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Product Specification

IEEE 802.11b/g/n 1T1R USB WiFi Module

Project Name	AltoBeam ATBM6022 802.11n WIFI Module
Model NO	<u>HR6022</u>
Customer	
Customer's Part NO	

<u>Approved:</u> SYMEN SONG	<u>Reviewed:</u> MIGAO	<u>Drafted:</u> JUSTIN
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Customer	Customer signature	Approved Date

INDEX

0. REVISION HISTORY.....	3
1. INTRODUCTION.....	4
1.1 OVERVIEW.....	4
1.2 SPECIFICATION REFERENCE.....	4
1.3 SYSTEM CHARACTERISTICS.....	5
2. MECHANICAL SPECIFICATION.....	6
2.1 OUTLINE DRAWING.....	6
2.2 CONNECTOR PIN DEFINITION.....	6
2.3 Layout reference.....	7
3. RF SPECIFICATION.....	7
3.1 TRANSMITTER POWER.....	8
3.2 EVM.....	9
3.3 TRANSMIT CENTER FREQUENCY TOLERANCE.....	9
3.4 RECEIVER SENSITIVITY.....	10
3.5 POWER CONSUMPTION.....	10
4. PACKAGE.....	11
5. USER'S MANUAL.....	12

0. Revision History

REV NO	Date	Modifications	Draft	Approved
Rev1.0	2017-9-13	First Released		JUSTIN

1. Introduction

HR6022 is a highly integrated and excellent performance Wireless LAN (WLAN) USB2.0 network interface device. High-speed wireless connection up to 150 Mbps.

1.1 Overview

The general hardware for the module is shown in Figure 1. This WLAN Module design is based on AltoBeam ATBM6022. It is a highly integrated single-chip 1*1 MIMO (Multiple In Multiple Out) Wireless LAN (WLAN) USB2.0 network interface controller complying with the 802.11n specification. It combines a MAC, a 1T1R capable baseband, and RF in a single chip. It is designed to provide excellent performance with low power Consumption and enhance the advantages of robust system and cost-effective.

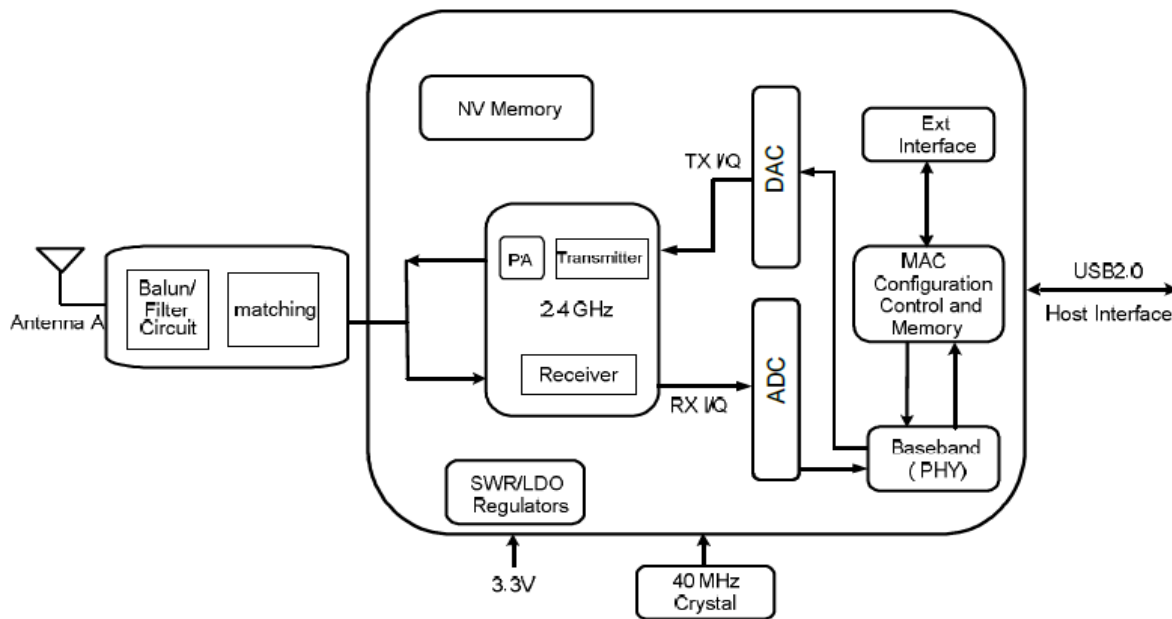


Figure 1. Single-Band 11n (1x1) Solution

1.2 SPECIFICATION REFERENCE

This specification is based on additional references listed as below.

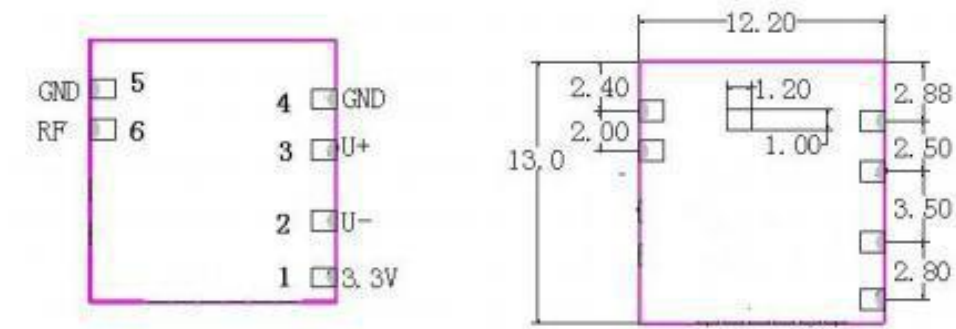
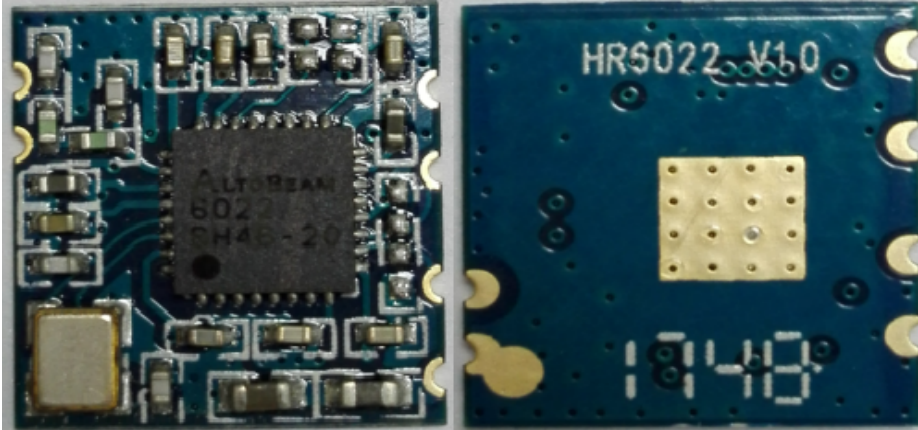
- iIEEE 802.11b
- iIEEE 802.11g
- iIEEE 802.11n

1.3 System Characteristics

Main Chipset	AltoBeam ATBM6022
Operating Frequency	2.412~2.484GHz
WIFI Standard	iEEE802.11b/g/n 1*1
Modulation	802.11b: CCK(11, 5.5Mbps), QPSK(2Mbps), BPSK(1Mbps) 802.11 g/n: OFDM
PHY Data rates	802.11b: 11,5.5,2,1 Mbps 802.11g: 54,48,36,24,18,12,9,6 Mbps 802.11n: up to 150Mbps
Receiver Sensitivity	130M : -70dBm@10% PER; 108M : -70dBm@10% PER; 54M : -70dBm@10% PER; 11M: -87dBm@8% PER; 6M: -90dBm@10% PER; 1M: -92dBm@8% PER
Host Interface	USB 2.0
Operation Range	Up to 150meters in open space
RF Power	<14dBm@11n,<18dBm@11b,<15dBm@11g
RF Antenna	External Antenna (2.4GHz 50Ohm Resistance)
OS Support	Android / Linux
Security	WEP,TKIP,AES,WPA,WPA2
Power Consumption	3.3Vdc 80mA Max
Operating Temperature	-20~ +70°C Ambient Temperature
Storage Temperature	-40~ +70°C Ambient Temperature
Humidity	5% to 90%maximum (non-condensing)
Dimension	Typical L13.00*W12.20*H2.00mm

2. Mechanical Specification

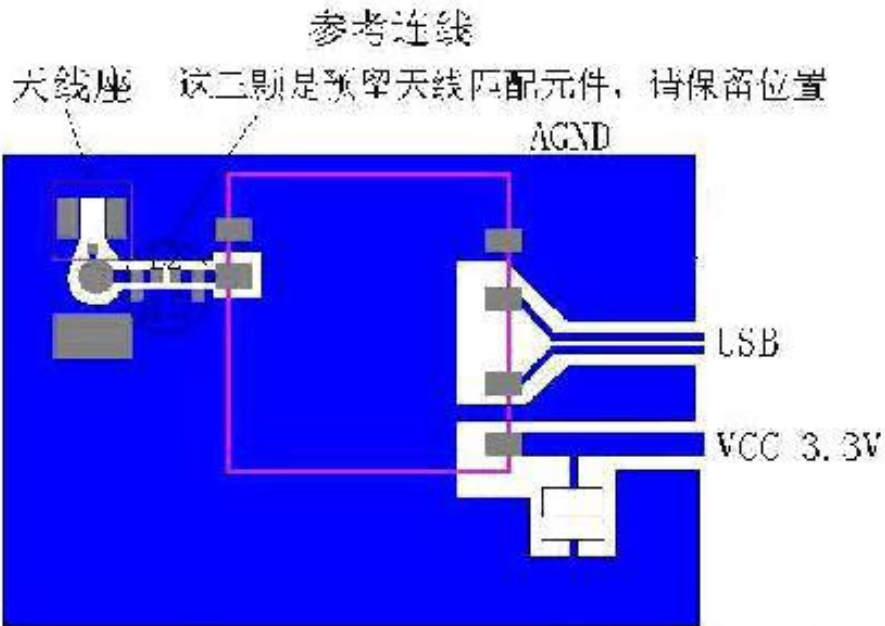
2.1 Outline Drawing L13mm*W12.2mm



2.2 Connector Pin Definition

Pin #	Name	Description
1	Vbus	3.3V DC power supply input
2	D-	USB Data DN
3	D+	USB Data DP
4	GND	Ground
5	RF GND	RF Ground
6	ANT1	External Antenna (2.4GHz 50Ohm)

2.3 Layout reference



备注: RF输出走线尽量取短, 保持50欧姆阻抗。

3. RF Performance

3.1 Transmitter Power (Unit in dBm) (Typical 1,6,13 Channel)

11b Mode (Spec ≥ 14 dBm)

mode	Rate	Channel 1	Channel 6	Channel 13
11b CCK	1Mbps	19.1	19.2	19.1
	2Mbps	18.8	18.9	18.8
	5.5Mbps	18.3	18.5	18.6
	11Mbps	17.8	17.9	17.8

11g Mode (Spec ≥ 12 dBm)

Mode	Rate	Channel 1	Channel 6	Channel 13
11g OFDM	6Mbps	16.5	16.6	16.5
	18Mbps	16.4	16.5	16.4
	36Mbps	15.5	15.6	16.5
	54Mbps	14.8	14.9	14.8

11n 20MHz Mode (Spec \geq 10dBm)

Mode	Rate	Channel 1	Channel 6	Channel 13
11n 20MHz	MCS0	14.5	14.3	14.4
	MCS3	14.3	14.4	14.3
	MCS5	14.5	14.2	14.5
	MCS7	14.3	14.5	14.4

11n 40MHz Mode (Spec \geq 10dBm)

Mode	Rate	Channel 1	Channel 6	Channel 13
11n 40MHz	MCS0	14.6	14.4	14.3
	MCS3	14.5	14.2	14.4
	MCS5	14.3	14.5	14.6
	MCS7	14.5	14.2	14.0

3.2 EVM

11b Mode: unit in % (Spec \leq 10%)

Mode	Rate	Channel 1	Channel 6	Channel 13
11b CCK	1Mbps	5.2	5.3	5.5
	2Mbps	5.4	5.3	5.5
	5.5Mbps	5.6	5.3	5.5
	11Mbps	5.9	5.6	5.9

11g Mode: unit in dB (Spec \leq -25dB)

Mode	Rate	Channel 1	Channel 6	Channel 13
11g OFDM	6Mbps	-29.3	-29.5	-29.1
	18Mbps	-29.2	-29.5	-29.3
	36Mbps	-29.5	-29.9	-29.1
	54Mbps	-31.5	-31.2	-31.0

11n 20MHz Mode: unit in dB (Spec \leq -25dB)

Mode	Rate	Channel 1	Channel 6	Channel 13
11n 20MHz	MCS0	-29.3	-29.5	-29.5
	MCS3	-29.2	-29.5	-29.4
	MCS5	-29.3	-29.5	-29.1
	MCS7	-30.1	-30.4	-30.0

11n 40MHz Mode: unit in dB (Spec \leq -25dB)

Mode	Rate	Channel 1	Channel 6	Channel 13
11n 40MHz	MCS0	-29.3	-29.2	-29.1
	MCS3	-29.4	-29.4	-29.4
	MCS5	-29.5	-29.5	-29.6
	MCS7	-31.3	-31.2	-31.1

3.3 Transmit Center Frequency Tolerance

11g transmit center frequency tolerance test result:

Channel	CH6
Result(ppm)	0.65
Frequency tolerance	1.57KHz
Pass/Fail	PASS

11n transmit center frequency tolerance test result:

Channel	CH6
Result(ppm)	0.71
Frequency tolerance	1.73KHz
Pass/Fail	PASS

3.4 Receiver Sensitivity (Unit in dBm)

11b Mode: 1RX (Spec \leq -75dBm)

Mode	Rate	Channel 1	Channel 6	Channel 13
11b	1Mbps	-93	-93	-93
	2Mbps	-91	-91	-91
	5.5Mbps	-89	-89	-89
	11Mbps	-85	-85	-85

11g Mode: 1RX (Spec \leq -65dBm)

Mode	Rate	Channel 1	Channel 6	Channel 13
11g	6Mbps	-90	-90	-90
	9Mbps	-90	-90	-90
	12Mbps	-89	-89	-89

	18Mbps	-86	-86	-86
	24Mbps	-79	-79	-79
	36Mbps	-75	-75	-75
	48Mbps	-71	-71	-71
	54Mbps	-70	-70	-70

11n 20MHz Mode: 1RX (Spec \leq -65dBm)

Mode	Rate	Channel 1	Channel 6	Channel 13
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11n 20MHz	MCS0	-85	-85	-85
	MCS1	-82	-82	-82
	MCS2	-80	-80	-80
	MCS3	-77	-77	-77
	MCS4	-73	-74	-74
	MCS5	-69	-69	-69
	MCS6	-68	-68	-68
	MCS7	-66	-66	-66

11n 40MHz Mode: 1RX (Spec \leq -60dBm)

Mode	Rate	Channel 1	Channel 6	Channel 13
11n 40MHz	MCS0	-83	-83	-83
	MCS1	-80	-80	-80
	MCS2	-77	-77	-77
	MCS3	-75	-75	-75
	MCS4	-71	-71	-71
	MCS5	-67	-67	-67
	MCS6	-65	-65	-65
	MCS7	-63	-63	-63

3.5 Power Consumption

Mode	Status	Power(mW)	Note
OS Android	Link Rx/ Tx	3.3Vdcx70mA = 214.50mW	20M
		3.3Vdcx80mA = 231.00mW	40M

4.0 Package

4.1 blister packaging 吸塑包装

A piece of 100 PCS

4.2 the take-up package 卷带包装

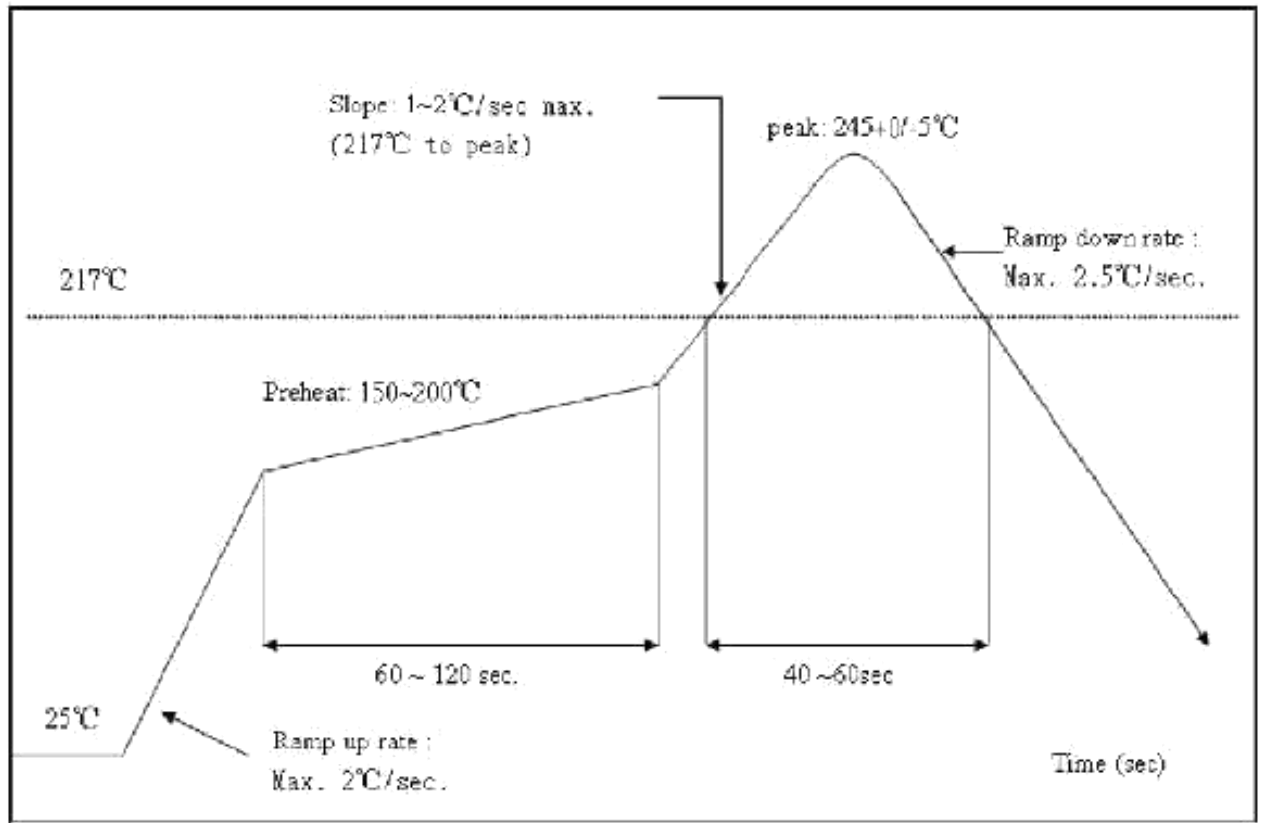


A roll of 2000pcs

5.0 User's Manual

5.1 Recommended Reflow Profile
Referred to IPC/JEDEC standard.
Peak Temperature : <math><250^{\circ}\text{C}</math>
Number of Times : ≤ 2 times

<http://www.huaray.com.cn>



5.2 Patch WIFI modules installed before the notice:

- 1, the customer must be at the time of open stencil will hole up WIFI module bonding pad, please press 1 to 1 and 0.7 Mm is widened to open outward, the thickness of 0.12 Mm.
- 2, have a need to get WIFI modules must not be light to get WIFI module, be sure to wear gloves and electrostatic ring.
- 3, on the size of the furnace temperature according to the customer the mainboard, generally stick on the tablet like 250 + - 5 degrees.

About the module packaging, storage and use control should pay attention to the following matters:

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% r.h.

2. The module vacuum packing once opened, time limit of the assembly:

Card: 1) check the humidity display value should be less than 30% (in blue), such as: 30% ~ 40% (pink), or greater than 40% (red) module has moisture absorption.

2.) factory environmental temperature humidity control: $\leq 30\%$ °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.

贴片 **WIFI** 模块装机的前注意事项:

- 1、客户在开钢网时一定要将 WIFI 模块焊盘的孔开大，请按 1 比 1 再向外扩大 0.7Mm 比例来开，厚度按 0.12Mm。
- 2、有需要拿 WIFI 模时一定要不要光着手去拿 WIFI 模块，一定要戴上手套及静电环。
- 3、过炉温度要根据客户主板的大小而定，一般像贴在平板电脑上 250+-5 度。

关于模块包装，储存以及使用管制应注意事项如下：1.模块的卷盘加真空包装之储存期限：1) .保存期限：8 个月，储存环境条件：温度在：<40℃，相对湿度： <90%R.H 2.模块真空包装拆封后，组装之时限：

1) .检查湿度卡：显示值应小于 30%（蓝色），如：30%~40%(粉红色) 或者大于 40%（红色）表示模块已吸湿气。

2) .工厂环境温度湿度管制：≦30%℃，≦60%R.H。3) .拆封后，车间的保存寿命为 168 小时。

3.拆封后，如未在 168 小时内使用完时：1) .模块须重新烘烤，以除去模块吸湿问题。

2) .烘烤温度条件：125℃，8 小时。3) .烘烤后，放入适量的干燥剂再密封包装。