Test Report

Verified code: 440752

Report No.: E202203219481-4

Customer:	Fiberhome Telecommunication Technologies Co., Ltd.
Address:	No.88 Youkeyuan Road, Hongshan District, Wuhan,Hubei, China
Sample Name:	GPON ONU
Sample Model:	HG6245Y
Receive Sample Date:	Apr.18,2022
Test Date:	Apr.19,2022 ~ May.07,2022
Reference Document:	CFR 47, FCC Part 2.1091 Radio frequency radiation exposure evaluation: Mobile devices. KDB 447498 D01 General RF Exposure Guidance v06
Test Result:	Pass

Prepared by: Chen XiaoCong Reviewed by: Jiang Tao Approved by: Xiao Liang

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-05-20

GUANGZHOU GRG METROLOGY & TEST CO., LTD.
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1. GENERAL DESCRIPTION OF EUT

1.1. APPLICANT

Name:	Fiberhome Telecommunication Technologies Co., Ltd.
Address:	No.88 Youkeyuan Road, Hongshan District, Wuhan,Hubei, China

1.2. MANUFACTURER

Name:	Fiberhome Telecommunication Technologies Co., Ltd.
Address:	No.88 Youkeyuan Road, Hongshan District, Wuhan,Hubei, China

1.3. FACTORY

Name:	Fiberhome Telecommunication Technologies Co., Ltd.
Address:	No.67,Chuangye Street,East Lake High-tech Development Zone,Wuhan City,Hubei Province,P.R.China

1.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	GPON ONU
Model No.:	HG6245Y
Adding Model:	/
Trade Name:	FiberHome
FCC ID:	
Power Supply:	DC12.0V power supplied by adapter
Adapter Specification:	Adapter: RD1202500-C55-195MG Input:100-240V~50/60Hz 1.5A Max Output:12V⎓2.5A
Work Frequency:	2.4G Wi-Fi: 2412MHz-2462MHz 5G Wi-Fi: 5150MHz-5250MHz
Transmit Power:	2.4G wifi: 21.45dBm for 802.11b mode (antenna 2) 22.26dBm for 802.11b mode (antenna 2) 15.75dBm for 802.11g mode (antenna 1) 15.91dBm for 802.11g mode (antenna 2) 19.20dBm for 802.11n HT20 mode(MIMO) 18.22dBm for 802.11ax HE20 mode(MIMO) 17.40dBm for 802.11n HT40 mode(MIMO) 17.37dBm for 802.11ax HE40 mode(MIMO) 5G wifi: U-NII-1: 18.94dBm for 802.11a 24.30dBm for 802.11n HT20(MIMO) 22.62dBm for 802.11ac VHT20(MIMO) 24.28dBm for 802.11ax HE20(MIMO)

	22.42dBm for 802.11n HT40(MIMO) 22.69dBm for 802.11ac VHT40(MIMO) 24.28dBm for 802.11ax HE40(MIMO) 22.39dBm for 802.11ac VHT80(MIMO) 22.39dBm for 802.11ax HE80(MIMO)
Modulation type:	2.4G wifi: DSSS for 802.11b mode; OFDM for 802.11g/n mode OFDMA for 802.11ax mode 5G wifi: OFDM for 802.11g/n/ac mode OFDMA for 802.11ax mode
Channel space:	2.4G wifi:5MHz 5G wifi: 802.11a: 20MHz 802.11n HT20: 20MHz 802.11n HT40: 40MHz 802.11ac VHT20: 20MHz 802.11ac VHT40: 40MHz 802.11ac VHT80: 80MHz 802.11ax HE20: 20MHz 802.11ax HE40: 40MHz 802.11ax HE80: 80MHz
Antenna Specification:	2.4G wifi: Internal antenna 1 with 3dBi gain (Max) Internal antenna 2 with 3dBi gain (Max) 5G wifi: U-NII-1: External antenna 1 with 3dBi gain (Max.) External antenna 2 with 3dBi gain (Max.)
Temperature Range:	-5 ℃ ~ 45 ℃
Hardware Version:	/
Software Version:	V1.0
Sample No:	E202109052880-0002
Note:	/

2. LABORATORY AND ACCREDITATIONS

2.1. LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add.:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.
P.C.:	518000
Tel :	0755-61180008
Fax:	0755-61180008

2.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	A2LA(Certificate #2861.01)
China	CNAS(L0446)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	ISED (Company Number: 24897，CAB identifier:CN0069)
USA	FCC (Registration Number: 759402，Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

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3. EVALUATION METHOD

Exposure category: General population/uncontrolled environment
EUT Type: Production Unit
Device Type: Mobile Device

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.
In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

4. LIMITS FOR GENERAL POPULATION/UNCONTROLLEDEXPOSURE

(B)Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength(H) (A/m)	Power Density (S) (Mw/cm^2)	Averaging Time$[E]^2$, $[H]^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100,000	/	/	1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

5. CALCULATION METHOD

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01
$S=PG/4\pi R^2$
Where: S=power density
P=power input to antenna
G=power gain of the antenna in the direction of interest relative to anisotropic radiator
R=distance to the center of radiation of the antenna
From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the maximum gain of the used as following information, the RF power density can be obtained.

Frequency Band	Antenna type	Internal Identification		Maximum antenna gain
2.4GHz	External antenna	Antenna 1		3dBi
		Antenna 2		3dBi
5GHz	External antenna	Antenna 1	U-NII-1	3dBi
		Antenna 2	U-NII-1	3dBi

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6. ESTIMATION RESULT

6.1. CONDUCTED POWER RESULTS

2.4G wifi

Antenna	Mode	Frequency(MHz)	Peak Conducted Output Power (dBm)
Antenna 1	802.11b	2412	21.45
		2437	21.42
		2462	21.20
	802.11g	2412	15.32
		2437	15.67
		2462	15.75
	802.11n HT20	2412	15.81
		2437	15.6
		2462	15.45
	802.11n HT40	2422	13.7
		2437	13.77
		2452	13.71
	802.11ax HE20	2412	14.77
		2437	14.69
		2462	14.57
	802.11ax HE40	2422	13.72
		2437	13.7
		2452	13.73
Antenna	**Mode**	**Frequency(MHz)**	**Peak Conducted Output Power (dBm)**
Antenna 2	802.11b	2412	**22.26**
		2437	21.73
		2462	22.23
	802.11g	2412	15.77
		2437	**15.91**
		2462	15.57
	802.11n HT20	2412	16.53
		2437	16.6
		2462	16.58
	802.11n HT40	2422	14.89
		2437	14.94
		2452	14.79
	802.11ax HE20	2412	15.53
		2437	15.68
		2462	15.54
	802.11ax HE40	2422	14.92
		2437	14.8
		2452	14.82

5GHz WIFI

Test Mode	Band	Frequency (MHz)	AVG Conducted Output Power (dBm)			
			antenna 1	antenna 2	antenna 3	antenna 4
802.11a	U-NII-1	5180	18.12	18.74	18.54	17.69
		5200	17.98	18.93	18.66	17.27
		5240	17.86	**18.94**	18.42	17.21
802.11n HT20	U-NII-1	5180	17.87	18.85	18.59	17.68
		5200	17.84	18.61	18.48	17.11
		5240	17.96	18.9	18.42	16.98
802.11n HT40	U-NII-1	5190	15.92	16.56	16.45	15.66
		5230	16.02	16.79	16.31	15.49
		5180	17.88	18.82	18.59	17.66
802.11ac VHT40	U-NII-1	5200	17.84	18.77	18.48	17.1
		5240	17.9	18.87	18.41	17.08
802.11ac VHT40	U-NII-1	5190	16.14	16.73	16.34	15.65
		5230	16.18	16.77	16.55	15.5
802.11ac VHT80	U-NII-1	5210	16.26	16.92	16.71	15.75
802.11ax HE20	U-NII-1	5180	18.02	18.73	18.56	17.65
		5200	17.74	18.69	18.45	17.13
		5240	17.84	18.82	18.38	17
802.11ax HE40	U-NII-1	5190	16.08	16.73	16.37	15.76
		5230	16.17	16.78	16.51	15.35
802.11ax HE80	U-NII-1	5210	16.29	16.82	16.62	15.68

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6.2. MANUFACTURING TOLERANCE

Frequency (MHz)	2.4G Wifi-Antenna 1					
	802.11b	802.11g	802.11n HT20	802.11ax HE20	802.11n HT40	802.11ax HE40
	2412	2462	2412	2412	2437	2452
Target(dBm)	22.0	16.0	16.0	15.0	14.0	14.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0

Frequency (MHz)	2.4G Wifi-Antenna 2					
	802.11b	802.11g	802.11n HT20	802.11ax HE20	802.11n HT40	802.11ax HE40
	2412	2437	2437	2437	2437	2422
Target(dBm)	22.0	16.0	16.0	15.0	15.0	15.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0

Frequency (MHz)	5G Wifi-Antenna 1								
	802.11a	802.11n HT20	802.11ac VHT20	802.11ax HE20	802.11n HT40	802.11ac VHT40	802.11 ax HE40	802.11ac VHT80	802.11 ax HE80
	5180	5240	5240	5180	5230	5230	5230	5210	5210
Target (dBm)	18.0	18.0	18.0	18.0	16.0	16.0	16.0	16.0	16.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Frequency (MHz)	5G Wifi-Antenna 2								
	802.11 a	802.11 n HT20	802.11ac VHT20	802.11ax HE20	802.11n HT40	802.11ac VHT40	802.11 ax HE40	802.11ac VHT80	802.11 ax HE80
	5240	5240	5240	5240	5230	5230	5230	5210	5210
Target (dBm)	19.0	19.0	19.0	19.0	17.0	17.0	17.0	17.0	17.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Frequency (MHz)	5G Wifi-Antenna 3								
	802.11 a	802.11 n HT20	802.11ac VHT20	802.11ax HE20	802.11n HT40	802.11ac VHT40	802.11 ax HE40	802.11ac VHT80	802.11 ax HE80
	5240	5240	5240	5180	5230	5230	5230	5210	5210
Target (dBm)	19.0	19.0	19.0	19.0	17.0	17.0	17.0	17.0	17.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Frequency (MHz)	5G Wifi-Antenna 4								
	802.11 a	802.11 n HT20	802.11ac VHT20	802.11ax HE20	802.11n HT40	802.11ac VHT40	802.11 ax HE40	802.11ac VHT80	802.11 ax HE80

	5180	5180	5180	5180	5190	5190	5190	5210	5210
Target (dBm)	18.0	18.0	18.0	18.0	16.0	16.0	16.0	16.0	16.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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6.3. MEASUREMENT RESULTS

6.3.1. STANDALONE MPE

2.4G wifi

Antenna 1

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle(%)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
802.11b	22.00	158.4893	3.00	2.00	95.10	0.0629	1.00
802.11g	16.00	39.8107	3.00	2.00	95.12	0.0158	1.00
802.11n HT20	16.00	39.8107	3.00	2.00	95.15	0.0158	1.00
802.11ax HE20	14.00	25.1189	3.00	2.00	98.57	0.0100	1.00
802.11n HT40	15.00	31.6228	3.00	2.00	90.61	0.0126	1.00
802.11ax HE40	14.00	25.1189	3.00	2.00	97.16	0.0100	1.00

Antenna 2

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle(%)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
802.11b	22.00	158.4893	3.00	2.00	95.10	0.0629	1.00
802.11g	16.00	39.8107	3.00	2.00	95.12	0.0158	1.00
802.11n HT20	16.00	39.8107	3.00	2.00	95.15	0.0158	1.00
802.11ax HE20	15.00	31.6228	3.00	2.00	98.57	0.0126	1.00
802.11n HT40	15.00	31.6228	3.00	2.00	90.61	0.0126	1.00
802.11ax HE40	15.00	31.6228	3.00	2.00	97.16	0.0126	1.00

5G wifi

Antenna 1

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle(%)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
802.11a	18	63.0957	3	2.00	98.95	0.0251	1
802.11n HT20	18	63.0957	3	2.00	98.87	0.0251	1
802.11n HT40	16	39.8107	3	2.00	90.71	0.0158	1
802.11ac VHT20	18	63.0957	3	2.00	98.62	0.0251	1
802.11ac VHT40	16	39.8107	3	2.00	97.25	0.0158	1
802.11ac VHT80	16	39.8107	3	2.00	94.48	0.0158	1
802.11ax HE20	18	63.0957	3	2.00	98.62	0.0251	1
802.11ax HE40	16	39.8107	3	2.00	97.27	0.0158	1
802.11ax HE80	16	39.8107	3	2.00	94.65	0.0158	1

Antenna 2

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle(%)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
802.11a	19	79.4328	3	2.00	98.95	0.0315	1
802.11n HT20	19	79.4328	3	2.00	98.87	0.0315	1
802.11n HT40	17	50.1187	3	2.00	90.71	0.0199	1
802.11ac VHT20	19	79.4328	3	2.00	98.62	0.0315	1
802.11ac VHT40	17	50.1187	3	2.00	97.25	0.0199	1
802.11ac VHT80	17	50.1187	3	2.00	94.48	0.0199	1
802.11ax HE20	19	79.4328	3	2.00	98.62	0.0315	1
802.11ax HE40	17	50.1187	3	2.00	97.27	0.0199	1
802.11ax HE80	17	50.1187	3	2.00	94.65	0.0199	1

Antenna 3

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle(%)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
802.11a	19	79.4328	3	2.00	98.95	0.0315	1
802.11n HT20	19	79.4328	3	2.00	98.87	0.0315	1
802.11n HT40	17	50.1187	3	2.00	90.71	0.0199	1
802.11ac VHT20	19	79.4328	3	2.00	98.62	0.0315	1
802.11ac VHT40	17	50.1187	3	2.00	97.25	0.0199	1
802.11ac VHT80	17	50.1187	3	2.00	94.48	0.0199	1
802.11ax HE20	19	79.4328	3	2.00	98.62	0.0315	1
802.11ax HE40	17	50.1187	3	2.00	97.27	0.0199	1
802.11ax HE80	17	50.1187	3	2.00	94.65	0.0199	1

Antenna 4

Mode	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	Duty Cycle(%)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)					
802.11a	18	63.0957	3	2.00	98.95	0.0251	1
802.11n HT20	18	63.0957	3	2.00	98.87	0.0251	1
802.11n HT40	16	39.8107	3	2.00	90.71	0.0158	1
802.11ac VHT20	18	63.0957	3	2.00	98.62	0.0251	1
802.11ac VHT40	16	39.8107	3	2.00	97.25	0.0158	1
802.11ac VHT80	16	39.8107	3	2.00	94.48	0.0158	1
802.11ax HE20	18	63.0957	3	2.00	98.62	0.0251	1
802.11ax HE40	16	39.8107	3	2.00	97.27	0.0158	1
802.11ax HE80	16	39.8107	3	2.00	94.65	0.0158	1

Remark: 1. Maximum average power including tune-up tolerance;
2. MPE use distance is 20cm from manufacturer declaration of user manual.

Antenna 1 and Antenna 2 for 2.4G WLAN and 5G WLAN

Band	Mode	MPE Ratio (mW/cm^2) Antenna 1	MPE Ratio (mW/cm^2) Antenna 2	∑MPE Ratios (mW/cm^2)	Limit (mW/cm^2)	Results
2.4G	802.11b	0.0629	0.0629	/	1.000	Pass
	802.11g	0.0158	0.0158	/	1.000	Pass
	802.11n HT20	0.0158	0.0158	0.0316	1.000	Pass
	802.11n HT40	0.0100	0.0126	0.0226	1.000	Pass
	802.11ax HE20	0.0126	0.0126	0.0252	1.000	Pass
	802.11ax HE40	0.0100	0.0126	0.0226	1.000	Pass

Band	Mode	MPE Ratio (mW/cm^2) Antenna 1	MPE Ratio (mW/cm^2) Antenna 2	MPE Ratio (mW/cm^2) Antenna 3	MPE Ratio (mW/cm^2) Antenna 4	∑MPE Ratios (mW/cm^2)	Limit (mW/cm^2)	Results
5G	802.11a	0.0251	0.0315	0.0315	0.0251	/	1.000	Pass
	802.11n HT20	0.0251	0.0315	0.0315	0.0251	0.1132	1.000	Pass
	802.11n HT40	0.0158	0.0199	0.0199	0.0158	0.0714	1.000	Pass
	802.11ac VHT20	0.0251	0.0315	0.0315	0.0251	0.1132	1.000	Pass
	802.11ac VHT40	0.0158	0.0199	0.0199	0.0158	0.0714	1.000	Pass
	802.11ac VHT80	0.0158	0.0199	0.0199	0.0158	0.0714	1.000	Pass
	802.11ax HE20	0.0251	0.0315	0.0315	0.0251	0.1132	1.000	Pass
	802.11ax HE40	0.0158	0.0199	0.0199	0.0158	0.0714	1.000	Pass
	802.11ax HE80	0.0158	0.0199	0.0199	0.0158	0.0714	1.000	Pass

Remark:

1. Maximum average power including tune-up tolerance;
2. MPE use distance is 20cm from manufacturer declaration of user manual.

We first evaluate WLAN simultaneous transmission and later evaluate WLAN simultaneous transmission;

Maximum Simultaneous transmission MPE Ratio for WLAN

Maximum MPE ratio (mW/cm^2) 2.4G	Maximum MPE ratio (mW/cm^2) 5G	∑ MPE ratios (mW/cm^2)	Limit (mW/cm^2)	Results
0.316	0.1132	0.4292	1.000	Pass

Note: The estimation distance is 20cm

7. CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

---------- End of Report ----------