TEST REPORT

Product	:	Electronic Smart Key
Trade mark	:	N/A
Model/Type reference	:	G3-3791200A-D1
Test Model No.:	:	G3-3791200A-D1
Serial Number	:	N/A
Report Number	:	EED32O80786301
FCC ID	:	2A5DHG3-3791200A-D1
Date of Issue	:	Jul. 08, 2022
Test Standards	:	47 CFR Part 15 Subpart C
Test result	:	PASS

Prepared for:

FinDreams Technology Company Limited
NO.3001~3009, Hengping Road, Pingshan New District, Shenzhen, Guangdong, P.R.China

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
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Compiled by:	Frazer Li	Reviewed by:	Tom Chen
Approved by:	Aaron Ma	Date:	Jul. 08, 2022

Check No.: 1535020622

1 Version

Version No.	Date	Description
00	Jul. 08, 2022	Original

2 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:

1.N/A:The product is powered by DC3.0V Battery.

2.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.

3 Contents

4 General Information

4.1 Client Information

Applicant:	FinDreams Technology Company Limited
Address of Applicant:	NO.3001~3009, Hengping Road, Pingshan New District, Shenzhen, Guangdong, P.R.China
Manufacturer:	FinDreams Technology Company Limited
Address of Manufacturer:	NO.3001~3009, Hengping Road, Pingshan New District, Shenzhen, Guangdong, P.R.China
Factory:	Electric Appliance Factory
Address of Factory:	No.1, West Qinling Avenue, Science and Technology Industrial Park, Caotang Town, High-tech Zone, Xi'an

4.2 General Description of EUT

Product Name:	Electronic Smart Key	
Model No.(EUT):	G3-3791200A-D1	
Trade Mark:	N/A	
Product Type:	☐ Mobile ☒ Portable ☐ Fix Location	
Power Supply:	Battery:	DC 3.0V
Frequency Range:	433.92MHz	
Modulation Type:	ASK	
Number of Channels:	1	
Antenna Type:	PCB antenna	
Antenna Gain:	-18dBi	
Test voltage:	DC 3.0V	
Sample Received Date:	Jun. 09, 2022	
Sample tested Date:	Jun. 09, 2022 to Jun. 26, 2022	

4.3 Test Environment and Mode

Operating Environment:	
Radiated Spurious Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
RF Conducted:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

1）support equipment

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

4.5 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

4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None.

4.8 Other Information Requested by the Customer

None.

4.9 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%

5 Equipment List

RF test system					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. Date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Spectrum Analyzer	R&S	FSP40	100416	04-01-2022	03-31-2023

3M Semi/full-anechoic Chamber					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05-22-2022	05-21-2025
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	05-22-2022	05-21-2023
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-15-2021	04-14-2024
Receiver	R&S	ESCI7	100938-003	10-14-2021	10-13-2022
Cable line	Fulai(7M)	SF106	5219/6A	---	---
Cable line	Fulai(6M)	SF106	5220/6A	---	---
Cable line	Fulai(3M)	SF106	5216/6A	---	---
Cable line	Fulai(3M)	SF106	5217/6A	---	---

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	03-01-2022	02-28-2023
Spectrum Analyzer	Keysight	N9020B	MY57111112	02-23-2022	02-22-2023
Spectrum Analyzer	Keysight	N9030B	MY57140871	02-23-2022	02-22-2023
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	04-20-2022	04-19-2023
Preamplifier	EMCI	EMC001330	980563	04-01-2022	03-31-2023
Preamplifier	JS Tonscend	980380	EMC051845SE	12-24-2021	12-23-2022
Communication test set	R&S	CMW500	102898	12-24-2021	12-23-2022
Temperature/ Humidity Indicator	biaozhi	GM1360	EE1186631	04-11-2022	04-10-2023
Fully Anechoic Chamber	TDK	FAC-3	---	01-09-2021	01-08-2024
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	---	---

6 Test results and Measurement Data

6.1 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 PCB antenna. The best case gain of the antenna is -18dBi.	

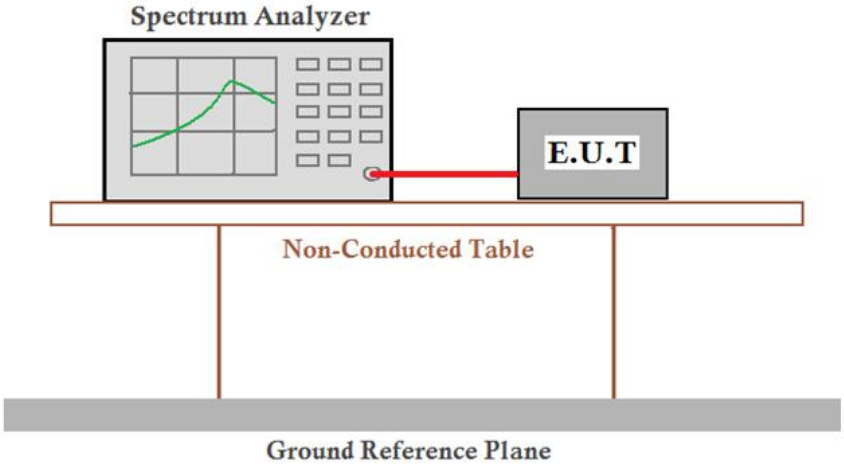
6.2 Spurious Emissions

6.2.1 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

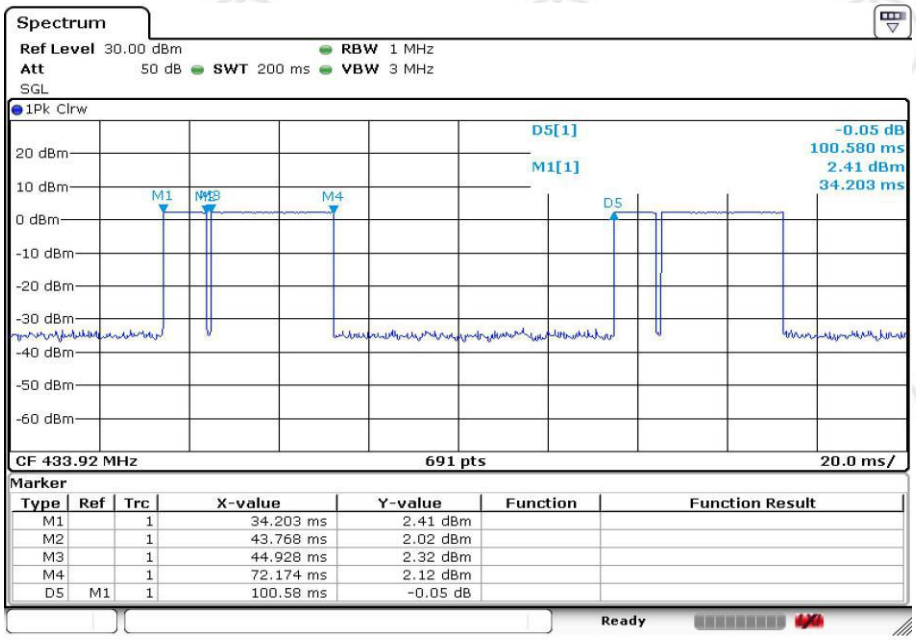
Test Results: Pass

T period (ms)	T on time (ms)	Duty cycle
100.0000	36.8110	0.368110

Note:
Duty cycle=T on time / T period

Test plot as follows:

Time slot:



6.2.2 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:

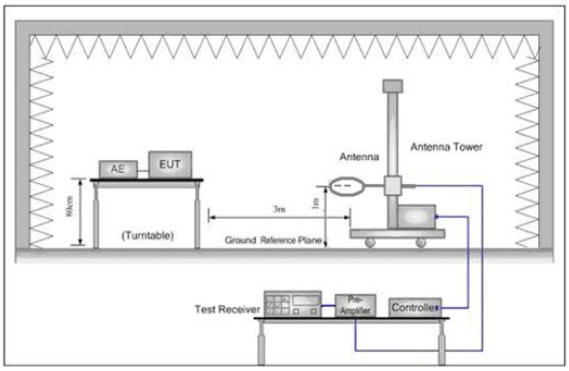


Figure 1. Below 30MHz

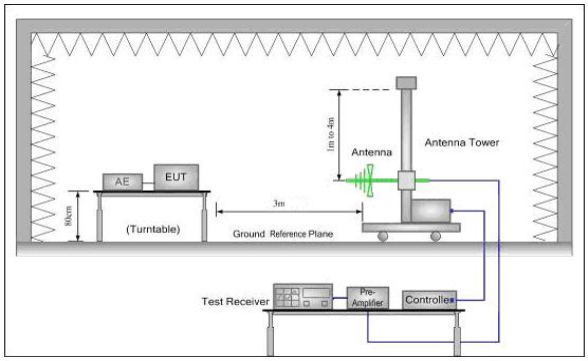


Figure 2. 30MHz to 1GHz

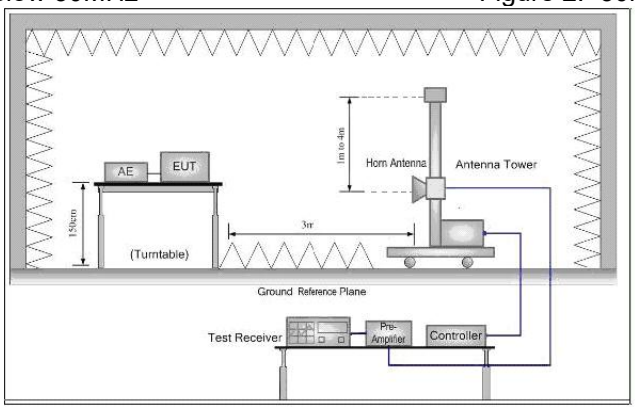


Figure 3. Above 1GHz

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. 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.
d. 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.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. 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:

g. 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).
h. Test the EUT in the only channel .
i. 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.
j. 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 log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	T on time =36.8110ms
	T period =100.0000ms
	PDCF=-8.680447689

Antenna polarization: Horizontal						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	54.91	20.12	75.03	100.8	-25.77	Peak
433.92	-	-	66.35	80.8	-14.45	Average

Antenna polarization: Vertical						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
433.92	47.36	20.12	67.48	100.8	-33.32	Peak
433.92	-	-	58.80	80.8	-22.00	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

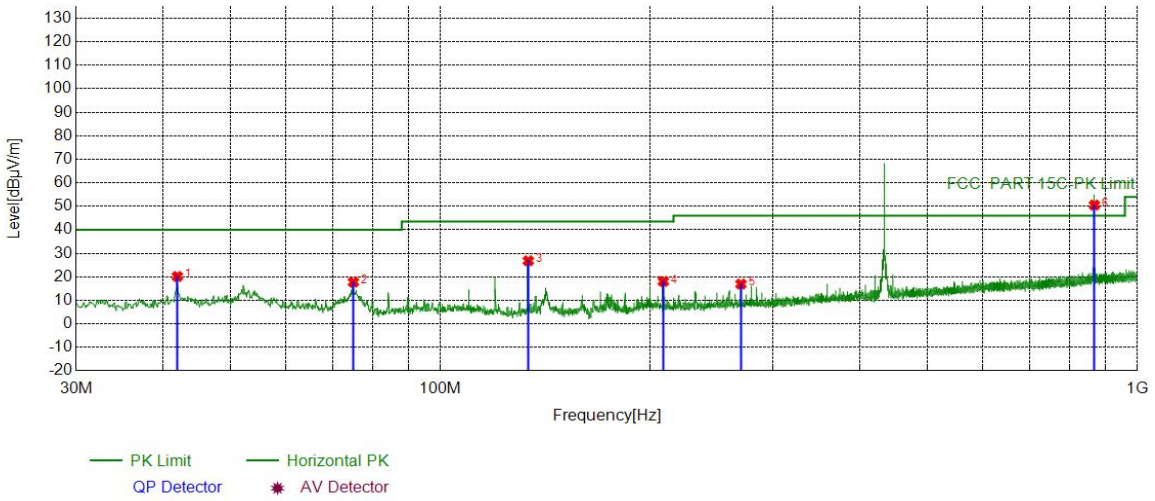
Spurious Emissions

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.

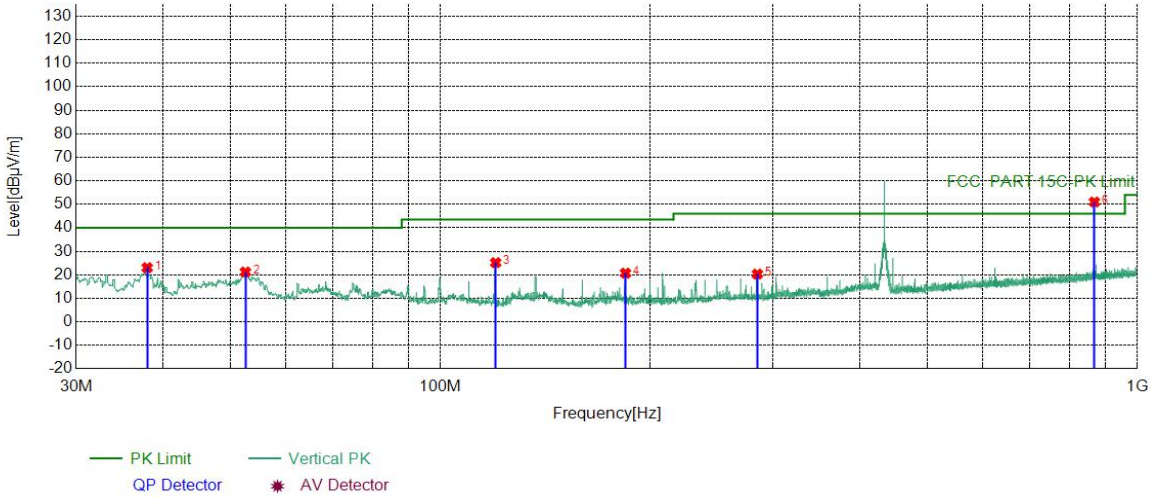
30MHz-1GHz

Horizontal:



Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	41.9322	-17.69	37.85	20.16	40.00	19.84	PASS	Horizontal	PK
2	75.0125	-21.68	39.43	17.75	40.00	22.25	PASS	Horizontal	PK
3	133.7034	-21.74	48.57	26.83	43.50	16.67	PASS	Horizontal	PK
4	208.8859	-17.63	35.69	18.06	43.50	25.44	PASS	Horizontal	PK
5	270.0020	-16.15	33.07	16.92	46.00	29.08	PASS	Horizontal	PK
6	867.9698	-5.26	55.79	50.53	60.83	10.30	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	37.9548	-18.67	41.71	23.04	40.00	16.96	PASS	Vertical	PK
2	52.5063	-17.51	38.72	21.21	40.00	18.79	PASS	Vertical	PK
3	120.0250	-20.08	45.26	25.18	43.50	18.32	PASS	Vertical	PK
4	184.3424	-19.36	40.07	20.71	43.50	22.79	PASS	Vertical	PK
5	285.0385	-15.83	36.16	20.33	46.00	25.67	PASS	Vertical	PK
6	867.9698	-5.26	56.25	50.99	60.83	9.84	PASS	Vertical	PK

Above 1GHz

Horizontal:

Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	1302.0201	-26.68	74.97	48.29	74.00	25.71	PASS	Horizontal	PK
2	1302.3535	-26.68	73.92	47.24	54.00	6.76	PASS	Horizontal	AV
3	1736.0491	-25.07	69.06	43.99	74.00	30.01	PASS	Horizontal	PK
4	1736.3824	-25.07	66.46	41.39	54.00	12.61	PASS	Horizontal	AV
5	2170.0780	-23.85	61.28	37.43	74.00	36.57	PASS	Horizontal	PK
6	2170.4114	-23.85	57.01	33.16	54.00	20.84	PASS	Horizontal	AV
7	2603.7736	-22.72	59.98	37.26	74.00	36.74	PASS	Horizontal	PK
8	2604.4403	-22.72	54.79	32.07	54.00	21.93	PASS	Horizontal	AV
9	3471.8315	-20.41	61.71	41.30	74.00	32.70	PASS	Horizontal	PK
10	3472.1648	-20.41	58.46	38.05	54.00	15.95	PASS	Horizontal	AV
11	3906.1937	-19.28	58.34	39.06	74.00	34.94	PASS	Horizontal	PK
12	3906.5271	-19.28	53.83	34.55	54.00	19.45	PASS	Horizontal	AV

Vertical:

Suspected List									
NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	1302.0201	-26.68	74.14	47.46	74.00	26.54	PASS	Vertical	PK
2	1302.3535	-26.68	73.22	46.54	54.00	7.46	PASS	Vertical	AV
3	1736.0491	-25.07	65.87	40.80	74.00	33.20	PASS	Vertical	PK
4	1736.3824	-25.07	63.33	38.26	54.00	15.74	PASS	Vertical	AV
5	2033.7356	-23.44	60.37	36.93	74.00	37.07	PASS	Vertical	PK
6	2034.0689	-23.44	49.09	25.65	54.00	28.35	PASS	Vertical	AV
7	2604.1069	-22.72	56.39	33.67	54.00	20.33	PASS	Vertical	AV
8	2604.1069	-22.72	61.84	39.12	74.00	34.88	PASS	Vertical	PK
9	3472.1648	-20.41	63.92	43.51	74.00	30.49	PASS	Vertical	PK
10	3472.4982	-20.41	61.79	41.38	54.00	12.62	PASS	Vertical	AV
11	3906.1937	-19.28	62.37	43.09	74.00	30.91	PASS	Vertical	PK
12	3906.5271	-19.28	59.29	40.01	54.00	13.99	PASS	Vertical	AV

Remark:

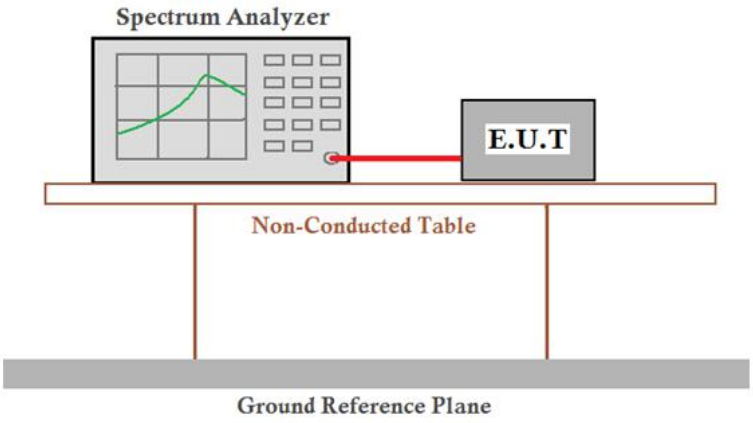
1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
   Final Test Level =Receiver Reading - Correct Factor
   Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor
2) Scan from 9kHz to 6GHz, 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.
3) The one with the * is the harmonic of 433.92MHz,and its limit is 60.83dBµV/m.

6.3 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.

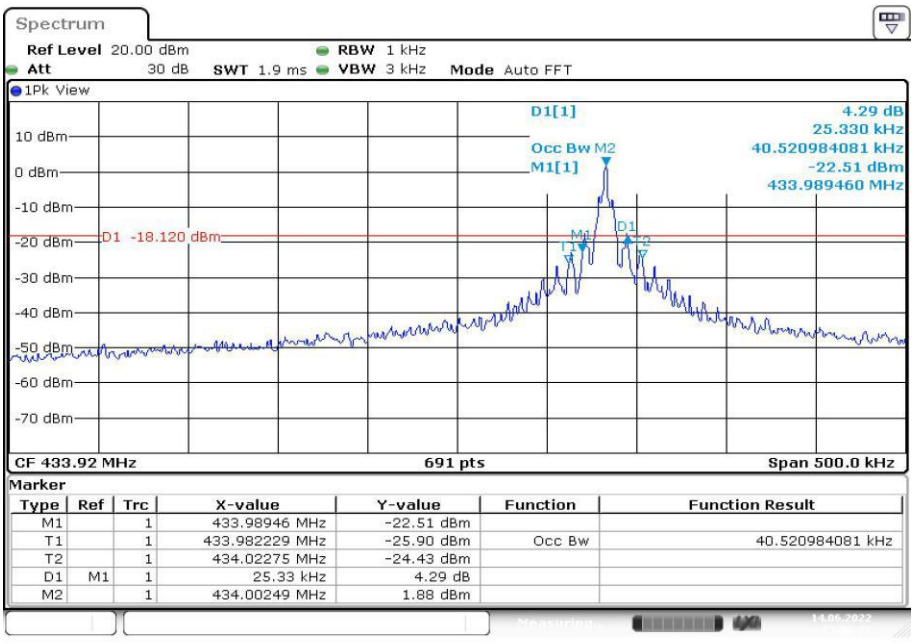
Test Mode: Transmitting mode

Test Results: Pass

Test data

20dB bandwidth (MHz)	Limit (MHz)	Results
0.02533	1.0848	PASS

Test plot as follows:

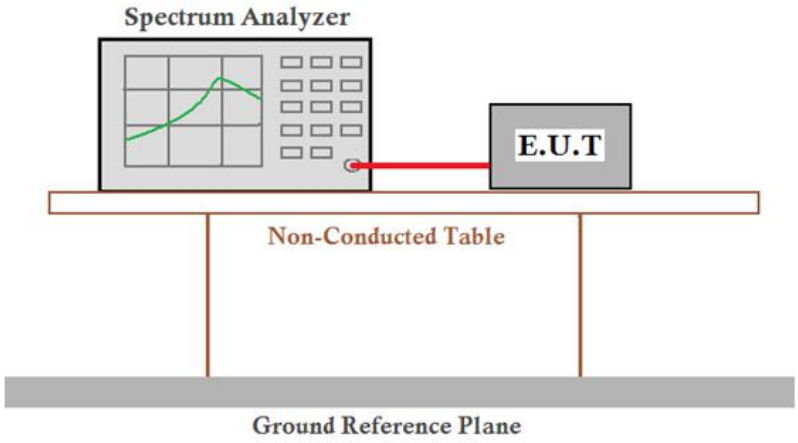


6.4 Dwell Time

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.

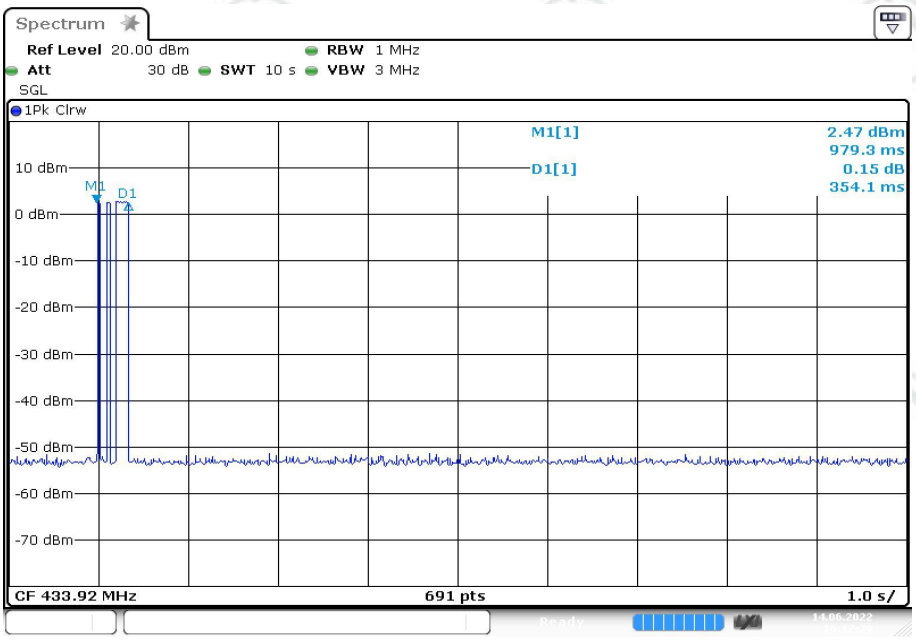
The EUT meets the requirements of this section.

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:

Test item	Limit (S)	Results (S)
Transmitting time	⩽5	0.3541

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.