

FCC RF EXPOSURE REPORT

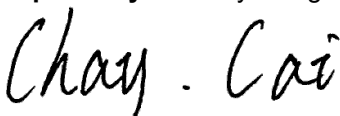
FCC ID: 2AV2N-SR1041F

Project No. : 2204C161A
Equipment : Wireless Router
Brand Name : FiberHome
Test Model : SR1041F
Series Model : N/A
Applicant : Fiberhome Telecommunication Technologies Co., Ltd.
Address : No.88 Youkeyuan Road, Hongshan District, Wuhan, Hubei , China
Manufacturer : Fiberhome Telecommunication Technologies Co., Ltd.
Address : No.88 Youkeyuan Road, Hongshan District, Wuhan, Hubei , China
Factory : Fiberhome Telecommunication Technologies Co., Ltd.
Address : No.88 Youkeyuan Road, Hongshan District, Wuhan, Hubei , China
Date of Receipt : Apr. 26, 2022
Jul. 24, 2022
Date of Test : Apr. 27, 2022 ~ May 21, 2022
Jul. 24, 2022 ~ Aug. 01, 2022
Issued Date : Aug. 05, 2022
Report Version : R00
Test Sample : Engineering Sample No.: DG20220427114
Standard(s) : FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091
FCC Title 47 Part 2.1091

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

REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-4-2204C161A	R00	Compared with original report(BTL-FCCP-4-2204C161), added the WiFi 5G UNII-2C. So added the description and recalculate the result. Other are kept the same.	Aug. 05, 2022	Valid

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 523792 People's Republic of China.

BTL's 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	P/N	Antenna Type	Connector	Gain (dBi)
1		RFA1650CBB01A	Dipole	IPEX	5.32
2		RFA1650CBB01B	Dipole	IPEX	5.19

Note:

- 1) This EUT supports CDD, and all antenna gains are not equal, so Directional gain=10log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})²/N]dBi, that is Directional gain=10log[(10^{5.32/20}+10^{5.19/20})²/2]dBi=8.27. So, the output power limit is 30-(8.27-6)=27.73, the power spectral density limit is 8-(8.27-6)=5.73.
- 2) Beamforming Gain: 3 dB. So Directional gain=3+5.32=8.32. So, the output power limit is 30-(8.32-6)=27.68.
- 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)	-
IEEE 802.11g		V (Ant. 1)	-
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 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 the UNII-1, UNII-2A, UNII-3:

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1		RFB1605CBB01C	Dipole	IPEX	5.19
2		RFB1605CBB01D	Dipole	IPEX	5.16
3		RFB1605CBB01E	Dipole	IPEX	5.29

Note:

- 1) This EUT supports CDD, and all antenna gains are not equal, so Directional gain= $10\log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2/N]$ dBi, that is Directional gain= $10\log[(10^{5.19/20}+10^{5.16/20}+10^{5.29/20})^2/3]$ dBi =9.98. So, the UNII-1, UNII-3 output power limit is 30-(9.98-6)=26.02, the UNII-2A output power limit is 23.98-(9.98-6)=20. The UNII-1 power spectral density limit is 17-(9.98-6)=13.02, the UNII-2A power spectral density limit is 11-(9.98-6)=7.02, the UNII-3 power spectral density limit is 30-(9.98-6)=26.02.
- 2) Beamforming Gain: 4.7 dB. That is Directional gain=4.7+5.29=9.99. So, the UNII-1, UNII-3 output power limit is 30-(9.99-6)=26.01, the UNII-2A output power limit is 23.98-(9.99-6)=19.99.
- 3) The antenna gain and beamforming gain are provided by the manufacturer.
- 4) The EUT is 3T3R, but only NSS2 is supported.

Table for Antenna Configuration:

For 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)
IEEE 802.11ax(HE20)	-	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE40)	-	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE80)	-	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE160)	-	V (Ant. 1+Ant. 2+Ant. 3)

For 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)
IEEE 802.11ax(HE20)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE40)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE80)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE160)	V (Ant. 1+Ant. 2+Ant. 3)

For 5GHz the UNII-2C:

Antenna Specification:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1		RFB1605CBB01C	Dipole	IPEX	5.23
2		RFB1605CBB01D	Dipole	IPEX	5.25
3		RFB1605CBB01E	Dipole	IPEX	5.29

Note:

- 1) This EUT supports CDD, and all antenna gains are not equal, so Directional gain= $10\log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2/N]$ dBi, that is Directional gain= $10\log[(10^{5.23/20}+10^{5.25/20}+10^{5.29/20})^2/3]$ dBi =10.03. So, the UNII-2C output power limit is 23.98-(10.03-6)=19.95. The UNII-2C power spectral density limit is 11-(10.03-6)=6.97.
- 2) Beamforming Gain: 4.7 dB. That is Directional gain=4.7+5.29=9.99. So, the UNII-2C output power limit is 23.98-(9.99-6)=19.99.
- 3) The antenna gain and beamforming gain are provided by the manufacturer.
- 4) The EUT is 3T3R, but only NSS2 is supported.

Table for Antenna Configuration:

For 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)
IEEE 802.11ax(HE20)	-	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE40)	-	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE80)	-	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE160)	-	V (Ant. 1+Ant. 2+Ant. 3)

For 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)
IEEE 802.11ax(HE20)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE40)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE80)	V (Ant. 1+Ant. 2+Ant. 3)
IEEE 802.11ax(HE160)	V (Ant. 1+Ant. 2+Ant. 3)

3. TEST RESULTS

For 2.4GHz Non Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Average Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
8.27	6.7143	22.26	168.2674	0.22488	1	Complies

For 2.4GHz Beamforming:

Directional Gain (dBi)	Directional Gain (numeric)	Max. Output Power (dBm)	Max. Average Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
8.32	6.7920	21.69	147.5707	0.19950	1	Complies

For 5GHz the UNII-1, UNII-2A, 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
9.98	9.9541	16.57	45.3942	0.08994	1	Complies

For 5GHz the UNII-1, UNII-2A, 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
9.99	9.9770	16.04	40.1791	0.07979	1	Complies

For 5GHz the UNII-2C 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
10.03	10.0693	16.75	47.3151	0.09483	1	Complies

For 5GHz the UNII-2C 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
9.99	9.9770	16.24	42.0727	0.08355	1	Complies

For the max simultaneous transmission MPE:

Ratio		Total	Limit of Ratio	Test Result
2.4GHz	5GHz			
0.22488	0.09483	0.31971	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report