SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch

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TEST REPORT

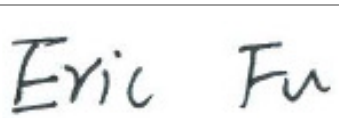
Application No.:	SZEM1703002497CR
Applicant:	GUANGDONG CHEERSON HOBBY TECHNOLOGY CO., LTD
Address of Applicant:	Fengxin No. 2 Road & Laimei Road, Fengxin Industrial Zone, Chenghai, Shantou, Guangdong province, China
Manufacturer:	GUANGDONG CHEERSON HOBBY TECHNOLOGY CO., LTD
Address of Manufacturer:	Fengxin No. 2 Road & Laimei Road, Fengxin Industrial Zone, Chenghai, Shantou, Guangdong province, China
Factory:	GUANGDONG CHEERSON HOBBY TECHNOLOGY CO., LTD
Address of Factory:	Fengxin No. 2 Road & Laimei Road, Fengxin Industrial Zone, Chenghai, Shantou, Guangdong province, China
Equipment Under Test (EUT):	
EUT Name:	UFO
Model No.:	CX-17, CX-17W, CX-17S, CX-17-TX, CX-18, CX-117, CX-95W, CX-95, CX-95S, CX-90, CX-19, CX-20, CX-22, CX-23, CX-32, CX-32W, CX-32S, CX-32C, CX-33, CX-33W, CX-33C, CX-33S, CX-30, CX-30C, CX-30W, CX-30W-TX, CX-30S, TINY95, TINY90, TINY93, CX-93, CX-93C, CX-93W, CX-93S, CX-96, CX-98, CX-97, CX-70, CX-23 ♣
♣	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
FCC ID:	2AD6LGC0324171
Standards:	47 CFR Part 15, Subpart C 15.249
Date of Receipt:	2017-03-30
Date of Test:	2017-04-03 to 2017-04-13
Date of Issue:	2017-04-19
Test Result :	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2017-04-19		Original

Authorized for issue by:				
Tested By				2017-04-13
		Bill Chen /Project Engineer		**Date**
Checked By				2017-04-19
		Eric Fu /Reviewer		**Date**

2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
Antenna Requirement	47 CFR Part 15, Subpart C 15.249	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Field Strength of the Fundamental Signal(15.249(a))	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass
Restricted Band Around Fundamental Frequency	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass

Remark:

Model No.: CX-17, CX-17W, CX-17S, CX-17-TX, CX-18, CX-117, CX-95W, CX-95, CX-95S, CX-90, CX-19, CX-20, CX-22, CX-23, CX-32, CX-32W, CX-32S, CX-32C, CX-33, CX-33W, CX-33C, CX-33S, CX-30, CX-30C, CX-30W, CX-30W-TX, CX-30S, TINY95, TINY90, TINY93, CX-93, CX-93C, CX-93W, CX-93S, CX-96, CX-98, CX-97, CX-70, CX-23

Only the model CX-17 was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, only different on model name.

3 Contents

4 General Information

4.1 Details of E.U.T.

Product Name:	UFO
Model No.:	CX-17
Carrier Frequency:	2420MHz-2460MHz
Modulation Type:	GFSK
Number of Channels:	41
Channel Spacing:	1MHz (declared by the client)
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	2dBi
Power supply:	Tx: DC 3.0V by 1.5V x 2 "AAA" batteries

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2420MHz	12	2431MHz	23	2442MHz	34	2453MHz
2	2421MHz	13	2432MHz	24	2443MHz	35	2454MHz
3	2422MHz	14	2433MHz	25	2444MHz	36	2455MHz
4	2423MHz	15	2434MHz	26	2445MHz	37	2456MHz
5	2424MHz	16	2435MHz	27	2446MHz	38	2457MHz
6	2425MHz	17	2436MHz	28	2447MHz	39	2458MHz
7	2426MHz	18	2437MHz	29	2448MHz	40	2459MHz
8	2427MHz	19	2438MHz	30	2449MHz	41	2460MHz
9	2428MHz	20	2439MHz	31	2450MHz		
10	2429MHz	21	2440MHz	32	2451MHz		
11	2430MHz	22	2441MHz	33	2452MHz		

Using test software was control EUT work in continuous transmitter and receiver mode.and select test channel as below:

Channel	Frequency
The Lowest channel(CH1)	2420MHz
The Middle channel(CH22)	2440MHz
The Highest channel(CH41)	2460MHz

4.2 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Laptop	Lenovo	T430u
Test board	Supply to SGS	FT232

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10-8
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7 8	RF Radiated power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
9	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-18GHz)
	Temperature test	1℃
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

• **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

• **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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 No.: 556682.

• **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

RE in Chamber					
Test Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (yyyy-mm-dd)**	**Cal. Due date (yyyy-mm-dd)**
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2016-05-13	2017-05-13
EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-09	2016-07-19	2017-07-19
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
Horn Antenna (18-26GHz)	ETS-Lindgren	3160	SEM003-12	2014-11-24	2017-11-24
Horn Antenna(26GHz-40GHz)	A.H.Systems, inc.	SAS-573	SEM003-13	2015-02-12	2018-02-12
Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09
Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A

20dB Bandwidth					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2016-05-18	2017-05-18

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.249

6.1.2 Conclusion

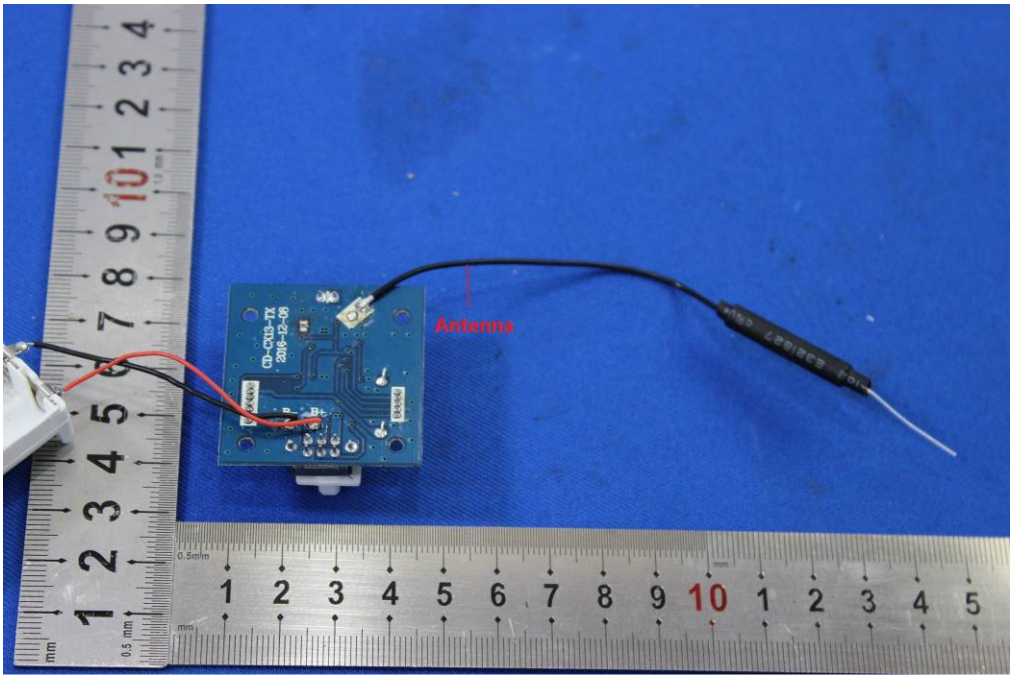
Standard Requirment:

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:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.



7 Radio Spectrum Matter Test Results

7.1 Field Strength of the Fundamental Signal(15.249(a))

Test Requirement 47 CFR Part 15, Subpart C 15.249(a)
Test Method: ANSI C63.10 (2013) Section 6.5&6.6
Measurement Distance: 3m
Limit:

Frequency	Limit (dBuV/m @3m)	Remark
2400MHz-2483.5MHz	94.0	Average Value
	114.0	Peak Value

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 55 % RH Atmospheric Pressure: 1020 mbar

Test mode: b:TX mode_Keep the EUT in transmitting mode

7.1.2 Measurement Data

a. For below 1GHz, 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. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. 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.

e. 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.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. 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.

h. Test the EUT in the lowest channel,the middle channel,the Highest 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 the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Mode:b; Polarization:Horizontal; Modulation Type:GFSK; Channel:Low

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2420.420	29.17	5.36	37.96	110.06	106.63	114	-7.37
2420.420	29.17	5.36	37.96	91.19	87.76	94	-6.24

Mode:b; Polarization:Vertical; Modulation Type:GFSK; ; Channel:Low

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2420.175	29.17	5.36	37.96	109.44	106.01	114	-7.99
2420.175	29.17	5.36	37.96	90.56	87.13	94	-6.87

Mode:b; Polarization:Horizontal; Modulation Type:GFSK; Channel:middle

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2440.358	29.23	5.38	37.96	109.59	106.24	114	-7.76
2440.358	29.23	5.38	37.96	90.78	87.43	94	-6.56

Mode:b; Polarization:Vertical; Modulation Type:GFSK; Channel:middle

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2440.118	29.23	5.38	37.96	107.86	104.51	114	-9.49
2440.118	29.23	5.38	37.96	88.98	85.63	94	-8.37

Mode:b; Polarization:Horizontal; Modulation Type:GFSK; Channel:High

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2460.068	29.28	5.39	37.95	112.62	109.34	114	-4.66
2460.068	29.28	5.39	37.95	93.89	90.61	94	-3.39

Mode:b; Polarization:Vertical; Modulation Type:GFSK; Channel:High

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2460.068	29.28	5.39	37.95	108.24	104.96	114	-9.04
2460.068	29.28	5.39	37.95	90.78	87.5	94	-6.5

7.2 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)
Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6
Measurement Distance: 3m
Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30
30-88	100	40.0	QP	3
88-216	150	43.5	QP	3
216-960	200	46.0	QP	3
960-1000	500	54.0	QP	3
Above 1000	500	54.0	AV	3

7.2.1 E.U.T. Operation

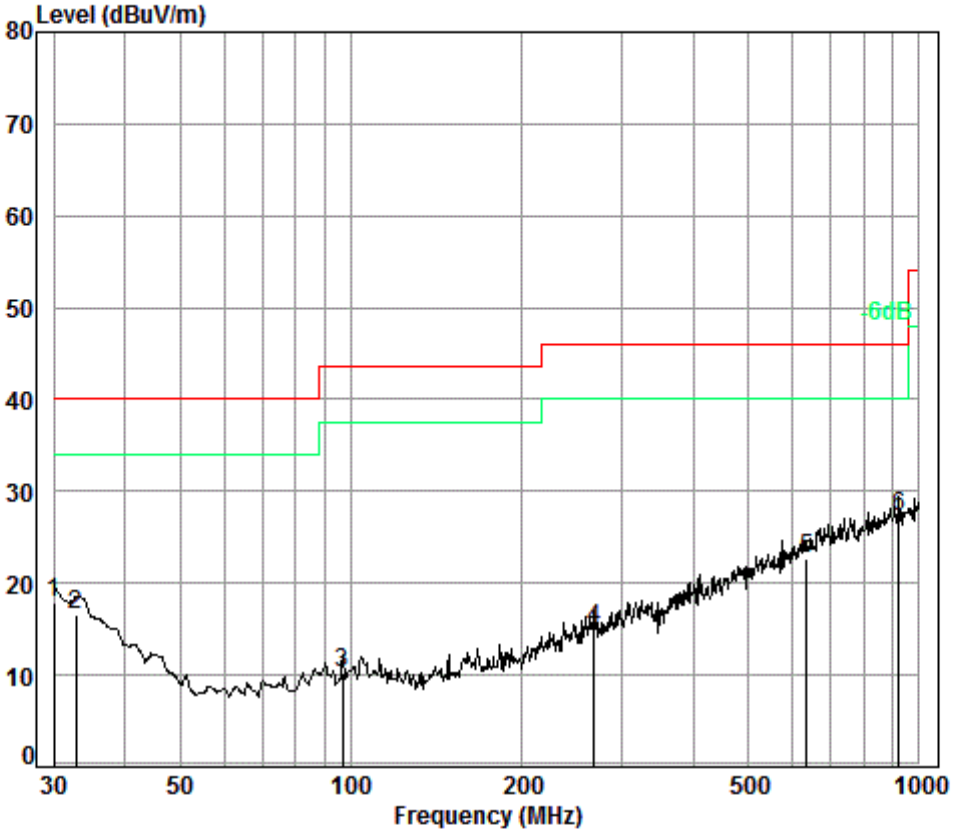
Operating Environment:
Temperature: 25.0 °C Humidity: 55 % RH Atmospheric Pressure: 1020 mbar
Test mode: b:TX mode_Keep the EUT in transmitting mode

7.2.2 Measurement Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

30MHz~1GHz

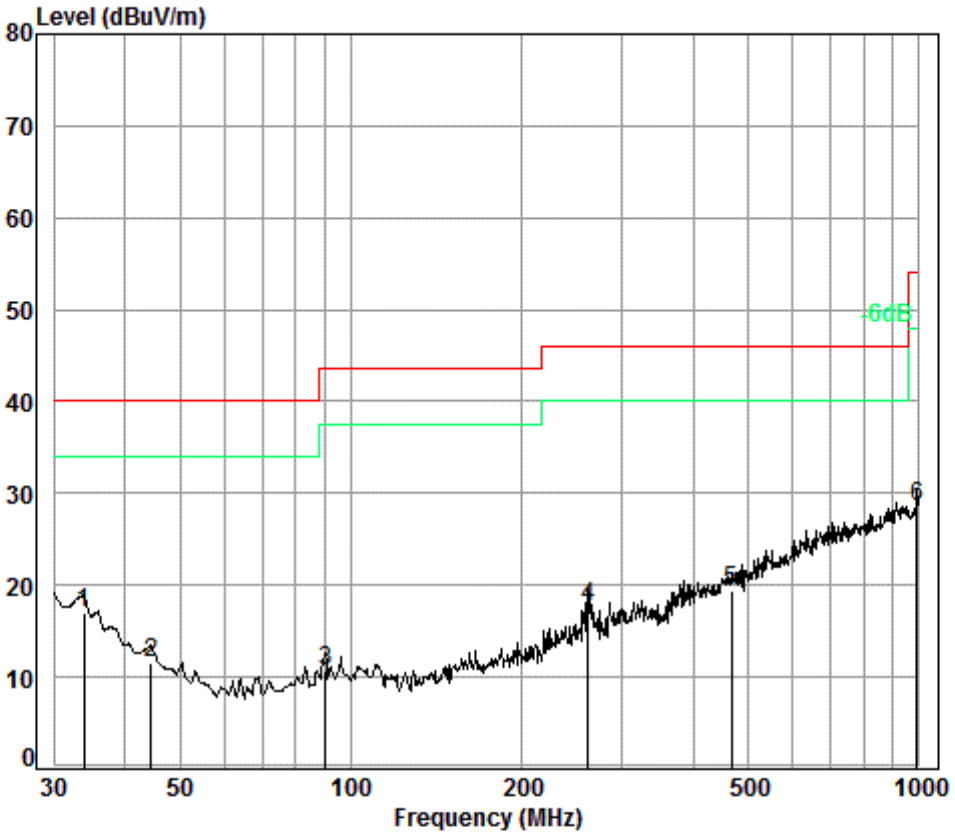
Mode:b ; Horizontal



Condition: 3m HORIZONTAL
Job No. : 02497CR
Test mode: b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.00	0.60	18.70	27.36	25.98	17.92	40.00	-22.08
2	32.86	0.60	17.10	27.35	26.18	16.53	40.00	-23.47
3	96.77	1.17	8.97	27.20	27.32	10.26	43.50	-33.24
4	267.55	1.76	12.65	26.49	27.16	15.08	46.00	-30.92
5	633.91	2.77	20.54	27.49	26.90	22.72	46.00	-23.28
6 pp	922.52	3.62	23.29	26.68	27.12	27.35	46.00	-18.65

Mode:b ; Vertical



Condition: 3m VERTICAL
Job No. : 02497CR
Test mode: b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	33.92	0.60	16.51	27.34	27.16	16.93	40.00	-23.07
2	44.59	0.70	11.08	27.31	27.08	11.55	40.00	-28.45
3	90.22	1.10	8.71	27.21	28.03	10.63	43.50	-32.87
4	261.98	1.73	12.54	26.50	29.92	17.69	46.00	-28.31
5	467.24	2.48	17.52	27.54	26.91	19.37	46.00	-26.63
6	989.54	3.69	23.88	26.37	27.31	28.51	54.00	-25.49

Mode:b; Polarization:Horizontal; Modulation Type:GFSK; Channel:Low

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
3864.464	33.24	6.60	37.99	45.10	47.43	74	-26.57
4840.000	34.22	7.78	38.42	45.53	49.51	74	-24.49
6157.871	34.83	8.85	38.14	44.18	50.01	74	-23.99
7260.000	36.39	9.69	37.07	56.32	65.58	74	-8.42
9680.000	37.54	11.13	35.06	39.44	53.50	74	-20.50
12476.26	38.89	13.11	36.74	33.24	53.12	74	-20.88

Average

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
7260.000	36.39	9.69	37.07	33.40	42.66	54	-11.34

Mode:b; Polarization:Vertical; Modulation Type:GFSK; Channel:Low

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
3847.726	33.19	6.58	37.98	44.83	47.11	74	-26.89
4840.000	34.22	7.78	38.42	48.39	52.37	74	-21.63
5761.355	34.56	8.52	38.35	45.66	50.79	74	-23.21
7260.000	36.39	9.69	37.07	57.00	66.26	74	-7.74
9680.000	37.54	11.13	35.06	39.77	53.83	74	-20.17
12548.68	38.89	13.16	36.92	37.6	53.32	74	-20.68

Average

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
7260.000	36.39	9.69	37.07	33.31	42.57	54	-11.43

Mode:b; Polarization:Horizontal; Modulation Type:GFSK; Channel:middle

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
3705.664	32.80	6.47	37.97	44.60	46.41	74.00	-27.59
4880.000	34.29	7.83	38.44	46.44	50.53	74.00	-23.47
6025.661	34.72	8.77	38.27	44.33	49.87	74.00	-24.13
7320.000	36.37	9.73	37.01	54.05	63.38	74.00	-10.62
9760.000	37.55	11.21	35.02	42.34	56.54	74.00	-17.46
12314.840	38.79	12.87	36.36	37.87	53.84	74.00	-20.16

Average

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
7320.000	36.37	9.73	37.01	35.79	45.12	54.00	-8.88
9760.000	37.55	11.21	35.02	23.24	37.44	54.00	-16.56

Mode:b; Polarization:Vertical; Modulation Type:GFSK; Channel:middle

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
3831.060	33.15	6.57	37.98	43.80	46.03	74	-27.97
4880.000	34.29	7.83	38.44	46.74	50.83	74	-23.17
6016.949	34.71	8.76	38.28	44.31	49.82	74	-24.18
7320.000	36.37	9.73	37.01	55.31	64.64	74	-9.36
9760.000	37.55	11.21	35.02	43.68	57.88	74	-16.12
12458.220	38.88	13.08	36.70	37.44	53.32	74	-20.68

Average

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
7320.000	36.37	9.73	37.01	36.74	46.07	54	-7.93
9760.000	37.55	11.21	35.02	24.75	38.95	74	-15.05

Mode:b; Polarization:Horizontal; Modulation Type:GFSK; Channel:High

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
3743.387	32.90	6.50	37.97	44.67	46.61	74	-27.39
4920.000	34.36	7.89	38.46	52.59	56.80	74	-17.20
6069.413	34.76	8.79	38.23	44.68	50.30	74	-23.70
7380.000	36.35	9.77	36.96	55.52	64.90	74	-9.10
9840.000	37.57	11.29	34.98	43.74	58.08	74	-15.92
12386.320	38.83	12.97	36.53	37.65	53.56	74	-20.44

Average

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
4920.000	34.36	7.89	38.46	32.62	37.83	54	-16.17
7380.000	36.35	9.77	36.96	32.78	45.16	54	-8.84
9840.000	37.57	11.29	34.98	24.65	38.99	54	-15.01

Mode:b; Polarization:Vertical; Modulation Type:GFSK; Channel:High

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
3492.224	32.19	6.29	37.95	44.41	45.48	74	-28.52
4920.000	34.36	7.89	38.46	50.39	54.60	74	-19.40
6247.618	34.90	8.91	38.05	45.45	51.51	74	-22.49
7380.000	36.35	9.77	36.96	55.97	65.35	74	-8.65
9840.000	37.57	11.29	34.98	45.14	59.48	74	-14.52
11963.580	38.56	12.40	35.59	37.43	53.58	74	-20.42

Average

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
4920.000	34.36	7.89	38.46	28.83	33.04	54	-20.96
7380.000	36.35	9.77	36.96	36.57	45.95	54	-8.05
9840.000	37.57	11.29	34.98	25.31	39.65	54	-14.35

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 + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 25GHz,The disturbance above 13GHz and 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 .

7.3 Restricted Band Around Fundamental Frequency

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209
Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6
Measurement Distance: 3m
Limit:

Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
Above 1GHz	74.0	Peak Value
Emission 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 Section 15.209,whichever is the lesser attenuation.		

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0 °C Humidity: 53 % RH Atmospheric Pressure: 1020 mbar

Test mode: b:TX mode_Keep the EUT in transmitting mode

7.3.2 Measurement Data

a. For below 1GHz, 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. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. 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.

e. 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.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

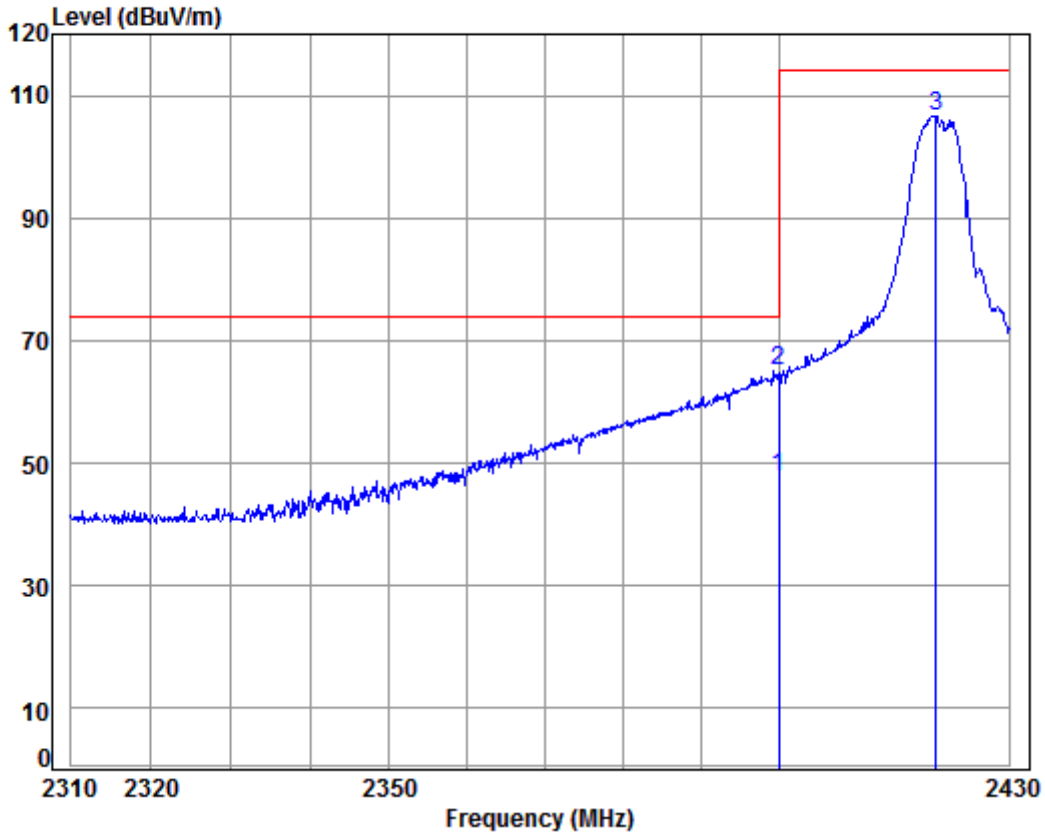
g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel,the middle channel,the Highest 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 the worst case.

j. Repeat above procedures until all frequencies measured was complete.

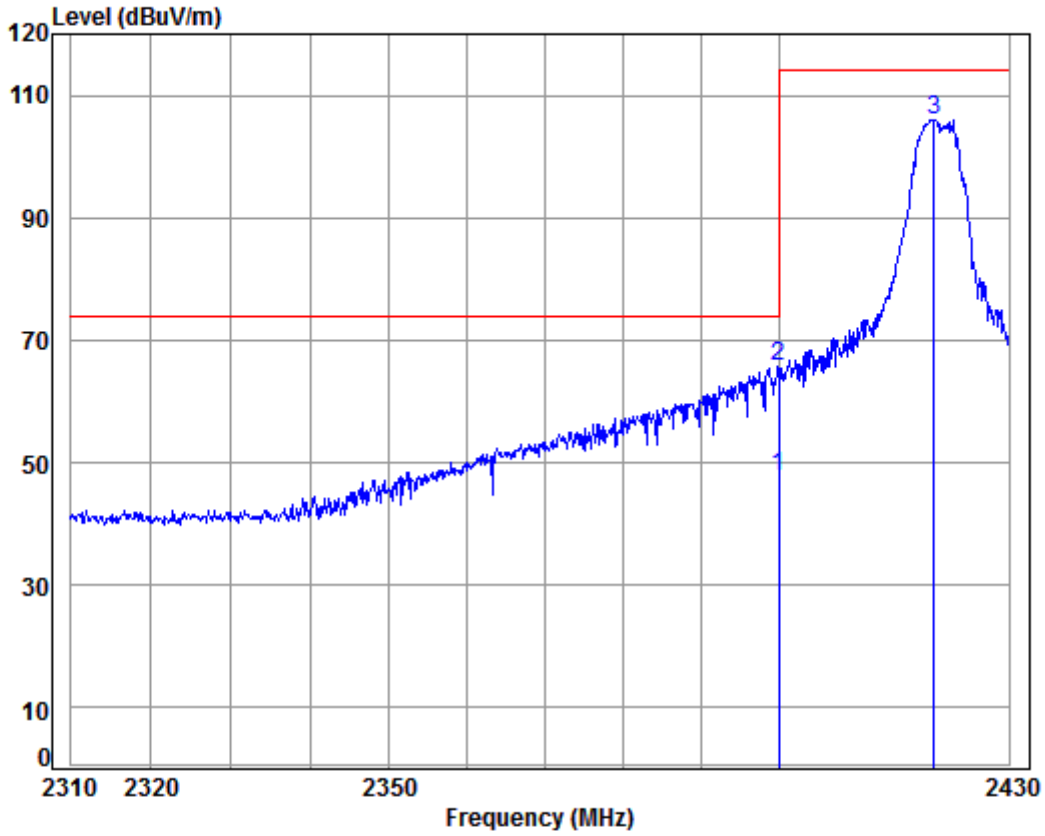
Mode:b; Polarization:Horizontal; Channel:Low



Condition: 3m Horizontal
Job No: : 02497CR
Mode: : 2420 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2400.000	5.34	29.11	37.96	51.26	47.75	54.00	-6.25	Average
2	2400.000	5.34	29.11	37.96	68.54	65.03	74.00	-8.97	Peak
3 pk	2420.420	5.36	29.17	37.96	110.06	106.63	114.00	-7.37	Peak

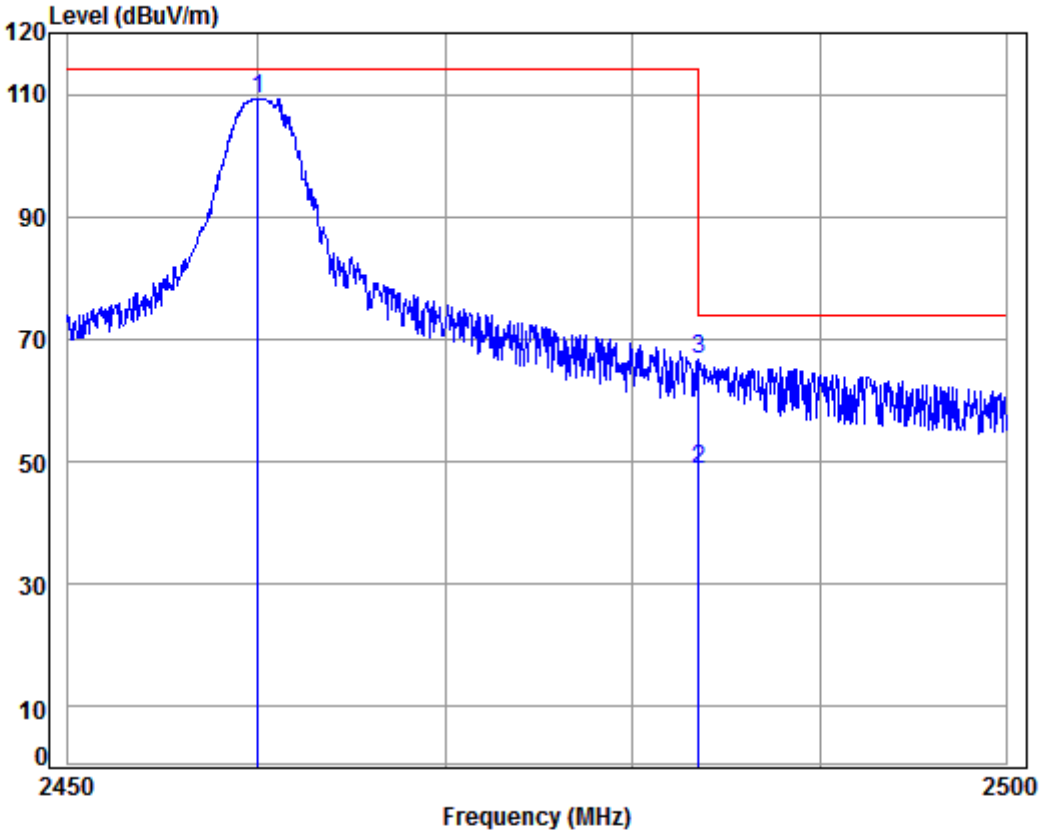
Mode:b; Polarization:Vertical; Channel:Low



Condition: 3m Vertical
Job No: : 02497CR
Mode: : 2420 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 2400.000	5.34	29.11	37.96	51.39	47.88	54.00	-6.12	Average
2	2400.000	5.34	29.11	37.96	69.33	65.82	74.00	-8.18	Peak
3	pk 2420.175	5.36	29.17	37.96	109.44	106.01	114.00	-7.99	Peak

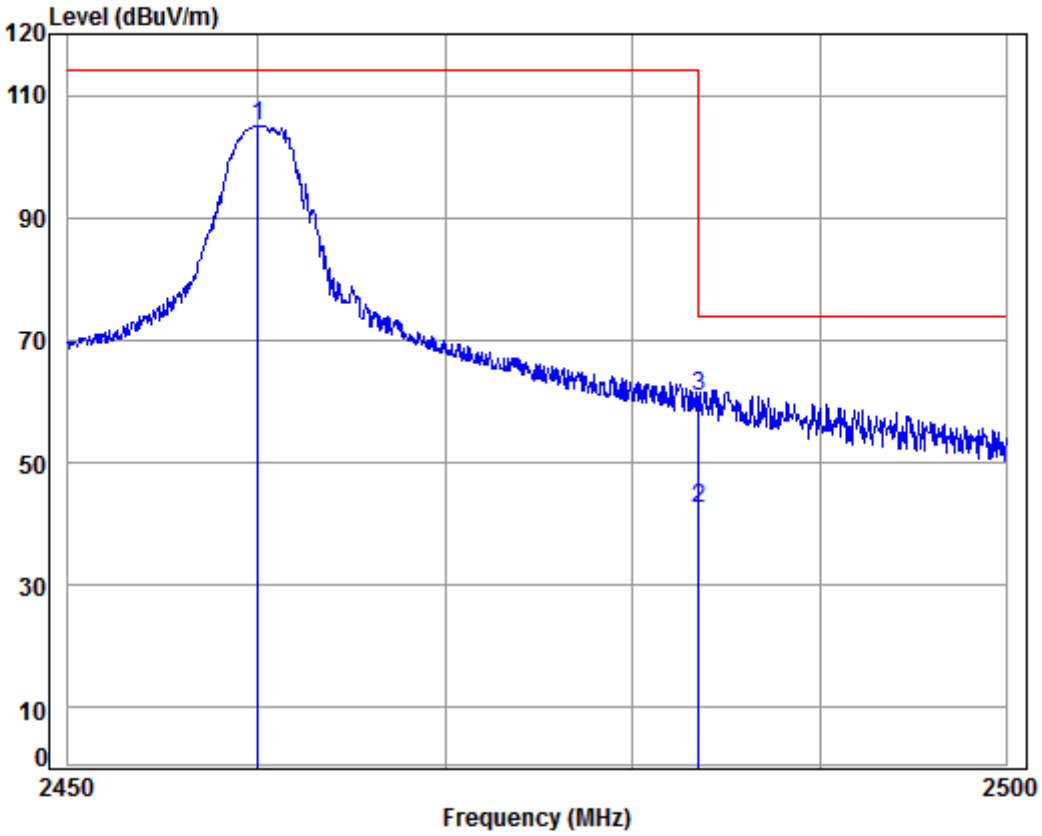
Mode:b; Polarization:Horizontal; Channel:High



Condition: 3m Horizontal
Job No: : 02497CR
Mode: : 2460 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2460.068	5.39	29.28	37.95	112.62	109.34	114.00	-4.66	Peak
2 av	2483.500	5.41	29.35	37.95	51.83	48.64	54.00	-5.36	Average
3	2483.500	5.41	29.35	37.95	69.92	66.73	74.00	-7.27	Peak

Mode:b; Polarization:Vertical; Channel: High



Condition: 3m VERTICAL
Job No: : 02497CR
Mode: : 2460 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2460.068	5.39	29.28	37.95	108.24	104.96	114.00	-9.04	Peak
2 av	2483.500	5.41	29.35	37.95	45.58	42.39	54.00	-11.61	Average
3	2483.500	5.41	29.35	37.95	63.88	60.69	74.00	-13.31	Peak

7.4 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215
Test Method: ANSI C63.10 (2013) Section 6.9
Limit: N/A

7.4.1 E.U.T. Operation

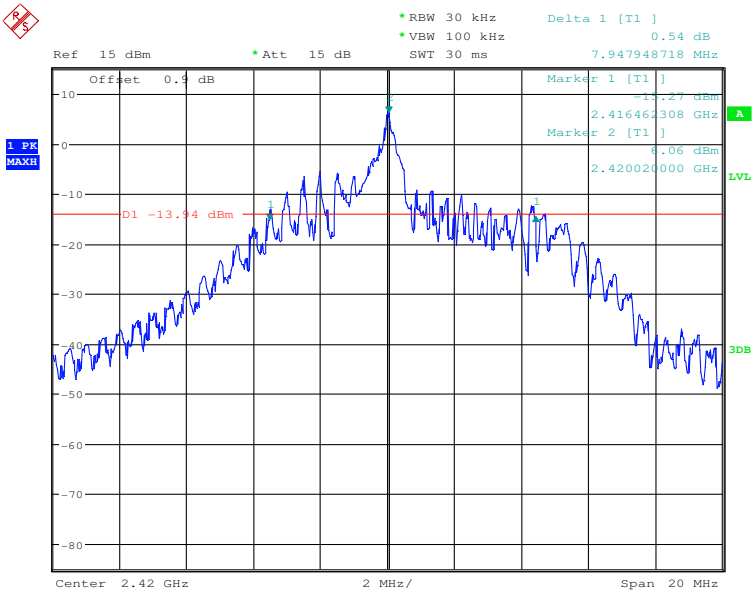
Operating Environment:
Temperature: 23.0 °C Humidity: 56 % RH Atmospheric Pressure: 1020 mbar
Test mode: b:TX mode_Keep the EUT in transmitting mode

7.4.2 Measurement Data

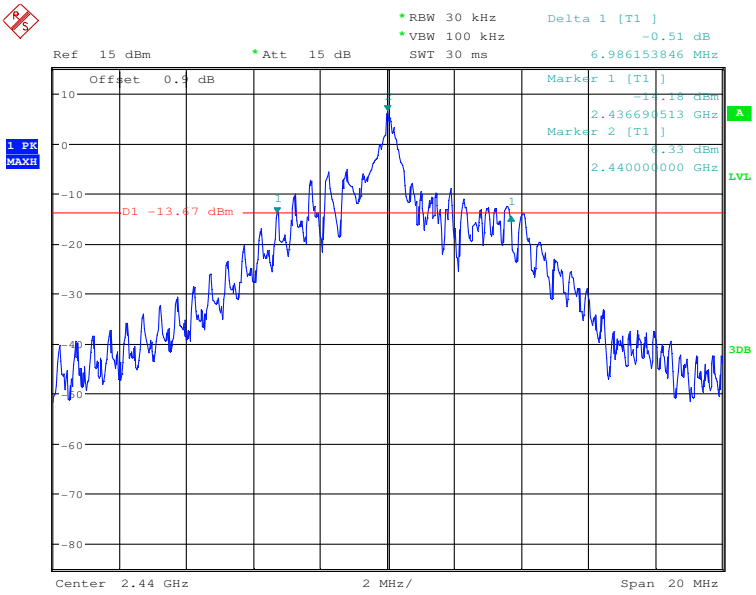
Test Channel	20dB bandwidth (MHz)	Results
Lowest	7.948	Pass
Middle	6.986	Pass
Highest	5.734	Pass

Test plot as follows:

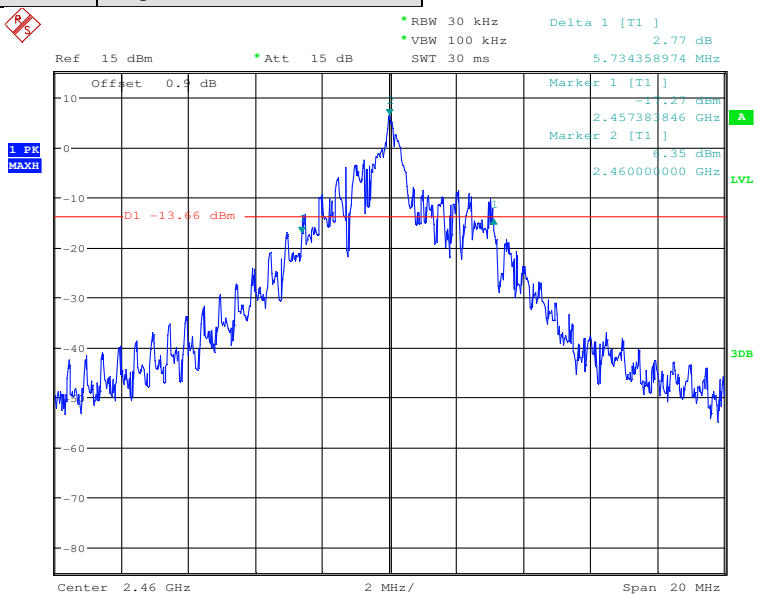
Test channel:	Lowest



Test channel:	Middle

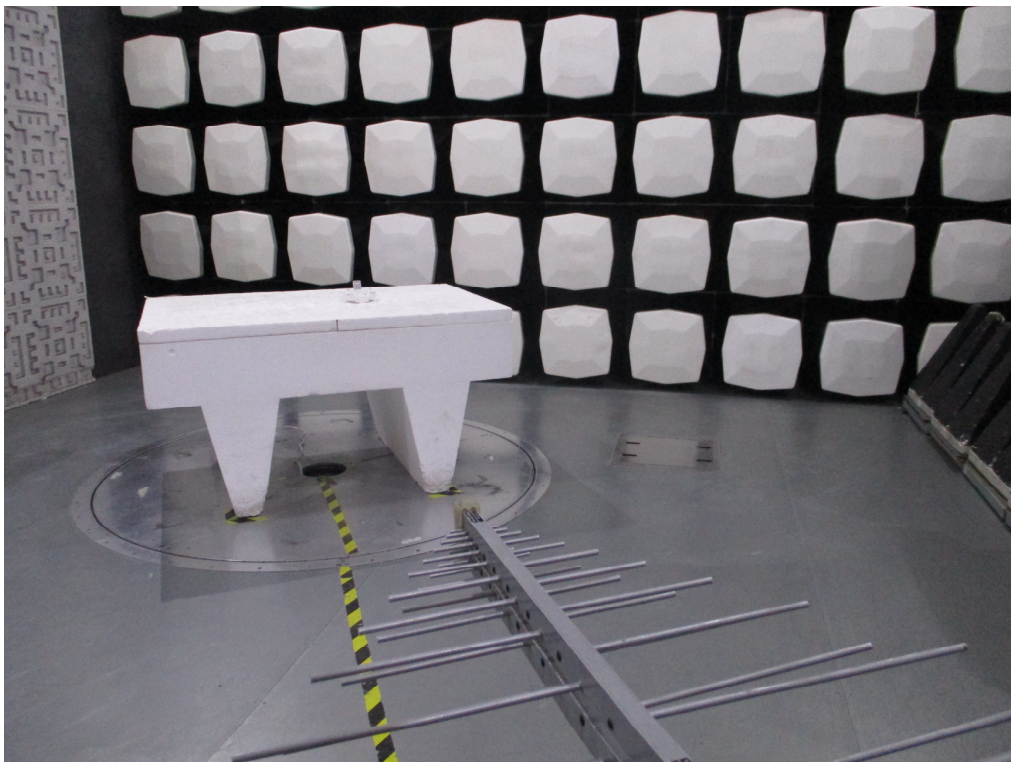


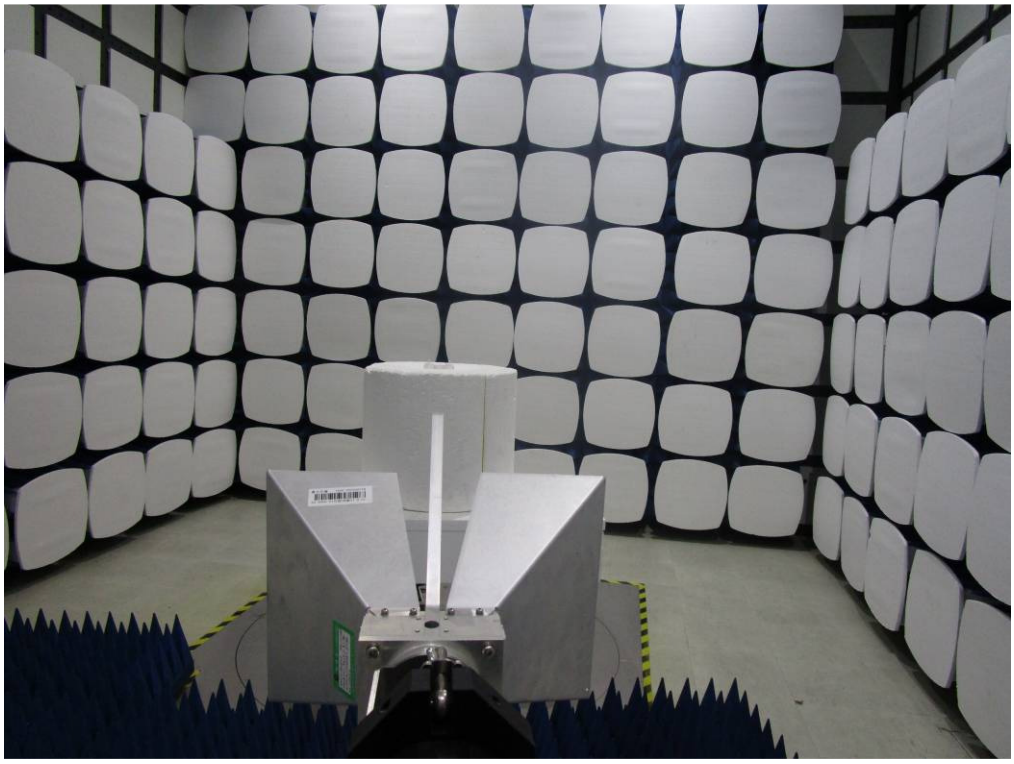
Test channel:	Highest



8 Photographs

8.1 Radiated Emissions Test Setup





8.2 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1703002497CR.