

# 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.

*Chella Zheng*

Prepared by : Chella Zheng

*Chay Cai*

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](http://www.newbtl.com)

### REPORT ISSUED HISTORY

| Report No.           | Version | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Issued Date  | Note  |
|----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------|
| BTL-FCCP-3-2008C032B | R00     | <p>Compared with original report (BTL-FCCP-3-2008C032),</p> <ol style="list-style-type: none"> <li>Added series model.</li> <li>Removed the standard OET Bulletin 65 Supplement C.</li> <li>The product has below changes: <ol style="list-style-type: none"> <li>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).</li> <li>The frequency of CPU is increased from 1.5GHz to 1.7GHz.</li> </ol> </li> </ol> <p>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.</p> | 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:

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

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

Note:

- 1) This EUT supports CDD, and all antenna gains are not equal, so Directional gain=10log[(10<sup>G1/20</sup>+10<sup>G2/20</sup>+...10<sup>GN/20</sup>)<sup>2</sup>/N]dBi, that is Directional gain=10log[(10<sup>1.97/20</sup>+10<sup>1.98/20</sup>)<sup>2</sup>/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:

- This EUT supports CDD,
  - For UNII-1, all antenna gains are not equal, so Directional gain= $10\log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2/N]$ dBi. the Directional gain= $10\log[(10^{0.94/20}+10^{0.97/20}+10^{0.98/20})^2/3]$ dBi=5.73.
  - 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 =  $G_{ANT} + \text{Array Gain} = G_{ANT}+10\log(N_{ANT}/N_{SS})$  dB = $0.92+10\log(2/1)$ dBi=3.93.
  - 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.
- 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 <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | 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 <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | 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 <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | 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 <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | 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 <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | 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 <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | 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**