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Report No.: SZEM160900756206

Page: 1 of 55

FCC REPORT

Application No: SZEM1609007562CR (SGS SH No.:SHEM1609005962CR)
Applicant: Powervision Robot Inc.
Manufacturer: Powervision Robot Inc.
Factory: Huizhou BYD Electronic Co., Ltd
Product Name: PowerEgg Base Station
Model No.(EUT): PEGRS10
Trade Mark: PowerVision
FCC ID: 2AJTNPEGRS10
Standards: 47 CFR Part 15, Subpart C (2015)
Date of Receipt: 2016-09-08
Date of Test: 2016-09-09 to 2016-10-09
Date of Issue: 2016-10-17

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.

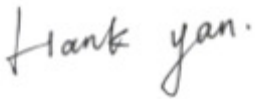

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2016-10-17		Original

Authorized for issue by:				
Tested By		 <hr/>		2016-10-12
				Date
Checked By		 <hr/>		2016-10-17
				Date
		(Hank Yan) /Project Engineer		
		(Eric Fu) /Reviewer		



3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2013	PASS
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10 2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10 2013	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10 2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS



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5 General Information

5.1 Client Information

Applicant:	Powervision Robot Inc.
Address of Applicant:	1st floor, Building No.33 YUNGU park, No.79 SHUANGYING west road, Technology Park, Changping District, Beijing
Manufacturer:	Powervision Robot Inc.
Address of Manufacturer:	1st floor, Building No.33 YUNGU park, No.79 SHUANGYING west road, Technology Park, Changping District, Beijing
Factory:	Huizhou BYD Electronic Co., Ltd
Address of Factory:	Xiangshui River, Economic Development Zone, Daya Bay, Huizhou, Guangdong, 516083,P.R.China

5.2 General Description of EUT

Product Name:	PowerEgg Base Station
Model No.:	PEGRS10
Trade Mark:	PowerVision
Operation Frequency:	4MHz Bandwidth mode: 2405MHz to 2475MHz 8MHz Bandwidth mode: 2407MHz to 2469MHz
Modulation Type:	OFDM
Number of Channel:	4MHz Bandwidth mode: 71 8MHz Bandwidth mode: 63
Sample Type:	Portable Device
Antenna Type:	Dipole Antenna
Antenna Gain:	3dBi
Power Supply:	DC 3.7V Li-ion Battery



4MHz Bandwidth mode:

Operation Frequency each of channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2405.00	19	2423.00	37	2441.00	55	2459.00
2	2406.00	20	2424.00	38	2442.00	56	2460.00
3	2407.00	21	2425.00	39	2443.00	57	2461.00
4	2408.00	22	2426.00	40	2444.00	58	2462.00
5	2409.00	23	2427.00	41	2445.00	59	2463.00
6	2410.00	24	2428.00	42	2446.00	60	2464.00
7	2411.00	25	2429.00	43	2447.00	61	2465.00
8	2412.00	26	2430.00	44	2448.00	62	2466.00
9	2413.00	27	2431.00	45	2449.00	63	2467.00
10	2414.00	28	2432.00	46	2450.00	64	2468.00
11	2415.00	29	2433.00	47	2451.00	65	2469.00
12	2416.00	30	2434.00	48	2452.00	66	2470.00
13	2417.00	31	2435.00	49	2453.00	67	2471.00
14	2418.00	32	2436.00	50	2454.00	68	2472.00
15	2419.00	33	2437.00	51	2455.00	69	2473.00
16	2420.00	34	2438.00	52	2456.00	70	2474.00
17	2421.00	35	2439.00	53	2457.00	71	2475.00
18	2422.00	36	2440.00	54	2458.00		



8MHz Bandwidth mode

Operation Frequency each of channel							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2407.00	17	2423.00	33	2439.00	49	2455.00
2	2408.00	18	2424.00	34	2440.00	50	2456.00
3	2409.00	19	2425.00	35	2441.00	51	2457.00
4	2410.00	20	2426.00	36	2442.00	52	2458.00
5	2411.00	21	2427.00	37	2443.00	53	2459.00
6	2412.00	22	2428.00	38	2444.00	54	2460.00
7	2413.00	23	2429.00	39	2445.00	55	2461.00
8	2414.00	24	2430.00	40	2446.00	56	2462.00
9	2415.00	25	2431.00	41	2447.00	57	2463.00
10	2416.00	26	2432.00	42	2448.00	58	2464.00
11	2417.00	27	2433.00	43	2449.00	59	2465.00
12	2418.00	28	2434.00	44	2450.00	60	2466.00
13	2419.00	29	2435.00	45	2451.00	61	2467.00
14	2420.00	30	2436.00	46	2452.00	62	2468.00
15	2421.00	31	2437.00	47	2453.00	63	2469.00
16	2422.00	32	2438.00	48	2454.00		



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:

4MHz Bandwidth mode:

Channel	Frequency
The lowest channel (CH1)	2405MHz
The middle channel (CH36)	2440MHz
The highest channel (CH71)	2475MHz

8MHz Bandwidth mode:

Channel	Frequency
The lowest channel (CH1)	2407MHz
The middle channel (CH32)	2438MHz
The highest channel (CH63)	2469MHz



5.3 Test Environment

Operating Environment:	
Temperature:	25.0 °C
Humidity:	53 % RH
Atmospheric Pressure:	1005mbar

5.4 Description of Support Units

The EUT has been tested independent unit.

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

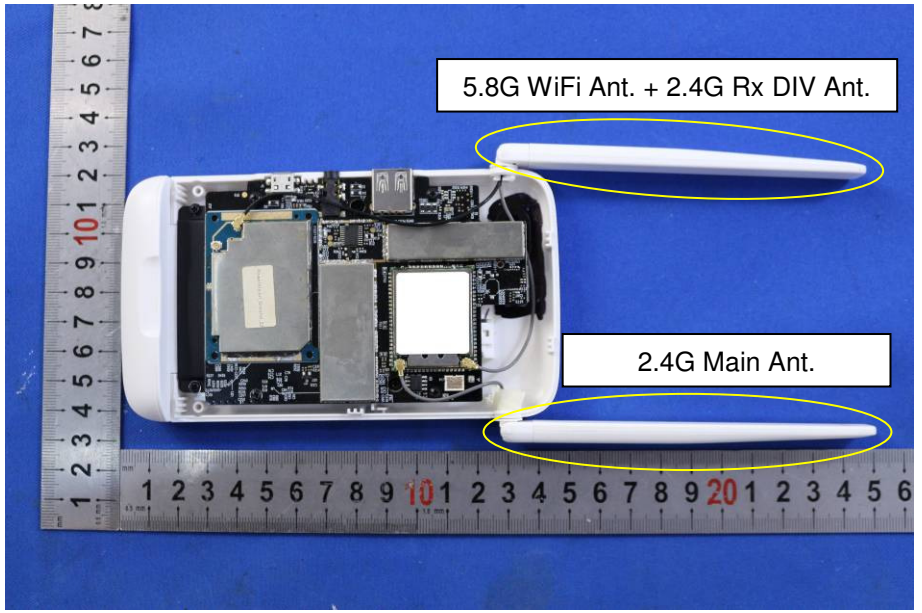
RF connected test						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2015-10-09	2016-10-09
2	Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2015-10-09	2016-10-09
3	Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2016-04-25	2017-04-25
4	Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2015-10-09	2016-10-09

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2016-05-13	2017-05-13
2	EMI Test Receiver (9k-3GHz)	Rohde & Schwarz	ESCI	SEM004-01	2016-04-25	2017-04-25
3	Trilog-Broadband Antenna(30M-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-06-29	2019-06-29
4	Pre-amplifier	Sonoma Instrument Co	310N	SEM005-03	2016-07-06	2017-07-06
5	Loop Antenna	ETS-Lindgren	6502	SEM003-08	2015-08-14	2018-08-14

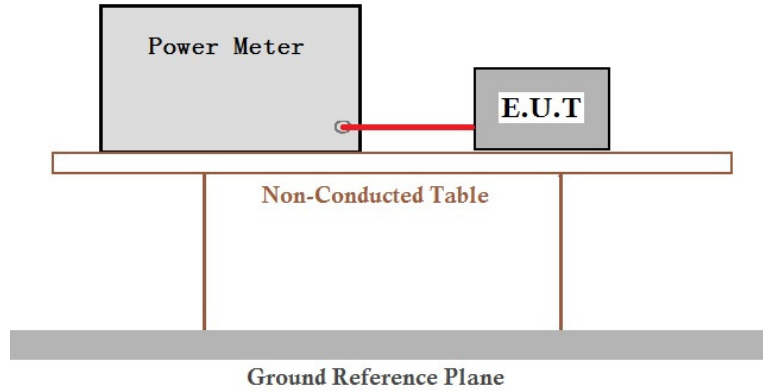
RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2016-05-13	2017-05-13
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEM004-04	2016-04-25	2017-04-25
3	BiConiLog Antenna (26-3000MHz)	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

6 Test results and Measurement Data

6.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
<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> <p>15.247(b) (4) requirement:</p> <p>The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</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 3dBi.</p>

6.2 Conducted Peak Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(1)
Test Method:	ANSI C63.10 :2013 Section 11.9.1
Test Setup:	 <p>The diagram illustrates the test setup. A rectangular box labeled 'Power Meter' is connected to a smaller box labeled 'E.U.T.' by a red cable. Both boxes are positioned on a 'Non-Conducted Table', which is represented by a horizontal line with two vertical legs. Below the table, a thick grey horizontal bar represents the 'Ground Reference Plane'.</p>
Limit:	30dBm
Test Mode:	Transmitting with 4MHz Bandwidth mode and 8MHz Bandwidth mode
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass



Measurement Data

Peak Power:

4MHz Bandwidth mode:			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	26.67	30.00	Pass
Middle	27.42	30.00	Pass
Highest	25.64	30.00	Pass

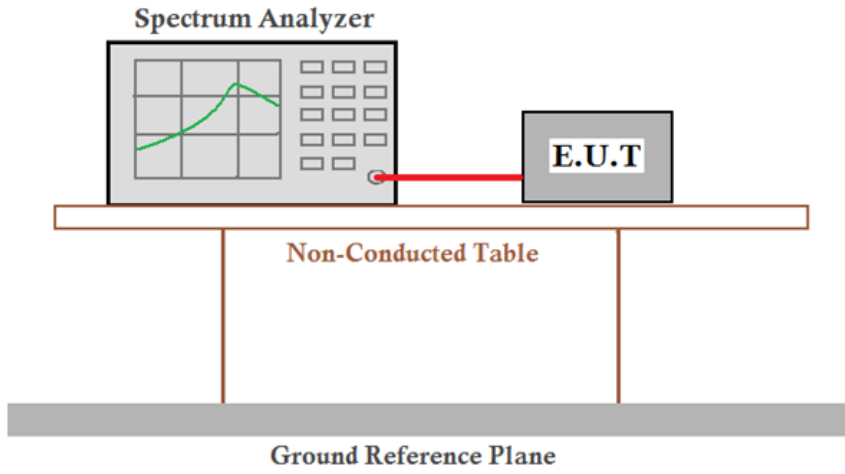
8MHz Bandwidth mode:			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	26.78	30.00	Pass
Middle	27.70	30.00	Pass
Highest	26.25	30.00	Pass

Average Power:

4MHz Bandwidth mode:			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	24.75	30.00	Pass
Middle	25.72	30.00	Pass
Highest	24.14	30.00	Pass

8MHz Bandwidth mode:			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	24.88	30.00	Pass
Middle	25.96	30.00	Pass
Highest	24.56	30.00	Pass

6.3 6dB Occupy Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013 Section 11.8
Test Setup:	
Limit:	≥ 500 kHz
Test Mode:	Transmitting with 4MHz Bandwidth mode and 8MHz Bandwidth mode
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass

Measurement Data

4MHz Bandwidth mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	4.56	≥ 500	Pass
Middle	4.60	≥ 500	Pass
Highest	4.60	≥ 500	Pass

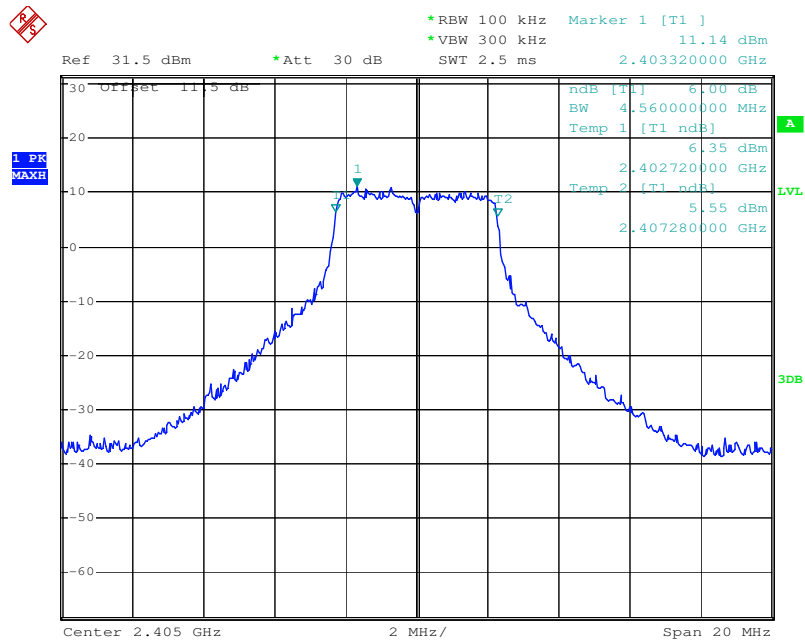
8MHz Bandwidth mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	9.12	≥ 500	Pass
Middle	9.16	≥ 500	Pass
Highest	9.16	≥ 500	Pass



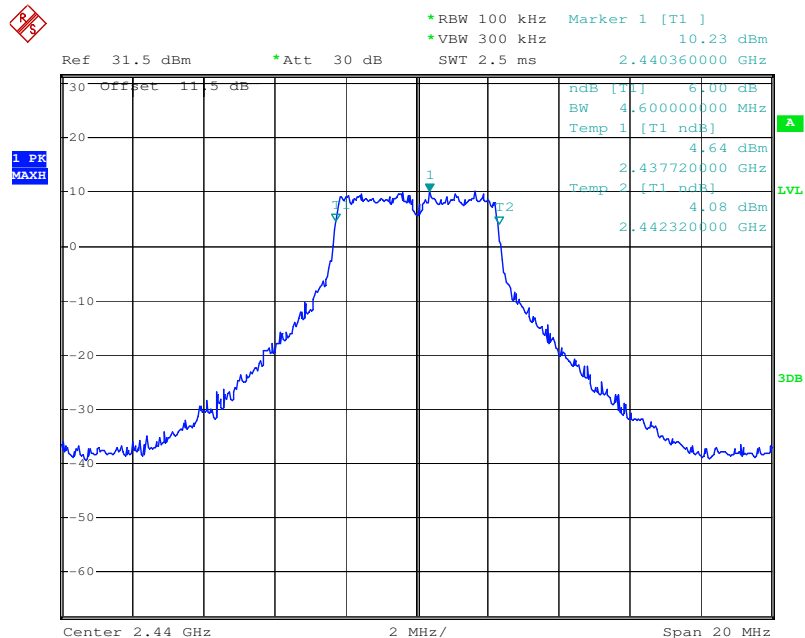
Test plot as follows:

4MHz Bandwidth mode

Test mode:	4MHz Bandwidth mode	Test channel:	Lowest
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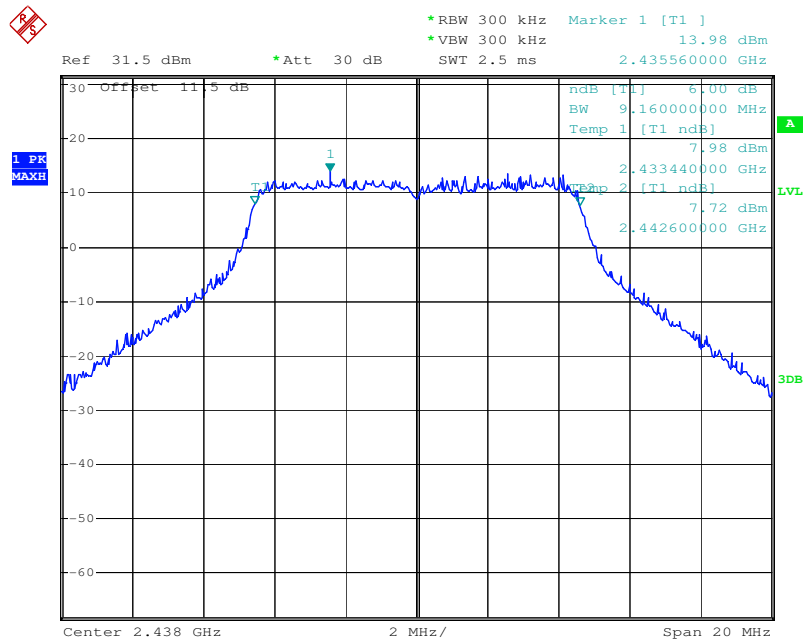


Test mode:	4MHz Bandwidth mode	Test channel:	Middle
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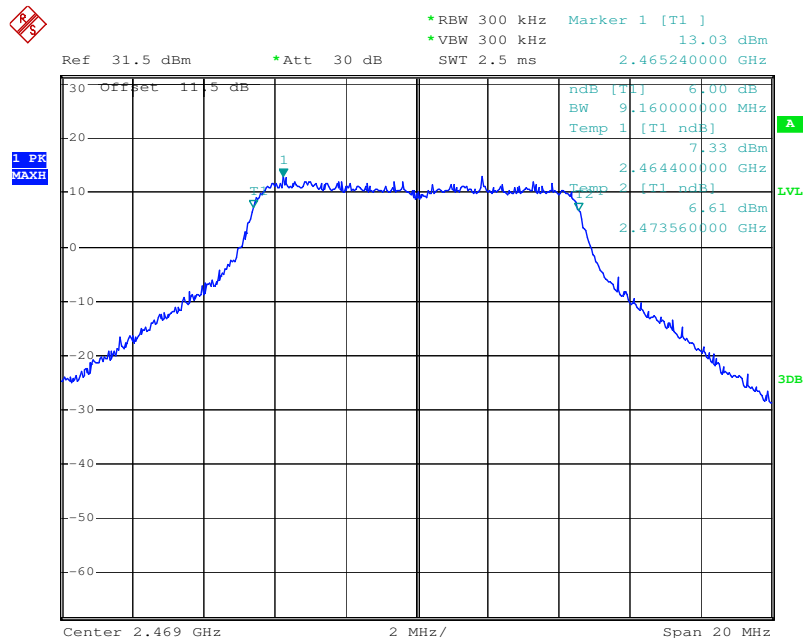




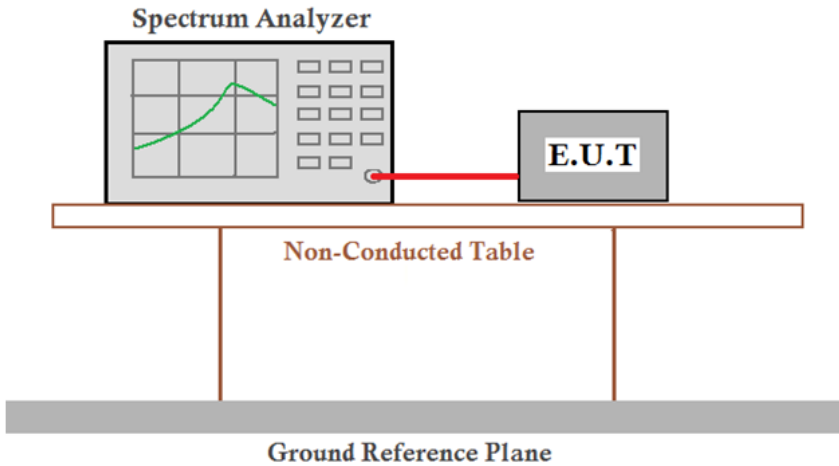
Test mode:	8MHz Bandwidth mode	Test channel:	Middle
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Test mode:	8MHz Bandwidth mode	Test channel:	Highest
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6.4 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 :2013 Section 11.10.2
Test Setup:	
Limit:	$\leq 8.00 \text{ dBm/3kHz}$
Test Mode:	Transmitting with 4MHz Bandwidth mode and 8MHz Bandwidth mode
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass

Measurement Data

4MHz Bandwidth mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-2.79	≤ 8.00	Pass
Middle	-2.37	≤ 8.00	Pass
Highest	-4.62	≤ 8.00	Pass

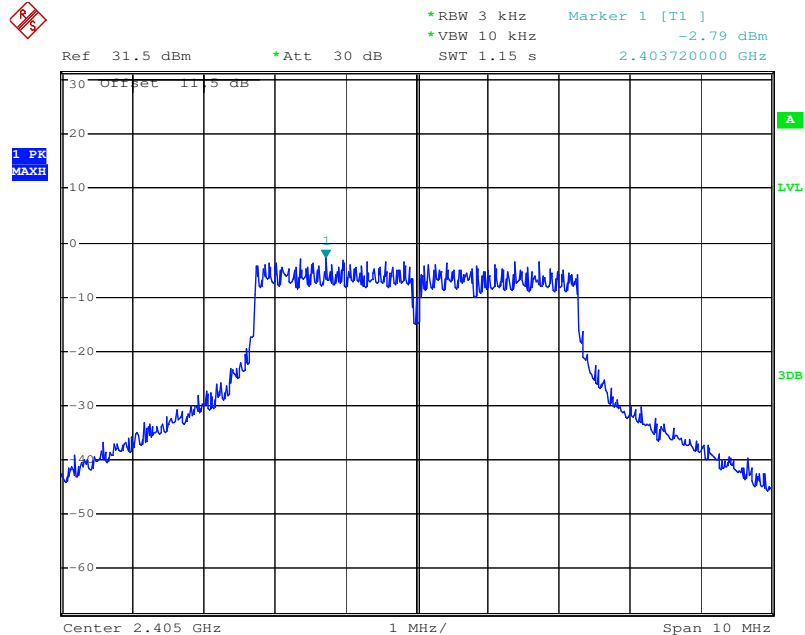
8MHz Bandwidth mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-3.79	≤ 8.00	Pass
Middle	-4.02	≤ 8.00	Pass
Highest	-5.32	≤ 8.00	Pass



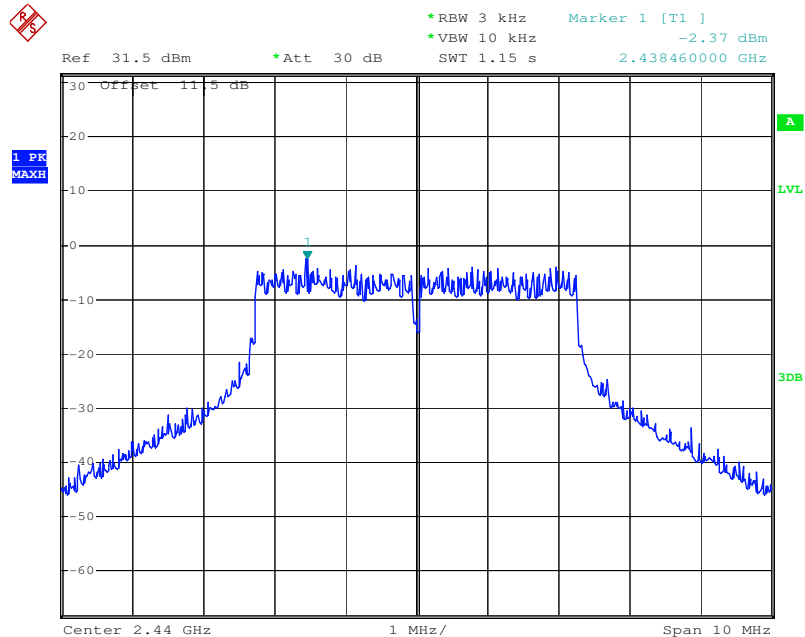
Test plot as follows:

4MHz Bandwidth mode

Test mode:	4MHz Bandwidth mode	Test channel:	Lowest
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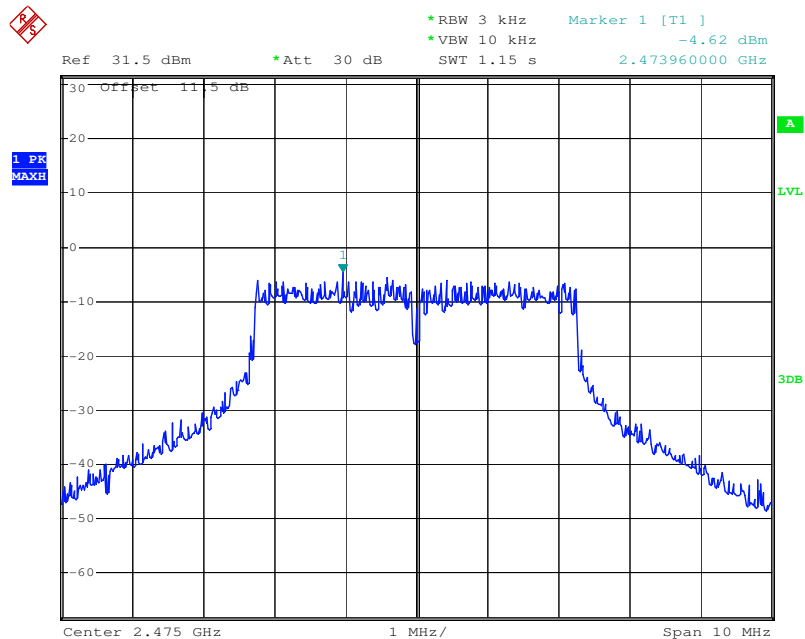


Test mode:	4MHz Bandwidth mode	Test channel:	Middle
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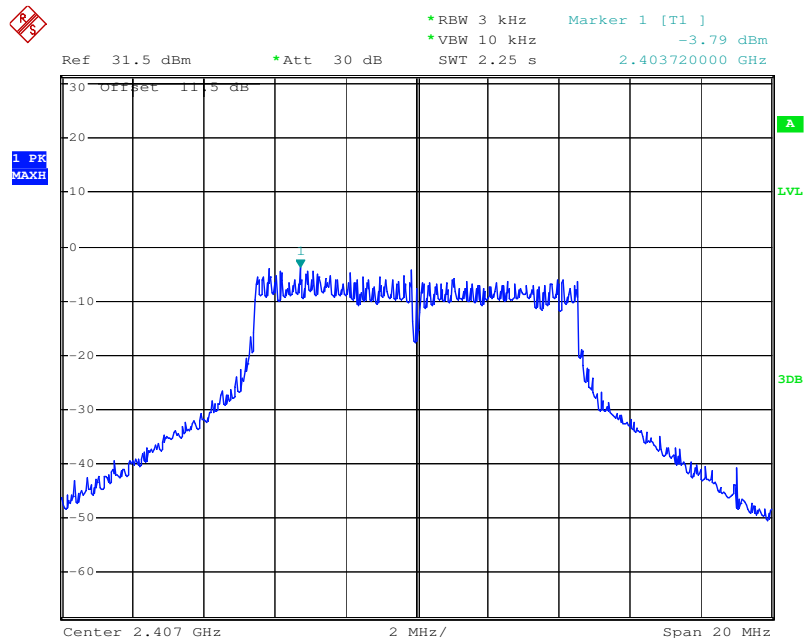


Test mode:	4MHz Bandwidth mode	Test channel:	Highest
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8MHz Bandwidth mode

Test mode:	8MHz Bandwidth mode	Test channel:	Lowest
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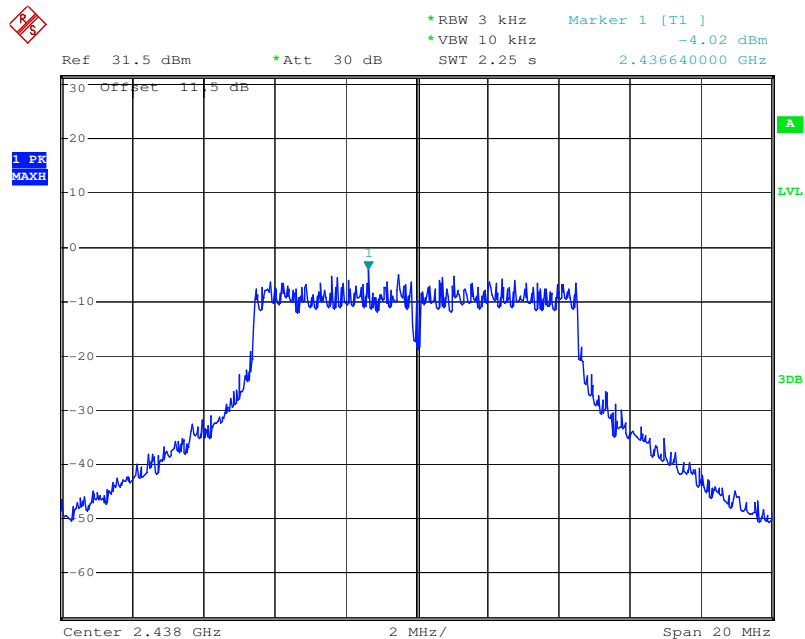


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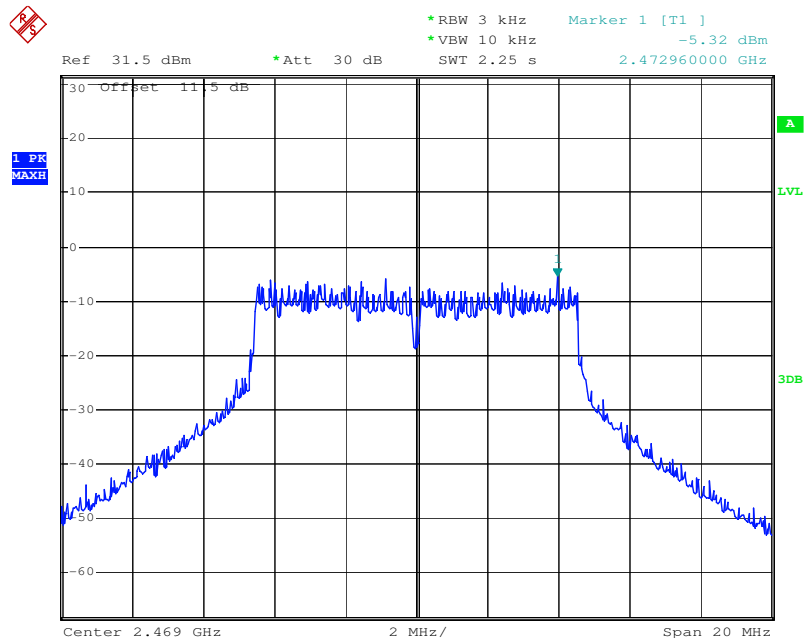
Report No.: SZEM160900756206

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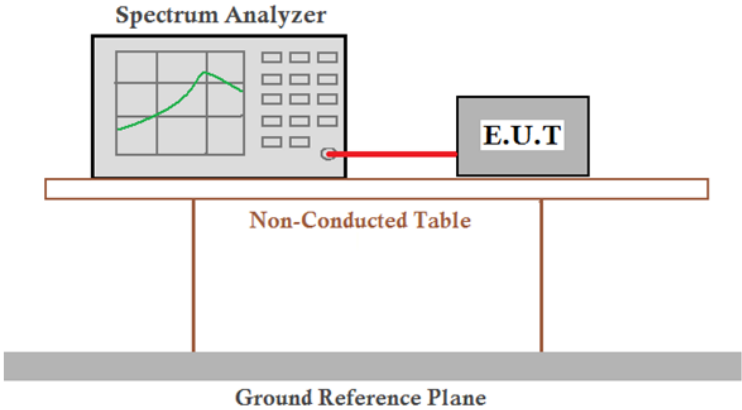
Test mode:	8MHz Bandwidth mode	Test channel:	Middle
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Test mode:	8MHz Bandwidth mode	Test channel:	Highest
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6.5 Band-edge for RF Conducted Emissions

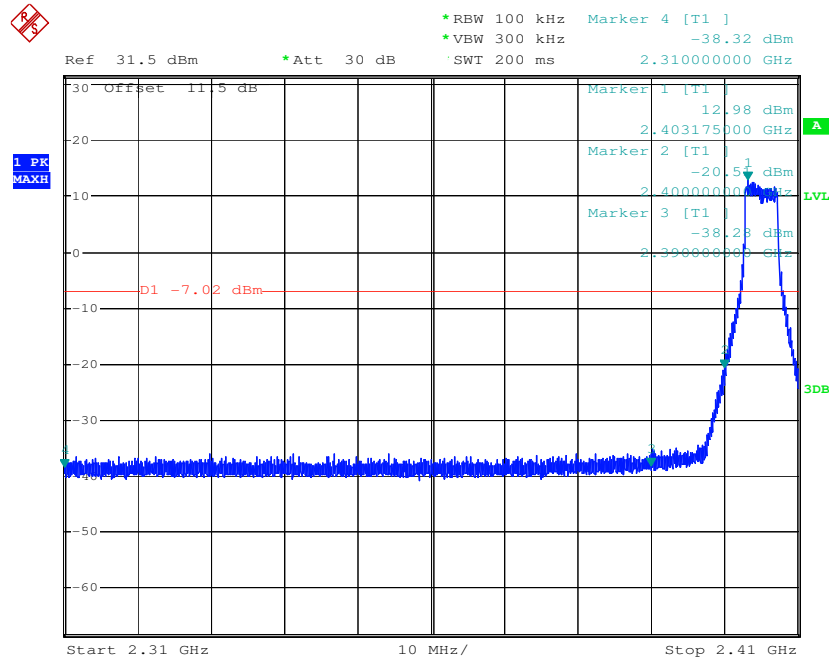
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.13
Test Setup:	 <p>Remark: Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Mode:	Transmitting with 4MHz Bandwidth mode and 8MHz Bandwidth mode
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass



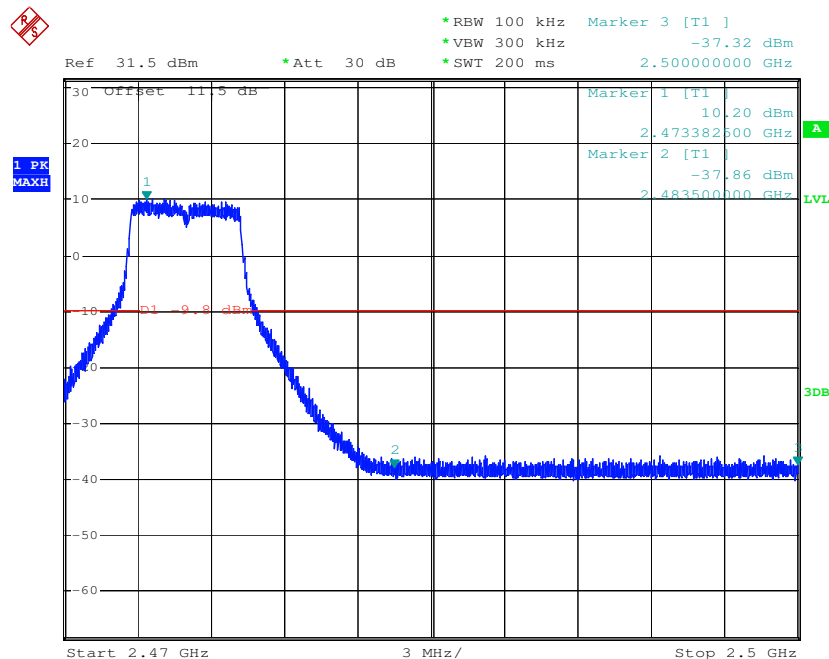
Test plot as follows:

4MHz Bandwidth mode

Test mode:	4MHz Bandwidth mode	Test channel:	Lowest
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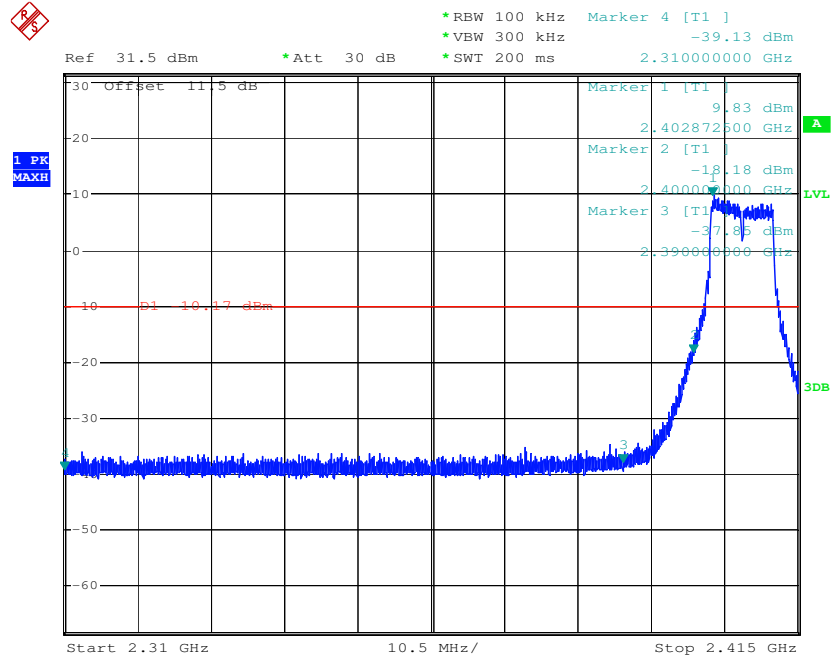
Test mode:	4MHz Bandwidth mode	Test channel:	Highest
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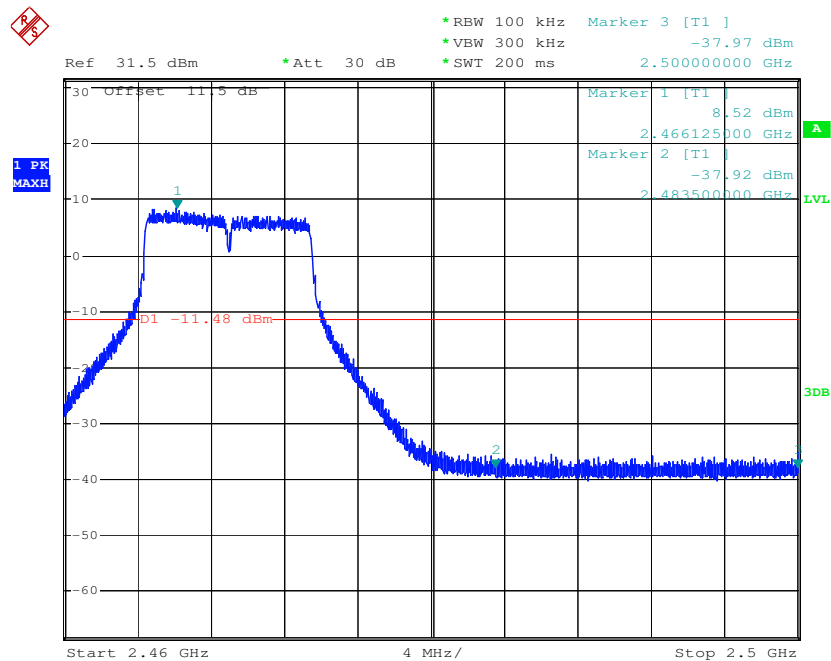


8MHz Bandwidth mode

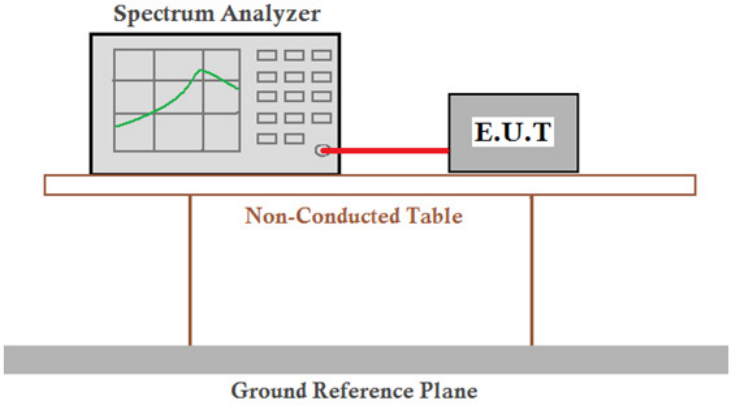
Test mode:	8MHz Bandwidth mode	Test channel:	Lowest
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Test mode:	8MHz Bandwidth mode	Test channel:	Highest
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6.6 Spurious RF Conducted Emissions

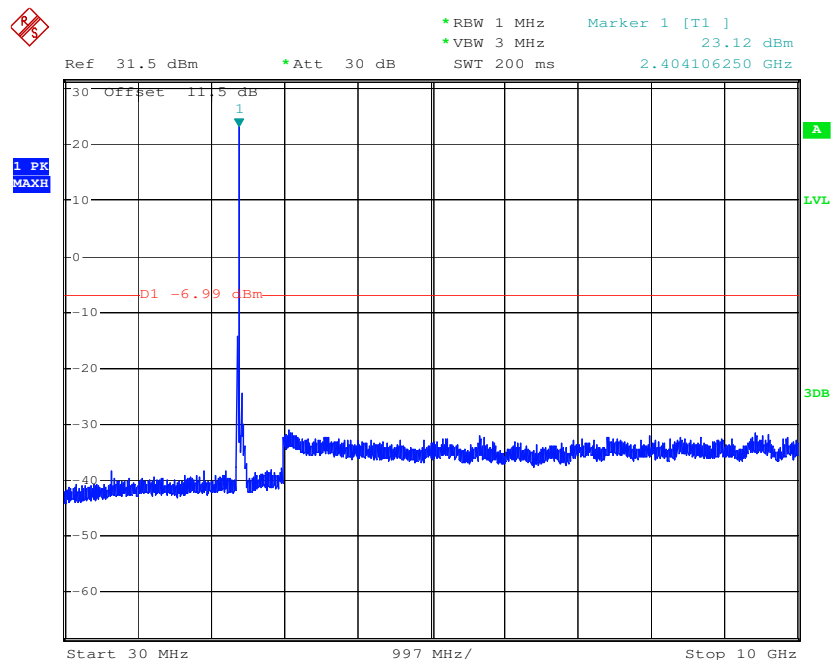
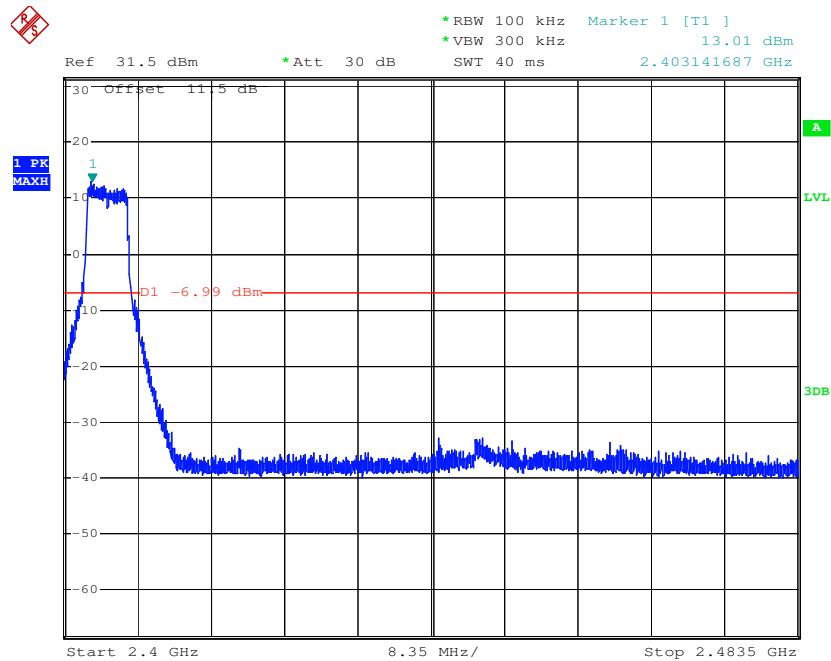
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
Test Setup:	 <p>Remark: Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Mode:	Transmitting with 4MHz Bandwidth mode and 8MHz Bandwidth mode
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass

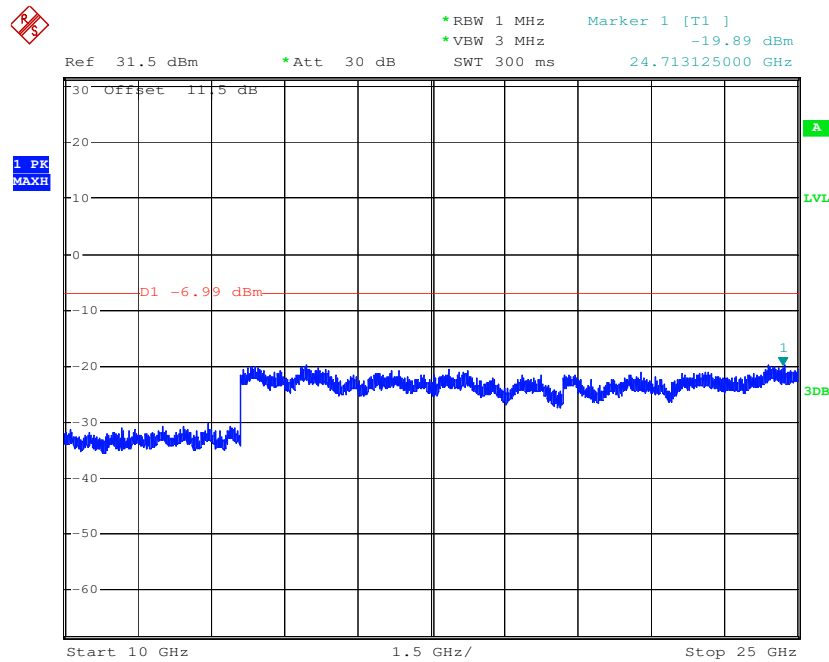


Test plot as follows:

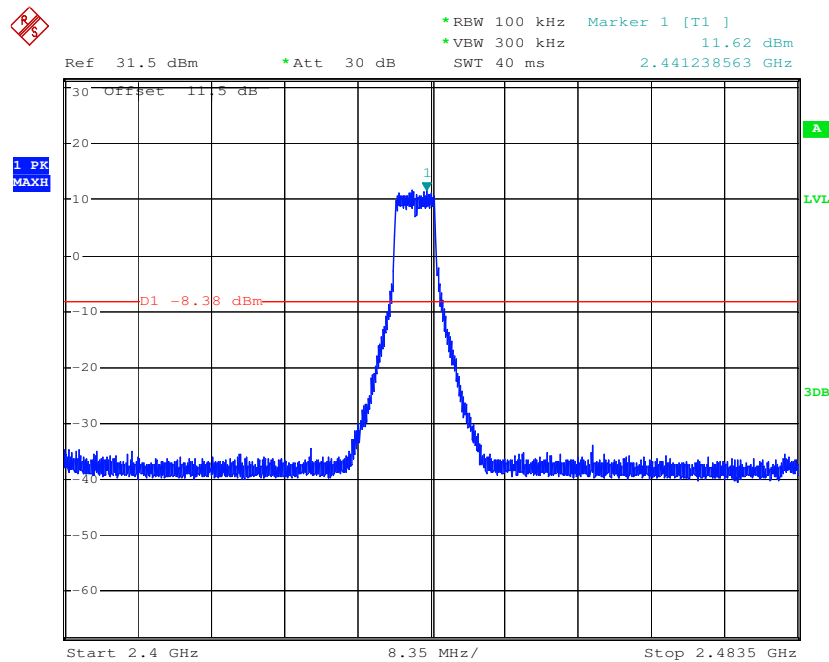
4MHz Bandwidth mode

Test mode:	4MHz Bandwidth mode	Test channel:	Lowest
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Test mode:	4MHz Bandwidth mode	Test channel:	Middle
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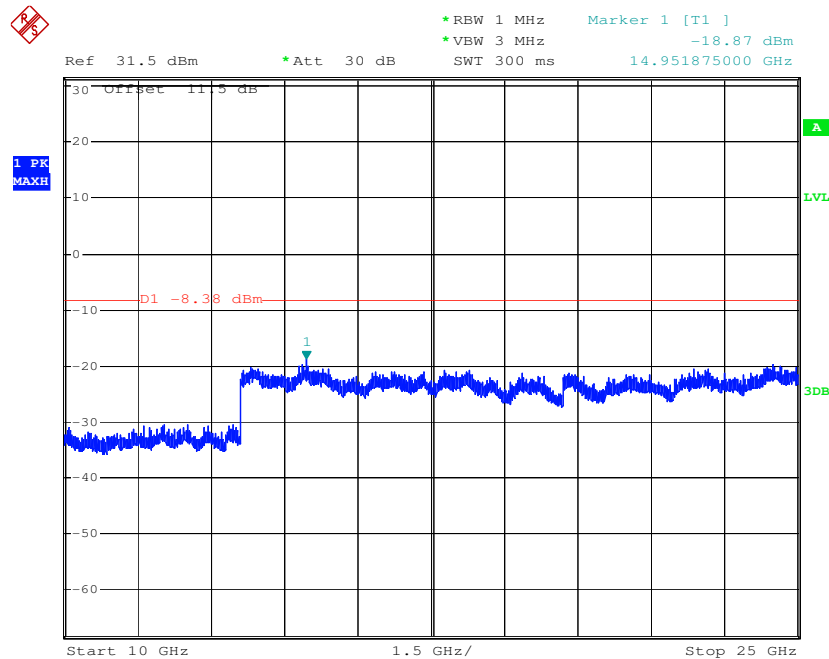
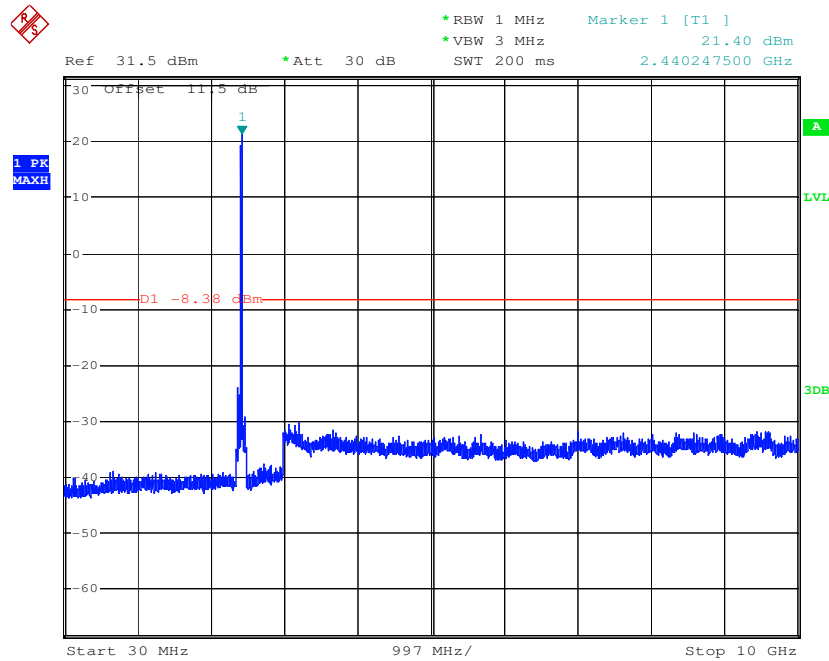




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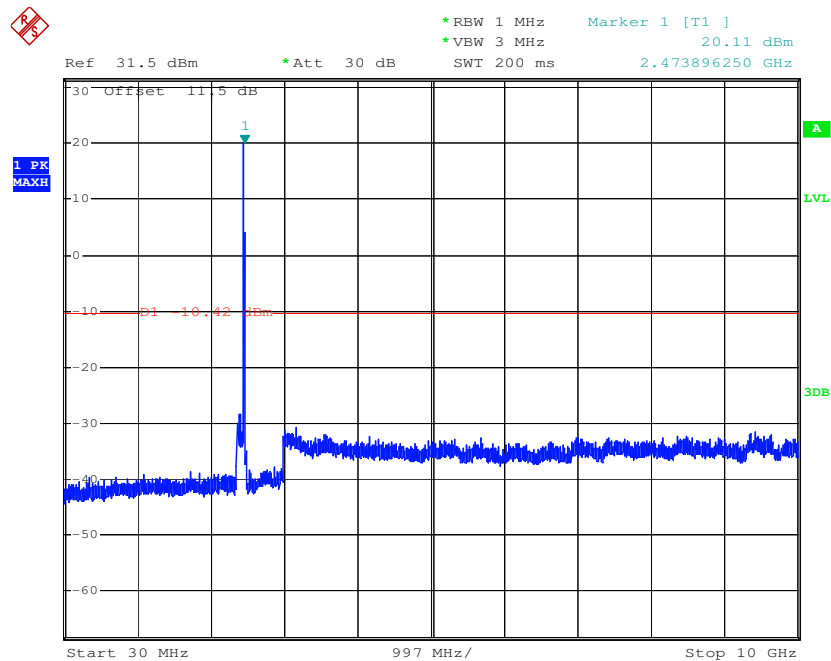
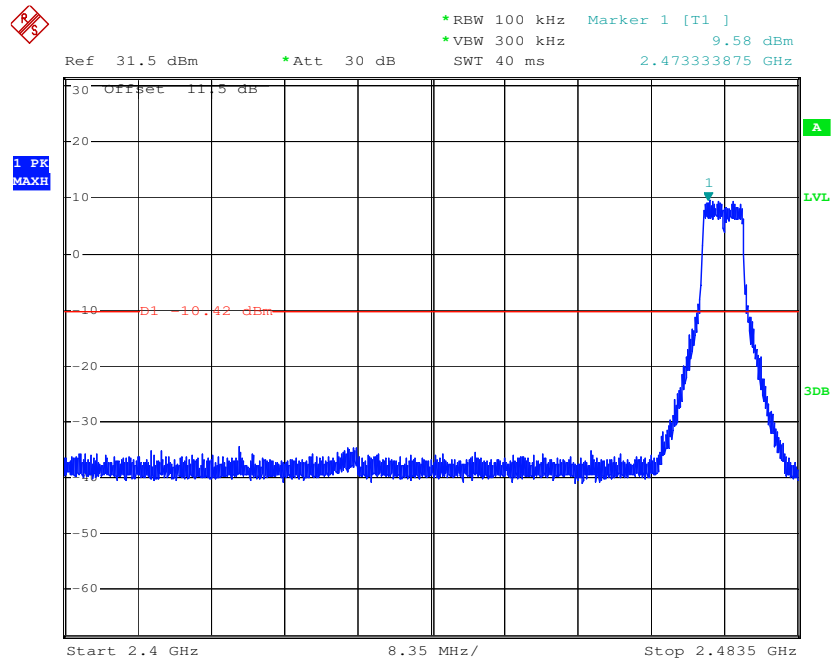
Report No.: SZEM160900756206

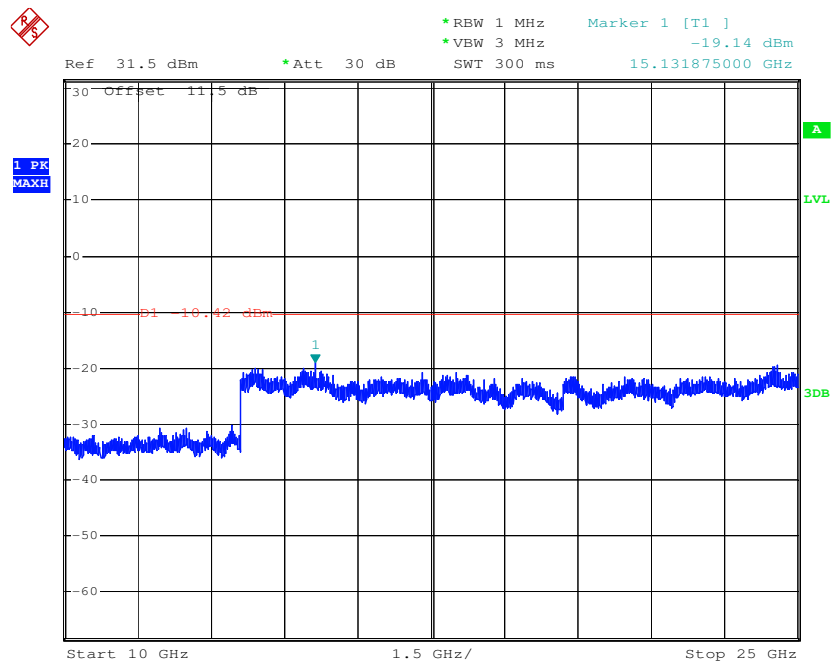
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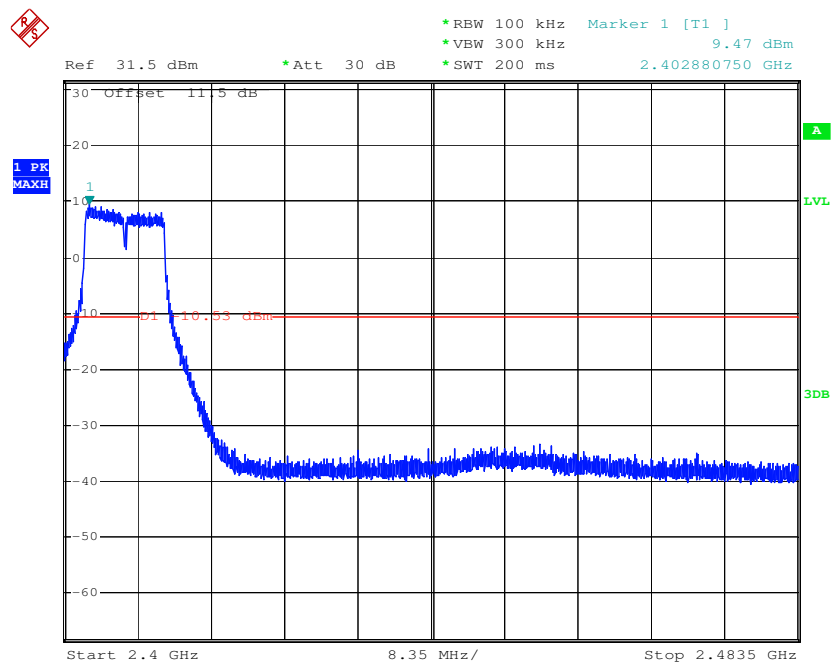
Test mode:	4MHz Bandwidth mode	Test channel:	Highest
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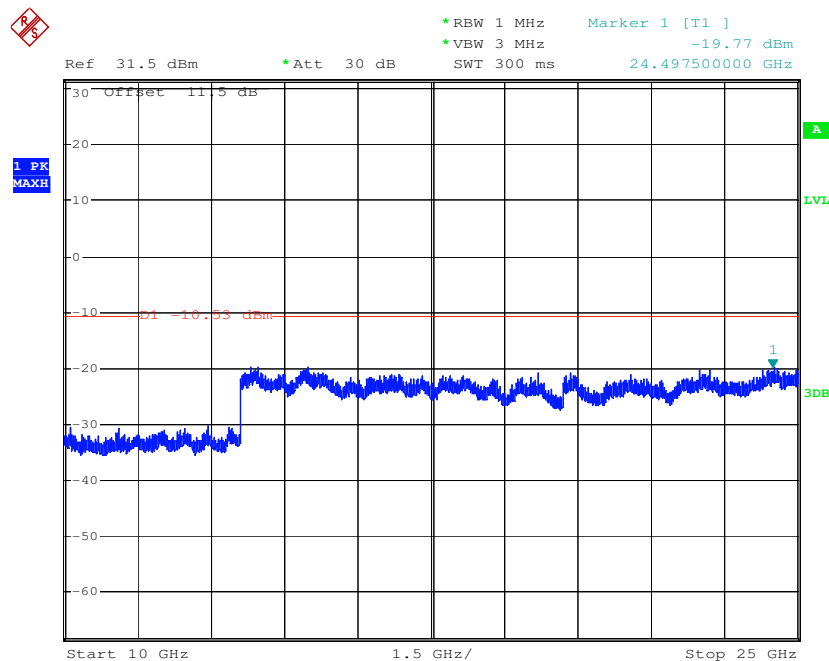
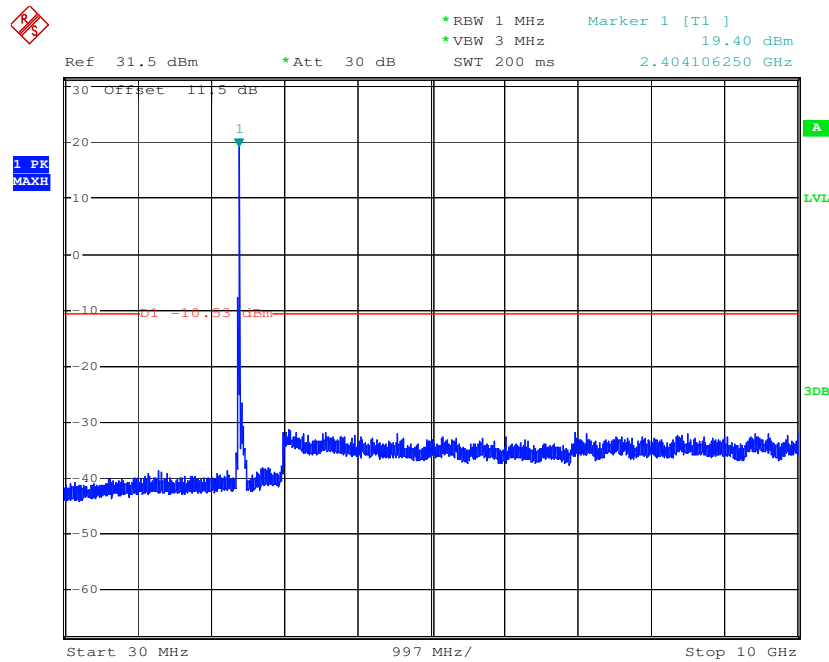




8MHz Bandwidth mode

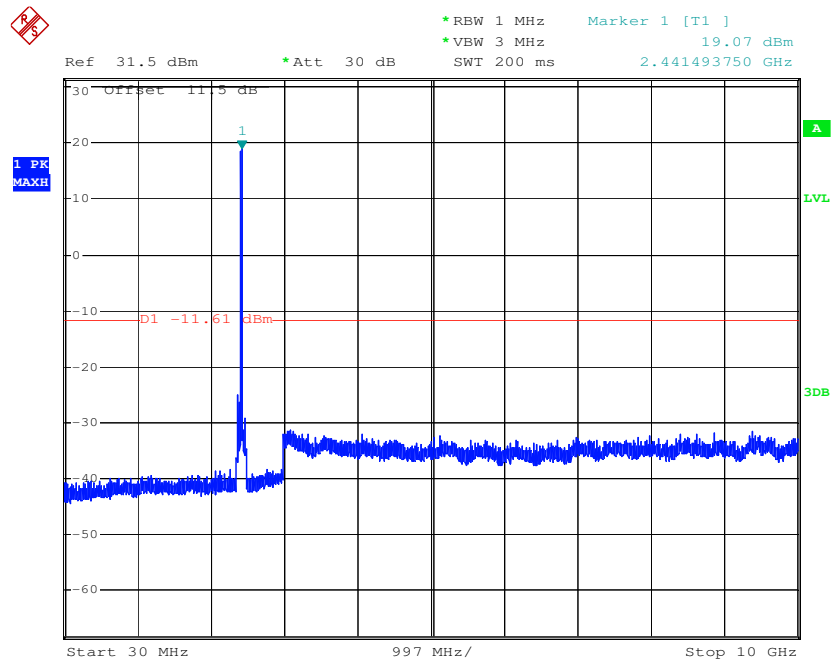
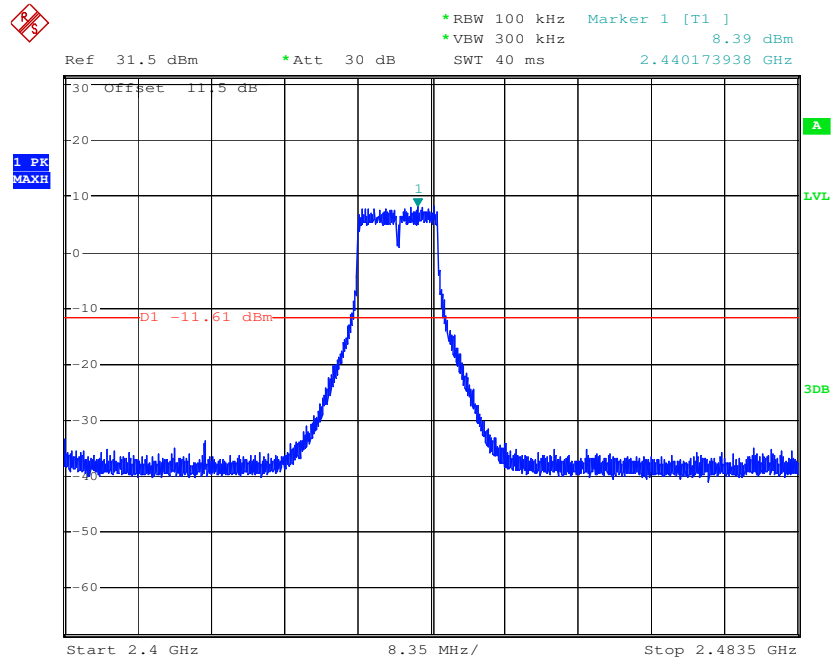
Test mode:	8MHz Bandwidth mode	Test channel:	Lowest
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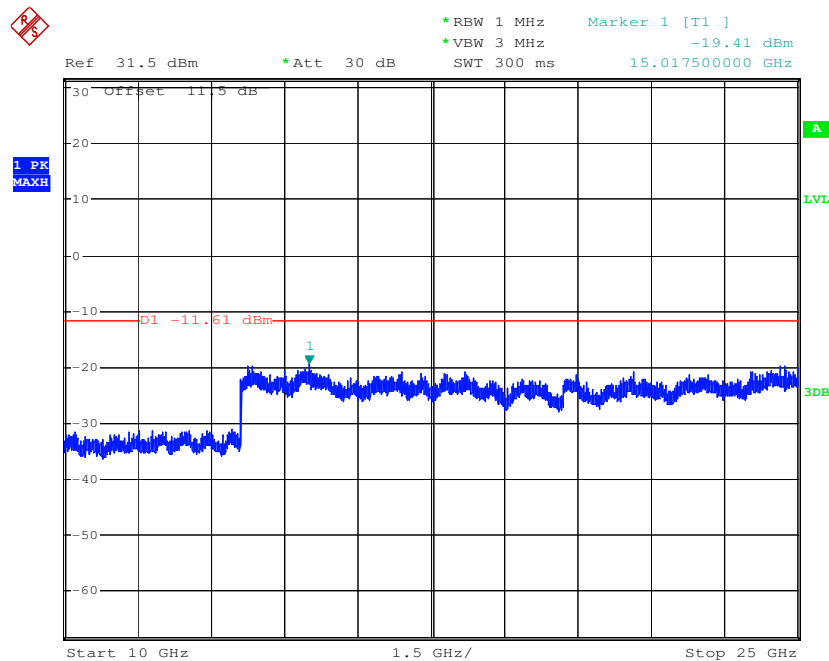




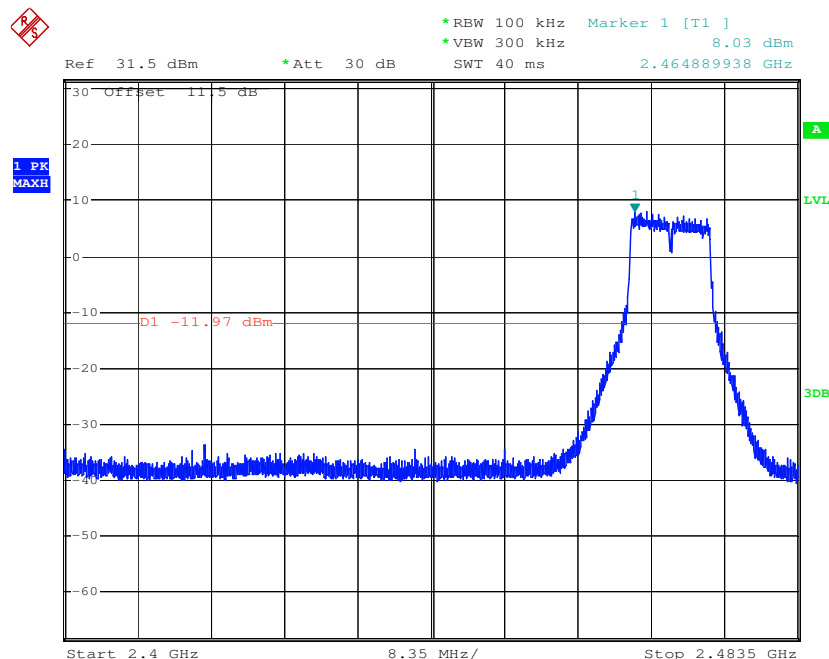


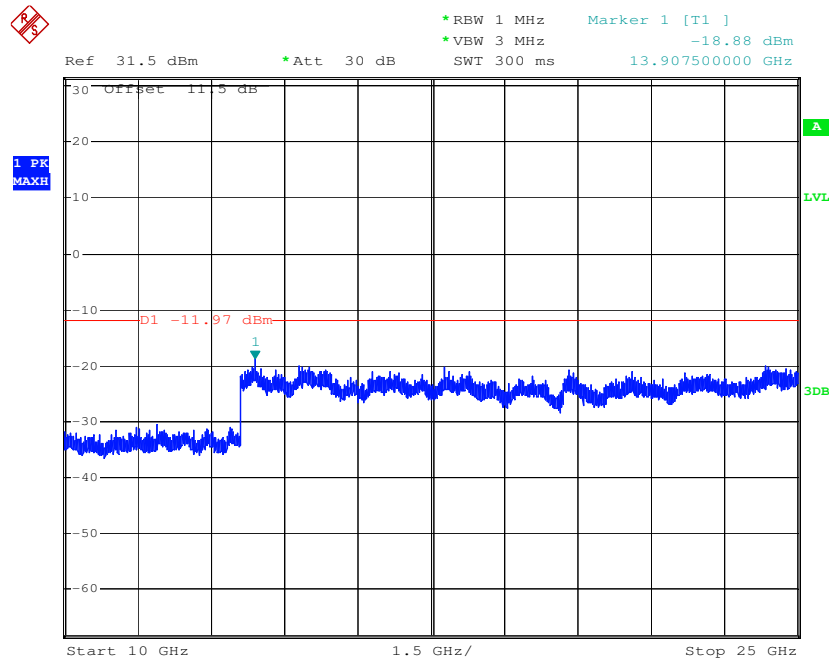
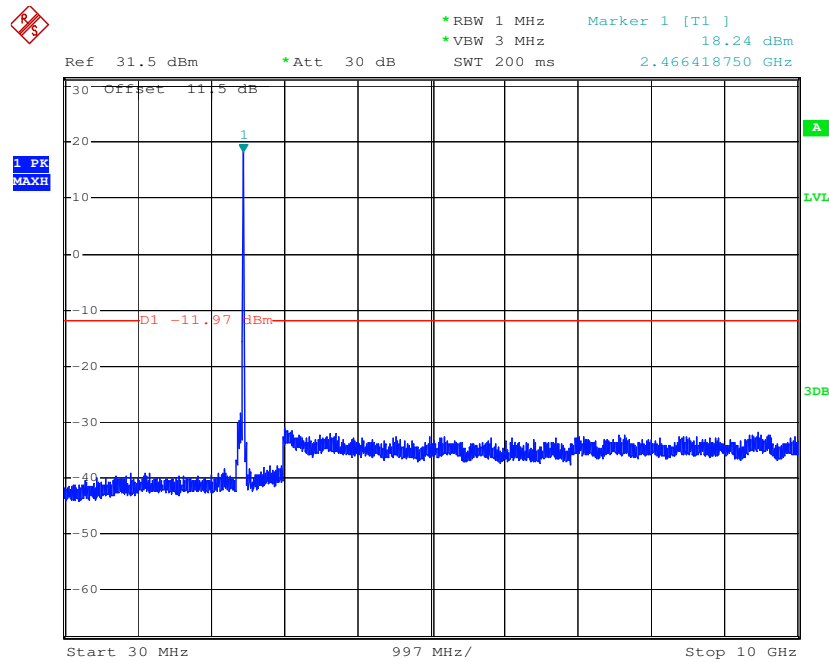
Test mode:	8MHz Bandwidth mode	Test channel:	Middle
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Test mode:	8MHz Bandwidth mode	Test channel:	Highest
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Remark:

Use 100kHz RBW to determine the relative limit in the band 2.4GHz to 2.4835GHz, and Use 1MHz RBW to measure spurious emissions in the band 30MHz to 10GHz and 10GHz to 25GHz. The sweep points set to 30001.



6.7 Radiated Spurious Emission

6.7.1 Spurious Emissions					
Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 :2013 Section 11.12				
Test Site:	Below 1GHz: Measurement Distance: 10m (Semi-Anechoic Chamber) Above 1GHz: Measurement Distance: 3m (Full-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:	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.				

Test Setup:

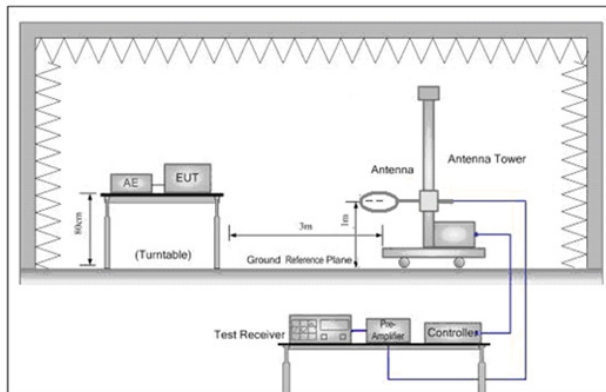


Figure 1. Below 30MHz

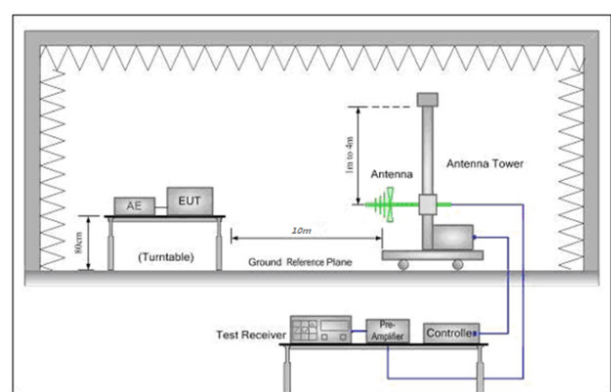


Figure 2. 30MHz to 1GHz

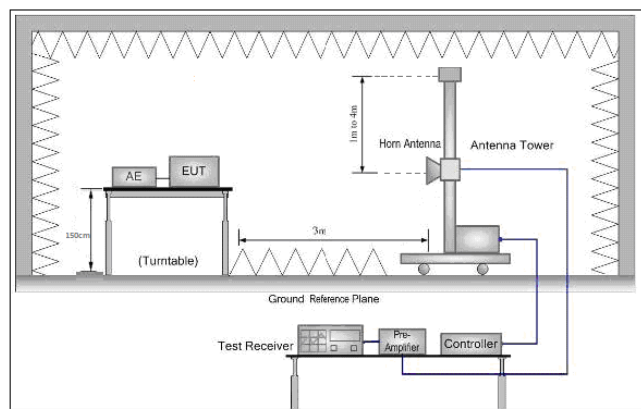


Figure 3. Above 1 GHz

Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 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 full-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 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.
- 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. h. Test the EUT in the lowest channel, the middle channel, and 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.
Exploratory Test Mode:	Transmitting with 4MHz Bandwidth mode and 8MHz Bandwidth mode Transmitting mode
Final Test Mode:	Transmitting with 4MHz Bandwidth mode and 8MHz Bandwidth mode Pretest the EUT at Transmitting mode For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass

For frequencies below 1GHz, the test was performed at a 10m test site. According to below formulate and the test data at 10m test distance,

$$L_3 / L_{10} = D_{10} / D_3$$

Note:

L_3 : Level @ 3m distance. Unit: $\mu\text{V/m}$;

L_{10} : Level @ 10m distance. Unit: $\mu\text{V/m}$;

D_3 : 3m distance. Unit: m

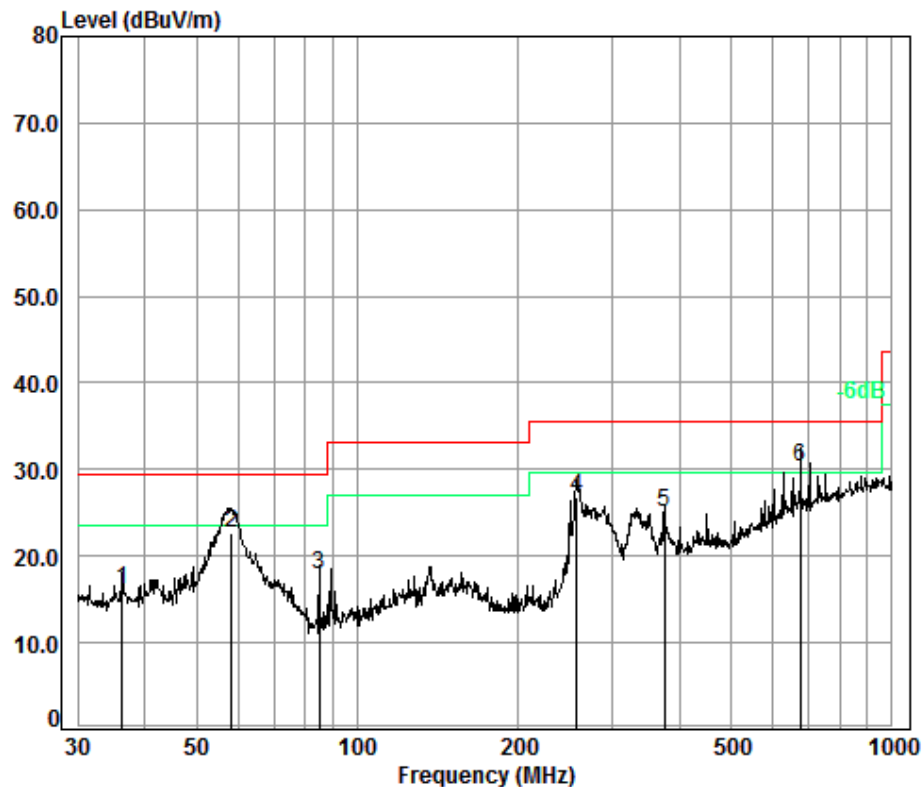
D_{10} : 10m distance. Unit: m

The level at 3m test distance is below:

Frequency (MHz)	Level @ 10m (dBuV/m)	Level @ 10m ($\mu\text{V/m}$)	Level @ 3m ($\mu\text{V/m}$)	Level @ 3m (dBuV/m)	Limit @ 3m (dBuV/m)	Margin (dB)	Ant. Polarization
36.38	16.11	6.39	21.30	26.57	40.00	-13.43	V
58.20	22.59	13.47	44.91	33.05	40.00	-6.95	V
85.00	17.89	7.84	26.14	28.35	40.00	-11.65	V
257.42	26.75	21.75	72.51	37.21	46.00	-8.79	V
375.94	24.99	17.76	59.21	35.45	46.00	-10.55	V
675.00	30.33	32.85	109.49	40.79	46.00	-5.21	V
41.57	15.09	5.68	18.94	25.55	40.00	-14.45	H
58.20	13.64	4.81	16.03	24.10	40.00	-15.90	H
160.35	15.09	5.68	18.94	25.55	43.50	-17.95	H
287.99	16.64	6.79	22.64	27.10	46.00	-18.90	H
451.14	24.26	16.33	54.44	34.72	46.00	-11.28	H
942.13	28.13	25.50	84.99	38.59	46.00	-7.41	H



Radiated Emission below 1GHz		
30MHz~1GHz (QP)		
Test mode:	Transmitting mode	Vertical



Condition: 10m VERTICAL

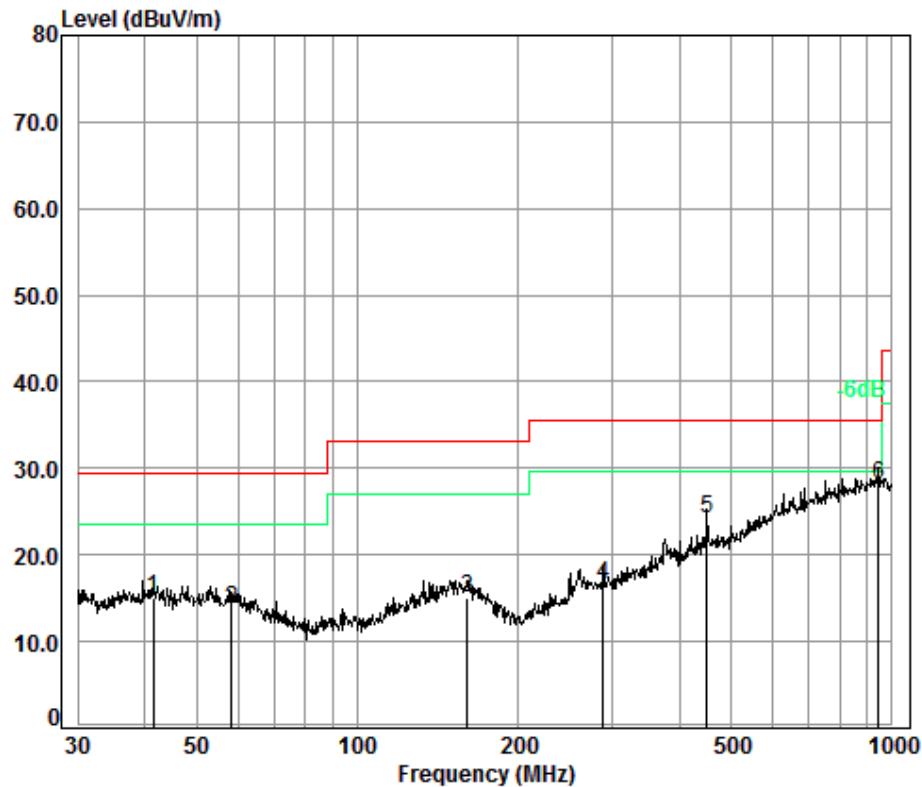
Job No. : 7562CR

Test Mode: TX mode

	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	36.38	6.73	12.84	32.98	29.52	16.11	29.50	-13.39
2	58.20	7.00	12.13	32.96	36.42	22.59	29.50	-6.91
3	85.00	7.15	8.62	32.85	34.97	17.89	29.50	-11.61
4	257.42	7.89	11.42	32.64	40.08	26.75	35.60	-8.85
5	375.94	8.30	14.41	32.60	34.88	24.99	35.60	-10.61
6 pp	675.00	9.09	19.84	32.60	34.00	30.33	35.60	-5.27



Test mode:	Transmitting mode	Horizontal
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Condition: 10m HORIZONTAL

Job No. : 7562CR

Test Mode: TX mode

	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	41.57	6.80	13.18	32.99	28.10	15.09	29.50	-14.41
2	58.20	7.00	12.13	32.96	27.47	13.64	29.50	-15.86
3	160.35	7.50	13.36	32.73	26.96	15.09	33.10	-18.01
4	287.99	8.02	12.36	32.61	28.87	16.64	35.60	-18.96
5	451.14	8.43	16.19	32.60	32.24	24.26	35.60	-11.34
6 pp	942.13	9.56	22.68	32.50	28.39	28.13	35.60	-7.47



Transmitter Emission above 1GHz

4MHz Bandwidth mode

Test mode:		4MHz Bandwidth mode		Test channel:		Lowest		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	
3858.877	33.22	7.76	38.64	45.20	47.54	74.00	-26.46	Vertical	
4810.000	34.17	8.88	39.03	43.08	47.10	74.00	-26.90	Vertical	
6166.787	34.84	10.34	38.89	44.51	50.80	74.00	-23.20	Vertical	
7215.000	36.41	10.68	38.17	43.36	52.28	74.00	-21.72	Vertical	
9620.000	37.52	12.51	36.98	39.56	52.61	74.00	-21.39	Vertical	
12137.940	38.68	14.45	38.44	38.94	53.63	74.00	-20.37	Vertical	
3915.118	33.38	7.78	38.66	45.31	47.81	74.00	-26.19	Horizontal	
4810.000	34.17	8.88	39.03	43.48	47.50	74.00	-26.50	Horizontal	
6078.201	34.76	10.46	38.95	45.28	51.55	74.00	-22.45	Horizontal	
7215.000	36.41	10.68	38.17	41.64	50.56	74.00	-23.44	Horizontal	
9620.000	37.52	12.51	36.98	39.56	52.61	74.00	-21.39	Horizontal	
11946.280	38.55	14.50	38.25	38.82	53.62	74.00	-20.38	Horizontal	

Test mode:		4MHz Bandwidth mode		Test channel:		Middle		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	
3776.027	33.00	7.73	38.60	44.12	46.25	74.00	-27.75	Vertical	
4880.000	34.29	8.97	39.06	43.35	47.55	74.00	-26.45	Vertical	
6087.002	34.77	10.45	38.94	44.88	51.16	74.00	-22.84	Vertical	
7320.000	36.37	10.72	38.07	42.08	51.10	74.00	-22.90	Vertical	
9760.000	37.55	12.58	36.92	39.31	52.52	74.00	-21.48	Vertical	
12404.260	38.84	14.23	38.71	38.93	53.29	74.00	-20.71	Vertical	
3584.372	32.45	7.66	38.51	45.65	47.25	74.00	-26.75	Horizontal	
4880.000	34.29	8.97	39.06	42.76	46.96	74.00	-27.04	Horizontal	
6113.481	34.79	10.41	38.93	43.86	50.13	74.00	-23.87	Horizontal	
7320.000	36.37	10.72	38.07	41.16	50.18	74.00	-23.82	Horizontal	
9760.000	37.55	12.58	36.92	38.97	52.18	74.00	-21.82	Horizontal	
12155.510	38.69	14.43	38.46	38.77	53.43	74.00	-20.57	Horizontal	



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Test mode:	4MHz Bandwidth mode			Test channel:	Highest		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
3842.163	33.18	7.76	38.63	45.04	47.35	74.00	-26.65	Vertical
4950.000	34.41	9.07	39.08	42.77	47.17	74.00	-26.83	Vertical
6051.874	34.74	10.49	38.97	45.11	51.37	74.00	-22.63	Vertical
7425.000	36.33	10.76	37.96	41.31	50.44	74.00	-23.56	Vertical
9900.000	37.58	12.66	36.85	38.78	52.17	74.00	-21.83	Vertical
12314.840	38.79	14.30	38.62	38.73	53.20	74.00	-20.80	Vertical
3842.163	33.18	7.76	38.63	44.67	46.98	74.00	-27.02	Horizontal
4950.000	34.41	9.07	39.08	43.30	47.70	74.00	-26.30	Horizontal
6338.673	34.97	10.13	38.79	44.49	50.80	74.00	-23.20	Horizontal
7425.000	36.33	10.76	37.96	40.72	49.85	74.00	-24.15	Horizontal
9900.000	37.58	12.66	36.85	39.14	52.53	74.00	-21.47	Horizontal
12033.020	38.62	14.53	38.33	38.68	53.50	74.00	-20.50	Horizontal



8MHz Bandwidth mode

Test mode:		8MHz Bandwidth mode		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		
3825.521	33.13	7.75	38.62	44.73	46.99	74.00	-27.01	Vertical		
4814.000	34.18	8.88	39.03	42.25	46.28	74.00	-27.72	Vertical		
5964.939	34.68	10.46	39.00	43.84	49.98	74.00	-24.03	Vertical		
7221.000	36.41	10.69	38.17	41.12	50.05	74.00	-23.95	Vertical		
9628.000	37.53	12.51	36.98	38.98	52.04	74.00	-21.97	Vertical		
12208.390	38.73	14.39	38.52	38.55	53.15	74.00	-20.86	Vertical		
4082.894	33.60	7.92	38.74	44.16	46.94	74.00	-27.07	Horizontal		
4814.000	34.18	8.88	39.03	41.69	45.72	74.00	-28.28	Horizontal		
6016.949	34.71	10.54	38.99	44.08	50.34	74.00	-23.66	Horizontal		
7221.000	36.41	10.69	38.17	42.28	51.21	74.00	-22.80	Horizontal		
9628.000	37.53	12.51	36.98	37.94	51.00	74.00	-23.01	Horizontal		
11639.160	38.24	14.17	37.95	37.72	52.18	74.00	-21.82	Horizontal		

Test mode:	8MHz Bandwidth mode			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
3641.878	32.62	7.68	38.54	44.14	45.90	74.00	-28.11	Vertical
4880.000	34.29	8.97	39.06	42.13	46.33	74.00	-27.68	Vertical
5939.103	34.66	10.39	39.01	44.55	50.59	74.00	-23.41	Vertical
7320.000	36.37	10.72	38.07	41.27	50.29	74.00	-23.71	Vertical
9760.000	37.55	12.58	36.92	39.62	52.83	74.00	-21.18	Vertical
12261.500	38.76	14.34	38.57	38.59	53.12	74.00	-20.88	Vertical
3626.104	32.57	7.68	38.53	42.45	44.17	74.00	-29.84	Horizontal
4880.000	34.29	8.97	39.06	40.52	44.72	74.00	-29.29	Horizontal
6060.637	34.75	10.48	38.96	42.18	48.45	74.00	-25.56	Horizontal
7320.000	36.37	10.72	38.07	40.26	49.28	74.00	-24.72	Horizontal
9760.000	37.55	12.58	36.92	38.12	51.33	74.00	-22.67	Horizontal
11825.890	38.43	14.37	38.13	38.16	52.83	74.00	-21.17	Horizontal



Test mode:	8MHz Bandwidth mode			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
3792.453	33.04	7.74	38.61	44.12	46.29	74.00	-27.71	Vertical
4938.000	34.39	9.05	39.08	42.97	47.33	74.00	-26.67	Vertical
5939.103	34.66	10.39	39.01	44.64	50.68	74.00	-23.32	Vertical
7407.000	36.34	10.76	37.98	40.50	49.62	74.00	-24.38	Vertical
9876.000	37.58	12.64	36.86	37.73	51.09	74.00	-22.91	Vertical
12261.500	38.76	14.34	38.57	38.15	52.68	74.00	-21.33	Vertical
3836.607	33.16	7.75	38.63	43.14	45.42	74.00	-28.58	Horizontal
4938.000	34.39	9.05	39.08	40.78	45.14	74.00	-28.87	Horizontal
6025.661	34.72	10.53	38.98	43.12	49.39	74.00	-24.61	Horizontal
7407.000	36.34	10.76	37.98	38.60	47.72	74.00	-26.28	Horizontal
9876.000	37.58	12.64	36.86	38.07	51.43	74.00	-22.58	Horizontal
11808.790	38.41	14.36	38.12	37.93	52.58	74.00	-21.43	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.

6.8 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10: 2013 Section 11.12		
Test Site:	Below 1GHz: Measurement Distance: 10m (Semi-Anechoic Chamber) Above 1GHz: Measurement Distance: 3m (Full-Anechoic Chamber)		
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
		74.0	Peak Value
Test Setup:			

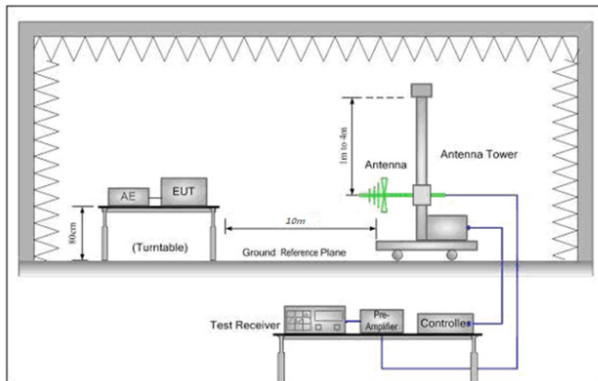


Figure 1. 30MHz to 1GHz

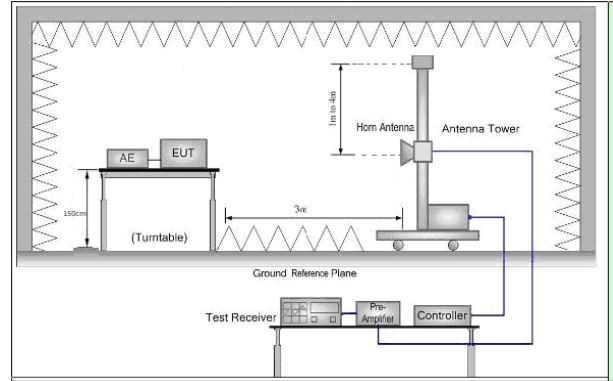


Figure 2. Above 1 GHz

Test Procedure:

- 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 full-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 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.
- 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
- Test the EUT in the lowest channel, the Highest channel



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Shenzhen Branch

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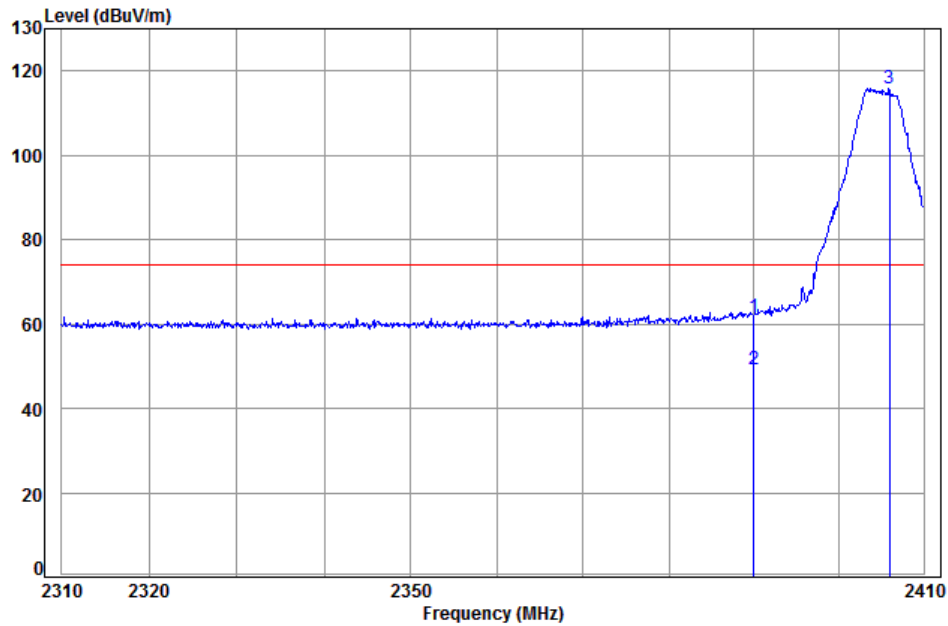
	i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. j. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with 4MHz Bandwidth mode and 8MHz Bandwidth mode Transmitting mode.
Final Test Mode:	Transmitting with 4MHz Bandwidth mode and 8MHz Bandwidth mode Pretest the EUT at Transmitting modeOnly the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details.
Test Results:	Pass



Test plot as follows:

4MHz Bandwidth mode

Test channel:	Lowest	Remark:	Peak	Vertical
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Condition: 3m VERTICAL

Job No: : 7562CR

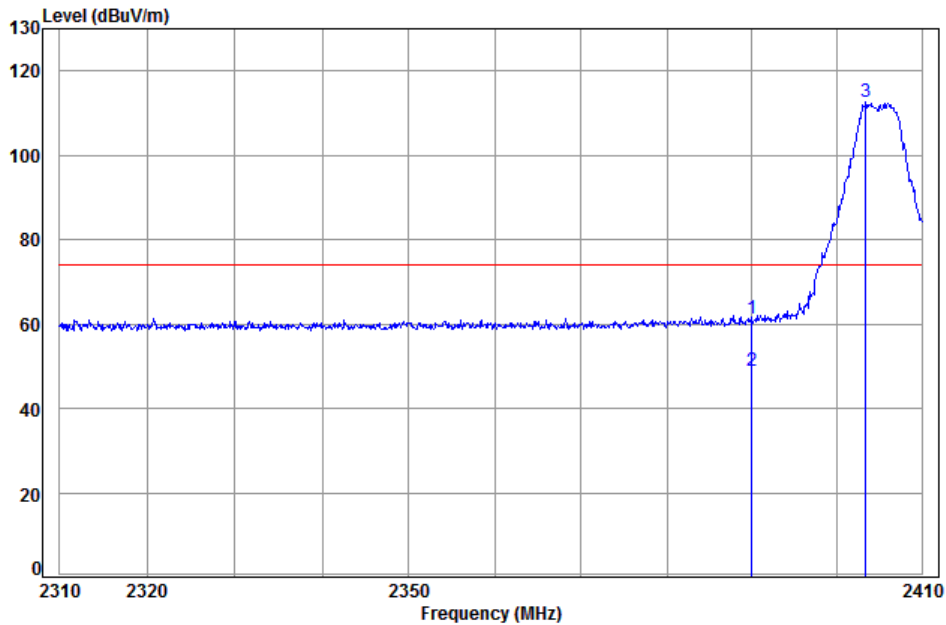
Mode: : 2405 Band edge

: 4M

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	Remark
1	2390.000	3.33	29.08	0.00	29.36	61.77	74.00	-12.23	
2 av	2390.000	3.33	29.08	0.00	16.71	49.12	54.00	-4.88	Average
3 pp	2405.918	3.34	29.12	0.00	83.38	115.84	74.00	41.84	



Test channel:	Lowest	Remark:	Peak	Horizontal
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Condition: 3m HORIZONTAL

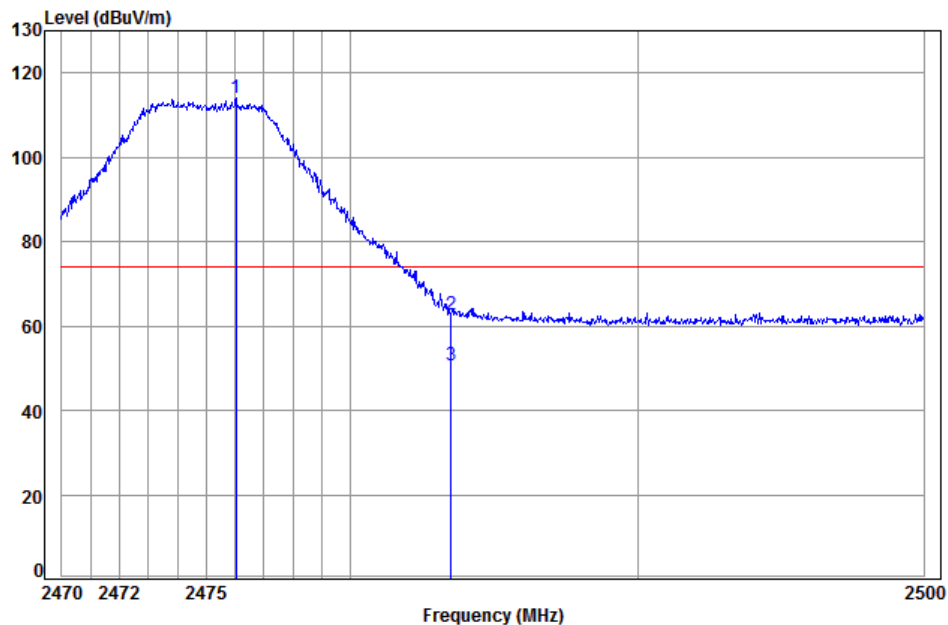
Job No: : 7562CR

Mode: : 2405 Band edge
: 4M

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	3.33	29.08	0.00	28.71	61.12	74.00	-12.88	
2 av	2390.000	3.33	29.08	0.00	16.54	48.95	54.00	-5.05	Average
3 pp	2403.370	3.34	29.12	0.00	80.35	112.81	74.00	38.81	



Test channel:	Highest	Remark:	Peak	Vertical
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Condition: 3m VERTICAL

Job No: : 7562CR

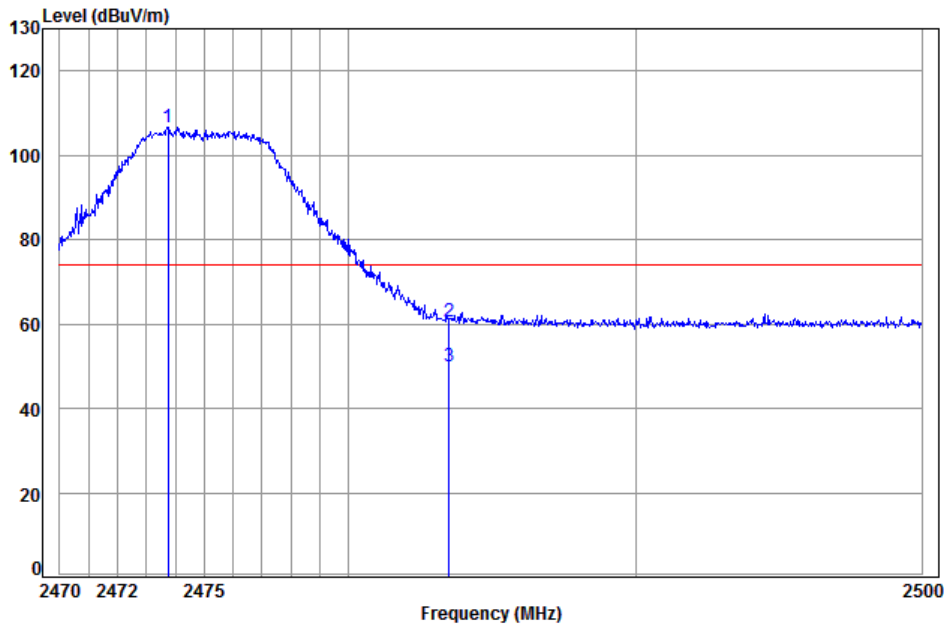
Mode: : 2475 Band edge

: 4M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2476.031	3.40	29.33	0.00	81.26	113.99	74.00	39.99
2	2483.500	3.41	29.35	0.00	30.11	62.87	74.00	-11.13
3 av	2483.500	3.41	29.35	0.00	18.06	50.82	54.00	-3.18 Average



Test channel:	Highest	Remark:	Peak	Horizontal
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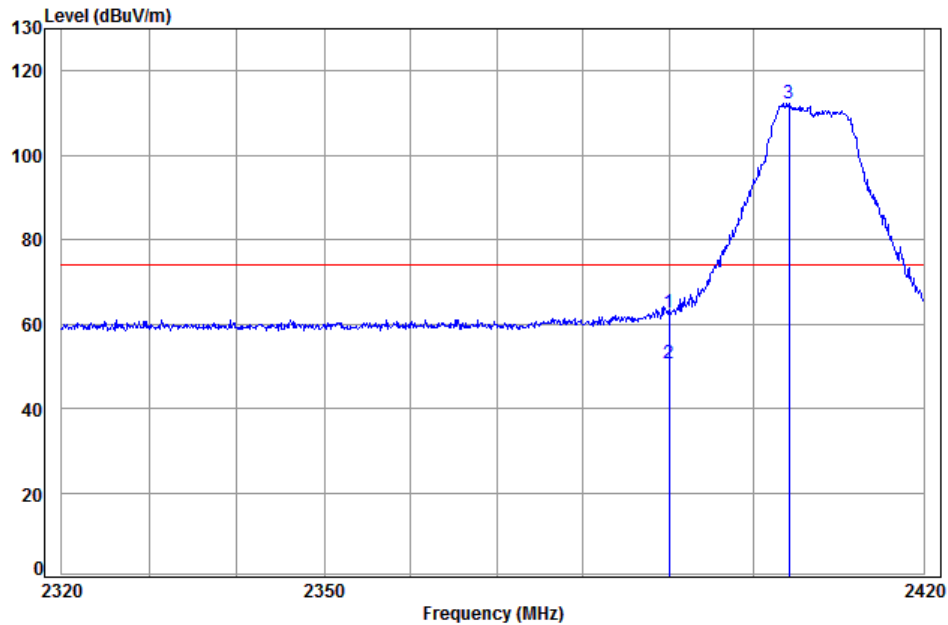
Condition: 3m HORIZONTAL
Job No: : 7562CR
Mode: : 2475 Band edge
: 4M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2473.760	3.40	29.32	0.00	74.01	106.73	74.00	32.73
2	2483.500	3.41	29.35	0.00	27.90	60.66	74.00	-13.34
3 av	2483.500	3.41	29.35	0.00	17.10	49.86	54.00	-4.14 Average



8MHz Bandwidth mode

Test channel:	Lowest	Remark:	Peak	Vertical
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Condition: 3m VERTICAL

Job No: : 7562CR

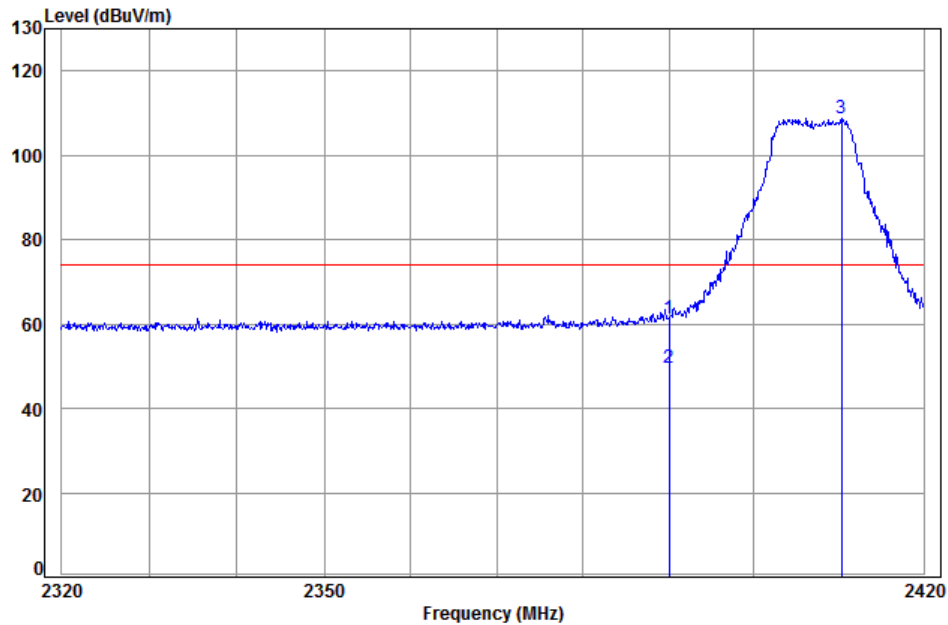
Mode: : 2407 Band edge

: 8M

	Freq	Cable	Ant	Preamp	Read	Limit	Over	
	MHz	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	3.33	29.08	0.00	30.35	62.76	74.00	-11.24
2 av	2390.000	3.33	29.08	0.00	18.16	50.57	54.00	-3.43 Average
3 pp	2404.121	3.34	29.12	0.00	79.96	112.42	74.00	38.42



Test channel:	Lowest	Remark:	Peak	Horizontal
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Condition: 3m HORIZONTAL

Job No: : 7562CR

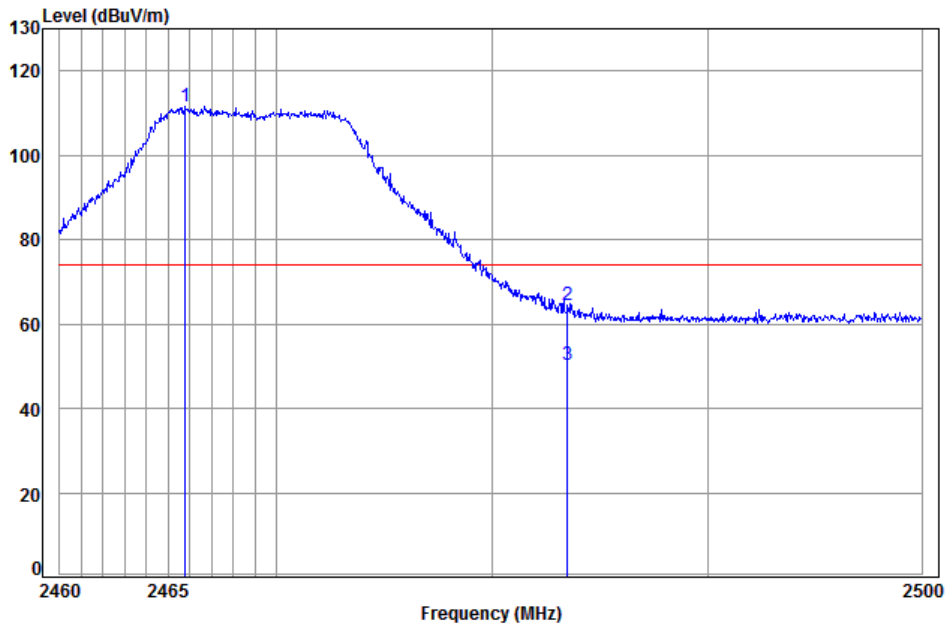
Mode: : 2407 Band edge

: 8M

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	3.33	29.08	0.00	28.84	61.25	74.00	-12.75	
2	av 2390.000	3.33	29.08	0.00	17.14	49.55	54.00	-4.45	Average
3	pp 2410.318	3.35	29.14	0.00	76.29	108.78	74.00	34.78	



Test channel:	Highest	Remark:	Peak	Vertical
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Condition: 3m VERTICAL

Job No: : 7562CR

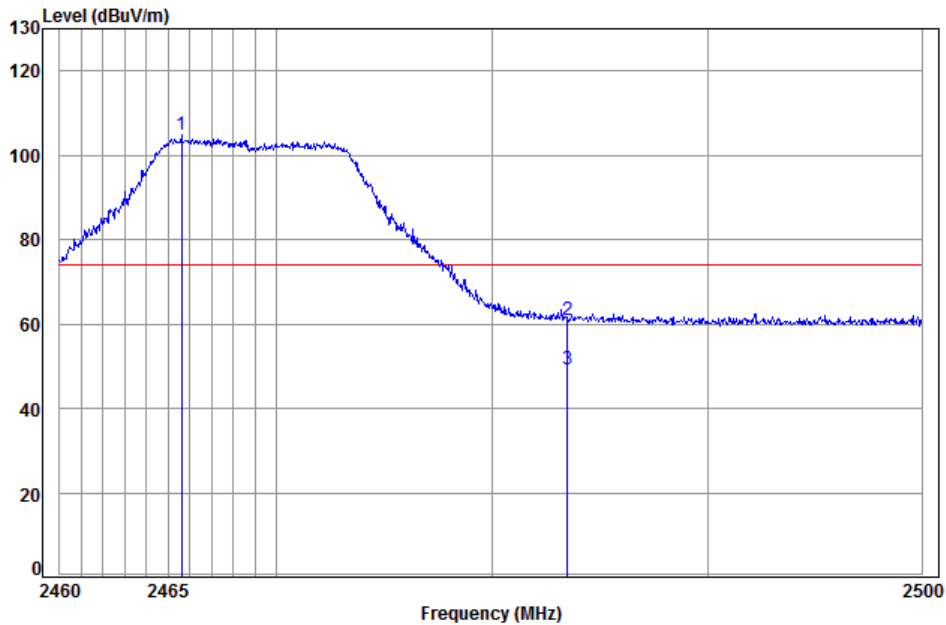
Mode: : 2469 Band edge

: 8M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp 2465.800	3.39	29.30	0.00	78.98	111.67	74.00	37.67
2	2483.500	3.41	29.35	0.00	31.64	64.40	74.00	-9.60
3	av 2483.500	3.41	29.35	0.00	17.39	50.15	54.00	-3.85 Average



Test channel:	Highest	Remark:	Peak	Horizontal
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Condition: 3m HORIZONTAL
Job No: : 7562CR
Mode: : 2469 Band edge
: 8M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2465.601	3.39	29.30	0.00	72.02	104.71	74.00	30.71
2	2483.500	3.41	29.35	0.00	28.16	60.92	74.00	-13.08
3 av	2483.500	3.41	29.35	0.00	16.65	49.41	54.00	-4.59 Average

Note:

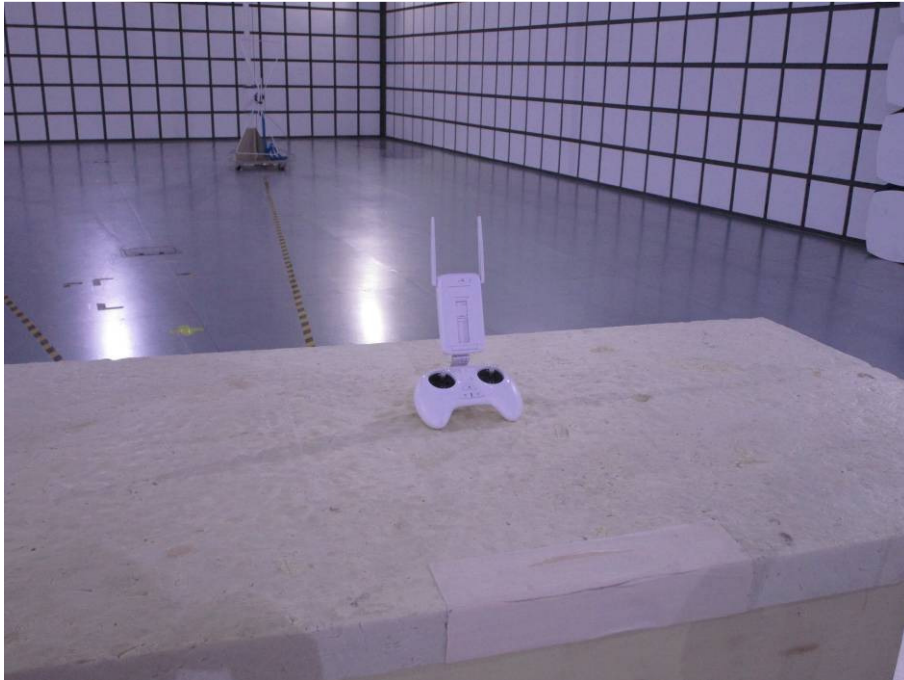
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

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

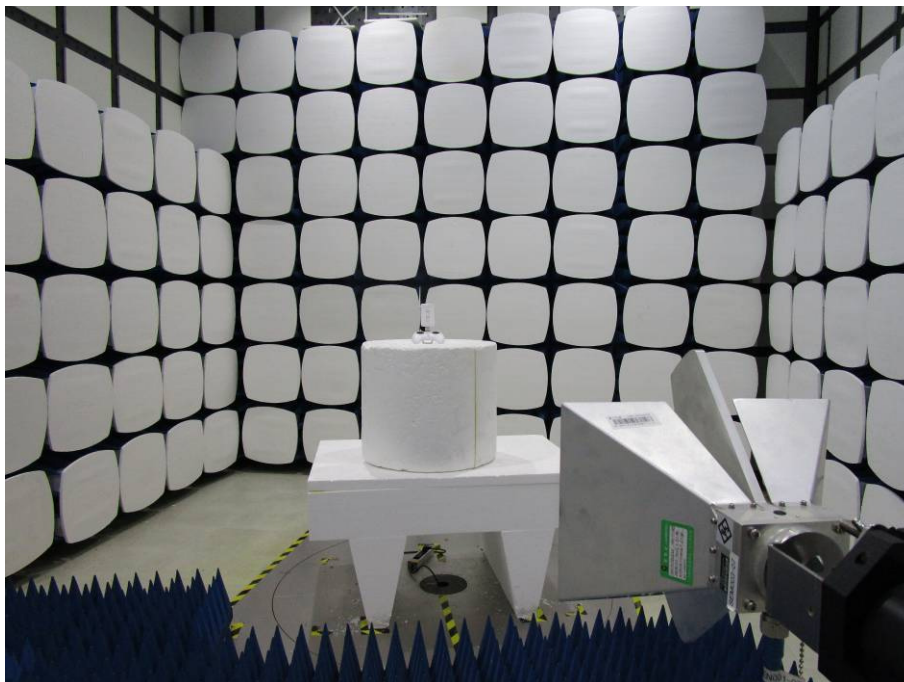
7 Photographs - EUT Test Setup

Test model No.: PEGRS10

7.1 Radiated Emission



7.2 Radiated Spurious Emission



8 Photographs - EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1609007562CR.