

## 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.

**Address:** No.82, Gongye 2nd Rd., Annan Dist., Tainan City 709, Taiwan(R.O.C)

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

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

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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.

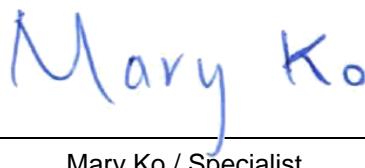
**Test Date:** Jan. 06 to 11, 2018

**Standards:** FCC Part 2 (Section 2.1091)

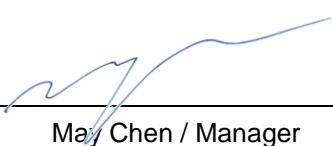
KDB 447498 D01 General RF Exposure Guidance v06

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 :** \_\_\_\_\_, **Date:** Feb. 09, 2018

Mary Ko / Specialist

  
**Approved by :** \_\_\_\_\_, **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 <sup>2</sup> )	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 <sup>2</sup> )*	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/cm<sup>2</sup>

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	Patch antenna	None
	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	Patch antenna	None
	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	Dipole antenna	N-type
	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	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		

**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 as 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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
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**

$$\text{WLAN 2.4GHz + WLAN 5GHz + Bluetooth} = 0.43672 / 1 + 0.47895 / 1 + 0.00017 / 1 = 0.91584$$

**Test model: API51c**

$$\text{WLAN 2.4GHz + WLAN 5GHz + Bluetooth} = 0.26044 / 1 + 0.50025 / 1 + 0.00017 / 1 = 0.76086$$

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

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