

# 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.

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**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**