RF Exposure Report

Report No.:	SA151230E03B
FCC ID:	2AHBN-AP41
Test Model:	AP41
Series Model:	AP41E
Received Date:	Dec. 23, 2015
Test Date:	Dec. 24, 2015 ~ Jan. 21, 2016 Mar. 12 ~ Apr. 27, 2016
Issued Date:	May 11, 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
SA151230E03B	Original release.	May 11, 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:	Dec. 24, 2015 ~ Jan. 21, 2016 Mar. 12 ~ Apr. 27, 2016
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 (October 23, 2015) 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:** May 11, 2016
Pettie Chen / Senior Specialist

Approved by : _____ , **Date:** May 11, 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 31cm 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	31	0.031	1
	2TX	25.45	6.37	31	0.126	1
	3TX	27.07	8.13	31	0.274	1
	4TX	28.38	9.43	31	0.500	1
5180-5240	1TX	25.14	3.85	31	0.066	1
	2TX	27.26	7.19	31	0.231	1
	3TX	26.27	8.73	31	0.262	1
	4TX	25.84	9.96	31	0.315	1
5745-5825	1TX	23.32	4.18	31	0.047	1
	2TX	25.95	7.10	31	0.167	1
	3TX	27.27	8.94	31	0.346	1
	4TX	28.22	10.19	31	0.574	1
EUT with external antenna						
2412-2462	1TX	22.65	4	31	0.038	1
	2TX	25.45	7.01	31	0.146	1
	3TX	27.07	8.77	31	0.318	1
	4TX	28.38	10.02	31	0.573	1
5180-5240	1TX	25.14	6	31	0.108	1
	2TX	27.26	9.01	31	0.351	1
	3TX	26.27	10.77	31	0.419	1
	4TX	25.84	12.02	31	0.506	1
5745-5825	1TX	23.32	6	31	0.071	1
	2TX	25.95	9.01	31	0.259	1
	3TX	27.27	10.77	31	0.527	1
	4TX	28.22	12.02	31	0.875	1

*Because the EUT was changing software to decrease power, the power of EUT with internal antenna was different from the original report.

Frequency Band (MHz)	TX Function	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
Radio 2						
2412-2462	1TX	13.49	3.61	31	0.004	1
5180-5240	1TX	24.17	3.59	31	0.049	1
5745-5825	1TX	23.88	4.29	31	0.054	1
Radio 3						
BT EDR	-	10.90	11.05	31	0.013	1
BT LE	-	6.13	11.05	31	0.004	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

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

5180-5240MHz, 5745-5825MHz:
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 2: WLAN	Radio 3: BT		
2.4GHz	28.38	13.49	10.90	28.59	30
5GHz: U-NII-1	27.26	24.17	-	28.99	30
5GHz: U-NII-3	28.22	23.88	-	29.58	30

CONCULSION:

Both of the WLAN 2.4G & WLAN 5G & BT can transmit simultaneously, 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 2: 5G + Radio 3: BT = 0.573 +0.054 + 0.013 =0.640

Radio 1: 5G + Radio 2: 5G + Radio 3: BT = 0.875 + 0.054 + 0.013 = 0.942

Radio 1: 5G + Radio 2: 2.4G + Radio 3: BT = 0.875 + 0.004 + 0.013 = 0.892

Radio 1: 2.4G + Radio 2: 2.4G + Radio 3: BT = 0.573 + 0.004 + 0.013 = 0.590

Therefore, the maximum calculation of this situation is 0.942, which is less than the “1” limit.

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