TB-02-Kit_V2.0 Specification

Version

V1.0

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Document creation/revision/abolition calendar

version	date	Development/revision of content	develop	approve
V1.0	2021.08.03	First developed	junx	Xu Hong

table of contents

1. Product Overview

TB-02-Kit_V2.0 development board is a smart lighting development board designed for TB-02 module, with five PWMs on board, adjustable RGB color lights and two warm and cold beads, all available IOs of the module are pinned out with row pins, which is convenient for developers to develop and debug by themselves; integrated rich materials, including AT commands, SDK secondary development, support for Bluetooth UART interface supports firmware burn-in, easy and fast! UART interface supports firmware burning, easy and fast!

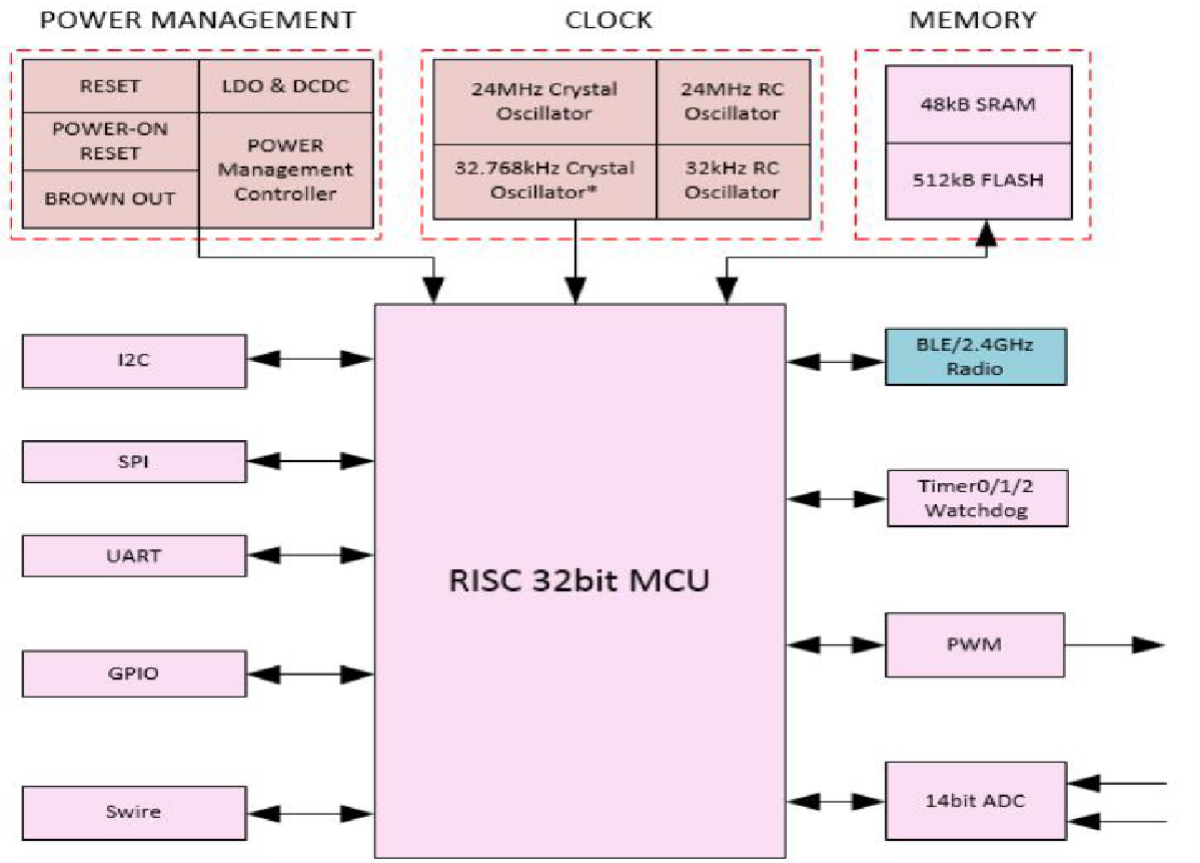


Figure 1 Chip Architecture Diagram

1.1. characteristics

- Module Model: TB-02
- Two options: Ali Tmall Genie Special Edition; Regular AT Edition
- BLE5.0 with Mesh support
- Interface type: standard micro USB + 2.54mm pitch row of pins
- Provides PWM/I2C/GPIO/ADC interface
- Comes with R/G/B triple bead and with cool/warm bead
- Self-reset button and 1 user-defined button
- Support Tmall Genie Voice Direct Control
- Support Android/IOS APP control and WeChat app control
- Support AT command, SDK secondary development.

2. Main parameters

Table 1 Description of the main parameters

Module Model	TB-02-Kit_V2.0 Development Board
package	DIP-20 (2.54 pitch standard row of pins)
size	32.3*28.7*18.0(±0.2)mm
Antenna Form	On-Board PCB Antennas
Spectral range	2400 ~ 2483.5MHz
transmitting power	10±2 dBm
reception sensitivity	Less than -94dBm
Working temperature	-20 ° C ~ 70 ° C
Storage Environment	-40 ℃ ~ 125 ℃ , < 90%RH
Scope of electricity supply	Micro USB power supply voltage 4.75V~5.25V, 5.0V recommended
Supported Interfaces	PWM/GPIO/UART/SPI/I2C/

Number of IO ports	14
Serial port rate	Default 115200 bps
bluetooth	BLE 5.0
power consumption	Sleep mode: 0.8uA (single module) Standby mode: 3mA (single module) Full load mode (TX: 10dBm): 23mA (single module) Development board backplane: 4mA
SPI Flash	Built-in 512KByte

2.1. Electrical parameters

The TB-02-Kit_V2.0 development board is an electrostatic sensitive device and requires special precautions when handling.

2.2. Electrical Characteristics

Absolute maximum rating

Any exceedance of the following absolute maximum ratings may result in chip damage

parameters	minimum value	typical value	maximum value	unit
Micro USB supply voltage	4.75	5.0	5.25	V
Working temperature	-20	-	+70	℃
Storage temperature	-40	-	+125	℃

BLE RF Performance

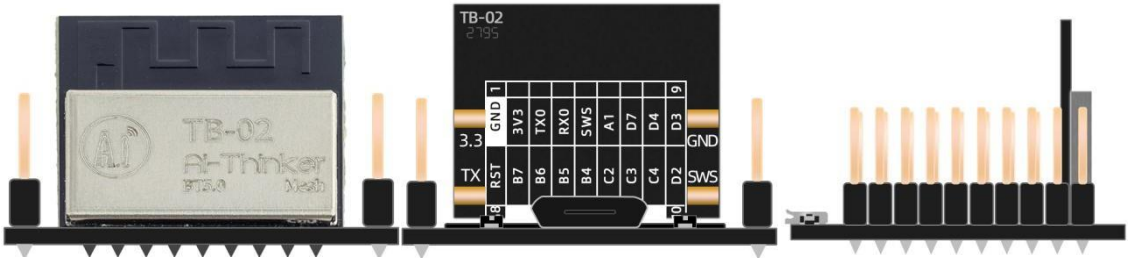
description	typical value	unit
Output Power		
transmitting power	10±2	dBm
Receiving Sensitivity Low Power Bluetooth 1M		
灵敏度@30.8%PER	<-94	dBm

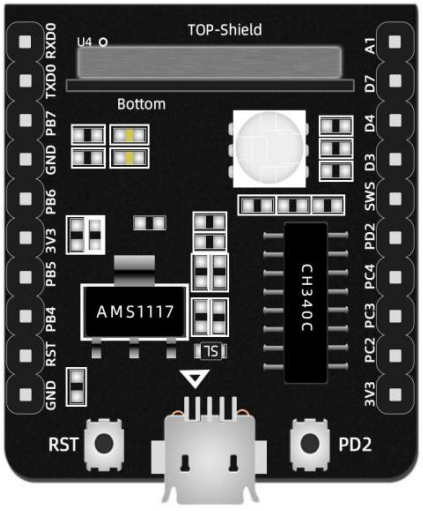
power wastage

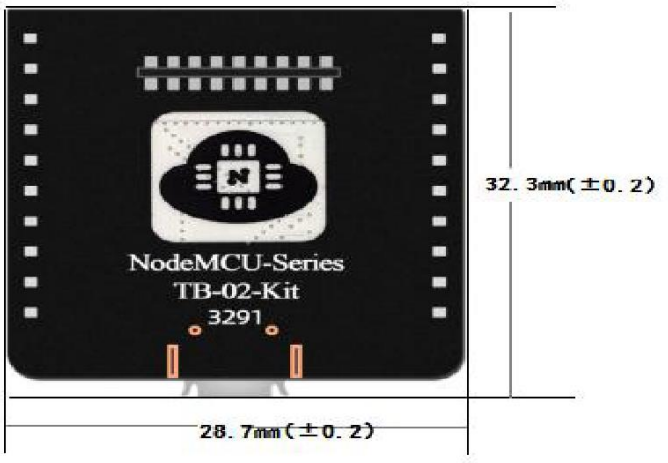
The power consumption here is for a single module.

mode	minimum value	typical value	maximum value	unit
Transmit Power Consumption (10dBm)	-	23	-	mA
Standby power consumption	-	3	-	mA
sleep	-	0.8	-	mA

3. Exterior dimensions

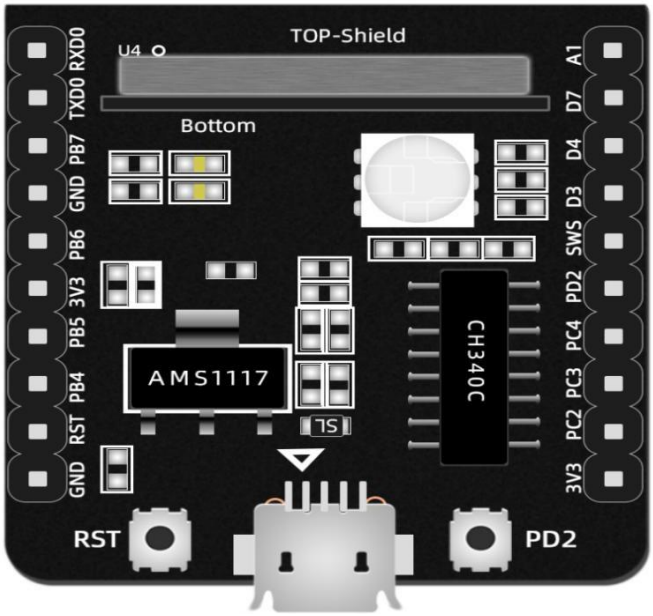






(Renderings are for reference only and subject to availability)

4.Pin Definitions



TB-02-KIT_V2.0 Pinout Diagram

The TB-02-Kit_V2.0 module is connected to a total of 20 interfaces, as shown in the pin schematic, and the pin function definition table is the interface definition.

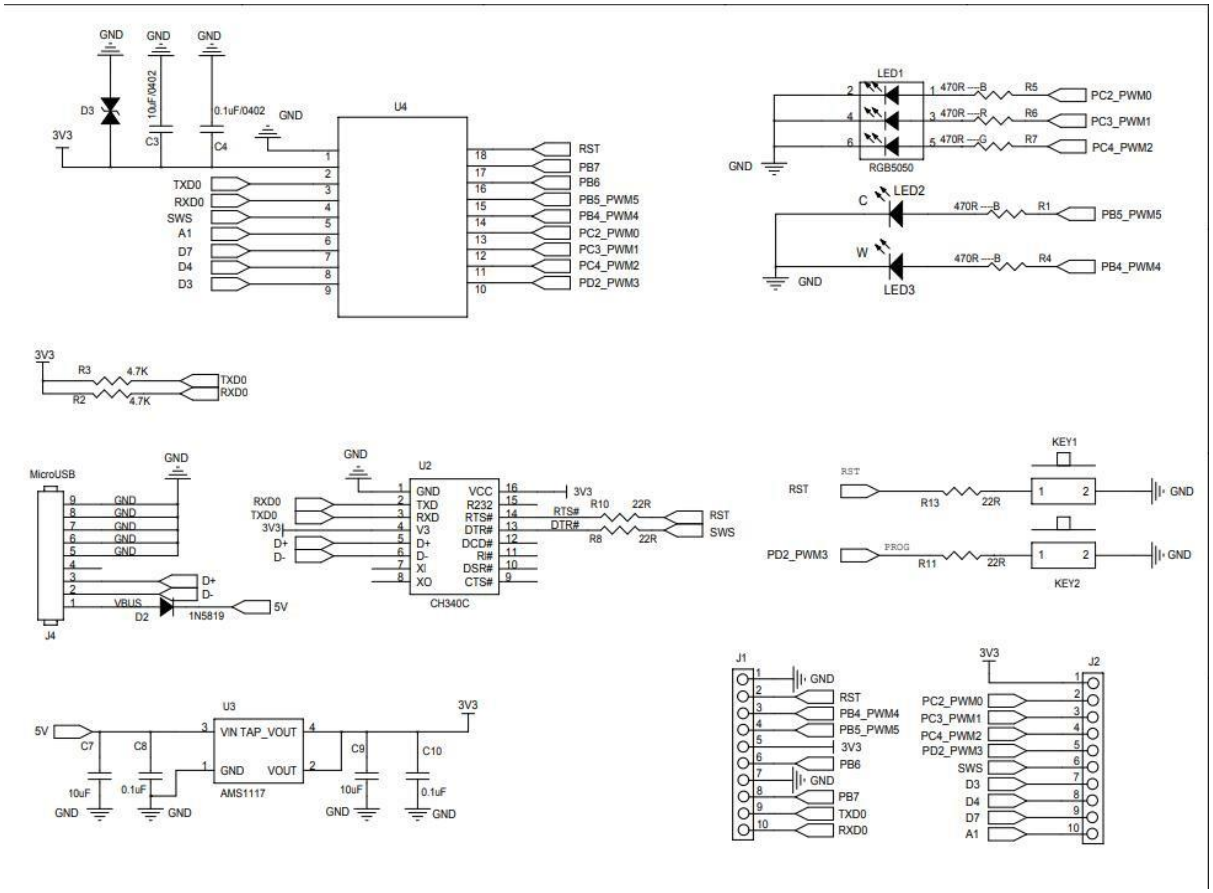
TB-02-Kit_V2.0 Pin Function Definition Table

foot notes	name (of a thing)	Function description
1	RXD	UART_RX/GPIO PA0/PWM0 Reverse output
2	TXD	UART_TX/GPIO PB1/PWM4 output/SAR ADC input
3	PB7	SPI_DO Data Output/UART_RX/SAR ADC Input/GPIO PB7
4	GND	earth (electric connection)

5	PB6	SPI_DI data input (I2C_SDA)/UART_RTS/SAR ADC input/GPIO PB6
6	3V3	supply electricity
7	PB5	Cooling and heating lamp C-port/PWM5 output/SAR ADC input/GPIO PB5
8	PB4	Cooling and heating lamp W port/PWM4 output/SAR ADC input/GPIO PB4
9	RST	Reset low valid
10	GND	earth (electric connection)

11	3V3	supply electricity
12	PC2	RGB light B port/PWM0 output/I2C serial data/32kHz crystal output (optional)/GPIO PC2
13	PC3	RGB light R port/PWM1 output/UART_RX/I2C serial clock/32kH crystal input (optional)/GPIO PC3
14	PC4	RGB Light G Port/PWM2 Output/UART_CTS/PWM0 Inverted Output/SAR ADC Input/GPIO PC4
15	PD2	GPIO PD2/PWM3 output/SPI chip select (active low)/I2S_LR
16	SWS	Single Wire Slave/UART_RTS/GPIO PA7
17	D3	GPIO PD3/PWM1 Reverse Output/I2S_SDI
18	D4	GPIO PD4/Single Wire Host SWM/PWM2 Reverse Output/I2S_SDO
19	D7	GPIO PD7/SPI clock (I2C_SCK)
20	A1	GPIO PA1/I2S_clock

5. schematic



6.Packaging Information

The TB-02-Kit_V2.0 is packaged in static bags.

7.Related Models

Product Model	supply electricity	package	size	Default communication interface
TB-02	3.3V	DIP-18/SMD-13	18.0*18.0*2.8(±0.2)MM	UART
TB-02-Kit	5V	DIP-16	30.0*40.0*13.0(±0.2)MM	UART
TB-02-Kit_V2.0	5V	DIP-20	32.3*28.7*18.0(±0.2)MM	UART
Product related information: https://docs.ai-thinker.com/blue_tooth				

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