

FCC RF EXPOSURE REPORT

FCC ID: 2ABZMEW12

Project No. : 2007C189
Equipment : AC2600 Tri-band Cable-Free WiFi System(Mini Basestation)
Brand Name : IP-COM
Test Model : EW12
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.
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Date of Receipt : Jul. 20, 2020
Date of Test : Jul. 20, 2020 ~ Sep. 11, 2020
Issued Date : Sep. 11, 2020
Report Version : R02
Test Sample : Engineering Sample No.: DG20200721132
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	Sep. 08, 2020
R01	Modified the comments of TCB.	Sep. 09, 2020
R02	Updated the data of output power for UNII-3.	Sep. 11, 2020

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:

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

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	Internal	N/A	3
2	N/A	N/A	Internal	N/A	4

Note:

- 1) This EUT supports CDD, and all antenna gains are not equal, so the Directional gain=10log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})²/N]dBi, that is Directional gain=10log[(10^{3/20}+10^{4/20})²/2]dBi=6.52. So, the output power limit is 30-(6.52-6)=29.48, the power spectral density limit is 8-(6.52-6)=7.48.
- 2) Beamforming Gain: 3dB. So the Directional gain=3+4=7. Then, the output power limit is 30-(7-6)=29.00.

Table for Antenna Configuration:

For 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 Beamforming:

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

For 5GHz:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain(dBi)	Note
1	N/A	N/A	Internal	N/A	4.5	UNII-1
2	N/A	N/A	Internal	N/A	4.3	
1	N/A	N/A	Internal	N/A	5.4	UNII-3
2	N/A	N/A	Internal	N/A	4.1	
3	N/A	N/A	Internal	N/A	4.5	

Note:

- 1) This EUT supports CDD, and all antenna gains are not equal, so Directional gain= $10\log[(10^{G1/20}+10^{G2/20}+\dots+10^{GN/20})^2/N]$ dBi.
 - a) For UNII-1: Directional gain= $10\log[(10^{4.5/20}+10^{4.3/20})^2/2]$ dBi=7.41. So, the output power limit is $30-(7.41-6)=28.59$, the power spectral density limit is $17-(7.41-6)=15.59$.
 - b) For UNII-3: Directional gain= $10\log[(10^{5.4/20}+10^{4.1/20}+10^{4.5/20})^2/3]$ dBi=9.46. So, the output power limit is $30-(9.46-6)=26.54$, the power spectral density limit is $30-(9.46-6)=26.54$.
- 2) UNII-1 Beamforming Gain: 3dB. So the Directional gain= $3+4.5=7.50$. So, the output power limit is $30-(7.50-6)=28.50$.
- 3) UNII-3 Beamforming Gain: 4.5dB. So the Directional gain= $4.5+5.4=9.90$. So, the output power limit is $30-(9.90-6)=26.10$.

Table for Antenna Configuration:

For UNII-1 Non Beamforming:

Operating Mode	1TX	2TX
TX Mode		
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 UNII-1 Beamforming:

Operating Mode	2TX
TX Mode	
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 UNII-3 Non Beamforming:

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

For UNII-3 Beamforming:

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

3. 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	2.5119	25.73	374.1106	0.18705	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	5.0119	20.68	116.9499	0.11667	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
7.41	5.5081	26.43	439.5416	0.48189	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
7.50	5.6234	26.27	423.6430	0.47419	1	Complies

For 5GHz UNII-3 Non Beamforming:

Antenna 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
5.40	3.4674	28.59	722.7698	0.49883	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
9.90	9.7724	24.18	261.8183	0.50927	1	Complies

For the max simultaneous transmission MPE:

Power Density (S) (mW/cm ²)	Power Density (S) (mW/cm ²)	Total	Limit of Power Density (S) (mW/cm ²)	Test Result
5GHz UNII-1	5GHz UNII-3			
0.48189	0.50927	0.99116	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report