RF TEST REPORT

For

Guangzhou Chengxin Technology Co., Ltd
Product Name: Barcode scanner
Test Model(s).: Kg1688R

Report Reference No.	:	**DACE240510007RL002**
FCC ID	:	**2BGG7-KG1688R**
Applicant's Name	:	Guangzhou Chengxin Technology Co., Ltd
Address	:	Room 407, Block 3, Haiyue Pavilion, Shangjiao Seaside Garden, No. 98 Luopu Road, Luopu Street, Panyu District, Guangzhou
Testing Laboratory	:	Shenzhen DACE Testing Technology Co., Ltd.
Address	:	102 Building H1 & 1/F., Building H, Hongfa Science & Technology Park, Tangtou, Shiyan, Bao' an District, Shenzhen, Guangdong, China
Test Specification Standard	:	**47 CFR Part 15.249**
Date of Receipt	:	May 10, 2024
Date of Test	:	May 10, 2024 to May 16, 2024
Data of Issue	:	May 16, 2024
Result	:	**Pass**

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Revision History Of Report

Version	Description	REPORT No.	Issue Date
V1.0	Original	DACE240510007RL002	May 16, 2024

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.

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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 : Guangzhou Chengxin Technology Co., Ltd
Address : Room 407, Block 3, Haiyue Pavilion, Shangjiao Seaside Garden, No. 98 Luopu Road, Luopu Street, Panyu District, Guangzhou

Manufacturer : Guangzhou Chengxin Technology Co., Ltd
Address : Room 407, Block 3, Haiyue Pavilion, Shangjiao Seaside Garden, No. 98 Luopu Road, Luopu Street, Panyu District, Guangzhou

2.2 Description of Device (EUT)

Product Name:	Barcode scanner
Model/Type reference:	Kg1688R
Series Model:	Kg1688,Kg520,Kg666,Kg888,Kg999,Kg126,Kg163,Kg100,Kg1688R,Kg520R,Kg666R,Kg888R Kg999R,Kg126R,Kg163R,Kg100R
Model Difference:	The product has many models, only the model name is different, and the other parts such as the circuit principle, pcb and electrical structure are the same.
Trade Mark:	Kdykgo
Power Supply:	DC 5V/2A from adapter Battery:DC3.7V 2000mA
Operation Frequency:	2409-2462MHz
Number of Channels:	4
Modulation Type:	GFSK
Antenna Type:	2.4GHz Spring Antenna
Antenna Gain:	0.56dBi
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)

Channel	Frequency
1	2409MHz
2	2421MHz
3	2449MHz
4	2462MHz

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)**
Lowest channel	2409MHz
Middle channel	2449MHz
Highest channel	2462MHz

2.3 Description of Test Modes

No	Title	Description
TM1	TX-GFSK	Keep the EUT 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 Ateennator	561-G071	2023-12-12	2024-12-11
50ΩCoaxial Switch	Anritsu	MP59B	M20531	/	/
Test Receiver	Rohde & Schwarz	ESPI TEST RECEIVER	ID:1164.6607K 03-102109-MH	2023-06-13	2024-06-12
L.I.S.N	R&S	ESH3-Z5	831.5518.52	2023-12-12	2024-12-11

Occupied Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
RF Test Software	TACHOY	RTS-01	V2.0.0.0	/	/
High Pass filter	ZHINAN	OQHPF1-M1.5-18G-224	6210075	/	/
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	2023-06-13	2024-06-12
Vector signal generator	Keysight	N5181A	MY48180415	2023-11-09	2024-11-08

Signal generator	Keysight	N5182A	MY50143455	2023-11-09	2024-11-08
Spectrum Analyzer	Keysight	N9020A	MY53420323	2023-12-12	2024-12-11

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

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test software	Farad	EZ -EMC	V1.1.42	/	/
Positioning Controller	/	MF-7802	/	/	/
High Pass filter	ZHINAN	OQHPF1-M1.5-18G-224	6210075	/	/
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	2021-07-05	2024-07-04
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	2023-06-13	2024-06-12
Power amplifier(HF)	Schwarzbeck	BBV9718	9718-282	2023-06-13	2024-06-12
Wideband radio communication tester	R&S	CMW500	113410	2023-06-13	2024-06-12
Spectrum Analyzer	R&S	FSP30	1321.3008K40 -101729-jR	2023-06-14	2024-06-13
Horn Antenna	Sunol Sciences	DRH-118	A091114	2023-05-13	2025-05-12
Broadband Antenna	Sunol Sciences	JB6 Antenna	A090414	2023-05-21	2025-05-20
Test Receiver	R&S	ESCI	102109	2023-06-13	2024-06-12

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, Shiyan, 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, Shiyan, Bao′ an District, Shenzhen, Guangdong, China
Phone Number:	+86-13267178997
Fax Number:	86-755-29113252
FCC Registration Number:	0032847402
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.

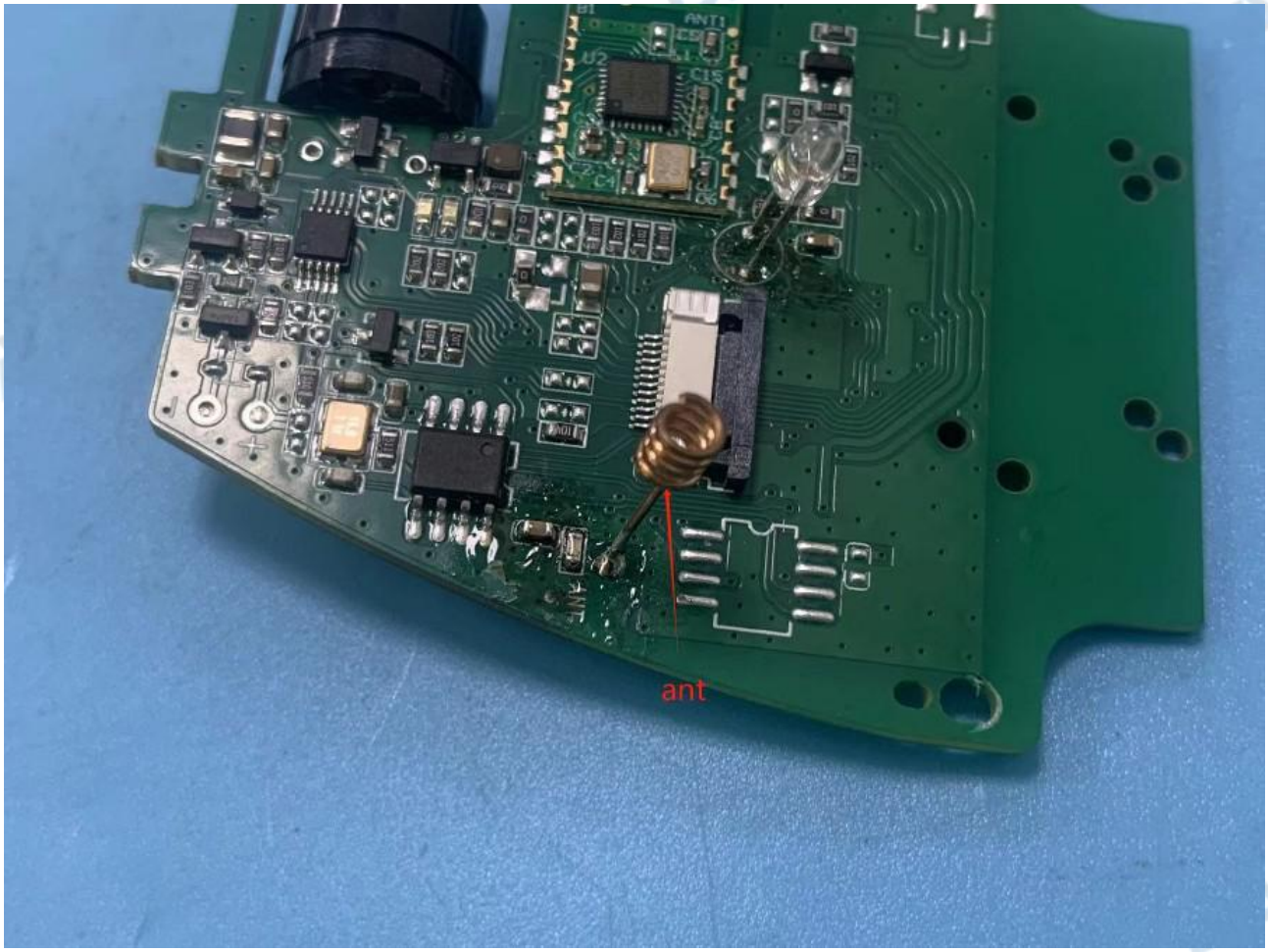
(6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

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

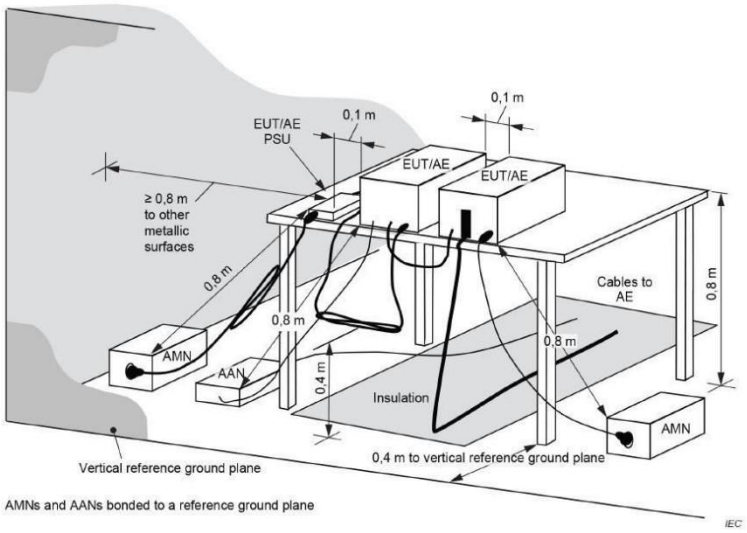
*Decreases with the logarithm of the frequency.

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:

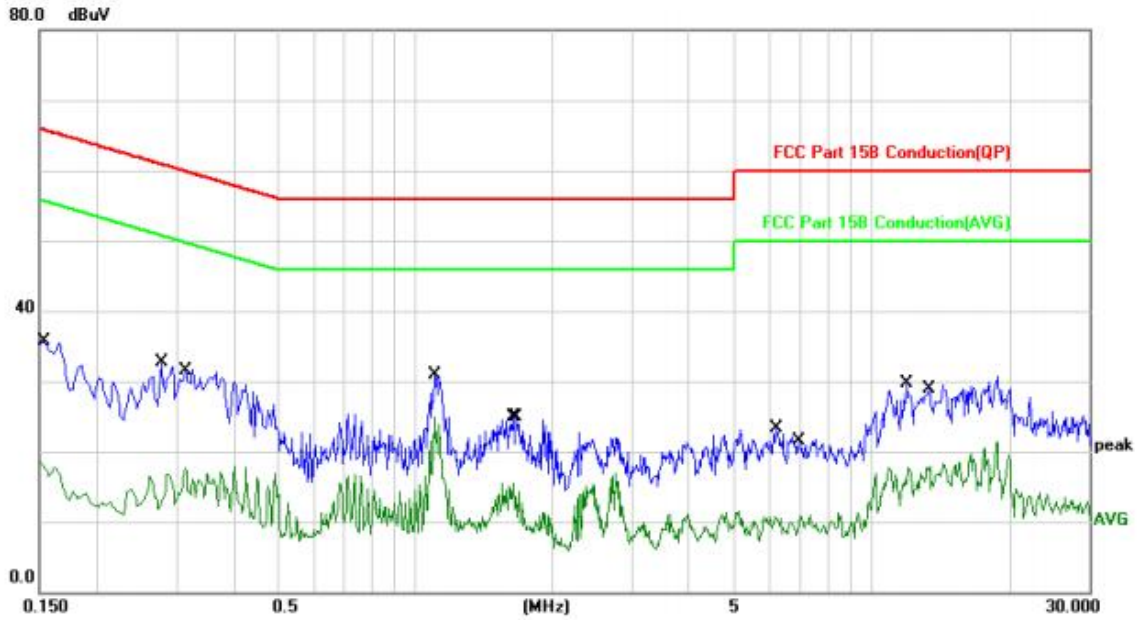
Operating Environment:					
Temperature:	23.6 °C	Humidity:	47.6 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1				
Final test mode:	TM1				

4.1.2 Test Setup Diagram:



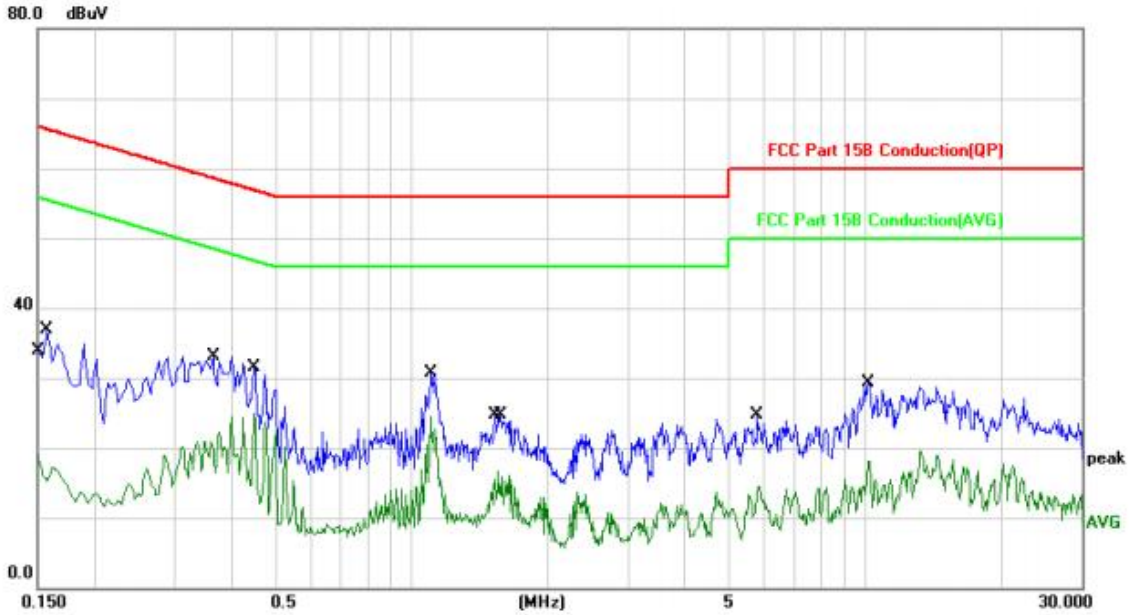
4.1.3 Test Data:

TM1 / Line: Line / Band: 2.4G / BW: 1
Power:AC120V60Hz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	18.79	0.00	18.79	55.99	-37.20	AVG	
2		0.1539	35.66	0.00	35.66	65.78	-30.12	QP	
3		0.2779	32.75	0.00	32.75	60.88	-28.13	QP	
4		0.3140	17.76	0.00	17.76	49.86	-32.10	AVG	
5		1.1019	30.92	0.00	30.92	56.00	-25.08	QP	
6	*	1.1019	24.87	0.00	24.87	46.00	-21.13	AVG	
7		1.6380	15.56	0.00	15.56	46.00	-30.44	AVG	
8		1.6660	24.93	0.00	24.93	56.00	-31.07	QP	
9		6.2100	23.25	0.00	23.25	60.00	-36.75	QP	
10		6.9740	10.84	0.00	10.84	50.00	-39.16	AVG	
11		11.9940	29.72	0.00	29.72	60.00	-30.28	QP	
12		13.4100	17.86	0.00	17.86	50.00	-32.14	AVG	

TM1 / Line: Neutral / Band: 2.4G / BW: 1
Power:AC120V60Hz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	19.05	0.00	19.05	55.99	-36.94	AVG	
2		0.1580	36.95	0.00	36.95	65.56	-28.61	QP	
3		0.3660	33.14	0.00	33.14	58.59	-25.45	QP	
4		0.4500	24.84	0.00	24.84	46.87	-22.03	AVG	
5	*	1.1019	24.44	0.00	24.44	46.00	-21.56	AVG	
6		1.1100	30.80	0.00	30.80	56.00	-25.20	QP	
7		1.5300	24.68	0.00	24.68	56.00	-31.32	QP	
8		1.5540	16.75	0.00	16.75	46.00	-29.25	AVG	
9		5.7860	24.63	0.00	24.63	60.00	-35.37	QP	
10		5.8140	14.54	0.00	14.54	50.00	-35.46	AVG	
11		10.1660	29.34	0.00	29.34	60.00	-30.66	QP	
12		10.1660	18.15	0.00	18.15	50.00	-31.85	AVG	

4.2 Occupied Bandwidth

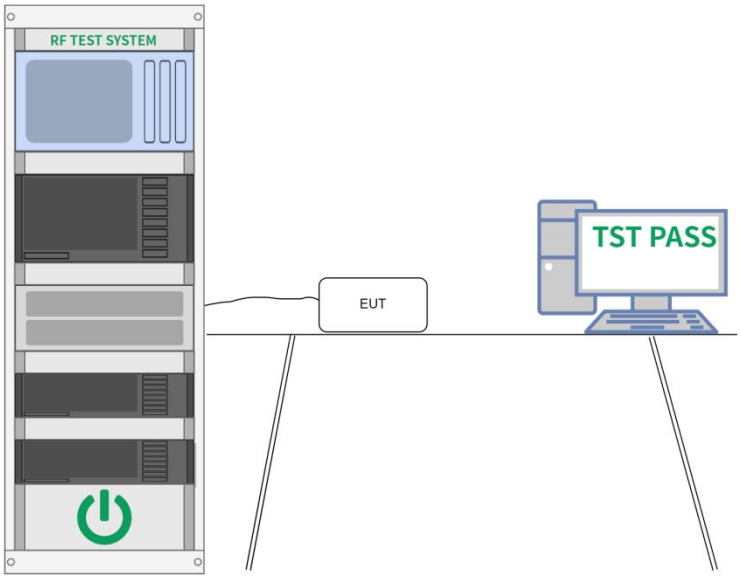
Test Requirement:	47 CFR 15.215(c)
Test Limit:	Refer to 47 CFR 15.215(c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the 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:	23.6 °C	Humidity:	47.6 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1				

Final test mode:	TM1

4.2.2 Test Setup Diagram:



4.2.3 Test Data:

Please Refer to Appendix for Details.

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:	23.6 °C	Humidity:	47.6 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1				
Final test mode:	TM1				

4.3.2 Test Data:

Frequency	Emission Level	Limits	Margin	Detector	Polarization
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(PK/AV)	(H/V)
2409	90.90	114.00	-23.1	PK	H
2409	87.95	94.00	-6.05	AV	H
2409	90.34	114.00	-23.66	PK	V
2409	87.63	94.00	-6.37	AV	V

Frequency	Emission Level	Limits	Margin	Detector	Polarization
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(PK/AV)	(H/V)
2449	89.98	114.00	-24.02	PK	H
2449	87.20	94.00	-6.8	AV	H
2449	90.31	114.00	-23.69	PK	V
2449	87.48	94.00	-6.52	AV	V

Frequency	Emission Level	Limits	Margin	Detector	Polarization
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(PK/AV)	(H/V)
2462	86.78	114.00	-27.22	PK	H
2462	83.94	94.00	-10.06	AV	H
2462	87.71	114.00	-26.29	PK	V
2462	84.85	94.00	-9.15	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

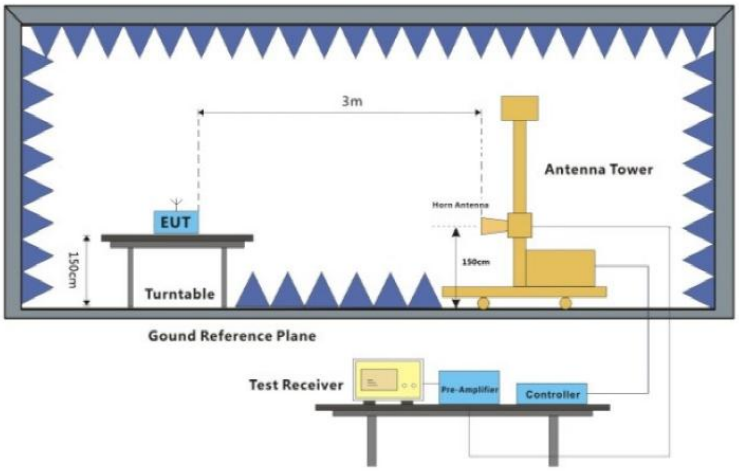
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this 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:

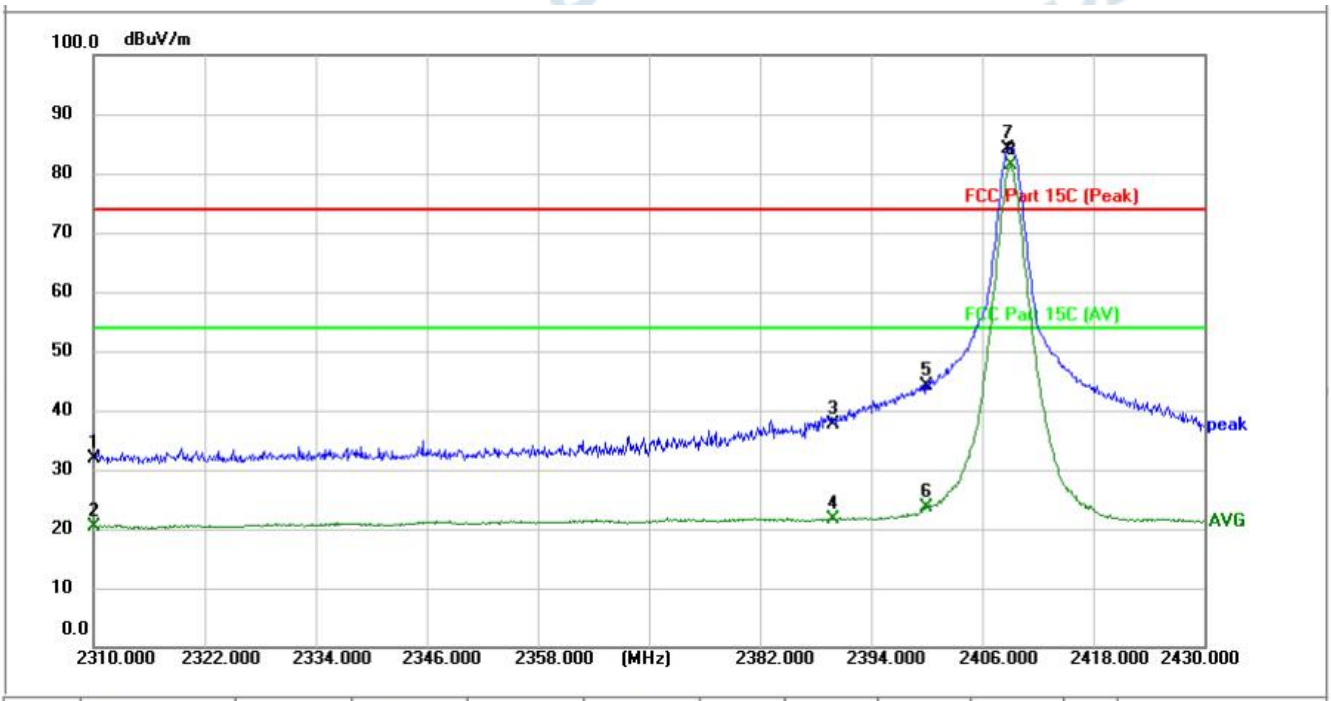
Operating Environment:					
Temperature:	23.6 °C	Humidity:	47.6 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1				
Final test mode:	TM1				

4.4.2 Test Setup Diagram:



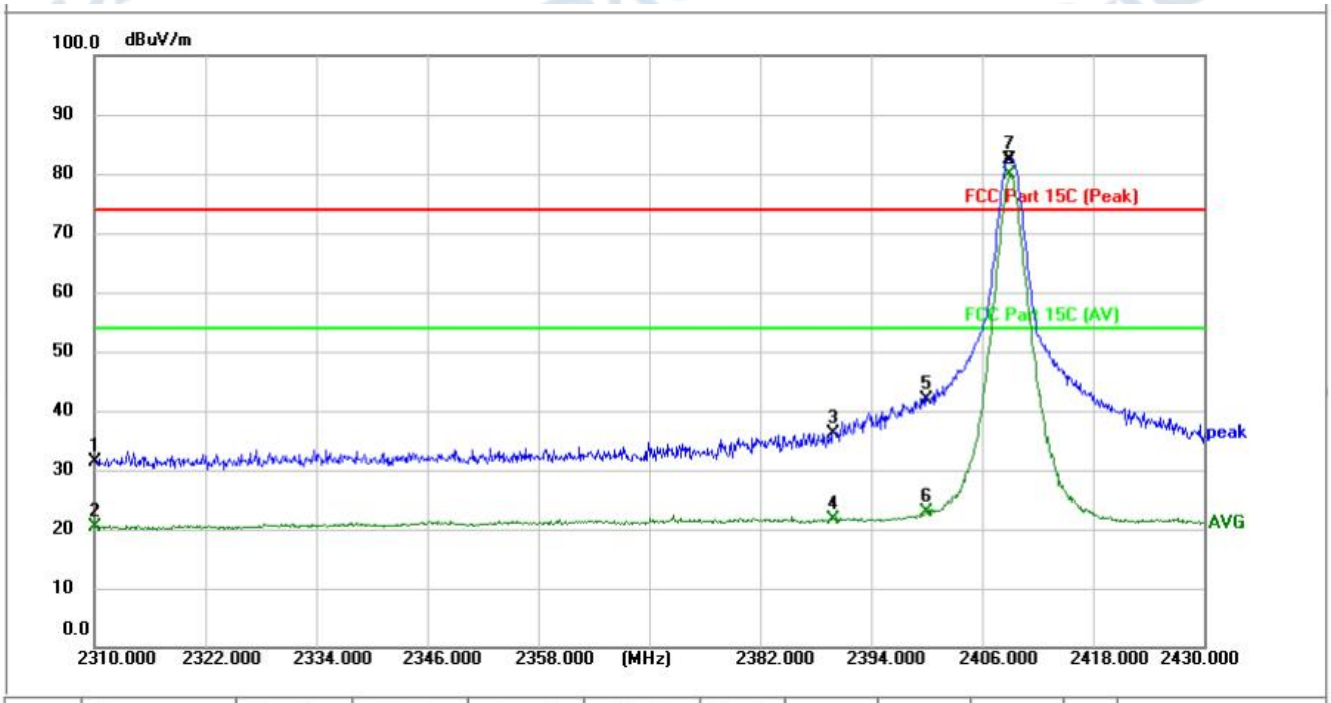
4.4.3 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 1 /Channel:2409MHz



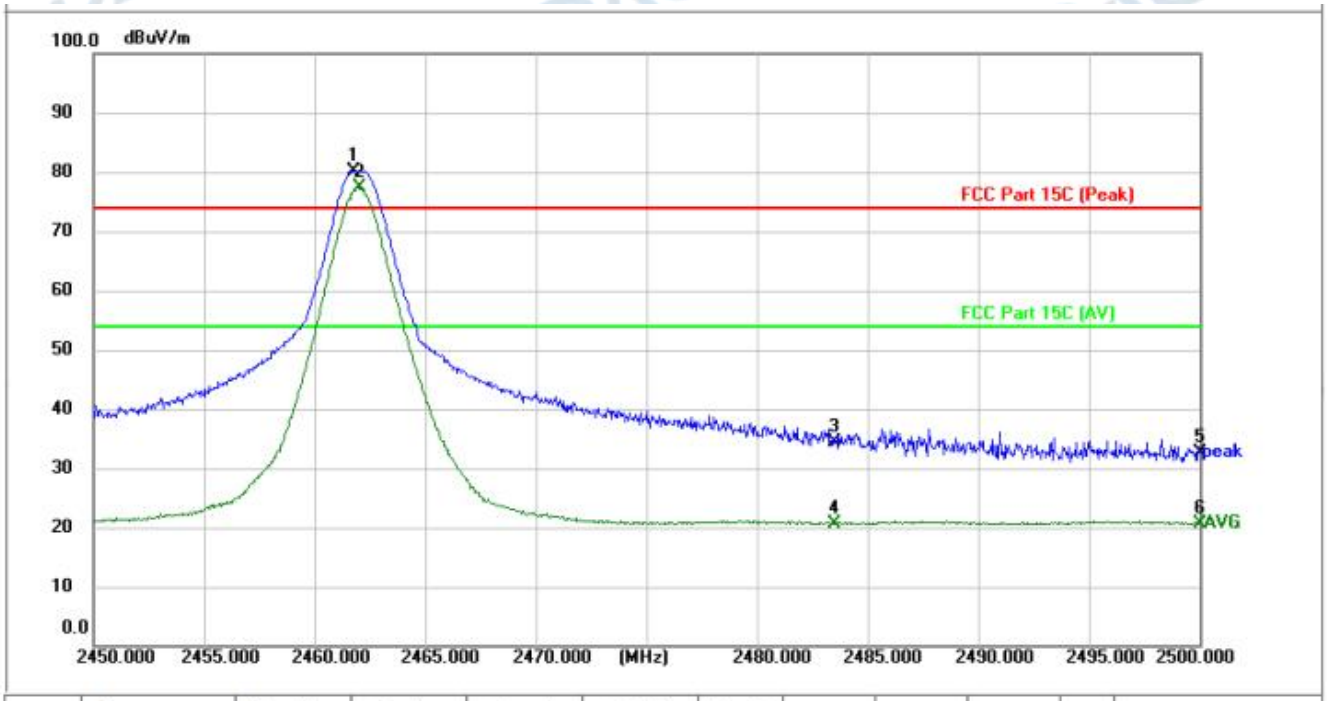
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2310.000	38.73	-6.93	31.80	74.00	-42.20	peak	150		P	
2	2310.000	27.38	-6.93	20.45	54.00	-33.55	AVG	150		P	
3	2390.000	44.29	-6.72	37.57	74.00	-36.43	peak	150		P	
4	2390.000	28.34	-6.72	21.62	54.00	-32.38	AVG	150		P	
5	2400.000	50.77	-6.69	44.08	74.00	-29.92	peak	150		P	
6	2400.000	30.34	-6.69	23.65	54.00	-30.35	AVG	150		P	
7 X	2408.880	90.90	-6.67	84.23	74.00	10.23	peak	150		F	Fundamental
8 *	2409.120	87.95	-6.67	81.28	54.00	27.28	AVG	150		F	Fundamental

TM1 / Polarization: Vertical / Band: 2.4G / BW: 1 /Channel:2409MHz



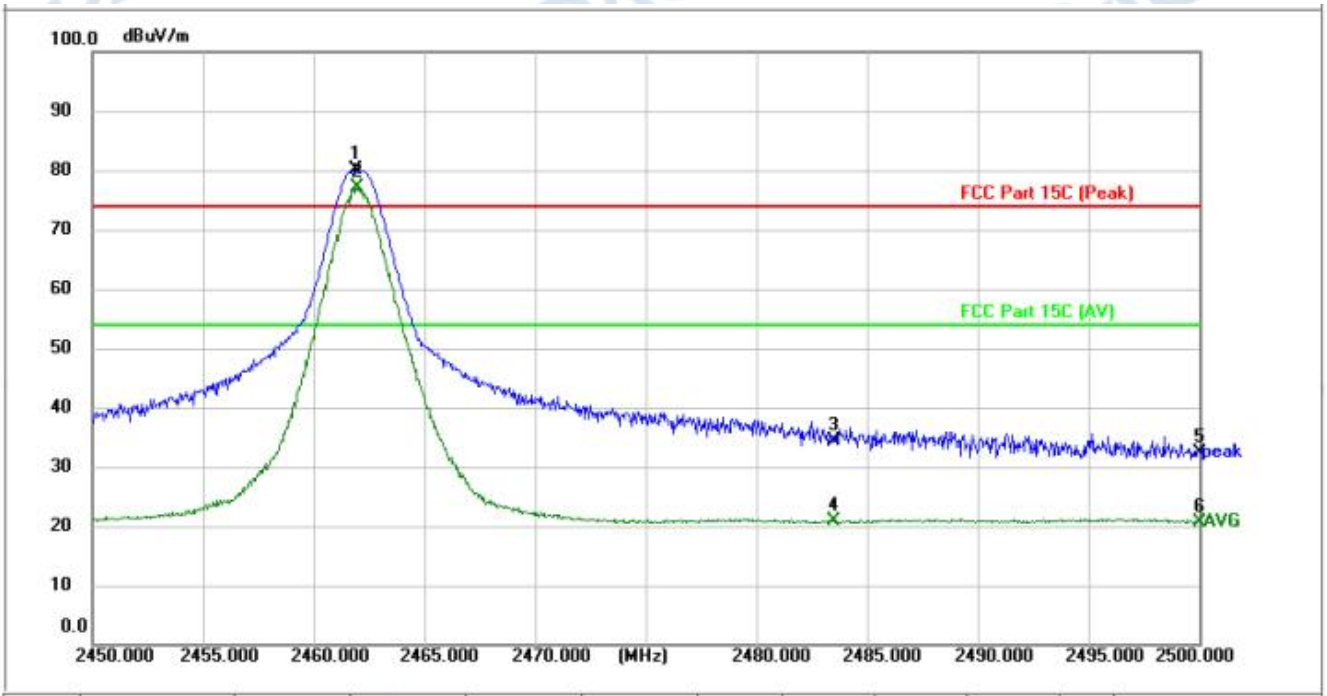
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	2310.000	39.54	-8.23	31.31	74.00	-42.69	peak	150		P	
2	2310.000	28.73	-8.23	20.50	54.00	-33.50	AVG	150		P	
3	2390.000	43.92	-7.91	36.01	74.00	-37.99	peak	150		P	
4	2390.000	29.64	-7.91	21.73	54.00	-32.27	AVG	150		P	
5	2400.000	49.84	-7.87	41.97	74.00	-32.03	peak	150		P	
6	2400.000	30.64	-7.87	22.77	54.00	-31.23	AVG	150		P	
7 X	2409.000	90.34	-7.84	82.50	74.00	8.50	peak	150		F	Fundamental
8 *	2409.000	87.63	-7.84	79.79	54.00	25.79	AVG	150		F	Fundamental

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 1 /Channel:2462MHz



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 X	2461.750	86.78	-6.53	80.25	74.00	6.25	peak	150			Fundamental
2 *	2462.000	83.94	-6.53	77.41	54.00	23.41	AVG	150			Fundamental
3	2483.500	40.89	-6.47	34.42	74.00	-39.58	peak	150		P	
4	2483.500	27.18	-6.47	20.71	54.00	-33.29	AVG	150		P	
5	2500.000	39.03	-6.43	32.60	74.00	-41.40	peak	150		P	
6	2500.000	27.09	-6.43	20.66	54.00	-33.34	AVG	150		P	

TM1 / Polarization: Vertical / Band: 2.4G / BW: 1 /Channel:2462MHz



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 X	2461.900	87.71	-7.63	80.08	74.00	6.08	peak	150			Fundamental
2 *	2461.950	84.85	-7.63	77.22	54.00	23.22	AVG	150			Fundamental
3	2483.500	41.97	-7.54	34.43	74.00	-39.57	peak	150		P	
4	2483.500	28.40	-7.54	20.86	54.00	-33.14	AVG	150		P	
5	2500.000	39.84	-7.48	32.36	74.00	-41.64	peak	150		P	
6	2500.000	28.12	-7.48	20.64	54.00	-33.36	AVG	150		P	

Note: The test software only records the worst height and cannot record the worst angle. Only the worst situation is displayed in the test report.

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:	23.6 °C	Humidity:	47.6 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1				
Final test mode:	TM1				

4.5.2 Test Data:

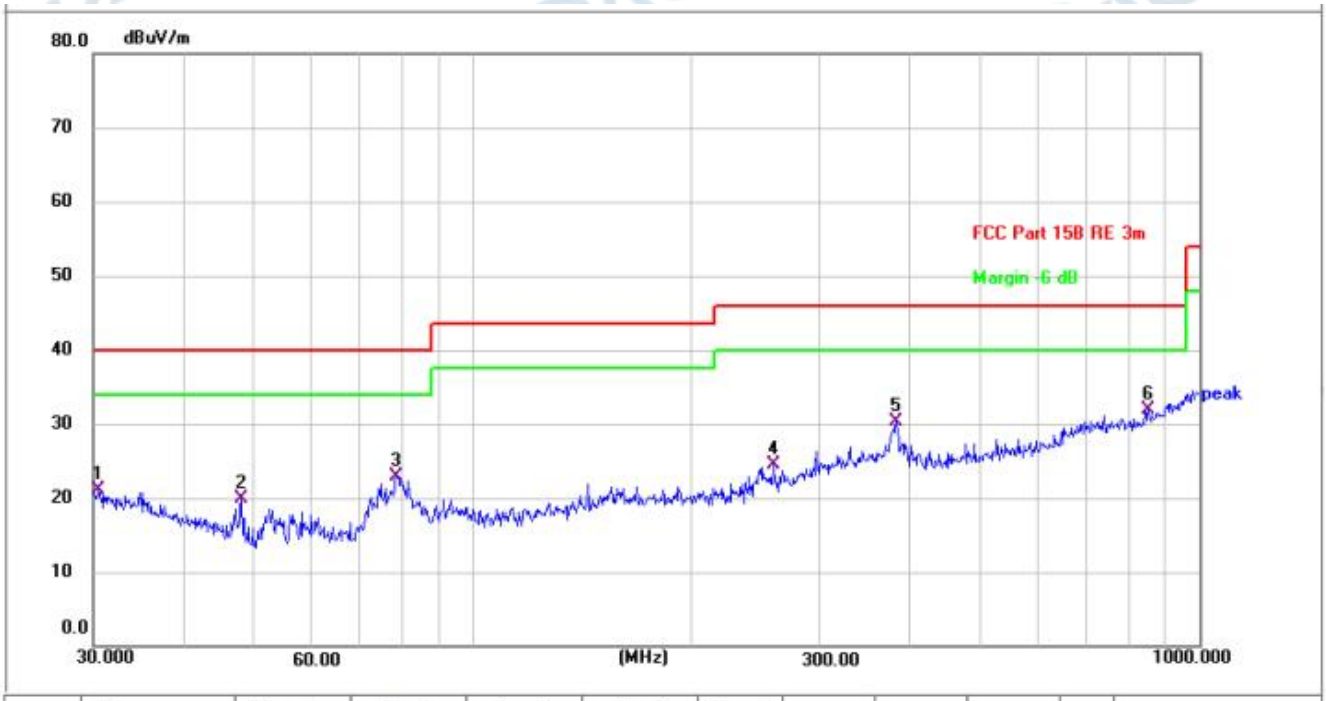
Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

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

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	81.2117	28.41	-7.50	20.91	40.00	-19.09	QP	100		P	
2	191.7450	31.50	-3.01	28.49	43.50	-15.01	QP	100		P	
3	248.5519	38.29	-2.15	36.14	46.00	-9.86	QP	100		P	
4	319.9370	35.93	1.12	37.05	46.00	-8.95	QP	100		P	
5 *	381.2487	38.82	1.52	40.34	46.00	-5.66	QP	100		P	
6	881.4067	31.13	7.43	38.56	46.00	-7.44	QP	100		P	

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



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	30.5306	24.12	-3.00	21.12	40.00	-18.88	QP	100		P	
2	47.9940	28.96	-9.00	19.96	40.00	-20.04	QP	100		P	
3	78.4133	30.77	-7.87	22.90	40.00	-17.10	QP	100		P	
4	259.2338	26.35	-1.76	24.59	46.00	-21.41	QP	100		P	
5	382.5879	29.18	1.16	30.34	46.00	-15.66	QP	100		P	
6 *	851.0353	25.65	6.27	31.92	46.00	-14.08	QP	100		P	

Note: The test software only records the worst height and cannot record the worst angle. Only the worst situation is displayed in the test report.

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.

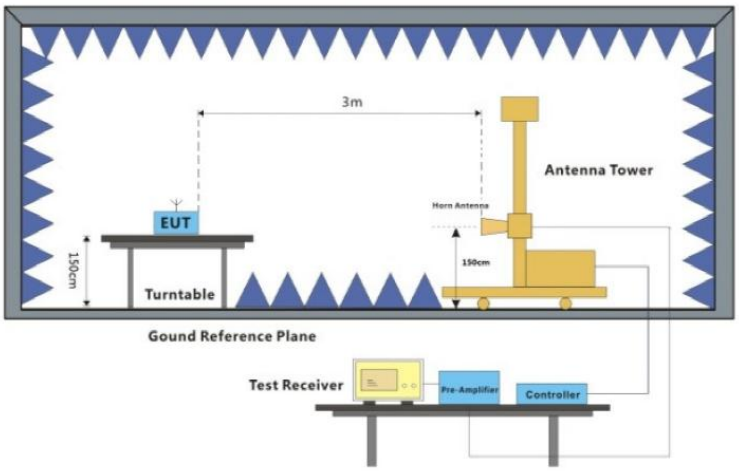
Test Method:	ANSI C63.10-2013 section 6.6
Procedure:	ANSI C63.10-2013 section 6.6

4.6.1 E.U.T. Operation:

Operating Environment:

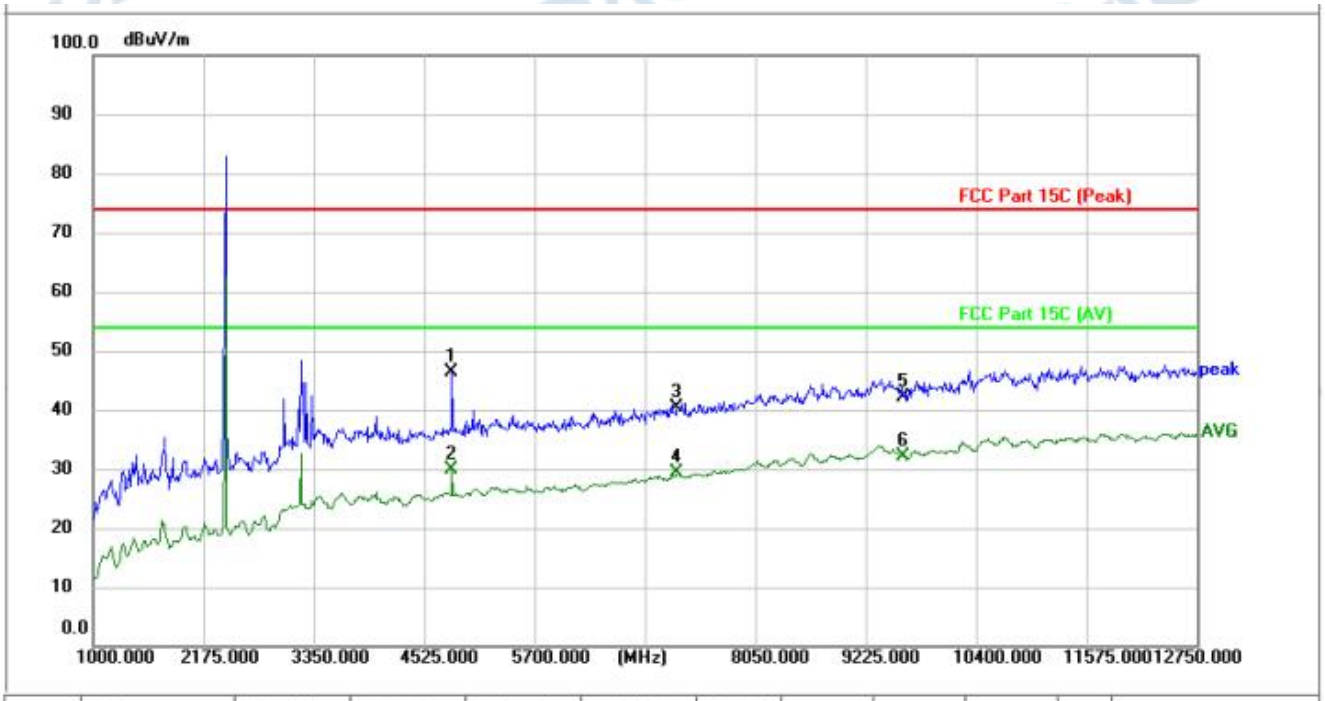
Temperature:	23.6 °C	Humidity:	47.6 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1				
Final test mode:	TM1				

4.6.2 Test Setup Diagram:



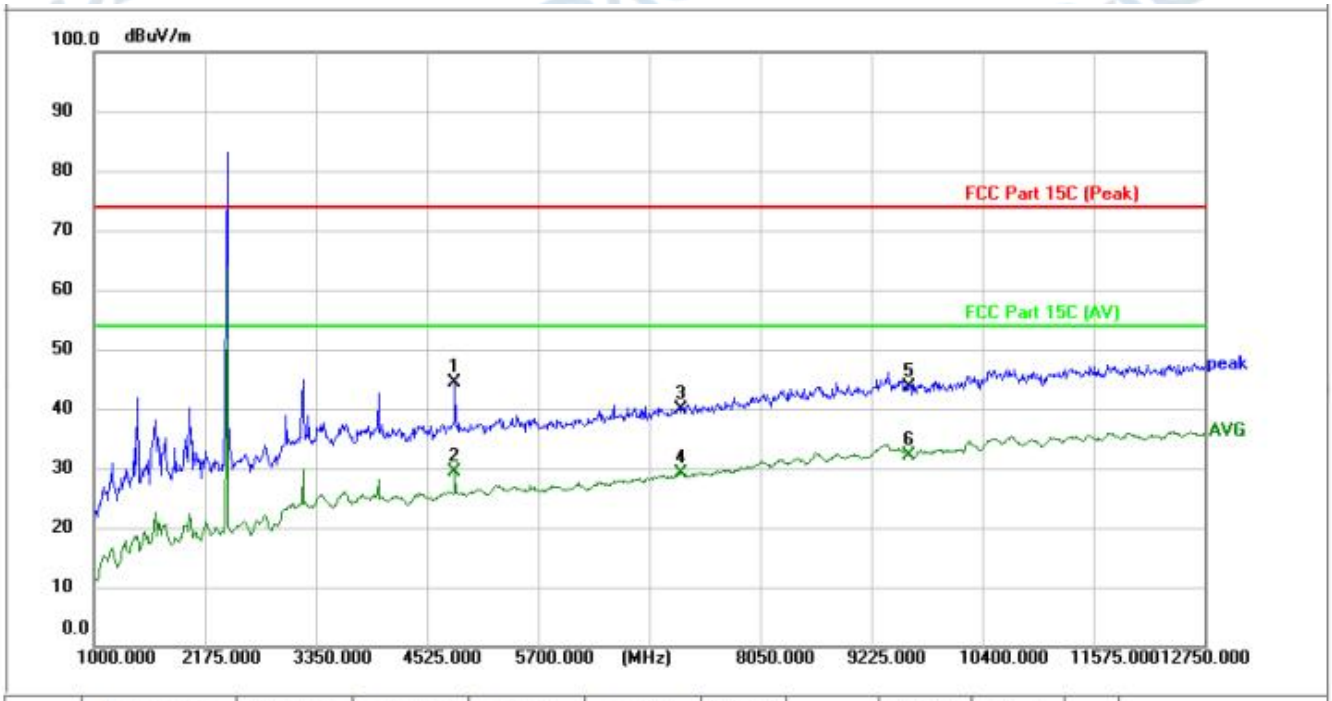
4.6.3 Test Data:

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 1 /Channel:2409MHz



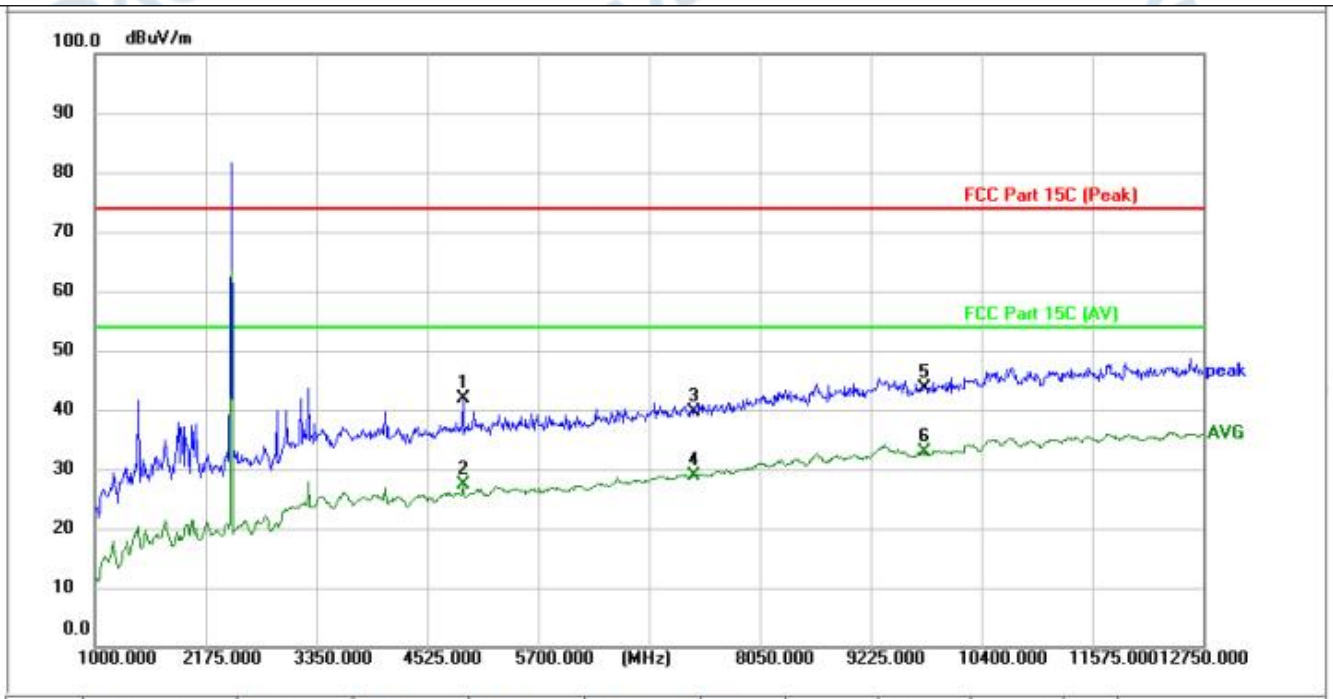
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4818.750	47.11	-0.85	46.26	74.00	-27.74	peak	150		P	
2	4818.750	30.76	-0.85	29.91	54.00	-24.09	AVG	150		P	
3	7227.000	36.27	4.16	40.43	74.00	-33.57	peak	150		P	
4	7227.000	25.14	4.16	29.30	54.00	-24.70	AVG	150		P	
5	9636.000	34.09	8.10	42.19	74.00	-31.81	peak	150		P	
6 *	9636.000	24.01	8.10	32.11	54.00	-21.89	AVG	150		P	

TM1 / Polarization: Vertical / Band: 2.4G / BW: 1 /Channel:2409MHz



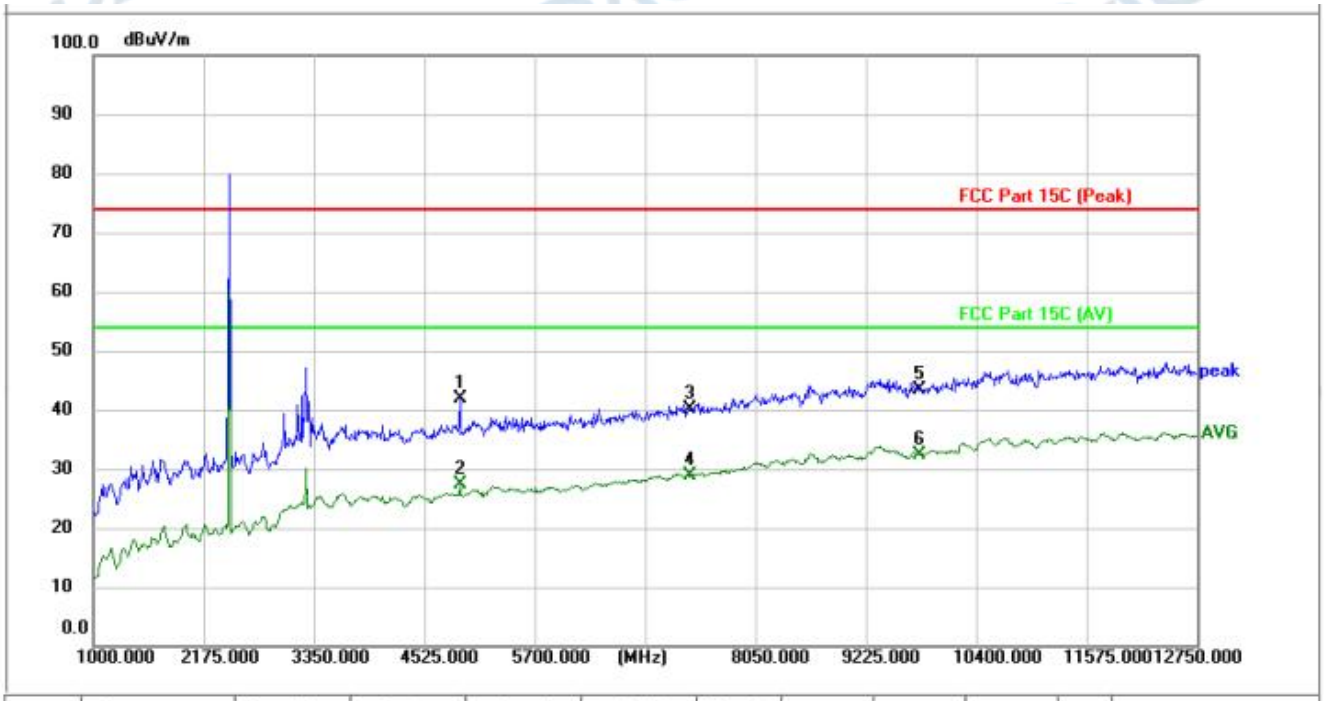
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4818.750	44.69	-0.23	44.46	74.00	-29.54	peak	150		P	
2	4818.750	29.61	-0.23	29.38	54.00	-24.62	AVG	150		P	
3	7227.000	35.81	4.15	39.96	74.00	-34.04	peak	150		P	
4	7227.000	25.10	4.15	29.25	54.00	-24.75	AVG	150		P	
5	9636.000	35.47	8.04	43.51	74.00	-30.49	peak	150		P	
6 *	9636.000	24.04	8.04	32.08	54.00	-21.92	AVG	150		P	

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 1 /Channel:2449MHz



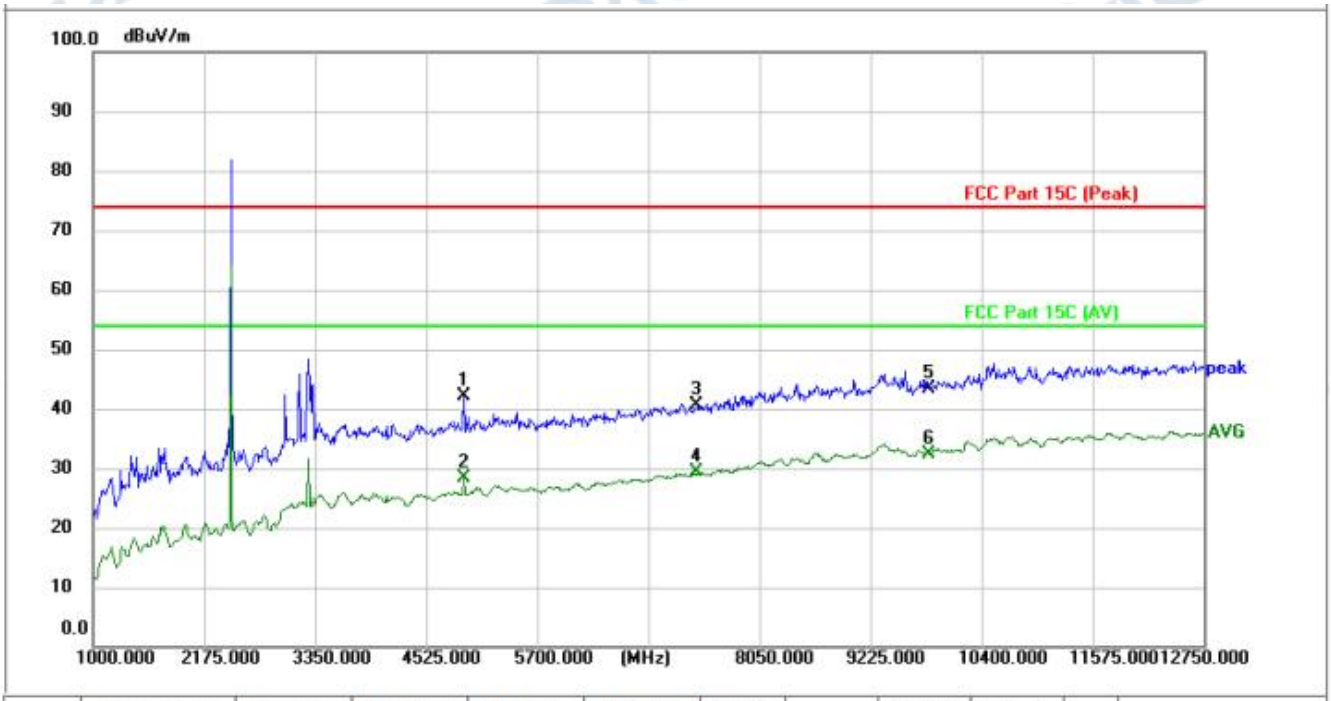
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4901.000	41.77	0.04	41.81	74.00	-32.19	peak	150		P	
2	4901.000	27.37	0.04	27.41	54.00	-26.59	AVG	150		P	
3	7347.000	35.31	4.43	39.74	74.00	-34.26	peak	150		P	
4	7347.000	24.42	4.43	28.85	54.00	-25.15	AVG	150		P	
5	9796.000	35.41	8.15	43.56	74.00	-30.44	peak	150		P	
6 *	9796.000	24.61	8.15	32.76	54.00	-21.24	AVG	150		P	

TM1 / Polarization: Vertical / Band: 2.4G / BW: 1 /Channel:2449MHz



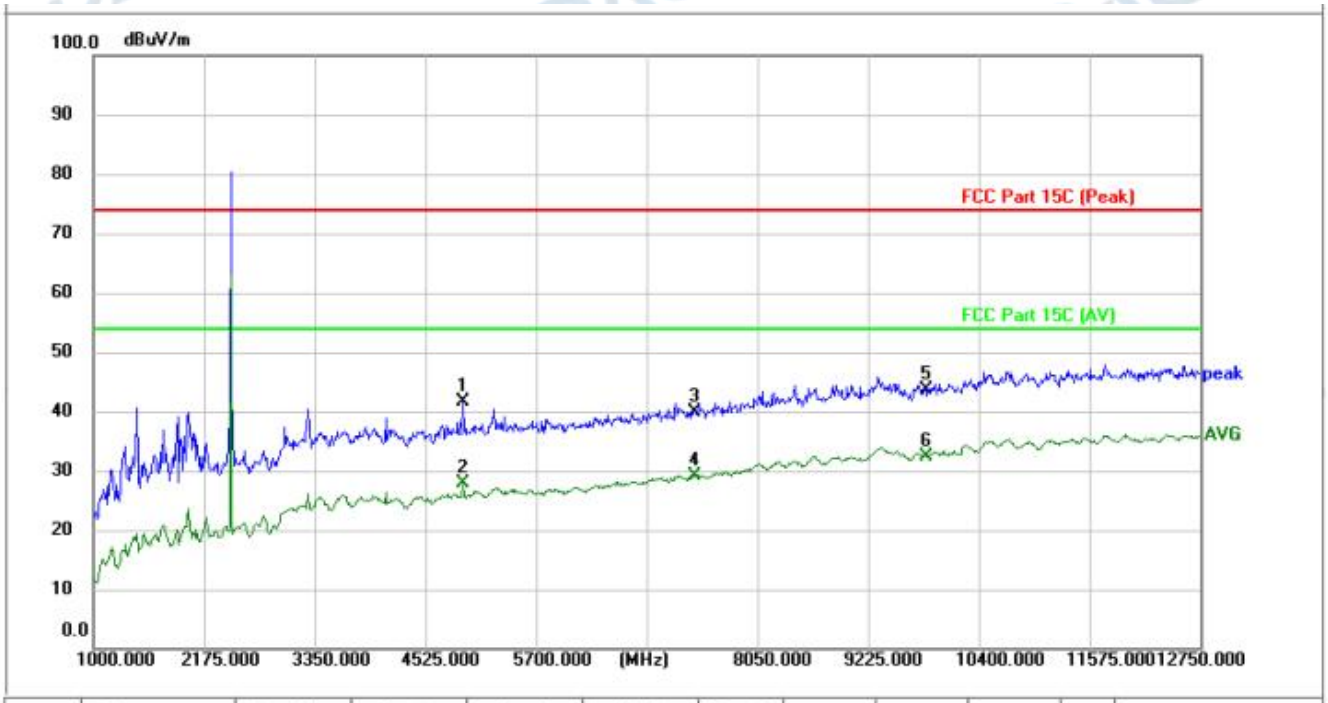
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	4901.000	42.57	-0.57	42.00	74.00	-32.00	peak	150		P	
2	4901.000	27.88	-0.57	27.31	54.00	-26.69	AVG	150		P	
3	7347.000	35.69	4.35	40.04	74.00	-33.96	peak	150		P	
4	7347.000	24.42	4.35	28.77	54.00	-25.23	AVG	150		P	
5	9796.000	35.17	8.09	43.26	74.00	-30.74	peak	150		P	
6 *	9796.000	24.36	8.09	32.45	54.00	-21.55	AVG	150		P	

TM1 / Polarization: Horizontal / Band: 2.4G / BW: 1 /Channel:2462MHz



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	4924.500	42.70	-0.50	42.20	74.00	-31.80	peak	150		P	
2	4924.500	28.79	-0.50	28.29	54.00	-25.71	AVG	150		P	
3	7386.000	36.18	4.41	40.59	74.00	-33.41	peak	150		P	
4	7386.000	24.85	4.41	29.26	54.00	-24.74	AVG	150		P	
5	9848.000	35.26	8.10	43.36	74.00	-30.64	peak	150		P	
6 *	9848.000	24.40	8.10	32.50	54.00	-21.50	AVG	150		P	

TM1 / Polarization: Vertical / Band: 2.4G / BW: 1 /Channel:2462MHz



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	4924.500	41.43	0.11	41.54	74.00	-32.46	peak	150		P	
2	4924.500	27.69	0.11	27.80	54.00	-26.20	AVG	150		P	
3	7386.000	35.45	4.52	39.97	74.00	-34.03	peak	150		P	
4	7386.000	24.68	4.52	29.20	54.00	-24.80	AVG	150		P	
5	9848.000	35.36	8.19	43.55	74.00	-30.45	peak	150		P	
6 *	9848.000	24.27	8.19	32.46	54.00	-21.54	AVG	150		P	

Note: The test software only records the worst height and cannot record the worst angle. Only the worst situation is displayed in the test report.

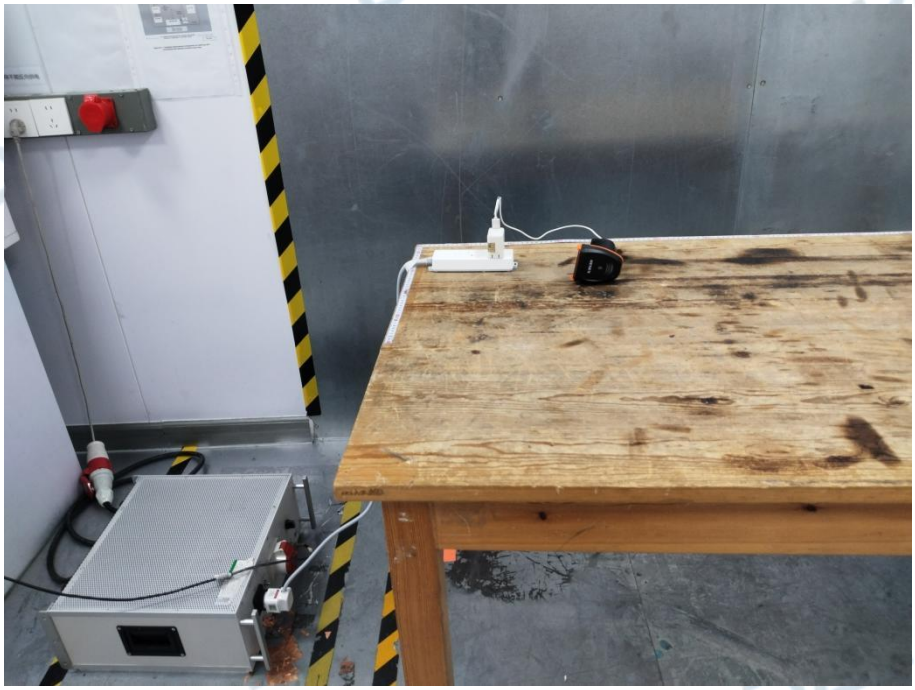
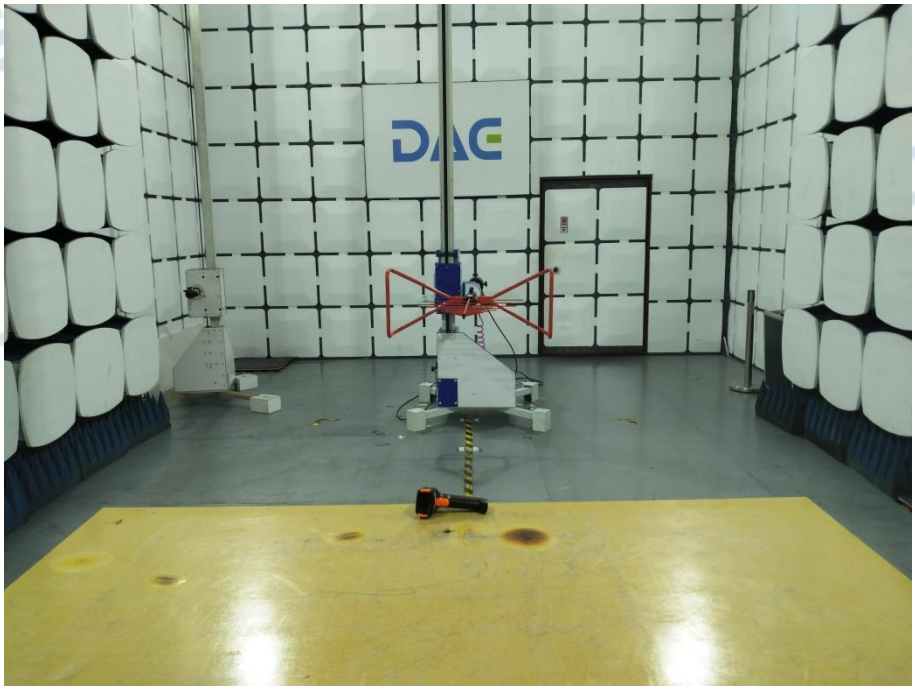
1.Test from 1GHz to 25GHz， no emission found above 12.75GHz，only report worse case

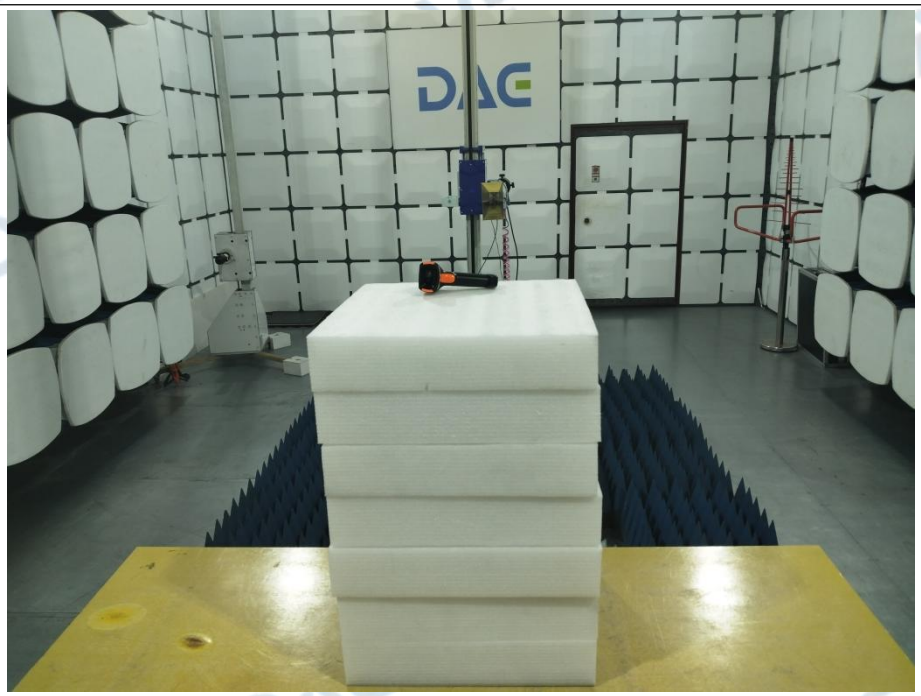
Margin= Measurement Level - Limit

Measurement Level=Test reading + correction factor

Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

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

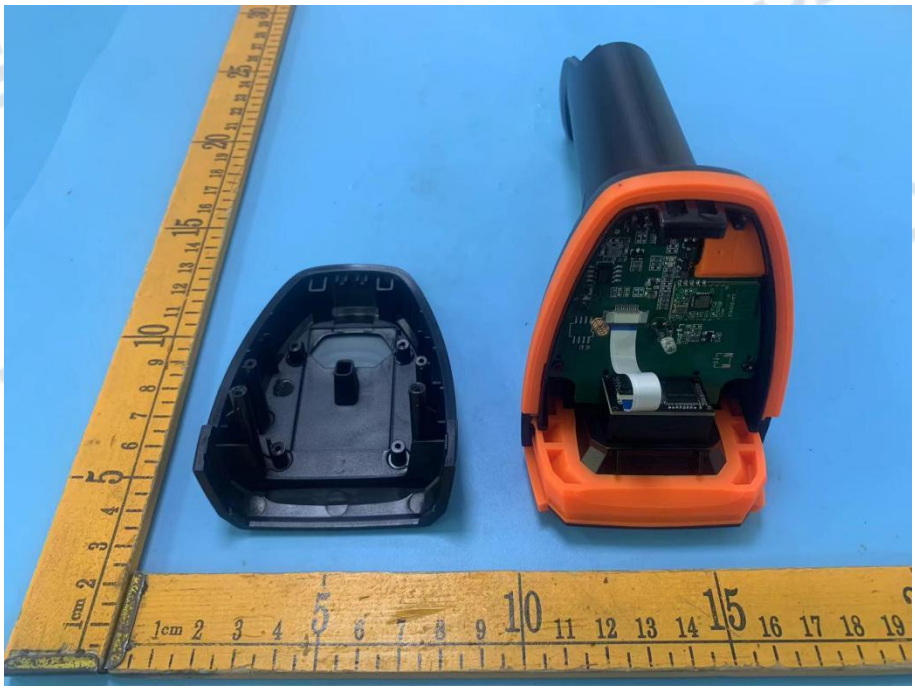
DO NOT STARE INTO BEAM

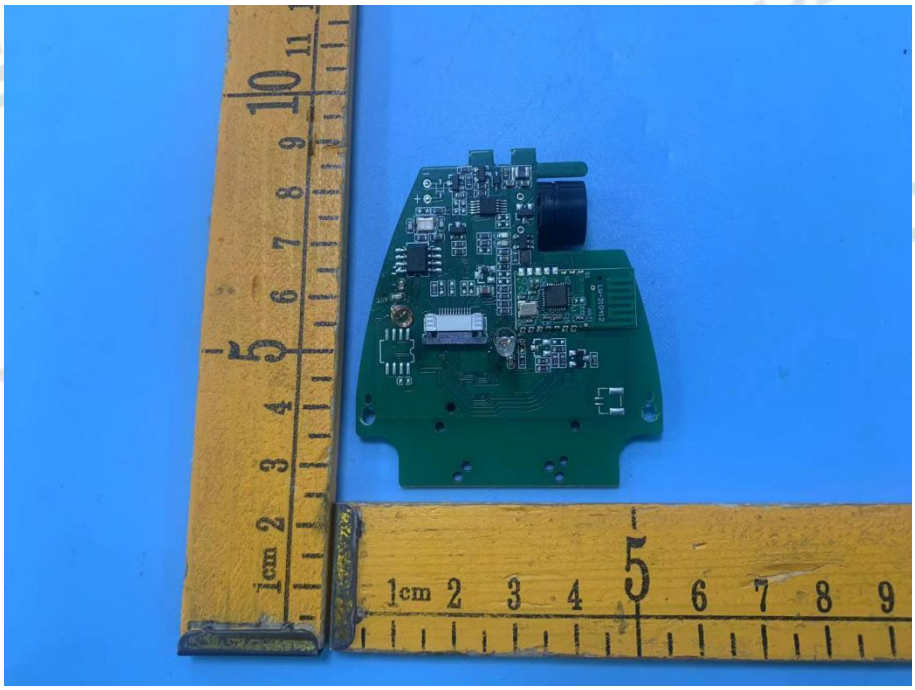
HENEX

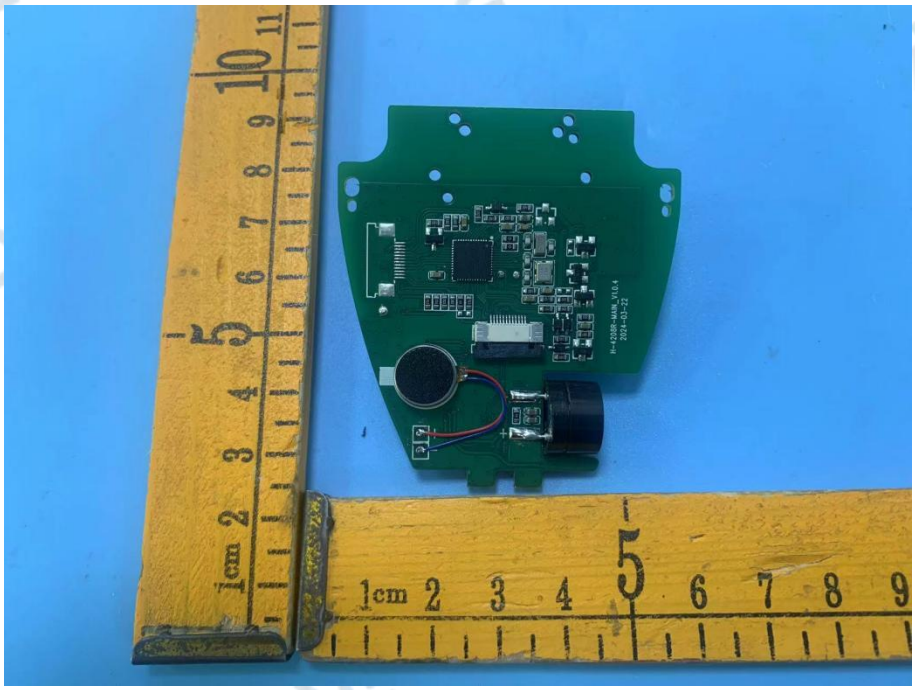
Internal

Rechargeable Li-ion 3.7V Battery Model:18650
18650 3.7V
2000mAh 7.4Wh
20240418

2D Barcode Scanner
MODEL:HC-4208R
S/N:4208R2404270002
P/N:HC4208R-2D
HENEX
HENEX TECH .CORP
Input: 5V 1A



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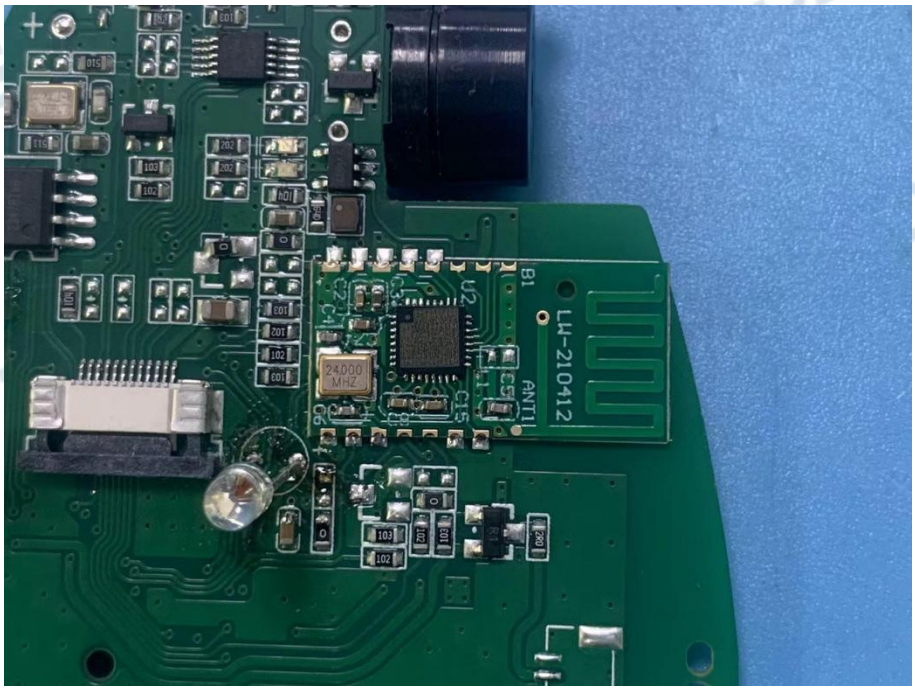
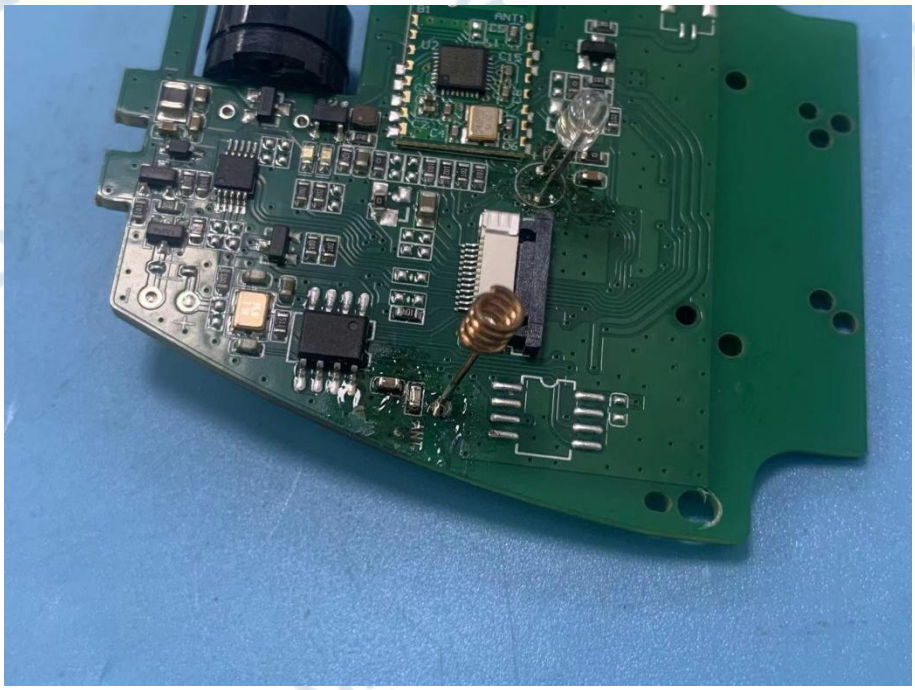
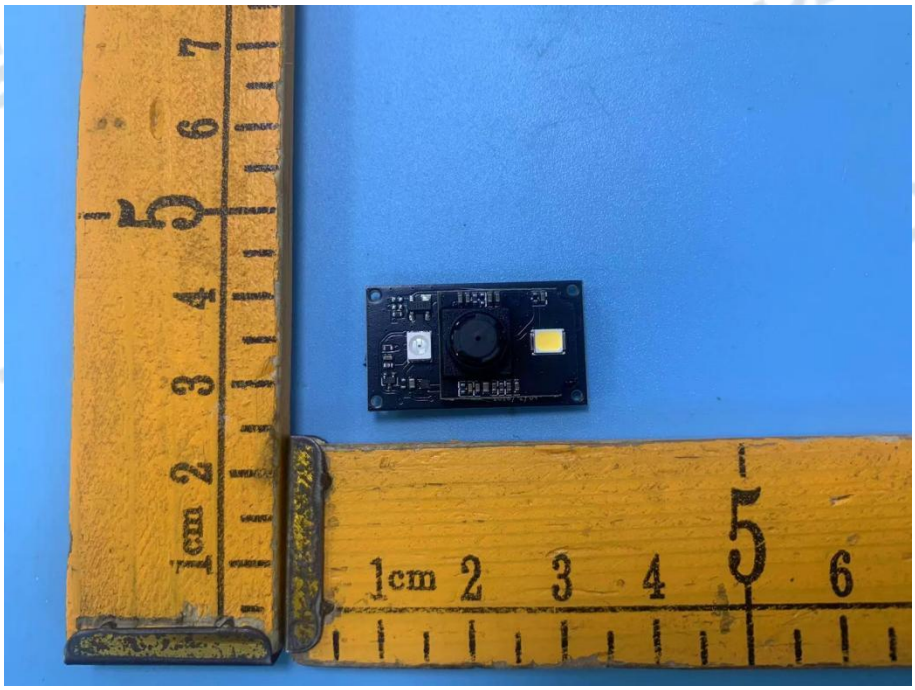
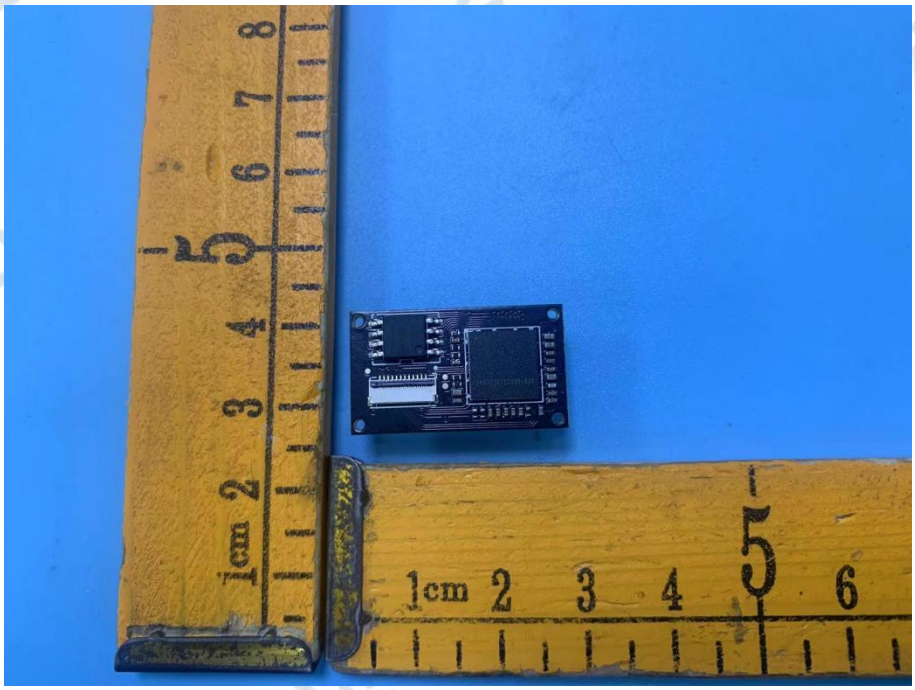

LW-210412
24000 MHZ




1cm 2 3 4 5 6


1cm 2 3 4 5 6
1cm 2 3 4 5 6 7 8

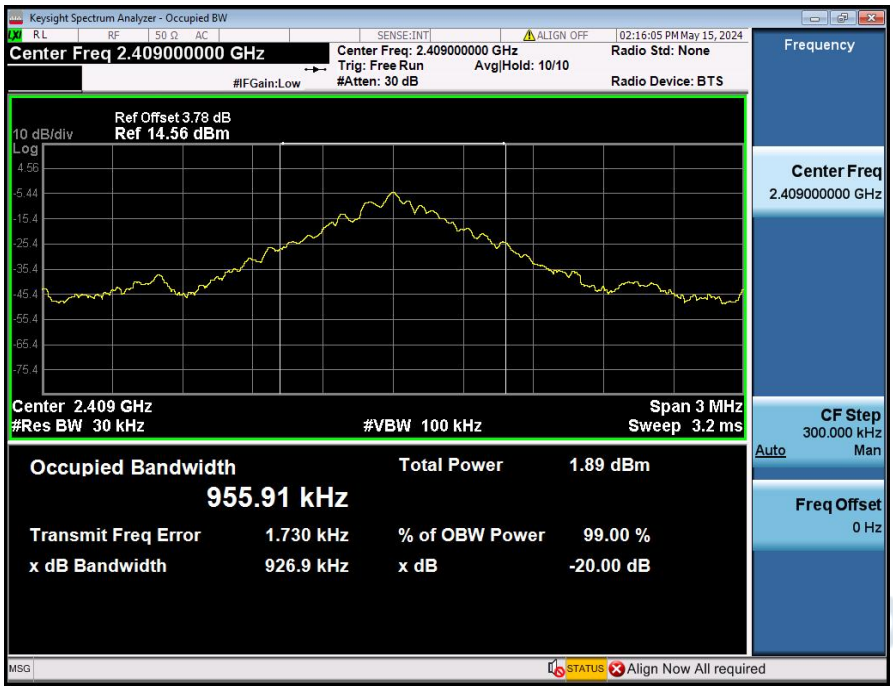
Appendix

HT240510008--Kg1688R--2.4G--CE
FCC_BT (Part15.247) Test Data

1. -20dB Bandwidth

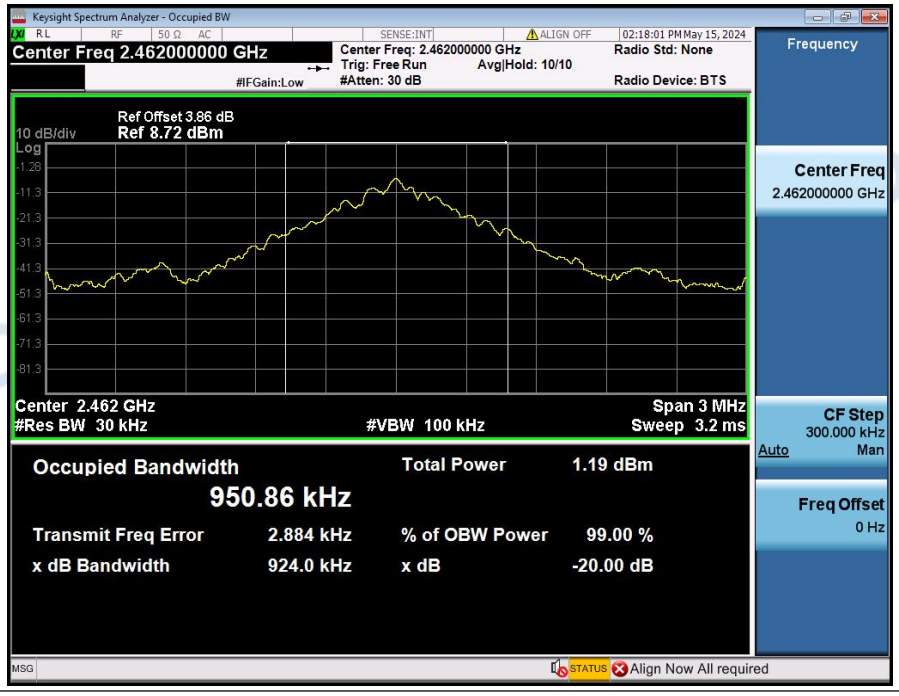
Condition	Antenna	Modulation	Frequency (MHz)	-20dB BW(MHz)	if larger than CFS
NVNT	ANT1	1-DH5	2409.00	0.927	No
NVNT	ANT1	1-DH5	2449.00	0.923	No
NVNT	ANT1	1-DH5	2462.00	0.924	No

-20dB_Bandwidth_NVNT_ANT1_1-DH5_2409



-20dB_Bandwidth_NVNT_ANT1_1-DH5_2449

-20dB_Bandwidth_NVNT_ANT1_1-DH5_2462



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