



# FCC RADIO EXPOSURE TEST REPORT

**FCC ID** : TE7X90

**Equipment** : AX6600 Whole Home Mesh Wi-Fi 6 System, AX5700 Whole Home Mesh Wi-Fi 6 System

**Brand Name** : tp-link

**Model Name** : Deco X90, Deco X5700

**Applicant** : TP-Link Technologies Co., Ltd.  
Building 24 (floors 1,3,4,5) and 28 (floors1-4),  
Central Science and Technology Park,Nanshan  
Shenzhen, 518057 China

**Manufacturer** : TP-Link Technologies Co., Ltd.  
Building 24 (floors 1,3,4,5) and 28 (floors1-4),  
Central Science and Technology Park,Nanshan  
Shenzhen, 518057 China

**Standard** : 47 CFR Part 2.1091

The product was received on Jul. 28, 2020, and testing was started from Jul. 31, 2020 and completed on Sep. 17, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Cliff Chang

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**  
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



## Table of Contents

|                                                 |          |
|-------------------------------------------------|----------|
| <b>History of this test report.....</b>         | <b>3</b> |
| <b>Summary of Test Result.....</b>              | <b>4</b> |
| <b>1 General Description .....</b>              | <b>5</b> |
| 1.1 EUT General Information .....               | 5        |
| 1.2 Testing Location .....                      | 6        |
| <b>2 Maximum Permissible Exposure .....</b>     | <b>7</b> |
| 2.1 Limit of Maximum Permissible Exposure ..... | 7        |
| 2.2 MPE Calculation Method.....                 | 7        |
| 2.3 Calculated Result and Limit.....            | 8        |
| <b>Photographs of EUT v01</b>                   |          |





## Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items          | Result (PASS/FAIL) | Remark |
|---------------|-----------------|---------------------|--------------------|--------|
| 2             | -               | Exposure evaluation | PASS               | -      |

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

**Reviewed by: Sam Chen**

**Report Producer: Wendy Pan**

# 1 General Description

## 1.1 EUT General Information

| RF General Information |                                     |                                     |                                                                                                                                                                                                |
|------------------------|-------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Evaluation Mode        | Frequency Range (MHz)               | Operating Frequency (MHz)           | Modulation Type                                                                                                                                                                                |
| 2.4GHz WLAN            | 2400-2483.5                         | 2412-2462                           | 802.11b: DSSS (DBPSK, DQPSK, CCK)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) |
| 5GHz WLAN              | 5150-5250<br>5250-5350<br>5725-5850 | 5180-5250<br>5260-5320<br>5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)                                 |

### 1.1.1 Table for Multiple Listing

The EUT has two equipment and model names which are identical to each other in all aspects except for the following table:

| Brand Name | Equipment Name                           | Model Name | Description                                                                                                                 |
|------------|------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------|
| tp-link    | AX6600 Whole Home Mesh<br>Wi-Fi 6 System | Deco X90   | All the equipment and model names are identical; the difference equipment name and model name served as marketing strategy. |
|            | AX5700 Whole Home Mesh<br>Wi-Fi 6 System | Deco X5700 |                                                                                                                             |

From the above models, model: Deco X90 was selected as representative model for the test and its data was recorded in this report.

### 1.1.2 Table for EUT support type

| Function |
|----------|
| AP       |
| Router   |
| Mesh     |

Note: After evaluating, there is only the Router selected to test and recorded in the report.



## 1.2 Testing Location

| Testing Location                    |        |                                                                                                                               |
|-------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | HWA YA | ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL : 886-3-327-3456 FAX : 886-3-327-0973   |
| <input checked="" type="checkbox"/> | JHUBEI | ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.<br>TEL : 886-3-656-9065 FAX : 886-3-656-9085 |

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

## 2 Maximum Permissible Exposure

### 2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | (100)*                                   | 6                                                                |
| 3.0-30                | 1842 / f                          | 4.89 / f                          | (900 / f)*                               | 6                                                                |
| 30-300                | 61.4                              | 0.163                             | 1.0                                      | 6                                                                |
| 300-1500              | -                                 | -                                 | F/300                                    | 6                                                                |
| 1500-100,000          | -                                 | -                                 | 5                                        | 6                                                                |

(B) Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-1.34              | 614                               | 1.63                              | (100)*                                   | 30                                                               |
| 1.34-30               | 824/f                             | 2.19/f                            | (180/f)*                                 | 30                                                               |
| 30-300                | 27.5                              | 0.073                             | 0.2                                      | 30                                                               |
| 300-1500              | -                                 | -                                 | F/1500                                   | 30                                                               |
| 1500-100,000          | -                                 | -                                 | 1.0                                      | 30                                                               |

Note: f = frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Method

The MPE was calculated at 29 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**E** = Electric field (V/m)

**P** = RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

**d** = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



## 2.3 Calculated Result and Limit

### Exposure Environment: General Population / Uncontrolled Exposure

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;D1D | 4.99     | 29.87       | 34.86      | 0.50           | 35.36              | 3.43558          | 29            | 0.32508                 | 1.00000                       |
| 5.2G;G1D | 6.99     | 28.91       | 35.90      | 0.09           | 35.99              | 3.97192          | 29            | 0.37582                 | 1.00000                       |
| 5.3G;D1D | 6.99     | 22.93       | 29.92      | 0.50           | 30.42              | 1.10154          | 29            | 0.10423                 | 1.00000                       |
| 5.8G;D1D | 3.98     | 29.96       | 33.94      | 0.50           | 34.44              | 2.77971          | 29            | 0.26302                 | 1.00000                       |

### Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz (Band 1,2) + WLAN 5GHz (Band 4)

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) | Ratio (S/Limit) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|-----------------|
| 2.4G;G1D | 4.99     | 29.87       | 34.86      | 0.50           | 35.36              | 3.43558          | 29            | 0.32508                 | 1.00000                       | 0.32508         |
| 5.2G;D1D | 6.99     | 28.91       | 35.90      | 0.09           | 35.99              | 3.97192          | 29            | 0.37582                 | 1.00000                       | 0.37582         |
| 5.8G;D1D | 3.98     | 29.96       | 33.94      | 0.50           | 34.44              | 2.77971          | 29            | 0.26302                 | 1.00000                       | 0.26302         |
|          |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.96392         |
|          |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

Note: The above antenna gain was declared by manufacturer.

————THE END————