

FCC RF EXPOSURE REPORT

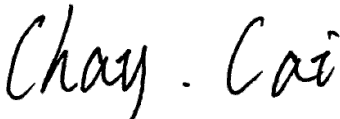
FCC ID: 2AXJ4HX510

Project No. : 2203C047
Equipment : AX3000 Whole Home Mesh Wi-Fi AP
Brand Name : tp-link
Test Model : HX510
Series Model : N/A
Applicant : TP-Link Corporation Limited
Address : Room 901, 9/F. , New East Ocean Centre, 9 Science Museum Road,
Tsim Sha Tsui, Kowloon, Hong Kong
Manufacturer : TP-Link Corporation Limited
Address : Room 901, 9/F. , New East Ocean Centre, 9 Science Museum Road,
Tsim Sha Tsui, Kowloon, Hong Kong
Date of Receipt : Mar. 09, 2022
Date of Test : Mar. 10, 2022 ~ May 10, 2022
Issued Date : May 23, 2022
Report Version : R00
Test Sample : Engineering Sample No.: DG2022030970
Standard(s) : FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091
FCC Title 47 Part 2.1091

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.



Prepared by : Sheldon Ou



Approved by : Chay Cai



TESTING CERT #5123.02

Add: No. 3 Jinshagang 1st Rd. Shixia, Dalang Town Dongguan City, Guangdong 523792

People's Republic of China

Tel: +86-769-8318-3000

Web: www.newbtl.com

REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-4-2203C047	R00	Original Report	May 23, 2022	Valid

1. TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 3 Jinshagang 1st Rd. Shixia, Dalang Town Dongguan City, Guangdong 523792 People's Republic of China.

BTL's Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

2. MPE CALCULATION METHOD

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi r^2} = \frac{EIRP}{4\pi r^2}$$

where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

For 2.4GHz:

Antenna Specification:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	tp-link	3101504341	Dipole	WELD	2
2	tp-link	3101504342	Dipole	WELD	2

Note:

- This EUT supports CDD, and all antennas have the same gain, Directional gain = $G_{ANT} + \text{Array Gain}$. For power measurements, Array Gain=0dB ($N_{ANT} \leq 4$), so the Directional gain=2 dBi. For power spectral density measurements, $N_{ANT}=2$, $N_{SS} = 1$. So the Directional gain= $G_{ANT} + \text{Array Gain} = G_{ANT} + 10\log(N_{ANT}/N_{SS})\text{dBi} = 2 + 10\log(2/1)\text{dBi} = 5.01$ dBi.
- Beamforming Gain: 3 dB. Then Directional gain=3+2=5 dBi.
- The antenna gain and beamforming gain are provided by the manufacturer.

Table for Antenna Configuration:

For Non Beamforming:

Operating Mode	TX Mode	2TX
IEEE 802.11b		V (Ant. 1+Ant. 2)
IEEE 802.11g		V (Ant. 1+Ant. 2)
IEEE 802.11n(HT20)		V (Ant. 1+Ant. 2)
IEEE 802.11n(HT40)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE20)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE40)		V (Ant. 1+Ant. 2)

For Beamforming:

Operating Mode	TX Mode	2TX
IEEE 802.11n(HT20)		V (Ant. 1+Ant. 2)
IEEE 802.11n(HT40)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE20)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE40)		V (Ant. 1+Ant. 2)

For 5GHz:

Antenna Specification:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	tp-link	3101504343	Dipole	WELD	1
2	tp-link	3101504344	Dipole	WELD	1

Note:

- 1) This EUT supports CDD, and all antennas have the same gain, Directional gain = $G_{ANT} + \text{Array Gain}$.
For power measurements, Array Gain=0dB ($N_{ANT} \leq 4$), so the Directional gain=1 dBi.
For power spectral density measurements, $N_{ANT}=2$, $N_{SS} = 1$.
So the Directional gain= $G_{ANT} + \text{Array Gain} = G_{ANT} + 10\log(N_{ANT}/N_{SS})\text{dBi} = 1 + 10\log(2/1)\text{dBi} = 4.01 \text{ dBi}$.
- 2) Beamforming Gain: 3 dB. Then the Directional gain=1+3=4 dBi.
- 3) The antenna gain and beamforming gain are provided by the manufacturer.

Table for Antenna Configuration:

For Non Beamforming:

Operating Mode	TX Mode	2TX
IEEE 802.11a		V (Ant. 1+Ant. 2)
IEEE 802.11n(HT20)		V (Ant. 1+Ant. 2)
IEEE 802.11n(HT40)		V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT20)		V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT40)		V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT80)		V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT160)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE20)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE40)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE80)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE160)		V (Ant. 1+Ant. 2)

For Beamforming:

Operating Mode	TX Mode	2TX
IEEE 802.11n(HT20)		V (Ant. 1+Ant. 2)
IEEE 802.11n(HT40)		V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT20)		V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT40)		V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT80)		V (Ant. 1+Ant. 2)
IEEE 802.11ac(VHT160)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE20)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE40)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE80)		V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE160)		V (Ant. 1+Ant. 2)

3. TEST RESULTS

For 2.4GHz Non Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Average Output Power (dBm)	Max. Average Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
2	1.5849	27.11	514.0437	0.16216	1	Complies

For 2.4GHz Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Average Output Power (dBm)	Max. Average Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
5	3.1623	25.83	382.8247	0.24096	1	Complies

For 5GHz Non Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
1	1.2589	25.95	393.5501	0.09862	1	Complies

For 5GHz Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
4	2.5119	25.94	392.6449	0.19631	1	Complies

For the max simultaneous transmission MPE:

Ratio		Total	Limit of Ratio	Test Result
2.4GHz	5GHz			
0.24096	0.19631	0.43727	1	Complies

Note: The calculated distance is 20 cm.
Output power including tune up tolerance.

End of Test Report