RoHS compliant

IEEE 802.11 a/b/g/n/ac 2T/2R Dual Band USB Module

Model Number: WC0F2601

2.4G channel： 1-11

5G channel： 36-48 149-165

客户认可 Custom Approval Section		
Custom Name		
Department		
Approval		Date：

拟制 DESIGN	审核 CHECK	批准 APPROVAL
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20161010	20161010	20161010

Document revision history

Revision	Date	Approved by	Remarks
Version 1.0	2016-07-11		Draft
Version 1.1	2016-07-12		Change 8 PIN to 10 PIN
Version 1.2	2016-08-06		Change Mechanical Dimensions 25*45mm to 47*30mm
Version 1.3	2016-09-18		1、Change function block diagram 2、Change the 5G receive Sensitivity. 3、Change Mechanical Dimensions 4、Change SMT connector spec 5、Change antenna spec
Version 1.4	2016-10-10		1、Change antenna spec 2、Update BOM

PRODUCTS SPECIFICATION

1.   General Description

This document is to specify the product requirements for 802.11a/b/g/n/ac USB Module. This Card is based on Realtek RTL8812AU chipset that complied with IEEE 802.11b/g/n/ac Draft 3.0 compatible WLAN ,and it is also backward complied with IEEE 802.11a standard from 5.15~5.825GHz wideband and IEEE 802.11b/g standard from 2.4000~2.4835GHz. It can be used to provide up to 54Mbps for IEEE 802.11a and IEEE 802.11g,11Mbps for IEEE 802.11b and 300Mbps for IEEE 802.11n and 866.7Mbps for IEEE 802.11ac   to connect your wireless LAN.

With seamless roaming, fully interoperability and advanced security with WEP standard,   802.11 a/b/g/n/ac USB Module offers absolute interoperability with different vendors 802.11a/b/g/n/ac.Access Points through the wireless LAN.

2.   Features

- Compatible with IEEE 802.11a standard to provide wireless 54Mbps data rate.
- Compatible with IEEE 802.11b standard to provide wireless 11Mbps data rate.
- Compatible with IEEE 802.11g standard to provide wireless 54Mbps data rate.
- Compatible with IEEE 802.11n standard to provide wireless 300Mbps data rate.
- Compatible with IEEE 802.11ac standard to provide wireless 866.7Mbps data rate.
- Operation at 2.4~2.5GHz and 5.15~5.825GHz frequency band to meet worldwide regulations
- Provides simple legacy and 20MHz/40MHz/80MHz co-existence mechanisms to ensure backward and network compatibility.
- Supports infrastructure networks via Access Point and ad-hoc network via peer-to-peer communication
- Supports IEEE 802.11i (WPA and WPA2), WAPI,. enhanced security
- Friendly user configuration and diagnostic utilities
- Drivers support Windows XP,Vista.Win7
- High speed USB 2.0 interface
- ROHS compliant

3. Application Diagrams

3.1 Functional Block Diagram
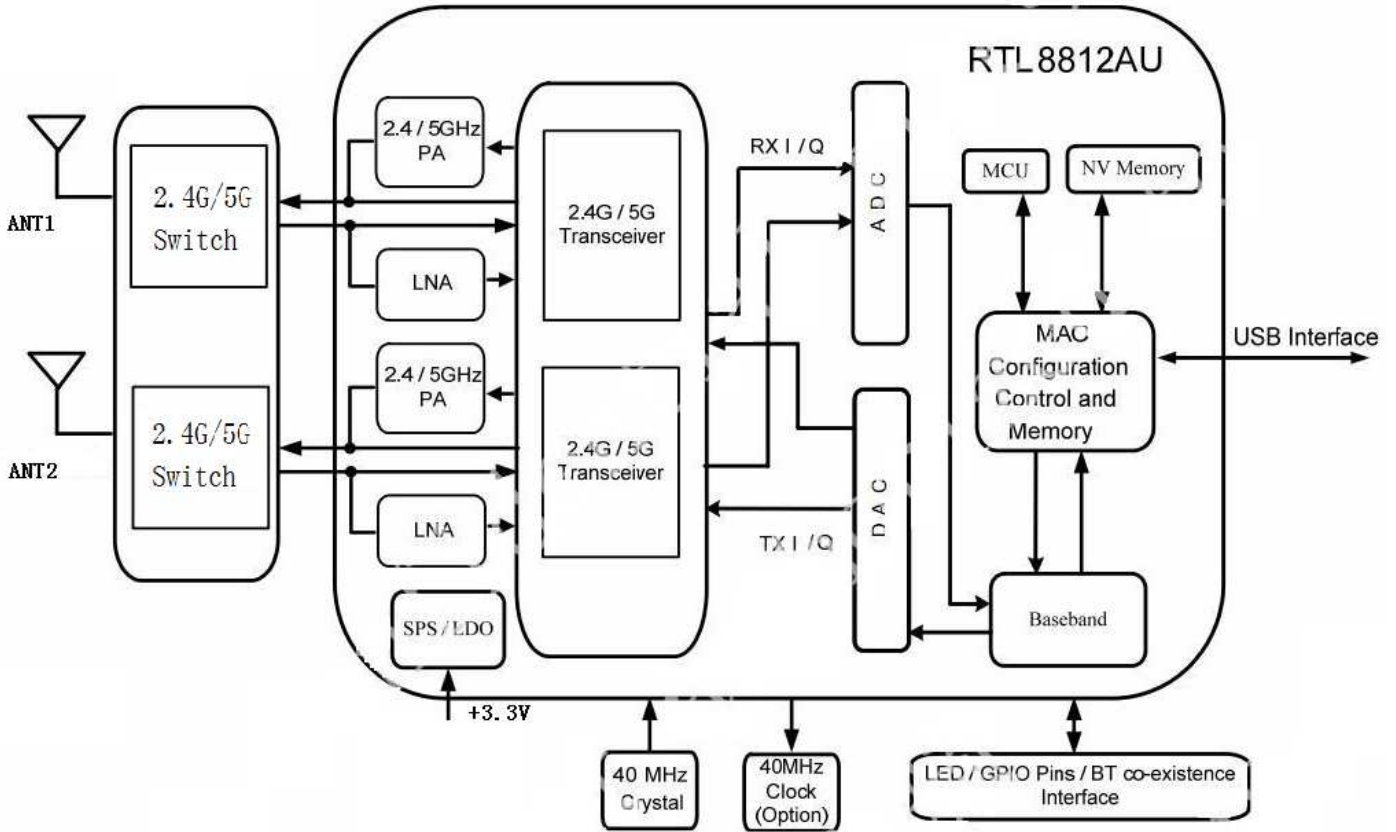
3.2 General Requirements

3.2.1 IEEE 802.11b Section

	Feature	Detailed Description
3.2.1.1	Standard	• IEEE 802.11b
3.2.1.2	Radio and Modulation Schemes	• DQPSK , DBPSK , DSSS , and CCK
3.2.1.3	Operating Frequency	• 2400 ～ 2483.5MHz ISM band
3.2.1.4	Channel Numbers	• 11 channels for United States • 13 channels for Europe Countries • 14 channels for Japan
3.2.1.5	Data Rate	• 11,5.5,2,and 1Mbps
3.2.1.6	Media Access Protocol	• CSMA/CA with ACK
3.2.1.7	Transmitter Output Power at Antenna Connector	• Typical RF Output Power(tolerance±2dB) at each RF chain,Data Rate and at room Temp. 25℃ • +19 dBm at 1Mbps • +18 dBm at 2Mbps • +17 dBm at 5.5Mbps • +16 dBm at 11Mbps

3.2.1.8	Receiver Sensitivity at Antenna Connector	● Typical Sensitivity at Which Frame(1000-byte PDUs)Error Rate=8% ● -88 dBm at 1Mbps ● -82 dBm for 11Mbps

3.2.2 IEEE 802.11g Section

	Feature	Detailed Description
3.2.2.1	Standard	● IEEE 802.11g
3.2.2.2	Radio and Modulation Type	● QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.2.3	Operating Frequency	● 2400 ～ 2483.5MHz ISM band
3.2.2.4	Channel Numbers	● 11 channels for United States ● 13 channels for Europe Countries ● 13 channels for Japan
3.2.2.5	Data Rate	● 6,9,12,18,24,36,48,54Mbps
3.2.2.6	Media Access Protocol	● CSMA/CA with ACK
3.2.2.7	Transmitter Output Power at Antenna Connector	● Typical RF Output Power(tolerance±2dB) at each RF chain, Data Rate and at roomTemp. 25℃ ● +18dBm at 6Mbps ● +14dBm at 54Mbps
3.2.2.8	Receiver Sensitivity at Antenna Connector	● Typical Sensitivity at each RF chain. Frame(1000-byte PDUs)Error Rate<10% at room Temp 25℃ ● -86 dBm at 6Mbps ● -73 dBm at 54Mbps

3.2.3 IEEE 802.11a Section

	Feature	Detailed Description
3.2.3.1	Standard	● IEEE 802.11a
3.2.3.2	Radio and Modulation Type	● QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.3.3	Operating Frequency	● 5.15~5.35GHz and 5.725~5.825GHz for US and Canada ● 5.15~5.35GHz and 5.47~5.725GHz for Japan ● 5.15~5.35GHz and 5.47~5.725GHz for Europe ● 5.725~5.825GHz for China
3.2.3.4	Channel Numbers	● 12 non-overlapping channels for US and Canada ● 8 non-overlapping channels for Japan ● 19 non-overlapping channels for Europe ● 4 non-overlapping channels for China
3.2.3.5	Data Rate	● 6,9,12,18,24,36,48,54Mbps
3.2.3.6	Media Access Protocol	● CSMA/CA with ACK
3.2.3.7	Transmitter Output Power at Antenna Connector	● Typical RF Output Power(tolerance±2dB) at each RF chain, Data Rate and at roomTemp. 25℃ ● +18 dBm at 6Mbps ● +14 dBm at 54Mbps
3.2.3.8	Receiver Sensitivity at Antenna Connector	● Typical Sensitivity at each RF chain. Frame(1000-byte PDUs)Error Rate<10% at room Temp 25℃ ● -83 dBm at 6Mbps ● -71 dBm at 54Mbps

3.2.4 IEEE 802.11n Section

	Feature	Detailed Description			
3.2.4.1	Standard	• IEEE 802.11n			
3.2.4.2	Radio and Modulation Type	• BPSK , QPSK , 16QAM ,64QAM with OFDM			
3.2.4.3	Operating Frequency	• 2.4GHz band:2400 ~ 2483.5MHz • 5GHz and:5150 ~ 5825MHZ			
3.2.4.4	Data Rate	MCS	GI=800ns		GI=400ns	

		MCS	20MHz	40MH	20MHz	40MHz
		0	6.5	13.5	7.2	15
		1	13	27	14.4	30
		2	19.5	40.5	21.7	45
		3	26	54	28.9	60
		4	39	81	43.3	90
		5	52	108	57.8	120
		6	58.5	121.5	65.0	135
		7	65	135	72.2	150
		8	13	27	14.4	30
		9	26	54	28.9	60
		10	39	81	43.3	90
		11	52	108	57.8	120
		12	78	162	86.7	180
		13	104	216	115.6	240
		14	117	243	130	170
		15	130	270	144.4	300

	Feature	Detailed Description	
3.2.4.5	Media Access Protocol	• CSMA/CA with ACK	
3.2.4.6	Transmitter Output Power at Antenna Connector	• Typical RF Output Power (tolerance±2dB) at each RF chain,Data Rate and at roomTemp. 25℃	
		• 2.4GHz Band/HT20 • 18 dBm at MCS0 • 12 dBm at MCS7	• 2.4GHz Band/HT40 • 18 dBm at MCS0 • 12 dBm at MCS7
		• 5GHz Band/HT20 • 18 dBm at MCS0 • 12 dBm at MCS7	• 5GHz Band/HT40 • 18 dBm at MCS0 • 12 dBm at MCS7
3.2.4.7	Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain at Which Frame (1000-byte PDUs) Error Rate=10% and at room Temp. 25℃	
		2.4GHz Band/HT20 • -86 dBm at MCS0 • -70 dBm at MCS7	2.4GHz Band/HT40 • -83 dBm at MCS0 • -66 dBm at MCS7

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5GHz Band/HT20 ● -83 dBm at MCS0/8 ● -68 dBm at MCS7/15	5GHz Band/HT40 ● -81 dBm at MCS0/8 ● -64 dBm at MCS7/15

3.2.5 IEEE 802.11ac Section

	Feature	Detailed Description
3.2.5.1	Standard	● IEEE 802.11ac
3.2.5.2	Radio and Modulation Type	● QPSK , BPSK , 16QAM ,64QAM,256QAM with OFDM
3.2.5.3	Operating Frequency	● 5.15~5.35GHz and 5.725~5.825GHz for US and Canada ● 5.15~5.35GHz and 5.47~5.725GHz for Japan ● 5.15~5.35GHz and 5.47~5.725GHz for Europe ● 5.725~5.825GHz for China
3.2.5.4	Channel Numbers	● 12 non-overlapping channels for US and Canada ● 8 non-overlapping channels for Japan ● 19 non-overlapping channels for Europe ● 4 non-overlapping channels for China
3.2.5.5	Data Rate	● at most 866.7 Mbps
3.2.5.6	Media Access Protocol	● CSMA/CA with ACK
3.2.5.7	Transmitter Output Power at Antenna Connector	● Typical RF Output Power(tolerance±2dB) at each RF chain, Data Rate and at roomTemp. 25℃ ● HT20 ● 18 dBm at MCS0 ● 12 dBm at MCS7 ● 11 dBm at MCS8 ● HT40 ● 18 dBm at MCS0 ● 12 dBm at MCS8 ● 11 dBm at MCS9 ● HT80 ● 18 dBm at MCS0 ● 12 dBm at MCS8 ● 11 dBm at MCS9
3.2.5.8	Receiver Sensitivity at Antenna Connector	● Typical Sensitivity at each RF chain. Frame(1000-byte PDUs)Error Rate<10% at room Temp 25℃ 5GHz Band / HT20 5GHz Band / HT40 ● -63 dBm at MCS8 ● -57 dBm at MCS9 5GHz Band / HT80 ● -56 dBm at MCS9

PRODUCTS SPECIFICATION

4. Electrical and Thermal Characteristics

4.1 Temperature Limit Ratings

Parameter	Minimum	Maximum	Units
Storage Temperature	-40	+80	℃
Ambient Operating Temperature	0	60	℃
Junction Temperature	0	125	℃

4.2 General Section

	Feature	Detailed Description
4.2.1	Antenna Type	● ANT1: IPEX connector ANT2: Metal antenna
4.2.2	Operating Voltage	● 3.3V±10%
4.2.3	Current Consumption	● ＜1100mA
4.2.4	Form Factor and Interface	● High Speed USB2.0 Interface

4.3 Software

Driver	Windows XP/ WinCE/ Vista,/ Win7, Linux, MAC
Security	64/128-bits WEP, WPA, WPA2

4.4 Mechanical Requirements

	Feature	Detailed Description
4.4.1	Length 长度	● 47mm
4.4.2	Width 宽度	● 30mm
4.4.3	High 高度	● 6.2mm(PCB:1mm)

5.   Connector Definition

10-Pin 1.25 mm connector（Horizontal Type）

Pin	1	2	3	4	5	6	7	8	9	10
Definition	VCC (3.3V)	VCC (3.3V)	D-	D+	GND	WL_Host_Wake (Internal pull-up 10K Ohm)	Reset (Internal pull-up 100K Ohm)	GND	NC	GND

6 Mechanical Dimensions
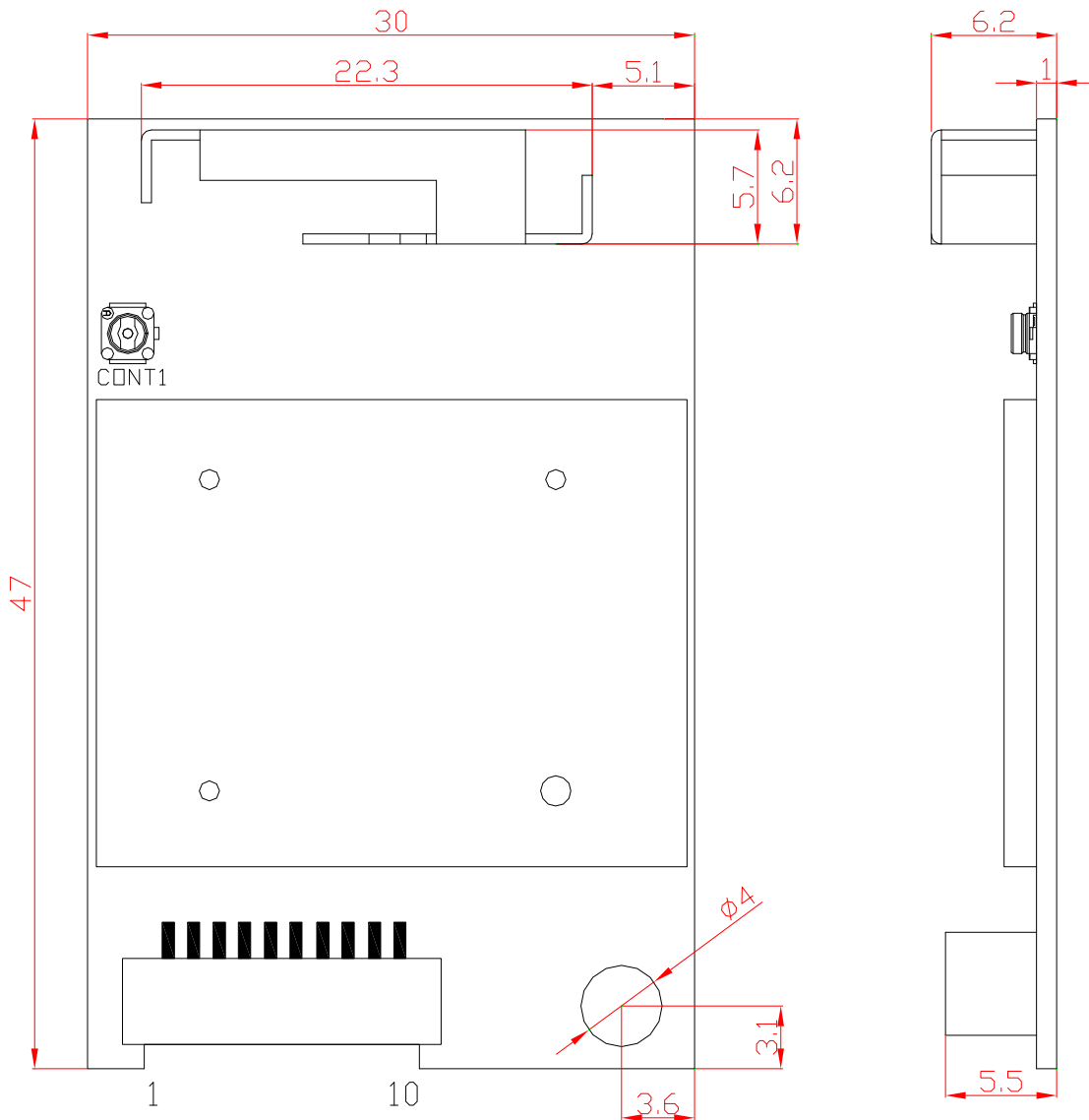
*TOLERANCES   ARE   +/-0.5mm   UNLESS   OTHERWISE   SPECIFIED

*UNIT:mm

FCC Statement

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.

To assure continued compliance, any changes or modifications not expressly approved by the party.

Responsible for compliance could void the user's authority to operate this equipment. (Example- use only shielded interface cables when connecting to computer or peripheral devices).

This equipment 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:

The equipment complies with FCC Radiation exposure limits set forth for uncontrolled enviroment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

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