RF EXPOSURE REPORT

REPORT NO.:	SA141024E06
MODEL NO.:	AP One AC mini, Pismo AC0, Surf series, AP series, Mesh Connector series, MAX series
FCC ID:	U8G-P1AC0
RECEIVED:	Oct. 24, 2014
TESTED:	Dec. 03, 2014
ISSUED:	Dec. 16, 2014

APPLICANT:	Pismo Labs Technology Limited
ADDRESS:	FLAT/RM A5, 5/F, HK SPINNERS IND BLDG PHASE 6, 481 CASTLE PEAK ROAD, CHEUNG SHA WAN, HONG KONG.

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS :	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (1):	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA141024E06	Original release	Dec. 16, 2014

1. CERTIFICATION

PRODUCT:	Pepwave / Peplink / Pismo Wireless Product
BRAND NAME:	Pepwave / Peplink / Pismo
MODEL NO.:	AP One AC mini, Pismo AC0, Surf series, AP series, Mesh Connector series, MAX series
TEST SAMPLE:	ENGINEER SAMPLE
APPLICANT:	Pismo Labs Technology Limited
TESTED:	Dec. 03, 2014
STANDARDS:	FCC Part 2 (Section 2.1091)
	KDB 447498 D03
	IEEE C95.1

The above equipment (Model: AP One AC mini) 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 : Phoenix Huang , **Date:** Dec. 16, 2014
(Phoenix Huang, Specialist)

Approved by : , **Date:** Dec. 16, 2014
(May Chen, Manager)

2. RF EXPOSURE LIMIT

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

3. 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

4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

2.4GHz								
Antenna No	Transmitter Circuit	Brand	Model	Gain (dBi) (Include cable loss)	Antenna Type	Connecter Type	Cable Length (cm)	Frequency range (MHz to MHz)
1	Chain (0)	Pulse	W3008C	2.2	Chip	NA	NA	2400~2483.5
2	Chain (1)	Pulse	W3008C	2.2	Chip	NA	NA	2400~2483.5
5GHz								
Antenna No	Transmitter Circuit	Brand	Model	Gain (dBi) (Include cable loss)	Antenna Type	Connecter Type	Cable Length (cm)	Frequency range (MHz to MHz)
1	Chain (0)	PSA Walsin Technology Corporation	PEPWAVE (PCB)	2.91	PCB	i-pex	7	5150~5250
				3.70				5725~5850
2	Chain (1)	PSA Walsin Technology Corporation	PEPWAVE (PCB)	3.06	PCB	i-pex	11	5150~5250
				3.20				5725~5850

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For 15.247:

802.11b:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
2412 ~ 2462	204.326	5.21	20	0.13491	1

Directional gain = 2.2dBi + 10log(2) = 5.21dBi

802.11g:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
2412 ~ 2462	934.394	5.21	20	0.61696	1

Directional gain = 2.2dBi + 10log(2) = 5.21dBi

802.11n (HT20):

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
2412 ~ 2462	920.711	5.21	20	0.60793	1

Directional gain = 2.2dBi + 10log(2) = 5.21dBi

802.11n (HT40):

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
2422 ~ 2452	781.783	5.21	20	0.51620	1

Directional gain = 2.2dBi + 10log(2) = 5.21dBi

For 15.407:

802.11a:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5180 – 5240	149.994	6	20	0.11880	1
5745 - 5825	176.85	6.46	20	0.15572	1

For 5150-5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6dBi

For 5725-5850MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.46dBi

802.11ac (VHT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5180 – 5240	146.418	6	20	0.11596	1
5745 - 5825	185.651	6.46	20	0.16347	1

For 5150-5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6dBi

For 5725-5850MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.46dBi

802.11ac (VHT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5190 – 5230	163.903	6	20	0.12981	1
5755 - 5795	200.594	6.46	20	0.17662	1

For 5150-5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6dBi

For 5725-5850MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.46dBi

802.11ac (VHT80)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5210	37.077	6	20	0.02937	1
5775	34.746	6.46	20	0.03059	1

For 5150-5250MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6dBi

For 5725-5850MHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.46dBi

CONCLUSION:

Both of the 2.4GHz and 5GHz WLAN can transmit simultaneously, the formula of calculated the MPE is:

$CPD_1 / LPD_1 + CPD_2 / LPD_2 + ……etc. < 1$
CPD = Calculation power density
LPD = Limit of power density

Therefore, the worst-case situation is 0.61696 / 1 + 0.17662 / 1 = 0.794, which is less than “1”. This confirmed that the device comply with FCC 1.1310 MPE limit.

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