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Report No.: SZEM120500273301
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FCC REPORT

Application No. :

SZEM1205002733RF

Applicant:

SHENZHEN OCEAN ELECTRONICS CO., LTD.

Manufacturer:

SHENZHEN OCEAN ELECTRONICS CO., LTD.

Factory:

SHENZHEN OCEAN ELECTRONICS CO., LTD.

Product Name:

Wireless Computer Mouse 2.4GHz

Model No.(EUT):

Evolution*Series

FCC ID:

YL2EVOLUTION

Standards:

47 CFR Part 15, Subpart C (2011)

Date of Receipt:

2012-05-24

Date of Test:

2012-06-01 to 2012-06-21

Date of Issue:

2012-07-04

Test Result:

PASS *

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

Authorized Signature:



Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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

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2 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
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C Section 15.249 (a)	ANSI C63.10 (2009)	PASS
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.249 (a)/15.209	ANSI C63.10 (2009)	PASS
Band edge (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.249(a)/15.205	ANSI C63.10 (2009)	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 (2009)	PASS

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4 General Information

4.1 Client Information

Applicant:	SHENZHEN OCEAN ELECTRONICS CO., LTD.
Address of Applicant:	B4 Building, Xinhaosheng Dingfeng Technology Park, Yonghe Rd., Fuyong Town, Baoan District, Shenzhen, China
Manufacturer:	SHENZHEN OCEAN ELECTRONICS CO., LTD.
Address of Manufacturer:	B4 Building, Xinhaosheng Dingfeng Technology Park, Yonghe Rd., Fuyong Town, Baoan District, Shenzhen, China
Factory:	SHENZHEN OCEAN ELECTRONICS CO., LTD.
Address of Factory:	B4 Building, Xinhaosheng Dingfeng Technology Park, Yonghe Rd., Fuyong Town, Baoan District, Shenzhen, China

4.2 General Description of EUT

Name:	Wireless Computer Mouse 2.4GHz
Model No.:	Evolution*Series
Trade Mark:	Sports Mouse™
Frequency Range:	2404MHz ~ 2480MHz
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	0dBi
Power Supply:	3.0V DC (1.5V x 2 "AAA" Size Batteries)

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	2404MHz
The Middle channel	2443MHz
The Highest channel	2480MHz

4.3 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	50 % RH
Atmospheric Pressure:	998 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode.

4.4 Description of Support Units

The EUT has been tested independently.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab,
No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**
CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.
- **VCCI**
The 3m Semi-anechoic chamber, Full-anechoic Chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197, G-416, T-1153 and C-2383 respectively.
- **FCC – Registration No.: 556682**
SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.
- **Industry Canada (IC)**
The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.



4.10 Test Instruments List

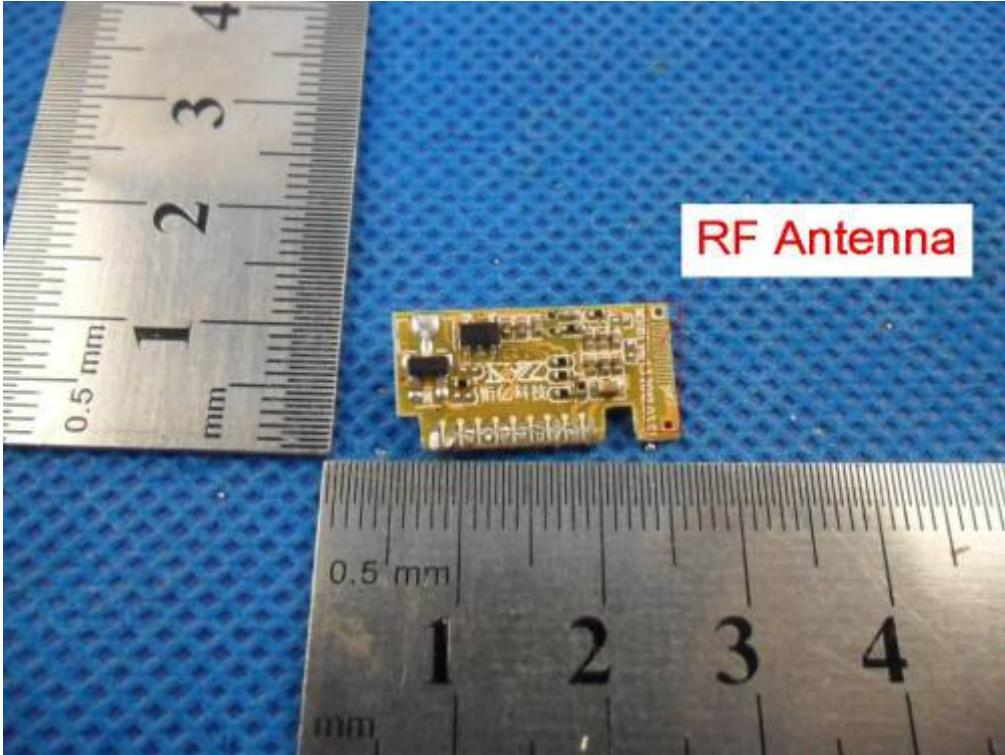
RE in Chamber					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2013-06-10
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2013-05-17
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2012-10-29
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2012-10-29
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2012-10-29
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2013-05-17
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2012-10-26
9	Coaxial cable	SGS	N/A	SEL0027	2013-05-29
10	Coaxial cable	SGS	N/A	SEL0189	2013-05-29
11	Coaxial cable	SGS	N/A	SEL0121	2013-05-29
12	Coaxial cable	SGS	N/A	SEL0178	2013-05-29
13	Band filter	Amindeon	82346	SEL0094	2013-05-17
14	Barometer	ChangChun	DYM3	SEL0088	2013-05-17
15	Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2012-10-28

General used equipment					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0102 to SEL0103	2012-10-27
2	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0101	2012-10-27
3	Barometer	ChangChun	DYM3	SEL0088	2013-05-17

RF conducted					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	Spectrum Analyzer	Rohde & Schwarz	FSP 30	SEL0154	2012-10-23
2	Coaxial cable	SGS	N/A	SEL0028	2013-05-29

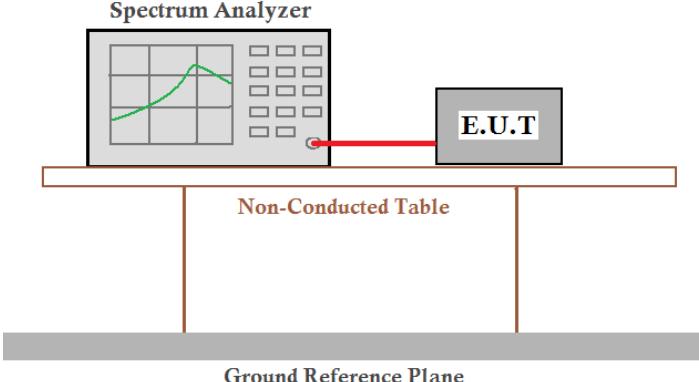
5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	FCC Part15 C 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>	
<p>EUT Antenna:</p> <p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.</p>	
	

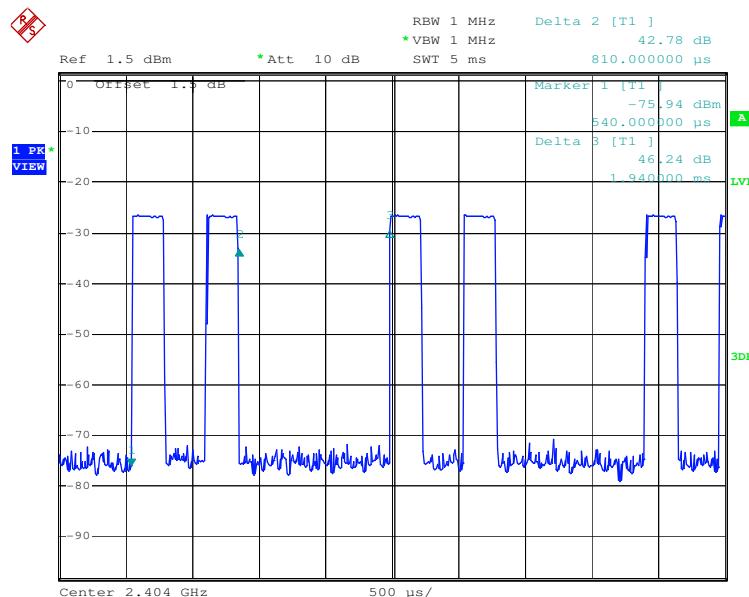
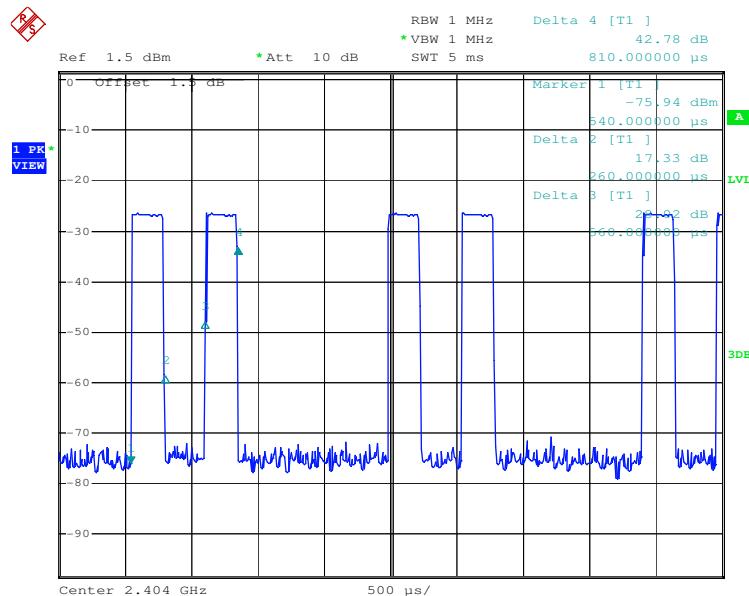
5.2 Spurious Emissions

5.2.1 Duty Cycle

Test Requirement:	FCC Part15 C Section 15.35 (c)
Test Method:	ANSI C63.10:2009
Test Setup:	
Instruments Used:	Refer to section 4.10 for details
Limit:	N/A
Test Mode:	Transmitting mode
Test Results:	Pass

Test plot as follows:

Duty cycle



5.2.2 Spurious Emissions

Test Requirement:	FCC Part15 C Section 15.249 and 15.209				
Test Method:	ANSI C63.10: 2009				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100kHz	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:					

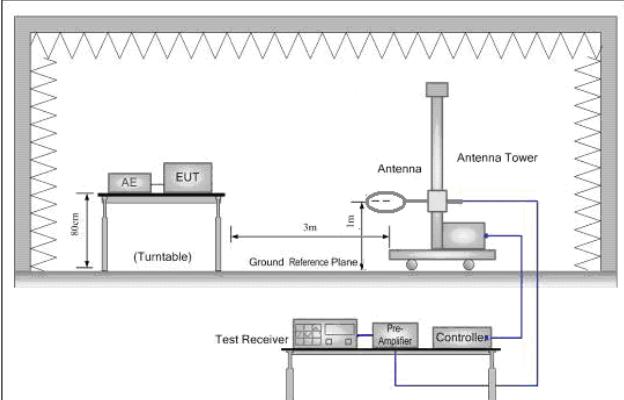


Figure 1. Below 30MHz

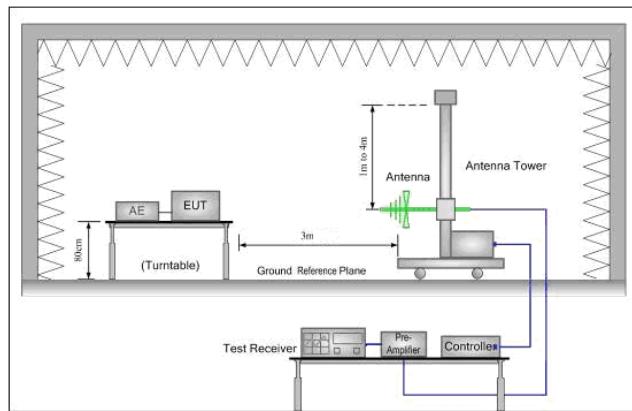


Figure 2. 30MHz to 1GHz

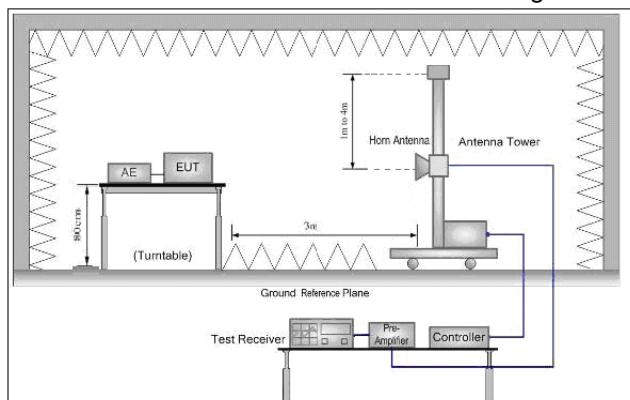


Figure 3. Above 1 GHz

Test Procedure:	<ol style="list-style-type: none"> a. 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. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel h. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.
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	i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 4.10 for details
Test Mode:	Transmitting mode
Test Results:	Pass

Average value:	
Calculate Formula:	Average value=Peak value + PDCF
	PDCF=20 log(Duty cycle)=-11.6
	Duty cycle= T on time / T period=(0.260+0.250)/1.94=26.3%
Test data:	Ton time =(0.260+0.250)ms
	T period =1.94ms

Measurement Data**5.2.2.1 Field Strength Of The Fundamental Signal**

Peak value:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2404.000	2.99	32.54	39.86	95.46	91.13	114	-22.87	Horizontal
2404.000	2.99	32.54	39.86	99.73	95.40	114	-18.60	Vertical
2443.000	3.01	32.61	39.89	96.87	92.60	114	-21.40	Horizontal
2442.000	3.01	32.61	39.89	100.13	95.86	114	-18.14	Vertical
2480.000	3.03	32.67	39.92	97.05	92.83	114	-21.17	Horizontal
2480.000	3.03	32.67	39.92	97.76	93.54	114	-20.46	Vertical

Average value:

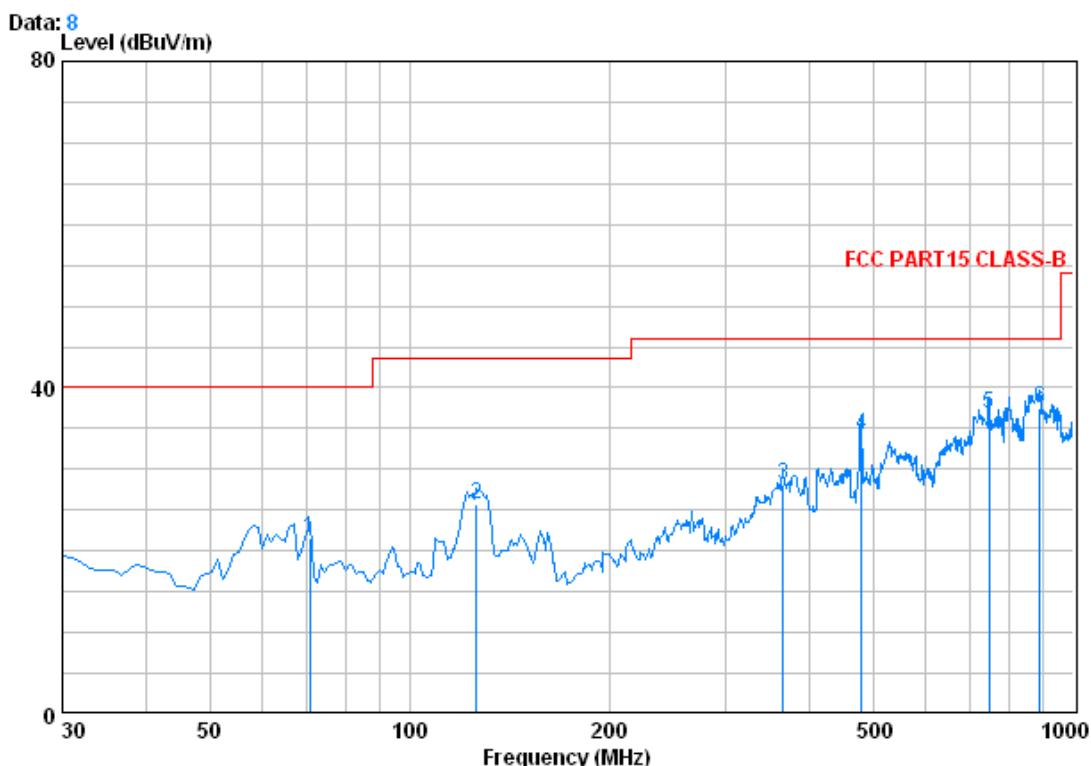
Frequency (MHz)	Peak value (dBuV/m)	PDCF	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2404.000	91.13	-11.6	79.53	94.00	-14.47	Horizontal
2404.000	95.40	-11.6	83.80	94.00	-10.20	Vertical
2443.000	92.60	-11.6	81.00	94.00	-13.00	Horizontal
2442.000	95.86	-11.6	84.26	94.00	-9.74	Vertical
2480.000	92.83	-11.6	81.23	94.00	-12.77	Horizontal
2480.000	93.54	-11.6	81.94	94.00	-12.06	Vertical

5.2.2.2 Spurious Emissions**30MHz~1GHz**

Test mode: Transmitting

QP value:

Vertical:



Condition : FCC PART15 CLASS-B 3m 0042673 VERTICAL

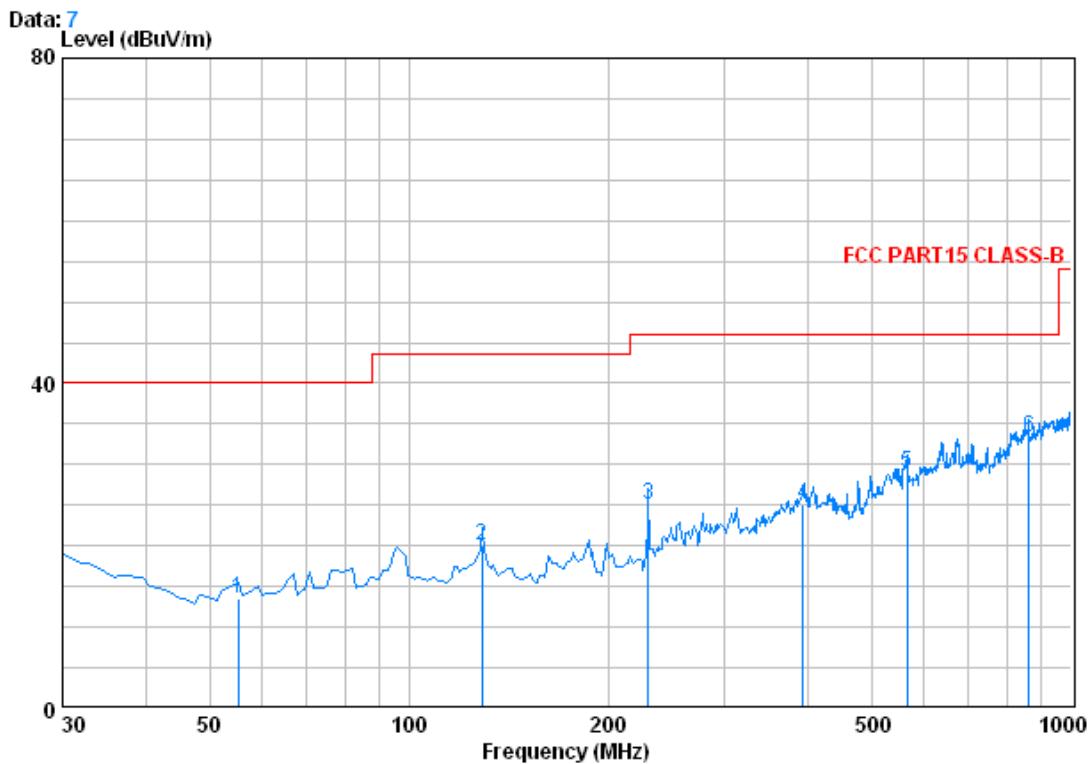
Job No. : 2733RF

Mode : transmitting (mouse)

Freq	Cable		Antenna	Preamp	Read	Limit	Over	
	Loss	Factor	Factor	Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	70.740	0.82	6.97	27.25	41.08	21.62	40.00	-18.38
2	126.030	1.27	7.77	27.03	43.75	25.75	43.50	-17.75
3	365.620	2.10	15.78	26.91	37.21	28.19	46.00	-17.81
4 0	479.110	2.52	17.80	27.60	41.41	34.13	46.00	-11.87
5 0	746.830	3.05	21.69	27.35	39.52	36.90	46.00	-9.10
6 0	890.390	3.56	23.14	26.82	37.69	37.58	46.00	-8.42



Horizontal:



Condition : FCC PART15 CLASS-B 3m 0042673 HORIZONTAL

Job No. : 2733RF

Mode : transmitting (mouse)

Freq	Cable		Antenna	Preamp	Read	Limit	Over	
	Loss	Factor	Factor	Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	55.220	0.80	7.78	27.28	32.19	13.50	40.00	-26.50
2	128.940	1.27	7.72	27.02	38.18	20.15	43.50	-23.35
3	229.820	1.57	11.64	26.59	38.52	25.14	46.00	-20.86
4	393.750	2.18	16.22	27.09	33.85	25.15	46.00	-20.85
5	564.470	2.67	19.02	27.59	35.00	29.09	46.00	-16.91
6 @	862.260	3.46	22.70	26.96	34.23	33.43	46.00	-12.57

Above 1GHz								
Test mode:	Transmitting		Test channel:	Lowest	Remark:		Peak	
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1353.804	2.42	27.85	39.29	47.69	38.67	74	-35.33	Vertical
3700.260	3.91	33.45	40.81	48.72	45.27	74	-28.73	Vertical
4821.757	4.70	34.68	41.64	51.79	49.53	74	-24.47	Vertical
6156.505	5.17	35.88	40.79	50.90	51.16	74	-22.84	Vertical
8549.586	6.18	36.24	38.72	48.56	52.26	74	-21.74	Vertical
12024.960	6.47	38.93	38.28	46.77	53.89	74	-20.11	Vertical
1908.972	2.78	31.06	39.53	46.24	40.55	74	-33.45	Horizontal
3616.451	3.84	33.34	40.76	47.72	44.14	74	-29.86	Horizontal
4983.987	4.77	34.43	41.77	48.98	46.41	74	-27.59	Horizontal
7209.015	5.79	35.88	39.87	51.97	53.77	74	-20.23	Horizontal
9370.083	6.05	37.03	37.99	46.75	51.84	74	-22.16	Horizontal
12055.600	6.48	38.95	38.30	45.92	53.05	74	-20.95	Horizontal

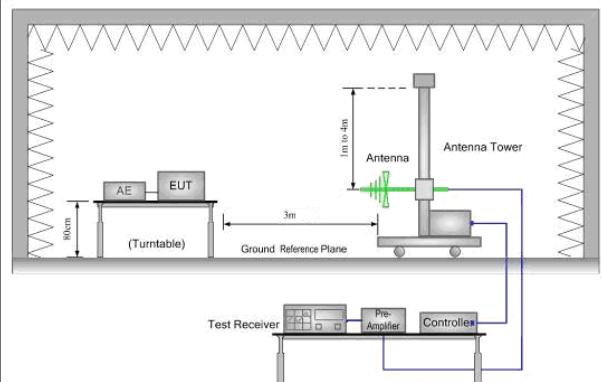
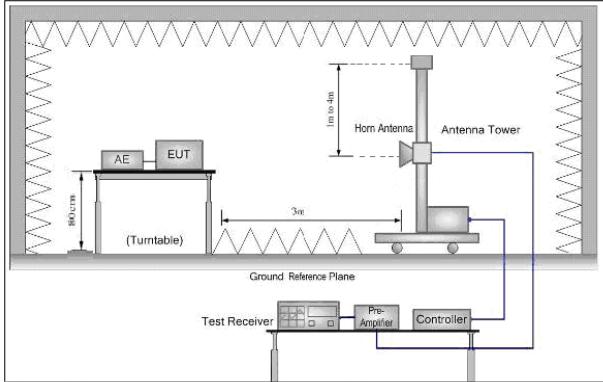
Test mode:	Transmitting		Test channel:	Middle	Remark:		Peak	
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1529.749	2.54	28.35	39.37	47.15	38.67	74	-35.33	Vertical
3747.656	3.95	33.51	40.86	49.00	45.60	74	-28.40	Vertical
4883.519	4.72	34.59	41.68	52.60	50.23	74	-23.77	Vertical
6063.190	5.14	35.78	40.87	49.50	49.55	74	-24.45	Vertical
7338.621	5.94	35.94	39.75	51.14	53.27	74	-20.73	Vertical
10269.320	6.04	38.02	37.56	46.53	53.03	74	-20.97	Vertical
1336.682	2.41	27.82	39.29	47.16	38.10	74	-35.90	Horizontal
1978.230	2.82	31.68	39.55	46.37	41.32	74	-32.68	Horizontal
3738.129	3.95	33.49	40.84	50.26	46.86	74	-27.14	Horizontal
4883.519	4.72	34.59	41.68	56.00	53.63	74	-20.37	Horizontal
7338.621	5.94	35.94	39.75	51.29	53.42	74	-20.58	Horizontal
10560.940	6.11	38.32	37.68	47.02	53.77	74	-20.23	Horizontal

Test mode:		Transmitting		Test channel:		Highest	Remark:		Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
1381.656	2.44	27.88	39.30	47.84	38.86	74	-35.14	Vertical	
1913.838	2.78	31.18	39.53	46.93	41.36	74	-32.64	Vertical	
3738.129	3.95	33.49	40.84	48.71	45.31	74	-28.69	Vertical	
4971.316	4.76	34.43	41.75	52.27	49.71	74	-24.29	Vertical	
7470.558	6.08	35.99	39.64	50.69	53.12	74	-20.88	Vertical	
11027.980	6.23	38.49	37.88	47.07	53.91	74	-20.09	Vertical	
1529.749	2.54	28.35	39.37	47.06	38.58	74	-35.42	Horizontal	
4096.875	4.23	34.08	41.11	48.60	45.80	74	-28.20	Horizontal	
4971.316	4.76	34.43	41.75	55.71	53.15	74	-20.85	Horizontal	
6283.164	5.20	36.04	40.68	49.91	50.47	74	-23.53	Horizontal	
7470.558	6.08	35.99	39.64	50.67	53.10	74	-20.90	Horizontal	
10453.950	6.09	38.24	37.64	46.96	53.65	74	-20.35	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) The disturbance above 13GHz and 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.
- 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.

5.3 Band edge (Radiated Emission)

Test Requirement:	FCC Part15 C Section 15.209 and 15.205																						
Test Method:	ANSI C63.10: 2009																						
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																						
Limit(band edge):	<p>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.</p> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Limit (dBuV/m @3m)</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>30MHz-88MHz</td> <td>40.0</td> <td>Quasi-peak Value</td> </tr> <tr> <td>88MHz-216MHz</td> <td>43.5</td> <td>Quasi-peak Value</td> </tr> <tr> <td>216MHz-960MHz</td> <td>46.0</td> <td>Quasi-peak Value</td> </tr> <tr> <td>960MHz-1GHz</td> <td>54.0</td> <td>Quasi-peak Value</td> </tr> <tr> <td>Above 1GHz</td> <td>54.0</td> <td>Average Value</td> </tr> <tr> <td></td> <td>74.0</td> <td>Peak Value</td> </tr> </tbody> </table>		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
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																					

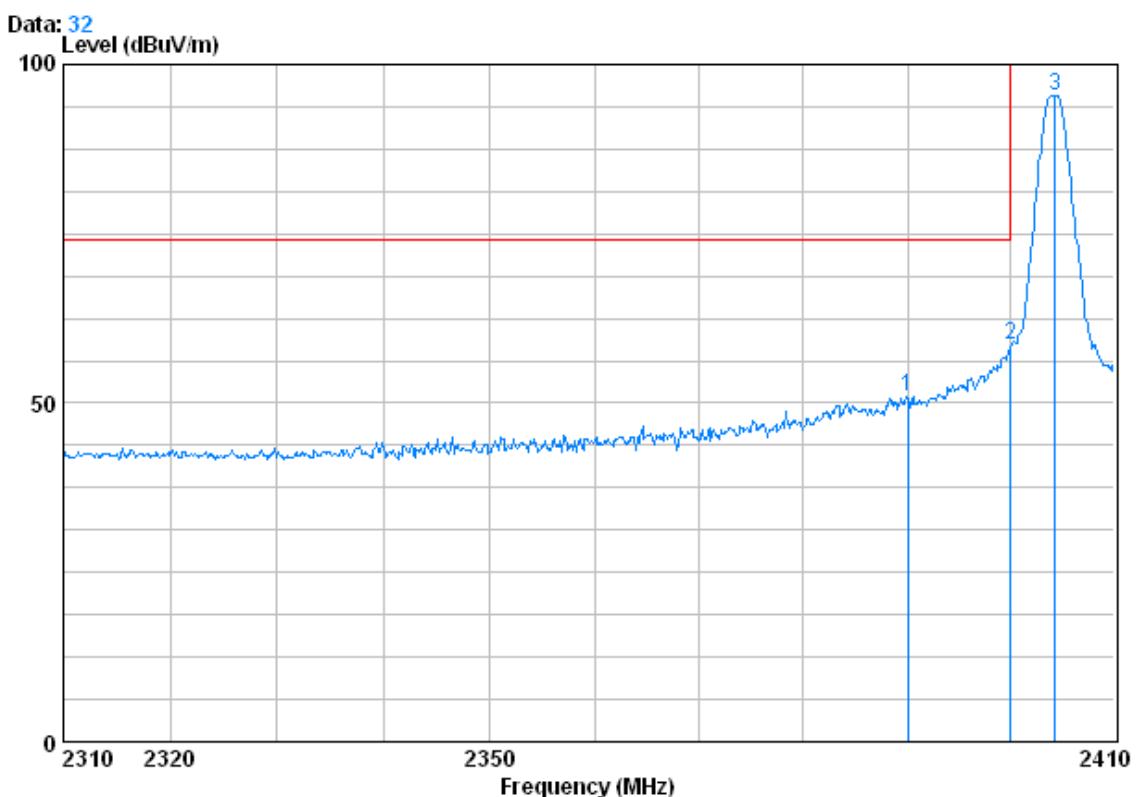
Test Procedure:	<ul style="list-style-type: none">a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channelg. Test the EUT in the lowest channel , the Highest channelh. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.i. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 4.10 for details
Test Mode:	Transmitting mode
Test Results:	Pass

Measurement Data

Band edge (Radiated Emission)

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



Condition : FCC PART15.249 2.4PK 3m VERTICAL

Job No. : 2733RF

test mode : 2404

Freq	Cable			Antenna	Preamp	Read	Limit	Over
	Loss	Factor	Factor			Level		
MHz	dB	dB/m		dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	55.41	51.05	74.00	-22.95
2	2400.000	2.98	32.51	39.86	62.99	58.63	74.00	-15.37
3	2404.300	2.99	32.54	39.86	99.73	95.40	114.00	-18.60

Horizontal:

Data: 29

Level (dBuV/m)

100

50

0

2310

2320

2350

2410

Frequency (MHz)

Condition : FCC PART15.249 2.4PK 3m HORIZONTAL

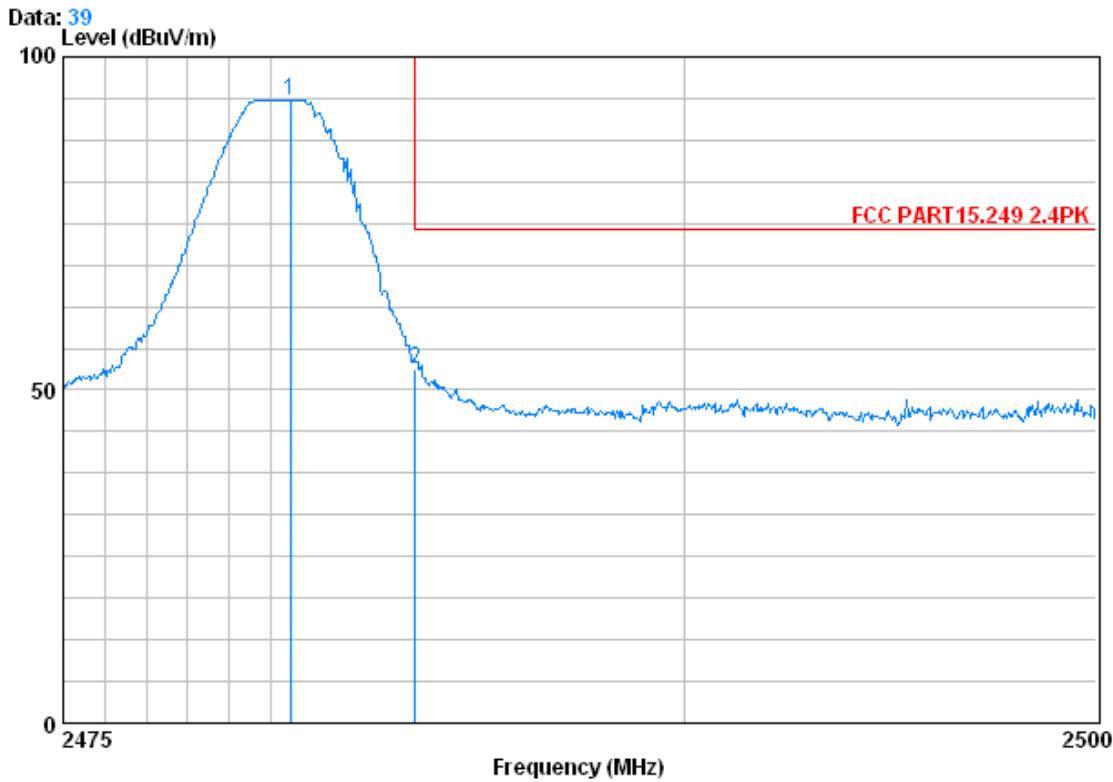
Job No. : 2733RF

test mode : 2404

Freq	Cable		Antenna	Preamp	Read	Limit	Over	
	Loss	Factor	Factor	Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	52.00	47.64	74.00	-26.36
2	2400.000	2.98	32.51	39.86	57.34	52.97	74.00	-21.03
3	2404.300	2.99	32.54	39.86	95.46	91.13	114.00	-22.87

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



Condition : FCC PART15.249 2.4PK 3m VERTICAL

Job No. : 2733RF

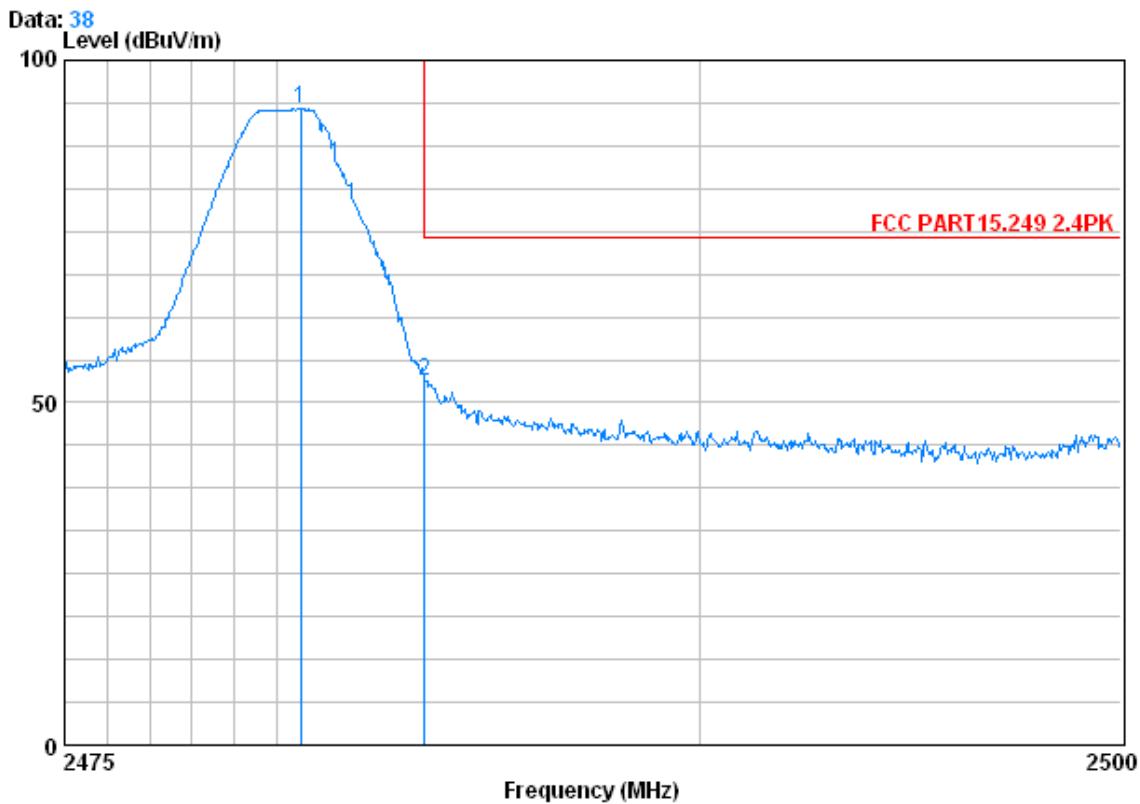
test mode : 2480

Freq	Cable		Antenna	Preamp	Read	Limit	Over		
	Loss	Factor	Factor	Level	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	0	2480.475	3.03	32.67	39.92	97.76	93.54	114.00	-20.46
2		2483.500	3.03	32.67	39.92	57.40	53.18	74.00	-20.82

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Horizontal:



Condition : FCC PART15.249 2.4PK 3m HORIZONTAL

Job No. : 2733RF

test mode : 2480

Freq	Cable		Antenna	Preamp	Read	Limit	Over	
	Loss	Factor	Factor	Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2480.575	3.03	32.67	39.92	97.05	92.83	114.00	-21.17
2	2483.500	3.03	32.67	39.92	57.36	53.14	74.00	-20.86

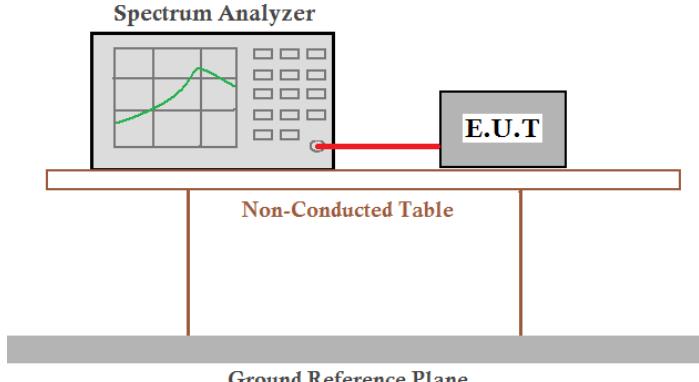
Note:

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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

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.

5.4 20dB Bandwidth

Test Requirement:	FCC Part15 C Section 15.215
Test Method:	ANSI C63.10:2009
Test Setup:	
Instruments Used:	Refer to section 4.7 for details
Test mode:	Transmitting mode
Limit:	N/A
Test Results:	Pass

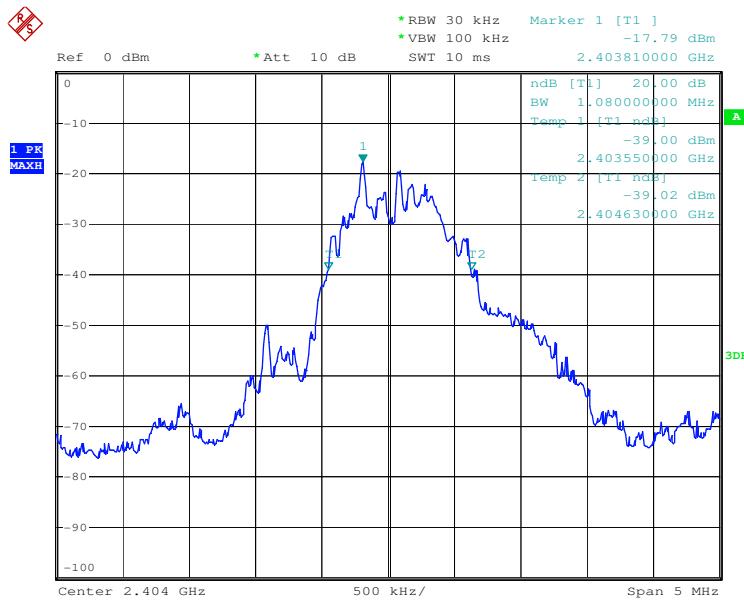
Measurement Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	1.080	Pass
Middle	1.090	Pass
Highest	1.350	Pass

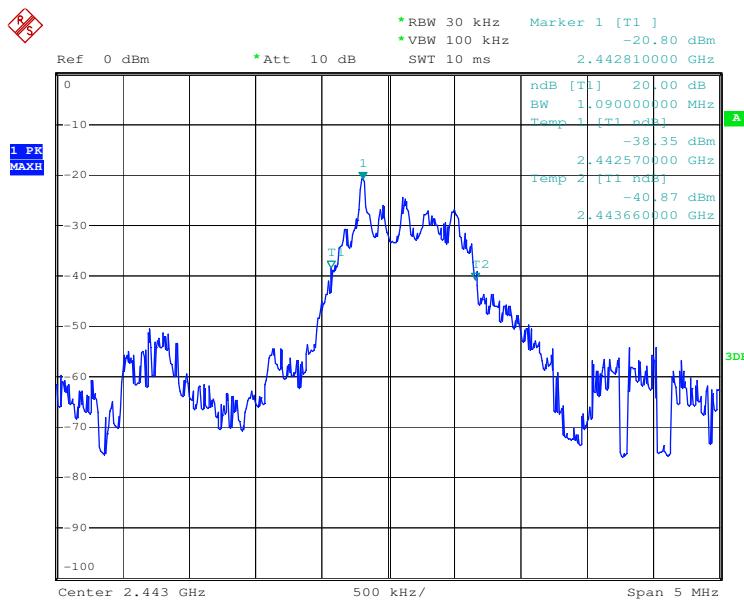


Test plot as follows:

Test channel:	Lowest
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Test channel:	Middle
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Test channel:	Highest
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