# RF Exposure Report

| | |
|---|---|
| **Report No.:** | SA151230E03G |
| **FCC ID:** | 2AHBN-AP41 |
| **Test Model:** | AP41 |
| **Series Model:** | AP41E |
| **Received Date:** | Oct. 24, 2016 |
| **Test Date:** | Oct. 26 ~ Nov. 16, 2016 |
| **Issued Date:** | Nov. 16, 2016 |
| **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 |
| **Test Location:** | No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.) |

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## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| SA151230E03G | Original release. | Nov. 16, 2016 |

## 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:** | Oct. 26 ~ Nov. 16, 2016 |
| **Standards:** | FCC Part 2 (Section 2.1091)<br>KDB 447498 D01 (October 23, 2015)<br>IEEE C95.1 |

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 EMC characteristics under the conditions specified in this report.

**Prepared by :** _____ , **Date:** Nov. 16, 2016

Pettie Chen / Senior Specialist

**Approved by :** _____ , **Date:** Nov. 16, 2016

Ken Liu / Senior Manager

## 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 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 ($mW/cm^2$) |
|---|---|---|---|---|---|---|
| Radio 1 | | | | | | |
| EUT with internal antenna | | | | | | |
| 2412-2462 | 1TX | 22.65 | 3.06 | 35 | 0.024 | 1 |
| | 2TX | 25.45 | 6.37 | 35 | 0.099 | 1 |
| | 3TX | 27.07 | 8.13 | 35 | 0.215 | 1 |
| | 4TX | 28.38 | 9.43 | 35 | 0.392 | 1 |
| 5180-5240 | 1TX | 25.14 | 3.85 | 35 | 0.051 | 1 |
| | 2TX | 27.26 | 7.19 | 35 | 0.181 | 1 |
| | 3TX | 26.27 | 8.73 | 35 | 0.205 | 1 |
| | 4TX | 25.84 | 9.96 | 35 | 0.247 | 1 |
| 5260-5320 | 1TX | 23.43 | 3.97 | 35 | 0.036 | 1 |
| | 2TX | 21.51 | 7.10 | 35 | 0.047 | 1 |
| | 3TX | 19.03 | 8.85 | 35 | 0.040 | 1 |
| | 4TX | 17.95 | 10.02 | 35 | 0.041 | 1 |
| 5500-5700 | 1TX | 23.77 | 4.21 | 35 | 0.041 | 1 |
| | 2TX | 21.70 | 6.76 | 35 | 0.046 | 1 |
| | 3TX | 19.40 | 8.65 | 35 | 0.041 | 1 |
| | 4TX | 18.01 | 9.94 | 35 | 0.041 | 1 |
| 5745-5825 | 1TX | 23.56 | 4.18 | 35 | 0.039 | 1 |
| | 2TX | 26.55 | 7.10 | 35 | 0.151 | 1 |
| | 3TX | 28.35 | 8.94 | 35 | 0.348 | 1 |
| | 4TX | 29.62 | 10.19 | 35 | 0.622 | 1 |

| Frequency Band (MHz) | TX Function | Max Power (dBm) | Antenna Gain (dBi) | Distance (cm) | Power Density ($mW/cm^2$) | Limit ($mW/cm^2$) |
|---|---|---|---|---|---|---|
| Radio 1 | | | | | | |
| EUT with external antenna | | | | | | |
| 2412-2462 | 1TX | 22.65 | 4 | 35 | 0.030 | 1 |
| | 2TX | 25.45 | 7.01 | 35 | 0.114 | 1 |
| | 3TX | 27.07 | 8.77 | 35 | 0.249 | 1 |
| | 4TX | 28.38 | 10.02 | 35 | 0.449 | 1 |
| 5180-5240 | 1TX | 25.14 | 6 | 35 | 0.084 | 1 |
| | 2TX | 27.26 | 9.01 | 35 | 0.275 | 1 |
| | 3TX | 26.27 | 10.77 | 35 | 0.329 | 1 |
| | 4TX | 25.84 | 12.02 | 35 | 0.397 | 1 |
| 5260-5320 | 1TX | 23.43 | 6 | 35 | 0.057 | 1 |
| | 2TX | 21.51 | 9.01 | 35 | 0.073 | 1 |
| | 3TX | 19.03 | 10.77 | 35 | 0.062 | 1 |
| | 4TX | 17.95 | 12.02 | 35 | 0.065 | 1 |
| 5500-5700 | 1TX | 23.77 | 6 | 35 | 0.062 | 1 |
| | 2TX | 21.70 | 9.01 | 35 | 0.076 | 1 |
| | 3TX | 19.40 | 10.77 | 35 | 0.068 | 1 |
| | 4TX | 18.01 | 12.02 | 35 | 0.065 | 1 |
| 5745-5825 | 1TX | 23.56 | 6 | 35 | 0.059 | 1 |
| | 2TX | 26.55 | 9.01 | 35 | 0.234 | 1 |
| | 3TX | 28.35 | 10.77 | 35 | 0.530 | 1 |
| | 4TX | 29.62 | 12.02 | 35 | 0.948 | 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:
**EUT with internal antenna**
2412-2462MHz:
2TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 6.37dBi
3TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 8.13dBi
4TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 9.43dBi

5180-5240MHz:
2TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 7.19dBi
3TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 8.73dBi
4TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 9.96dBi

5260-5320MHz:
2TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 7.10dBi
3TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 8.85dBi
4TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 10.02dBi

5500-5700MHz:
2TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 6.76dBi
3TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 8.65dBi
4TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 9.94dBi

5745-5825MHz:
2TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 7.10dBi
3TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 8.94dBi
4TX: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N$] = 10.19dBi

**EUT with external antenna**
2412-2462MHz:
2TX: Directional gain = 4 dBi + 10 log(2) = 7.01dBi
3TX: Directional gain = 4 dBi + 10 log(3) = 8.77dBi
4TX: Directional gain = 4 dBi + 10 log(4) = 10.02dBi

5GHz Band:
2TX: Directional gain = 6 dBi + 10 log(2)= 9.01dBi
3TX: Directional gain = 6 dBi + 10 log(3)= 10.77dBi
4TX: Directional gain = 6 dBi + 10 log(4)= 12.02dBi

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 | 28.38 | 10.90 | 28.46 | 30 |

**CONCULSION:**

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 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

**Radio 1: 2.4G + Radio 3: BT** = 0.449 + 0.010 =0.459

**Radio 1: 5G + Radio 3: BT** = 0.948 + 0.010 = 0.958

Therefore, the maximum calculation of this situation is 0.958, which is less than the “1” limit.

**---END---**