

RF Exposure Report

Report No.: SA170912E01

FCC ID: 2AHCN-AP61

Test Model: AP61

Received Date: Sep. 14, 2017

Test Date: Oct. 12, 2017

Issued Date: Oct. 27, 2017

Applicant: Mist Systems, Inc.

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Release Control Record

| Issue No. | Description | Date Issued |
|-------------|-------------------|---------------|
| SA170912E01 | Original release. | Oct. 27, 2017 |

1 Certificate of Conformity

Product: Premium Outdoor Wi-Fi & BLE Array AP

Brand: Mist

Test Model: AP61

Sample Status: ENGINEERING SAMPLE

Applicant: Mist Systems, Inc.

Test Date: Oct. 12, 2017

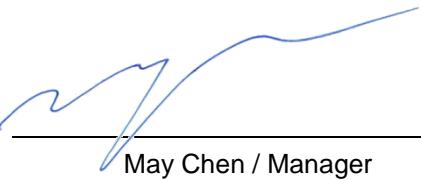
Standards: FCC Part 2 (Section 2.1091)

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 EMC characteristics under the conditions specified in this report.


Prepared by : _____, **Date:** Oct. 27, 2017
Mary Ko / Specialist


Approved by : _____, **Date:** Oct. 27, 2017
May Chen / 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 | | | | |
| 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

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

where

Pd = power density in mW/cm²

Pout = 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 32cm away from the body of the user.

So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Radio 1
WLAN - 2.4GHz + 5GHz (Internal antenna)

| Antenna No. | Transmitter Circuit | Antenna Net Gain (dBi) | Frequency Range (GHz) | Antenna Type | Connector Type |
|-------------|---------------------|------------------------|-----------------------|--------------|----------------|
| 1 | Chain (0) | 3.87 | 2.4~2.4835 | PIFA | i-pex(MHF) |
| | | 4.94 | 5.15~5.25 | | |
| | | 4.66 | 5.25~5.35 | | |
| | | 4.25 | 5.47~5.725 | | |
| | | 4.42 | 5.725~5.85 | | |
| 2 | Chain (1) | 3.91 | 2.4~2.4835 | PIFA | i-pex(MHF) |
| | | 4.23 | 5.15~5.25 | | |
| | | 4.54 | 5.25~5.35 | | |
| | | 4.66 | 5.47~5.725 | | |
| | | 4.70 | 5.725~5.85 | | |
| 3 | Chain (2) | 3.93 | 2.4~2.4835 | PIFA | i-pex(MHF) |
| | | 4.53 | 5.15~5.25 | | |
| | | 4.86 | 5.25~5.35 | | |
| | | 4.95 | 5.47~5.725 | | |
| | | 4.94 | 5.725~5.85 | | |
| 4 | Chain (3) | 3.81 | 2.4~2.4835 | PIFA | i-pex(MHF) |
| | | 4.50 | 5.15~5.25 | | |
| | | 4.92 | 5.25~5.35 | | |
| | | 4.71 | 5.47~5.725 | | |
| | | 4.90 | 5.725~5.85 | | |

Radio 2
WLAN RX only - 2.4GHz + 5GHz (Scanning radio antenna)

| Antenna No. | Transmitter Circuit | Antenna Net Gain (dBi) | Frequency Range (GHz) | Antenna Type | Connector Type |
|-------------|---------------------|------------------------|-----------------------|--------------|----------------|
| 1 | Chain (0) | 3.85 | 2.4~2.4835 | PIFA | i-pex(MHF) |
| | | 4.61 | 5.15~5.25 | | |
| | | 4.71 | 5.25~5.35 | | |
| | | 4.72 | 5.47~5.725 | | |
| | | 4.73 | 5.725~5.85 | | |

Radio 3
Bluetooth

| Antenna No. | Transmitter Circuit | Antenna Net Gain (dBi) | Frequency Range (GHz) | Antenna Type | Connector Type |
|-------------|---------------------|------------------------|-----------------------|--------------|----------------|
| 1 | Chain (0) | 3.56 | 2.4~2.4835 | Omni | i-pex(MHF) |
| 2 | Chain (1) | 5.01 | 2.4~2.4835 | Patch | i-pex(MHF) |

2.5 Calculation Result of Maximum Conducted Power

For WLAN:

| Frequency Band (MHz) | Max Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm ²) | Limit (mW/cm ²) |
|----------------------|----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2412-2462 | 631.677 | 9.90 | 32 | 0.047972 | 1 |
| 5180-5240 (1TX) | 40.272 | 4.94 | 32 | 0.00976 | 1 |
| 5180-5240 (4TX) | 39.684 | 9.90 | 32 | 0.03516 | 1 |
| 5745-5825 | 957.748 | 10.76 | 32 | 0.88663 | 1 |

NOTE:

2.4GHz: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 9.90 \text{ dBi}$

5.GHz:

UNII-3: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.76 \text{ dBi}$

For BT-EDR:

| Frequency Band (MHz) | Max Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm ²) | Limit (mW/cm ²) |
|----------------------|----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2402-2480 | 10.375 | 5.01 | 32 | 0.00256 | 1 |

For BT-LE:

| Frequency Band (MHz) | Max Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm ²) | Limit (mW/cm ²) |
|----------------------|----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2402-2480 | 6.622 | 5.01 | 32 | 0.00163 | 1 |

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + Bluetooth = $0.47972 / 1 + 0.00256 / 1 = 0.48228$

WLAN 5GHz + Bluetooth = $0.88663 / 1 + 0.00256 / 1 = 0.88919$

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

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