RF Exposure Evaluation Declaration

FCC ID:	TE7AX50
APPLICANT:	TP-Link Technologies Co., Ltd.
Application Type:	Certification
Product:	AX3000 Gigabit Wi-Fi Router
Model No.:	Archer AX50, Archer AX3000
Trademark:	tp-link
FCC Classification:	Digital Transmission System (DTS) Unlicensed National Information Infrastructure (NII)
Test Procedure(s):	KDB 447498 D01v06
Test Date:	May 24, 2019

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Testing Laboratory
3261

Revision History

Report No.	Version	Description	Issue Date	Note
1905TW0114-U5	Rev. 01	Initial report	05-25-2019	Valid

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name	AX3000 Gigabit Wi-Fi 6 Router
Model No.	Archer AX50, Archer AX3000
Brand Name:	tp-link
Wi-Fi Specification:	802.11a/b/g/n/ac/ax

Note: These models are different in the USB interface, Archer AX50 supports USB 3.0, Archer AX3000 supports USB2.0. Others are the same. So Archer AX50 is chosen for the tests.

1.2. Description of Available Antennas

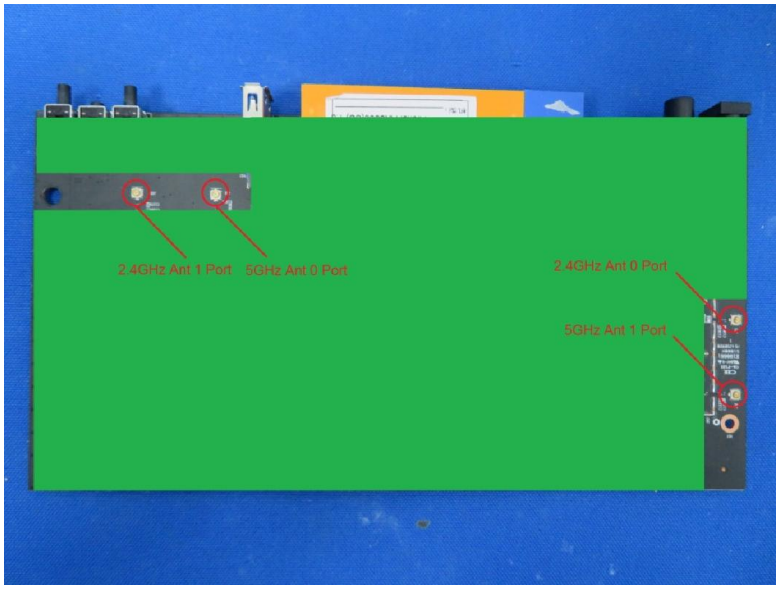
Antenna Type	Frequency Band (MHz)	TX Paths	Max Antenna Gain (dBi)		Directional Gain (dBi)	
			Ant 0	Ant 1	For Power	For PSD
Dipole Antenna	2400 ~ 2500	2	2.00	2.00	2.00	5.01
	5150 ~ 5850	2	3.00	3.00	3.00	6.01

Note:

1. 802.11b support single transmission at Ant 0 port only.
2. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.
   For CDD transmissions, directional gain is calculated as follows, N_{ANT} = 2, N_{SS} = 1.
   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 = 3.01;
   - For power measurements on IEEE 802.11 devices,
     Array Gain = 0 dB for $N_{ANT} \leq 4$;

1.3. Description of Antenna RF Port

Antenna RF Port				
Software Control Port	2.4GHz RF Port		5GHz RF Port	
	Ant 0	Ant 1	Ant 0	Ant 1



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

Where
Pd = power density in mW/cm^2
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

Pd is the limit of MPE, 1mW/cm². 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	AX3000 Gigabit Wi-Fi 6 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)
802.11b/g/n/ax	2412 ~ 2462	29.79	2.00	31.79
802.11 a/n/ac/ax	5180 ~ 5320, 5500 ~ 5720, 5745 ~ 5825	29.71	3.00	32.71

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)
802.11b/g/n/ax	2412 ~ 2462	31.79	0.3004	1
802.11 a/n/ac/ax	5180 ~ 5320, 5500 ~ 5720, 5745 ~ 5825	32.71	0.3713	1

CONCLUSION:

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

The max Power Density at R (20 cm) = 0.3004mW/cm^2 + 0.3713mW/cm^2 = 0.6717mW/cm^2 < 1mW/cm^2.

So the safety distance is 20cm for **AX3000 Gigabit Wi-Fi 6 Router** installed without any other radio equipment.

The End

Appendix A - EUT Photograph

Refer to “1905TW0114-UE” file.