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Report No.: SZEM110700255401

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# FCC REPORT

**Application No. :** SZEM1107002554RF

**Applicant:** SHANTOU BENMA HOBBY INDUSTRIAL CO., LTD.

**Product Name:** 2.4GHz TX FOR R/C HELICOPTER

**Operation Frequency:** 2404.8MHz to 2479.8MHz

**FCC ID:** ZWR86988889123

**Standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.249: 2010

**Date of Receipt** 2011-07-28

**Date of Test** 2011-07-28 to 2011-08-16

**Date of Issue** 2011-08-18

<b>Test Result :</b>	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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### 3 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a)/15.209	Pass
Band edge (Radiated Emission)	15.249(a)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

*Remark: Pass: The EUT complies with the essential requirements in the standard.*

*Fail: The EUT does not comply with the essential requirements in the standard.*



## 4 General Information

### 4.1 Client Information

Applicant:	SHANTOU BENMA HOBBY INDUSTRIAL CO., LTD.
Address of Applicant:	YUTAN ROAD, GUANGYI STREET, CHENGHAI DISTRICT, SHANTOU CITY, GUANGDONG PROVINCE, CHINA

### 4.2 General Description of E.U.T.

Product Name:	2.4GHz TX FOR R/C HELICOPTER		
Model No.:	AZSH1100B AZSH1100R 9988 9958 9978 9998 8830 8831 8829 6031 6032 6033 6034 6035 6036 9108 9109 9110 9111 9112 9113 9114 9115 9116 9117 9118 9119 9120 9121 9122 Only the model 9988 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being the decoration, colours and the model No..		
Operation Frequency:	2404.8MHz to 2479.8MHz		
Channel numbers:	16		
Modulation type:	GFSK		
Antenna Type:	Integral		
Power supply:	6.0V DC (4 x 1.5V "AA" Size Batteries)		
Channel number	Frequency(MHz)	Channel number	Frequency(MHz)
CH 00	2404.8	CH 08	2444.8
CH 01	2409.8	CH 09	2449.8
CH 02	2414.8	CH 10	2454.8
CH 03	2419.8	CH 11	2459.8
CH 04	2424.8	CH 12	2464.8
CH 05	2429.8	CH 13	2469.8
CH 06	2434.8	CH 14	2474.8
CH 07	2439.8	CH 15	2479.8

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	2404.8MHz
The middle channel	2439.8MHz
The Highest channel	2479.8MHz

### 4.3 E.U.T Operation mode

**Operating Environment:**

Temperature: 24.0 °C  
Humidity: 51 % RH  
Atmospheric Pressure: 1004 mbar

**Test mode:**

Transmitting mode: Keep the EUT in Transmitting mode.

### 4.4 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 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 and C-2383 respectively.

Date of Registration: September 29, 2008. Valid until September 28, 2011.

- **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 556682, March 16, 2011

- **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.

### 4.5 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

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

### 4.6 Other Information Requested by the Customer

None.

**4.7 Test Instruments list:**

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2011-06-10	2012-06-10
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2011-05-26	2012-05-26
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A
4	Coaxial cable	SGS	N/A	SEL0028	2011-05-29	2012-05-29
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2010-11-09	2011-11-09
6	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2010-11-09	2011-11-09
7	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2010-11-09	2011-11-09
8	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2011-05-26	2012-05-26
9	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2010-10-27	2011-10-27
11	Band filter	Amindeon	82346	SEL0094	2011-05-26	2012-05-26

General used equipment						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0102 to SEL0103	2010-11-04	2011-11-04
2	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0101	2011-03-10	2012-03-10
3	Barometer	ChangChun	DYM3	SEL0088	2011-05-18	2012-05-18
4	Oscillograph	Tektronix	TDS2022B	SZE007-4	2010-12-04	2011-12-04

## 5 Test results and Measurement Data

### 5.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement:	<p><i>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.</i></p>
E.U.T Antenna:	

## 5.2 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.249 and 15.209																								
Test Method:	ANSI C63.10: 2009																								
Test Frequency Range:	30MHz to 25000MHz																								
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																								
Receiver setup:	<table border="1"> <thead> <tr> <th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr> </thead> <tbody> <tr> <td>30MHz-1GHz</td><td>Quasi-peak</td><td>100kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr> <tr> <td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr> <tr> <td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr> </tbody> </table>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value	Peak	1MHz	10Hz	Average Value	
Frequency	Detector	RBW	VBW	Remark																					
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Above 1GHz	Peak	1MHz	3MHz	Peak Value																					
	Peak	1MHz	10Hz	Average Value																					
Limit: (Field strength of the fundamental signal)	<table border="1"> <thead> <tr> <th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr> </thead> <tbody> <tr> <td>2400MHz-2483.5MHz</td><td>94.0</td><td>Average Value</td></tr> <tr> <td></td><td>114.0</td><td>Peak Value</td></tr> </tbody> </table>					Frequency	Limit (dBuV/m @3m)	Remark	2400MHz-2483.5MHz	94.0	Average Value		114.0	Peak Value											
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2400MHz-2483.5MHz	94.0	Average Value																							
	114.0	Peak Value																							
Limit: (Spurious Emissions)	<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 rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr> <tr> <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																							
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216MHz-960MHz	46.0	Quasi-peak Value																							
960MHz-1GHz	54.0	Quasi-peak Value																							
Above 1GHz	54.0	Average Value																							
	74.0	Peak Value																							
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.																								
Test Procedure:	<ol style="list-style-type: none"> <li>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>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>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>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>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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</li> </ol>																								

	in a data sheet.
Test Instruments:	Refer to section 4.7 for details.
Test setup:	<p>Below 1GHz</p> <p>Above 1GHz</p>
Test mode:	Transmitting mode
Test results:	Pass

**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

**Measurement Data****5.2.1 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
2404.800	2.98	32.51	39.86	94.46	90.09	114.00	-23.91	Horizontal
2404.800	2.98	32.51	39.86	95.14	90.77	114.00	-23.23	Vertical
2439.800	3.01	32.61	39.89	95.12	90.85	114.00	-23.15	Horizontal
2439.800	3.01	32.61	39.89	94.74	90.47	114.00	-23.53	Vertical
2479.800	3.03	32.67	39.92	93.18	88.96	114.00	-25.04	Horizontal
2479.800	3.03	32.67	39.92	94.19	89.97	114.00	-24.03	Vertical

Average value:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2404.800	2.98	32.54	39.86	89.41	85.07	94.00	-8.93	Horizontal
2404.800	2.98	32.54	39.86	89.14	84.80	94.00	-9.20	Vertical
2439.800	3.01	32.61	39.89	92.53	88.26	94.00	-5.74	Horizontal
2439.800	3.01	32.61	39.89	92.76	88.49	94.00	-5.51	Vertical
2479.800	3.03	32.67	39.92	92.95	88.73	94.00	-5.27	Horizontal
2479.800	3.03	32.67	39.92	89.35	85.13	94.00	-8.87	Vertical

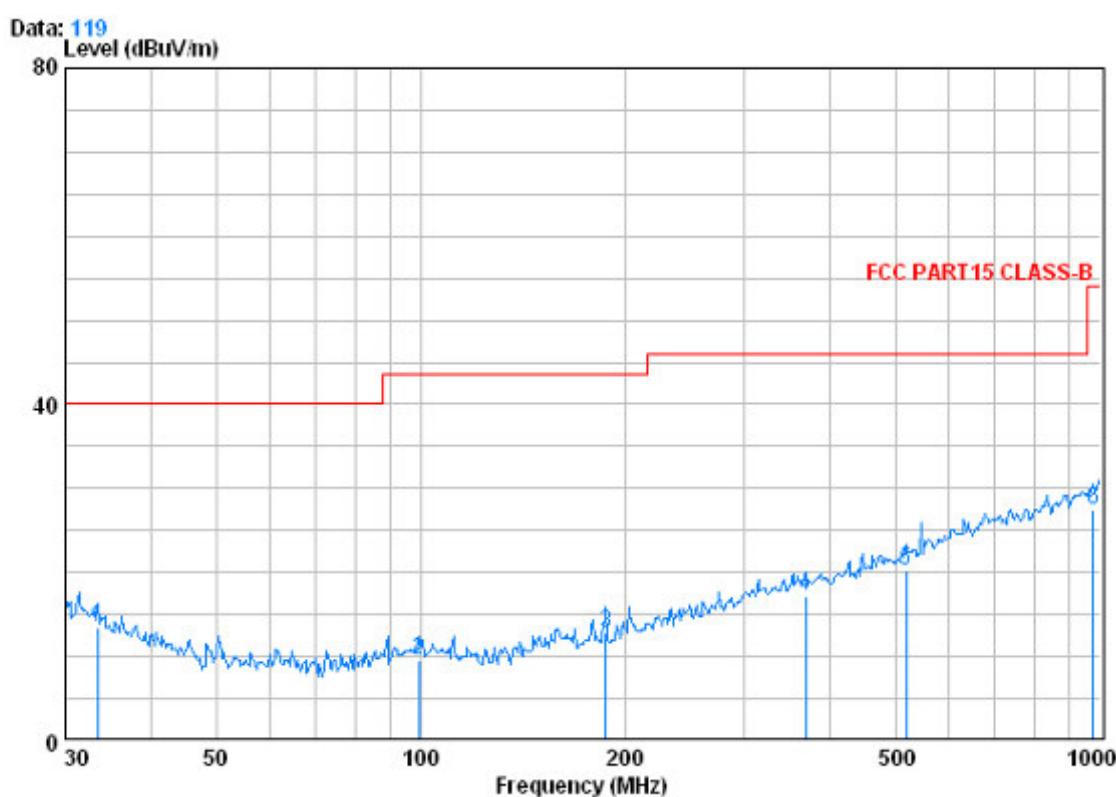
Note:

Peak Level (Final Level)= Reading Level + Antenna Factor + Cable Loss - Preamp Factor

## 5.2.2 Spurious Emissions

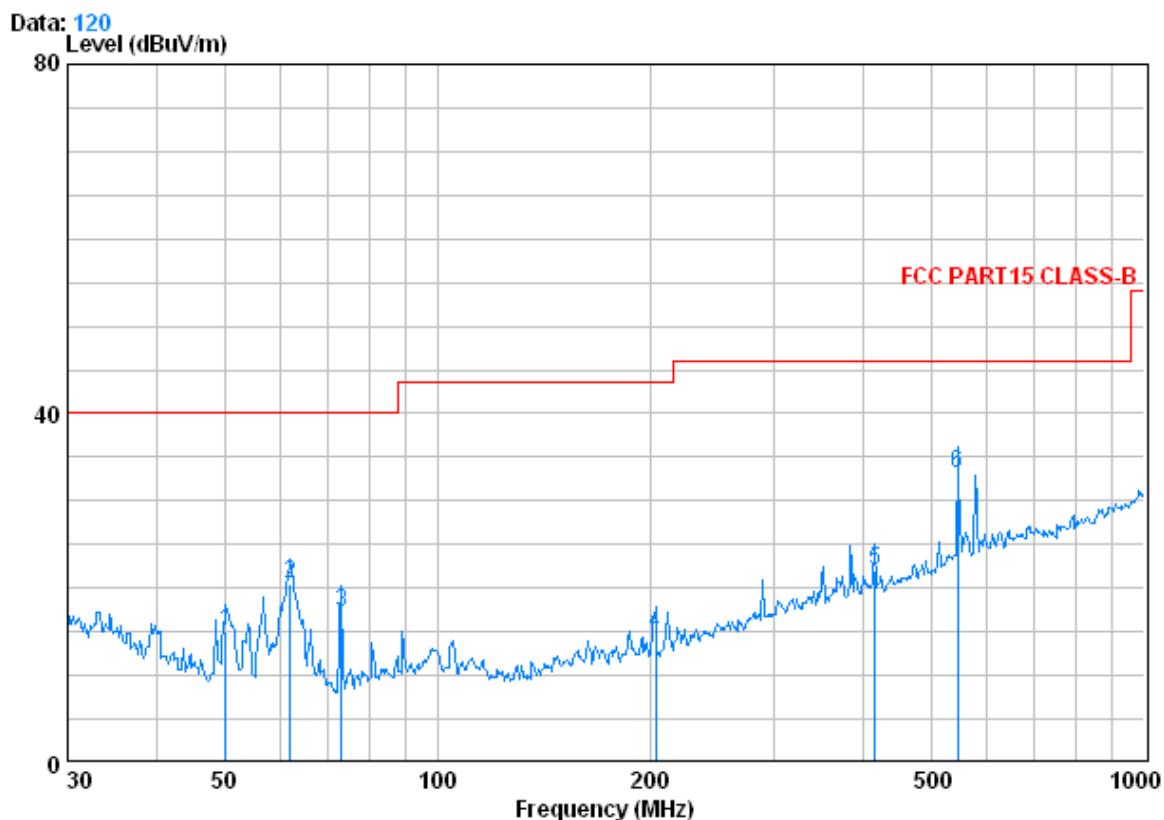
### 30MHz~1GHz

Horizontal:



Freq	Cable	Antenna	Preamp	Read	Limit	Over	Over	
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	33.458	0.60	13.69	27.34	26.47	13.42	40.00	-26.58
2	99.337	1.19	9.07	27.20	26.44	9.50	43.50	-34.00
3	187.355	1.38	10.05	26.74	28.18	12.86	43.50	-30.64
4	369.355	2.12	15.87	26.93	26.07	17.14	46.00	-28.86
5	518.601	2.62	18.34	27.67	27.01	20.30	46.00	-25.70
6	978.110	3.68	24.04	26.40	26.14	27.46	54.00	-26.54

Vertical:



Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level		Limit Level	Line Limit	Over Limit	
				MHz	dB	dB/m	dB	dBuV	dBuV/m
1 0	50.232	0.80	7.98	27.29	33.65	15.14	40.00	40.00	-24.86
2 0	61.995	0.80	7.14	27.26	39.75	20.42	40.00	40.00	-19.58
3 0	73.103	0.90	7.17	27.24	36.47	17.30	40.00	40.00	-22.70
4	203.523	1.42	10.36	26.69	29.73	14.83	43.50	43.50	-28.67
5 0	416.179	2.27	16.36	27.23	30.62	22.02	46.00	46.00	-23.98
6 0	545.183	2.65	18.84	27.63	39.33	33.19	46.00	46.00	-12.81



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### 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
1458.250	2.49	28.04	39.33	46.63	37.83	74.00	-36.17	Vertical
2316.000	2.96	32.36	39.79	46.91	42.44	74.00	-31.56	Vertical
3326.500	3.59	33.27	40.54	49.10	45.42	74.00	-28.58	Vertical
4783.500	4.68	34.73	41.61	70.37	68.17	74.00	-5.83	Vertical
6898.500	5.43	35.90	40.15	49.68	50.86	74.00	-23.14	Vertical
10094.500	6.00	37.82	37.49	45.44	51.77	74.00	-22.23	Vertical
1434.750	2.48	28.01	39.33	46.47	37.63	74.00	-36.37	Horizontal
2327.750	2.96	32.39	39.81	47.03	42.57	74.00	-31.43	Horizontal
4783.500	4.68	34.73	41.61	67.35	65.15	74.00	-8.85	Horizontal
6522.500	5.26	36.28	40.46	49.48	50.56	74.00	-23.44	Horizontal
8931.250	6.16	36.55	38.39	47.44	51.76	74.00	-22.24	Horizontal
11504.500	6.34	38.40	38.07	46.25	52.92	74.00	-21.08	Horizontal

Test mode:	Transmitting		Test channel:		Lowest		Remark:	Average
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
1458.250	2.49	28.04	39.33	35.24	26.44	54.00	-27.56	Vertical
2316.000	2.96	32.36	39.79	35.91	31.44	54.00	-22.56	Vertical
3326.500	3.59	33.27	40.54	37.43	33.75	54.00	-20.25	Vertical
4783.500	4.68	34.73	41.61	51.37	49.17	54.00	-4.83	Vertical
6898.500	5.43	35.90	40.15	38.68	39.86	54.00	-14.14	Vertical
10082.750	5.99	37.80	37.48	35.62	41.93	54.00	-12.07	Vertical
1434.750	2.48	28.01	39.33	31.25	22.41	54.00	-31.59	Horizontal
2327.750	2.96	32.39	39.81	34.15	29.69	54.00	-24.31	Horizontal
4783.500	4.68	34.73	41.61	48.35	46.15	54.00	-7.85	Horizontal
6522.500	5.26	36.28	40.46	38.35	39.43	54.00	-14.57	Horizontal
8931.250	6.16	36.55	38.39	34.44	38.76	54.00	-15.24	Horizontal
11504.500	6.34	38.40	38.07	39.85	46.52	54.00	-7.48	Horizontal



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Test mode:	Transmitting	Test channel:	Middle	Remark:	Peak
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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
1258.500	2.36	27.67	39.25	47.46	38.24	74.00	-35.76	Vertical
2010.500	2.84	31.80	39.57	47.31	42.38	74.00	-31.62	Vertical
3244.250	3.52	33.30	40.48	48.22	44.56	74.00	-29.44	Vertical
4936.250	4.75	34.48	41.72	66.24	63.75	74.00	-10.25	Vertical
7991.250	6.21	36.00	39.20	49.06	52.07	74.00	-21.93	Vertical
10752.500	6.16	38.40	37.76	45.85	52.65	74.00	-21.35	Vertical
1505.250	2.52	28.22	39.36	47.62	39.00	74.00	-35.00	Horizontal
3620.250	3.84	33.34	40.76	48.59	45.01	74.00	-28.99	Horizontal
4936.250	4.75	34.48	41.72	69.56	67.07	74.00	-6.93	Horizontal
6675.250	5.30	36.13	40.33	49.55	50.65	74.00	-23.35	Horizontal
8884.250	6.16	36.51	38.42	47.11	51.36	74.00	-22.64	Horizontal
11892.250	6.44	38.80	38.23	47.15	54.16	74.00	-19.84	Horizontal

Test mode:	Transmitting	Test channel:	Middle	Remark:	Average
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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
1258.500	2.36	27.67	39.25	33.24	24.02	54.00	-29.98	Vertical
2010.500	2.84	31.80	39.57	33.31	28.38	54.00	-25.62	Vertical
3244.250	3.52	33.30	40.48	38.65	34.99	54.00	-19.01	Vertical
4936.250	4.75	34.48	41.72	50.68	48.19	54.00	-5.81	Vertical
7991.250	6.21	36.00	39.20	36.06	39.07	54.00	-14.93	Vertical
10752.500	6.16	38.40	37.76	36.24	43.04	54.00	-10.96	Vertical
1505.250	2.52	28.22	39.36	33.62	25.00	54.00	-29.00	Horizontal
3620.250	3.84	33.34	40.76	37.35	33.77	54.00	-20.23	Horizontal
4936.250	4.75	34.48	41.72	51.26	48.77	54.00	-5.23	Horizontal
6675.250	5.30	36.13	40.33	38.55	39.65	54.00	-14.35	Horizontal
8884.250	6.16	36.51	38.42	36.11	40.36	54.00	-13.64	Horizontal
11892.250	6.44	38.80	38.23	37.42	44.43	54.00	-9.57	Horizontal



## SGS-CSTC Standards Technical Services Ltd.

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Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak
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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
1258.500	2.36	27.67	39.25	47.46	38.24	74.00	-35.76	Vertical
2010.500	2.84	31.80	39.57	47.31	42.38	74.00	-31.62	Vertical
3244.250	3.52	33.30	40.48	48.22	44.56	74.00	-29.44	Vertical
4936.250	4.75	34.48	41.72	66.24	63.75	74.00	-10.25	Vertical
7991.250	6.21	36.00	39.20	49.06	52.07	74.00	-21.93	Vertical
10752.500	6.16	38.40	37.76	45.85	52.65	74.00	-21.35	Vertical
1505.250	2.52	28.22	39.36	47.62	39.00	74.00	-35.00	Horizontal
3620.250	3.84	33.34	40.76	48.59	45.01	74.00	-28.99	Horizontal
4936.250	4.75	34.48	41.72	69.56	67.07	74.00	-6.93	Horizontal
6675.250	5.30	36.13	40.33	49.55	50.65	74.00	-23.35	Horizontal
8884.250	6.16	36.51	38.42	47.11	51.36	74.00	-22.64	Horizontal
11892.250	6.44	38.80	38.23	47.15	54.16	74.00	-19.84	Horizontal

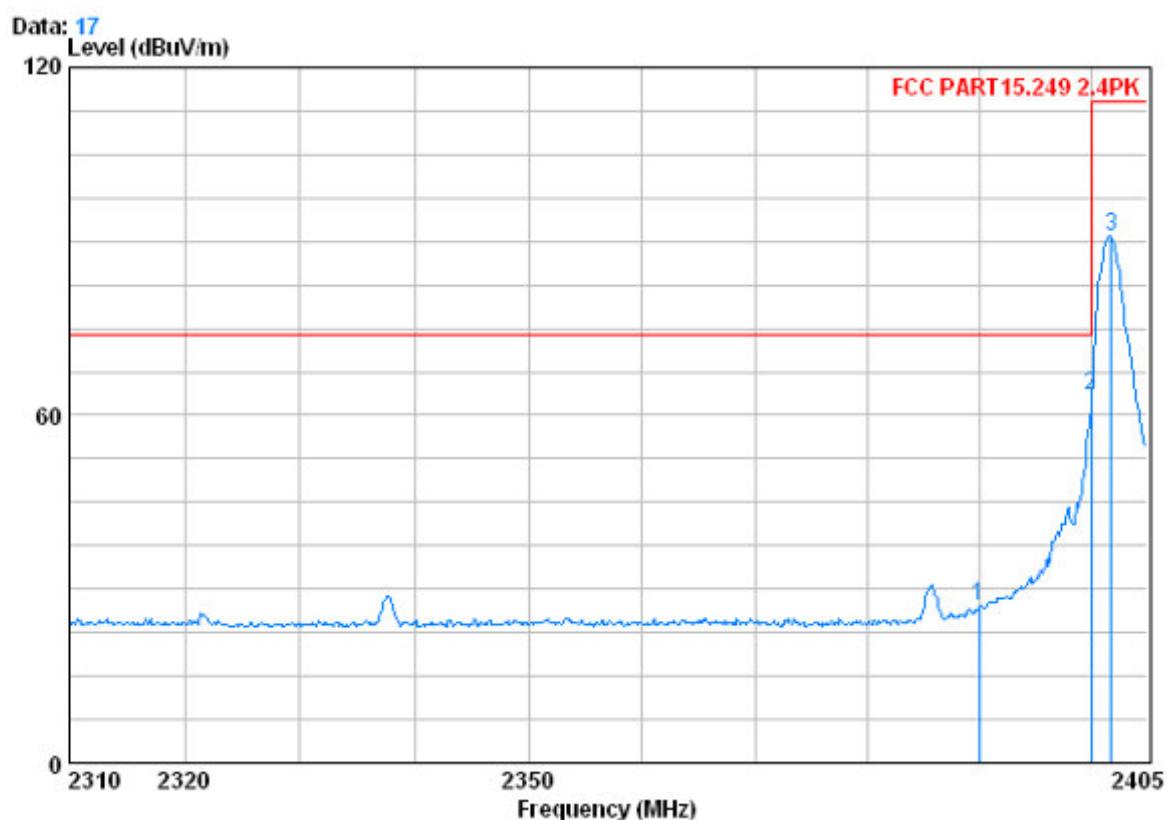
Test mode:	Transmitting	Test channel:	Highest	Remark:	Average
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Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1258.500	2.36	27.67	39.25	33.24	24.02	54.00	-29.98	Vertical
2010.500	2.84	31.80	39.57	33.31	28.38	54.00	-25.62	Vertical
3244.250	3.52	33.30	40.48	38.65	34.99	54.00	-19.01	Vertical
4936.250	4.75	34.48	41.72	50.68	48.19	54.00	-5.81	Vertical
7991.250	6.21	36.00	39.20	36.06	39.07	54.00	-14.93	Vertical
10752.500	6.16	38.40	37.76	36.24	43.04	54.00	-10.96	Vertical
1505.250	2.52	28.22	39.36	33.62	25.00	54.00	-29.00	Horizontal
3620.250	3.84	33.34	40.76	37.35	33.77	54.00	-20.23	Horizontal
4936.250	4.75	34.48	41.72	51.26	48.77	54.00	-5.23	Horizontal
6675.250	5.30	36.13	40.33	38.55	39.65	54.00	-14.35	Horizontal
8884.250	6.16	36.51	38.42	36.11	40.36	54.00	-13.64	Horizontal
11892.250	6.44	38.80	38.23	37.42	44.43	54.00	-9.57	Horizontal

### 5.2.3 Band edge (Radiated Emission)

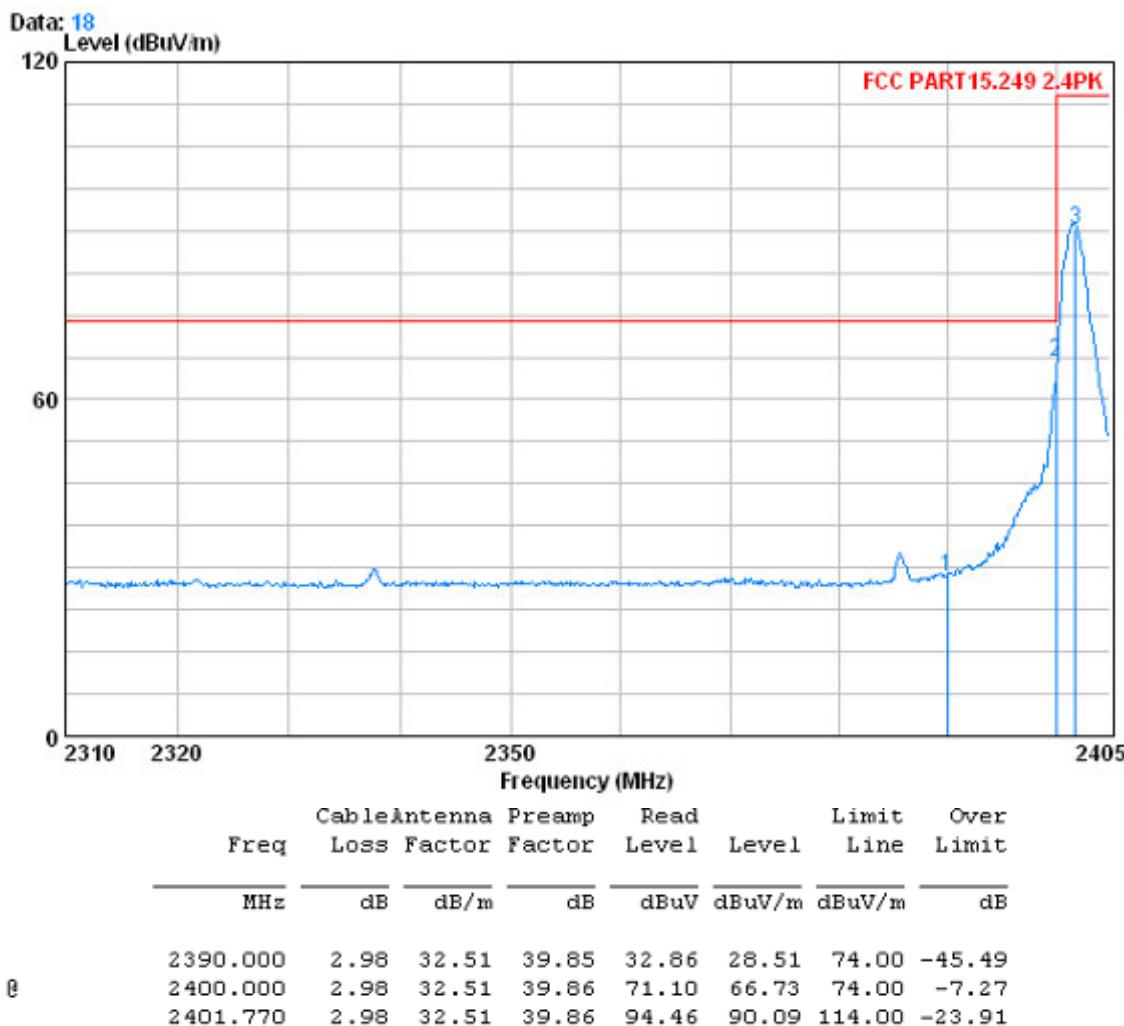
Test mode:	Transmitting	Test channel:	Lowest	Remark:	Peak
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Vertical:



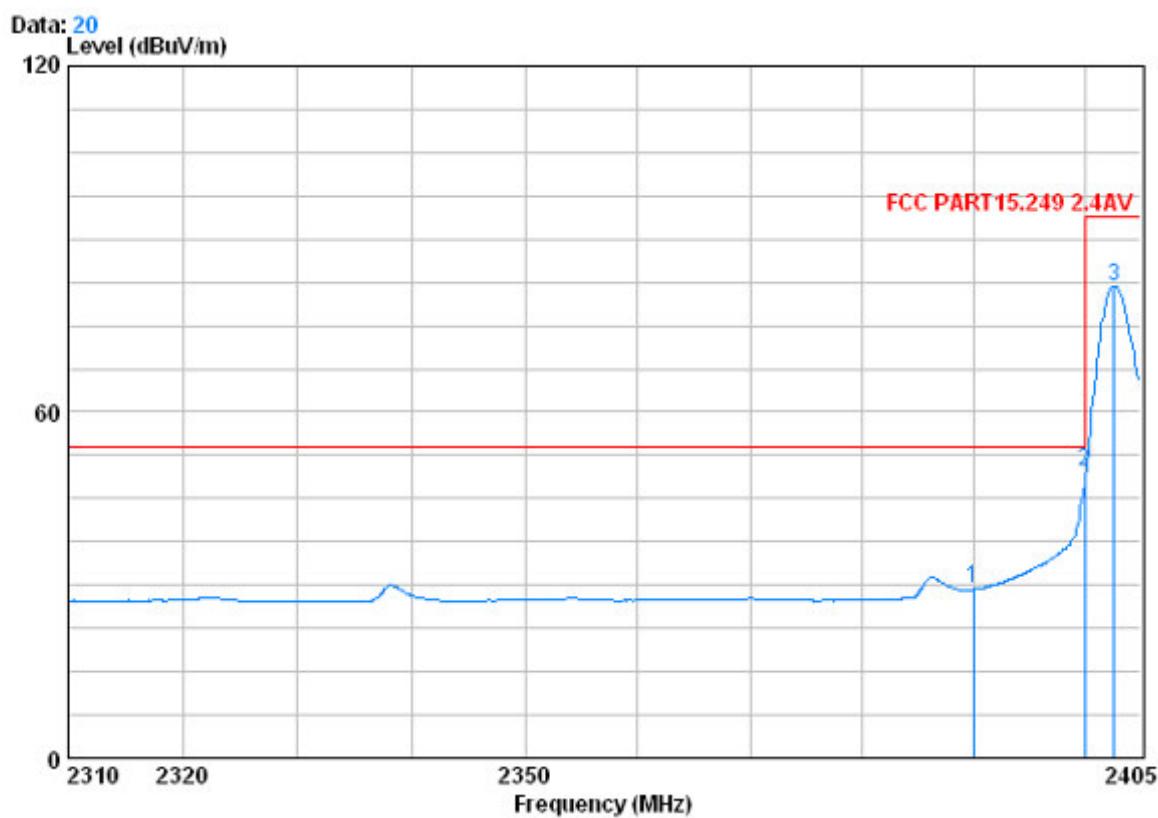
Freq	Cable		Antenna	Preamp	Read	Limit	Over	
	Loss	Factor	Factor	Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	31.52	27.17	74.00	-46.83
2	2400.000	2.98	32.51	39.86	67.77	63.40	74.00	-10.60
3	2401.770	2.98	32.51	39.86	95.14	90.77	114.00	-23.23

Horizontal:



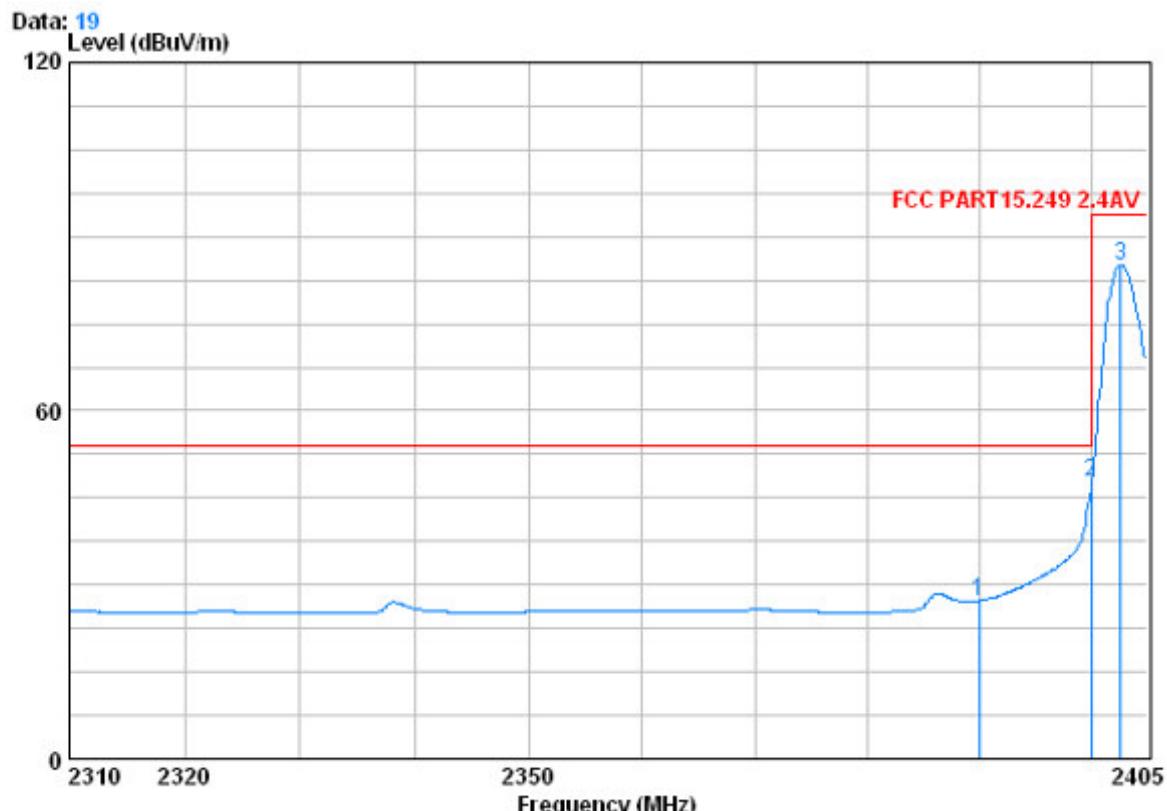
Test mode:	Transmitting	Test channel:	Lowest	Remark:	Avarage
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Vertical:



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	33.67	29.32	54.00	-24.68
2	2400.000	2.98	32.51	39.86	54.06	49.70	54.00	-4.30
3	2402.625	2.98	32.54	39.86	86.14	81.80	94.00	-12.20

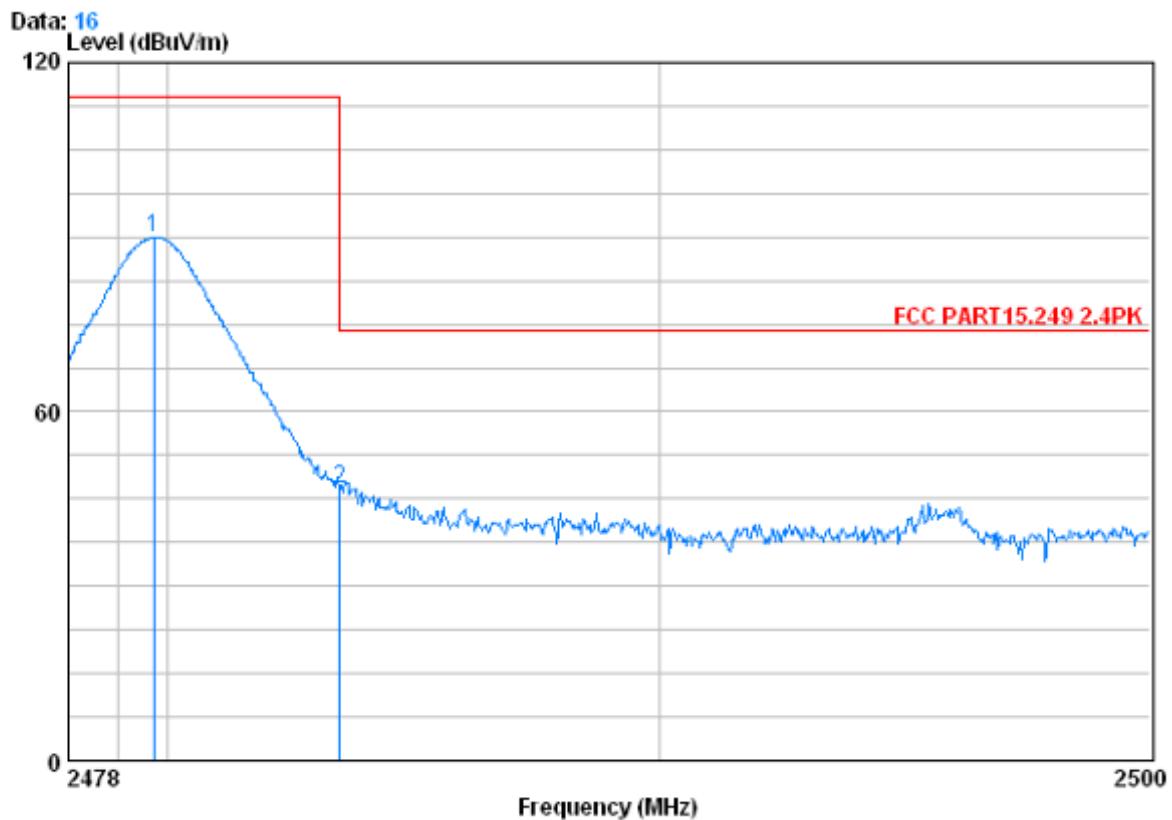
Horizontal:



Freq	Cable Loss	Antenna Factor	Preamp Factor	Read	Limit Line	Over Limit		
				Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	31.63	27.28	54.00	-26.72
2	2400.000	2.98	32.51	39.86	52.15	47.78	54.00	-6.22
3	2402.625	2.98	32.54	39.86	89.41	85.07	94.00	-8.93

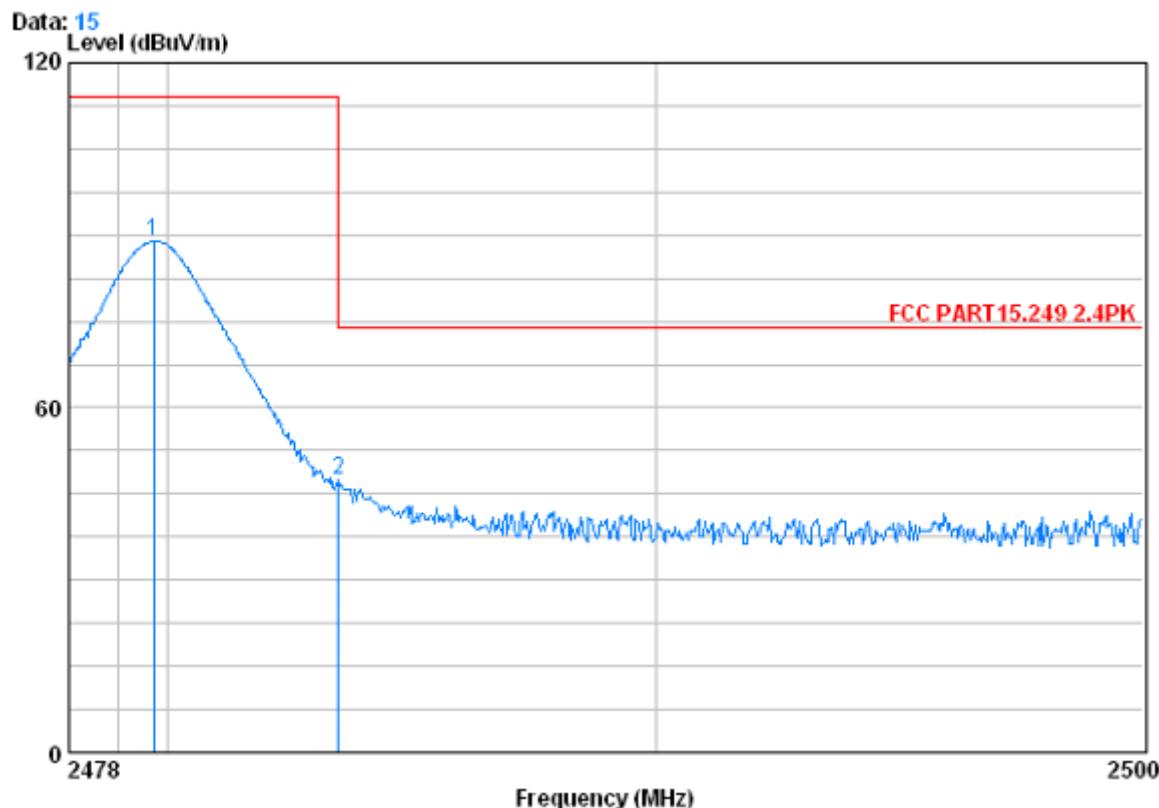
Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak
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Vertical:



Freq	Cable		Antenna	Preamp	Read	Limit	Over	
	Loss	Factor	Factor	Level	Level			
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2479.738	3.03	32.67	39.92	94.19	89.97	114.00	-24.03
2	2483.500	3.03	32.67	39.92	50.87	46.65	74.00	-27.35

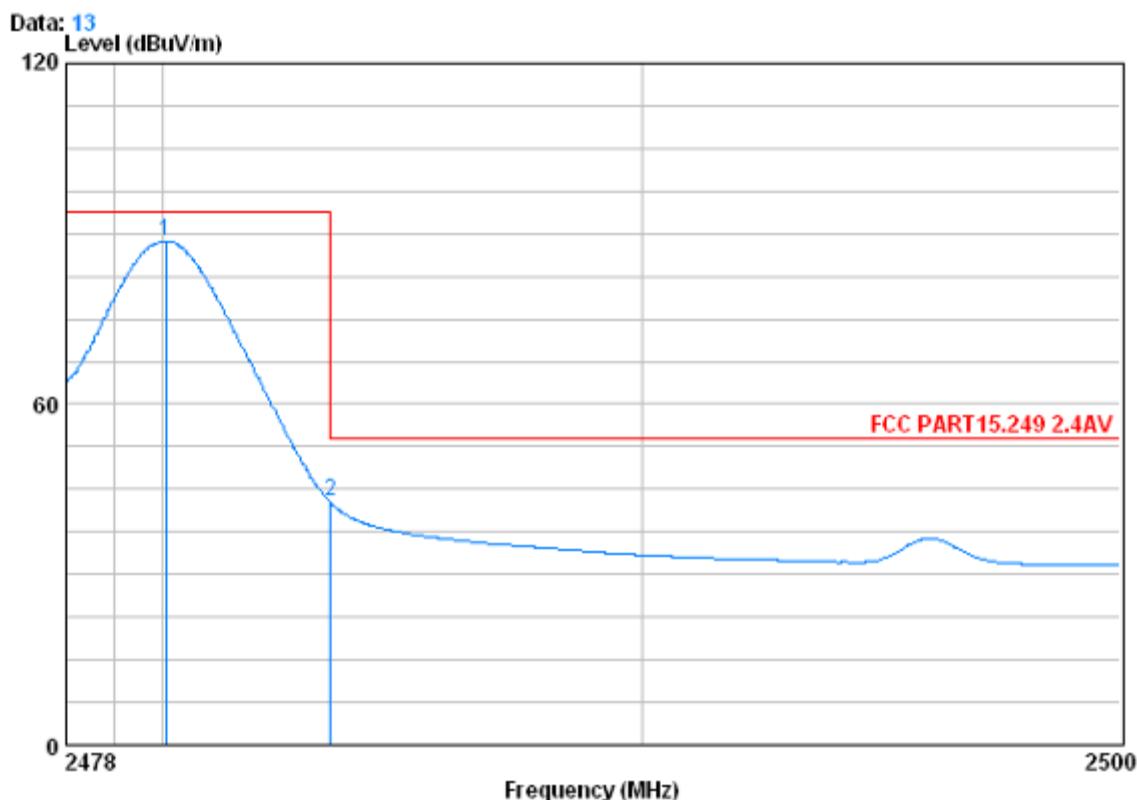
Horizontal:



Freq	Cable	Antenna	Preamp	Read	Limit	Over	Line	Limit
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2479.738	3.03	32.67	39.92	93.18	88.96	114.00	-25.04
2	2483.500	3.03	32.67	39.92	51.61	47.39	74.00	-26.61

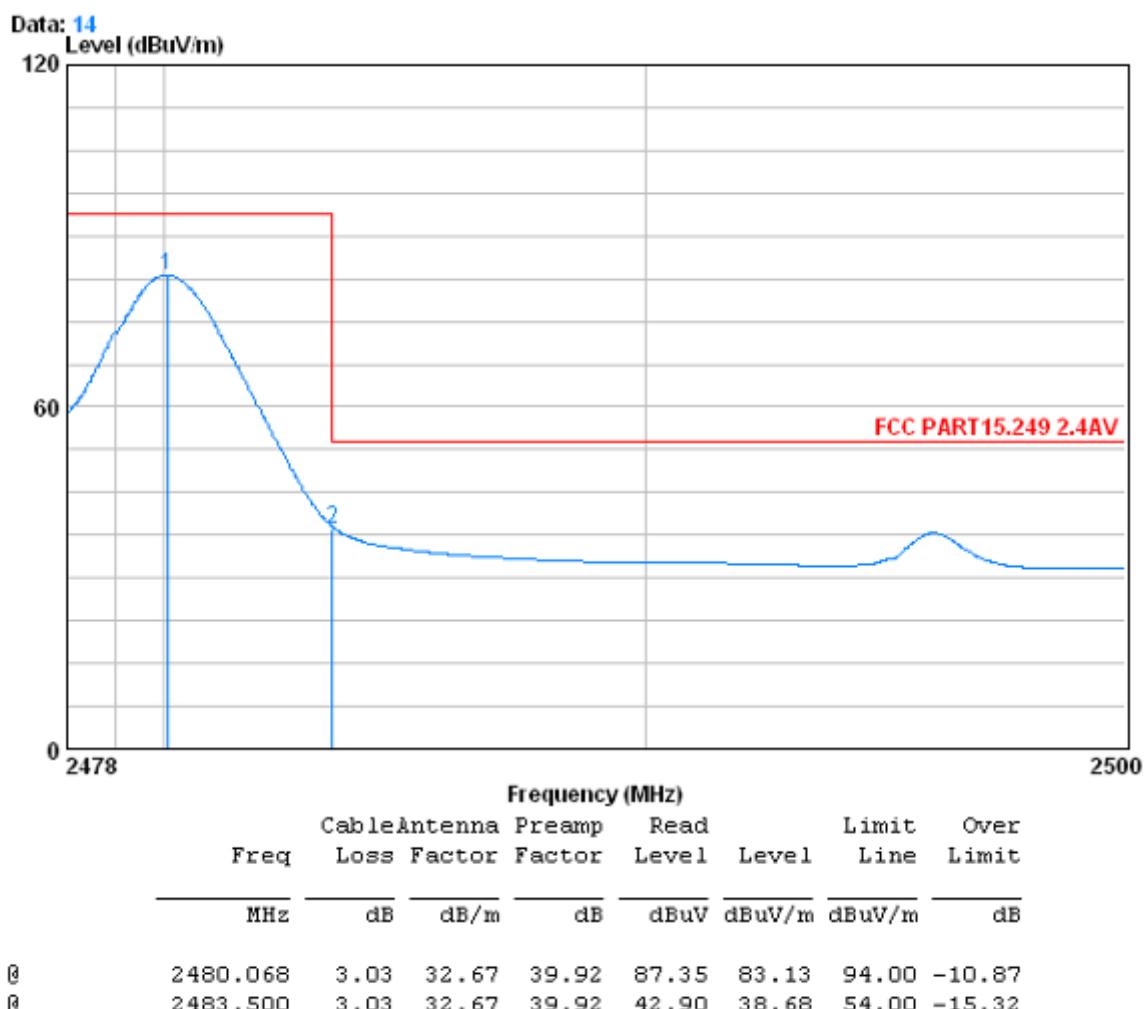
Test mode:	Transmitting	Test channel:	Highest	Remark:	Avarage
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Vertical:



Freq	Cable		Antenna		Preamp		Read	Limit	Over
	Loss	Factor	Factor	Factor	Level	Level	Line		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 0	2480.068	3.03	32.67	39.92	92.95	88.73	94.00	-5.27	
2 0	2483.500	3.03	32.67	39.92	46.98	42.76	54.00	-11.24	

Horizontal:



### 5.3 20dB Bandwidth

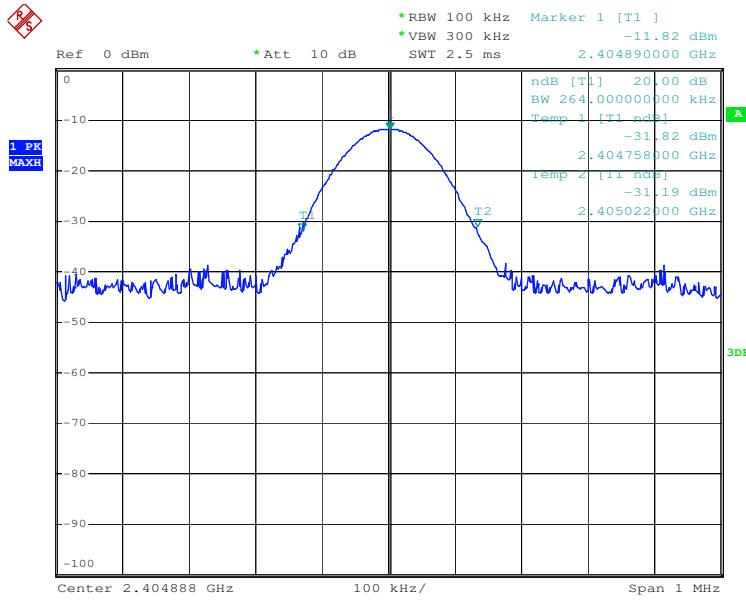
Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10: 2009
Receiver setup:	RBW=100kHz, VBW=300kHz, detector: Peak
Limit:	Operation Frequency range 2400MHz-2483.5MHz
Test Procedure:	<ol style="list-style-type: none"> <li>1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.</li> <li>2. Set the EUT to proper test channel.</li> <li>3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points.</li> <li>4. Read 20dB bandwidth.</li> </ol>
Test setup:	<p>The diagram illustrates the test setup. A 'Spectrum Analyzer' is connected to an 'E.U.T.' (Equipment Under Test) via a cable. The entire setup is positioned on a 'Non-Conducted Table', which is situated above a 'Ground Reference Plane'.</p>
Test Instruments:	Refer to section 4.7 for details.
Test mode:	Transmitting mode
Test results:	Pass

#### Measurement Data

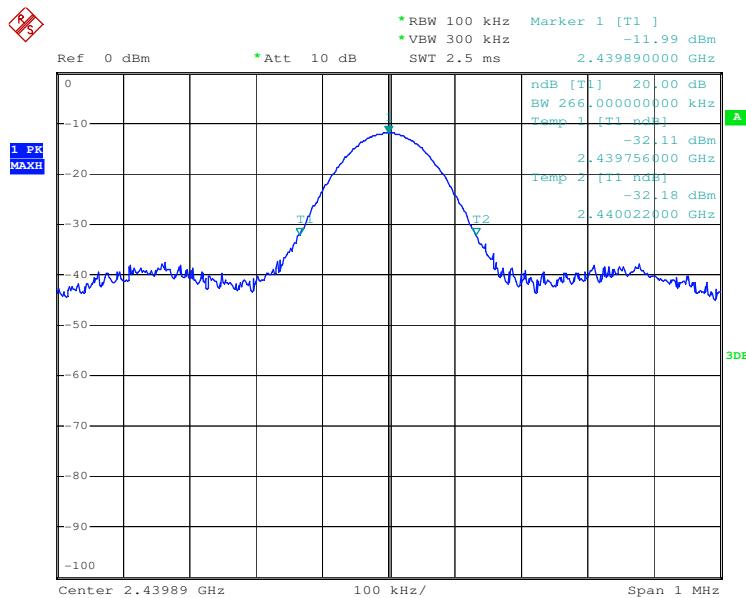
Test channel	20dB bandwidth (kHz)	Results
Lowest	264	Pass
Middle	266	Pass
Highest	294	Pass

**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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