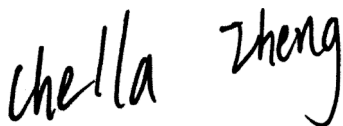


FCC RF EXPOSURE REPORT

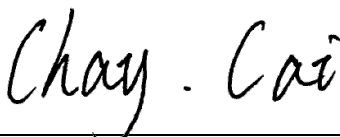
FCC ID: 2AXJ4RE815XE

Project No. : 2205C155
Equipment : AXE5400 Tri-Band Wi-Fi 6E Range Extender
Brand Name : tp-link
Test Model : RE815XE
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 : May 27, 2022
Date of Test : May 31, 2022 ~ Aug. 24, 2022
Issued Date : Sep. 08, 2022
Report Version : R00
Test Sample : Engineering Sample No.: DG20220530511, DG20220530510
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 : Chella Zheng



Approved by : Chay Cai



TESTING CERT #5123.02

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-5-2205C155	R00	Original Report	Sep. 08, 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:

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

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

For 2.4GHz:

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	tp-link	N/A	Dipole	N/A	2.79
2	tp-link	N/A	Dipole	N/A	3.00

Note:

- 1) This EUT supports CDD and all antenna gains are not equal, Directional gain= G_{ANT} +Array Gain. For power measurements, Array Gain=0dB ($N_{ANT} \leq 4$), so the Directional gain=3.00. For power spectral density measurements, $N_{ANT}=2$, $N_{SS}=1$. Then the Directional gain= G_{ANT} +Array Gain= $G_{ANT}+10\log(N_{ANT}/N_{SS})$ dBi=3.00+10log(2/1)dBi=6.01. So the power spectral density limit is 8-(6.01-6)=7.99.
- 2) Beamforming Gain: 3dB. Then the Directional gain=3+3=6.
- 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 802.11b		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	Model Name	Antenna Type	Connector	Gain (dBi)
1	tp-link	N/A	Dipole	N/A	2.69
2	tp-link	N/A	Dipole	N/A	3.00

Note:

- 1) This EUT supports CDD and all antenna gains are not equal, Directional gain= $G_{ANT} + \text{Array Gain}$. For power measurements, Array Gain=0dB ($N_{ANT} \leq 4$), so the Directional gain=3.00. For power spectral density measurements, $N_{ANT}=2$, $N_{SS}=1$. Then the Directional gain= $G_{ANT} + \text{Array Gain} = G_{ANT} + 10\log(N_{ANT}/N_{SS})\text{dBi} = 3 + 10\log(2/1)\text{dBi} = 6.01$. So the UNII-1 power spectral density limit is $17 - (6.01 - 6) = 16.99$, the UNII-2A and UNII-2C power spectral density limit is $11 - (6.01 - 6) = 10.99$, the UNII-3 power spectral density limit is $30 - (6.01 - 6) = 29.99$.
- 2) Beamforming Gain: 3dB. Then the Directional gain= $3 + 3 = 6$.
- 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)

For WIFI 6E:

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	tp-link	N/A	Dipole	N/A	3.00
2	tp-link	N/A	Dipole	N/A	3.00

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=3.00.
For power spectral density measurements, $N_{ANT}=2$, $N_{SS} = 1$ and $N_{SS} = 2$.
So the NSS1 Directional gain= $G_{ANT} + \text{Array Gain} = G_{ANT} + 10\log(N_{ANT}/N_{SS})\text{dBi} = 3.00 + 10\log(2/1)\text{dBi} = 6.01$,
the NSS2 Directional gain= $G_{ANT} + 10\log(N_{ANT}/N_{SS})\text{dBi} = 3.00 + 10\log(2/2)\text{dBi} = 3.00$.
- 2) Beamforming Gain: 3dB. Then the Directional gain=3+3=6.
- 3) The antenna gain and beamforming gain are provided by the manufacturer.

Table for Antenna Configuration:

Operating Mode	TX Mode	2TX
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)	Antenna 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
3.00	1.9953	28.24	666.8068	0.16948	1	Complies

For 2.4GHz Beamforming:

Directional Gain (dBi)	Antenna 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
6.00	3.9811	27.54	567.5446	0.28783	1	Complies

For 5GHz Non Beamforming:

Directional Gain (dBi)	Antenna 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
3.00	1.9953	27.39	548.2770	0.13936	1	Complies

For 5GHz Beamforming:

Directional Gain (dBi)	Antenna 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
6.00	3.9811	26.90	489.7788	0.24839	1	Complies

For WIFI 6E Non Beamforming:

Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
26.91	490.9079	0.06254	1	Complies

For WIFI 6E Beamforming:

Max. e.i.r.p. (dBm)	Max. e.i.r.p. (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
29.41	872.9714	0.11121	1	Complies

For the max simultaneous transmission MPE:

Ratio			Total	Limit of Ratio	Test Result
2.4GHz	5GHz	WIFI 6E			
0.28783	0.24839	0.11121	0.64743	1	Complies

Note: The calculated distance is 25 cm.
Output power including tune up tolerance.

End of Test Report