# FCC RF EXPOSURE REPORT

## FCC ID: TE7EC440-G4U

| | | |
|---|---|---|
| **Project No.** | : | 1812C143 |
| **Equipment** | : | AC2600 Wireless Dual Band Gigabit Router |
| **Test Model** | : | EC440-G4u |
| **Series Model** | : | N/A |
| **Applicant** | : | TP-Link Technologies Co., Ltd. |
| **Address** | : | TP-Link Technologies Co., Ltd.Building 24 (floors 1,3,4,5) and 28 (floors1-4),CentralScience and Technology Park,Nanshan Shenzhen,518057China |
| **According** | : | FCC Part 2, Subpart J (§2.1093)<br>KDB 447498 D01 General RF Exposure Guidance v06<br>IEEE Std C95.1-2005 |

**Authorized Signatory** : Herbert Liu
(Herbert Liu)


BTL INC.
No.18, Ln. 171, Sec. 2, Jiuzong Rd.,
Neihu Dist., Taipei City, Taiwan (R.O.C.)
TEL:+886-2-2657-3299 FAX: +886-2-2657-3331

# MPE CALCULATION METHOD:

**Table 4: RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)**

| Frequency Range (MHz) | Electric Field (V/m rms) | Magnetic Field (A/m rms) | Power Density ($W/m^2$) | Reference Period (minutes) |
|---|---|---|---|---|
| 0.003-10[21] | 83 | 90 | - | Instantaneous* |
| 0.1-10 | - | $0.73/f$ | - | 6** |
| 1.1-10 | $87/f^{0.5}$ | - | - | 6** |
| 10-20 | 27.46 | 0.0728 | 2 | 6 |
| 20-48 | $58.07/f^{0.25}$ | $0.1540/f^{0.25}$ | $8.944/f^{0.5}$ | 6 |
| 48-300 | 22.06 | 0.05852 | 1.291 | 6 |
| 300-6000 | $3.142f^{0.3417}$ | $0.008335f^{0.3417}$ | $0.02619f^{0.6834}$ | 6 |
| 6000-15000 | 61.4 | 0.163 | 10 | 6 |
| 15000-150000 | 61.4 | 0.163 | 10 | $616000/f^{1.2}$ |
| 150000-300000 | $0.158f^{0.5}$ | $4.21 \times 10^{-4}f^{0.5}$ | $6.67 \times 10^{-5}f$ | $616000/f^{1.2}$ |

Note: $f$ is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

Table for Filed Antenna:

For WLAN

| Ant. | Brand | Model | Type | Connector | Gain (dBi) |
|---|---|---|---|---|---|
| 1 | TP-Link | 3101502192 | PCB | I-PEX | 3.77 |
| 2 | TP-Link | 3101502193 | PCB | I-PEX | 5.00 |
| 3 | TP-Link | 3101502194 | PCB | I-PEX | 4.49 |
| 4 | TP-Link | 3101502195 | PCB | I-PEX | 5.65 |

For RLAN
UNII-1:

| Ant. | Brand | Model | Type | Connector | Gain (dBi) |
|---|---|---|---|---|---|
| 1 | TP-Link | 3101502192 | PCB | I-PEX | 4.8 |
| 2 | TP-Link | 3101502193 | PCB | I-PEX | 5.09 |
| 3 | TP-Link | 3101502194 | PCB | I-PEX | 4.64 |
| 4 | TP-Link | 3101502195 | PCB | I-PEX | 4.83 |

UNII-3:

| Ant. | Brand | Model | Type | Connector | Gain (dBi) |
|---|---|---|---|---|---|
| 1 | TP-Link | 3101502192 | PCB | I-PEX | 5.4 |
| 2 | TP-Link | 3101502193 | PCB | I-PEX | 5.66 |
| 3 | TP-Link | 3101502194 | PCB | I-PEX | 4.67 |
| 4 | TP-Link | 3101502195 | PCB | I-PEX | 6.47 |

NOTE:
(a) The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers (4T4R). 2.4 GHz and 5GHz can transmit simultaneously.

# Test Result

For WLAN 2.4 GHz:

| Frequency (MHz) | Average Power (dBm) | Average Power (W) | Antenna Gain (dBi) | Distance (cm) | Power Density ($W/m^2$) | Power Density Limit($W/m^2$) |
|---|---|---|---|---|---|---|
| 2412-2462 | 29.70 | 0.9339 | 5.65 | 25 | 0.4364 | 1 |

For RLAN 5 GHz:

| Frequency (MHz) | Average Power (dBm) | Average Power (W) | Antenna Gain (dBi) | Distance (cm) | Power Density ($W/m^2$) | Power Density Limit($W/m^2$) |
|---|---|---|---|---|---|---|
| 5180-5240 (CDD mode) | 25.53 | 0.3574 | 5.09 | 25 | 0.1469 | 1 |
| 5180-5240 (beamforming mode) | 23.84 | 0.2423 | 12.33 | 25 | 0.5271 | 1 |
| 5745-5825 (CDD mode) | 29.37 | 0.8650 | 6.47 | 25 | 0.4886 | 1 |
| 5745-5825 (beamforming mode) | 23.94 | 0.2478 | 12.33 | 25 | 0.4624 | 1 |

NOTE:

1. WLAN 2.4GHz:
   For $N_{ANT} = 4 < 5$,
   Direction gain = $G_{ANT} + 0 = 5.65 + 0 = 5.65$ dBi .

2. For RLAN 5GHz:

| Mode | | Maximum Directional Gain (dBi.) |
|---|---|---|
| **UNII-1** | CDD **NOTE(1)** | 5.09 |
| | Beamforming **NOTE(2)** | 12.33 |
| **UNII-3** | CDD **NOTE(1)** | 6.47 |
| | Beamforming **NOTE(2)** | 12.33 |

NOTE:
(1) For CDD Mode:
For $N_{ANT} = 4 < 5$,
Direction gain = $G_{ANT} + 0$
(2) For Beamforming Mode:
Directional Gain = $G_{ANT} + 10\log (N_{ANT}/N_{SS})$ + Beamforming Gain

# Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1
CPD = Calculation power density
LPD = Limit of power density

WLAN 2.4 GHz + RLAN 5 GHz = 0.4364 / 1 + 0.5271 / 1 = 0.9635

Therefore the maximum calculations of above situations are less than the “1” limit.

**End of Test Report**