



Registration  
No.788871

## MPE REPORT

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Report No.: SRTC2018-9004(F)-17122801(I)

Product Name: WLAN controller

Product Model: ATBM602X

Applicant: Altobeam(China) Inc.

Manufacturer: Altobeam(China) Inc.

Specification: FCC Part §2.1091, §1.1307(b)

FCC ID: 2AOXX-ATBM602X

The State Radio\_monitoring\_center Testing Center (SRTC)  
15th Building, No.30, Shixing Street, Shijingshan District, Beijing,  
P.R.China

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## **1. GENERAL INFORMATION**

### **1.1 Notes of the test report**

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The test results relate only to individual items of the samples which have been tested.

### **1.2 Information about the testing laboratory**

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, P.R.China
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### **1.3 Applicant's details**

Company:	Altobeam(China) Inc.
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### **1.4 Manufacturer's details**

Company:	Altobeam(China) Inc.
Address:	No. A1, A2, D, 8F, Building 2, 1# Yard, Wangzhuang Road, Haidian District, Beijing, China
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Tel:	+86 10 62707811 6674
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Email:	guorui@altobeam.com

## 2. DESCRIPTION OF THE DEVICE UNDER TEST

### 2.1 Final Equipment Build Status

#### WLAN

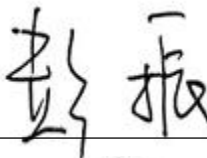


Frequency Range	2.412GHz~2.462GHz
Number of Channel	11
Modulation Type	DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM
Duplex Mode	TDD
Channel Spacing	5MHz
Data Rate	1Mbps/2Mbps/5.5Mbps/11Mbps/6Mbps/9Mbps/12Mbps /18Mbps/24Mbps/36Mbps/48Mbps/54Mbps/6.5Mbps /13.0Mbps/13.5Mbps/19.5Mbps/26.0Mbps/27.0Mbps /39.0Mbps/40.5Mbps/52.0Mbps/58.5Mbps/65Mbps /81.0Mbps/108.0Mbps/121.5Mbps/135.0Mbps
Antenna Type	Dipole Antenna
Antenna Gain	2dBi
Software Revision	WIFI_GUI3619_FW3630_HMAC3619
Hardware Revision	ATBM6012_USB_SOCKET_BOARD_20170707_V1.0
SN:	1#

### **3. REFERENCE SPECIFICATION**

Specification	Version	Title
2.1091	June 23, 2015	Radiofrequency radiation exposure evaluation: mobile devices.
1.1307(b)	Apr. 22, 1986	Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.
KDB447498 D01	v06	General RF Exposure Guidance

#### 4. RESULT SUMMARY

No.	Test case	FCC reference
1	MPE Calculation	FCC Part §2.1091, FCC Part §1.1307(b) KDB447498 D01

This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Ms.Liujia 
Tested by: Mr. Chang Taosha 	Issued date: 20180205

## **5. TEST RESULTS**

### **5.1 Average Power Output**

#### **5.1.1 Ambient condition**

Temperature	Relative humidity	Pressure
23°C	33%	101.5kPa

#### **5.1.2 Test Description**

A transmitter antenna terminal of EUT is connected to the power meter. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies.

#### **5.1.3 Test Procedure Used**

KDB 558074 D01 DTS Meas Guidance v04 – Section 9.2.3

#### **5.1.4 Test Settings**

The maximum average conducted output power may be measured using a broadband average RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

a) As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.

1) The EUT is configured to transmit continuously, or to transmit with a constant duty factor.

2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.

3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

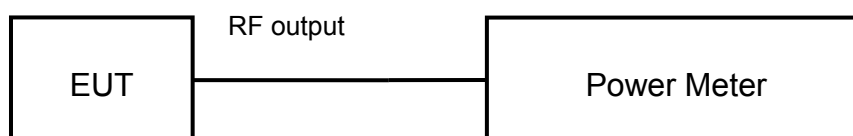
b) If the transmitter does not transmit continuously, measure the duty cycle (x) of the transmitter output signal as described in Section 6.0.

c) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

d) Adjust the measurement in dBm by adding  $10\log(1/x)$ , where x is the duty cycle to the measurement result.

#### **5.1.5 Test Setup**

The EUT and measurement equipment were set up as shown in the diagram below.



### 5.1.6 Test Result

#### 2.4GHz Average Power Output test result

Modulation type		Average power output (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462MHz (Ch11)
11b	1 Mbps	16.32	16.76	16.72
	2 Mbps	16.28	16.73	16.68
	5.5 Mbps	16.26	16.71	16.67
	11 Mbps	16.25	16.63	16.65
11g	6 Mbps	14.88	15.16	15.29
	9 Mbps	14.83	14.87	15.17
	12 Mbps	14.72	14.73	15.09
	18 Mbps	14.65	14.52	14.87
	24 Mbps	14.32	14.35	14.36
	36 Mbps	14.12	14.23	14.21
	48 Mbps	13.75	13.93	14.11
	54 Mbps	13.47	13.80	14.02
11n HT20	6.5 Mbps	14.78	15.05	15.13
	13 Mbps	14.53	14.75	14.86
	19.5 Mbps	14.47	14.53	14.72
	26 Mbps	14.28	14.37	14.53
	39 Mbps	14.12	14.27	14.12
	52 Mbps	13.56	13.67	13.78
	58.5 Mbps	13.21	13.37	13.41
	65 Mbps	12.73	12.82	12.98

Modulation type		Average power output (dBm)		
		2422MHz (Ch3)	2437MHz (Ch6)	2452MHz (Ch9)
11n HT40	13.5 Mbps	14.55	14.63	14.79
	27 Mbps	14.32	14.34	14.23
	40.5 Mbps	14.21	14.27	14.11
	54 Mbps	13.71	14.11	13.46
	81 Mbps	13.42	13.67	13.27
	108 Mbps	13.15	13.21	13.11
	121.5 Mbps	12.43	12.65	12.87
	135 Mbps	11.92	12.12	12.17



## 5.2 Calculation result

### FCC LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

#### (A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

#### (B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz \*Plane-wave equivalent power density

Calculation procedure:

According to §2.1091 and §1.1307, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

$$\text{The } S = PG / (4\pi R^2)$$

Where S = power density in mW/cm<sup>2</sup>

P = transmit power in mW

G = numeric gain of transmit antenna

R = distance (cm)

The calculations in the table below use the highest gain of antenna for client EUT. These calculations represent worst case in terms of the exposure levels.

Mode/Band	Freq (GHz)	Power		Antenna Gain		R (cm)	S (mW/cm <sup>2</sup> )	Limits (mW/cm <sup>2</sup> )
		(dBm)	(mW)	(dBi)	(Numeric)			
WLAN/2.4GHz	2.437	16.76	47.42	2.00	1.58	20	0.015	1.00

Note: 1mW/cm<sup>2</sup> from 1.1310 Table 1.

According to the KDB447498 D01 determine the module is exclusion from SAR test.

---End of Test Report---