



## SGS-CSTC Standards Technical Services Ltd.

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Report No.: SZEM150500243201  
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# FCC REPORT

**Application No:** SZEM1505002432CR  
**Applicant:** LONGSYS ELECTRONICS (HK) CO., LTD  
**Manufacturer/ Factory:** Shenzhen Longsys electronics co Ltd  
**Product Name:** Wifi Module  
**Model No.(EUT):** WK1230  
**FCC ID:** 2ADPDWK1230  
**Standards:** 47 CFR Part 15, Subpart C (2014)  
**Date of Receipt:** 2015-05-08  
**Date of Test:** 2015-05-15 2015-05-28  
**Date of Issue:** 2015-06-08

<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

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2015-06-08		Original

Authorized for issue by:				
Tested By		 (Eric Fu) /Project Engineer		2015-05-28 Date
Prepared By		 (Jade Chen) /Clerk		2015-06-08 Date
Checked By		 (Owen Zhou) /Reviewer		2015-06-08 Date



### 3 Test Summary

Test Item	Test Requirement	Test method	Result
<b>Antenna Requirement</b>	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2009	PASS
<b>AC Power Line Conducted Emission</b>	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2009	PASS
<b>Conducted Peak Output Power</b>	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	KDB558074 D01 v03r02	PASS
<b>6dB Occupied Bandwidth</b>	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	KDB558074 D01 v03r02	PASS
<b>Power Spectral Density</b>	47 CFR Part 15, Subpart C Section 15.247 (e)	KDB558074 D01 v03r02	PASS
<b>Band-edge for RF Conducted Emissions</b>	47 CFR Part 15, Subpart C Section 15.247(d)	KDB558074 D01 v03r02	PASS
<b>RF Conducted Spurious Emissions</b>	47 CFR Part 15, Subpart C Section 15.247(d)	KDB558074 D01 v03r02	PASS
<b>Radiated Spurious Emissions</b>	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2009	PASS
<b>Restricted bands around fundamental frequency (Radiated Emission)</b>	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2009	PASS



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## 5 General Information

### 5.1 Client Information

Applicant:	LONGSYS ELECTRONICS (HK) CO., LTD
Address of Applicant:	10/F china aerospace ctr 143 hoi bun rd kwun tong kln hong kong
Manufacturer:	Shenzhen Longsys electronics co Ltd
Address of Manufacturer:	8/F.1 Building, Financial Base, No. 8, Kefa Road, High-Tech Park, Shenzhen, China
Factory:	Shenzhen Longsys electronics co Ltd
Address of Factory:	8/F.1 Building, Financial Base, No. 8, Kefa Road, High-Tech Park, Shenzhen, China

### 5.2 General Description of EUT

Product Name:	Wifi Module
Model No.:	WK1230
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Sample Type:	Mobile production
Test Software of EUT:	Artgui.exe
Antenna Type and Gain:	Type: Integral Gain: 3dBi
Power Supply:	DC 3.3V



Operation Frequency each of channel(802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		
Operation Frequency each of channel(802.11n HT40)							
Channel		Frequency		Channel		Frequency	
1		2422MHz		4		2437MHz	
2		2427MHz		5		2442MHz	
3		2432MHz		6		2447MHz	

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:

For 802.11b/g/n (HT20):

Channel	Frequency
The Lowest channel	2412MHz
The Middle channel	2437MHz
The Highest channel	2462MHz

For 802.11n (HT40):

Channel	Frequency
The Lowest channel	2422MHz
The Middle channel	2437MHz
The Highest channel	2452MHz





### 5.3 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1005 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

### 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 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.



## 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.

- **VCCI**

The 10m 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.: 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 of SGS-CSTC Standards Technical Services Co., Ltd. have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1 & 4620C-2.

## 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**

<b>Conducted Emission</b>					
<b>Item</b>	<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Inventory No.</b>	<b>Cal.Due date (yyyy-mm-dd)</b>
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2016-05-13
2	LISN	Rohde & Schwarz	ENV216	SEL0152	2015-10-24
3	LISN	ETS-LINDGREN	3816/2	SEL0021	2016-05-13
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	SEL0162	2015-08-30
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	SEL0163	2015-08-30
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	SEL0164	2015-08-30
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2016-05-13
8	Coaxial Cable	SGS	N/A	SEL0025	2016-05-13
9	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24
10	Humidity/ Temperature Indicator	Shanghai Qixiang	ZJ1-2B	SEL0103	2015-10-24
11	Barometer	Chang Chun	DYM3	SEL0088	2016-05-13



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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	2016-05-13
2	EMI Test Receiver	Agilent Technologies	N9038A	SEL0312	2015-09-16
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2015-10-24
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2015-10-24
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2015-10-24
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2016-05-13
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2015-10-24
9	Coaxial cable	SGS	N/A	SEL0027	2016-05-13
10	Coaxial cable	SGS	N/A	SEL0189	2016-05-13
11	Coaxial cable	SGS	N/A	SEL0121	2016-05-13
12	Coaxial cable	SGS	N/A	SEL0178	2016-05-13
13	Band filter	Amindeon	82346	SEL0094	2016-05-13
14	Barometer	Chang Chun	DYM3	SEL0088	2016-05-13
15	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24
16	Humidity/ Temperature Indicator	Shanghai Qixiang	ZJ1-2B	SEL0103	2015-10-24
17	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2016-05-13
18	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2015-10-24
19	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2016-05-13

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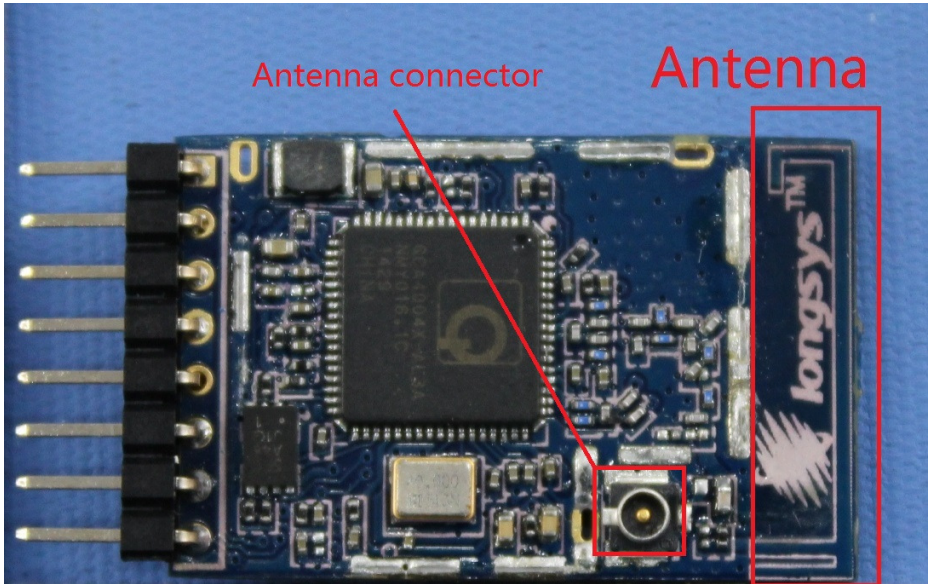
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RF connected test					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2015-10-24
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2015-10-24
4	Coaxial cable	SGS	N/A	SEL0178	2016-05-13
5	Coaxial cable	SGS	N/A	SEL0179	2016-05-13
6	Barometer	ChangChun	DYM3	SEL0088	2016-05-13
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2016-04-25
8	Band filter	amideon	82346	SEL0094	2016-05-13
9	POWER METER	R & S	NRVS	SEL0144	2015-10-24
10	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2016-04-25
11	Power Divider(splitter)	Agilent Technologies	11636B	SEL0130	2015-10-24

Note: The calibration interval is one year, all the instruments are valid.

## 6 Test results and Measurement Data

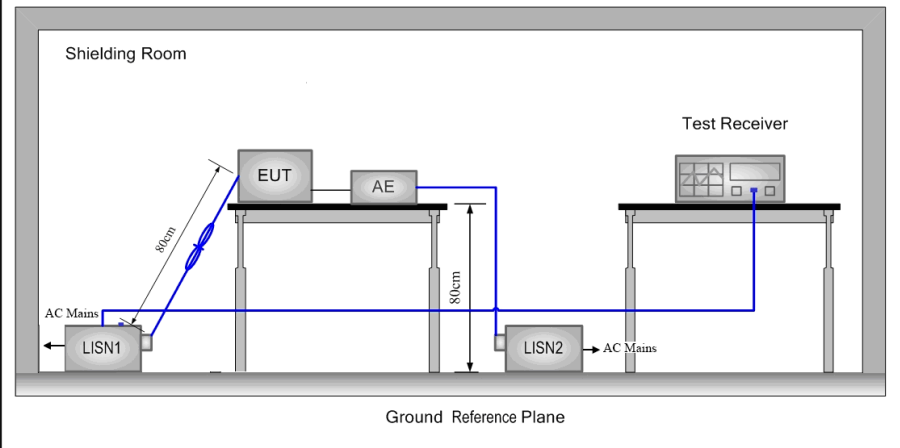
### 6.1 Antenna Requirement

<b>Standard requirement:</b>	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>
<b>EUT Antenna:</b>	 <p>The PCB antenna are integrated on the main PCB and no consideration of replacement. The best case gain of the PCB antenna is 3dBi. ( The antenna connector is design for test used, not for external antenna)</p>



## 6.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2009		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	<ol style="list-style-type: none"><li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li><li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a <math>50\Omega/50\mu\text{H} + 5\Omega</math> linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</li><li>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</li><li>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</li><li>5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.</li></ol>		

<p>Test Setup:</p>	 <p>The diagram illustrates the test setup within a Shielding Room. The Equipment Under Test (EUT) and Antenna (AE) are positioned on a table. The Test Receiver is on a separate table. Two LISNs (LISN1 and LISN2) are connected to the AC Mains. A Ground Reference Plane is established at the bottom. Dimensions of 80cm are indicated for the height of the equipment and the distance between the LISNs.</p>
<p>Exploratory Test Mode:</p>	<p>Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Transmitting mode.</p>
<p>Final Test Mode:</p>	<p>Through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case.</p> <p>Only the worst case is recorded in the report.</p>
<p>Instruments Used:</p>	<p>Refer to section 5.10 for details</p>
<p>Test Results:</p>	<p>Pass</p>

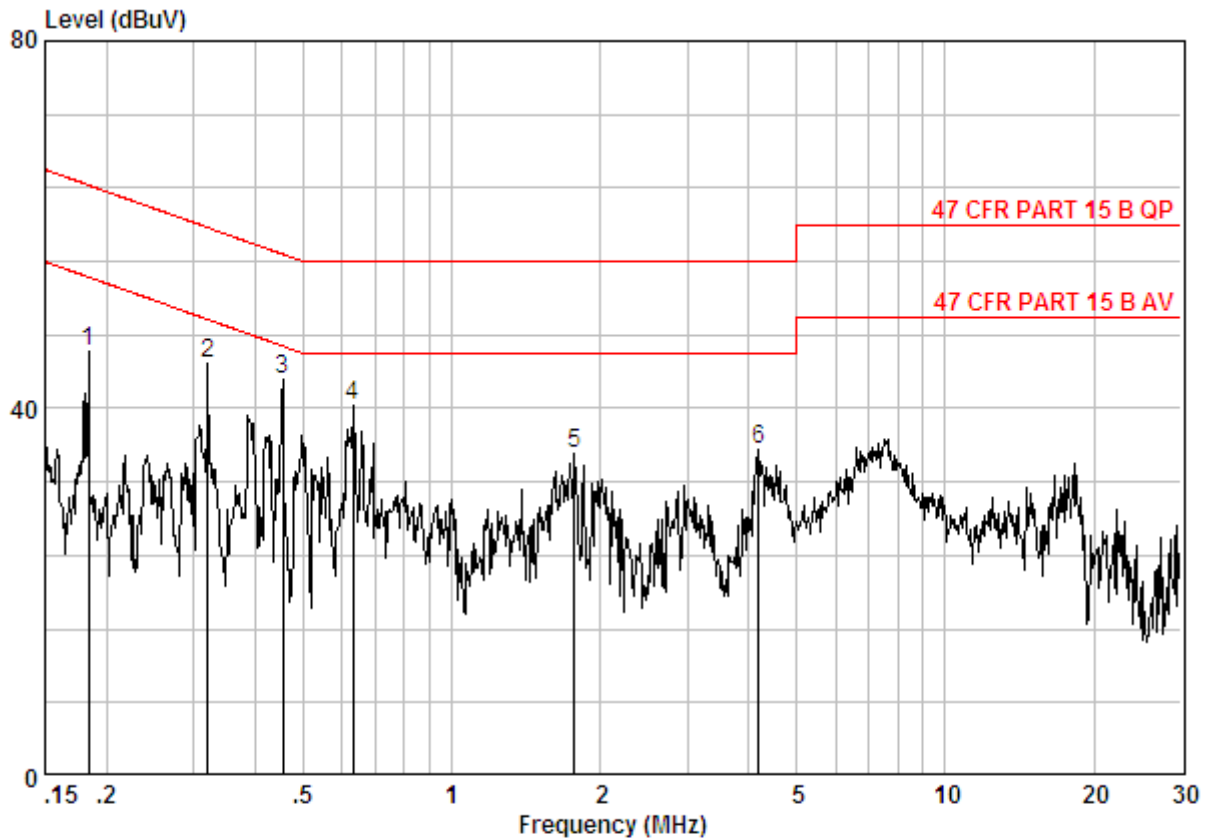


### Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live Line:



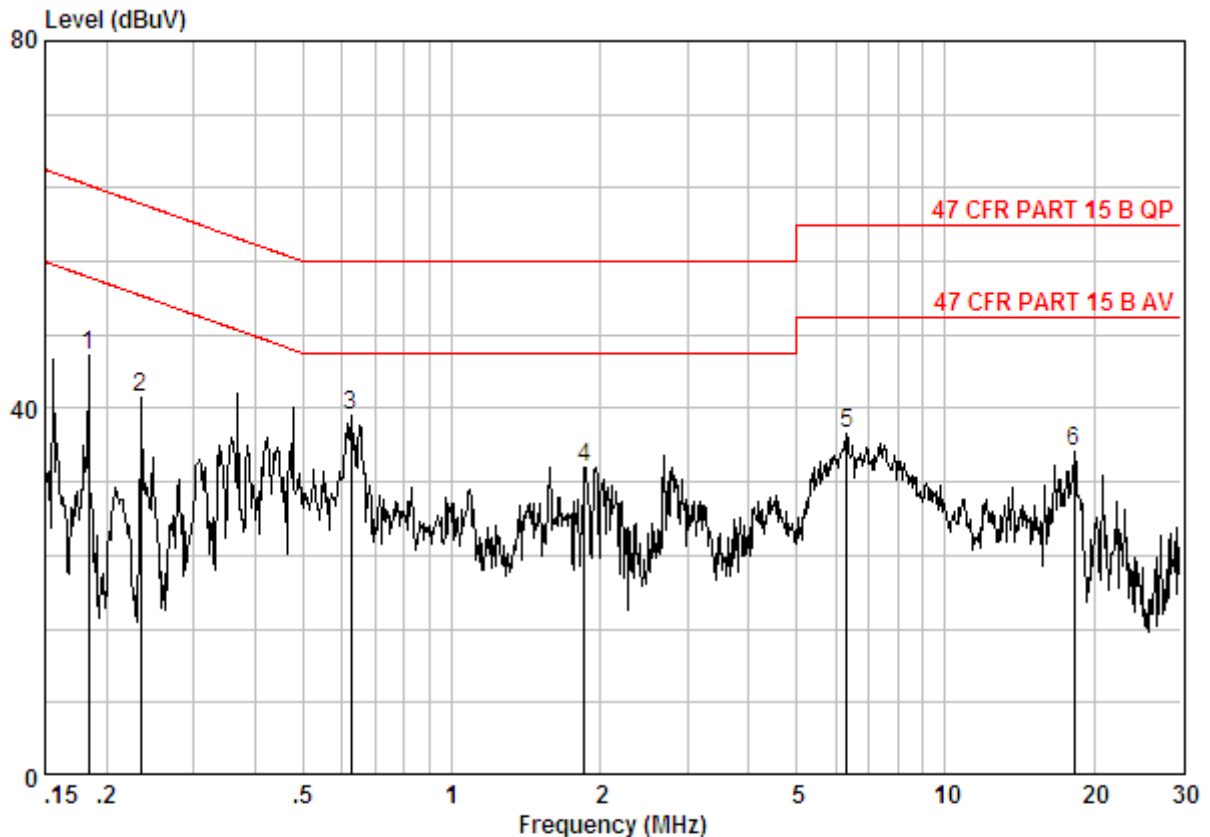
Site : Shielding Room  
Condition : 47 CFR PART 15 B AV CE LINE  
Job No. : 2432CR

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.18346	0.02	9.83	36.42	46.27	54.33	-8.06	Peak
2 @	0.31999	0.01	9.85	35.09	44.95	49.71	-4.76	Peak
3 @	0.45395	0.01	9.86	33.37	43.23	46.80	-3.57	Peak
4	0.63048	0.02	9.87	30.40	40.29	46.00	-5.71	Peak
5	1.772	0.02	9.94	25.07	35.03	46.00	-10.97	Peak
6	4.180	0.01	10.09	25.33	35.44	46.00	-10.56	Peak





Neutral Line:



Site : Shielding Room  
Condition : 47 CFR PART 15 B AV CE NEUTRAL  
Job No. : 2432CR

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.18346	0.02	9.83	36.00	45.85	54.33	-8.48	Peak
2	0.23409	0.02	9.86	31.37	41.24	52.30	-11.06	Peak
3	0.62383	0.02	9.93	29.34	39.29	46.00	-6.71	Peak
4	1.858	0.02	10.11	23.50	33.63	46.00	-12.37	Peak
5	6.319	0.01	10.13	27.15	37.29	50.00	-12.71	Peak
6	18.232	0.02	10.33	25.06	35.41	50.00	-14.59	Peak

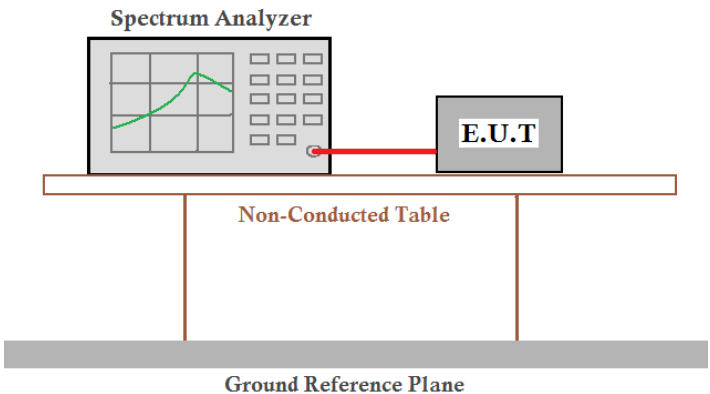
Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.





### 6.3 Conducted Peak Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	KDB558074 D01 v03r02
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Test Instruments:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	30dBm
Test Results:	Pass



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Pre-scan under all rate at lowest channel 1								
Mode	802.11b							
Data Rate	1Mbps	2Mbps	5.5Mbps	11Mbps				
Power (dBm)	20.06	20.01	19.78	18.96				
Mode	802.11g							
Data Rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Power (dBm)	22.62	22.48	22.22	22.01	21.85	21.60	21.52	20.88
Mode	802.11n(HT20)							
Data Rate	6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
Power (dBm)	20.09	19.88	19.65	19.34	19.12	18.89	18.60	17.98
Mode	802.11n(HT40)							
Data Rate	13.5Mbps	27Mbps	40.5Mbps	54Mbps	81Mbps	108Mbps	121.5Mbps	135Mbps
Power (dBm)	20.35	20.12	19.89	19.56	19.33	19.12	18.87	18.01
Through Pre-scan, 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40).								

**Measurement Data**

802.11b mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	20.06	30.00	Pass
Middle	20.18	30.00	Pass
Highest	20.81	30.00	Pass
802.11g mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	22.62	30.00	Pass
Middle	22.95	30.00	Pass
Highest	23.21	30.00	Pass
802.11n(HT20)mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	20.09	30.00	Pass
Middle	20.91	30.00	Pass
Highest	21.23	30.00	Pass
802.11n(HT40)mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	20.35	30.00	Pass
Middle	21.25	30.00	Pass
Highest	21.04	30.00	Pass



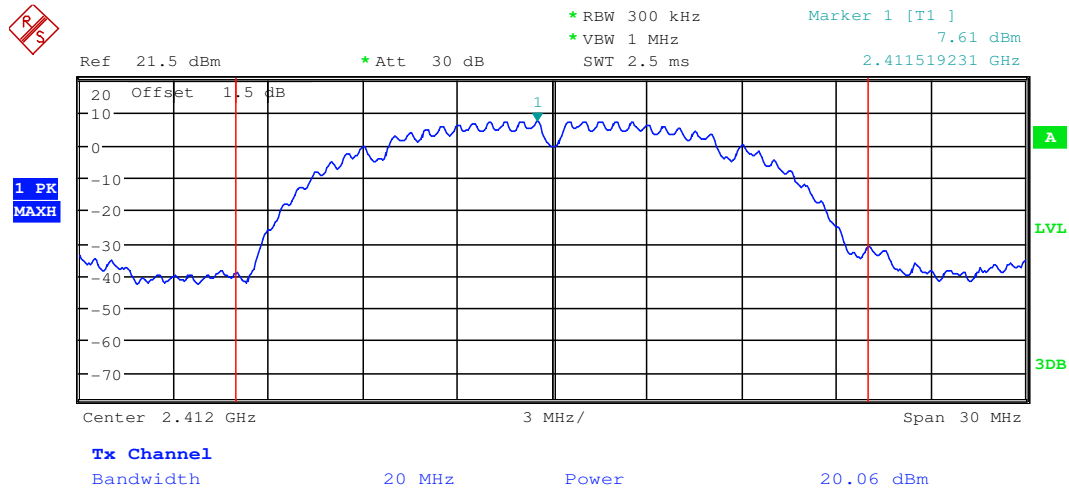
# SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEM150500243201

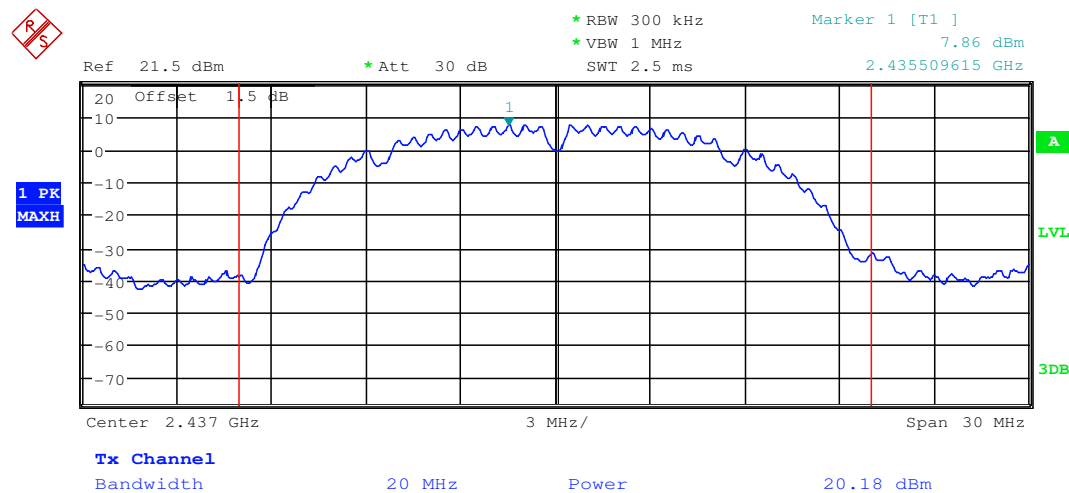
Page: 20 of 125

Test plot as follows:

Test mode:	802.11b	Test channel:	Lowest
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Test mode:	802.11b	Test channel:	Middle
------------	---------	---------------	--------



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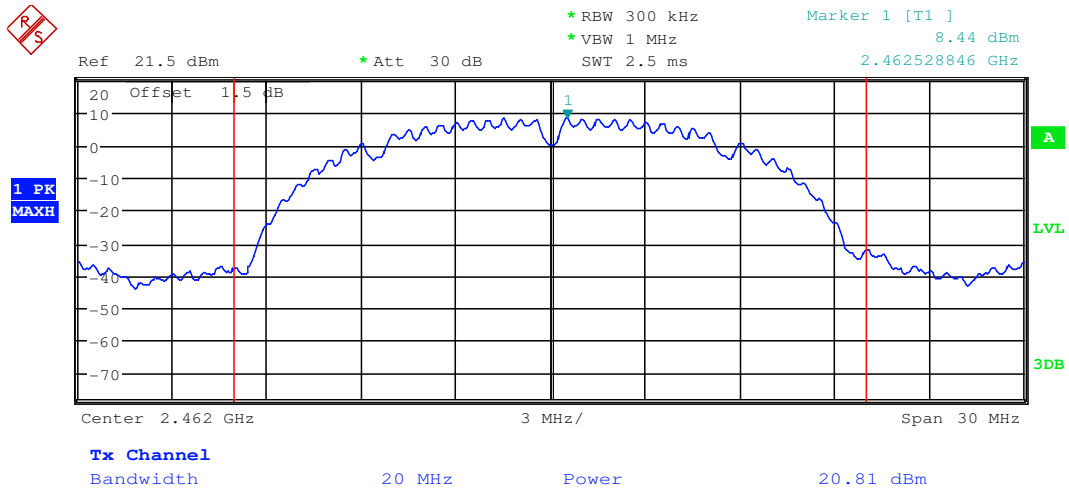


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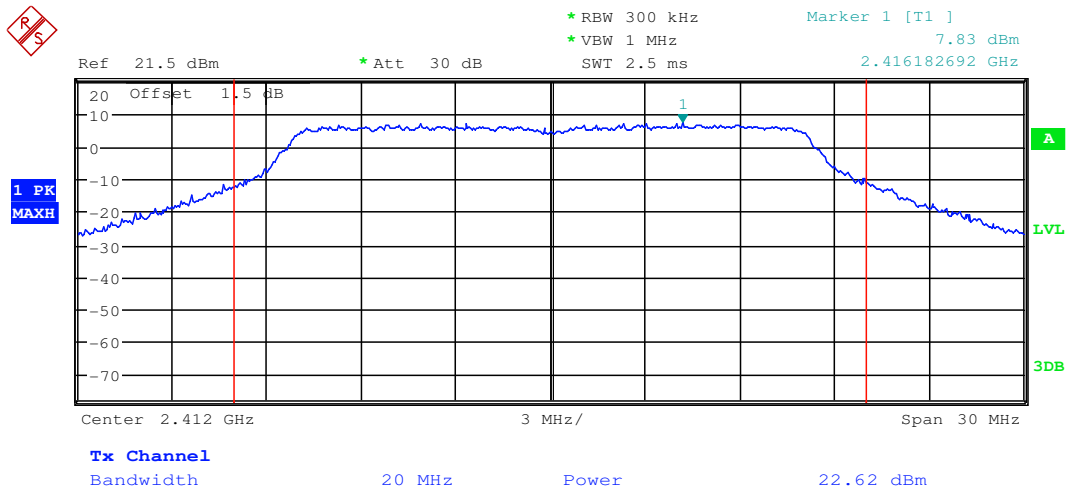
Report No.: SZEM150500243201

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Test mode:	802.11b	Test channel:	Highest
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Test mode:	802.11g	Test channel:	Lowest
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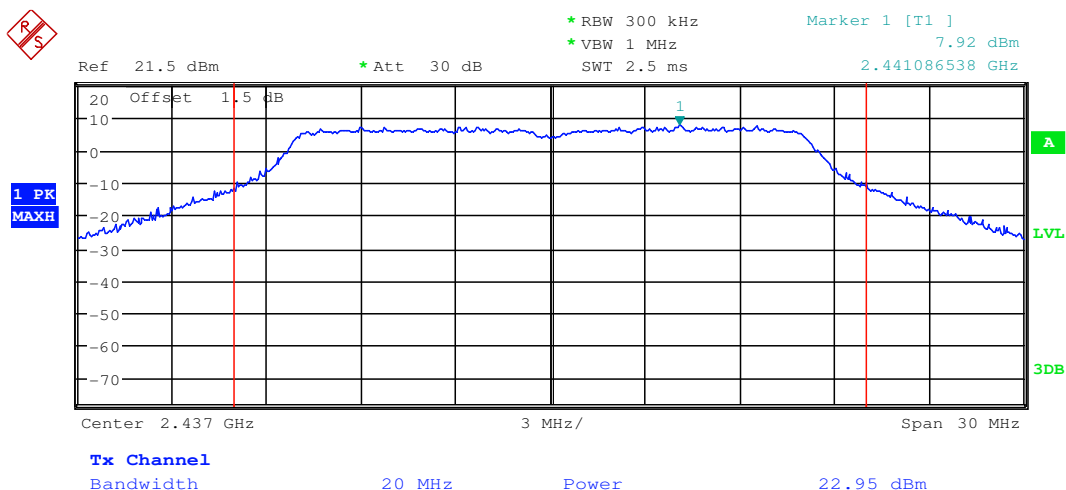


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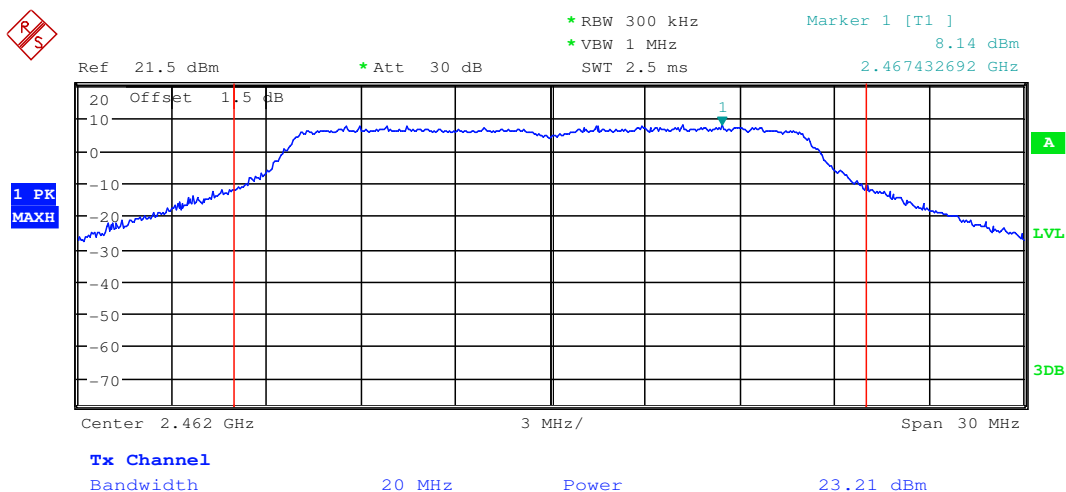
Report No.: SZEM150500243201

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Test mode:	802.11g	Test channel:	Middle
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Test mode:	802.11g	Test channel:	Highest
------------	---------	---------------	---------



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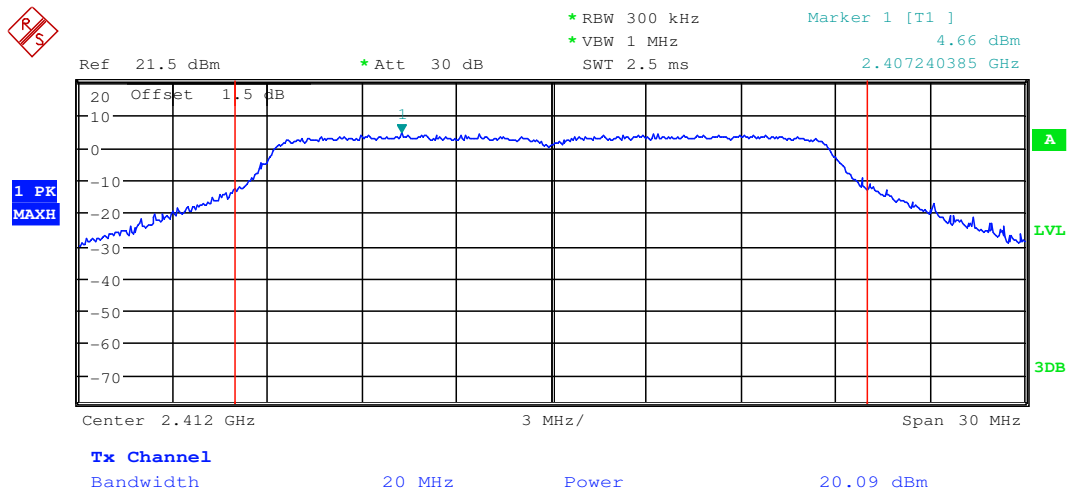


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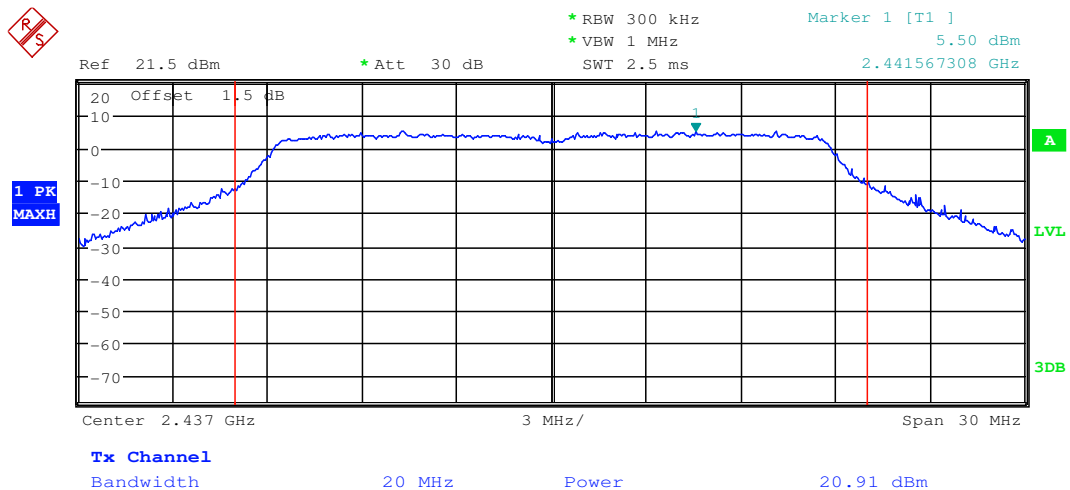
Report No.: SZEM150500243201

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Test mode:	802.11n(HT20)	Test channel:	Lowest
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Test mode:	802.11n(HT20)	Test channel:	Middle
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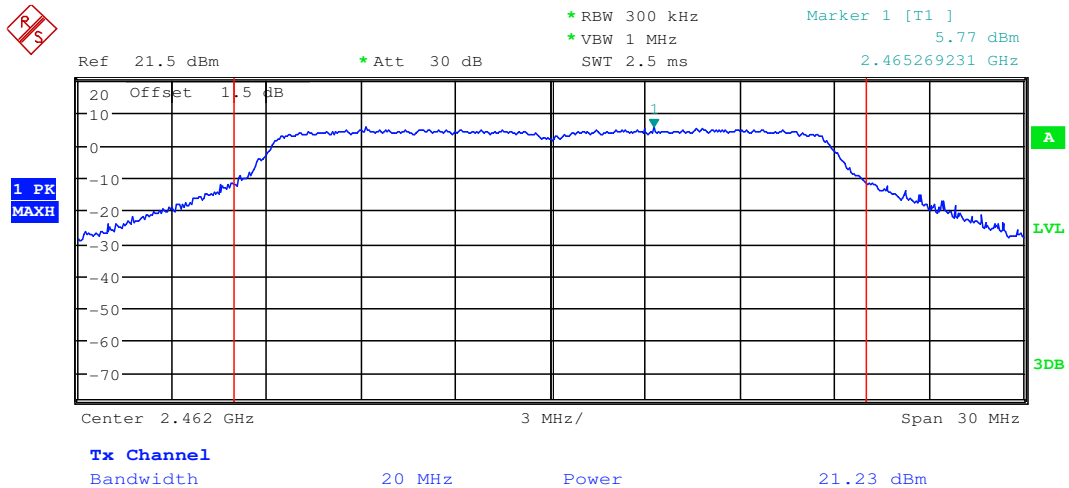


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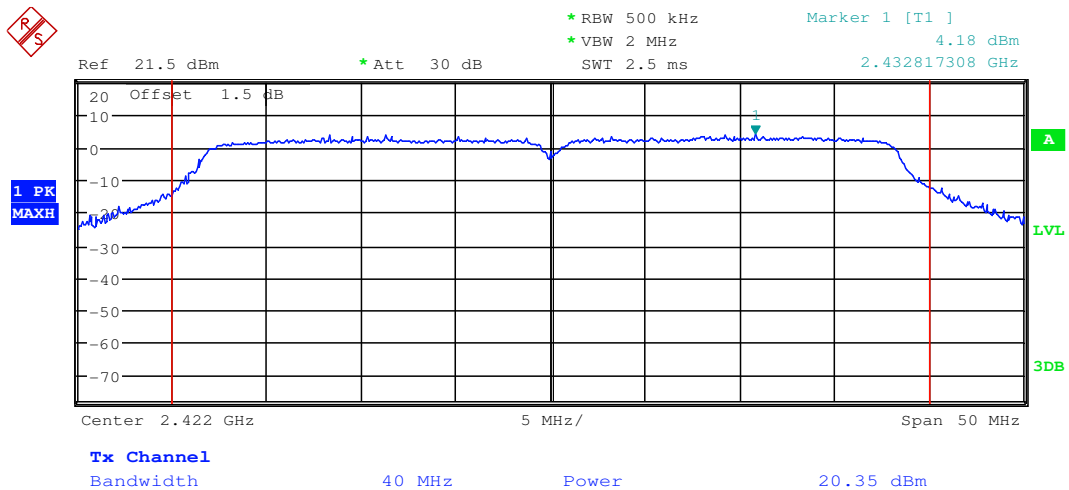
Report No.: SZEM150500243201

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Test mode:	802.11n(HT20)	Test channel:	Highest
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Test mode:	802.11n(HT40)	Test channel:	Lowest
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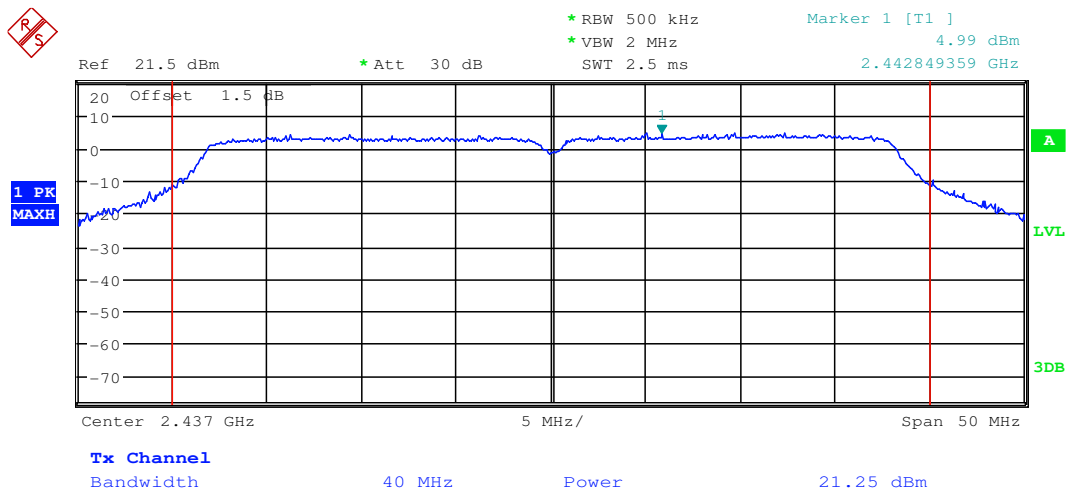


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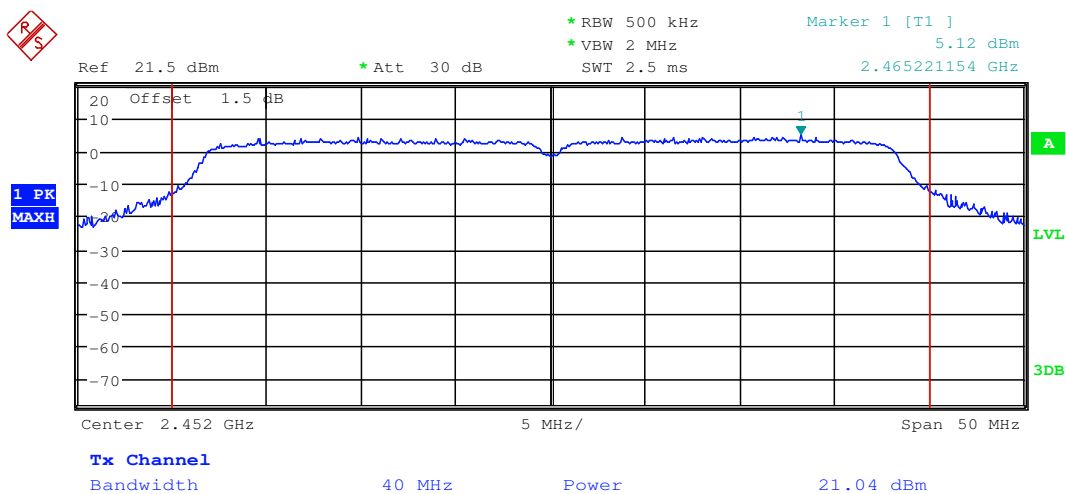




Test mode:	802.11n(HT40)	Test channel:	Middle
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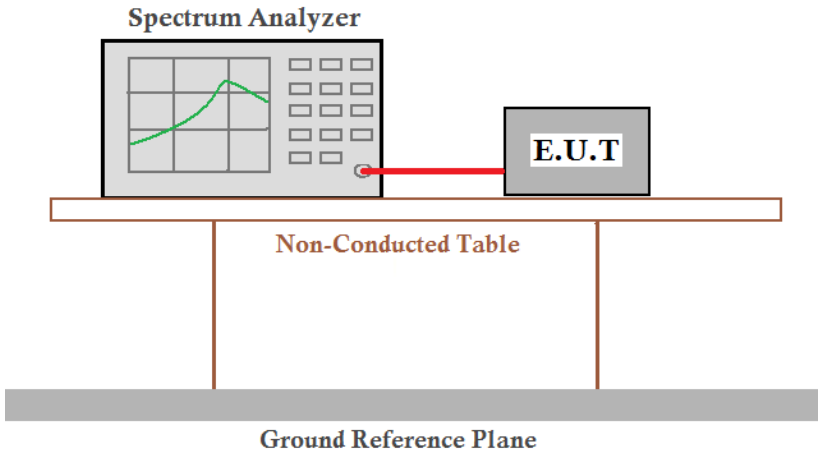


Test mode:	802.11n(HT40)	Test channel:	Highest
------------	---------------	---------------	---------



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## 6.4 6dB Occupy Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	KDB558074 D01 v03r02
Test Setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two vertical legs. Below the table is a Ground Reference Plane.</p>
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	$\geq 500$ kHz
Test Results:	Pass



**Measurement Data**

802.11b mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	10.192	≥500	Pass
Middle	10.192	≥500	Pass
Highest	10.192	≥500	Pass
802.11g mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	16.442	≥500	Pass
Middle	16.442	≥500	Pass
Highest	16.442	≥500	Pass
802.11n(HT20) mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	17.596	≥500	Pass
Middle	17.692	≥500	Pass
Highest	17.692	≥500	Pass
802.11n(HT40)mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	36.138	≥500	Pass
Middle	36.538	≥500	Pass
Highest	36.298	≥500	Pass



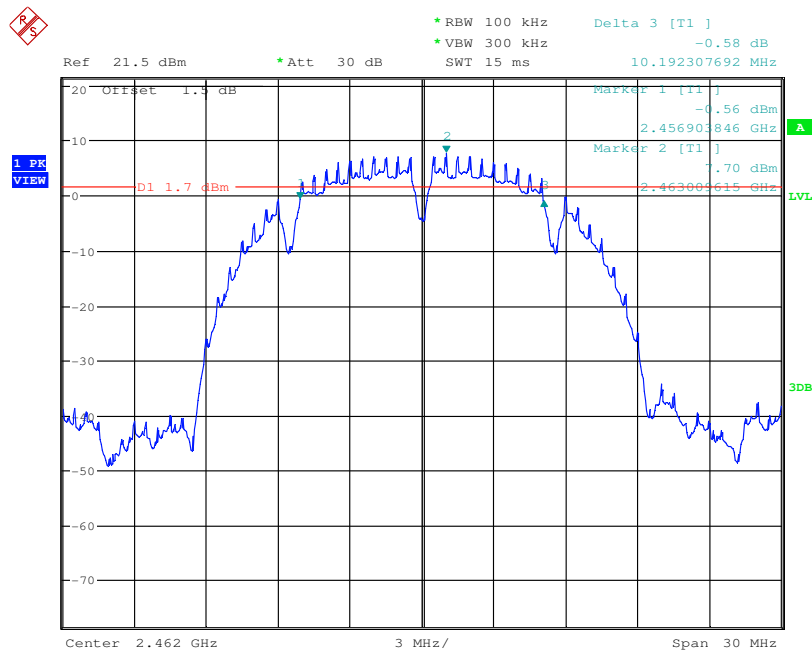


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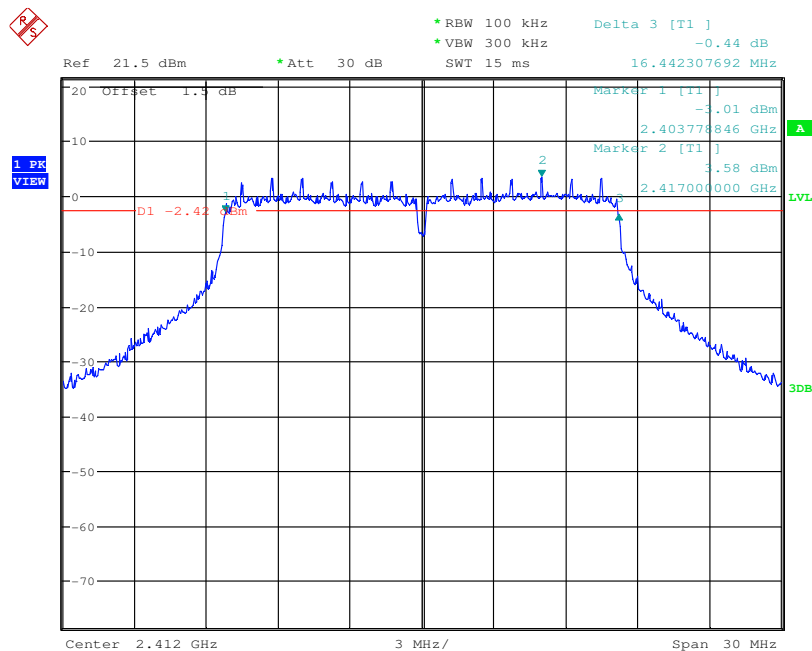
Report No.: SZEM150500243201

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Test mode:	802.11b	Test channel:	Highest
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Test mode:	802.11g	Test channel:	Lowest
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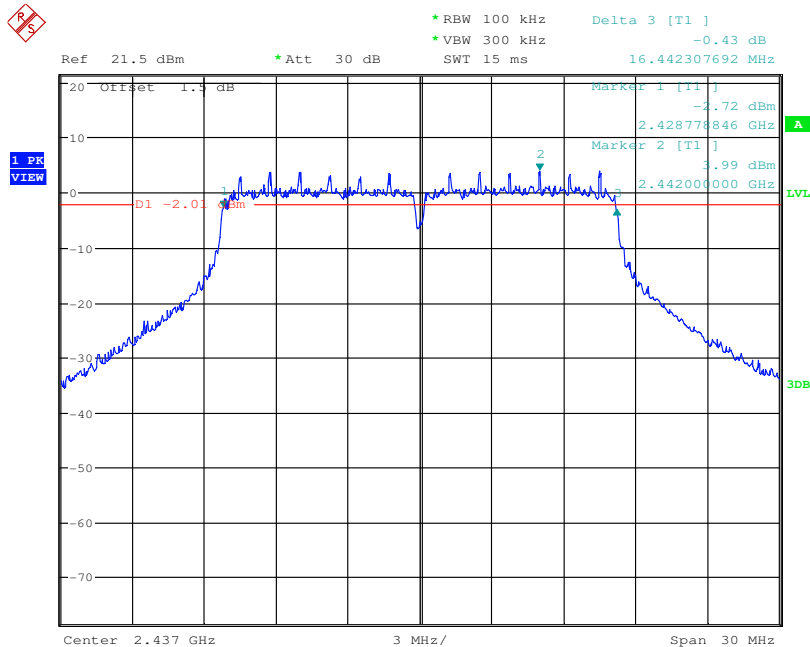


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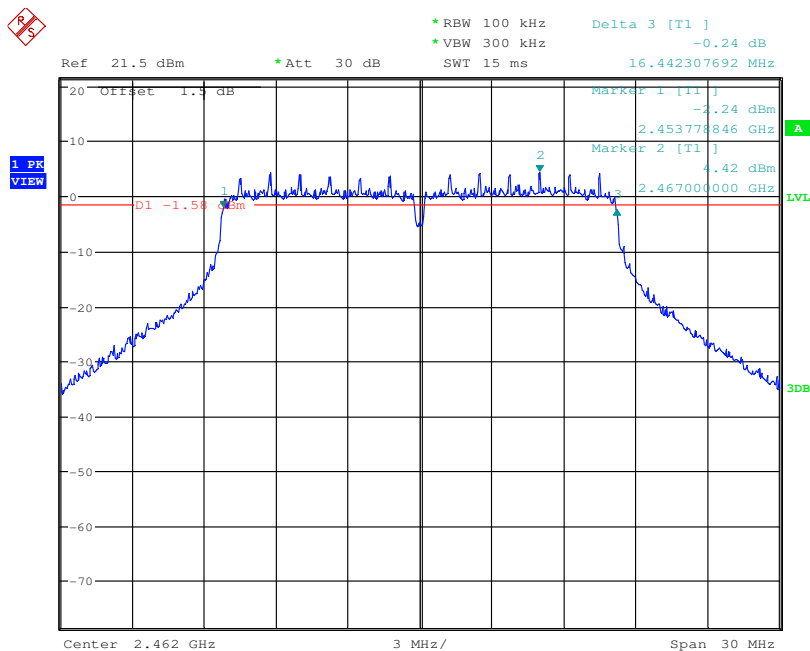
Report No.: SZEM150500243201

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Test mode:	802.11g	Test channel:	Middle
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Test mode:	802.11g	Test channel:	Highest
------------	---------	---------------	---------



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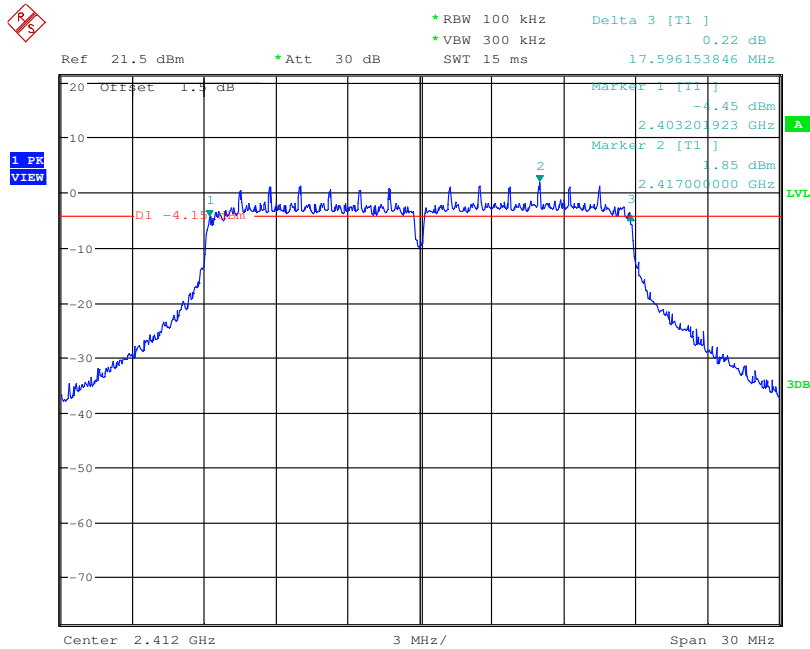


# SGS-CSTC Standards Technical Services Ltd.

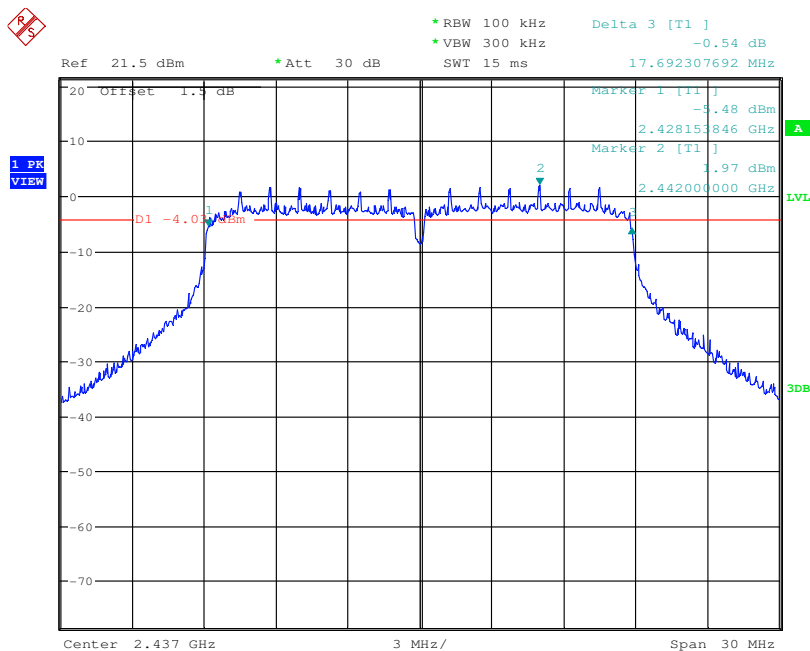
Report No.: SZEM150500243201

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Test mode:	802.11n(HT20)	Test channel:	Lowest
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Test mode:	802.11n(HT20)	Test channel:	Middle
------------	---------------	---------------	--------



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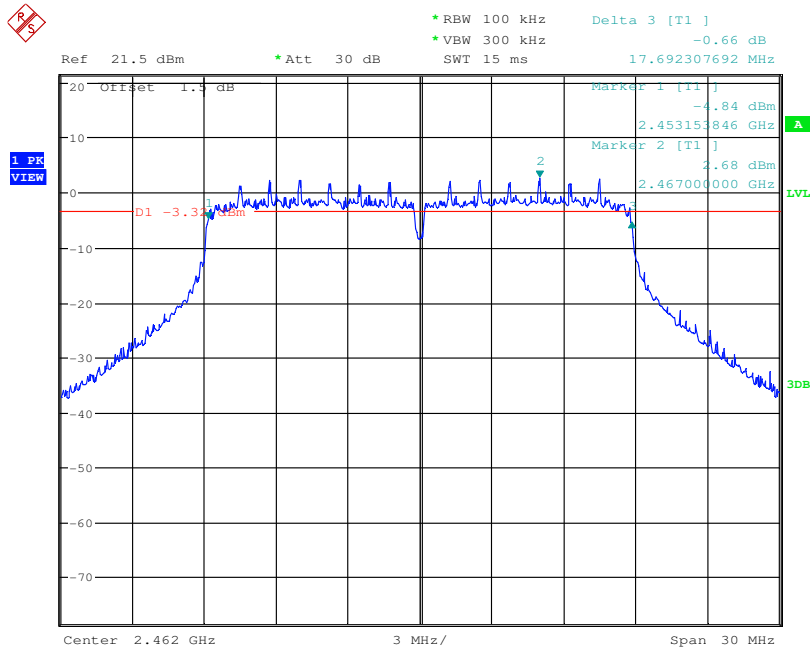


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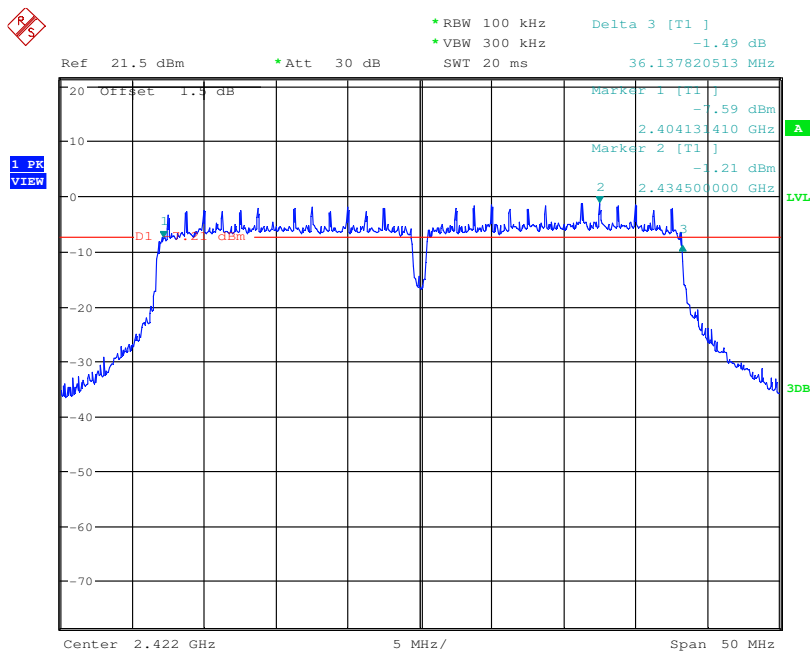
Report No.: SZEM150500243201

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Test mode:	802.11n(HT20)	Test channel:	Highest
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Test mode:	802.11n(HT40)	Test channel:	Lowest
------------	---------------	---------------	--------



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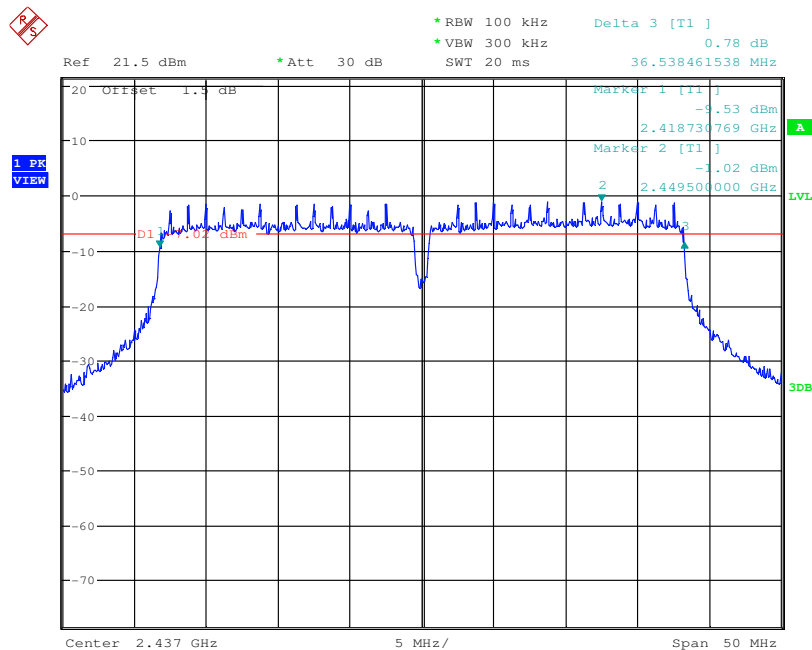


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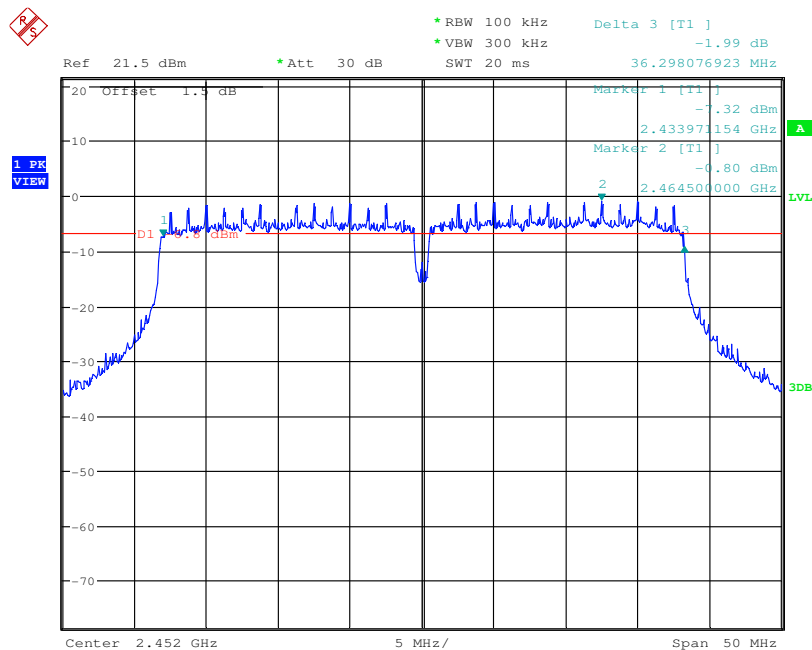
Report No.: SZEM150500243201

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Test mode:	802.11n(HT40)	Test channel:	Middle
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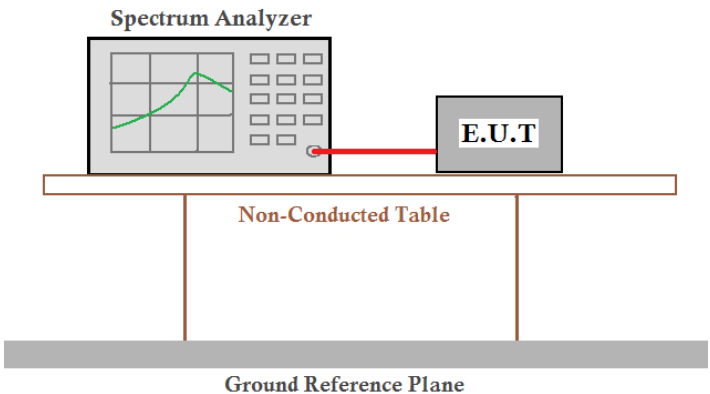


Test mode:	802.11n(HT40)	Test channel:	Highest
------------	---------------	---------------	---------



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## 6.5 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	KDB558074 D01 v03r02
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Test Instruments:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	≤8.00dBm/3kHz
Test Results:	Pass

**Measurement Data**

802.11b mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-7.15	≤8.00	Pass
Middle	-7.06	≤8.00	Pass
Highest	-6.33	≤8.00	Pass
802.11g mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-8.55	≤8.00	Pass
Middle	-9.26	≤8.00	Pass
Highest	-8.90	≤8.00	Pass
802.11n(HT20) mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-11.96	≤8.00	Pass
Middle	-11.14	≤8.00	Pass
Highest	-11.32	≤8.00	Pass
802.11n(HT40) mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-14.55	≤8.00	Pass
Middle	-15.64	≤8.00	Pass
Highest	-13.99	≤8.00	Pass



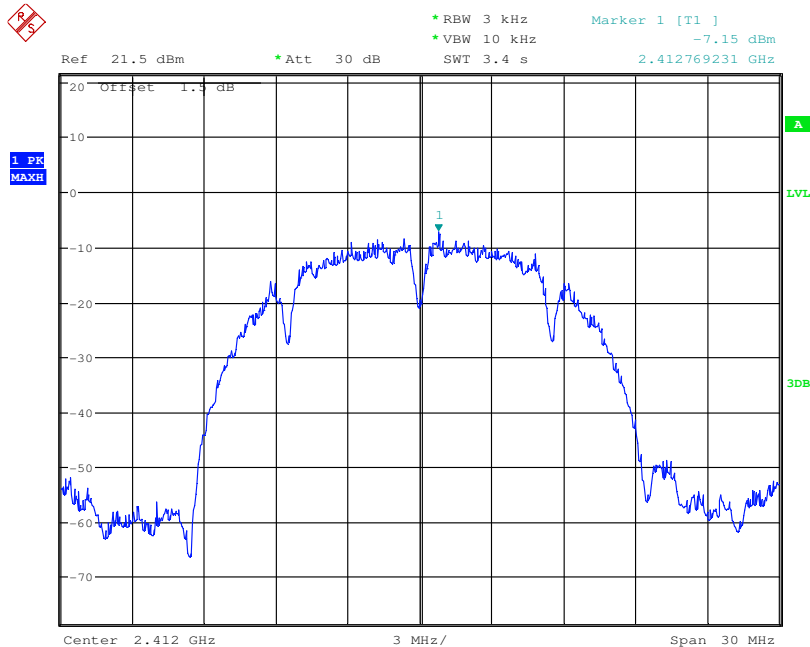
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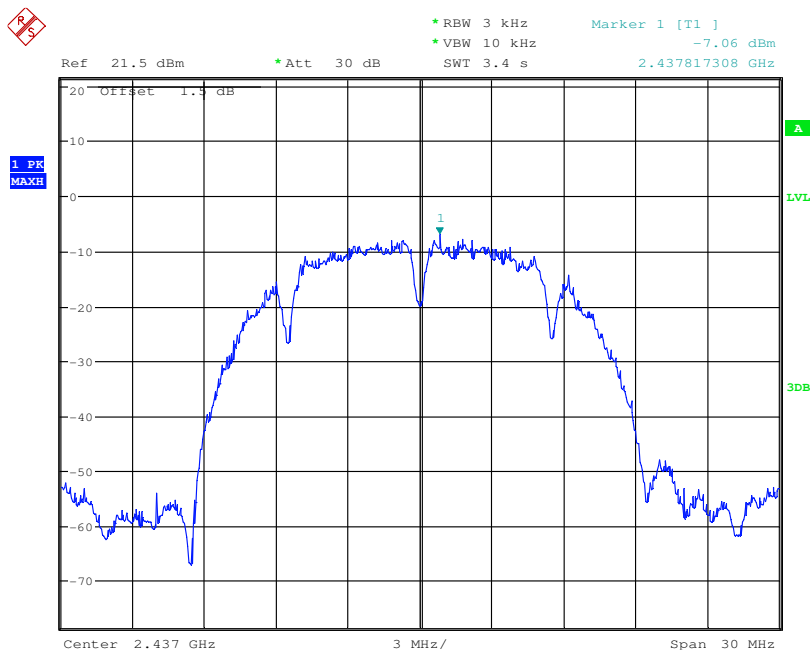
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Test plot as follows:

Test mode:	802.11b	Test channel:	Lowest
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Test mode:	802.11b	Test channel:	Middle
------------	---------	---------------	--------



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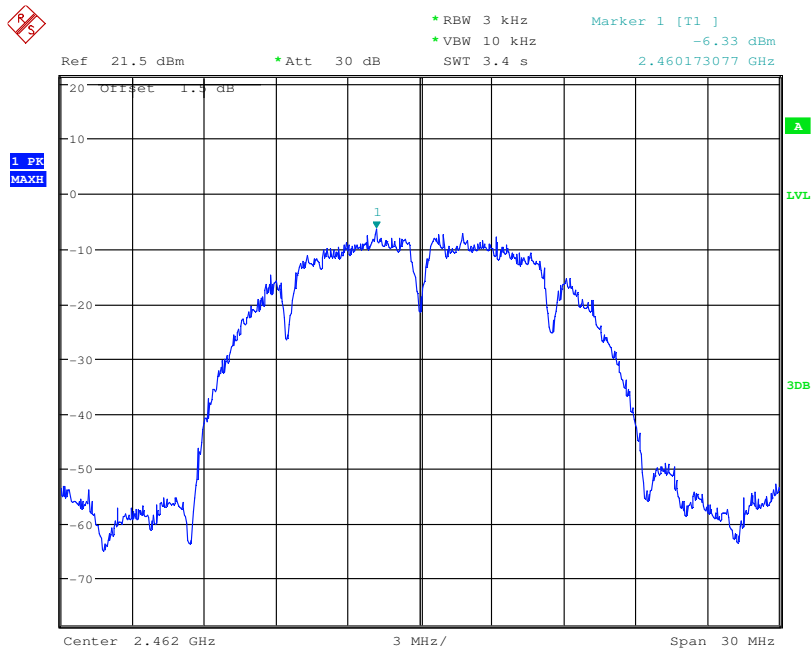


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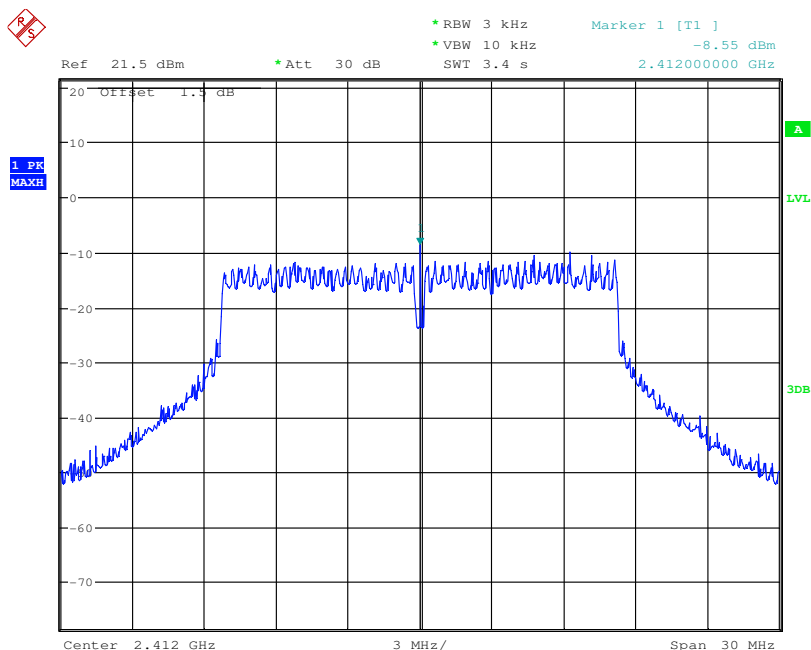
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Test mode:	802.11b	Test channel:	Highest
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Test mode:	802.11g	Test channel:	Lowest
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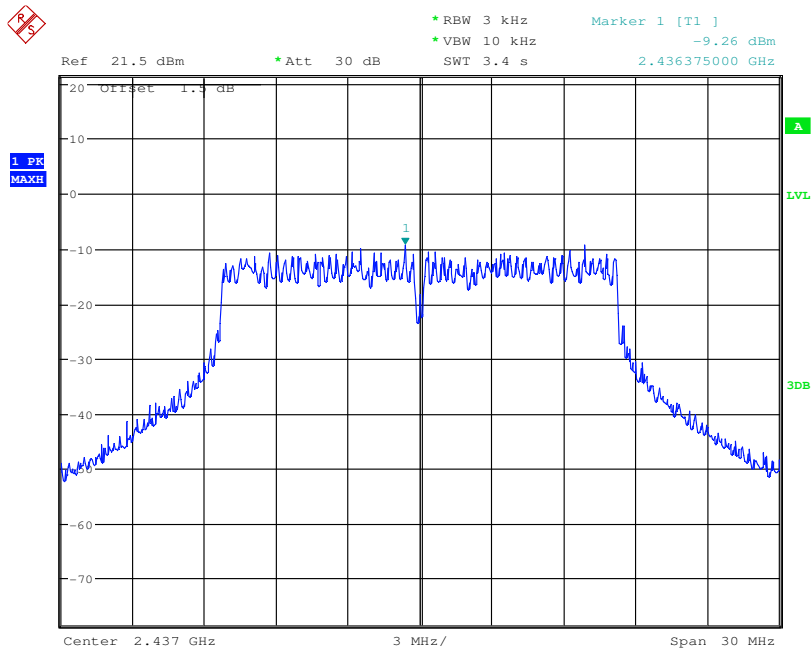


# SGS-CSTC Standards Technical Services Ltd.

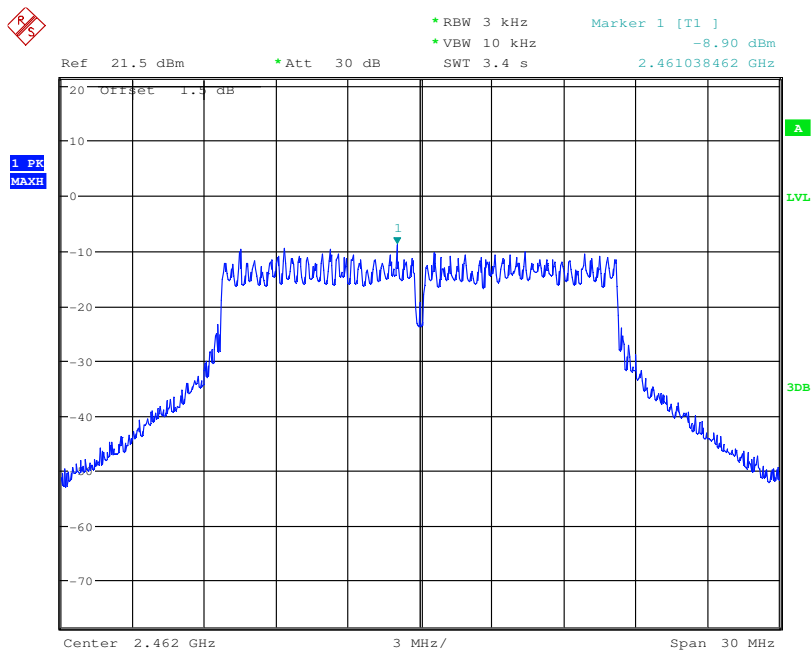
Report No.: SZEM150500243201

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Test mode:	802.11g	Test channel:	Middle
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Test mode:	802.11g	Test channel:	Highest
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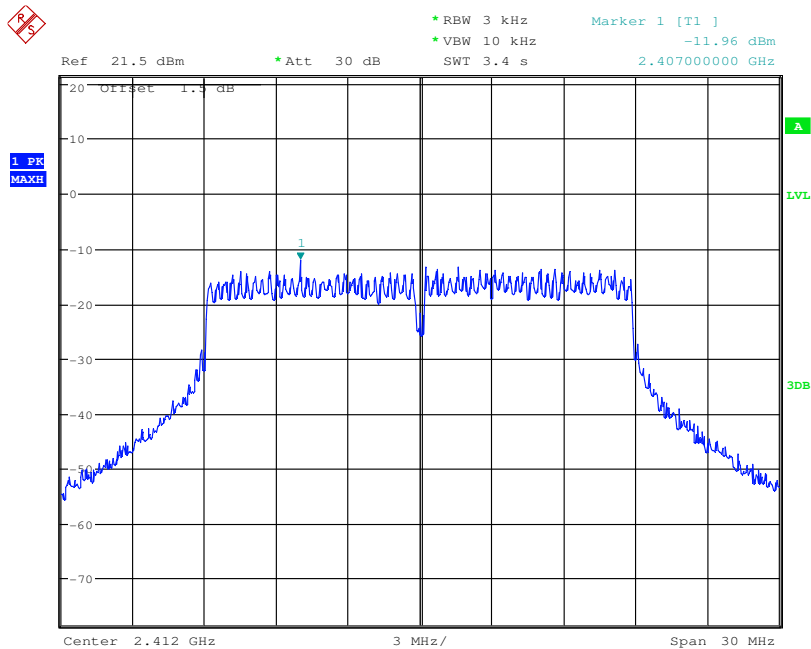


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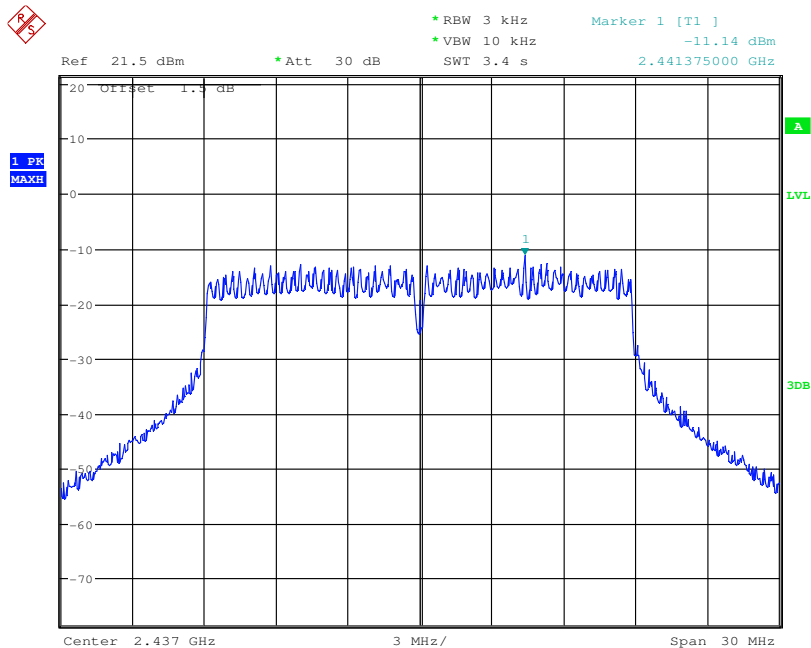
Report No.: SZEM150500243201

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Test mode:	802.11n(HT20)	Test channel:	Lowest
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Test mode:	802.11n(HT20)	Test channel:	Middle
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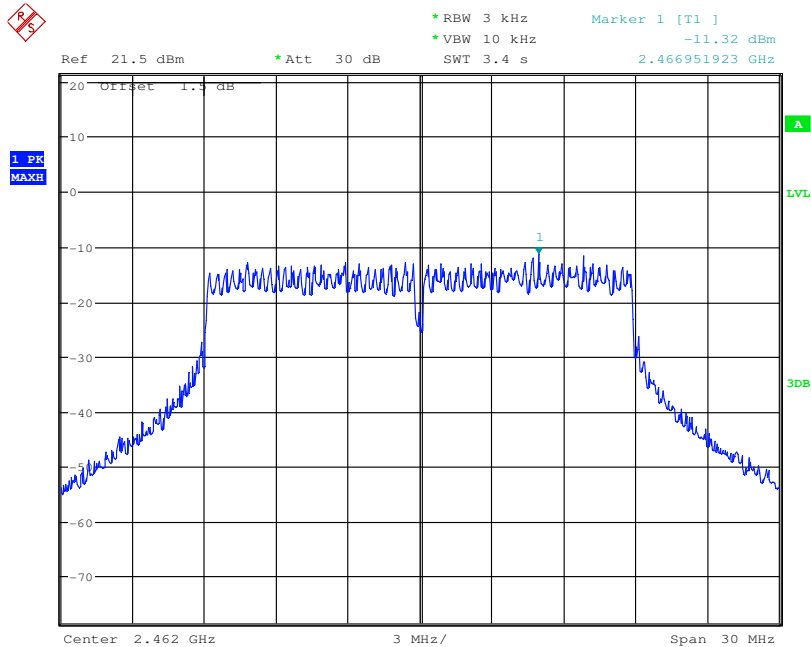


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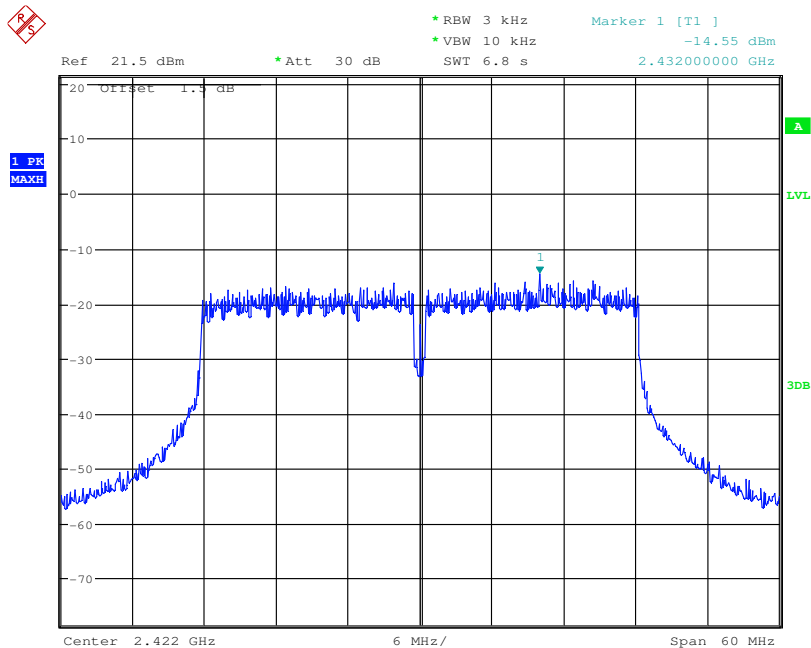
Report No.: SZEM150500243201

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Test mode:	802.11n(HT20)	Test channel:	Highest
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Test mode:	802.11n(HT40)	Test channel:	Lowest
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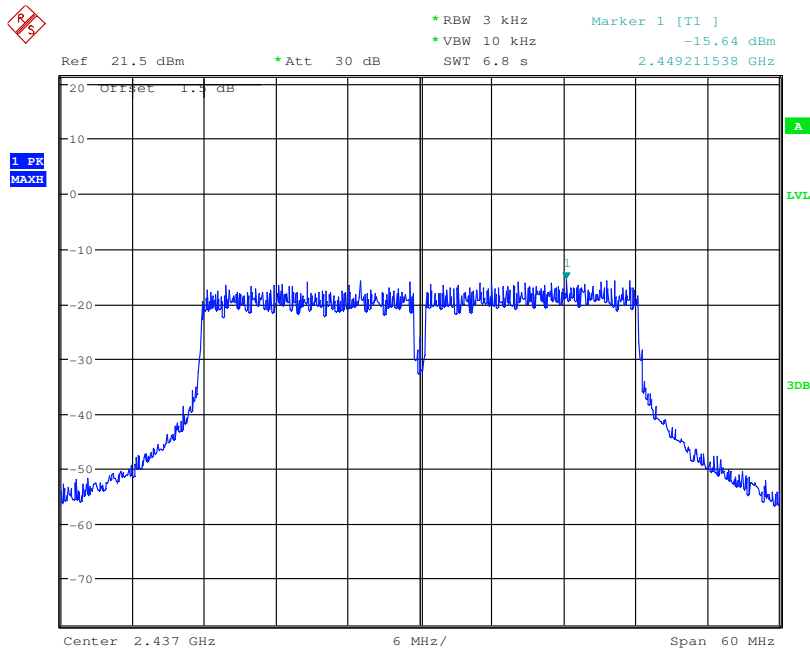


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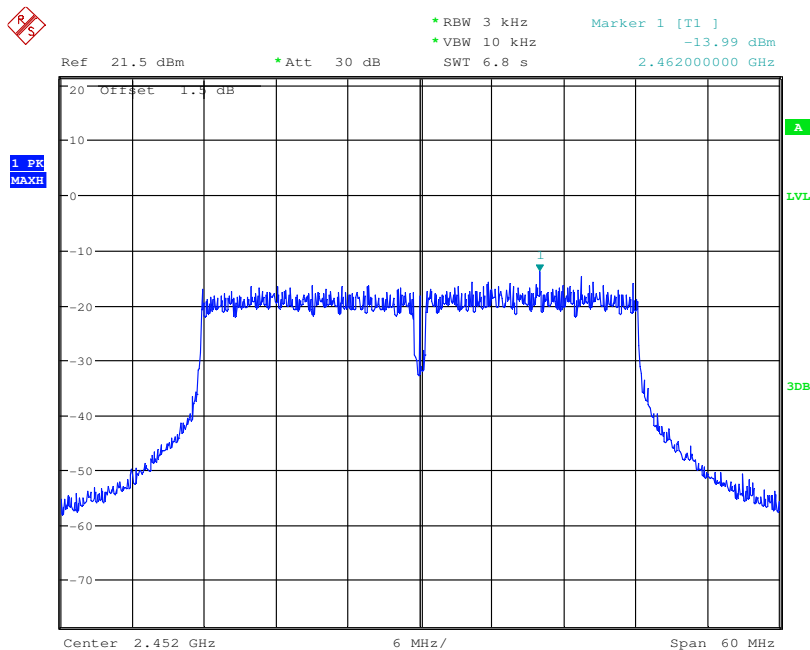
Report No.: SZEM150500243201

Page: 41 of 125

Test mode:	802.11n(HT40)	Test channel:	Middle
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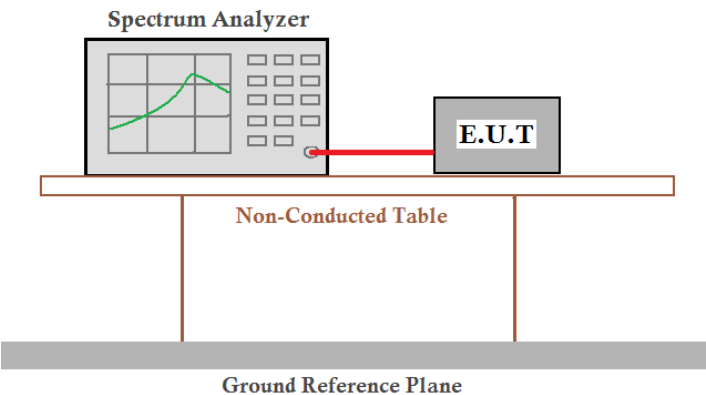


Test mode:	802.11n(HT40)	Test channel:	Highest
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## 6.6 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	KDB558074 D01 v03r02
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
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.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



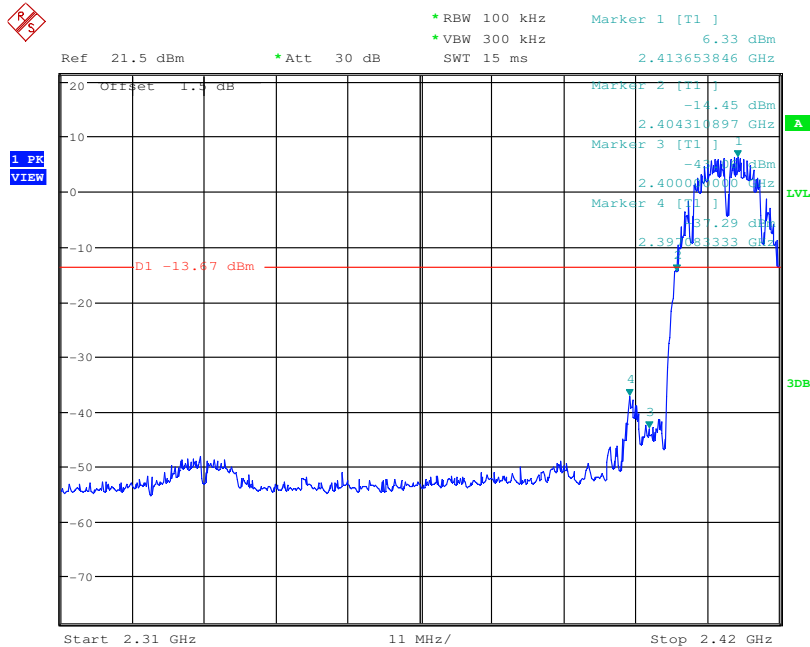
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Report No.: SZEM150500243201

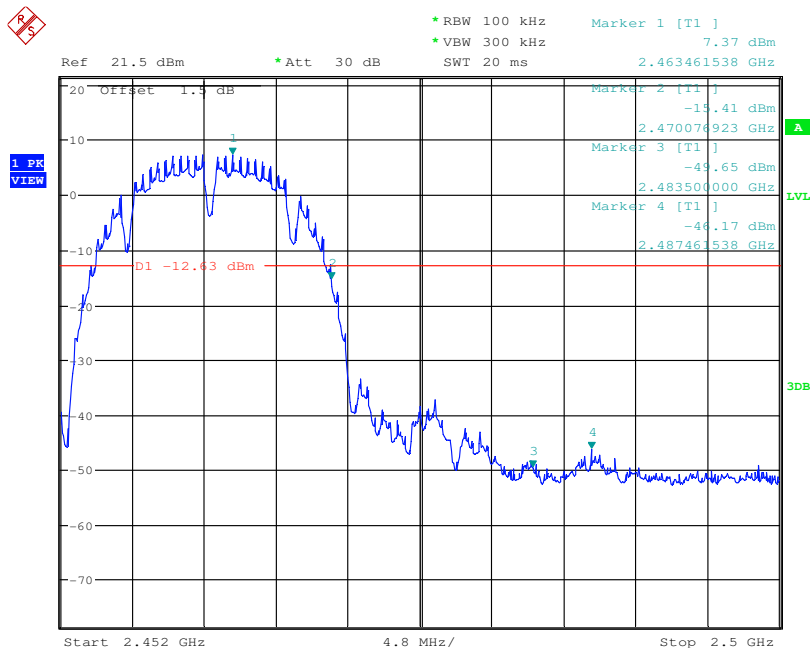
Page: 43 of 125

Test plot as follows:

Test mode:	802.11b	Test channel:	Lowest
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Test mode:	802.11b	Test channel:	Highest
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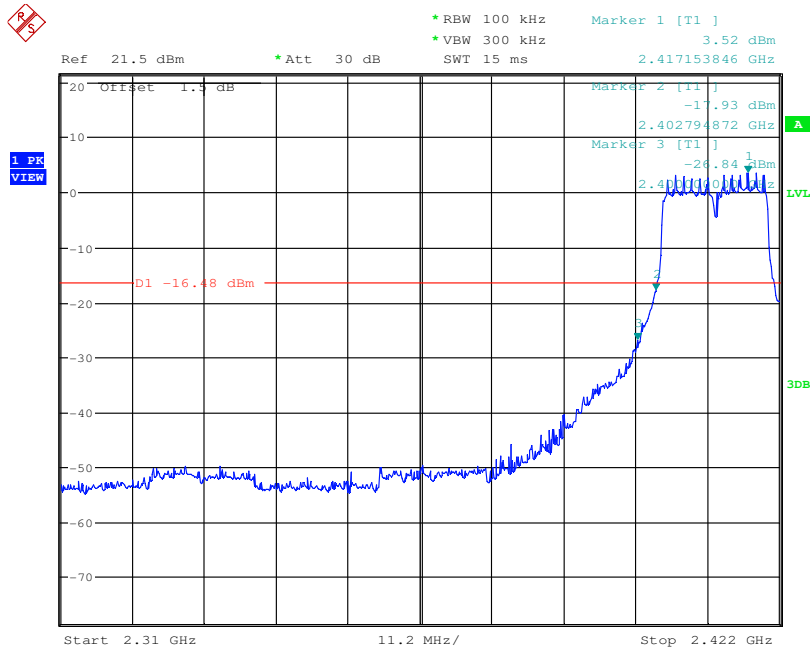


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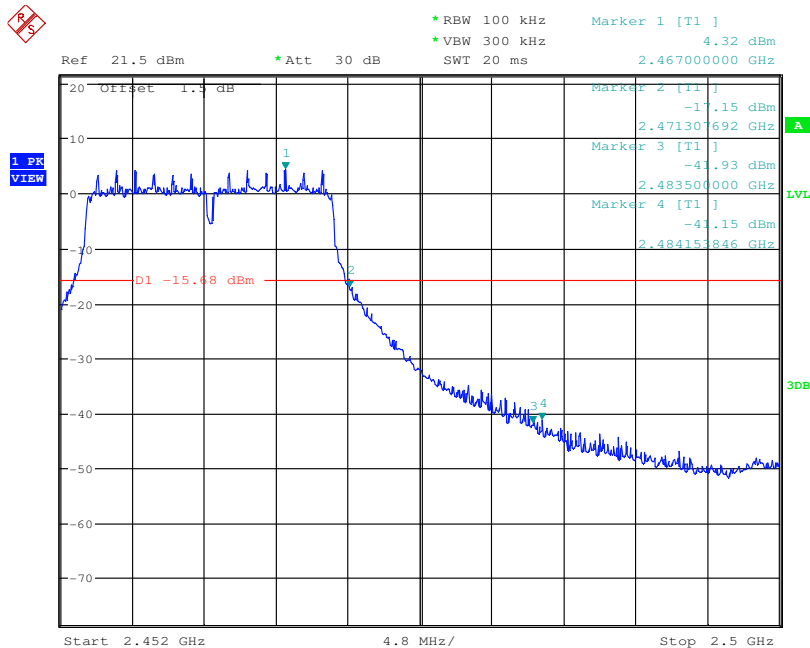
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Test mode:	802.11g	Test channel:	Lowest
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Test mode:	802.11g	Test channel:	Highest
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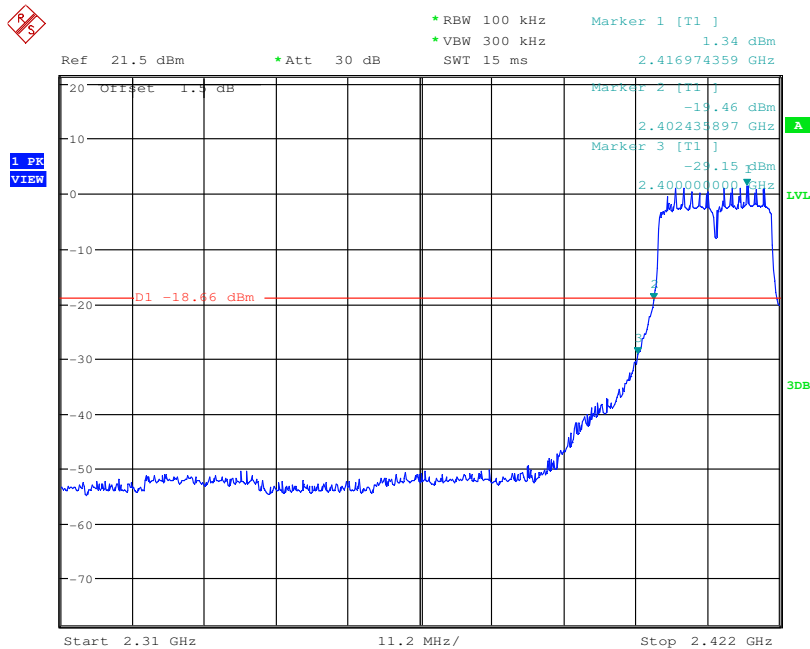


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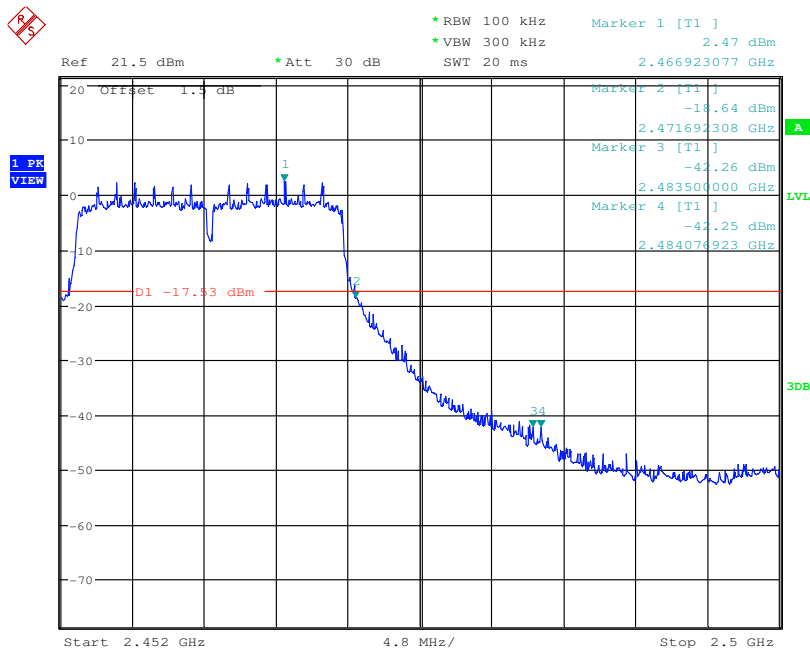
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Test mode:	802.11n(HT20)	Test channel:	Lowest
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Test mode:	802.11n(HT20)	Test channel:	Highest
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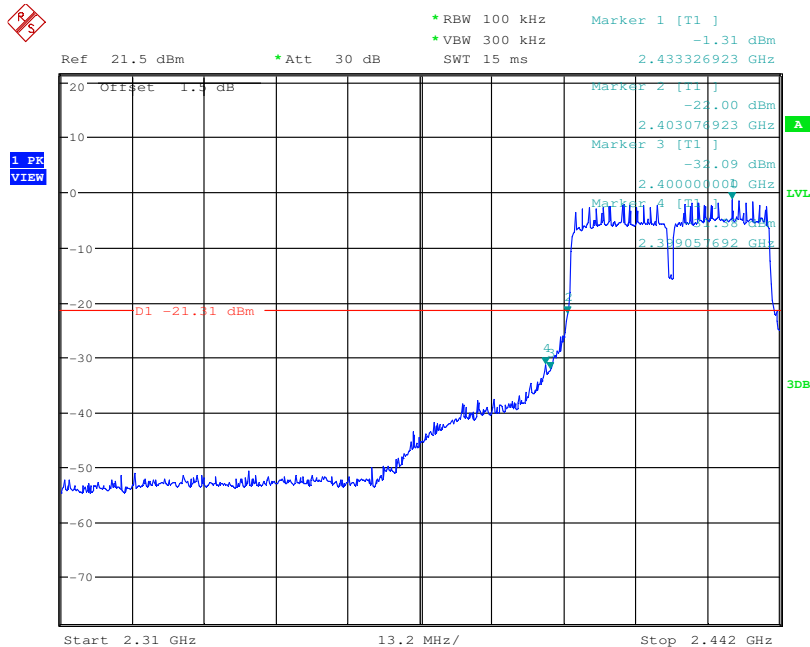


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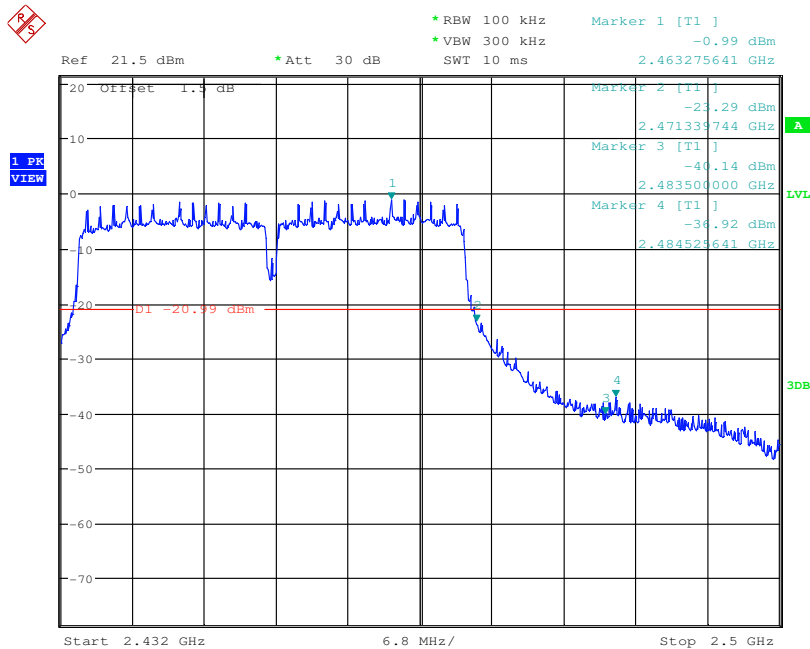
Report No.: SZEM150500243201

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Test mode:	802.11n(HT40)	Test channel:	Lowest
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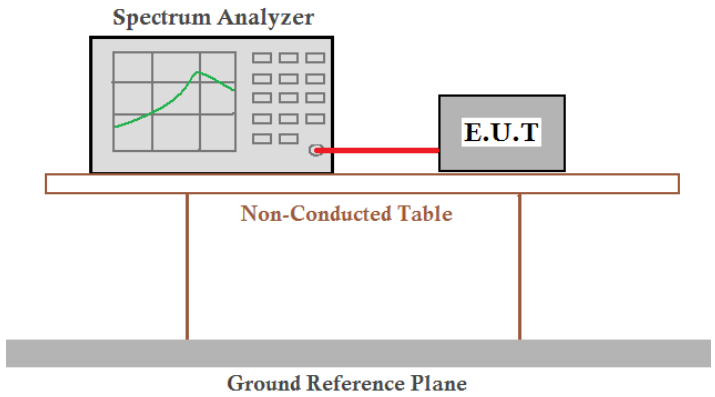


Test mode:	802.11n(HT40)	Test channel:	Highest
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## 6.7 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	KDB558074 D01 v03r02
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
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.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



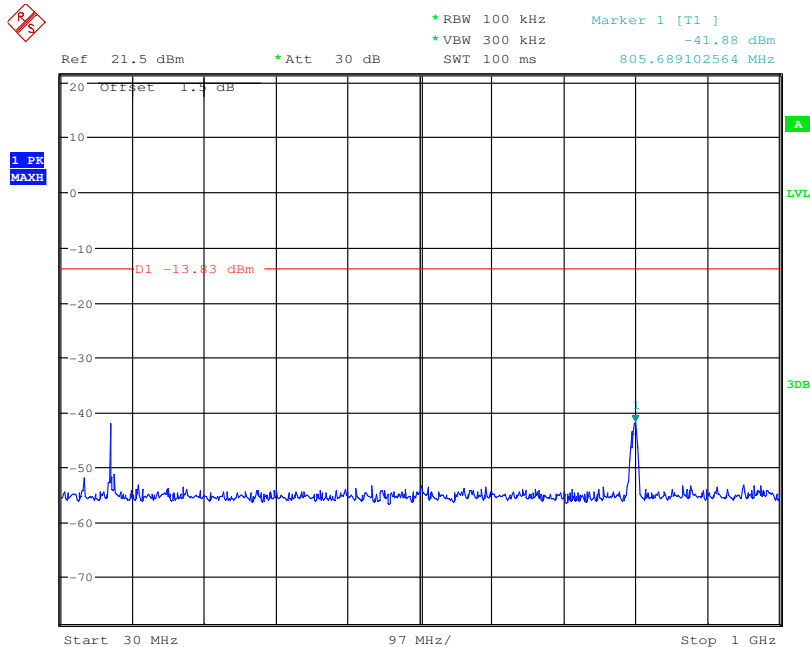
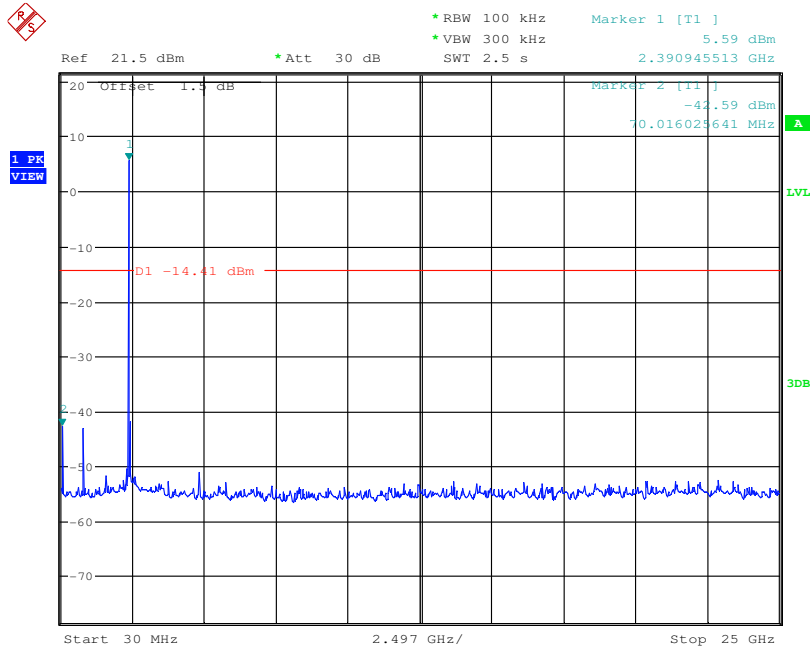
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Test plot as follows:

Test mode:	802.11b	Test channel:	Lowest
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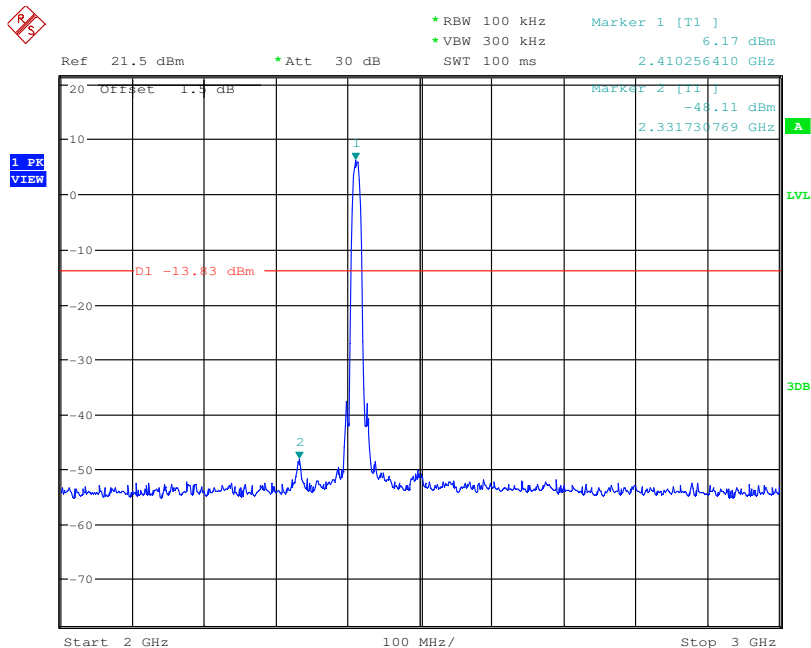
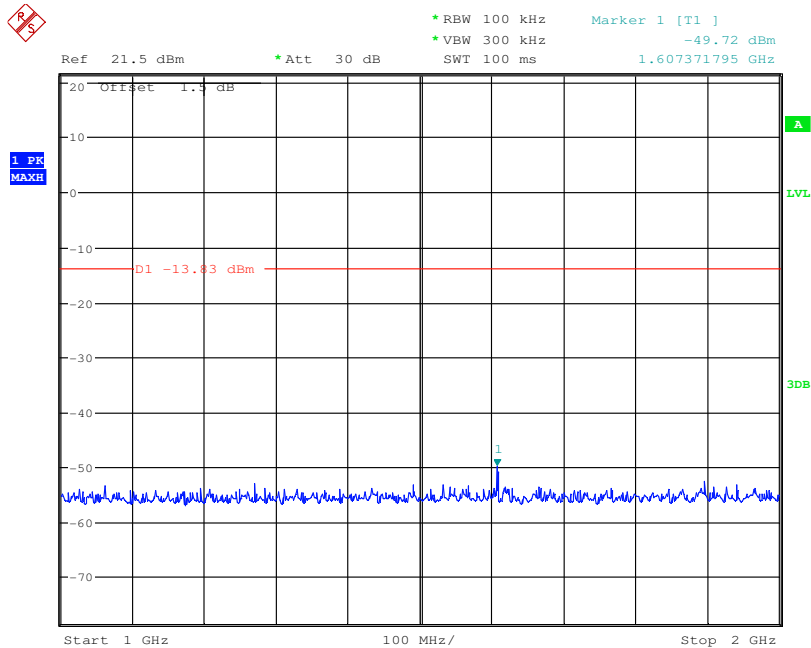




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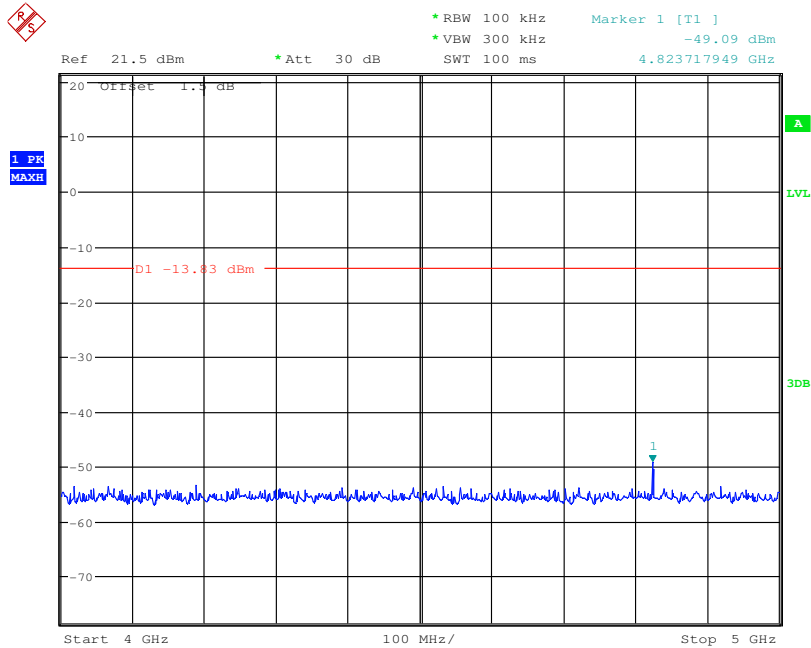
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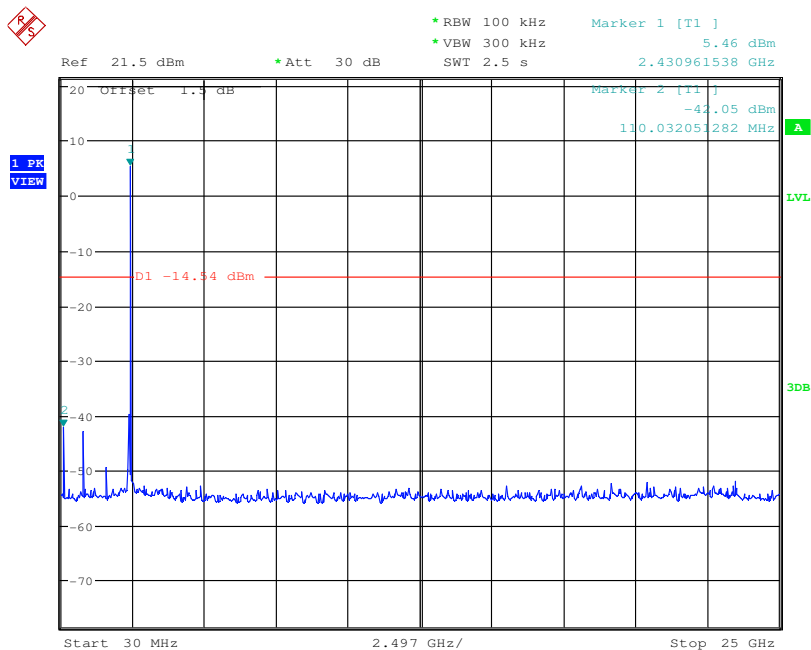
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Test mode:	802.11b	Test channel:	Middle
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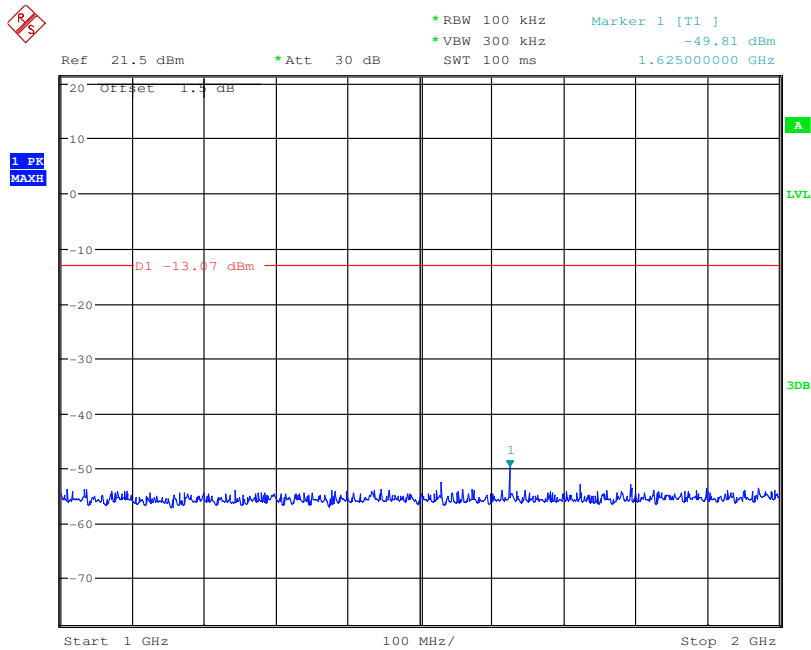
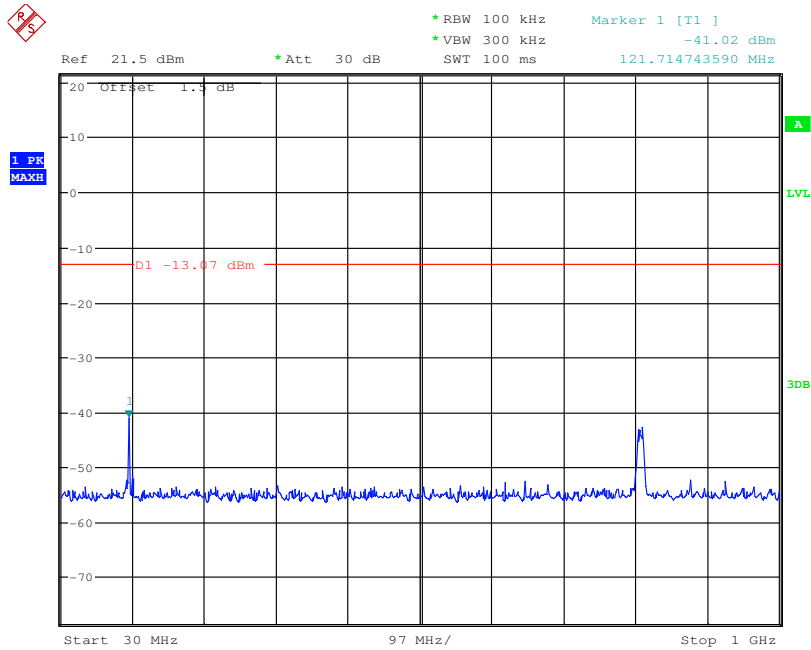
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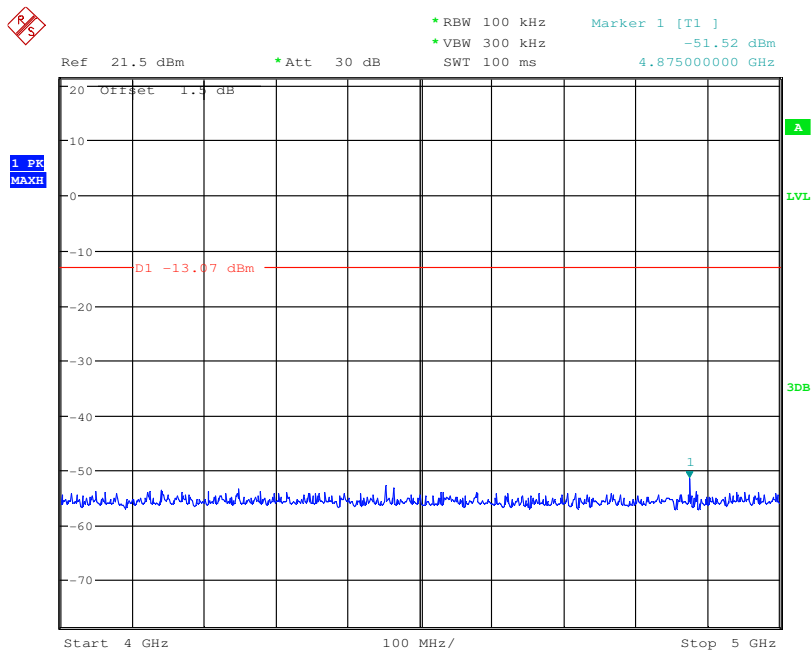
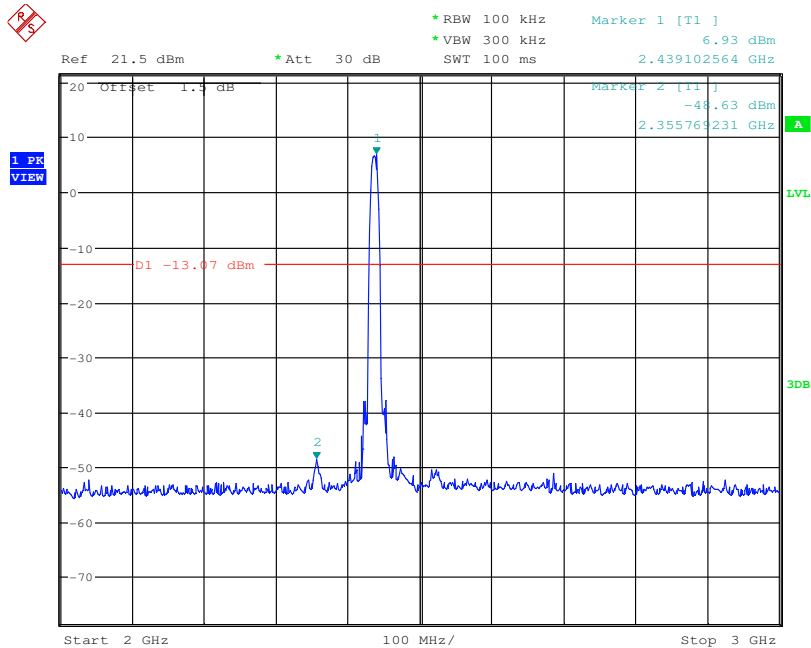
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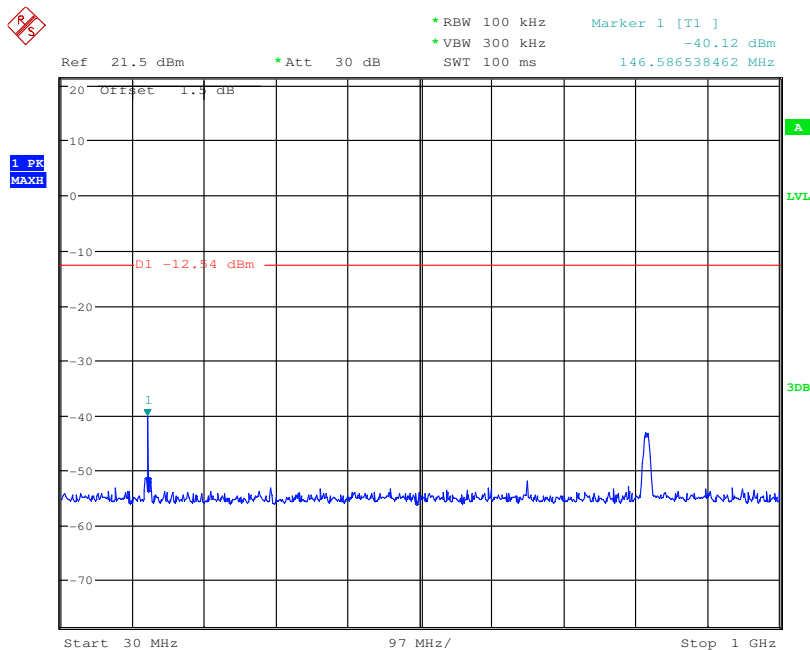
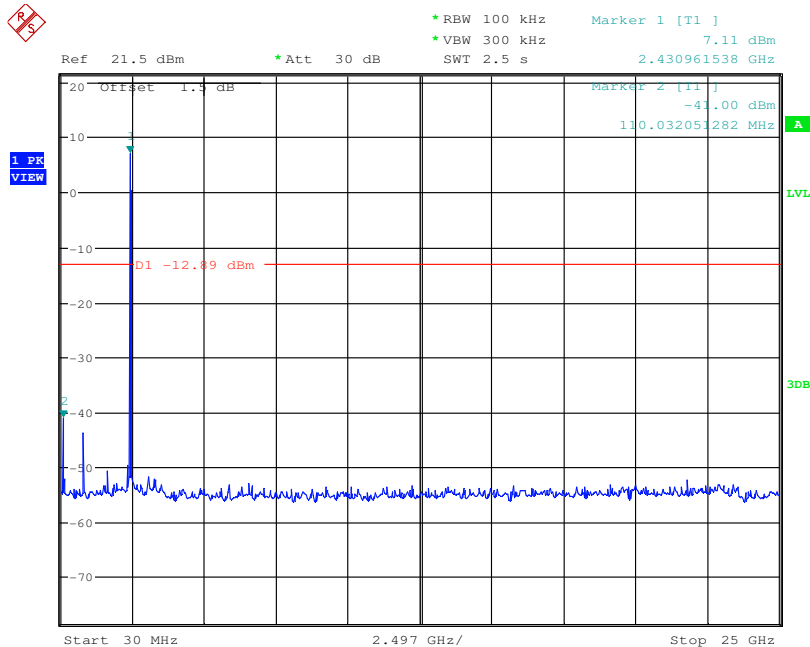


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Test mode:	802.11b	Test channel:	Highest
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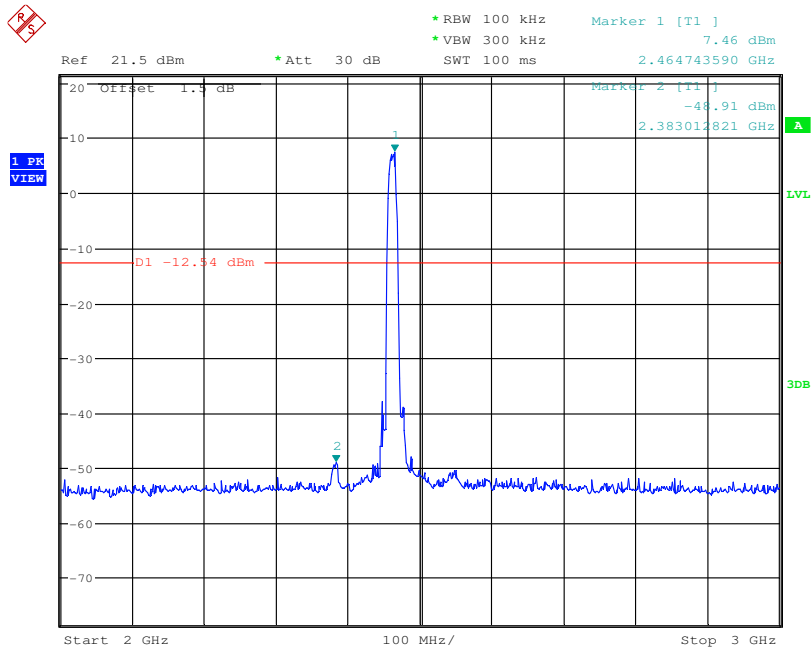
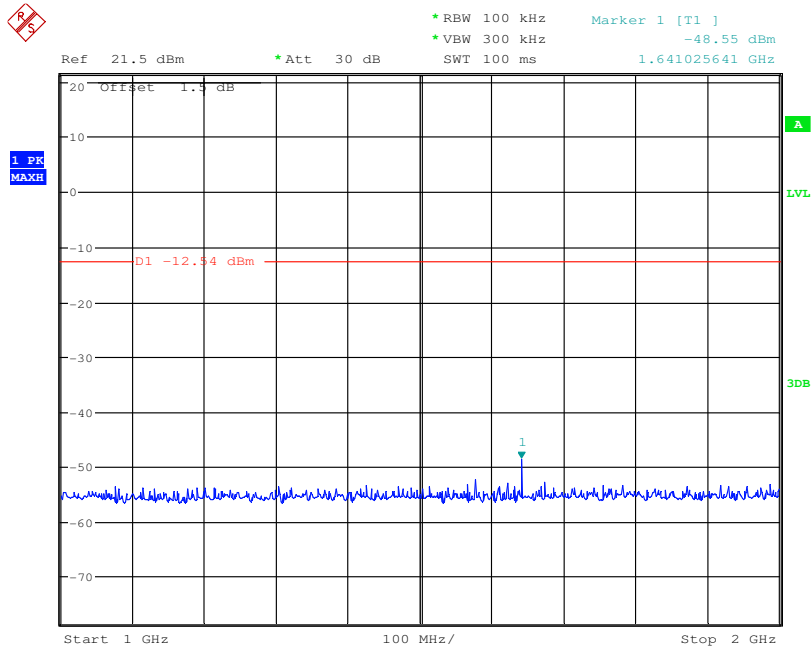
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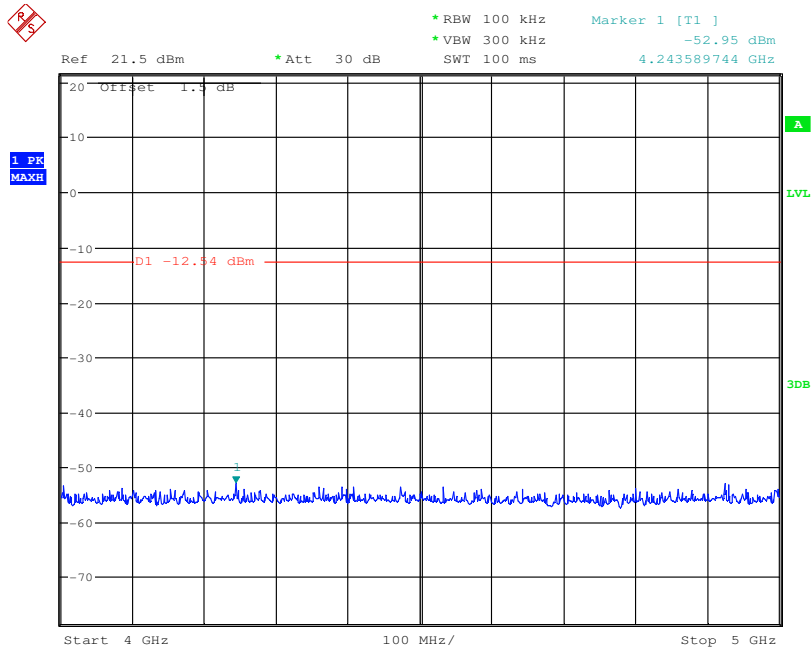
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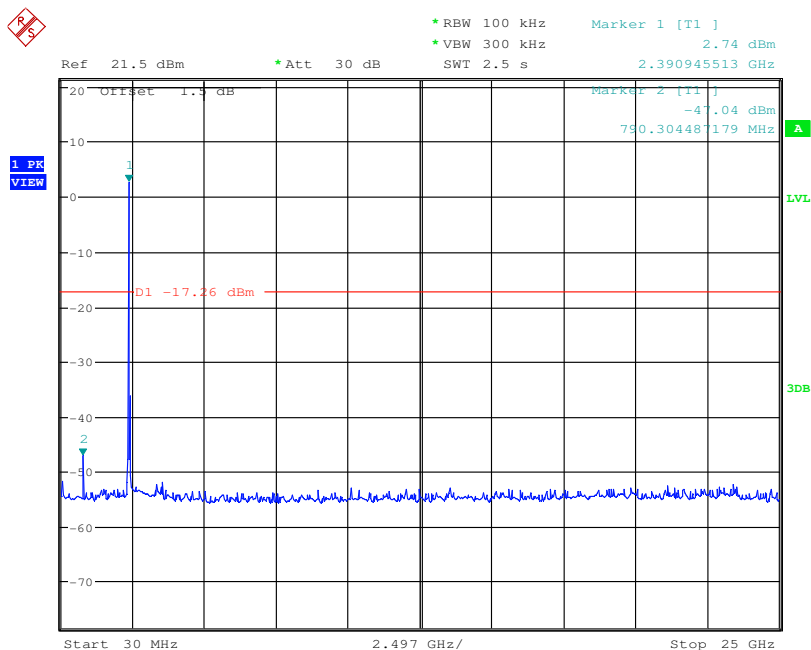
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Test mode:	802.11g	Test channel:	Lowest
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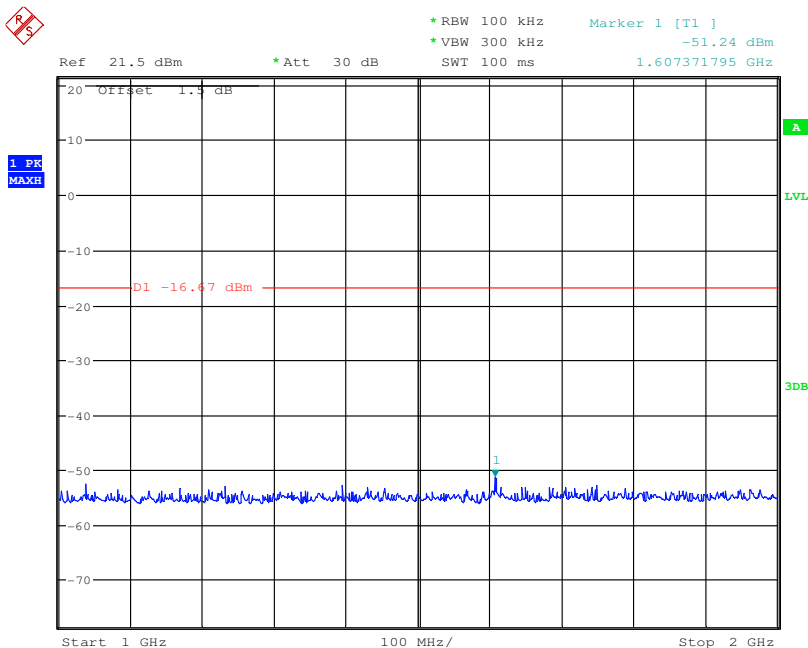
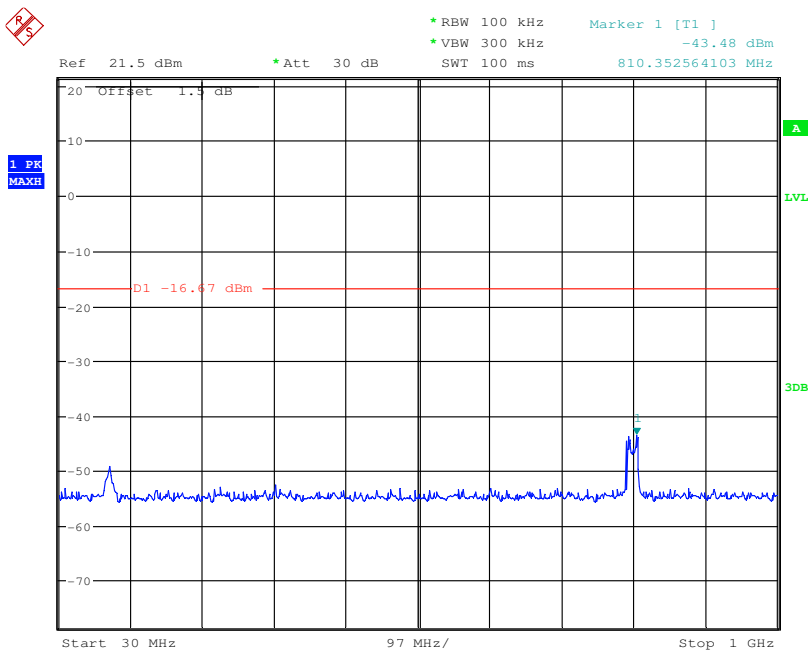
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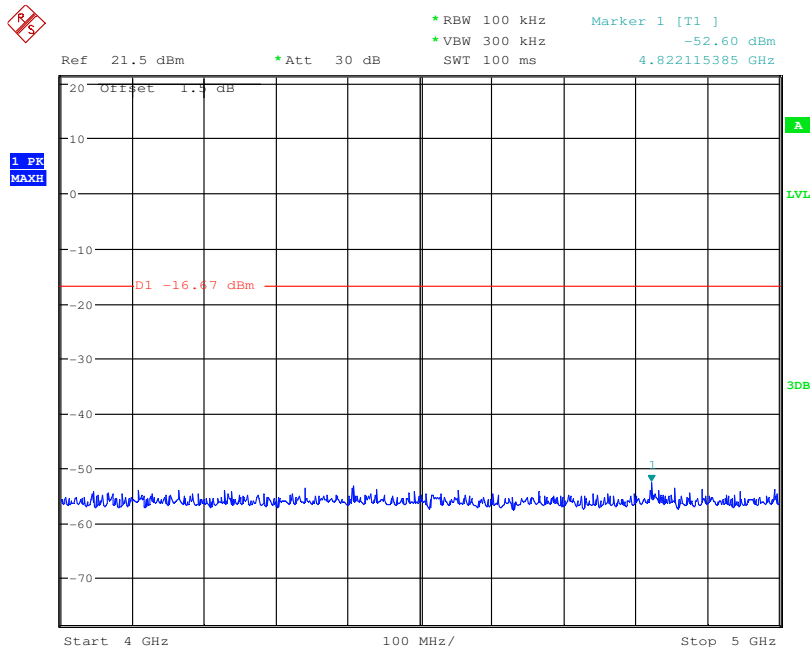
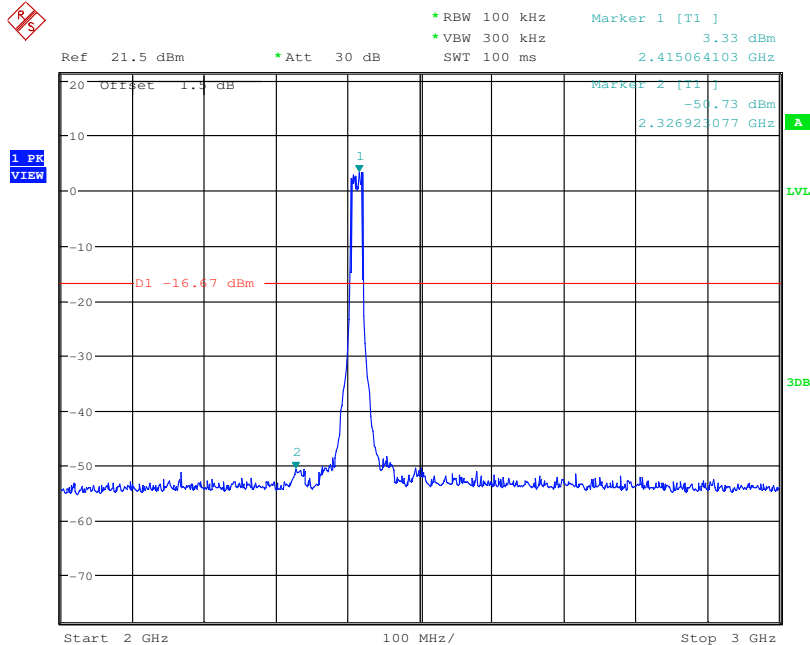
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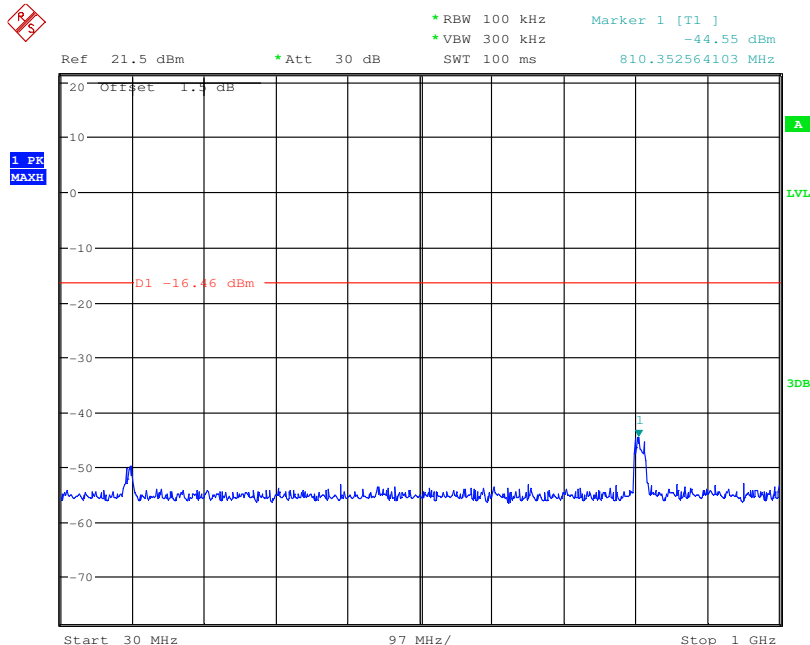
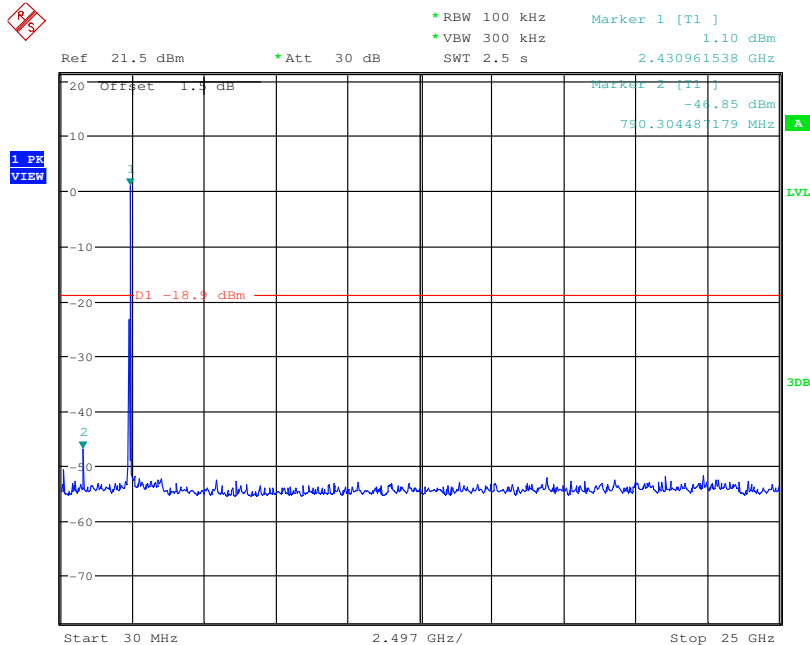


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Test mode:	802.11g	Test channel:	Middle
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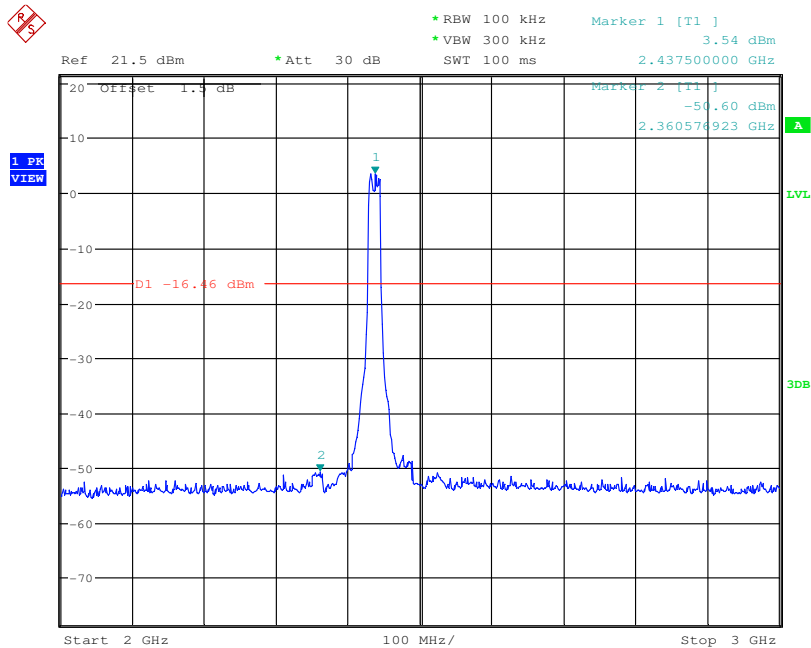
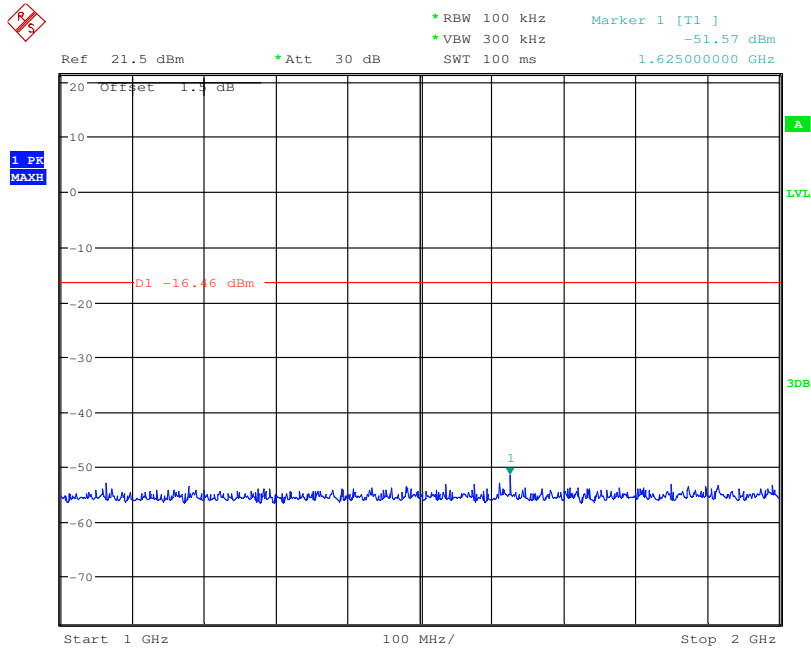
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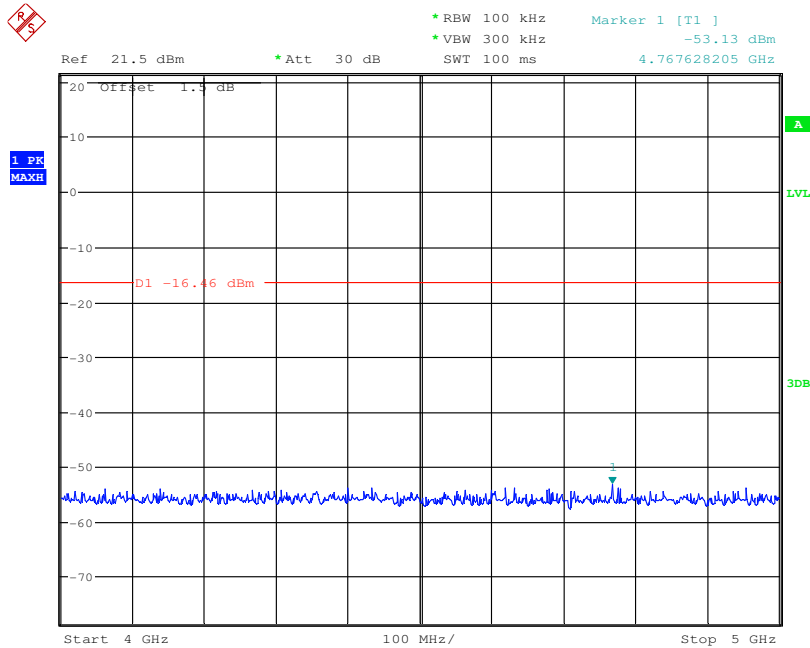
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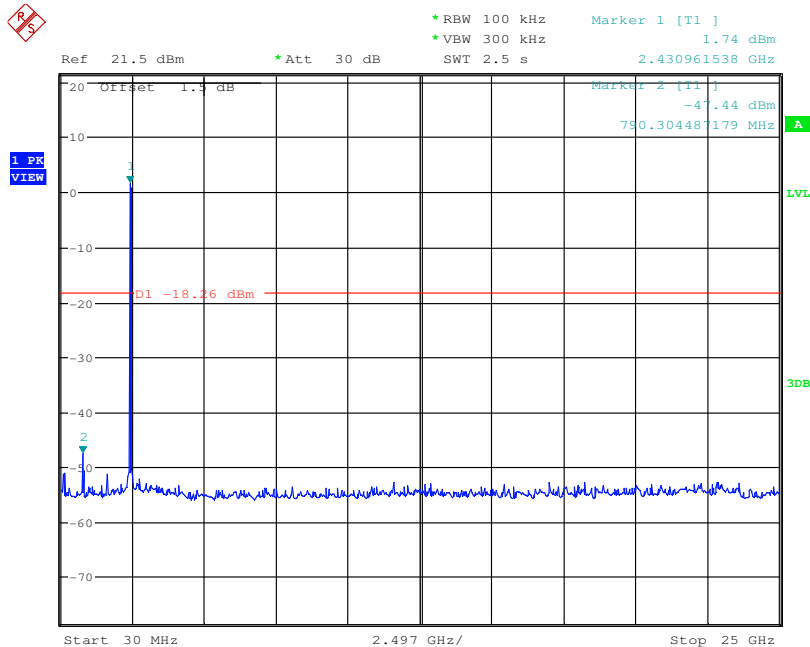
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11g	Test channel:	Highest
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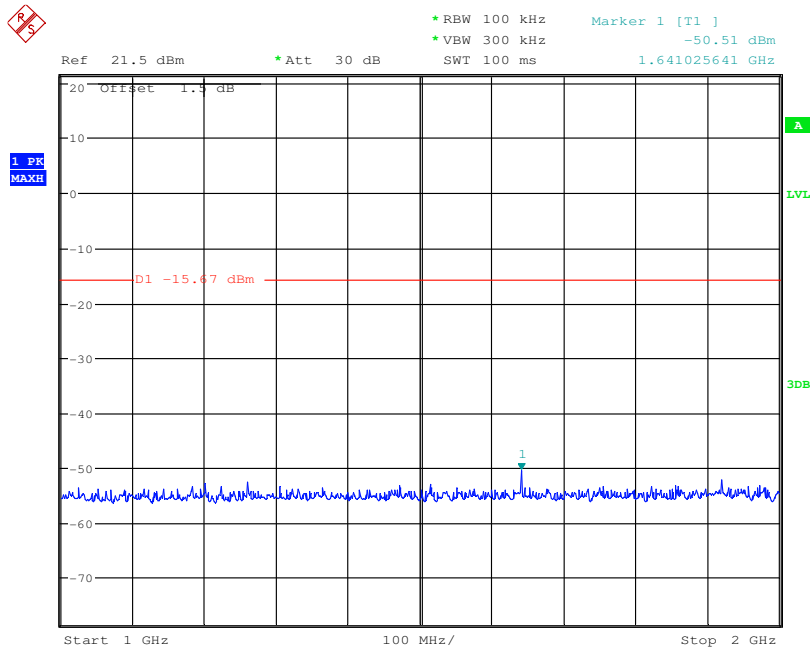
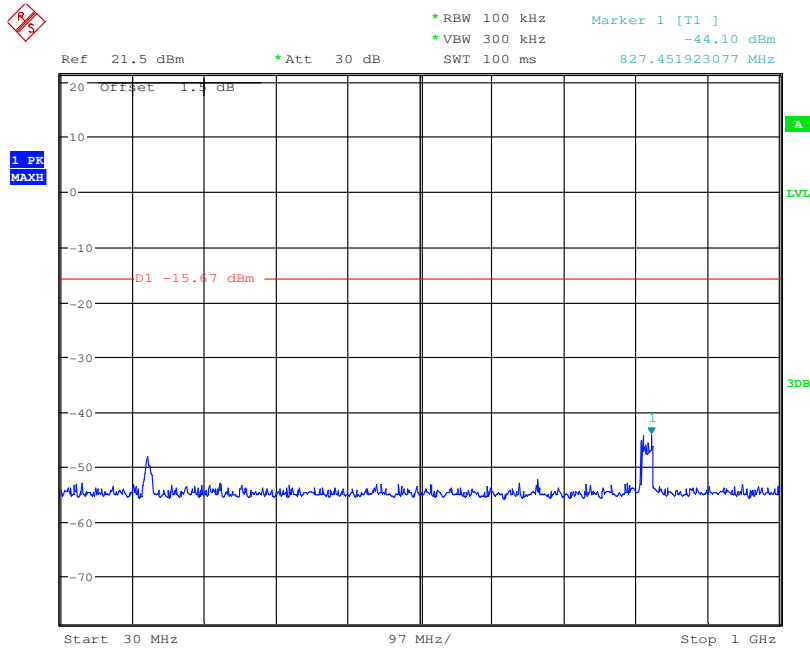
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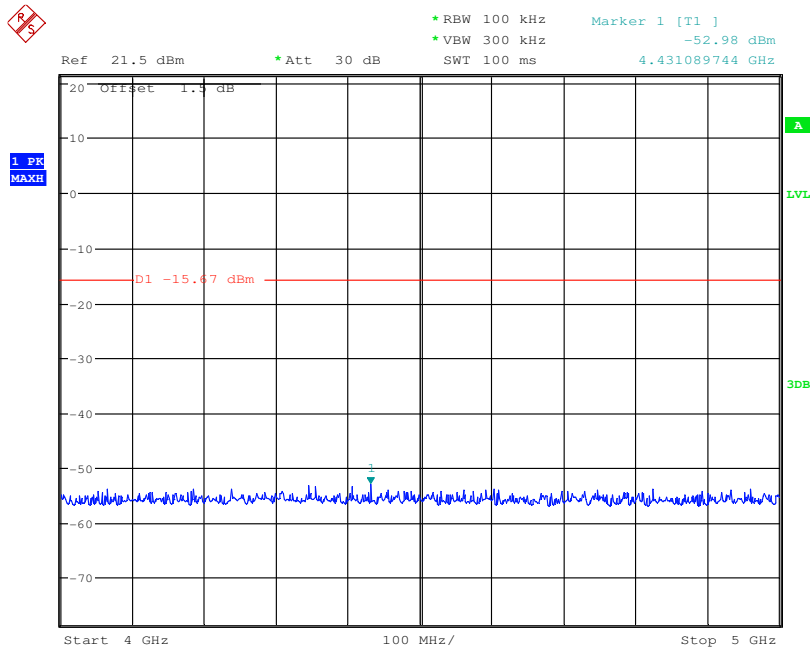
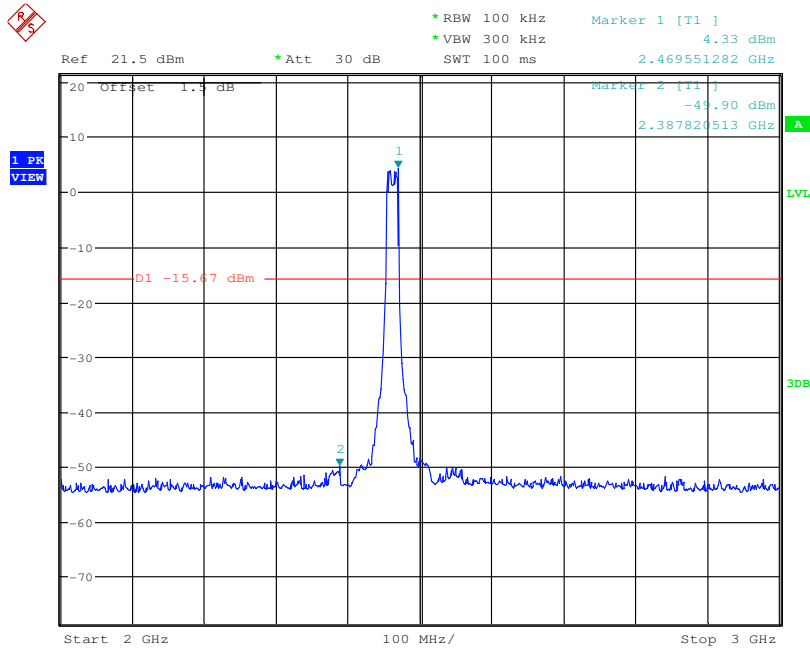
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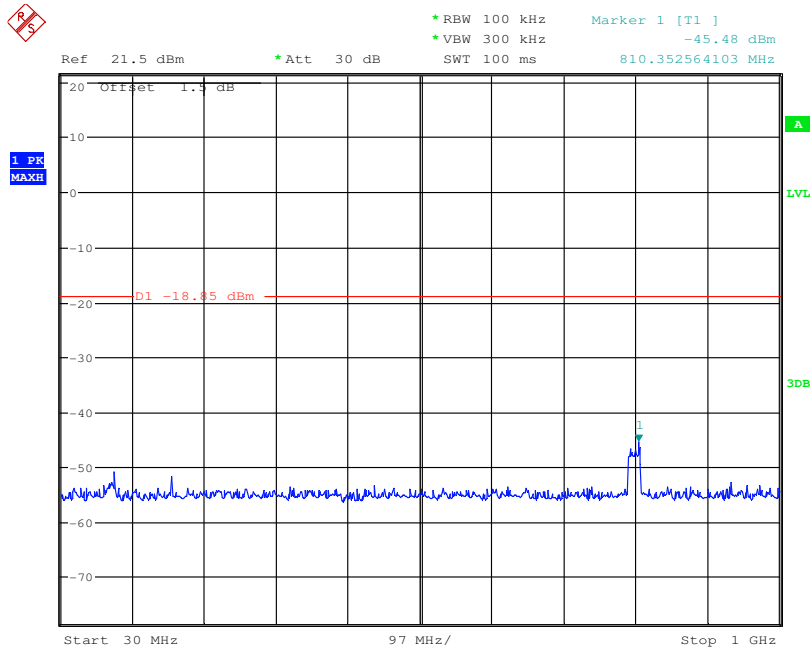
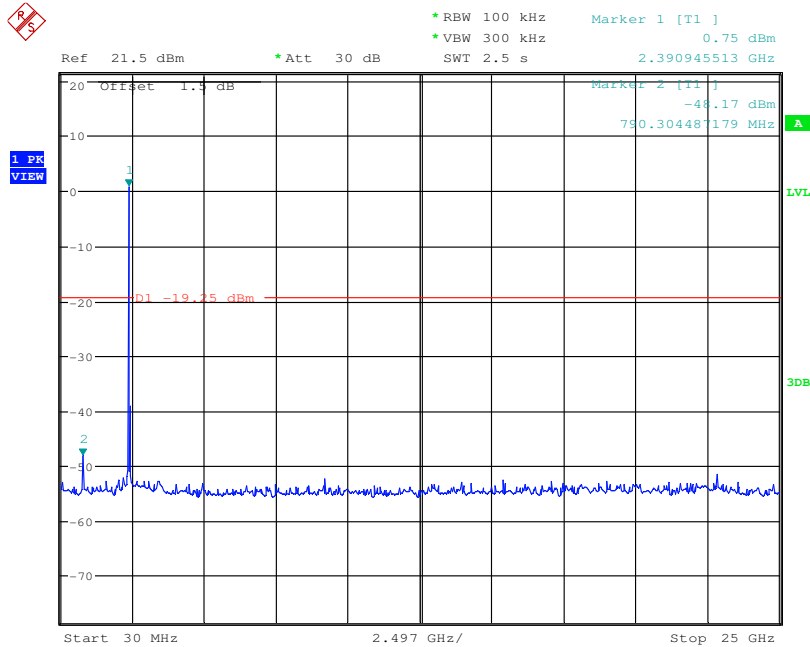


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Test mode:	802.11n(HT20)	Test channel:	Lowest
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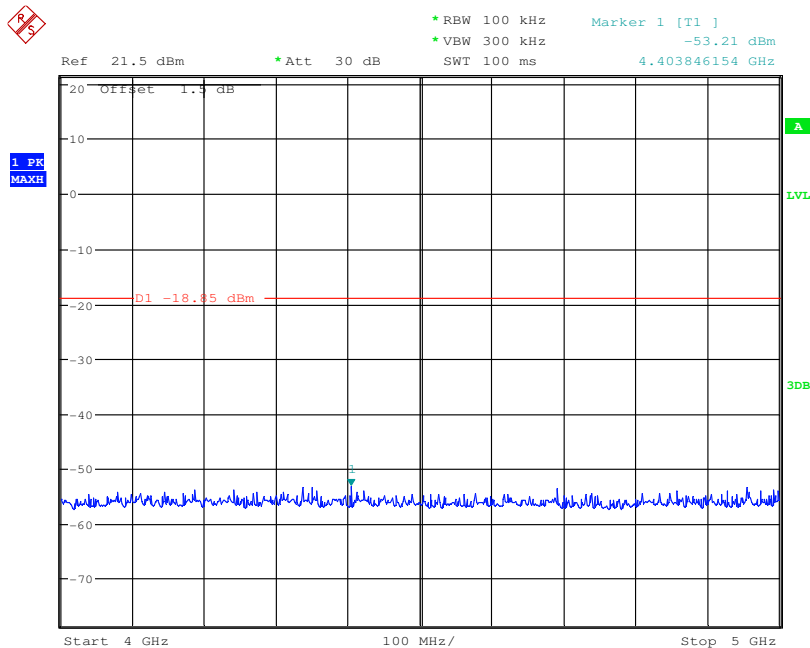




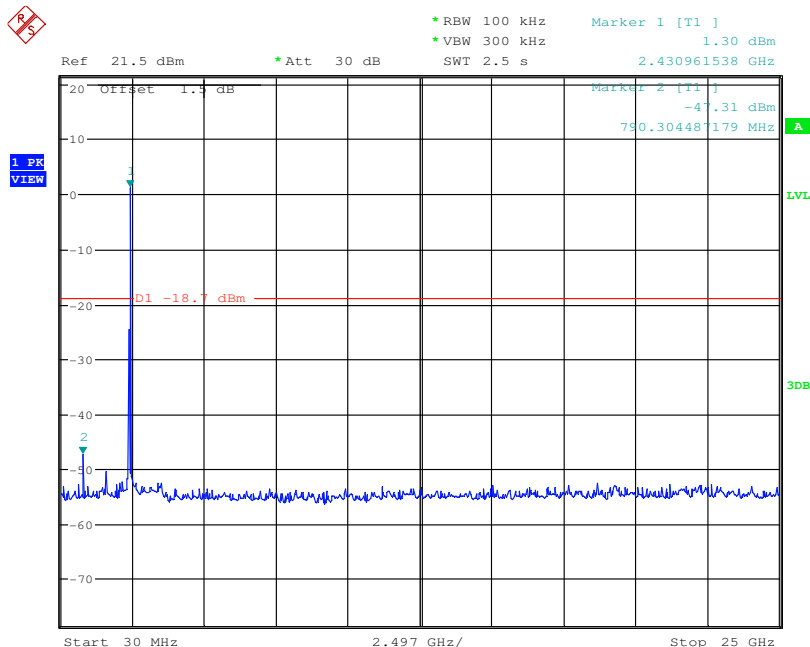
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT20)	Test channel:	Middle
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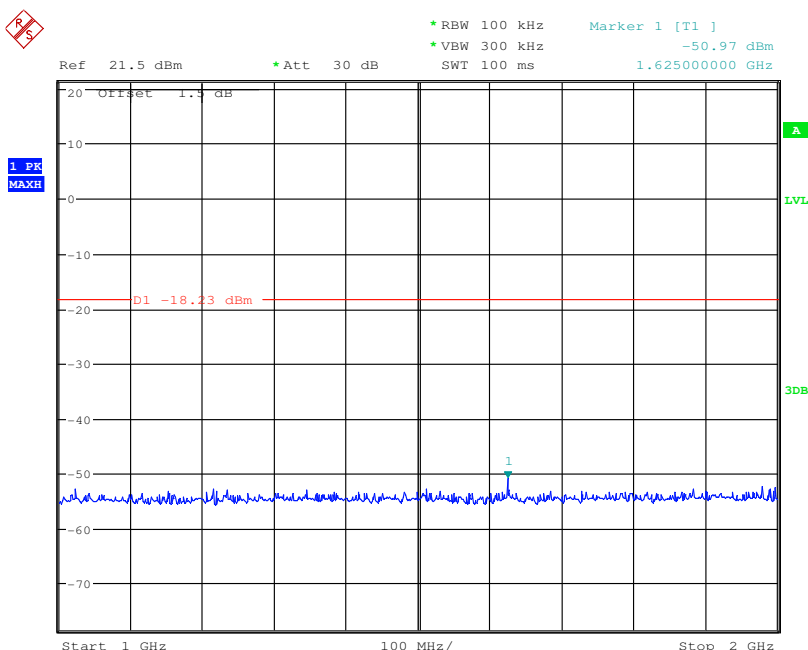
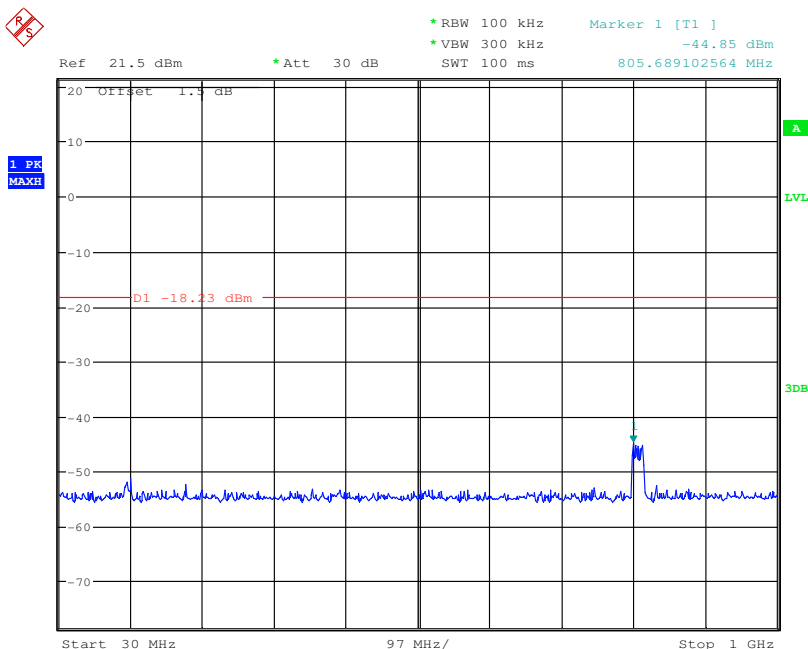
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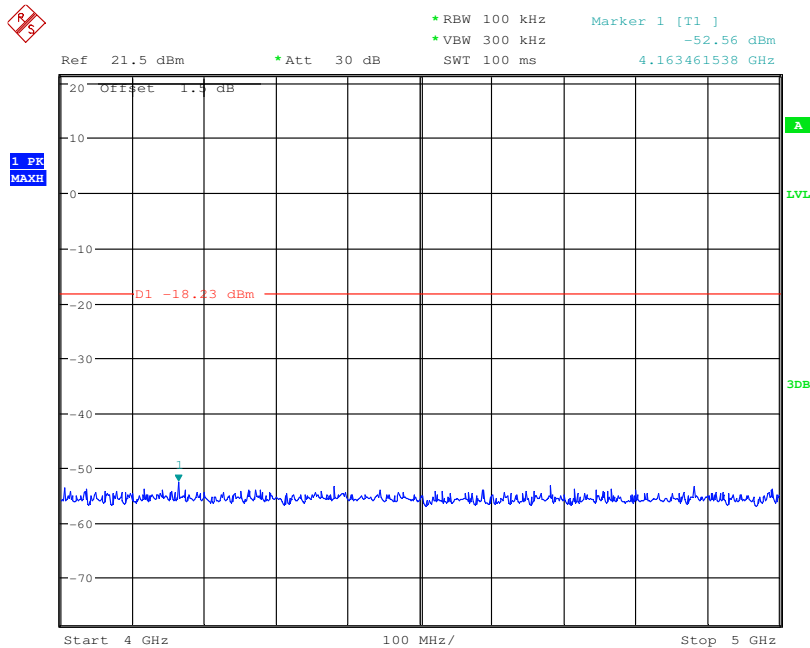
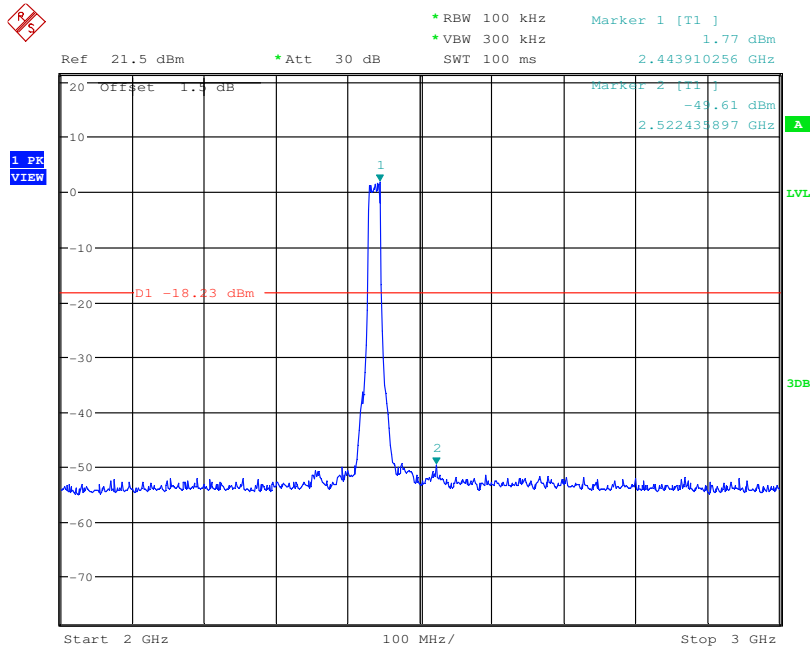
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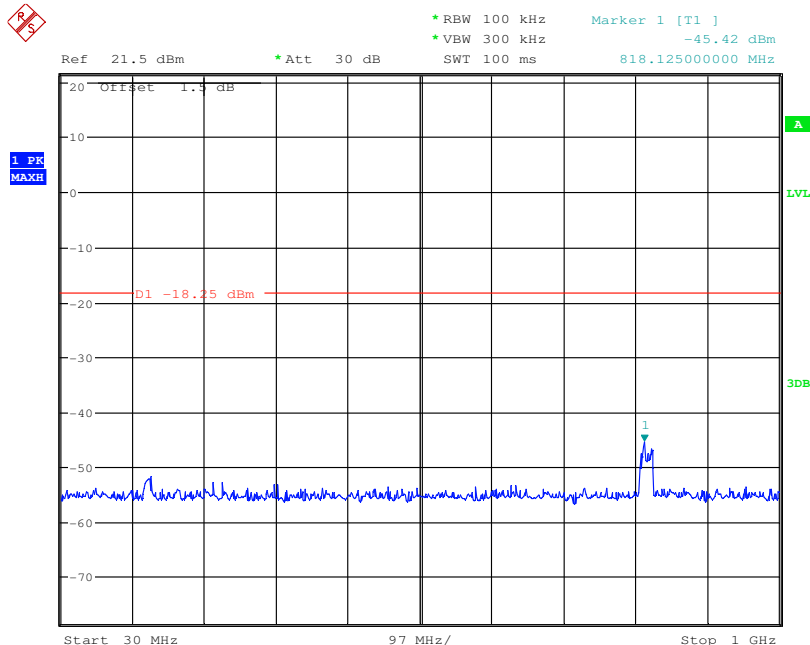
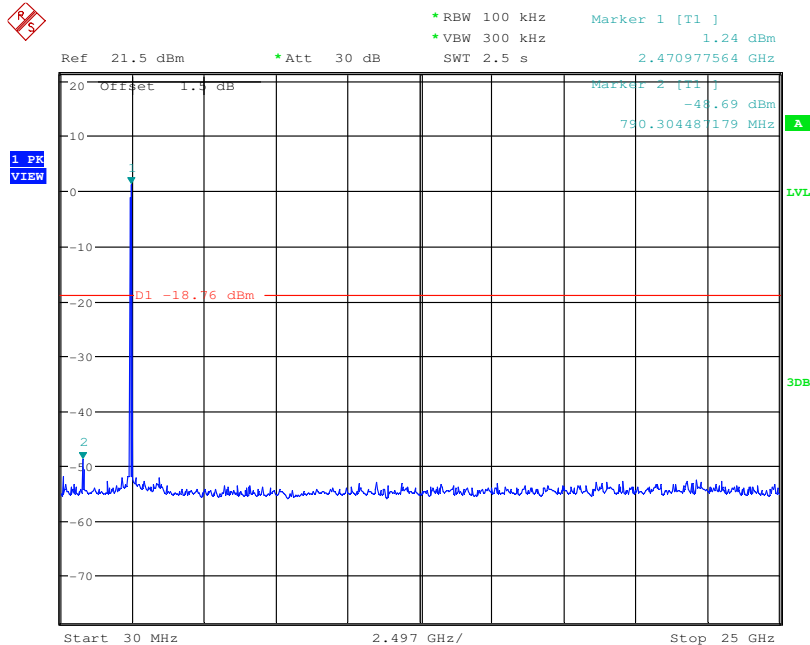


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Test mode:	802.11n(HT20)	Test channel:	Highest
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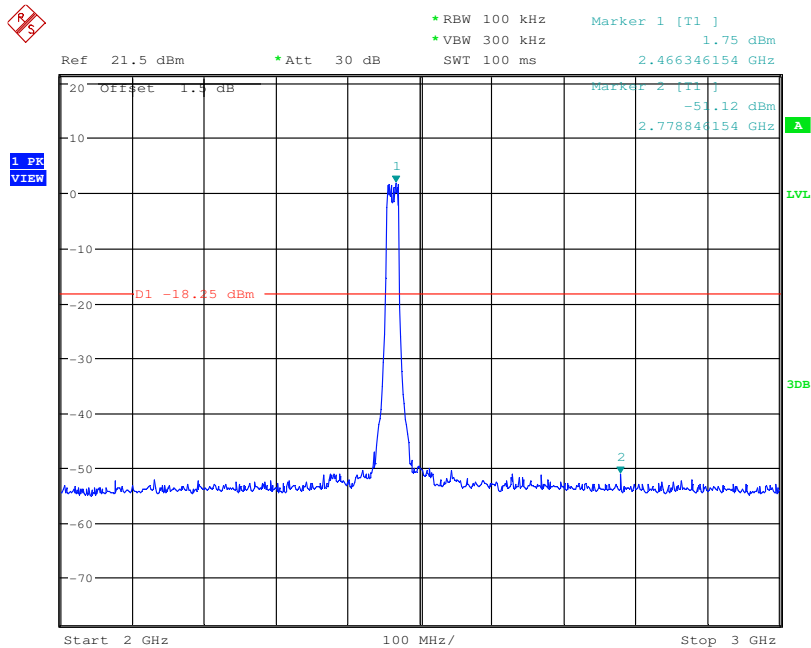
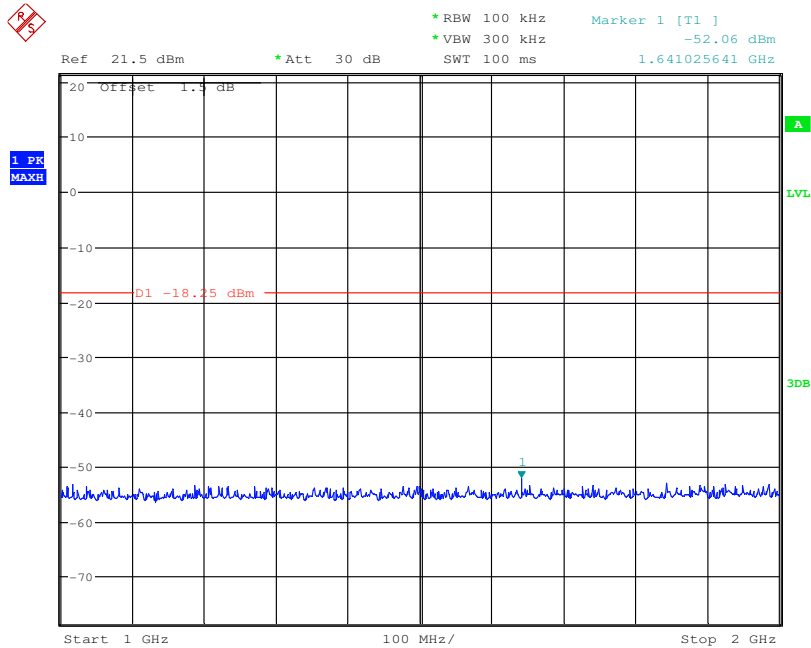
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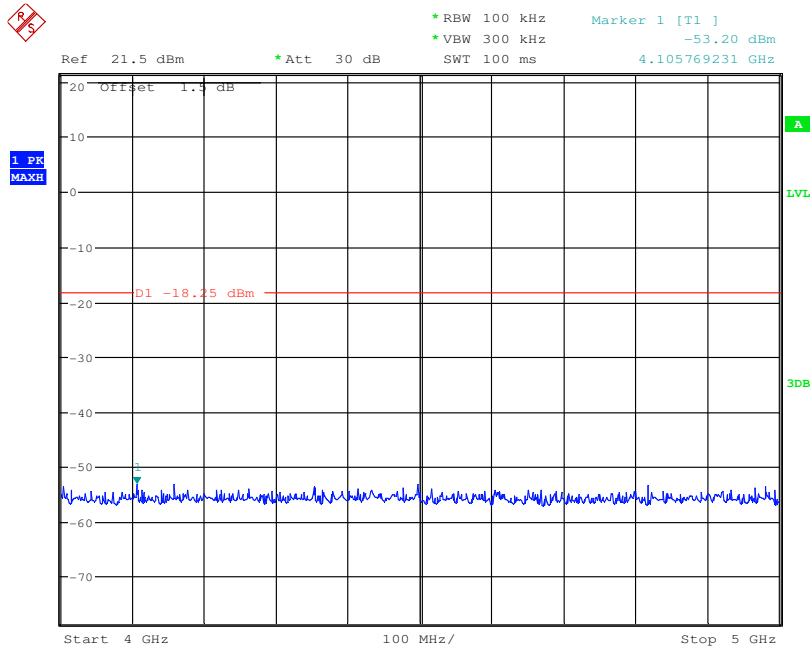
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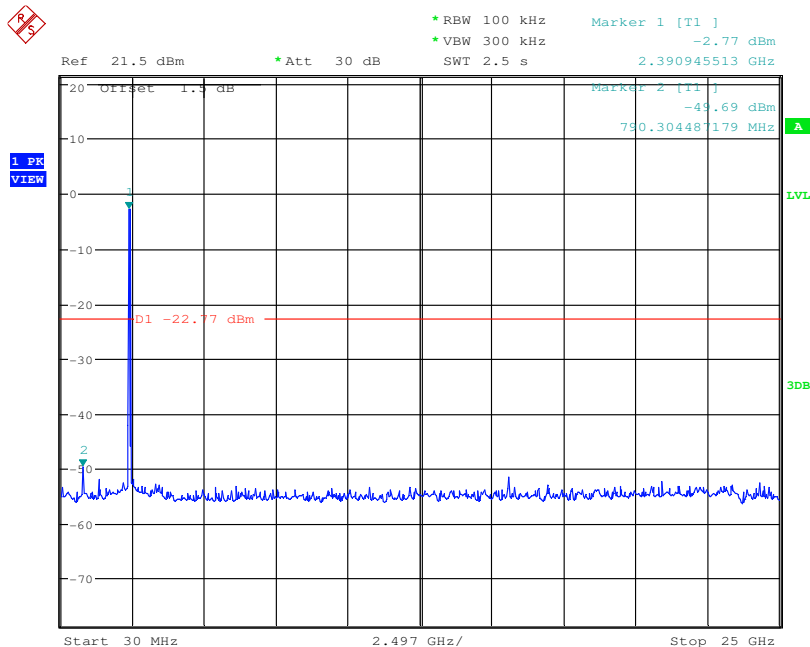
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Test mode:	802.11n(HT40)	Test channel:	Lowest
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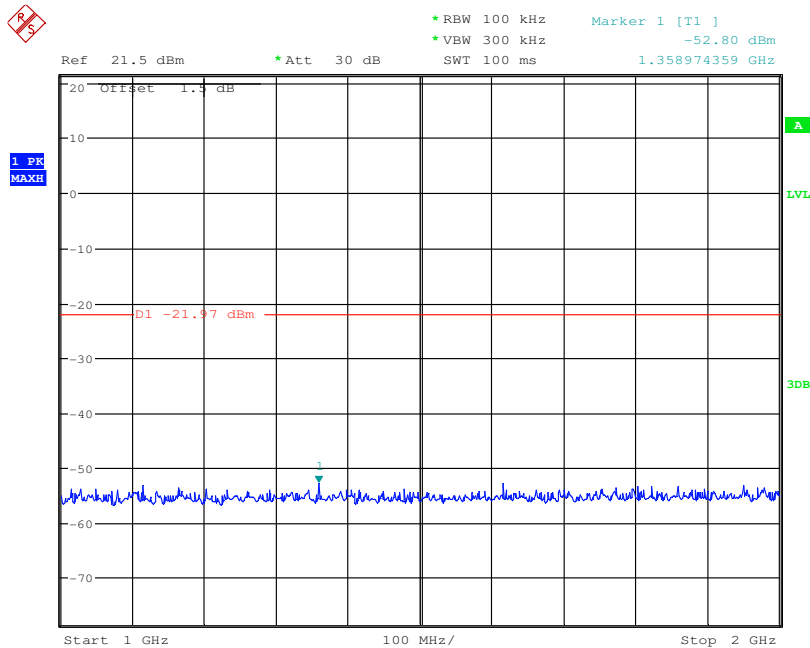
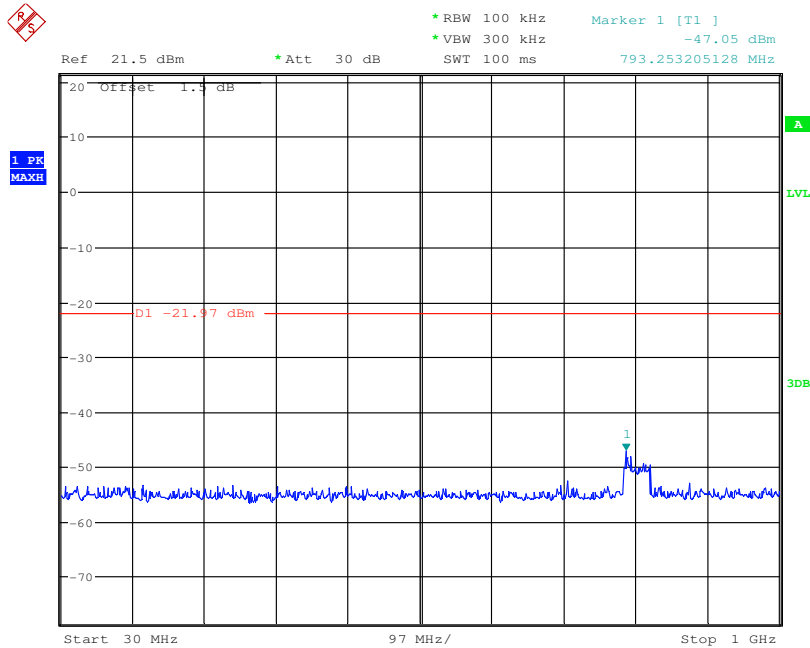
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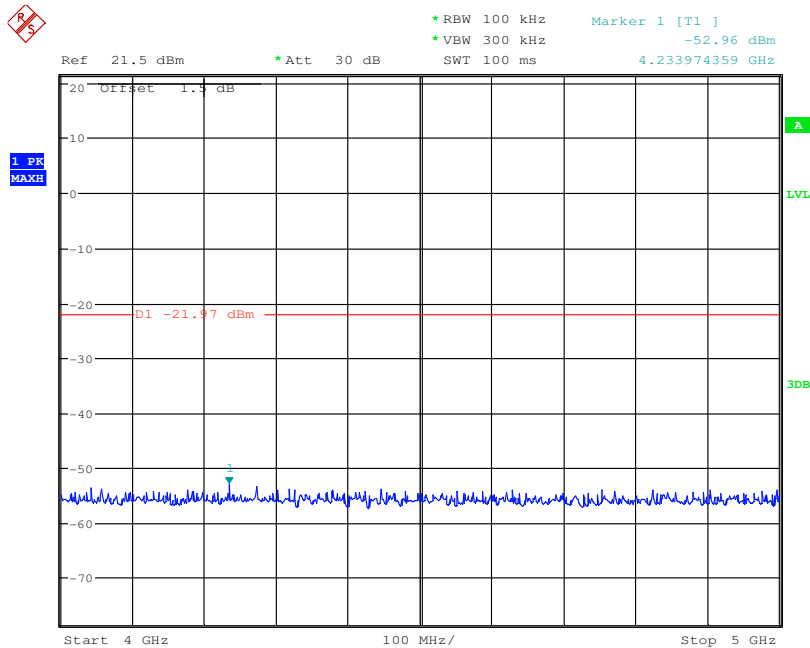
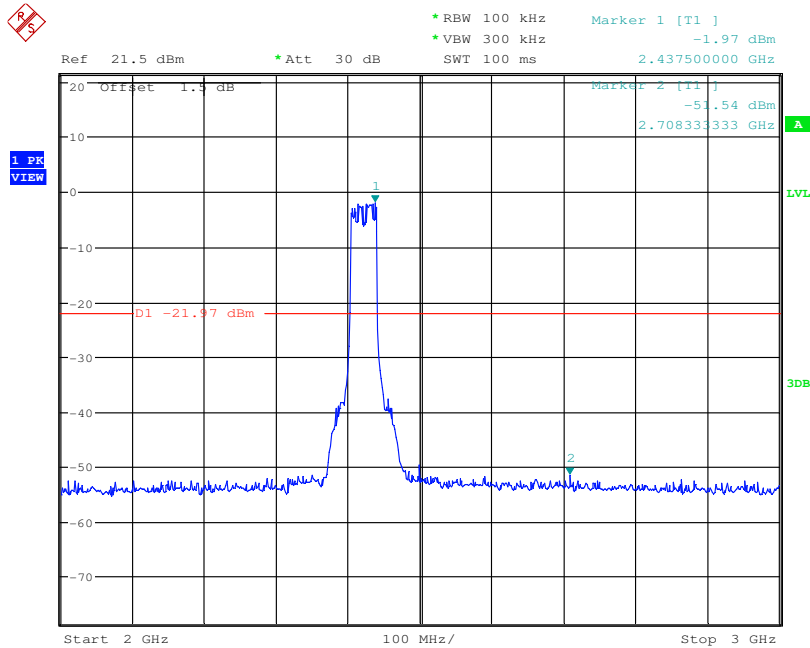
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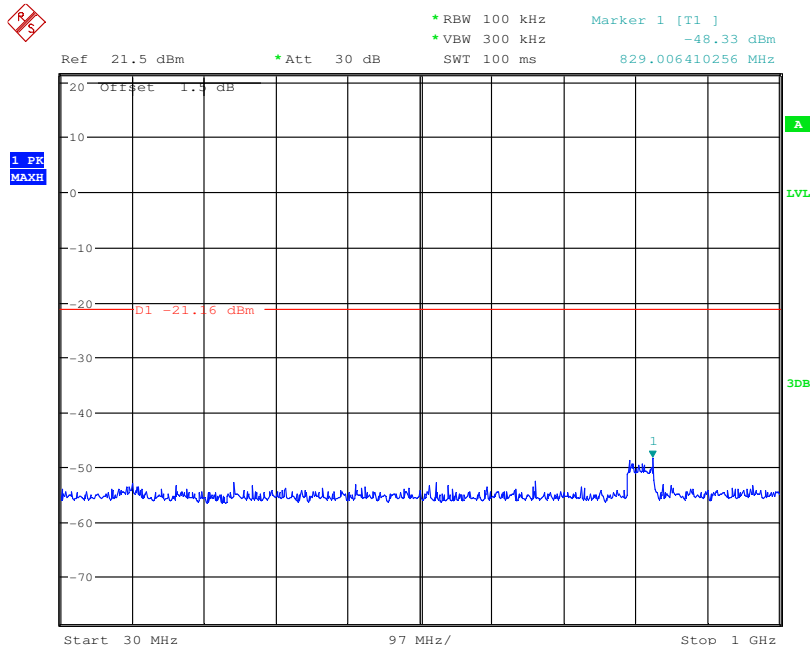
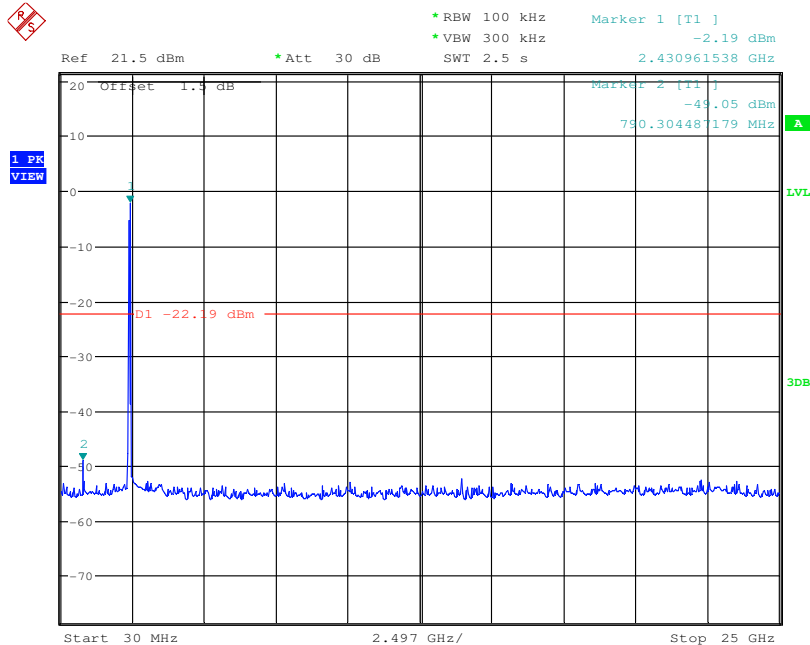


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Test mode:	802.11n(HT40)	Test channel:	Middle
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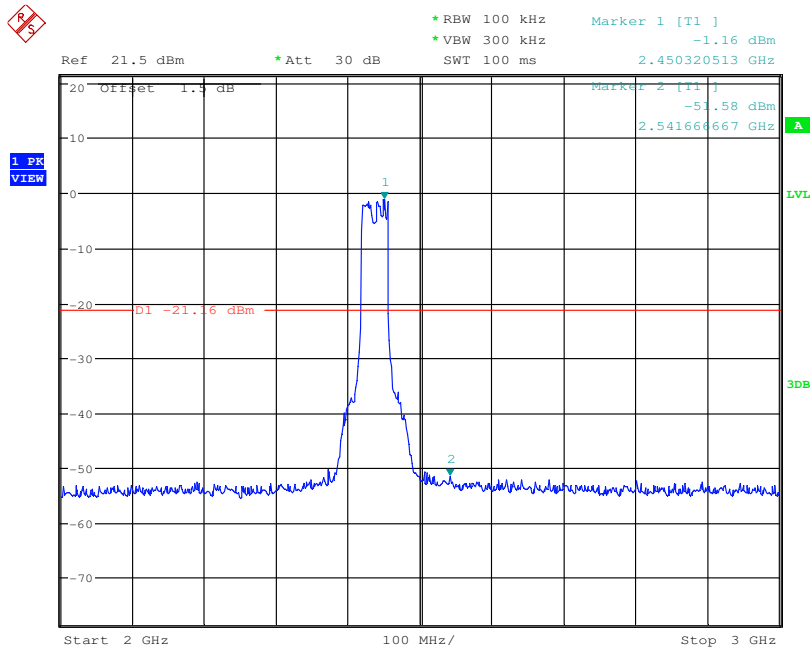
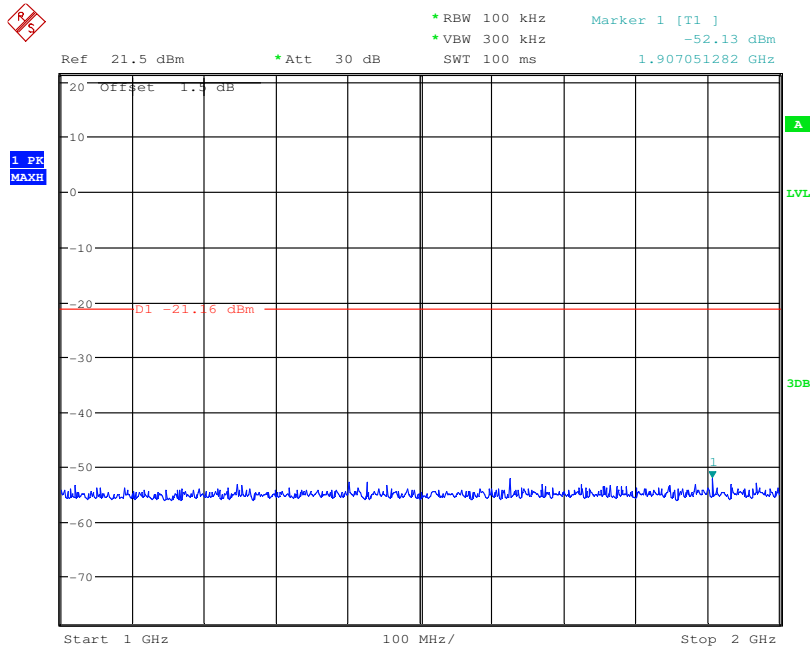
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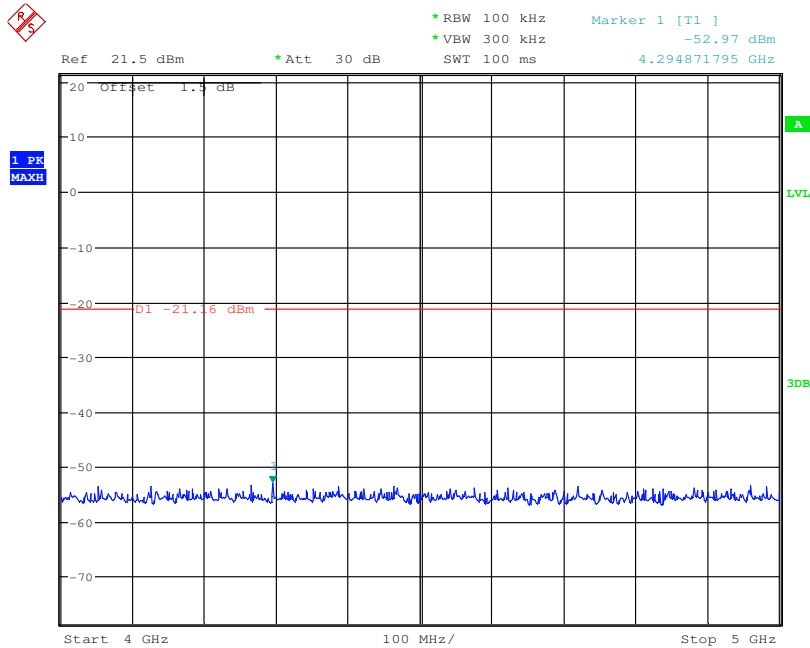
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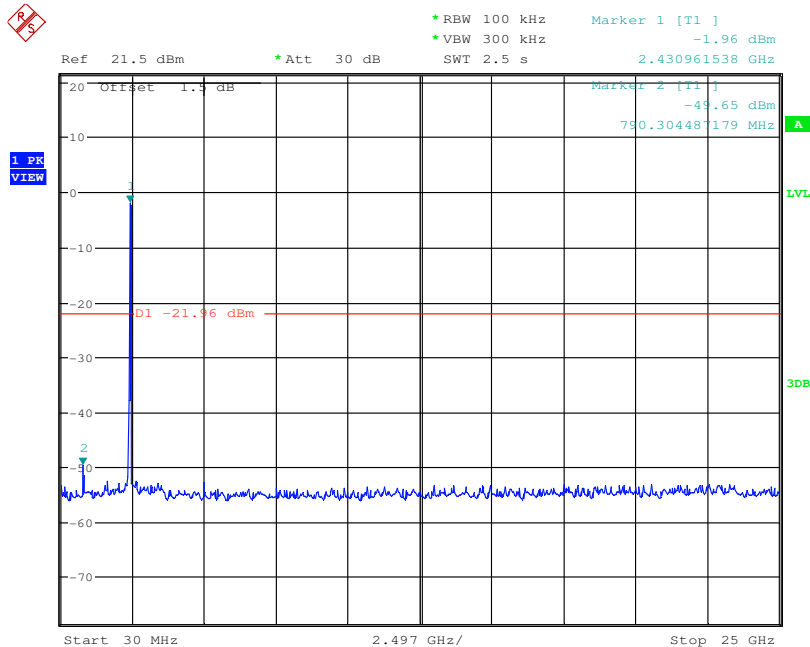
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Test mode:	802.11n(HT40)	Test channel:	Highest
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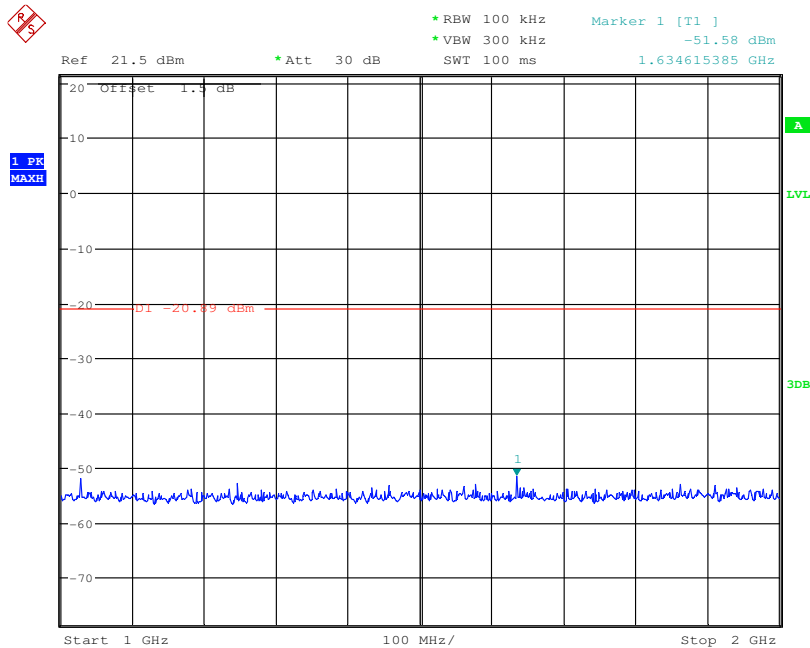
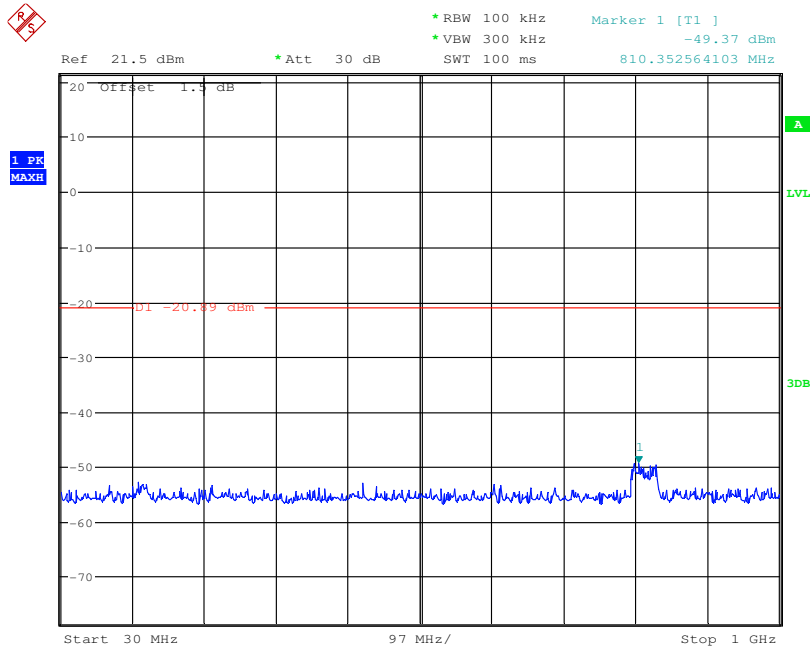
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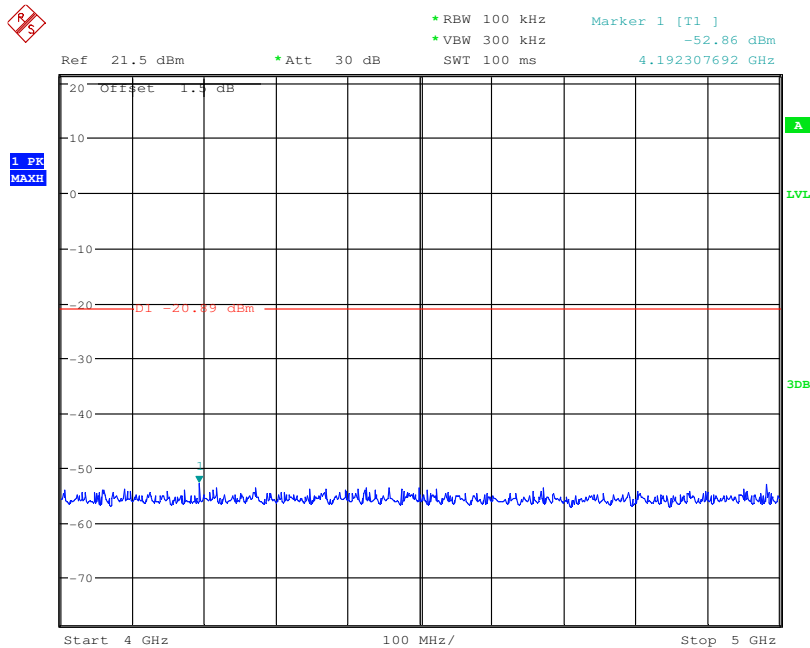
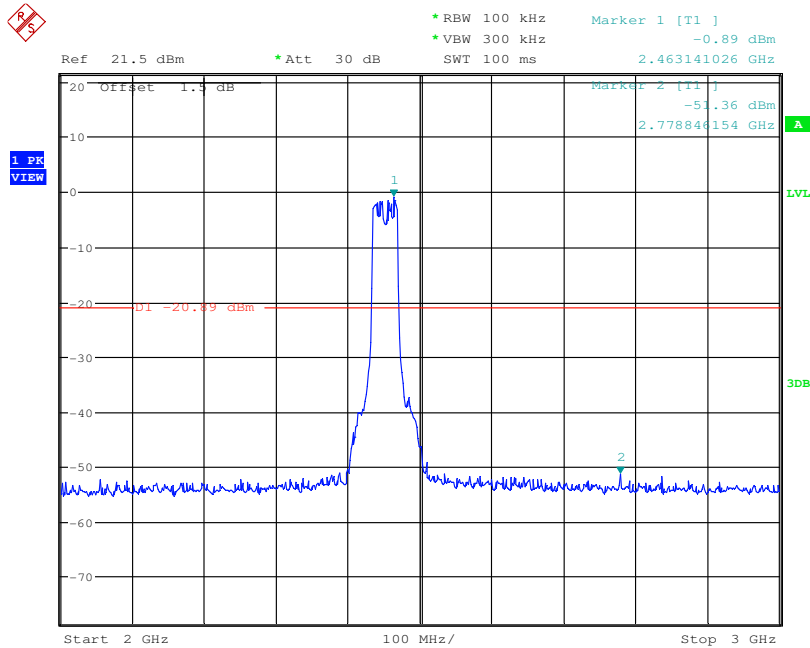
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Remark:

Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o), The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.

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## 6.8 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
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	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:

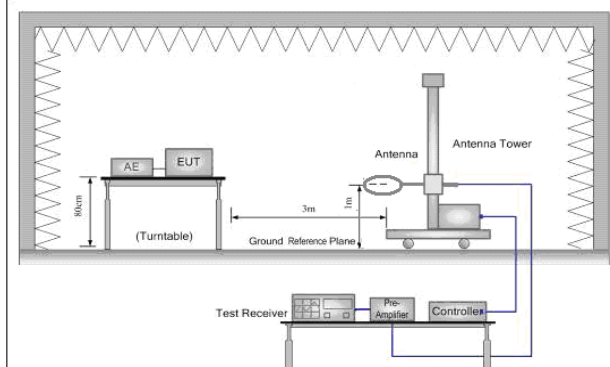


Figure 1. Below 30MHz

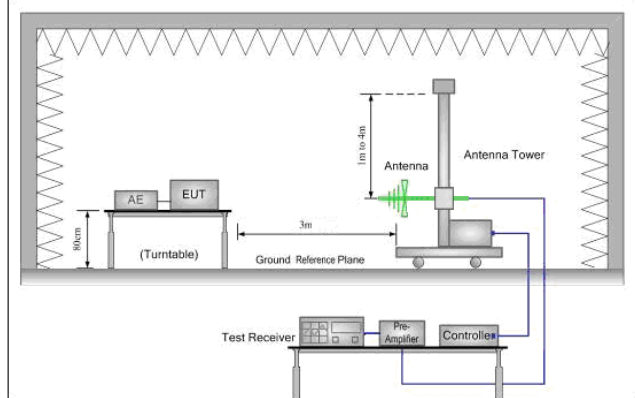


Figure 2. 30MHz to 1GHz

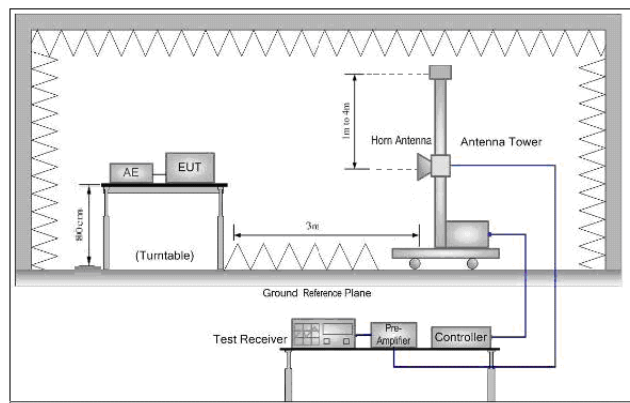


Figure 3. Above 1 GHz

## Test Procedure:

- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average



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	<p>method as specified and then reported in a data sheet.</p> <p>g. Test the EUT in the lowest channel ,the middle channel ,the Highest channel</p> <p>h. 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>i. Repeat above procedures until all frequencies measured was complete.</p>
Exploratory Test Mode:	<p>Transmitting with all kind of modulations, data rates.</p> <p>Transmitting mode.</p>
Final Test Mode:	<p>Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)</p> <p>For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case.</p> <p>Only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

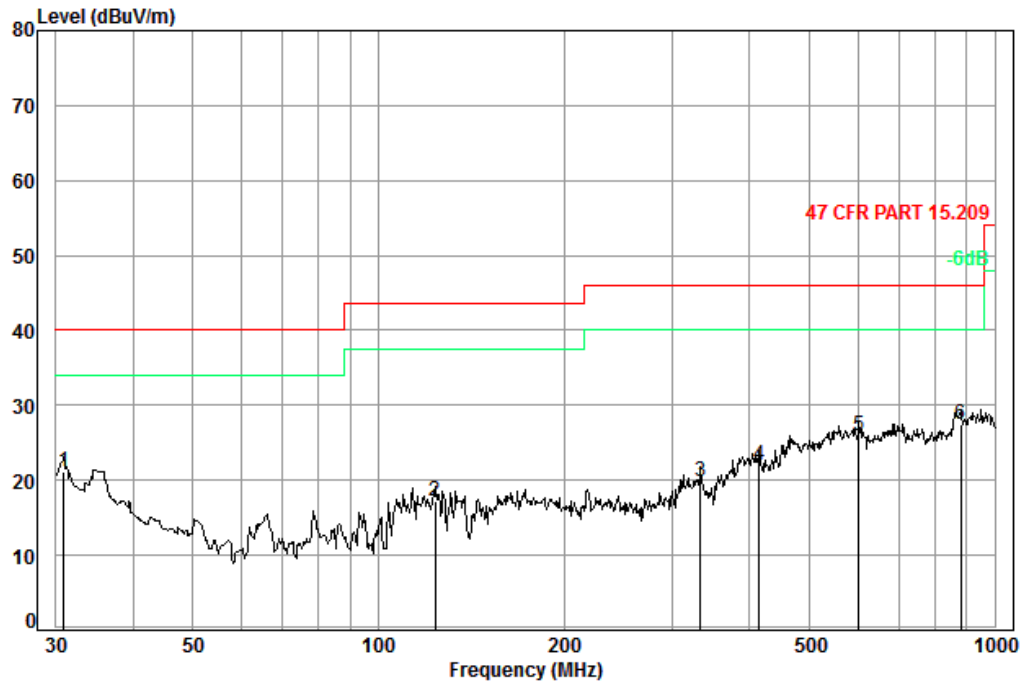




### 6.8.1 Radiated emission below 1GHz

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

Data: 66



Condition: 47 CFR PART 15.209 3m Vertical

Job No. : 2432CR

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Limit Level	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	30.87	0.60	18.22	27.35	29.63	21.10	40.00 -18.90
2	123.53	1.26	7.83	27.05	35.16	17.20	43.50 -26.30
3	333.36	2.01	14.50	26.66	29.96	19.81	46.00 -26.19
4	414.96	2.27	16.36	27.23	30.62	22.02	46.00 -23.98
5	602.12	2.71	19.86	27.54	30.84	25.87	46.00 -20.13
6	880.08	3.53	23.04	26.89	27.84	27.52	46.00 -18.48



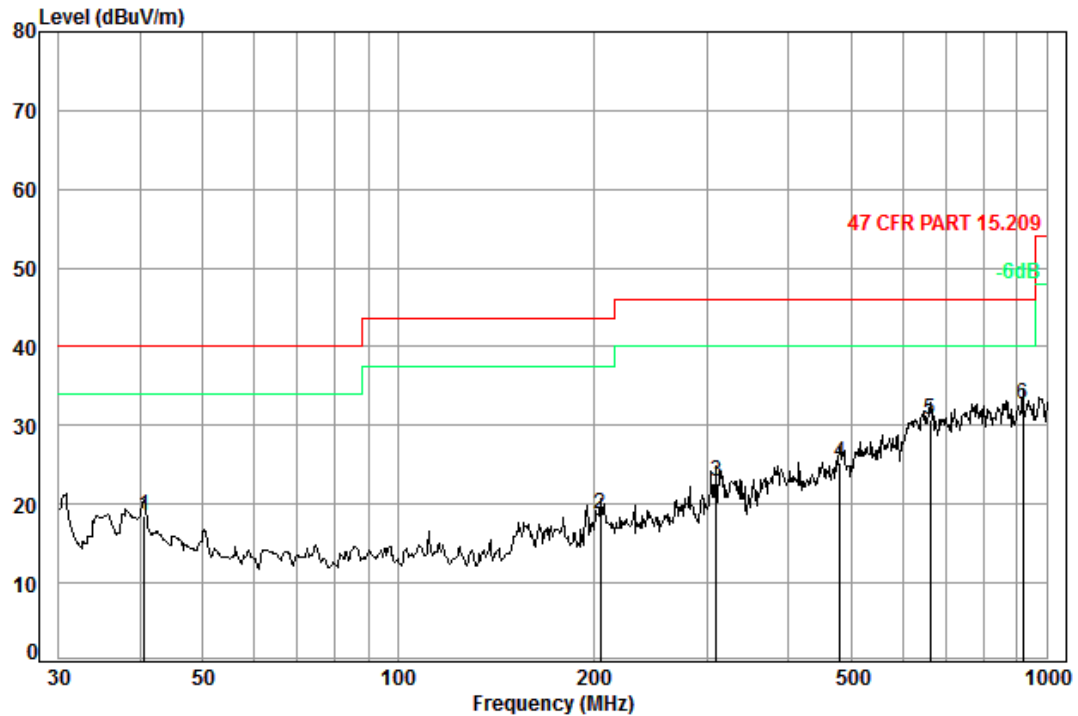
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Test mode:	Transmitting	Horizontal
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Data: 65



Condition: 47 CFR PART 15.209 3m Horizontal

Job No. : 2432CR

	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	40.58	0.61	12.84	27.32	32.38	18.51	40.00	-21.49
2	205.16	1.43	10.47	26.68	33.45	18.67	43.50	-24.83
3	309.89	1.93	14.26	26.48	33.17	22.88	46.00	-23.12
4	480.19	2.53	17.80	27.60	32.48	25.21	46.00	-20.79
5	662.05	2.83	20.99	27.46	34.48	30.84	46.00	-15.16
6	919.48	3.62	23.28	26.68	32.41	32.63	46.00	-13.37

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**6.8.2 Transmitter emission above 1GHz**

Test mode:		802.11b		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		
1672.296	2.76	29.54	38.39	47.02	40.93	74.00	-33.07	Vertical		
3709.691	4.06	33.08	38.83	46.21	44.52	74.00	-29.48	Vertical		
4824.000	4.29	34.70	39.24	46.38	46.13	74.00	-27.87	Vertical		
7236.000	5.30	35.63	39.07	44.72	46.58	74.00	-27.42	Vertical		
9648.000	6.52	37.33	37.93	43.14	49.06	74.00	-24.94	Vertical		
11515.680	7.62	38.24	38.47	44.90	52.29	74.00	-21.71	Vertical		
1621.985	2.70	29.30	38.39	46.09	39.70	74.00	-34.30	Horizontal		
3598.087	4.17	33.00	38.78	47.36	45.75	74.00	-28.25	Horizontal		
4824.000	4.29	34.70	39.24	49.57	49.32	74.00	-24.68	Horizontal		
7236.000	5.30	35.63	39.07	45.48	47.34	74.00	-26.66	Horizontal		
9648.000	6.52	37.33	37.93	43.75	49.67	74.00	-24.33	Horizontal		
11515.680	7.62	38.24	38.47	44.90	52.29	74.00	-21.71	Horizontal		

Test mode:		802.11b		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			
1880.038	2.93	30.76	38.41	46.74	42.02	74.00	-31.98	Vertical			
3644.175	4.13	33.03	38.80	45.23	43.59	74.00	-30.41	Vertical			
4874.000	4.36	34.78	39.26	44.96	44.84	74.00	-29.16	Vertical			
7311.000	5.20	35.50	39.06	44.94	46.58	74.00	-27.42	Vertical			
9748.000	6.49	37.81	37.84	41.92	48.38	74.00	-25.62	Vertical			
11722.720	7.38	38.42	38.57	43.37	50.60	74.00	-23.40	Vertical			
1823.477	2.90	30.30	38.41	46.43	41.22	74.00	-32.78	Horizontal			
3454.486	3.85	32.84	38.72	46.80	44.77	74.00	-29.23	Horizontal			
4874.000	4.36	34.78	39.26	49.63	49.51	74.00	-24.49	Horizontal			
7311.000	5.20	35.50	39.06	44.52	46.16	74.00	-27.84	Horizontal			
9748.000	6.49	37.81	37.84	43.00	49.46	74.00	-24.54	Horizontal			
11226.250	7.47	38.12	38.33	44.42	51.68	74.00	-22.32	Horizontal			



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Test mode:		802.11b		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			
1805.005	2.88	30.14	38.41	46.30	40.91	74.00	-33.09	Vertical			
3672.110	4.10	33.06	38.82	46.34	44.68	74.00	-29.32	Vertical			
4924.000	4.43	34.86	39.29	46.14	46.14	74.00	-27.86	Vertical			
7386.000	5.15	35.43	39.05	42.68	44.21	74.00	-29.79	Vertical			
9848.000	6.83	38.27	37.75	42.32	49.67	74.00	-24.33	Vertical			
12024.960	7.17	38.73	38.72	45.19	52.37	74.00	-21.63	Vertical			
1899.278	2.95	30.92	38.42	45.48	40.93	74.00	-33.07	Horizontal			
3489.840	3.93	32.88	38.74	46.09	44.16	74.00	-29.84	Horizontal			
4924.000	4.43	34.86	39.29	44.07	44.07	74.00	-29.93	Horizontal			
7386.000	5.15	35.43	39.05	43.84	45.37	74.00	-28.63	Horizontal			
9848.000	6.83	38.27	37.75	39.41	46.76	74.00	-27.24	Horizontal			
11812.580	7.32	38.51	38.61	43.55	50.77	74.00	-23.23	Horizontal			

Test mode:		802.11g		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			
1655.354	2.74	29.46	38.39	52.65	46.46	74.00	-27.54	Vertical			
3709.691	4.06	33.08	38.83	45.57	43.88	74.00	-30.12	Vertical			
4824.000	4.31	34.72	39.24	47.41	47.20	74.00	-26.80	Vertical			
7236.000	5.28	35.60	39.06	43.36	45.18	74.00	-28.82	Vertical			
9648.000	6.51	37.45	37.91	42.42	48.47	74.00	-25.53	Vertical			
11933.470	7.25	38.63	38.67	42.69	49.90	74.00	-24.10	Vertical			
1663.803	2.75	29.50	38.39	50.58	44.44	74.00	-29.56	Horizontal			
3598.087	4.17	33.00	38.78	45.65	44.04	74.00	-29.96	Horizontal			
4824.000	4.31	34.72	39.24	45.00	44.79	74.00	-29.21	Horizontal			
7236.000	5.28	35.60	39.06	44.21	46.03	74.00	-27.97	Horizontal			
9648.000	6.51	37.45	37.91	44.00	50.05	74.00	-23.95	Horizontal			
12241.140	6.82	39.00	38.91	44.00	50.91	74.00	-23.09	Horizontal			

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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	
1541.476	2.66	28.84	38.38	48.74	41.86	74.00	-32.14	Vertical	
3709.691	4.06	33.08	38.83	45.47	43.78	74.00	-30.22	Vertical	
4874.000	4.36	34.77	39.26	50.22	50.09	74.00	-23.91	Vertical	
7311.000	5.22	35.52	39.06	44.65	46.33	74.00	-27.67	Vertical	
9748.000	6.49	37.76	37.85	41.40	47.80	74.00	-26.20	Vertical	
11283.550	7.60	38.13	38.36	43.92	51.29	74.00	-22.71	Vertical	
1655.354	2.74	29.46	38.39	52.77	46.58	74.00	-27.42	Horizontal	
3579.815	4.13	32.98	38.78	44.68	43.01	74.00	-30.99	Horizontal	
4874.000	4.36	34.77	39.26	44.83	44.70	74.00	-29.30	Horizontal	
7311.000	5.22	35.52	39.06	43.22	44.90	74.00	-29.10	Horizontal	
9748.000	6.49	37.76	37.85	42.77	49.17	74.00	-24.83	Horizontal	
12117.140	7.02	38.85	38.80	42.91	49.98	74.00	-24.02	Horizontal	

Test mode:		802.11g		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	
1663.803	2.75	29.50	38.39	54.46	48.32	74.00	-25.68	Vertical	
3489.840	3.93	32.88	38.74	45.56	43.63	74.00	-30.37	Vertical	
4944.000	4.42	34.84	39.28	47.56	47.54	74.00	-26.46	Vertical	
7416.000	5.14	35.42	39.05	45.16	46.67	74.00	-27.33	Vertical	
9888.000	6.74	38.18	37.77	41.71	48.86	74.00	-25.14	Vertical	
12556.750	6.82	39.24	39.17	44.29	51.18	74.00	-22.82	Vertical	
1655.354	2.74	29.46	38.39	53.00	46.81	74.00	-27.19	Horizontal	
3709.691	4.06	33.08	38.83	45.51	43.82	74.00	-30.18	Horizontal	
4944.000	4.42	34.84	39.28	47.56	47.54	74.00	-26.46	Horizontal	
7416.000	5.14	35.42	39.05	44.26	45.77	74.00	-28.23	Horizontal	
9888.000	6.74	38.18	37.77	41.33	48.48	74.00	-25.52	Horizontal	
11283.550	7.60	38.13	38.36	43.03	50.40	74.00	-23.60	Horizontal	

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Test mode:		802.11n(HT20)		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	
1663.803	2.75	29.50	38.39	50.58	44.44	74.00	-29.56	Vertical	
3454.486	3.85	32.84	38.72	46.27	44.24	74.00	-29.76	Vertical	
4824.000	4.31	34.72	39.24	44.40	44.19	74.00	-29.81	Vertical	
7236.000	5.28	35.60	39.06	43.87	45.69	74.00	-28.31	Vertical	
9648.000	6.51	37.45	37.91	41.83	47.88	74.00	-26.12	Vertical	
11692.920	7.39	38.39	38.56	43.51	50.73	74.00	-23.27	Vertical	
1663.803	2.75	29.50	38.39	47.78	41.64	74.00	-32.36	Horizontal	
3893.520	4.12	33.32	38.91	44.70	43.23	74.00	-30.77	Horizontal	
4824.000	4.31	34.72	39.24	44.40	44.19	74.00	-29.81	Horizontal	
7236.000	5.28	35.60	39.06	43.15	44.97	74.00	-29.03	Horizontal	
9648.000	6.51	37.45	37.91	40.34	46.39	74.00	-27.61	Horizontal	
12055.600	7.12	38.77	38.75	42.10	49.24	74.00	-24.76	Horizontal	

Test mode:		802.11n(HT20)		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	
1698.033	2.78	29.65	38.4	45.45	39.48	74	-34.52	Vertical	
3690.853	4.08	33.07	38.82	45.18	43.51	74	-30.49	Vertical	
4874.000	4.36	34.77	39.26	49.44	49.31	74	-24.69	Vertical	
7311.000	5.22	35.52	39.06	42.94	44.62	74	-29.38	Vertical	
9748.000	6.49	37.76	37.85	40.05	46.45	74	-27.55	Vertical	
11056.090	7.32	38.11	38.25	42.13	49.31	74	-24.69	Vertical	
1655.354	2.74	29.46	38.39	51.46	45.27	74	-28.73	Horizontal	
3709.691	4.06	33.08	38.83	46.39	44.7	74	-29.3	Horizontal	
4874.000	4.36	34.77	39.26	44.79	44.66	74	-29.34	Horizontal	
7311.000	5.22	35.52	39.06	45.13	46.81	74	-27.19	Horizontal	
9748.000	6.49	37.76	37.85	42.55	48.95	74	-25.05	Horizontal	
11872.880	7.29	38.57	38.64	44.15	51.37	74	-22.63	Horizontal	



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Test mode:		802.11n(HT20)		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	
1663.803	2.75	29.50	38.39	51.51	45.37	74.00	-28.63	Vertical	
3672.110	4.10	33.06	38.82	46.58	44.92	74.00	-29.08	Vertical	
4944.000	4.42	34.84	39.28	46.58	46.56	74.00	-27.44	Vertical	
7416.000	5.14	35.42	39.05	47.28	48.79	74.00	-25.21	Vertical	
9888.000	6.74	38.18	37.77	41.71	48.86	74.00	-25.14	Vertical	
12117.140	7.02	38.85	38.80	44.44	51.51	74.00	-22.49	Vertical	
1655.354	2.74	29.46	38.39	49.37	43.18	74.00	-30.82	Horizontal	
3672.110	4.10	33.06	38.82	46.58	44.92	74.00	-29.08	Horizontal	
4944.000	4.42	34.84	39.28	46.58	46.56	74.00	-27.44	Horizontal	
7416.000	5.14	35.42	39.05	45.17	46.68	74.00	-27.32	Horizontal	
9888.000	6.74	38.18	37.77	41.71	48.86	74.00	-25.14	Horizontal	
12117.140	7.02	38.85	38.80	44.44	51.51	74.00	-22.49	Horizontal	

Test mode:		802.11n(HT40)		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	
1329.894	2.55	27.77	38.35	49.25	41.22	74.00	-32.78	Vertical	
3747.656	4.03	33.11	38.85	45.51	43.80	74.00	-30.20	Vertical	
4844.000	4.33	34.74	39.25	44.88	44.70	74.00	-29.30	Vertical	
7266.000	5.25	35.57	39.06	43.41	45.17	74.00	-28.83	Vertical	
9688.000	6.50	37.57	37.88	43.64	49.83	74.00	-24.17	Vertical	
12117.140	7.02	38.85	38.80	43.51	50.58	74.00	-23.42	Vertical	
1655.354	2.74	29.46	38.39	54.26	48.07	74.00	-25.93	Horizontal	
3598.087	4.17	33.00	38.78	45.05	43.44	74.00	-30.56	Horizontal	
4844.000	4.33	34.74	39.25	50.92	50.74	74.00	-23.26	Horizontal	
7266.000	5.25	35.57	39.06	43.40	45.16	74.00	-28.84	Horizontal	
9688.000	6.50	37.57	37.88	40.33	46.52	74.00	-27.48	Horizontal	
11283.550	7.60	38.13	38.36	43.37	50.74	74.00	-23.26	Horizontal	

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Test mode:		802.11n(HT40)		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			
1655.354	2.74	29.46	38.39	53.68	47.49	74.00	-26.51	Vertical			
3728.625	4.05	33.10	38.84	45.24	43.55	74.00	-30.45	Vertical			
4874.000	4.36	34.77	39.26	47.99	47.86	74.00	-26.14	Vertical			
7311.000	5.22	35.52	39.06	44.43	46.11	74.00	-27.89	Vertical			
9748.000	6.49	37.76	37.85	41.30	47.70	74.00	-26.30	Vertical			
11994.380	7.21	38.69	38.70	43.54	50.74	74.00	-23.26	Vertical			
1655.354	2.74	29.46	38.39	49.99	43.80	74.00	-30.20	Horizontal			
3728.625	4.05	33.10	38.84	45.24	43.55	74.00	-30.45	Horizontal			
4874.000	4.36	34.77	39.26	47.99	47.86	74.00	-26.14	Horizontal			
7311.000	5.22	35.52	39.06	44.43	46.11	74.00	-27.89	Horizontal			
9748.000	6.49	37.76	37.85	41.07	47.47	74.00	-26.53	Horizontal			
12055.600	7.12	38.77	38.75	43.38	50.52	74.00	-23.48	Horizontal			

Test mode:		802.11n(HT40)		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			
1663.803	2.75	29.50	38.39	45.65	39.51	74.00	-34.49	Vertical			
3598.087	4.17	33.00	38.78	43.96	42.35	74.00	-31.65	Vertical			
4924.000	4.40	34.82	39.28	43.43	43.37	74.00	-30.63	Vertical			
7386.000	5.15	35.44	39.05	43.57	45.11	74.00	-28.89	Vertical			
9848.000	6.62	38.06	37.79	41.00	47.89	74.00	-26.11	Vertical			
11812.580	7.32	38.51	38.61	42.07	49.29	74.00	-24.71	Vertical			
1663.803	2.75	29.50	38.39	53.12	46.98	74.00	-27.02	Horizontal			
3709.691	4.06	33.08	38.83	45.55	43.86	74.00	-30.14	Horizontal			
4924.000	4.40	34.82	39.28	49.09	49.03	74.00	-24.97	Horizontal			
7386.000	5.15	35.44	39.05	44.98	46.52	74.00	-27.48	Horizontal			
9848.000	6.62	38.06	37.79	40.49	47.38	74.00	-26.62	Horizontal			
12024.960	7.17	38.73	38.72	43.22	50.40	74.00	-23.60	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.

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- 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.

## 6.9 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10 2009		
Test Site:	Measurement Distance: 3m (Semi-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:

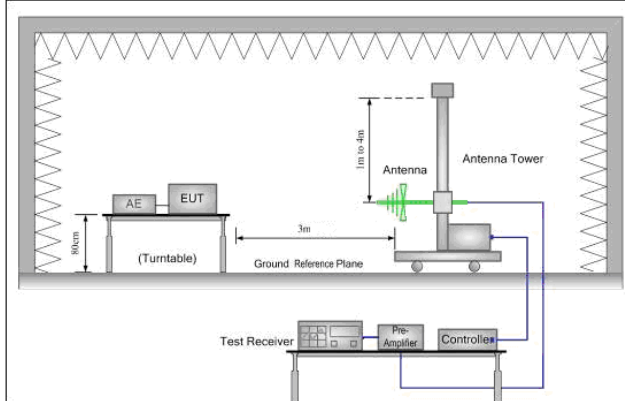


Figure 1. 30MHz to 1GHz

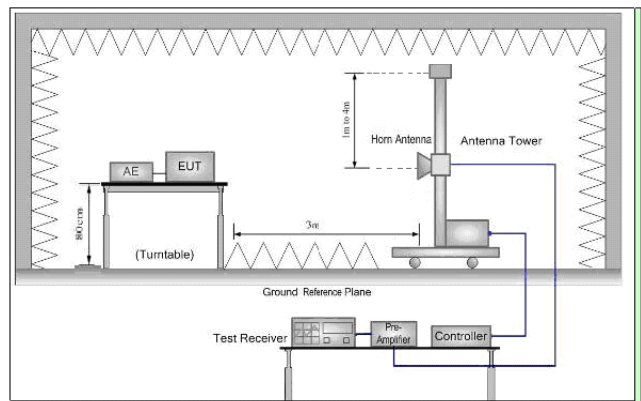


Figure 2. Above 1 GHz



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Test Procedure:	<ul style="list-style-type: none"><li>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.</li><li>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.</li><li>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.</li><li>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.</li><li>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>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 channel</li><li>g. Test the EUT in the lowest channel , the Highest channel</li><li>h. 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>i. Repeat above procedures until all frequencies measured was complete.</li></ul>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Transmitting mode.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40) Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



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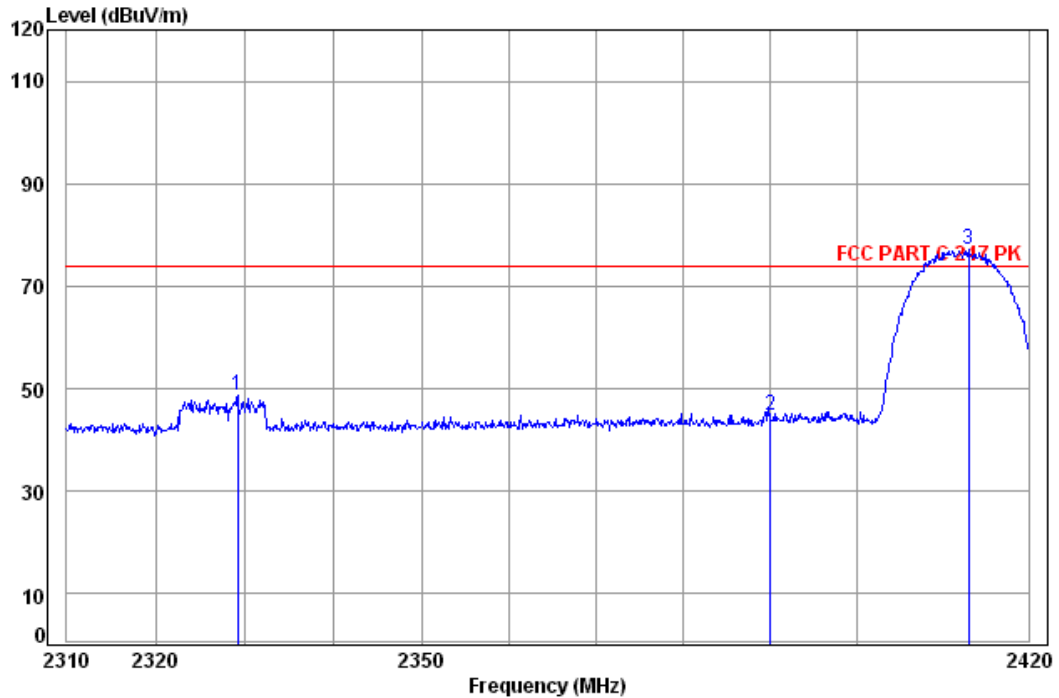
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Test plot as follows:

Test mode:	802.11b	Test channel:	Lowest	Remark:	Peak	Vertical
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Data: 69



Site : chamber  
Condition: FCC PART C 247 PK 3m Vertical  
Job No: : 2432CR  
Mode: : 2412 B Band edge

	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	2329.21	4.82	31.95	38.45	50.33	48.65	74.00	-25.35
2	2390.00	4.90	32.35	38.46	45.97	44.76	74.00	-29.24
3 pp	2413.03	4.93	32.41	38.46	78.18	77.06	74.00	3.06

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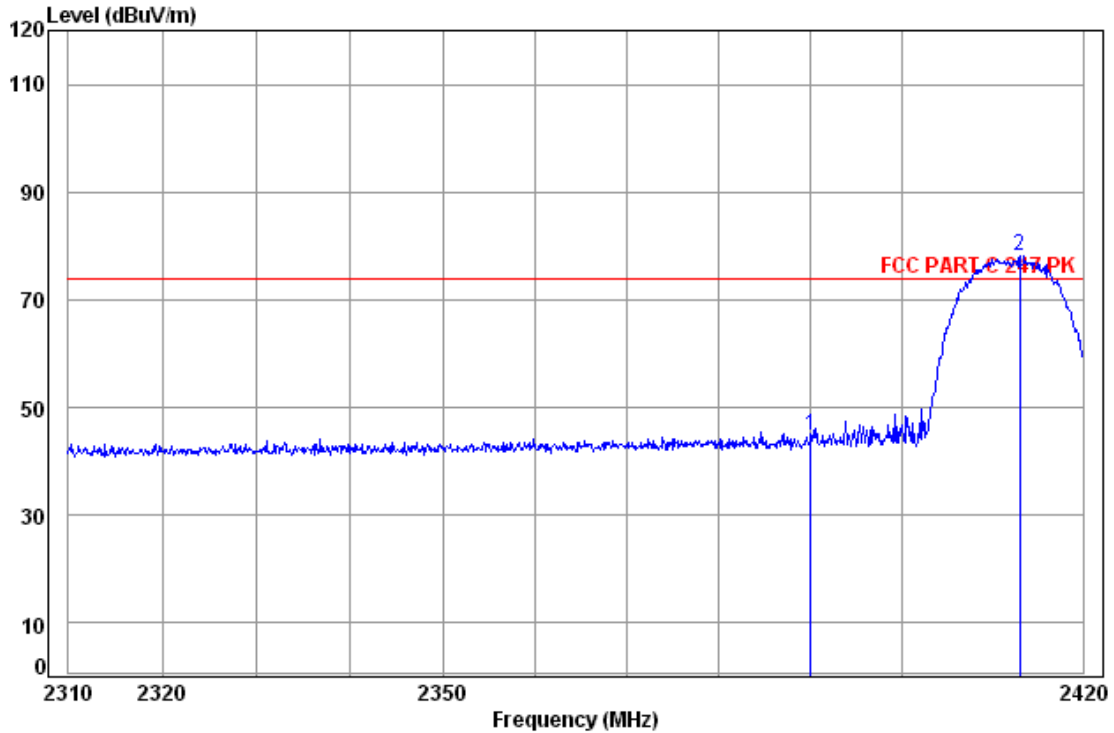
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Test mode:	802.11b	Test channel:	Lowest	Remark:	Peak	Horizontal
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Data: 71



Site : chamber  
Condition: FCC PART C 247 PK 3m Horizontal  
Job No: : 2432CR  
Mode: : 2412 B Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	45.94	44.73	74.00	-29.27
2 pp	2413.03	4.93	32.41	38.46	79.13	78.01	74.00	4.01

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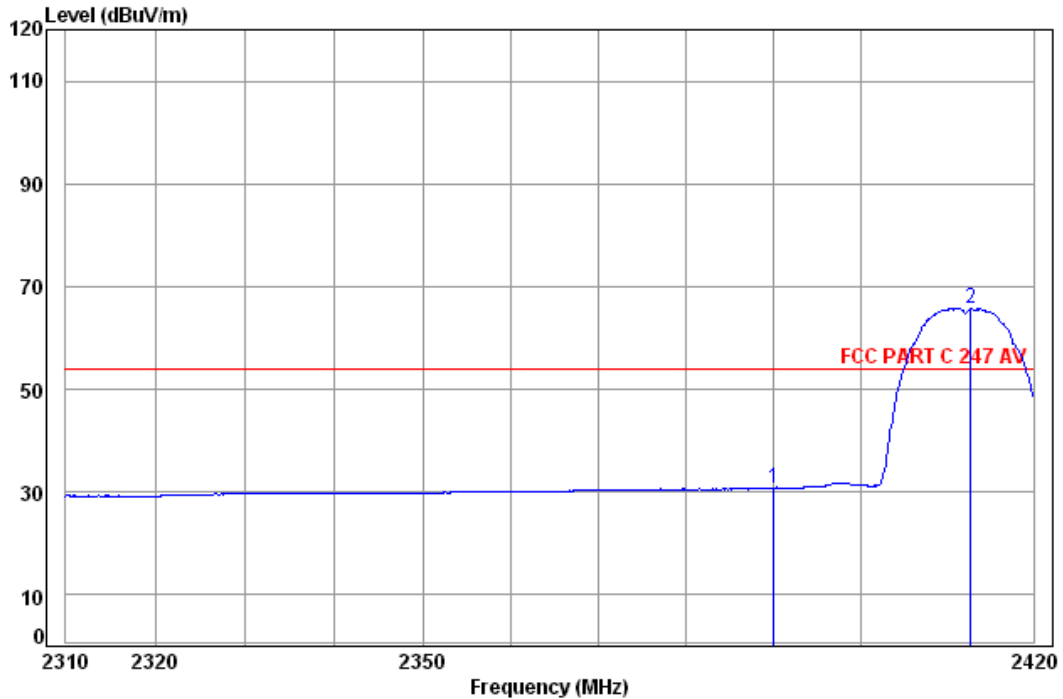
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Test mode:	802.11b	Test channel:	Lowest	Remark:	Average	Vertical
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Data: 70



Site : chamber  
Condition: FCC PART C 247 AV 3m Vertical  
Job No: : 2432CR  
Mode: : 2412 B Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	32.05	30.84	54.00	-23.16
2 pp	2412.69	4.93	32.41	38.46	66.88	65.76	54.00	11.76

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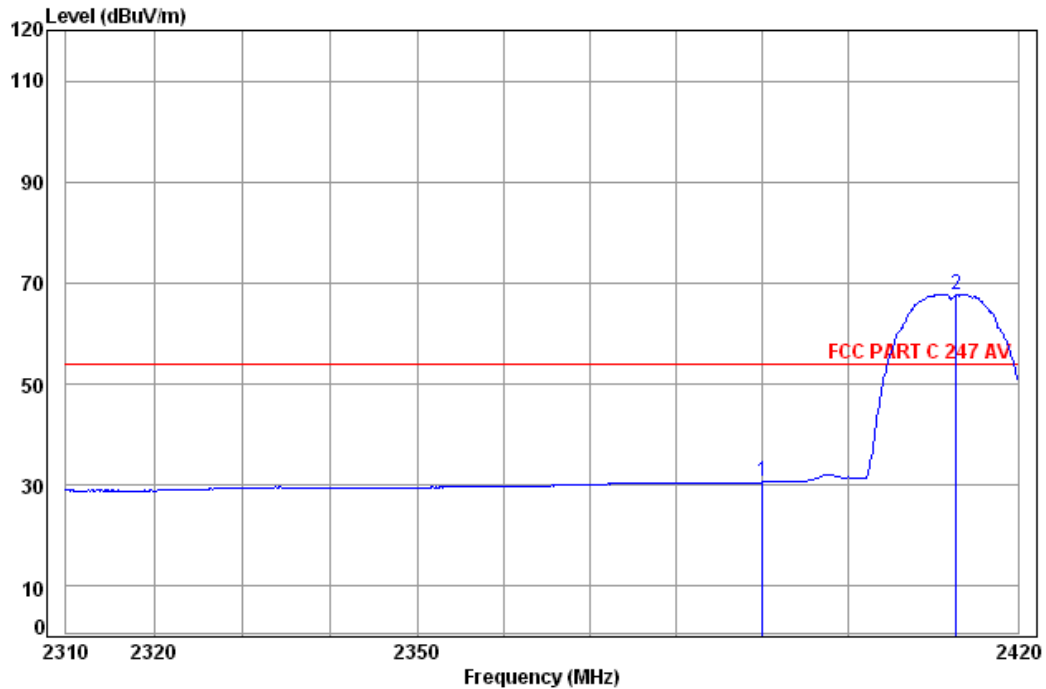
# SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEM150500243201

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Test mode:	802.11b	Test channel:	Lowest	Remark:	Average	Horizontal
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Data: 72



Site : chamber

Condition: FCC PART C 247 AV 3m Horizontal

Job No: : 2432CR

Mode: : 2412 B Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	31.84	30.63	54.00	-23.37
2 pp	2412.69	4.93	32.41	38.46	68.92	67.80	54.00	13.80

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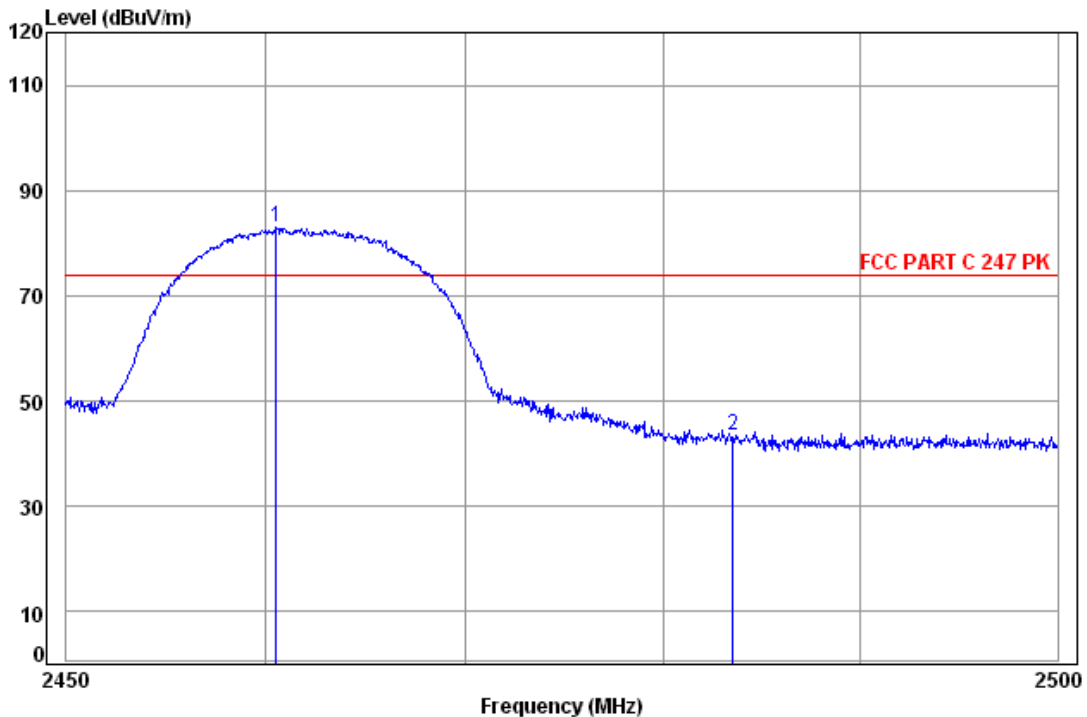
# SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEM150500243201

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Test mode:	802.11b	Test channel:	Highest	Remark:	Peak	Vertical
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Data: 153



Site : chamber  
Condition: FCC PART C 247 PK 3m Vertical  
Job No: : 2432CR  
Mode: : 2462 B Band edge

		Cable	Ant	Preamp	Read	Limit	Over
	Freq	Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m
1 pp	2460.52	5.00	32.43	38.46	84.11	83.08	74.00
2	2483.50	5.03	32.44	38.47	44.48	43.48	74.00



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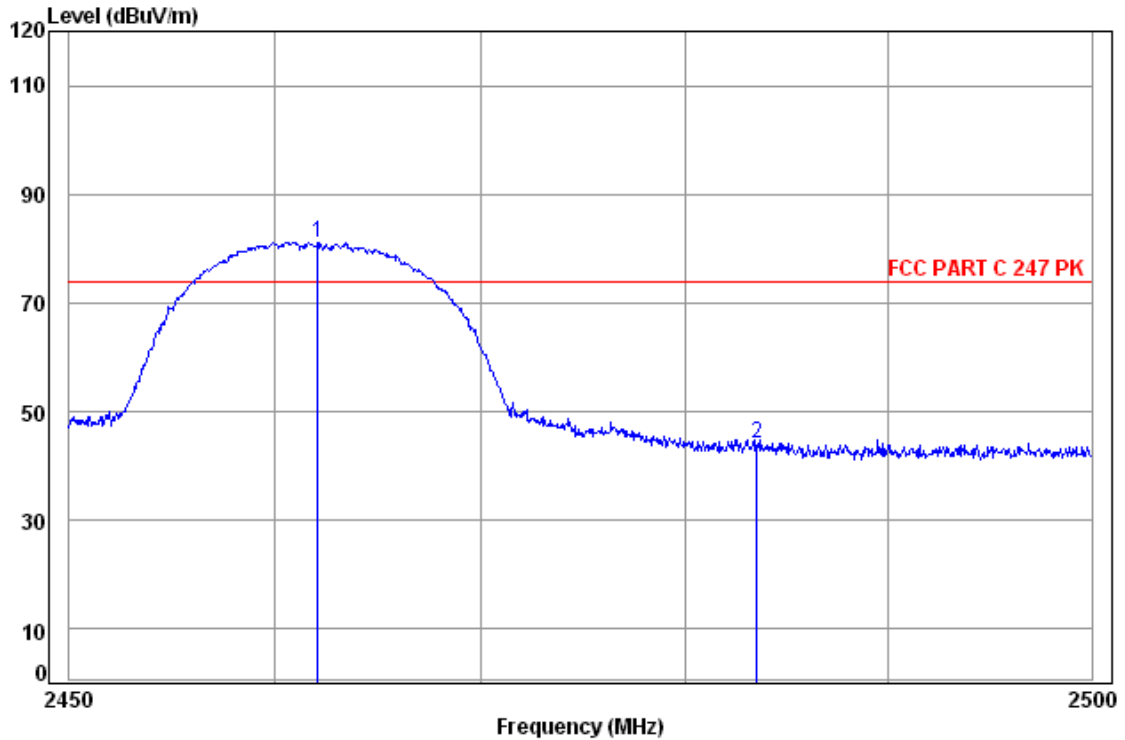
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11b	Test channel:	Highest	Remark:	Peak	Horizontal
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Data: 151



Site : chamber  
Condition: FCC PART C 247 PK 3m Horizontal  
Job No: : 2432CR  
Mode: : 2462 B Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2462.06	5.00	32.43	38.46	82.18	81.15	74.00	7.15
2	2483.50	5.03	32.44	38.47	45.25	44.25	74.00	-29.75

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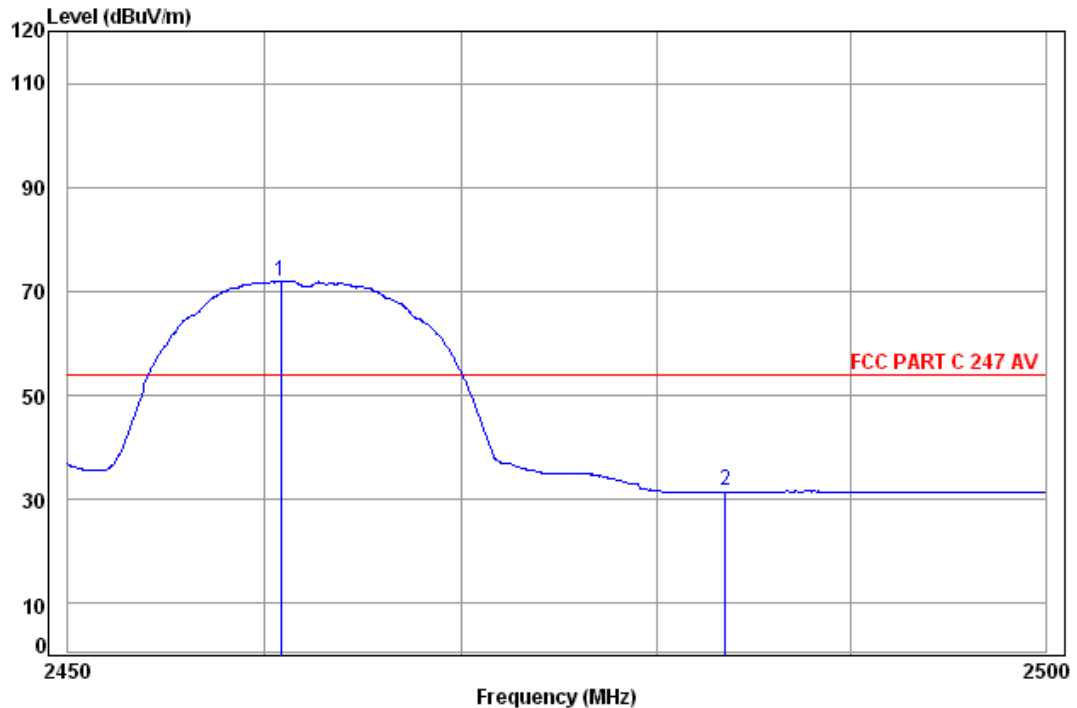
# SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEM150500243201

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Test mode:	802.11b	Test channel:	Highest	Remark:	Average	Vertical
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Data: 154



Site : chamber  
Condition: FCC PART C 247 AV 3m Vertical  
Job No: : 2432CR  
Mode: : 2462 B Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2460.81	5.00	32.43	38.46	73.05	72.02	54.00	18.02
2	2483.50	5.03	32.44	38.47	32.76	31.76	54.00	-22.24

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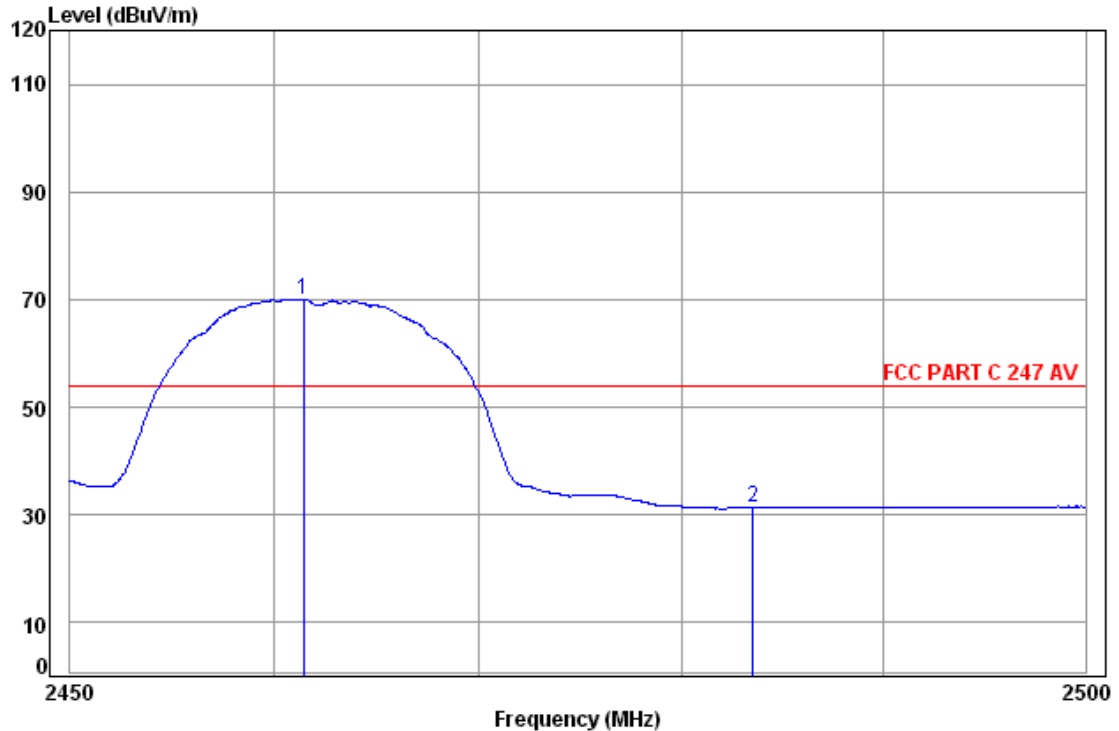
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11b	Test channel:	Highest	Remark:	Average	Horizontal
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Data: 152



Site : chamber  
Condition: FCC PART C 247 AV 3m Horizontal  
Job No: : 2432CR  
Mode: : 2462 B Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2461.41	5.00	32.43	38.46	71.05	70.02	54.00	16.02
2	2483.50	5.03	32.44	38.47	32.35	31.35	54.00	-22.65

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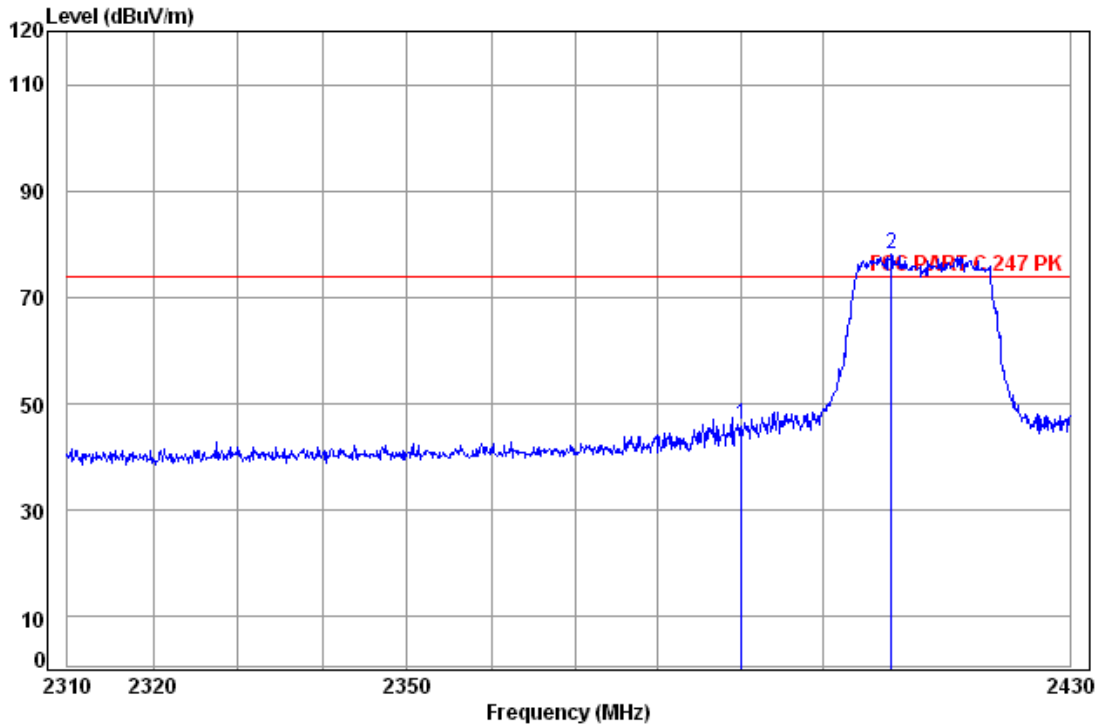
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11g	Test channel:	Lowest	Remark:	Peak	Vertical
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Data: 83



Site : chamber  
Condition: FCC PART C 247 PK 3m Vertical  
Job No: : 2432CR  
Mode: : 2412 G Band edge

		Cable	Ant	Preampl	Read	Limit	Over
	Freq	Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	47.41	46.20	74.00 -27.80
2 pp	2408.19	4.93	32.41	38.46	79.39	78.27	74.00 4.27

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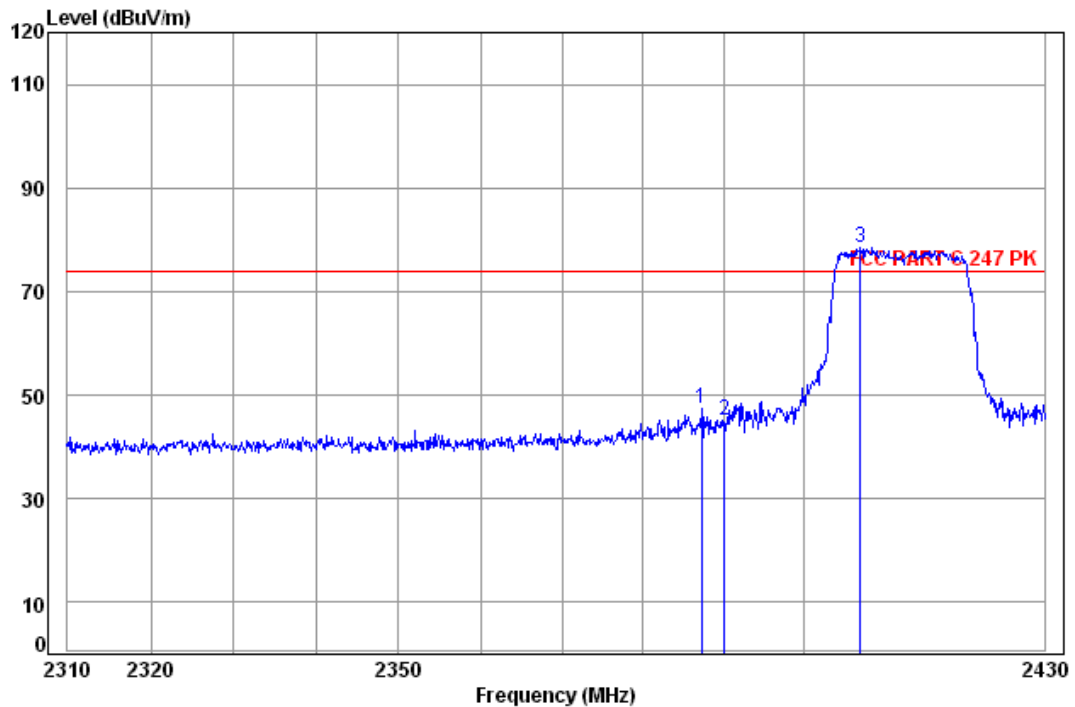
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11g	Test channel:	Lowest	Remark:	Peak	Horizontal
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Data: 81



Site : chamber  
Condition: FCC PART C 247 PK 3m Horizontal  
Job No: : 2432CR  
Mode: : 2412 G Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2387.19	4.90	32.33	38.46	48.60	47.37	74.00	-26.63
2	2390.00	4.90	32.35	38.46	46.31	45.10	74.00	-28.90
3 pp	2406.97	4.92	32.41	38.46	79.76	78.63	74.00	4.63

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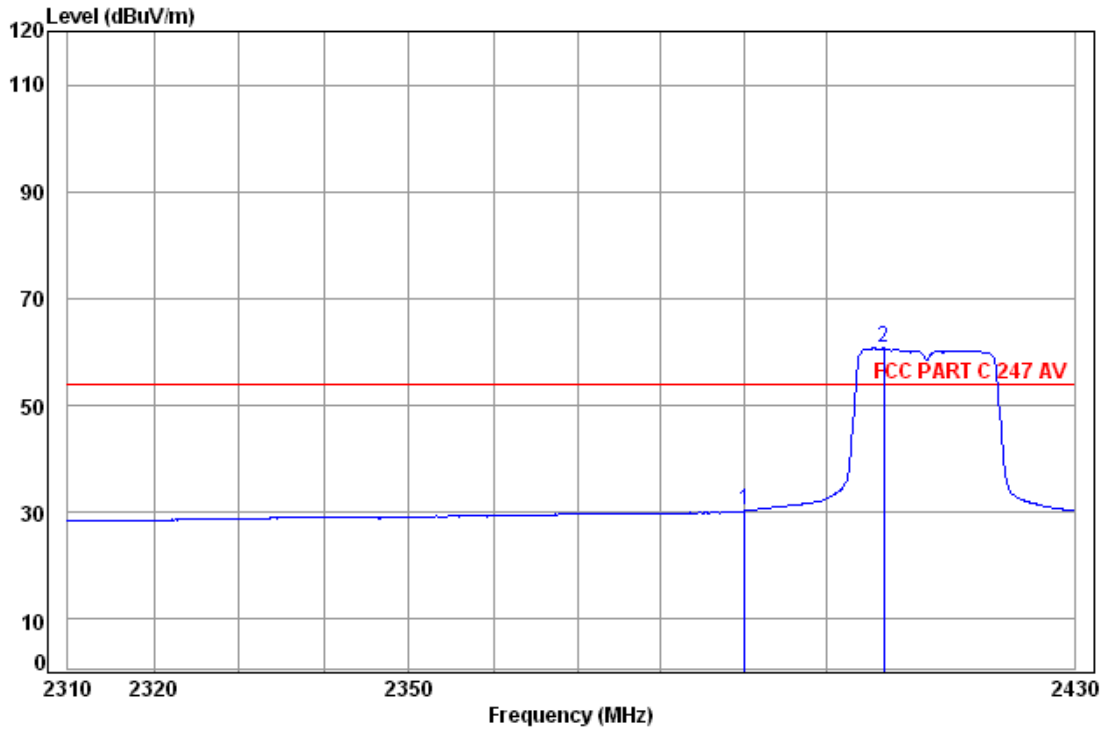
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11g	Test channel:	Lowest	Remark:	Average	Vertical
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Data: 84



Site : chamber  
Condition: FCC PART C 247 AV 3m Vertical  
Job No: : 2432CR  
Mode: : 2412 G Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	31.51	30.30	54.00	-23.70
2 pp	2406.85	4.92	32.41	38.46	61.84	60.71	54.00	6.71

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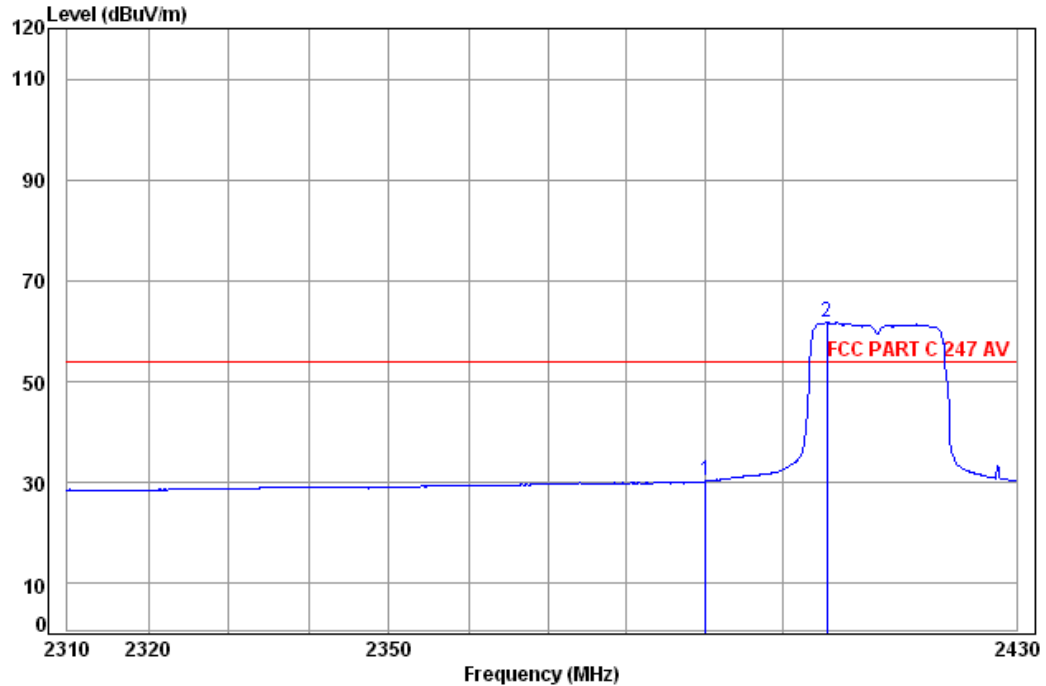
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11g	Test channel:	Lowest	Remark:	Average	Horizontal
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Data: 82



Site : chamber  
 Condition: FCC PART C 247 AV 3m Horizontal  
 Job No: : 2432CR  
 Mode: : 2412 G Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	Limit
1	2390.00	4.90	32.35	38.46	31.60	30.39	54.00 -23.61
2 pp	2405.51	4.92	32.41	38.46	62.85	61.72	54.00 7.72

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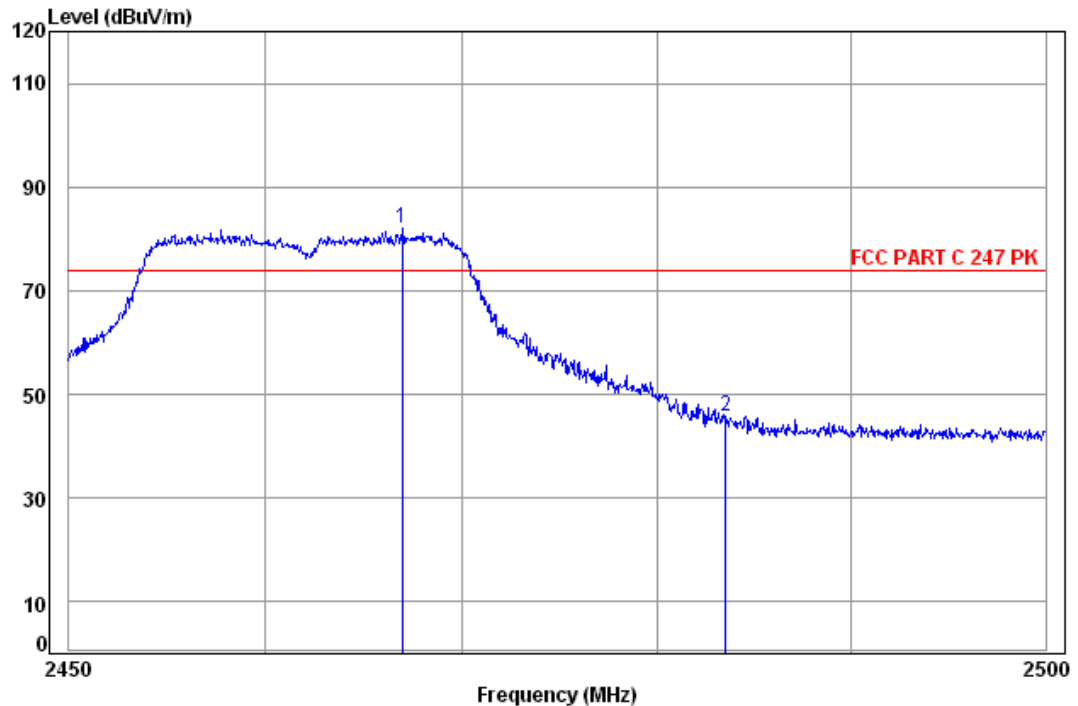
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11g	Test channel:	Highest	Remark:	Peak	Horizontal
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Data: 157



Site : chamber  
Condition: FCC PART C 247 PK 3m Horizontal  
Job No: : 2432CR  
Mode: : 2462 G Band edge

		Cable	Ant	Preamp	Read	Limit	Over
	Freq	Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m
1	pp 2466.94	5.01	32.43	38.46	83.16	82.14	74.00
2	2483.50	5.03	32.44	38.47	46.75	45.75	74.00

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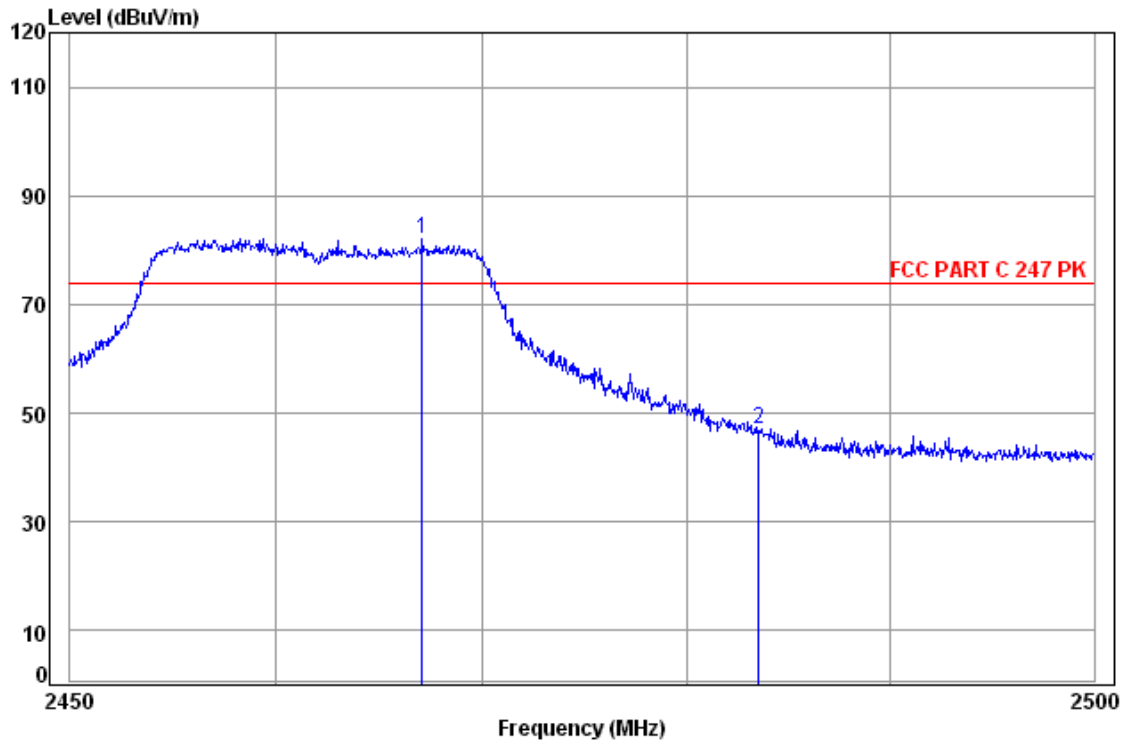
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11g	Test channel:	Highest	Remark:	Peak	Vertical
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Data: 155



Site : chamber  
Condition: FCC PART C 247 PK 3m Vertical  
Job No: : 2432CR  
Mode: : 2462 G Band edge

	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 pp	2467.09	5.01	32.43	38.46	82.94	81.92	74.00	7.92
2	2483.50	5.03	32.44	38.47	48.09	47.09	74.00	-26.91

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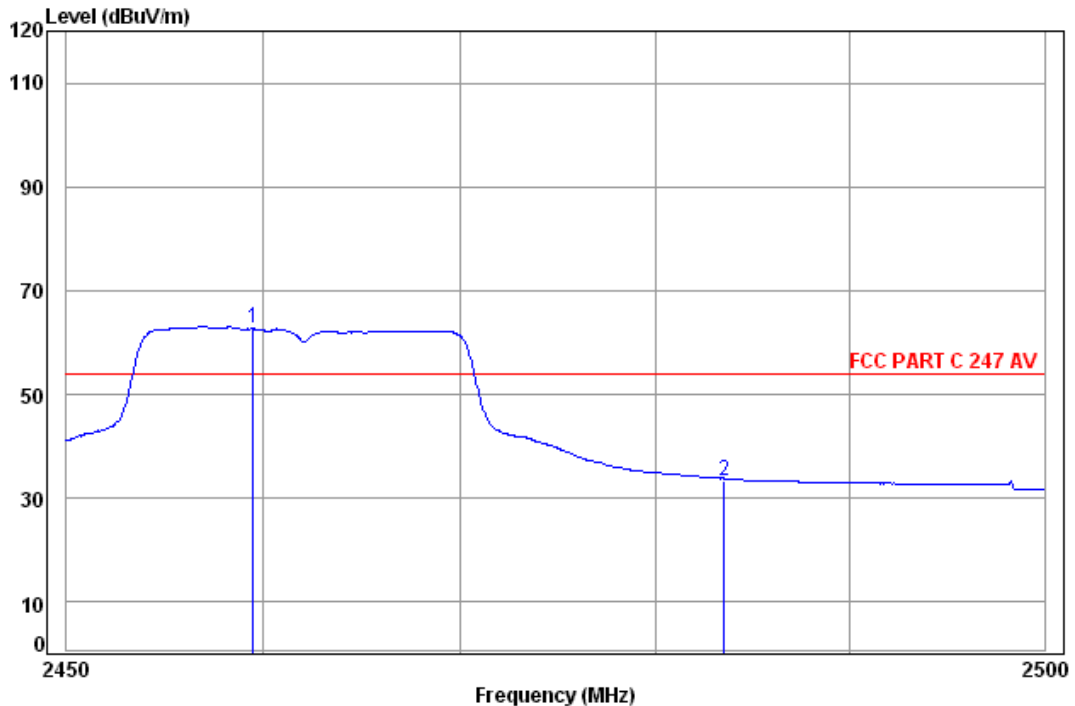
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11g	Test channel:	Highest	Remark:	Average	Vertical
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Data: 156



Site : chamber  
Condition: FCC PART C 247 AV 3m Vertical  
Job No: : 2432CR  
Mode: : 2462 G Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2459.47	5.00	32.43	38.46	63.70	62.67	54.00	8.67
2	2483.50	5.03	32.44	38.47	34.42	33.42	54.00	-20.58



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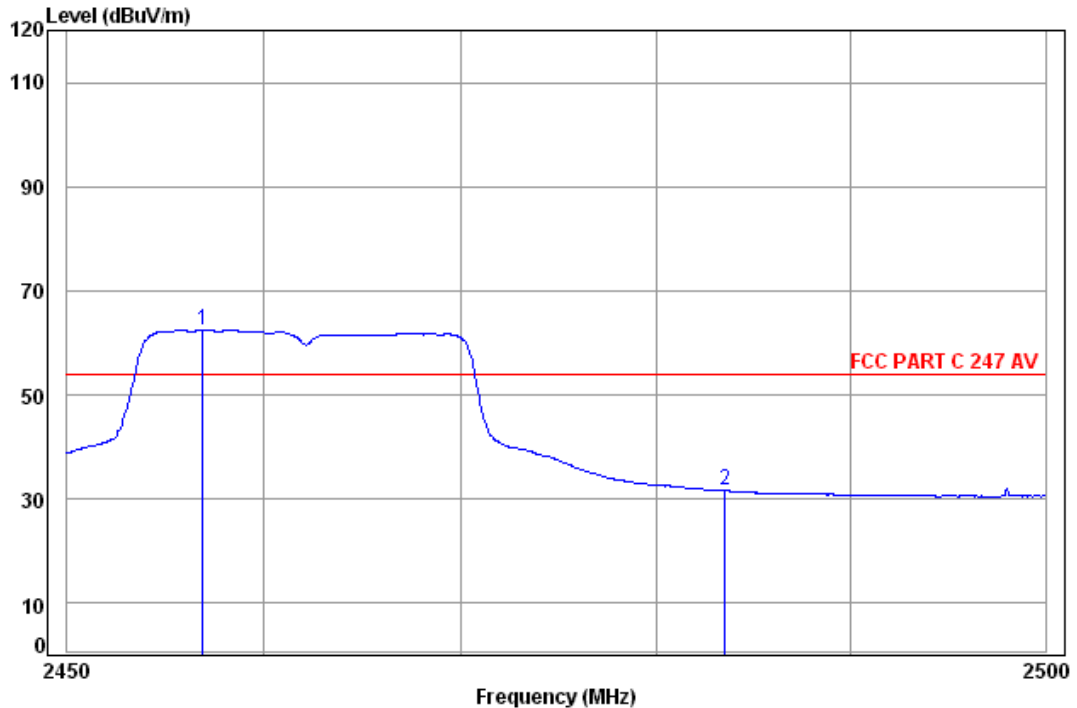
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11g	Test channel:	Highest	Remark:	Average	Horizontal
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Data: 158



Site : chamber  
Condition: FCC PART C 247 AV 3m Horizontal  
Job No: : 2432CR  
Mode: : 2462 G Band edge

		Cable	Ant	Preamplifier	Read	Limit	Over
	Freq	Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1 pp	2456.89	4.99	32.43	38.46	63.61	62.57	54.00 8.57
2	2483.50	5.03	32.44	38.47	32.58	31.58	54.00 -22.42

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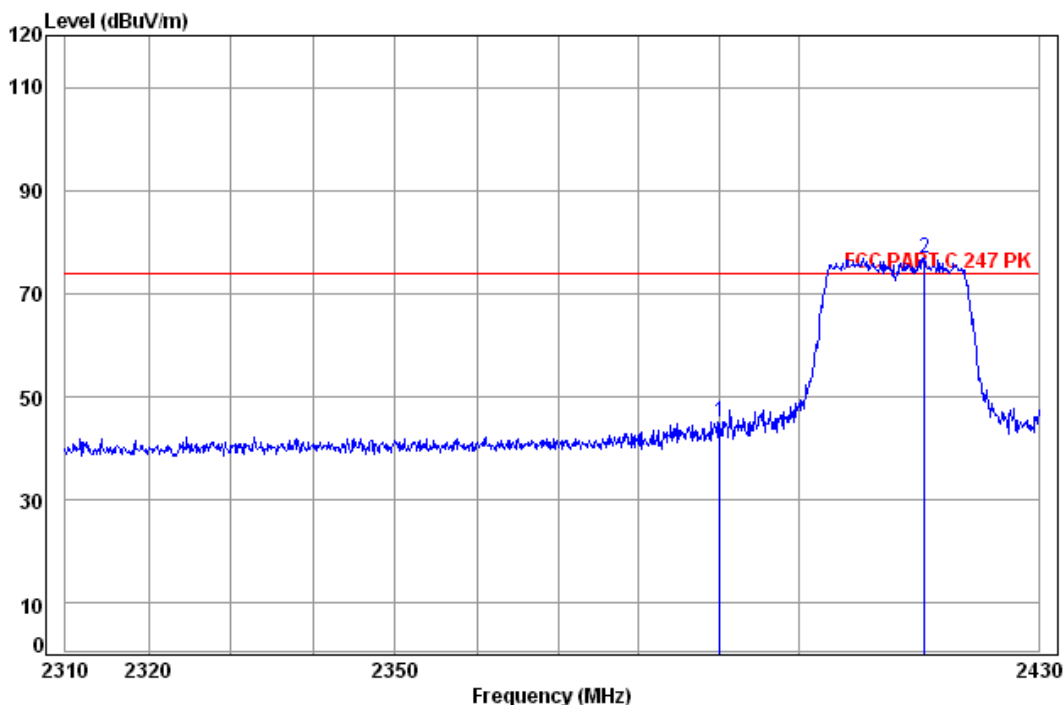
# SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEM150500243201

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Test mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Peak	Vertical
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Data: 87



Site : chamber  
 Condition: FCC PART C 247 PK 3m Vertical  
 Job No: : 2432CR  
 Mode: : 2412 H20 Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	46.26	45.05	74.00	-28.95
2 pp	2415.64	4.94	32.42	38.46	77.93	76.83	74.00	2.83

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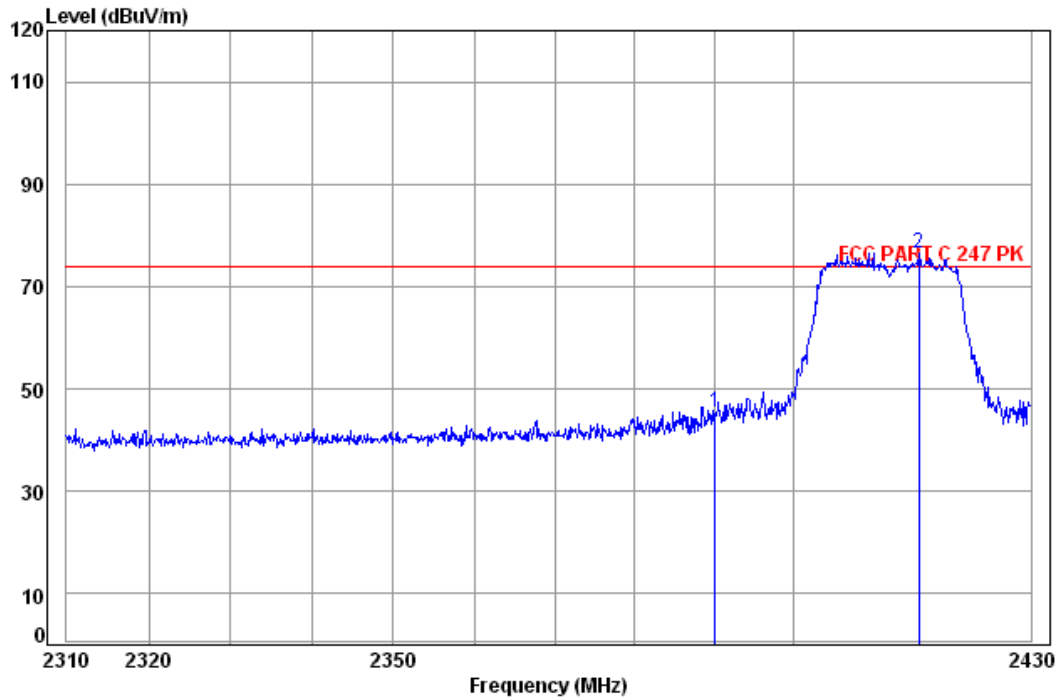
# SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEM150500243201

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Test mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Peak	Horizontal
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Data: 85



Site : chamber  
Condition: FCC PART C 247 PK 3m Horizontal  
Job No: : 2432CR  
Mode: : 2412 N20 Band edge

	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	2390.00	4.90	32.35	38.46	46.76	45.55	74.00	-28.45
2 pp	2415.77	4.94	32.42	38.46	77.59	76.49	74.00	2.49

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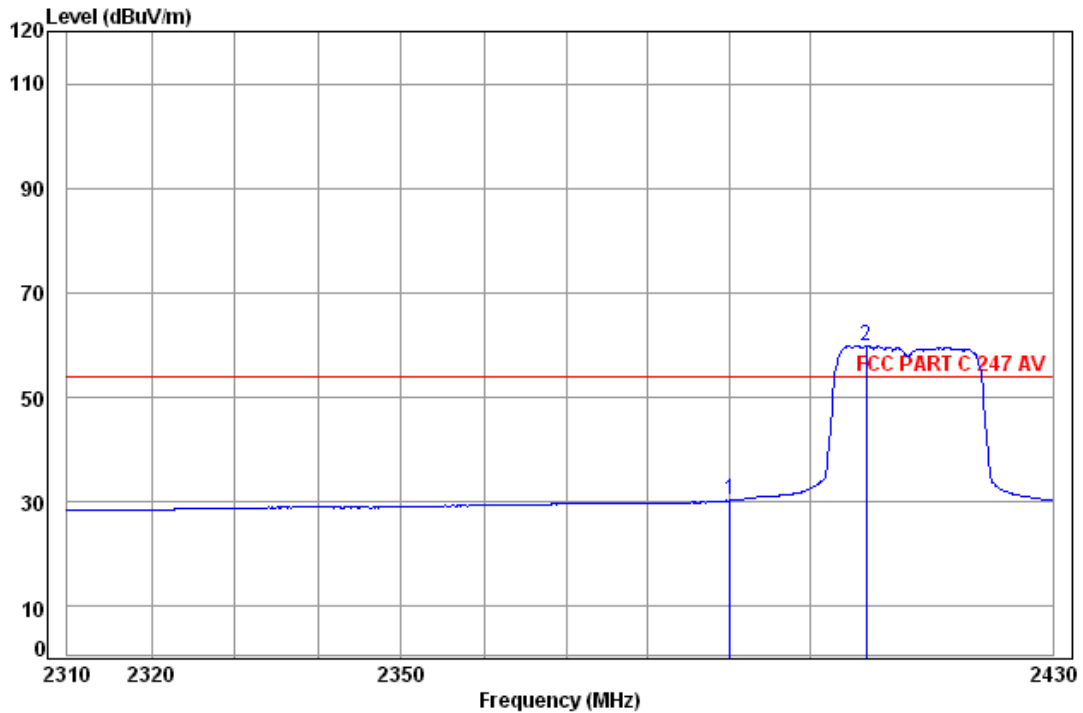
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Average	Vertical
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Data: 88



Site : chamber  
Condition: FCC PART C 247 AV 3m Vertical  
Job No: : 2432CR  
Mode: : 2412 N20 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	31.56	30.35	54.00	-23.65
2 pp	2406.85	4.92	32.41	38.46	60.99	59.86	54.00	5.86

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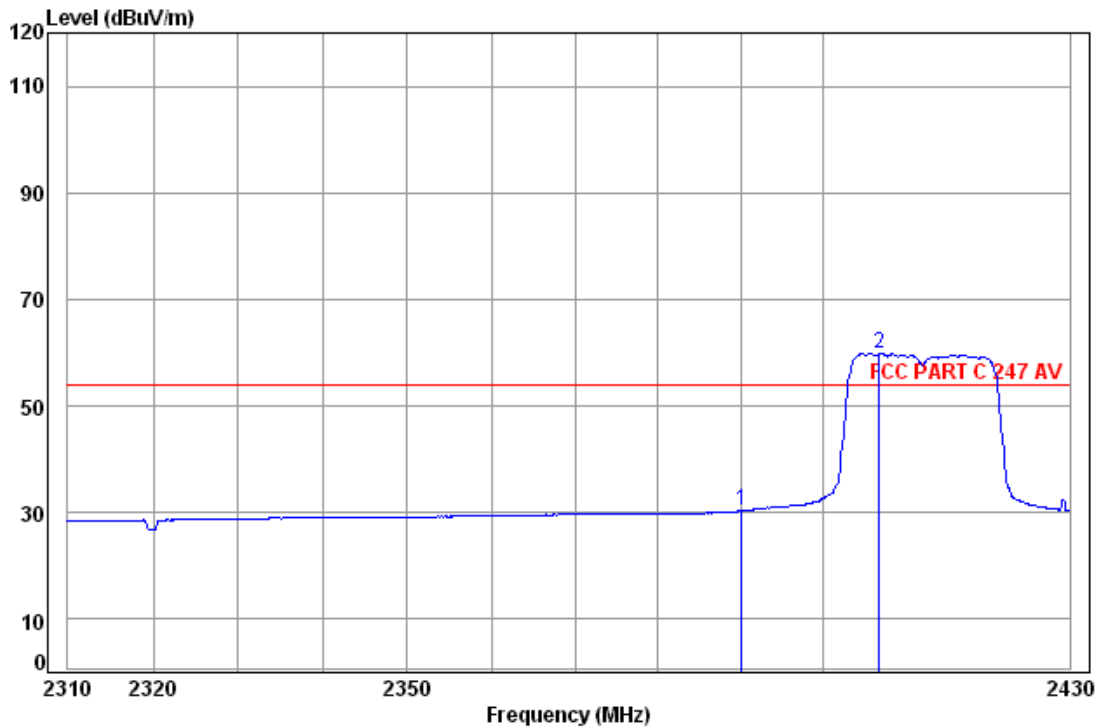
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Average	Horizontal
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Data: 86



Site : chamber  
Condition: FCC PART C 247 AV 3m Horizontal  
Job No: : 2432CR  
Mode: : 2412 H20 Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	31.56	30.35	54.00	-23.65
2 pp	2406.73	4.92	32.41	38.46	61.00	59.87	54.00	5.87

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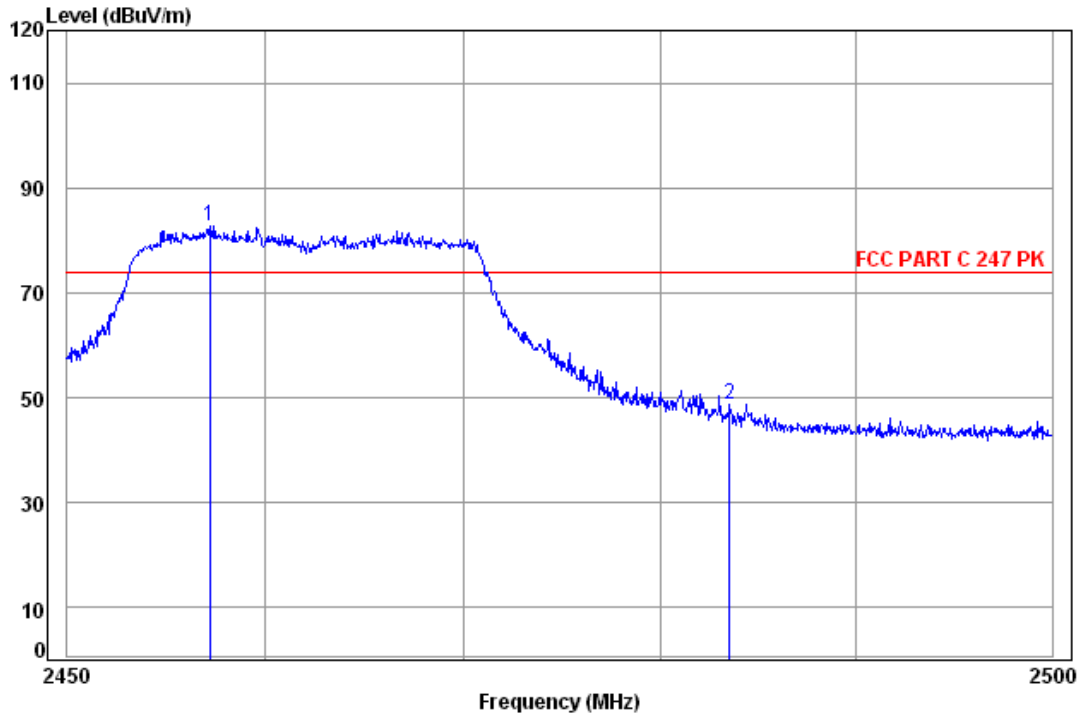
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Peak	Horizontal
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Data: 159



Site : chamber  
Condition: FCC PART C 247 PK 3m Horizontal  
Job No: : 2432CR  
Mode: : 2462 N20 Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2457.19	4.99	32.43	38.46	83.79	82.75	74.00	8.75
2	2483.50	5.03	32.44	38.47	49.82	48.82	74.00	-25.18

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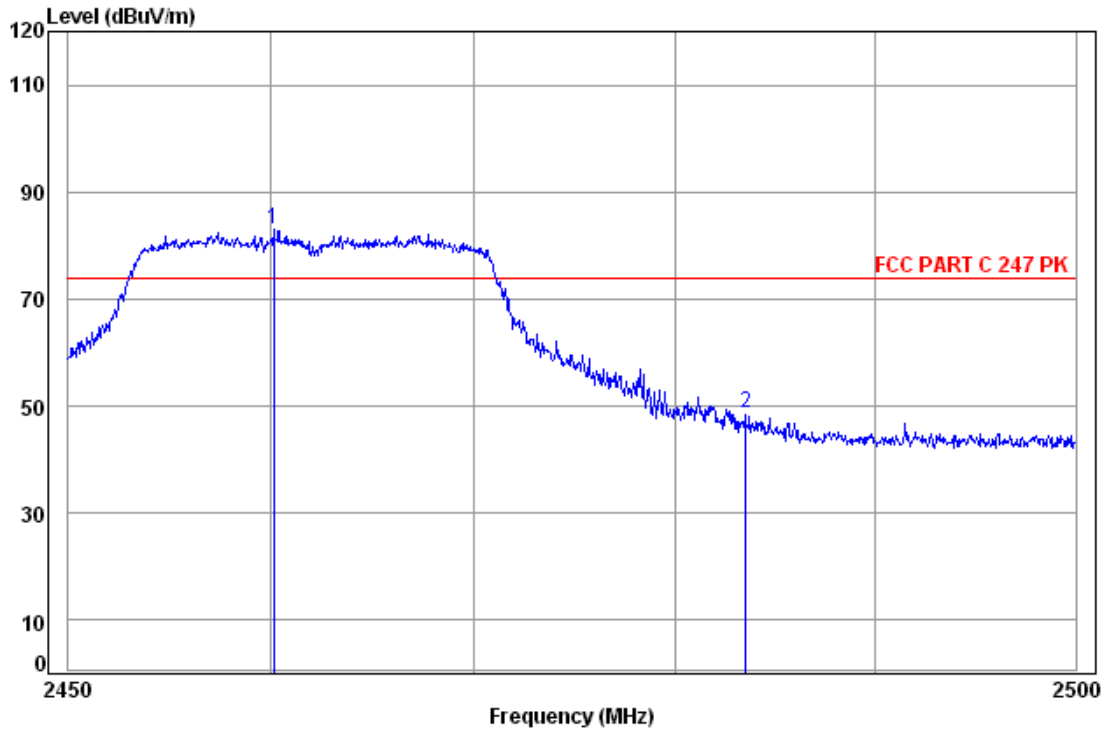
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Peak	Vertical
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Data: 160



Site : chamber  
Condition: FCC PART C 247 PK 3m Vertical  
Job No: : 2432CR  
Mode: : 2462 N20 Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2460.12	5.00	32.43	38.46	84.09	83.06	74.00	9.06
2	2483.50	5.03	32.44	38.47	49.61	48.61	74.00	-25.39

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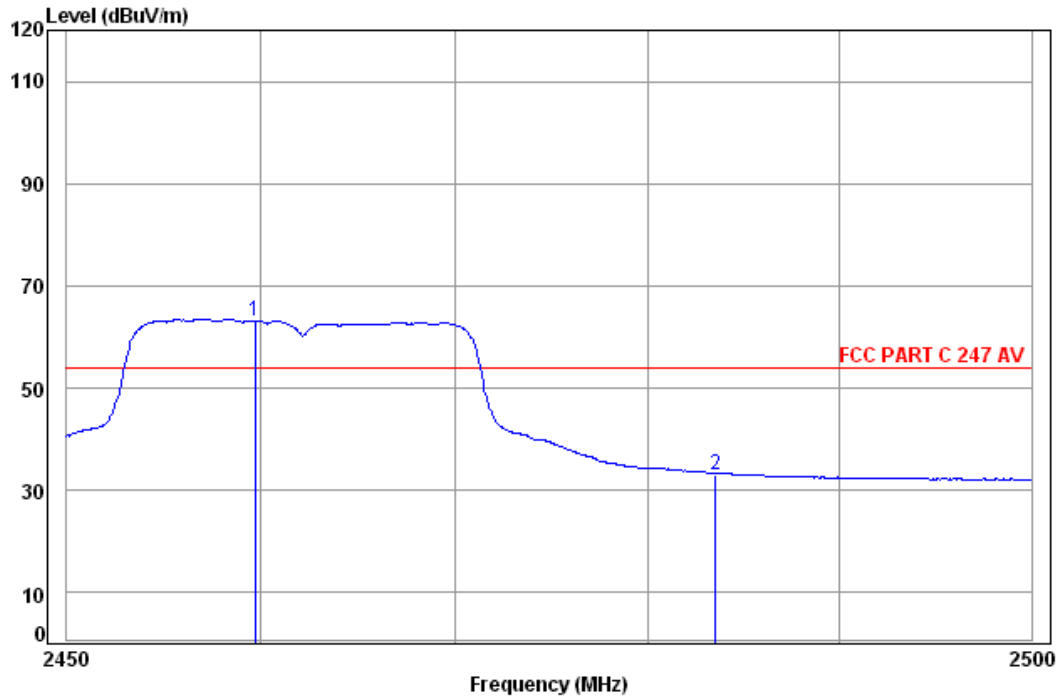
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Average	Vertical
------------	---------------	---------------	---------	---------	---------	----------

Data: 162



Site : chamber  
Condition: FCC PART C 247 AV 3m Vertical  
Job No: : 2432CR  
Mode: : 2462 H20 Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2459.67	5.00	32.43	38.46	64.26	63.23	54.00	9.23
2	2483.50	5.03	32.44	38.47	33.98	32.98	54.00	-21.02

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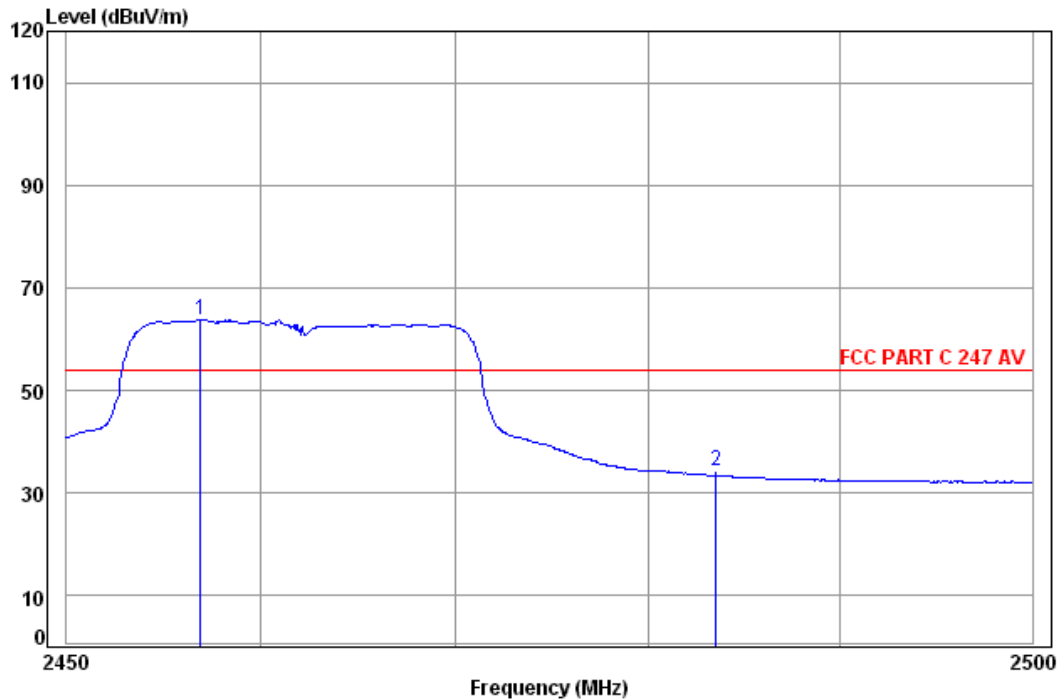
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Average	Horizontal
------------	---------------	---------------	---------	---------	---------	------------

Data: 161



Site : chamber  
Condition: FCC PART C 247 AV 3m Horizontal  
Job No: : 2432CR  
Mode: : 2462 H20 Band edge

		Cable	Ant	Preampl	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2456.89	4.99	32.43	38.46	64.83	63.79	54.00	9.79
2	2483.50	5.03	32.44	38.47	35.32	34.32	54.00	-19.68

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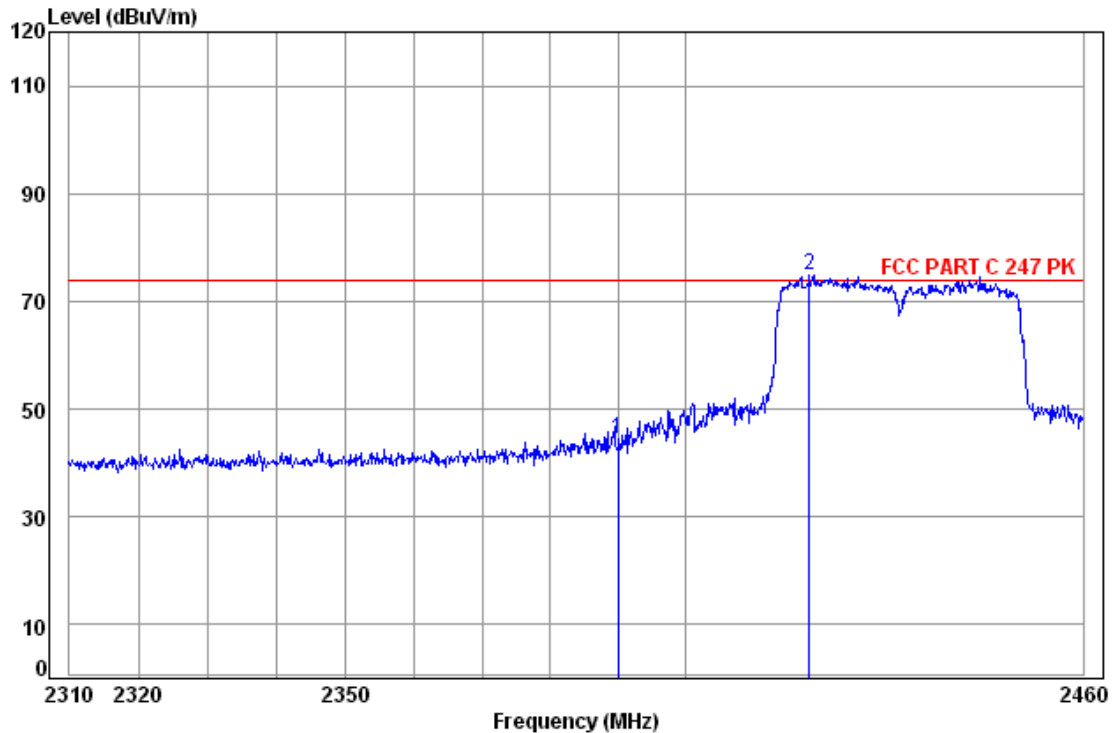
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT40)	Test channel:	Lowest	Remark:	Peak	Vertical
------------	---------------	---------------	--------	---------	------	----------

Data: 97



Site : chamber  
Condition: FCC PART C 247 PK 3m Vertical  
Job No: : 2432CR  
Mode: : 2422 N40 Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	45.55	44.34	74.00	-29.66
2 pp	2418.57	4.94	32.42	38.46	76.03	74.93	74.00	0.93



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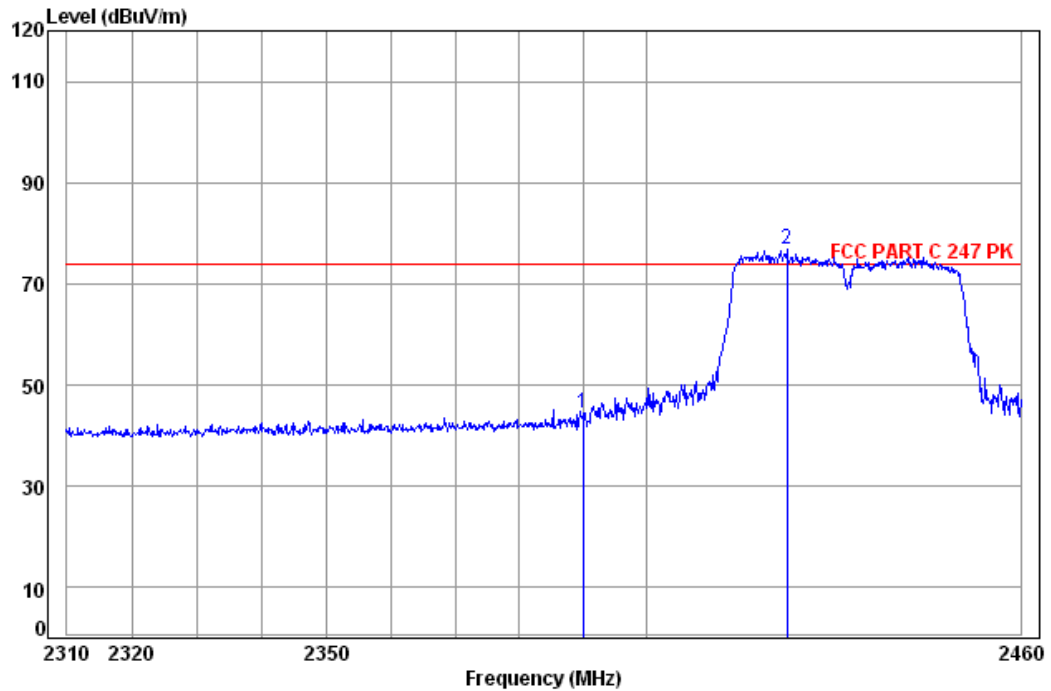
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT40)	Test channel:	Lowest	Remark:	Peak	Horizontal
------------	---------------	---------------	--------	---------	------	------------

Data: 99



Site : chamber

Condition: FCC PART C 247 PK 3m Horizontal

Job No: : 2432CR

Mode: : 2422 N40 Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	45.84	44.63	74.00	-29.37
2 pp	2422.37	4.95	32.42	38.46	77.79	76.70	74.00	2.70

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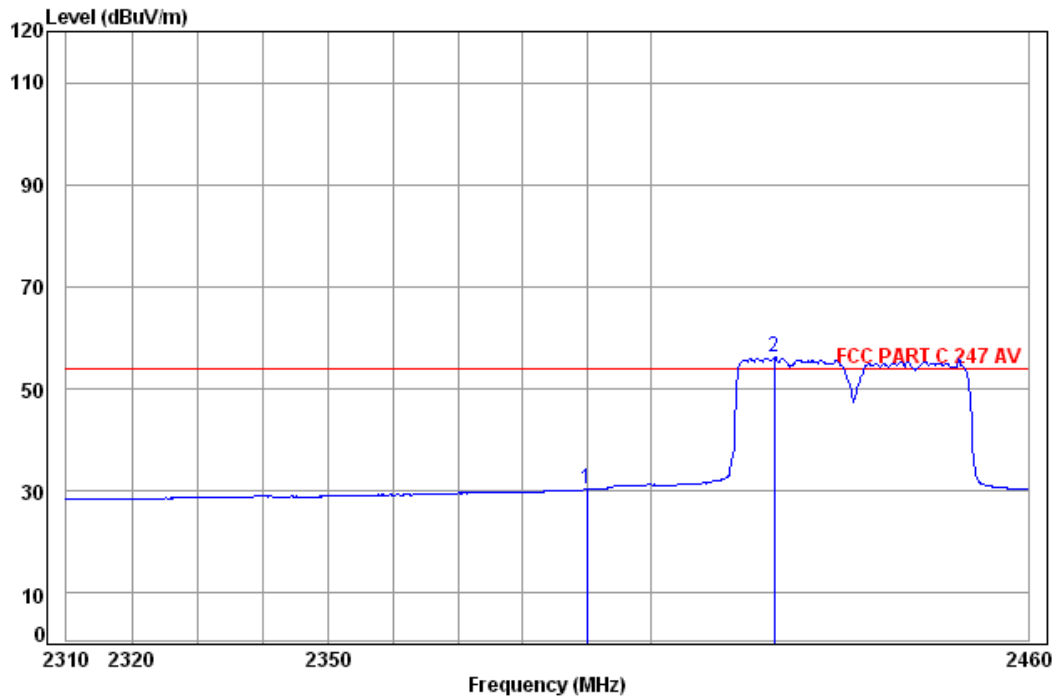
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT40)	Test channel:	Lowest	Remark:	Average	Vertical
------------	---------------	---------------	--------	---------	---------	----------

Data: 98



Site : chamber  
Condition: FCC PART C 247 AV 3m Vertical  
Job No: : 2432CR  
Mode: : 2422 H40 Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.00	4.90	32.35	38.46	31.55	30.34	54.00	-23.66
2 pp	2419.48	4.94	32.42	38.46	57.27	56.17	54.00	2.17

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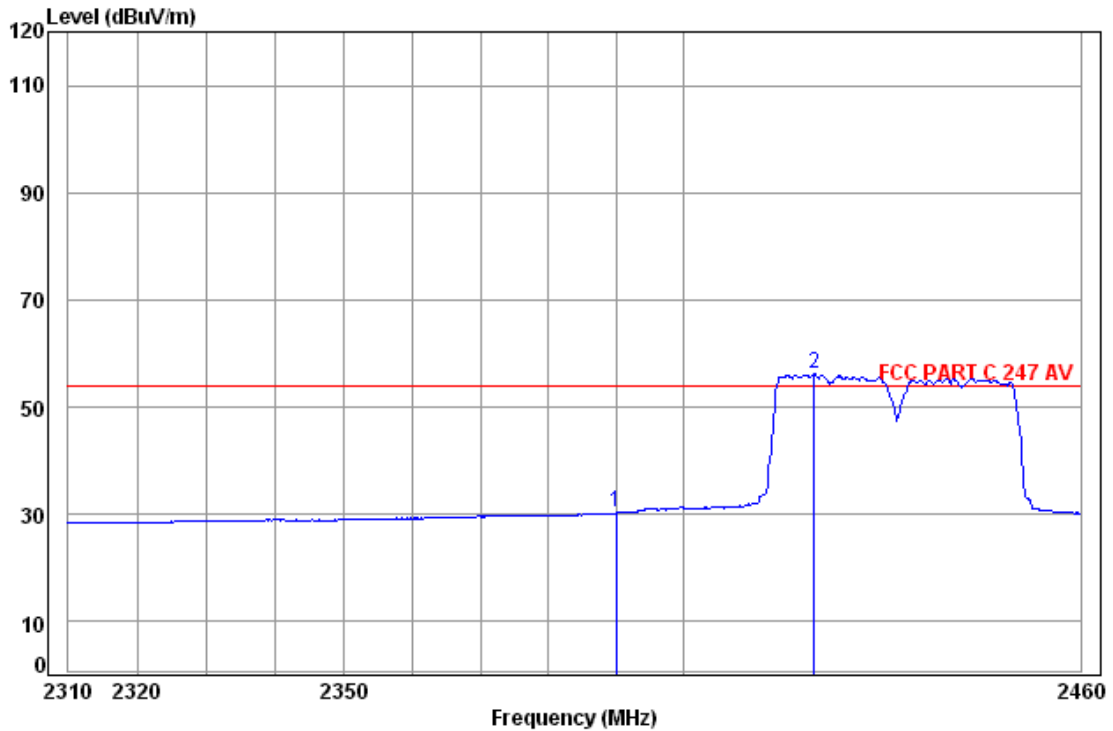
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT40)	Test channel:	Lowest	Remark:	Average	Horizontal
------------	---------------	---------------	--------	---------	---------	------------

Data: 100



Site : chamber  
Condition: FCC PART C 247 AV 3m Horizontal  
Job No: : 2432CR  
Mode: : 2422 H40 Band edge

		Cable	Ant	Preamp	Read	Limit	Over
	Freq	Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m
1	2390.00	4.90	32.35	38.46	31.55	30.34	54.00
2 pp	2419.63	4.94	32.42	38.46	57.29	56.19	54.00

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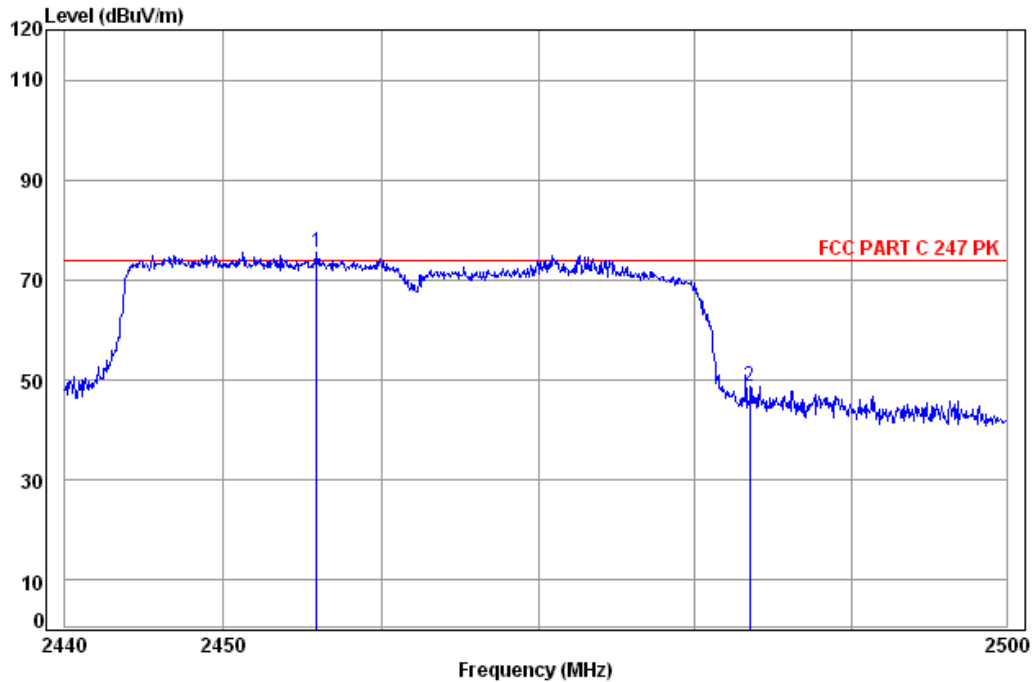
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Test mode:	802.11n(HT40)	Test channel:	Highest	Remark:	Peak	Horizontal
------------	---------------	---------------	---------	---------	------	------------

Data: 93



Site : chamber  
Condition: FCC PART C 247 PK 3m Horizontal  
Job No: : 2432CR  
Mode: : 2452 N40 Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2455.88	4.99	32.43	38.46	76.53	75.49	74.00	1.49
2	2483.50	5.03	32.44	38.47	49.74	48.74	74.00	-25.26

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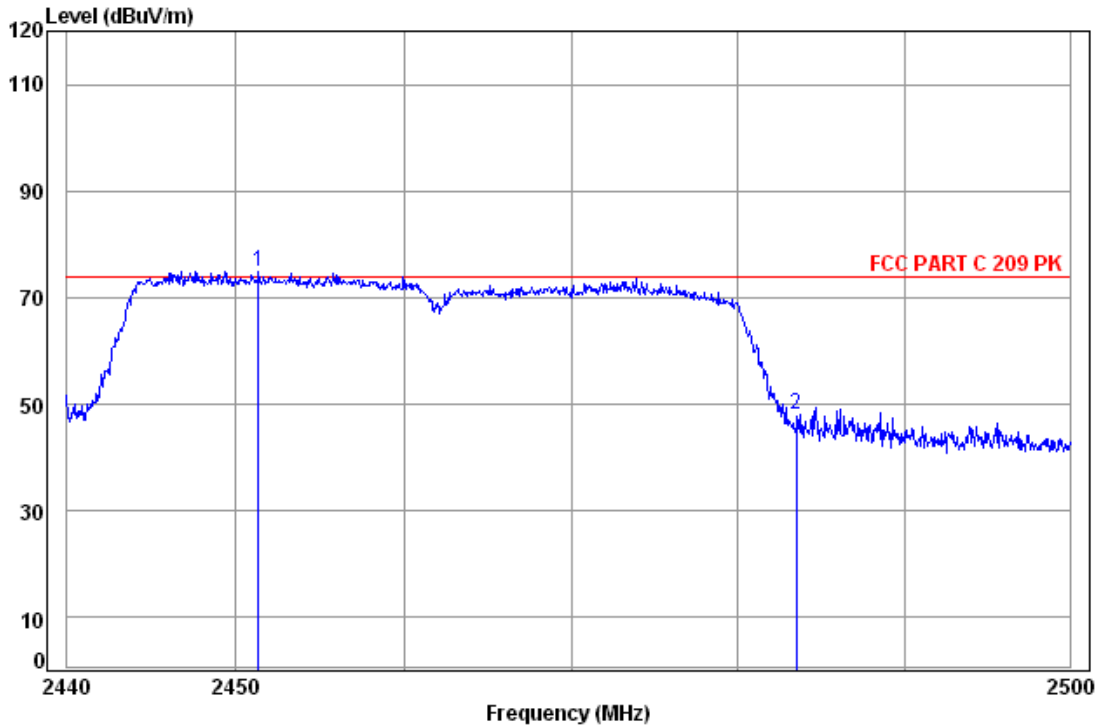
# SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEM150500243201

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Test mode:	802.11n(HT40)	Test channel:	Highest	Remark:	Peak	Vertical
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Data: 95



Site : chamber  
Condition: FCC PART C 209 PK 3m Vertical  
Job No: : 2432CR  
Mode: : 2452 N40 Band edge

	Cable	Ant	Preamp	Read	Limit	Over
Freq	Loss	Factor	Factor	Level	Line	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m
1 pp 2451.35	4.98	32.43	38.46	75.98	74.93	74.00
2 2483.50	5.03	32.44	38.47	49.15	48.15	74.00

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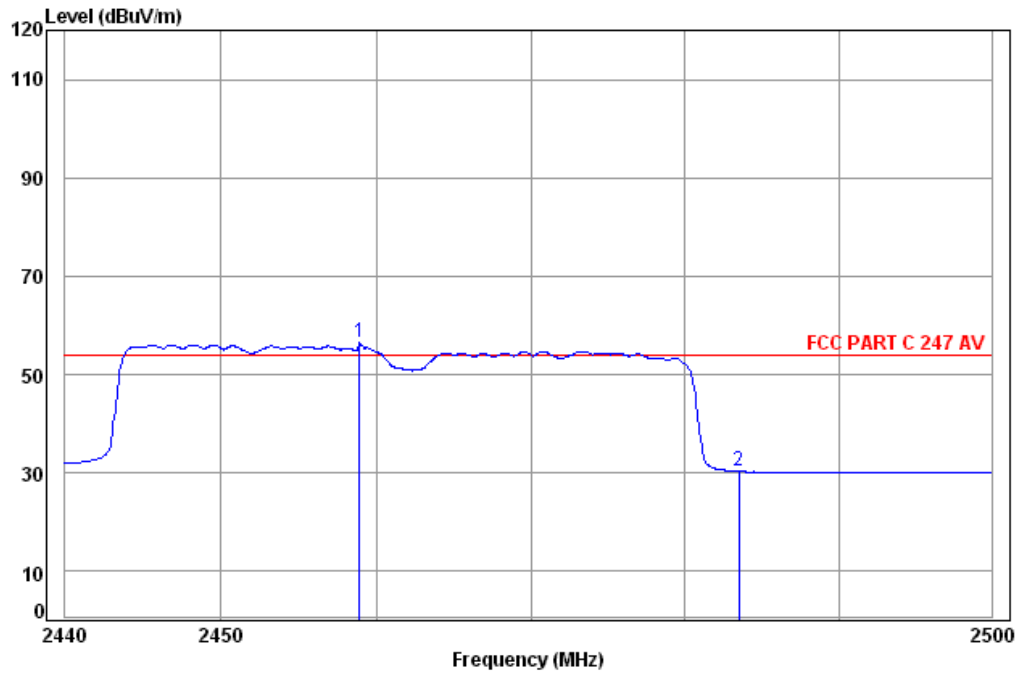
# SGS-CSTC Standards Technical Services Ltd.

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Test mode:	802.11n(HT40)	Test channel:	Highest	Remark:	Average	Vertical
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Data: 96



Site : chamber  
Condition: FCC PART C 247 AV 3m Vertical  
Job No: : 2432CR  
Mode: : 2452 H40 Band edge

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2458.92	5.00	32.43	38.46	57.58	56.55	54.00	2.55
2	2483.50	5.03	32.44	38.47	31.36	30.36	54.00	-23.64

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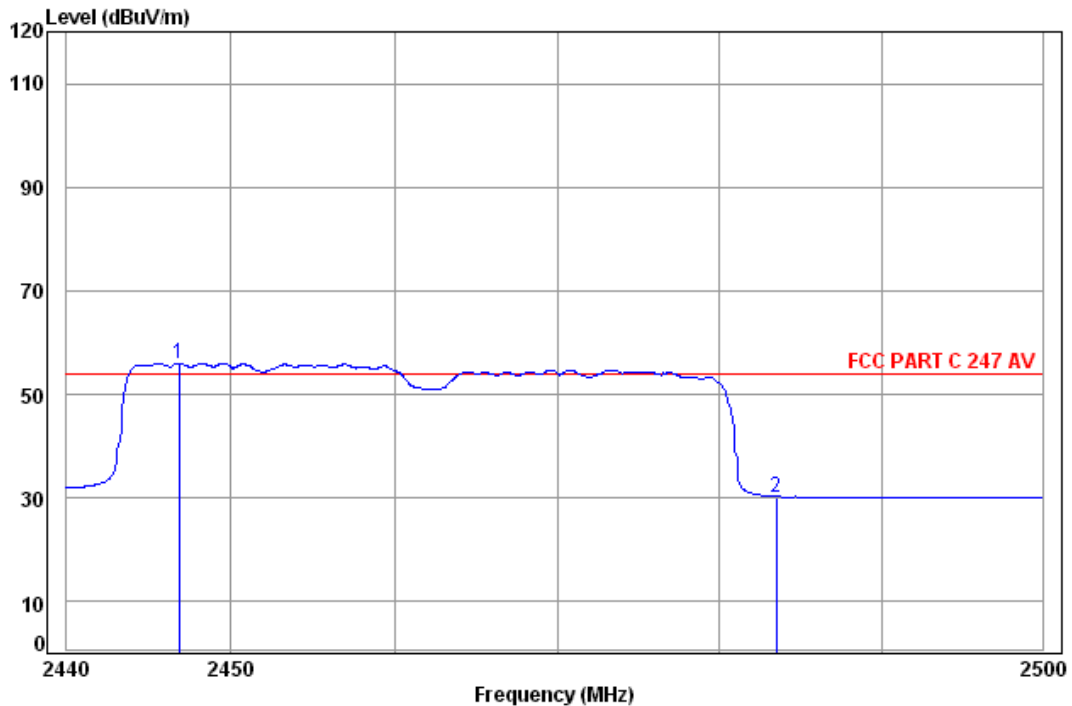
# SGS-CSTC Standards Technical Services Ltd.

Report No.: SZEM150500243201

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Test mode:	802.11n(HT40)	Test channel:	Highest	Remark:	Average	Horizontal
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Data: 94



Site : chamber  
Condition: FCC PART C 247 AV 3m Horizontal  
Job No: : 2432CR  
Mode: : 2452 N40 Band edge

	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 pp	2446.83	4.98	32.43	38.46	57.11	56.06	54.00	2.06
2	2483.50	5.03	32.44	38.47	31.15	30.15	54.00	-23.85

## Note:

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

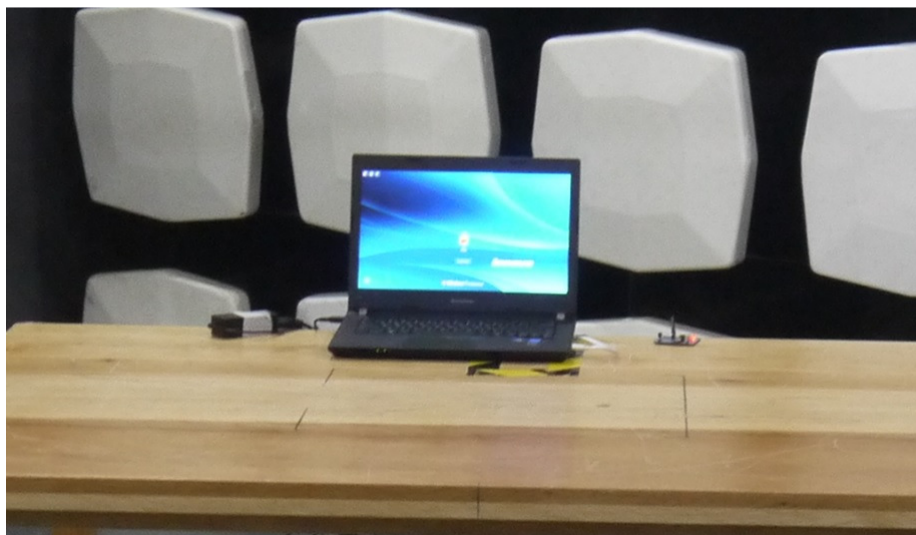
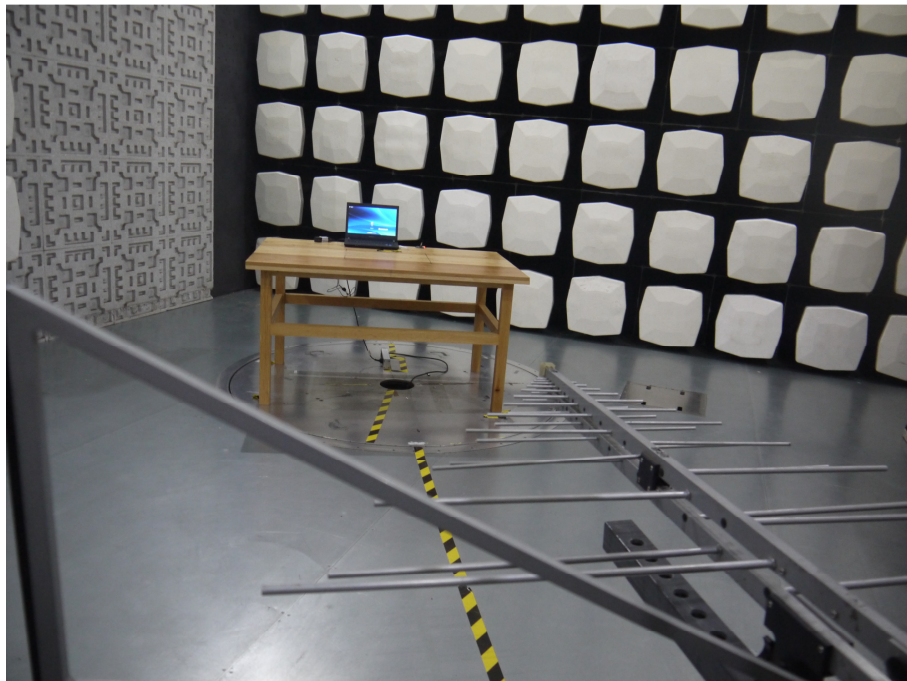
$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

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## 7 Photographs - EUT Test Setup

Test model No.: WK1230

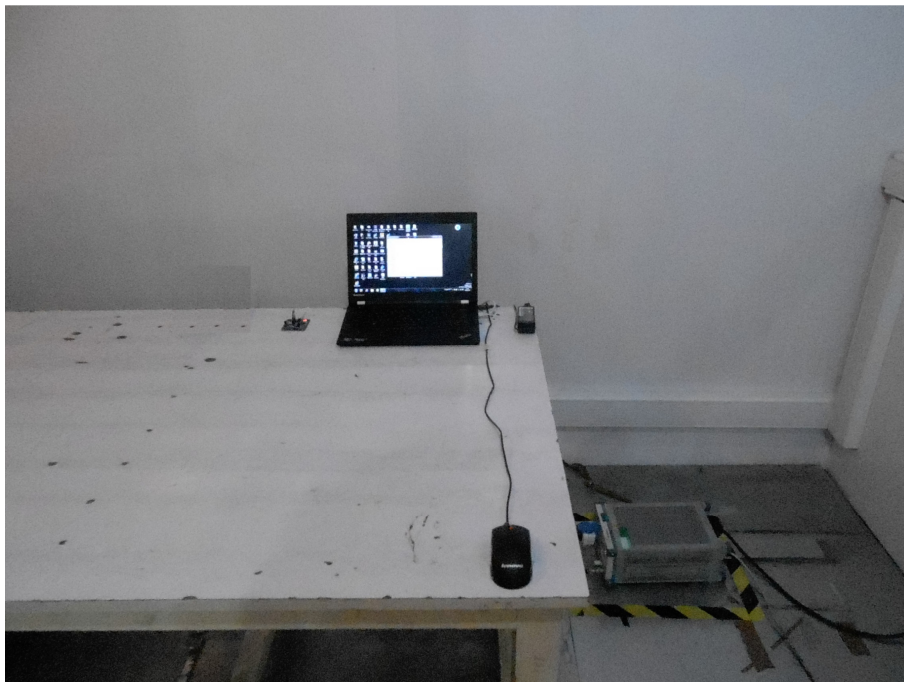
### 7.1 Radiated Spurious Emission







## 7.2 Conducted Emission



## 8 Photographs - EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1505002432CR.