



FCC RADIO EXPOSURE TEST REPORT

FCC ID : VGYAP903
Equipment : Dual Band Security Firewall
Brand Name : DrayTek Corp.
Model Name : VigorAP 903, Vigor2122ac
Applicant : DrayTek Corp.
No.26 Fu Shing Rd., HuKou County,Hsin-Chu
Industrial Park,Hsin-Chu,Taiwan 303 R.O.C
Manufacturer : DrayTek Corp.
No.26 Fu Shing Rd., HuKou County,Hsin-Chu
Industrial Park,Hsin-Chu,Taiwan 303 R.O.C
Standard : 47 CFR Part 2.1091

The product was received on Jan. 12, 2018, and testing was started from Jan. 12, 2018 and completed on Apr. 30, 2018. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



Table of Contents

History of this test report.....3
Summary of Test Result.....4
1 General Description5
1.1 EUT General Information5
1.2 Table for Multiple Listing5
1.3 Testing Location5
2 Maximum Permissible Exposure6
2.1 Limit of Maximum Permissible Exposure6
2.2 MPE Calculation Method.....6
2.3 Calculated Result and Limit.....7

Photographs of EUT v01



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Reviewed by: Sam Chen

Report Producer: Sandy Chuang



1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

1.2 Table for Multiple Listing

The EUT has two model names which are identical to each other in all aspects except for the following table:

Model Name	WIFI	Ethernet Port	USB Port	PoE Function	Adapter DC Voltage	EUT
VigorAP 903	V	5	V	V	+12V, 1.5A	EUT 1
Vigor2122ac	V	5	V	X	+12V, 1.5A	EUT 2

Note 1: From the above models, model: VigorAP 903 (EUT 1) were selected as representative model for the test and its data was recorded in this report.

Note 2: V : With X :Without

1.3 Testing Location

Testing Location		
<input type="checkbox"/>	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
<input checked="" type="checkbox"/>	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.



2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(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 ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	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 ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

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

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;G1D	1.81	26.13	27.94	0.50	28.44	0.69823	20	0.13891	1.00000
5.2G;D1D	6.89	24.81	31.70	0.50	32.20	1.65959	20	0.33016	1.00000
5.8G;D1D	6.89	24.96	31.85	0.50	32.35	1.71791	20	0.34177	1.00000

Simultaneous Transmission Analysis Mode: EUT 1: WLAN 2.4GHz + WLAN 5GHz

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;G1D	1.81	26.13	27.94	0.50	28.44	0.69823	20	0.13891	1.00000	0.13891
5.8G;D1D	6.89	24.96	31.85	0.50	32.35	1.71791	20	0.34177	1.00000	0.34177
									Sum Ratio	0.48068
									Ratio Limit	1

————THE END————