

RF Exposure Report

Report No.: SA151230E03O

FCC ID: 2AHBN-AP41

Test Model: AP41

Series Model: AP41E

Received Date: Jun. 26, 2019

Test Date: Jul. 02 ~ Aug. 05, 2019

Issued Date: Aug. 13, 2019

Applicant: Mist Systems, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration / 788550 / TW0003
Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
SA151230E03O	Original release	Aug. 13, 2019

1 Certificate of Conformity

Product: Premium Wi-Fi & BLE Array AP

Brand: Mist

Test Model: AP41

Series Model: AP41E

Sample Status: Engineering sample

Applicant: Mist Systems, Inc.

Test Date: Jul. 02 ~ Aug. 05, 2019

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.3 -2002

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by :

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Date:

Aug. 13, 2019

Pettie Chen / Senior Specialist

Approved by :

Bruce Chen

Date:

Aug. 13, 2019

Bruce Chen / Senior Project Engineer

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
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

2.2 MPE Calculation Formula

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

r = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 35cm away from the body of the user. So, this device is classified as Mobile Device.

3 Calculation Result of Maximum Conducted Power

Frequency Band (MHz)	TX Function	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
CDD Mode						
2412-2462	1TX	19.57	8	35	0.037	1
	2TX	23.04	11.01	35	0.165	1
	3TX	25.02	12.77	35	0.391	1
	4TX	26.20	14.02	35	0.683	1
5180-5240	1TX	17.04	8	35	0.021	1
	2TX	20.47	11.01	35	0.091	1
	3TX	22.60	12.77	35	0.224	1
	4TX	23.73	14.02	35	0.387	1
5260-5320	1TX	10.88	8	35	0.005	1
	2TX	14.38	11.01	35	0.022	1
	3TX	16.34	12.77	35	0.053	1
	4TX	17.49	14.02	35	0.092	1
5500-5700	1TX	11.45	8	35	0.006	1
	2TX	14.73	11.01	35	0.024	1
	3TX	16.64	12.77	35	0.057	1
	4TX	17.72	14.02	35	0.097	1
5745-5825	1TX	21.62	8	35	0.060	1
	2TX	24.48	11.01	35	0.230	1
	3TX	26.65	12.77	35	0.568	1
	4TX	27.80	14.02	35	0.988	1

Frequency Band (MHz)	TX Function	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
Beamforming Mode						
2412-2462	2TX	18.65	11.01	35	0.060	1
	3TX	20.65	12.77	35	0.143	1
	4TX	21.87	14.02	35	0.252	1
5180-5240	2TX	18.52	11.01	35	0.058	1
	3TX	20.61	12.77	35	0.141	1
	4TX	21.75	14.02	35	0.245	1
5260-5320	2TX	12.88	11.01	35	0.016	1
	3TX	14.81	12.77	35	0.037	1
	4TX	15.97	14.02	35	0.065	1
5500-5700	2TX	12.88	11.01	35	0.016	1
	3TX	14.75	12.77	35	0.037	1
	4TX	15.86	14.02	35	0.063	1
5745-5825	2TX	18.74	11.01	35	0.061	1
	3TX	20.76	12.77	35	0.146	1
	4TX	21.86	14.02	35	0.252	1

Frequency Band (MHz)	TX Function	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
Radio 3						
BT EDR	-	10.90	11.05	35	0.010	1
BT LE	-	6.13	11.05	35	0.003	1

Note:

WLAN:

2TX: Directional gain = 8 dBi + 10 log(2)= 11.01dBi

3TX: Directional gain = 8 dBi + 10 log(3)= 12.77dBi

4TX: Directional gain = 8 dBi + 10 log(4)= 14.02dBi

BT EDR/BT LE: Directional gain = 5.03dBi + 10log(4) = 11.05dBi

	MAX POWER (dBm)		TOTAL POWER (dBm)	POWER LIMIT (dBm)
	Radio 1: WLAN	Radio 3: BT		
2.4GHz	26.20	10.90	26.33	30

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

CONCLUSION:

2.4G & 5G & BT cannot transmit simultaneously.

The simultaneous operation mode was determined by client as below:

1. Radio 1: 2.4G + Radio 3: BT
2. Radio 1: 5G + Radio 3: BT

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

Radio 1: 2.4G + Radio 3: BT = $0.683/1 + 0.010/1 = 0.693$

Radio 1: 5G + Radio 3: BT = $0.988/1 + 0.010/1 = 0.998$

Therefore, the maximum calculation of this situation is 0.998, which is less than the "1" limit.

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