

WF-M601-UWS3 WiFi Module

Features:

- **Supported WLAN Standards**
 - IEEE Std. 802.11b
 - IEEE Std. 802.11g
 - IEEE Std. 802.11n
- **Chip Solution**
 - MTK MT7601UN/B
- **Size**
 - 33.0mm*40.0mm*6.0mm



Model Overview:

Module Name	Installation	Supported Standards	Data Rate (max)	Band	Antenna Interface	Note
WF-M601-UWS3	Plugin	IEEE 802.11b/g/n	150Mbps	2.4 GHz	Integral	5V power supply

Sichuan AI-Link Technology Co.,Ltd

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Feedback of customer's Confirmation**We accept the specification after Confirmed**

Customer name	Customer signature	Confirmation Date

Please feed back this paper and first paper after your signature by the address,thanks!

ADD: Anzhou,Industrial park,Mianyang,Sichuan

Factory: Sichuan AI-Link Technology Co.,Ltd.

Approved	Checked	Designed	Product	WiFi Module
Bai Lang	Ding Shuang Peng	Feng Jie	Model	WF-M601-UWS3
			Date	2018-10-30

Record of Modification

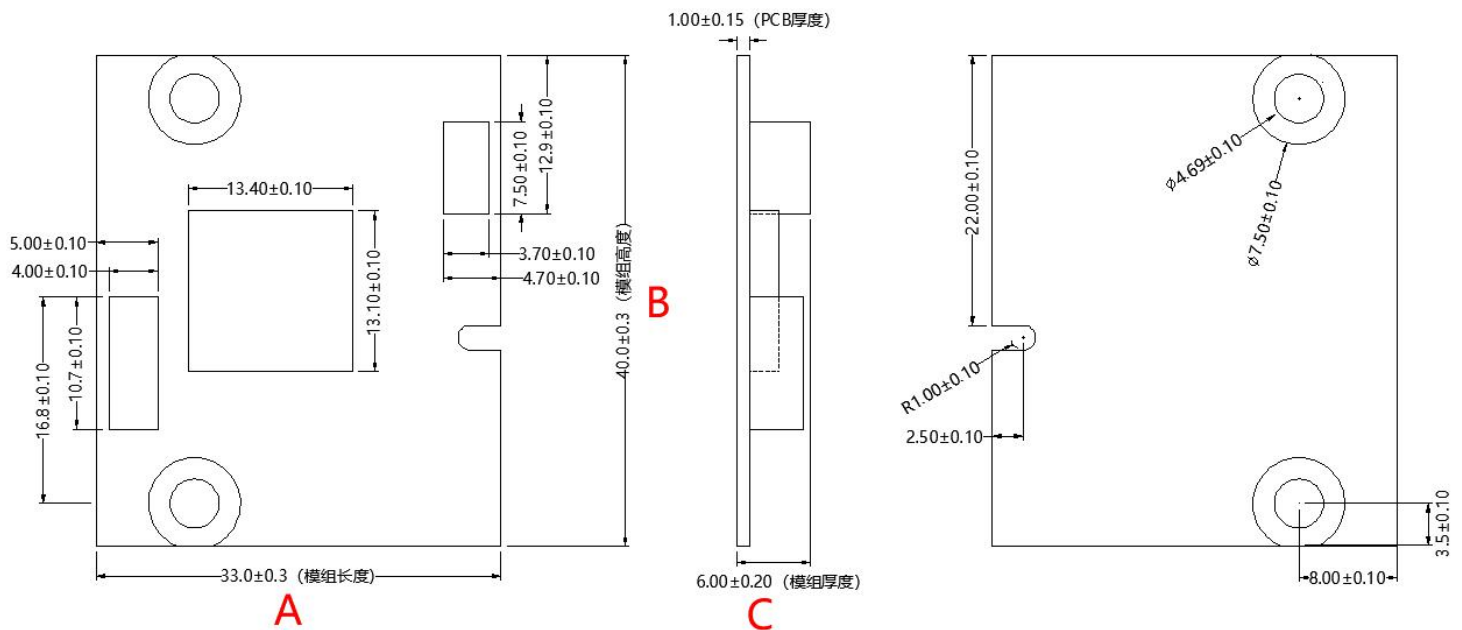
No	Date of modification	Main content of modification	Reason of modification	Serial number of modification	Confirm
V1.0	20181030	Initial Release			Feng Jie

1. Brief description:

WIFI MODULE WF-M601-UWS3 is based on MTK MT7601UN/B complied with IEEE 802.11b/g/n standard from 2.4GHz-2.5GHz.Supported for 150Mbps high speed wireless network connection.

2. Block diagram:(N/A)

3. Package outline and Mounting:(units:mm)



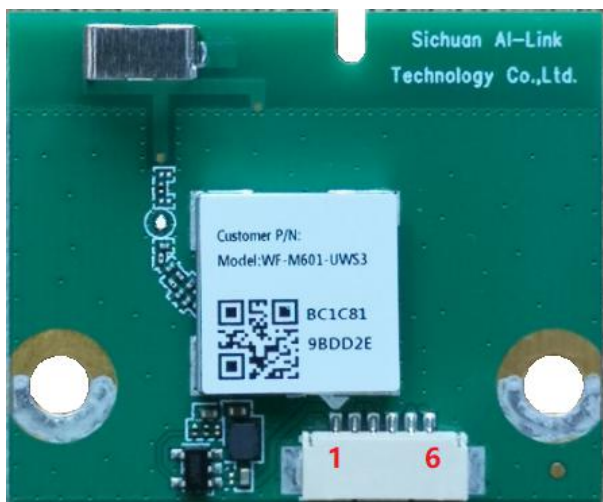
NOTE:General tolerance $\pm 0.2\text{mm}$ unless otherwise stated

4. Pin Definition:

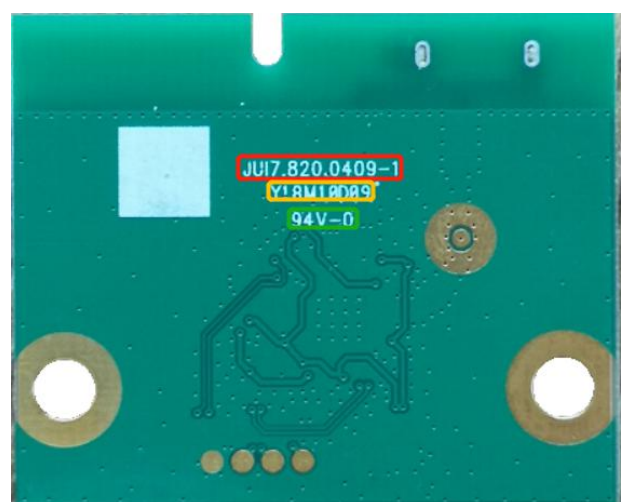
Pin	Symbol	Description
1	VCC-5V	+5V DC Power Supply Input
2	UDM	USB Data DM
3	UDP	USB Data DP
4	GND	Connected to Ground
5	WLAN_DE V_WAKE	Wake Up
6	RST	Reset the WLAN

Pin Definition

5. Product Pictures



TOP VIEW



BOTTOM VIEW

Silk Introduction:

- 1.The characters is the version of PCB in the red box;
- 2.The characters is PCB flame retardant in the green box;
- 3.The characters is the manufacture date of PCB in the yellow box;

6. Key Materials

Item	Category	MPN	Description	MFR	Note
1	IC	MT7601UN/B	40-QFN	MTK	
2	PCB	JUI7.820.0409-1	FR-4,2LAY	Sunlord IQPCB SHPCB	
3	Crystal Oscillator	E3SB40E00001BE	40M	JWT Hosonic ACX	

7. General Requirements:

No.	Feature	Description
7-1	Operation Voltage	3.3V+/-0.3
7-2	Current Consumption	210mA @TX HT40 MCS7 15dBm 242mA @TX CCK 11M 19dBm
7-3	Operation Temperature	0°C to +60°C
7-4	Antenna Type	Integral antenna
7-5	USB	High Speed USB 2.0 Interface
7-6	Storage Temperature	-40°C to +125°C

8. RF Characteristics:**8-1 IEEE 802.11b Section:**

Items	Contents				
Specification	IEEE802.11b				
Mode	CCK				
Channel	CH1 to CH13				
Data rate	1, 2, 5.5, 11Mbps				
	Min.	Typ.	Max.	Unit	Remark
TX Characteristics					
1. Power Levels(Calibrated)					
1) EIRP Power	15.5	17	18.5	dBm	
2. Spectrum Mask @ target power					
1) fc +/-11MHz to +/-22MHz	-	-	-30	dBr	
2) fc > +/-22MHz	-	-	-50	dBr	
3 Constellation Error(EVM)@ target power					
1) 1Mbps	-	-	-10	dB	
2) 2Mbps	-	-	-10	dB	
3) 5.5Mbps	-	-	-10	dB	
4) 11Mbps	-	-	-10	dB	
4. Frequency Error	-10	-5	10	ppm	
RX Characteristics					
5 Minimum Input Level Sensitivity(each chain)					
1) 1Mbps (FER $\leq$ 8%)	-		-83	dBm	
2) 2Mbps (FER $\leq$ 8%)	-		-80	dBm	
3) 5.5Mbps (FER $\leq$ 8%)	-		-79	dBm	
4) 11Mbps (FER $\leq$ 8%)	-		-76	dBm	
6 Maximum Input Level (FER $\leq$ 8%)	-10	-	-	dBm	

8-2 IEEE 802.11g Section:

Items	Contents				
Specification	IEEE802.11g				
Mode	OFDM				
Channel	CH1 to CH13				
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps				
	Min.	Typ.	Max.	Unit	Remark
TX Characteristics					
1. Power Levels					
1) EIRP Power	13.5	15	16.5	dBm	
2. Spectrum Mask @ target power					
1) at fc +/-11MHz	-	-	-20	dBr	
2) at fc +/-20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-40	dBr	
3 Constellation Error(EVM)@ target power					
1) 6Mbps	-	-	-5	dB	
2) 9Mbps	-	-	-8	dB	
3) 12Mbps	-	-	-10	dB	
4) 18Mbps	-	-	-13	dB	
5) 24Mbps	-	-	-16	dB	
6) 36Mbps	-	-	-19	dB	
7) 48Mbps	-	-	-22	dB	
8) 54Mbps	-	-	-25	dB	
4 Frequency Error	-10	-5	10	ppm	
RX Characteristics					
	Min.	Typ.	Max.	Unit	
5 Minimum Input Level Sensitivity(each chain)					
1) 6Mbps (PER $\leq$ 10%)	-		-85	dBm	
2) 9Mbps (PER $\leq$ 10%)	-		-84	dBm	
3) 12Mbps (PER $\leq$ 10%)	-		-82	dBm	
4) 18Mbps (PER $\leq$ 10%)	-		-80	dBm	
5) 24Mbps (PER $\leq$ 10%)	-		-77	dBm	
6) 36Mbps (PER $\leq$ 10%)	-		-73	dBm	
7) 48Mbps (PER $\leq$ 10%)	-		-69	dBm	
8) 54Mbps (PER $\leq$ 10%)	-		-65	dBm	
6 Maximum Input Level (PER $\leq$ 10%)	-20	-	-	dBm	

8-3 IEEE 802.11n HT20 Section:

Items	Contents				
Specification	IEEE802.11n HT20 @ 2.4GHz				
Mode	OFDM				
Channel	CH1 to CH13				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15				
	Min.	Typ.	Max.	Unit	Remark
TX Characteristics	Min.	Typ.	Max.	Unit	
2. Power Levels					
1) EIRP Power	12.5	14	15.5	dBm	
3. Spectrum Mask @target power					
1) at fc +/-11MHz	-	-	-20	dBr	
2) at fc +/-20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-45	dBr	
4. Constellation Error(EVM)@ target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-		-28	dB	
5. Frequency Error	-10	-	10	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
6. Minimum Input Level Sensitivity(each chain)					
1) MCS0 (PER $\leq$ 10%)	-		-82	dBm	
2) MCS1 (PER $\leq$ 10%)	-		-79	dBm	
3) MCS2 (PER $\leq$ 10%)	-		-77	dBm	
4) MCS3 (PER $\leq$ 10%)	-		-74	dBm	
5) MCS4 (PER $\leq$ 10%)	-		-70	dBm	
6) MCS5 (PER $\leq$ 10%)	-		-66	dBm	
7) MCS6 (PER $\leq$ 10%)	-		-65	dBm	
8) MCS7 (PER $\leq$ 10%)	-		-64	dBm	
7. Maximum Input Level (PER $\leq$ 10%)	-20	-	-	dBm	

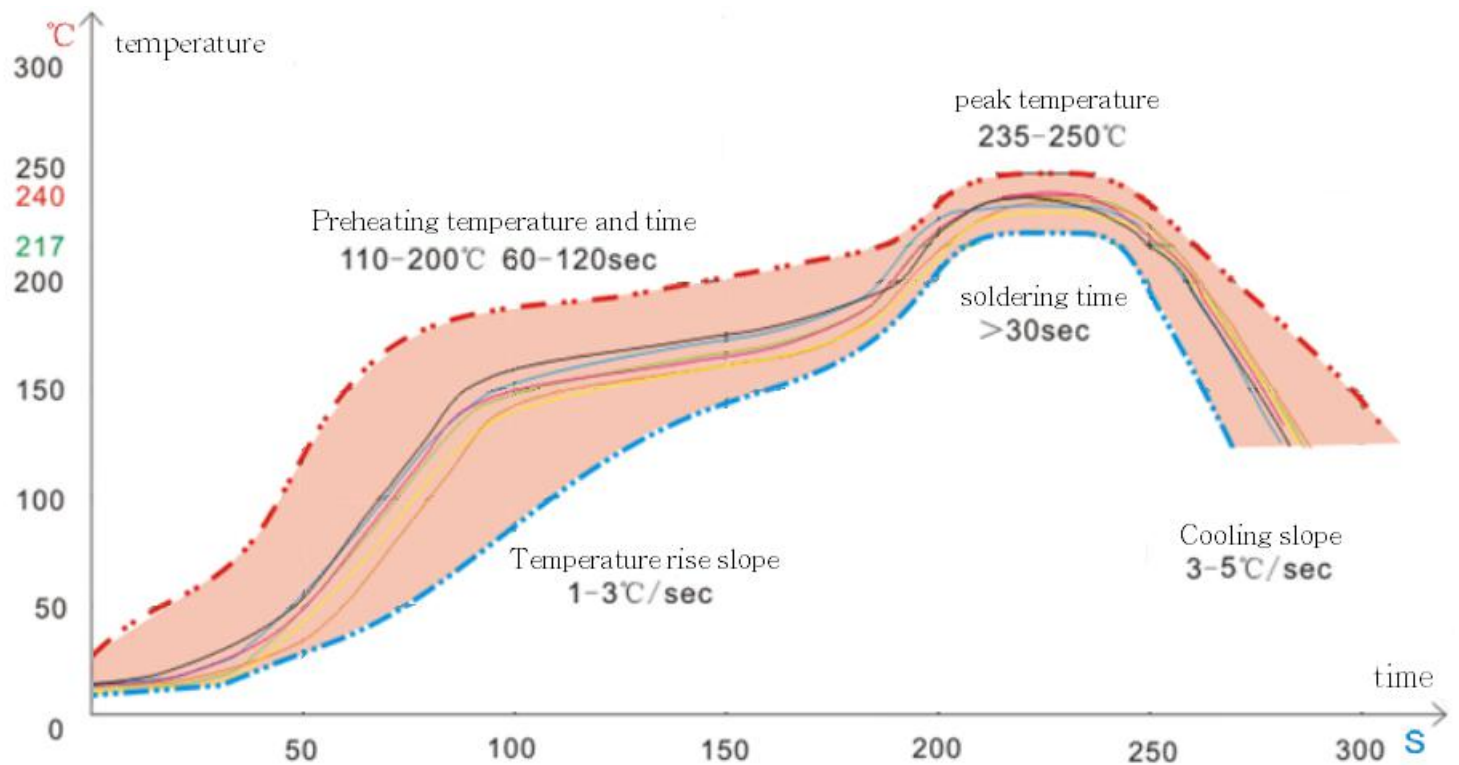
8-4 IEEE 802.11n HT40 Section:

Items	Contents				
Specification	IEEE802.11n HT40 @ 2.4GHz				
Mode	OFDM				
Channel	CH3 to CH11				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15				
	Min.	Typ.	Max.	Unit	Remark
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels (Calibrated)					
1) EIRP Power	12.5	14	15.5	dBm	
2. Spectrum Mask @target power					
1) at fc +/-22MHz	-	-	-20	dBr	
2) at fc +/-40MHz	-	-	-28	dBr	
3) at fc > +/-60MHz	-	-	-45	dBr	
3. Constellation Error(EVM)@target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-		-28	dB	
4. Frequency Error	-10	-5	10	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5. Minimum Input Level Sensitivity(each chain)					
1) MCS0 (PER $\leq$ 10%)			-79	dBm	
2) MCS1 (PER $\leq$ 10%)			-76	dBm	
3) MCS2 (PER $\leq$ 10%)			-74	dBm	
4) MCS3 (PER $\leq$ 10%)			-71	dBm	
5) MCS4 (PER $\leq$ 10%)			-67	dBm	
6) MCS5 (PER $\leq$ 10%)			-63	dBm	
7) MCS6 (PER $\leq$ 10%)			-62	dBm	
8) MCS7 (PER $\leq$ 10%)	-		-61	dBm	
6. Maximum Input Level(PER $\leq$ 10%)	-20	-	-	dBm	

9. Software Requirements

The driver supports the following operating systems: Linux, Microsoft Windows XP, Vista and Win7.
Mfg. software tool version is MT7601 USB QA V1.0.9.0 or later.

10. Refelow Standard Condition



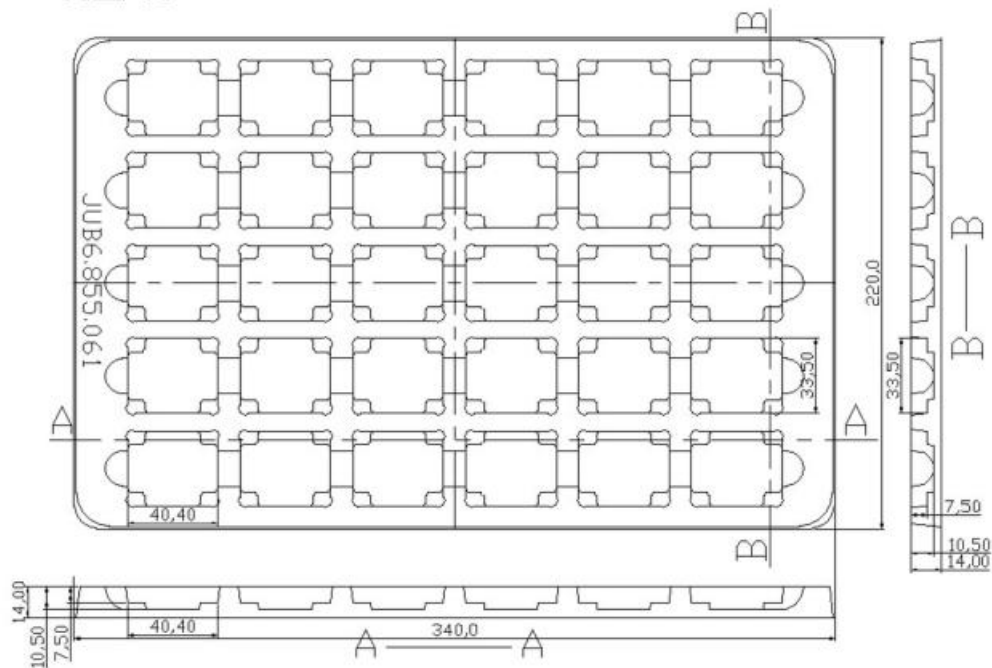
11. Mechanical, Environmental and Reliability Tests

Test Items		Test Conditions	Qty	Criteria Condition
4-1	Drop test	The packed samples within 100Kg can be tested Drop height: Face Side: 800/600/450mm Edge line: 600/450/350mm Drop time: 1 each Face and edge.	1xBox	After drop test, the outer box and inner box will not be broken by appearance visual inspection.
4-2	Vibration test	X-Y-Z direction, first Frequency changing from 10Hz to 30Hz to 10Hz ,amplitude 0.75mm, 5 times vibrations, then frequency Changing from 30Hz to 55 Hz to 30 Hz, amplitude 0.15mm, 5 time vibration.	3	After test, the Appearance, Power EVM and Frequency error shall be satisfied with the specification.
4-3	Impact test	Impact acceleration: 50m/sec ² ; Impact duration: 16ms; Impact times: 1000.	3	After test, the Appearance, Power EVM and Frequency error shall be satisfied with the specification.

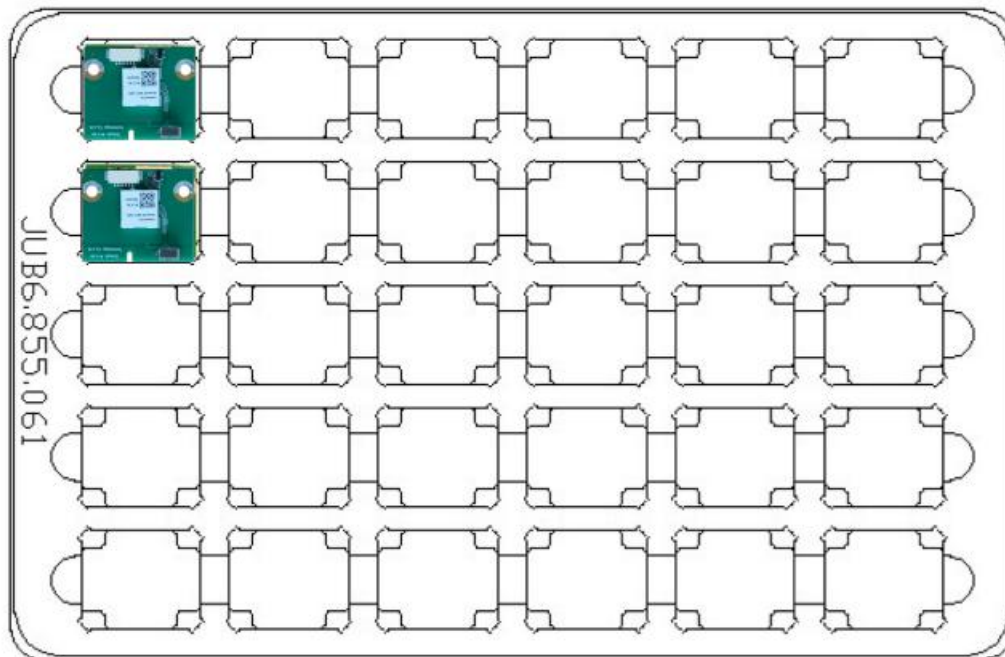
4-4	Soldering ability test	Soldering temperature: $235\pm 5^{\circ}\text{C}$ Soldering duration: $2\pm 0.5\text{S}$	3	1. After soldering, the soldered area must be covered by a smooth bright solder layer, some deficiencies such as a small amount of the pinhole, not wetting are allowed, but the deficiencies can not be in the same place; 2. At least 90% of soldered area shall be covered continuously by the soldering material.
4-5	Humidity test	Leave samples in $40\pm 3^{\circ}\text{C}$, 93% RH @ 96 hours	3	Leave samples in standard test condition for 2 hours then test, the Appearance, Power, EVM and Frequency error functional parameter shall be satisfied with the test specification.
4-6	High temperature load life test	Thermostat cabinet temperature: $55\pm 5^{\circ}\text{C}$ Applied voltage: 110% rated voltage Working duration: 200 hour (Supply Voltage Cycle 23h power on, 1h power off)	60	After test, leave samples in standard condition for 1 hour and test, Power, EVM and Frequency error shall be satisfied with the test specification.
4-7	High temperature load test	Temperature: $55\pm 5^{\circ}\text{C}$ Samples work for 16 hours	3	After test, the Appearance, Power, EVM and Frequency error shall be Satisfied with the test specification.
4-8	Low temperature storage test	Leave the samples in $-25\pm 3^{\circ}\text{C}$ @ 24 hours	3	Leave samples in standard test condition for 2 hours then test, the Appearance, Power, EVM and Frequency error shall be satisfied with the test specification.
4-9	Low temperature load test	Leave samples in $-15\pm 3^{\circ}\text{C}$ @ 2 hours, samples' function shall be normal, the let samples work for 1 hour	3	After test, leave the samples in standard condition and tested the Appearance, Power, EVM and Frequency error shall be satisfied with the test specification.
4-10	Temperature circle test	One cycle duration $-10\pm 3^{\circ}\text{C}$ @ 3H $40\pm 3^{\circ}\text{C}$ @ 3H Total cycle: 10x	3	After test, leave the samples in standard condition and tested Power EVM and Frequency error shall be qualified and all the characters shall be satisfied with the test specification.
4-11	Continuous TP test	Twice cycle duration $-10\pm 3^{\circ}\text{C}$ @ 4H $+60\pm 3^{\circ}\text{C}$ @ 4H, $+25$ @ 2H @ 2H	3	During test, There will not been appeared signal disconnection or interruption between DUT and AP.
4-12	ESD	Discharge voltage: 2kV C: 150pF Discharge resistance: 330Ω Positive 10 times 1 time for each second	3	The products can recoverable smoothly after ESD test.

12.Package

(1) Tray Dimensions



(2) the Direction of Product in Tray



Notes:

1. Dimensions of the case: 472mm*365mm*150mm;
2. 30PCS Products per tray, and total 900PCS Products per case;

FCC Statement

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

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.

FCC Radiation Exposure Statement:

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

OEM INTEGRATION INSTRUCTIONS:

This device is intended only for OEM integrators under the following conditions:

The module must be installed in the host equipment such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the internal on-board antenna that has been originally tested and certified with this module. External antennas are not supported. As long as these 3 conditions above are met, further transmitter test will not be required.

However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.). The end-product may need Verification testing, Declaration of Conformity testing, a Permissive Class II Change or new Certification. Please involve a FCC certification specialist in order to determine what will be exactly applicable for the end-product.

Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization. In such cases, please involve a FCC certification specialist in order to determine if a Permissive Class II Change or new Certification is required.

Upgrade Firmware:

The software provided for firmware upgrade will not be capable to affect any RF parameters as certified for the FCC for this module, in order to prevent compliance issues.

End product labeling:

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: 2AOKI-WFM601UWS3".

Information that must be placed in the end user manual:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

IC Statement

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

The term "IC: " before the certification/registration number only signifies that the Industry Canada technical specifications were met. This product meets the applicable Industry Canada technical specifications.

1, This modular complies with IC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be collocated or operating in conjunction with antenna or transmitter. If the IC 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 label referring to the enclosed module. This exterior label can use wording such as the following: Contains Transmitter Module IC number: 23460-WFM601UWS3 Or Contains IC number: 23460-WFM601UWS3 when the module is installed inside another device.

2, 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. This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and user.
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

Module Antenna Type: Integral Antenna, ANT Gain: 2dBi

3, This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and any part of your body.

Le présent appareil est conforme aux CNR d'Industrie Canada applicable aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage,
- et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de distance de 20cm entre le radiateur et n'importe quelle partie de votre corps.

CE Statement

Herby, Sichuan AI-Link Technology Co., Ltd. declares that this WiFi Module, WF-M601-UWS3 is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. In accordance with Article 10(2) and Article 10(10), this product allowed to be used in all EU member states.

Use the WiFi Module in the environment with the temperature between 0℃ and 60℃

Operation Frequency: 2412MHz~2472MHz (802.11b/802.11g/802.11n(HT20))

2422MHz~2462MHz (802.11n(HT40))

Max output power: 0.0515W

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