

RF EXPOSURE Test Report

Report No. : MTi250714009-0106E5
Date of issue : 2025-09-12
Applicant : Wuhan Chengle Science and Technology Co., Ltd.
Product : WiFi6/BT/BLE Module
Model(s) : C611L40
FCC ID : 2BQYO1

Shenzhen Microtest Co., Ltd.

TEST REPORT

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Test Result Certification		
Applicant	Wuhan Chengle Science and Technology Co., Ltd.	
Applicant Address	Room A112, Jiangzhidu Maker Space, 8th Floor, Unit/Tower B, Huitong Tiandi, No. 6 Xudong Street, Wuchang District, Wuhan City, Hubei Province	
Manufacturer	Wuhan Chengle Science and Technology Co., Ltd.	
Manufacturer Address	Room A112, Jiangzhidu Maker Space, 8th Floor, Unit/Tower B, Huitong Tiandi, No. 6 Xudong Street, Wuchang District, Wuhan City, Hubei Province	
Factory	Wuhan Chengle Science and Technology Co., Ltd.	
Factory Address	Room A112, Jiangzhidu Maker Space, 8th Floor, Unit/Tower B, Huitong Tiandi, No. 6 Xudong Street, Wuchang District, Wuhan City, Hubei Province	
Product description		
Product name	WiFi6/BT/BLE Module	
Trademark	N/A	
Model name	C611L40	
Series Model(s)	N/A	
Standards	47 CFR Part 2.1091	
Test method	KDB 447498 D01 v06	
Testing Information		
Date of test	2025-07-28 to 2025-09-11	
Test Result	Pass	
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Approved by:	Lewis Lian	<i>Lewis Lian</i>

1 RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

MPE Calculation Method

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

R = distance between observation point and center of the radiator in cm(20cm)

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

2 Measurement Result

BT&BLE:

Operation Frequency: 2402-2480MHz,
Power density limited: 1mW/ cm²

Antenna Type: Rod-shaped antenna

Antenna gain: 3.97dBi

R=20cm

$mW=10^{(dBm/10)}$

Antenna gain Numeric= $10^{(dBi/10)}=10^{(3.97/10)}=2.49$

BT:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
		(dBm)		tune-up power (dBm)	(mW)	Gain (dBi)	Numeric		
2402	GFSK	8.66	8±1	9	7.94	2.58	2.49	0.0039	1
2441		9.01	9±1	10	10.00	2.58	2.49	0.0050	1
2480		6.64	6±1	7	5.01	2.58	2.49	0.0025	1
2402	π/4-DQPSK	5.12	5±1	6	3.98	2.58	2.49	0.0020	1
2441		5.54	5±1	6	3.98	2.58	2.49	0.0020	1
2480		6.07	6±1	7	5.01	2.58	2.49	0.0025	1
2402	8DPSK	5.42	5±1	6	3.98	2.58	2.49	0.0020	1
2441		5.77	5±1	6	3.98	2.58	2.49	0.0020	1
2480		9.32	9±1	10	10.00	2.58	2.49	0.0050	1

BLE:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
		(dBm)		tune-up power (dBm)	(mW)	Gain (dBi)	Numeric		
2402	GFSK-1M	7.93	7±1	8	6.310	2.58	2.49	0.0031	1
2440		8.61	8±1	9	7.943	2.58	2.49	0.0039	1
2480		8.79	8±1	9	7.943	2.58	2.49	0.0039	1
2402	GFSK-2M	7.79	7±1	8	6.310	2.58	2.49	0.0031	1
2440		8.59	8±1	9	7.943	2.58	2.49	0.0039	1
2480		8.78	8±1	9	7.943	2.58	2.49	0.0039	1

2.4G WIFI:

Operation Frequency: WIFI 802.11b/g/n HT20: 2412-2462MHz, WIFI 802.11n HT40/AX40: 2422-2452MHz,
Power density limited: 1mW/ cm²

Antenna Type: Rod-shaped antenna

Antenna gain: 3.97dBi

R=20cm

$mW=10^{(dBm/10)}$

Antenna gain Numeric= $10^{(dBi/10)}=10^{(3.97/10)}=2.49$

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm ²)	(mW/cm ²)
				(dBm)	(mW)	Numeric		
2412	802.11b	14.44	14±1	15	31.62	2.49	0.01569	1
2437		14.75	14±1	15	31.62	2.49	0.01569	1
2462		13.78	13±1	14	25.12	2.49	0.01247	1
2412	802.11g	15.81	15±1	16	39.81	2.49	0.01976	1
2437		15.32	15±1	16	39.81	2.49	0.01976	1
2462		15.31	15±1	16	39.81	2.49	0.01976	1
2412	802.11n H20	15.91	15±1	16	39.81	2.49	0.01976	1
2437		15.17	15±1	16	39.81	2.49	0.01976	1
2462		15.24	15±1	16	39.81	2.49	0.01976	1
2422	802.11n H40	15.72	15±1	16	39.81	2.49	0.01976	1
2437		15.00	15±1	16	39.81	2.49	0.01976	1
2452		13.81	13±1	14	25.12	2.49	0.01247	1
2412	802.11ax H20	16.25	16±1	17	50.12	2.49	0.02487	1
2437		15.56	15±1	16	39.81	2.49	0.01976	1
2462		15.61	15±1	16	39.81	2.49	0.01976	1
2422	802.11ax H40	15.52	15±1	16	39.81	2.49	0.01976	1
2437		15.00	15±1	16	39.81	2.49	0.01976	1
2452		14.09	14±1	15	31.62	2.49	0.01569	1

802.11a/n/ax(HT20):

U-NII Band 1: 5180MHz to 5240MHz;

U-NII Band 3: 5745MHz to 5825MHz;

802.11n/ax(HT40):

U-NII Band 1: 5190MHz to 5230MHz;

U-NII Band 3: 5755MHz to 5795MHz;

ANT Gain: U-NII Band 1: -2.93dBi; U-NII Band 3: 2.38dBi;

Power density limited: 1mW/ cm2

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain Numeric	Power density(mW/cm2)	(mW/cm2)
				(dBm)	(mW)			
5180	11A	5.64	5±1	6	3.98	0.51	0.00040	1
5200		5.50	5±1	6	3.98	0.51	0.00040	1
5240		5.43	5±1	6	3.98	0.51	0.00040	1
5745		7.18	7±1	8	6.31	1.73	0.00217	1
5785		6.74	6±1	7	5.01	1.73	0.00172	1
5825		6.25	6±1	7	5.01	1.73	0.00172	1
5180	11N20SISO	5.35	5±1	6	3.98	0.51	0.00040	1
5200		5.33	5±1	6	3.98	0.51	0.00040	1
5240		5.33	5±1	6	3.98	0.51	0.00040	1
5745		7.13	7±1	8	6.31	1.73	0.00217	1
5785		6.22	6±1	7	5.01	1.73	0.00172	1
5825		6.25	6±1	7	5.01	1.73	0.00172	1
5190	11N40SISO	4.31	4±1	5	3.16	0.51	0.00032	1
5230		5.63	5±1	6	3.98	0.51	0.00040	1
5755		6.91	6±1	7	5.01	1.73	0.00172	1
5795		6.34	6±1	7	5.01	1.73	0.00172	1
5180	11AC20SISO	5.41	5±1	6	3.98	0.51	0.00040	1
5200		5.27	5±1	6	3.98	0.51	0.00040	1
5240		5.41	5±1	6	3.98	0.51	0.00040	1
5745		7.07	7±1	8	6.31	1.73	0.00217	1
5785		6.73	6±1	7	5.01	1.73	0.00172	1
5825		5.71	5±1	6	3.98	1.73	0.00137	1
5190	11AC40SISO	4.62	4±1	5	3.16	0.51	0.00032	1
5230		5.86	5±1	6	3.98	0.51	0.00040	1
5755		7.52	7±1	8	6.31	1.73	0.00217	1
5795		6.94	6±1	7	5.01	1.73	0.00172	1
5180	11AX20SISO	5.24	5±1	6	3.98	0.51	0.00040	1
5200		5.27	5±1	6	3.98	0.51	0.00040	1
5240		5.43	5±1	6	3.98	0.51	0.00040	1
5745		7.14	7±1	8	6.31	1.73	0.00217	1
5785		6.12	6±1	7	5.01	1.73	0.00172	1
5825		5.74	5±1	6	3.98	1.73	0.00137	1
5190	11AX40SISO	6.95	6±1	7	5.01	0.51	0.00051	1
5230		5.65	5±1	6	3.98	0.51	0.00040	1
5755		6.07	6±1	7	5.01	1.73	0.00172	1
5795		7.04	7±1	8	6.31	1.73	0.00217	1

Conclusion:**SIMULTANEOUS TRANSMISSIONS**

When a number of sources at different frequencies, and/or broadband sources, contribute to the total exposure, it becomes necessary to weigh each contribution relative to the MPE. To comply with the MPE, the fraction of the MPE in terms of E2, H2 (or power density) incurred within each frequency interval should be determined and the sum of all such fractions should not exceed unity. In order to ensure compliance with the MPE for a controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unity. That is

$$\sum_{i=1}^n \frac{S_i}{MPE_i} \leq 1$$

Simultaneous transmit:

Operating Band	The MPE ratio
BLE	0.0039
BR&EDR	0.005
2.4G WIFI	0.02487
5G WIFI	0.00217

So the simultaneous transmitting antenna pairs as below:

BR&EDR +2.4G WIFI = 0.005+ 0.02487=0.02987

For the max result: 0.02987≤ 1.0, No SAR is required.

Statement

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***** END OF REPORT *****