



# RF Exposure Evaluation Declaration

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**FCC ID:** TE7AX6000

**APPLICANT:** TP-Link Technologies Co., Ltd.

**Application Type:** Certification

**Product:** AX6000 MU-MIMO Wi-Fi Router

**Model No.:** Archer AX6000

**Trademark:** tp-link

**FCC Classification:** FCC Part 15 Spread Spectrum Transmitter(DSS)  
Digital Transmission System (DTS)  
Unlicensed National Information Infrastructure (NII)

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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.

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## Revision History

Report No.	Version	Description	Issue Date	Note
1808RSU004-U7	Rev. 01	Initial Report	11-10-2018	Valid

## 1. PRODUCT INFORMATION

### 1.1. Equipment Description

Product Name	AX6000 MU-MIMO Wi-Fi Router
Model No.	Archer AX6000
Brand Name:	tp-link
Wi-Fi Specification:	802.11a/b/g/n/ac/ax
Bluetooth Specification:	v4.1 dual mode
<b>Components</b>	
Adapter	MODEL: S050FU1200400 INPUT: 100 - 240V ~ 50/60Hz 1.5A Max. OUTPUT: DC 12.0V 4000mA

### 1.2. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	TX Paths	Max Antenna Gain (dBi)	BF Directional Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For PSD
<b>Wi-Fi External Antenna</b>						
Dipole Antenna	2412 ~ 2462	4	1.16	7.18	1.16	7.18
	5150 ~ 5850	4	2.28	8.30	2.28	8.30
<b>Bluetooth Internal Antenna</b>						
PCB Antenna	2402 ~ 2480	1	4.05	--	--	--

Note:

- The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.  
 For CDD transmissions, directional gain is calculated as follows,  $N_{ANT} = 4$ ,  $N_{SS} = 1$ .  
 If all antennas have the same gain,  $G_{ANT}$ , Directional gain =  $G_{ANT} + \text{Array Gain}$ , where Array Gain is as follows.
  - For power spectral density (PSD) measurements on all devices,  
 Array Gain =  $10 \log (N_{ANT}/ N_{SS})$  dB = 6.02;
  - For power measurements on IEEE 802.11 devices,  
 Array Gain = 0 dB for  $N_{ANT} \leq 4$ ;
- The EUT also supports Beam Forming mode, and the Beam Forming support 802.11ac/ax, not include 802.11a/b/g/n. BF Directional gain =  $G_{ANT} + 10 \log (N_{ANT})$ .

## 2. RF Exposure Evaluation

### 2.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

Calculation Formula:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

$P_d$  is the limit of MPE, 1mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

## 2.2. Test Result of RF Exposure Evaluation

Product	AX6000 MU-MIMO Wi-Fi Router
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to clause 1.2.

Test Mode	Frequency Band (MHz)	Max Conducted Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (dBm)
BT	2402 ~ 2480	8.67	4.05	12.72
802.11b/g/n/ac/ax	2412 ~ 2462	28.80	7.18	35.98
802.11 a/n/ac/ax	5180 ~ 5320, 5500 ~ 5720, 5745 ~ 5825	27.56	8.30	35.86

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Power Density at R = 25 cm (mW/cm <sup>2</sup> )
Bluetooth	2402 ~ 2480	12.72	0.0037	1	0.0024
802.11b/g/n/ac/ax	2412 ~ 2462	35.98	0.7884	1	0.5046
802.11a/n/ac/ax	5180 ~ 5320, 5500 ~ 5720, 5745 ~ 5825	35.86	0.7669	1	0.4908

### CONCLUSION:

Both of the WLAN 2.4GHz Band, WLAN 5GHz Band and Bluetooth Band can transmit simultaneously.

The max Power Density at R (20 cm) =  $0.0037\text{mW/cm}^2 + 0.7884\text{mW/cm}^2 + 0.7669\text{mW/cm}^2 = 1.5590\text{mW/cm}^2 < 1\text{mW/cm}^2$ .

The max Power Density at R (25 cm) =  $0.0024\text{mW/cm}^2 + 0.5046\text{mW/cm}^2 + 0.4908\text{mW/cm}^2 = 0.9978\text{mW/cm}^2 < 1\text{mW/cm}^2$ .

Therefore, the Min Safety Distance is 25cm.

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## **Appendix A - Test Setup Photograph**

Refer to "1808RSU004-UT" file.

## **Appendix B - EUT Photograph**

Refer to "1808RSU004-UE" file.