



TB-02-Kit Specification

Version V1.0

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Document Revision History

Version	Date	Created / Revised Content	Prepared by	Approved by
V1.0	2019-03-04	First edition	Xie Yiji	

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1. Product Overview

The TB-02-Kit development board is a smart lighting development board designed for the TB-02 module. It features five built-in PWM channels, supporting independent adjustment of 7-color RGB LED and two warm/cool LED channels. All available I/Os of the module are exposed via pin headers for convenient development and debugging.

The development board integrates a wealth of resources, including AT commands, SDK secondary development, supporting Bluetooth Mesh networking, Android/iOS app control and Wechat mini program control, as well as Tmall Genie voice direct control. Multiple development boards can be interconnected for mesh network debugging. All interfaces including GPIOs, PWM, I2C, ADC are accessible via 2.54 mm pin headers, enabling flexible peripheral connections.

The UART interface supports firmware programming for quick and easy updates! Additionally, the SWS pin on the pin header can be used with Telink's official programming tool for firmware programming.

Features

- Module model: TB-02
- Two versions: Alibaba Tmall Genie dedicated version; standard AT version
- BLE 5.0, supports Mesh
- Interface type: Standard micro USB + 2.54mm pitch pin header
- Provides PWM, I2C, GPIO and ADC interfaces
- Equipped with integrated RGB three-in-one LED beads and warm/cool LED beads
- Features a reset button and one user-defined button
- Supports Tmall Genie voice direct control
- Supports Android/iOS app control and Wechat mini program control
- Supports AT commands and SDK secondary development

Key Specifications

Table 1 Key Specifications

Model	TB-02-Kit development board
Dimensions	30mm (W) * 40mm (H) ± 0.2 mm
Package	DIP-16 (2.54mm pitch standard pin header)
Wireless Standard	BLE 5.0, supports Mesh
Frequency Range	2400 – 2483.5MHz
Transmit Power	Max. 10dBm
Receiver Sensitivity	Min. -94dBm
Supported Interfaces	PWM/I2C/GPIO/ADC
Operating Temperature	-20 – 70°C
Storage Conditions	-40 – 125°C, <90% RH
Power Supply Range	Micro USB supply voltage: 4.75 – 5.25V, 5.0V recommended
Power Consumption	Sleep mode: 0.8 μ A (module only)
	Standby mode: 3mA (module only)
	Full load mode (TX: 10dBm): 23mA (module only)
	Development board baseboard: 4mA

2. Electrical Parameters

Electrical Characteristics

Absolute Maximum Ratings

Any value exceeding the following absolute maximum ratings may result in chip damage.

Parameter	Min	Typ	Max	Unit
Micro USB Power Supply Voltage	4.75	5.0	5.25	V
Operating Temperature	-20	-	+70	°C
Storage Temperature	-40	-	+125	°C

Power Consumption

Mode	Typ	Unit
Transmit Power Consumption (10dBm)	23	mA
Standby Power Consumption	3	mA
Sleep	0.8	μA

Note: The above power consumption values are measured with the module only.

RF Parameters

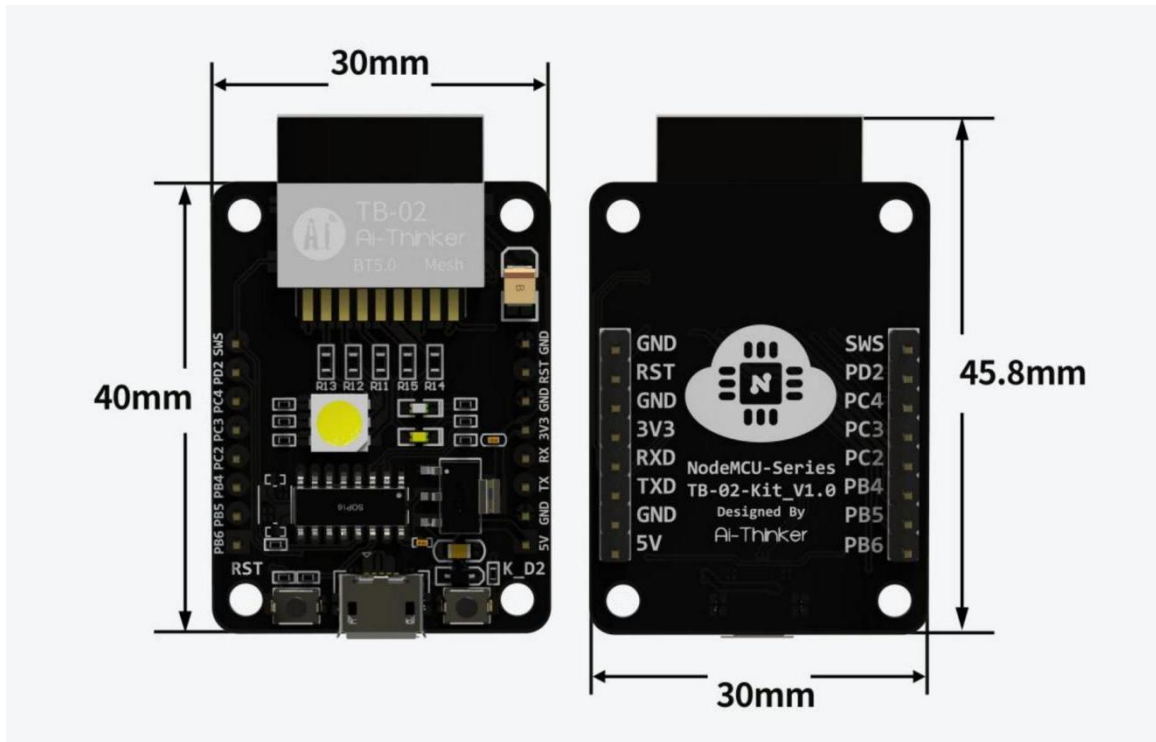
Transmit Power

Parameter	Min	Typ	Max	Unit
Average Power (2400 – 2483.5MHz)	7.1	8.5	10	dBm

Receiver Sensitivity

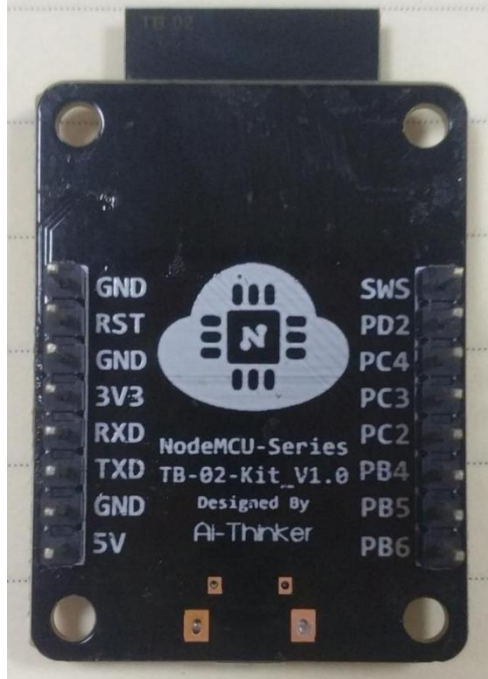
Parameter	Min	Typ	Max	Unit
Receiver Sensitivity	-94	-93	-92	dBm

3. Appearance and Dimensions



4. Pin Definition

TB-02-Kit development board exposes a total of 16 pins, as shown in the pin diagram. The pin function definition table provides the detailed interface specifications.



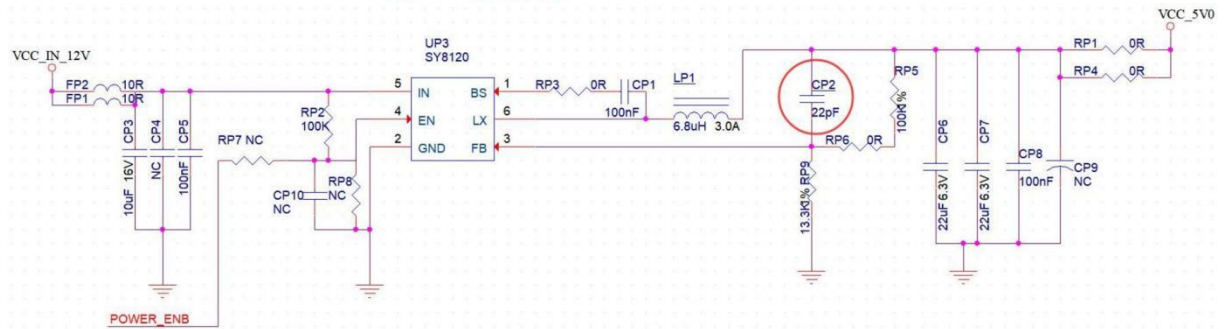
TB-02-Kit Pin Diagram

Pin Function Definition

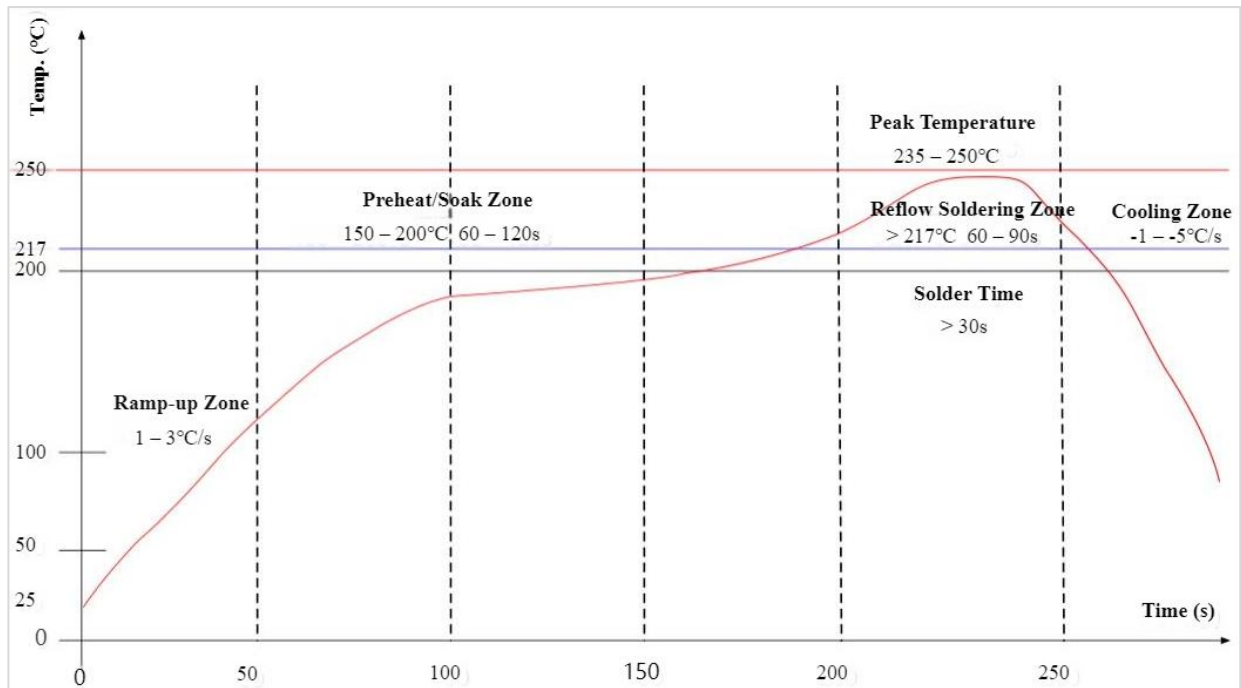
No.	Name	Function Description
1	GND	Ground
2	RST	Reset pin
3	GND	Ground
4	3V3	Power supply
5	RXD	UART RX
6	TXD	UART TX
7	GND	Ground
8	5V	5V power supply
9	SWS	Single-wire slave/UART_RTS/GPIO PA7
10	PD2	SPI chip select (active low)/PWM3 output/GPIO PD2

11	PC4	PWM2 output/UART_CTS/PWM0 inverted output/SAR ADC input/GPIO PC4
12	PC3	PWM1 output/UART_RX/I2C serial clock/32kHz crystal input (optional)/GPIO PC3
13	PC2	PWM0 output/I2C serial data/32kHz crystal output (optional)/GPIO PC2
14	PB4	PWM4 output/SAR ADC input/GPIO PB4
15	PB5	PWM5 output/SAR ADC input/GPIO PB5
16	PB6	SPI data input (I2C_SDA)/UART_RTS/SAR ADC input/GPIO PB6

12V--->5V0 2A



7. Reflow Soldering Profile



8. Packaging Information

The TB-02-Kit is packaged in an ESD bag.

9. Contact Information

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

Development DOCS: <https://docs.ai-thinker.com>

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

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