

## RF Exposure Report

**Report No.:** SA170713D01A

**FCC ID:** 2ALJ3AP24X

**Test Model:** AP241, AP241e

**Received Date:** Jul. 20, 2017

**Test Date:** Sep. 13 ~ Oct. 27, 2017

**Issued Date:** Nov. 3, 2017

**Applicant:** HAN Networks Co., Ltd.

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**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 (R.O.C.)



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### Release Control Record

Issue No.	Description	Date Issued
SA170713D01A	Original release.	Nov. 3, 2017

## 1 Certificate of Conformity

**Product:** HAN Access Point

**Brand:** HAN

**Test Model:** AP241, AP241e

**Sample Status:** Engineering sample

**Applicant:** HAN Networks Co., Ltd.

**Test Date:** Sep. 13 ~ Oct. 27, 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 RF characteristics under the conditions specified in this report.

**Prepared by :**



**Date:**

Nov. 3, 2017

Jessica Cheng / Senior Specialist

**Approved by :**



**Date:**

Nov. 3, 2017

Rex Lai / Associate Technical 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				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

### 2.2 MPE Calculation Formula

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

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

#### **AP241 (with internal antenna):**

The antenna of this product, under normal use condition, is at least 37cm away from the body of the user.  
So, this device is classified as **Mobile Device**.

#### **AP241e (with External antenna):**

The antenna of this product, under normal use condition, is at least 39cm away from the body of the user.  
So, this device is classified as **Mobile Device**.

## 2.4 Calculation Result Of Maximum Conducted Power

### AP241 (with internal antenna):

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	27.42	10.4	37	0.3519	1
5180-5240	18.44	10.49	37	0.0454	1
5260-5320	18.39	10.49	37	0.0449	1
5500-5700	23.31	10.49	37	0.1394	1
5745-5825	29.54	10.49	37	0.5853	1
2402-2480 Bluetooth EDR	4.91	4.89	37	0.0006	1
2402-2480 Bluetooth LE	4.52	4.89	37	0.0005	1

#### NOTE:

2.4GHz Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / 4] = 10.4\text{dBi}$

5.0GHz Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / 4] = 10.49\text{dBi}$

The Max Power = Max tune up power

### 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

WLAN 2.4GHz + WLAN 5GHz + Bluetooth EDR =  $0.3519 + 0.5853 + 0.0006 = 0.9378$

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

**AP241e (with External antenna):**

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	28.36	10.02	39	0.3603	1
5180-5240	16.93	12.02	39	0.0411	1
5260-5320	16.88	12.02	39	0.0406	1
5500-5700	22.32	12.02	39	0.1421	1
5745-5825	28.62	12.02	39	0.6063	1
2402-2480 Bluetooth EDR	4.91	3.42	39	0.0004	1
2402-2480 Bluetooth LE	4.52	3.42	39	0.0003	1

**NOTE:**

2.4GHz Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / 4] = 10.02\text{dBi}$

5.0GHz Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / 4] = 12.02\text{dBi}$

The Max Power = Max tune up power

**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

WLAN 2.4GHz + WLAN 5GHz + Bluetooth EDR =  $0.3603 + 0.6063 + 0.0004 = 0.967$

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

**--- END ---**