# FCC RF EXPOSURE REPORT

# FCC ID: 2BH7FBE4800

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|---|---|---|
| **Project No.** | : | 2502G003 |
| **Equipment** | : | BE4800 Dual-Band Wi-Fi 7 Router |
| **Brand Name** | : | tp-link |
| **Test Model** | : | Archer BE4800 |
| **Series Model** | : | N/A |
| **Applicant** | : | TP-Link Systems Inc. |
| **Address** | : | 10 Mauchly, Irvine, CA 92618 |
| **Manufacturer** | : | TP-Link Systems Inc. |
| **Address** | : | 10 Mauchly, Irvine, CA 92618 |
| **Date of Receipt** | : | Feb. 07, 2025 |
| **Date of Test** | : | Feb. 07, 2025 ~ Mar. 25, 2025 |
| **Issued Date** | : | May 13, 2025 |
| **Report Version** | : | R01 |
| **Test Sample** | : | Engineering Sample No.: DG2025020741 |
| **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. (Dongguan)

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# REPORT ISSUED HISTORY

| Report No. | Version | Description | Issued Date | Note |
|---|---|---|---|---|
| BTL-FCCP-5-2502G003 | R00 | Original Report. | Apr. 18, 2025 | Invalid |
| BTL-FCCP-5-2502G003 | R01 | Revised report to address comments. | May 13, 2025 | 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 | Model Name | Antenna Type | Connector | Gain (dBi) |
|---|---|---|---|---|---|
| 1 | tp-link | N/A | Dipole | weld | 6.43 |
| 2 | tp-link | N/A | Dipole | weld | 5.26 |

Note:
1) This EUT supports CDD, and all antenna gains are not equal, Directional gain = $G_{ANT}$+Array Gain.
    For power measurements, Array Gain=0dB ($N_{ANT} \leqslant 4$), so the Directional gain=6.43.
    For power spectral density measurements, Directional gain(each
    angle)=$10\log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2/N]$dBi=$10\log[(10^{6.43/20}+10^{1.03/20})^2/2]$=7.15dBi,
2) Beamforming gain is 3dB.
3) The antenna gain and beamforming gain are provided by the manufacturer.

For 5GHz:

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) | Note |
|---|---|---|---|---|---|---|
| 1 | tp-link | N/A | Dipole | weld | 5.89 | UNII-1 |
| 2 | tp-link | N/A | Dipole | weld | 5.50 | |
| 1 | tp-link | N/A | Dipole | weld | 6.65 | UNII-2A |
| 2 | tp-link | N/A | Dipole | weld | 6.35 | |
| 1 | tp-link | N/A | Dipole | weld | 6.43 | UNII-2C |
| 2 | tp-link | N/A | Dipole | weld | 6.76 | |
| 1 | tp-link | N/A | Dipole | weld | 5.17 | UNII-3/UNII-4 |
| 2 | tp-link | N/A | Dipole | weld | 6.61 | |

Note:
1) This EUT supports CDD, and all antenna gains are not equal, Directional gain = $G_{ANT}$+Array Gain.
    For power measurements, Array Gain=0dB ($N_{ANT} \leq 4$), so the UNII-1 Directional gain=5.89, the UNII-2A
    Directional gain=6.65, the UNII-2C Directional gain=6.76, the UNII-3/UNII-4 Directional gain=6.61.
    For power spectral density measurements,
    Directional gain(each angle)=$10\log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2/N]$dBi.
    So the UNII-1 Directional gain(each angle)=$10\log[(10^{5.74/20}+10^{4.60/20})^2/2]$dBi=8.20,
    the UNII-2A Directional gain(each angle)=$10\log[(10^{6.65/20}+10^{4.38/20})^2/2]$dBi=8.60,
    the UNII-2C Directional gain(each angle)=$10\log[(10^{6.15/20}+10^{3.94/20})^2/2]$dBi=8.13,
    the UNII-3 Directional gain(each angle)=$10\log[(10^{4.89/20}+10^{3.99/20})^2/2]$dBi=7.46.
2) Beamforming Gain: 3 dB.
3) The antenna gain and beamforming gain are provided by the manufacturer.

## 3. CALCULATED RESULT

For 2.4GHz:

| 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 |
|---|---|---|---|---|---|---|
| 6.43 | 4.3954 | 28.09 | 644.1693 | 0.3607 | 1 | Complies |

For 5GHz (UNII-1 Indoor access point device):

| 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 |
|---|---|---|---|---|---|---|
| 5.89 | 3.8815 | 25.87 | 386.3670 | 0.1910 | 1 | Complies |

For 5GHz (UNII-1 Client device):

| 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 |
|---|---|---|---|---|---|---|
| 5.89 | 3.8815 | 23.88 | 244.3431 | 0.1208 | 1 | Complies |

For 5GHz (UNII-2A):

| 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 |
|---|---|---|---|---|---|---|
| 6.65 | 4.6238 | 19.99 | 99.7700 | 0.0588 | 1 | Complies |

For 5GHz (UNII-2C):

| 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 |
|---|---|---|---|---|---|---|
| 6.76 | 4.7424 | 23.18 | 207.9697 | 0.1256 | 1 | Complies |

For 5GHz (UNII-3):

| 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 |
|---|---|---|---|---|---|---|
| 6.61 | 4.5814 | 28.69 | 739.6053 | 0.4316 | 1 | Complies |

For 5.9GHz (UNII-4 Indoor access point device):

| 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 |
|---|---|---|---|---|
| 34.89 | 3083.1880 | 0.3928 | 1 | Complies |

For 5.9GHz (UNII-4 Client device):

| 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 |
|---|---|---|---|---|
| 29.72 | 937.5620 | 0.1194 | 1 | Complies |

**For the max simultaneous transmission MPE:**

| Ratio | | Total | Limit of Ratio | Test Result |
|---|---|---|---|---|
| 2.4GHz | 5GHz | | | |
| 0.3607 | 0.4316 | 0.7923 | 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**