

RF Exposure Report

Report No.: SA190326C19

FCC ID: M82-261ACNBT

Test Model: WPEQ-261ACN(BT)

Received Date: Feb. 27, 2019

Test Date: Mar. 26 ~ Apr. 03, 2019

Issued Date: Apr. 17, 2019

Applicant: ADVANTECH CO., LTD

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

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**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
SA190326C19	Original release	Apr. 17, 2019

1 Certificate of Conformity

Product: 802.11ac/b/g/n Wi-Fi+BT module

Brand: Advantech

Test Model: WPEQ-261ACN(BT)

Sample Status: Engineering sample

Applicant: ADVANTECH CO., LTD

Test Date: Mar. 26 ~ Apr. 03, 2019

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 : Pettie Chen, **Date:** Apr. 17, 2019
Pettie Chen / Senior Specialist

Approved by : Bruce Chen, **Date:** Apr. 17, 2019
Bruce Chen / Project Engineer

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

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

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

r = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as Mobile Device.

3 Calculation Result of Maximum Conducted Power

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN 2412~2462	19.49	7.45	20	0.098	1
WLAN 5180~5240	18.76	8.81	20	0.114	1
WLAN 5260~5320	18.71	8.81	20	0.112	1
WLAN 5500~5720	17.13	8.81	20	0.078	1
WLAN 5745~5825	18.02	8.81	20	0.096	1
BT LE 2402~2480	-1.03	4.44	20	0.0004	1
BT EDR 2402~2480	2.91	4.44	20	0.001	1

For WLAN 2.4GHz Band: Directional gain = $4.44\text{dBi} + 10\log(2) = 7.45\text{dBi}$

For WLAN 5.0GHz Band: Directional gain = $5.8\text{dBi} + 10\log(2) = 8.81\text{dBi}$

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

WLAN (5GHz) + Bluetooth = $0.114 / 1 + 0.001 / 1 = 0.115$

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

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