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TEST REPORT

47 CFR Part 15, Subpart C 15.249

Report Reference No.....: **CTL2410213011-WF**

Compiled by: (position+printed name+signature)	Happy Guo (File administrators)	Happy Guo
Tested by: (position+printed name+signature)	Jack Wang (Test Engineer)	Jack Wang
Approved by: (position+printed name+signature)	Ivan Xie (Manager)	Ivan Xie

Product Name..... :	REMOTE CONTROL CAR TOYS
Model/Type reference.....:	HW8810
List Model(s).....:	Refer to page 2
Trade Mark..... :	N/A
FCC ID..... :	**2A9DA-HW8810**
Applicant's name..... :	**SHANTOU CITY CHENGHAI DISTRICT HONGWANG ELECTRONICS CO., LTD**
Address of applicant.....:	1ST AND 2ND FLOOR, NO. 3,YIZHOU ROAD, CHENCUOZHOU INDUSTRIAL ZONE, LIANXIA TOWN, CHENGHAI DISTRICT, SHANTOU CITY, CHINA
Test Firm.....:	**Shenzhen CTL Testing Technology Co., Ltd.**
Address of Test Firm.....:	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Test specification.....:	
Standard.....:	**47 CFR Part 15, Subpart C 15.249:**Operation within the bands 920-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz and 24.0 - 24.25 GHz.
TRF Originator.....:	Shenzhen CTL Testing Technology Co., Ltd.
Master TRF..... :	Dated 2011-01
Date of receipt of test item..... :	October 23, 2024
Date of Test Date.....:	October 23, 2024–November 11, 2024
Data of Issue.....:	November 12, 2024
Result..... :	**Pass**

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TEST REPORT

Test Report No. :	CTL2410213011-WF	November 12, 2024 Date of issue

Equipment under Test	:	REMOTE CONTROL CAR TOYS
Sample No	:	CTL2410213011
Model /Type	:	HW8810
Listed Models	:	HW8801, HW8802, HW8803, HW8804, HW8805, HW8806, HW8807, HW8808, HW8809, HW8811, HW8812, HW8813, HW8814, HW8815, HW8816, HW8817, HW8818, HW8819, HW8820, HW8821, HW8822, HW8823, HW8824, HW8825, HW8826, HW8827, HW8828, HW8829, HW8830, HW8831
Applicant	:	**SHANTOU CITY CHENGHAI DISTRICT HONGWANG ELECTRONICS CO., LTD**
Address	:	1ST AND 2ND FLOOR, NO. 3,YIZHOU ROAD, CHENCUOZHOU INDUSTRIAL ZONE, LIANXIA TOWN, CHENGHAI DISTRICT, SHANTOU CITY, CHINA
Manufacturer	:	**SHANTOU CITY CHENGHAI DISTRICT HONGWANG ELECTRONICS CO., LTD**
Address	:	1ST AND 2ND FLOOR, NO. 3,YIZHOU ROAD, CHENCUOZHOU INDUSTRIAL ZONE, LIANXIA TOWN, CHENGHAI DISTRICT, SHANTOU CITY, CHINA

Test result	**Pass ***

∗ In the configuration tested, the EUT complied with the standards specified page 5.

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

** Modified History **

Revision	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	November 12, 2024	CTL2410213011-WF	Tracy Qi

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1. SUMMARY

1.1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.249: Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz.

ANSI C63.10:2013 : American National Standard for Testing Unlicensed Wireless Devices

1.2. Test Description

47 CFR Part 15, Subpart C 15.249		
47 CFR Part 15, Subpart C 15.249(a)	Field Strength of Fundamental	PASS
47 CFR Part 15, Subpart C 15.209	Spurious Emission	PASS
47 CFR Part 15, Subpart C 15.209	Band edge	PASS
47 CFR Part 15, Subpart C 15.215(c)	20dB bandwidth	PASS
47 CFR Part 15, Subpart C 15.207	Conducted Emission	N/A
47 CFR Part 15, Subpart C 15.203	Antenna Requirement	PASS

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co.,Ltd.
Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.10 and CISPR 32/EN 55032 requirements.

1.3.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L7497

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No. 4343.01

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

IC Registration No.: 9618B

CAB identifier: CN0041

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9618B.

FCC-Registration No.: 399832

Designation No.: CN1216

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832.

1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.08dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

Occupied Bandwidth	±1.9%	(1)	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

2. GENERAL INFORMATION

2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2. General Description of EUT

Product Name:	REMOTE CONTROL CAR TOYS
Model/Type reference:	HW8810
Power supply:	DC 4.50V from battery
2.4GHz Wireless	
Modulation:	GFSK
Operation frequency:	2480MHz~2483MHz
Channel number:	4
Channel separation:	1 MHz
Antenna type:	Internal Antenna

Note1: For more details, please refer to the user's manual of the EUT.
Note2: Antenna gain provided by the applicant.

2.3. Description of Test Modes and Test Frequency

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) .There are 4 channels provided to the EUT and Channel 01/02/04 were selected for testing.

Operation Frequency List：

Channel	Frequency (MHz)
01	**2480**
02	**2481**
03	2482
04	**2483**

Note: The line display in grey is the channel selected to perform test.

2.4. Equipments Used during the Test

Conducted Emission						
Test Equipment	Manufacturer	Model No.	Serial No.	Previous calibration	Last Cal.	Cal.Due
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2023/05/04	2024/04/30	2025/04/29
LISN	ROHDE & SCHWARZ	ESH2-Z5	860014/010	2023/05/04	2024/04/30	2025/04/29
Limitator	ROHDE & SCHWARZ	ESH3-Z2	100408	2023/05/04	2024/04/30	2025/04/29
Software:						
Name of Software:			Version:			
ES-K1			V1.71			

Radiated Emission						
Test Equipment	Manufacturer	Model No.	Serial No.	Previous calibration	Last Cal.	Cal.Due
Active Loop Antenna	Da Ze	ZN30900A	/	2021/05/13	2024/04/30	2025/04/29
Double cone logarithmic antenna	Schwarzbeck	VULB 9168	824	/	2023/02/13	2026/02/12
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	/	2021/12/23	2024/12/22
Horn Antenna	Ocean Microwave	OBH100400	26999002	/	2021/12/22	2024/12/21
Amplifier	MRT-AP01M06	MRT	S-001	2023/05/04	2024/04/30	2025/04/29
Amplifier	Agilent	8449B	3008A02306	2023/05/04	2024/04/30	2025/04/29
Amplifier	Brief&Smart	LNA-4018	2104197	2023/05/05	2024/05/03	2025/05/02
EMI Test Receiver	ROHDE & SCHWARZ	ESCI	1166.5950.03	2023/05/04	2024/04/30	2025/04/29
Spectrum Analyzer	RS	FSP	1164.4391.38	2023/05/05	2024/05/03	2025/05/02
Software:						
Name of Software:			Version:			
EZ_EMC(Below 1GHz)			V1.1.4.2			
EZ_EMC(Above 1GHz)			V1.1.4.2			

RF Conducted						
Test Equipment	Manufacturer	Model No.	Serial No.	Previous calibration	Last Cal.	Cal.Due
Spectrum Analyzer	Keysight	N9020A	MY53420874	2023/05/04	2024/05/01	2025/04/30
Temperature/Humidity Meter	Ji Yu	MC501	/	2023/05/09	2024/05/04	2025/05/03
Software:						
Name of Software:			Version:			
TST-PASS			V2.0			

2.5. Related Submittal(s) / Grant(s)

This submittal(s) (test report) is intended to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

2.6. Modifications

No modifications were implemented to meet testing criteria.

3. TEST CONDITIONS AND RESULTS

3.1. Conducted Emissions Test

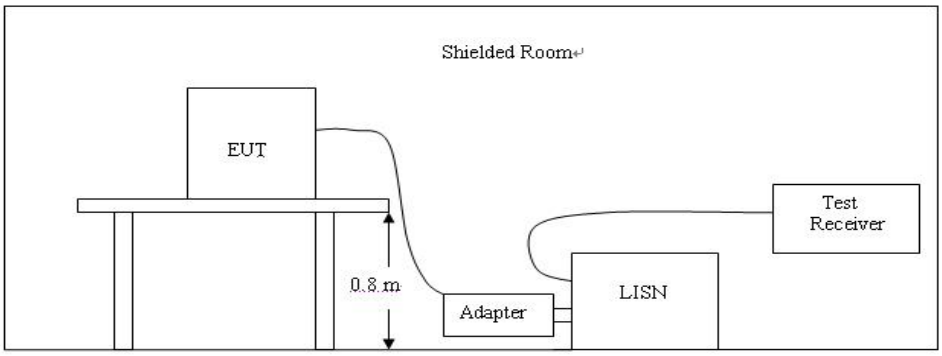
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	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 CONFIGURATION



TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST RESULTS

Not applicable to this device.

3.2. Radiated Emissions and Band Edge

Limit

According 15.249, the field strength of emissions from intentional radiators operated within 2400MHz-2483.5 MHz shall not exceed 94dBμV/m (50mV/m):

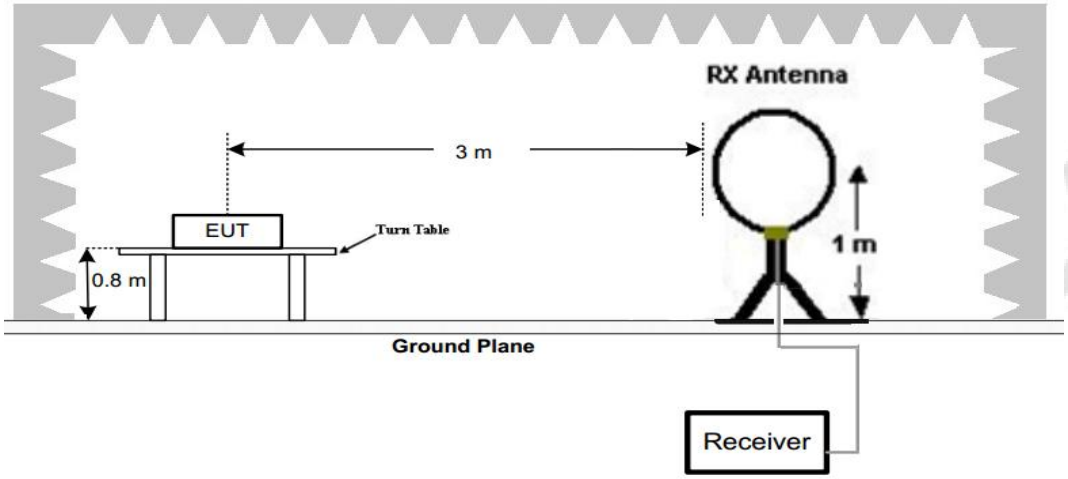
FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

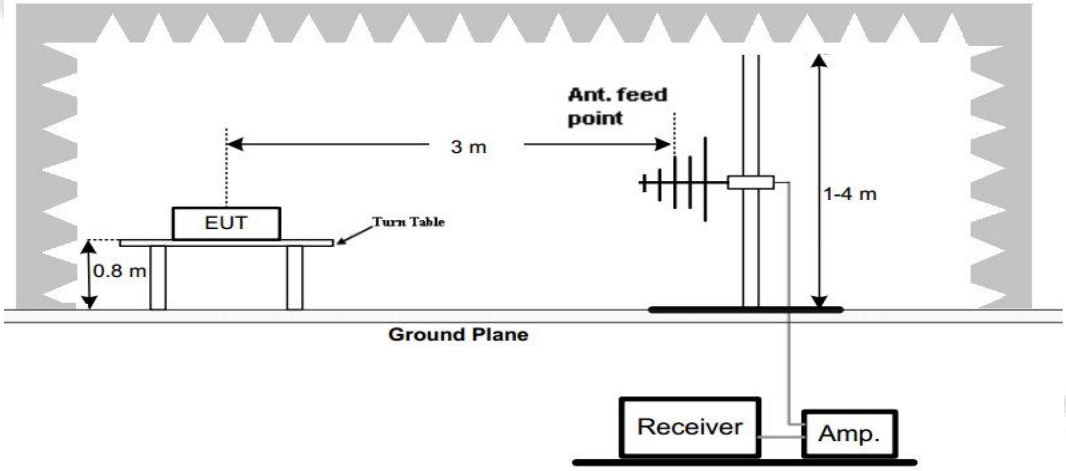
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST CONFIGURATION

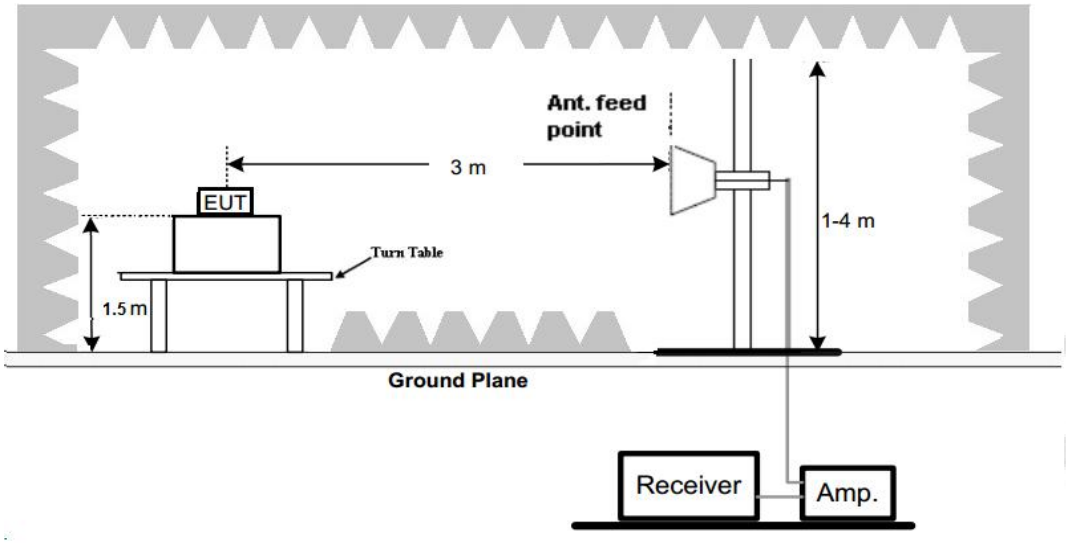
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Test Procedure

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3
1GHz-18GHz	Horn Antenna	3
18GHz-25GHz	Horn Anternna	1

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

TEST RESULTS

Remark:
1. We measured Radiated Emission at GFSK mode from 9 KHz to 25GHz and recorded worst case.
2. For below 1GHz testing recorded worst at GFSK low channel.
3. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Horizontal

Shenzhen CTL Testing Technology Co., Ltd
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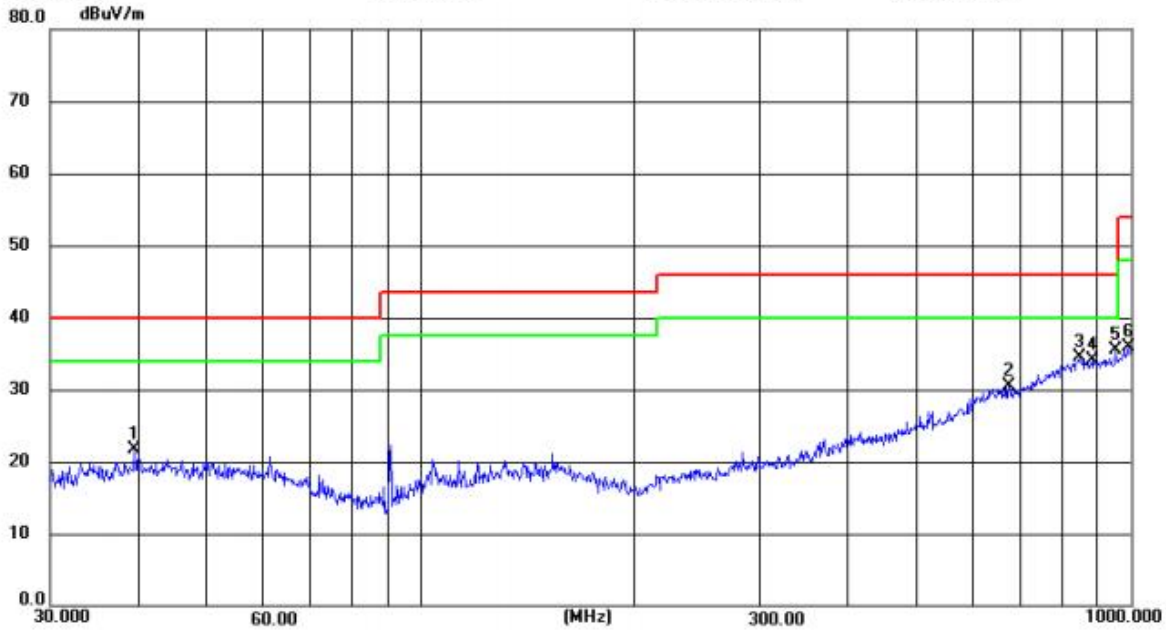
Radiated Emission Measurement

File :RF_10 Data :#1739 Date: 2024/10/31 Time: 22:35:16



Site LAB Chamber 2 Polarization: ***Horizontal*** Temperature: 25(C)
Limit: FCC Part15 RE-Class C_30-1000MHz Power: Humidity: 50 %
EUT: Distance: 3m
M/N: HW8810
Mode: 2480MHz
Note: SHANTOU CITY CHENGHAI DISTRICT HONGWANG ELECTRONICS CO., LTD.

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	39.5583	6.98	14.74	21.72	40.00	18.28	peak	100	339	P	
2	674.6163	7.15	23.34	30.49	46.00	15.51	peak	100	350	P	
3	847.3132	7.14	27.30	34.44	46.00	11.56	peak	100	185	P	
4	882.1797	6.91	27.22	34.13	46.00	11.87	peak	100	175	P	
5	955.0194	7.20	28.34	35.54	46.00	10.46	peak	100	185	P	
6	994.7540	7.10	28.73	35.83	54.00	18.17	peak	100	9	P	

Vertical

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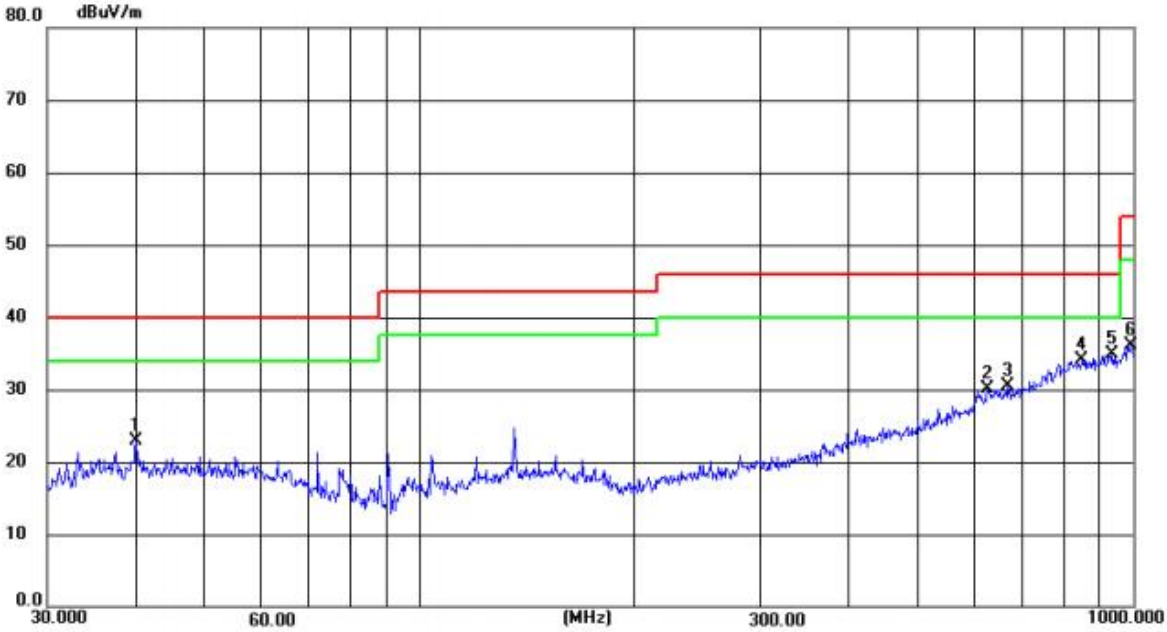
Tel: +86-755-89486194

Radiated Emission Measurement

File :RF_10 Data :#1740 Date: 2024/10/31 Time: 22:36:19



Site LAB Chamber 2 Polarization: *Vertical* Temperature: 25(C)
Limit: FCC Part15 RE-Class C_30-1000MHz Power: Humidity: 50 %
EUT: Distance: 3m
M/N: HW8810
Mode: 2480MHz
Note: SHANTOU CITY CHENGHAI DISTRICT HONGWANG ELECTRONICS CO., LTD.

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	40.0118	8.04	14.84	22.88	40.00	17.12	peak	100	299	P	
2	625.6263	7.02	23.12	30.14	46.00	15.86	peak	100	352	P	
3	669.3147	7.12	23.33	30.45	46.00	15.55	peak	100	319	P	
4	848.0563	6.85	27.30	34.15	46.00	11.85	peak	100	186	P	
5	936.7774	6.52	28.33	34.85	46.00	11.15	peak	100	217	P	
6	996.0629	7.42	28.77	36.19	54.00	17.81	peak	100	352	P	

For 1GHz to 25GHz

GFSK Mode (above 1GHz)

Frequency(MHz):				2480		Polarity:			HORIZONTAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2480.00	101.34	PK	114	12.66	67.95	28.78	4.61	0.00	33.39
1	2480.00	92.66	AV	94	1.34	59.27	28.78	4.61	0.00	33.39
2	2390.00	46.26	PK	74	27.74	12.94	28.72	4.60	0.00	33.32
2	2390.00	--	AV	54	--	--	--	--	--	--
3	2400.00	48.61	PK	74	3.58	15.22	28.78	4.61	0.00	33.39
3	2400.00	--	AV	54	--	--	--	--	--	--
4	4960.00	50.14	PK	74	23.86	45.63	33.49	6.91	35.89	4.51
4	4960.00	--	AV	54	--	--	--	--	--	--
5	5282.42	49.26	PK	74	24.74	41.28	34.99	7.56	34.57	7.98
5	5282.42	--	AV	54	--	--	--	--	--	--
6	7440.00	48.72	PK	74	3.58	37.62	36.95	9.18	35.03	11.10
6	7440.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):				2480		Polarity:			VERTICAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2480.00	91.17	PK	114	22.83	57.78	28.78	4.61	0.00	33.39
1	2480.00	88.83	AV	94	5.17	55.44	28.78	4.61	0.00	33.39
2	2390.00	45.64	PK	74	28.36	12.32	28.72	4.60	0.00	33.32
2	2390.00	--	AV	54	--	--	--	--	--	--
3	2400.00	48.26	PK	74	3.58	14.87	28.78	4.61	0.00	33.39
3	2400.00	--	AV	54	--	--	--	--	--	--
4	4960.00	49.72	PK	74	24.28	45.21	33.49	6.91	35.89	4.51
4	4960.00	--	AV	54	--	--	--	--	--	--
5	5955.26	47.28	PK	74	26.72	39.30	34.99	7.56	34.57	7.98
5	5955.26	--	AV	54	--	--	--	--	--	--
6	7440.00	48.66	PK	74	3.58	37.56	36.95	9.18	35.03	11.10
6	7440.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
7. For fundamental frequency, RBW 3MHz VBW 3MHz Peak detector is for PK Value ; RMS detector is for AV value.

Frequency(MHz):				2481		Polarity:			HORIZONTAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2481.00	101.05	PK	114	12.95	67.55	28.85	4.65	0.00	33.50
1	2481.00	92.95	AV	94	1.05	59.45	28.85	4.65	0.00	33.50
2	4265.00	45.49	PK	74	28.51	47.24	28.93	4.70	35.38	-1.75
2	4265.00	--	AV	54	--	--	--	--	--	--
3	4962.00	48.95	PK	74	3.58	42.70	33.6	6.95	34.30	6.25
3	4962.00	--	AV	54	--	--	--	--	--	--
4	5859.00	47.62	PK	74	26.38	39.38	35.17	7.69	34.62	8.24
4	5859.00	--	AV	54	--	--	--	--	--	--
5	7443.00	48.22	PK	74	25.78	36.53	37.46	9.23	35.00	11.69
5	7443.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):				2481		Polarity:			VERTICAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2481.00	96.94	PK	114	17.06	63.44	28.85	4.65	0.00	33.50
1	2481.00	87.06	AV	94	6.94	53.56	28.85	4.65	0.00	33.50
2	4575.00	45.26	PK	74	28.74	41.35	32.98	6.77	35.84	3.91
2	4575.00	--	AV	54	--	--	--	--	--	--
3	4962.00	47.49	PK	74	3.58	41.24	33.60	6.95	34.30	6.25
3	4962.00	--	AV	54	--	--	--	--	--	--
4	6259.00	45.62	PK	74	28.38	37.21	35.19	7.91	34.69	8.41
4	6259.00	--	AV	54	--	--	--	--	--	--
5	7443.00	48.07	PK	74	25.93	36.38	37.46	9.23	35.00	11.69
5	7443.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
7. For fundamental frequency, RBW 3MHz VBW 3MHz Peak detector is for PK Value; RMS detector is for AV value.

Frequency(MHz):				2483		Polarity:			HORIZONTAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2483.00	100.99	PK	114	13.01	67.37	28.92	4.70	0.00	33.62
1	2483.00	91.01	AV	94	2.99	57.39	28.92	4.70	0.00	33.62
2	2483.50	48.95	PK	74	25.05	15.32	28.93	4.70	0.00	33.63
2	2483.50	--	AV	54	--	--	--	--	--	--
3	2500.00	45.69	PK	74	3.58	12.01	28.96	4.72	0.00	33.68
3	2500.00	--	AV	54	--	--	--	--	--	--
4	4966.00	49.07	PK	74	24.93	42.48	33.84	7.00	34.25	6.59
4	4966.00	--	AV	54	--	--	--	--	--	--
5	5326.00	46.95	PK	74	27.05	39.45	34.64	7.20	34.34	7.50
5	5326.00	--	AV	54	--	--	--	--	--	--
6	7449.00	51.08	PK	74	3.58	39.13	37.64	9.28	34.97	11.95
6	7449.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):				2483		Polarity:			VERTICAL	
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2483.00	96.97	PK	114	17.03	63.35	28.92	4.70	0.00	33.62
1	2483.00	87.03	AV	94	6.97	53.41	28.92	4.70	0.00	33.62
2	2483.50	46.49	PK	74	27.51	12.86	28.93	4.70	0.00	33.63
2	2483.50	--	AV	54	--	--	--	--	--	--
3	2500.00	44.26	PK	74	3.58	10.58	28.96	4.72	0.00	33.68
3	2500.00	--	AV	54	--	--	--	--	--	--
4	4966.00	48.15	PK	74	25.85	41.56	33.84	7.00	34.25	6.59
4	4966.00	--	AV	54	--	--	--	--	--	--
5	5157.00	46.25	PK	74	27.75	38.68	34.69	7.23	34.35	7.57
5	5157.00	--	AV	54	--	--	--	--	--	--
6	7449.00	49.26	PK	74	3.58	37.31	37.64	9.28	34.97	11.95
6	7449.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.
7. For fundamental frequency, RBW 3MHz VBW 3MHz Peak detector is for PK Value; RMS detector is for AV value.

3.3. Occupied Bandwidth Measurement

Limit

N/A

Test Configuration

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW.

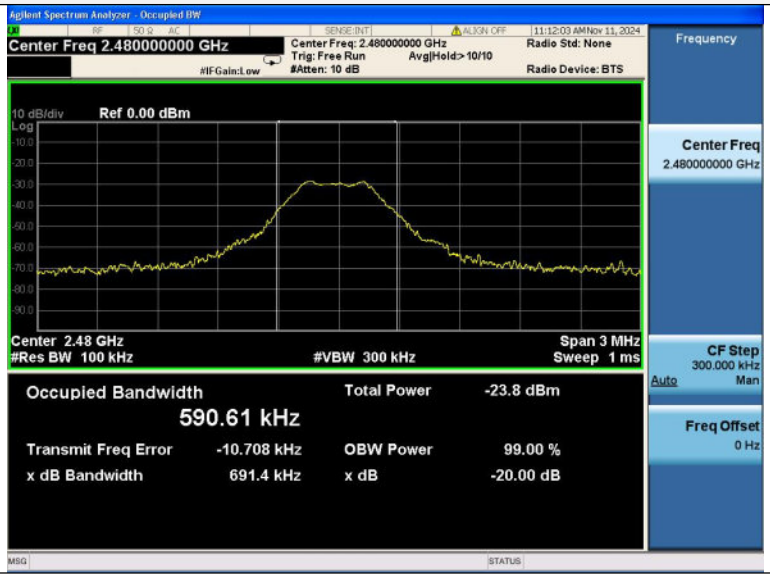
The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

Test Results

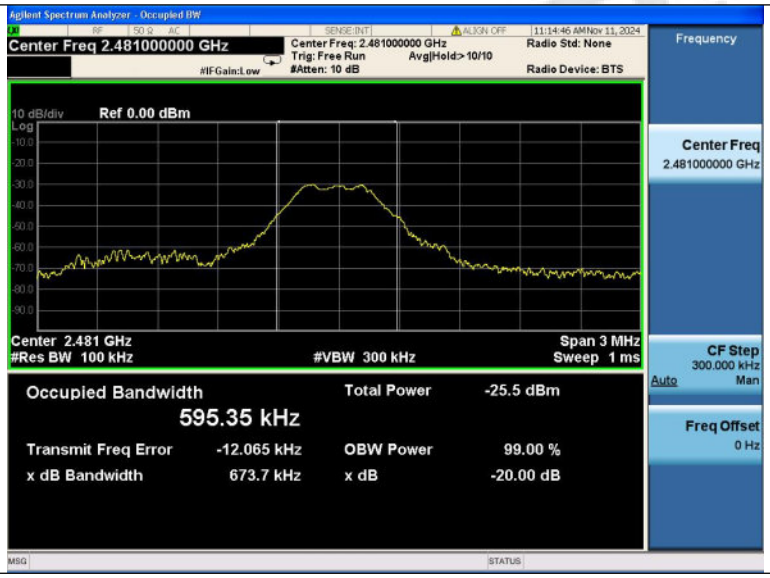
Modulation	Channel	99% OBW (MHz)	20dB bandwidth (MHz)	Result
GFSK	CH01	0.591	0.691	Pass
	CH02	0.595	0.674	
	CH04	0.591	0.677	

Test plot as follows:

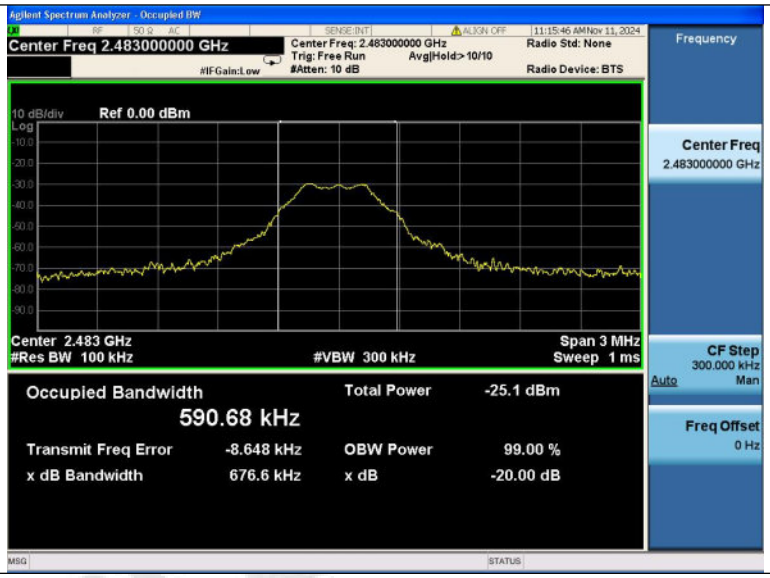
GFSK Modulation



CH01


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.481000000 GHz
Center Freq: 2.481000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
11:14:46 AM Nov 11, 2024
Frequency
10 dB/div
Ref 0.00 dBm
Center 2.481 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1 ms
Occupied Bandwidth
595.35 kHz
Total Power -25.5 dBm
Transmit Freq Error -12.065 kHz
OBW Power 99.00 %
x dB Bandwidth 673.7 kHz
x dB -20.00 dB
Center Freq
2.481000000 GHz
CF Step
300.000 kHz
Auto Man
Freq Offset
0 Hz

CH02


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.483000000 GHz
Center Freq: 2.483000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
11:15:46 AM Nov 11, 2024
Frequency
10 dB/div
Ref 0.00 dBm
Center 2.483 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1 ms
Occupied Bandwidth
590.68 kHz
Total Power -25.1 dBm
Transmit Freq Error -8.648 kHz
OBW Power 99.00 %
x dB Bandwidth 676.6 kHz
x dB -20.00 dB
Center Freq
2.483000000 GHz
CF Step
300.000 kHz
Auto Man
Freq Offset
0 Hz

CH04

3.4. Antenna Requirement

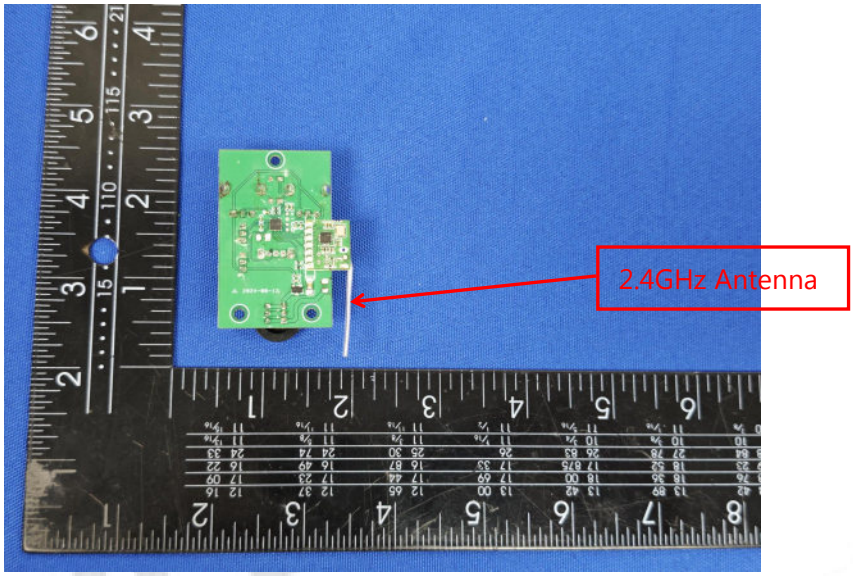
Standard Applicable

For intentional device, according to FCC 47 CFR Section 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.

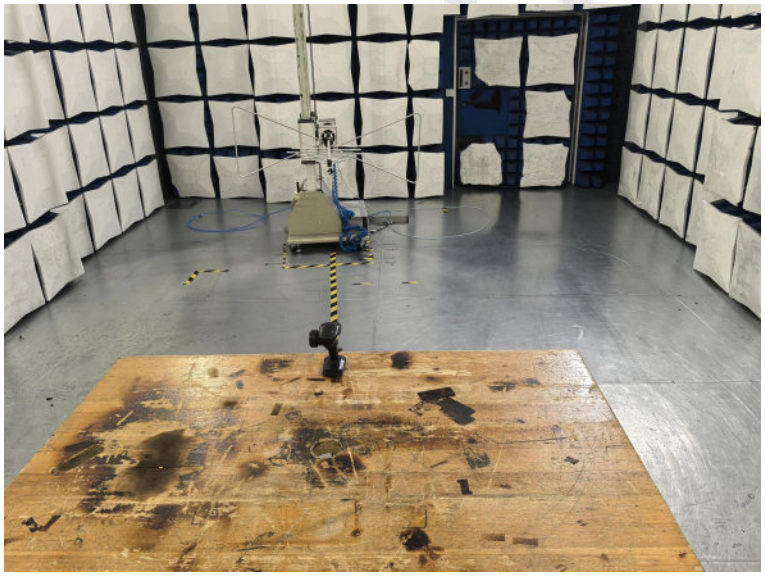
Refer to statement below for compliance.
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

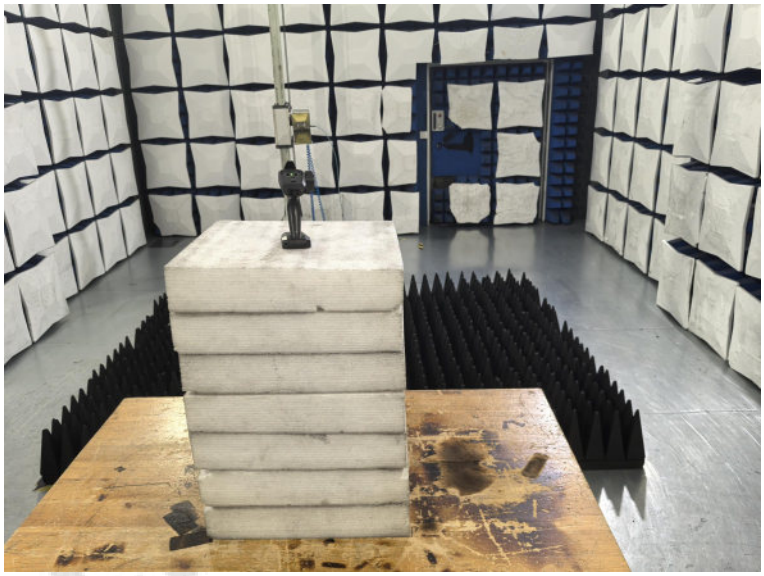
Antenna Connected Construction

The antenna used in this product is a Internal Antenna.



4. Test Setup Photos of the EUT

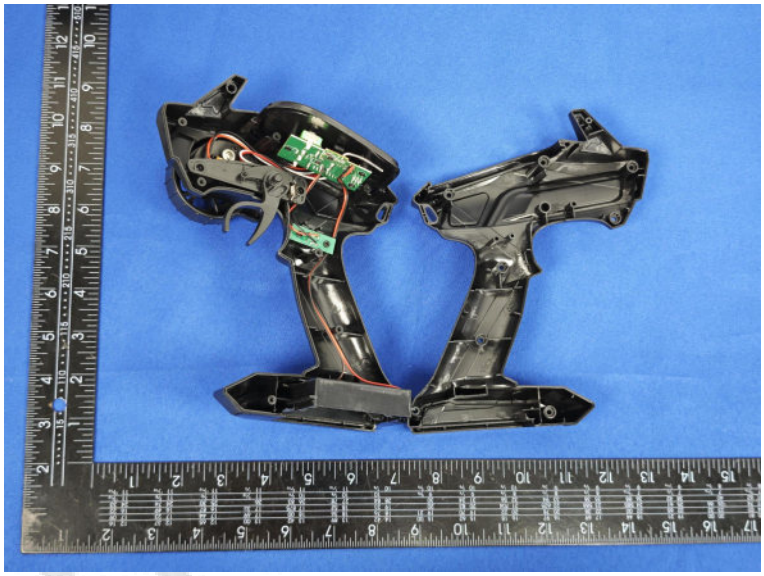


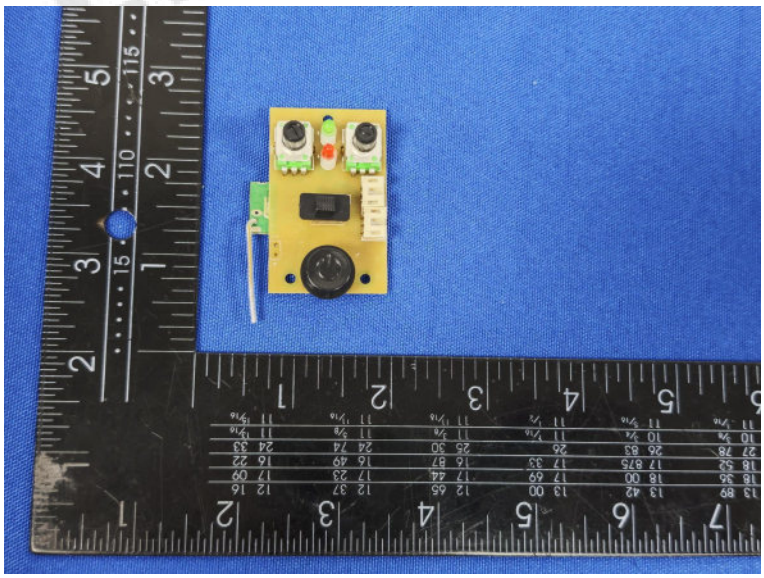


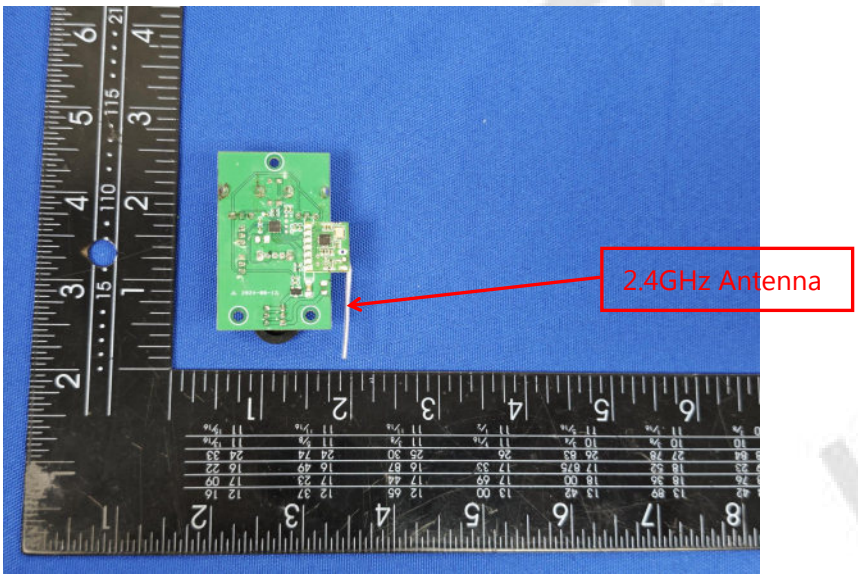
5. External and Internal Photos of the EUT

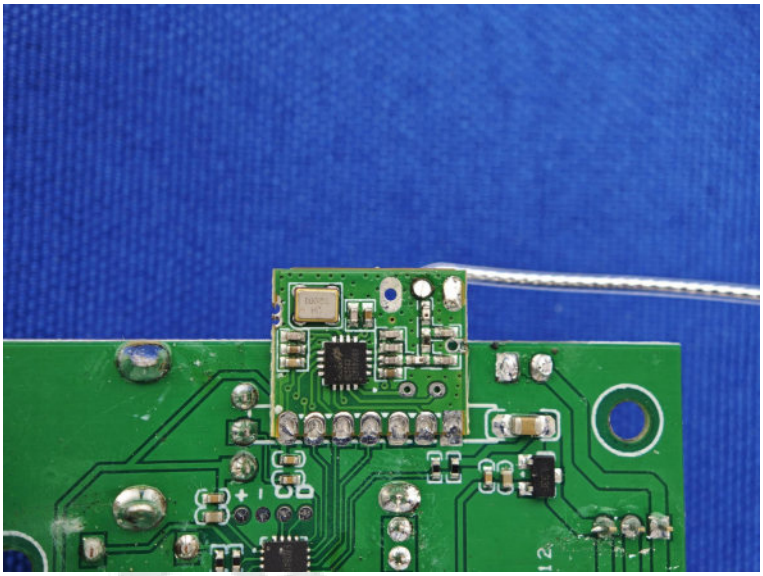
External Photos of EUT

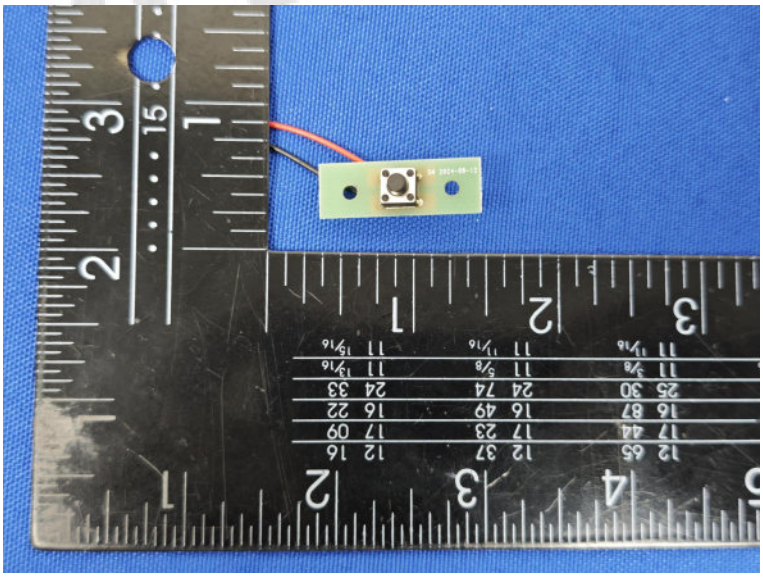
Internal Photos of EUT

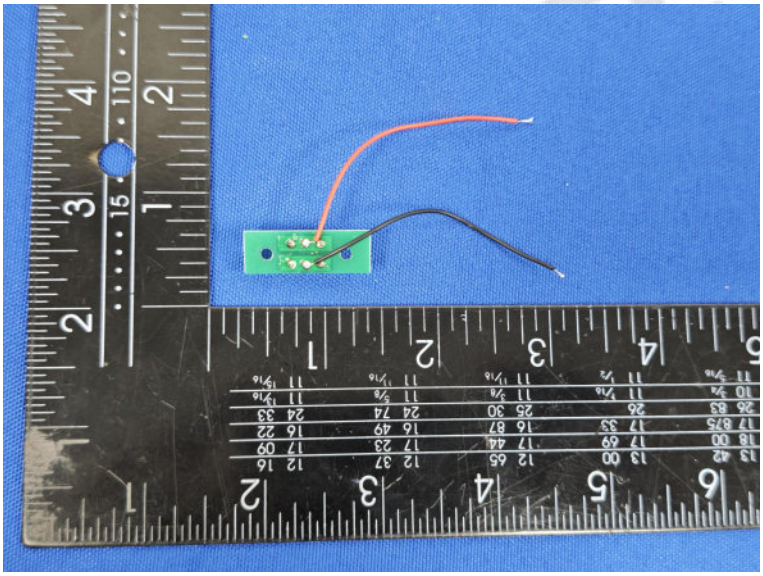





2.4GHz Antenna







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