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Report No.: SZEM161000896702  
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# FCC REPORT

**Application No. :** SZEM1610008967CR  
**Applicant:** Xiamen Huoshiquan Import &Export CO., LTD  
**Manufacturer:** Xiamen Huoshiquan Import &Export CO., LTD  
**Factory:** Xiamen Huoshiquan Import &Export CO., LTD  
**Product Name:** Remote control four axis series  
**Model No.(EUT):** HS200  
**Add Model No.:** HS100, HS110, HS120, HS130, HS140, HS180, HS190,HS150, HS160, HS210, HS220, HS230, HS240, HS250, HS260,HS270, HS280, HS290, HS300, HS310, HS320, HS330, HS340, HS350, HS360, HS370, HS380, HS390, HS400, HS818, HS007,HS9001, HS100W, HS200W, HS110W, HS120W, HS130W, HS140W,HS150W, HS160W, HS230W, HS300W, HS818W, HS100D, HS200D,HS110D, HS120D, HS130D, HS140D, HS150D, HS160D, HS230D, HS300D, HS400D, HS818D

**FCC ID:** 2AJ5513358327006  
**Standards:** 47 CFR Part 15, Subpart C (2015)  
**Date of Receipt:** 2016-10-28  
**Date of Test:** 2016-11-01 to 2016-11-03  
**Date of Issue:** 2016-11-07

<b>Test Result:</b>	<b>PASS *</b>
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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.


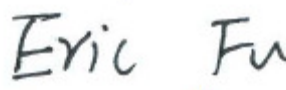
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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**2 Version**

<b>Revision Record</b>				
<b>Version</b>	<b>Chapter</b>	<b>Date</b>	<b>Modifier</b>	<b>Remark</b>
00		2016-11-08		Original

<b>Authorized for issue by:</b>			
<b>Tested By</b>			2016-11-03
	<hr/>		<hr/>
	<b>(Peter Geng) /Project Engineer</b>		<b>Date</b>
<b>Checked By</b>			2016-11-08
	<hr/>		<hr/>
	<b>(Eric Fu) /Reviewer</b>		<b>Date</b>



### 3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 (2009)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (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

Remark:

Model No.: HS200, HS100, HS110, HS120, HS130, HS140, HS180, HS190,HS150, HS160, HS210, HS220, HS230, HS240, HS250, HS260,HS270, HS280, HS290, HS300, HS310, HS320, HS330, HS340, HS350, HS360, HS370, HS380, HS390, HS400, HS818, HS007,HS9001, HS100W, HS200W, HS110W, HS120W, HS130W, HS140W,HS150W, HS160W, HS230W, HS300W, HS818W, HS100D, HS200D,HS110D, HS120D, HS130D, HS140D, HS150D, HS160D, HS230D, HS300D, HS400D, HS818D

Only the model HS200 was tested, since the circuit design, PCB layout, electrical components used, internal wiring and functions were identical for the above models, only different on model No. and color..



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## 5 General Information

### 5.1 Client Information

Applicant:	Xiamen Huoshiquan Import &Export CO., LTD
Address of Applicant:	Room 703, No. 813-2 Xiahe Road, Siming District, Xiamen
Manufacturer:	Xiamen Huoshiquan Import &Export CO., LTD
Address of Manufacturer:	Room 703, No. 813-2 Xiahe Road, Siming District, Xiamen
Factory:	Xiamen Huoshiquan Import &Export CO., LTD
Address of Factory:	Room 703, No. 813-2 Xiahe Road, Siming District, Xiamen

### 5.2 General Description of EUT

Name:	Remote control four axis series
Model No.:	HS200
Frequency Range:	2404-2480MHz
Modulation Type:	GFSK
Number of Channels:	16 (please refer to the channel list in next page)
Antenna Type:	Integral
Antenna Gain:	0dBi
Power Supply:	Remote: 6V DC( 1.5V x 4 "AA" Size Batteries)



<b>Operation Frequency each of channel</b>			
Channel	Frequency	Channel	Frequency
1CH	2404 MHz	9CH	2446 MHz
2CH	2411 MHz	10CH	2451 MHz
3CH	2416 MHz	11CH	2456 MHz
4CH	2421 MHz	12CH	2461 MHz
5CH	2426 MHz	13CH	2466 MHz
6CH	2431 MHz	14CH	2471 MHz
7CH	2436 MHz	15CH	2476 MHz
8CH	2442 MHz	16CH	2480 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)	2404MHz
The Middle channel(CH8)	2442MHz
The Highest channel(CH16)	2480MHz



### 5.3 Test Environment and Mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1008 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation .

### 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.





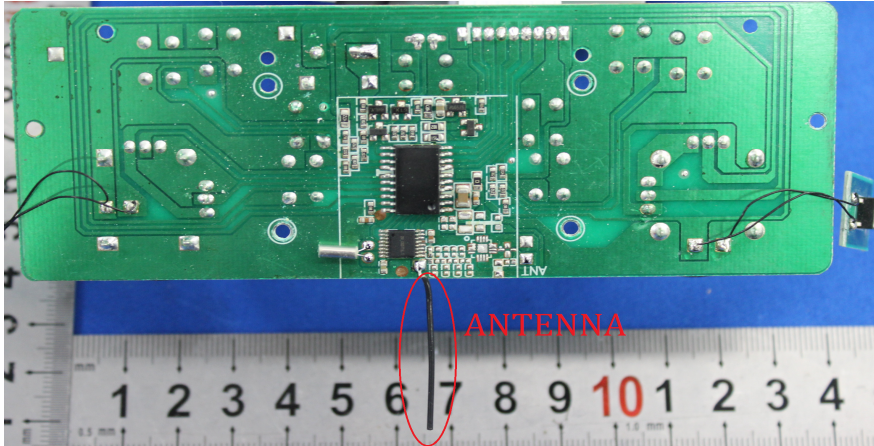
## 5.10 Equipment List

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	2016-10-09	2017-10-09
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	2016-10-09	2017-10-09
9	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A

## 6 Test results and Measurement Data

### 6.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203
<p>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.</p>	
<b>EUT Antenna:</b>	
<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

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209				
Test Method:	ANSI C63.10: 2013				
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: (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:**

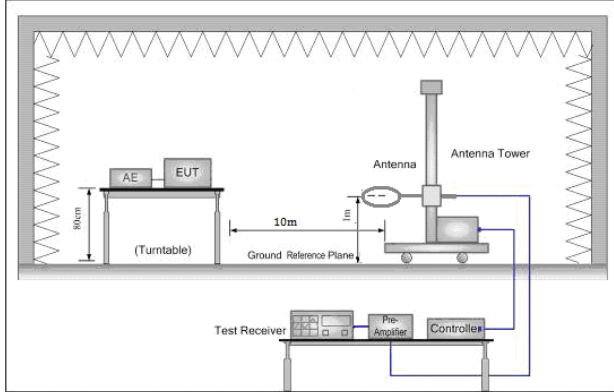


Figure 1. Below 30MHz

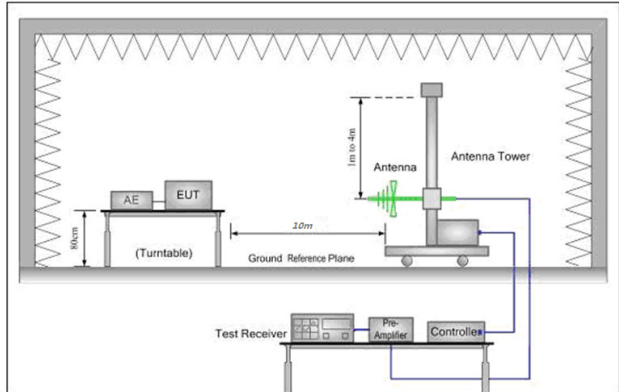


Figure 2. 30MHz to 1GHz

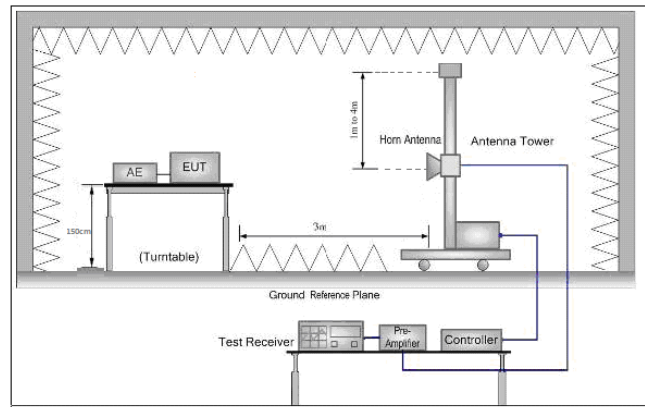


Figure 3. Above 1 GHz

**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 10 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 semi-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 (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



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	<p>Specified Bandwidth with Maximum Hold Mode.</p> <p>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.</p> <p>h. Test the EUT in the lowest channel,the middle channel,the Highest channel</p> <p>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.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p>
Exploratory Test Mode:	Transmitting mode
Final Test Mode:	Transmitting mode
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



**Measurement Data**

**6.3.1 Field Strength Of The Fundamental Signal**

Peak value:

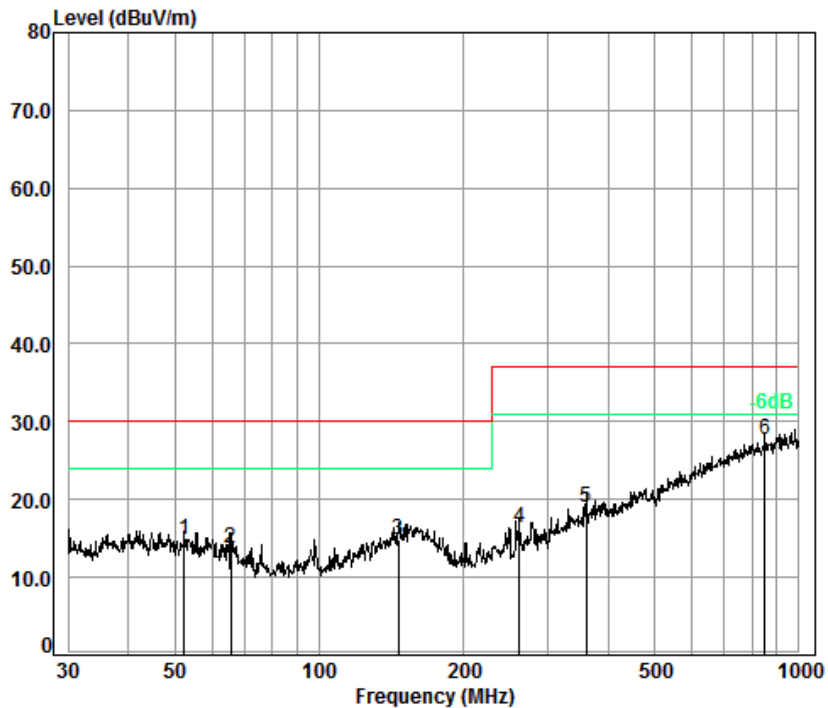
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2404.389	29.12	5.35	38.15	79.17	75.49	114.00	-38.51	Horizontal
2404.389	29.12	5.35	38.15	84.55	80.87	114.00	-33.13	Vertical
2442.474	29.23	5.38	38.15	78.21	74.67	114.00	-39.33	Horizontal
2441.833	29.23	5.38	38.15	83.31	79.77	114.00	-34.23	Vertical
2479.781	29.34	5.41	38.15	82.58	79.18	114.00	-34.82	Horizontal
2479.781	29.34	5.41	38.15	84.70	81.30	114.00	-32.70	Vertical



6.3.2 Spurious Emissions

30MHz~1GHz	
Test mode:	Transmitting

Vertical

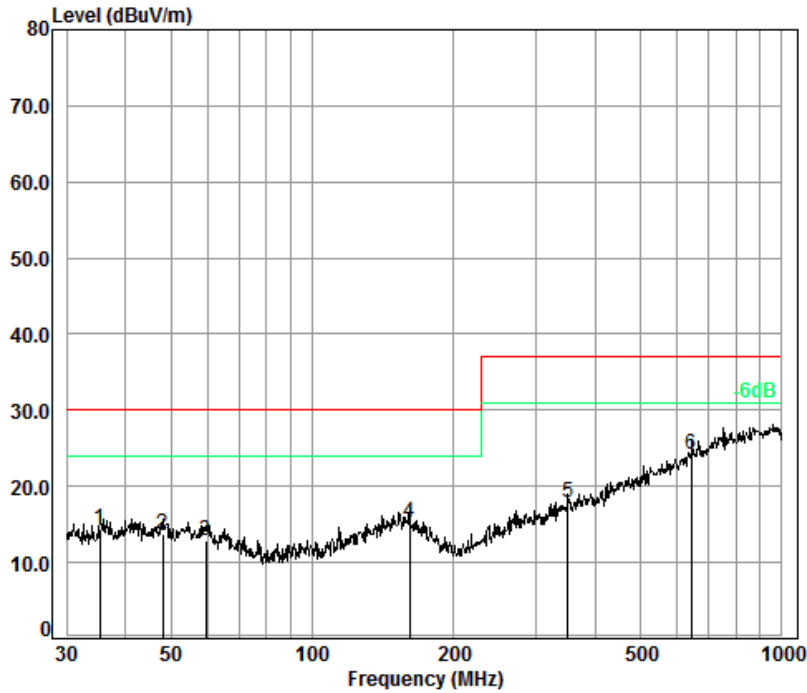


Condition: 10m VERTICAL  
Job No. : 8967CR  
Test Mode: TX Mode

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	52.39	6.95	12.58	32.99	28.38	14.92	30.00	-15.08
2	65.57	6.99	10.89	32.92	28.75	13.71	30.00	-16.29
3	146.37	7.43	13.18	32.75	27.04	14.90	30.00	-15.10
4	261.98	7.91	11.55	32.63	29.62	16.45	37.00	-20.55
5	360.45	8.30	14.07	32.60	29.10	18.87	37.00	-18.13
6 pp	848.06	9.34	21.59	32.55	29.24	27.62	37.00	-9.38



Horizontal



Condition: 10m HORIZONTAL

Job No. : 8967CR

Test Mode: TX Mode

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	35.38	6.71	12.69	32.98	28.01	14.43	30.00 -15.57
2	48.16	6.86	12.82	33.00	26.99	13.67	30.00 -16.33
3	59.44	7.00	12.04	32.95	26.76	12.85	30.00 -17.15
4	161.47	7.50	13.24	32.73	27.27	15.28	30.00 -14.72
5	350.48	8.25	13.85	32.60	28.38	17.88	37.00 -19.12
6 pp	642.86	9.01	19.45	32.60	28.39	24.25	37.00 -12.75





**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<sub>3</sub>: Level @ 3m distance. Unit: uV/m;

L<sub>10</sub>: Level @ 10m distance. Unit: uV/m;

D<sub>3</sub>: 3m distance. Unit: m

D<sub>10</sub>: 10m distance. Unit: m

The level at 3m test distance is below:

Frequency (MHz)	Level @ 10m (dBuV/m)	Level @ 10m (uV/m)	Level @ 3m (uV/m)	Level @ 3m (dBuV/m)	Limit @ 3m (dBuV/m)	Margin (dB)	Ant. Polarization
52.39	14.92	5.57	18.57	25.38	40.00	-14.62	V
65.57	13.71	4.85	16.16	24.17	40.00	-15.83	V
146.37	14.90	5.56	18.53	25.36	43.50	-18.14	V
261.98	16.45	6.65	22.15	26.91	46.00	-19.09	V
360.45	18.87	8.78	29.27	29.33	46.00	-16.67	V
848.06	27.62	24.04	80.15	38.08	46.00	-7.92	V
35.38	14.43	5.27	17.55	24.89	40.00	-15.11	H
48.16	13.67	4.83	16.08	24.13	40.00	-15.87	H
59.44	12.85	4.39	14.63	23.31	40.00	-16.69	H
161.47	15.28	5.81	19.36	25.74	43.50	-17.76	H
350.48	17.88	7.83	26.11	28.34	46.00	-17.66	H
642.86	24.25	16.31	54.37	34.71	46.00	-11.29	H



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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
3727.173	32.86	7.71	38.58	44.14	46.13	74	-27.87	Vertical
4808.000	34.17	8.87	39.03	43.00	47.01	74	-26.99	Vertical
5939.103	34.66	10.39	39.01	44.88	50.92	74	-23.08	Vertical
7212.000	36.41	10.68	38.18	41.87	50.78	74	-23.22	Vertical
9616.000	37.52	12.50	36.99	39.53	52.56	74	-21.44	Vertical
12350.530	38.81	14.27	38.66	38.95	53.37	74	-20.63	Vertical
3589.562	32.46	7.66	38.51	45.43	47.04	74	-26.96	Horizontal
4808.000	34.17	8.87	39.03	44.15	48.16	74	-25.84	Horizontal
5778.052	34.57	9.94	39.02	45.21	50.70	74	-23.30	Horizontal
7212.000	36.41	10.68	38.18	41.80	50.71	74	-23.29	Horizontal
9616.000	37.52	12.50	36.99	39.39	52.42	74	-21.58	Horizontal
12226.070	38.74	14.37	38.53	38.45	53.03	74	-20.97	Horizontal

Test mode:	Transmitting	Test channel:	Middle	Remark:	Peak
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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
3732.570	32.87	7.72	38.58	43.43	45.44	74	-28.56	Vertical
4884.000	34.30	8.98	39.06	42.44	46.66	74	-27.34	Vertical
6008.249	34.71	10.55	38.99	44.04	50.31	74	-23.69	Vertical
7326.000	36.37	10.73	38.06	42.79	51.83	74	-22.17	Vertical
9768.000	37.55	12.59	36.91	39.31	52.54	74	-21.46	Vertical
12279.260	38.77	14.33	38.59	39.28	53.79	74	-20.21	Vertical
3574.015	32.42	7.66	38.50	43.98	45.56	74	-28.44	Horizontal
4884.000	34.30	8.98	39.06	43.43	47.65	74	-26.35	Horizontal
6148.967	34.82	10.37	38.90	43.49	49.78	74	-24.22	Horizontal
7326.000	36.37	10.73	38.06	41.27	50.31	74	-23.69	Horizontal
9768.000	37.55	12.59	36.91	39.58	52.81	74	-21.19	Horizontal
12015.620	38.61	14.55	38.32	38.66	53.50	74	-20.50	Horizontal



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Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak
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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
3847.726	33.19	7.76	38.63	44.32	46.64	74	-27.36	Vertical
4960.000	34.43	9.09	39.09	43.09	47.52	74	-26.48	Vertical
6193.614	34.86	10.31	38.88	44.87	51.16	74	-22.84	Vertical
7440.000	36.32	10.77	37.94	41.94	51.09	74	-22.91	Vertical
9920.000	37.58	12.67	36.84	38.98	52.39	74	-21.61	Vertical
12261.500	38.76	14.34	38.57	38.81	53.34	74	-20.66	Vertical
3825.521	33.13	7.75	38.62	46.09	48.35	74	-25.65	Horizontal
4960.000	34.43	9.09	39.09	43.33	47.76	74	-26.24	Horizontal
6069.413	34.76	10.47	38.96	44.23	50.50	74	-23.50	Horizontal
7440.000	36.32	10.77	37.94	41.99	51.14	74	-22.86	Horizontal
9920.000	37.58	12.67	36.84	39.20	52.61	74	-21.39	Horizontal
12332.670	38.80	14.29	38.64	38.60	53.05	74	-20.95	Horizontal

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Pre-amplifier. The basic equation with a sample calculation is as follows:

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

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		
Test Site:	Measurement Distance: 3m (Fully-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
	Above 1GHz	54.0	Average Value
74.0		Peak Value	
Test Setup:			

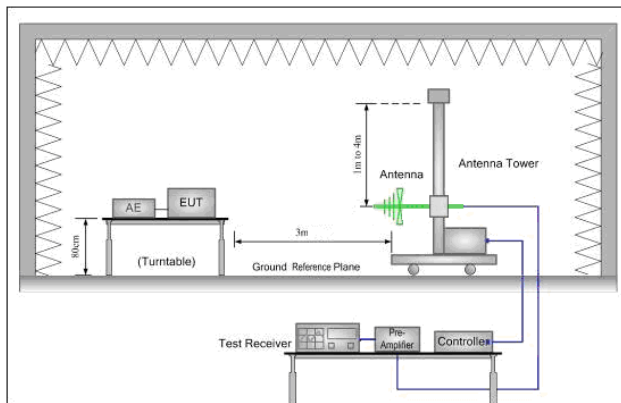


Figure 1. 30MHz to 1GHz

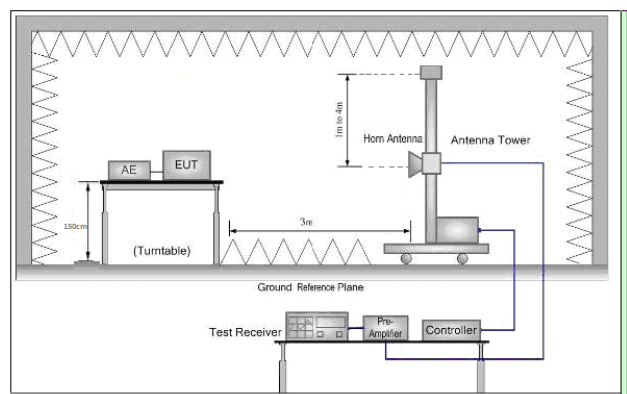


Figure 2. Above 1 GHz



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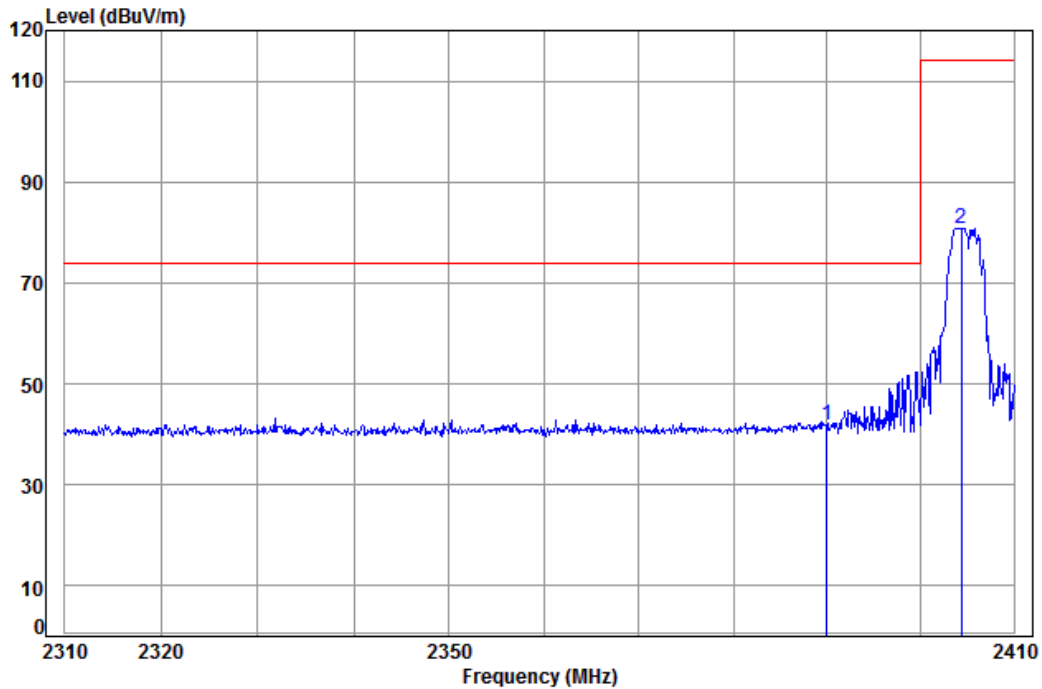
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<p>Test Procedure:</p>	<ol style="list-style-type: none"> <li>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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</li> <li>h. Test the EUT in the lowest channel , the Highest channel</li> <li>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.</li> <li>j. Repeat above procedures until all frequencies measured was complete.</li> </ol>
<p>Exploratory Test Mode:</p>	<p>Transmitting</p>
<p>Final Test Mode:</p>	<p>Transmitting</p>
<p>Instruments Used:</p>	<p>Refer to section 5.10 for details</p>
<p>Test Results:</p>	<p>Pass</p>



Test plot as follows:

Test mode:	Transmitting	Test channel:	Lowest	Remark:	Peak	Vertical
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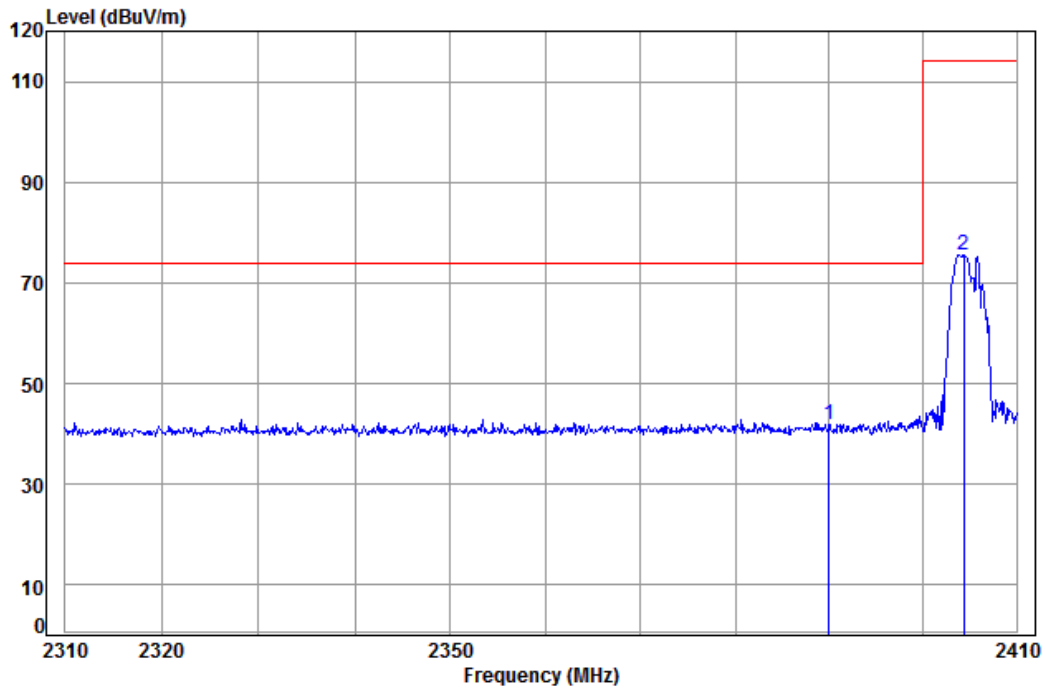


Condition: 3m Vertical  
Job No: : 8967CR  
Mode: : 2404 Band edge  
: 2.4G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2390.000	5.34	29.08	38.14	45.47	41.75	74.00	-32.25	
2	2404.389	5.35	29.12	38.15	84.55	80.87	114.00	-33.13	



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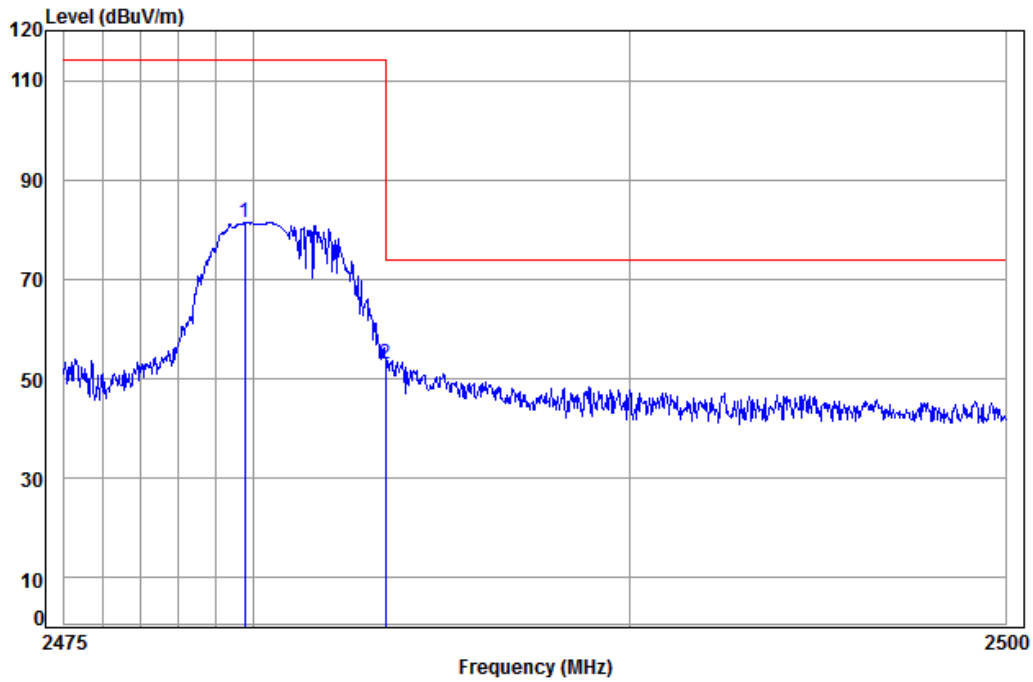


Condition: 3m HORIZONTAL  
Job No: : 8967CR  
Mode: : 2404 Band edge  
: 2.4G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2390.000	5.34	29.08	38.14	45.53	41.81	74.00	-32.19	
2	2404.389	5.35	29.12	38.15	79.17	75.49	114.00	-38.51	



Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak	Vertical
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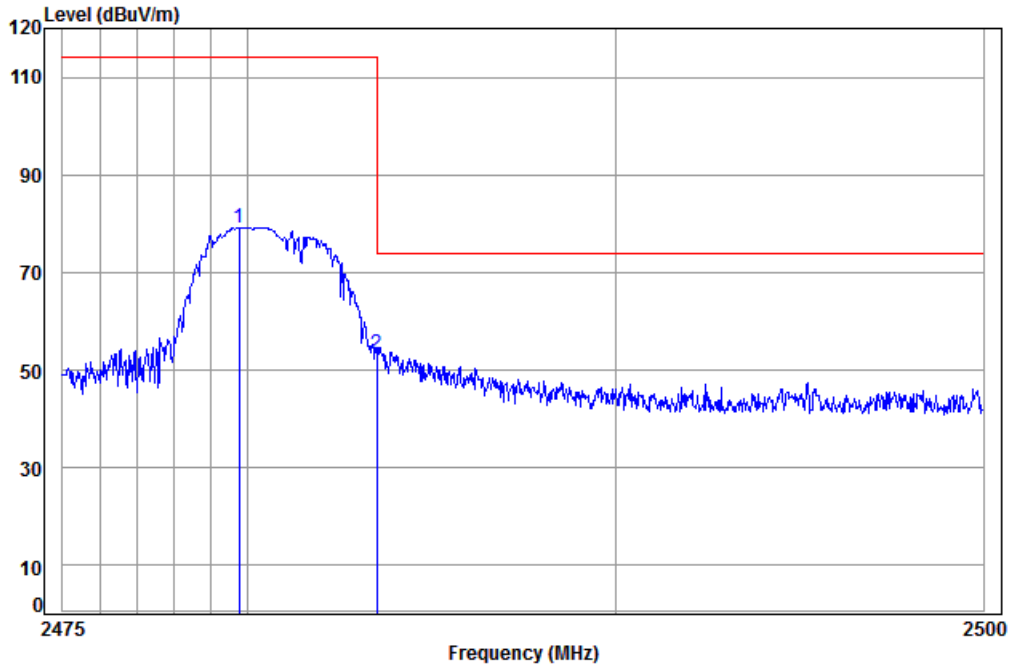
Condition: 3m VERTICAL  
Job No: : 8967CR  
Mode: : 2480 Band edge  
: 2.4G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2479.781	5.41	29.34	38.15	84.70	81.30	114.00	-32.70	
2	pp 2483.500	5.41	29.35	38.15	56.22	52.83	74.00	-21.17	





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

Job No: : 8967CR

Mode: : 2480 Band edge

: 2.4G

	Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2479.781	5.41	29.34	38.15	82.58	79.18	114.00 -34.82
2	pp 2483.500	5.41	29.35	38.15	56.60	53.21	74.00 -20.79

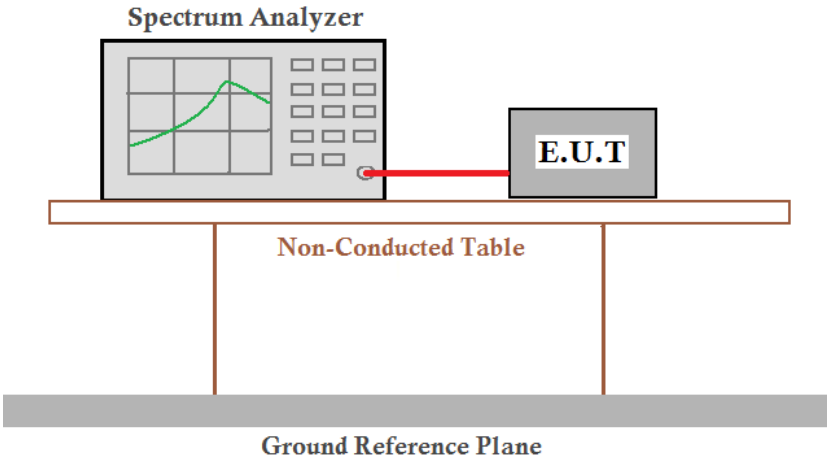
**Note:**

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation

with a sample calculation is as follows:

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

### 6.5 20dB Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2013
Test Setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Limit:	N/A
Exploratory Test Mode:	Transmitter mode
Final Test Mode:	Transmitter mode
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

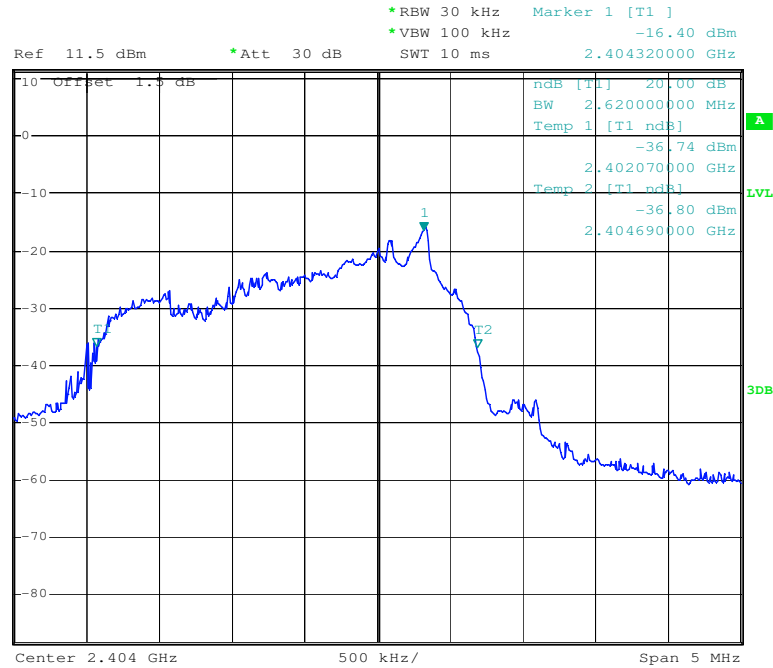
### Measurement Data

Test Channel	20dB bandwidth (MHz)	Results
Lowest	2.620	Pass
Middle	1.940	Pass
Highest	1.530	Pass

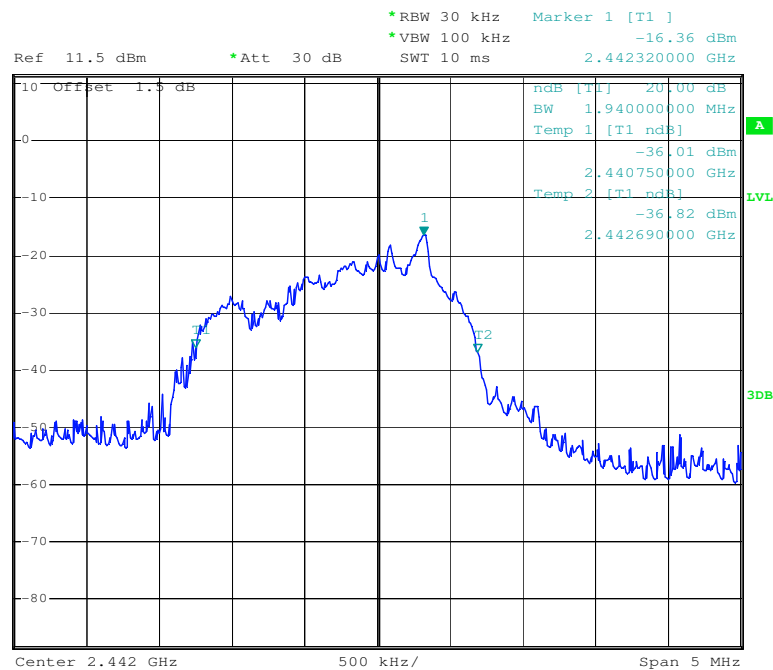


Test plot as follows:

Test channel:	Lowest
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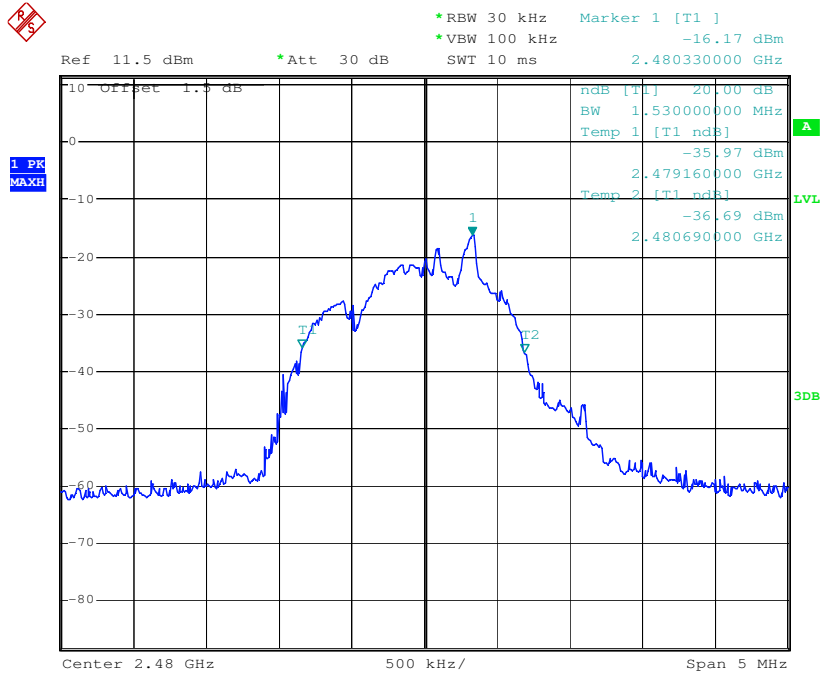


Test channel:	Middle
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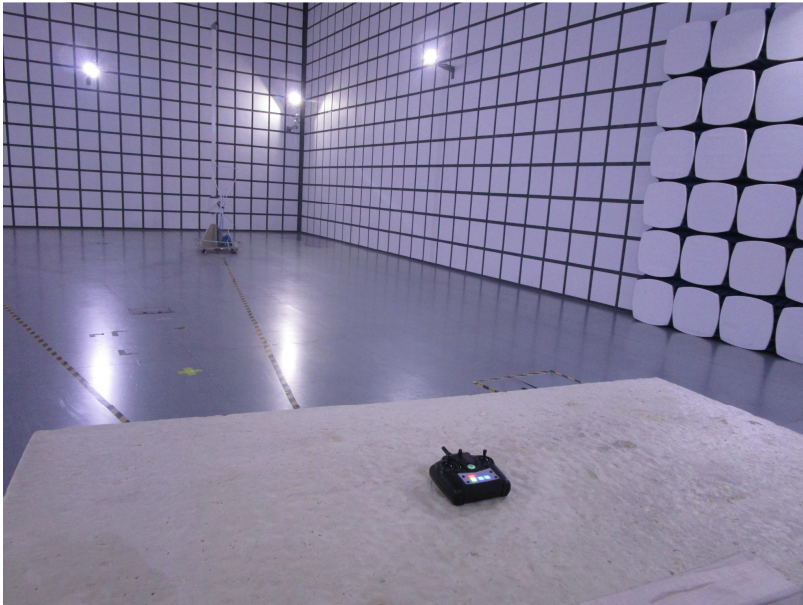


Test channel:	Highest
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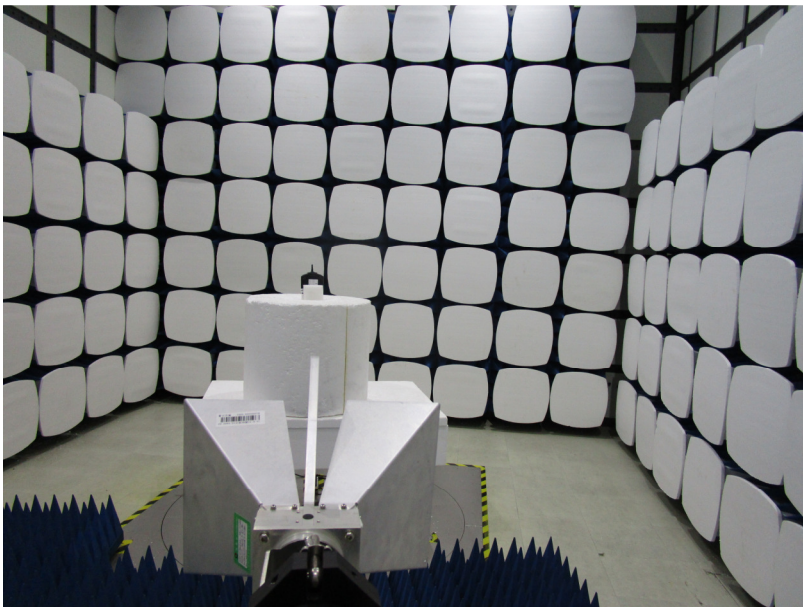


## 7 Photographs - EUT Test Setup

### 7.1 Radiated Emission



### 7.2 Radiated Spurious Emission



## 8 Photographs - EUT Constructional Details



