

TEST REPORT

Product : Intelligent Automotive Detection Tool
Trade mark : **SmartSafe**
Model/Type reference : iSmartTool 601Max,
iSmartTool 601,
iSmartTool 601BT,
iSmartTool 601TT
Serial Number : N/A
Report Number : EED32N80831506
FCC ID : 2AYANISMARTTOOL
Date of Issue : Oct. 25, 2021
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

SHENZHEN SMARTSAFE TECH CO., LTD.
3F, Building B, Qiao'an Technology Industrial Park,
Guanlan, Longhua New District, Shenzhen, China

Prepared by:

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Oct. 25, 2021

Check No.:2230060921



1 Version

Version No.	Date	Description
00	Oct. 25, 2021	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	PASS
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. 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.

2. Model No.: iSmartTool 601Max, iSmartTool 601, iSmartTool 601BT, iSmartTool 601TT

Only the model iSmartTool 601Max was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being software, and model name.

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4 General Information

4.1 Client Information

Applicant:	SHENZHEN SMARTSAFE TECH CO., LTD.
Address of Applicant:	3F, Building B, Qiao'an Technology Industrial Park, Guanlan, Longhua New District, Shenzhen, China
Manufacturer:	SHENZHEN SMARTSAFE TECH CO., LTD.
Address of Manufacturer:	3F, Building B, Qiao'an Technology Industrial Park, Guanlan, Longhua New District, Shenzhen, China
Factory:	SHENZHEN SMARTSAFE TECH CO., LTD.
Address of Factory:	3F, Building B, Qiao'an Technology Industrial Park, Guanlan, Longhua New District, Shenzhen, China

4.2 General Description of EUT

Product Name:	Intelligent Automotive Detection Tool	
Model No.(EUT):	iSmartTool 601Max	
Add Model No.:	iSmartTool 601, iSmartTool 601BT, iSmartTool 601TT	
Trade Mark:		
Product Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location	
Power Supply:	AC Adapter	Model:C1902XZ/C1902XA/C1902XJ Input:100-240V~50/60Hz 0.5A Output:PD:5.0V,3.0A/9.0V,2.22A/12.0V,1.67A MAX:20.0W
	Rechargeable lithium ion battery	Model:KPL3878100-2S1P DC 7.6V,4500mAh,34.2Wh
Frequency Range:	315MHz	
Modulation Type:	FSK	
Number of Channels:	1	
Antenna Type:	Internal antenna	
Antenna Gain:	0dBi	
Power Supply:	AC Adapter	Model:C1902XZ/C1902XA/C1902XJ Input:100-240V~50/60Hz 0.5A Output:PD:5.0V,3.0A/9.0V,2.22A/12.0V,1.67A MAX:20.0W
	Rechargeable lithium ion battery	Model:KPL3878100-2S1P DC 7.6V,4500mAh,34.2Wh
Test voltage:	Rechargeable lithium ion battery DC 7.6V	
Sample Received Date:	Sep. 06, 2021	
Sample tested Date:	Sep. 06, 2021 to Oct. 26, 2021	

4.3 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
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
Sensor	SHENZHEN SMARTSAFE TECH CO., LTD.	LTR-01	CE&FCC	Client

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	FSV40	101200	08-26-2021	08-25-2022

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	---	05-24-2019	05-23-2022
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	05-16-2021	05-15-2022
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-15-2021	04-14-2024
Receiver	R&S	ESCI7	100938-003	10-16-2020 10-15-2021	10-15-2021 10-14-2022
Multi device Controller	matur	NCD/070/107 11112	---	---	---
Temperature/ Humidity Indicator	Shanghai qixiang	HM10	1804298	06-24-2021	06-23-2022
Communication test set	Agilent	E5515C	GB4705053 4	03-01-2019	02-28-2022
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	---	---
band rejection filter	Sinoscite	FL5CX01CA 08CL12- 0393-001	---	---	---

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100435	04-15-2021	04-14-2022
Temperature/ Humidity Indicator	Defu	TH128	/	---	---
LISN	R&S	ENV216	100098	03-04-2021	03-03-2022
Barometer	changchun	DYM3	1188	---	---

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	03-04-2021	03-03-2022
Spectrum Analyzer	Keysight	N9020B	MY57111112	03-04-2021	03-03-2022
Spectrum Analyzer	Keysight	N9030B	MY57140871	03-04-2021	03-03-2022
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
Communication Antenna	Schwarzbeck	CLSA 0110L	1014	---	---
Horn Antenna	ETS-LINDGREN	3117	57407	07-04-2021	07-03-2024
Preamplifier	EMCI	EMC184055SE	980597	05-20-2021	05-19-2022
Communication test set	R&S	CMW500	102898	12-31-2020	12-30-2021
Preamplifier	EMCI	EMC001330	980563	04-15-2021	04-14-2022
Preamplifier	JS Tonscend	980380	EMC051845 SE	12-31-2020	12-30-2021
Temperature/ Humidity Indicator	biaozhi	GM1360	EE1186631	04-16-2021	04-15-2022
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

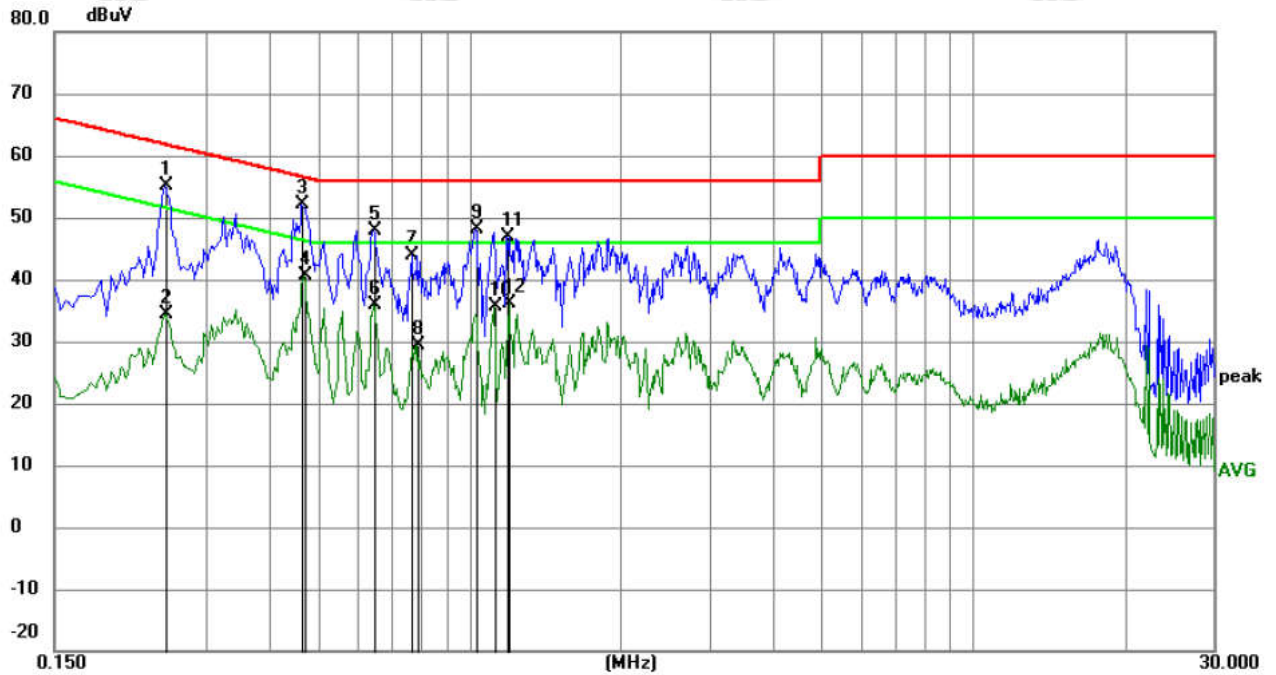
Standard requirement:	47 CFR Part 15C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique 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 Internal antenna. The best case gain of the antenna is 0dBi.	

6.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto		
Limit:	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 Setup:			
Test Procedure:	<ol style="list-style-type: none"> 1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 		
Test Mode:	All modes were tested, only the worst case was recorded in the report.		
Test Voltage:	AC 120V/60Hz		
Test Results:	Pass		

Measurement Data

Live line:

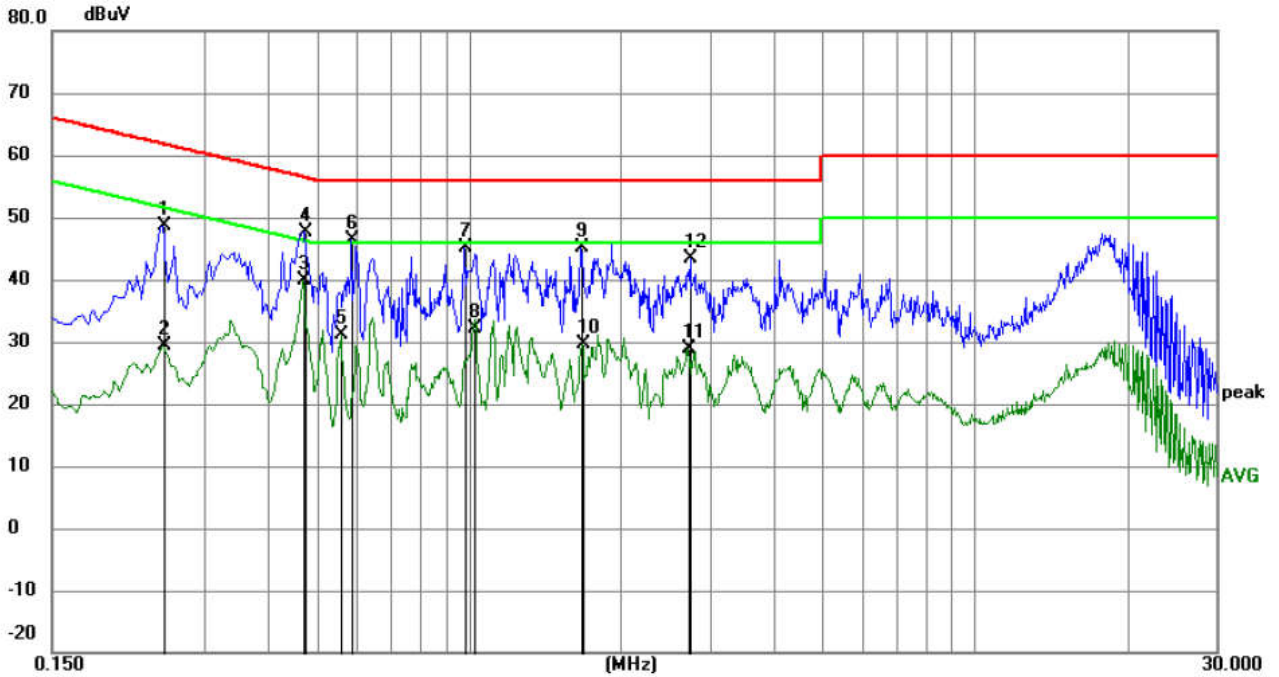


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.2490	45.05	9.97	55.02	61.79	-6.77	peak	
2		0.2490	24.52	9.97	34.49	51.79	-17.30	AVG	
3	*	0.4650	42.15	9.96	52.11	56.60	-4.49	peak	
4		0.4695	30.57	9.96	40.53	46.52	-5.99	AVG	
5		0.6450	37.97	9.98	47.95	56.00	-8.05	peak	
6		0.6450	26.02	9.98	36.00	46.00	-10.00	AVG	
7		0.7710	34.02	9.86	43.88	56.00	-12.12	peak	
8		0.7890	19.58	9.85	29.43	46.00	-16.57	AVG	
9		1.0275	38.34	9.83	48.17	56.00	-7.83	peak	
10		1.1220	25.86	9.83	35.69	46.00	-10.31	AVG	
11		1.1895	36.96	9.82	46.78	56.00	-9.22	peak	
12		1.1985	26.30	9.82	36.12	46.00	-9.88	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.2490	38.72	9.97	48.69	61.79	-13.10	peak	
2	0.2490	19.36	9.97	29.33	51.79	-22.46	AVG	
3 *	0.4695	29.93	9.96	39.89	46.52	-6.63	AVG	
4	0.4740	37.58	9.96	47.54	56.44	-8.90	peak	
5	0.5595	21.21	10.02	31.23	46.00	-14.77	AVG	
6	0.5865	36.37	10.05	46.42	56.00	-9.58	peak	
7	0.9825	35.24	9.83	45.07	56.00	-10.93	peak	
8	1.0230	22.27	9.83	32.10	46.00	-13.90	AVG	
9	1.6710	35.22	9.80	45.02	56.00	-10.98	peak	
10	1.6800	19.85	9.80	29.65	46.00	-16.35	AVG	
11	2.7150	19.01	9.79	28.80	46.00	-17.20	AVG	
12	2.7420	33.48	9.79	43.27	56.00	-12.73	peak	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

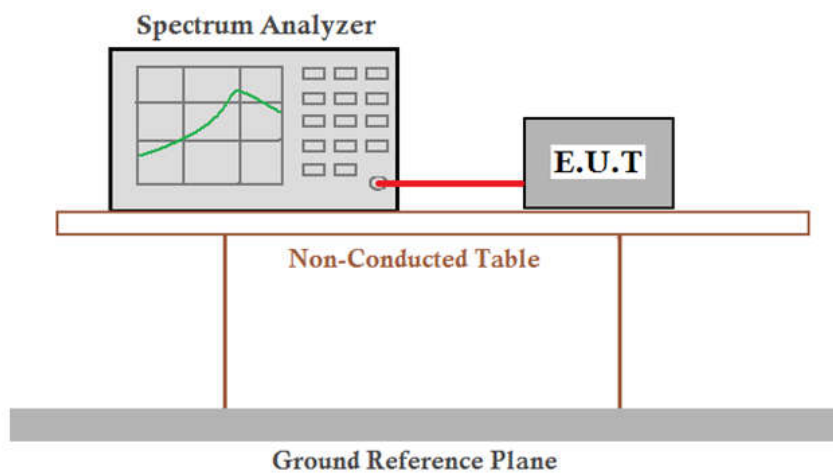
6.3 Spurious Emissions

6.3.1 Duty Cycle

Test Requirement: 47 CFR Part 15C Section 15.35 (c)

Test Method: ANSI C63.10:2013

Test Setup:



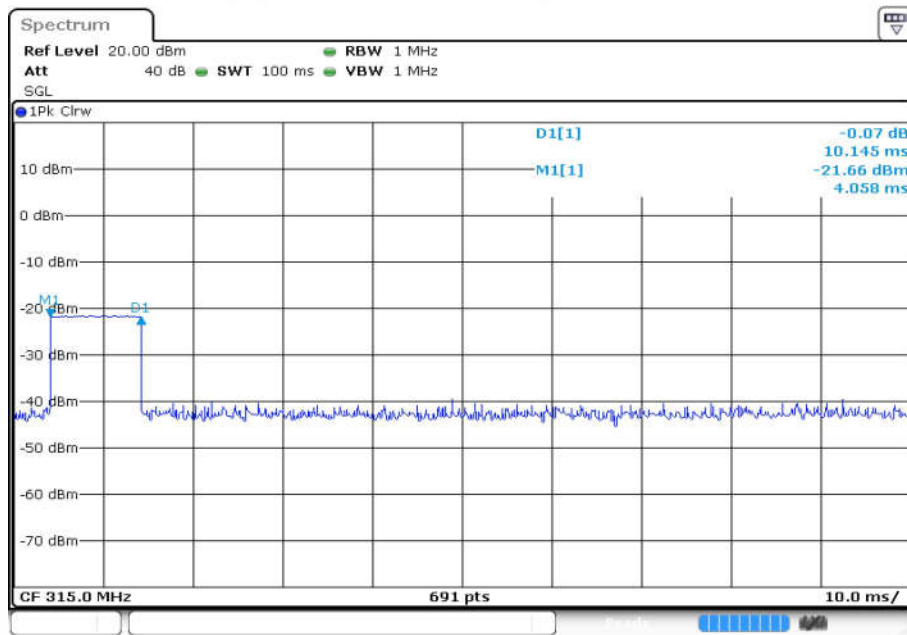
Limit: N/A
Test Mode: Transmitting mode
Test Results: Pass

T period (ms)	T on time (ms)	Duty cycle
100	10.145	0.10145

Note: Duty cycle=T on time / T period

Test plot as follows:

Time slot:



Date: 26.OCT.2021 14:13:24

6.3.2 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:

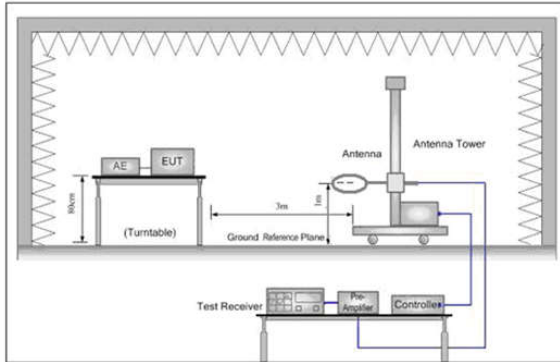


Figure 1. Below 30MHz

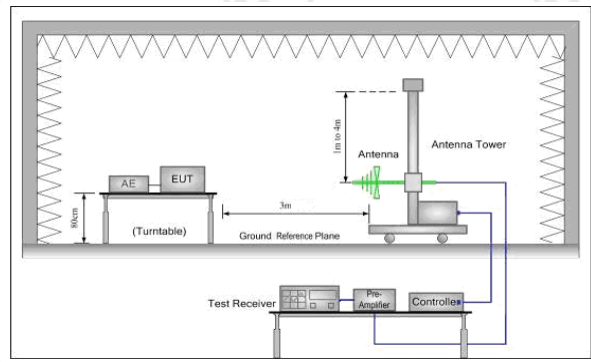


Figure 2. 30MHz to 1GHz

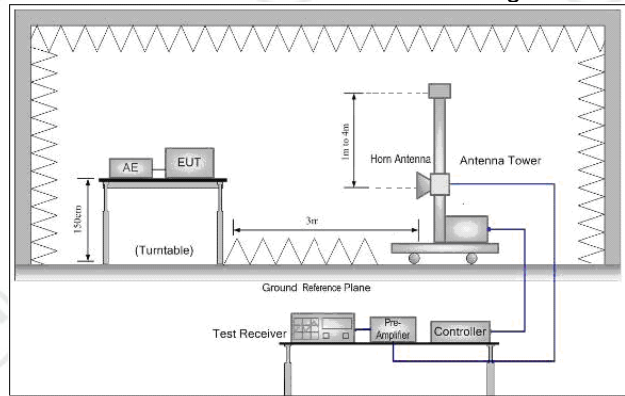


Figure 3. Above 1GHz

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 chamber. 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 (dB μ V/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 (dB μ V/m @3m)	Remark
315MHz	75.6	Average Value
	95.6	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 =10.145ms
	T period =100ms
	PDCF= -19.87

Antenna polarization: Horizontal						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
315	71.60	15.16	86.76	95.6	-8.84	Peak
315	-	-	66.89	75.6	-8.71	Average

Antenna polarization: Vertical						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
315	65.22	15.16	80.38	95.6	-15.22	Peak
315	-	-	60.51	75.6	-15.09	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:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

Spurious Emissions

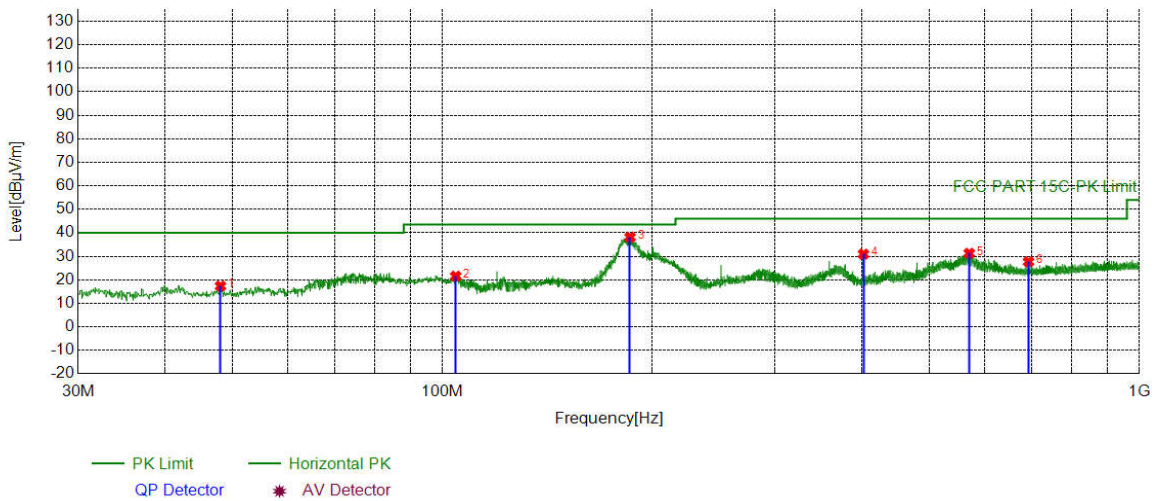
9KHz-30MHz

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

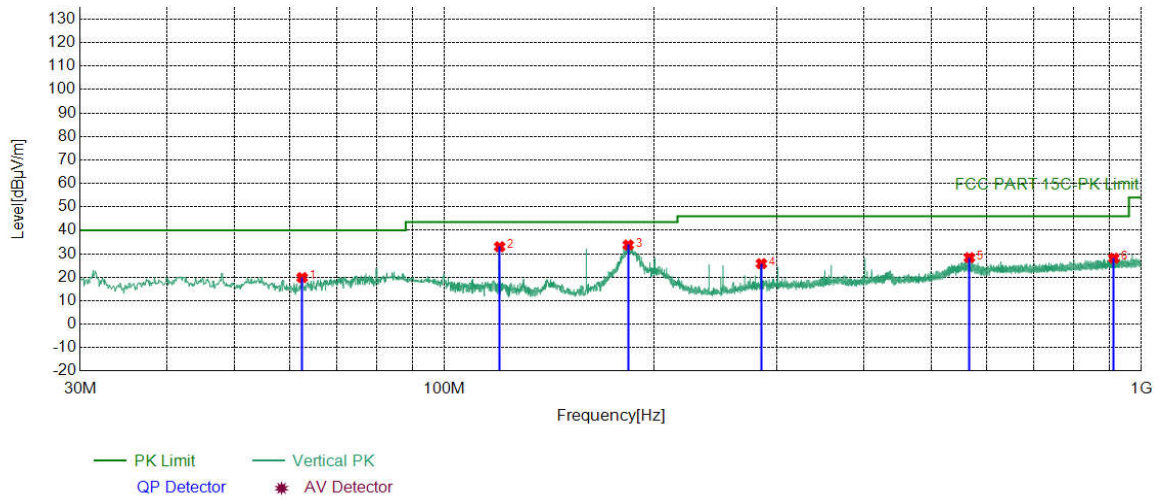
Horizontal:



Suspected List

NO	Freq. [MHz]	Factor [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Result	Polarity	Remark
1	48.0438	-17.17	34.53	17.36	40.00	22.64	PASS	Horizontal	PK
2	104.5035	-18.39	39.93	21.54	43.50	21.96	PASS	Horizontal	PK
3	185.8946	-19.20	57.34	38.14	43.50	5.36	PASS	Horizontal	PK
4	402.0322	-12.89	43.83	30.94	46.00	15.06	PASS	Horizontal	PK
5	570.2470	-9.29	40.58	31.29	46.00	14.71	PASS	Horizontal	PK
6	693.6434	-7.74	35.43	27.69	46.00	18.31	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	62.4983	-19.07	38.93	19.86	40.00	20.14	PASS	Vertical	PK
2	120.0250	-20.08	53.09	33.01	43.50	10.49	PASS	Vertical	PK
3	183.5664	-19.44	53.22	33.78	43.50	9.72	PASS	Vertical	PK
4	285.0385	-15.83	41.64	25.81	46.00	20.19	PASS	Vertical	PK
5	566.7547	-9.38	37.72	28.34	46.00	17.66	PASS	Vertical	PK
6	913.4673	-4.86	33.00	28.14	46.00	17.86	PASS	Vertical	PK

Above 1GHz

Peak value:

Frequency (MHz)	Height (cm)	Azimuth (deg)	Correct Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Antenna Polaxis
1336.4336	-26.73	58.97	32.24	74.00	41.76	Pass	H
1612.4612	-26.01	59.54	33.53	74.00	40.47	Pass	H
2184.5185	-24.00	58.46	34.46	74.00	39.54	Pass	H
2699.7700	-22.27	58.08	35.81	74.00	38.19	Pass	V
3471.4471	-20.41	58.01	37.60	74.00	36.40	Pass	V
4772.3772	-16.43	56.21	39.78	74.00	34.22	Pass	V

Average value:

Frequency (MHz)	Height (cm)	Azimuth (deg)	Correct Factor (dB)	Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Antenna Polaxis
1268.4268	-26.65	59.50	32.85	74.00	41.15	Pass	H
1635.6636	-25.81	59.76	33.95	74.00	40.05	Pass	H
2099.7100	-23.10	58.64	35.54	74.00	38.46	Pass	H
2802.1802	-21.86	57.99	36.13	74.00	37.87	Pass	V
3450.2450	-20.44	57.57	37.13	74.00	36.87	Pass	V
4257.1257	-17.55	57.28	39.73	74.00	34.27	Pass	V

Remark:

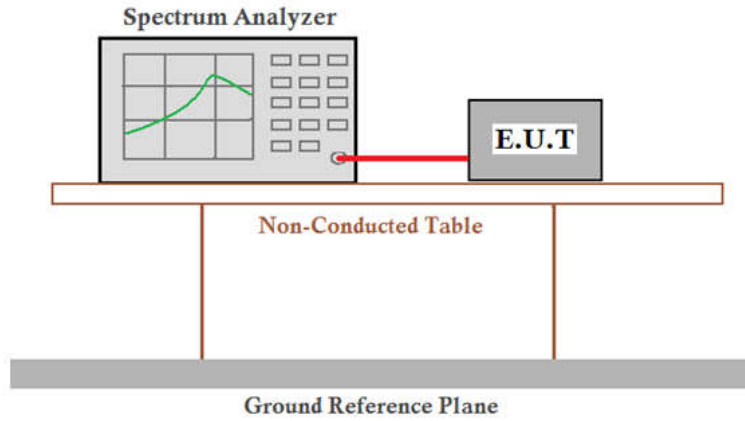
- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
 Final Test Level = Receiver Reading - Correct Factor
 Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor
- 2) Scan from 9kHz 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.

6.4 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.

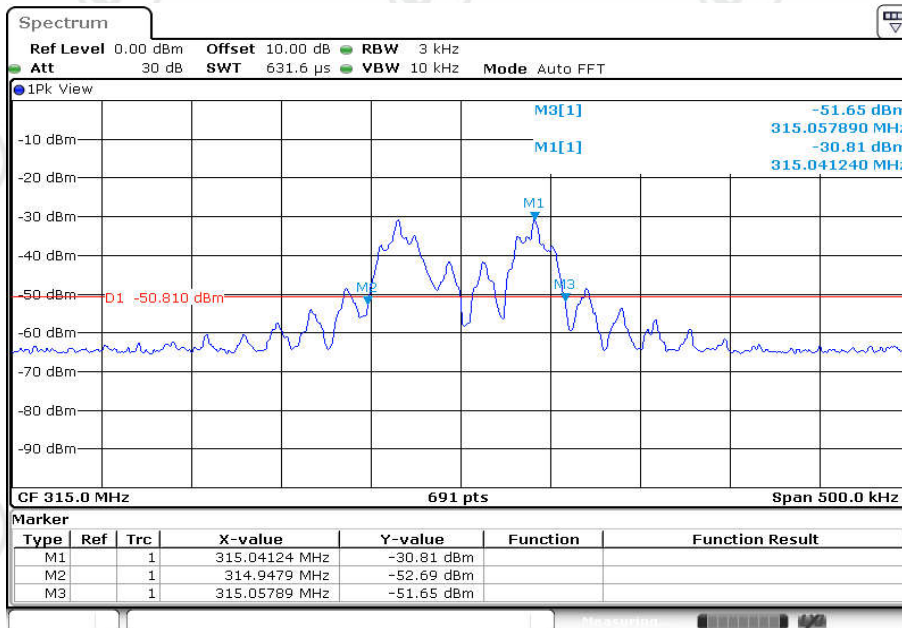
Test Mode: Transmitting mode

Test Results: Pass

Test data

20dB bandwidth (MHz)	Limit (MHz)	Results
0.10999	0.7875	PASS

Test plot as follows:



Date: 24 SEP 2021 13:21:48

6.5 Dwell Time

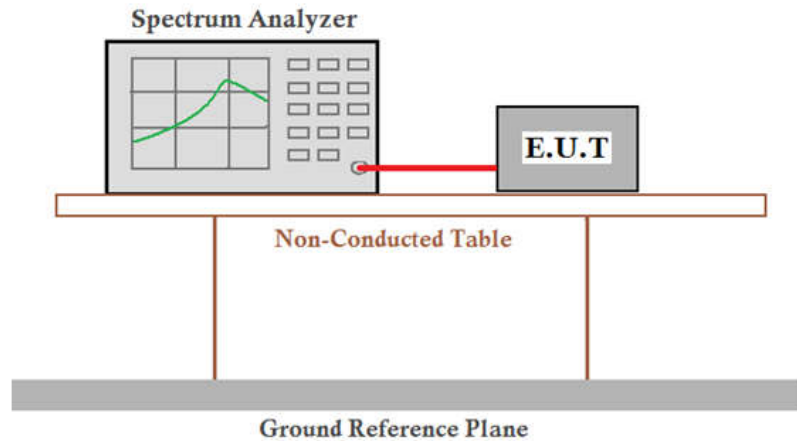
Test Requirement:

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.

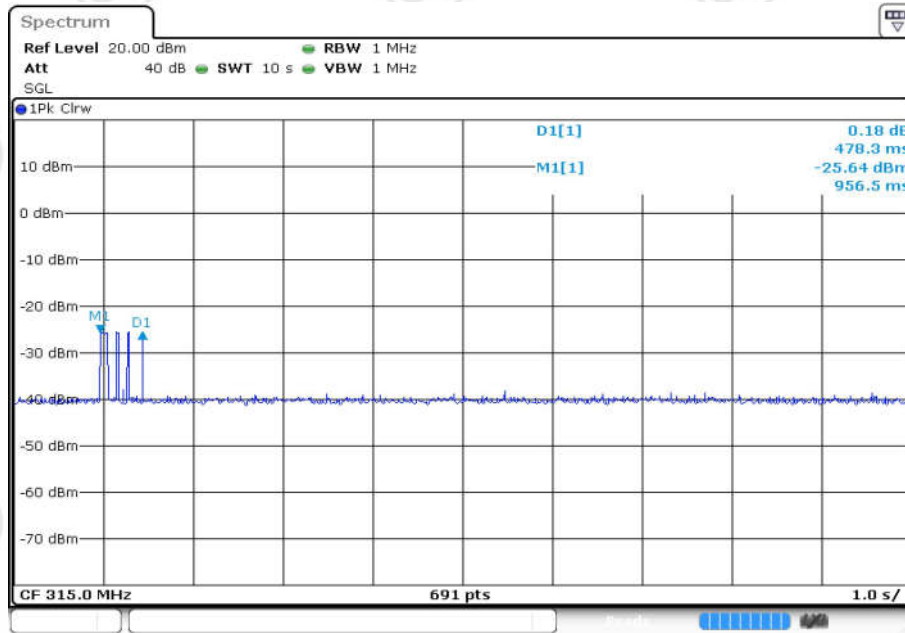
The EUT meets the requirements of this section.

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	0.4783

Test plot as follows:



Date: 26.OCT.2021 14:09:25

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. Regulation 15.231 (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.