RF Exposure Report

Report No.:	SA190211C09
FCC ID:	2AHBN-AP43
Test Model:	AP43E, AP43
Received Date:	Feb. 11, 2019
Test Date:	Feb. 21 ~ Apr. 16, 2019
Issued Date:	Apr. 18, 2019
Applicant:	Mist Systems, Inc.
Address:	1601 South De Anza Blvd. Suite 248 Cupertino California United States 95014
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
SA190211C09	Original release	Apr. 18, 2019

1 Certificate of Conformity

Product:	Premium 802.11ax WiFi and BLE AP
Brand:	Mist
Test Model:	AP43E, AP43
Sample Status:	Engineering sample
Applicant:	Mist Systems, Inc.
Test Date:	Feb. 21 ~ Apr. 16, 2019
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.1-1992

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 : Celine Chou , **Date:** Apr. 18, 2019

Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Apr. 18, 2019

Bruce Chen / 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				
300-1500	…	…	F/1500	30
1500-100,000	…	…	1.0	30

F = Frequency in MHz

2.2 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$
where
Pd = power density in mW/cm^2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
pi = 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 37cm away from the body of the user. So, this device is classified as **Mobile Device**.

3 Calculation Result of Maximum Conducted Power

WLAN

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
Internal antenna + Eth6 Radio, CDD Mode					
5180-5240	24.17	11.45	37	0.212	1
5745-5825	25.94	11.45	37	0.319	1
Internal antenna + Eth6 Radio, Beamforming Mode					
5180-5240	23.74	11.45	37	0.192	1
5745-5825	23.72	11.45	37	0.191	1
Internal antenna + Eth7 Radio, CDD Mode					
2412-2462	21.86	5.51	37	0.032	1
5180-5240	25.38	8.46	37	0.141	1
5745-5825	25.43	8.46	37	0.142	1
Internal antenna + Eth8 Radio, CDD Mode					
2412-2462	25.44	9.37	37	0.176	1
5745-5825	28.52	10.96	37	0.516	1
Internal antenna + Eth8 Radio, Beamforming Mode					
2412-2462	25.10	9.37	37	0.163	1
5745-5825	24.53	10.96	37	0.206	1
External antenna + Eth6 Radio, CDD Mode					
5180-5240	24.17	12.02	37	0.242	1
5745-5825	25.94	12.02	37	0.363	1
External antenna + Eth6 Radio, Beamforming Mode					
5180-5240	23.74	12.02	37	0.219	1
5745-5825	23.72	12.02	37	0.218	1
External antenna + Eth7 Radio, CDD Mode					
2412-2462	21.88	7.01	37	0.045	1
5180-5240	25.38	9.01	37	0.160	1
5745-5825	25.43	9.01	37	0.162	1
External antenna + Eth8 Radio, CDD Mode					
2412-2462	25.44	10.02	37	0.204	1
External antenna + Eth8 Radio, Beamforming Mode					
2412-2462	25.10	10.02	37	0.189	1

BT LE

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
BT-Omni antenna + BT LE Radio					
2402-2480	6.39	0.1	37	0.0003	1
BT-Directional antenna + BT LE Radio					
2402-2480	6.39	4.5	37	0.001	1

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

Internal antenna + Eth6 Radio

1. 5GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/4] = 11.45dBi$

Internal antenna + Eth7 Radio

1. 2.4GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2] = 5.51dBi$
2. 5GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2] = 8.46dBi$

Internal antenna + Eth8 Radio

1. 2.4GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/4] = 9.37dBi$
2. 5GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/4] = 10.96dBi$

External antenna + Eth6 Radio

1. 5GHz: Directional gain = 6dBi + 10log(4) = 12.02dBi

External antenna + Eth7 Radio

1. 2.4GHz: Directional gain = 4dBi + 10log(2) = 7.01dBi
2. 5GHz: Directional gain = 6dBi + 10log(2) = 9.01dBi

External antenna + Eth8 Radio

1. 2.4GHz: Directional gain = 4dBi + 10log(4) = 10.02dBi

Conclusion:

The Eth6 Radio & Eth7 Radio & Eth8 Radio & BT LE Radio can transmit simultaneously, but will not simultaneously in the same sub-band, the formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

AP43 (Internal antenna): Eth6 Radio WLAN + Eth7 Radio WLAN + Eth8 Radio WLAN + BT LE = 0.319 / 1 + 0.142 / 1 + 0.516 / 1 + 0.001 / 1 = 0.978

AP43E (External antenna): Eth6 Radio WLAN + Eth7 Radio WLAN + Eth8 Radio WLAN + BT LE = 0.363 / 1 + 0.162 / 1 + 0.204 / 1 + 0.001 / 1 = 0.730

Therefore the maximum calculations of above situations are less than the “1” limit.

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