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

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

Telephone: +86 (0) 755 2601 2053
Fax: +86 (0) 755 2671 0594
Email: ee.shenzhen@sgs.com

FCC REPORT

Application No. :	SZEM1603001478CR (GZEM1603001267CR)
Applicant:	Mattel Asia Pacific Sourcing Limited
Manufacturer:	Mattel Asia Pacific Sourcing Limited
Factory:	JETTA (CHINA) INDUSTRIES CO.,LTD
Product Name:	Minecraft Flying Ghast
Model No.(EUT):	DNM77T / DNM77R
Trade Mark:	MATTEL
FCC ID:	PIYDNM77-16A5R
Standards:	47 CFR Part 15, Subpart C (2015)
Date of Receipt:	2016-03-18
Date of Test:	2016-03-21 to 2016-03-30
Date of Issue:	2016-04-01
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		2016-04-01		Original

Authorized for issue by:				
Tested By		Bill Chen **(Bill Chen) /Project Engineer**		2016-03-30 **Date**
Prepared By		Iris Zhou **(Iris Zhou) /Clerk**		2016-04-01 **Date**
Checked By		Eric Fu **(Eric Fu) /Reviewer**		2016-04-01 **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 (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 15.249 (a)	ANSI C63.10 (2013)	PASS
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.249 (a)/15.209	ANSI C63.10 (2013)	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.249(a)/15.205	ANSI C63.10 (2013)	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 (2013)	PASS

4 Contents

5 General Information

5.1 Client Information

Applicant:	Mattel Asia Pacific Sourcing Limited
Address of Applicant:	13/F., South Tower, World Finance Centre, Harbour City, Tsimshatsui, Kowloon, Hong Kong
Manufacturer:	Mattel Asia Pacific Sourcing Limited
Address of Manufacturer:	13/F., South Tower, World Finance Centre, Harbour City, Tsimshatsui, Kowloon, Hong Kong
Factory:	JETTA (CHINA) INDUSTRIES CO.,LTD
Address of Factory:	333 Cai Xin Lu, Lan He Zhen, Nab Sha Qu, Guangzhou Shi, Guangdong Province, China.

5.2 General Description of EUT

Name:	Minecraft Flying Ghast
Model No.:	DNM77R
Trade Mark :	MATTEL
Frequency Range:	2420MHz-2460MHz
Modulation Type:	GFSK
Number of Channels:	41 (declared by the client)
Sample Type:	Mobile production
Antenna Type:	Integral
Antenna Gain:	0dBi
Power Supply:	DC 3.7V/650mAh 2.41Wh

Operation Frequency each of channel					
Channel	Frequency	Channel	Frequency	Channel	Frequency
1CH	2420 MHz	15CH	2434 MHz	29CH	2448MHz
2CH	2421 MHz	16CH	2435 MHz	30CH	2449 MHz
3CH	2422 MHz	17CH	2436 MHz	31CH	2450 MHz
4CH	2423 MHz	18CH	2437 MHz	32CH	2451 MHz
5CH	2424 MHz	19CH	2438 MHz	33CH	2452 MHz
6CH	2425 MHz	20CH	2439 MHz	34CH	2453 MHz
7CH	2426 MHz	21CH	2440 MHz	35CH	2454 MHz
8CH	2427 MHz	22CH	2441 MHz	36CH	2455 MHz
9CH	2428 MHz	23CH	2442 MHz	37CH	2456 MHz
10CH	2429 MHz	24CH	2443 MHz	38CH	2457 MHz
11CH	2430 MHz	25CH	2444 MHz	39CH	2458 MHz
12CH	2431 MHz	26CH	2445 MHz	40CH	2459 MHz
13CH	2432 MHz	27CH	2446 MHz	41CH	2460 MHz
14CH	2433 MHz	28CH	2447 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)	2420MHz
The Middle channel(CH21)	2440MHz
The Highest channel(CH41)	2460MHz

5.3 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	50 %
Atmospheric Pressure:	1025 mbar
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.

• 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)

The 3m Semi-anechoic chambers and the 10m Semi-anechoic chambers 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-2,
4620C-3.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

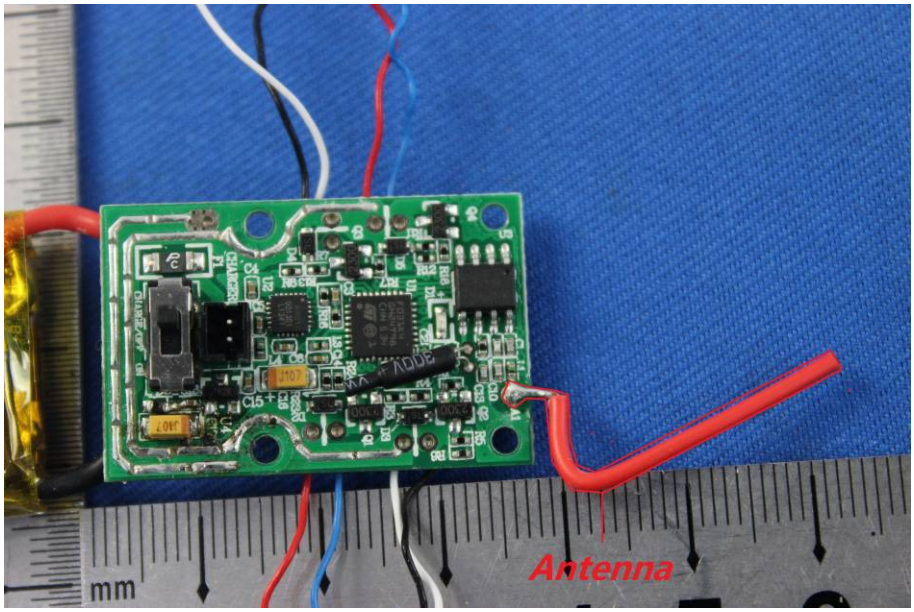
5.10 Equipment List

RE in Chamber						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. date (yyyy-mm-dd)**	**Cal.Due date (yyyy-mm-dd)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2015-05-13	2016-05-13
2	EMI Test Receiver	Agilent Technologies	N9038A	SEL0312	2015-09-16	2016-09-16
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2014-11-01	2017-11-01
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2015-10-17	2016-10-17
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2014-11-24	2017-11-24
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2015-05-13	2016-05-13
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2015-10-17	2016-10-17
9	Coaxial cable	SGS	N/A	SEL0027	2015-05-13	2016-05-13
10	Coaxial cable	SGS	N/A	SEL0189	2015-05-13	2016-05-13
11	Coaxial cable	SGS	N/A	SEL0121	2015-05-13	2016-05-13
12	Coaxial cable	SGS	N/A	SEL0178	2015-05-13	2016-05-13
13	Band filter	Amindeon	82346	SEL0094	2015-05-13	2016-05-13
14	Barometer	Chang Chun	DYM3	SEL0088	2015-05-13	2016-05-13
15	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-09	2016-10-09
16	Humidity/ Temperature Indicator	Shanhai Qixiang	ZJ1-2B	SEL0103	2015-10-24	2016-10-24
17	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2015-05-13	2016-05-13
18	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2015-05-13	2016-05-13

RF connected test						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. date (yyyy-mm-dd)**	**Cal.Due date (yyyy-mm-dd)**
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-09	2016-10-09
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2015-10-24	2016-10-24
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2015-10-17	2016-10-17
4	Coaxial cable	SGS	N/A	SEL0178	2015-05-13	2016-05-13
5	Coaxial cable	SGS	N/A	SEL0179	2015-05-13	2016-05-13
6	Barometer	ChangChun	DYM3	SEL0088	2015-05-13	2016-05-13
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2015-04-25	2016-04-25
8	POWER METER	R & S	NRVS	SEL0144	2015-10-09	2016-10-09
9	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2015-04-25	2016-04-25

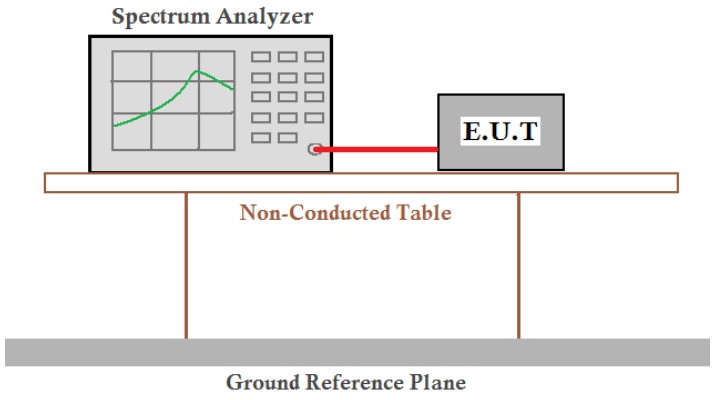
6 Test results and Measurement Data

6.1 Antenna Requirement

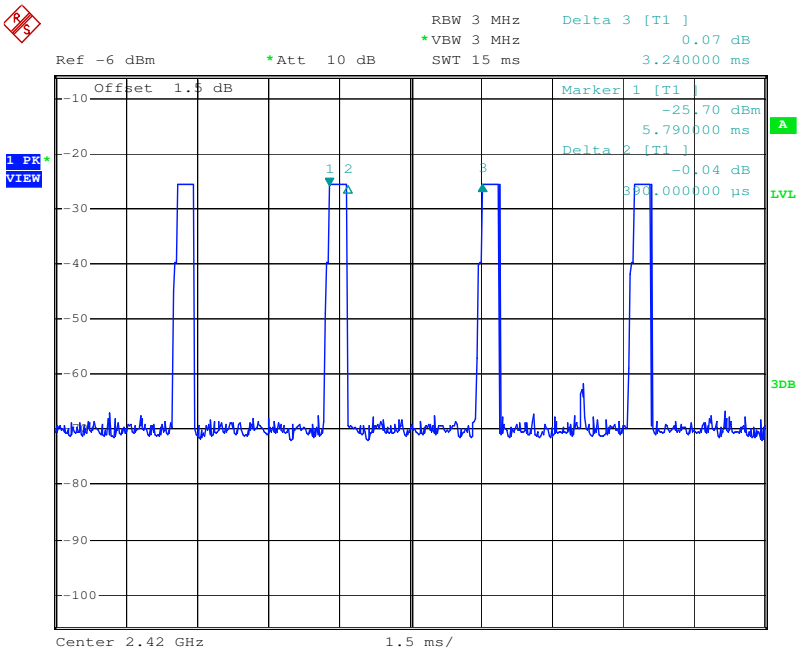
Standard requirement:	47 CFR Part 15C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique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

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:	
Instruments Used:	Refer to section 5.10 for details
Limit:	N/A
Test Mode:	Transmitting mode
Test Results:	Pass

Duty cycle numbers



6.2.2 Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.249 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	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:

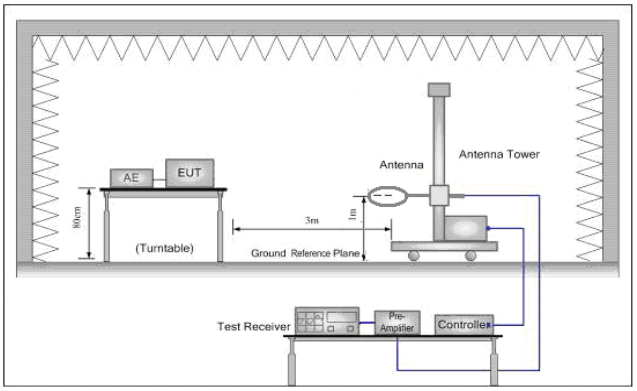


Figure 1. Below 30MHz

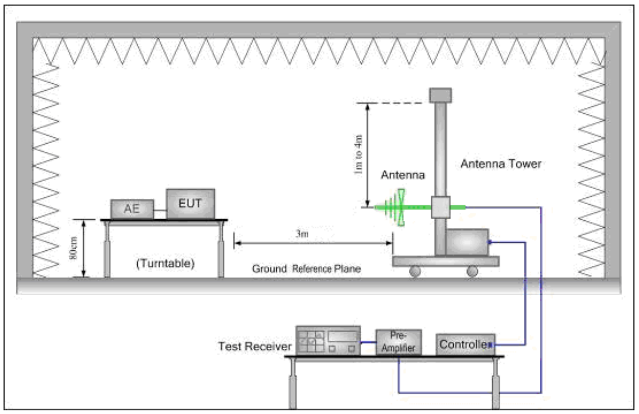


Figure 2. 30MHz to 1GHz

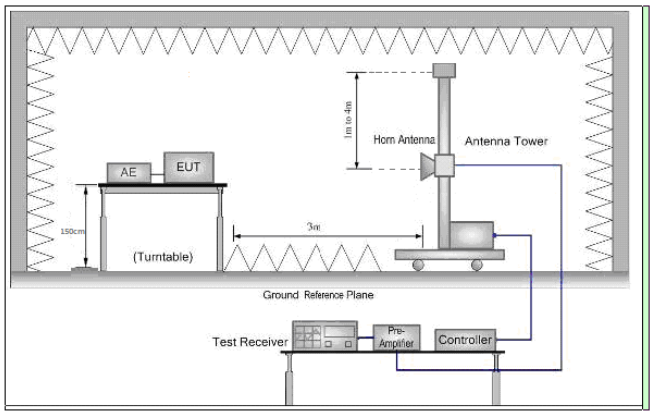


Figure 3. Above 1 GHz

Test Procedure:	a. 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 camber. 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 semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation c. The EUT was set 3 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 worse case. j. 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:

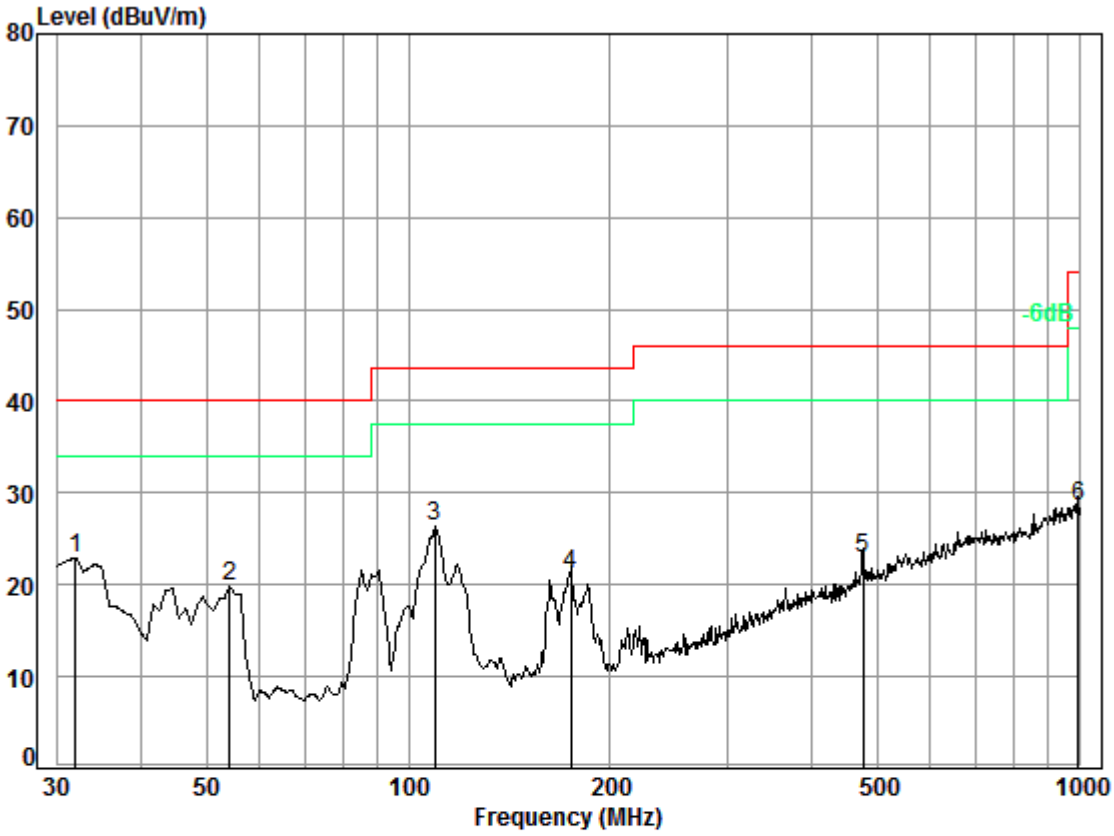
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2420.175	28.69	5.36	38.11	69.01	64.95	114.00	-49.05	Horizontal
2420.000	28.69	5.36	38.11	62.20	58.14	114.00	-55.86	Vertical
2440.358	28.79	5.38	38.11	64.44	60.50	114.00	-53.50	Horizontal
2440.038	28.79	5.38	38.11	61.40	57.46	114.00	-56.54	Vertical
2460.218	28.88	5.39	38.12	66.93	63.08	114.00	-50.92	Horizontal
2460.118	28.88	5.39	38.12	62.39	58.54	114.00	-55.46	Vertical

Remark:

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 peak measurements were shown in the report.

6.2.2.2 Spurious Emissions

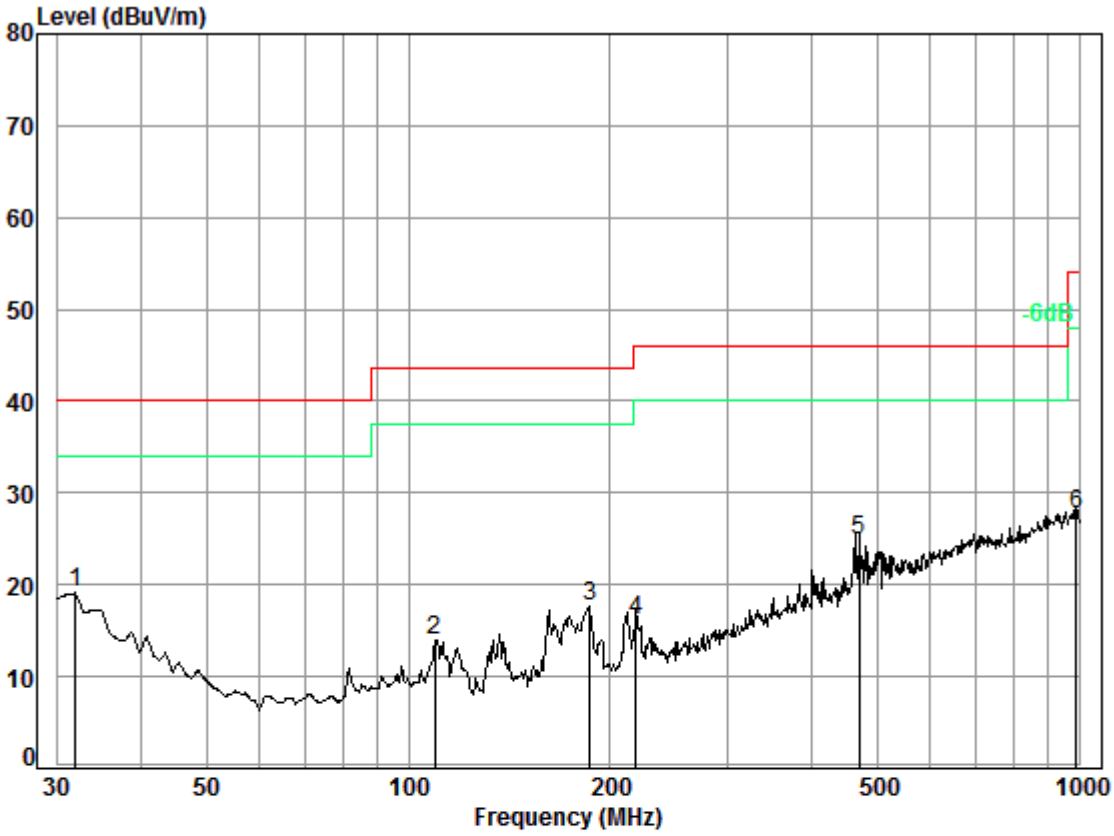
Radiated emission below 1GHz			
Test mode:	Transmitter mode	Polarization:	Vertical



Condition: 3m Vertical
Job No. : 1478CR
Test Mode: TX

	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	31.95	0.60	17.73	26.00	30.65	22.98	40.00	-17.02
2	54.26	0.80	8.14	25.95	36.81	19.80	40.00	-20.20
3	109.41	1.23	8.72	25.88	42.29	26.36	43.50	-17.14
4	174.42	1.36	9.68	25.80	35.87	21.11	43.50	-22.39
5	475.50	2.51	17.70	25.63	28.29	22.87	46.00	-23.13
6	996.50	3.70	24.04	24.42	25.33	28.65	54.00	-25.35

Test mode:	Transmitter mode	Polarization:	Horizontal



Condition: 3m Horizontal
Job No. : 1478CR
Test Mode: TX

	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	31.95	0.60	17.73	26.00	26.76	19.09	40.00	-20.91
2	109.41	1.23	8.72	25.88	29.86	13.93	43.50	-29.57
3	186.44	1.38	10.03	25.79	32.14	17.76	43.50	-25.74
4	218.31	1.51	11.09	25.76	29.37	16.21	46.00	-29.79
5	468.88	2.49	17.51	25.64	30.42	24.78	46.00	-21.22
6	989.54	3.69	23.93	24.47	24.47	27.62	54.00	-26.38

Transmitter emission above 1GHz								
Test mode:	Transmitter		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
3737.975	32.66	7.72	38.46	47.16	49.08	74	-24.92	Vertical
4840.000	34.14	8.92	38.76	45.45	49.75	74	-24.25	Vertical
6016.949	34.71	10.54	38.94	45.66	51.97	74	-22.03	Vertical
7260.000	35.57	10.70	37.62	41.19	49.84	74	-24.16	Vertical
9680.000	37.10	12.54	36.25	36.57	49.96	74	-24.04	Vertical
12530.530	37.83	14.24	37.68	38.07	52.46	74	-21.54	Vertical
3748.808	32.70	7.72	38.47	44.14	46.09	74	-27.91	Horizontal
4840.000	34.14	8.92	38.76	45.48	49.78	74	-24.22	Horizontal
6034.386	34.72	10.52	38.91	46.04	52.37	74	-21.63	Horizontal
7260.000	35.57	10.70	37.62	41.39	50.04	74	-23.96	Horizontal
9680.000	37.10	12.54	36.25	35.77	49.16	74	-24.84	Horizontal
12639.790	37.92	14.55	37.79	38.23	52.91	74	-21.09	Horizontal

Test mode:	Transmitter		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
3705.664	32.53	7.71	38.45	44.67	46.46	74	-27.54	Vertical
4880.000	34.18	8.97	38.76	45.35	49.74	74	-24.26	Vertical
5999.562	34.70	10.56	38.96	46.04	52.34	74	-21.66	Vertical
7320.000	35.54	10.72	37.59	41.47	50.14	74	-23.86	Vertical
9760.000	37.10	12.58	36.14	39.44	52.98	74	-21.02	Vertical
12603.270	37.90	14.44	37.75	39.08	53.67	74	-20.33	Vertical
3705.664	32.53	7.71	38.45	45.81	47.60	74	-26.40	Horizontal
4880.000	34.18	8.97	38.76	46.73	51.12	74	-22.88	Horizontal
6016.949	34.71	10.54	38.94	45.53	51.84	74	-22.16	Horizontal
7320.000	35.54	10.72	37.59	41.00	49.67	74	-24.33	Horizontal
9760.000	37.10	12.58	36.14	39.83	53.37	74	-20.63	Horizontal
12603.270	37.90	14.44	37.75	38.98	53.57	74	-20.43	Horizontal

Test mode:	Transmitter		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
3737.975	32.66	7.72	38.46	44.57	46.49	74	-27.51	Vertical
4920.000	34.22	9.03	38.77	45.96	50.44	74	-23.56	Vertical
6140.076	34.77	10.38	38.78	45.80	52.17	74	-21.83	Vertical
7380.000	35.51	10.75	37.56	41.04	49.74	74	-24.26	Vertical
9840.000	37.14	12.63	36.04	39.78	53.51	74	-20.49	Vertical
12621.510	37.91	14.50	37.77	37.06	51.70	74	-22.30	Vertical
3803.444	32.90	7.74	38.49	45.09	47.24	74	-26.76	Horizontal
4920.000	34.22	9.03	38.77	45.20	49.68	74	-24.32	Horizontal
6265.724	34.80	10.22	38.61	46.14	52.55	74	-21.45	Horizontal
7380.000	35.51	10.75	37.56	40.75	49.45	74	-24.55	Horizontal
9840.000	37.14	12.63	36.04	39.36	53.09	74	-20.91	Horizontal
12566.850	37.87	14.34	37.72	38.19	52.68	74	-21.32	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 3GHz, 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 peak 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: 2013
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:

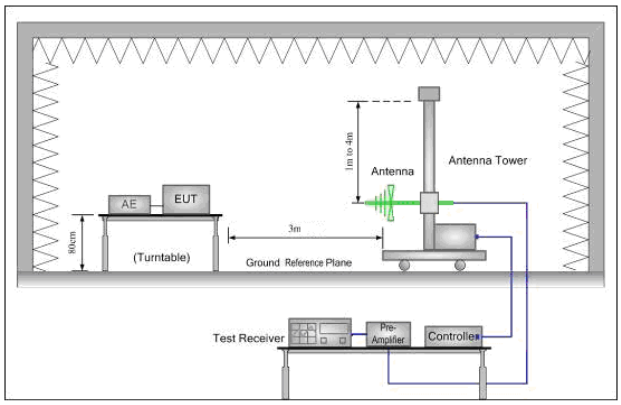


Figure 1. 30MHz to 1GHz

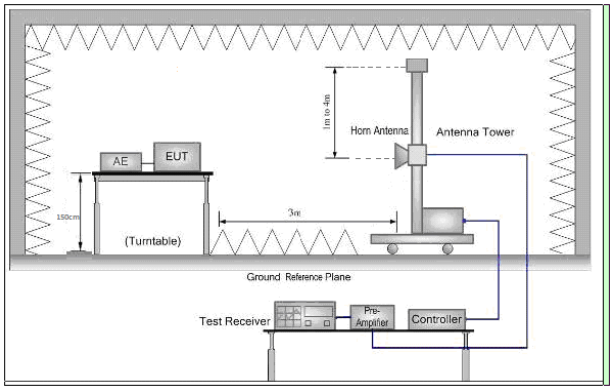
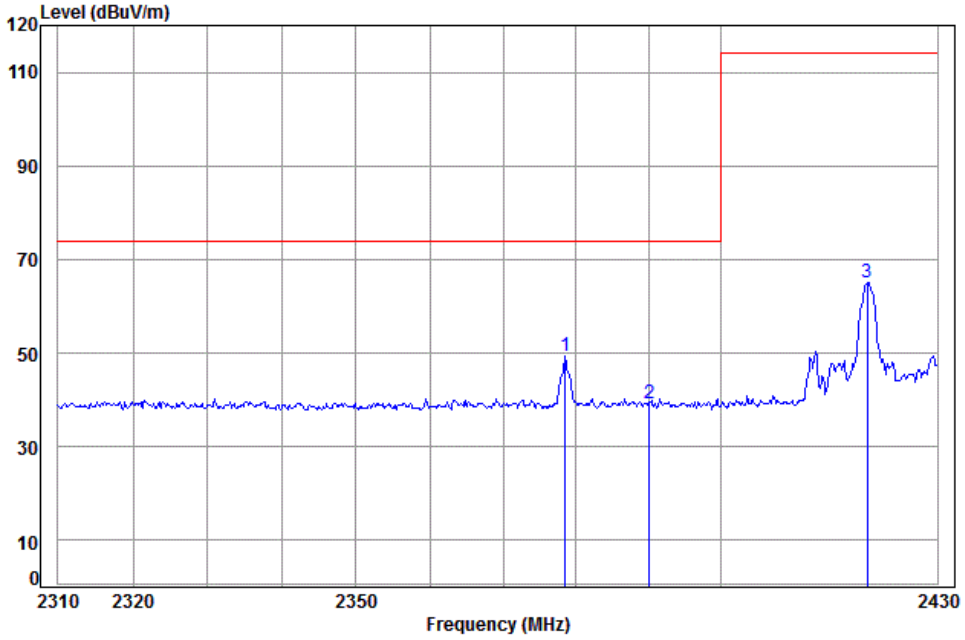


Figure 2. Above 1 GHz

Test Procedure:	a. 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 camber. 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 semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. c. The EUT was set 3 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 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. 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 h. Test the EUT in the lowest 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 worse case.. j. 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

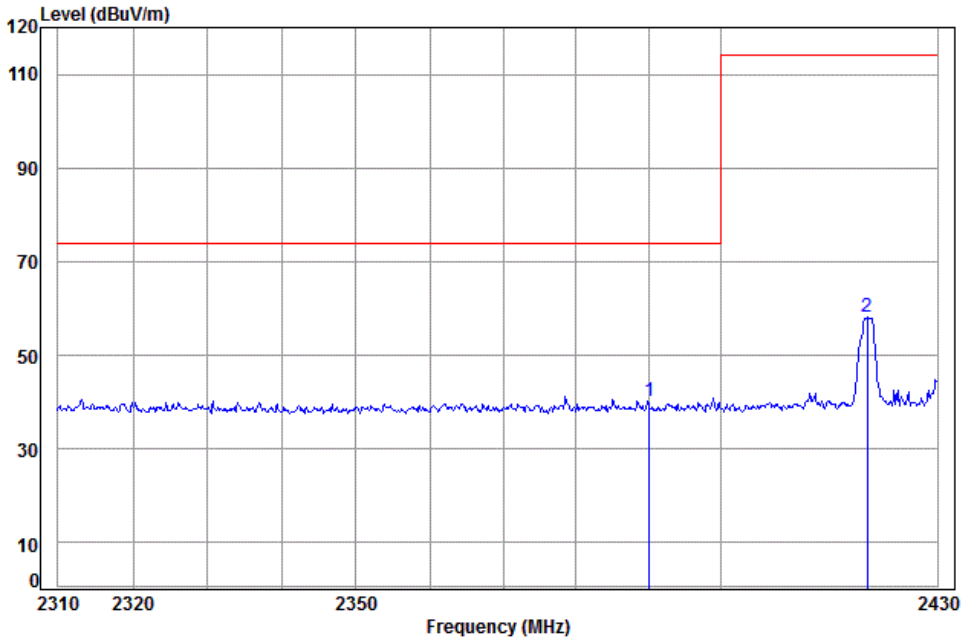
Band edge (Radiated Emission)					
Worse case mode:	Transmitting	Test channel:	Lowest	Remark:	Horizontal



Condition: 3m Horizontal
Job No: : 1478CR
Mode: : 2420 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	2378.50	5.33	28.54	38.11	53.65	49.41	74.00	-24.59
2	2390.00	5.34	28.57	38.11	43.46	39.26	74.00	-34.74
3	2420.18	5.36	28.69	38.11	69.01	64.95	114.00	-49.05

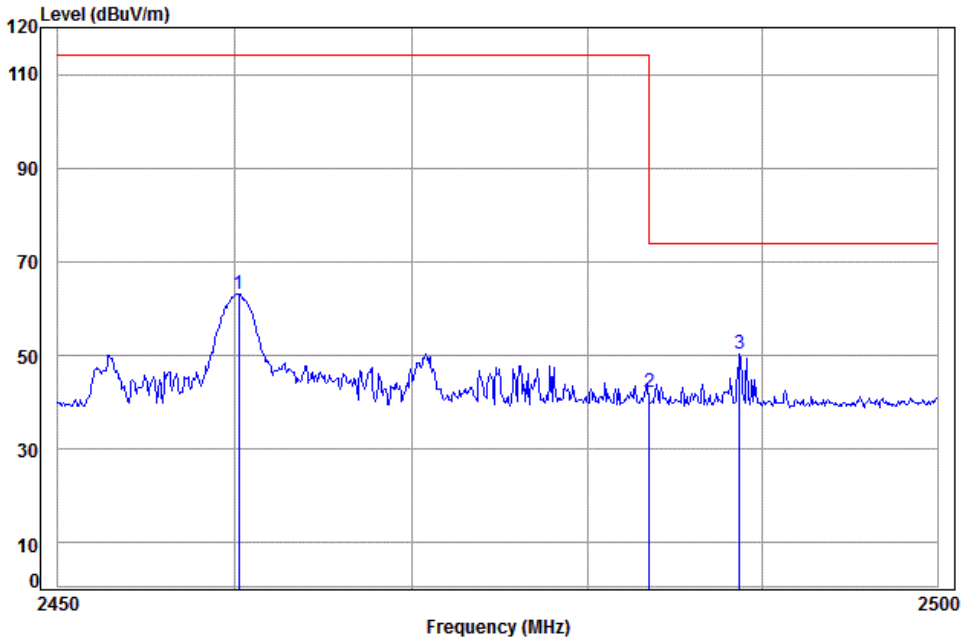
Worse case mode:	Transmitting	Test channel:	Lowest	Remark:	Vertical



Condition: 3m Vertical
Job No: : 1478CR
Mode: : 2420 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	2390.00	5.34	28.57	38.11	44.27	40.07	74.00	-33.93
2	2420.18	5.36	28.69	38.11	62.20	58.14	114.00	-55.86

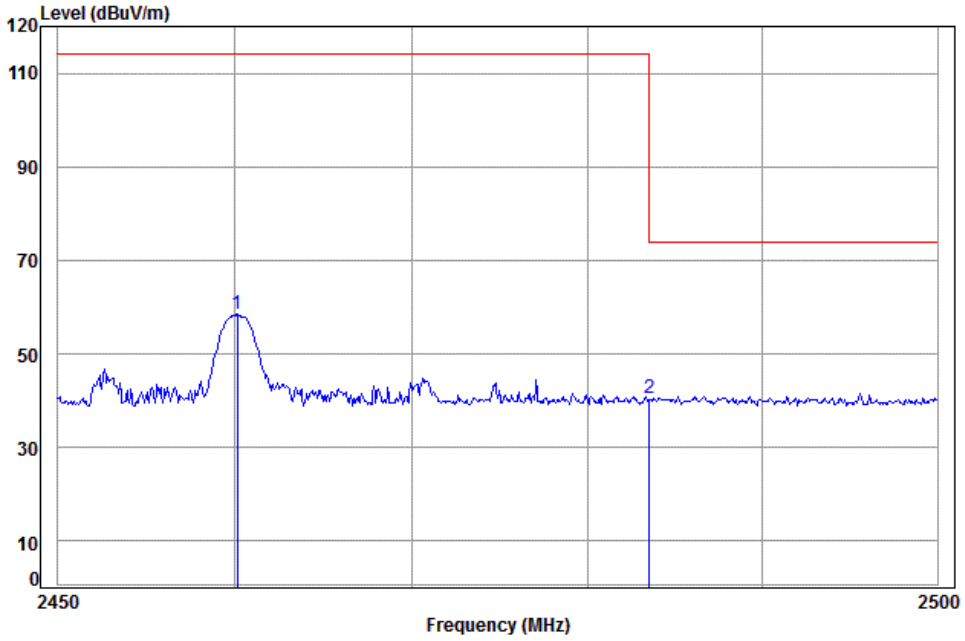
Worse case mode:	Transmitting	Test channel:	Highest	Remark:	Horizontal



Condition: 3m Horizontal
Job No: : 1478CR
Mode: : 2460 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	2460.22	5.39	28.88	38.12	66.93	63.08	114.00	-50.92
2	2483.50	5.41	28.98	38.12	46.05	42.32	74.00	-31.68
3 pp	2488.66	5.41	29.01	38.12	53.93	50.23	74.00	-23.77

Worse case mode:	Transmitting	Test channel:	Highest	Remark:	Vertical



Condition: 3m Vertical
Job No: : 1478CR
Mode: : 2460 Band edge

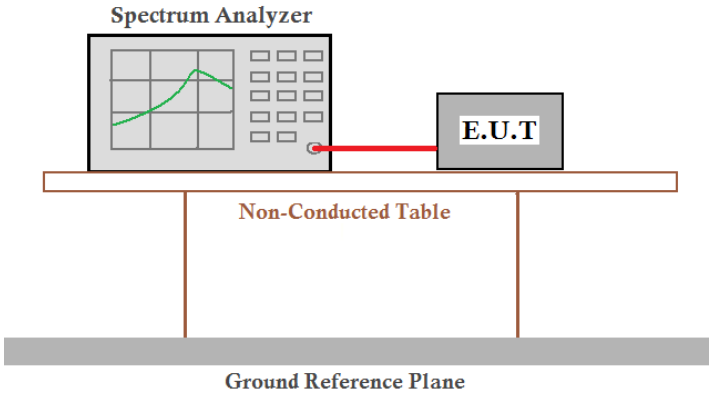
	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2460.12	5.39	28.88	38.12	62.39	58.54	114.00	-55.46
2 pp	2483.50	5.41	28.98	38.12	44.13	40.40	74.00	-33.60

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

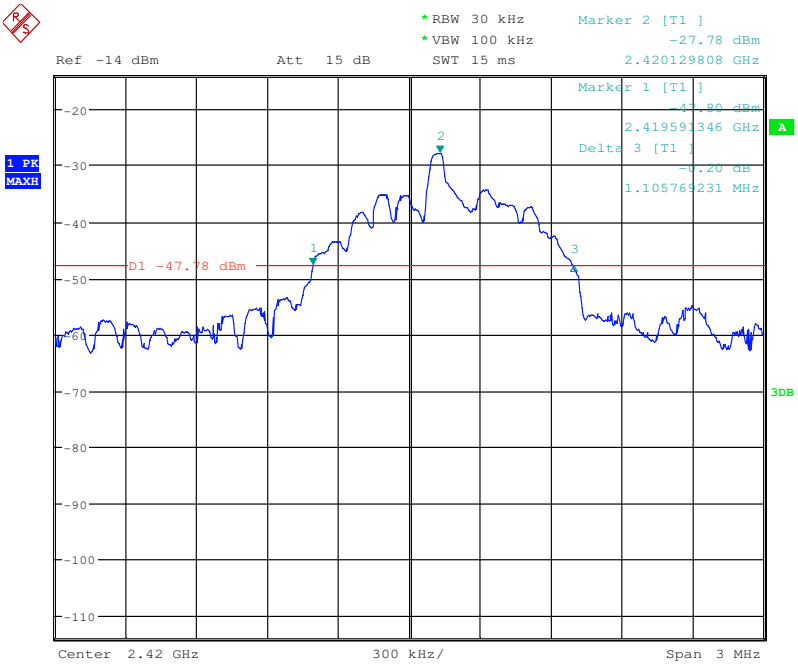
Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2013
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Test mode:	Transmitting mode
Limit:	N/A
Test Results:	Pass

Measurement Data

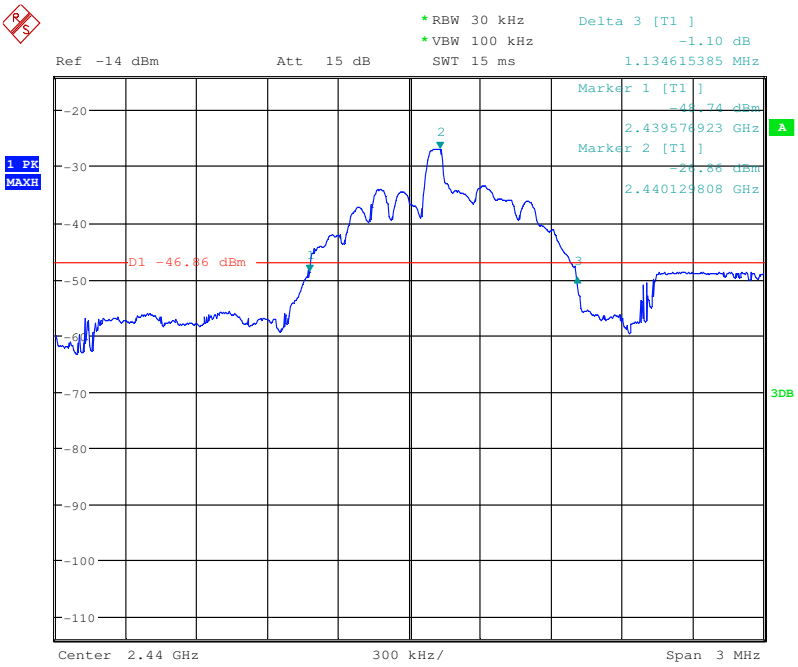
Test channel	20dB bandwidth (MHz)	Results
Lowest	1.106	Pass
Middle	1.135	Pass
Highest	1.115	Pass

Test plot as follows:

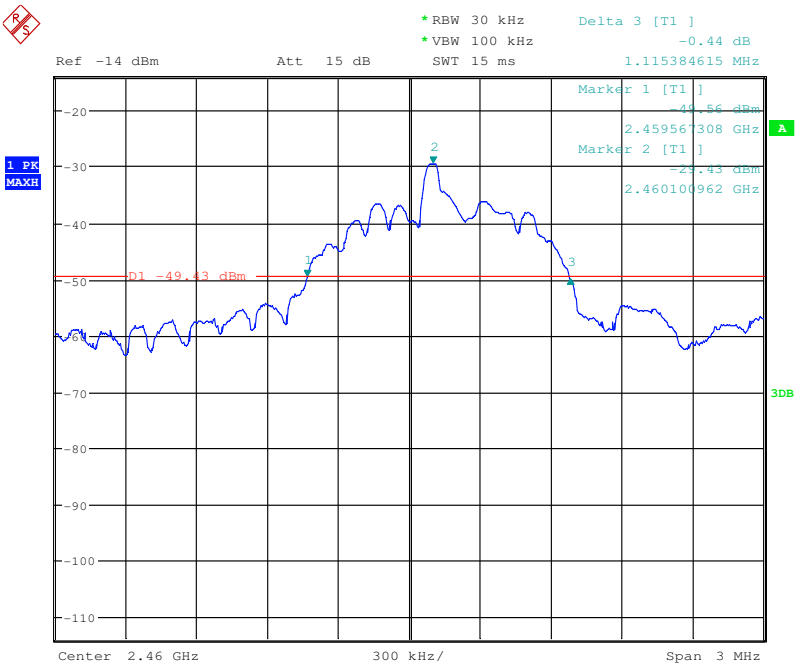
Test channel:	Lowest



Test channel:	Middle



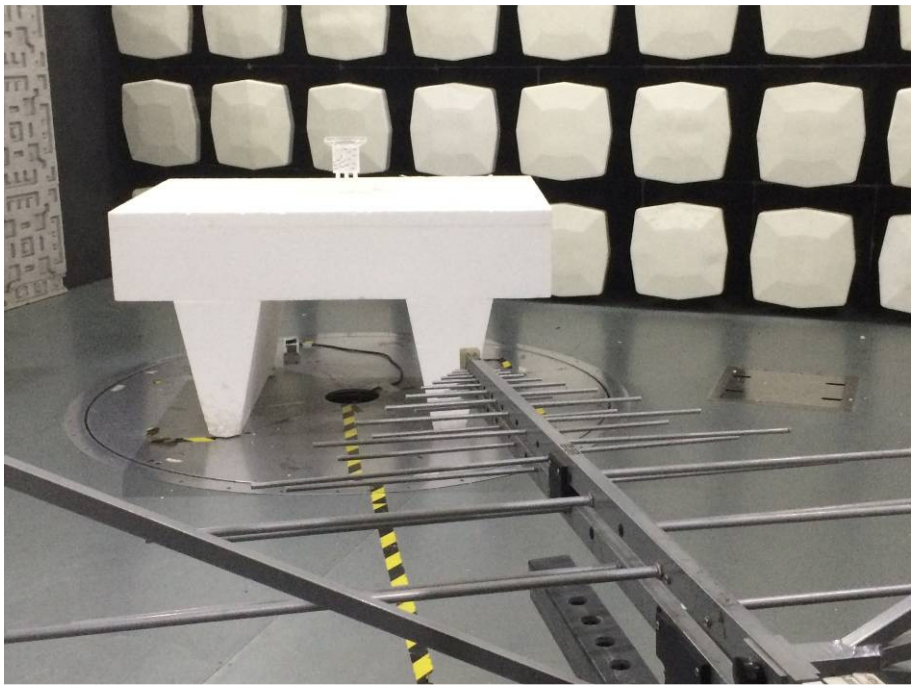
Test channel:	Highest

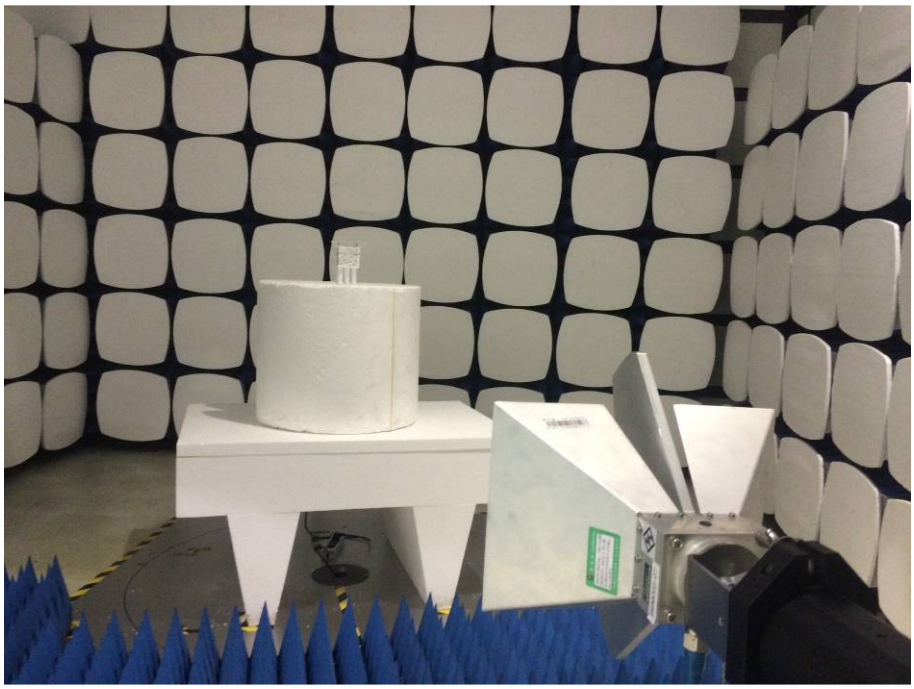


7 Photographs

Test model No.: DNM77R

7.1 Radiated Emission Test Setup





7.2 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1603001478CR.