



# 产品规格书

## Specification

产品名称: Wi-Fi 模组

Production name: Wi-Fi Internet of things module

型号/Model No: MT7682

系列号/Serial No.: SM011A

版本/Version: V1.0





## 产品规格 SPECIFICATIONS

Serial No.:

SM011A

### 1. DESCRIPTION

SM011A 是支持 802.11b/g/n 的 Wi-Fi 模组, 提供了一种将用户的物理设备连接到 Wi-Fi 无线网络上, 可以通过 UART、SPI、I2C 等数据通信接口与其他设备进行数据通信。模组集成了射频收发单元、MAC、基带处理、所有的 Wi-Fi 协议和配置信息以及网络协议栈。模组的 MCU 拥有最高 192MHz 的主频, 并集成 384KB 的 SRAM 和 32KB 的启动 ROM, 以及 8Mbits 的 Flash。采用表面贴片封装。

SM011A is the Wi-Fi module which supported 802.11b/g/n standard, and this Wi-Fi module provides the connection between device and Wi-Fi wireless network. It can use UART, SPI and I2C interface to communicate with other device.

Wi-Fi integrates the RF, MAC, base-band and all Wi-Fi protocol, and configuration information, and network protocol.

Wi-Fi module's cpu frequency is 192MHz, also it contains 384KB SRAM and 32KB ROM, and it has 8Mbits Flash.

### 2. FEATURES

- 支持 IEEE802.11b/g/n 无线标准, Wi-Fi@2.4GHz
- Support IEEE802.11b/g/n wireless protocol, 2.4GHz.
- 支持 WPS、WAP、WPA 及 WPA2 加密, WEP、TKIP 和 AES 硬件加密
- Support WPS, WAP, WPA and WPA2, encryption, TKIP and AES hardware encryption
- 支持 UART、PWM、ADC、GPIO、I2C、I2S、SPI 接口
- Support UART、PWM、ADC、GPIO、I2C、I2S、SPI interface.
- 支持无线和远程升级固件
- Support wireless and OTA
- 包含用于校准 WiFi 性能的内部 OTP 存储器
- Contain calibrate Wi-Fi function in intel OTP memory.
- 支持板载 PCB 天线或外置天线接口 (I-PEX)
- Support ANT on Board or external ANT interface(I-PEX)
- 3.3V 单电源供电
- 3.3V supply power
- 尺寸 37.25mm\*20.5mm\*2.5mm
- Dimension 37.25mm\*20.5mm\*2.5mm
- 符合 RoHS 标准
- Meet RoHS standard

### 3. Electrical characteristics

#### 1) ABSOLUTE MAXIMUM RATINGS

Symbol	Description	Min	Max	Unit
VDD33	3.3V Supply Voltage	-0.3	3.63	V
Ts	Storage temperature	-40	125	°C
TA	Ambient operating temperature	-30	85	°C
VESD	HBM(human body model)		2000	V

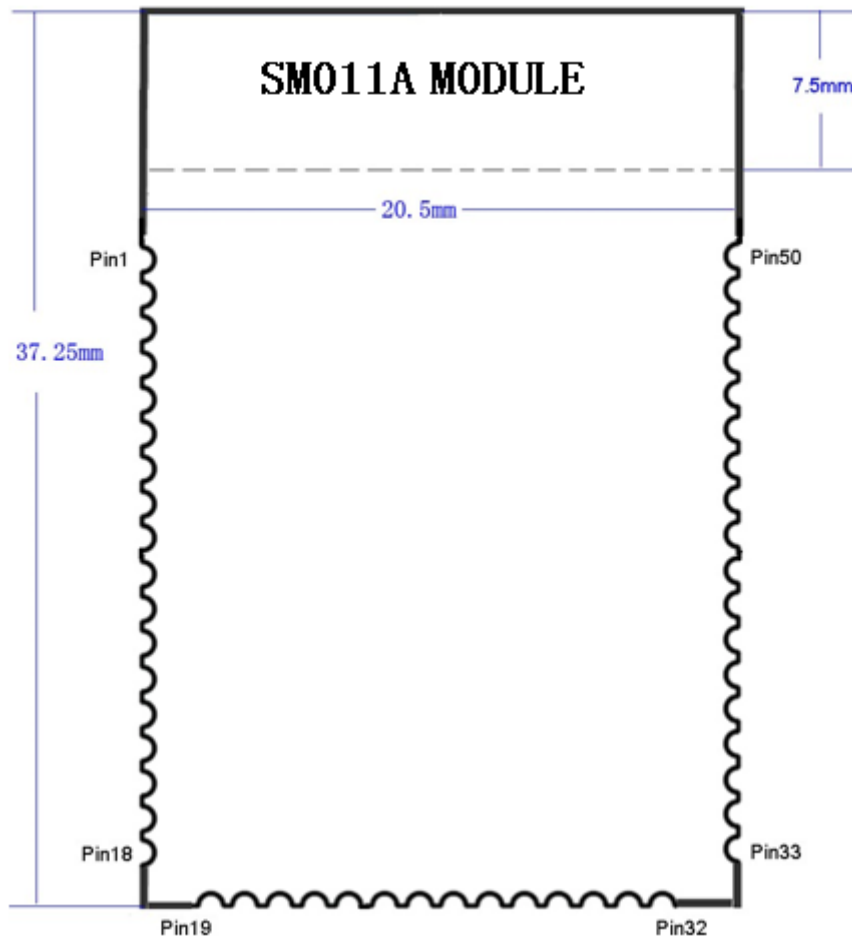
## 2) DC CHARACTERISTICS (@ 25 ° C, VDD = 3.3V )

Specifications		Min	Max	Unit
V <sub>IL</sub>	Input Low Voltage	-0.28	0.8	V
V <sub>IH</sub>	Input High Voltage	2	3.63	V
V <sub>OL</sub>	Output Low Voltage	-0.28	0.4	V
V <sub>OH</sub>	Output High Voltage	2.4	VDD+0.33	V
R <sub>FU</sub>	Input Pull-Up Resistance	40	190	K Ω
R <sub>FD</sub>	Input Pull-Down Resistance	40	190	K Ω

## 3) WLAN CHARACTERISTICS (@25 ° C, VDD = 3.3V )

频率范围 frequency rang	2.412 GHz - 2.484 GHz
无线标准 wireless standard	IEEE 802.11 b/g/n
发射功率 emission power	802.11b:16dBm +/-2dBm 802.11g:14dBm +/-2dBm 802.11n:14dBm +/-2dBm
接收灵敏度 receive sensitivity	802.11b<-82dBm 802.11g<-74dBm 802.11n<-64dBm
协议栈支持 protocol stack support	IPv4, TCP/UDP/FTP/HTTP/HTTPS/TLS/mDNS
数据速率 data rate	11M (802.11b,) 54M (802.11g) , MCS7 (802.11n)
安全性支持 satey support	加密标准: WEP/WEPA/WPA2 Encryption standard: WEP/WEPA/WPA2 加密算法: WEP64/WEP128/TKIP/AES Encryption algorithm: WEP64/WEP128/TKIP/AES
天线类型 ANT type	板载: PCB 天线 (默认) ANT on board 外接: I-PEX 接口 (可选) External: I-PEX interface (optional)

## 4. PIN ASSIGNMENTS



(Dimension : mm)

Module foot print: MD\_SM011A-  
20.5X37.25X4.0

Pin	Net	Signal	Type	Description
1	GND	GND	POWER	
2	NC	NC		
3	NC	NC		
4	NC	NC		
5	NC	NC		
6	NC	NC		
7	PMU_EN_WF	PMU_EN_WF	I	External PMU enable
8	UART1_TX	GPI03	DIO	General purpose input/output, Default pull-down
9	UART1_RX	GPI02	DIO	General purpose input/output, Default pull-down
10	GND	GND	POWER	
11	NC	NC		
12	NC	NC		
13	NC	NC		
14	NC	NC		
15	NC	NC		



16	NC	NC		
17	GPI011	GPI011	DIO	General purpose input/output, Default pull-down
18	NC	NC		
19	GND	GND	POWER	
20	NC	NC		
21	NC	NC		
22	NC	NC		
23	NC	NC		
24	NC	NC		
25	NC	NC		
26	GND	GND	POWER	
27	NC	NC		
28	GPI00	GPI00	DIO	General purpose input/output, Default pull-down
29	GPI01	GPI01	DIO	General purpose input/output, Default pull-down
30	NC	NC		
31	RTC_EINT	RTC_EINT	DIO	Dedicate EINT input in RTC
32	GND	GND	POWER	
33	WiFi_3V3	3V3	POWER	Module power
34				
35	GND	GND	POWER	
36	NC	NC		
37	NC	NC		
38	CHIP_EN	CHIP_EN	AI	Chip enable
39	UART0_RX	GPI021	DIO	General purpose input/output, Default pull-down
40	UART0_TX	GPI022	DIO	General purpose input/output, Default pull-down
41	NC	NC		
42	GPI012	GPI012	DIO	General purpose input/output, Default pull-down
43	GND	GND	POWER	
44	NC	NC		
45	NC	NC		
46	NC	NC		
47	NC	NC		
48	NC	NC		
49	NC	NC		
50	GND	GND	POWER	

注:

### 1) Pin Types

Pin Type	Description
I/O	Digital input/output
I	Digital input



0	Digital output
AI	Analog input
A0	Analog output

### 1) GPIO12(Boot)

主要用于量产烧录程序用，默认为 0；当 GPIO12=0 时,code 由UART 写入SRAM；当 GPIO12=1 时,WiFi 将进入正常工作模式；

The function is use for programme, the default setting is 0, when GPIO12=0, programme SRAM, when GPIO12 = 1, WiFi Enter into normal mode.

### 2) GPIO17

GPIO17 用于晶振频率选择，本模组使用 40MHz 晶振，GPIO17=1；

GPIO12 is used for oscillator, this Wi-Fi module is 40MHz.

### 3) GPIO

所有 IO 口均可设置成上拉、下拉或是高阻状态;IO 口供电为 3.3V 时,可提供 16mA 的灌\拉电流;

All GPIOs are configured with pull-up, pull-down and high-resistant, When the voltage is 3.3V, GPIO can supply 16mA current

## 5. 内置天线

模组支持选择 PCB 板载天线，在 2.4G~2.5G 频率范围内。当

选择 PCB 板载天线时,模组在放置时需注意以下几点:

Wi-Fi module support ANT on board, the frequency is between

2.4G and 2.5G, the below item needs to pay attention.

1) PCB 底板与模组天线对应区域不能放置元器件以及铺地，最好可以将该区域的 PCB 镂空；

The bottom of PCB and ANT can't lay the components, it would empty in this area.

2) 天线需要远离金属，至少距离周围较高元器件 10mm 以上；

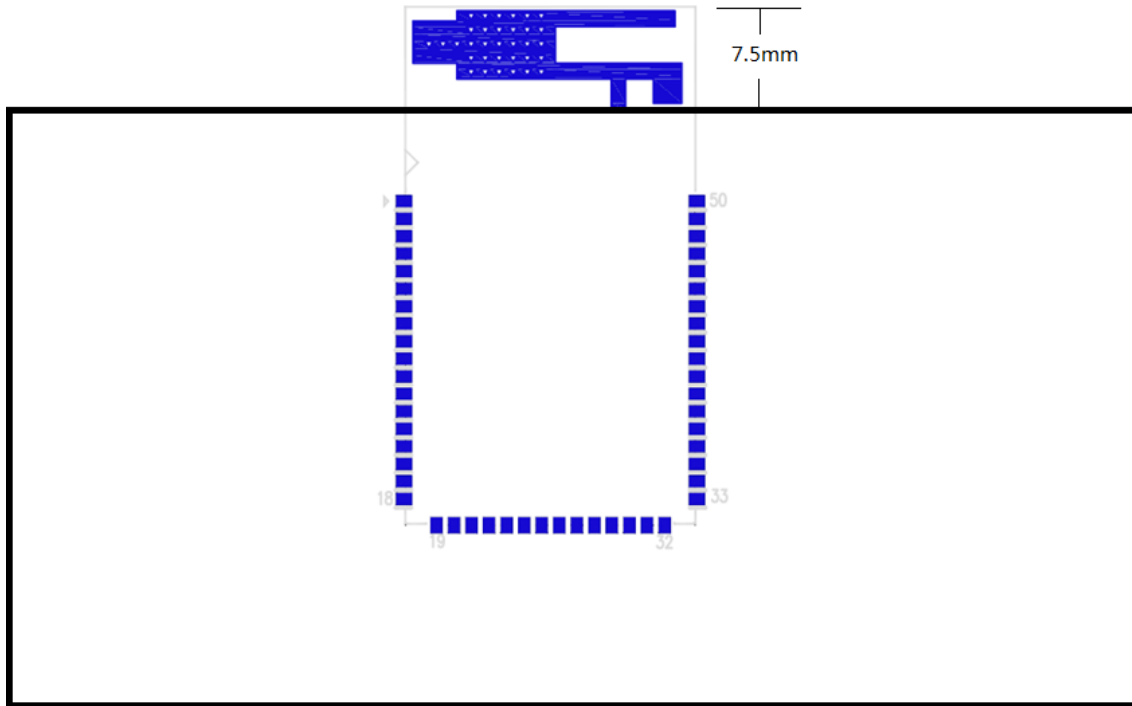
It would need to keep away the metal, and it may need to keep away more than 10mm from the high components.

3) 建议在 PCB 板布局时，尽量将 Wi-Fi 模组的天线靠近底板边缘或突出底板边缘,以保证天线良好的性能;

Strong recommend that the ANT of Wi-Fi can stand out the main PCB, to ensure the better performance.

4) 天线部分不能被金属外壳遮挡；

ANT area can't shield by metals.



## 6. 外置天线

模组也可以选择外置天线形式，外置天线通过 I-PEX 接口与模组相连，外置天线性能参数要求：

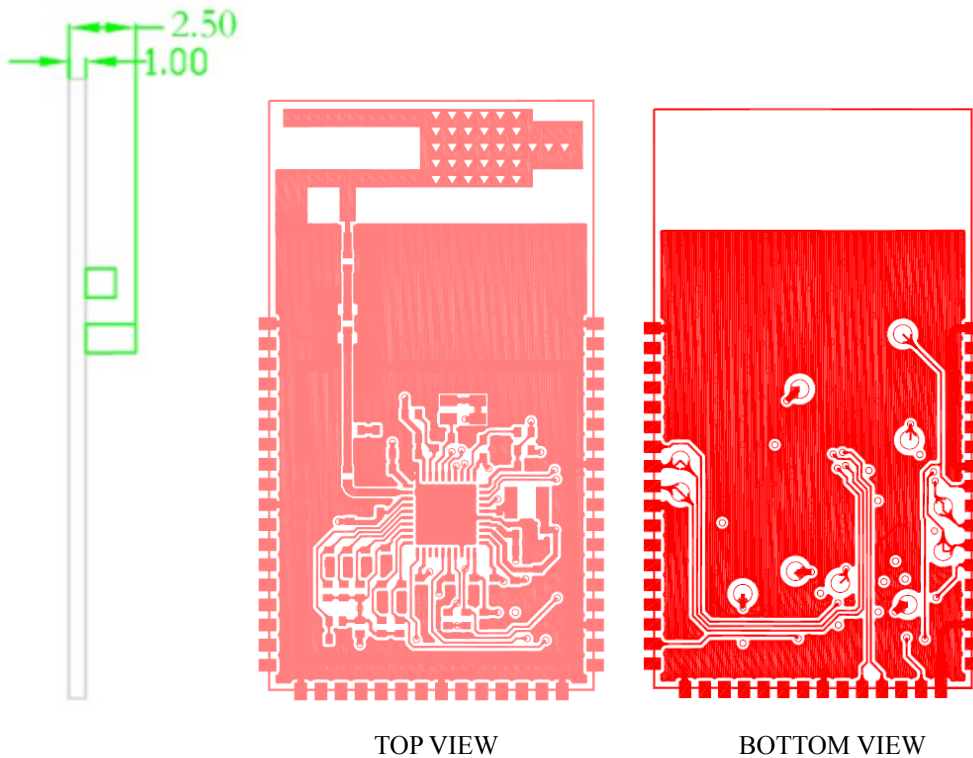
项目 item	参数 parameter
频率范围 frequency range	2.4~2.5GHz
阻抗 resistant	50 ohm
VSWR	2 (MAX)
回波损耗 loss	-10dB (MAX)
连接类型 interface type	I-PEX



## 7. PCB Layout Package

外形尺寸：37.25mm\*20.5mm\*2.5mm

Demension: 37.25mm\*20.5mm\*2.5mm



## 8. Warnings

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: 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 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 may cause undesired operation.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

Any company of the host device which install this modular with modular approval should perform the test of radiated & conducted emission and spurious emission, etc. according to FCC part 15C : 15.247 and 15.209 & 15.207 ,15B Class B requirement, Only if the test result comply with FCC part 15C : 15.247 and 15.209 & 15.207 ,15B Class B requirement, then the host can be sold legally.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.  
(2) This device must accept any interference, including interference that may cause undesired operation of the device.  
Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (s) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes :  
(1) Cet appareil ne doit pas causer d'interférences.  
(2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.

#### FCC Radiation Exposure Statement

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device. This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2AJNO-MT7682 Or Contains FCC ID: 2AJNO-MT7682"

#### IC Radiation Exposure Statement

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device. This modular complies with IC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body. Cette modulaire doit être installé et utilisé à une distance minimum de 20 cm entre le radiateur et le corps de l'utilisateur.

If the IC number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains IC: 23812-MT7682"

#### **When the module is installed inside another device, the user manual of the host must contain below warning statements;**

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: 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



# 漳州众环科技股份有限公司

Zhangzhou iHastek Inc.

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 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.
  - (2) This device must accept any interference received, including interference that may cause undesired operation
- This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
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Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes :

- (1) Cet appareil ne doit pas causer d'interférences.
- (2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.