

## 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

$$Pd = (Pout * G) / (4 * pi * r^2)$$

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

#### **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<br>Bluetooth EDR | 4.91            | 4.89               | 37            | 0.0006                              | 1                           |
| 2402-2480<br>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<br>Bluetooth EDR | 4.91            | 3.42               | 39            | 0.0004                              | 1                           |
| 2402-2480<br>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.**

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