



REPORT No.: SZ20010031S01

RFEXPOSURE ASSESSMENTREPORT

APPLICANT : Atmoph Inc.
PRODUCT NAME : Atmoph Window 2
MODEL NAME : AW102
BRAND NAME : ATMOPH
FCC ID : 2AVSP-AW102A
STANDARD(S) : 47CFR 2.1091
: KDB 447498
RECEIPT DATE : 2020-01-13
TEST DATE : 2020-03-05 to 2020-04-04
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MORLAB

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Change history		
Version	Date	Reason of changed
1.0	2020-05-08	Original



1. Technical Information

Note: Provide by applicant.

1.1 Applicant and Manufacturer Information

Applicant:	Atmoph Inc.
Applicant Address:	75-6 Yanagihachimanchō, Nakagyo-ku, LS Kyoto 3F, Kyoto, 604-8101, Japan
Manufacturer:	Jenesis (Shenzhen) Co., Ltd.
Manufacturer Address:	401-1 Building 2nd, Runheng industrial factory building , No.1 Liu'xian 3rd Road, Xingdong Community, Xin'an Avenue, Bao'an District, Shenzhen, Guangdong, China 518101

1.2 Equipment under Test (EUT) Description

Product Name:	Atmoph Window 2
Serial No:	(N/A, marked #1 by test site)
Hardware Version:	AW102-V1
Software Version:	1.0.0
Frequency Bands:	WLAN 2.4GHz: 2412 MHz ~ 2472 MHz U-NII Band 1: 5180 MHz ~ 5240 MHz U-NII Band 2A: 5260 MHz ~ 5320 MHz U-NII Band 2C: 5500 MHz ~ 5720 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Modulation Mode:	802.11b: DSSS 802.11a/g/n-HT20/HT40/ ac-VHT20/ac-VHT40/VHT80: OFDM Bluetooth BR+EDR: GFSK, $\pi/4$ -DQPSK, 8-DPSK Bluetooth LE: GFSK
Antenna Type:	FPC Antenna
Antenna Gain:	WLAN 2.4GHz:1.53dBi WLAN 5GHz:3.05dBi Bluetooth:1.53dBi



1.3 Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title	Method determination /Remark
1	47 CFR§2.1091	Radio Frequency Radiation Exposure Assessment: mobile devices	No deviation
2	KDB 447498 D01v06	General RF Exposure Guidance	No deviation
Note 1: The test item is not applicable. Note 2: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.			



2. Device Category and RF Exposure Limit

Per user manual, Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

Mobile Devices:

47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

General Population/Uncontrolled Exposure:

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

Table 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)	Averaging time (minutes)
(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

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



3. RF Output Power

<WLAN 2.4GHz>

2.4GHz WLAN	Mode	Frequency (MHz)	Average power (dBm)	EIRP (dBm)	Tune-up Power(dBm)
	802.11b 1Mbps	2412	15.43	16.00	100.00
		2442	15.75	16.00	
		2472	15.53	16.00	
	802.11g 6Mbps	2412	14.47	15.00	100.00
		2442	14.94	15.00	
		2472	14.69	15.00	
	802.11n-HT20 MCS0	2412	14.56	15.00	100.00
		2442	14.81	15.00	
		2472	14.81	15.00	

<WLAN 5GHz>

5.2GHz WLAN	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-up Power	Duty Cycle %
	802.11a 1Mbps	CH 36	5180	15.96	16.0	97.22
		CH 40	5200	15.74	16.0	
		CH 48	5240	15.42	16.0	
	802.11n-HT20 MCS0	CH 36	5180	15.63	16.0	93.99
		CH 40	5200	15.58	16.0	
		CH 48	5240	15.18	16.0	
	802.11n-HT40 MCS0	CH 38	5190	15.68	16.0	93.91
		CH 46	5230	15.37	16.0	
	802.11n-VHT20 MCS0	CH 36	5180	15.87	16.0	96.69
		CH 40	5200	15.72	16.0	
		CH 48	5240	15.34	16.0	
	802.11n-VHT40 MCS0	CH 38	5190	15.54	16.0	96.69
		CH 46	5230	15.29	16.0	
	802.11n-VHT80 MCS0	CH 42	5210	14.39	15.0	93.99



	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-up Power	Duty Cycle %
5.3GHz WLAN	802.11a 1Mbps	CH 52	5260	15.27	15.5	97.22
		CH 60	5300	14.94	15.5	
		CH 64	5320	14.62	15.5	
	802.11n-HT20 MCS0	CH 52	5260	15.18	15.5	93.99
		CH 60	5300	14.77	15.5	
		CH 64	5320	14.52	15.5	
	802.11n-HT40 MCS0	CH 54	5270	15.02	15.5	93.91
		CH 62	5310	14.78	15.5	
	802.11n-VHT20 MCS0	CH 52	5260	15.49	15.5	96.69
		CH 60	5300	15.10	15.5	
		CH 64	5320	14.89	15.5	
	802.11n-VHT40 MCS0	CH 54	5270	15.09	15.5	96.69
		CH 62	5310	14.50	15.5	
	802.11n-VHT80 MCS0	CH 58	5290	13.94	14.4	93.99



	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-up Power	Duty Cycle %
5.5GHz WLAN	802.11a 1Mbps	CH 100	5500	13.76	14.0	97.22
		CH 120	5600	14.71	15.0	
		CH 144	5720	14.85	15.0	
	802.11n-HT20 MCS0	CH 100	5500	13.66	14.0	93.99
		CH 120	5600	14.51	15.0	
		CH 144	5720	14.57	15.0	
	802.11n-HT40 MCS0	CH 102	5510	13.92	14.5	93.91
		CH 126	5630	14.61	15.0	
		CH 142	5710	14.87	15.0	
	802.11n-VHT20 MCS0	CH 100	5500	13.86	14.5	96.69
		CH 120	5600	14.74	15.5	
		CH 144	5720	14.94	15.5	
	802.11n-VHT40 MCS0	CH 102	5510	13.84	14.5	96.69
		CH 126	5630	14.52	15.0	
		CH 142	5710	14.80	15.0	
	802.11n-VHT80 MCS0	CH 106	5530	12.83	13.5	93.99
		CH 122	5610	13.62	14.0	
		CH 138	5690	13.77	14.0	

<Bluetooth>

Mode	Channel	Frequency (MHz)	Average power (dBm)	
			1Mbps	2Mbps
BLE	CH 00	2402	4.13	2.59
	CH 19	2440	2.95	2.77
	CH 39	2480	1.86	0.73
Tune-up Limit			5.00	3.00

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BT classic	CH 00	2402	8.00	3.52	3.35
	CH 39	2441	7.56	3.21	3.21
	CH 78	2480	6.93	2.42	2.20
Tune-up Limit			8.50	4.00	4.00

Note 1 : The output power of WLAN and Bluetooth is derived from the report SZ20010031W01/W02/W03/W04.

4. RF Exposure Assessment

➤ Standalone Transmission Assessment:

Bands	Frequency (MHz)	Maximum Tune-up Power (dBm)	Antenna Gain (dBi)	EIRP (mW)	Power Density (mW/cm ²)	Limit for MPE (mW/cm ²)
WLAN 2.4GHz	2412	16.0	1.53	56.62	0.011	1.0
WLAN 5GHz	5180	16.0	3.05	80.35	0.016	1.0
Bluetooth	2402	8.5	1.53	10.07	0.002	1.0

Note:

1. The WLAN 2.4G, WLAN 5G and Bluetooth transmitter share the same antenna, Therefore simultaneous transmission assessment is not required.
2. For 5GHz WLAN, only the worst case will be used for calculating the power density.
3. MPE calculate method

$$\text{Power Density} = \text{EIRP} / 4\pi R^2$$

Where: EIRP = P+G

P = Output Power (dBm)

G = Antenna Gain (dBi)

R = Separation Distance (20cm)

➤ Simultaneous Transmission Assessment:

This device contains transmitters that cannot operate simultaneously, therefore simultaneous transmission analysis is not required.

➤ Conclusion:

According to 47 CFR §2.1091, this device complies with human exposure basic restrictions.



Annex A General Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
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2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

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