


# RF EXPOSURE EVALUATION REPORT

FCC ID : 2AG7G-J1A  
Equipment : Plume Adaptive Wi-Fi  
Brand Name : Plume Design, Inc.  
Model Name : J1A  
Applicant : Plume Design, Inc.  
Manufacturer : Plume Design, Inc.  
325 Lytton Ave., Palo Alto,  
CA 94301  
Standard : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part2.1091 and it complies with applicable limit.

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC evaluation.

The 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: Cona Huang / Deputy Manager



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## History of this test report

Report No.	Version	Description	Issued Date
FA1O0638	Rev. 01	Initial issue of report	Jan. 18, 2022

**1. Description of Equipment Under Test (EUT)**

Product Feature & Specification	
EUT Type	Plume Adaptive Wi-Fi
Brand Name	Plume Design, Inc.
Model Name	J1A
FCC ID	2AG7G-J1A
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.5GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8GHz Band: 5725 MHz ~ 5855 MHz WLAN U-NII 5: 5925 MHz ~ 6425 MHz WLAN U-NII 6: 6425 MHz ~ 6525 MHz WLAN U-NII 7: 6525 MHz ~ 6875 MHz WLAN U-NII 8: 6875 MHz ~ 7125 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz UWB : 6644.85 MHz
Mode	WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE UWB: UWB: Plused Tx with pseudo random bi-phase
EUT Stage	Production Unit

**<Beamforming Gain>**

Bands	BF gain (dBi)
2.4G	5.03
WLAN5GHz Band 1	8.65
WLAN5GHz Band 2	9.28
WLAN5GHz Band 3	9.76
WLAN5GHz Band 4	9.58
6G	10.03

**<Non-Beamforming Gain>**

Antenna Gain (dBi)								
	Ant1	Ant2	Ant3	Ant4	Ant5	Ant6	Ant7	Ant8
BLE (IFA Antenna)	3							
2.4G (IFA Antenna)			1.4	2.6				
5G B1 (IFA antenna)	3	2.8	2.4	2.3				
5G B2 (IFA/Slot antenna)	4.1	3.8	2.4	2.6				
5G B3 (IFA/Slot antenna)	4.6	4.8	2.7	2.6				
5G B4 (IFA/Slot antenna)	4.3	4.7	2.4	2.6				
6G UNII5(IFA Antenna)					4	3.5	3	3.8
6G UNII6(IFA Antenna)					4	4.2	3.4	4.4
6G UNII7(IFA Antenna)					4	4.2	3.4	4.4
6G UNII8(IFA Antenna)					3.4	4.2	4	3.4

**Reviewed by: Jason Wang****Report Producer: Paula Chen**

## 2. Maximum RF average output power

Mode	Maimum Power (non TXBF) (dBm)	Maimum Power (TXBF) (dBm)
BLE	18.70	
WLAN 2.4G	29.06	25.31
WLAN5GHz Band 1	24.90	23.87
WLAN5GHz Band 2	21.48	18.93
WLAN5GHz Band 3	23.92	18.60
WLAN5GHz Band 4	27.17	24.22
WLAN 6G	14.55	7.15

Mode	EIRP (dBm)
UWB	-6.92

### 3. 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

## **4. Radio Frequency Radiation Exposure Evaluation**

### **4.1. Standalone Power Density Calculation**

Band	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> )	Power Density / Limit
UWB	4.00	-6.92	-2.92	0.00	0.51	0.000	1.000	0.000

#### **<Beamforming Mode>**

Band	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> )	Power Density / Limit
WLAN2.4GHz Band	5.03	25.31	30.34	1.08	1081.43	0.215	1.000	0.215
WLAN5GHz Band 1	8.65	23.87	32.52	1.79	1786.49	0.356	1.000	0.356
WLAN5GHz Band 2	9.28	18.93	28.21	0.66	662.22	0.132	1.000	0.132
WLAN5GHz Band 3	9.76	18.60	28.36	0.69	685.49	0.136	1.000	0.136
WLAN5GHz Band 4	9.58	24.22	33.80	2.40	2398.83	0.477	1.000	0.477
WLAN6GHz	10.03	7.15	17.18	0.05	52.24	0.010	1.000	0.010

#### **<Non-Beamforming Mode>**

Band	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> )	Power Density / Limit
WLAN2.4GHz Band	2.60	29.06	31.66	1.47	1465.55	0.292	1.000	0.292
WLAN5GHz Band 1	3.00	24.90	27.90	0.62	616.60	0.123	1.000	0.123
WLAN5GHz Band 2	4.10	21.48	25.58	0.36	361.41	0.072	1.000	0.072
WLAN5GHz Band 3	4.80	23.92	28.72	0.74	744.73	0.148	1.000	0.148
WLAN5GHz Band 4	4.70	27.17	31.87	1.54	1538.15	0.306	1.000	0.306
WLAN6GHz	4.40	14.55	18.95	0.08	78.52	0.016	1.000	0.016
Bluetooth	3.00	18.70	21.70	0.15	147.91	0.029	1.000	0.029

**4.2. Collocated Power Density Calculation****<Beamforming Mode>**

Maximum 2.4GHz WLAN Power Density / Limit	Maximum 5GHz WLAN Power Density / Limit	Maximum 6GHz WLAN Power Density / Limit	Maximum Bluetooth Power Density / Limit	UWB Power Density / Limit	$\Sigma$ (Power Density / Limit
0.215	0.477	0.010	0.029	0	0.731

**<Non-Beamforming Mode>**

Maximum 2.4GHz WLAN Power Density / Limit	Maximum 5GHz WLAN Power Density / Limit	Maximum 6GHz WLAN Power Density / Limit	Maximum Bluetooth Power Density / Limit	UWB Power Density / Limit	$\Sigma$ (Power Density / Limit
0.292	0.306	0.016	0.029	0	0.643

**Note:**

1.  $\Sigma$  (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)].
2. Considering all of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1.

**Conclusion:**

According to 47 CFR §1.1307, the RF exposure analysis concludes that the RF Exposure is FCC compliant.