

TEST REPORT

Product : RF433 remote control
Trade mark : N/A
Model/Type reference : 8806
Serial Number : N/A
Report Number : EED32Q80011801
FCC ID : 2BEQ2HBRSB-001
Date of Issue : Feb. 29, 2024
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

Huizhou RSP Technology Co.,LTD
Building A13, Wang Yang Zhong Chuang Cheng City, Shuang Yang
Road, Yangqiao Town, Boluo County, HuiZhou GuangDong,
China 516100

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

Compiled by:

mark.chen.

Reviewed by:

Frazer. Li

Mark Chen

Frazer Li

Approved by:

Aaron Ma

Feb. 29, 2024

Aaron Ma

Date:

Check No.: 5202040124



1 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10:2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10:2013	N/A
Field Strength of the Fundamental Signal	47 CFR Part 15 Subpart C Section 15.231 (b)	ANSI C63.10:2013	PASS
Spurious Emissions	47 CFR Part 15 Subpart C Section 15.231 (b)/15.209	ANSI C63.10:2013	PASS
20dB Bandwidth	47 CFR Part 15 Subpart C Section 15.231 (c)	ANSI C63.10:2013	PASS
Dwell Time	47 CFR Part 15 Subpart C Section 15.231 (a)	ANSI C63.10:2013	PASS

Remark:

Company Name and Address shown on Report, the sample(s) and sample Information were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

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3 General Information

3.1 Client Information

Applicant:	Huizhou RSP Technology Co.,LTD
Address of Applicant:	Building A13, Wang Yang Zhong Chuang Cheng City, Shuang Yang Road, Yangqiao Town, Boluo County, HuiZhou Guangdong, China 516100
Manufacturer:	Huizhou RSP Technology Co.,LTD
Address of Manufacturer:	Building A13, Wang Yang Zhong Chuang Cheng City, Shuang Yang Road, Yangqiao Town, Boluo County, HuiZhou Guangdong, China 516100
Factory:	Huizhou RSP Technology Co.,LTD
Address of Factory:	Building A13, Wang Yang Zhong Chuang Cheng City, Shuang Yang Road, Yangqiao Town, Boluo County, HuiZhou Guangdong, China 516100

3.2 General Description of EUT

Product Name:	RF433 remote control
Model No.(EUT):	8806
Trade Mark:	N/A
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location
Frequency Range:	433.92MHz
Modulation Type:	ASK
Number of Channels:	1 (declared by the client)
Antenna Type:	PCB Antenna
Test Software of EUT:	N/A
Power Supply:	Battery DC 3.0V
Test voltage:	DC 3.0V
Sample Received Date:	Jan. 04, 2024
Sample tested Date:	Jan. 04, 2024 to Jan. 16, 2024

3.3 Test Environment and Mode

Operating Environment:	
Radiated Spurious Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
Conducted Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar

Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.

3.4 Description of Support Units

The EUT has been tested with associated equipment below.

1) support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
/	/	/	/	/

3.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd
Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China
Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

3.6 Deviation from Standards

None.

3.7 Abnormalities from Standard Conditions

None.

3.8 Other Information Requested by the Customer

None.

3.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	3.3dB (9kHz-30MHz)
		4.3dB (30MHz-1GHz)
		4.5dB (1GHz-12.75GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

4 Equipment List

RF test system					
Equipment	Manufacturer	Model	Serial No.	Cal. Date	Due Date
Spectrum Analyzer	R&S	FSV40	101200	07-25-2023	07-24-2024

3M Semi-anechoic Chamber (2)- Radiated disturbance Test					
Equipment	Manufacturer	Model	Serial No.	Cal. Date	Due Date
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05/22/2022	05/21/2025
Receiver	R&S	ESCI7	100938-003	09-22-2023	09-21-2024
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-618	05/22/2022	05/21/2025
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04/15/2021	04/14/2024
Multi device Controller	maturo	NCD/070/10711112	---	---	---
Horn Antenna	ETS-LINGREN	BBHA 9120D	9120D-1869	04/15/2021	04/14/2024
Microwave Preamplifier	Agilent	8449B	3008A02425	06/20/2023	06/19/2024
high-low temperature test chamber	Dong Guang Qin Zhuo	LK-80GA	QZ20150611879	12/11/2023	12/10/2024
Receiver	R&S	ESCI	100009	04/25/2023	04/24/2024
Test software	Fara	EZ-EMC	EMEC-3A1-Pre	---	---

3M full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
RSE Automatic test software	JS Tonscend	JS36-RSE	10166	---	---
Receiver	Keysight	N9038A	MY57290136	02-27-2023	02-26-2024
Spectrum Analyzer	Keysight	N9020B	MY57111112	02-21-2023	02-20-2024
Spectrum Analyzer	Keysight	N9030B	MY57140871	02-21-2023	02-20-2024
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-28-2021	04-27-2024
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-15-2021	04-14-2024
Horn Antenna	ETS-LINDGREN	3117	57407	07-04-2021	07-03-2024
Preamplifier	EMCI	EMC184055SE	980597	04-13-2023	04-12-2024
Preamplifier	EMCI	EMC001330	980563	03-28-2023	03-27-2024
Preamplifier	JS Tonscend	TAP-011858	AP21B806112	07-25-2023	07-24-2024
Communication test set	R&S	CMW500	102898	12-14-2023	12-13-2024
Temperature/Humidity Indicator	biaozhi	GM1360	EE1186631	04-11-2023	04-10-2024
Fully Anechoic Chamber	TDK	FAC-3	---	01-16-2021 01-09-2024	01-15-2024 01-08-2027
Cable line	Times	SFT205-NMSM-2.50M	394812-0001	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0002	---	---
Cable line	Times	SFT205-NMSM-2.50M	394812-0003	---	---
Cable line	Times	SFT205-NMSM-2.50M	393495-0001	---	---
Cable line	Times	EMC104-NMNM-1000	SN160710	---	---
Cable line	Times	SFT205-NMSM-3.00M	394813-0001	---	---
Cable line	Times	SFT205-NMNM-1.50M	381964-0001	---	---
Cable line	Times	SFT205-NMSM-7.00M	394815-0001	---	---
Cable line	Times	HF160-KMKM-3.00M	393493-0001	---	---

5 Test results and Measurement Data

5.1 Antenna Requirement

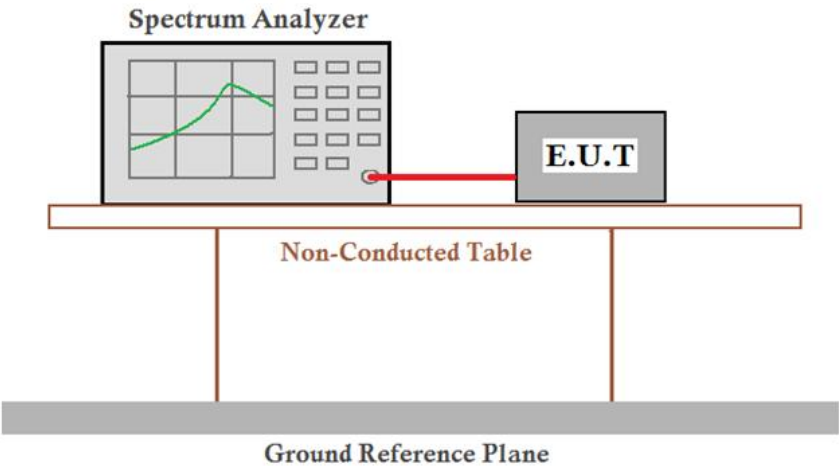
Standard requirement:	47 CFR Part 15C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	Please see Internal photos
The antenna is integrated on the main PCB and no consideration of replacement.	

5.2 Spurious Emissions

5.2.1 Duty Cycle

Test Requirement: 47 CFR Part 15C Section 15.35 (c)
Test Method: ANSI C63.10:2013

Test Setup:

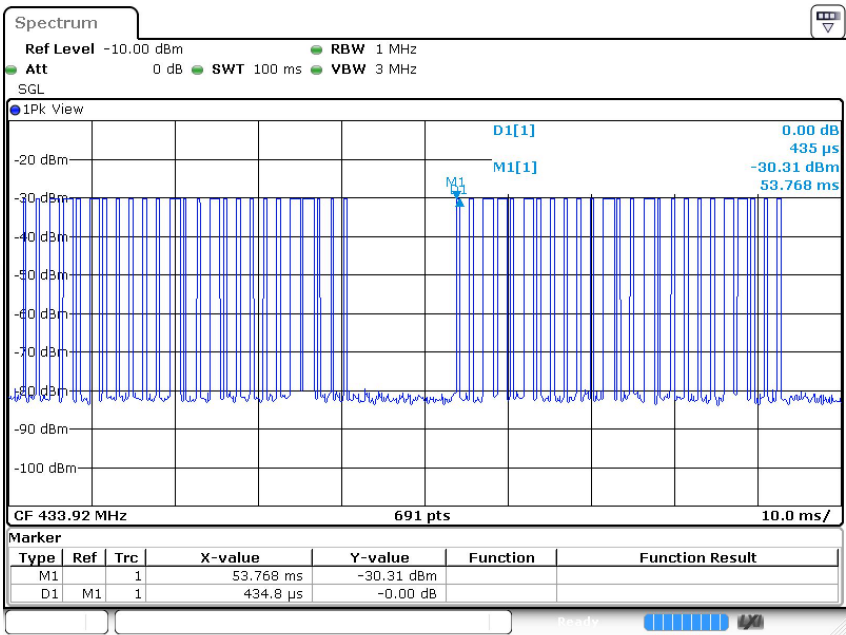


Limit: N/A
Test Mode: Transmitting mode
Test Results: Pass

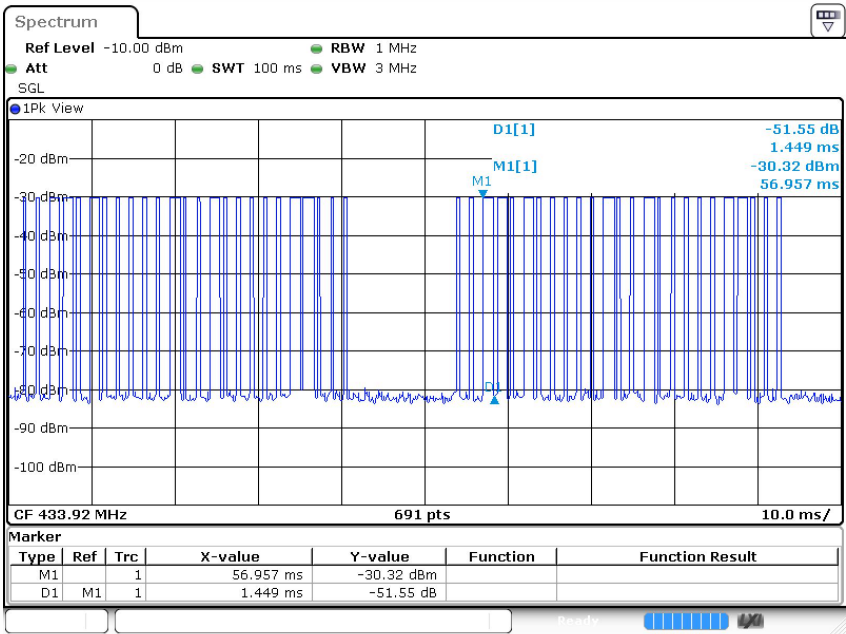
T on time (ms)	T period (ms)	Duty cycle
35.946	100	0.35946

Note:
 $T \text{ on time} = 435(\mu\text{s}) \times 18 \times 2 + 1.449(\text{ms}) \times 7 \times 2 = 35.946\text{ms}$,
 $\text{Duty cycle} = T \text{ on time} / T \text{ period}$

Test plot as follows:



Date: 15 JAN 2024 10:33:57



Date: 15 JAN 2024 10:34:23

5.2.2 Spurious Emissions

Test Requirement: 47 CFR Part 15C Section 15.231(b) and 15.209

Test Method: ANSI C63.10: 2013

Test Site: Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Setup:

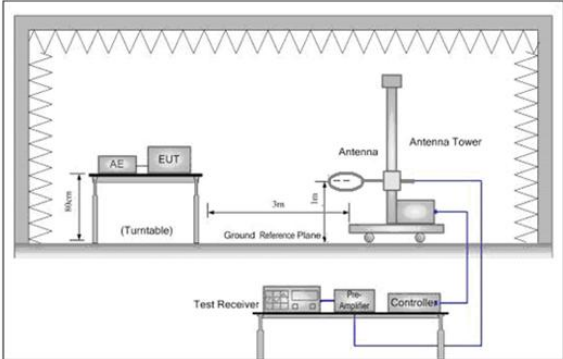


Figure 1. Below 30MHz

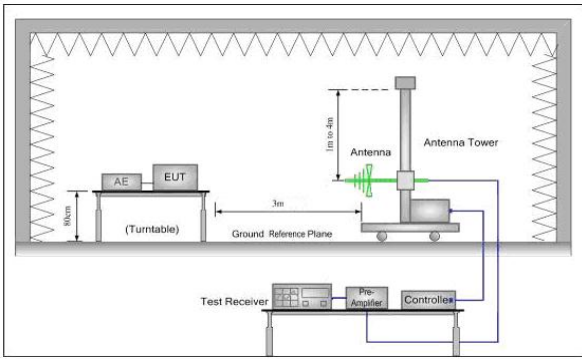


Figure 2. 30MHz to 1GHz

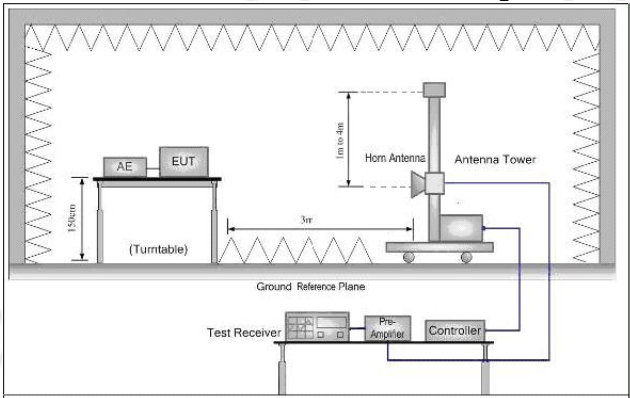


Figure 3. Above 1GHz

Test Procedure:

Below 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
- Test the EUT in the lowest channel ,middle channel, the Highest channel
- The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
- Repeat above procedures until all frequencies measured was complete.

**Limit:
(Spurious
Emissions)**

Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

**Limit:
(Field strength of
the fundamental
signal)**

Frequency	Limit (dBμV/m @3m)	Remark
433.92MHz	80.8	Average Value
	100.8	Peak Value

Test Mode:

Transmitting mode

Test Results:

Pass

Test data
Field Strength of the Fundamental Signal

Average value:	
Calculate Formula:	Average value=Peak value + PDCF
	PDCF=20*Ig(Duty cycle)
	Duty cycle= T on time / T period
Test data:	T on time =35.946ms
	T period =100ms
	PDCF=-8.89

Antenna polarization: Horizontal						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	61.04	19.42	80.46	100.80	-28.34	Peak
433.92	-	-	71.57	80.80	-9.23	Average

Antenna polarization: Vertical						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	58.93	19.42	78.35	100.80	-30.45	Peak
433.92	-	-	69.46	80.80	-11.34	Average

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

Over Limit=Level -Limit Line

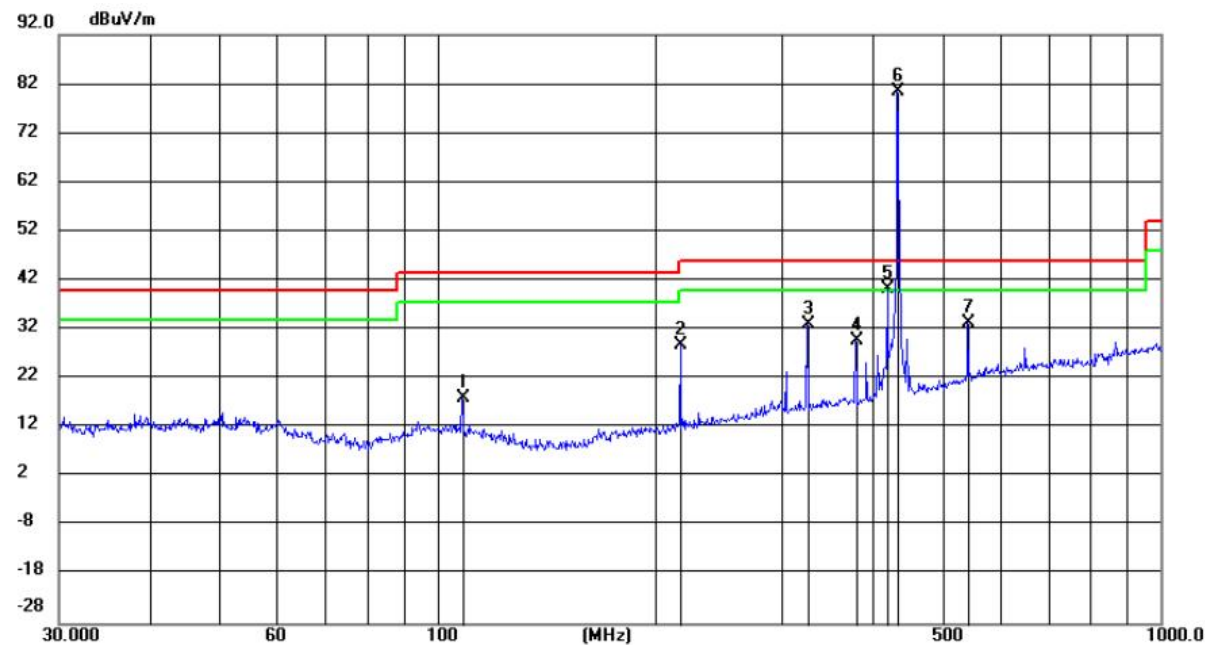
Spurious Emissions

9KHz-30MHz

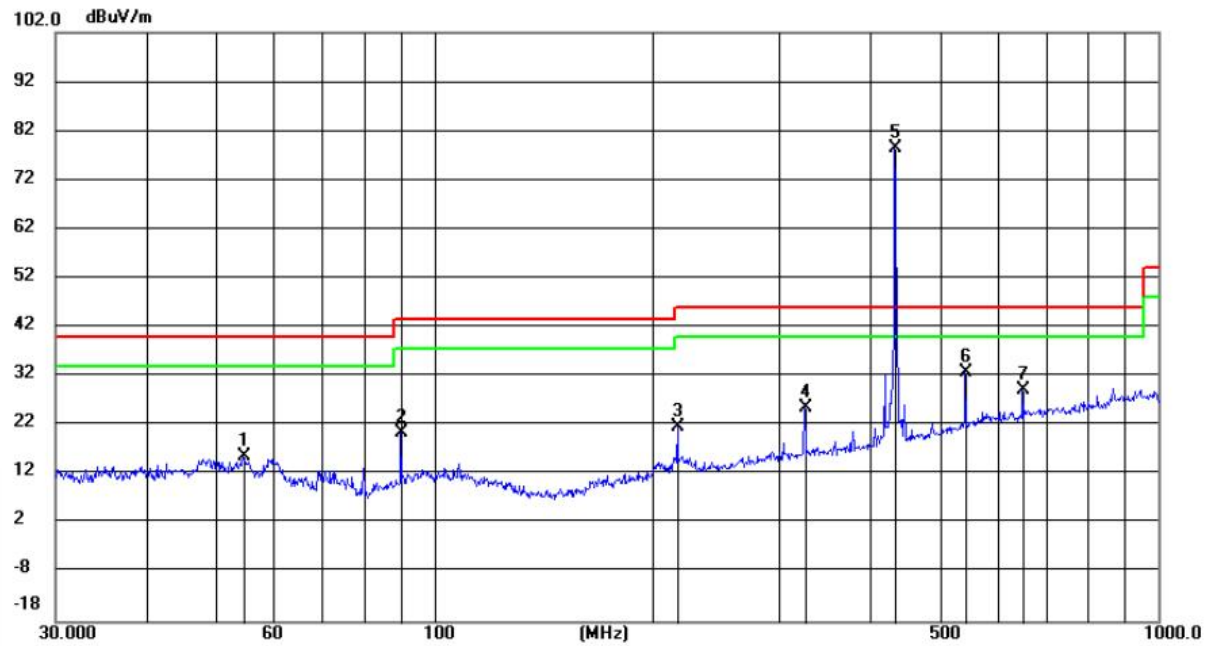
9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

30MHz-1GHz

Horizontal:



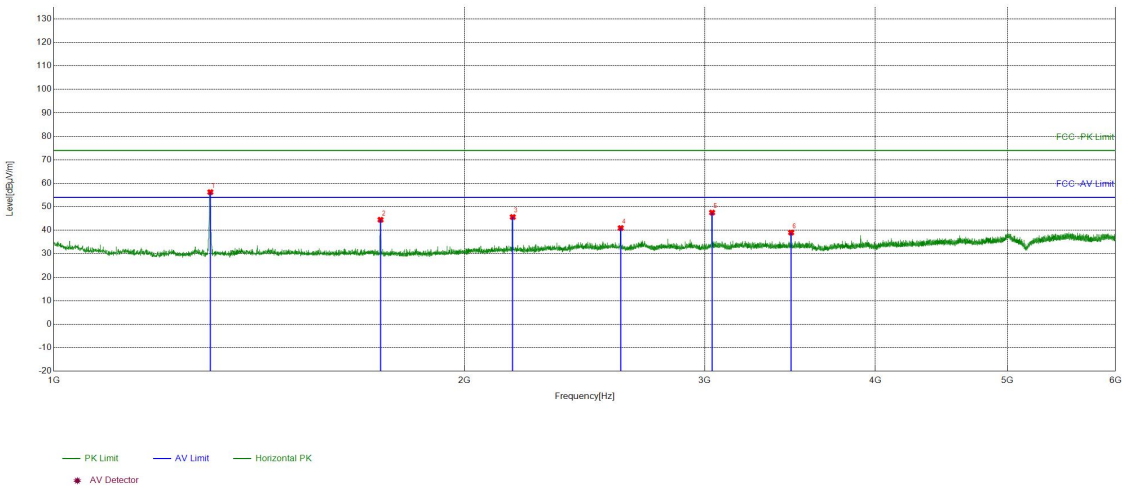
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		108.4756	4.91	13.15	18.06	43.50	-25.44	peak	100	236
2		216.9729	15.36	13.38	28.74	46.00	-17.26	peak	100	96
3		325.4816	15.83	17.17	33.00	46.00	-13.00	peak	100	302
4		379.7143	11.38	18.26	29.64	46.00	-16.36	peak	100	65
5	!	420.4328	21.02	19.12	40.14	46.00	-5.86	peak	100	65
6	*	433.9889	61.04	19.42	80.46	46.00	34.46	peak	200	69
7		542.4176	11.21	22.01	33.22	46.00	-12.78	peak	200	254



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree	Comment
1		54.5184	1.88	13.76	15.64	40.00	-24.36	peak	100	265	
2		89.9204	8.57	12.03	20.60	43.50	-22.90	peak	100	352	
3		216.9729	8.43	13.38	21.81	46.00	-24.19	peak	100	157	
4		325.4817	8.53	17.17	25.70	46.00	-20.30	peak	199	144	
5	*	433.9890	58.93	19.42	78.35	46.00	32.35	peak	199	49	
6		542.4176	10.87	22.01	32.88	46.00	-13.12	peak	199	60	
7		650.9138	5.32	23.87	29.19	46.00	-16.81	peak	100	55	

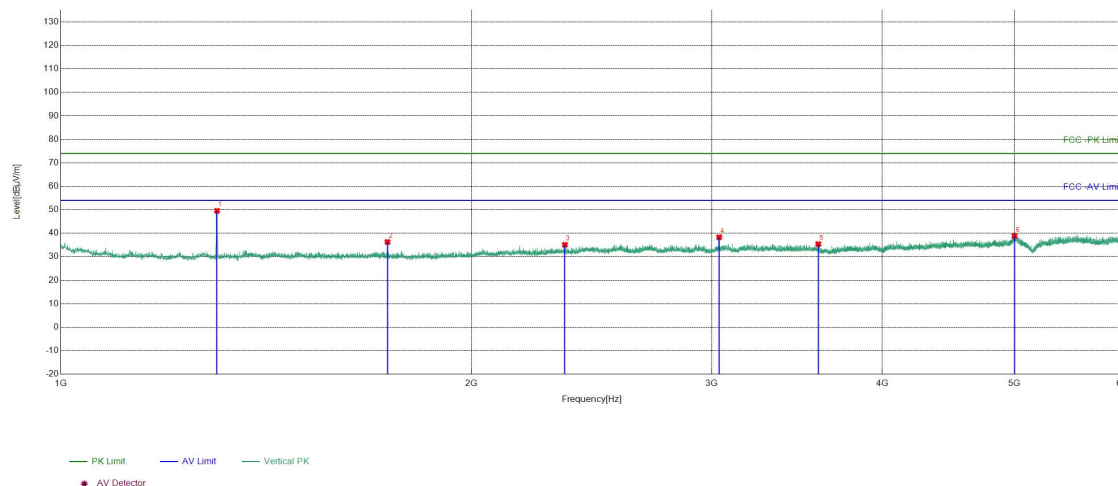
Above 1GHz

Horizontal:



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1302.3535	-25.48	81.72	56.24	74.00	17.76	PASS	Horizontal	PK
2	1735.7157	-24.84	69.32	44.48	74.00	29.52	PASS	Horizontal	PK
3	2169.7446	-22.73	68.37	45.64	74.00	28.36	PASS	Horizontal	PK
4	2603.4402	-20.71	61.65	40.94	74.00	33.06	PASS	Horizontal	PK
5	3037.4692	-19.61	67.15	47.54	74.00	26.46	PASS	Horizontal	PK
6	3471.1647	-18.56	57.57	39.01	74.00	34.99	PASS	Horizontal	PK

Vertical:



Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	1301.6868	-25.48	75.06	49.58	74.00	24.42	PASS	Vertical	PK
2	1735.7157	-24.84	61.15	36.31	74.00	37.69	PASS	Vertical	PK
3	2341.4228	-21.91	57.02	35.11	74.00	38.89	PASS	Vertical	PK
4	3037.8025	-19.62	57.95	38.33	74.00	35.67	PASS	Vertical	PK
5	3591.1727	-18.11	53.50	35.39	74.00	38.61	PASS	Vertical	PK
6	5000.9334	-13.51	52.34	38.83	74.00	35.17	PASS	Vertical	PK

Remark:

- The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} - \text{Correct Factor}$$

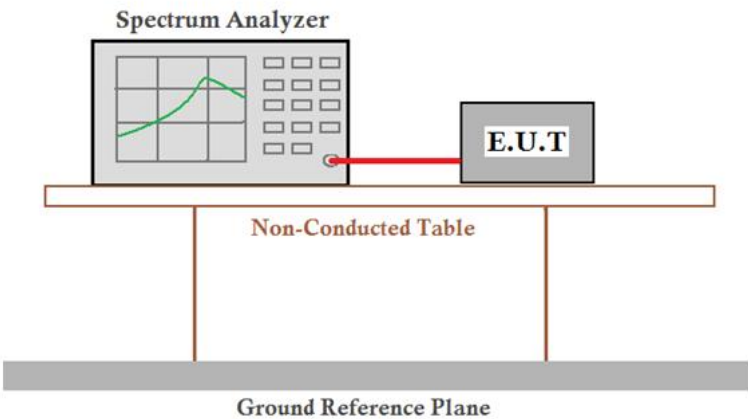
$$\text{Correct Factor} = \text{Preamplifier Factor} - \text{Antenna Factor} - \text{Cable Factor}$$
- Scan from 9kHz to 6GHz, the disturbance below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

5.3 20dB Bandwidth

Test Requirement: tion 15.231 (c)

Test Method:

Test Setup:



Limit:

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

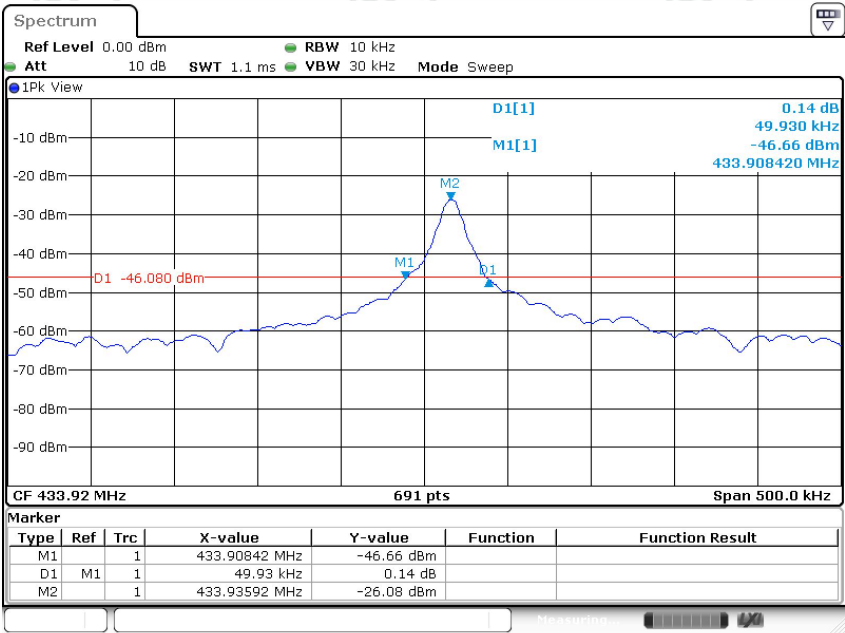
Test Mode: Transmitting mode

Test Results: Pass

Test data

Frequency(MHz)	20dB bandwidth (kHz)	Limit (kHz)	Results
433.92	49.930	≤1084.8	Pass

Test plot as follows:



Date: 15 JAN 2024 10:45:13

5.4 Dwell Time

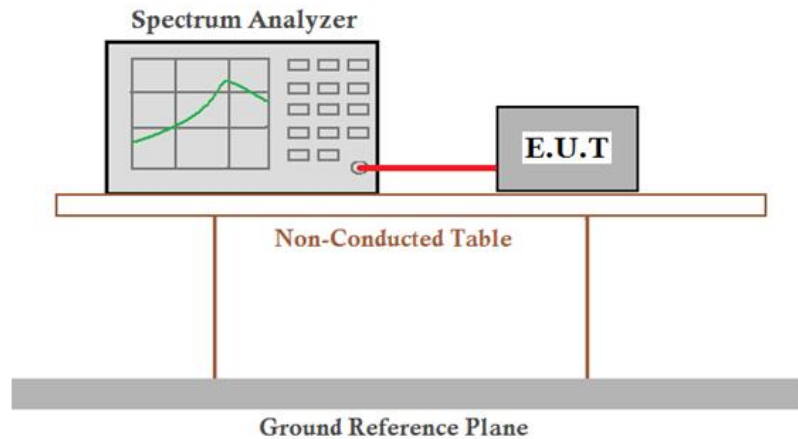
Test Requirement:

47 CFR Part 15C Section 15.231 (a)

Test Method:

ANSI C63.10:2013

Test Setup:



Limit:

Not more than 5 seconds

Test Mode:

Transmitting mode

Test Results:

Pass

Requirements:

1. Regulation 15.231 (a) The provisions of this Section are restricted to periodic operation within the band 40.66~40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this Section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Radio control of toys is not permitted. Continuous transmissions, such as voice or video, and data transmissions are not permitted. The prohibition against data transmissions does not preclude the use of recognition codes. Those codes are used to identify the sensor that is activated or to identify the particular component as being part of the system.

Result:

The EUT is a remote switch without audio or video transmitted.

The EUT meets the requirements of this section.

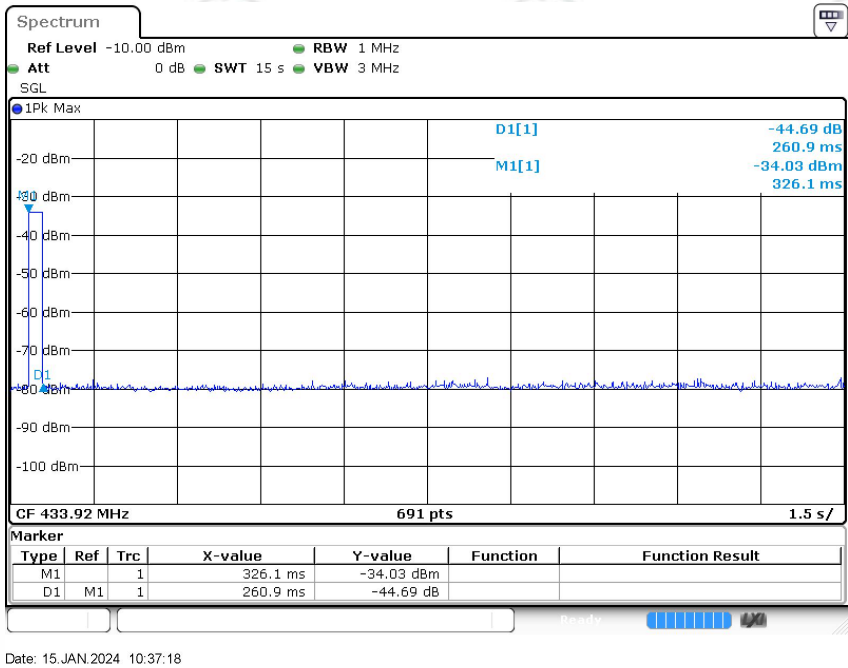
2. Regulation 15.231 (a1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Result:

Transmitting time (S)	Limit (S)	Results
0.2609	≤ 5	Pass

Transmitting time=260.9ms*1/1000=0.2609s

Test plot as follows:



3. Regulation 15.231 (a2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

Result:

The EUT does not have automatic transmission.

4. Regulation15.231 (a3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

Result:

The EUT does not employ periodic transmission.

5. Regulation 15.231 (a4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

Result:

This section is not applicable to the EUT.