RF TEST REPORT

For

Shenzhen GeRunYing Technology Co., Ltd.
Product Name: Bluetooth wireless dual mode mouse
Test Model(s): Sb001

Report Reference No.	:	**DACE250111015RL002**
FCC ID	:	**2BQBM-SB001**
Applicant's Name	:	Shenzhen GeRunYing Technology Co., Ltd.
Address	:	Room 2928D2, Building 1, No. 6018, Longgang Avenue (Longgang Section), Nanlian Community, Longgang Street, Longgang District, Shenzhen
Testing Laboratory	:	Shenzhen DACE Testing Technology Co., Ltd.
Address	:	102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Community, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Test Specification Standard	:	**47 CFR Part 15.249**
Date of Receipt	:	January 11, 2025
Date of Test	:	January 11, 2025 to February 12, 2025
Data of Issue	:	February 12, 2025
Result	:	**Pass**

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Apply for company information

Applicant's Name	:	Shenzhen GeRunYing Technology Co., Ltd.
Address	:	Room 2928D2, Building 1, No. 6018, Longgang Avenue (Longgang Section), Nanlian Community, Longgang Street, Longgang District, Shenzhen
Product Name	:	Bluetooth wireless dual mode mouse
Test Model(s)	:	Sb001
Series Model(s)	:	N/A
Test Specification Standard(s)	:	47 CFR Part 15.249

NOTE1:

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

Compiled by:	Supervised by:	Approved by:
Keren Huang	Ben Tang	Machael Mo
Keren Huang / Test Engineer	Ben Tang / Project Engineer	Machael Mo / Manager
February 12, 2025	February 12, 2025	February 12, 2025

Revision History Of Report

Version	Description	REPORT No.	Issue Date
V1.0	Original	DACE250111015RL002	February 12, 2025

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1 TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

47 CFR Part 15.249: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHZ, and 24.0-24.25 GHz

1.2 Summary of Test Result

Item	Standard	Method	Requirement	Result
Antenna requirement	47 CFR Part 15.249		47 CFR Part 15.203	Pass
Conducted Emission at AC power line	47 CFR Part 15.249	ANSI C63.10-2013 section 6.2	47 CFR 15.207(a)	Pass
Occupied Bandwidth	47 CFR Part 15.249	ANSI C63.10-2013, section 6.9.2	47 CFR 15.215(c)	Pass
Field strength of fundamental	47 CFR Part 15.249	ANSI C63.10-2013 section 6.6	47 CFR 15.249(a) 47 CFR 15.249(b)(1)	Pass
Band edge emissions (Radiated)	47 CFR Part 15.249	ANSI C63.10-2013 section 6.6.4	47 CFR 15.249(d)	Pass
Emissions in frequency bands (below 1GHz)	47 CFR Part 15.249	ANSI C63.10-2013 section 6.5	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)	Pass
Emissions in frequency bands (above 1GHz)	47 CFR Part 15.249	ANSI C63.10-2013 section 6.6	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)	Pass

2 GENERAL INFORMATION

2.1 Client Information

Applicant's Name : Shenzhen GeRunYing Technology Co., Ltd.
Address : Room 2928D2, Building 1, No. 6018, Longgang Avenue (Longgang Section), Nanlian Community, Longgang Street, Longgang District, Shenzhen

Manufacturer : Shenzhen core microelectronics co., LTD
Address : Building A17, District 4, Cuigang, Huaid, Fuyong Sub-district, Bao'an District, Shenzhen City

2.2 Description of Device (EUT)

Product Name:	Bluetooth wireless dual mode mouse
Model/Type reference:	Sb001
Series Model:	N/A
Trade Mark:	N/A
Power Supply:	DC 5V/1A from adapter Battery:DC3.7V 500mAh
Operation Frequency:	2402MHz to 2480MHz
Number of Channels:	40
Modulation Type:	GFSK
Antenna Type:	PCB Antenna
Antenna Gain:	2.34 dBi
Hardware Version:	V1.0
Software Version:	V1.0

(Remark:The Antenna Gain is supplied by the customer.DACE is not responsible for This data and the related calculations associated with it)

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402 MHz	11	2422 MHz	21	2442 MHz	31	2462 MHz
2	2404 MHz	12	2424 MHz	22	2444 MHz	32	2464 MHz
3	2406 MHz	13	2426 MHz	23	2446 MHz	33	2466 MHz
4	2408 MHz	14	2428 MHz	24	2448 MHz	34	2468 MHz
5	2410 MHz	15	2430 MHz	25	2450 MHz	35	2470 MHz
6	2412 MHz	16	2432 MHz	26	2452 MHz	36	2472 MHz
7	2414 MHz	17	2434 MHz	27	2454 MHz	37	2474 MHz
8	2416 MHz	18	2436 MHz	28	2456 MHz	38	2476 MHz
9	2418 MHz	19	2438 MHz	29	2458 MHz	39	2478 MHz
10	2420 MHz	20	2440 MHz	30	2460 MHz	40	2480 MHz

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)
	SRD
Lowest channel	2402MHz
Middle channel	2440MHz
Highest channel	2480MHz
Remark:Only the data of the worst mode would be recorded in this report.	

2.3 Description of Test Modes

No	Title	Description
TM1	Lowest channel	Keep the EUT connect to AC power line and works in continuously transmitting mode with GFSK modulation.
TM2	Middle channel	Keep the EUT connect to AC power line and works in continuously transmitting mode with GFSK modulation.
TM3	Highest channel	Keep the EUT connect to AC power line and works in continuously transmitting mode with GFSK modulation.

2.4 Description of Support Units

Title	Manufacturer	Model No.	Serial No.
AC-DC adapter	HUAWEI TECHNOLOGY	HW100400C01	

2.5 Equipments Used During The Test

Conducted Emission at AC power line					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Power absorbing clamp	SCHWARZ BECK	MESS-ELEKTRONIK	/	2024-03-25	2025-03-24
Electric Network	SCHWARZ BECK	CAT5 8158	CAT5 8158#207	/	/
Cable	SCHWARZ BECK	/	/	2024-03-20	2025-03-19
Pulse Limiter	SCHWARZ BECK	VTSD 9561-F Pulse limiter 10dB Attenuation	561-G071	2024-12-06	2025-12-05
50ΩCoaxial Switch	Anritsu	MP59B	M20531	/	/
Test Receiver	Rohde & Schwarz	ESPI TEST RECEIVER	ID:1164.6607K 03-102109-MH	2024-06-12	2025-06-11
L.I.S.N	R&S	ESH3-Z5	831.5518.52	2023-12-12	2025-12-11
L.I.S.N	SCHWARZ BECK	NSLK 8126	05055	2024-06-14	2025-06-13
Pulse Limiter	CYBERTEK	EM5010A	/	2024-09-27	2025-09-26
EMI test software	EZ -EMC	EZ	V1.1.42	/	/

Occupied Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
RF Test Software	Tachoy Information Technology(shenzhen) Co.,Ltd.	RTS-01	V1.0.0	/	/
Power divider	MIDEWEST	PWD-2533	SMA-79	2023-05-11	2026-05-10
RF Sensor Unit	Tachoy Information Technology(shenzhen) Co.,Ltd.	TR1029-2	000001	/	/
Wideband radio communication tester	R&S	CMW500	113410	2024-06-12	2025-06-11
Vector Signal Generator	Keysight	N5181A	MY50143455	2024-12-06	2025-12-05
Signal Generator	Keysight	N5182A	MY48180415	2024-12-06	2025-12-05
Spectrum Analyzer	Keysight	N9020A	MY53420323	2024-12-06	2025-12-05

Emissions in frequency bands (below 1GHz)
Emissions in frequency bands (above 1GHz)
Field strength of fundamental
Band edge emissions (Radiated)

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test software	Farad	EZ -EMC	V1.1.42	/	/
Positioning Controller	MF	MF-7802	/	/	/
Amplifier(18-40G)	COM-POWER	AH-1840	10100008-1	2022-04-05	2025-04-04
Horn antenna	COM-POWER	AH-1840 (18-40G)	10100008	2023-04-05	2025-04-04
Loop antenna	ZHINAN	ZN30900C	ZN30900C	2024-06-14	2026-06-13
Cable(LF)#2	Schwarzbeck	/	/	2024-02-19	2025-02-18
Cable(LF)#1	Schwarzbeck	/	/	2024-02-19	2025-02-18
Cable(HF)#2	Schwarzbeck	AK9515E	96250	2024-03-20	2025-03-19
Cable(HF)#1	Schwarzbeck	SYV-50-3-1	/	2024-03-20	2025-03-19
Power amplifier(LF)	Schwarzbeck	BBV9743	9743-151	2024-06-12	2025-06-11
Power amplifier(HF)	Schwarzbeck	BBV9718	9718-282	2024-06-12	2025-06-11
Wideband radio communication tester	R&S	CMW500	113410	2024-06-12	2025-06-11
Spectrum Analyzer	R&S	FSP30	1321.3008K40 -101729-jR	2024-06-12	2025-06-11
Test Receiver	R&S	ESCI 3	1166.5950K03 -101431-Jq	2024-06-13	2025-06-12
Horn Antenna	Sunol Sciences	DRH-118	A091114	2023-05-13	2025-05-12
Broadband Antenna	Sunol Sciences	JB6 Antenna	A090414	2024-09-28	2026-09-27

2.6 Statement Of The Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Disturbance (0.15~30MHz)	±3.41dB
Occupied Bandwidth	±3.63%
Radiated Emission (Above 1GHz)	±5.46dB
Radiated Emission (Below 1GHz)	±5.79dB
Note: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

2.7 Identification of Testing Laboratory

Company Name:	Shenzhen DACE Testing Technology Co., Ltd.
Address:	102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Connunity, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252

Identification of the Responsible Testing Location

Company Name:	Shenzhen DACE Testing Technology Co., Ltd.
Address:	102, Building H1, & 1/F., Building H, Hongfa Science & Technology Park, Tangtou Connunity, Shiyan Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252
Designation Number:	CN1342
Test Firm Registration Number:	778666
A2LA Certificate Number:	6270.01

2.8 Announcement

(1) The test report reference to the report template version v0.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) This document may not be altered or revised in any way unless done so by DACE and all revisions are duly noted in the revisions section.

(5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

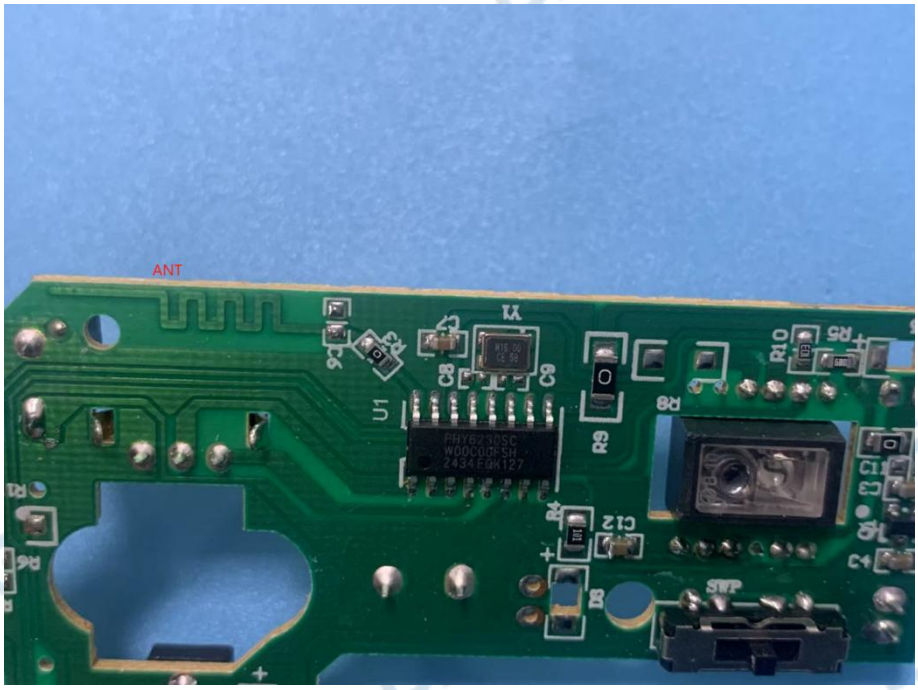
(6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

3 Evaluation Results (Evaluation)

3.1 Antenna requirement

Test Requirement:	Refer to 47 CFR Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.1.1 Conclusion:



4 Radio Spectrum Matter Test Results (RF)

4.1 Conducted Emission at AC power line

Test Requirement:	Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).
Test Limit:	

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

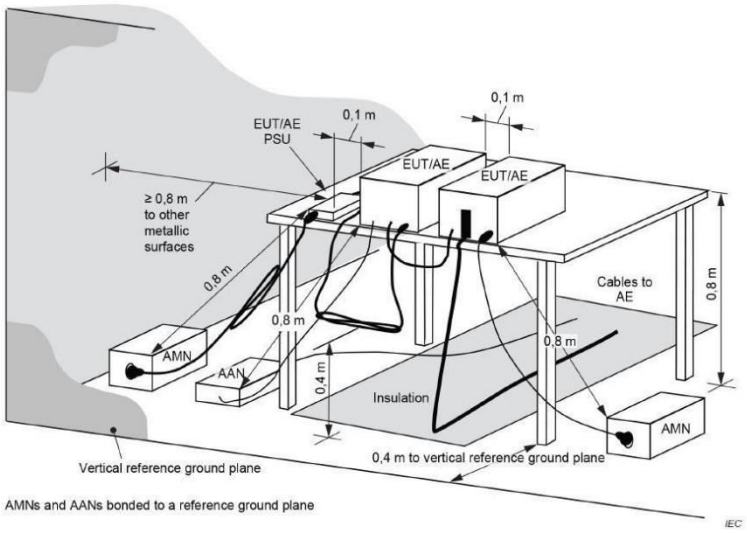
*Decreases with the logarithm of the frequency.

Test Method:	ANSI C63.10-2013 section 6.2
Procedure:	Refer to ANSI C63.10-2013 section 6.2, standard test method for ac power-line conducted emissions from unlicensed wireless devices

4.1.1 E.U.T. Operation:

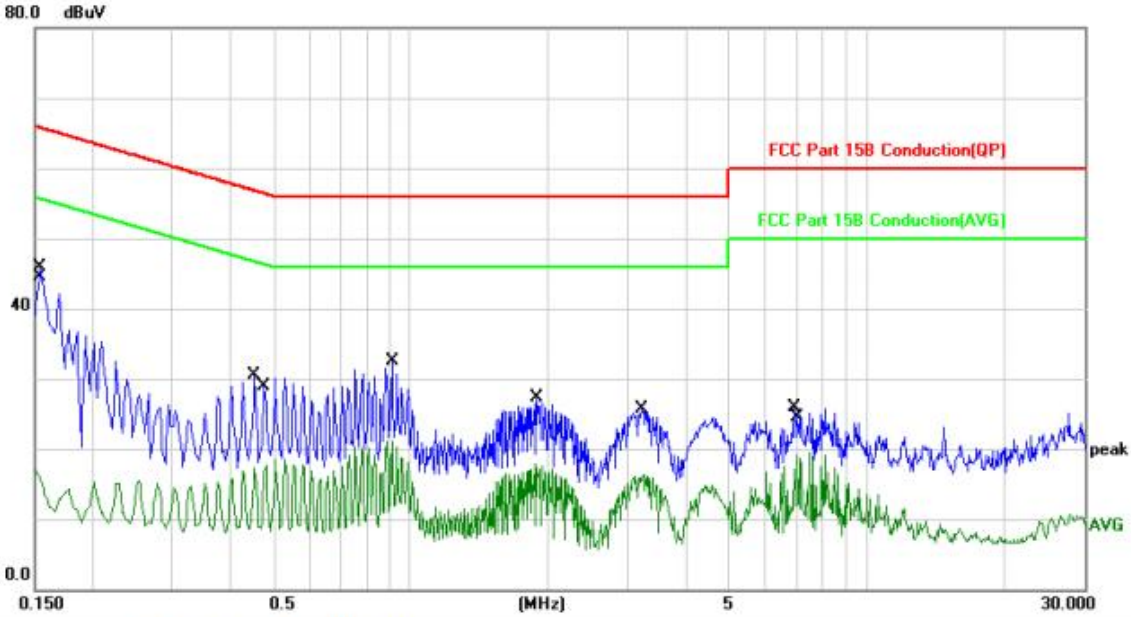
Operating Environment:					
Temperature:	23.1 °C	Humidity:	55 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM1				
Final test mode:	TM1				

4.1.2 Test Setup Diagram:



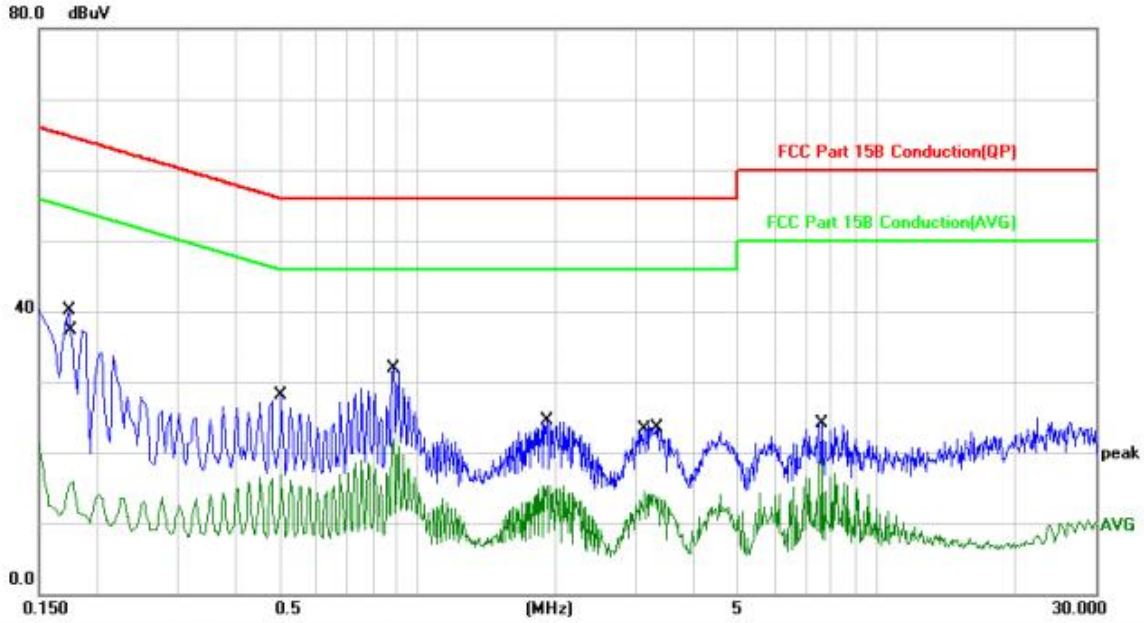
4.1.3 Test Data:

TM1 / Line: Line / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1499	-16.15	33.20	17.05	56.00	-38.95	AVG	
2	*	0.1539	12.67	33.20	45.87	65.78	-19.91	QP	
3		0.4540	-2.85	33.42	30.57	56.80	-26.23	QP	
4		0.4820	-15.65	33.38	17.73	46.30	-28.57	AVG	
5		0.9100	-0.99	33.50	32.51	56.00	-23.49	QP	
6		0.9100	-12.38	33.50	21.12	46.00	-24.88	AVG	
7		1.8700	-15.78	33.59	17.81	46.00	-28.19	AVG	
8		1.8940	-6.25	33.59	27.34	56.00	-28.66	QP	
9		3.2100	-7.90	33.54	25.64	56.00	-30.36	QP	
10		3.2580	-17.20	33.54	16.34	46.00	-29.66	AVG	
11		6.9459	-8.33	34.13	25.80	60.00	-34.20	QP	
12		7.0579	-15.08	34.17	19.09	50.00	-30.91	AVG	

TM1 / Line: Neutral / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1740	6.97	33.20	40.17	64.76	-24.59	QP	
2		0.1780	-17.27	33.20	15.93	54.57	-38.64	AVG	
3		0.5060	-5.14	33.34	28.20	56.00	-27.80	QP	
4		0.5060	-16.52	33.34	16.82	46.00	-29.18	AVG	
5		0.8860	-1.69	33.50	31.81	56.00	-24.19	QP	
6	*	0.8860	-11.67	33.50	21.83	46.00	-24.17	AVG	
7		1.9220	-9.08	33.59	24.51	56.00	-31.49	QP	
8		1.9460	-18.19	33.59	15.40	46.00	-30.60	AVG	
9		3.1340	-18.98	33.54	14.56	46.00	-31.44	AVG	
10		3.3140	-9.94	33.53	23.59	56.00	-32.41	QP	
11		7.6260	-10.35	34.37	24.02	60.00	-35.98	QP	
12		7.6260	-15.58	34.37	18.79	50.00	-31.21	AVG	

4.2 Occupied Bandwidth

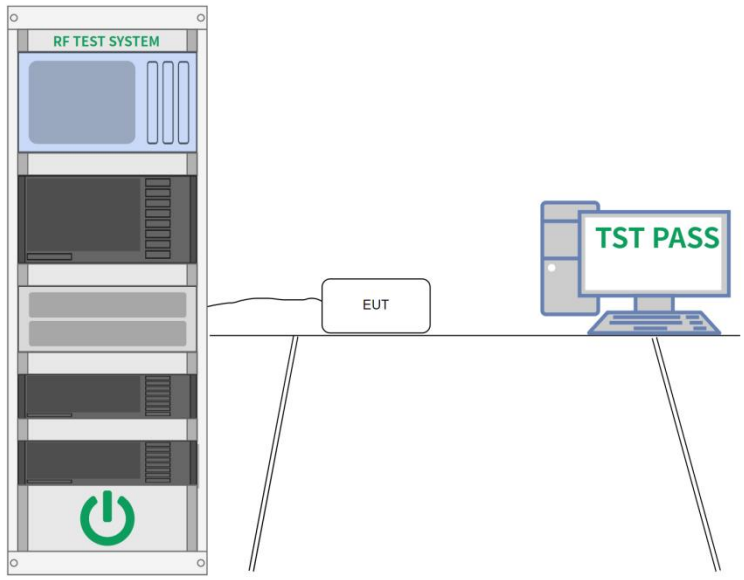
Test Requirement:	47 CFR 15.215(c)
Test Limit:	Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
Test Method:	ANSI C63.10-2013, section 6.9.2
Procedure:	a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2. d) Steps a) through c) might require iteration to adjust within the specified tolerances. e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "−xx dB down" requirement; that is, if the requirement calls for measuring the −20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value. f) Set detection mode to peak and trace mode to max hold. g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value). h) Determine the "−xx dB down amplitude" using [(reference value) − xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument. i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j). j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "-xx dB down amplitude" determined in step h). If a marker is below this "−xx dB down amplitude" value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the "-xx dB down amplitude" determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth. k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

4.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.1 °C	Humidity:	55 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM1, TM2, TM3				

Final test mode:	TM1, TM2, TM3

4.2.2 Test Setup Diagram:



4.2.3 Test Data:

Condition	Antenna	Modulation	Frequency (MHz)	-20dB BW(MHz)	if larger than CFS
NVNT	ANT1	1-DH5	2402.00	1.197	Yes
NVNT	ANT1	1-DH5	2440.00	1.198	Yes
NVNT	ANT1	1-DH5	2480.00	1.195	Yes

-20dB_Bandwidth_NVNT_ANT1_1-DH5_2402_00

-20dB_Bandwidth_NVNT_ANT1_1-DH5_2440_00

-20dB_Bandwidth_NVNT_ANT1_1-DH5_2480_00

4.3 Field strength of fundamental

Test Requirement:	Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following: Fundamental frequency / Field strength of fundamental (millivolts/meter) / Field strength of harmonics (microvolts/meter) 902-928 MHz / 50 / 500 2400-2483.5 MHz / 50 / 500 5725-5875 MHz / 50 / 500 24.0-24.25 GHz / 250 / 2500 The field strength of emissions in this band shall not exceed 2500 millivolts/meter.
Test Method:	ANSI C63.10-2013 section 6.6
Procedure:	ANSI C63.10-2013 section 6.6

4.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.1 °C	Humidity:	55 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM1, TM2, TM3				
Final test mode:	TM1, TM2, TM3				

4.3.2 Test Data:

Frequency	Emission Level	Limits	Margin	Detector	Polarization
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(PK/AV)	(H/V)
2402	102.11	114	-11.89	PK	H
2402	92.56	94	-1.44	AV	H
2402	88.14	114	-25.86	PK	V
2402	79.53	94	-14.47	AV	V

Frequency	Emission Level	Limits	Margin	Detector	Polarization
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(PK/AV)	(H/V)
2440	100.28	114	-13.72	PK	H
2440	86.74	94	-7.26	AV	H
2440	89.64	114	-24.36	PK	V
2440	81.54	94	-12.46	AV	V

Frequency	Emission Level	Limits	Margin	Detector	Polarization
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(PK/AV)	(H/V)
2480	103.02	114	-10.98	PK	H
2480	91.45	94	-2.55	AV	H
2480	88.54	114	-25.46	PK	V
2480	80.41	94	-13.59	AV	V

Note: Margin = Emission Level – Limit; For fundamental frequency, RBW>20dB BW, VBW>=3XRBW

4.4 Band edge emissions (Radiated)

Test Requirement:	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.
Test Limit:	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

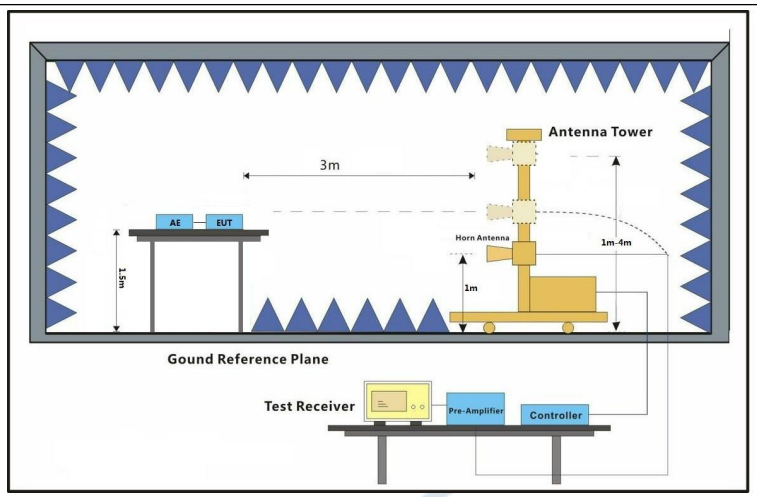
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Method:	ANSI C63.10-2013 section 6.6.4
Procedure:	ANSI C63.10-2013 section 6.6.4

4.4.1 E.U.T. Operation:

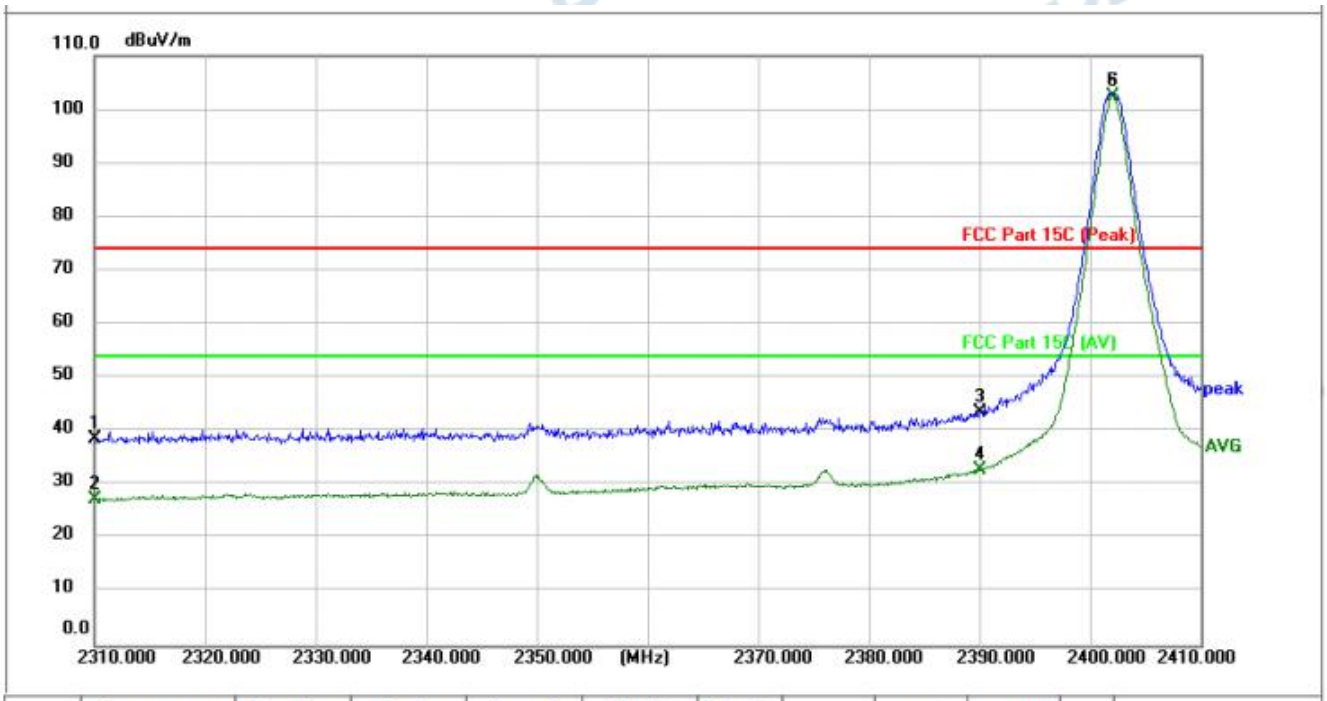
Operating Environment:					
Temperature:	23.1 °C	Humidity:	55 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM1, TM2, TM3				
Final test mode:	TM1, TM2, TM3				

4.4.2 Test Setup Diagram:



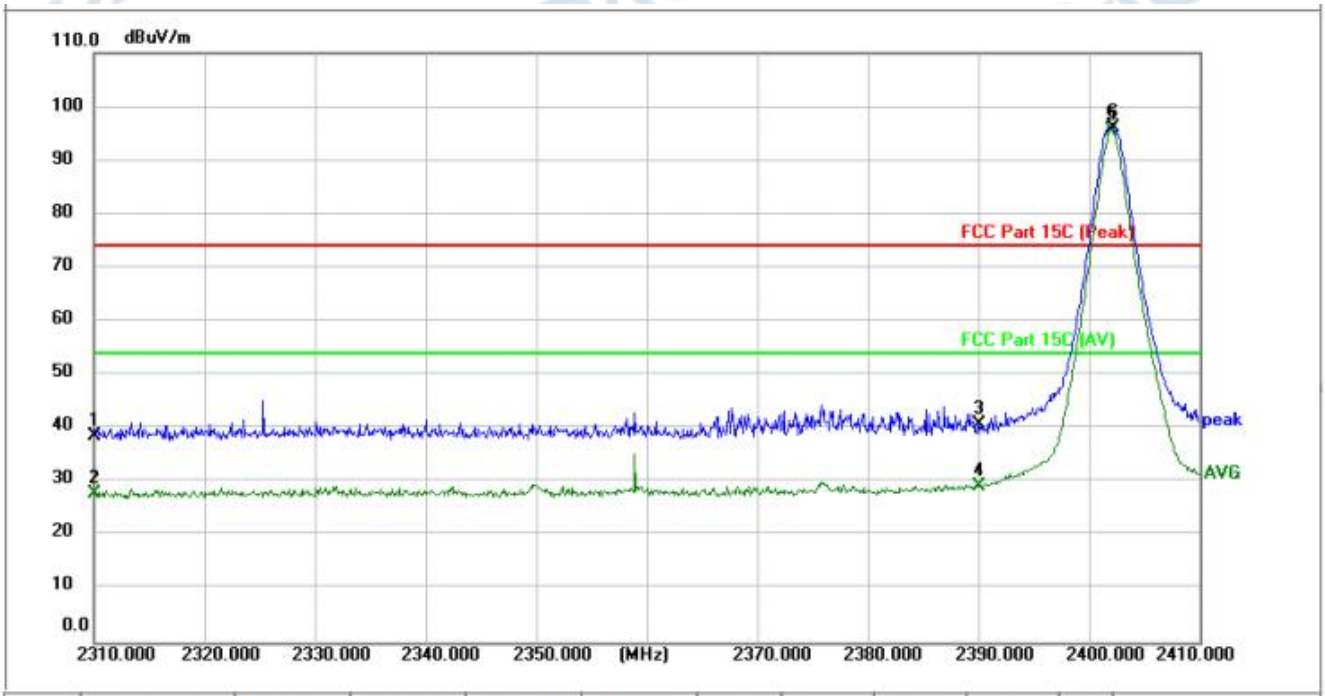
4.4.3 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 1 / CH: L



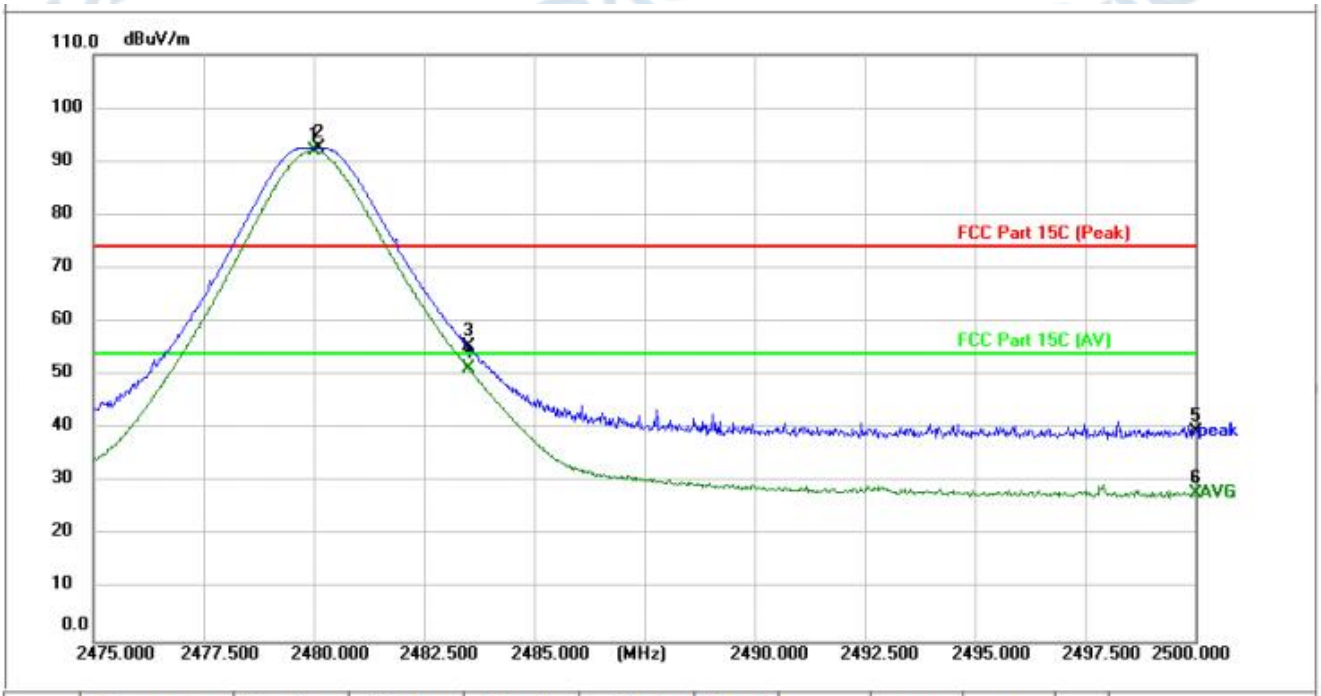
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2310.000	42.38	-3.63	38.75	74.00	-35.25	peak			P	
2	2310.000	31.13	-3.63	27.50	54.00	-26.50	AVG			P	
3	2390.000	47.11	-3.42	43.69	74.00	-30.31	peak			P	
4	2390.000	36.37	-3.42	32.95	54.00	-21.05	AVG			P	
5 *	2402.100	105.78	-3.39	102.39	54.00	48.39	AVG			F	
6 *	2402.100	105.78	-3.39	102.39	54.00	48.39	AVG			F	

TM1 / Polarization: Vertical / Band: 2.4G / BW: 1 / CH: L



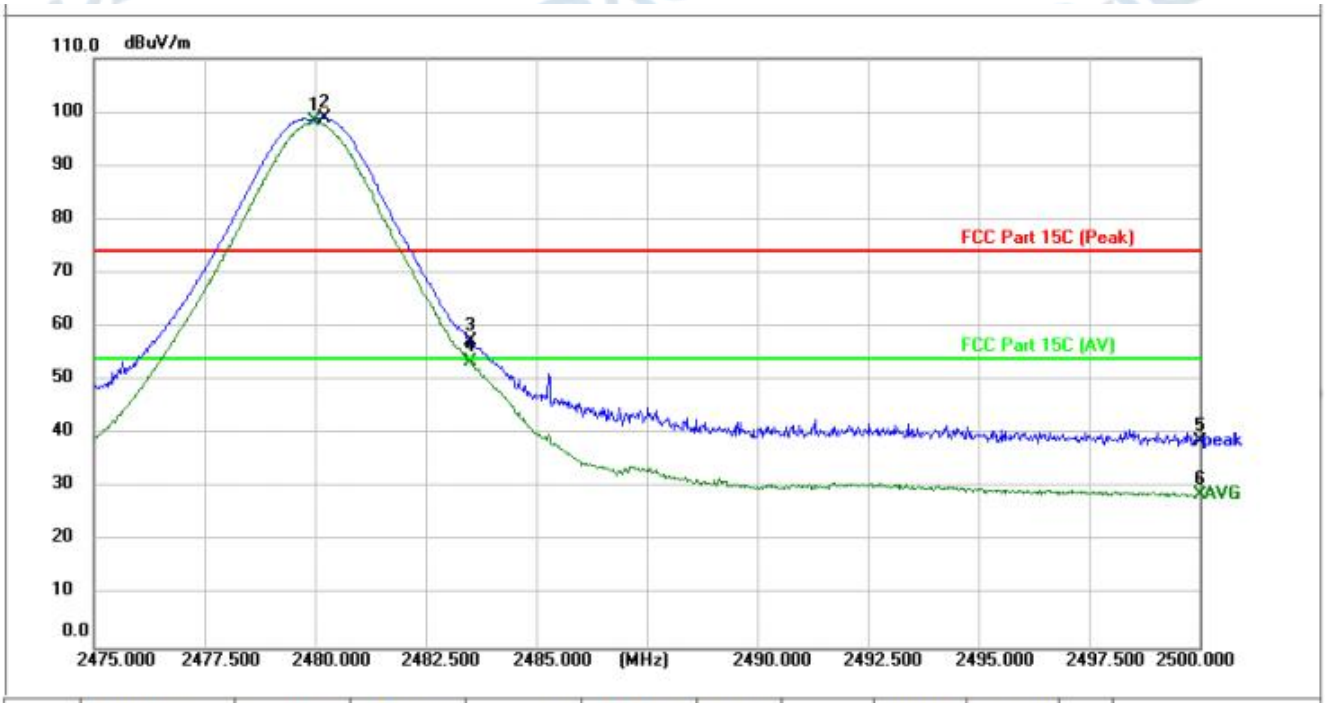
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2310.000	42.29	-3.63	38.66	74.00	-35.34	peak	149		P	
2	2310.000	31.56	-3.63	27.93	54.00	-26.07	AVG	149		P	
3	2390.000	44.25	-3.42	40.83	74.00	-33.17	peak	149		P	
4	2390.000	32.79	-3.42	29.37	54.00	-24.63	AVG	149		P	
5 *	2402.100	98.86	-3.39	95.47	54.00	41.47	AVG	149		F	
6 X	2402.200	99.49	-3.39	96.10	74.00	22.10	peak	149		F	

TM2 / Polarization: Horizontal / Band: 2.4G / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	2480.000	95.20	-3.19	92.01	54.00	38.01	AVG			F	
2 X	2480.125	95.80	-3.19	92.61	74.00	18.61	peak			F	
3	2483.500	58.45	-3.17	55.28	74.00	-18.72	peak	149		P	
4	2483.500	54.54	-3.17	51.37	54.00	-2.63	AVG	149		P	
5	2500.000	42.71	-3.13	39.58	74.00	-34.42	peak	149		P	
6	2500.000	31.08	-3.13	27.95	54.00	-26.05	AVG	149		P	

TM2 / Polarization: Vertical / Band: 2.4G / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	2479.975	101.39	-3.19	98.20	54.00	44.20	AVG			F	
2 X	2480.225	102.01	-3.19	98.82	74.00	24.82	peak			F	
3	2483.500	60.50	-3.17	57.33	74.00	-16.67	peak	149		P	
4	2483.500	56.58	-3.17	53.41	54.00	-0.59	AVG	149		P	
5	2500.000	41.83	-3.13	38.70	74.00	-35.30	peak	149		P	
6	2500.000	31.75	-3.13	28.62	54.00	-25.38	AVG	149		P	

4.5 Emissions in frequency bands (below 1GHz)

Test Requirement:	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)
Test Limit:	Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a)and (b)of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b)of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

Test Method:	ANSI C63.10-2013 section 6.5
Procedure:	ANSI C63.10-2013 section 6.5

4.5.1 E.U.T. Operation:

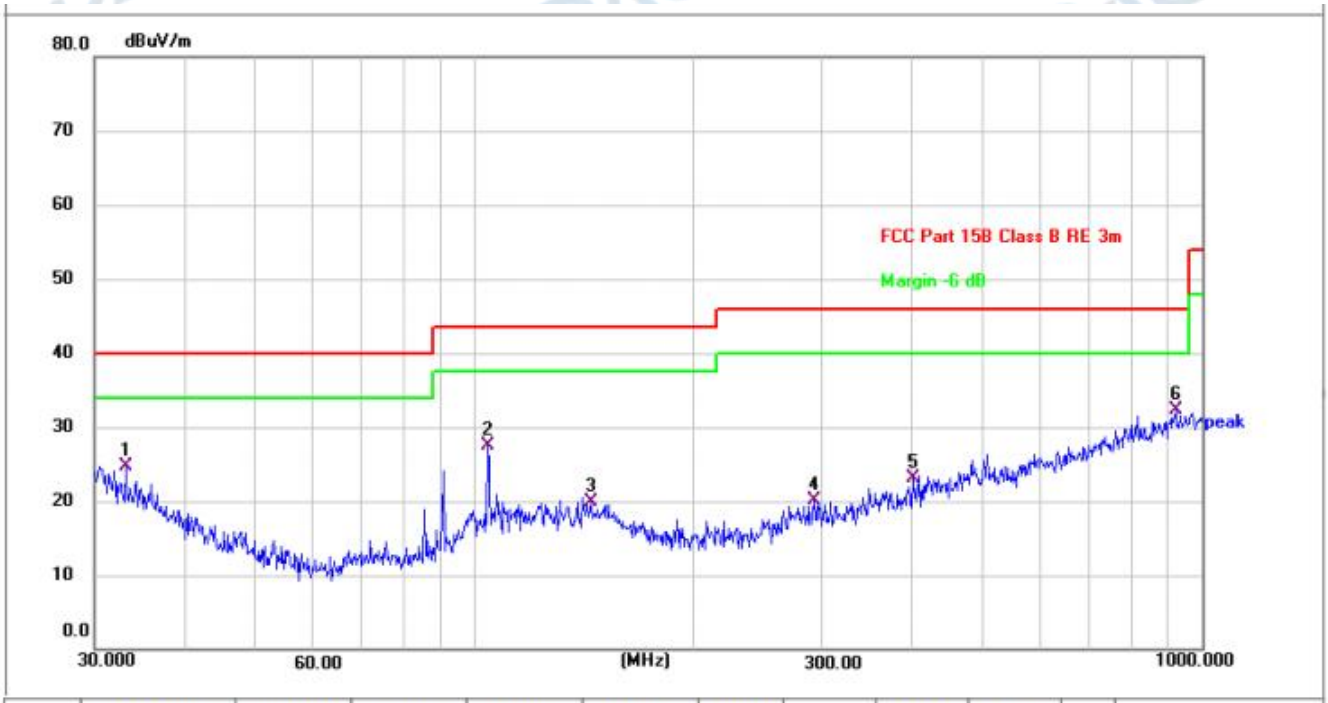
Operating Environment:					
Temperature:	23.1 °C	Humidity:	55 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM1				
Final test mode:	TM1				

4.5.2 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 1 / CH: L

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	30.9618	26.15	-0.13	26.02	40.00	-13.98	QP			P	
2	73.6170	27.28	-11.64	15.64	40.00	-24.36	QP			P	
3	133.1510	26.41	-5.90	20.51	43.50	-22.99	QP			P	
4	279.0436	26.79	-6.03	20.76	46.00	-25.24	QP			P	
5	381.2485	37.12	-4.49	32.63	46.00	-13.37	QP			P	
6 *	925.7562	26.75	6.34	33.09	46.00	-12.91	QP			P	

TM1 / Polarization: Vertical / Band: 2.4G / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	33.0950	26.21	-1.55	24.66	40.00	-15.34	QP	100		P	
2	104.1701	34.87	-7.31	27.56	43.50	-15.94	QP	100		P	
3	144.3348	26.47	-6.54	19.93	43.50	-23.57	QP	100		P	
4	293.0842	26.22	-6.12	20.10	46.00	-25.90	QP	100		P	
5	400.4319	26.96	-3.84	23.12	46.00	-22.88	QP	100		P	
6 *	919.2866	25.99	6.24	32.23	46.00	-13.77	QP	100		P	

4.6 Emissions in frequency bands (above 1GHz)

Test Requirement:	47 CFR 15.249(a) 47 CFR 15.249(d) 47 CFR 15.249(e)
Test Limit:	Except as provided in paragraph (b)of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

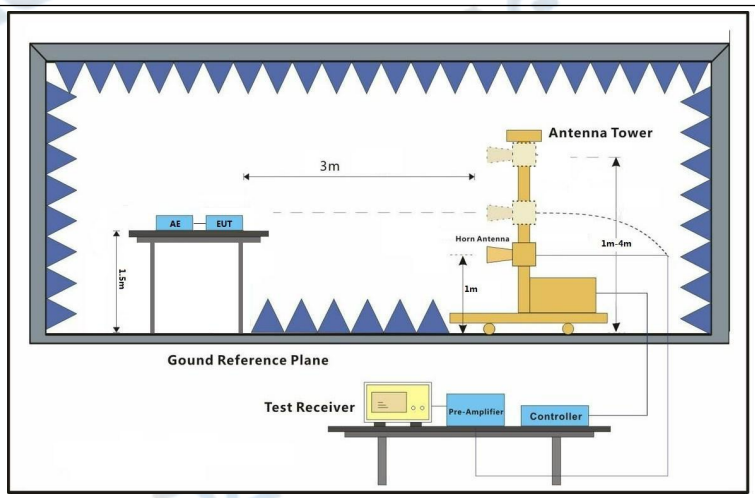
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a)and (b)of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b)of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

Test Method:	ANSI C63.10-2013 section 6.6
Procedure:	ANSI C63.10-2013 section 6.6

4.6.1 E.U.T. Operation:

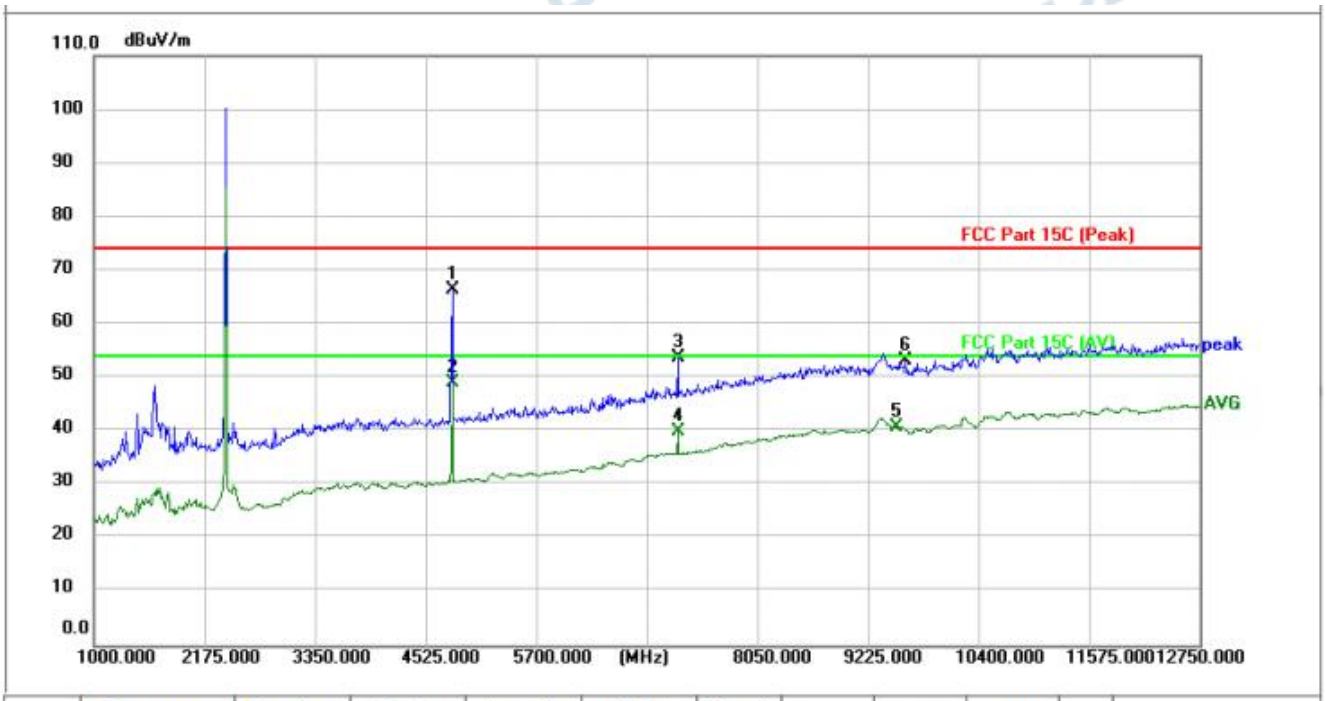
Operating Environment:					
Temperature:	23.1 °C	Humidity:	55 %	Atmospheric Pressure:	102 kPa
Pretest mode:	TM1, TM2, TM3				
Final test mode:	TM1, TM2, TM3				

4.6.2 Test Setup Diagram:



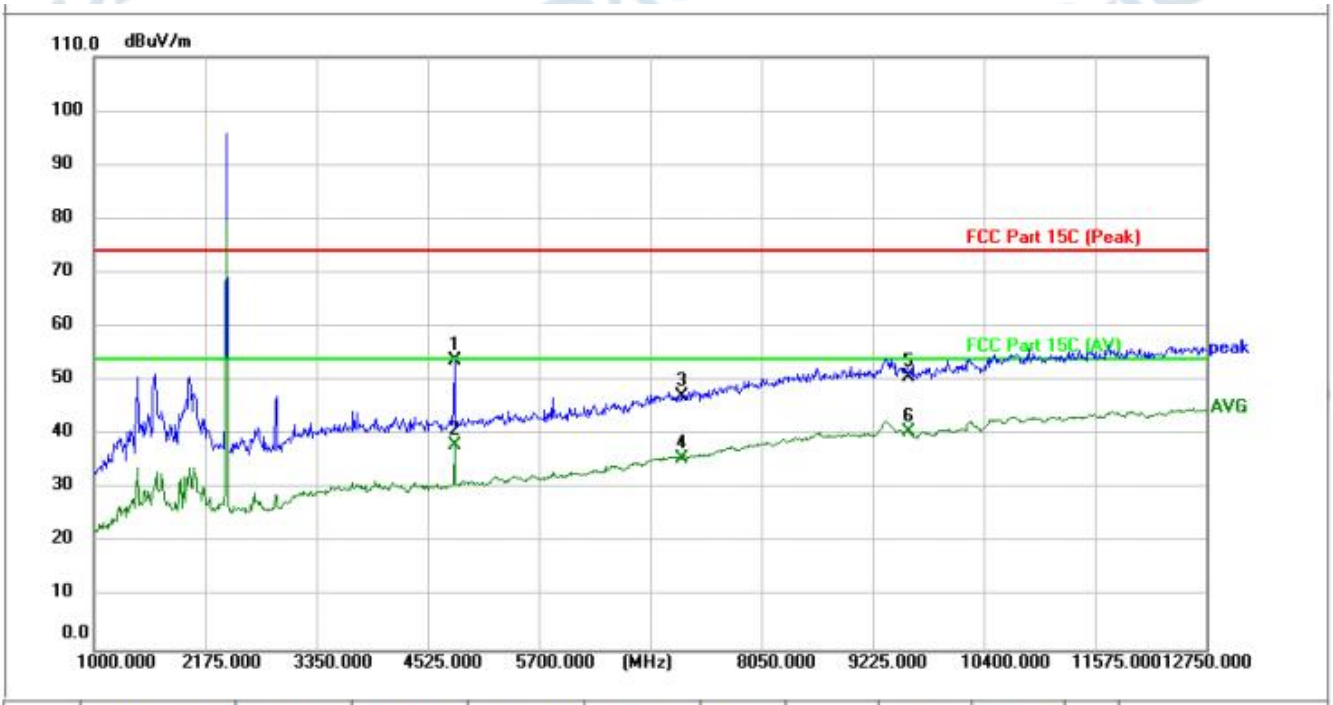
4.6.3 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 1 / CH: L



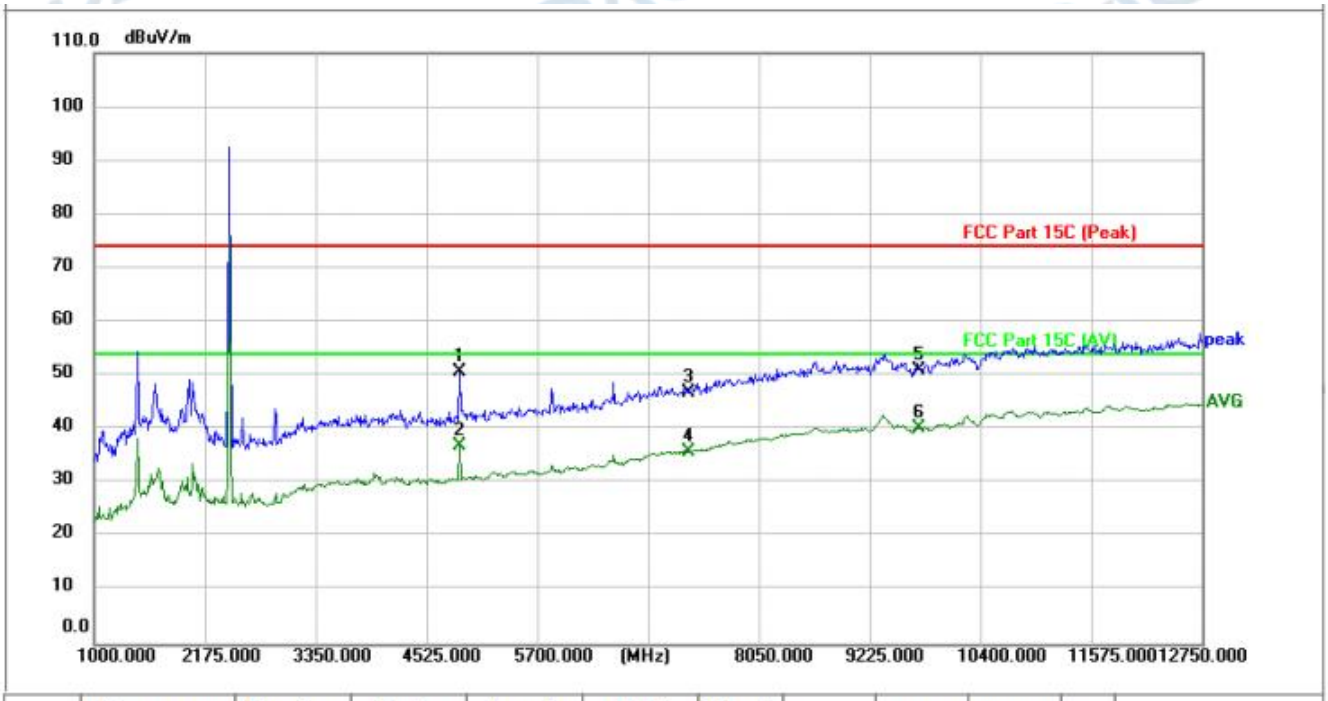
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4807.000	62.98	3.31	66.29	74.00	-7.71	peak	149		P	
2 *	4807.000	45.90	3.31	49.21	54.00	-4.79	AVG	149		P	
3	7204.000	43.29	10.37	53.66	74.00	-20.34	peak	149		P	
4	7204.000	29.64	10.37	40.01	54.00	-13.99	AVG	149		P	
5	9530.500	25.80	15.10	40.90	54.00	-13.10	AVG	149		P	
6	9624.500	38.21	15.09	53.30	74.00	-20.70	peak	149		P	

TM1 / Polarization: Vertical / Band: 2.4G / BW: 1 / CH: L



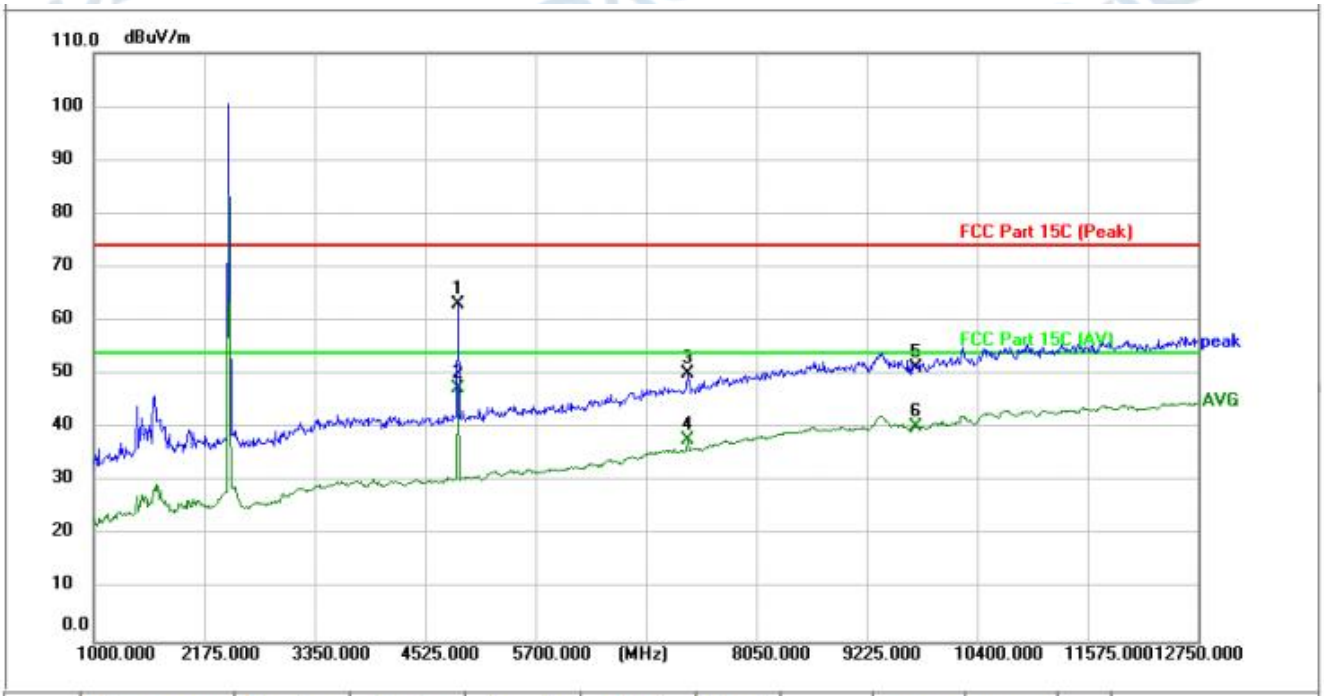
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4807.000	50.48	3.31	53.79	74.00	-20.21	peak	149		P	
2	4807.000	34.90	3.31	38.21	54.00	-15.79	AVG	149		P	
3	7206.000	36.89	10.37	47.26	74.00	-26.74	peak	149		P	
4	7206.000	25.35	10.37	35.72	54.00	-18.28	AVG	149		P	
5	9608.000	35.70	15.09	50.79	74.00	-23.21	peak	149		P	
6 *	9608.000	25.35	15.09	40.44	54.00	-13.56	AVG	149		P	

TM2 / Polarization: Horizontal / Band: 2.4G / BW: 1 / CH: M



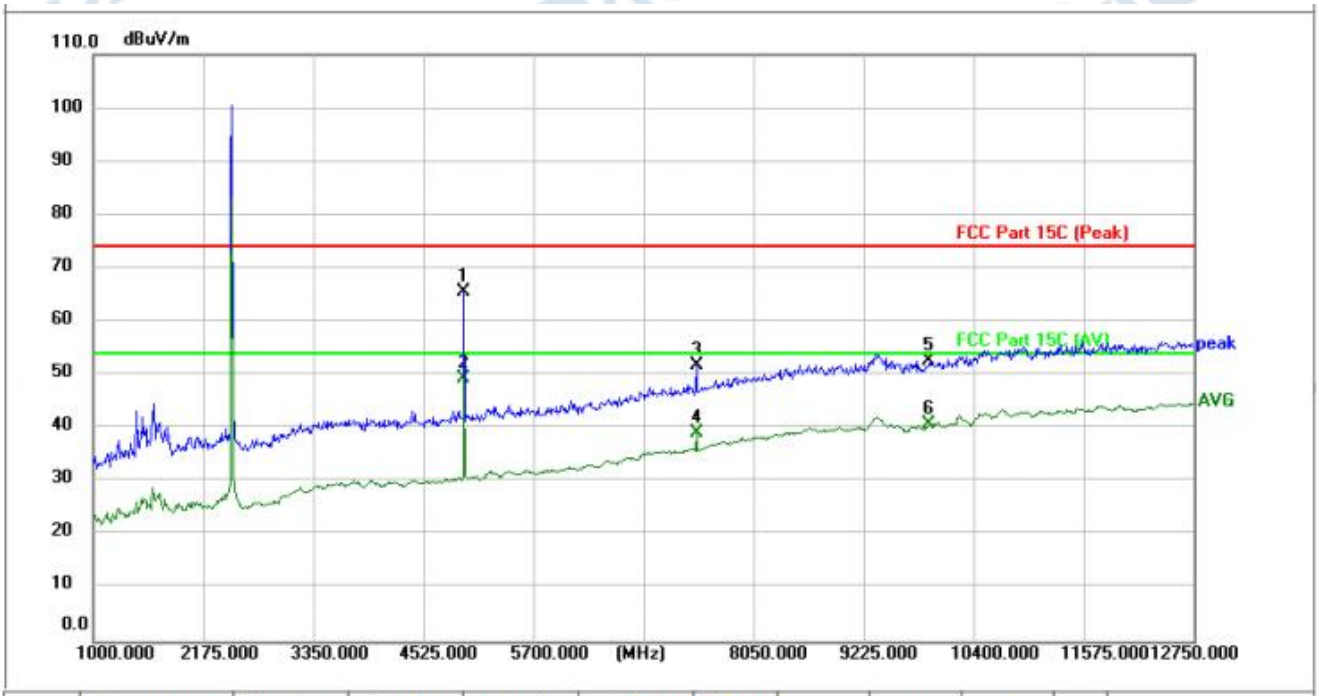
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4877.500	47.22	3.55	50.77	74.00	-23.23	peak	149		P	
2	4877.500	33.56	3.55	37.11	54.00	-16.89	AVG	149		P	
3	7320.000	36.43	10.57	47.00	74.00	-27.00	peak	149		P	
4	7320.000	25.39	10.57	35.96	54.00	-18.04	AVG	149		P	
5	9760.000	35.98	15.09	51.07	74.00	-22.93	peak	149		P	
6 *	9760.000	25.17	15.09	40.26	54.00	-13.74	AVG	149		P	

TM2 / Polarization: Vertical / Band: 2.4G / BW: 1 / CH: M



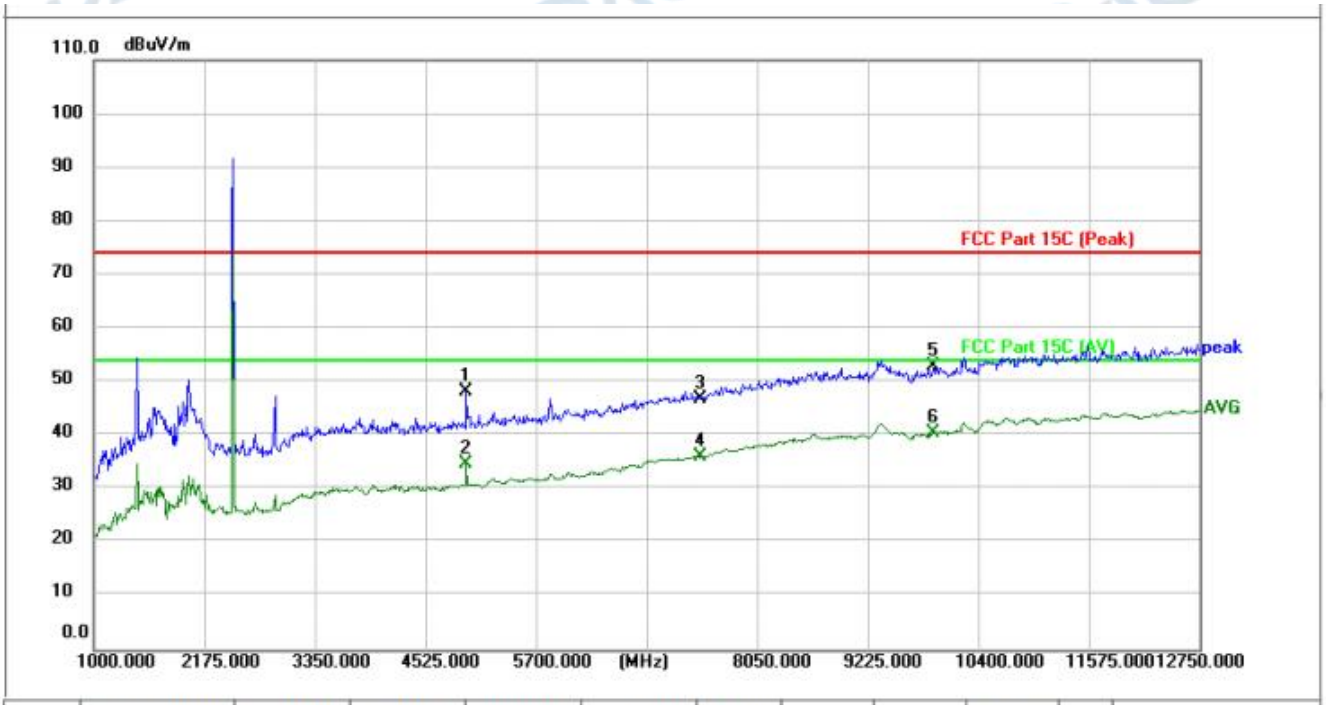
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4877.500	59.61	3.55	63.16	74.00	-10.84	peak	149		P	
2 *	4877.500	43.79	3.55	47.34	54.00	-6.66	AVG	149		P	
3	7321.500	39.60	10.57	50.17	74.00	-23.83	peak	149		P	
4	7321.500	27.18	10.57	37.75	54.00	-16.25	AVG	149		P	
5	9760.000	36.22	15.09	51.31	74.00	-22.69	peak	149		P	
6	9760.000	25.19	15.09	40.28	54.00	-13.72	AVG	149		P	

TM3 / Polarization: Horizontal / Band: 2.4G / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4959.750	61.68	3.83	65.51	74.00	-8.49	peak	149		P	
2 *	4959.750	45.60	3.83	49.43	54.00	-4.57	AVG	149		P	
3	7439.000	40.93	10.78	51.71	74.00	-22.29	peak	149		P	
4	7439.000	28.28	10.78	39.06	54.00	-14.94	AVG	149		P	
5	9920.000	37.72	15.08	52.80	74.00	-21.20	peak	149		P	
6	9920.000	25.63	15.08	40.71	54.00	-13.29	AVG	149		P	

TM3 / Polarization: Vertical / Band: 2.4G / BW: 1 / CH: H

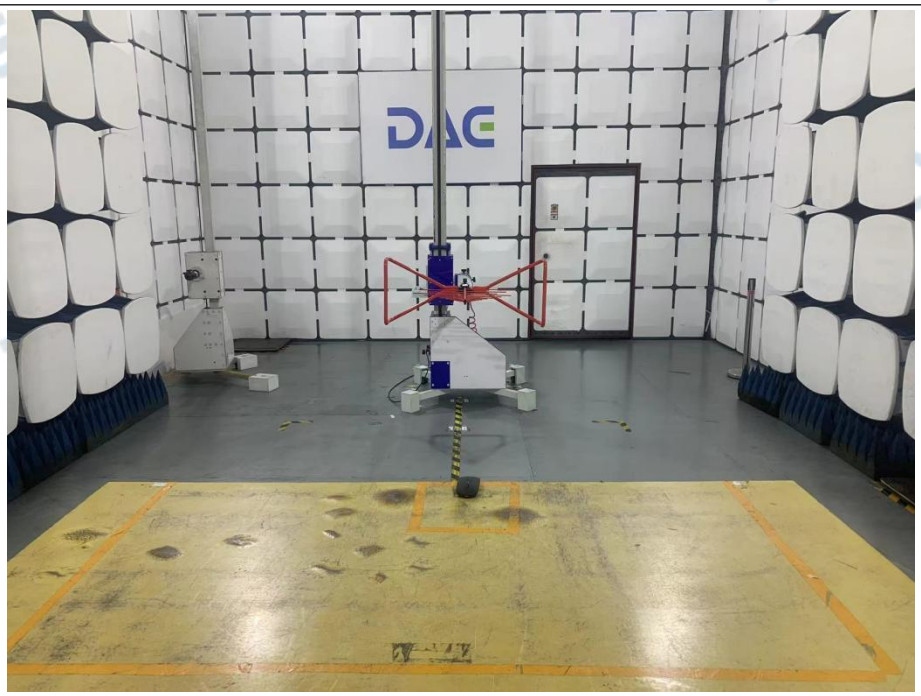


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4959.750	44.54	3.83	48.37	74.00	-25.63	peak	149		P	
2	4959.750	30.95	3.83	34.78	54.00	-19.22	AVG	149		P	
3	7440.000	36.04	10.78	46.82	74.00	-27.18	peak	149		P	
4	7440.000	25.34	10.78	36.12	54.00	-17.88	AVG	149		P	
5	9920.000	37.95	15.08	53.03	74.00	-20.97	peak	149		P	
6 *	9920.000	25.56	15.08	40.64	54.00	-13.36	AVG	149		P	

5 TEST SETUP PHOTOS

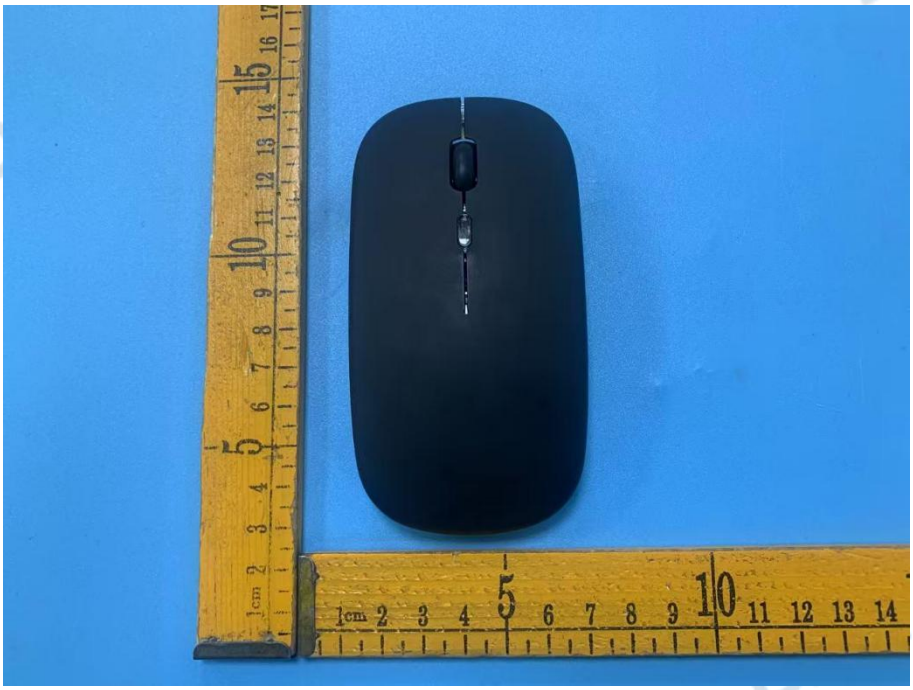
Conducted Emission at AC power line

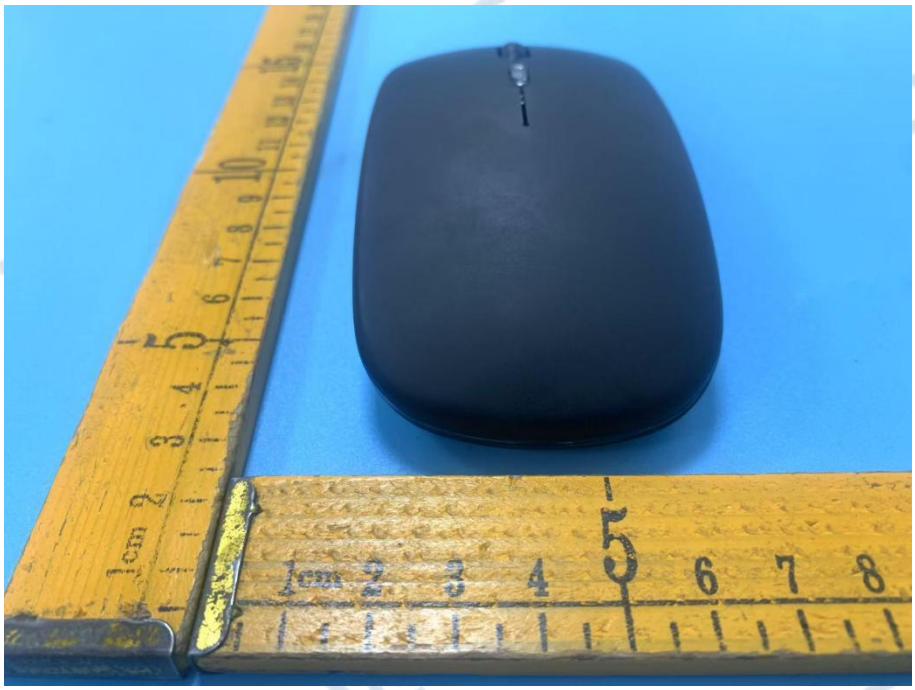
Emissions in frequency bands (below 1GHz)

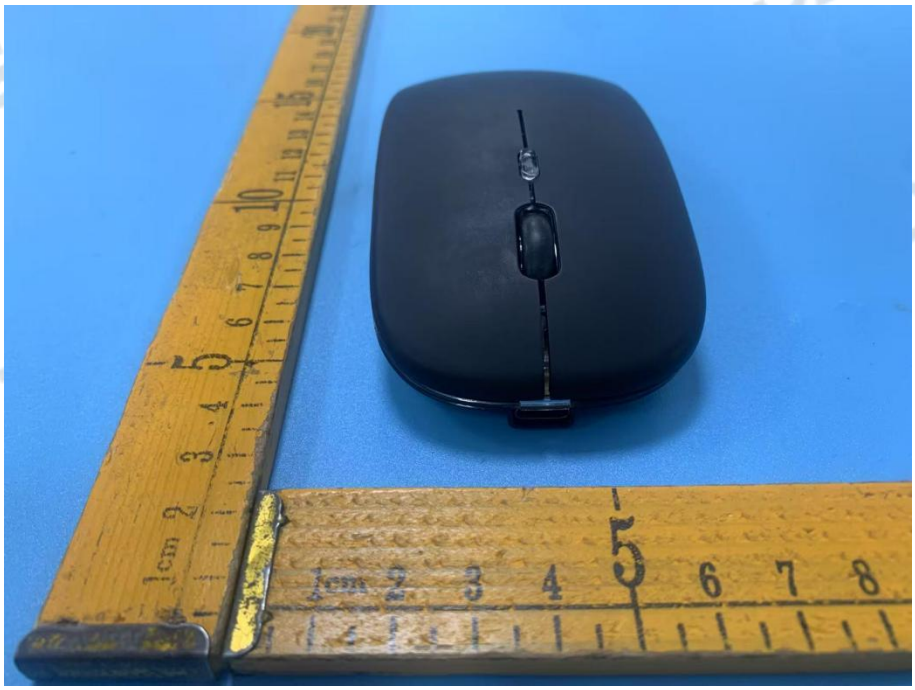


Emissions in frequency bands (above 1GHz)

6 PHOTOS OF THE EUT

External






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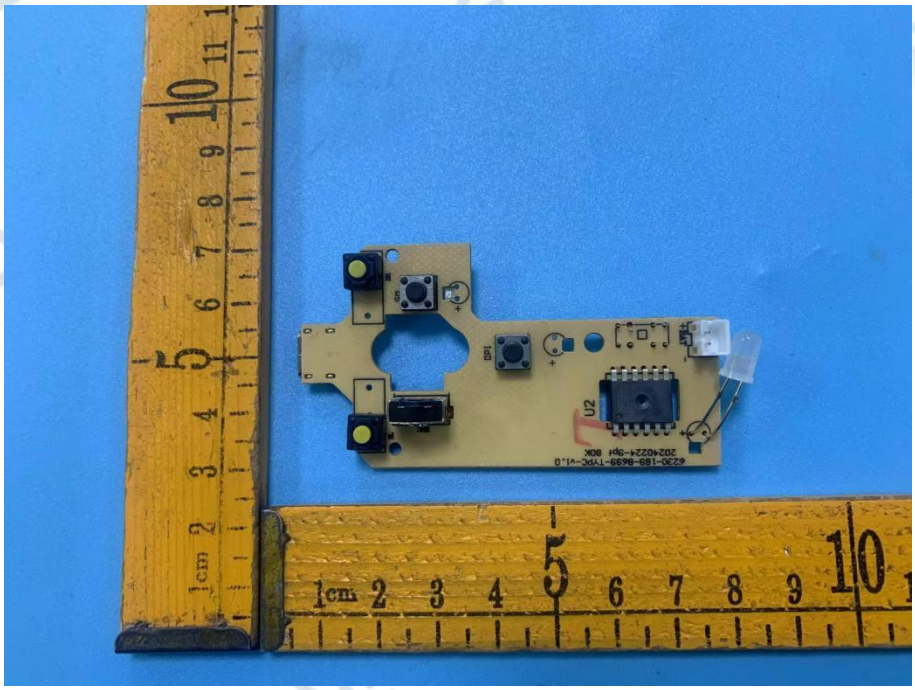

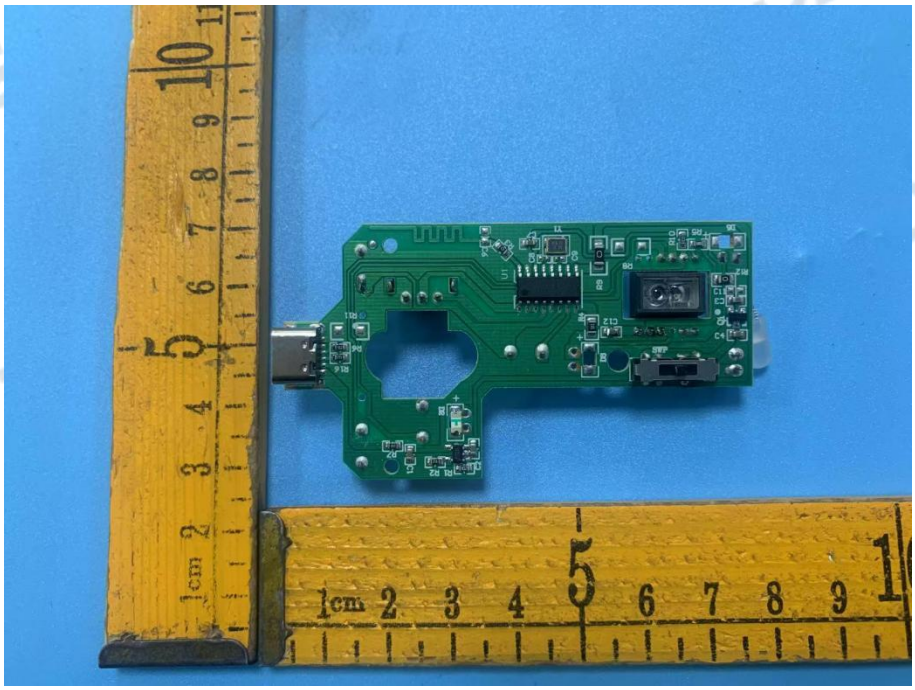

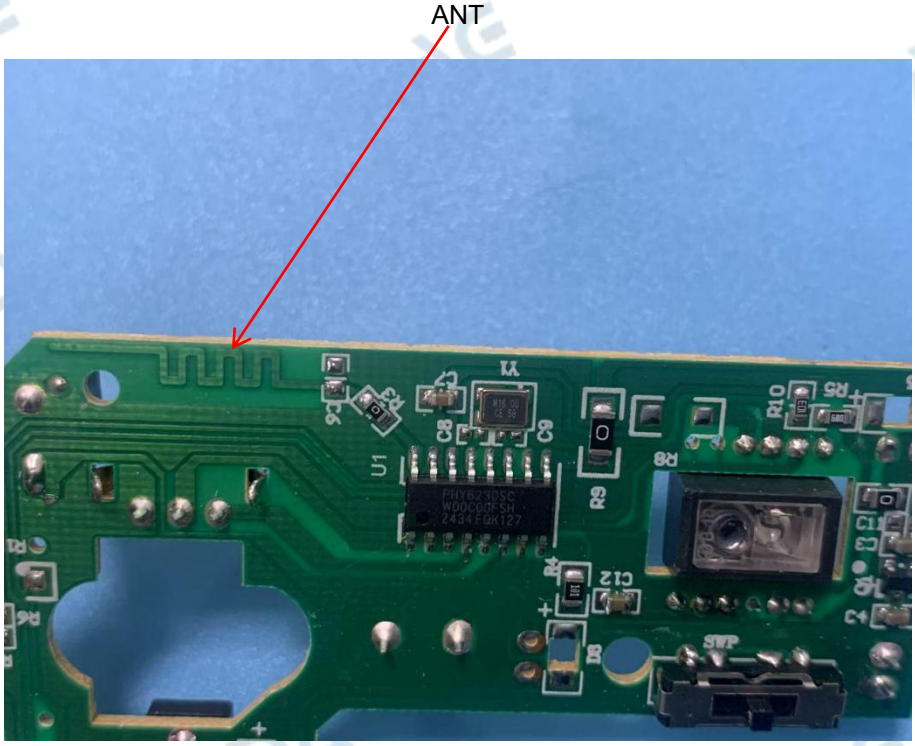

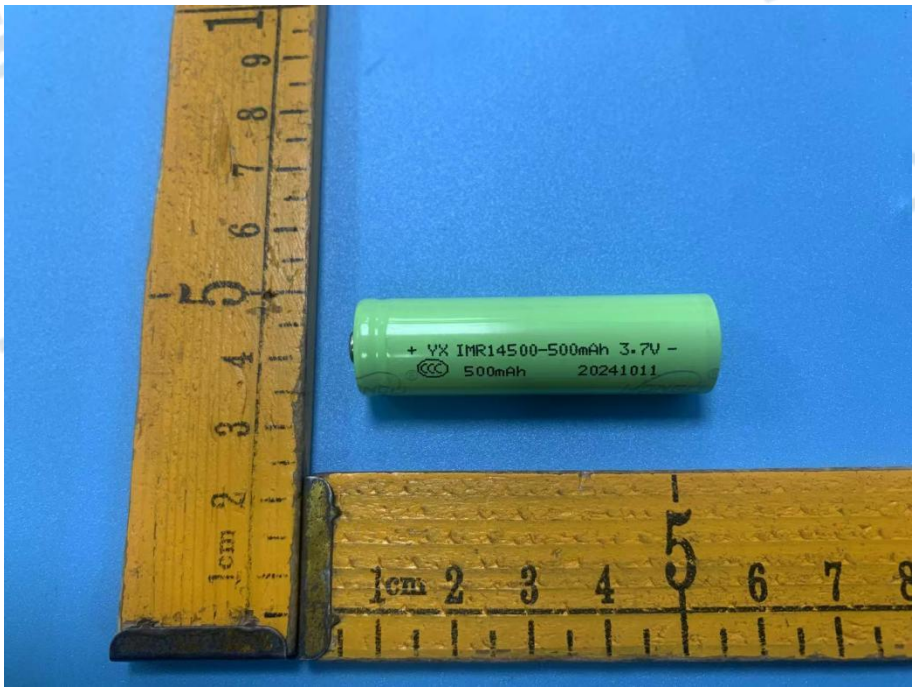

********** End of Report **********