

# FCC RF EXPOSURE REPORT

## FCC ID: TE7M5V3

**Project No.** : 1907C037  
**Equipment** : AC1300 Whole Home Mesh Wi-Fi System  
**Brand Name** : tp-link  
**Test Model** : Deco M5R  
**Series Model** : N/A  
**Applicant** : TP-Link Technologies Co., Ltd.  
**Address** : Building 24(floors1,3,4,5) and 28(floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China  
**Manufacturer** : TP-Link Technologies Co., Ltd.  
**Address** : Building 24(floors1,3,4,5) and 28(floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China  
**Date of Receipt** : Jul. 03, 2019  
**Date of Test** : Jul. 05, 2019 ~ Sep. 24, 2019  
**Issued Date** : Oct. 24, 2019  
**Report Version** : R00  
**Test Sample** : Engineering Sample No.: DG190703114  
**Standard(s)** : FCC Guidelines for Human Exposure IEEE C95.1  
FCC Title 47 Part 2.1091, OET Bulletin 65 Supplement C

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



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**REPORT ISSUED HISTORY**

| Report Version | Description    | Issued Date   |
|----------------|----------------|---------------|
| R00            | Original Issue | Oct. 24, 2019 |

## 1. 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

Antenna Specification:

For BT LE:

| Ant. | Brand                                                                             | P/N | Antenna Type | Connector | Gain (dBi) |
|------|-----------------------------------------------------------------------------------|-----|--------------|-----------|------------|
| 1    |  | N/A | Internal     | N/A       | 1.40       |

For 2.4GHz:

| Ant. | Brand                                                                               | P/N        | Antenna Type | Connector | Gain (dBi) |
|------|-------------------------------------------------------------------------------------|------------|--------------|-----------|------------|
| 1    |  | 3101502591 | Internal     | Weld      | 1.30       |
| 2    |  | 3101502592 | Internal     | Weld      | 1.30       |

Note:

(1) This EUT supports CDD, and all antennas have the same gain.

So, the directional gain =  $G_{ANT} + \text{Array Gain}$ .

For power Directional gain=1.30.

For power spectral density measurements, Array Gain=10log ( $N_{ANT}/N_{SS}$ ) dB, that is Directional gain = 1.30+10log(2/1)dBi=4.31

(2) For Beamforming Gain: 3.00 dB. So the Directional gain = 3.0+1.30=4.30.

For 5GHz:

| Ant. | Brand                                                                               | P/N        | Antenna Type | Connector | Gain (dBi) |
|------|-------------------------------------------------------------------------------------|------------|--------------|-----------|------------|
| 1    |  | 3101502593 | Internal     | I-PEX     | 0.64       |
| 2    |  | 3101502594 | Internal     | I-PEX     | 0.64       |

Note: This EUT supports CDD, and all antennas have the same gain,

Directional gain =  $G_{ANT} + \text{Array Gain}$ , where Array Gain is as follows:

(1) For power Directional gain=0.64.

For power spectral density measurements,  $N_{ANT} = 2$ ,  $N_{SS} = 1$ .

So Directional gain =  $G_{ANT} + \text{Array Gain} = 10 \log (N_{ANT}/N_{SS}) \text{ dB} = 0.64 + 10\log(2/1)\text{dBi} = 3.65 \text{ dB}$ .

(2) For Beamforming Gain: 3.00 dB. So the Directional gain = 3.0+0.64=3.64.

## 2. TEST RESULTS

For BT LE:

| Antenna Gain (dBi) | Antenna 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 |
|--------------------|------------------------|---------------------------------|--------------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 1.40               | 1.3804                 | 8.76                            | 7.5162                         | 0.00207                                 | 1                                                | Complies    |

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 |
|------------------------|----------------------------|---------------------------------|--------------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 1.30                   | 1.3490                     | 26.06                           | 403.6454                       | 0.10838                                 | 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 |
|------------------------|----------------------------|---------------------------------|--------------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 4.30                   | 2.6915                     | 25.54                           | 358.0964                       | 0.19184                                 | 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 |
|------------------------|----------------------------|-------------------------|------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 0.64                   | 1.1588                     | 27.32                   | 539.5106               | 0.12444                                 | 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 |
|------------------------|----------------------------|-------------------------|------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 0.64                   | 1.1588                     | 26.07                   | 404.5759               | 0.09331                                 | 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 |
|------------------------|----------------------------|-------------------------|------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 3.64                   | 2.3121                     | 25.48                   | 353.1832               | 0.16254                                 | 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 |
|------------------------|----------------------------|-------------------------|------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 3.64                   | 2.3121                     | 25.07                   | 321.3661               | 0.14789                                 | 1                                                | Complies    |

**For the max simultaneous transmission MPE:**

| Power Density (S)<br>(mW/cm <sup>2</sup> ) | Power Density (S)<br>(mW/cm <sup>2</sup> ) | Power Density (S)<br>(mW/cm <sup>2</sup> ) | Total   | Limit of Power<br>Density (S)<br>(mW/cm <sup>2</sup> ) | Test Result |
|--------------------------------------------|--------------------------------------------|--------------------------------------------|---------|--------------------------------------------------------|-------------|
| BT LE                                      | 2.4GHz                                     | 5GHz                                       |         |                                                        |             |
| 0.00207                                    | 0.19184                                    | 0.16254                                    | 0.35645 | 1                                                      | Complies    |

Note: The calculated distance is 20 cm.  
Output power including tune up tolerance.

**End of Test Report**