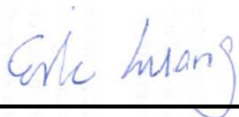


# RF Exposure Evaluation Report

APPLICANT : Ignition Design Lab (US) LLC  
EQUIPMENT : Advanced Wireless Router  
BRAND NAME : Ignition Design Labs  
MODEL NAME : Portal SAP001  
MARKETING NAME : IgnitionHub  
FCC ID : 2AFZUSAP001  
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.)



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**Revision History**

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA5O0602	Rev. 01	Initial issue of report	Nov. 30, 2015



## **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 Lab (US) LLC
Address	5F-2., No.158, Sec.2, Gongdao 5th Rd., Hsinchu City 30070, Taiwan

Manufacturer	
Company Name	Ignition Design Lab (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 SAP001
Marketing Name	IgnitionHub
FCC ID	2AFZUSAP001
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz
Mode	• 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80
HW Version	v0.1
SW Version	1.0.003
EUT Stage	Production Unit

**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 2.4GHz Band								
Mod.	Data Rate	NTX	CH.	Average Power (dBm)				
				Ant 1	Ant 2	Ant 3	Ant 4	SUM
11b	1Mbps	4	1	25.00			10.00	29.50
11b	1Mbps	4	6					
11b	1Mbps	4	11					
11g	6Mbps	4	1	22.00			16.50	27.00
11g	6Mbps	4	6					
11g	6Mbps	4	11					
HT20	MCS0	4	1	21.50			14.00	26.50
HT20	MCS0	4	6				16.50	
HT20	MCS0	4	11				16.50	
HT40	MCS0	4	3	20.50			11.00	25.00
HT40	MCS0	4	6				15.50	
HT40	MCS0	4	9				15.50	

WLAN 5.2GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Power (dBm)					
					Ant 1	Ant 2	Ant 3	Ant 4	Ant 5	SUM
11a	6Mbps	5	36	5180	15.50					22.50
11a	6Mbps	5	44	5220						
11a	6Mbps	5	48	5240						
HT20	MCS0	5	36	5180	15.50				14.00	22.00
HT20	MCS0	5	44	5220						
HT20	MCS0	5	48	5240						
HT40	MCS0	5	38	5190	14.00				20.50	
HT40	MCS0	5	46	5230						
VHT20	MCS0	5	36	5180	15.50				14.00	22.00
VHT20	MCS0	5	44	5220						
VHT20	MCS0	5	48	5240						
VHT40	MCS0	5	38	5190	14.00				20.50	
VHT40	MCS0	5	46	5230						
VHT80	MCS0	5	42	5210	10.50				17.00	



WLAN 5.8GHz Band										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Power (dBm)					
					Ant 1	Ant 2	Ant 3	Ant 4	Ant 5	SUM
11a	6Mbps	5	149	5745	15.50				16.50	22.50
11a	6Mbps	5	157	5785	15.50					
11a	6Mbps	5	165	5825	15.50					
HT20	MCS0	5	149	5745	15.50					
HT20	MCS0	5	157	5785	15.50					
HT20	MCS0	5	165	5825	15.50					
HT40	MCS0	5	151	5755	14.00				21.50	
HT40	MCS0	5	159	5795	14.00					
VHT20	MCS0	5	149	5745	15.00					
VHT20	MCS0	5	157	5785	15.00					
VHT20	MCS0	5	165	5825	15.50					
VHT40	MCS0	5	151	5755	14.00					
VHT40	MCS0	5	159	5795	14.00					
VHT80	MCS0	5	155	5775	9.00				7.00	15.00



#### **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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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 20 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**

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2.4GHz WLAN	2412.0	3.00	29.50	32.500	1.778	1778.279	0.354	1.000
5GHz WLAN	5180.0	2.00	22.50	24.500	0.282	281.838	0.056	1.000

**Note:** For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band

### **Conclusion:**

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