

# WF-M38G-UTH1

## WiFi Module

### Features:

- **Reserving System**
  - IEEE Std. 802.11b
  - IEEE Std. 802.11g
  - IEEE Std. 802.11n
  - Bluetooth 2.1+EDR,4.2 LE,5.0
- **Chip Solution**
  - MT7638GU
- **Band**
  - 2.4G

### Model Overview:

Model	Standard	Rate	Channel	POWER
WF-M38G-UTH1	IEEE 802.11b/g/n	300Mbps	2.4G	3.3V
	Bluetooth 5.0	3Mbps	2.4G	

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# 1. Introduction

**WF-M38G-UTH1** is based on MT7638GU, complied with IEEE 802.11b/g/n dual-band WIFI subsystem and a Bluetooth subsystem..

## 1.1 RF module Overview

The general HW architecture for the module is shown in Figure 1. This WLAN Module design is based on MTK MT7638GU. It is a highly integrated single-chip MIMO(Multiple In Multiple Out) Wireless LAN (WLAN) USB2.0 network interface controller complying with the 802.11n specification. It combines a MAC, a 2T2R capable baseband, and RF in a single chip. The MT7638GU provides a complete solution for a highthroughput performance wireless client. The Bluetooth subsystem contains the Bluetooth radio, baseband, link controller. It also uses the 32-bit RISC MCU for the Bluetooth protocols.

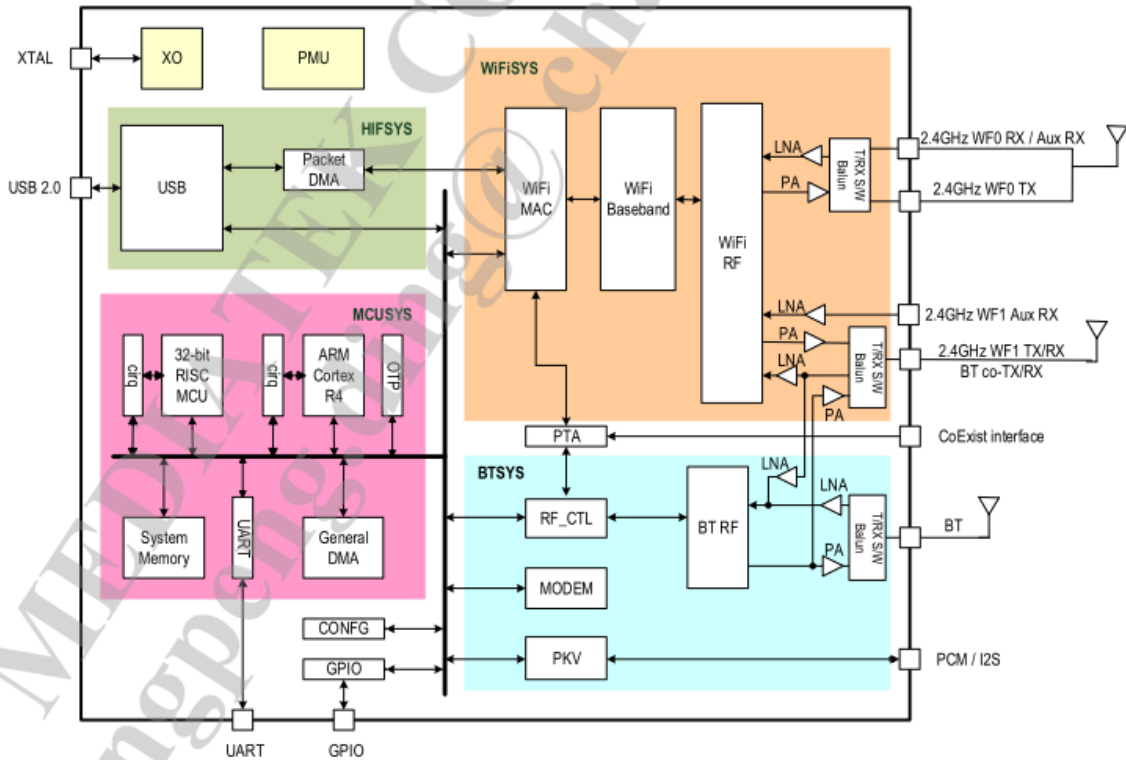


Figure 1 **WF-M38G-UTH1** Block Diagram

## 1.2 Specification reference

This specification is based on additional references listed below.

- \_ IEEE Std. 802.11b
- \_ IEEE Std. 802.11g
- \_ IEEE Std. 802.11n

## 1.3 System Functions

Table1: General Specification as below:

Standard	IEEE 802.11 b/g/n	Bluetooth 2.1+EDR,4.2 LE,5.0
Interface	USB 2.0	
ANT	2T2R	
Modulation	802.11b:DBPSK,DQPSK,CCK for DSSS 802.11g:BPSK,QPSK,16QAM,64QAM for OFDM 802.11n:BPSK,QPSK,16QAM,64QAM for OFDM BT:GFSK/DQPSK/8DPSK BLE: GFSK	

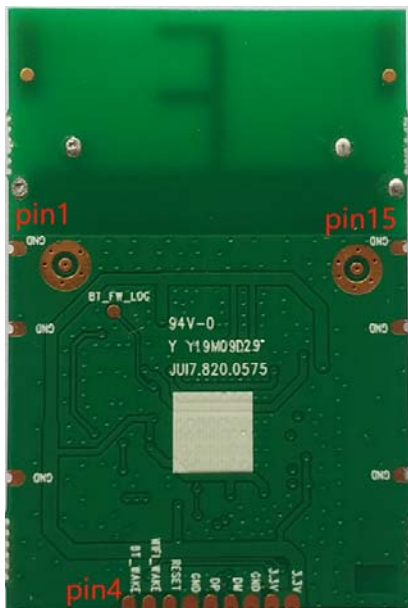
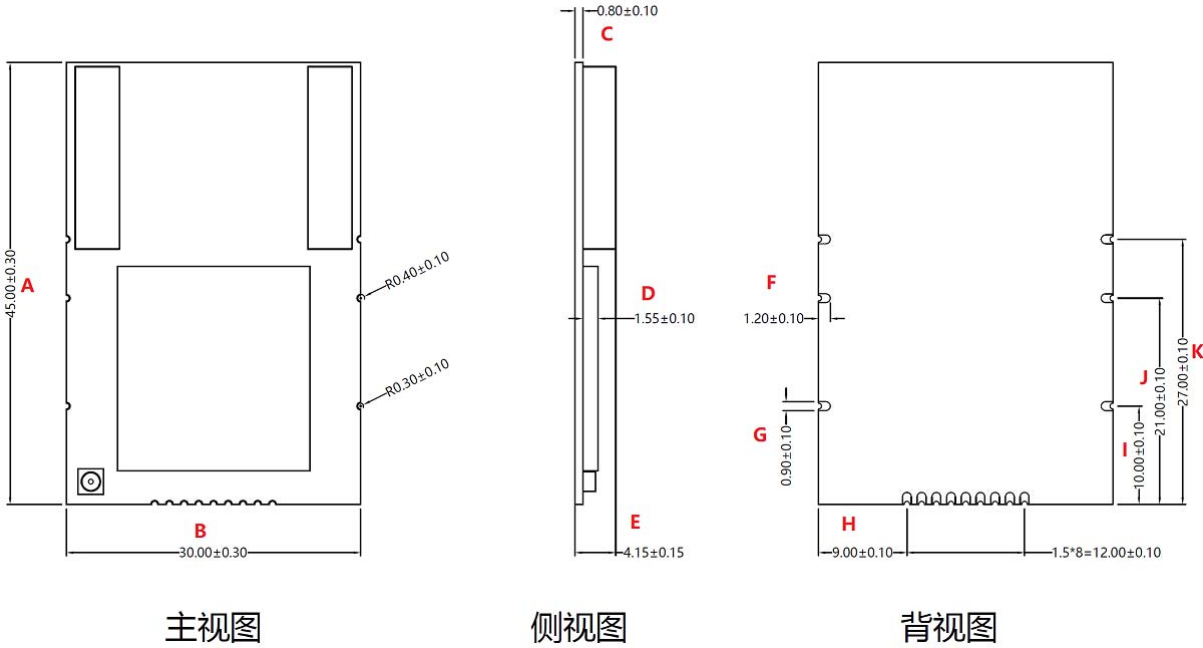
Operating Frequency	2.400 ~ 2.4835 GHz,																												
TX Power	WiFi: 11b: 17 +/- 1.5dBm (11Mbps) 11g: 15 +/- 1.5dBm (54Mbps) 11n: 18 +/- 1.5dBm (MCS7 HT20) 11n: 18 +/- 1.5dBm (MCS7 HT40) BT: DH5,Class 1(5dBm Typical)																												
Frequency offset	≤±-15PPM																												
EVM	11b @ 11Mbps: (Max.) : 35%, (Typical) : 6% 11g @ 54Mbps: (Max.) : -25dB , (Typical) : -30dB 11n @ MCS7 (2.4G): (Max.) : -28dB, (Typical) : -32dB 11n @ MCS7 (2.4G): (Max.) : -28dB, (Typical) : -32dB																												
RX Sensitivity	WiFi: 11b @ 11Mbps: (Max.) : -85dBm , (Typical) : -86dBm (PER<8%) 11g @ 54Mbps: (Max.) : -65dBm , (Typical) : -73dBm (PER<10%) 11n @ MCS7 (2.4GHT20): (Max.) : -64dBm , (Typical) : -71dBm (PER<10%) 11n @ MCS7 (2.4GHT40): (Max.) : -61dBm , (Typical) : -68dBm (PER<10%) BT: GFSK: typical -93dBm π/4 DQPSK: typical -93dBm 8DPSK: typical -87dBm -97 dBm(BLE)																												
Channel	2.4GHz: CH1-CH11																												
Operation Voltage	3.3V±0.1%																												
Power consumption	<table border="1"> <tr> <td colspan="2">WIFI</td> </tr> <tr> <td>Sleep</td> <td>1.5</td> </tr> <tr> <td>DTIM=1</td> <td>3.3</td> </tr> <tr> <td>2.4GHz RX Active, HT20, MCS15</td> <td>144</td> </tr> <tr> <td>2.4GHz TX CCK, 11Mbps @ 21dBm</td> <td>403</td> </tr> <tr> <td>2.4GHz TX HT20, MCS15 @ 17.5dBm</td> <td>496</td> </tr> <tr> <td>2.4GHz TX HT20, MCS8 @ 18dBm</td> <td>520</td> </tr> <tr> <td colspan="2">BT</td> </tr> <tr> <td>Sleep mode, radio off, suspend</td> <td>1.5</td> </tr> <tr> <td>Bluetooth TX @ 9dBm</td> <td>42</td> </tr> <tr> <td>Bluetooth RX</td> <td>21</td> </tr> <tr> <td>Bluetooth SCO connection, HV3 packets + sniff mode + scan</td> <td>21</td> </tr> <tr> <td>Bluetooth page scan + inquiry scan</td> <td>1.7</td> </tr> <tr> <td>Bluetooth page scan</td> <td>1.6</td> </tr> </table>	WIFI		Sleep	1.5	DTIM=1	3.3	2.4GHz RX Active, HT20, MCS15	144	2.4GHz TX CCK, 11Mbps @ 21dBm	403	2.4GHz TX HT20, MCS15 @ 17.5dBm	496	2.4GHz TX HT20, MCS8 @ 18dBm	520	BT		Sleep mode, radio off, suspend	1.5	Bluetooth TX @ 9dBm	42	Bluetooth RX	21	Bluetooth SCO connection, HV3 packets + sniff mode + scan	21	Bluetooth page scan + inquiry scan	1.7	Bluetooth page scan	1.6
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ANT	2.4G gain 2dBi																												
Operation	-10℃ to +70℃																												

Temperature	
Storage Temperature	-40°C to +125°C
Hardware version	JUI7.820.0575
Software version	customer_package

## 2. Mechanical Specification

Typical Dimension (W x L x T): 30.0mmx 45.0mm x 4.15mm

PCB Thickness: 0.8mm



no	Defintion	NOTE
1	GND	GND
2	GND	GND
3	GND	GND
4	BT_WAKE	BT_WAKE
5	WIFI_WAKE	WIFI_WAKE
6	RESET	RESET
7	GND	GND
8	DP	USB D+
9	DW	USB D-
10	GND	GND
11	3.3V	Power supply
12	3.3V	Power supply
13	GND	GND
14	GND	GND
15	GND	GND

### 3. Product Picture



Top view



Bottom view

Noet: No marked size tolerance:  $\pm 0.3\text{mm}$

### 7、 Statement:

#### A、 CE Statement

Herby, Sichuan AI-Link Technology Co., Ltd. declares that this WiFi Module, WF-M68A-UWF1 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 t WiFi Module in the environment with the temperature between  $-10^{\circ}\text{C}$  and  $70^{\circ}\text{C}$

Operation Frequency:

For BT/BLE: 2402MHz~2480MHz

For 2.4G WIFI:

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

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

Max output power: WIFI: 0.0767W    BT: 0.0048W    BLE: 0.0039W

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#### B、 FCC Statement

FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

For BT/BLE: FPC antenna with Gain 2dBi    For 2.4G WIFI: Integral Antenna with Gain 2dBi

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.

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

#### FCC RF 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 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-WFM38GUTH1".

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 sole legally

When the module is installed inside another device, the user manual of the host contain below 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.

## C、 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 ISED 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 must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains IC: 23460-WFM38GUTH1" 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-WFM38GUTH1 » 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.

## DECLARATION OF CONFORMITY

I hereby declare that the product

**Product:**

Product Name: WiFi Module

Model: WF-M38G-UTH1

Brand Name: N/A

Hardware Version: JUI7.820.0575

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

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

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

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

\_\_\_\_\_  
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, California 94566

\_\_\_\_\_  
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.

**Point of contact:**

\_\_\_\_\_  
Caixia Hu, +86- 0816-2438701/+86- 0816-2438701

\_\_\_\_\_  
(Name, telephone and fax number)

\_\_\_\_\_  
2019-12-16

\_\_\_\_\_  
(Place, date of issue)

\_\_\_\_\_  
*Caixia Hu*

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
Caixia Hu, Engineer

\_\_\_\_\_  
(Name and title in block letters)