

WF-M603-USB1 WiFi Module

Features:

- **Supported WLAN Standards**
 - IEEE Std. 802.11b
 - IEEE Std. 802.11g
 - IEEE Std. 802.11n
- **Chip Solution**
- MT7603UN/B
- **Size**
20mm*35mm*6.1mm



Product Name	Installation	Data Rate (max)	Band	Antenna Interface	Note
WF-M603-USB1	SMD	300Mbps	2.4 GHz	IPEX/PCB Trace Antenna	DC 3.3V Power Supply

Sichuan AI-Link Technology Co.,Ltd

Add: Anzhou, Industrial park, Mianyang, Sichuan

Web: <http://www.changhong.com>

Tel: +86-13881190925

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
Ding Shuangpeng	Ding Shuangpeng	Feng Jie	Model	WF-M603-USB1
			Date	2019-11-28

Record of Modification

No	Date of modification	Main content of modification	Reason of modification	Serial number of modification	Confirm
v1.0	20191128	Initial Release			Feng Jie

1. Brief Description

WIFI Module WF-M603-USB1 is based on MTK WIFI single chip MT7603U, fully complied with IEEE 802.11 b/g/n standard from 2.4GHz-2.5GHz. It supports for 300Mbps high speed wireless network connection.

1.1 WIFI Feature

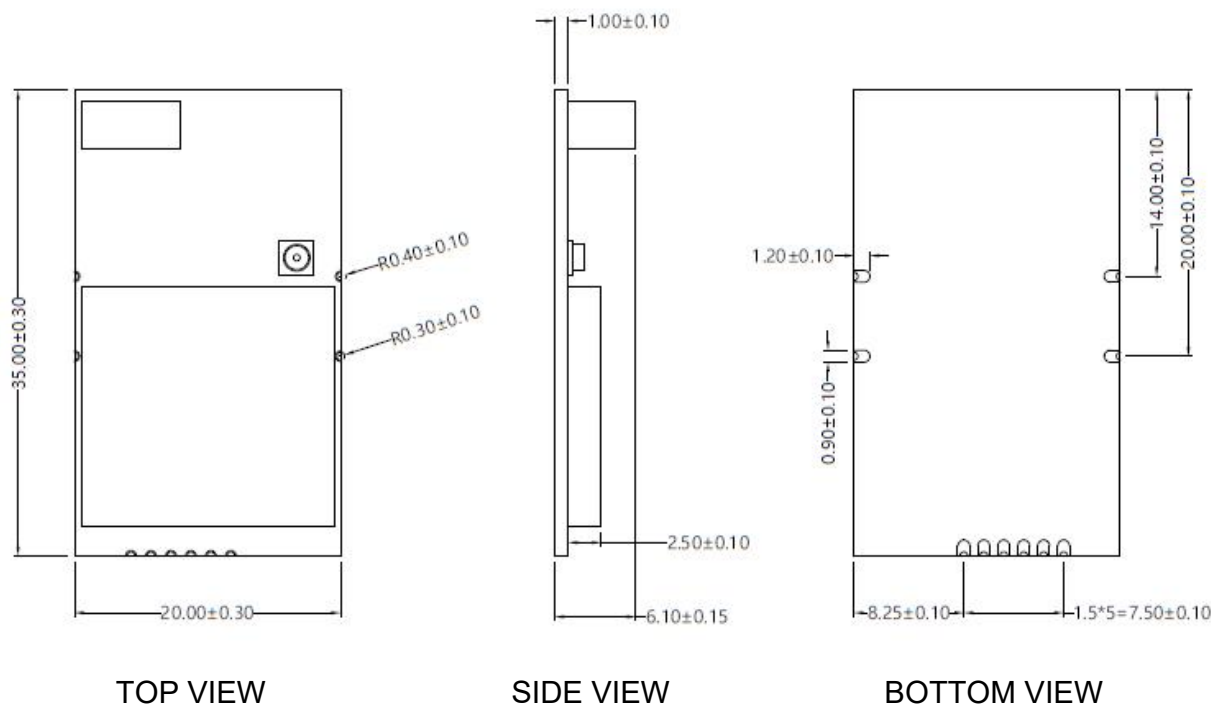
- Single band 2.4GHz ISM
- Supported IEEE 802.11b/g/n

1.2 Hardware Feature

No.	Feature	Description
1	Main Chip	MT7603UN/B
4	Form Factor	10 pins(stamp hole)
5	Size	20mm*35mm*6.1mm. The length and width error is ± 0.3 mm. The thickness error is ± 0.15 mm.
6	Interface	USB×1
7	Operation Voltage	3.3V \pm 0.3
8	Current Consumption	(TBD)
9	Antenna Type	Integral Antenna
10	Operating Temperature	0°C to +60°C
11	Storage Temperature	-40°C to +125°C
12	Antenna Gain	1.5dBi

2. Mechanical Specification(units:mm)

2.1 Mechanical Drawing



NOTE: General tolerance ± 0.1 mm unless otherwise stated

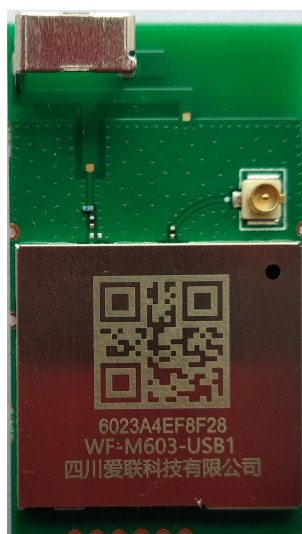
2.2 Pin Definition



Figure 2.2 Pin assignment

Pin	Symbol	Description
1、2、5、9、10	GND	Connected to Ground
3	WOW	Wake WLAN
4	RST	Reset the WLAN,Active Low
6	UDP	USB Data DP
7	UDN	USB Data DN
8	3.3V	+3.3V DC Power supply input

2.3 Product Pictures



TOP VIEW



BOTTOM VIEW

3. RF Characteristics:

3-1 IEEE 802.11b Section:

Items	Contents				
Specification	IEEE802.11b				
Mode	DBPSK, DQPSK and CCK and DSSS				
Channel	CH1 to CH11				
Data rate	1, 2, 5.5, 11Mbps				
	Min.	Typ.	Max.	Unit	Remark
TX Characteristics					
1. Power Levels(Calibrated)					
1) for each data rate	12.49	15	16.15	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%)	-	-87	-83	dBm	
2) 2Mbps (FER \leq 8%)	-	-86	-80	dBm	
3) 5.5Mbps (FER \leq 8%)	-	-85	-79	dBm	
4) 11Mbps (FER \leq 8%)	-	-84	-76	dBm	
6 Maximum Input Level (FER \leq 8%)	-10	-	-	dBm	

3-2 IEEE 802.11g Section:

Items	Contents				
Specification	IEEE802.11g				
Mode	BPSK, QPSK, 16QAM, 64QAM and OFDM				
Channel	CH1 to CH11				
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps				
	Min.	Typ.	Max.	Unit	Remark
TX Characteristics					
1. Power Levels					
1) For Each data rate	12.5	14	15.01	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					
5 Minimum Input Level Sensitivity(each chain)					
1) 6Mbps (PER \leq 10%)	-	-87	-85	dBm	
2) 9Mbps (PER \leq 10%)	-	-86	-84	dBm	
3) 12Mbps (PER \leq 10%)	-	-85	-82	dBm	
4) 18Mbps (PER \leq 10%)	-	-83	-80	dBm	
5) 24Mbps (PER \leq 10%)	-	-80	-77	dBm	
6) 36Mbps (PER \leq 10%)	-	-77	-73	dBm	
7) 48Mbps (PER \leq 10%)	-	-74	-69	dBm	
8) 54Mbps (PER \leq 10%)	-	-71	-65	dBm	
6 Maximum Input Level (PER \leq 10%)	-20	-	-	dBm	

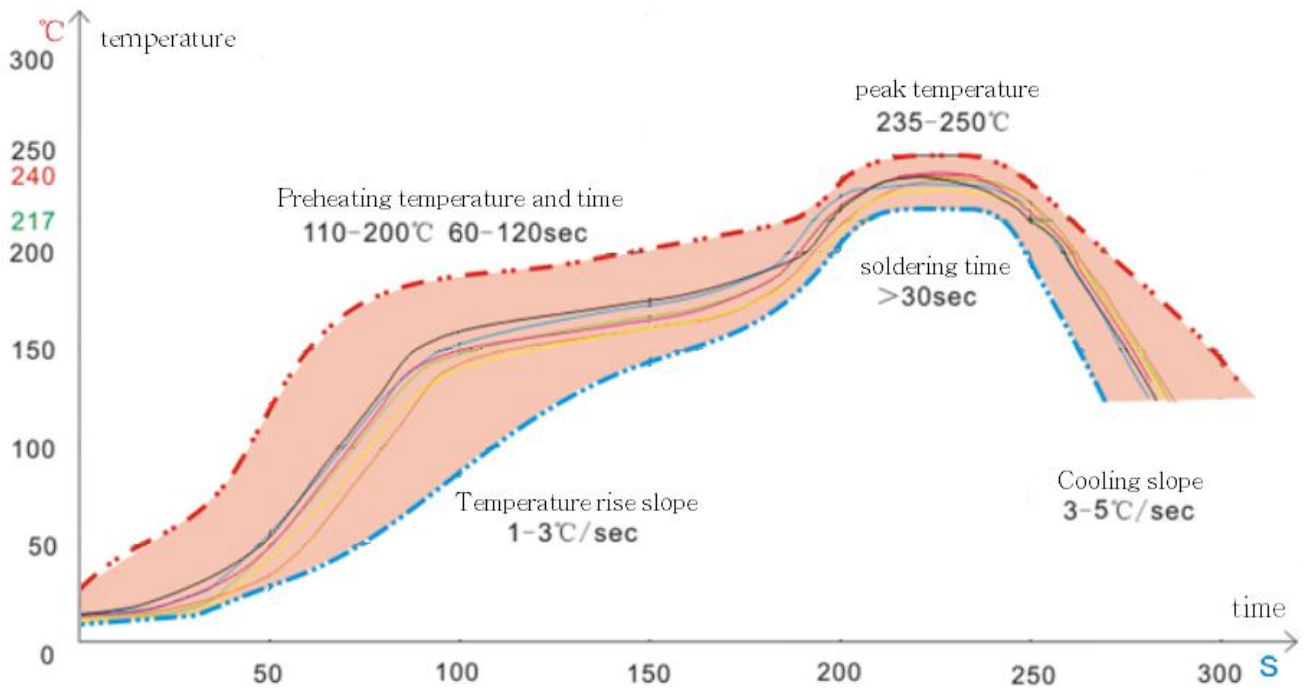
3-3 IEEE 802.11n HT20 Section:

Items	Contents				
Specification	IEEE802.11n HT20 @ 2.4GHz				
Mode	BPSK, QPSK, 16QAM, 64QAM and OFDM				
Channel	CH1 to CH11				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
2. Power Levels					
1) For Each antenna port	15.98	15	16.5	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%)	-	-85	-82	dBm	
2) MCS1 (PER \leq 10%)	-	-84	-79	dBm	
3) MCS2 (PER \leq 10%)	-	-82	-77	dBm	
4) MCS3 (PER \leq 10%)	-	-80	-74	dBm	
5) MCS4 (PER \leq 10%)	-	-76	-70	dBm	
6) MCS5 (PER \leq 10%)	-	-72	-66	dBm	
7) MCS6 (PER \leq 10%)	-	-70	-65	dBm	
8) MCS7 (PER \leq 10%)	-	-69	-64	dBm	
7. Maximum Input Level (PER \leq 10%)	-20	-	-	dBm	

3-4 IEEE 802.11n HT40 Section:

Items	Contents				
Specification	IEEE802.11n HT40 @ 2.4GHz				
Mode	OFDM				
Channel	CH3 to CH9				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels (Calibrated)					
1) 15dBm Target (For Each antenna port)	18.16	18.5	18.97	dBm	
2. Spectrum Mask @ 13dBm					
1) at fc +/-21MHz	-	-	-20	dBr	
2) at fc +/-40MHz	-	-	-28	dBr	
3) at fc > +/-60MHz	-	-	-45	dBr	
3. Constellation Error(EVM) @ 14dBm					
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	-	-30	-28	dB	
4. Frequency Error	-10	-	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	

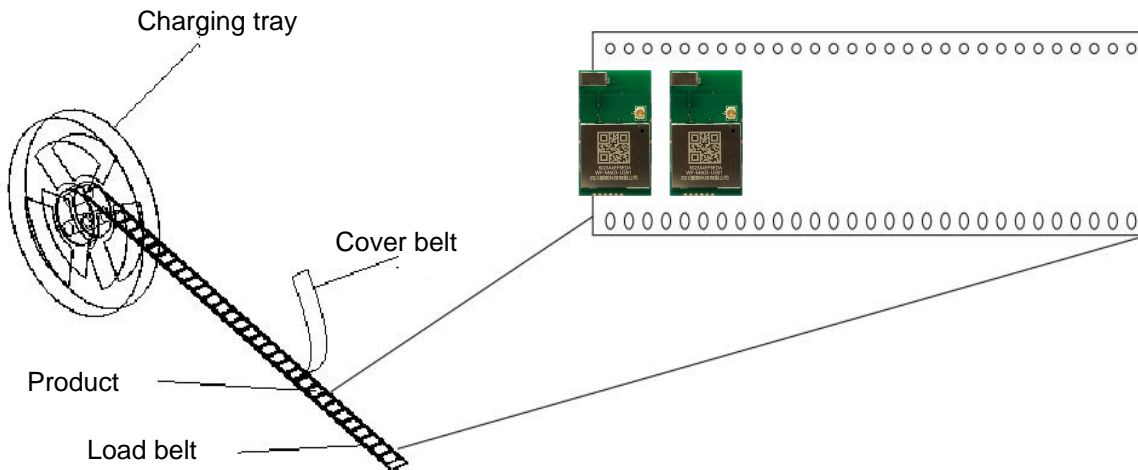
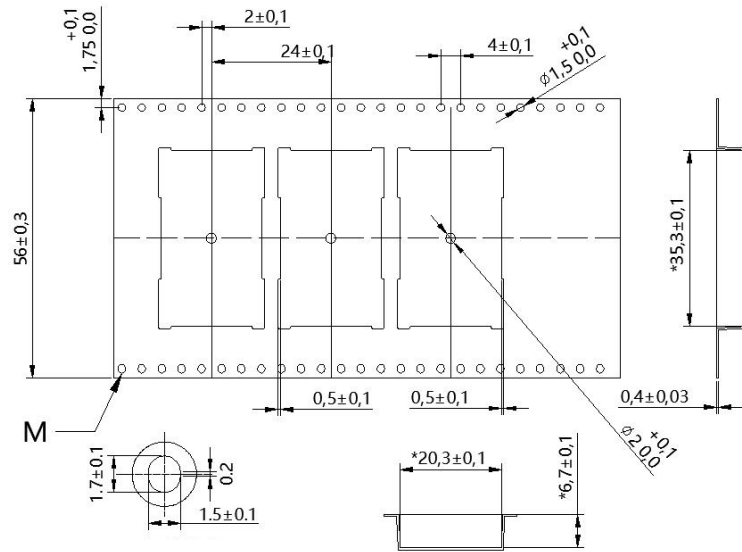
4. Reflow Standard Condition



5. Key Materials

Item	Category	MPN	Description	MFR	Notes
1	IC	MT7603UN/B	48-QFN	MTK	
2	PCB	JUI7.820.0571-5	FR-2,2LAY	INNO CIRCUITS LIMITED	
3	Crystal Oscillator	E3SB40E00003RE	40MHz,3225,11pF ± 10ppm,-30~85°C;	Hosonic	
4	Antenna	RFMTA070300NNA B001			

6. Package



Notes:

1. Dimensions of the inner box: 355mm*355mm*72mm;
Dimensions of the Outer case: 370mm*370mm*300mm;
2. 400PCS modules per tape, 1 tape for each inner box, 4 inner boxes for each outer case, and total 1600PCS modules per outer case;

7. Statement

FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247
Integral antenna with gain 1.5dBi

FCC Regulatory Compliance:

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.

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.

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

If power exceeds the limit and the distance(Over 20cm distance in actual use between the device and user) is compliance with the requirement

RF Exposure Compliance:

This equipment complies with FCC 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.

Notice to OEM integrator

If the FCC ID 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.

The end product shall have the words "Contains Transmitter Module FCC ID: 2AOKI-WFM603USB1".

The device must be professionally installed.

The intended use is generally not for the general public. It is generally for industry/commercial use.

The connector is within the transmitter enclosure and can only be accessed by disassembly of the transmitter that is not normally required. The user has no access to the connector.

Installation must be controlled. Installation requires special training.

Any company of the host device which installs this modular with unlimited 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 tests result comply with FCC part 15C: 15.247 and 15.209 & 15.207, 15B Class B requirement, then the host can be sold legally.

When the module is installed inside another device, the user manual of the host device contains the following warning statement:

- 1) This device may not cause harmful interference.
- 2) This device must accept any interference received, including interference that may cause undesired operation.

IC statement

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.

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.

Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. 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.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :

- 1) L'appareil ne doit pas produire de brouillage;
- 2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Please notice that if the ICED certification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed should display a label referring to the enclosed module.

This exterior label can use wording such as the following: "Contains IC: 23460-WFM603USB1" any similar wording that expresses the same meaning may be used.

L'appareil hôte doit porter une étiquette donnant le numéro de certification du module d'Industrie Canada, précédé des mots «Contient un module d'émission», du mot « IC: 23460-WFM603USB1 » ou d'une formulation similaire exprimant le même sens, comme suit

The device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et la conformité à l'exposition de RSS-102 rf, utilisateurs peut obtenir l'information canadienne sur l'exposition et la conformité de rf.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur.

Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

CE Statement

Herby, Sichuan AI-Link Technology Co., Ltd declares that this WiFi Module, WF-M603-USB1 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 °C and 60 °C. This device is restricted to indoor use where operated in the European Community using frequency in to reduce the potential for interference.

Operation Frequency:

2412MHz~2462MHz (802.11b/802.11g/802.11n(HT20))

2422MHz~2452MHz (802.11n(HT40))

Max output power: 0.0771W

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

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E-mail: caixia.hu@changhong.com

DECLARATION OF CONFORMITY

I hereby declare that the product

Product:

Product Name: WiFi Module
Model: WF-M603-USB1
Brand Name: N/A
Hardware Version: JUI7.820.0571-5
Software Version: customer_package

(Name of product, type or model, batch or serial number)

satisfies all the technical regulations applicable to the product within the scope of Council Directives 2014/53/EU, 2014/35/EU and 2014/30/EU:and declare that the same application has not been lodged with any other notified body.

EN 62368-1:2014+A11:2017

ETSI EN 300 328 V2.2.2 (2019-07)

Draft ETSI EN 301 489-17 V3.2.0 (2017-03)

ETSI EN 301 489-1 V2.2.3 (2019-11)

EN62311:2008

(Title(s) of regulations, standards, etc.)

All essential radio test suites have been carried out.

NOTIFIED BODY: MiCOM Labs Inc

– **Address:**

575 Boulder Court,
Pleasanton, California94566
USA
Identification Number: 2280

MANUFACTURER or AUTHORISED REPRESENTATIVE:

– **Address:**

Sichuan AI-Link Technology Co., Ltd.
Anzhou, Industrial park, Mianyang, Sichuan, China

This declaration is issued under the sole responsibility of the manufacturer and, if applicable, his authorised representative.

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(Name, telephone and fax number)

2019-12-19

(Place, date of issue)

Caixia Hu

(Signature)

Caixia Hu, Engineer

(Name and title in block letters)