FCC RF EXPOSURE REPORT

FCC ID: 2AXJ4X3600

Project No.	:	2008C032B
Equipment	:	AX3600 Whole Home Mesh Wi-Fi 6 System
Brand Name	:	tp-link
Test Model	:	Deco X68
Series Model	:	Deco X3600, Deco W7200
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	:	Aug. 20, 2020 May 11, 2022
Date of Test	:	Aug. 21, 2020 ~ Oct. 21, 2020
Issued Date	:	May 23, 2022
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG2020082029
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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TESTING CERT #5123.02

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-3-2008C032B	R00	Compared with original report (BTL-FCCP-3-2008C032), 1. Added series model. 2. Removed the standard OET Bulletin 65 Supplement C. 3. The product has below changes: a. The main chip is replaced by pin to pin, the chip is changed from BCM6755 to BCM6756. The chip BCM6756 opened the 160MHz bandwidth of 5G (Model Deco X68 not supports) and supported WIFI 6G (Model Deco X68 not uses). b. The frequency of CPU is increased from 1.5GHz to 1.7GHz. So the worst case of power is verified. It is found that the original data are the worse. So the original test data are saved in this 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

Table for Filed Antenna:
For 2.4GHz:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	TP-LINK	3101503310	Internal	IPEX	1.97
2	TP-LINK	3101503311	Internal	IPEX	1.98

Note:
1) This EUT supports CDD, and all antenna gains are not equal, so Directional gain=10log[$(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2$/N]dBi, that is Directional gain=10log[$(10^{1.97/20}+10^{1.98/20})^2$/2]dBi=4.99.
2) Beamforming Gain: 3 dB. So the Directional gain=3+1.98=4.98.
3) The antenna gain and beamforming gain are provided by the manufacturer.

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 802.11nax(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 802.11nax(HE40)	V (Ant. 1 + Ant. 2)

For 5GHz:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	TP-LINK	3101503313	Internal	IPEX	0.94	UNII-1
2	TP-LINK	3101503312	Internal	IPEX	0.97	UNII-1
3	TP-LINK	3101503314	Internal	IPEX	0.98	UNII-1
1	TP-LINK	3101503310	Internal	IPEX	0.92	UNII-3
2	TP-LINK	3101503311	Internal	IPEX	0.92	UNII-3

Note:

1. This EUT supports CDD,
   1) For UNII-1, all antenna gains are not equal, so Directional gain=10log[$(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2$/N]dBi. the Directional gain=10log[$(10^{0.94/20}+10^{0.97/20}+10^{0.98/20})^2$/3]dBi=5.73.
   2) For UNII-3, all antennas have the same gain, then, Directional gain = G_{ANT}+Array Gain,
      For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=0.92.
      For power spectral density measurements, $N_{ANT} = 2$, $N_{SS} = 1$.
      So Directional gain = G_{ANT} + Array Gain = G_{ANT}+10log (N_{ANT}/ N_{SS}) dB =0.92+10log(2/1)dBi=3.93.
   3) a) For UNII-1, Beamforming Gain: 4.7 dB, the Directional gain=4.7+0.98=5.68.
      b) For UNII-3, Beamforming Gain: 3 dB the Directional gain=3+0.92=3.92.
2. The antenna gain and beamforming gain are provided by the manufacturer.

4. Table for Antenna Configuration:

UNII-1:

For Non Beamforming:

Operating Mode / TX Mode	3TX
IEEE 802.11a	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ac (VHT20)	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ac (VHT40)	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ac (VHT80)	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ax (HE20)	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ax (HE40)	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ax (HE80)	V (Ant. 1 + Ant. 2 + Ant. 3)

For Beamforming:

Operating Mode / TX Mode	3TX
IEEE 802.11ac (VHT20)	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ac (VHT40)	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ac (VHT80)	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ax (HE20)	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ax (HE40)	V (Ant. 1 + Ant. 2 + Ant. 3)
IEEE 802.11ax (HE80)	V (Ant. 1 + Ant. 2 + Ant. 3)

UNII-3:

For Non Beamforming:

Operating Mode / TX Mode	2TX
IEEE 802.11a	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 802.11ac (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)

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
4.99	3.1550	29.28	847.2274	0.34051	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
4.98	3.1477	28.51	709.5778	0.28453	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
5.73	3.7411	28.08	642.6877	0.30629	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
5.68	3.6983	27.79	601.1737	0.28322	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
3.93	2.4717	28.54	714.4963	0.22497	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
3.92	2.4660	28.18	657.6578	0.20660	1	Complies

For the max simultaneous transmission MPE:

Ratio		Total	Limit of Ratio	Test Result
2.4GHz	5GHz			
0.34051	0.30629	0.64680	1	Complies

Note: The calculated distance is 25 cm.

End of Test Report