FCC RF EXPOSURE REPORT

FCC ID: 2ABZMEW15D

Project No.	:	2104C212
Equipment	:	AC3000 Tri-band Cable-Free WiFi Router
Brand Name	:	IP-COM
Test Model	:	EW15D
Series Model	:	N/A
Applicant	:	SHENZHEN IP-COM NETWORKS CO.,LTD.
Address	:	Room 101, Unit A, First Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Manufacturer	:	SHENZHEN IP-COM NETWORKS CO.,LTD.
Address	:	Room 101, Unit A, First Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Date of Receipt	:	Apr. 28, 2021
Date of Test	:	Apr. 31, 2021 ~ Jun. 02, 2021
Issued Date	:	Jun. 10, 2021
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG2021042941
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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Certificate #5123.02

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue	Jun. 10, 2021

1. TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3,Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.
BTL's Test Firm Registration Number for FCC: 357015
BTL's Designation Number for FCC: CN1240

2. 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	Tenda	N/A	Internal	N/A	3.88
2	Tenda	N/A	Internal	N/A	3.77

Note:
1) This EUT supports CDD, and all antenna gains are not equal, then Directional gain=10log[($10^{G1/20}$+$10^{G2/20}$+...$10^{GN/20}$)^2/N]dBi, that is Directional gain=10log[($10^{3.88/20}$+$10^{3.77/20}$)^2/2]dBi =6.84. So, the output power limit is 30-(6.84-6)=29.16, the power spectral density limit is 8-(6.84-6)=7.16.
2) Beamforming Gain: 3dB. Then Directional gain=3+3.88=6.88. So the output power limit is 30-(6.88-6)=29.12.
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	Tenda	N/A	Internal	N/A	4.47	UNII-1
2	Tenda	N/A	Internal	N/A	4.27	
1	Tenda	N/A	Internal	N/A	4.77	UNII-3
2	Tenda	N/A	Internal	N/A	4.75	
3	Tenda	N/A	Internal	N/A	4.47	
4	Tenda	N/A	Internal	N/A	4.28	

Note:
1) This EUT supports CDD, and all antenna gains are not equal, Directional gain=10log[($10^{G1/20}$+$10^{G2/20}$+...$10^{GN/20}$)^2/N]dBi. Then,
For UNII-1: Directional gain=10log[($10^{4.47/20}$+$10^{4.27/20}$)^2/2]dBi =7.38. So, the output power limit is 30-(7.38-6)=28.62, the power spectral density limit is 17-(7.38-6)=15.62.
For UNII-3: Directional gain=10log[($10^{4.77/20}$+$10^{4.75/20}$+$10^{4.47/20}$+$10^{4.28/20}$)^2/4]dBi =10.59. So, the output power limit is 30-(10.59-6)=25.41, the power spectral density limit is 30-(10.59-6)=25.41.
2) UNII-1 Beamforming Gain: 3 dB. Then, Directional gain=3+4.47=7.47. So the output power limit is 30-(7.47-6)=28.53.
UNII-3 Beamforming Gain: 6 dB. Then, Directional gain=6+4.77=10.77. So the output power limit is 30-(10.77-6)=25.23.
3) The antenna gain and beamforming gain are provided by the manufacturer.

Table for Antenna Configuration:
For 2.4GHz Non Beamforming:

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

For 2.4GHz 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 UNII-1 Non Beamforming:

Operating Mode / TX Mode	1TX	2TX
IEEE 802.11a	V (Ant. 1)	-
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)

For 5GHz UNII-1 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)

For 5GHz UNII-3 Non Beamforming:

Operating Mode / TX Mode	1TX	4TX
IEEE 802.11a	V (Ant. 1)	-
IEEE 802.11n(HT20)	-	V (Ant. 1+Ant. 2+Ant. 3+Ant. 4)
IEEE 802.11n(HT40)	-	V (Ant. 1+Ant. 2+Ant. 3+Ant. 4)
IEEE 802.11ac(VHT20)	-	V (Ant. 1+Ant. 2+Ant. 3+Ant. 4)
IEEE 802.11ac(VHT40)	-	V (Ant. 1+Ant. 2+Ant. 3+Ant. 4)
IEEE 802.11ac(VHT80)	-	V (Ant. 1+Ant. 2+Ant. 3+Ant. 4)

For 5GHz UNII-3 Beamforming:

Operating Mode / TX Mode	4TX
IEEE 802.11n(HT20)	V (Ant. 1+Ant. 2+Ant. 3+Ant. 4)
IEEE 802.11n(HT40)	V (Ant. 1+Ant. 2+Ant. 3+Ant. 4)
IEEE 802.11ac(VHT20)	V (Ant. 1+Ant. 2+Ant. 3+Ant. 4)
IEEE 802.11ac(VHT40)	V (Ant. 1+Ant. 2+Ant. 3+Ant. 4)
IEEE 802.11ac(VHT80)	V (Ant. 1+Ant. 2+Ant. 3+Ant. 4)

3. TEST RESULTS

For 2.4GHz Non Beamforming:

Directional Gain (dBi)	Antenna 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
6.84	4.8306	23.47	222.3310	0.21377	1	Complies

For 2.4GHz Beamforming:

Directional Gain (dBi)	Antenna 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
6.88	4.8753	22.34	171.3957	0.16632	1	Complies

For 5GHz UNII-1 Non Beamforming:

Directional Gain (dBi)	Antenna 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
7.38	5.4702	23.39	218.2730	0.23766	1	Complies

For 5GHz UNII-1 Beamforming:

Directional Gain (dBi)	Antenna 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
7.47	5.5847	22.84	192.3092	0.21377	1	Complies

For 5GHz UNII-3 Non Beamforming:

Directional Gain (dBi)	Antenna 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
10.59	11.4551	23.49	223.3572	0.50927	1	Complies

For 5GHz UNII-3 Beamforming:

Directional Gain (dBi)	Antenna 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
10.77	11.9399	22.98	198.6095	0.47201	1	Complies

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 UNII-1	5GHz UNII-3			
0.21377	0.23766	0.50927	0.9607	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report