

FCC RF EXPOSURE REPORT

FCC ID: 2AV2N-SR120C

Project No. : 2002C069
Equipment : Smart Router
Brand Name : FiberHome
Test Model : SR120-C
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 : Feb. 26, 2020
Date of Test : Feb. 27, 2020 ~ Mar. 30, 2020
Issued Date : Jul. 08, 2020
Report Version : R02
Test Sample : Engineering Sample No.: DG2020022721
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.

Vincent Tan

Prepared by : Vincent Tan

Ethan Ma

Approved by : Ethan Ma



Certificate #5123.02

Add: No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

Tel: +86-769-8318-3000

Web: www.newbtl.com

REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue	Jun. 17, 2020
R01	Revised report to address comments.	Jul. 02, 2020
R02	Revised report to address comments.	Jul. 08, 2020

1. 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 2.4GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	South Star	N12-4345-R0B	PCB	N/A	3.66
2	South Star	N12-4346-R0B	PCB	N/A	3.40

Note:

This EUT supports MIMO 2X2, any transmit signals are correlated with each other, So,

(1) For Non Beamforming function, Directional gain=10log [(10^{G1/20}+10^{G2/20}+...10^{GN/20})²/N]dBi=6.54
So, the output power limit is 30-(6.54-6)=29.46, the power spectral density limit is 8-(6.54-6)=7.46.

(2) For Beamforming function, Beamforming Gain is 3dB. So Directional gain=3.66 + 3.00 = 6.66
So, the output power limit is 30-(6.66-6)=29.34.

Table for Antenna Configuration:

For Non Beamforming:

Operating Mode	TX Mode	2TX
802.11b		V (Ant. 1 + Ant. 2)
802.11g		V (Ant. 1 + Ant. 2)
802.11n(20 MHz)		V (Ant. 1 + Ant. 2)
802.11n(40 MHz)		V (Ant. 1 + Ant. 2)

For Beamforming:

Operating Mode	TX Mode	2TX
802.11n(20 MHz)		V (Ant. 1 + Ant. 2)
802.11n(40 MHz)		V (Ant. 1 + Ant. 2)

For 5GHz:

Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	South Star	N12-4347-R0B	PCB	N/A	4.72
2	South Star	N12-4348-R0B	PCB	N/A	4.19

Note:

This EUT supports MIMO 2X2, any transmit signals are correlated with each other, So

(1) For Non Beamforming function, Directional gain= $10\log [(10^{G1/20}+10^{G2/20}+...10^{GN/20})^2/N]$ dBi = 7.47.

So, the UNII-1 & UNII-3 output power limit is $30-(7.47-6)=28.53$, the UNII-2A, UNII-2C output power limit is $24-(7.47-6)=22.53$. The UNII-1 power spectral density limit is $17-(7.47-6)=15.53$, the UNII-2A, UNII-2C power spectral density limit is $11-(7.47-6)=9.53$, the UNII-3 power spectral density limit is $30-(7.47-6)=28.53$.

(2) For Beamforming function, Beamforming Gain is 3dB, so Directional gain= $3+4.72=7.72$

So, the UNII-1 & UNII-3 output power limit is $30-(7.72-6)=28.28$, the UNII-2A, UNII-2C output power limit is $24-(7.72-6)=22.28$.

Table for Antenna Configuration:

For Non Beamforming:

Operating Mode	TX Mode	2TX
IEEE 802.11a		V (Ant. 1 + Ant. 2)
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 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)

2. TEST RESULTS

For 2.4GHz_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
6.54	4.5082	11.86	15.3462	0.01377	1	Complies

For 2.4GHz_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
6.66	4.6345	11.72	14.8594	0.01371	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
7.47	5.5847	12.66	18.4502	0.02051	1	Complies

For 5GHz UNII-2A_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
7.47	5.5847	11.70	14.7911	0.01644	1	Complies

For 5GHz 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
7.47	5.5847	11.20	13.1826	0.01465	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
7.47	5.5847	13.67	23.2809	0.02588	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
7.72	5.9156	12.6	18.1970	0.02143	1	Complies

For 5GHz UNII-2A_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
7.72	5.9156	11.6	14.4544	0.01702	1	Complies

For 5GHz 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
7.72	5.9156	11.08	12.8233	0.01510	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
7.72	5.9156	13.54	22.5944	0.02660	1	Complies

For the max simultaneous transmission MPE:

2.4G+5G:

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			
0.01377	0.02660	0.04037	1	Complies

Note: The calculated distance is 20 cm.

End of Test Report