

TCPWIFI8711-2400

Module User Manual

Module Model : TCPWIFI8711-2400

Version v2.0

Date: 2018-06-28

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Changes Record

*A - Add M - Modify D - Delete

Version	Date	(A*M*D)	Modifier	Description	Remark
V1.0	2017-06-06	A	RuanCJ	First release	
V1.1	2017-10-10	M	RuanCJ	Modify definition of Pin	
V1.2	2018-03-12	M	RuanCJ	Modify definition of Pin	
V2.0	2018-06-28	M	RuanCJ	Modify definition of Pin	



1. Introduction

The T C P WIFI8711 module is a 2.4GHZ wireless WiFi module, Meet the wireless standard IEEE 802.11b/g/n20/n40. The module is designed specifically for smart LED lights, Support a single dimmer, dual color temperature light, color RGB lights (RGB / RGBW \ RGBCW) and other product forms, Support HomeKit protocol, Support based on amazon alexa voice control, and the development of dedicated APP.

Features

- ☒ AP configuration, homekit equipment distribution network protocol
- ☒ Friendly, simple, user-friendly APP user interface
- ☒ Support AP mode and station mode to form wireless network
- ☒ Support WPA / WPA-PSK / WPA2 PSK encryption, encryption algorithm support AES and TKIP
- ☒ WIFI connection is automatically restored after disconnect
- ☒ Support network data transfer protocol TCP, UDP, HTTP
- ☒ Support UART/PWM/GPIO Data Communication Interface
- ☒ Support 5-way PWM IO port, support dual dimming or RGBW dimming
- ☒ Support for Apple HomeKit IOT
- ☒ Integrated PCB antenna, do not need customer RF debugging
- ☒ Support amazon alexa voice control
- ☒ Low power consumption
- ☒ Product size small 30X15mm, cost-effective

Applications

- ☒ LED Lighting control

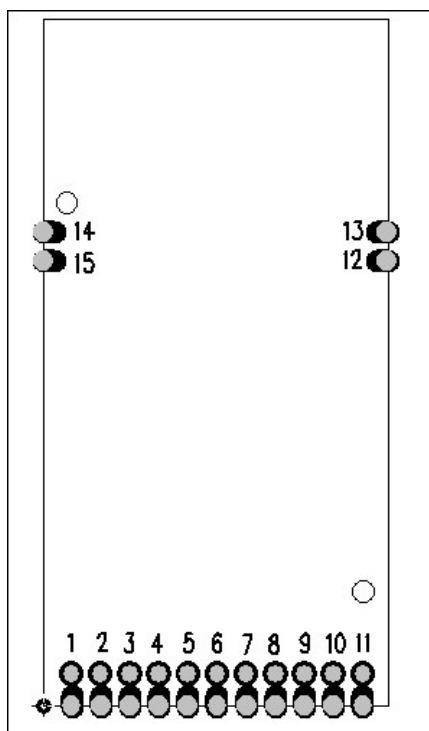
2. Technical specifications

Network Standard	Wireless: IEEE 802. 11b, IEEE 802. 11g, IEEE 802. 11n (HT20), IEEE 802. 11n (HT40)				
Channel No.	1-11 (Channels vary from country to country)				
Frequency Range	2. 412-2. 462GHz (Frequency varies from country to country)				
Transmit Power	Test Item	Minimum Value	Reference Value	Max Value	Unit
	802. 11b 1Mbps	-	20. 54	21	dBm
	802. 11g 6Mbps	-	20. 52	21	dBm
	802. 11n (HT20) MCS 0	-	20. 64	21	dBm
	802. 11n (HT40) MCS 0	-	20. 34	21	dBm
	Frequency Error	-15	-	15	KHZ
EVM	802. 11b 1Mbps EVM		-20	-10	dB
	802. 11g 6Mbps EVM		-33	-25	dB
	802. 11n (HT20) MCS 0		-32	-27	dB
	802. 11n (HT40) MCS 0		-31.5	-27	dB
Receive Sensitivity	802. 11b 1Mbps		-96	-83	dBm
	802. 11b 1Mbps		-88	-76	dBm
	802. 11g 6Mbps		-76	-65	dBm
	802. 11n (HT20) MCS 0		-72.5	-64	dBm
	802. 11n (HT40) MCS 0		-70	-61	dBm
Antenna Type	On-board				
Functional Parameter					
WIFI work mode	Device mode				
Others					
Environment Temp.	Work Temp. : -20-85℃				

3. Electrical characteristics

parameter	symbol	condition	Minimum value	Typical value	Maximum value	unit
3.3V power supply	VCC_3V3		3.15	3.3	3.45	V
3.3V power consumption				80	400	m A
DC electrical characteristics for digital I/Os						
High Level Input Voltage	V _{IH}		2.8	–	3.6	V
Low Level Input Voltage	V _{IL}		-0.3	–	0.3	V
High Level Output Voltage	V _{OH}		2.2	–	3.3	V
Low Level Input Voltage	V _{OL}			0	0.4	V
High Level Output Current	I _{OH}			5		m A
Low Level Output Current	I _{OL}			5		m A

4. Pin Definition (Top View)

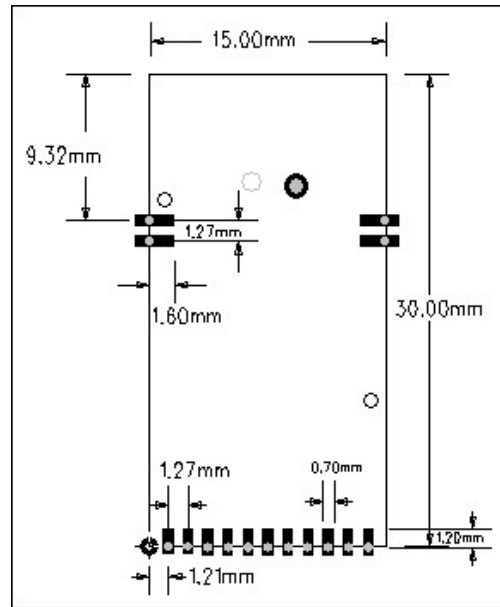


5. Pin Assignment

Pin	symbol	I/O	Description
1	VDD	P	3.3V/400mA
2, 12-13, 15	GND	P	GND
3	PWM1_R/ PE0	I/O	PWM1_R/ GPIO
4	PWM2_G/ PE1	I/O	PWM2_G/ GPIO
5	PWM3_B/ PA6	I/O	PWM3_B/ GPIO
6	PWM5_CW/ PC4	I/O	PWM5_CW/ GPIO
7	PWM4_WW/ PC5	I/O	PWM4_WW/ GPIO
8	GPIOA_3	I/O	GPIO
9	TXD	I/O	UART
10	GPIOA_5	I/O	GPIO
11	RXD	I/O	UART
14	CHIP_EN	I	NC

6. Mechanical structure

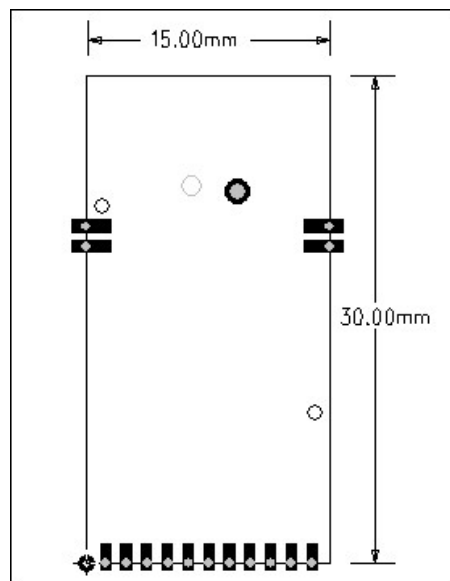
6.1 Module package dimensions



TOP

6.2 Module physical map and size

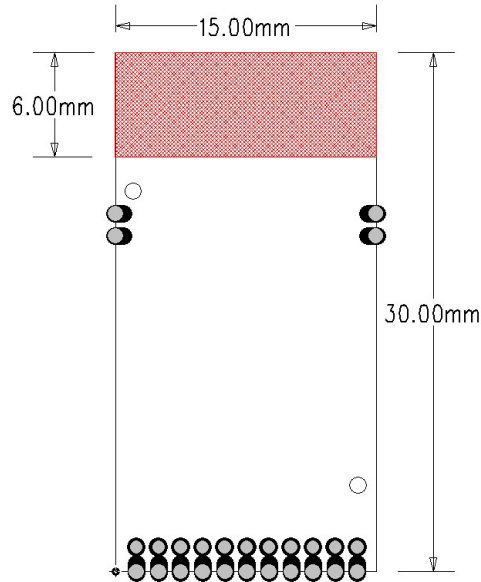
1. Module size (30 * 15 * 2.8MM)



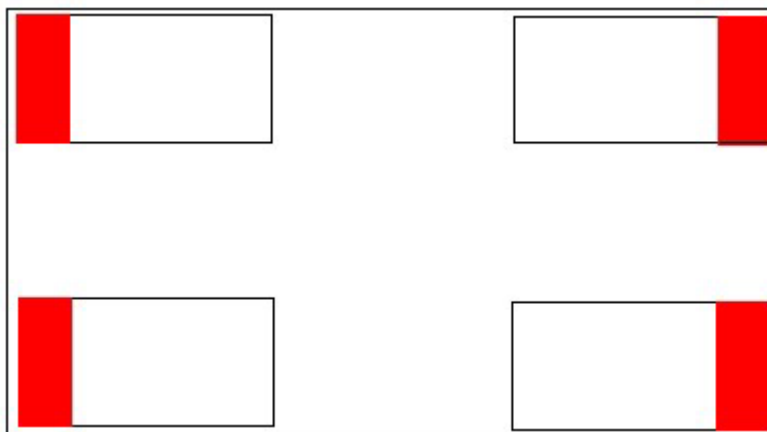
7. Attentions for Antenna

Followings are attentions for on-board antenna.

1. Components and GND are not allowed to place in red zone below. It is suggested to be hollow.
2. Metals should be far away from antenna, at lease 10mm away from the highest component.
3. Antenna can not be covered by metal shell.



4. Components are prefer to place in red zone below to reduce the impact to antenna. Also you can ask for technical support about layout design.



8. Regulatory Module Integration Instructions

8.1 List of applicable FCC rules

This device complies with part 15.247 of the FCC Rules.

8.2 Summarize the specific operational use conditions

This module can be used in household electrical appliances as well as lighting equipments. The input voltage to the module should be nominally 3.0~3.6 VDC ,typical value 3.3VDC and the ambient temperature of the module should not exceed 85°C.

This module using only one kind of antennas with maximum gain is 0 dBi .Other antenna arrangement is not covered by this certification.

The antenna is not field replaceable. If the antenna needs to be changed, the certification should be re-applied.

8.3 Limited module procedures

This module can be used in lighting equipment, smart frontpanel, household electrical appliances. Normally host device should provide a power supply in range 3.0-3.6VDC, typically 3.3VDC for this module. The limited module manufacturer will reviews detailed test data or host designs prior to giving the host manufacturer approval.

8.4 Trace antenna designs Not applicable

8.5 RF exposure considerations

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. If the device built into a host as a portable usage,

the additional RF exposure evaluation may be required as specified by§ 2.1093.

8.6 Antennas

Module only contains one PCB antenna. No additional external connectors.

8.7 Label and compliance information

The outside of final products that contains this module device must display a label referring to the enclosed module. This exterior label can use wording such as: "Contains Transmitter Module FCC ID: NIR-WIFI8711 ",or "Contains FCC ID: NIR-WIFI8711", Any similar wording that expresses the same meaning may be used.

8.8 Information on test modes and additional testing requirements

- a) The modular transmitter has been fully tested by the module grantee on the required number of channels, modulation types, and modes, it should not be necessary for the host installer to re-test all the available transmitter modes or settings. It is recommended that the host product manufacturer, installing the modular transmitter, perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits (e.g., where a different antenna may be causing additional emissions).
- b) The testing should check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure). This investigation is especially important when integrating multiple modular transmitters where the certification is based on testing each of them in a stand-alone configuration. It is important to note that host product manufacturers should not assume that because the modular transmitter is certified that they do not have any responsibility for final product compliance.
- c) If the investigation indicates a compliance concern the host product manufacturer is obligated to mitigate the issue. Host products using a modular transmitter are subject to all the applicable individual technical rules as well as to the general conditions of operation in Sections 15.5, 15.15, and 15.29 to not cause interference. The operator of the host product will be obligated to stop operating the device until the interference has been corrected

Below are steps for on test modes :

For the convenience of customers to test and debug Ameba Series IC, we offer our customers a windows- based system UI_mptool; The tool contains four sub-interface Main, PSD, Efuse, Reg.

Operation steps:

1. Open "Setup/ Realtek_DUT_Selection.exe",and set every item according to the picture below, Module, RF Mode, Software Control Interface setup Items are particularly important.

Note : Module for Ameba1 (8195AM/8711AM/8711AF) ,Please select " RTL81 XXE Series " : For AmebaZ(8710BN/8711BN/8711BG),Please select " RTL871XB Series" .

2. Open " UI_mptool.exe". Firstly, you must "Initialize" the DUT, and then the four sub interface: Main, PSD, Efuse, Reg can be operated.

3. Main:

Note: When you select "Initialize with Pidx in EEPROM",

a) It means that TX Power Index Column A will show the Efuse Index Value, which also have been limited by "Power by rate table " (limit power by rate in each mode) and "Power limit table " (limit power by channel plan value) before shown.

b) If you want to load power index only from Efuse, not count in the

"Power by rate table" and "Power limit table" ,you can modify the \WiFiChip\Realtek_WiFi_Device_Setup to "CalculateIndexByDriver .If TX Power Index show '0' , It's probably that the MAC address have not been programmed in Efuse, thus you should PG Efuse entirely in Another Page.

8.9 Additional testing, Part 15 subpart B disclaimer

The final host / module combination need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.

The host integrator installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation and should refer to guidance in KDB 996369. Frequency spectrum to be investigated

For host products with certified modular transmitter, the frequency range of investigation of the composite system is specified by rule in Sections 15.33(a)(1) through (a)(3), or the range applicable to the digital device, as shown in Section 15.33(b)(1), whichever is the higher frequency range of investigation.

Operating the host product

When testing the host product, all the transmitters must be operating. The transmitters can be enabled by using publicly-available drivers and turned on, so the transmitters are active. In certain conditions it might be appropriate to use a technology-specific call box (test set) where accessory devices or drivers are not available.

When testing for emissions from the unintentional radiator, the transmitter shall be placed in the receive mode or idle mode, if possible. If receive mode only is not possible then, the radio shall be passive (preferred) and/or active scanning. In these cases, this would need to enable activity on the communication BUS (i.e., PCIe, SDIO, USB) to ensure the unintentional radiator circuitry is enabled. Testing laboratories may need to add attenuation or filters depending on the signal strength of any active beacons (if applicable) from the enabled radio(s). See ANSI C63.4, ANSI C63.10 and ANSI C63.26 for further general testing details.

The product under test is placed into a normal 'paired' mode with another WIFI device, as per the normal intended use of the product (for example, transferring data).

FCC Statement:

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

ISED RSS Warning:

This device complies with Innovation, Science and Economic Development Canada licence-exempt RSS standard(s). 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.
- Le présent appareil est conforme aux CNR d'ISED applicables 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.

ISED RF exposure statement:

This equipment complies with ISED 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. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. Le rayonnement de la classe b respecte ISED fixaient un environnement non contrôlés. Installation et mise en œuvre de ce matériel devrait avec échangeur distance minimale entre 20 cm ton corps. Lanceurs ou ne peuvent pas coexister cette antenne ou capteurs avec d'autres.

IC Label Instructions:

The outside of final products that contains this module device must display a label referring to the enclosed module. This exterior label can use wording such as: "Contains Transmitter Module IC: 9486A-WIFI8710", or "Contains IC:9486A-WIFI8710", Any similar wording that expresses the same meaning may be used.

Instructions d'étiquetage IC:

L'extérieur des produits finis contenant ce module doit afficher une étiquette faisant référence au module inclus. Cette étiquette extérieure peut utiliser des libellés tels que: contient le module émetteur IC:9486A-WIFI8710 "ou" contient: IC: 9486A-WIFI8710 ", tout libellé similaire exprimant le même sens peut être utilisé.