

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
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Manufacturer : SHENZHEN TENDA TECHNOLOGY CO.,LTD
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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:

$$S = \frac{PG}{4\pi^2} = \frac{EIRP}{4\pi^2}$$

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

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 ²)	Limit of Power Density (S) (mW/cm ²)	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 ²)	Limit of Power Density (S) (mW/cm ²)	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 ²)	Limit of Power Density (S) (mW/cm ²)	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 ²)	Limit of Power Density (S) (mW/cm ²)	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 ²)	Limit of Power Density (S) (mW/cm ²)	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 ²)	Limit of Power Density (S) (mW/cm ²)	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 ²)	Power Density Limit (mW/cm ²)
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 ²)	Power Density Limit (mW/cm ²)
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 ²)	Power Density (S) (mW/cm ²)	Power Density (S) (mW/cm ²)	Total	Limit of Power Density (S) (mW/cm ²)	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