FCC RF EXPOSURE REPORT

FCC ID: 2AUA9-RQZY002

Project No.	:	2006C111
Equipment	:	AC2100 Dual Band WiFi Repeater
Brand Name	:	ROCK, rock space
Test Model	:	RSD0617
Series Model	:	N/A
Applicant	:	Shenzhen Renqing Excellent Technology Co., Ltd.
Address	:	104, No.15, Longfu Industrial Zone, Tongsheng Community, Dalang Street, Longhua District, Shenzhen, Guangdong, China
Manufacturer	:	Shenzhen Renqing Excellent Technology Co., Ltd.
Address	:	104, No.15, Longfu Industrial Zone, Tongsheng Community, Dalang Street, Longhua District, Shenzhen, Guangdong, China
Date of Receipt	:	Jun. 22, 2020
Date of Test	:	Jun. 23, 2020 ~ Jul. 15, 2020
Issued Date	:	Jul. 23, 2020
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG2020061981
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	Jul. 23, 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:

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

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 WLAN 2.4G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Dipole	N/A	3.4
2	N/A	N/A	Dipole	N/A	3.5

Note:
1)This EUT supports CDD, and antenna gains are not equal, so Directional gain=10log $[(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2/N]$dBi=6.46. So the output power limit is 30-(6.46-6)=29.54, the power spectral density limit is 8-(6.46-6)=7.54.
2)Beamforming Gain: 3 dB. Then the Directional Gain=3+3.5=6.5 dB. So the output power limit is 30-(6.5-6)=29.50.

Table for Antenna Configuration:

For Non Beamforming

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

For WLAN 5G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Dipole	N/A	2.7	UNII-1
2	N/A	N/A	Dipole	N/A	3.3	UNII-1
3	N/A	N/A	Dipole	N/A	3.7	UNII-1
4	N/A	N/A	Dipole	N/A	3.7	UNII-1
1	N/A	N/A	Dipole	N/A	3.6	UNII-3
2	N/A	N/A	Dipole	N/A	3.7	UNII-3
3	N/A	N/A	Dipole	N/A	3.8	UNII-3
4	N/A	N/A	Dipole	N/A	3.9	UNII-3

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.
   a) For UNII-1, the Directional gain = 10log[$(10^{2.7/20}+10^{3.3/20}+10^{3.7/20}10^{3.7/20})^2/4$]=9.38. So the output power limit is 30-(9.38-6)=26.62, the power spectral density limit is 17-(9.38-6)=13.62.
   b) For UNII-3, the Directional gain=10log[$(10^{3.6/20}+10^{3.7/20}+10^{3.8/20}10^{3.9/20})^2/4$]=9.77.
   So the output power limit is 30-(9.77-6)=26.23, the power spectral density limit is 30-(9.77-6)=26.23.
2) Beamforming Gain: 6dB.
   a) For UNII-1: The Directional gain=6+3.7=9.70dB. So the output power limit is 30-(9.70-6)=26.30.
   b) For UNII-3: The Directional gain=6+3.9=9.90dB. So the output power limit is 30-(9.90-6)=26.10.

Table for Antenna Configuration:

For 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 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)	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
6.46	4.4259	21.64	145.8814	0.12851	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
6.50	4.4668	21.47	140.2814	0.12472	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
9.38	8.6696	23.73	236.0478	0.40733	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
9.70	9.3325	23.4	218.7762	0.40640	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
9.77	9.4842	26.21	417.8304	0.78877	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	25.76	376.7038	0.73274	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			
0.12851	0.78877	0.91728	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report