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

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FCC REPORT

Application No.:	SZEM1507004178CR(SGS HK No.:T31520220063EM)
Applicant:	EASTCOLIGHT (HONG KONG) LTD
Product Name:	SUPER DIGITAL WALKIE TALKIE
Item No.(EUT):	SI010
FCC ID:	OIJSI010
Standards:	47 CFR Part 15, Subpart C (2014)
Date of Receipt:	2015-07-14
Date of Test:	2015-07-16 to 2015-08-28
Date of Issue:	2015-08-31
Test Result:	**PASS ***

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

Authorized Signature:

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.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00		2015-08-31		Original

Authorized for issue by:				
Tested By		Eric Fu **(Eric Fu) /Project Engineer**		2015-08-28 **Date**
Prepared By		Jade Chen **(Jade Chen) /Clerk**		2015-08-31 **Date**
Checked By		Owen Zhou **(Owen Zhou) /Reviewer**		2015-08-31 **Date**

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 (2009)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2009)	PASS
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C Section 15.249 (a)	ANSI C63.10 (2009)	PASS
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.249 (a)/15.209	ANSI C63.10 (2009)	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.249(a)/15.205	ANSI C63.10 (2009)	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 (2009)	PASS

4 Contents

5 General Information

5.1 Client Information

Applicant:	EASTCOLIGHT (HONG KONG) LTD
Address of Applicant:	ROOM1108-1110, PENINSULA CENTRE, 67 MODY ROAD, TSIMSHATSUI EAST, KOWLOON, HONG KONG

5.2 General Description of EUT

Producted Name:	SUPER DIGITAL WALKIE TALKIE
Item No.:	SI010
P.O./Ref. No.:	SI0101, SI0102, 9836, 1836, 2216
Labelled Age Grading:	AGES 8 AND UP
Country of Origin:	CHINA
Frequency Range:	2.4GHz Wireless 2408MHz-2474MHz
Channel Number:	45 (manufacturer declare)
Modulation Type:	FSK
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	0.5dBi
Power Supply:	DC 4.5V (3*1.5V “AG13” Size batteries)

Operation Frequency each of channel					
Channel	Frequency	Channel	Frequency	Channel	Frequency
1CH	2408 MHz	16CH	2430.5 MHz	31CH	2453 MHz
2CH	2409.5 MHz	17CH	2432 MHz	32CH	2454.5 MHz
3CH	2411 MHz	18CH	2433.5 MHz	33CH	2456 MHz
4CH	2412.5 MHz	19CH	2435 MHz	34CH	2457.5 MHz
5CH	2414 MHz	20CH	2436.5 MHz	35CH	2459 MHz
6CH	2415.5 MHz	21CH	2438 MHz	36CH	2460.5 MHz
7CH	2417 MHz	22CH	2439.5 MHz	37CH	2462 MHz
8CH	2418.5 MHz	23CH	2441 MHz	38CH	2463.5 MHz
9CH	2420 MHz	24CH	2442.5 MHz	39CH	2465 MHz
10CH	2421.5 MHz	25CH	2444 MHz	40CH	2466.5 MHz
11CH	2423 MHz	26CH	2445.5 MHz	41CH	2468 MHz
12CH	2424.5 MHz	27CH	2447 MHz	42CH	2469.5 MHz
13CH	2426 MHz	28CH	2448.5 MHz	43CH	2471 MHz
14CH	2427.5 MHz	29CH	2450 MHz	44CH	2472.5 MHz
15CH	2429 MHz	30CH	2451.5 MHz	45CH	2474 MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel(CH1)	2408MHz
The Middle channel(CH23)	2441MHz
The Highest channel(CH45)	2474MHz

5.3 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1010mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.

5.4 Description of Support Units

The EUT has been tested independently.

5.5 Test Location

All tests were performed at:

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

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.

5.6 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.

- **VCCI**

  The 10m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) 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 of SGS-CSTC Standards Technical Services Co., Ltd. have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-2.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

5.10 Equipment List

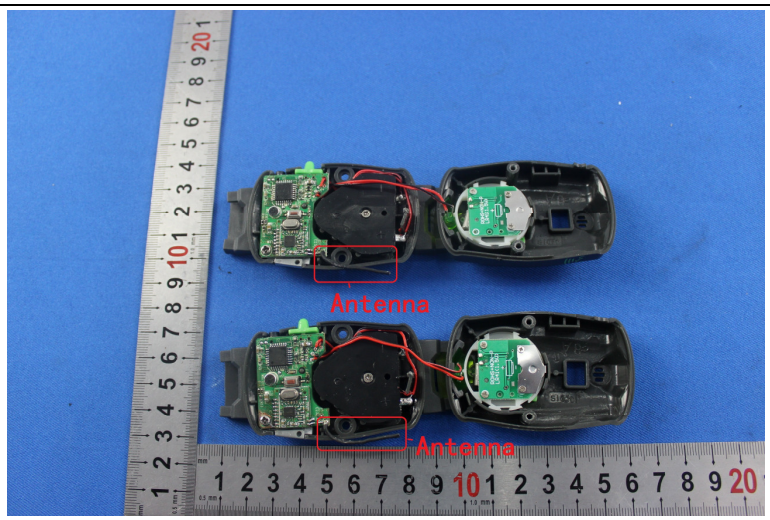
RE in Chamber					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2016-05-13
2	EMI Test Receiver	Agilent Technologies	N9038A	SEL0312	2015-09-16
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2015-10-24
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2015-10-24
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2015-10-24
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2016-05-13
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2015-10-24
9	Coaxial cable	SGS	N/A	SEL0027	2016-05-13
10	Coaxial cable	SGS	N/A	SEL0189	2016-05-13
11	Coaxial cable	SGS	N/A	SEL0121	2016-05-13
12	Coaxial cable	SGS	N/A	SEL0178	2016-05-13
13	Band filter	Amindeon	82346	SEL0094	2016-05-13
14	Barometer	Chang Chun	DYM3	SEL0088	2016-05-13
15	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24
16	Humidity/ Temperature Indicator	Shanhai Qixiang	ZJ1-2B	SEL0103	2015-10-24
17	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2016-05-13
18	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2015-10-24
19	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2016-05-13

RF connected test					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2015-10-24
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2015-10-24
4	Coaxial cable	SGS	N/A	SEL0178	2016-05-13
5	Coaxial cable	SGS	N/A	SEL0179	2016-05-13
6	Barometer	ChangChun	DYM3	SEL0088	2016-05-13
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2016-04-25
8	Band filter	amideon	82346	SEL0094	2016-05-13
9	POWER METER	R & S	NRVS	SEL0144	2015-10-24
10	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2016-04-25
11	Power Divider(splitter)	Agilent Technologies	11636B	SEL0130	2015-10-24

Note: The calibration interval is one year, all the instruments are valid.

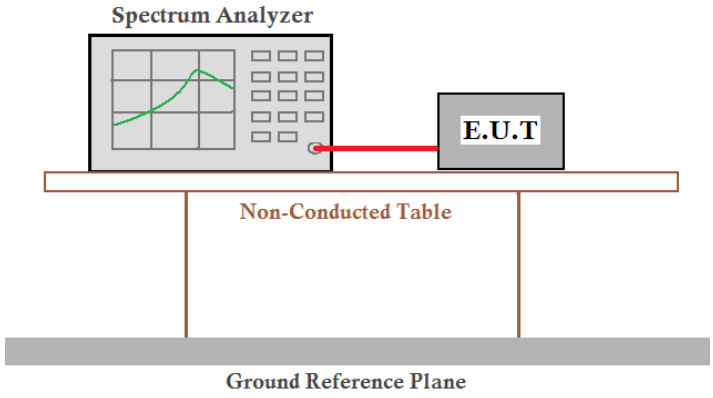
6 Test results and Measurement Data

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:	
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.5dBi.	

6.2 Spurious Emissions

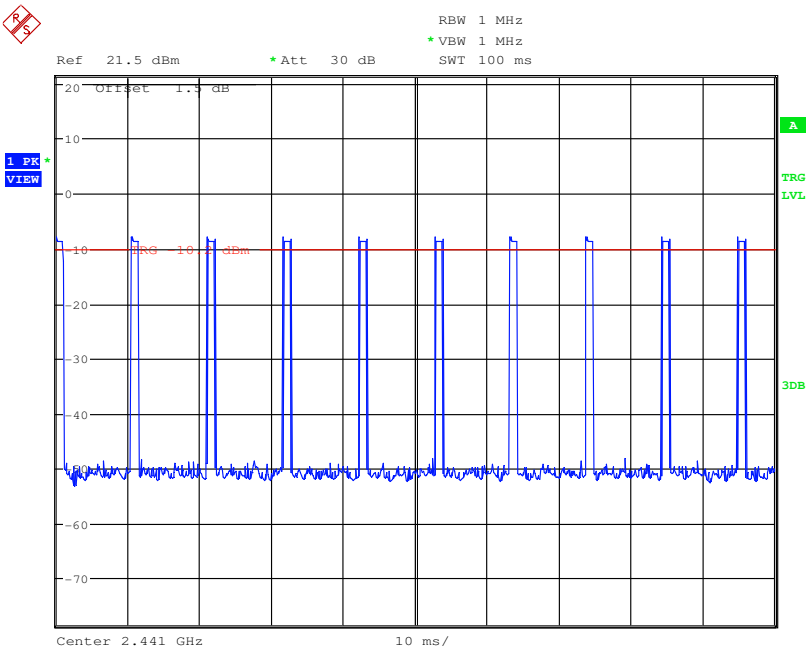
6.2.1 Duty Cycle

Test Requirement:	47 CFR Part 15C Section 15.35 (c)
Test Method:	ANSI C63.10:2009
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Limit:	N/A
Test Mode:	Transmitting mode
Test Results:	Pass

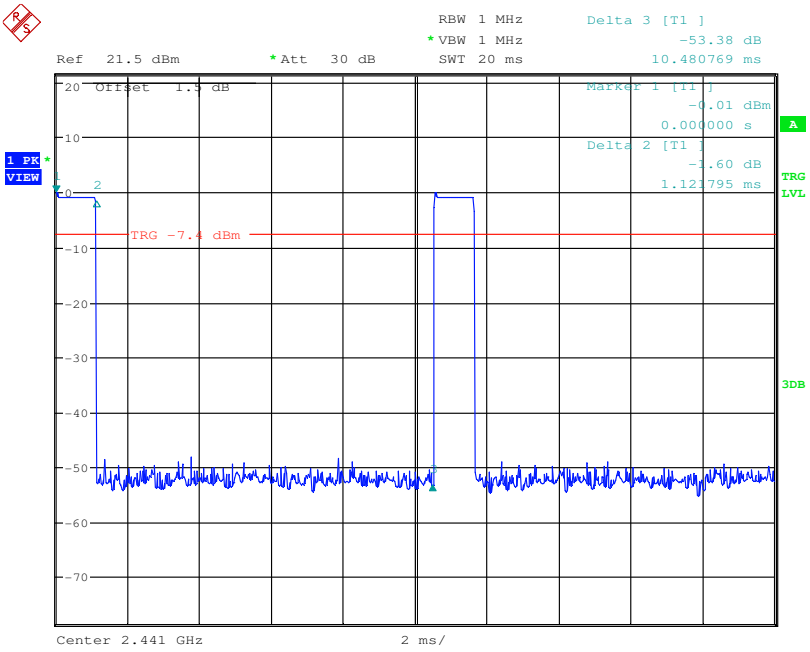
Test data:	
Calculate Formula:	PDCF=20 log(Duty cycle)
	Duty cycle= T on time / T period
Test data:	Ton time =1.1218ms
	T period =10.4808ms
	PDCF =-19.41

Test plot as follows:

Duty cycle numbers



Time slot:



6.2.2 Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209
Test Method:	ANSI C63.10: 2009
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	100 kHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:
(Spurious Emissions)

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

Test Setup:

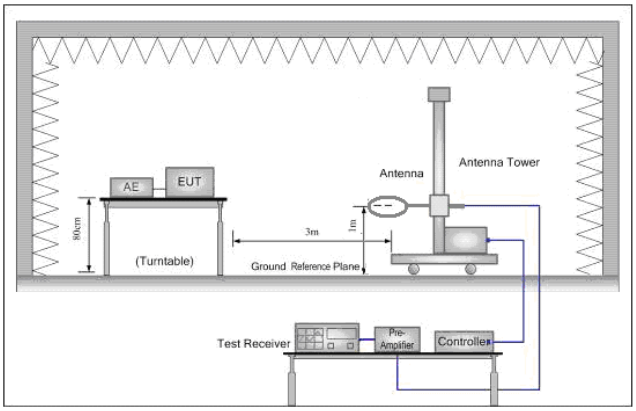


Figure 1. Below 30MHz

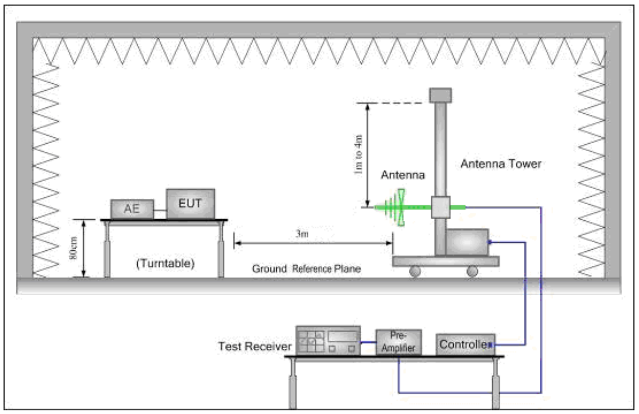


Figure 2. 30MHz to 1GHz

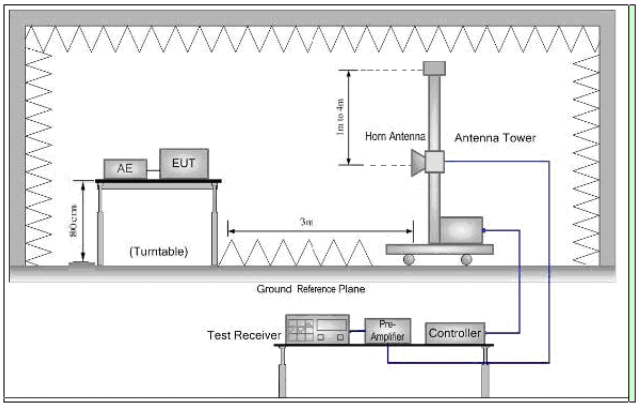


Figure 3. Above 1 GHz

Test Procedure:	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. g. Test the EUT in the lowest channel, the middle channel, the Highest channel h. 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. i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 5.10 for details
Test Mode:	Transmitting mode
Test Results:	Pass

Measurement Data

6.2.2.1 Field Strength Of The Fundamental Signal

Peak value:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
2408.00	4.93	32.41	38.46	103.69	102.57	114.00	-11.43
2441.00	4.97	32.42	38.46	102.9	101.83	114.00	-12.17
2474.00	5.02	32.44	38.46	105.17	104.17	114.00	-9.83

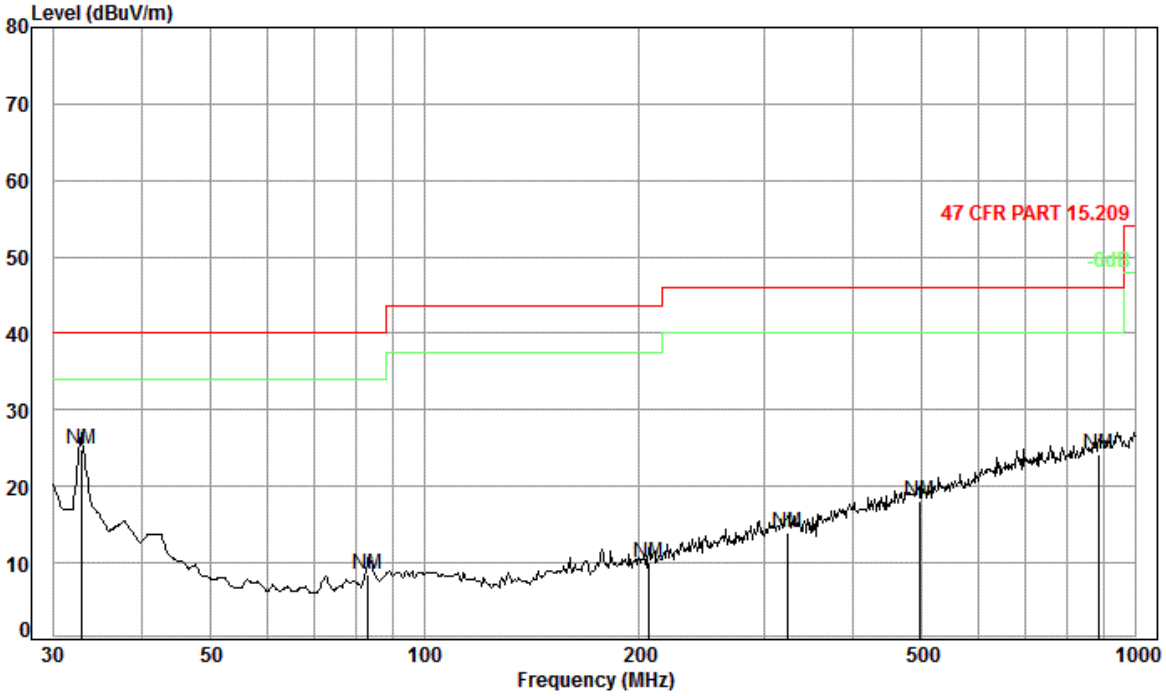
Average value=Peak value + PDCF:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
2408.00	83.16	94.00	-10.84
2441.00	82.42	94.00	-11.58
2474.00	84.76	94.00	-9.24

6.2.2.2 Spurious Emissions

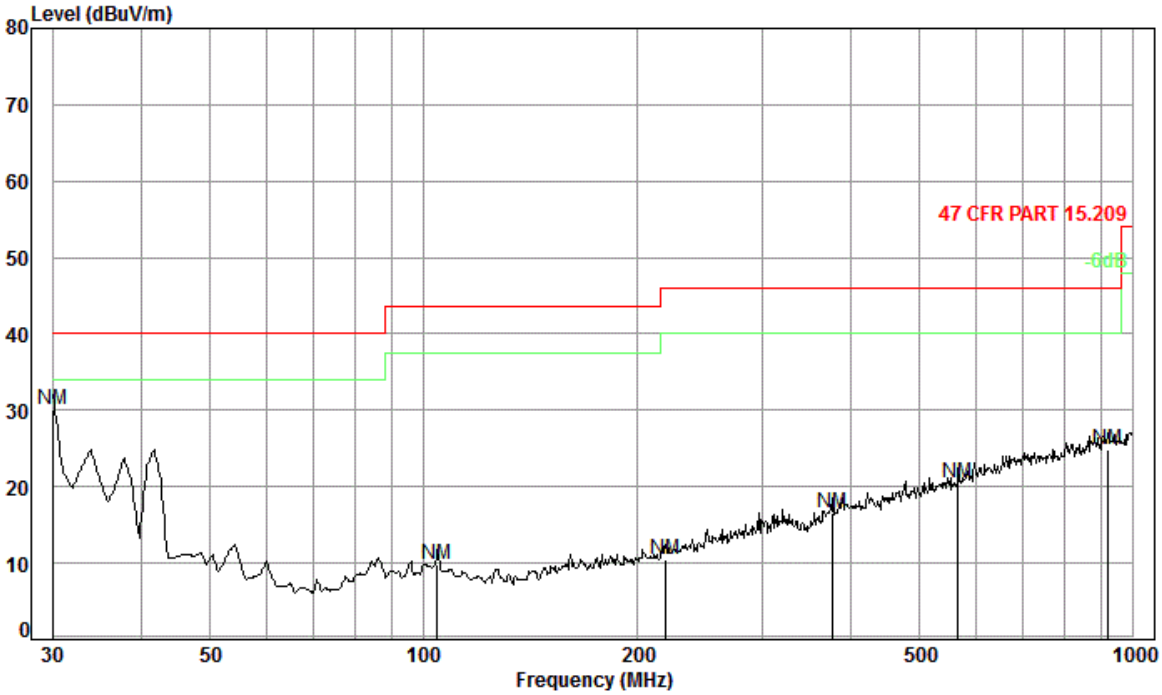
30MHz~1GHz	
Test mode:	Transmitting

QP value:



Condition: 47 CFR PART 15.209 3m 3142C Horizontal
Job No. : 4178CR

	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	32.86	0.60	17.10	27.35	34.60	24.95	40.00	-15.05
2	83.23	1.10	8.02	27.22	26.69	8.59	40.00	-31.41
3	206.40	1.44	10.53	26.67	24.75	10.05	43.50	-33.45
4	324.46	1.98	14.78	26.58	23.88	14.06	46.00	-31.94
5	495.93	2.59	17.80	27.68	25.42	18.13	46.00	-27.87
6	887.61	3.55	23.10	26.85	24.40	24.20	46.00	-21.80



Condition: 47 CFR PART 15.209 3m 3142C Vertical
Job No. : 4178CR

	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	38.21	30.15	40.00	-9.85
2	104.54	1.21	8.87	27.17	26.82	9.73	43.50	-33.77
3	219.08	1.51	11.19	26.63	24.34	10.41	46.00	-35.59
4	375.94	2.13	16.01	26.97	25.45	16.62	46.00	-29.38
5	566.62	2.67	19.03	27.59	26.33	20.44	46.00	-25.56
6	922.52	3.62	23.29	26.68	24.71	24.94	46.00	-21.06

Above 1GHz					
Test mode:	Transmitting	Test channel:	Lowest	Remark:	Peak

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3492.224	6.98	32.88	38.74	46.01	47.13	74	-26.87	Vertical
4808.000	6.43	34.71	39.24	57.48	59.38	74	-14.62	Vertical
6087.002	8.06	36.20	39.17	45.92	51.01	74	-22.99	Vertical
7212.000	8.93	35.63	39.07	50.77	56.26	74	-17.74	Vertical
9616.000	9.98	37.35	37.93	43.19	52.59	74	-21.41	Vertical
11438.810	10.38	38.18	38.44	43.14	53.26	74	-20.74	Vertical
3492.224	6.98	32.88	38.74	46.23	47.35	74	-26.65	Horizontal
4816.000	6.43	34.71	39.24	58.57	60.47	74	-13.53	Horizontal
6016.949	8.08	36.28	39.18	46.18	51.36	74	-22.64	Horizontal
7224.000	8.93	35.63	39.07	47.65	53.14	74	-20.86	Horizontal
9632.000	9.98	37.35	37.93	43.38	52.78	74	-21.22	Horizontal
11946.280	10.59	38.65	38.68	42.65	53.21	74	-20.79	Horizontal

Average value= Peak value+ PDCF:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3492.224	27.72	54	-26.28	Vertical
4808.000	39.97	54	-14.03	Vertical
6087.002	31.60	54	-22.40	Vertical
7212.000	36.85	54	-17.15	Vertical
9616.000	33.18	54	-20.82	Vertical
11438.810	33.85	54	-20.15	Vertical
3492.224	27.94	54	-26.06	Horizontal
4816.000	41.06	54	-12.94	Horizontal
6016.949	31.95	54	-22.05	Horizontal
7224.000	33.73	54	-20.27	Horizontal
9632.000	33.37	54	-20.63	Horizontal
11946.280	33.80	54	-20.20	Horizontal

Test mode:	Transmitting	Test channel:	Middle	Remark:	Peak

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3594.760	6.91	32.99	38.78	46.67	47.79	74	-26.21	Vertical
4882.000	6.59	34.78	39.26	59.32	61.43	74	-12.57	Vertical
5990.888	8.07	36.28	39.18	45.81	50.98	74	-23.02	Vertical
7323.000	9.08	35.50	39.06	45.64	51.16	74	-22.84	Vertical
9764.000	9.90	37.81	37.84	42.67	52.54	74	-21.46	Vertical
11471.960	10.38	38.20	38.45	43.18	53.31	74	-20.69	Vertical
3579.190	6.92	32.98	38.78	46.31	47.43	74	-26.57	Horizontal
4882.000	6.59	34.78	39.26	59.32	61.43	74	-12.57	Horizontal
5990.888	8.07	36.28	39.18	46.42	51.59	74	-22.41	Horizontal
7323.000	9.08	35.50	39.06	48.12	53.64	74	-20.36	Horizontal
9764.000	9.90	37.81	37.84	42.72	52.59	74	-21.41	Horizontal
11689.790	10.47	38.39	38.56	42.92	53.22	74	-20.78	Horizontal

Average value= Peak value+ PDCF:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3594.760	28.38	54	-25.62	Vertical
4882.000	42.02	54	-11.98	Vertical
5990.888	31.57	54	-22.43	Vertical
7323.000	31.75	54	-22.25	Vertical
9764.000	33.13	54	-20.87	Vertical
11471.960	33.90	54	-20.10	Vertical
3579.190	28.02	54	-25.98	Horizontal
4882.000	42.02	54	-11.98	Horizontal
5990.888	32.18	54	-21.82	Horizontal
7323.000	34.23	54	-19.77	Horizontal
9764.000	33.18	54	-20.82	Horizontal
11689.790	33.81	54	-20.19	Horizontal

Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3668.321	6.87	33.05	38.81	46.84	47.95	74	-26.05	Vertical
4944.000	6.72	34.84	39.28	58.87	61.15	74	-12.85	Vertical
5990.888	8.07	36.28	39.18	46.74	51.91	74	-22.09	Vertical
7491.000	9.30	35.45	39.04	47.91	53.62	74	-20.38	Vertical
9948.000	9.80	38.35	37.73	42.16	52.58	74	-21.42	Vertical
11274.500	10.34	38.13	38.36	43.25	53.36	74	-20.64	Vertical
3737.975	6.83	33.10	38.84	45.73	46.82	74	-27.18	Horizontal
4994.000	6.83	34.89	39.30	58.89	61.31	74	-12.69	Horizontal
5973.576	8.04	36.25	39.19	46.84	51.94	74	-22.06	Horizontal
7421.518	9.21	35.43	39.05	47.61	53.20	74	-20.80	Horizontal
9061.715	9.80	36.16	38.27	43.96	51.65	74	-22.35	Horizontal
11521.870	10.40	38.24	38.48	43.81	53.97	74	-20.03	Horizontal

Average value= Peak value+ PDCF:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3668.321	28.54	54	-25.46	Vertical
4944.000	41.74	54	-12.26	Vertical
5990.888	32.50	54	-21.50	Vertical
7491.000	34.21	54	-19.79	Vertical
9948.000	33.17	54	-20.83	Vertical
11274.500	33.95	54	-20.05	Vertical
3737.975	27.41	54	-26.59	Horizontal
4994.000	41.90	54	-12.10	Horizontal
5973.576	32.53	54	-21.47	Horizontal
7421.518	33.79	54	-20.21	Horizontal
9061.715	32.24	54	-21.76	Horizontal
11521.870	34.56	54	-19.44	Horizontal

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 .

3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the above measurements were shown in the report.

6.3 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205
Test Method:	ANSI C63.10: 2009
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
Limit(band edge):	Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

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
	74.0	Peak Value

Test Setup:

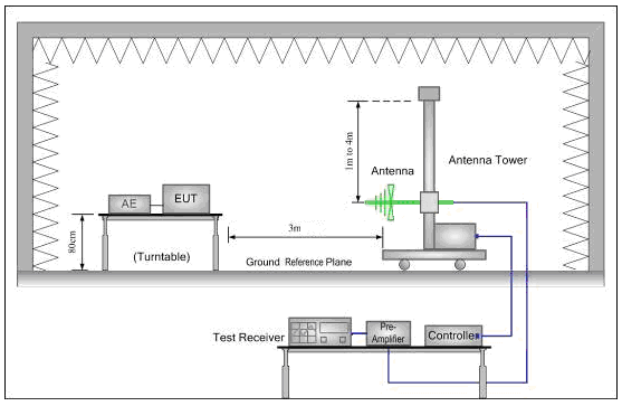


Figure 1. 30MHz to 1GHz

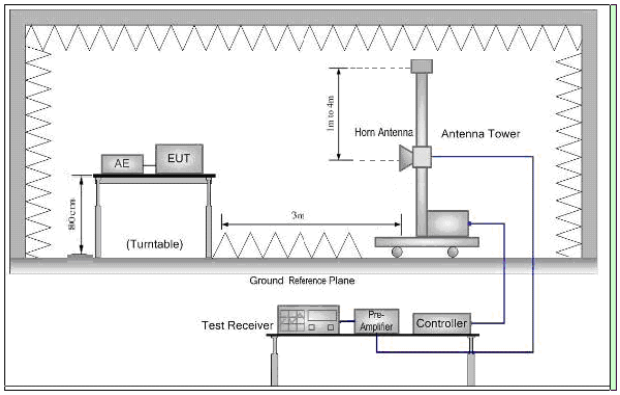
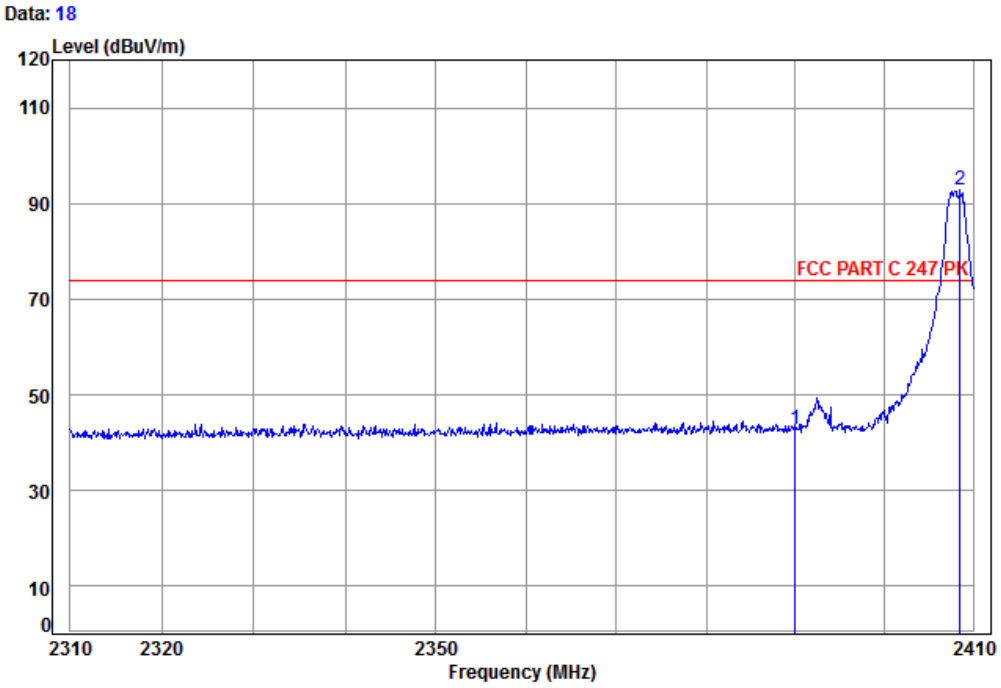


Figure 2. Above 1 GHz

Test Procedure:	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 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. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel g. Test the EUT in the lowest channel , the Highest channel h. 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.. i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 5.10 for details
Test Mode:	Transmitting mode.
Test Results:	Pass

Band edge (Radiated Emission)						
Test mode:	FSK	Test channel:	Lowest	Remark:	Peak	Vertical

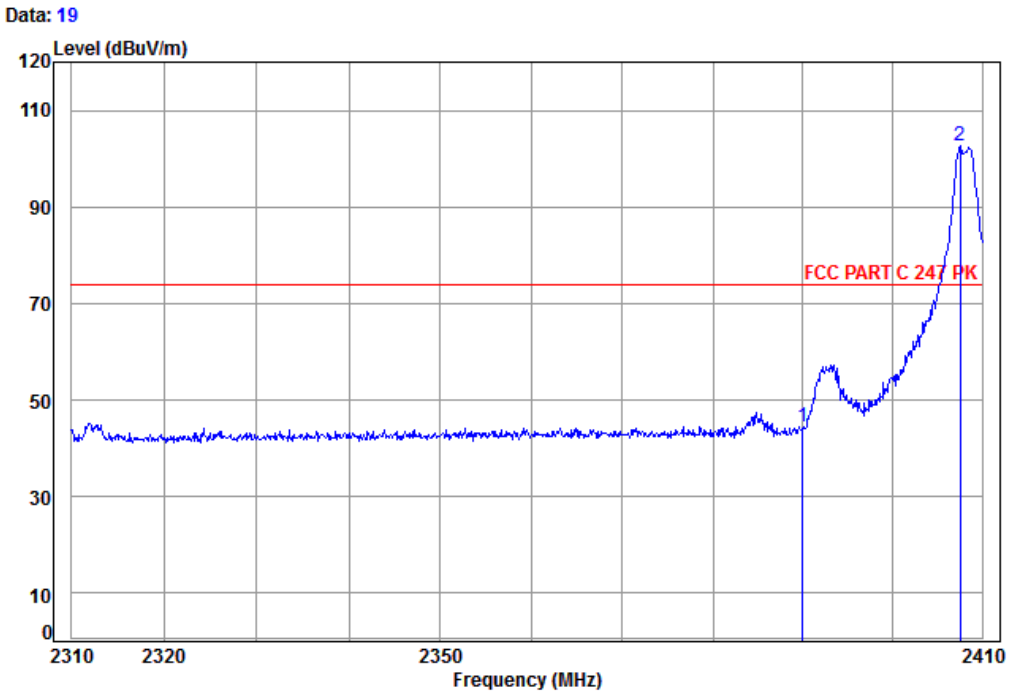



```
Site     : chamber
Condition: FCC PART C 247 PK 3m Vertical
Job No:  : 4178CR
Mode:    : 2408 Band edge
                Cable    Ant Preamp   Read          Limit   Over
           Freq  Loss Factor Factor  Level  Level   Line  Limit

            MHz    dB   dB/m    dB   dBuV dBuV/m dBuV/m    dB

  1     2390.00  4.90  32.35 38.46  44.08  42.87  74.00 -31.13
  2 pp  2408.57  4.93  32.41 38.46  93.89  92.77  74.00  18.77
```

Average value= Peak value+ PDCF:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
2390.00	23.46	54.00	-30.54
2408.57	73.36	54.00	19.36

Test mode:	FSK	Test channel:	Lowest	Remark:	Peak	Horizontal

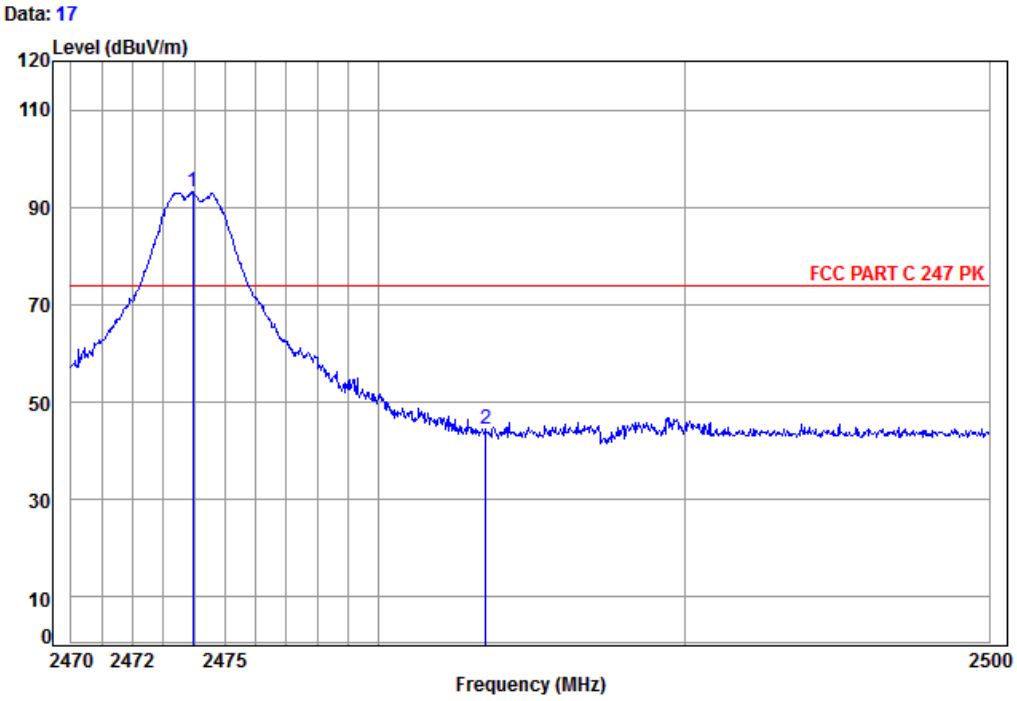



```
Site     : chamber
Condition: FCC PART C 247 PK 3m Horizontal
Job No:  : 4178CR
Mode:    : 2408 Band edge
                Cable    Ant Preamp   Read          Limit   Over
           Freq  Loss Factor Factor  Level  Level   Line  Limit
          ------ ------ ------ ------ ------ ------ ------ ------
            MHz     dB   dB/m     dB  dBuV dBuV/m dBuV/m     dB

  1     2390.00   4.90  32.35  38.46  45.69  44.48  74.00 -29.52
  2 pp  2407.55   4.93  32.41  38.46 103.69 102.57  74.00  28.57
```

Average value= Peak value+ PDCF:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
2390.00	25.07	54.00	-28.93
2407.55	83.16	54.00	29.16

Test mode:	FSK	Test channel:	Highest	Remark:	Peak	Vertical

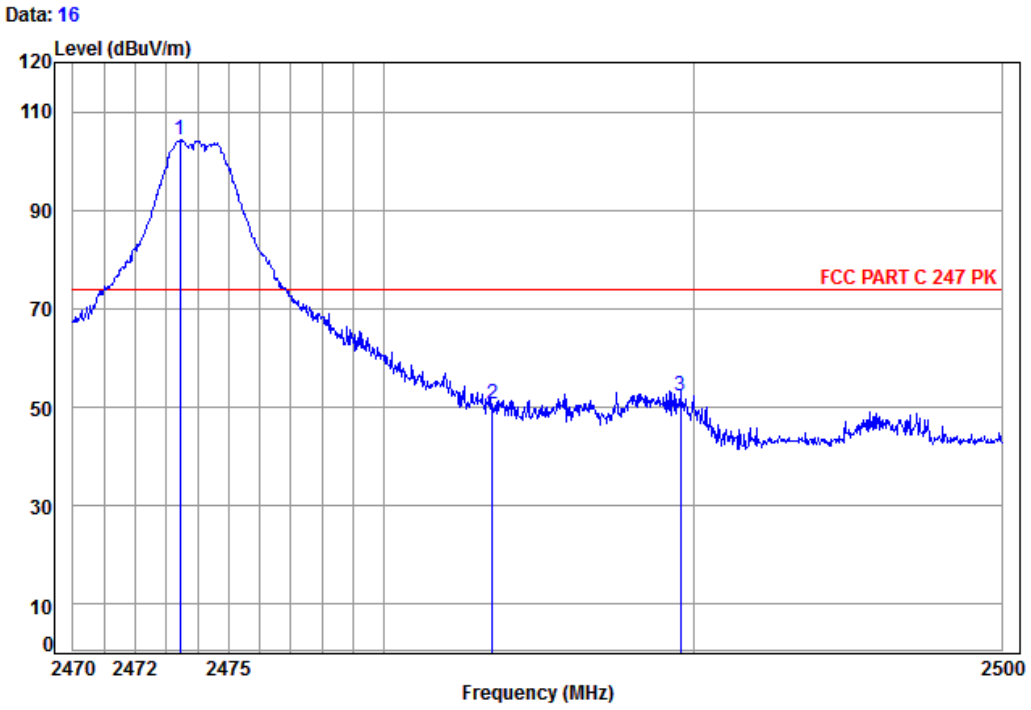



```
Site     : chamber
Condition: FCC PART C 247 PK 3m Vertical
Job No:  : 4178CR
Mode:    : 2474 Band edge
                Cable    Ant Preamp   Read          Limit   Over
           Freq  Loss Factor Factor  Level  Level   Line  Limit
                  dB   dB/m     dB  dBuV dBuV/m dBuV/m     dB
1 pp  2473.97  5.02  32.44  38.46 94.07  93.07  74.00  19.07
2     2483.50  5.03  32.44  38.47 45.42  44.42  74.00 -29.58
```

Average value= Peak value+ PDCF:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
2473.97	73.66	54.00	19.66
2483.50	25.01	54.00	-28.99

Test mode:	FSK	Test channel:	Highest	Remark:	Peak	Horizontal



Site : chamber
Condition: FCC PART C 247 PK 3m Horizontal
Job No: : 4178CR
Mode: : 2474 Band edge

	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	2473.43	5.01	32.44	38.46	105.18	104.17	74.00	30.17
2	2483.50	5.03	32.44	38.47	51.78	50.78	74.00	-23.22
3	2489.58	5.04	32.44	38.47	53.40	52.41	74.00	-21.59

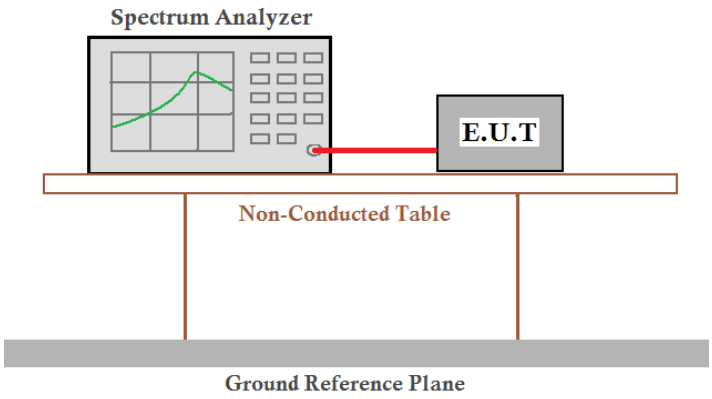
Average value= Peak value+ PDCF:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)
2473.43	84.76	54.00	30.76
2483.50	31.37	54.00	-22.63
2489.58	33.00	54.00	-21.00

Note:
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

6.4 20dB Bandwidth

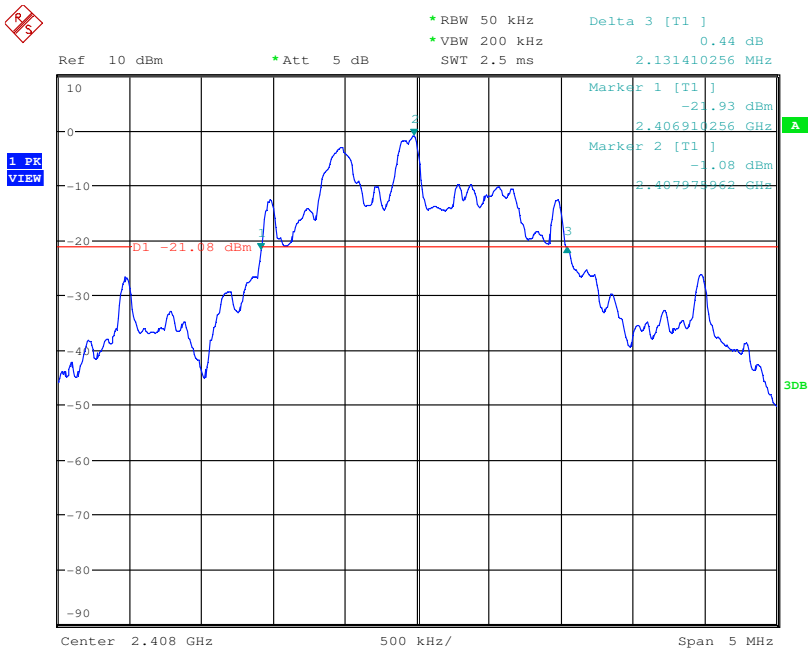
Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2009
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Test mode:	Transmitting mode
Limit:	Within the band 2400MHz-2483.5MHz
Test Results:	Pass

Measurement Data

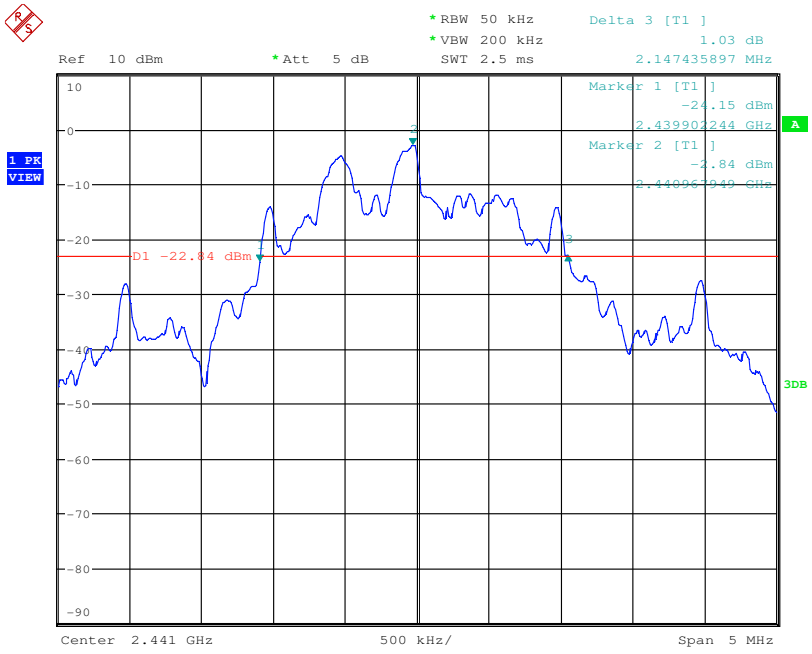
Test channel	20dB bandwidth (MHz)	Results
Lowest	2.131	Pass
Middle	2.147	Pass
Highest	2.131	Pass

Test plot as follows:

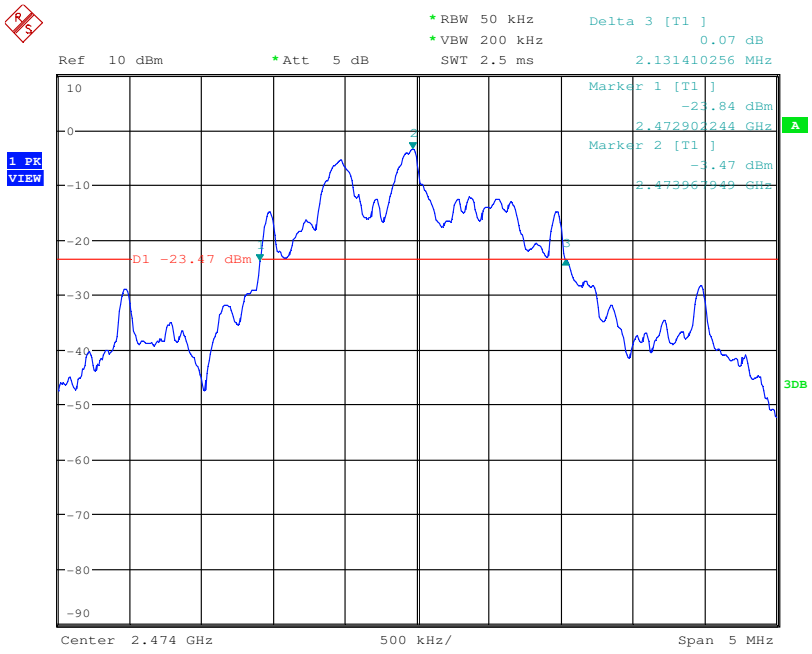
Test channel:	Lowest



Test channel:	Middle



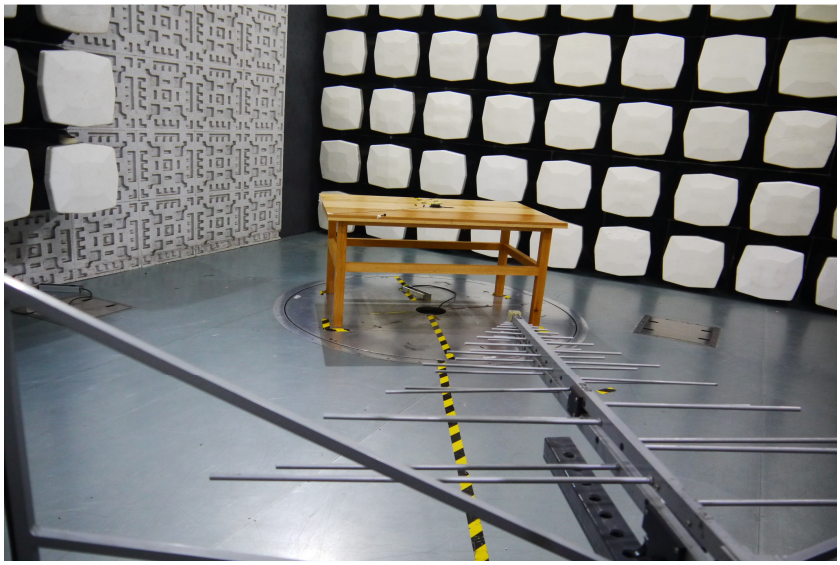
Test channel:	Highest



7 Photographs

Test Item No.: SI010

7.1 Radiated Spurious Emission Test Setup



7.2 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1507004178CR.