-TYBT1 or Contains FCC ID:2ANDL-TYBT1" , Any similar wording that expresses the same meaning may be used.