

RF Exposure Report

Report No.: SA171215C04

FCC ID: RC6-API50C

Test Model: API50c, API51c

Series Model: KW-AP200T-US, OW-408 A1, OW-218 A1, OW-400 A1, OW-200 A1

Received Date: Dec. 15, 2017

Test Date: Jan. 06 to 11, 2018

Issued Date: Feb. 09, 2018

Applicant: Amigo Technology Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

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Release Control Record

Issue No.	Description	Date Issued
SA171215C04	Original release.	Feb. 09, 2018

1 Certificate of Conformity

Product: Ruggedized Access Point

Brand: Amigo, KeyWest Networks, Inc, Cerio

Test Model: API50c, API51c

Series Model: KW-AP200T-US, OW-408 A1, OW-218 A1, OW-400 A1, OW-200 A1

Sample Status: ENGINEERING SAMPLE

Applicant: Amigo Technology Inc.

Test Date: Jan. 06 to 11, 2018

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 :

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Date:

Feb. 09, 2018

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Approved by :

May Chen

Date:

Feb. 09, 2018

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

$$Pd = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

Pd = power density in mW/cm²

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

Test model: API50c

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**.

Test model: API51c

The antenna of this product, under normal use condition, is at least 35m away from the body of the user.

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

2.4 Antenna Gain

For Model No.: API50c (Internal Patch antenna)

2.4GHz antenna spec.

Antenna No.	Frequency (MHz)	Peak Gain (dBi)	Antenna Type	Connector Type
1	2400	8.0	Patch antenna	None
	2450	8.2		
	2500	8.0		
2	2400	8.3		
	2450	8.4		
	2500	7.8		

5GHz antenna spec.

Antenna No.	Frequency (MHz)	Peak Gain (dBi)	Antenna Type	Connector Type
1	5150	7.0	Patch antenna	None
	5500	6.8		
	5825	7.3		
2	5150	7.0		
	5500	6.7		
	5825	6.6		

For Model No.: API51c (External Dipole antenna)
2.4GHz antenna spec.

Antenna No.	Frequency (MHz)	Peak Gain (dBi)	Antenna Type	Connector Type
1	2400	4.87	Dipole antenna	N-type
	2450	4.9		
	2500	4.92		
2	2400	4.87		
	2450	4.9		
	2500	4.92		

5GHz antenna spec.

Antenna No.	Frequency (MHz)	Peak Gain (dBi)	Antenna Type	Connector Type
1	5150	6.87	Dipole antenna	N-type
	5250	6.8		
	5350	6.76		
	5450	6.83		
	5550	6.85		
	5650	6.75		
	5750	6.92		
	5850	6.83		
2	5150	6.87		
	5250	6.8		
	5350	6.76		
	5450	6.83		
	5550	6.85		
	5650	6.75		
	5750	6.92		
	5850	6.83		

Bluetooth antenna spec.

Frequency (MHz)	Peak Gain (dBi)	Antenna Type	Connector Type
2400	3.71	PIFA	None
2450	3.79		
2500	3.88		

GPS antenna spec.

Frequency (MHz)	Peak Gain (dBiC)		Antenna Type	Connector Type
	Horizontal	Vertical		
1575	2.8	3.8	PIFA	Mini PCI
1575.4	2.7	3.7		
1610	3.9	3.4		

Note:

1. For bluetooth antenna and GPS antenna, Model No.: API50c is as same sa API51c.

2.1 Calculation Result

Test model: API50c

For WLAN:

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	497.225	11.31	35	0.43672	1
5180-5240	173.482	10.16	35	0.07928	1
5745-5825	710.614	10.16	35	0.47895	1

NOTE:

2.4GHz: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 11.31\text{dBi}$

5GHz: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 10.16\text{dBi}$

For BT-LE (FCC ID: RC6-M2-TBT):

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2402-2480	1.059	3.88	35	0.00017	1

Test model: API51c

For WLAN:

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	645.727	7.93	35	0.26044	1
5180-5240	201.971	9.93	35	0.12910	1
5745-5825	782.596	9.93	35	0.50025	1

NOTE:

2.4GHz: Directional gain = $4.92\text{dBi} + 10 \log(2) = 7.93\text{dBi}$

5GHz: Directional gain = $6.92\text{dBi} + 10 \log(2) = 9.93\text{dBi}$

For BT-LE (FCC ID: RC6-M2-TBT):

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2402-2480	1.059	3.88	35	0.00017	1

Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

Test model: API50c

WLAN 2.4GHz + WLAN 5GHz + Bluetooth = $0.43672 / 1 + 0.47895 / 1 + 0.00017 / 1 = 0.91584$

Test model: API51c

WLAN 2.4GHz + WLAN 5GHz + Bluetooth = $0.26044 / 1 + 0.50025 / 1 + 0.00017 / 1 = 0.76086$

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

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