

Product Specification

Project Name	802.11a/b/g/n/ac 2T2R WIFI Module
Model NO	W21 (USB2.0 Interface)
Customer	
Customer's Part NO	

Approved:	Check:	Draft:
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Feedback of customer's Confirmation		
We accept the specification after Confirmed.		
Customer	Customer signature	Approved Date

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0. Revision History

REV NO	Date	Modifications	Approved	Draft
Rev1.0	Mar.5 2015	The First Released		
Rev1.1	Mar.24 2015	Update the outline drawing		

0.1 MODEL NO DIFINITION

EXAMPLE: W21

Z	12A	S	U	M	1	3	-W	1
							Control NO: 0, 1, 2....	
							Antenna: W External, B Print ANT	
							Voltage: 3 3.3Vdc, 5 5Vdc	
							Product NO: 1, 2, 3....	
							Product Type: M Module, D Dongle	
							Interface: S SDIO, U USB, E PCI-E	
							IC Version: D	
							IC Part NO: RTL8812AU	
							Manufacturer:ZAPO	

1. Introduction

W21 is a highly integrated single-chip MIMO (Multiple In, Multiple Out) Wireless LAN(WLAN) USB2.0 network interface controller complying with the wireless very high throughput IEEE 802.11ac Draft 2.0 and 802.11n specifications. The RTL8812AU provides a complete solution for a high-performance wireless client and also supports WIFI Direct feature that can easily build a WIFI P2P PAN network.

1.1 Overview

The general hardware for the module is shown in Figure 1. This WLAN Module design is based on Realtek RTL8812AU. It is a highly integrated single-chip MIMO Wireless LAN (WLAN) USB2.0 network interface controller complying with the 802.11a/b/g/n/ac specification. It combines a MAC, a 2T2R capable baseband, support 2.4G & 5G band, and RF in a single chip. It is designed to provide excellent performance and enhance the advantages of robust system and cost-effective.

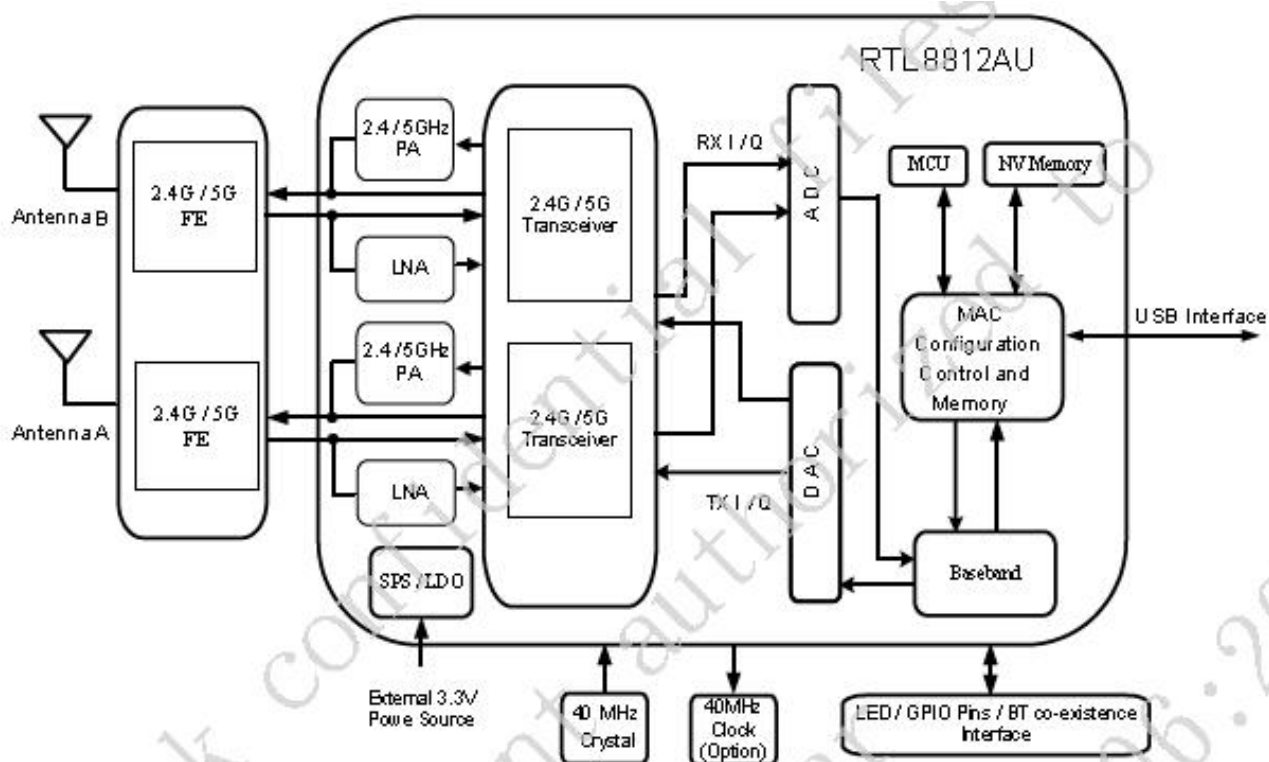


Figure 1. Dual-Band MIMO 2x2 Solution—RTL8812AU (11ac 2x2 MAC/BB/RF + PA)

1.2 SPECIFICATION REFERENCE

This specification is based on additional references listed as below.

- IEEE 802.11a
- IEEE 802.11b
- IEEE 802.11g
- IEEE 802.11n
- IEEE 802.11ac
- IEEE 802.11e(WMM)、
- IEEE 802.11i(WPA,WPA2)
- IEEE 802.11hTPC
- IEEE 802.11k、WAPI

2. GENERAL SPECIFICATION

2.1 WiFi Specifications

Features	Descriptions	
Main Chipset	Realtek RTL8812AU-VS-CG	
Operating Frequency	2.4G: 2.4000GHz~2.4835GHz 5G: 5.150GHz~5.825GHz	
Host Interface	USB2.0	
WIFI Standard	IEEE802.11a/b/g/n/ac 2T2R	
2.4G/5G At the same time work	Nonsupport	
Modulation	802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps) 802.11 a/g: OFDM 802.11n: MCS0-7 802.11ac: MCS0-9	
PHY Data rates	802.11a: 54,48,36,24,18,12,9,6 Mbps 802.11b: 11,5.5,2,1 Mbps 802.11g: 54,48,36,24,18,12,9,6 Mbps 802.11n: 6.5~300Mbps 802.11ac: up to 866.7Mbps	
Transmit Output Power	802.11b@11Mbps 16±2dBm 802.11g@54Mbps 14±2dBm 802.11n@65Mbps 13±2dBm (MCS 0_HT20) 13±2dBm (MCS 7_HT20) 13±2dBm (MCS 0_HT40) 13±2dBm (MCS 7_HT40) 802.11a@54Mbps 14±2dBm 802.11ac@MCS9 13±2dBm	
EVM	802.11b /11Mbps : EVM ≤ -9dB 802.11a/g /54Mbps : EVM ≤ -25dB 802.11n /MCS7 : EVM ≤ -28dB 802.11ac /MCS9 : EVM ≤ -32dB	
Receiver Sensitivity Bandwidth: 20MHz	802.11b@8% PER 1Mbps ≤ -88dBm 2Mbps ≤ -87dBm 5.5Mbps ≤ -85dBm 11Mbps ≤ -82dBm	
	802.11g@10% PER 6Mbps ≤ -86dBm 9Mbps ≤ -85dBm 12Mbps ≤ -84dBm 18Mbps ≤ -82dBm 24Mbps ≤ -80dBm 36Mbps ≤ -77dBm 48Mbps ≤ -73dBm 54Mbps ≤ -71dBm	802.11a@10% PER 6Mbps ≤ -86dBm 9Mbps ≤ -85dBm 12Mbps ≤ -84dBm 18Mbps ≤ -82dBm 24Mbps ≤ -80dBm 36Mbps ≤ -77dBm 48Mbps ≤ -73dBm 54Mbps ≤ -71dBm

	802.11n 2.4G @10% PER MCS 0 ≤ -83dBm MCS 1 ≤ -82dBm MCS 2 ≤ -80dBm MCS 3 ≤ -78dBm MCS 4 ≤ -75dBm MCS 5 ≤ -71dBm MCS 6 ≤ -69dBm MCS 7 ≤ -67dBm	802.11n 5G @10% PER MCS 0 ≤ -83dBm MCS 1 ≤ -82dBm MCS 2 ≤ -80dBm MCS 3 ≤ -78dBm MCS 4 ≤ -75dBm MCS 5 ≤ -71dBm MCS 6 ≤ -69dBm MCS 7 ≤ -67dBm
Receiver Sensitivity Bandwidth: 40MHz	802.11n 2.4G @10% PER MCS 0 ≤ -80dBm MCS 1 ≤ -79dBm MCS 2 ≤ -77dBm MCS 3 ≤ -75dBm MCS 4 ≤ -72dBm MCS 5 ≤ -68dBm MCS 6 ≤ -66dBm MCS 7 ≤ -64dBm	802.11n 5G @10% PER MCS 0 ≤ -80dBm MCS 1 ≤ -79dBm MCS 2 ≤ -77dBm MCS 3 ≤ -75dBm MCS 4 ≤ -72dBm MCS 5 ≤ -68dBm MCS 6 ≤ -66dBm MCS 7 ≤ -64dBm
Receiver Sensitivity Bandwidth: 80MHz	802.11ac 5G @10% PER MCS 0 ≤ -76dBm MCS 1 ≤ -73dBm MCS 2 ≤ -71dBm MCS 3 ≤ -68dBm MCS 4 ≤ -64dBm MCS 5 ≤ -60dBm MCS 6 ≤ -59dBm MCS 7 ≤ -58dBm MCS 8 ≤ -53dBm MCS 9 ≤ -51dBm	
RF Antenna	External Antenna	
OS Support	Android / Win CE /iOS /Linux/Windows 2000/XP/WIN7	
Security	WEP,TKIP,AES,WPA,WPA2	
Dimension	Typical L27.0*W20.0*T3.5mm (Without PIN header)	

2.2 Power Consumption

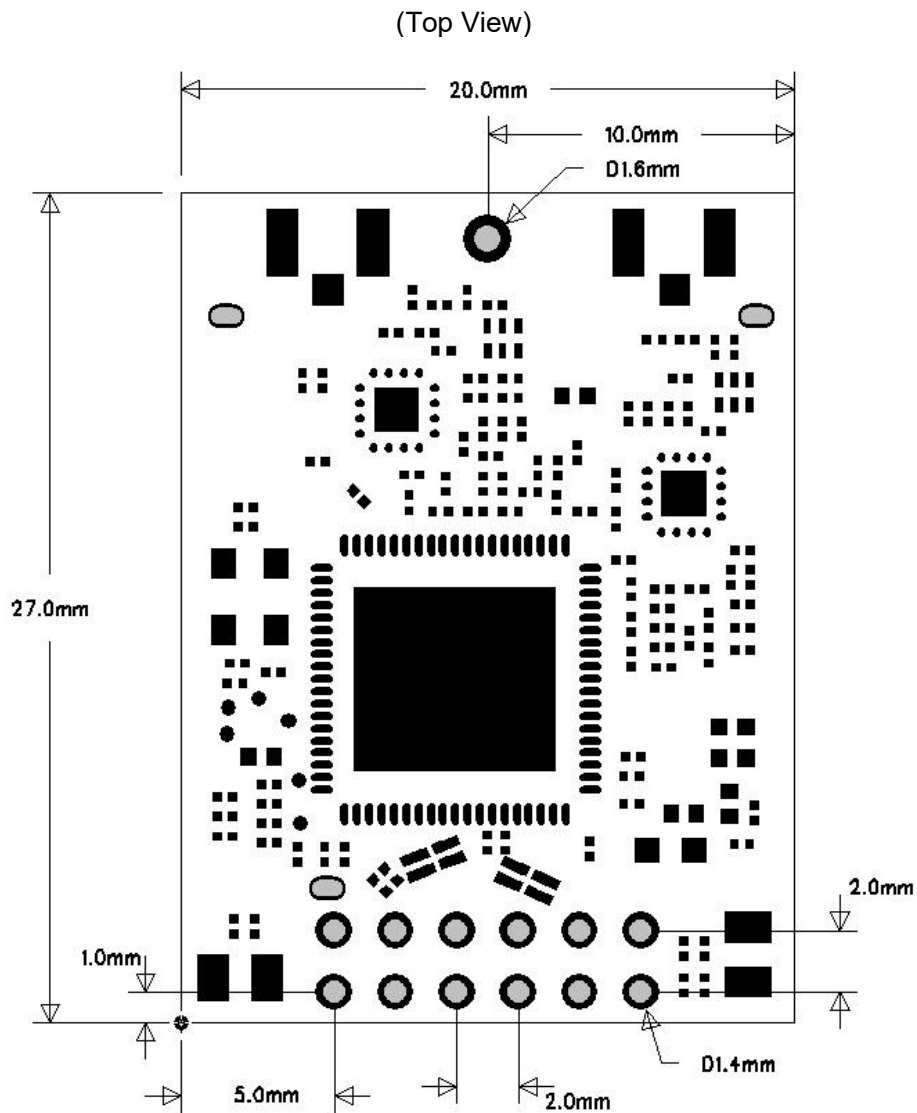
Test Environment: Win XP SP3、Voltage:3.3V

Mode		Current (mA)
2.4G	LINK	170
	Tx (CCK 11M)	330
	Tx (OFDM 54M)	180
	Tx (MCS7 20M)	200
	Tx (MCS7 40M)	180
	Rx	170
5 G	LINK	220
	80M MCS0	400
	80M MCS9	270
	40M MCS0	550
	40M MCS15	320

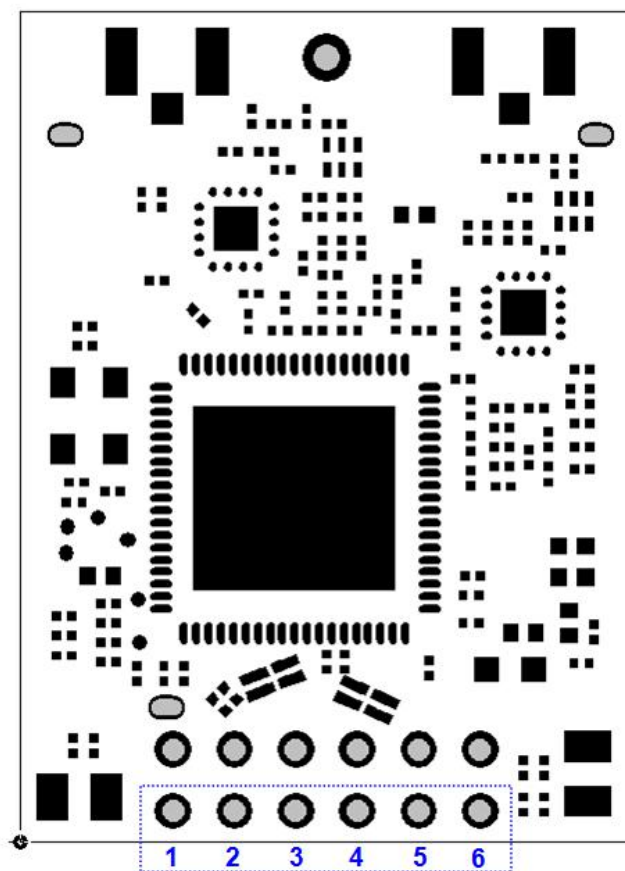
	20M MCS0	440
	20M MCS15	340
Disable		30

3. Mechanical Specification

3.1 Outline Drawing

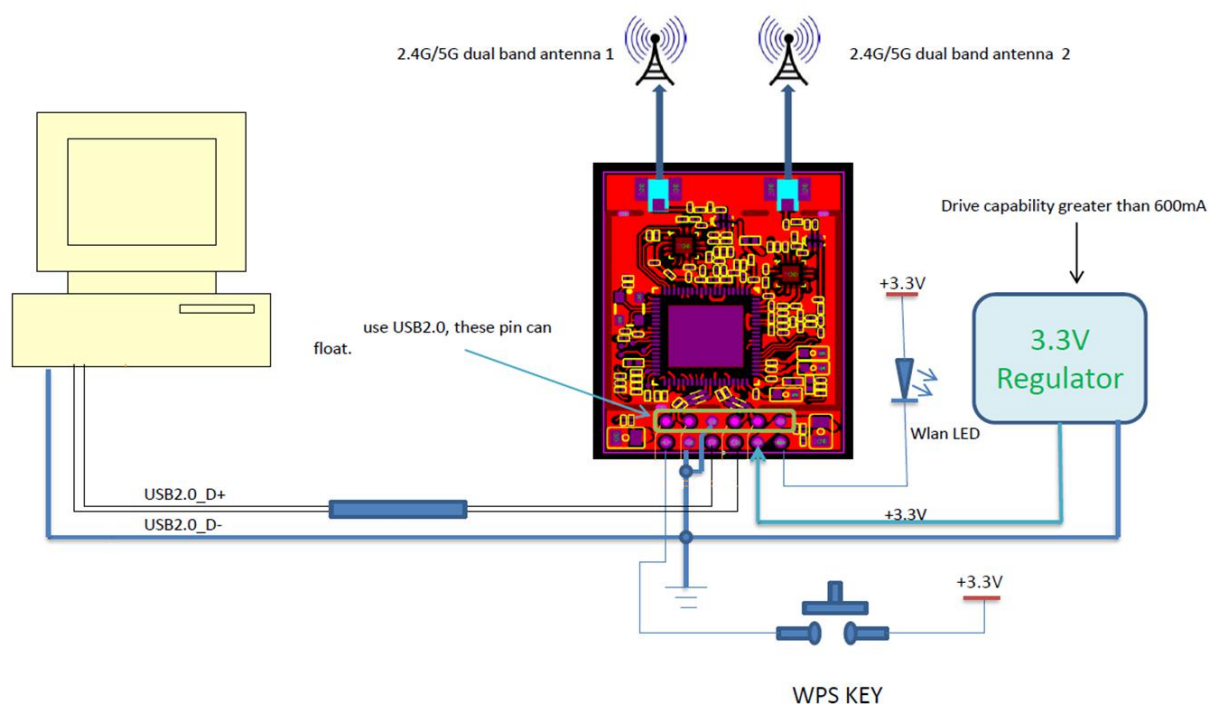


3.2 Connector Pin Definition



Pin #	Name	Description
1	PB-P2	WPS Switch (high potential)
2	GND	Ground
3	DP	USB Data +
4	DM	USB Data -
5	3.3VCC	3.3V Power Supply
6	LED	External LED control

3.3 Typical application circuit



4. Environmental Requirements

4.1 Operating& Storage Conditions

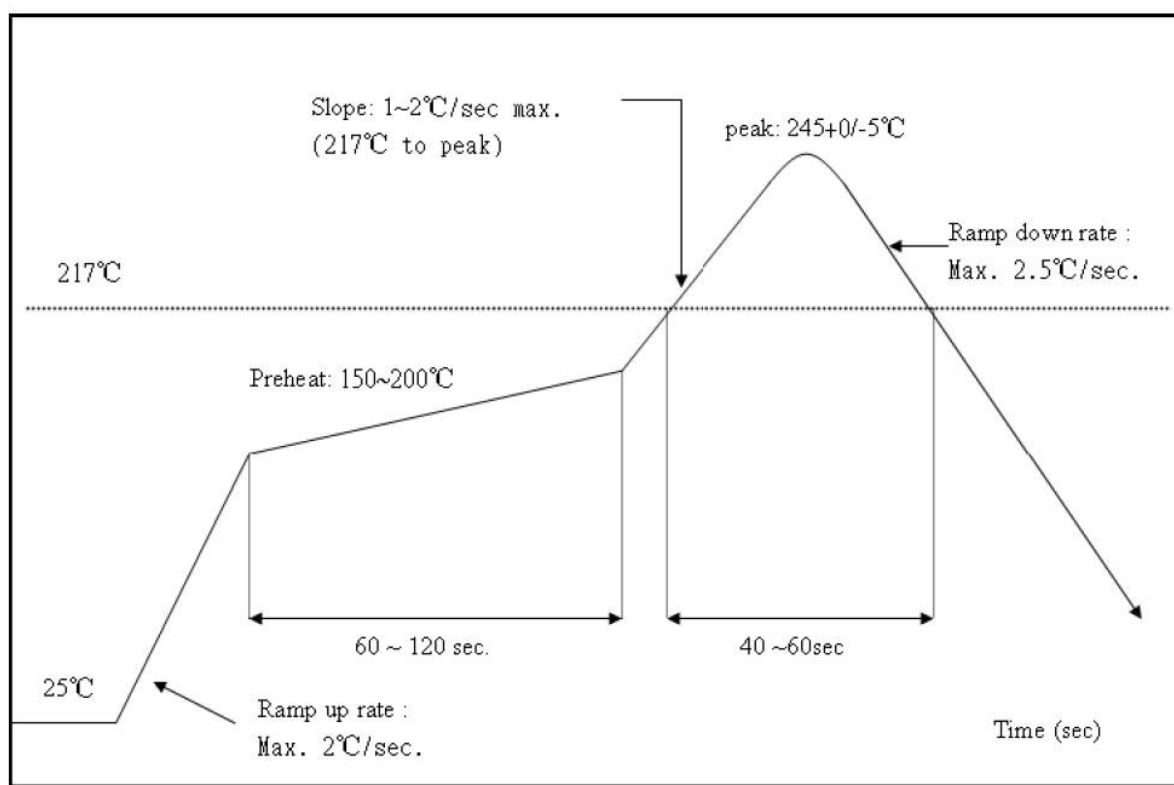
Operating	Temperature: 0°C to +70°C
	Relative Humidity: 10-90% (non-condensing)
Storage	Temperature: -40°C to +80°C (non-operating)
	Relative Humidity: 5-90% (non-condensing)
MTBF (Mean Time Between Failures)	Over 150,000hours

4.2 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <250°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 + 5 °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 °C, relative humidity: < 90%RH.
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: ≤ -30 °C, ≤ 60% RH.
 - 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...