



RF Exposure Evaluation Declaration

FCC ID: 2AF5PR14
Applicant: MTRLC LLC
Product: AX6000 Dual-band WiFi Router
Model No.: R14
FCC Classification: Digital Transmission System (DTS)
Unlicensed National Information Infrastructure (NII)
FCC Rule Part(s): FCC Part 2.1091
Result: Complies

Reviewed By:

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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.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.


Revision History

Report No.	Version	Description	Issue Date	Note
2301RSU001-U4	V01	Initial Report	2023-03-18	Valid

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1.4. Product Information

Product Name	AX6000 Dual-band WiFi Router
Model No.	R14
Wi-Fi Specification	802.11a/b/g/n/ac/ax
Antenna Information	See Section 1.5
Accessories	
Adapter	Model: RD1202000-CS5-154MG Input: 100-240V ~ 50/60Hz 1.0A Max Output: 12V  2.0A
Note: 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 Range (MHz)	N _{ANT}	Antenna Gain (dBi)				Max. Antenna Gain (dBi)	Directional Gain (dBi)
			Ant 1	Ant 2	Ant 3	Ant 4		
Dipole	2400 ~ 2483.5	4	2.14	2.38	2.77	4.15	4.15	7.64
	5150 ~ 5250	4	4.94	5.30	4.26	3.81	5.30	7.40
	5250 ~ 5350	4	5.07	4.96	3.78	3.21	5.07	7.05
	5470 ~ 5725	4	3.73	2.81	2.29	2.28	3.73	6.20
	5725 ~ 5850	4	4.28	2.31	2.55	3.66	4.28	7.31
Remark: The directional gain is measured which follows the procedure of KDB 662911 D03. The antenna report is provided for this application.								

1.6. Device Classification

According to the user manual, the antenna of this device is at least 35 cm away from the body of the user, this device is classified as a Mobile Device. So, the RF exposure evaluation requirements of § 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	AX6000 Dual-band WiFi Router
Test Item	RF Exposure Evaluation

Test Mode	Frequency Band (MHz)	Max. Conducted Power (dBm)	Max. Antenna Gain (dBi)	Max. EIRP (dBm)	Compliance Distance (R) (m)	ERP (W)	Threshold ERP (W)
802.11b/g/n/ax	2412 ~ 2462	27.40	4.15	31.55	0.35	0.8710	2.352
802.11a/n/ac/ax	5180 ~ 5240	28.35	5.30	33.65	0.35	1.4125	2.352
	5260 ~ 5320	23.38	5.07	28.45	0.35	0.4266	2.352
	5500 ~ 5720	23.95	3.73	27.68	0.35	0.3573	2.352
	5745 ~ 5825	26.91	4.28	31.19	0.35	0.8017	2.352

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. $\text{Threshold ERP (W)} = 19.2 * R^2 \text{ (W)} = 19.2 * 0.35^2 \text{ (W)} = 2.352 \text{ (W)}$

The 2.4GHz WLAN and 5GHz WLAN can transmit simultaneously.

$$\text{Exposure Ratio} = 0.8710 / 2.352 + 1.4125 / 2.352 = 0.9709 < 1.$$

Therefore, this device meets the RF Exposure requirements when it is installed and operated with a minimum distance of 35cm between the radiator and user.