



RF Exposure Evaluation Declaration

FCC ID: UIDW61

Applicant: ARRIS

Product: Wireless Router

Model No.: W61

FCC Classification: Digital Transmission System (DTS)
Unlicensed National Information Infrastructure (NII)
15E 6 GHz Low Power Indoor Access Point (6ID)
15E 6 GHz Subordinate Indoor Device (6PP)

FCC Rule Part(s) FCC Part 2.1091

Test Procedure KDB 447498 D04 Interim General RF Exposure
Guidance v01

Reviewed By:

Vincent Yu

Approved By:

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The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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27Revision History

Report No.	Version	Description	Issue Date	Note
2205RSU031-U5	Rev. 01	Initial Report	2022-08-04	Valid

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1. General Information

1.1. Applicant

ARRIS

3871 LAKEFIELD DR, SUWANEE GA 30024, UNITED STATES

1.2. Manufacturer

ARRIS

3871 LAKEFIELD DR, SUWANEE GA 30024, UNITED STATES

1.3. Testing Facility

☒	Test Site – MRT Suzhou Laboratory Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China Laboratory Accreditations A2LA: 3628.01 CNAS: L10551 FCC: CN1166 ISED: CN0001 VCCI: ☐ R-20025 ☐ G-20034 ☐ C-20020 ☐ T-20020 ☐ R-20141 ☐ G-20134 ☐ C-20103 ☐ T-20104
☒	Test Site – MRT Shenzhen Laboratory Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China Laboratory Accreditations A2LA: 3628.02 CNAS: L10551 FCC: CN1284 ISED: CN0105
☐	Test Site – MRT Taiwan Laboratory Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) Laboratory Accreditations TAF: L3261-190725 FCC: 291082, TW3261 ISED: TW3261

1.4. Product Information

Product Name	Wireless Router
Model No.	W61
Wi-Fi Specification	802.11a/b/g/n/ac/ax
Antenna Information	Refer to Clause 1.5
Power Supply	AC/DC Adapter
Accessories	
Adapter 1#	Model: WA-30P12FU Input:100-120V ~ 50/60Hz 0.9A Max Output: 12V 2.5A
Adapter 2#	Model: F30L10-120250SPAU Input:100-120V ~ 50/60Hz 0.9A Max Output: 12V 2.5A, 30.0W
Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Antenna Details

Antenna Type	Frequency Band	Tx Paths	N _{SS}	Antenna Gain (dBi)				Max. Gain (dBi)	BF DG (dBi)	CDD DG (dBi)	
				Ant 0	Ant 1	Ant 2	Ant 3			Power	PSD
Dipole	2.4GHz	2	1	4.5	4.8	--	--	4.8	7.81	4.8	7.81
	5GHz	2	1	4.9	4.4	--	--	4.9	7.91	4.9	7.91
	6GHz	4	1	5.7	5.2	5.8	5.8	5.8	11.82	5.8	11.82

Remark:

- The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.
If all antennas have the same gain, G_{ANT} , Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.
 - For power spectral density (PSD) measurements on all devices,
Array Gain = $10 \log (N_{ANT} / N_{SS})$ dB;
 - For power measurements on IEEE 802.11 devices,
Array Gain = 0 dB for $N_{ANT} \leq 4$;
- The EUT also supports beamforming mode, and the beamforming support 802.11n/ac/ax only, not include 802.11a/b/g. BF Directional Gain = Max. Gain + $10 \log (N_{ANT} / N_{SS})$.
For beamforming operation, manufacturer automatically backs power down based on a $10 \log (N_{ANT})$ factor based on CDD power. Therefore, only the CDD mode was evaluated in this report.

1.6. Device Classification

According to the user manual, the antenna of this device is at least 30cm away from the body of the user, this device is classified as a **Mobile Device**. Therefore, the RF exposure evaluation requirements of FCC Part 2.1091 for mobile device exposure conditions subject to MPE limits.

2. RF Exposure Evaluation

2.1. Test Limits

According to FCC Part 2.1091, A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the RF source's radiating structure(s) and the body of the user or nearby persons.

According to FCC Part 1.1307(b)(3)(i)(C), for the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1.920 R^2$
1.34-30	$3.450 R^2/f^2$
30-300	$3.83 R^2$
300-1500	$0.0128 R^2 f$
1500-100,000	$19.2 R^2$

f = frequency in MHz, R = minimum separation distance in meters.

According to FCC Part 1.1307(b)(3)(ii)(B), in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

2.2. Test Result

Product	Wireless Router
Test Item	RF Exposure Evaluation

Test Mode	Frequency Band (MHz)	Max. Conducted Power (dBm)	Max. Antenna Gain (dBi)	EIRP (dBm)	ERP (W)	Compliance Distance (R) (m)	Threshold ERP (W)
802.11b/g/n/ax	2412 ~ 2462	25.94	4.8	30.74	0.723	0.30	1.728
802.11a/n/ac/ax	5180 ~ 5825	23.95	4.9	28.85	0.468	0.30	1.728
802.11ax	5955 ~ 7095	--	--	23.836	0.147	0.30	1.728

Note:

1. $EIRP \text{ (dBm)} = \text{Max. Conducted Power (dBm)} + \text{Max. Antenna Gain (dBi)}$
2. $ERP \text{ (W)} = 10^{[ERP \text{ (dBm)} - 30]/10} = 10^{[EIRP \text{ (dBm)} - 2.15 \text{ (dB)} - 30]/10}$
3. $\text{Threshold ERP (W)} = 19.2 * R^2 \text{ (W)} = 19.2 * 0.30^2 \text{ (W)} = 1.728 \text{ (W)}$

The 2.4GHz WLAN, 5GHz WLAN and 6GHz RLAN can transmit simultaneously.

$$\text{Exposure Ratio} = (0.723 + 0.468 + 0.147) / 1.728 = 0.774 < 1.$$

Therefore, this device meets the RF Exposure requirements when it is installed and operated with a minimum distance of 30cm between the radiator and user.