

RF Exposure Report

Report No.: SA171215C04B

FCC ID: VZ9180003

Test Model: OWL550

Received Date: Dec. 15, 2017

Test Date: Jan. 06 to 11, 2018

Issued Date: Apr. 11, 2018

Applicant: 4IPNET, INC.

Address: 5F, NO. 367, FUXING N. RD., SONGSHAN DIST., TAIPEI 105, TAIWAN
(R.O.C.)

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan R.O.C.

Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan R.O.C.

**FCC Registration /
Designation Number:** 723255 / TW2022

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

Table of Contents

Release Control Record	3
1 Certificate of Conformity.....	4
2 RF Exposure.....	5
2.1 Limits for Maximum Permissible Exposure (MPE)	5
2.2 MPE Calculation Formula	5
2.3 Classification	5
2.4 Antenna Gain	6
2.5 Calculation Result	7

Release Control Record

Issue No.	Description	Date Issued
SA171215C04B	Original release.	Apr. 11, 2018

1 Certificate of Conformity

Product: Access Point

Brand: 4ipnet

Test Model: OWL550

Sample Status: ENGINEERING SAMPLE

Applicant: 4IPNET, INC.

Test Date: Jan. 06 to 11, 2018

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :

Mary Ko

Date: Apr. 11, 2018

Mary Ko / Specialist

Approved by :

May Chen

Date: Apr. 11, 2018

May Chen / Manager

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
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
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

2.3 Classification

The antenna of this product, under normal use condition, is at least 35cm away from the body of the user.

So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

2.4GHz antenna spec.				
Antenna No.	Frequency (MHz)	Peak Gain (dBi)	Antenna Type	Connector Type
1	2400	4.87	Dipole antenna	N-type
	2450	4.9		
	2500	4.92		
2	2400	4.87		
	2450	4.9		
	2500	4.92		
5GHz antenna spec.				
Antenna No.	Frequency (MHz)	Peak Gain (dBi)	Antenna Type	Connector Type
1	5150	6.87	Dipole antenna	N-type
	5250	6.8		
	5350	6.76		
	5450	6.83		
	5550	6.85		
	5650	6.75		
	5750	6.92		
	5850	6.83		
2	5150	6.87		
	5250	6.8		
	5350	6.76		
	5450	6.83		
	5550	6.85		
	5650	6.75		
	5750	6.92		
	5850	6.83		
Bluetooth antenna spec.				
Frequency (MHz)	Peak Gain (dBi)	Antenna Type	Connector Type	
2400	3.71	PIFA	None	
2450	3.79			
2500	3.88			
GPS antenna spec.				
Frequency (MHz)	Peak Gain (dBiC)		Antenna Type	Connector Type
	Horizontal	Vertical		
1575	2.8	3.8	PIFA	Mini PCI
1575.4	2.7	3.7		
1610	3.9	3.4		

2.5 Calculation Result

For WLAN:

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	645.727	7.93	35	0.26044	1
5180-5240	201.971	9.93	35	0.12910	1
5745-5825	782.596	9.93	35	0.50025	1

NOTE:

2.4GHz: Directional gain = 4.92dBi + 10 log(2) = 7.93dBi

5GHz: Directional gain = 6.92dBi + 10 log(2) = 9.93dBi

For BT-LE (FCC ID: RC6-M2-TBT):

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2402-2480	1.059	3.88	35	0.00017	1

Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz + Bluetooth = $0.26044 / 1 + 0.50025 / 1 + 0.00017 / 1 = 0.76086$

Therefore the maximum calculations of above situations are less than the "1" limit.

--- END ---