

RF Exposure Report

Report No.: SA180522C01 R1

FCC ID: M82-ARK1124

Model: ARK-1124

Series Model: ARK-1124YXXXXXXXXXXXXXXXXXX, ARK1124YXXXXXXXXXXXXXXXXXX,
EIS-D210WXXXXXXXXXXXXXXXXXX, EISD210WXXXXXXXXXXXXXXXXXX
(X=0-9, A-Z, hyphen, or blank, Y= 0-9, A-Z, hyphen, or blank, except "Y" not be
"D" and "F")

Received Date: May 22, 2018

Test Date: Jun. 06 ~ Jun. 27, 2018

Issued Date: Aug. 13, 2018

Applicant: ADVANTECH CO., LTD

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

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R.O.C.

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, TAIWAN (R.O.C.)



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Release Control Record

Issue No.	Description	Date Issued
SA180522C01	Original release	Jul. 16, 2018
SA180522C01 R1	Added WiFi module information	Aug. 13, 2018

1 Certificate of Conformity

Product: Computer

Brand: Advantech

Model: ARK-1124

Series Model: ARK-1124YXXXXXXXXXXXXXXXXXX, ARK1124YXXXXXXXXXXXXXXXXXX,
EIS-D210WXXXXXXXXXXXXXXXXXX, EISD210WXXXXXXXXXXXXXXXXXX
(X=0-9, A-Z, hyphen, or blank, Y= 0-9, A-Z, hyphen, or blank, except "Y" not be "D" and
"F")

Sample Status: Engineering sample

Applicant: ADVANTECH CO., LTD

Test Date: Jun. 06 ~ Jun. 27, 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 RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen, **Date:** Aug. 13, 2018
Pettie Chen / Senior Specialist

Approved by : Bruce Chen, **Date:** Aug. 13, 2018
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

The following WiFi module was provided to the EUT.

Model	Chipset	Type
QCNFA364A	QCA6174A	IEEE 802.11ac/a/b/g/n 2X2 MIMO WLAN & Bluetooth M.2 module

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN: 2412-2472	26.61	5.90	20	0.355	1
WLAN: 5180-5240	15.82	6.59	20	0.035	1
WLAN: 5260-5320	20.09	6.59	20	0.093	1
WLAN: 5500-5720	19.76	6.59	20	0.086	1
WLAN: 5745-5825	20.22	6.59	20	0.095	1
BT EDR: 2402-2480	5.48	2.89	20	0.001	1
BT LE: 2402-2480	-1.13	2.89	20	0.0003	1

WLAN 2.4GHz Band: Directional gain = $2.89\text{dBi} + 10\log(2) = 5.9\text{dBi}$

WLAN 5GHz Band: Directional gain = $3.58\text{dBi} + 10\log(2) = 6.59\text{dBi}$

* Both of the Bluetooth and WLAN (5GHz) can transmit simultaneously.

CONCLUSION:

Both of the Bluetooth and WLAN (5GHz) can transmit simultaneously, 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

Bluetooth LE + WLAN 5GHz = $0.0003 + 0.095 = 0.0953 < 1$

Bluetooth EDR + WLAN 5GHz = $0.001 + 0.095 = 0.096 < 1$

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

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