

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

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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 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

2.2 MPE Calculation Formula

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

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

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 ²)	Limit (mW/cm ²)
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 ²)	Limit (mW/cm ²)
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.

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