

RF Exposure Report

Report No.: SABAOZ-WTW-P21060679-1

FCC ID: 2AHKM-ARIA3411

Test Model: ARIA3411

Series Model: OS3411

Received Date: 2021/6/22

Test Date: 2021/8/27

Issued Date: 2022/4/25

Applicant: Hitron Technologies Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
SABAOZ-WTW-P21060679-1	Original release.	2022/4/25

1 Certificate of Conformity

Product: Tri-band WiFi Extender
Brand: hitron
Test Model: ARIA3411
Series Model: OS3411
Sample Status: Engineering sample
Applicant: Hitron Technologies Inc.
Test Date: 2021/8/27
Standards: FCC Part 2 (Section 2.1091)
KDB 447498 D01 General RF Exposure Guidance v06

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 EMC characteristics under the conditions specified in this report.

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Cherry Chuo / Specialist

Approved by : Clark Lin , **Date:** 2022/4/25
Clark Lin / 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				
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 26 cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Antenna NO.	Model	Antenna Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connector Type	Cable Length
1	RFPCA252525IMLB901	2.63	2.4~2.4835	printed PCB	ipex(MHF)	24cm
		4.02	5.15~5.85			
2	RFPCA282525IMLB901	2.6	2.4~2.4835	printed PCB	ipex(MHF)	24cm
		3.81	5.15~5.85			
3	RFPCA212009IMMB901	3.59	5.85~7.125	printed PCB	ipex(MHF)	10cm
4	RFPCA221508IMMB901	4.71	5.85~7.125	printed PCB	ipex(MHF)	7.5cm
5	RFPCA221514IMMB901	4.7	5.85~7.125	printed PCB	ipex(MHF)	13.5cm
6	RFPCA212009IMMB902	4.59	5.85~7.125	printed PCB	ipex(MHF)	8.5cm
7 (for BT)	RFPCA381007IMAB301	4.77	2.4~2.4835	printed PCB	ipex(MHF)	6.5cm

Note: The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.5 Calculation Result

For WLAN 2.4GHz, WLAN 5GHz (U-NII-1 & U-NII-3) and WLAN 6GHz data was copied from the original test report (Report No.: SABAOZ-WTW-P21060679)

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
WLAN 2.4GHz	2412~2462	990.903	5.63	26	0.42646	1	Pass
WLAN 5GHz (U-NII-1)	5180~5240	707.181	6.93	26	0.41056	1	Pass
WLAN (U-NII-2A)	5260~5320	246.12	6.93	26	0.14289	1	Pass
WLAN (U-NII-2C)	5500~5720	234.382	6.93	26	0.13607	1	Pass
WLAN 5GHz (U-NII-3)	5745~5825	795.324	6.93	26	0.46173	1	Pass
Bluetooth	2402~2480	5.14	4.77	26	0.00181	1	Pass

Operation Mode	Evaluation Frequency (MHz)	Max EIRP (mW)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
WLAN 6GHz (U-NII-5)	6115~6415	121.619	26	0.01432	1	Pass
WLAN 6GHz (U-NII-6)	6435~6515	116.145	26	0.01099	1	Pass
WLAN 6GHz (U-NII-7)	6535~6875	127.35	26	0.01499	1	Pass
WLAN 6GHz (U-NII-8)	7015~7115	121.619	26	0.01432	1	Pass

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.63 \text{ dBi}$
5GHz: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 6.93 \text{ dBi}$

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

$$\text{WLAN 2.4GHz} + \text{WLAN 5GHz} + \text{WLAN 6GHz} + \text{Bluetooth} \\ = 0.42646 / 1 + 0.46173 / 1 + 0.01499 / 1 + 0.00181 / 1 = 0.90499$$

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

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