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Report No.: SZEM160900821202
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FCC REPORT

Application No. : SZEM1609008212CR (SGS SZ No.:T51610250108EM)
Applicant: SpinMaster Toys Far East LTD.
Manufacturer: SpinMaster Toys Far East LTD.
Product Name: AIR HOGS EJECTOR JET
Item No.(EUT): 44519RX
Brand Name: ARH
FCC ID: PQN44519RX2G4
Standards: 47 CFR Part 15, Subpart C (2015)
Date of Receipt: 2016-09-26
Date of Test: 2016-10-08 to 2016-10-09
Date of Issue: 2016-10-11

Test Result:	PASS *
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* 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.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2016-10-11		Original

Authorized for issue by:			
Tested By	Gebin Sun	2016-10-09	
	(Gebin Sun) /Project Engineer	Date	
Checked By	Eric Fu	2016-10-11	
	(Eric Fu) /Reviewer	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



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5 General Information

5.1 Client Information

Applicant:	SpinMaster Toys Far East LTD.
Address of Applicant:	1113, 11th Floor, Chinachen Golden Plaza, 77 Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong
Manufacturer:	SpinMaster Toys Far East LTD.

5.2 General Description of EUT

Product Name:	AIR HOGS EJECTOR JET
Item No.:	44519RX
Brand Name::	ARH
Family No.:	44519
Request Age Grading:	8+
Date Code:	60915AWS
Country of Origin:	Made In China
Country of Destination:	US
Frequency Range:	2.4GHz (2407 MHz ~ 2477MHz)
Modulation Type:	GFSK
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	0dBi
Power Supply:	3.7V DC(1 x 3.7V Rechargeable battery) Battery: Charge by DC 5V for plane



Operation Frequency each of channel					
Channel	Frequency	Channel	Frequency	Channel	Frequency
1CH	2407 MHz	7CH	2435 MHz	16CH	2467 MHz
2CH	2408 MHz	8CH	2436 MHz	17CH	2468 MHz
3CH	2409 MHz	9CH	2438 MHz	18CH	2469 MHz
4CH	2410 MHz	10CH	2440 MHz	19CH	2470 MHz
5CH	2411 MHz	11CH	2441 MHz	20CH	2471 MHz
6CH	2413 MHz	12CH	2442 MHz	21CH	2472 MHz
		13CH	2443 MHz	22CH	2473 MHz
		14CH	2444 MHz	23CH	2474 MHz
		15CH	2445 MHz	24CH	2475 MHz
				25CH	2476 MHz
				26CH	2477 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)	2407MHz
The Middle channel(CH12)	2442MHz
The Highest channel(CH26)	2477MHz



5.3 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	50 % RH
Atmospheric Pressure:	1005 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

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)**

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.

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	SEM001-01	2016-05-13	2017-05-13
2	EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2016-10-09	2017-10-09
3	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2014-11-01	2017-11-01
4	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEM003-11	2015-10-17	2018-10-17
5	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEM003-12	2014-11-24	2017-11-24
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2016-04-25	2017-04-25
7	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A
8	DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
9	Loop Antenna	Beijing Daze	ZN30401	SEM003-09	2015-05-13	2018-05-13



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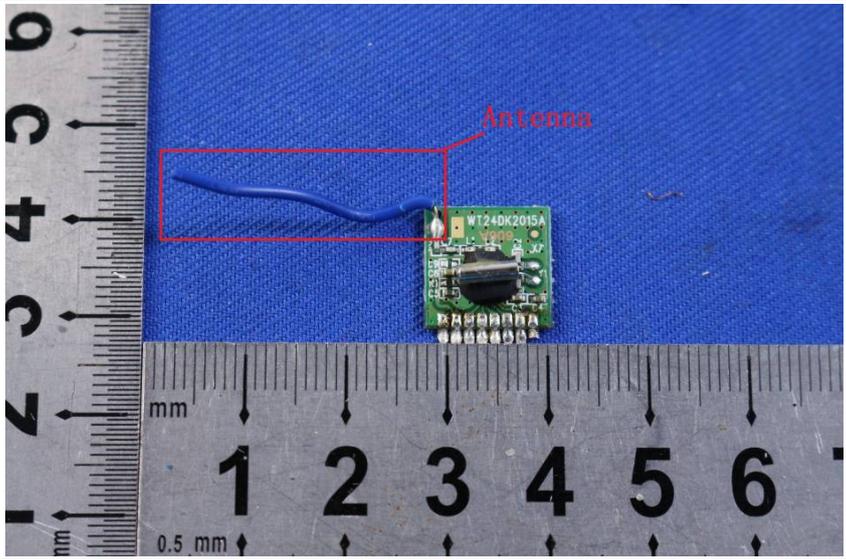
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RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2016-05-13	2017-05-13
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEM004-04	2016-04-25	2017-04-25
3	BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
4	Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2015-10-09	2016-10-09
5	Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
6	Horn Antenna (18-26GHz)	ETS-Lindgren	3160	SEM003-12	2014-11-24	2017-11-24
7	Horn Antenna(26GHz-40GHz)	A.H.Systems, inc.	SAS-573	SEM003-13	2015-02-12	2018-02-12
8	Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2015-10-09	2016-10-09
9	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A

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	ZhaoXin	RXN-305D	SEM011-02	2015-10-09	2016-10-09
2	Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2015-10-17	2016-10-17
3	Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2016-04-25	2017-04-25
4	Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2015-10-09	2016-10-09

6 Test results and Measurement Data

6.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203
<p>15.203 requirement:</p> <p>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.</p>	
EUT Antenna:	
<p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.</p>	



6.2 Radiated Spurious Emissions

6.2.1 Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209				
Test Method:	ANSI C63.10: 2013 Clause 6.4,6.5 and 6.6				
Test Site:	Measurement Distance: 3m				
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:					

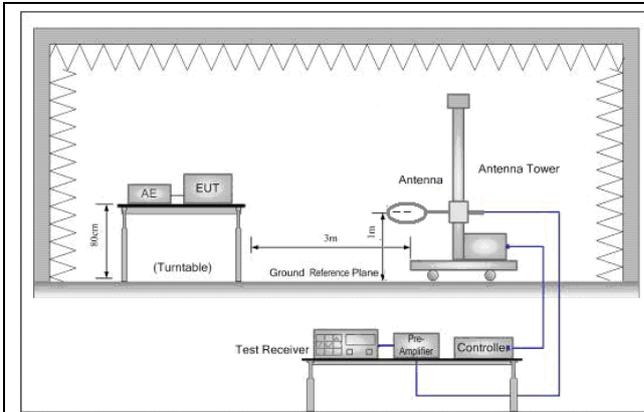


Figure 1. Below 30MHz

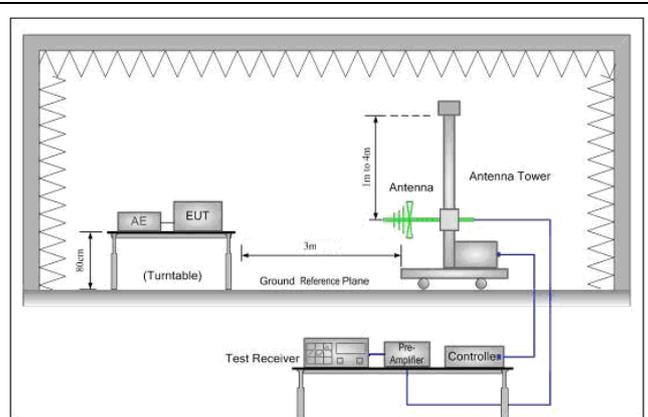


Figure 2. 30MHz to 1GHz

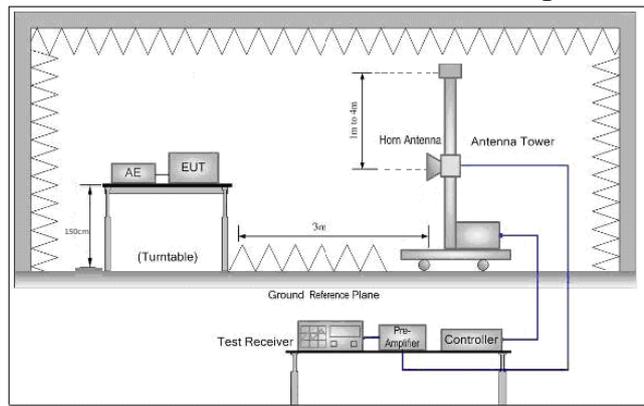


Figure 3. Above 1 GHz

<p>Test Procedure:</p>	<ol style="list-style-type: none"> 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. 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 The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 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. 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. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 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.
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	<p>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.</p>
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting mode
Final Test Mode:	Pretest the EUT at Transmitting mode Only the worst case is recorded in the report.
Test Results:	Pass



Measurement Data

6.2.1.1 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
2406.734	28.63	5.35	38.15	104.06	99.89	114.00	-14.11	Horizontal
2407.346	28.63	5.35	38.15	98.55	94.38	114.00	-19.62	Vertical
2442.279	28.80	5.38	38.15	103.12	99.15	114.00	-14.85	Horizontal
2442.119	28.80	5.38	38.15	99.23	95.26	114.00	-18.74	Vertical
2477.321	28.96	5.40	38.15	101.64	97.85	114.00	-16.15	Horizontal
2477.281	28.96	5.40	38.15	97.51	93.72	114.00	-20.28	Vertical

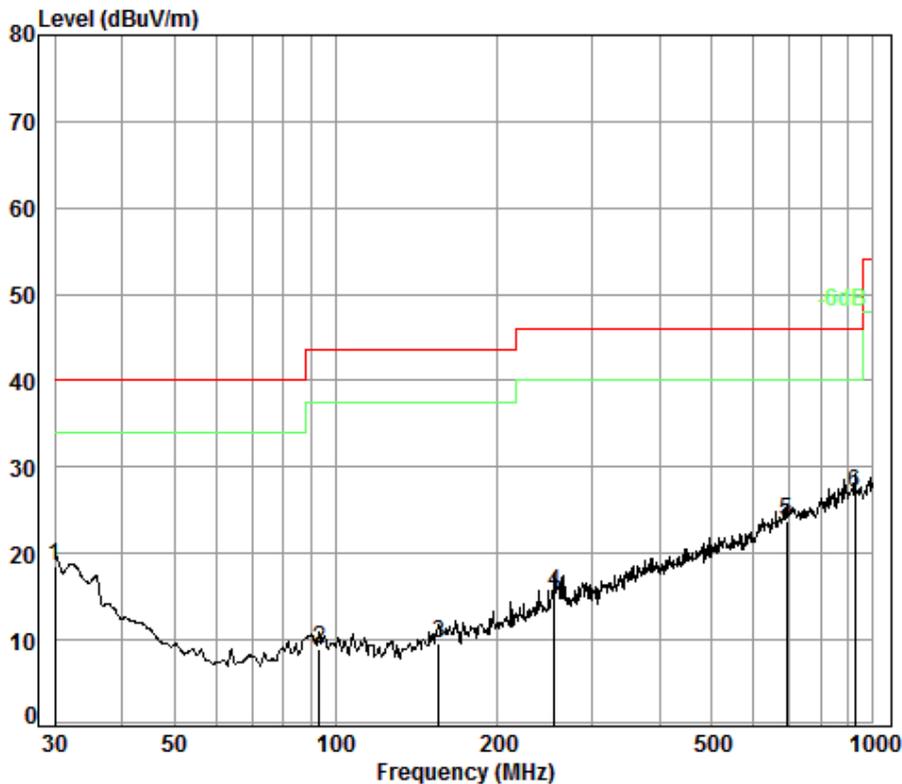
Average value:

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
2406.734	28.63	5.35	38.15	89.52	85.35	94.00	-8.65	Horizontal
2407.346	28.63	5.35	38.15	85.35	81.18	94.00	-12.82	Vertical
2442.279	28.80	5.38	38.15	90.56	86.59	94.00	-7.41	Horizontal
2442.119	28.80	5.38	38.15	86.64	82.67	94.00	-11.33	Vertical
2477.321	28.96	5.40	38.15	87.49	83.70	94.00	-10.30	Horizontal



6.2.1.2 Spurious Emissions

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



Condition: 3m VERTICAL

Job No. : 8212CR

Test mode: TX mode

: Plane

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.00	0.60	19.00	27.40	26.39	18.59	40.00	-21.41
2	93.11	1.13	8.90	27.31	26.28	9.00	43.50	-34.50
3	155.36	1.33	9.52	27.02	25.84	9.67	43.50	-33.83
4	255.62	1.70	12.32	26.70	28.24	15.56	46.00	-30.44
5	689.56	2.88	21.53	27.61	26.93	23.73	46.00	-22.27
6 pp	925.76	3.63	23.39	26.81	26.90	27.11	46.00	-18.89

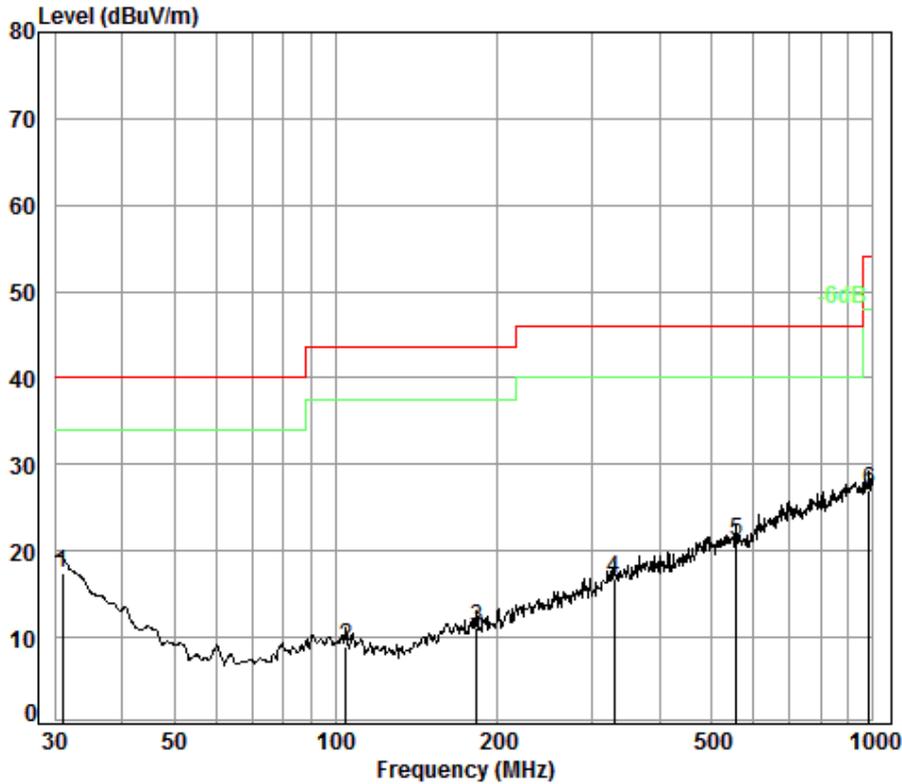


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Test mode:	Transmitter mode	Polarization:	Horizontal
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Condition: 3m HORIZONTAL

Job No. : 8212CR

Test mode: TX mode

: Plane

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	30.96	0.60	18.36	27.40	25.88	17.44	40.00	-22.56
2	104.54	1.21	8.91	27.27	26.18	9.03	43.50	-34.47
3	183.20	1.37	9.97	26.91	26.71	11.14	43.50	-32.36
4	330.19	2.00	14.95	26.77	26.67	16.85	46.00	-29.15
5	556.77	2.66	19.00	27.67	27.05	21.04	46.00	-24.96
6	982.62	3.68	23.82	26.57	26.21	27.14	54.00	-26.86



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Above 1GHz									
Test mode:		Transmitting		Test channel:		Lowest		Remark:	Peak
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
3780.095	33.01	7.73	38.60	45.10	47.24	74.00	-26.76	Vertical	
4814.000	34.18	8.88	39.03	43.68	47.71	74.00	-26.29	Vertical	
5948.056	34.67	10.42	39.00	45.21	51.30	74.00	-22.70	Vertical	
7221.000	36.41	10.69	38.17	43.01	51.94	74.00	-22.06	Vertical	
9628.000	37.53	12.51	36.98	39.40	52.46	74.00	-21.54	Vertical	
11793.120	38.40	14.34	38.10	38.78	53.42	74.00	-20.58	Horizontal	
3712.969	32.82	7.71	38.57	45.10	47.06	74.00	-26.94	Horizontal	
4814.000	34.18	8.88	39.03	49.54	53.57	74.00	-20.43	Horizontal	
5937.408	34.66	10.39	39.01	45.78	51.82	74.00	-22.18	Horizontal	
7221.000	36.41	10.69	38.17	43.55	52.48	74.00	-21.52	Horizontal	

Test mode:		Transmitting		Test channel:		Middle		Remark:	Peak
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
3608.036	32.52	7.67	38.52	45.04	46.71	74.00	-27.29	Vertical	
4884.000	34.30	8.98	39.06	43.50	47.72	74.00	-26.28	Vertical	
6044.750	34.74	10.50	38.97	44.47	50.74	74.00	-23.26	Vertical	
7326.000	36.37	10.73	38.06	42.64	51.68	74.00	-22.32	Vertical	
9768.000	37.55	12.59	36.91	38.99	52.22	74.00	-21.78	Vertical	
12267.280	38.76	14.34	38.58	39.05	53.57	74.00	-20.43	Horizontal	
3786.875	33.03	7.74	38.60	44.30	46.47	74.00	-27.53	Horizontal	
4884.000	34.30	8.98	39.06	48.29	52.51	74.00	-21.49	Horizontal	
5969.409	34.68	10.48	39.00	44.93	51.09	74.00	-22.91	Horizontal	
7326.000	36.37	10.73	38.06	42.40	51.44	74.00	-22.56	Horizontal	

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Report No.: SZEM160900821202

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Test mode:		Transmitting		Test channel:		Highest		Remark:		Peak
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
3786.875	33.03	7.74	38.60	44.64	46.81	74.00	-27.19	Vertical		
4954.000	34.42	9.08	39.08	44.64	49.06	74.00	-24.94	Vertical		
6321.675	34.96	10.15	38.80	44.29	50.60	74.00	-23.40	Vertical		
7431.000	36.33	10.76	37.95	43.63	52.77	74.00	-21.23	Vertical		
9908.000	37.58	12.66	36.84	39.25	52.65	74.00	-21.35	Vertical		
12466.700	38.88	14.18	38.78	39.53	53.81	74.00	-20.19	Horizontal		
3595.129	32.48	7.67	38.51	45.50	47.14	74.00	-26.86	Horizontal		
4954.000	34.42	9.08	39.08	47.16	51.58	74.00	-22.42	Horizontal		
6220.550	34.88	10.28	38.86	44.19	50.49	74.00	-23.51	Horizontal		
7431.000	36.33	10.76	37.95	43.15	52.29	74.00	-21.71	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 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 Clause 6.10		
Test site:	Measurement Distance: 3m		
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:			

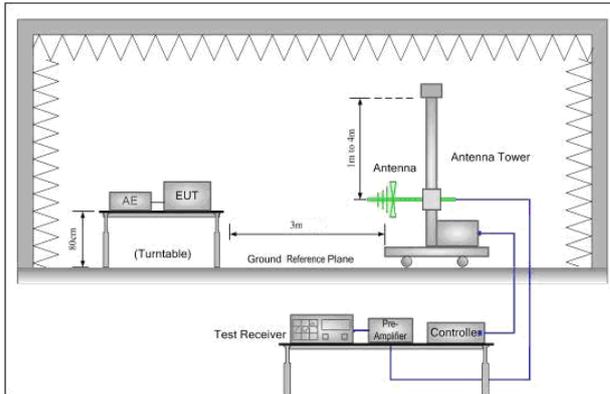


Figure 1. 30MHz to 1GHz

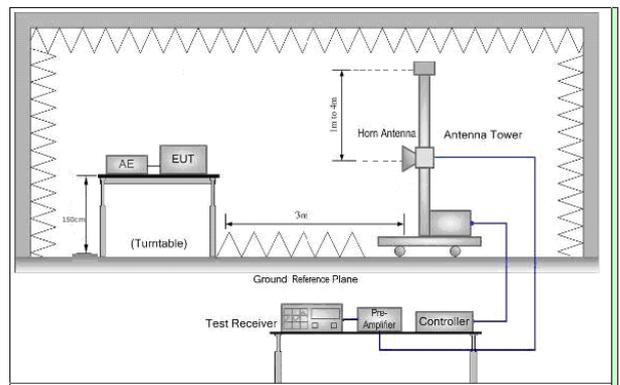


Figure 2. Above 1 GHz



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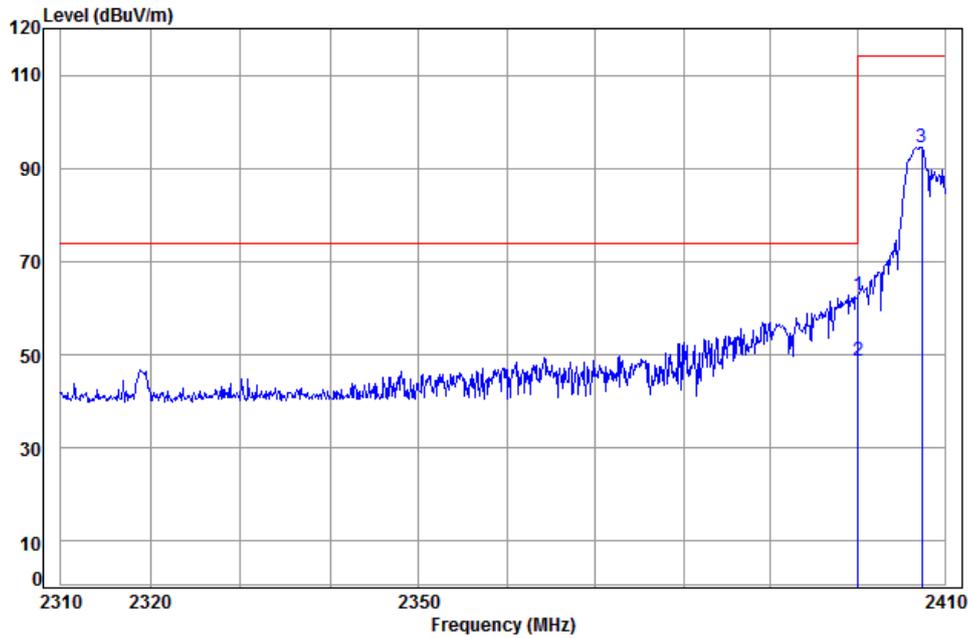
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Test Procedure:	<ul style="list-style-type: none"> a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the 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 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
Exploratory Test Mode:	Transmitting mode
Final Test Mode:	Pretest the EUT at Transmitting mode Only the worst case is recorded in the report.
Test Results:	Pass



Measurement Data

Worse case mode:	Transmitting	Test channel:	Lowest	Remark:	Vertical
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Condition: 3m Vertical

Job No: : 8212CR

Mode: : 2407 Band edge

: Plane

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2400.000	5.34	28.60	38.14	66.82	62.62	74.00	-11.38
2 pp	2400.000	5.34	28.60	38.14	52.81	48.61	54.00	-5.39
3	2407.346	5.35	28.63	38.15	98.55	94.38	114.00	-19.62

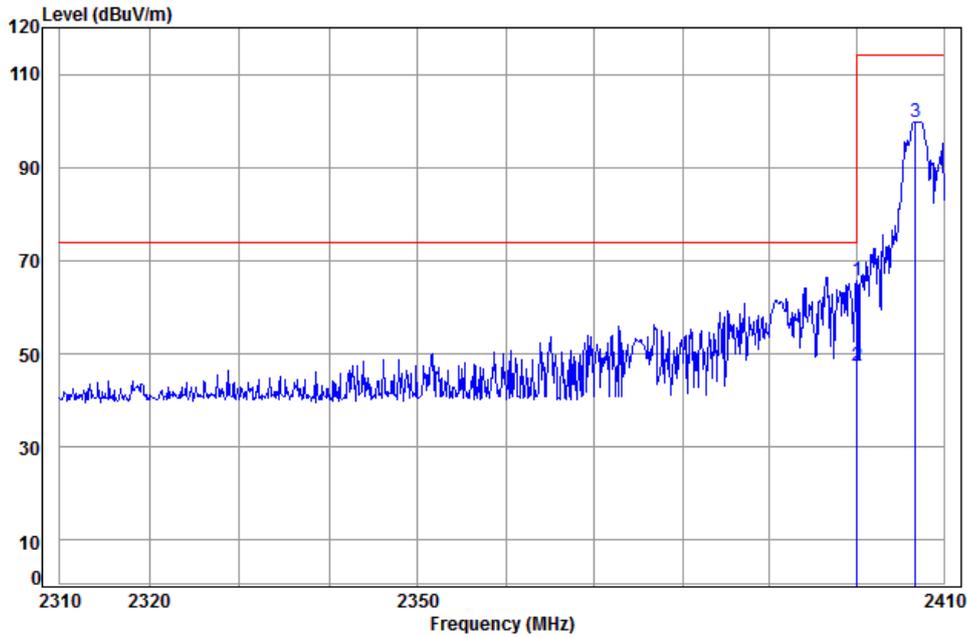


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Worse case mode:	Transmitting	Test channel:	Lowest	Remark:	Horizontal
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Condition: 3m HORIZONTAL

Job No: : 8212CR

Mode: : 2407 Band edge

: Plane

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2400.000	5.34	28.60	38.14	70.00	65.80	74.00	-8.20
2 pp	2400.000	5.34	28.60	38.14	51.56	47.36	54.00	-6.64
3	2406.734	5.35	28.63	38.15	104.06	99.89	114.00	-14.11

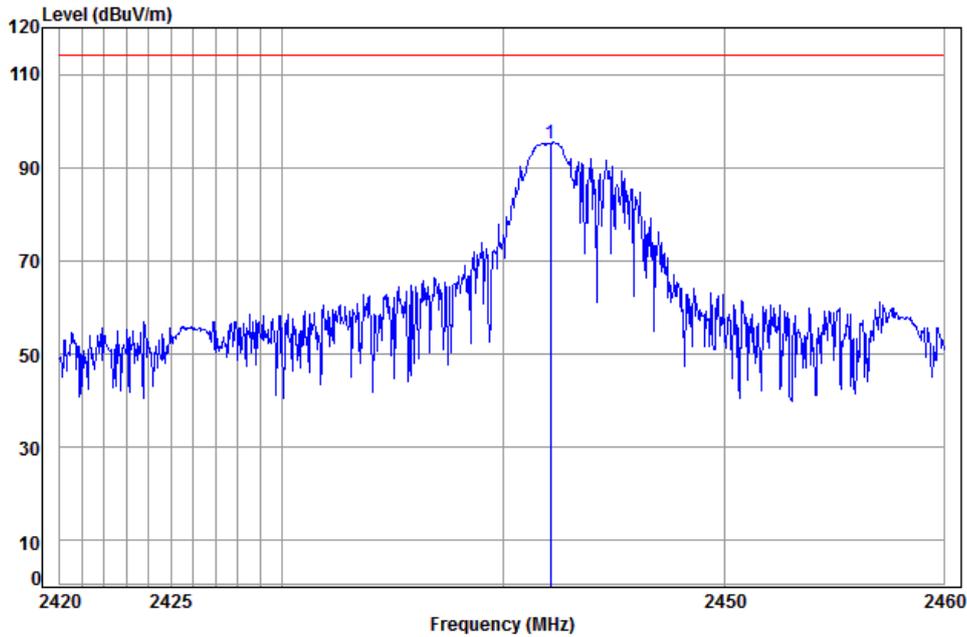


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Worse case mode:	Transmitting	Test channel:	Middle	Remark:	Vertical
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Condition: 3m Vertical

Job No: : 8212CR

Mode: : 2442 Band edge

: Plane

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp 2442.119	5.38	28.80	38.15	99.23	95.26	114.00	-18.74

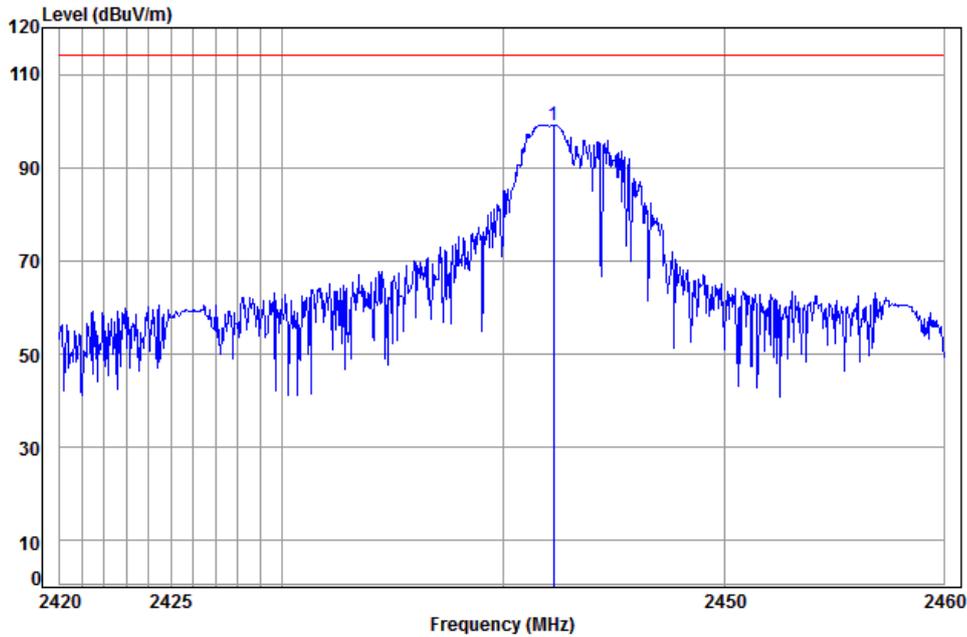


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Worse case mode:	Transmitting	Test channel:	Middle	Remark:	Horizontal
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Condition: 3m HORIZONTAL

Job No: : 8212CR

Mode: : 2442 Band edge

: Plane

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m
1 pp 2442.279	5.38	28.80	38.15	103.12	99.15	114.00 -14.85

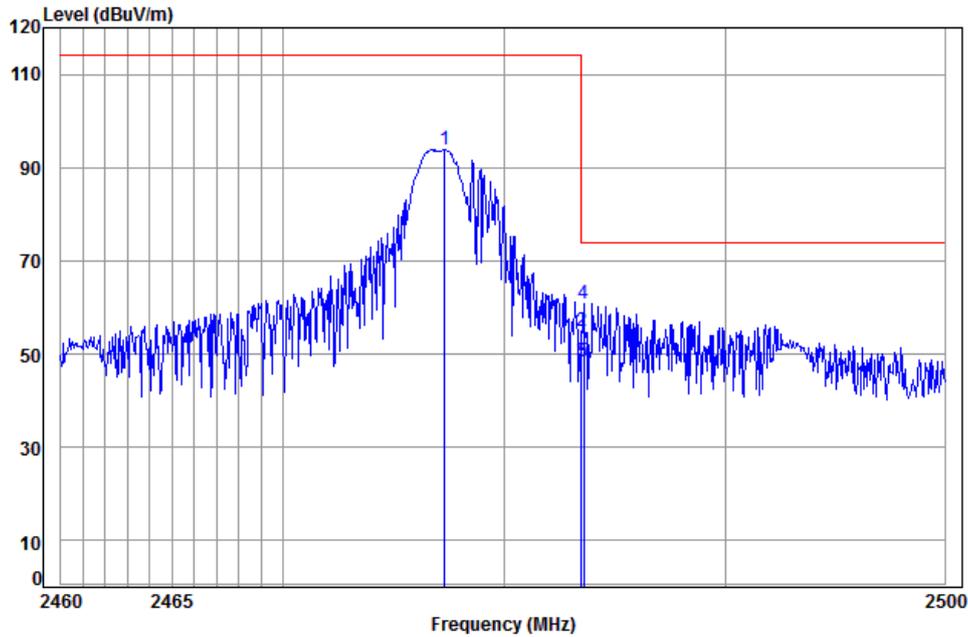


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Worse case mode:	Transmitting	Test channel:	Highest	Remark:	Vertical
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Condition: 3m Vertical

Job No: : 8212CR

Mode: : 2477 Band edge

: Plane

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2477.281	5.40	28.96	38.15	97.51	93.72	114.00	-20.28
2	2483.500	5.41	28.98	38.15	58.82	55.06	74.00	-18.94
3	2483.500	5.41	28.98	38.15	52.23	48.47	54.00	-5.53
4	2483.602	5.41	28.99	38.15	64.52	60.77	74.00	-13.23
5 pp	2483.602	5.41	28.99	38.15	52.30	48.55	54.00	-5.45

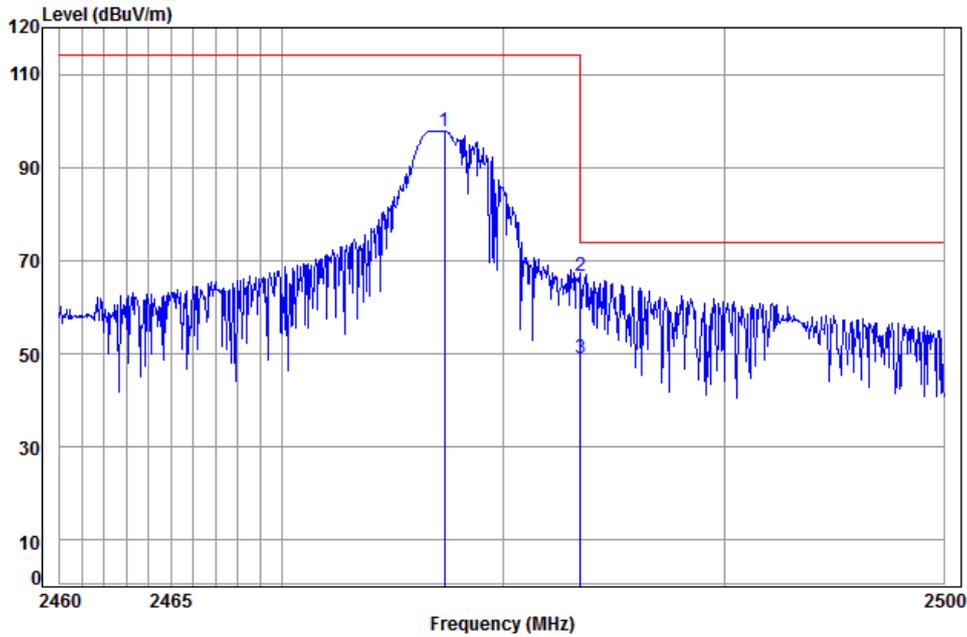


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Worse case mode:	Transmitting	Test channel:	Highest	Remark:	Horizontal
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Condition: 3m HORIZONTAL

Job No: : 8212CR

Mode: : 2477 Band edge

: Plane

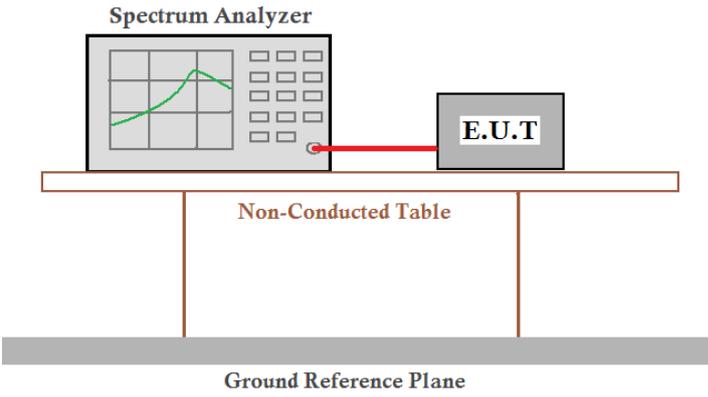
	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2477.321	5.40	28.96	38.15	101.64	97.85	114.00	-16.15
2	2483.500	5.41	28.98	38.15	70.47	66.71	74.00	-7.29
3 pp	2483.500	5.41	28.98	38.15	52.97	49.21	54.00	-4.79

Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

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

6.4 20dB Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2013 Clause 6.9
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Test mode:	Transmitting mode
Limit:	N/A
Test Results:	Pass

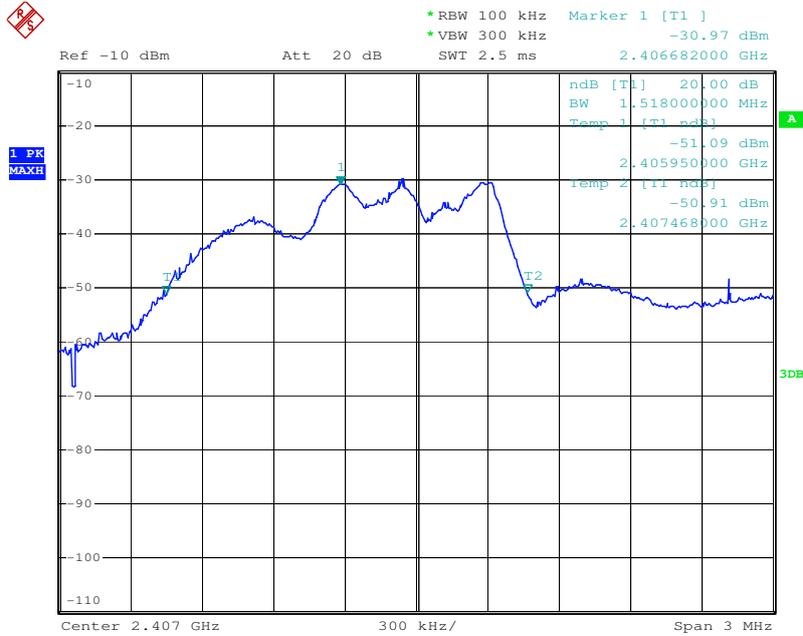
Measurement Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	1.518	Pass
Middle	1.272	Pass
Highest	1.530	Pass

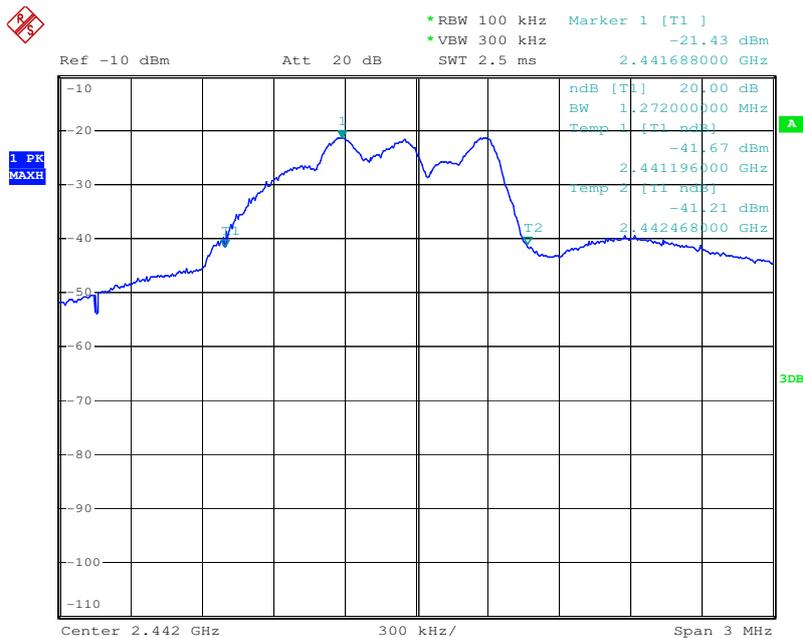


Test plot as follows:

Test channel:	Lowest
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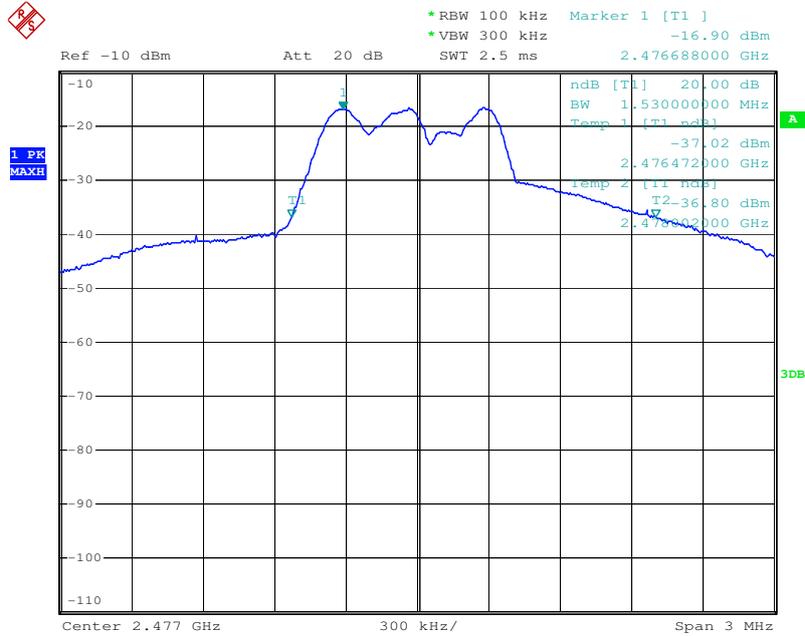


Test channel:	Middle
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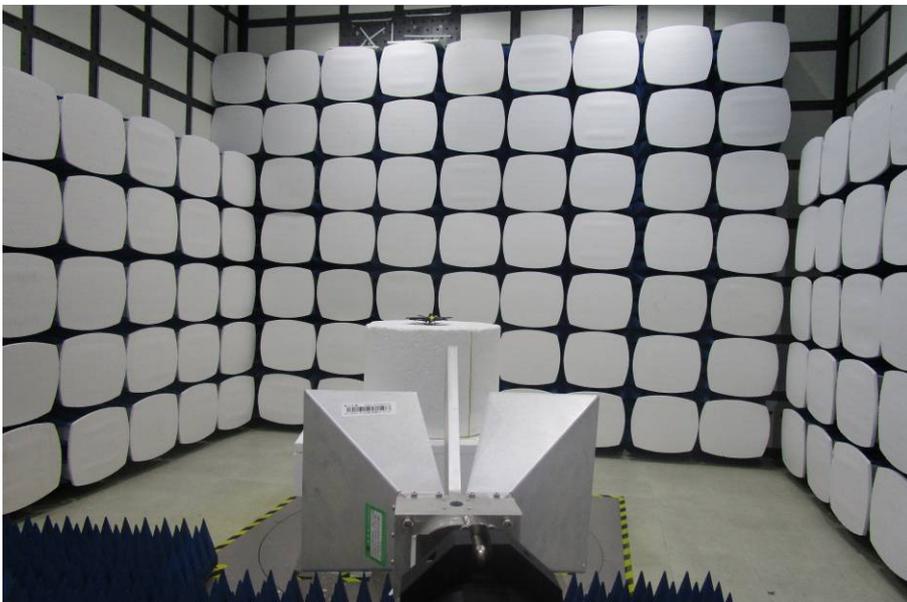
Test channel: Highest



7 Photographs

Test Item No.: 44519RX

7.1 Radiated Emission Test Setup



7.2 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1609008212CR.