



Tuya Smart BLE Module

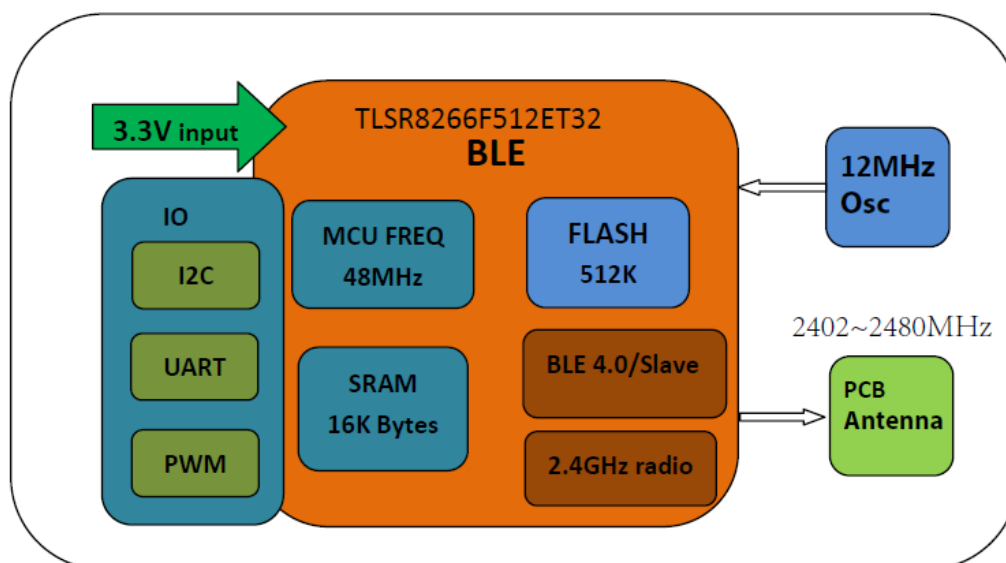
1. Product Overview

TYLC3 is a Bluetooth (BLE) module designed by HangZhou Tuya Technology Corporation, which is designed for outputting LED control signals. The BLE Module consists of a highly integrated wireless Bluetooth chip TLSR8266F512ET32 and some extra electric circuits that have been programmed with Bluetooth network protocol and plenty of software examples. TYLC3 include a 32-bit CPU, BLE, 512K byte flash, 16k SRAM and 4-channel PWM.

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

Figure 1 shows the block diagram of the TYLC3.

Figure 1. The block diagram of the TYLC3



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: 4*PWM
- ✧ BLE RF features:
 - Compatible with BLE 4.0
 - Transmitting data rate can go up to 1Mbps
 - TX transmitting power: +7dBm
 - RX receiving sensitivity: -92dBm
 - AES hardware encryption
 - On-board PCB antenna

- Operating temperature range: -20°C to 85°C

1.2 Main Application Fields

- ✧ Intelligent LED
- ✧ Intelligent household applications

2. Dimensions and Footprint

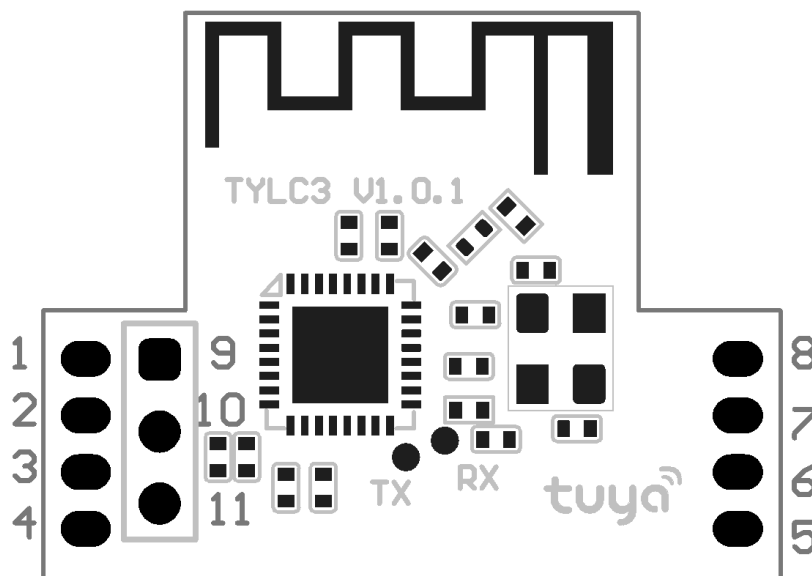
2.1 Dimensions

TYLC3 has 2 columns of Pins. The distance between each Pin is 2.0mm.

Size of TYLC3: 20mm(W)*26mm(L).

Figure 2 shows the dimensions of TYLC3.

Figure 2. The dimensions of TYLC3



2.2 Pin Definition

Table 1 shows the general pin attributes of TYLC3

Table 1. The typical pin definition of TYLC3

PIN NO.	NAME	TYPE	DESCRIPTION
1	NC	/	Non-connected
2	NC	/	Non-connected
3	3.3V	P	Supply voltage
4	GND	P	Ground
5	W	I/O	PWM output pin, default for White LED line
6	B	I/O	PWM output pin, default for Blue LED line
7	G	I/O	PWM output pin, default for Green LED line
8	R	I/O	PWM output pin, default for Red LED line
9	SW	I/O	Bluetooth chipset burning pin
10	GND	P	Ground for Bluetooth chipset burning
11	3.3V	P	Supply voltage for Bluetooth chipset burning

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	°C
VCC	Supply voltage	-0.3	3.9	V
Electrostatic release quantity (Human body model)	TAMB-25°C	-	2	KV
Electrostatic release quantity (Machine model)	TAMB-25°C	-	0.5	KV

3.2 Electrical Conditions

Table 3. Electrical Conditions

PARAMETERS	DESCRIPTION	MIN	TYPICAL	MAX	UNIT
Ta	Temperature for Commercial grade	-20	-	85	°C
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
I _{tx}	Continuously transmitting, 7dBm power output	13	mA
I _{rx}	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 Average output power consumption	3.8	7	-	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

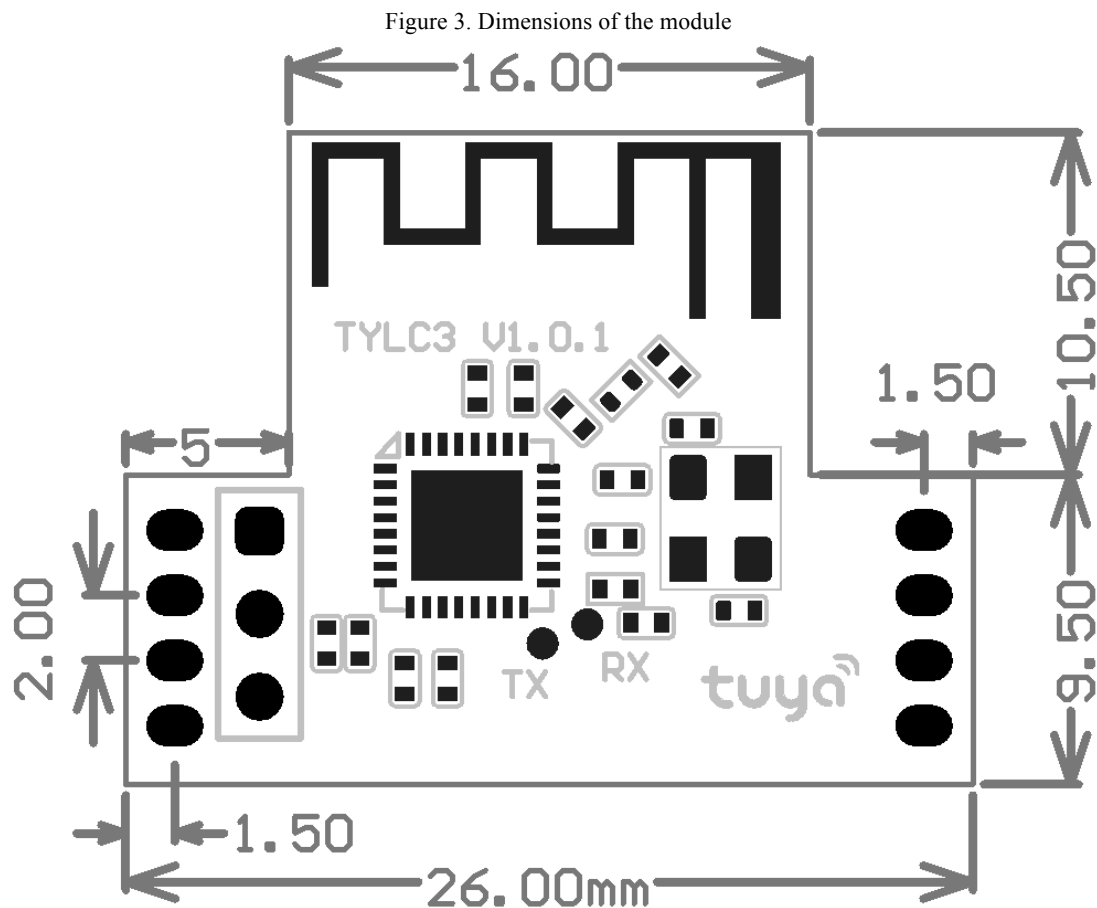
Antenna can be connected using On-board PCB antenna only.

5.2 Reduce Antenna Interference

In order to have the best RF performance, it's recommended to keep a minimum 15mm distance between the antenna part and the other metal pieces.

6. Packaging Information And Production Guide

6.1 Mechanical Dimensions



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 $< 30^{\circ}\text{C}$ and humidity $< 85\% \text{ RH}$.
 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-TYLC3 or "Contains FCC ID:2ANDL-TYLC3 , Any similar wording that expresses the same meaning may be used.