Midea IoT
Module User Mannual

Manufacturer name: GD Midea Air-Conditioning Equipment Co.,Ltd

Module name: Bluetooth & 2.4GHz Wi-Fi dual band Communication Module

Model specification: MWB-S-WB01

Material code:

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1、Product Overview

MWB-SWB01 is a fully functional, highly integrated, low-power WiFi + BLE module for the Internet of things developed by Midea. The module adopts Built-in PCB antenna design and Midea's customized WB01 chip. The main chip highly integrates power management, memory, flash memory, WiFi baseband and Bluetooth baseband. It supports IEEE 802.11b/g/n protocol and provides UART communication interface to communicate with the main device. It can be widely used in smart home devices, remote monitoring devices, medical machinery and other fields

The module has the following characteristics:

➢ Support 160MHz，RAM 352KB，4M Flash

➢ Support IEEE 802.11b/g/n protocol

➢ In 2.4GHz band support 20MHz bandwidth

➢ Support Bluetooth BLE 5.1(1M, 2M)

➢ Support encryption protocols：WEP, WPA, WPA2, WPA3，TKIP

➢ PCB Build-in Antenna: Ant Gain 2dBi

➢ Working temperature ：-20℃ to 85℃

➢ The product shall be supplied by ES1/PS1 power source, which is insulated to the AC mains by double or reinforced insulation.
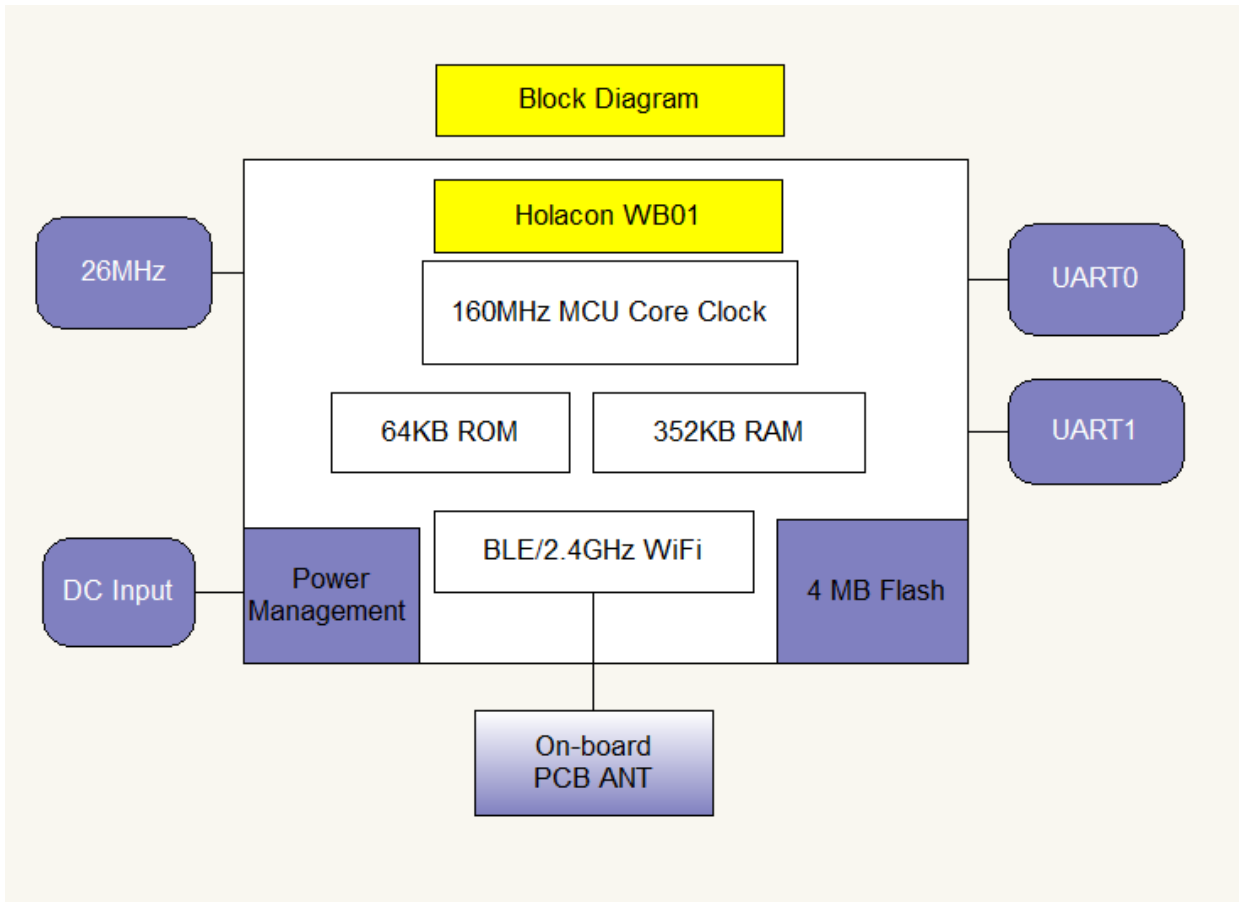
The block diagram of the module is as follows:

图 1.1 MWB-S-WB01 Module diagram Block

2、Top view

Positive figure:

On the back of the figure：

3、Radio frequency characteristics

3.1 Radio frequency basically characteristics

Frequency range	WIFI:2.4GHz~2.485GHz Bluetooth：2402~2480MHz
Wireless standard	WIFI:802.11b/g/n，Bluetooth：BLE 5.1
Antenna	PCB 天线
Tx Rate	11b: 1Mbps,2Mbps,5.5Mbps,11Mbps 11g:6Mbps,9Mbps,12Mbps,18Mbps,24Mbps,36Mbps,48Mbps,54Mbps 11n: MCS0,MCS1,MCS2,MCS3,MCS4,MCS5,MCS5,MCS6,MCS7 Bluetooth: 1Mbps，2Mbps
Protocol Support	WIFI:IPV4,TCP/UDP/HTTP/MQTT/Websocket/ARP/ICMP Bluetooth：GATT/ATT/SMP/L2CAP/GAP/HCI/LL
Security Support	Encryption Standard： WEP/WPA/WPA2/WPA3 Encryption algorithm： WEP64/WEP128/TKIP/AES

3.2 RF Tx Power characteristics

Rate	Min.	Typ.	Max.	The Unit
1Mbps	15	17	19	dBm
11Mbps	15	17	19	dBm
54Mbps	12	14	16	dBm
HT20-MCS7	11	13	15	dBm
Bluetooth 1Mbps	4	6	8	dBm

Bluetooth 2Mbps	4	6	8	dBm
Fre Err	-10	0	10	ppm

3.3 RF Rx Sensitivity characteristics

Rate	Min.	Typ.	Max.	The Unit
1Mbps	-84	-	-97	dBm
11Mbps	-78	-	-90	dBm
54Mbps	-65	-	-75	dBm
HT20-MCS7	-64	-	-71	dBm
Bluetooth 1Mbps	-70	-	-96	dBm
Bluetooth 2Mbps	-70	-	-96	dBm

3.4 Antenna characteristics

The passive performance of the antenna of the Wi-Fi & Bluetooth module should meet the following requirements:

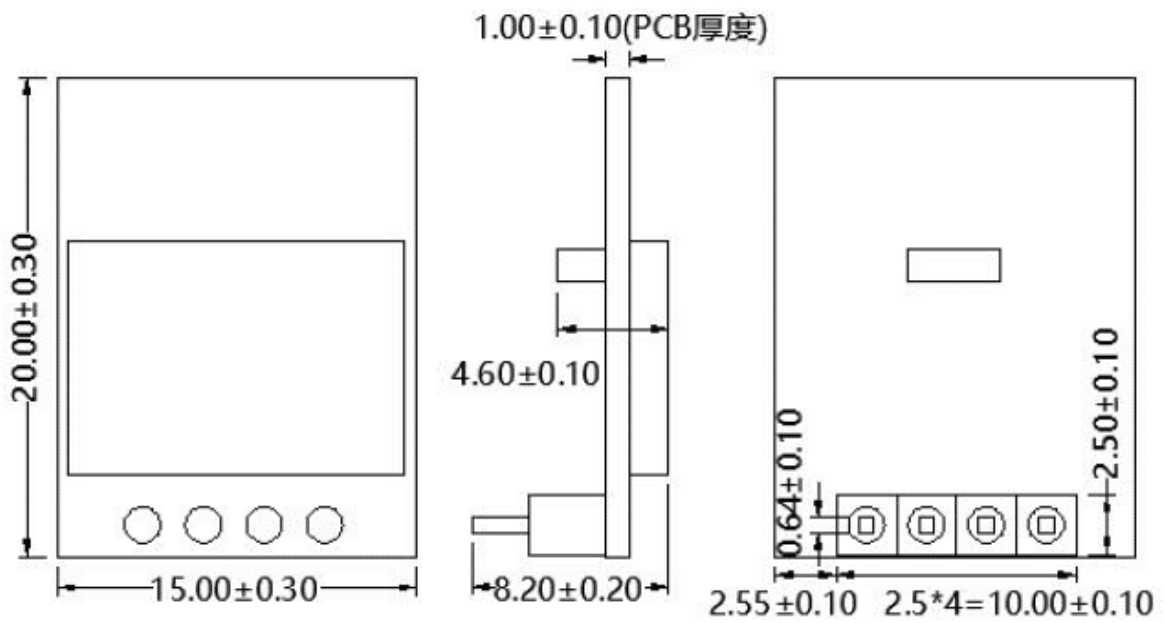| Parameter	In 2.4g frequency band：2.4GHz~2.485GHz
S11	<-10dB
The efficiency of ANT	>40%

➢ Antenna Drawing :
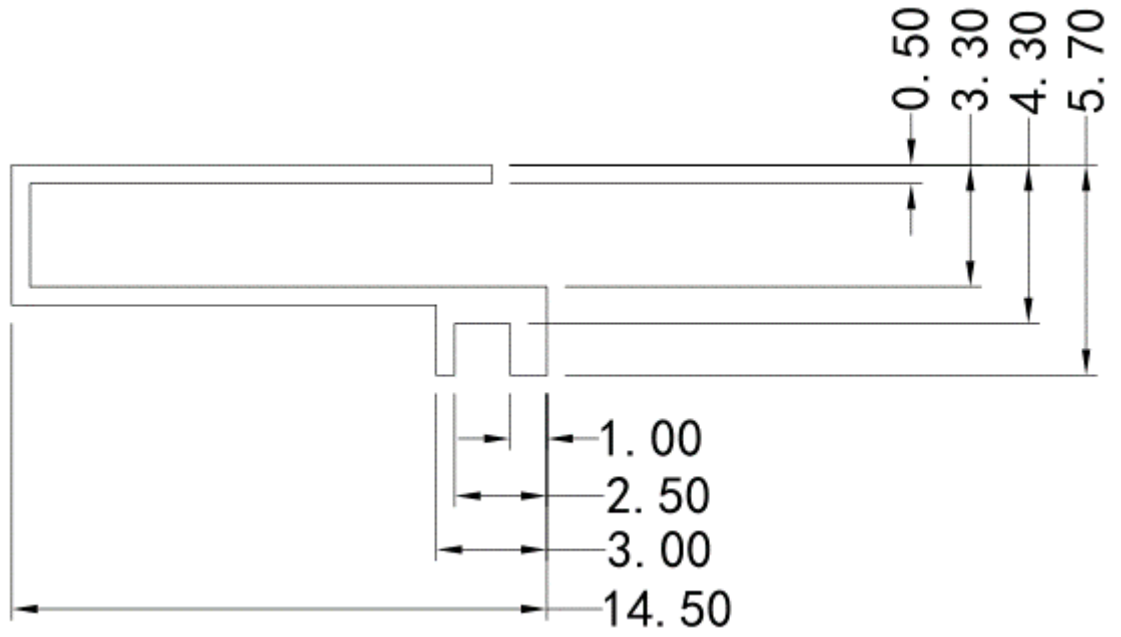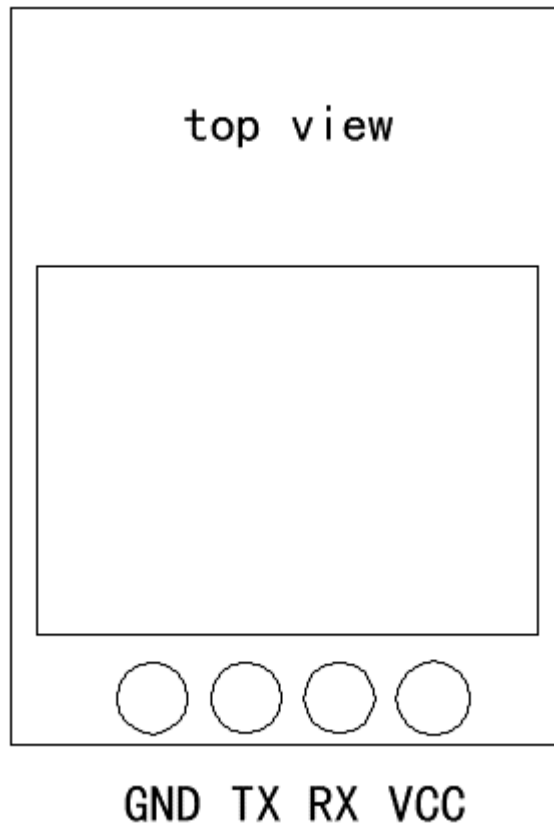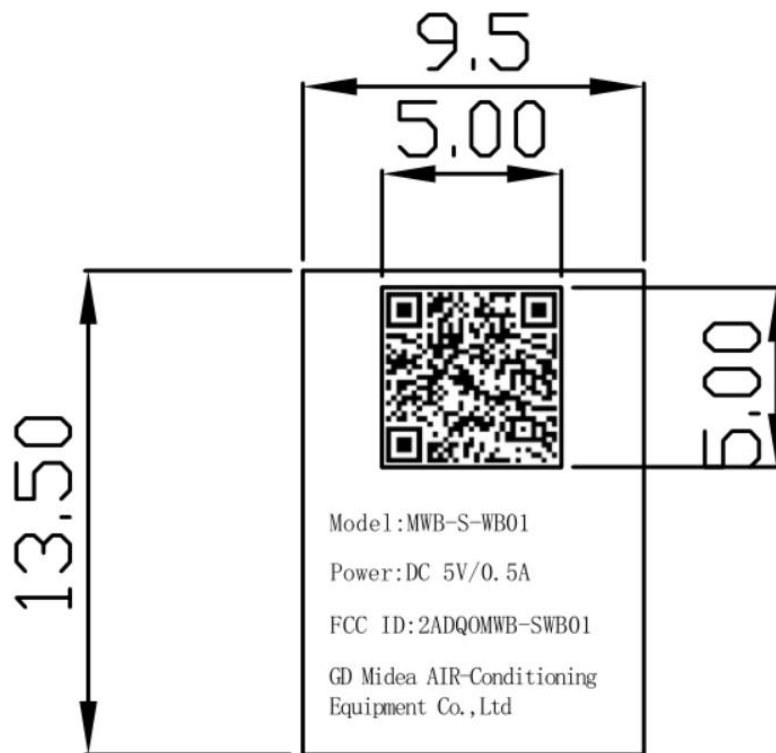
4、Product structure digram

4.1 PCB size

1.00±0.10(PCB厚度)

➢ Plate thickness: 1.0 ㎜

➢   Module thickness (with shield): 15 * 20 * 4.6 mm

➢   Tolerance: ± 0.2mm

➢   Material: FR-4

4.2 Line drawing

SN.	Tag	Wi-Fi module end pin description
1	VCC	VCC power supply
2	RX	RX module receives
3	TX	TX module transimit
4	GND symbol	GND

4.3 Label requirement

Label printing requirements::

Label size is 13.5*9.5mm，label material is white, Song typeface; The dimension of the QR code is 5*5mm。

QR code content:

The content of the QR code is shown in the following table.

QR code content		
Field	Characters in length	Note
ID	10	After get ID and print
MAC address	12	
Production information S/N	26	If the content is less than 26 characters, fill in the front with the character "X" Factory code (2 a) + job number (8) + production date (6th) + small software version number (6) + enterprise code (4 digits) : "02BPF4FM041706080000010000"
Software version number	12	050509011835
The power supply	4	Fixed content as "5.0V"
current	5	500mA

Note:

Starting code (4 bits) : MAC:

MAC address (12 bits) : XXXXXXXXXX

Production information (bit 26) : 01 XXXXXXXX 160919 000109 0000

      Position 1 and 2: represent the manufacturing plant

      Position 3-10: represents the job number of the manufacturing plant

      Bit 11~16: production date, such as September 19, 2016 marked 160919

      Bits 17 to 22: software minor version Numbers

      No. 23-26: enterprise code, midea's internal business department is "0000"
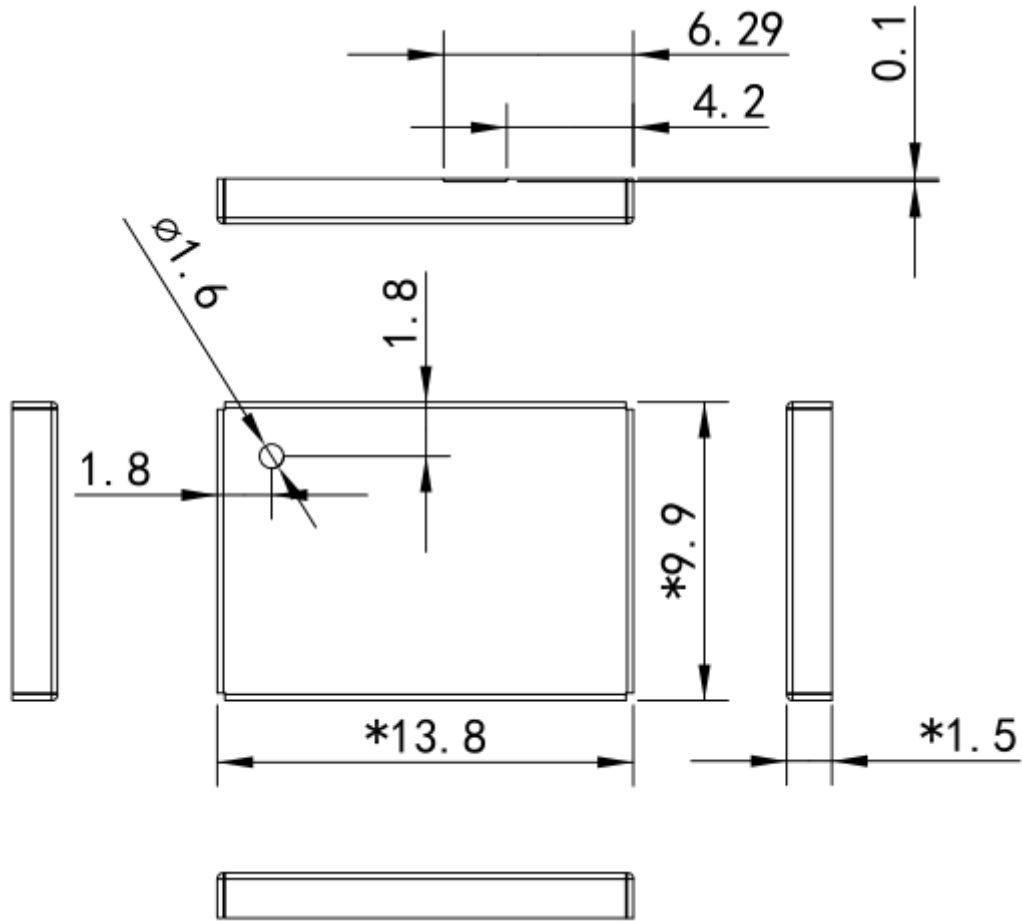
Non-american enterprise code according to the software code.

Software version (12 bits)：XXXXXXXXXXXX

Power supply (4-bit) : working voltage of the module

Current (5 bits) : 500mA
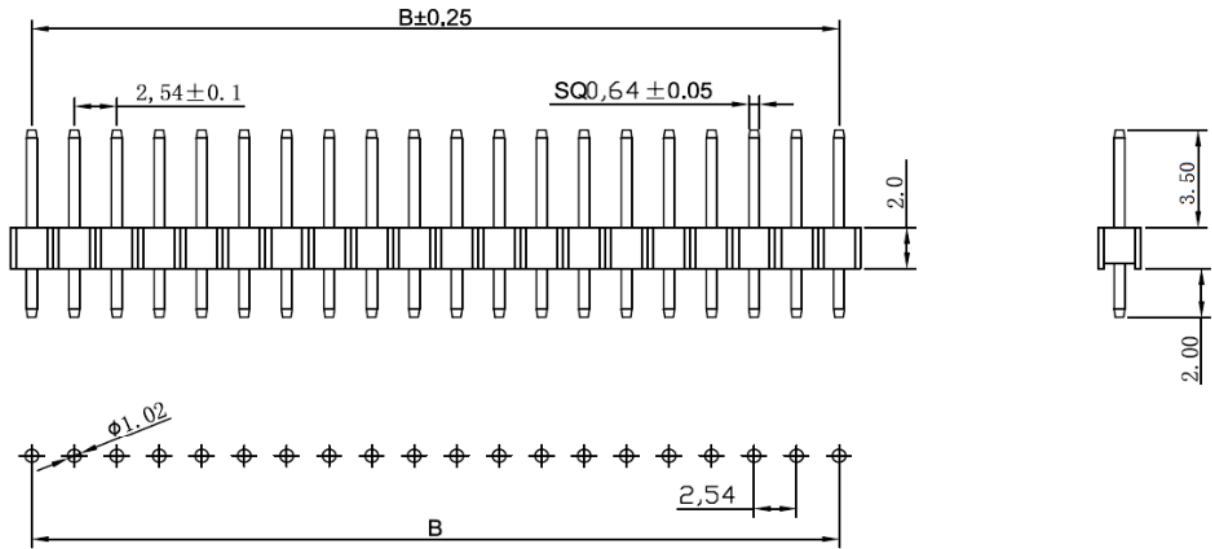
4.4 Size of shield cover

Technical requirements:

➢ Material: Cupronickel c7701, t = 0.2mm, H = 1.5mm

➢ The surface shall be clean without burr, flash and other defects

➢ The dimension tolerance without indication is ± 0.1mm

➢ The unmarked angle is r0.2mm, and the unmarked bending angle is below r0.2mm

4.5 Pin drawing

Technical requirements:

➢ Material: Cupronickel c7701, t = 0.2mm, H = 1.5mm

➢ The surface shall be clean without burr, flash and other defects

➢ The dimension tolerance without indication is ± 0.1mm

➢ The unmarked angle is r0.2mm, and the unmarked bending angle is below r0.2mm

➢ Rated current: 3A

➢ Withstand voltage: AC 500V

➢ Operating temperature: - 40 ℃ ~ + 105 ℃

➢ Insulation material: Black PA6T

➢ Material: Brass

➢ Electroplating: g / F plated over nicke

5、Power consumption description

The state	The avg current（mA）	The Min. current（mA）	The Max. current（mA）	The avg power consumption（mW）
Idle	21.06	17.76	86.98	69.21
AP	44.43	36.81	224.26	222.15
Station Idle	40.28	4.96	239.01	201.43
Station date transmission	41.31	7.04	238.72	206.57
Station AP offline	42.47	7.06	237.68	212.37

6、Electrical parameters

6.1 Absolutly electrical parameters

Power supply parameters:

Parameters	Description	Min.	Max.	The unit
Ts	Storage temperature	-40	85	℃
VCC	Power supply	3.0	5.5	V
ESD（HM）	TAMB-25℃	-2	2	KV
ESD（MM）	TAMB-25℃	-0.75	0.75	KV

6.2 Working conditions

Parameter	Description	Min.	Typ.	Max.	The unit

Ta	Working temperature	−40	−	85	℃
VCC	working power supply	3.0	5/3.3	5.5	V
VIL	Low Level Input Voltage	−0.3	−	0.3	V
VIH	High Level Input Voltage	4.5	5	5.5	V
VOH	High Level Output Voltage	4.75	5	5.25	V
VOL	Low Level Output Voltage	0	−	0.4	V

7、Compliance with standards and certification

Wi-Fi Bluetooth module must comply with ROHS environmental assessment certification。

8、Precautions for use

The Wi-Fi & Bluetooth module exposed in the air (the core board inside the module or the whole composed of the core board and the base board) shall at least meet the service environmental conditions of general consumer electronic products, including but not limited to:

➢ Working temperature: − 20 ~ 85 ℃
➢ Storage temperature: − 40 ~ 85 ℃
➢ Working humidity: 0~95 %RH
➢ Storage humidity: 0~98 %RH
➢ Tolerance − 20 / + 85 ℃, every 2h a cycle, thermal shock, under the impact of the cycle of at least 20 don't appear dysfunction or performance degradation, no significant tin crack phenomenon.
➢ When working for a long time, the temperature rise of the circuit components should meet the requirements of their own specifications.
➢ To simulate the transportation process and home application scenarios, the module should be able to withstand a certain degree of mechanical impact and drop.

Through certain protective means, Wi-Fi & Bluetooth module can have higher environmental adaptability. When designing a Wi-Fi & Bluetooth module, the performance, size and process margin required for the implementation of protection measures should be reserved

Note/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.

—This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

MODIFICATION: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the device.

FCC label statement

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 my cause undesired operation.

-To satisfy FCC exterior labeling requirements, the following text must be placed on the exterior of the end product. "Contains Transmitter module FCC ID: 2ADQOMWB-SWB01"