FCC RF EXPOSURE REPORT

FCC ID: 2ABZM-PRO6LR

Project No.	:	2106C018
Equipment	:	802.11ax Dual-Band Long Range Access Point
Brand Name	:	IP-COM
Test Model	:	Pro-6-LR
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	:	Jun. 02, 2021
Date of Test	:	Jun. 05, 2021 ~ Jul. 08, 2021
Issued Date	:	Aug. 10, 2021
Report Version	:	R01
Test Sample	:	Engineering Sample No.: DG2021060299
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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TESTING CERT #5123.02

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue	Jul. 29, 2021
R01	Updated the description in page 3-5.	Aug. 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 Rd. Shixia, Dalang Town, Dongguan City, Guangdong, People's Republic of 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

For 2.4GHz:
Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Internal	N/A	4.77
2	N/A	N/A	Internal	N/A	4.45

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[$(10^{4.77/20}+10^{4.45/20})^2$/2]dBi =7.62. So, the output power limit is 30-(7.62-6)=28.38, the power spectral density limit is 8-(7.62-6)=6.38.
2) Beamforming Gain: 3 dB. Then, Directional gain=3+4.77=7.77. So, the output power limit is 30-(7.77-6)=28.23.
3) The antenna gain and beamforming gain are provided by the manufacturer.

Table for Antenna Configuration:
For Non Beamforming:

Operating Mode / TX Mode	1TX	2TX
IEEE 802.11b	V (Ant. 1 / Ant. 2)	-
IEEE 802.11g	V (Ant. 1 / Ant. 2)	-
IEEE 802.11n(HT20)	(Ant. 1 / Ant. 2)	V (Ant. 1+Ant. 2)
IEEE 802.11n(HT40)	(Ant. 1 / Ant. 2)	V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE20)	(Ant. 1 / Ant. 2)	V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE40)	(Ant. 1 / Ant. 2)	V (Ant. 1+Ant. 2)

For 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 802.11ax(HE20)	V (Ant. 1+Ant. 2)
IEEE 802.11ax(HE40)	V (Ant. 1+Ant. 2)

For 5GHz:
Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Internal	N/A	5
2	N/A	N/A	Internal	N/A	5

Note:

1) This EUT supports CDD, and all antennas have the same gain, Directional gain = G_{ANT}+Array Gain.
For power measurements, Array Gain=0dB ($N_{ANT} \leqslant 4$), so the Directional gain=5.
For power spectral density measurements, N_{ANT}=2, N_{SS} = 1.
So the Directional gain=G_{ANT}+Array Gain=G_{ANT}+10log(N_{ANT}/ N_{SS})dBi=5+10log(2/1)dBi=8.01.
Then, the UNII-1 power spectral density limit is 17-(8.01-6)=14.99, the UNII-3 power spectral density limit is 30-(8.01-6)=27.99.
2) Beamforming Gain: 3 dB. Then, Directional gain=3+5=8. So, the output power limit is 30-(8-6)=28.00.
3) The antenna gain and beamforming gain are provided by the manufacturer.

Table for Antenna Configuration:
For Non Beamforming:

Operating Mode / TX Mode	1TX	2TX
IEEE 802.11a	V (Ant. 1 / Ant. 2)	-
IEEE 802.11n(HT20)	(Ant. 1 / Ant. 2)	V (Ant. 1 + Ant. 2)
IEEE 802.11n(HT40)	(Ant. 1 / Ant. 2)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT20)	(Ant. 1 / Ant. 2)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT40)	(Ant. 1 / Ant. 2)	V (Ant. 1 + Ant. 2)
IEEE 802.11ac(VHT80)	(Ant. 1 / Ant. 2)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE20)	(Ant. 1 / Ant. 2)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE40)	(Ant. 1 / Ant. 2)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE80)	(Ant. 1 / Ant. 2)	V (Ant. 1 + Ant. 2)

For 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)
IEEE 802.11ax(HE20)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE40)	V (Ant. 1 + Ant. 2)
IEEE 802.11ax(HE80)	V (Ant. 1 + Ant. 2)

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
4.77	2.9992	24.38	274.1574	0.16366	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
7.77	5.9841	18.14	65.1628	0.07762	1	Complies

For 5GHz UNII-1 Non 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
8.01	6.3241	26.58	454.9881	0.57273	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
8.01	6.3241	28.12	648.6344	0.81649	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	6.3096	26.11	408.3194	0.51280	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	6.3096	27.79	601.1737	0.75501	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
2.4GHz	5GHz			
0.16366	0.81649	0.98015	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report