HK NATER TECH LIMITED

NT-AR1021X-PA Specification

Customer: _____

Description: NT-USB-AR1021X-5.8G-PA

Customer P/N:_____

Date: _____

Customer		
Approve	Auditing	Admit

Provider		
Approve	Auditing	Admit

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NT-USB-AR1021X-5.8G-PA

Product Specification

802.11a /n USB Module

Version 1.1

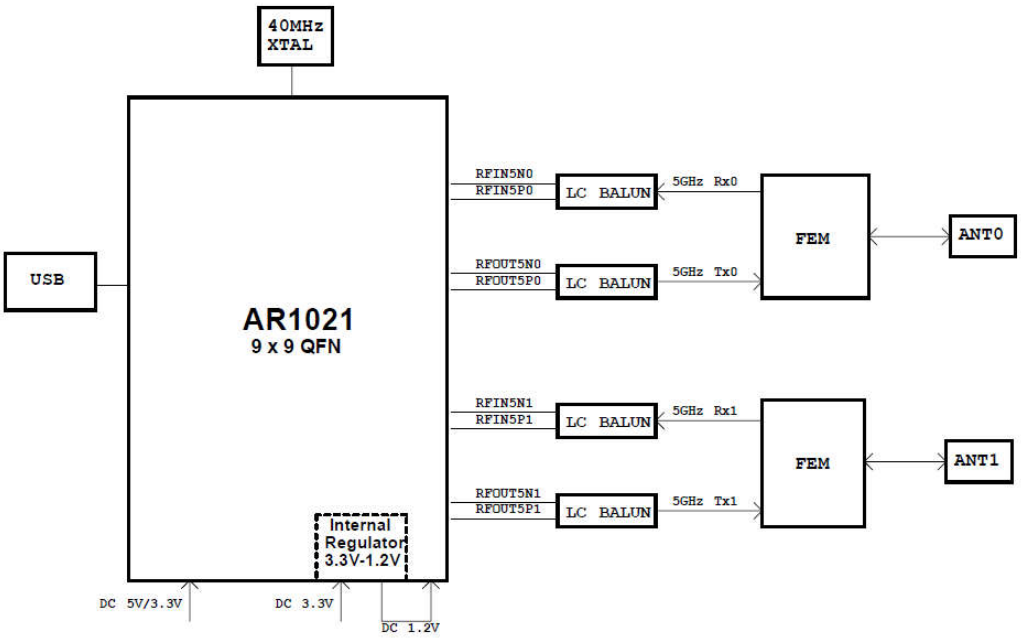
1. Product Overview

The module NT-USB-AR1021X-5.8G-PA provides wireless modem functionality for CE applications utilizing direct sequence spread spectrum and OFDM/CCK technology. The module supports IEEE 802.11a/n protocol. Data rate of up to 54Mbps for 802.11a and 144.4Mbps for 802.11n HT20,300Mbps for HT40. The module is based on QualcommAtheros AR1021X which is highly integrated,system-on-a -chip solution for 5GHz IEEE 802.11n 2x2 MIMO WLAN.

2. Module Hardware Overview

2.1 Block Diagram

The general Hardware architecture is shown below Figure:



Module Block Diagram

2.2 Features

- IEEE802.11a/n (2X2) based on QualcommAtheros AR1021X solution
- USB 2.0 Interface, High and Full Speeds supported
- Module is powered by the host with a 5V and 3.3V +/- 10% supply.
- Internal OTP memory for calibration data
- Advanced power management to minimize standby,sleep and active power
- Security support for WPS,WPA2,WPA,WAP and protected management frames
- Full 802.11e QoS support including WMM and U-APSD
- Support for the IEEE 802.11e,h,i,j
- WEP,TKIP,and AES hardware encryption
- Support Ad hoc and infrastructure mode

2.3 Interface

◆ Interface

■ Interface: Half Hole

■ Antenna: IPEX connector

◆ Pin definition

From Module TOP View

Pin Number	Symbol Name	Status	Pin Description
1	GND	P	Ground pad
2	5V	P	FEM power supply. Suggest to separate from other power supply
3,4	NC	/	Rerseverd, please keep it floating
5	GND	P	Ground pad
6	USB_DP	I/O	USB D+ signal
7	USB_DN	I/O	USB D- signal
8	3.3V	P	Analog 3.3V power supply
9	CHIP_PWD_L	I	Reset, low active
10	GND	P	Ground pad
11	GND	P	Ground pad

3. Electrical Specification

3. 1 Recommended operating rating

Element	Symbol	Min	Typ	Max	Unit
DC supply voltage	3.3V	3.0	3.3	3.6	(V)
DC supply voltage	5V	3.9	5.0	5.5	(V)

3. 2 DC Characteristics

Parameter	Power	Min	Typ	Max	Unit
Standby	5V	--	3.3	--	(mA)
	3.3V	--	5.0	--	(mA)
Continuous Tx Current 5GHz(Dual Chain)	5V	--	--	670	(mA)
	3.3V	--	--	410	(mA)
Continuous Rx Current 5GHz(Dual Chain)	5V	--	20	--	(mA)
	3.3V	--	120	--	(mA)

3. 3 Environment Storage Condition

Environment condition	
Temperature	Operating Temperature: -10 deg.C ~70 deg.C
	Storage Temperature: -40 deg.C ~80 deg.C
Humidity	Operating Humidity: 5% ~95% (Non-condensing)
	Storage Humidity: 5% ~95% (Non-condensing)

4. RF Specification

4.1 Rx Characteristics

Parameter	Min.	Typ.	Max.	Unit
Rx input frequency range	5.150	-	5.825	GHz
RX Characteristics	Min.	Typ.	Max.	Unit
1.Minimum Input Level Sensitivity				
1) 802.11a, 54Mbps(PER ≤ 10%)	-	-80	-71	dBm
2) 802.11n, HT20-MCS0(PER ≤ 10%)	-	-97	-89	dBm
3) 802.11n, HT20-MCS7(PER ≤ 10%)	-	-76	-67	dBm
4) 802.11n, HT40-MCS0(PER ≤ 10%)	-	-93	-85	dBm
5) 802.11n, HT40-MCS7(PER ≤ 10%)	-	-73	-64	dBm
2. Maximum Input Level (PER ≤ 8%)				
1) 802.11a, 54Mbps(PER ≤ 10%)	-30	-	-	dBm
2) 802.11n,5G,HT20-MCS7(PER ≤ 10%)	-30	-	-	dBm
3) 802.11n,5G,HT40-MCS7(PER ≤ 10%)	-30	-	-	dBm

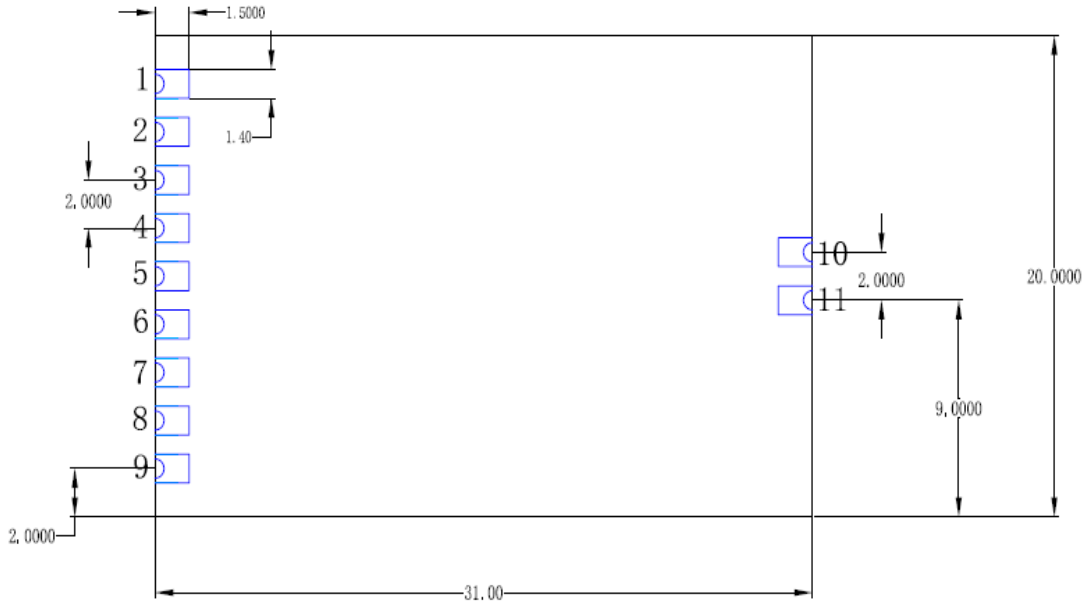
4.2 Tx Characteristics

Parameter	Min.	Typ.	Max.	Unit
Tx input frequency range	5.150	-	5.825	GHz
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels				
1) 802.11a, Target Power@6Mbps	21	23	25	dBm
2) 802.11a, Target Power@54Mbps	16	18	20	dBm
3)802.11n,Target Power@HT20-MCS0	20	22	24	dBm
4)802.11n,Target Power@HT20-MCS7	15	17	19	dBm
5)802.11n,Target Power@HT40-MCS0	19	21	23	dBm
6)802.11n,Target Power@HT40-MCS7	15	17	19	dBm
2. Frequence Error	-20	-	+20	ppm
3. Modulation Accuracy(EVM)@Target Power				
1) 802.11g, 54Mbps	-	-31	-25	dB
4) 802.11n, HT20-MCS7	-	-31	-28	dB
5) 802.11n, HT40-MCS7	-	-32	-28	dB

4.3 Mechanical Specifications

PCB Assembly Dimension:

- Dimension (L x W x H): L:31.0mm* W:20.0mm



Environmental Requirements and Specifications TP Content

1 Temperature

1.1 Operating Temperature Conditions

The product shall be capable of continuous reliable operation when operating in ambient temperature of -10℃ to +70℃.

1.2 Non-Operating Temperature Conditions

Neither subassemblies shall be damaged nor shall the operational performance be degraded when restored to the operating temperature when exposed to storage temperature in the range of -45℃ to +135℃.

2 PCB Bending

The PCB bending spec shall be keep planeness under 0.1mm for both NATER and end assembly customer.

3 Handling environment

3.1. ESD

Symbol	Ratings	Max	Unit
V_{ESD}(HBM)	Electrostatic discharge voltage (human body model)	2000	V
V_{ESD}(CDM)	Electrostatic discharge voltage (charge device model)	500	

Please handle it under ESD protection environment.

3.2. Terminals

The product is mounted with motherboard through half hole. In order to prevent poor soldering, please do not touch the pad by hand.

3.3. Falling

It will cause damage on the mounted components when the product is falling or receiving drop shock. It may cause the product mal-function.

4 Storage Condition

4.1 Moisture barrier bag before opened

Moisture barrier bag must be stored under 30 degree C, humidity under 85% RH. The calculated shelf life for the dry packed product shall be a 12 months from the bag seal date.

4.2. Moisture barrier bag open

Humidity indicator cards must be blue, <30%.

5 Baking Condition

Products require baking before mounting if

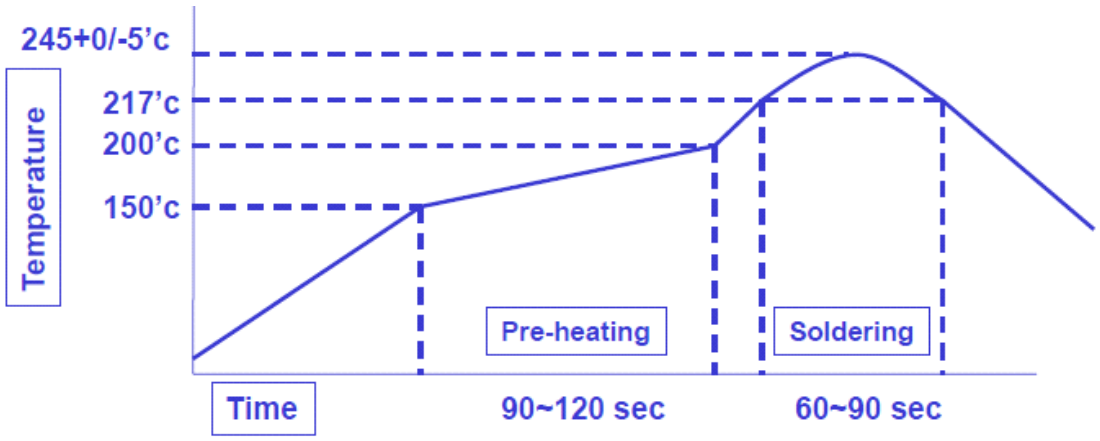
a) humidity indicator cards reads >30%

b) temp <30 degree C, humidity < 70% RH, over 96 hours

Baking condition: 90 degree C, 12-24 hours

Baking times: 1 time

6 Soldering and reflow condition



- Follow the solder paste composition to set the reflow profile
- Lead free solder paste(SAC305, SAC387 or SAC405) reflow profile setting as above :
  - Ramp up rate (to Peak temp) : < 1.2'c/sec, typically
  - Time above Liquidus(217'C) : 60~90Sec
  - Peak Temp : 245+0/-5'C
  - Ramp-down rate (Peak to RT) : 1~3'C/sec, typically