

FCC RF EXPOSURE REPORT

FCC ID: 2BCGWAX10

Project No. : 2311G085
Equipment : AX1500 Wi-Fi 6 Router
Brand Name : tp-link
Test Model : Archer AX10
Series Model : Archer AX1500
Applicant : TP-LINK CORPORATION PTE. LTD.
Address : 7 Temasek Boulevard #29-03 Suntec Tower One, Singapore 038987
Manufacturer : TP-LINK CORPORATION PTE. LTD.
Address : 7 Temasek Boulevard #29-03 Suntec Tower One, Singapore 038987
Date of Receipt : Nov. 17, 2023
Date of Test : Dec. 13, 2023 ~ Feb. 05, 2024
Issued Date : Feb. 27, 2024
Report Version : R00
Test Sample : Engineering Sample No.: SSL202311163
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.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-3-2311G085	R00	Original Report.	Feb. 27, 2024	Valid

1. MPE CALCULATION METHOD

Calculation Method of RF Safety Distance:

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

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

Table for Filed Antenna:

For 2.4GHz:

Ant.	Manufacturer	P/N	Antenna Type	Connector	Gain (dBi)
1	BIG FIELD GLOBAL PTE. LTD.	3101503966	Dipole	N/A	2
2	BIG FIELD GLOBAL PTE. LTD.	3101504414	Dipole	N/A	2

Note:

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

For 5GHz:

Ant.	Manufacturer	P/N	Antenna Type	Connector	Gain (dBi)
1	BIG FIELD GLOBAL PTE. LTD.	3101506685	Dipole	N/A	3
2	BIG FIELD GLOBAL PTE. LTD.	3101506301	Dipole	N/A	3

Note:

- This EUT supports CDD, and all antennas have the same gain, Directional gain = G_{ANT} +Array Gain. For power measurements, Array Gain=0dB ($N_{ANT} \leq 4$), so the Directional gain=3. For power spectral density measurements, $N_{ANT}=2$, $N_{SS} = 1$. So the Directional gain= G_{ANT} +Array Gain= $G_{ANT}+10\log(N_{ANT}/ N_{SS})$ dBi=3+10log(2/1)dBi=6.01. Then, the UNII-1 power spectral density limit is 17-(6.01-6)=16.99, the UNII-3 power spectral density limit is 30-(6.01-6)=29.99.
- Beamforming gain is 3dB.
- The antenna gain and beamforming gain are provided by the manufacturer.

Table for Antenna Configuration:

For 2.4GHz:

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)

For 5GHz:

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 802.11ax(HE20)	V (Ant. 1 + Ant. 2)
	IEEE 802.11ax(HE40)	V (Ant. 1 + Ant. 2)
	IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2)

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 802.11ax(HE20)	V (Ant. 1 + Ant. 2)
	IEEE 802.11ax(HE40)	V (Ant. 1 + Ant. 2)
	IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2)

2. TEST RESULTS

For 2.4GHz:

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
2	1.5849	24.58	228.0342	0.07194	1	Complies

For 5GHz UNII-1_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
3	1.9953	26.03	400.8667	0.15920	1	Complies

For 5GHz UNII-1_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
6	3.9811	25.63	365.5948	0.28970	1	Complies

For 5GHz UNII-3_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
3	1.9953	25.81	381.0658	0.15134	1	Complies

For 5GHz UNII-3_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
6	3.9811	25.70	381.0658	0.30196	1	Complies

For the max simultaneous transmission MPE:

Ratio		Total	Limit of Ratio	Test Result
2.4GHz	5GHz			
0.07194	0.30196	0.3739	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report