

RF Exposure Report

Report No.: SABDHL-WTW-P20080206

FCC ID: GZ5NVG578HLX

Test Model: NVG578HLX

Series Model: NVG568HLX

Received Date: Aug. 11, 2020

Test Date: Oct. 26, 2020

Issued Date: Nov. 26, 2020

Applicant: ARRIS

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SABDHL-WTW-P20080206	Original release.	Nov. 26, 2020

1 Certificate of Conformity

Product: Dual-Band 802.11ax Wireless Router
Brand: ARRIS
Test Model: NVG578HLX
Series Model: NVG568HLX
Sample Status: ENGINEERING SAMPLE
Applicant: ARRIS
Test Date: Oct. 26, 2020
Standards: FCC Part 2 (Section 2.1091)
IEEE C95.3 -2002
References Test Guidance: 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.

Prepared by : Cherry Chuo , **Date:** Nov. 26, 2020
Cherry Chuo / Specialist

Approved by : Clark Lin , **Date:** Nov. 26, 2020
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

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

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

The antenna of this product, under normal use condition, is at least 33 cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Ant. Set	RF Chain No.	Ant. Net Gain (dBi)	Freq. Range (GHz)	Ant. Type	Connector Type	Cable Length (mm)
0	5G Chain0	3.93	5.15~5.25	PIFA	RF switch	on-board no cable
		3.45	5.25~5.35			
		4.15	5.47~5.725			
		4.33	5.725~5.85			
1	5G Chain1 / 2.4G Chain 2	4.69	2.4~2.4835	PIFA	RF switch	on-board no cable
		2.77	5.15~5.25			
		3.33	5.25~5.35			
		4.33	5.47~5.725			
		4.54	5.725~5.85			
2	5G Chain2 / 2.4G Chain 1	2.27	2.4~2.4835	Dipole	i-pex(MHF)	200
		2.65	5.15~5.25			
		2.86	5.25~5.35			
		3.12	5.47~5.725			
		3.12	5.725~5.85			
3	5G Chain3 / 2.4G Chain 0	3.36	2.4~2.4835	Dipole	i-pex(MHF)	200
		2.83	5.15~5.25			
		2.77	5.25~5.35			
		2.65	5.47~5.725			
		2.83	5.725~5.85			

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 of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN 2.4GHz	2412~2462	349.696	8.27	33	0.17157	1
WLAN 5GHz (U-NII-1)	5180~5250	913.035	9.08	33	0.53982	1
WLAN 5GHz (U-NII-3)	5745~5825	993.722	9.76	33	0.68711	1

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2 / 3] = 8.27$ dBi
- 5GHz:
 - For U-NII-1: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2 / 3] = 9.08$ dBi
 - For U-NII-3: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 9.76$ 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

$$\text{WLAN 2.4GHz} + \text{WLAN 5GHz (U-NII-3)} = 0.17157 / 1 + 0.68711 / 1 = 0.85868$$

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

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