

MPE REPORT

FCC ID: 2ARNO-VAP11G-300

Date of issue: Nov. 01, 2018

Report Number:	MTi181030E122
Sample Description:	WiFi Bridge&repeater
Model(s):	VAP11G-300
Applicant:	Shenzhen HouTian Network Communication Technology Co., Ltd.
Address:	Floor 3, Building B, No.29 Longfeng Road, Long Gang District, Shen zhen City, Guangdong Province, China.
Date of Test:	Oct. 16. 2018 – Nov 01. 2018

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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TEST RESULT CERTIFICATION	
Applicant's name:	Shenzhen HouTian Network Communication Technology Co., Ltd.
Address:	Floor 3, Building B, No.29 Longfeng Road, Long Gang District, Shenzhen City, Guangdong Province, China.
Manufacture's Name:	Shenzhen HouTian Network Communication Technology Co., Ltd
Address:	Floor 3,Building B,No.29 Longfeng Road, Long Gang District, Shenzhen City, Guangdong Province, China
Product name :	WiFi Bridge&repeater
Trademark:	VONETS
Model and/or type reference :	VAP11G-300
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:



Demi Mu

Nov. 01, 2018

Reviewed by:



Blue Zheng

Nov. 01, 2018

Approved by:



Smith Chen

Nov. 01, 2018

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 = 3.14115926

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,

802.11n HT40: 2422-2452MHz,

Power density limited: 1mW/ cm²

Antenna Type: Wifi Antenna: PCB antenna;

WIFI antenna gain: 802.11b/g: 2dBi (ANT A), 2dBi (ANT B),

802.11n: working in MIMO mode, the antenna gains should be calculated by the formula:

Directional Gain = GANT+10*log(NANT)dBi

$$= 2 \text{ dBi} + 10 \cdot \log(2) \text{ dBi} = 5 \text{ dBi}$$

R=20cm

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

802.11b/g: antenna gain Numeric=10^{^(dBi/10)}= 10^{^(2/10)}=1.58

802.11n: antenna gain Numeric=10^{^(dBi/10)}= 10^{^(5/10)}=3.16

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					
		Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Sum	
2412	802.11b	12.80	12.00	12±1	11±1	13	12	19.953	15.849	1.58	1.58	0.00627	0.00498	/	
2437		12.13	11.29	12±1	11±1	13	12	19.953	15.849	1.58	1.58	0.00627	0.00498	/	1
2462		12.21	11.48	12±1	11±1	13	12	19.953	15.849	1.58	1.58	0.00627	0.00498	/	1
2412	802.11g	13.41	12.21	12±1	11±1	13	12	19.953	15.849	1.58	1.58	0.00627	0.00498	/	1
2437		12.59	11.37	12±1	11±1	13	12	19.953	15.849	1.58	1.58	0.00627	0.00498	/	1
2462		12.56	11.73	12±1	11±1	13	12	19.953	15.849	1.58	1.58	0.00627	0.00498	/	1
2412	802.11n H20	12.95	11.60	12±1	10±1	13	11	19.953	12.589	3.16	3.16	0.01254	0.00791	0.02046	1
2437		12.07	10.90	12±1	10±1	13	11	19.953	12.589	3.16	3.16	0.01254	0.00791	0.02046	1
2462		12.13	11.29	12±1	10±1	13	11	19.953	12.589	3.16	3.16	0.01254	0.00791	0.02046	1
2422	802.11n H40	8.72	7.57	8±1	7±1	9	8	7.9433	6.310	3.16	3.16	0.00499	0.00397	0.00896	1
2437		8.85	7.41	8±1	7±1	9	8	7.9433	6.310	3.16	3.16	0.00499	0.00397	0.00896	1
2452		8.40	7.62	8±1	7±1	9	8	7.9433	6.310	3.16	3.16	0.00499	0.00397	0.00896	1

The sum=Power density Ant A/1+Power density Ant b/1

Conclusion:

For the max result: 0.2046≤ 1.0 for 1g SAR, No SAR is required.

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