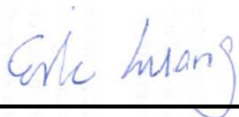


RF Exposure Evaluation Report

APPLICANT : Ignition Design Labs (US) LLC
EQUIPMENT : Advanced Wireless Router
BRAND NAME : Ignition Design Labs
MODEL NAME : Portal
MARKETING NAME : Portal
FCC ID : 2AFZUSAP102
STANDARD : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Eric Huang / Deputy Manager



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.)



Table of Contents

1. ADMINISTRATION DATA	4
1.1. Testing Laboratory	4
2. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)	4
3. MAXIMUM RF AVERAGE OUTPUT POWER AMONG PRODUCTION UNITS	5
4. RF EXPOSURE LIMIT INTRODUCTION	6
5. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION	7
5.1. Standalone Power Density Calculation	7
5.2. Collocated Power Density Calculation.....	7



Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA652049-01	Rev. 01	The variant report to enable WLAN 5.3GHz / 5.5GHz.	Jul. 28, 2016

1. Administration Data

1.1. Testing Laboratory

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978

Applicant	
Company Name	Ignition Design Labs (US) LLC
Address	5F-2., No.158, Sec.2, Gongdao 5th Rd., Hsinchu City 30070, Taiwan

Manufacturer	
Company Name	Ignition Design Labs (US) LLC
Address	5F-2., No.158, Sec.2, Gongdao 5th Rd., Hsinchu City 30070, Taiwan

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Advanced Wireless Router
Brand Name	Ignition Design Labs
Model Name	Portal
Marketing Name	Portal
FCC ID	2AFZUSAP102
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	· 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80 · Bluetooth EDR/LE
HW Version	v1.0
SW Version	v1.0
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

**3. Maximum RF average output power among production units**

WLAN 5.3GHz									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Power (dBm)				
					Ant 1	Ant 2	Ant 3	Ant 4	SUM
11a	6Mbps	4	52	5260	12.5	13	13.5	13.5	19.5
11a	6Mbps	4	60	5300	13.5	12.5	13	13	19.5
11a	6Mbps	4	64	5320	13.5	12.5	13	13	19.5
HT20	MCS0	4	52	5260	6	6	6.5	7	12.5
HT20	MCS0	4	60	5300	7	6.5	7	7	13
HT20	MCS0	4	64	5320	7.5	7	7	7	13.5
HT40	MCS0	4	54	5270	8.5	8.5	9	9	15
HT40	MCS0	4	62	5310	9.5	9	9	9	15.5
VHT20	MCS0	4	52	5260	7.5	7	6	5.5	13
VHT20	MCS0	4	60	5300	8	7.5	7	6.5	13.5
VHT20	MCS0	4	64	5320	8	7	7	6.5	13.5
VHT40	MCS0	4	54	5270	9.5	9	8.5	8	15
VHT40	MCS0	4	62	5310	9.5	9.5	9	8.5	15.5
VHT80	MCS0	4	58	5290	13	12.5	12	11.5	18.5

WLAN 5.5GHz									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Power (dBm)				
					Ant 1	Ant 2	Ant 3	Ant 4	SUM
11a	6Mbps	4	100	5500	11.5	11.5	11.5	11.5	18
11a	6Mbps	4	116	5580	11	11	11	11.5	17.5
11a	6Mbps	4	140	5700	13	12.5	12.5	12.5	19
HT20	MCS0	4	100	5500	6	6.5	6	6.5	12.5
HT20	MCS0	4	116	5580	5.5	6	6	6	12
HT20	MCS0	4	140	5700	6.5	6	6	6.5	12.5
HT40	MCS0	4	102	5510	8	8.5	8	8.5	14.5
HT40	MCS0	4	110	5550	7.5	8	8	8	14
HT40	MCS0	4	134	5670	9	8.5	8.5	9.5	15
VHT20	MCS0	4	100	5500	6.5	5.5	6.5	6	12.5
VHT20	MCS0	4	116	5580	6	5.5	6	5.5	12
VHT20	MCS0	4	140	5700	7	6.5	7	6.5	13
VHT40	MCS0	4	102	5510	9	8	8.5	8	14.5
VHT40	MCS0	4	110	5550	8	7.5	8	7.5	14
VHT40	MCS0	4	134	5670	9	9	9	9	15.5
VHT80	MCS0	4	106	5530	11.5	10.5	10.5	11	17
VHT80	MCS0	4	122	5610	12	11.5	11	11.5	18



4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

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 Exposures				
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
300-1500			f/300	6
1500-100,000			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
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 30 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Antenna	Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 30cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
Ant 1/2/3/4	WLAN 5.3GHz	5260	4.93	19.50	24.430	0.277	277.332	0.025	1.000	0.025
Ant 1/2/3/4	WLAN 5.5GHz	5700	5.30	19.00	24.300	0.269	269.153	0.024	1.000	0.024

<For Beamforming mode>

Antenna	Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 30cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
Ant 1/2/3/4	WLAN 5.3GHz	5290	9.63	18.50	28.130	0.650	650.130	0.058	1.000	0.058
Ant 1/2/3/4	WLAN 5.5GHz	5610	10.44	18.00	28.440	0.698	698.232	0.062	1.000	0.062

Note:

- This device support Beamforming for WLAN 5GHz VHT20/VHT40/VHT80 only ,
 - For WLAN 5.3GHz Beamforming mode, the maximum directional Gain is 9.63 dBi.
 - For WLAN 5.5GHz Beamforming mode, the maximum directional Gain is 10.44 dBi.

5.2. Collocated Power Density Calculation

(Ant 8) WLAN 2.4GHz Power Density / Limit	(Ant 5/6/7) WLAN 2.4GHz Power Density / Limit	(Ant 1/2/3/4) WLAN 5GHz Power Density / Limit	Σ (Power Density / Limit)
0.029	0.166	0.415	0.610

Note:

- The table above has considered the collocation of power density for all radio transmitters, for BT / WLAN2.4GHz / WLAN5.2GHz / WLAN 5.8GHz power density can refer to Sporton RF Exposure Evaluation Original Report, Report No: FA652049.
- Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for all radio transmitter.
- Considering all antenna collocation of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of all collocated transmitters is compliant

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.