

MPE REPORT

FCC ID: 2AVTT-XR21A

Date of issue: Feb. 27, 2020

Report number:	MTi19111507-6E2
Sample description:	2.4G WIFI module
Model(s):	XR-21A
Applicant:	Shenzhen Jixin intelligence Co., Ltd
Address:	A505 Room, Business Building, Suojia Science Park, Xixiang, Baoan District, Shenzhen
Date of test:	Jan. 14, 2020 to Mar. 18, 2020

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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TEST RESULT CERTIFICATION	
Applicant's name:	Shenzhen Jixin intelligence Co., Ltd
Address:	A505 Room, Business Building, Suojia Science Park, Xixiang, Baoan District, Shenzhen
Manufacture's name:	Shenzhen Jixin intelligence Co., Ltd
Address:	A505 Room, Business Building, Suojia Science Park, Xixiang, Baoan District, Shenzhen
Product name:	2.4G WIFI module
Trademark:	N/A
Model and/or type reference .:	XR-21A
Serial model	N/A
RF exposure procedures	KDB 447498 D01 v06

This device described above has been tested by Shenzhen Microtest Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by:

Danny Xu

Mar. 18, 2020

Reviewed by:

Leo Su

Mar. 18, 2020

Approved by:

Tom Xue

Mar. 18, 2020



RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

MPE Calculation Method

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

R = distance between observation point and center of the radiator in cm(20cm)

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

WIFI:

Operation Frequency: WIFI 802.11b/g/n HT20: 2412-2462MHz,

Power density limited: 1mW/ cm²

Antenna Type: PCB Antenna;

Antenna gain: 2dBi

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(2/10)}=1.58$

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm2)	(mW/cm2)
				(dBm)	(mW)	Numeric		
2412	802.11b	16.77	16±1	17	50.1187	1.58	0.01575	1
2437		16.67	16±1	17	50.1187	1.58	0.01575	1
2462		16.63	16±1	17	50.1187	1.58	0.01575	1
2412	802.11g	14.94	15±1	16	39.8107	1.58	0.01251	1
2437		14.63	15±1	16	39.8107	1.58	0.01251	1
2462		14.46	15±1	16	39.8107	1.58	0.01251	1
2412	802.11n H20	15.02	15±1	16	39.8107	1.58	0.01251	1
2437		14.58	15±1	16	39.8107	1.58	0.01251	1
2462		15.41	15±1	16	39.8107	1.58	0.01251	1

Conclusion:

For the max result: $0.01575 \leq 1.0$ for 1g SAR, No SAR is required.

----END OF REPORT----