四川爱联

WIFI module

WF-R11M-RWG2

IEEE 802.11b/g/n 1T1R UART SoC Module

特性 Features：

- **接收制式 Supported WLAN Standard**
  IEEE Std. 802.11b/g/n Wi-Fi
  1T1R System-on-Chip UART module

- **芯片方案 Chip Solution**
  RTL8711AM

- **结构大小 Size**
  25.0mm x42.6mm x3.5mm

接口	安装方式	频段	天线	供电电压
UART	Plug	2.4G	PCB 天线	5V

Company Confidential /Country of Origin:

四川爱联科技有限公司
Sichuan AI-Link Technology Co., Ltd.

1. Introduction

WF-R11M-RWG2 SoC module designed base on RTL8711AM chip solution, The SOC module is a highly intelligent platform for the Internet of Everything that contains a low-power Wi-Fi connectivity solution on one package. It includes a number of TCP/IP based connectivity protocols along with SSL, enabling a low-cost, low-complexity system to obtain full-featured internet connectivity and reliable information exchange.

Realtek RTL8711AM is a highly integrated single-chip low power 802.11n Wireless LAN (WLAN) network controller. It combines an ARM-Cortex M3 MCU, WLAN MAC, a 1T1R capable WLAN baseband, and RF in a single chip. It also provides a bunch of configurable GPIOs which are configured as digital peripherals for different applications and control usage.

RTL8711AM integrates internal memories for complete WIFI protocol functions. The embedded memory configuration also provides simple application developments.

1.1 RF module Overview

The general HW architecture for the module is shown in Figure-1, The WF-R11M-RWG2 module is a aloned chipset solution, system-on-chip-module, 1x1 802.11 b/g/n device optimized for low-power embedded applications with single-stream capability for both transmit and receive. It has an integrated network processor with a large set of TCP/IP with IPv4/IPv6 based services.

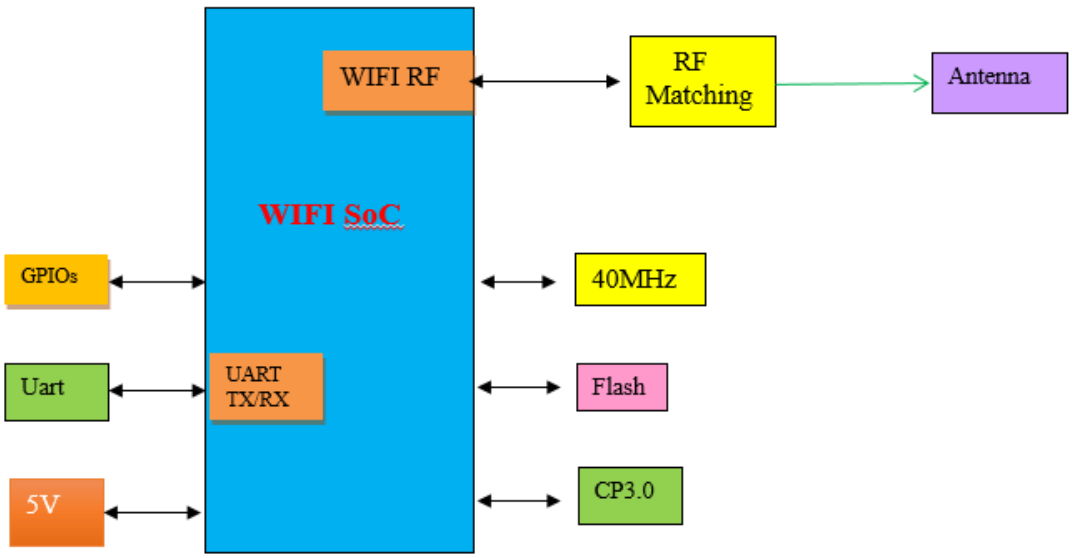


Figure 1 Block Diagram

1.2. RF Specification Reference

SoC RF specification refer to below list.

Main Chipset	RTL8711AM
SoC RF standard	IEEE 802.11 b/g/n
Operating Frequency	2.412~2.462 GHz/2.422~2.452 GHz
UART Interface	For testing and OTP programming (Calibration data)
Antenna Design Options	PCB Antenna/ 1dBi
RF Modulation	WIFI: 11b: DBPSK, DQPSK and CCK and DSSS 11a/g: BPSK, QPSK, 16QAM, 64QAM and OFDM 11n: BPSK, QPSK, 16QAM, 64QAM and OFDM
Data rates	11b: 1, 2, 5.5 and 11Mbps 11a/g: 6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11n: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps,up to 150Mbps
Antenna type:	PCB antenna
Antenna Gain:	1dBi
Operation Voltage	5V +/-10% input

1.3. System Functions

SoC S/W & system general specification refer to below list:

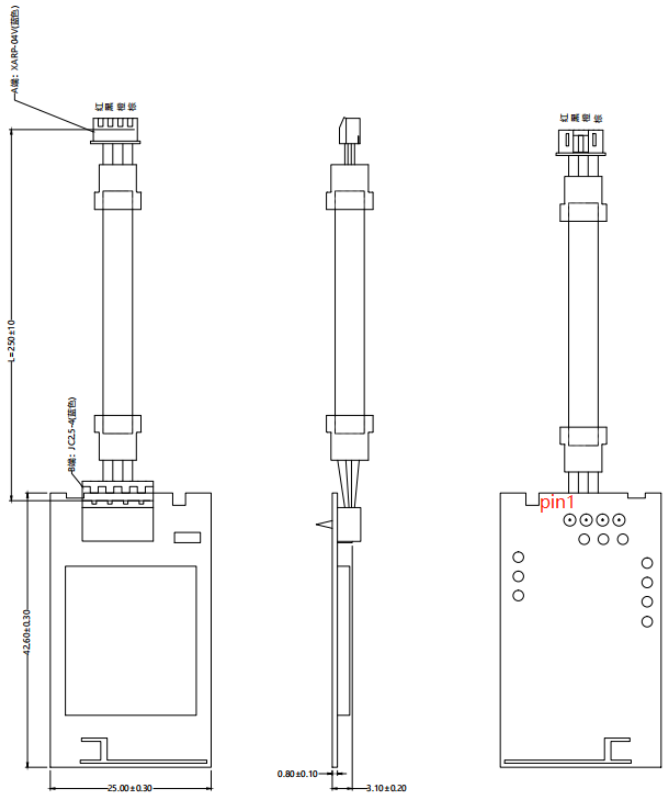
Main Chipset	RTL8711AM
WLAN PHY Features	1T1R
Connective	WIFI Direct support
Package	QFN56 (7x7mm)
Bandwidth	20MHz and 40MHz bandwidth transmission
HW acceleration	WPA, WPA2, WPS2.0
Form factor	Maximum 19 GPIO pins
PCB Stack	4-layers design (0.8+/-0.15mm)
Module Dimension	Typical，25.0mm x42.6mm x3.5mm
Operation Temperature	-20℃ to +85℃
Storage Temperature	-40℃ to +125℃

2. Mechanical Specification

2.1 PCBA Mechanical Outline Drawing

Typical Dimension (W x L x T): 25.0mm x42.6mm x3.5mm

PCB Thickness: 0.8mm (+/-0.15mm)



2.2 Pin Distribution Definition

Pins sequence and distribution list as follows

pin num.	pin name	pin fuction
1	5V	5V
2	TX	Tx
3	RX	Rx
4	GND	GND

FCC Statement

FCC regulatory compliance statement

§ 15.19 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 may cause undesired operation.

§ 15.21 Information to user

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

RF Exposure compliance statement

This Module 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 your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Labelling Instruction for Host Product Integrator

Please notice that 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 *FCC ID:* **2AOKI-WFR11MRWG2**" any similar wording that expresses the same meaning may be used.

Installation Notice to Host Product Manufacturer

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.
The module is limited to installation in mobile application, a separate approval is required for all other operating configurations, including portable configurations with respect to §*2.1093* and difference antenna configurations.

Antenna Change Notice to Host manufacturer

If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

Federal Communication Commission Interference 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 may cause undesired operation. 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 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. FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

INTEGRATION INSTRUCTIONS

2.2 This modular transmitter complies with FCC Rules:

47 CFR Part 15, Subpart C 15.247

2.3 Specific operational use conditions

Antenna Change Notice to Host manufacturer

Recommend using antenna which certified with this module mentioned in this manual.

If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application, based on the new emissions testing. Please perform testing on frequency bands where the antenna gain is highest, worst-case band-edges based on original filing, and only on frequency bands where the antenna gain is highest.

Peak gain per frequency band and minimum gain:

2412MHz-2462MHz/2422MHz-2452MHz

Peak Gain:1dBi

Minimum gain: -5dBi

2.5 Trace antenna design

no trace antenna is used in this module.

Co-location Rule

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

2.6 RF exposure compliance instruction

This module is limited to installation in mobile application with a minimum separation distance of at least 20 cm from a person's body, a separate approval is required for all other operating configurations, including portable configurations with respect to § *2.1093* and different antenna configurations.

Host product manufacturer shall at least provide information of minimum separation distance to end users in RF exposure compliance statement to end users in their end-product manuals.

2.7 This module is tested with the following antenna

Antenna Type	**Max. Antenna Gain**
PCB antenna	1dBi

Instruction to Host product manufacturer when choosing external connector

Unique antenna connector must be used on our FCC Part 15 authorized transmitters used in the host product.

Here is a list of acceptable unique connectors:

Brand/ Manufacturer	**Model No.**
/	/

2.8 Labelling and compliance statement instruction for host product manufacturer

Please notice that 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 FCC ID: **2AOKI-WFR11MRWG2**" any similar wording that expresses the same meaning may be used.

§ 15.19 Labelling requirements shall be complied on end user device.
Labelling rules for special device, please refer to *§2.925*, *§ 15.19 (a)(5)* and relevant KDB publications. For E-label, please refer to *§2.935*.

FCC regulatory Compliance Statement mentioned in this manual shall be properly included in host product manual per FCC Rules. The host product manufacturer shall be aware not to provide information to the end user on how to install or remove this module in your host product manual.

2.9 Guide on test modes and additional testing requirements
Host product manufacturer is ultimately responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, additional transmitter(s) in the host, etc.).
Furthermore, FCC KDB 996369 D04 Module Integration Guide v01 has elaborated guidance for modular transmitter integration for host product manufacturers.

Test software access to different test modes:
XCOM V2.0.exe

2.10 Disclaimer on additional testing, Part 15 Subpart B compliance of Host Product
This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.
Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements.
Please note that For a Class B or Class A digital device or peripheral, the instructions furnished the user manual of the end-user product shall include statement set out in *§15.105 Information to the user* or such similar statement and place it in a prominent location in the text of host product manual. Original texts from FCC Rules are as following you may refer to:
For Class B

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.*

ISED Regulatory Compliance

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.
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.

This equipment complies with IC RSS‐102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.
Cet équipement est conforme aux limites d'exposition aux radiations IC CNR‐102 établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20cm entre le radiateur et votre corps.

Please notice that 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 a label referring to the enclosed module. This exterior label can use wording such as the following: "**Contains IC: 2AOKI-WFR11MRWG2**" any similar wording that expresses the same meaning may be used.
L'étiquette d'homologation d'un module d'Innovation, Sciences et Développement économique Canada devra être posée sur le produit hôte à un endroit bien en vue, en tout temps. En l'absence d'étiquette, le produit hôte doit porter une étiquette sur laquelle figure le numéro d'homologation du module d'Innovation, Sciences et Développement économique Canada, précédé du mot « contient », ou d'une formulation similaire allant dans le même sens et qui va comme suit : **Contains IC: 2AOKI-WFR11MRWG2** est le numéro d'homologation du module.

Product label, label location