

**Version V1.0**

Version:

Date	Item	Version	Remark
2021.7.15	Initial release	V1.0.	First Release

1、Module Description:

SM-030 module developed and designed by Shenzhen kuzhai Technology Co., Ltd. (hereinafter referred to as kuzhai Technology). is a high integration, low power consumption, built-in WiFi and Bluetooth Le 5.0 dual protocol module. SM-030 module supports 2-channel PWM output and 5-channel PWM, as well as PWM dimming chip with I2C interface. The module chip integrates cache, memory, voltage management and other control units, and has rich peripheral resources. In addition, various common security and confidentiality agreements are also supported.

2、Characteristics

1. Chip Charecteristics

- RISV-V 32-bit With floating point
- Multi layer 32-bit
- AHB bus architecture
- 96KB ESRAM
- 180KB Random-access memory
- 128KB ROM
- Off chip memory Flash
- Intergration balun, with PA / LNA Wi-Fi and BLE
- Operation Voltage: 3.3V +/- 0.3V

2. WiFi Charecteristics

- 802.11 b/g/n
- Wi-Fi 20MHz bandwidth
- Wi-Fi Safty WPS/WEP/WPA/WPA2 Personal/WPA2 Enterprise/
-

3. BT Charecteristics

- Bluetooth® BLE 5.0
- Support BLE 5.0 Chanel # 2
- Whithout 2M PHY/Code PHY / ADV Extend
-

4. Security mechanism

- secure boot
- Support AES 128/192/256 encryption engine
- Support SHA-1/224/256
- TRNG
- PKA

5. Module characteristics

- Support STA/AP/STA+AP
- Support SmartConfig and AP (including Android and IOS Devices)
- PCB antenna
- Operation temperature: -40°C to + 85°C
- Operation Voltage 3V ~ 3.6V
- Maximum frequency support 160MHz
- When the voltage is lower than 2.93v, the module will reset automatically.

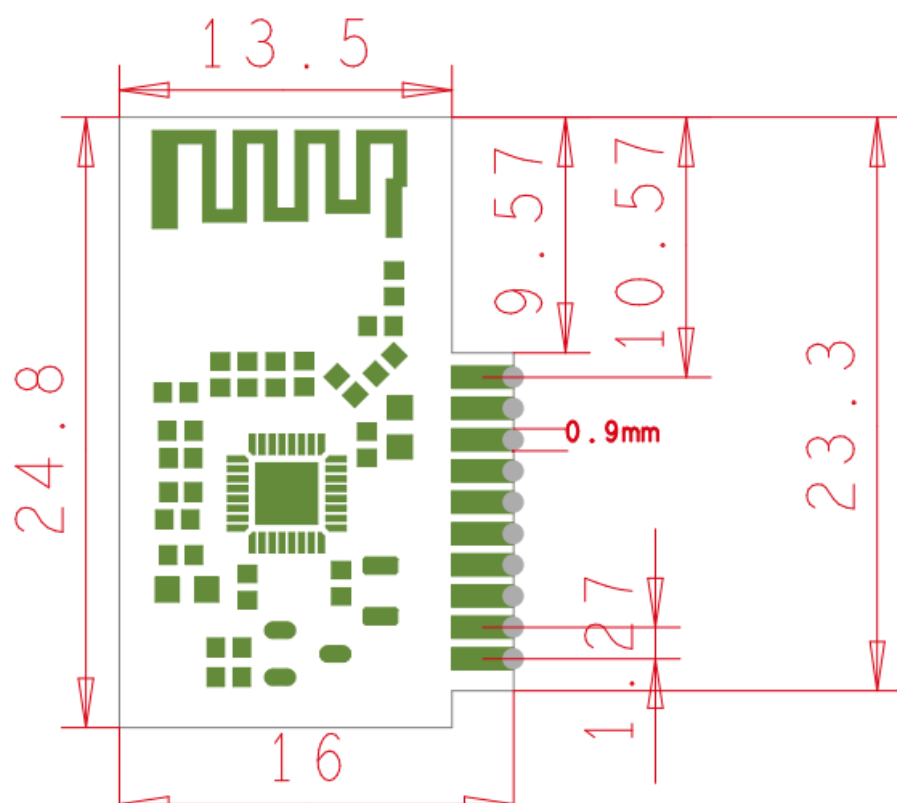
6. Application area

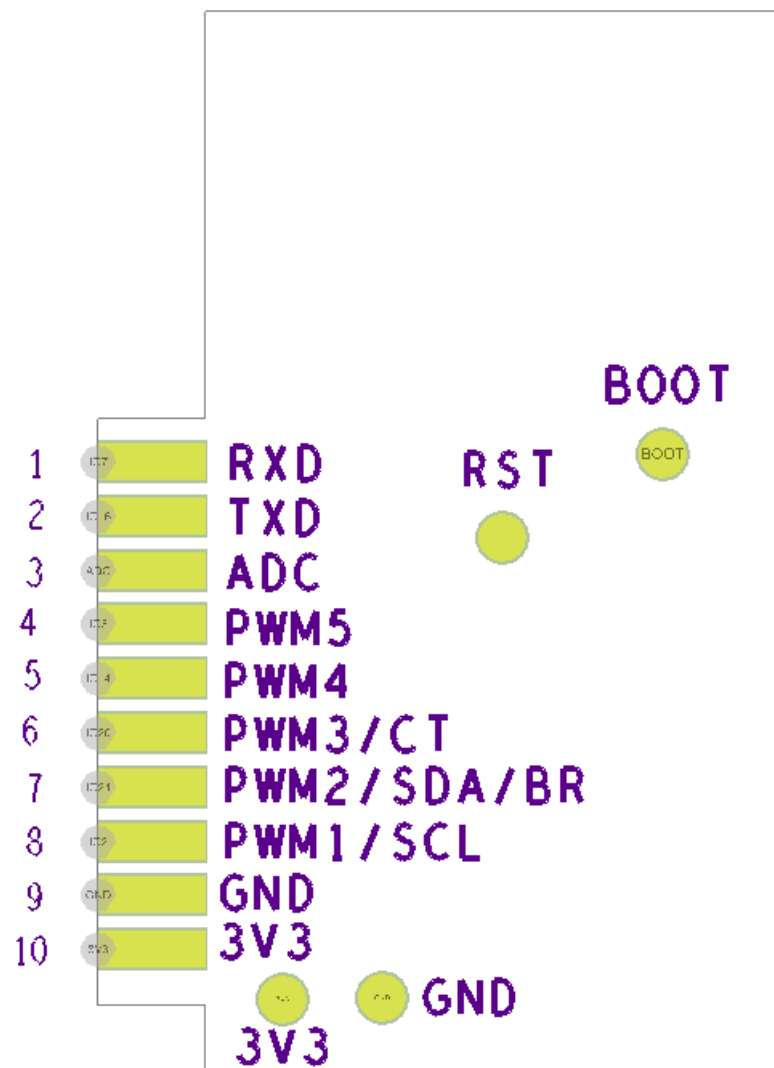
- Smart lighting, smart home, smart light, smart building

3、Module information

1. SM-030 Top view drawing

- SM-030 module can be used in the form of patch and plug-in, and its PCB thickness is $1.0 \pm 0.1\text{mm}$
- SM-030 Pin spacing is $1.27 \pm 0.1\text{mm}$.
- SM-030 Overall size : $24.8 \pm 0.2\text{mm(L)} \times 16 \pm 0.2\text{mm(W)} \times 3.8 \pm 0.2\text{mm(H)}$ (Including shielding cover)





Bottom view

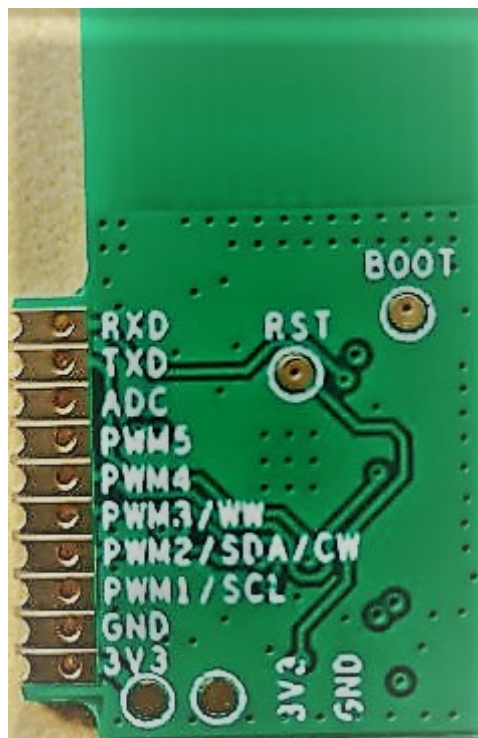
o



☐ Top view



☐ Bottom view



2. SM-030 pin description

Item	Pin	IO type	Function Description
1	RXD	I/O	Module UART interface RX
2	TXD	I/O	Module UART interface TX
3	ADC	AI	ADC Pin
4	PWM5	I/O	Module PWM signal output
5	PWM4	I/O	Module PWM signal output
6	PWM3	I/O	Module PWM signal output / Warm light PWM Control
7	PWM2	I/O	Module PWM signal output / Cold light PWM Control /I2C interface SDA
8	PWM1	I/O	Module PWM signal output / I2C interface SCK
9	GND	P	Module grounding anchor
10	3V3	P	Module power input pin

3.

BOOT		3V3	
RST	When pulled down, the chip is forced into reset	RXD	
GND	Chip ground	TXD	

4、Electrical characteristics

- Limit maximum rating

characteristic	condition	Min.	Typical	Max	Unit
VDD	Supply voltage	-0.3	3.3	3.6	V
ESD-HBM		-	-	2000	V
Top	operation temperature	-40		+85	℃
Tstg	Storage temperature	-45		135	℃

5、RF parameters

1. Basic RF characteristics of the module

Item	Description	Re-mark
Operating frequency	WIFI:2412~2462MHz; BT:2402~2480MHz	
WIFI	IEEE 802.11 b/g/n	
BT	BLE 5.0	
Date Rate	11b: 1Mbps, 2 Mbps, 5.5Mbps 11g: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps <br 11n: HT20 MCS0~7	
Antenna Type	PCB	

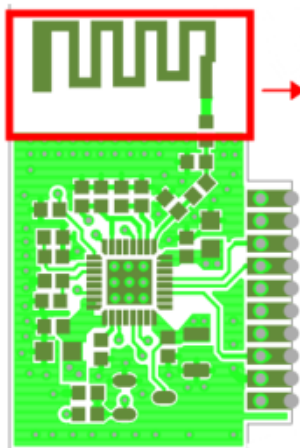
2. Power consumption parameters of module in continuous transmission state

Note: The test was conducted at room temperature of 25 °C and DC power supply of 3.3V.

6、Antenna type

1. Antenna types supported by the module

- The module is equipped with PCB on-board antenna, and there is no other antenna access mode.
- In order to ensure the optimal WiFi or ble performance of the module, a certain empty area shall be maintained in the antenna area of the module, and there shall be no components, fixing screws or grounding layers in the accessories within the length of the antenna.
- The direction of the antenna should be consistent with the discovery of the final product, so that the antenna has the maximum radiation in the required direction.
- The antenna cannot be completely covered by metal or metal shell, which will reduce the energy radiated by the screen antenna and weaken the received energy.
- There should be no ground plane for the positive transmission of the antenna.
- As shown in the figure below, the left and right sides of the antenna shall be kept at least 6mm away from the ground plane.



→ **Antenna clearance area**

FCC Warning:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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 and your body.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

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.

2.7 Antennas

This radio transmitter FCC ID:2A2SV-SM-030 has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna No.	Operate frequency band	Antenna Type	Maximum antenna gain
BT/WIFI Antenna	2400-2500MHz	PCB Antenna	0dBi

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID:2A2SV-SM-030".

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.