FCC RF EXPOSURE REPORT

FCC ID: 2BCGWHB710

Project No.	:	2405G048
Equipment	:	1) BE21000 Whole Home Mesh Wi-Fi 7 AP 2) BE18000 Whole Home Mesh Wi-Fi 7 AP
Brand Name	:	tp-link
Test Model	:	1) HB710
Series Model	:	2) Hexagon PB70
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	:	May 15, 2024
Date of Test	:	May 17, 2024 ~ Jul. 12, 2024
Issued Date	:	Jul. 22, 2024
Report Version	:	R00
Test Sample	:	Engineering Sample No.: SSL20240515100
Standard(s)	:	FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091 FCC Title 47 Part 2.1091 & KDB 447498 D01 v06

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

Prepared by : Grani Zhou

Grani Zhou

Approved by : Chay . Cai

Chay Cai

Room 108, Building 2, No.1, Yile Road, Songshan Lake Zone, Dongguan City, Guangdong, People's Republic of China.

Tel: +86-769-8318-3000 Web: www.newbtl.com Service mail: btl_qa@newbtl.com

REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-5-2405G048	R00	Original Report.	Jul. 22, 2024	Valid

1. 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

2. ANTENNA SPECIFICATION

For 2.4GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	TP-LINK	3101506913	Dipole	N/A	1.56
2	TP-LINK	3101506915	Dipole	N/A	1.78

Note:
1) This EUT supports CDD, and all antenna gains are not equal, Directional gain = G_{ANT} + Array Gain, For Power measurement, Array Gain = 0 dB($N_{ANT} \leqslant 4$), so Directional gain=1.78+0=1.78.
2) The beamforming gain is 3dB. So Directional gain=1.78+3=4.78dBi.
3) The antenna gain and beamforming gain are provided by the manufacturer.

For 5GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	TP-LINK	3101506916	Dipole	N/A	2.97
2	TP-LINK	3101506913	Dipole	N/A	2.56
3	TP-LINK	3101506917	Dipole	N/A	2.77
4	TP-LINK	3101506915	Dipole	N/A	2.92

Note:
1) This EUT supports CDD, and all antenna gains are not equal, Directional gain = G_{ANT} + Array Gain, For Power measurement, Array Gain = 0 dB($N_{ANT} \leqslant 4$), so Directional gain=2.97+0=2.97.
2) The beamforming gain is 6dB. So Directional gain=2.97+6=8.97dBi.
3) The antenna gain and beamforming gain are provided by the manufacturer.

For 6GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	TP-LINK	3101506912	Dipole	N/A	3.00
2	TP-LINK	3101505937	Dipole	N/A	2.56
3	TP-LINK	3101506914	Dipole	N/A	2.77
4	TP-LINK	3101505939	Dipole	N/A	2.92

Note:
1) This EUT supports CDD, and all antenna gains are not equal, Directional gain = G_{ANT} + Array Gain, For Power measurement, Array Gain = 0 dB($N_{ANT} \leqslant 4$), so Directional gain=3+0=3.
2) The beamforming gain is 6dB. So Directional gain=3.00+6=9.00dBi.
3) The antenna gain and beamforming gain are provided by the manufacturer.

3. TABLE FOR ANTENNA CONFIGURATION

For 2.4GHz:
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)
IEEE 802.11be(EHT20)	V(Ant. 1 + Ant. 2)
IEEE 802.11be(EHT40)	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)
IEEE 802.11be(EHT20)	V(Ant. 1 + Ant. 2)
IEEE 802.11be(EHT40)	V(Ant. 1 + Ant. 2)

For 5GHz:
For Non Beamforming:

Operating Mode / TX Mode	4TX
IEEE 802.11a	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n(HT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n(HT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT160)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE160)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT160)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)

For Beamforming:

Operating Mode / TX Mode	4TX
IEEE 802.11n(HT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11n(HT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ac(VHT160)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE160)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT160)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)

For 6GHz:

Operating Mode / TX Mode	4TX
IEEE 802.11ax(HE20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11ax(HE160)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT20)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT40)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT80)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT160)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)
IEEE 802.11be(EHT320)	V (Ant. 1 + Ant. 2 + Ant. 3 + Ant. 4)

4. CALCULATED RESULT

For 2.4GHz_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
1.78	1.5066	27.33	540.7543	0.10378	1	Complies

For 2.4GHz_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
4.78	3.0061	26.7	467.7351	0.17911	1	Complies

For 5GHz_Non Beamforming_NSS1:

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
2.97	1.9815	29.71	935.4057	0.23612	1	Complies

For 5GHz_Non Beamforming_NSS4:

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
2.97	1.9815	29.57	905.7326	0.22863	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
8.97	7.8886	26.89	488.6524	0.49106	1	Complies

For 6GHz_Non Beamforming_NSS1:

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
21.47	140.2814	0.01787	1	Complies

For 6GHz_Non Beamforming_NSS4:

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
26.65	462.3810	0.05890	1	Complies

For 6GHz_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
21.8	151.3561	0.01928	1	Complies

For the max simultaneous transmission MPE:

Ratio			Total	Limit of Ratio	Test Result
2.4GHz	5GHz	6GHz			
0.17911	0.49106	0.05890	0.72907	1	Complies

Note:
(1) The calculated distance is 25 cm.
(2) Ratio=Power Density (S) (mW/cm^2)/Limit of Power Density (S) (mW/cm^2)

End of Test Report