FCC RF EXPOSURE REPORT

FCC ID: 2AUA9-RQZY003

Project No.	:	2005C136
Equipment	:	AC2100 Smart WiFi Router
Brand Name	:	ROCK, rock space
Test Model	:	RSD0614
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	:	May 21, 2020
Date of Test	:	May 22, 2020 ~ Jun. 10, 2020
Issued Date	:	Jul. 02, 2020
Report Version	:	R02
Test Sample	:	Engineering Sample No.: DG202005224
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. 17, 2020
R01	Updated the address of applicant and manufacturer.	Jun. 28, 2020
R02	Added the test factory information.	Jul. 02, 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 2.4GHz:

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

Note:
This EUT supports CDD, and all antennas have the same gain, then,

1) Non Beamforming function, Directional gain = G_{ANT}+Array Gain,
For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=3.5.
For power spectral density measurements, $N_{ANT} = 2$, $N_{SS} = 1$. So Directional gain = G_{ANT} + Array Gain = G_{ANT}+10log (N_{ANT}/ N_{SS}) dB =3.5+10log(2/1)dBi=6.51. Then, the power spectral density limit is 8-(6.51-6)=7.49.
2) Beamforming function, Beamforming Gain: 3dB. So the Directional gain=3+3.5=6.5.
Then, the power limit is 30-(6.5-6)=29.5.

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 5GHz:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Dipole	N/A	4	UNII-1
2	N/A	N/A	Dipole	N/A	4	UNII-1
3	N/A	N/A	Dipole	N/A	4	UNII-1
4	N/A	N/A	Dipole	N/A	4	UNII-1
1	N/A	N/A	Dipole	N/A	5.5	UNII-3
2	N/A	N/A	Dipole	N/A	5.5	UNII-3
3	N/A	N/A	Dipole	N/A	5.5	UNII-3
4	N/A	N/A	Dipole	N/A	5.5	UNII-3

Note:

This EUT supports CDD, and all antennas have the same gain, then,

1) Non Beamforming function, Directional gain = G_{ANT}+Array Gain,
   a) For UNII-1:
      For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=4.
      For power spectral density measurements, $N_{ANT} = 4$, $N_{SS} = 1$. So Directional gain=G_{ANT}+Array Gain = G_{ANT}+10log (N_{ANT}/ N_{SS}) dB =4+10log(4/1)dBi=10.02. Then, the power spectral density limit is 17-(10.02-6)=12.98.
   b) For UNII-3:
      For power measurements, Array Gain = 0 dB ($N_{ANT} \leq 4$), so the Directional gain=5.5.
      For power spectral density measurements, $N_{ANT} = 4$, $N_{SS} = 1$. So Directional gain = G_{ANT} + Array Gain = G_{ANT}+10log (N_{ANT}/ N_{SS}) dB =5.5+10log(4/1)dBi=11.52. Then, the power spectral density Limit is 30-(11.52-6)=24.48.
2) Beamforming function, Beamforming Gain: 6dB. So,
   a) For UNII-1:
      The Directional gain=6+4=10. Then, the average output power limit is 30-(10-6)=26.
   b) For UNII-3:
      The Directional gain=6+5.5=11.5. Then, the average output power limit is 30-(11.5-6)=24.5.

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
3.5	2.2387	24.73	297.1666	0.13242	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
6.5	4.4668	18.14	65.1628	0.05794	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
4	2.5119	24.58	287.0781	0.14353	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
5.5	3.5481	29.14	820.3515	0.57936	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
10	10.0000	24.26	266.6859	0.53082	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
11.5	14.1254	24.43	277.3320	0.77974	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			
0.13242	0.77974	0.91216	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report