

HDWF-11AU

Product Specification

IEEE 802.11 a/b/g/n/ac 1T/1R Band USB Module

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0. Revision History

Version NO	Date	Modifications	Draft
Rev0.1	Jul.15.2014	First Released	
Rev0.2	Nov.20.2014	Modify USB PIN	
Rev0.3	Apr.15.2015	Modify the outline drawing	

1. Introduction

This document is to specify the product requirements for 802.11a/b/g/n/ac USB Module. This Card is based on Realtek RTL8811AU 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 2.4~2.5GHz. It can be used to provide up to 54Mbps for IEEE 802.11a and IEEE 802.11g, 11Mbps for IEEE 802.11b and 150Mbps for IEEE 802.11n and 433.3Mbps for IEEE 802.11ac to connect your wireless LAN.

1.1 Overview

The general hardware for the module is shown in Figure 1.

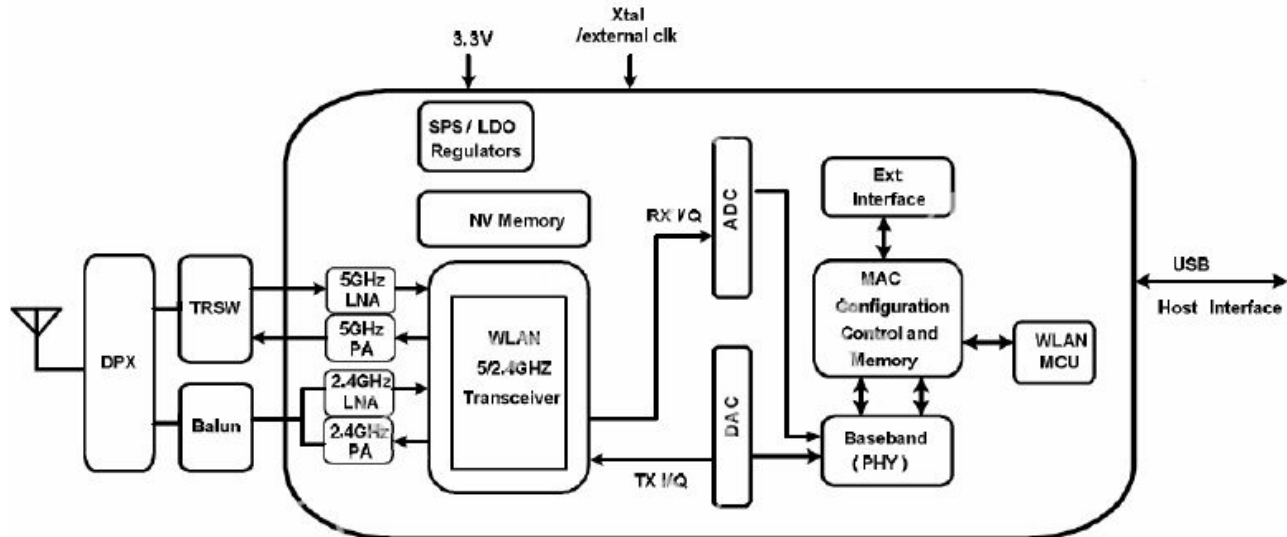


Figure 1. Dual-Band 11ac (1x1) Solution with single Antenna

1.2 Features

- Compatible with IEEE 802.11a standard to provide wireless 54Mbps data rate.
- Compatible with IEEE 802.11g standard to provide wireless 54Mbps data rate.
- Compatible with IEEE 802.11b standard to provide wireless 11Mbps data rate.
- Compatible with IEEE 802.11n standard to provide wireless 150Mbps data rate.
- Compatible with IEEE 802.11ac standard to provide wireless 433.3Mbps 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

2. GENERAL SPECIFICATION

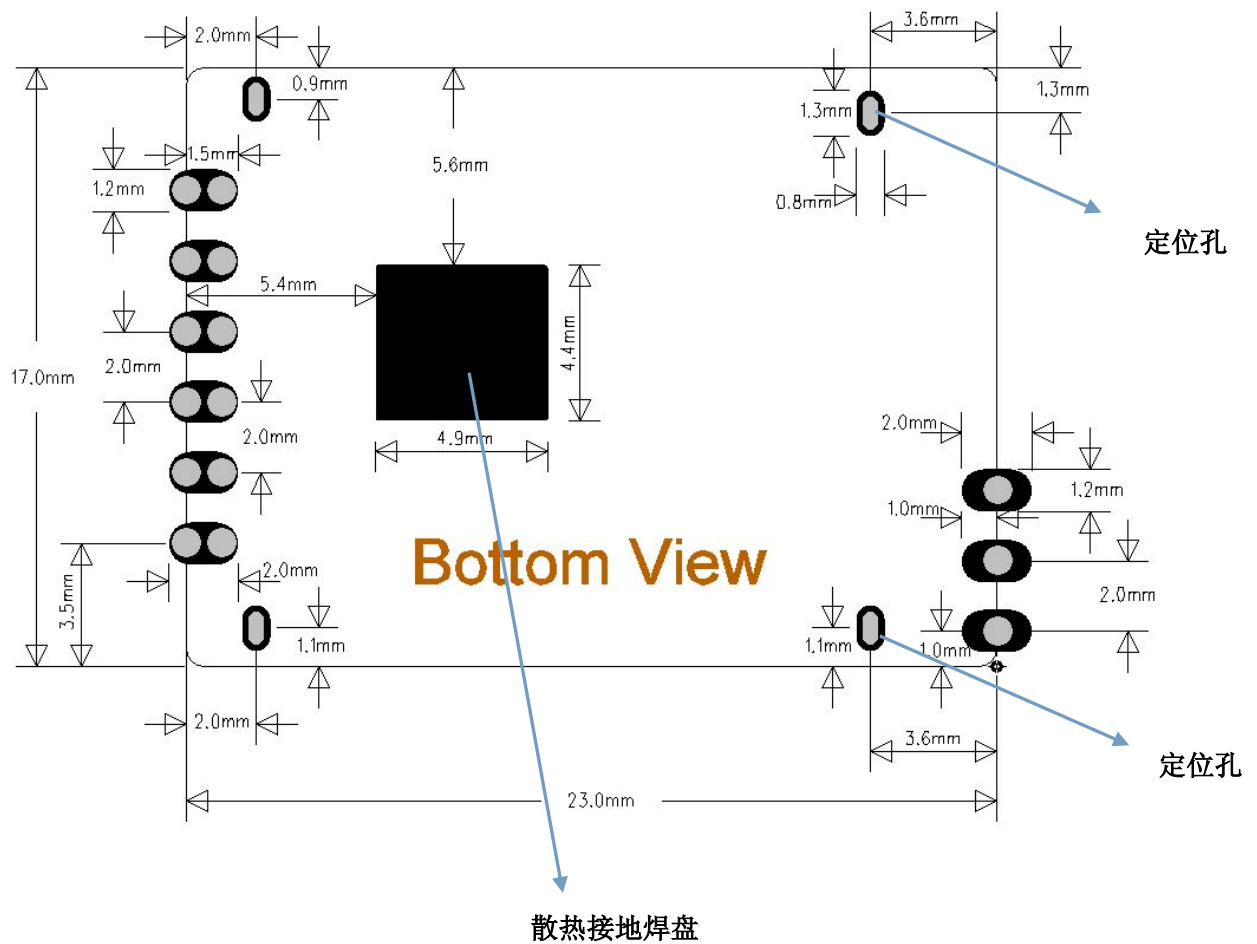
2.1 WiFi Specifications

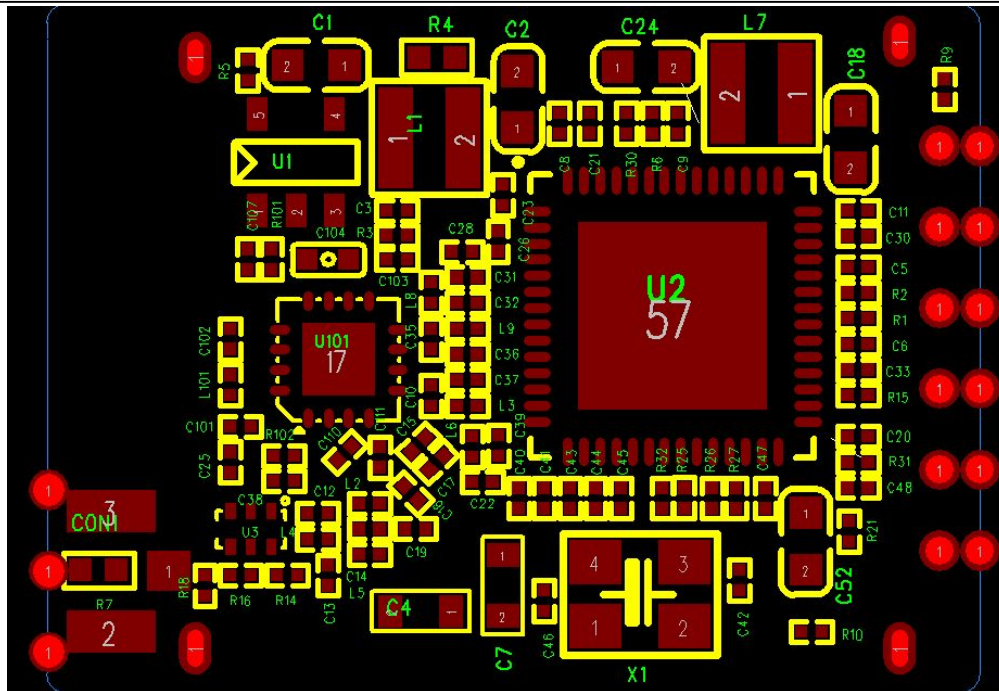
Features	Descriptions	
Main Chipset	Realtek RTL8811AU	
Operating Frequency	2.4G: 2.4000GHz~2.4835GHz 5G: 5.150GHz~5.825GHz	
Host Interface	USB 2.0	
WIFI Standard	iEEE802.11a/b/g/n/ac	
Modulation	802.11b: QPSK , BPSK , 16QAM ,64QAM with OFDM 802.11 g/n: BPSK , QPSK , 16QAM ,64QAM with OFDM 802.11a: QPSK , BPSK , 16QAM ,64QAM with OFDM 802.11ac: QPSK , BPSK , 16QAM ,64QAM,256QAM with OFDM	
PHY Data rates	802.11a: 6,9,12,18,24,36,48,54Mbps 802.11b: 11,5.5,2,1 Mbps 802.11g: 6,9,12,18,24,36,48,54Mbps 802.11n: up to 150Mbps 802.11ac: up to 433.3Mbps	
Transmit Output Power	802.11b@11Mbps 16±2dBm 802.11g@6Mbps 15±2dBm 802.11g@54Mbps 15±2dBm 802.11n@65Mbps 14±2dBm (MCS 0_HT20) 14±2dBm (MCS 7_HT20) 14±2dBm (MCS 0_HT40) 14±2dBm (MCS 7_HT40) 802.11a@54Mbps 13±2dBm 802.11ac@MCS7 13±2dBm 802.11ac@MCS9 12±2dBm	
Receiver Sensitivity Bandwidth: 20MHz (Typical Sensitivity at each RF chain at Which Frame(1000-byte PDUs)Error Rate=10% and at room Temp.25 degreeC)	802.11b@8% PER 1Mbps ≤ -83 ± 1dBm 2Mbps ≤ -80 ± 1dBm 5.5Mbps ≤ -79 ± 1dBm 11Mbps ≤ -76 ± 1dBm	
	802.11g@10% PER 6Mbps ≤ -82 ± 1dBm 9Mbps ≤ -81 ± 1dBm 12Mbps ≤ -79 ± 1dBm 18Mbps ≤ -77 ± 1dBm 24Mbps ≤ -74 ± 1dBm 36Mbps ≤ -70 ± 1dBm 48Mbps ≤ -66 ± 1dBm 54Mbps ≤ -65 ± 1dBm	
	802.11n@10% PER 2.4GHz Band/HT20 ● -82dBm at MCS0 ● -79dBm at MCS1 ● -77dBm at MCS2 ● -74dBm at MCS3 ● -70dBm at MCS4 ● -66dBm at MCS5 ● -65dBm at MCS6 ● -64dBm at MCS7	2.4GHz Band/HT40 ● -79dBm at MCS0 ● -76dBm at MCS1 ● -74dBm at MCS2 ● -71dBm at MCS3 ● -67dBm at MCS4 ● -63dBm at MCS5 ● -62dBm at MCS6 ● -61dBm at MCS7
	5GHz Band/HT20 ● -82dBm at MCS0 ● -79dBm at MCS1	5GHz Band/HT40 ● -79dBm at MCS0 ● -76dBm at MCS1

	• -77dBm at MCS2 • -74dBm at MCS3 • -70dBm at MCS4 • -66dBm at MCS5 • -65dBm at MCS6 • -64dBm at MCS7		• -74dBm at MCS2 • -71dBm at MCS3 • -67dBm at MCS4 • -63dBm at MCS5 • -62dBm at MCS6 • -61dBm at MCS7	
	802.11a@10% PER 6Mbps ≤-82±1dBm 9Mbps ≤-81±1dBm 12Mbps ≤-79±1dBm 18Mbps ≤-77±1dBm 24Mbps ≤-74±1dBm 36Mbps ≤-70±1dBm 48Mbps ≤-66±1dBm 54Mbps ≤-65±1dBm			
	802.11ac@10% PER 5GHz Band / HT20 • -82dBm at MCS0 • -79dBm at MCS1 • -77dBm at MCS2 • -74dBm at MCS3 • -70dBm at MCS4 • -66dBm at MCS5 • -65dBm at MCS6 • -64dBm at MCS7 • -59dBm at MCS8 • -57dBm at MCS9		5GHz Band / HT40 • -79dBm at MCS0 • -76dBm at MCS1 • -74dBm at MCS2 • -71dBm at MCS3 • -67dBm at MCS4 • -63dBm at MCS5 • -62dBm at MCS6 • -61dBm at MCS7 • -56dBm at MCS8 • -54dBm at MCS9	
	5GHz Band / HT80 • -76dBm at MCS0 • -73dBm at MCS1 • -71dBm at MCS2 • -68dBm at MCS3 • -64dBm at MCS4 • -60dBm at MCS5 • -59dBm at MCS6 • -58dBm at MCS7 • -55dBm at MCS8 • -51dBm at MCS9			
Operation Range	Up to 150meters in open space			
RF Antenna	External Antenna			
OS Support	Windows XP,Vista.Win7			
Security	WEP,TKIP,AES,WPA,WPA2			
Dimension	L23.0mm*W17.0mm*T3.0mm			
Power Consumption 3.3V Power supply	LINK	200mA		
	TX 2.4G	20M:240mA; 40M:220mA		
	TX 5G	20M:300mA; 40M:270mA; 80M:260mA		
	RX	210mA		

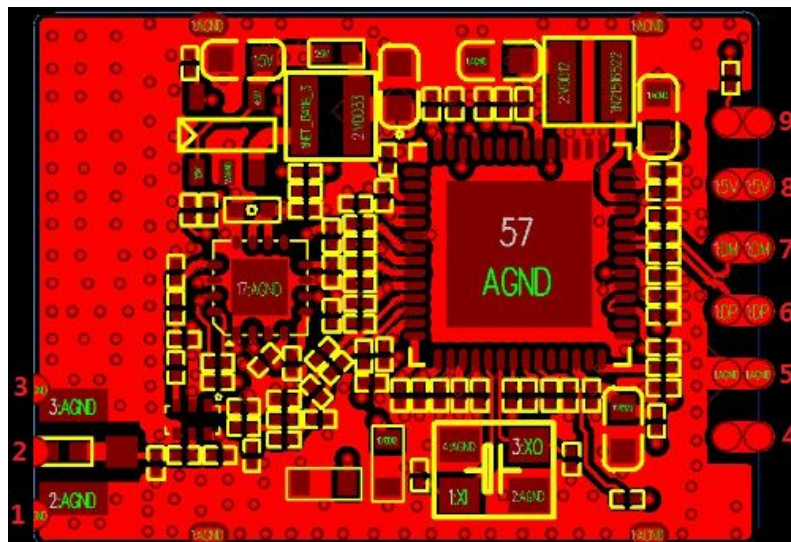
3. Mechanical Specification

3.1 Outline Drawing(unit: mm)



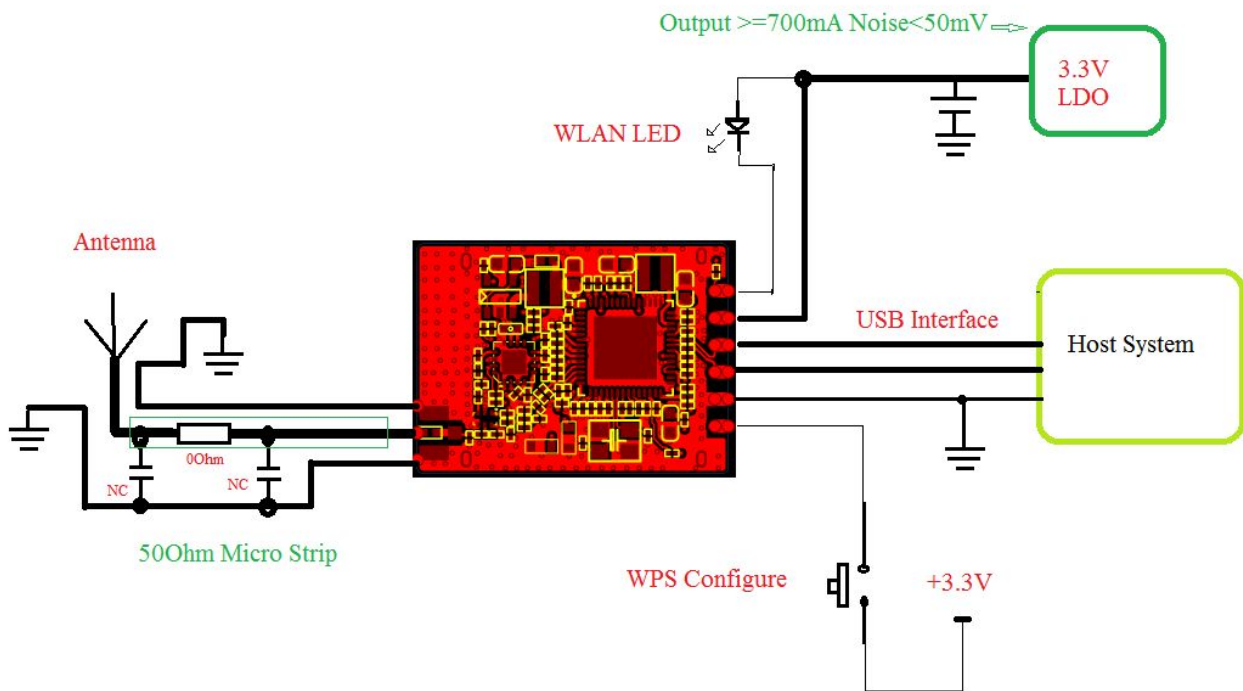


3.2 Connector Pin Definition



Pin #	Name	Description
1	GND	Ground
2	RF	Antenna
3	GND	Ground
4	PB	WPS
5	GND	Ground
6	DP	USB+
7	DM	USB-
8	VDD	3.3V Input
9	LED	LED PIN

3.3 Typical Application Circuit



4. Environmental Requirements

4.1 Operating & Storage Conditions

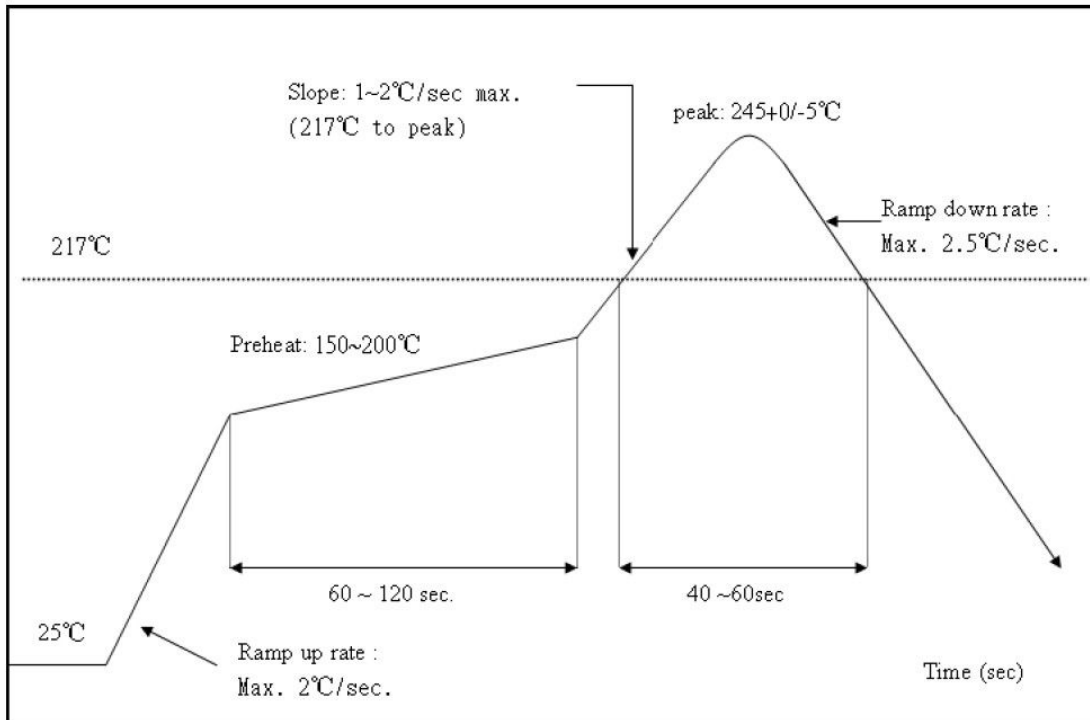
Operating	Temperature: -5°C to +55°C
	Relative Humidity: 10-90% (non-condensing)
Storage	Temperature: -40°C to +80°C (non-operating)
	Relative Humidity: 5-90% (non-condensing)
MTBF (Mean Time Between Failures)	Over 150,000hours

4.2 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : $< 250^{\circ}\text{C}$

Number of Times : ≤ 2 times



4.3 Patch WIFI modules installed before the notice:

WIFI module installed note:

1. Please press 1 : 1 and then expand outward proportion to 0.7 mm, 0.12 mm thickness When open a stencil
2. Take and use the WIFI module, please insure the electrostatic protective measures.
3. Reflow soldering temperature should be according to the customer the main size of the products, such as the temperature set at $250 \pm 5^\circ\text{C}$ for the MID motherboard.

About the module packaging, storage and use of matters needing attention are as follows:

1. The module of the reel and storage life of vacuum packing: 1). Shelf life: 8 months, storage environment conditions: temperature in: $< 40^\circ\text{C}$, relative humidity: $< 90\%$ r.h.
2. The module vacuum packing once opened, time limit of the assembly:
 - 1) check the humidity display value should be less than 30% (in blue), such as: 30% ~ 40% (pink), or greater than 40% (red) the module have been moisture absorption.
 - 2) factory environmental temperature humidity control: $\leq 30^\circ\text{C}$, $\leq 60\%$ r.h..
 - 3) Once opened, the workshop the preservation of life for 168 hours.
3. Once opened, such as when not used up within 168 hours:
 - 1) The module must be again to remove the module moisture absorption.
 - 2) The baking temperature: 125°C , 8 hours.
 - 3) After baking, put the right amount of desiccant to seal packages.

5. Package

TBD...