



TB-01 Specification

Version V1.0

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Contents

一、INTRODUCTION.....	5
二、SPECIFICATION.....	7
三、DIMENSION.....	8
四、PIN DEFINITION.....	9
五、SCHEMATIC.....	10
六、DESIGN GUIDE.....	10
1、Application circuit.....	10
2、Antenna layout requirements.....	10
3、Electricity Supply.....	11
4、PWM Dimming Solution Design Instructions.....	11
5、LED Drive Reference Design.....	12
6、Secondary development.....	12
七、REFLOW PROFILE.....	13
八、PACKAGING.....	14
九、CONTACT US.....	14

一、INTRODUCTION

The TB-01 intelligent lighting module is a Bluetooth module based on the EP2S12F40 chip and compatible with BT 4.2 low-power Tmall Genie Mesh. This module supports the Bluetooth module directly controlled by Tmall Genie and has a Bluetooth mesh networking function. Peer-to-peer network communication, using Bluetooth broadcast for communication, can ensure timely response in the case of multiple devices. It is mainly used in intelligent light control, which can meet the requirements of low power consumption, low latency, and short-range wireless data communication.

Features

- Can be directly controlled by Tmall Elf without a gateway
- 2.0mm pitch pin vertical solder package
- 2 positive white warm white PWM outputs
- With on-board antenna, no need to design antenna
- Brightness (duty cycle) adjustment range 5% -100%
- Factory default 50% duty cycle for cool and warm colors
- PWM output power 1KHz
- With night light function
- With wall switch to switch color temperature function

Parameters

LIST 1 Main Parameters

Model Name	TB-01
Size	22.0*14.0*2.0(±0.2)MM
Package	SMD-7 or DIP-5
Wireless Standard	Bluetooth V4.2
Frequency Range	2400 ~ 2483.5MHz
Output Power	10dBm
Max Sensitivity	-92dBm
Interface	PWM
Work Temperature	-20°C ~ 70 °C
Store Temperature	-40 °C ~ 125 °C , < 90%RH
Voltage Range	Voltage 2.7V ~ 3.6V, Current ≥ 50mA
Power	Deep Sleep Mode: 0.9uA
	Sleep Mode: 1.9uA
	Mesh Mode: 30mA
Transmission distance	80m ~ 150m

二、SPECIFICATION

Electrical characteristics

Absolute Maximum Rating

Any exceeding the following absolute maximum ratings may cause damage to AB1611

Item	Min	Typical	Max	Unit
Voltage	2.7V	3.3V	3.6V	V
I/O Voltage (VCCIO)	-0.3V	-	3.6V	V
Work Temperature	-20℃	-	+70℃	℃
Store Temperature	-40℃	-	+125℃	℃

Recommended Operating Conditions

Item	Min	Typical	Max	Unit
RF Voltage (VCCRF)	-	1.2V	-	V

RF Specification

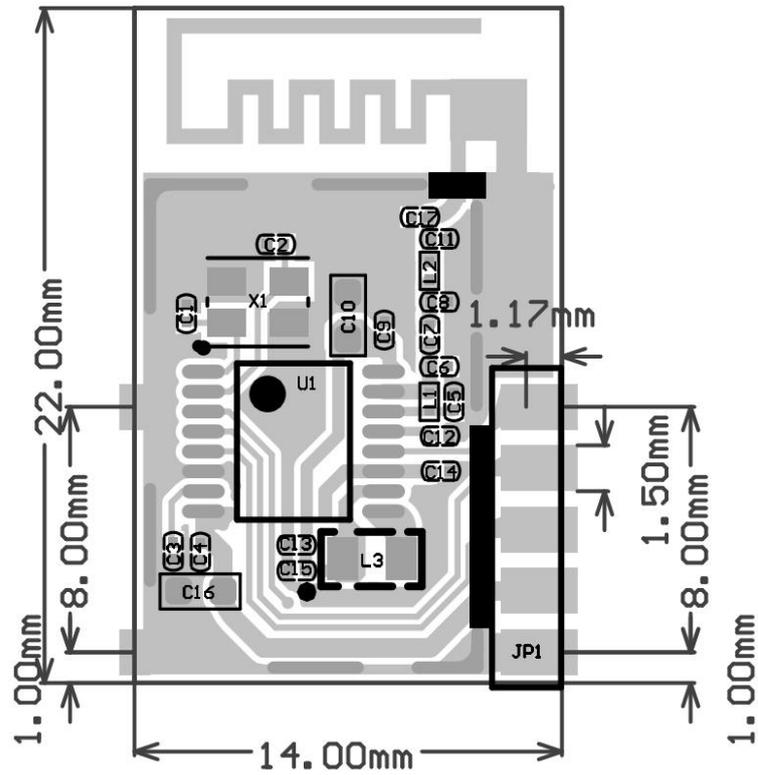
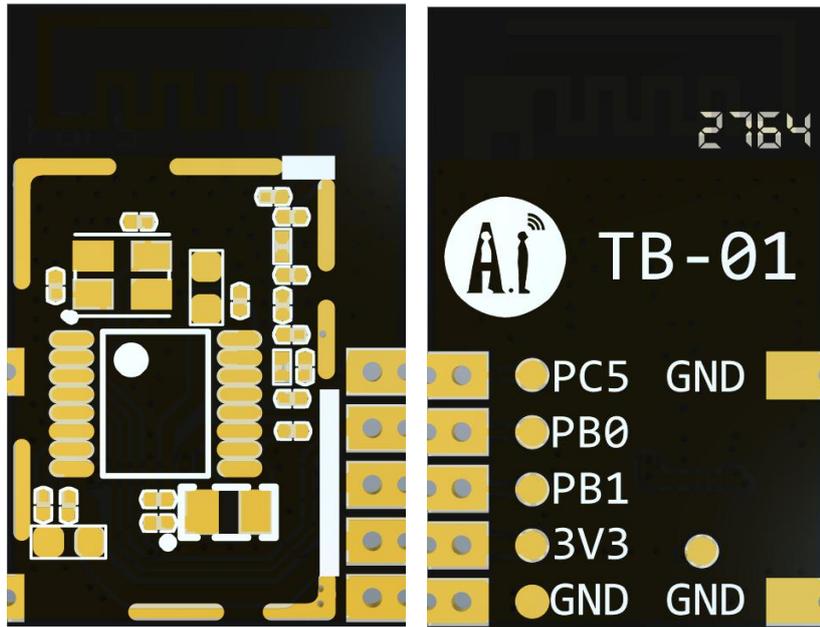
Output Power

Item	Min	Typical	Max	Unit
Average Power	8.5dBm	9.5dBm	10dBm	dBm

Sensitivity

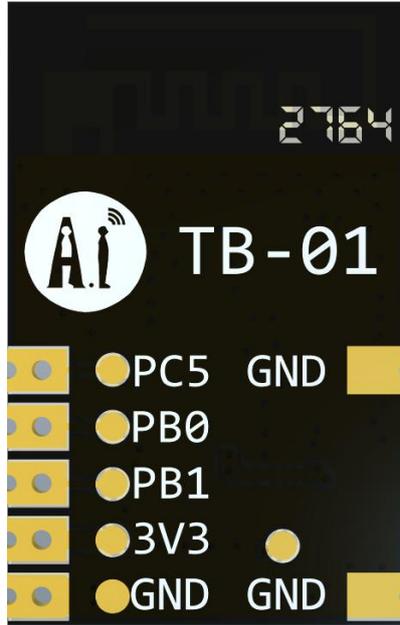
Item	Min	Typical	Max	Unit
Sensitivity	-92dBm	-91dBm	-90dBm	dBm

三、DIMENSION



四、PIN DEFINITION

The TB-01 module has a total of 7 interfaces. For example, the pin diagram, the pin function definition table is the interface definition.

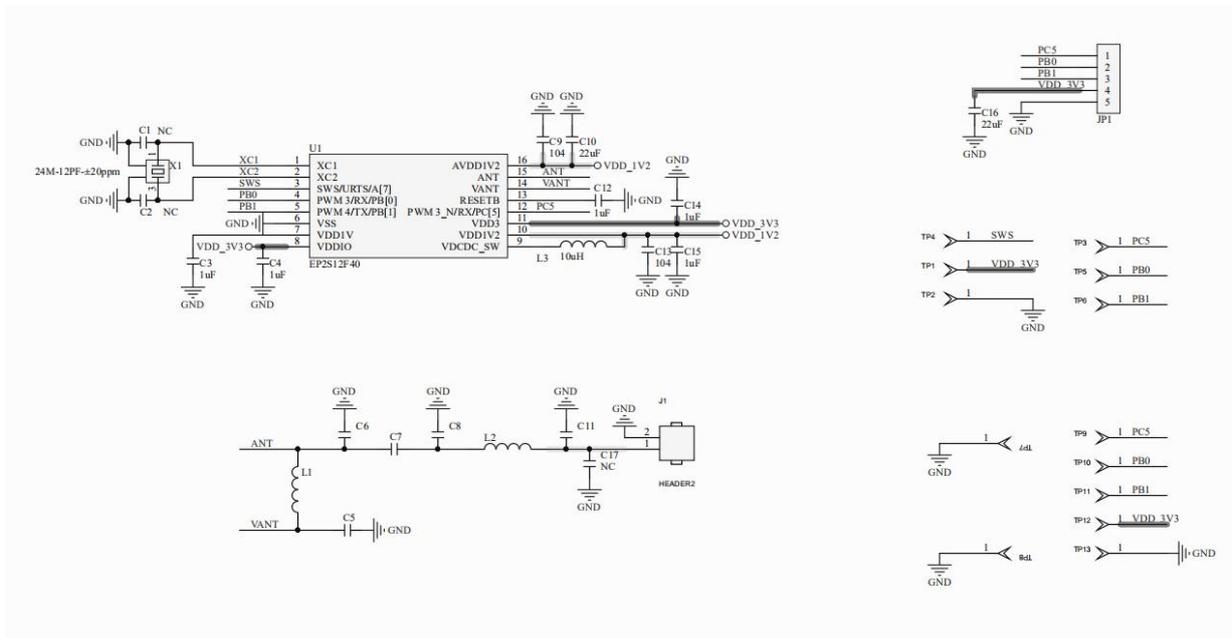


TB-01 Pin diagram

PIN function definition sheet

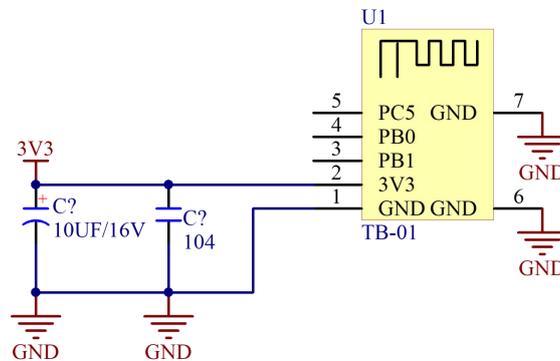
No.	Item	Function Description
1	GND	Ground
2	3V3	Electricity supply
3	PB1	Positive white PWM output, high effective
4	PB0	Warm white PWM output, high effective
5	PC5	AC power-down detection pin (function can be customized)
6	GND	Ground
7	GND	Ground

五、SCHEMATIC



六、DESIGN GUIDE

1、Application circuit



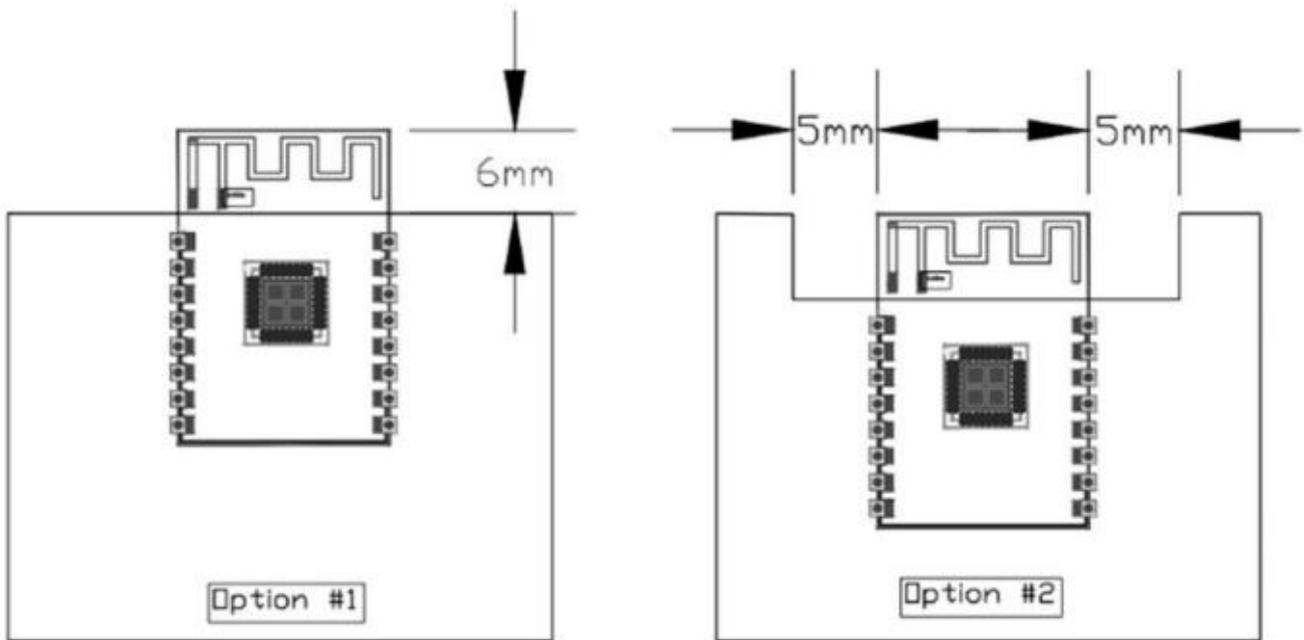
2、Antenna layout requirements

(1) For the installation position on the motherboard, the following two methods are recommended:

Solution 1: Place the module on the edge of the motherboard, and the antenna area extends beyond the edge of the motherboard.

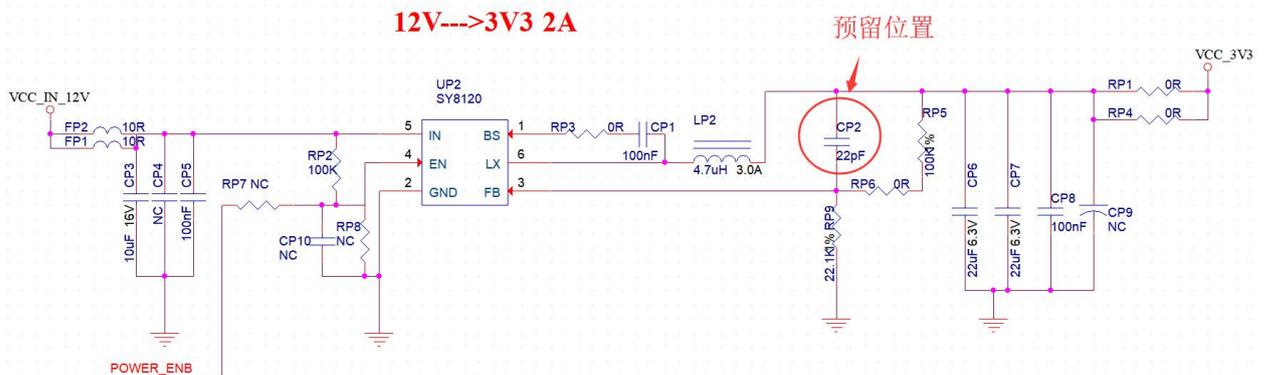
Solution 2: Place the module on the edge of the motherboard, and the edge of the motherboard hollows out an area at the antenna position.

(2) In order to meet the performance of the on-board antenna, it is forbidden to place metal parts around the antenna and keep it away from high-frequency devices.



3、Electricity Supply

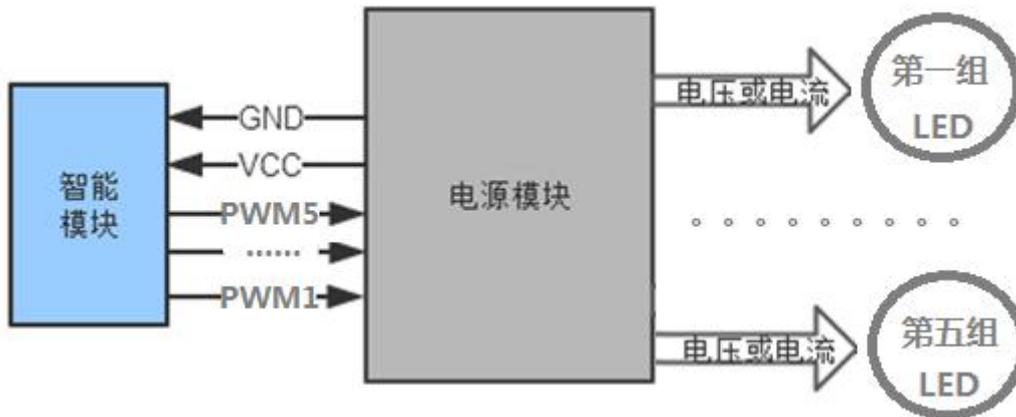
- (1) Recommended 3.3V voltage, peak current above 50mA
- (2) It is recommended to use LDO power supply; if using DC-DC, it is recommended to control the ripple within 30mV.
- (3) The DC-DC power supply circuit is recommended to reserve the position of the dynamic response capacitor, which can optimize the output ripple when the load changes greatly.
- (4) 3.3V power interface is recommended to add ESD devices.



4、PWM Dimming Solution Design Instructions

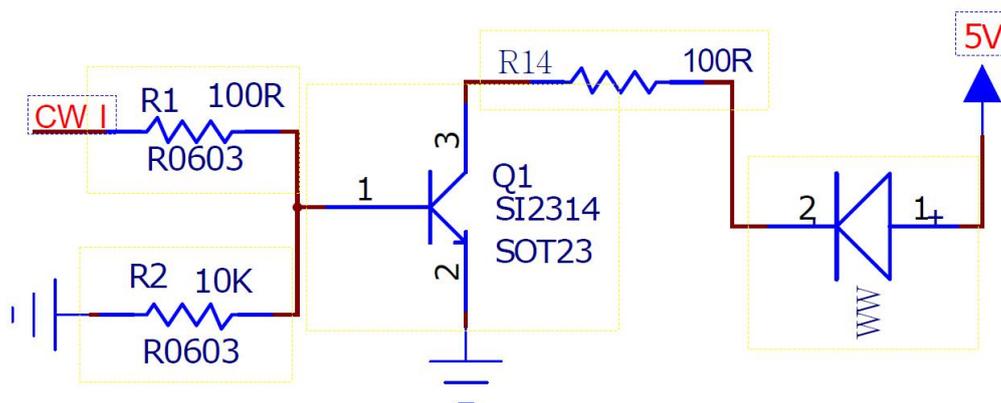
For lamps that require dimming, you only need to connect the PWM pins of the corresponding color to the control end of the subsequent stage drive circuit; the PWM independently outputs a 100-level adjustable digital signal, and the subsequent stage circuit can be voltage The driving type may be a current driving type.

Connection diagram



5、LED Drive Reference Design

TB-01 module application only needs 3.3V power supply and simple driving circuit to achieve intelligent light control. Take MOS tube to drive a channel of white light as an example, the design reference is as follows; CW_I is the module's positive white light PWM output , Q1 is MOS tube, WW is LED lamp beads, the other 4 road lamp driving circuit is the same as this road design method.



6、Secondary development

The TB-01 module supports users to write their own firmware programs to achieve customized functions.

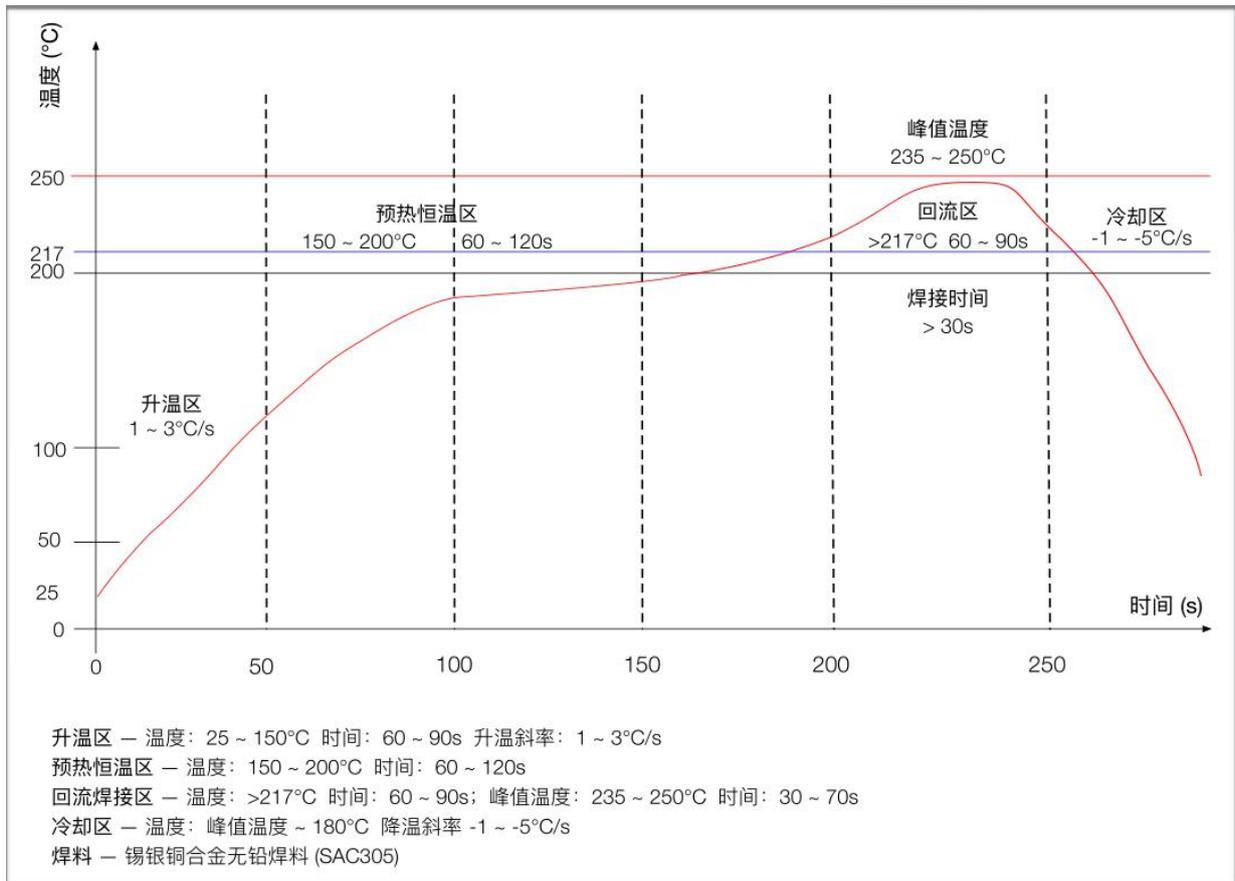
If you use a Linux machine to develop the firmware, you can refer to the SDK, documentation and source address of Anxin's collation:

https://github.com/Ai-Thinker-Open/Telink_825X_SDK.

If you use Windows development, you can refer to the original SDK provided by the chip manufacturer. Download address:

<http://wiki.telink-semi.cn>

七、REFLOW PROFILE



八、PACKAGING

As shown below, the packaging of TB-01 is taping packaging.



九、CONTACT US

Company Website: <https://www.ai-thinker.com>

Development DOCS: <https://docs.aithinker.com>

Official Forum: <http://bbs.ai-thinker.com>

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