

# FCC RF EXPOSURE REPORT

## FCC ID: V7T4G09

**Project No.** : 2001C104  
**Equipment** : AC1200 Dual-band Wi-Fi 4G+ LTE Router  
**Brand Name** : Tenda  
**Test Model** : 4G09  
**Series Model** : 4G09A  
**Applicant** : SHENZHEN TENDA TECHNOLOGY CO.,LTD  
**Address** : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052  
**Manufacturer** : SHENZHEN TENDA TECHNOLOGY CO.,LTD  
**Address** : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052  
**Date of Receipt** : Jan. 17, 2020  
**Date of Test** : Jan. 19, 2020 ~ May 11, 2020  
**Issued Date** : May 11, 2020  
**Report Version** : R01  
**Test Sample** : Engineering Sample No.: DG20200402159  
**Standard(s)** : FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091  
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.

*Chay . Cai*

Prepared by : Chay Cai

*Ethan Ma*

Approved by : Ethan Ma



Certificate #5123.02

Add: No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

Tel: +86-769-8318-3000

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

**REPORT ISSUED HISTORY**

| Report Version | Description                   | Issued Date   |
|----------------|-------------------------------|---------------|
| R00            | Original Issue                | Apr. 28, 2020 |
| R01            | Modified the comments of TCB. | May 11, 2020  |

## 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

Table for Filed Antenna:

For 2.4GHz

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) |
|------|-------|------------|--------------|-----------|------------|
| 1    | N/A   | N/A        | PCB          | N/A       | 4.27       |
| 2    | N/A   | N/A        | PCB          | N/A       | 3.42       |

Note:

This EUT supports CDD, and antenna gains are not equal, then,

- 1) For Non Beamforming, Directional gain= $10\log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N]$  dBi=6.87. So the output power limit is  $30 - (6.87 - 6) = 29.13$ , the power spectral density limit is  $8 - (6.87 - 6) = 7.13$ .
- 2) For Beamforming, Beamforming Gain=3 dB, so Directional gain=  $3 + 4.27 = 7.27$  dBi. Thus, the output power limit is  $30 - (7.27 - 6) = 28.73$ .

For 5GHz:

| Ant. | Brand | Model Name | Antenna Type | Connector | Gain (dBi) |
|------|-------|------------|--------------|-----------|------------|
| 1    | N/A   | N/A        | PCB          | N/A       | 4.78       |
| 2    | N/A   | N/A        | PCB          | N/A       | 5.29       |

Note:

This EUT supports CDD, and antenna gains are not equal, then,

- 1) For Non Beamforming, Directional gain= $10\log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N]$  dBi=8.05. So the output power limit is  $30 - (8.05 - 6) = 27.95$ , the UNII-1 power spectral density limit is  $17 - (8.05 - 6) = 14.95$ , the UNII-3 power spectral density limit is  $30 - (8.05 - 6) = 27.95$ .
- 2) For Beamforming, Beamforming Gain=3 dB, so Directional gain=  $3 + 5.29 = 8.29$  dBi. Thus, the output power limit is  $30 - (8.29 - 6) = 27.71$ .

For WCDMA:

| Brand | Model Name | Antenna Type | Connector | Gain (dBi) | Note    |
|-------|------------|--------------|-----------|------------|---------|
| N/A   | N/A        | Dipole       | N/A       | 5.04       | Band II |
| N/A   | N/A        | Dipole       | N/A       | 4.42       | Band IV |
| N/A   | N/A        | Dipole       | N/A       | 1.66       | Band V  |

For LTE:

| Brand | Model Name | Antenna Type | Connector | Gain (dBi) | Note    |
|-------|------------|--------------|-----------|------------|---------|
| N/A   | N/A        | Dipole       | N/A       | 5.04       | Band 2  |
| N/A   | N/A        | Dipole       | N/A       | 4.42       | Band 4  |
| N/A   | N/A        | Dipole       | N/A       | 1.66       | Band 5  |
| N/A   | N/A        | Dipole       | N/A       | 4.62       | Band 7  |
| N/A   | N/A        | Dipole       | N/A       | 2.38       | Band 12 |
| N/A   | N/A        | Dipole       | N/A       | -1.39      | Band 13 |
| N/A   | N/A        | Dipole       | N/A       | 5.04       | Band 25 |
| N/A   | N/A        | Dipole       | N/A       | 1.66       | Band 26 |
| N/A   | N/A        | Dipole       | N/A       | 4.15       | Band 30 |
| N/A   | N/A        | Dipole       | N/A       | 4.73       | Band 66 |

## Table for Antenna Configuration:

For 2.4GHz:

Non Beamforming:

| Operating Mode / TX Mode | 1TX        | 2TX                 |
|--------------------------|------------|---------------------|
| IEEE 802.11b             | V (Ant. 2) | -                   |
| IEEE 802.11g             | V (Ant. 2) | -                   |
| IEEE 802.11n (HT20)      | -          | V (Ant. 1 + Ant. 2) |
| IEEE 802.11n (HT40)      | -          | V (Ant. 1 + Ant. 2) |

Beamforming:

| Operating Mode / TX Mode | 2TX                 |
|--------------------------|---------------------|
| IEEE 802.11n (HT20)      | V (Ant. 1 + Ant. 2) |
| IEEE 802.11n (HT40)      | V (Ant. 1 + Ant. 2) |

For 5GHz:

Non Beamforming:

| Operating Mode / TX Mode | 1TX        | 2TX                 |
|--------------------------|------------|---------------------|
| IEEE 802.11a             | V (Ant. 2) | -                   |
| IEEE 802.11n (HT20)      | -          | V (Ant. 1 + Ant. 2) |
| IEEE 802.11n (HT40)      | -          | 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) |

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 802.11ac (VHT20)    | V (Ant. 1 + Ant. 2) |
| IEEE 802.11ac (VHT40)    | V (Ant. 1 + Ant. 2) |
| IEEE 802.11ac (VHT80)    | V (Ant. 1 + Ant. 2) |

## 2. TEST RESULTS

For 2.4GHz Non Beamforming:

| 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 |
|--------------------|------------------------|---------------------------------|--------------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 4.27               | 2.6730                 | 25.91                           | 389.9420                       | 0.20747                                 | 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 |
|------------------------|----------------------------|---------------------------------|--------------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 7.27                   | 5.3333                     | 19.74                           | 94.1890                        | 0.09999                                 | 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 |
|------------------------|----------------------------|-------------------------|------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 8.05                   | 6.3826                     | 26.65                   | 462.3810               | 0.58742                                 | 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 |
|------------------------|----------------------------|-------------------------|------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 8.05                   | 6.3826                     | 26.87                   | 486.4072               | 0.61795                                 | 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 |
|------------------------|----------------------------|-------------------------|------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 8.29                   | 6.7453                     | 26.30                   | 426.5795               | 0.57273                                 | 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 |
|------------------------|----------------------------|-------------------------|------------------------|-----------------------------------------|--------------------------------------------------|-------------|
| 8.29                   | 6.7453                     | 26.61                   | 458.1419               | 0.61511                                 | 1                                                | Complies    |

## For WCDMA:

| Band    | Frequency (MHz) | Max. Output Power (dBm) | Antenna Gain (dBi) | Antenna Gain (linear) | R (cm) | Output Power to Antenna | Power Density (mW/cm <sup>2</sup> ) | Power Density Limit (mW/cm <sup>2</sup> ) |
|---------|-----------------|-------------------------|--------------------|-----------------------|--------|-------------------------|-------------------------------------|-------------------------------------------|
| Band II | 1880            | 23.09                   | 5.04               | 3.19                  | 20.0   | 650.13                  | 0.1293                              | 1.0000                                    |
| Band IV | 1732.6          | 22.99                   | 4.42               | 2.77                  | 20.0   | 550.81                  | 0.1096                              | 1.0000                                    |
| Band V  | 836.4           | 23.03                   | 1.66               | 1.47                  | 20.0   | 294.44                  | 0.0586                              | 0.5576                                    |

## For LTE:

| Band    | Frequency (MHz) | Max. Output Power (dBm) | Antenna Gain (dBi) | Antenna Gain (linear) | R (cm) | Output Power to Antenna | Power Density (mW/cm <sup>2</sup> ) | Power Density Limit (mW/cm <sup>2</sup> ) |
|---------|-----------------|-------------------------|--------------------|-----------------------|--------|-------------------------|-------------------------------------|-------------------------------------------|
| Band 2  | 1905            | 24.39                   | 5.04               | 3.19                  | 20.0   | 877.00                  | 0.1745                              | 1.0000                                    |
| Band 4  | 1720            | 23.42                   | 4.42               | 2.77                  | 20.0   | 608.14                  | 0.1210                              | 1.0000                                    |
| Band 5  | 848.3           | 23.08                   | 1.66               | 1.47                  | 20.0   | 297.85                  | 0.0593                              | 0.5655                                    |
| Band 7  | 2510            | 23.71                   | 4.62               | 2.90                  | 20.0   | 680.77                  | 0.1354                              | 1.0000                                    |
| Band 12 | 699.7           | 23.49                   | 2.38               | 1.73                  | 20.0   | 386.37                  | 0.0769                              | 0.4665                                    |
| Band 13 | 784.5           | 23.36                   | -1.39              | 0.73                  | 20.0   | 157.40                  | 0.0313                              | 0.5230                                    |
| Band 25 | 1905            | 24.39                   | 5.04               | 3.19                  | 20.0   | 877.00                  | 0.1745                              | 1.0000                                    |
| Band 26 | 848.3           | 23.08                   | 1.66               | 1.47                  | 20.0   | 297.85                  | 0.0593                              | 0.5655                                    |
| Band 30 | 2307.5          | 22.95                   | 4.15               | 2.60                  | 20.0   | 512.86                  | 0.1020                              | 1.0000                                    |
| Band 66 | 1720            | 23.42                   | 4.73               | 2.97                  | 20.0   | 653.13                  | 0.1299                              | 1.0000                                    |

## For the max simultaneous transmission MPE:

| Power Density (S) (mW/cm <sup>2</sup> ) | Power Density (S) (mW/cm <sup>2</sup> ) | Power Density (S) (mW/cm <sup>2</sup> ) | Total   | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|-----------------------------------------|-----------------------------------------|-----------------------------------------|---------|--------------------------------------------------|-------------|
| 2.4GHz                                  | 5GHz                                    | LTE                                     |         |                                                  |             |
| 0.20747                                 | 0.61795                                 | 0.1745                                  | 0.99992 | 1                                                | Complies    |

Note: The calculated distance is 20 cm.

End of Test Report