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Report No.: SZEM131200680901
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FCC REPORT

Application No: SZEM1312006809RF
Applicant: NEOSTRA INDUSTRIAL (HK) LIMITED
Manufacturer: NEOSTRA INDUSTRIAL (HK) LIMITED
Factory: Shenzhen Neostra Technology Co., Ltd.
Product Name: MID
Model No.(EUT): HSTNN-N03C
FCC ID: 2ABNS1400
Standards: 47 CFR Part 15, Subpart C (2012)
Date of Receipt: 2013-12-20
Date of Test: 2013-12-24 to 2014-01-06
Date of Issue: 2014-01-21

Test Result:	PASS *
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. * In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang
EMC Laboratory Manager

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

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2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2009	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2009	PASS
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	KDB558074 D01 v03r01	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	KDB558074 D01 v03r01	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	KDB558074 D01 v03r01	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	KDB558074 D01 v03r01	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	KDB558074 D01 v03r01	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2009	PASS
Band Edge (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2009	PASS



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4 General Information

4.1 Client Information

Applicant:	NEOSTRA INDUSTRIAL (HK) LIMITED
Address of Applicant:	MSC2971 RM 1007 10/F HO KING CTR 2-16 FA YUEN ST MONGKOK KL, HONG KONG
Manufacturer:	NEOSTRA INDUSTRIAL (HK) LIMITED
Address of Manufacturer:	MSC2971 RM 1007 10/F HO KING CTR 2-16 FA YUEN ST MONGKOK KL, HONG KONG
Factory:	Shenzhen Neotra Technology Co., Ltd.
Address of Factory:	Build 7, Huai De Cui Hai Industrial Park, Fu Yong Town, Bao'an District, Shenzhen, China.

4.2 General Description of EUT

Product Name:	MID
Model No.:	HSTNN-N03C
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 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): OFDM (64QAM, 16QAM,QPSK,BPSK)
Sample Type:	Portable production
Test Software of EUT:	RFTestTool (manufacturer declare)
Antenna Type:	Integral
Antenna Gain:	2.44dBi
Power Supply:	AC Adapter: MODEL: W12-010N3G INPUT: AC 100-240V~50/60Hz 0.3A MAX OUTPUT: 5.0V  2.0A
	Lithium polymer battery 3800mAh 3.7V
USB Cable:	75cm (Shielded with two ferrite core)
Test Voltage:	120V/60Hz



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		

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



4.3 Test Environment and Mode

Operating Environment:	
Temperature:	23.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1015 mbar
Test mode:	
Transmitting mode:	The EUT transmitted the continuous modulation test signal at the specific channel(s)
AC charge + Transmitting mode	The EUT transmitted the continuous modulation test signal at the specific channel(s) and AC charge it.

4.4 Description of Support Units

The EUT has been tested independent unit.

4.5 Test Location

All tests (except Radiated Emission, 30MHz to 1GHz) were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China 518057

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

Radiated Emission (30MHz to 1GHz) were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,

198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,

Guangzhou, Guangdong, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059



4.6 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **VCCI**

The 3m Semi-anechoic chamber, Full-anechoic Chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197, G-416, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

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.

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.

**4.10 Equipment List**

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2014-06-10
2	LISN	Rohde & Schwarz	ENV216	SEL0152	2014-10-24
3	LISN	ETS-LINDGREN	3816/2	SEL0021	2014-05-16
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	SEL0162	2014-11-10
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	SEL0163	2014-11-10
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	SEL0164	2014-11-10
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2014-05-16
8	Coaxial Cable	SGS	N/A	SEL0025	2014-05-29
9	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2014-10-24
10	Humidity/ Temperature Indicator	Shanghai Qixiang	ZJ1-2B	SEL0103	2014-10-24
11	Barometer	Chang Chun	DYM3	SEL0088	2014-05-24



RE in Chamber					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Due date
					(YYYY-MM-DD)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2014-08-30
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2014-05-06
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2014-03-04
EMC0528	RI High frequency Cable	SGS	20 m	N/A	2014-05-09
EMC2025	Trilog Broadband Antenna 30-3000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9163	9163-450	2016-08-31
EMC0524	Bi-log Type Antenna	Schaffner -Chase	CBL6112B	2966	2016-08-31
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2014-06-02
EMC2026	Horn Antenna 1-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	9120D-841	2016-08-31
EMC0518	Horn Antenna	Rohde & Schwarz	HF906	100096	2014-07-01
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2014-03-04
EMC2065	Amplifier	HP	8447F	N/A	2014-08-31
EMC2063	1-26GHz Pre Amplifier	Compliance Direction System Inc.	PAP-1G26-48	6279.628	2014-07-29
EMC0075	310N Amplifier	Sonama	310N	272683	2014-03-04
EMC0523	Active Loop Antenna	EMCO	6502	42963	2014-04-07
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9170	9170-375	2014-06-01
EMC2069	2.4GHz filter	Micro-Tronics	BRM 50702	149	2014-06-05
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	2014-04-27

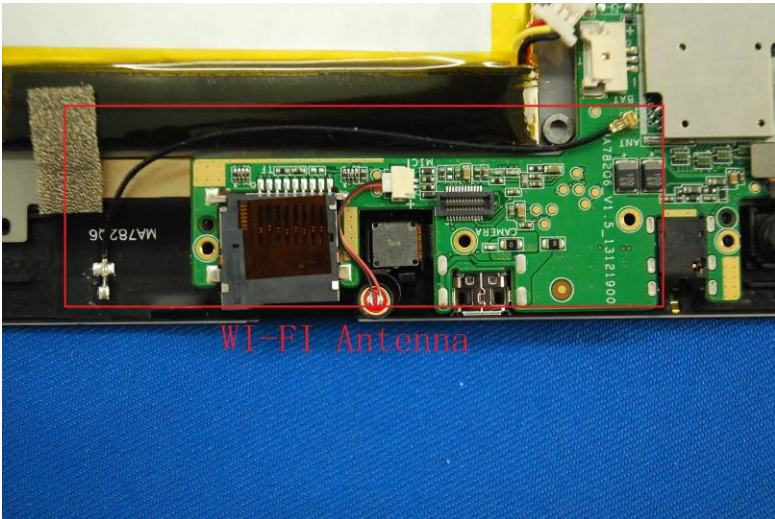


RF connected test					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2014-10-24
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2014-10-24
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2014-10-24
4	Coaxial cable	SGS	N/A	SEL0178	2014-05-29
5	Coaxial cable	SGS	N/A	SEL0179	2014-05-29
6	Barometer	ChangChun	DYM3	SEL0088	2014-05-24
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2014-05-16
8	Band filter	amideon	82346	SEL0094	2014-05-16
9	POWER METER	R & S	NRVS	SEL0144	2014-10-24
10	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2014-05-16
11	Power Divider(splitter)	Agilent Technologies	11636B	SEL0130	2014-10-24

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

5 Test results and Measurement Data

5.1 Antenna Requirement

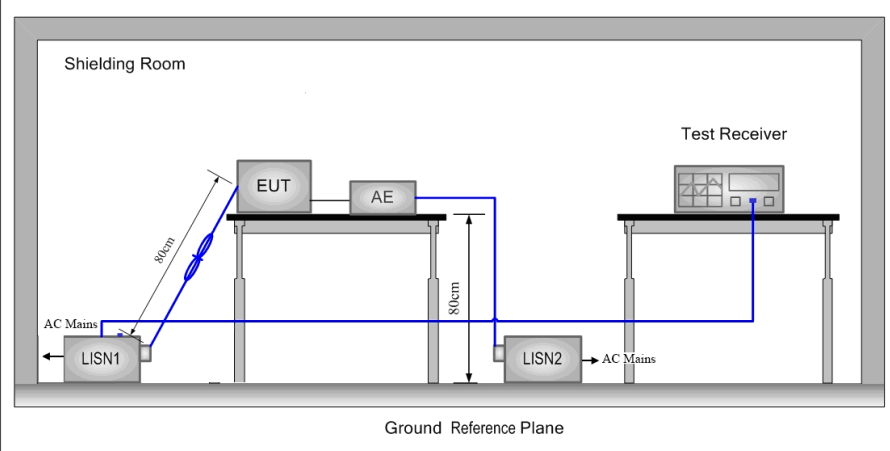
Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
<p>15.203 requirement:</p> <p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p> <p>15.247(b) (4) requirement:</p> <p>The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.</p>	
EUT Antenna:	
<p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.44dBi.</p> 	





5.2 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">1) The mains terminal disturbance voltage test was conducted in a shielded room.2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω 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.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,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 2.5) 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.		

Test Setup:	
Test Mode:	AC charge + Transmitting mode
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

Measurement Data

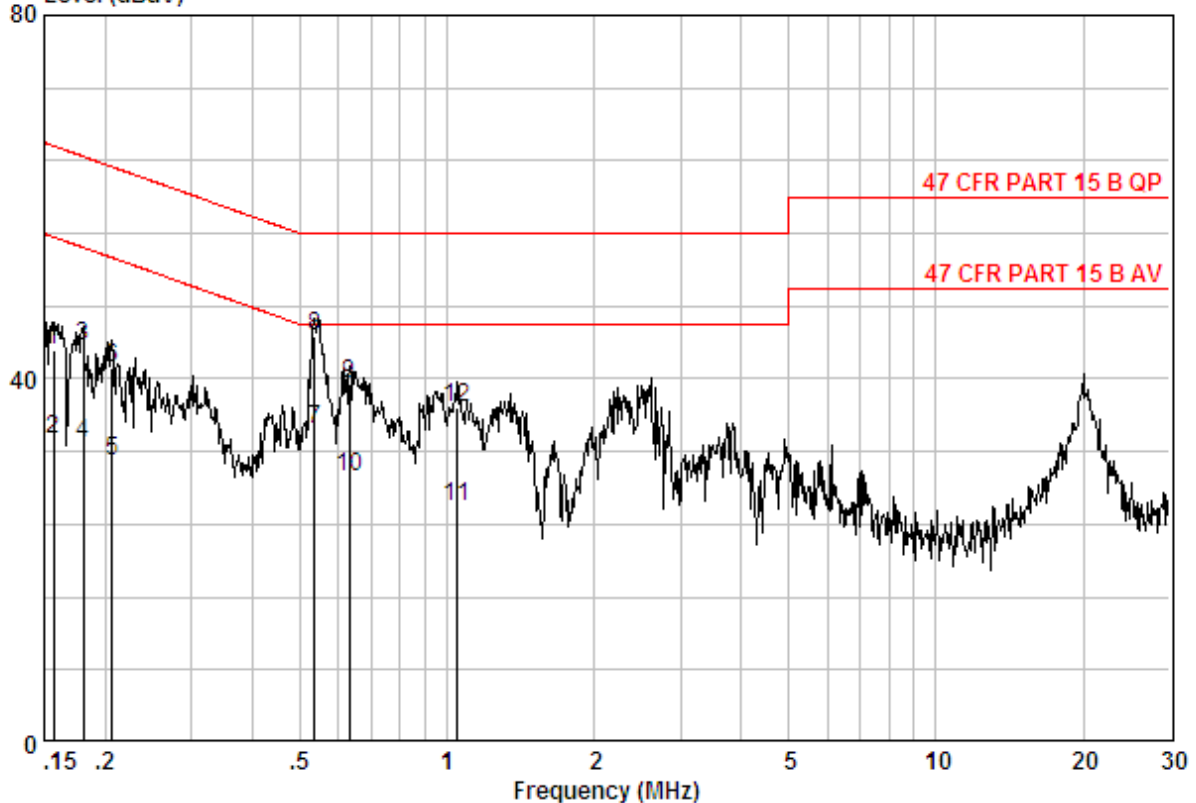
An initial pre-scan was performed on the live and neutral lines with peak detector.

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

Live Line:

Data: 121

Level (dBuV)



Site : Shielding Room
Condition : 47 CFR PART 15 B QP CE LINE
Job No. : 6809RF
Test mode : AC charge + TX

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.15649	0.02	9.70	33.46	43.18	65.65	-22.47	QP
2	0.15649	0.02	9.70	23.61	33.33	55.65	-22.32	Average
3	0.18056	0.02	9.70	33.97	43.69	64.46	-20.77	QP
4	0.18056	0.02	9.70	23.21	32.93	54.46	-21.53	Average
5	0.20614	0.02	9.70	21.26	30.98	53.36	-22.38	Average
6	0.20614	0.02	9.70	31.50	41.22	63.36	-22.14	QP
7	0.53498	0.01	9.80	24.69	34.50	46.00	-11.50	Average
8 @	0.53498	0.01	9.80	34.93	44.74	56.00	-11.26	QP
9	0.63048	0.02	9.80	29.55	39.37	56.00	-16.63	QP
10	0.63048	0.02	9.80	19.43	29.25	46.00	-16.75	Average
11	1.049	0.02	9.80	16.15	25.97	46.00	-20.03	Average
12	1.049	0.02	9.80	26.91	36.73	56.00	-19.27	QP

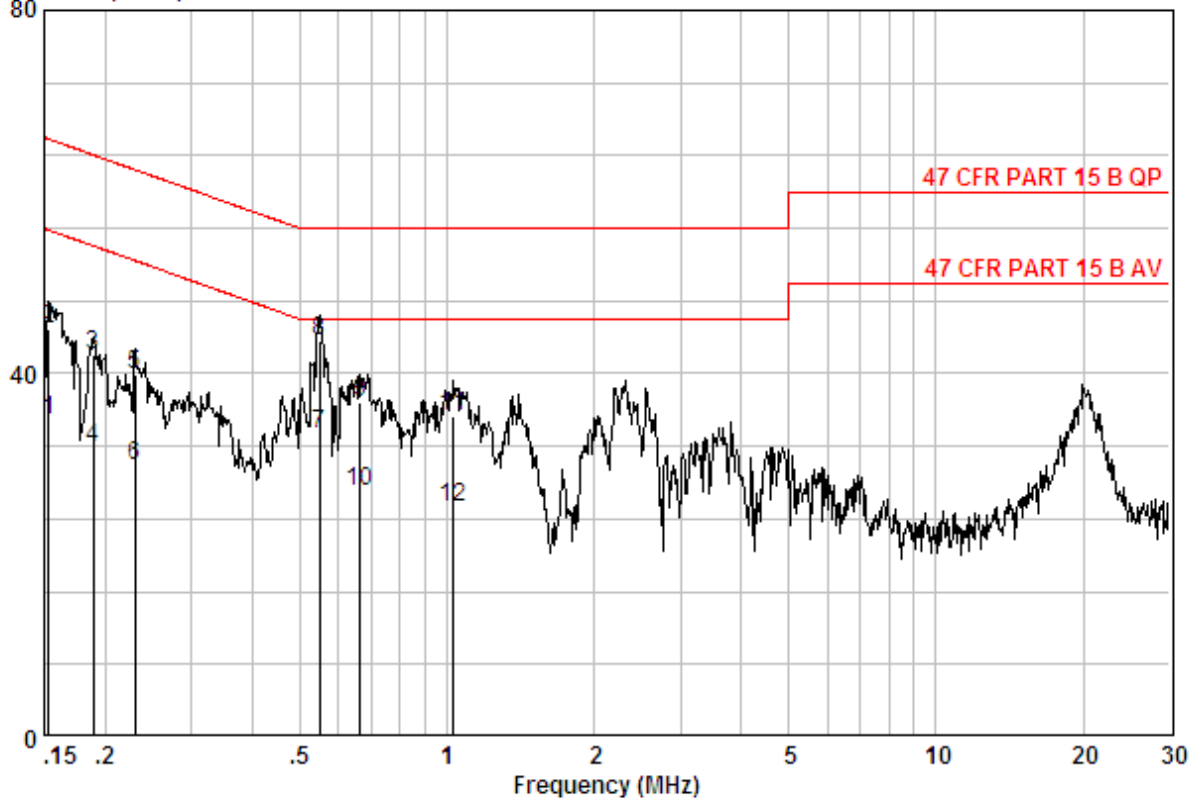
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Neutral Line:

Data: 122

Level (dBuV)



Site : Shielding Room
Condition : 47 CFR PART 15 B QP CE NEUTRAL
Job No. : 6809RF
Test mode : AC charge + TX

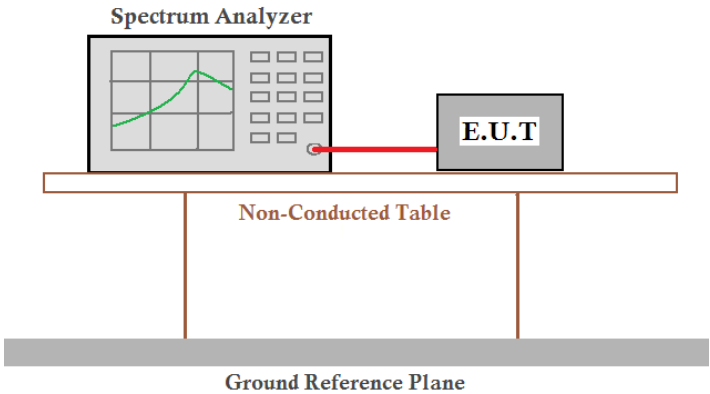
	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.15321	0.02	9.70	25.16	34.88	55.82	-20.94	Average
2	0.15321	0.02	9.70	35.23	44.95	65.82	-20.87	QP
3	0.18938	0.02	9.70	32.36	42.08	64.06	-21.98	QP
4	0.18938	0.02	9.70	22.15	31.87	54.06	-22.19	Average
5	0.23040	0.02	9.70	30.08	39.80	62.44	-22.64	QP
6	0.23040	0.02	9.70	20.15	29.87	52.44	-22.56	Average
7	0.54934	0.01	9.80	23.61	33.42	46.00	-12.58	Average
8	0.54934	0.01	9.80	33.72	43.53	56.00	-12.47	QP
9	0.66478	0.02	9.80	27.06	36.88	56.00	-19.12	QP
10	0.66478	0.02	9.80	17.21	27.03	46.00	-18.97	Average
11	1.032	0.02	9.80	25.50	35.32	56.00	-20.68	QP
12	1.032	0.02	9.80	15.54	25.36	46.00	-20.64	Average

Notes:

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

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5.3 Conducted Peak Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	KDB558074 D01 v03r01
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Test Instruments:	Refer to section 4.10 for details
Exploratory Test Mode:	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).
Limit:	30dBm
Test Results:	Pass



SGS-CSTC Standards Technical Services Ltd.

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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)	19.93	19.87	19.82	19.78				
Mode	802.11g							
Data Rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Power (dBm)	23.25	22.92	22.84	22.81	22.75	22.74	22.64	22.61
Mode	802.11n(HT20)							
Data Rate	6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
Power (dBm)	22.59	22.46	22.41	22.36	22.31	22.27	22.21	22.17
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);								

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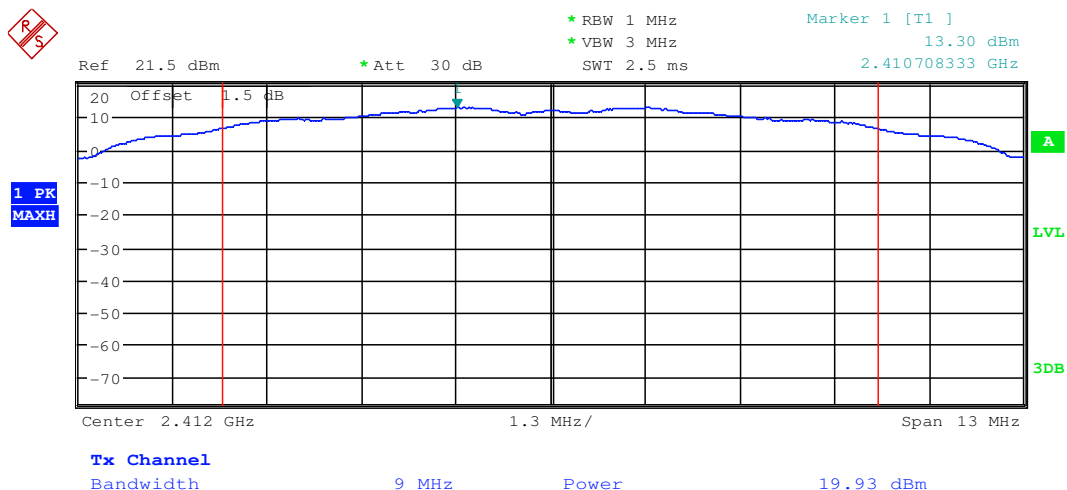
**Measurement Data**

802.11b mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	19.93	30.00	Pass
Middle	19.85	30.00	Pass
Highest	19.80	30.00	Pass
802.11g mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	23.25	30.00	Pass
Middle	23.43	30.00	Pass
Highest	23.09	30.00	Pass
802.11n(HT20)mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	22.59	30.00	Pass
Middle	22.66	30.00	Pass
Highest	22.44	30.00	Pass

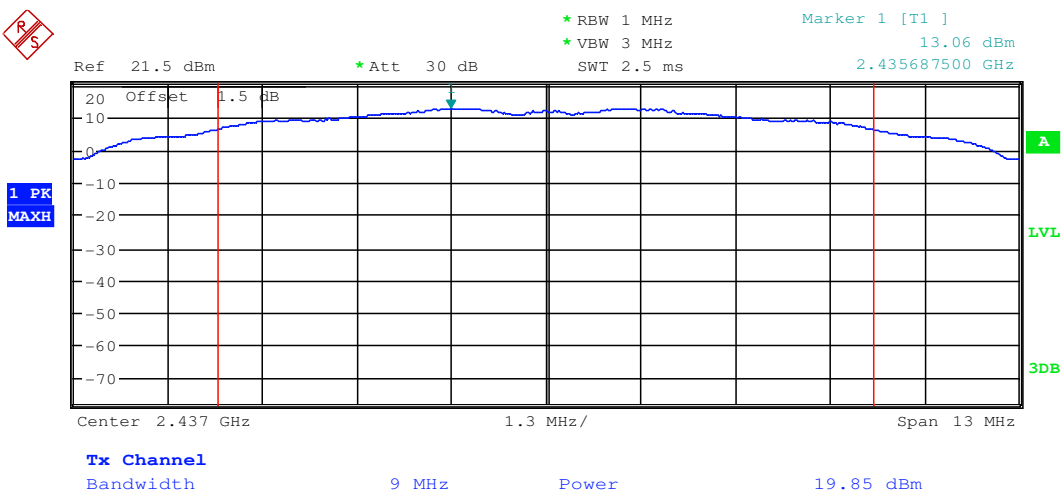


Test plot as follows:

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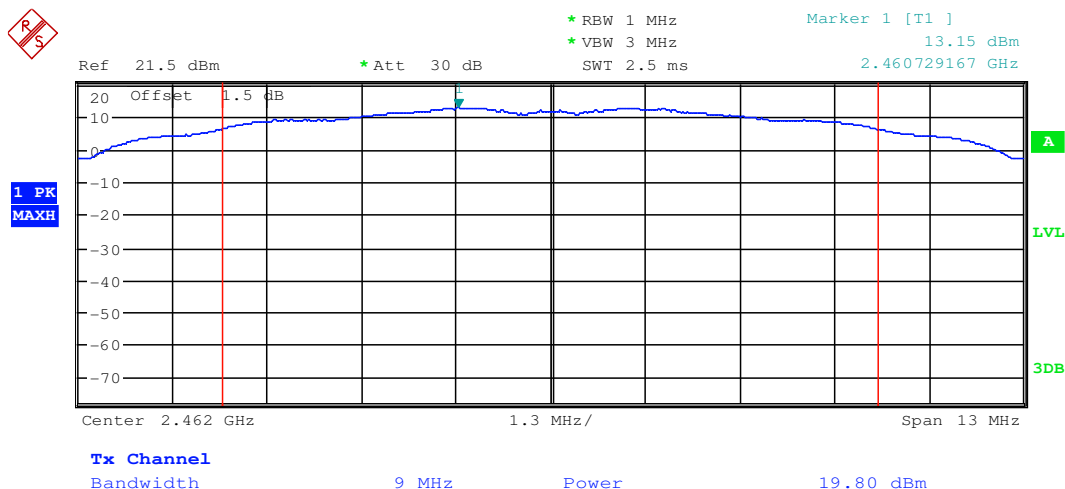
Test mode:	802.11b	Test channel:	Middle
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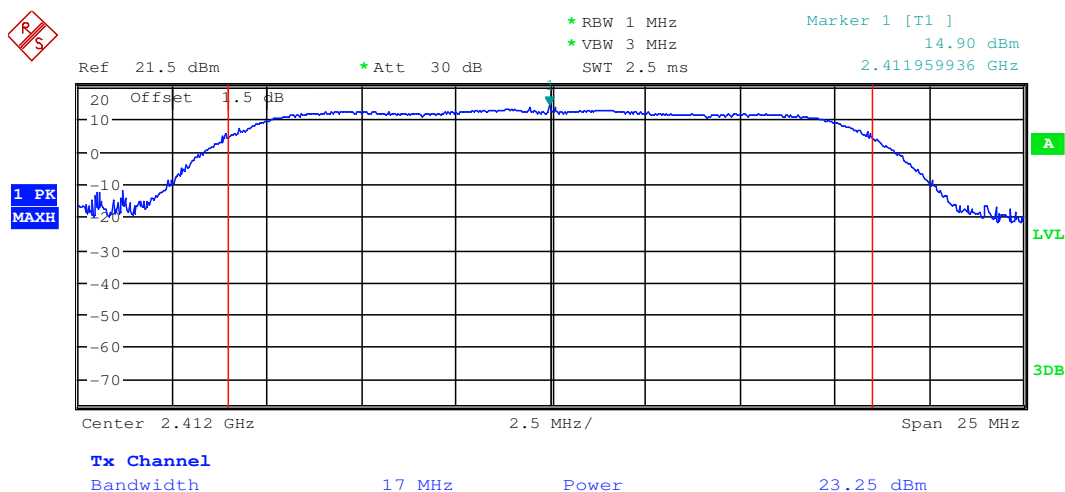


Report No.: SZEM131200680901
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Test mode:	802.11b	Test channel:	Highest
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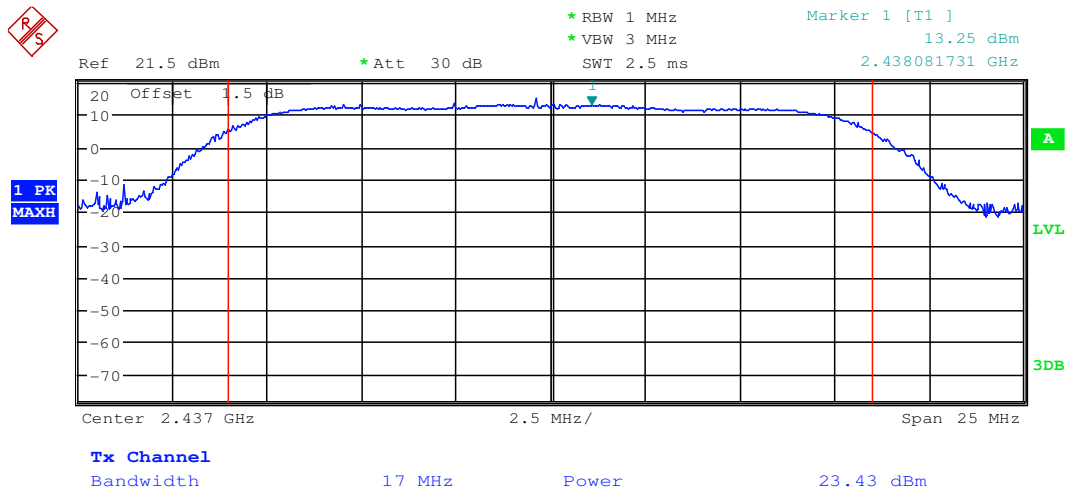
Test mode:	802.11g	Test channel:	Lowest
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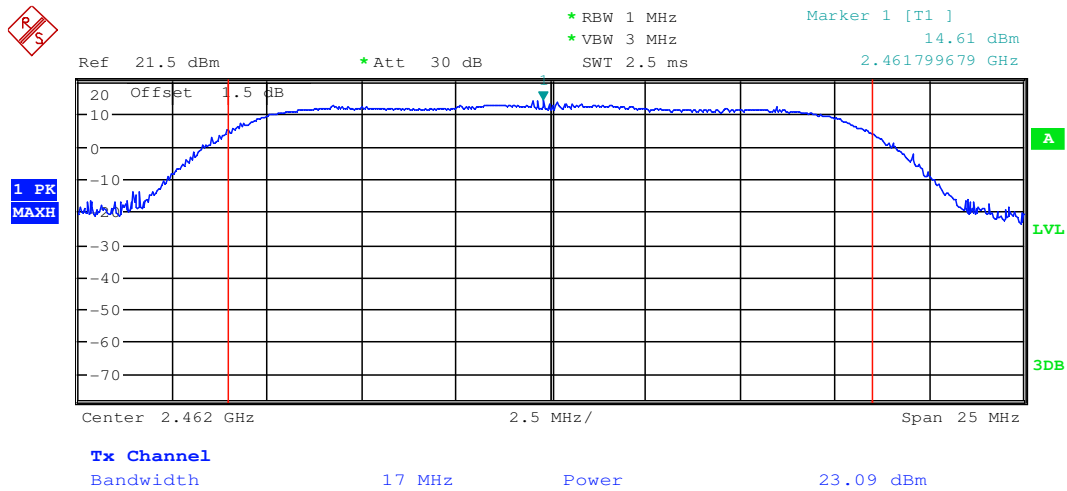
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Test mode:	802.11g	Test channel:	Middle
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Test mode:	802.11g	Test channel:	Highest
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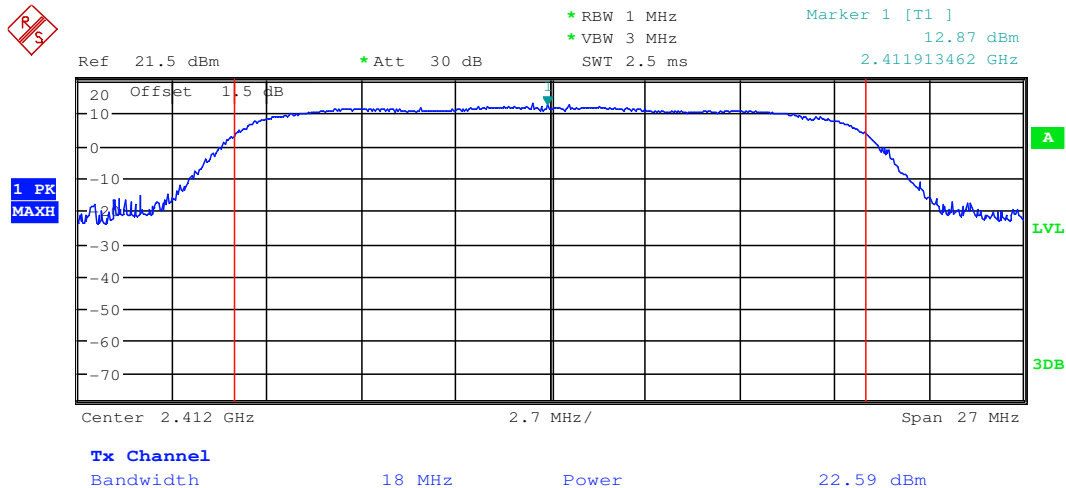


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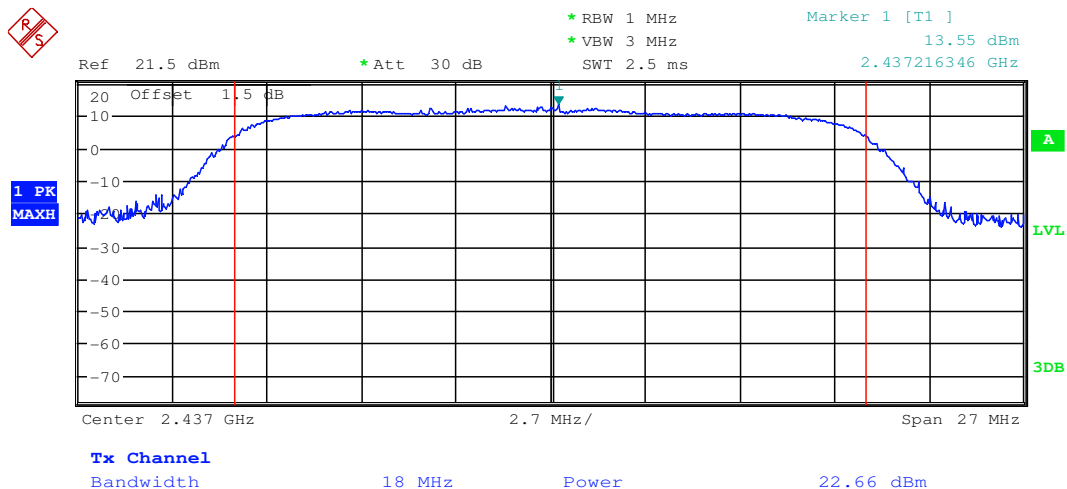
Report No.: SZEM131200680901

Page: 22 of 83

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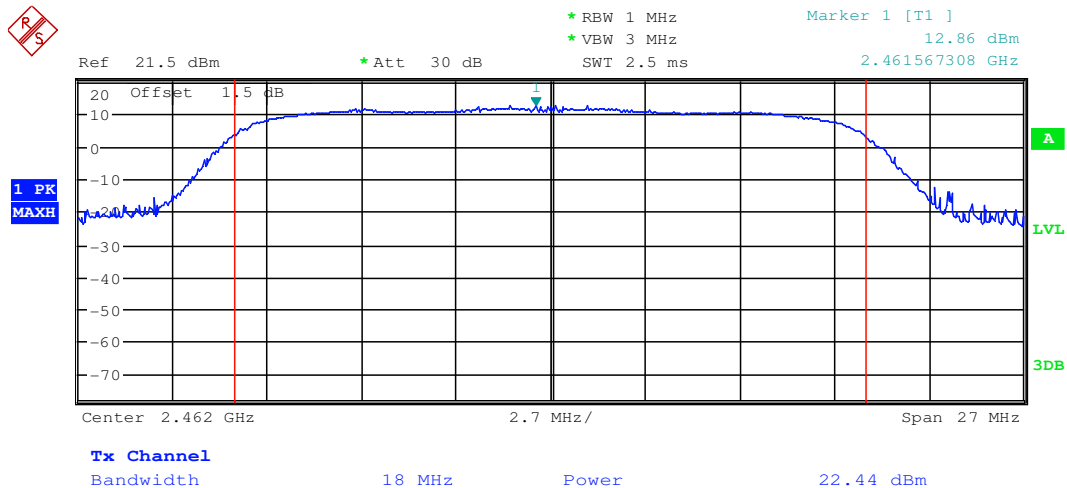
Test mode:	802.11n(HT20)	Test channel:	Middle
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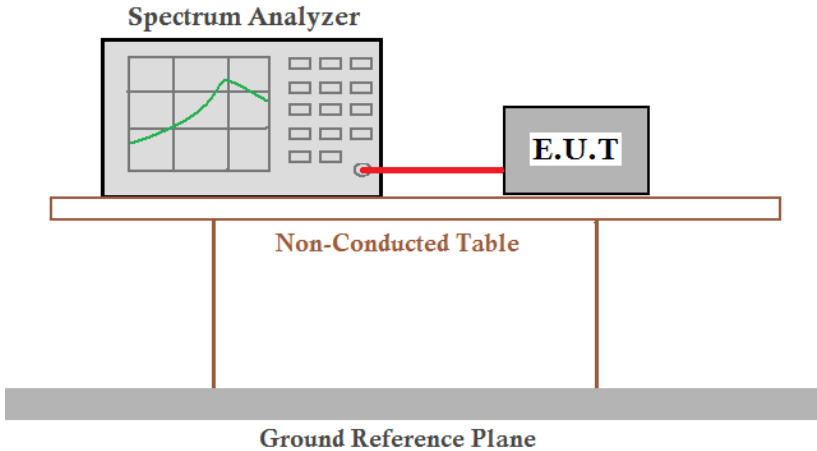


Test mode:	802.11n(HT20)	Test channel:	Highest
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5.4 6dB Occupy Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	KDB558074 D01 v03r01
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 4.10 for details
Exploratory Test Mode:	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)
Limit:	≥ 500 kHz
Test Results:	Pass

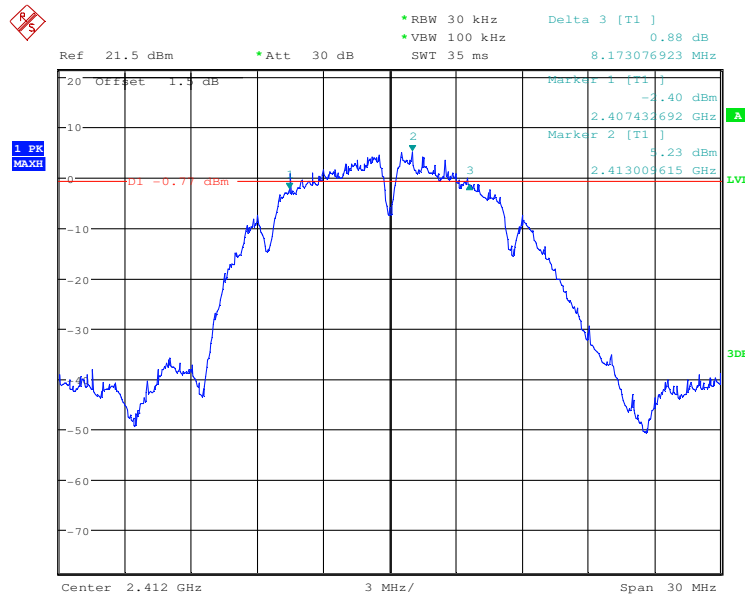
**Measurement Data**

802.11b mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	8.173076923	≥500	Pass
Middle	8.125000000	≥500	Pass
Highest	7.644230769	≥500	Pass
802.11g mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	16.442307692	≥500	Pass
Middle	16.394230769	≥500	Pass
Highest	16.442307692	≥500	Pass
802.11n(HT20) mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	17.692307692	≥500	Pass
Middle	17.692307692	≥500	Pass
Highest	17.692307692	≥500	Pass

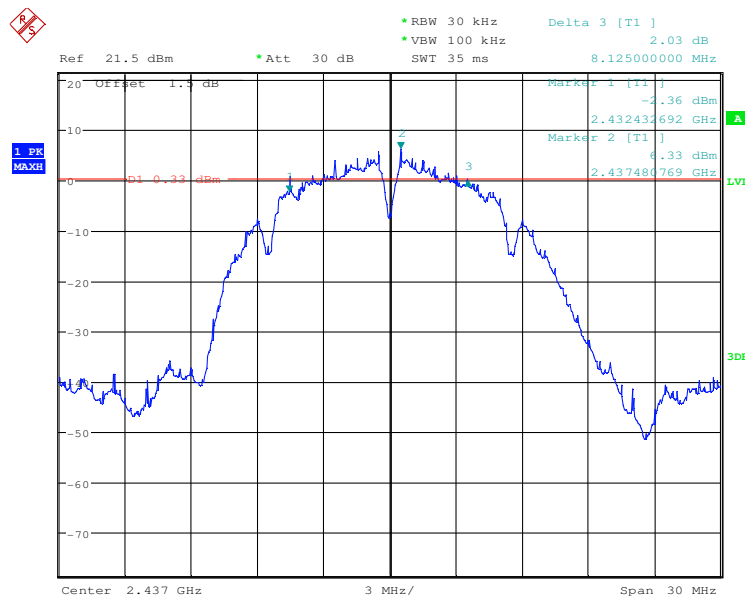


Test plot as follows:

Test mode:	802.11b	Test channel:	Lowest
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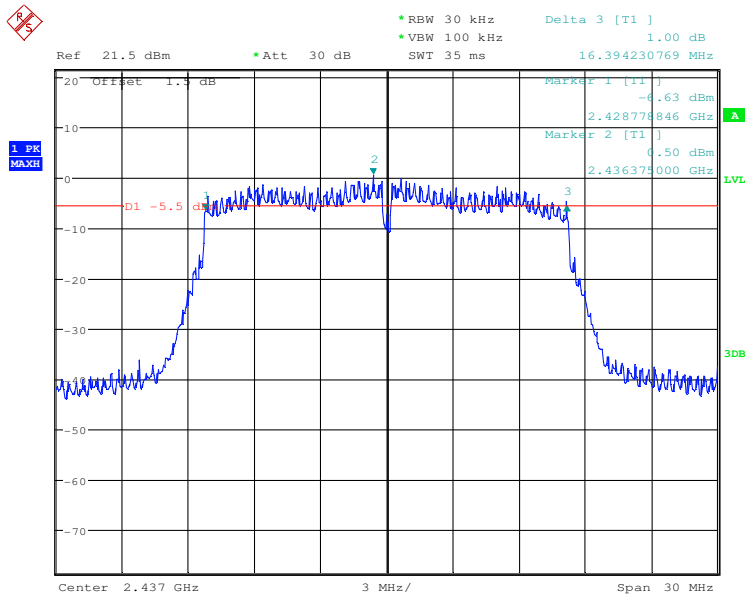
Test mode:	802.11b	Test channel:	Middle
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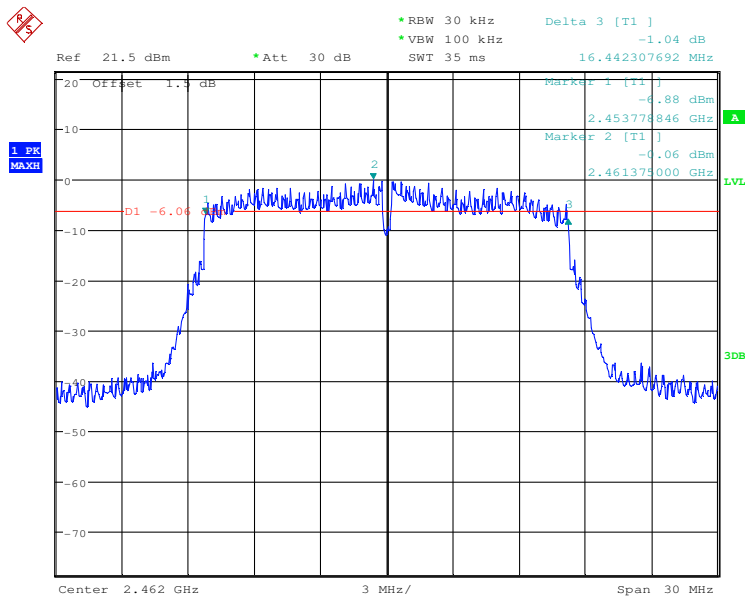
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Test mode:	802.11g	Test channel:	Middle
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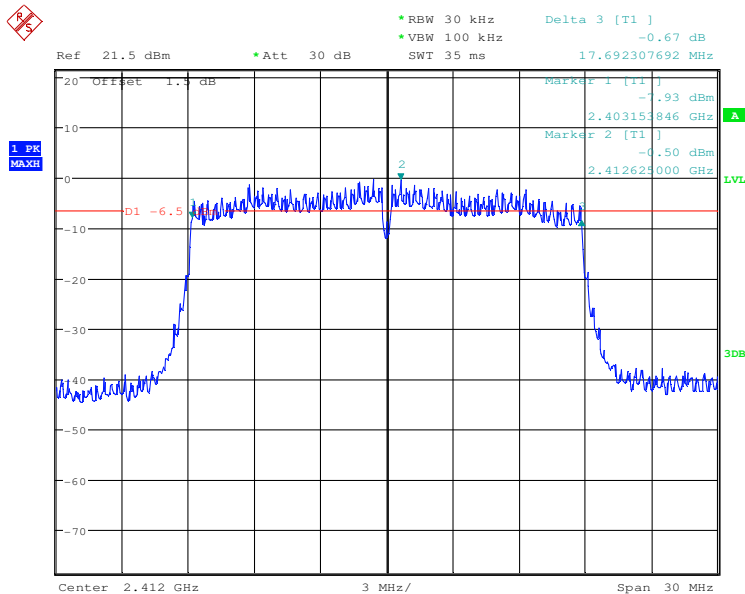
Test mode:	802.11g	Test channel:	Highest
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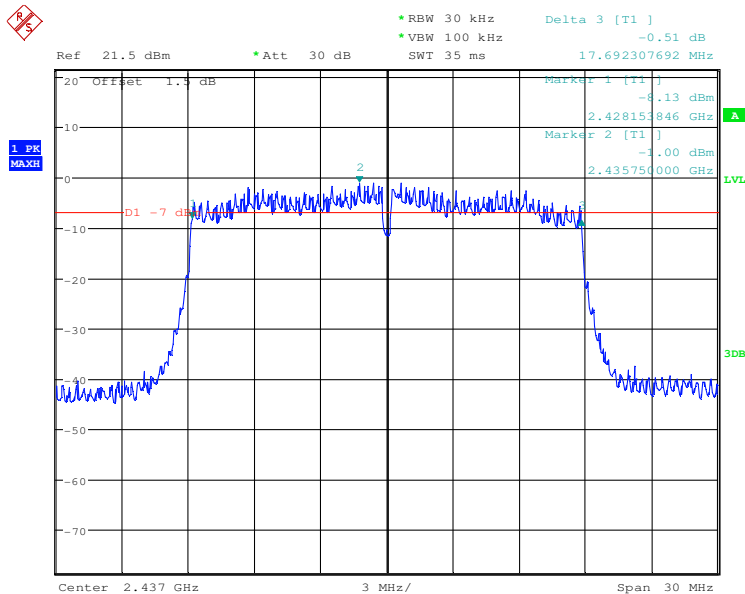
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Test mode:	802.11n(HT20)	Test channel:	Lowest
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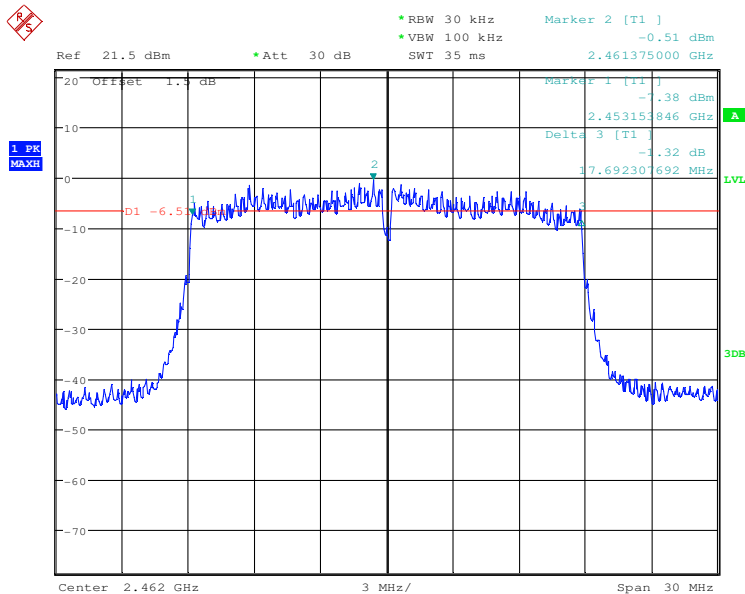
Test mode:	802.11n(HT20)	Test channel:	Middle
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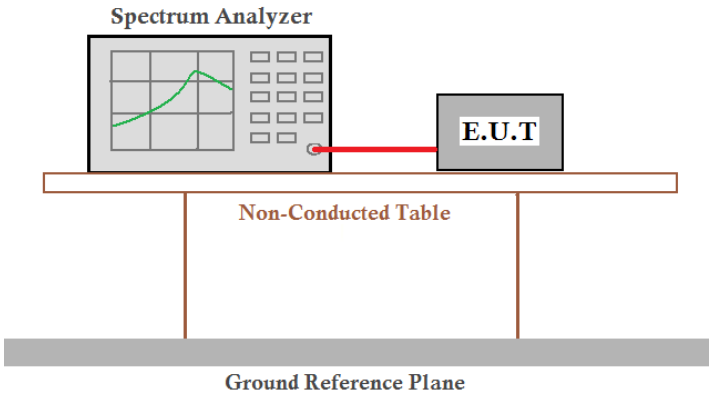


Test mode:	802.11n(HT20)	Test channel:	Highest
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5.5 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	KDB558074 D01 v03r01
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Test Instruments:	Refer to section 4.10 for details
Exploratory Test Mode:	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)
Limit:	≤8.00dBm
Test Results:	Pass



**Measurement Data**

802.11b mode			
Test channel	Power Spectral Density (dBm)	Limit (dBm)	Result
Lowest	-4.88	≤8.00	Pass
Middle	-5.35	≤8.00	Pass
Highest	-6.57	≤8.00	Pass
802.11g mode			
Test channel	Power Spectral Density (dBm)	Limit (dBm)	Result
Lowest	-10.08	≤8.00	Pass
Middle	-10.65	≤8.00	Pass
Highest	-10.11	≤8.00	Pass
802.11n(HT20) mode			
Test channel	Power Spectral Density (dBm)	Limit (dBm)	Result
Lowest	-10.52	≤8.00	Pass
Middle	-11.43	≤8.00	Pass
Highest	-11.09	≤8.00	Pass



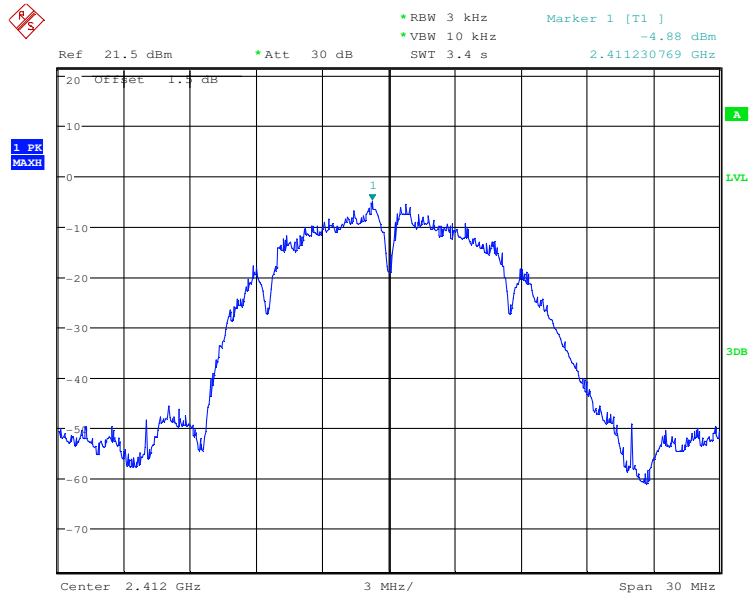
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Report No.: SZEM131200680901

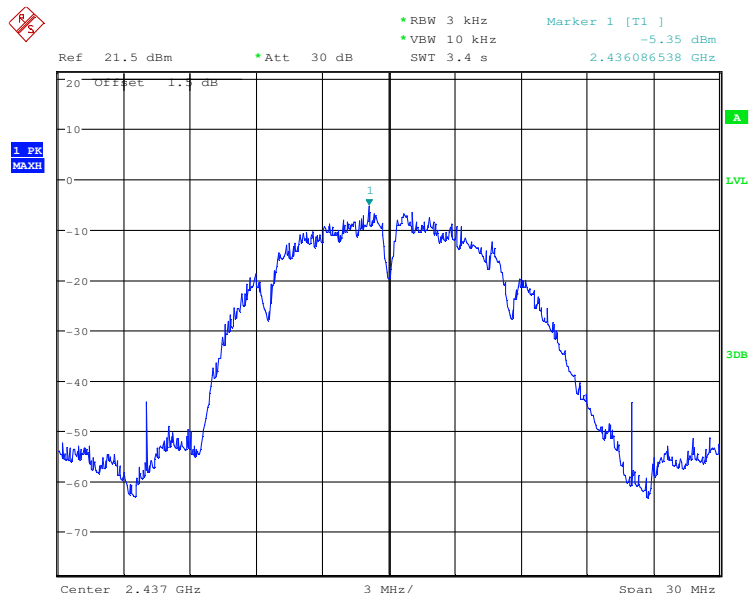
Page: 33 of 83

Test plot as follows:

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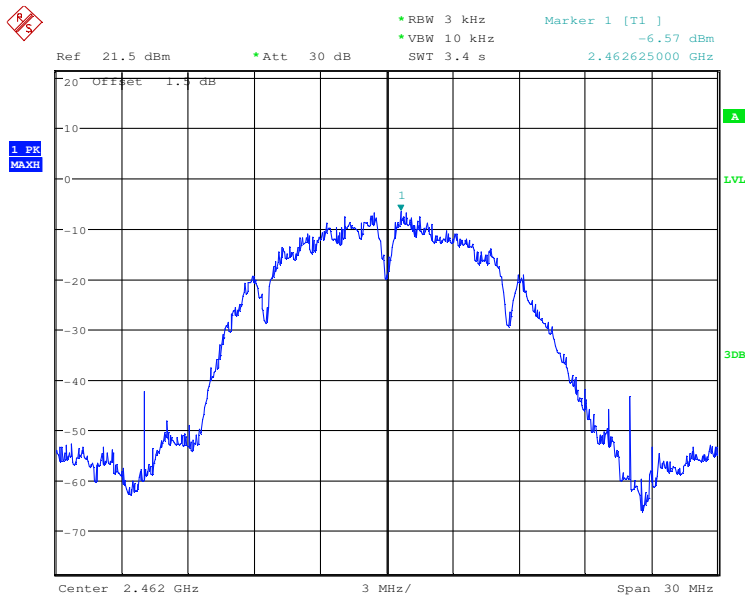
Test mode:	802.11b	Test channel:	Middle
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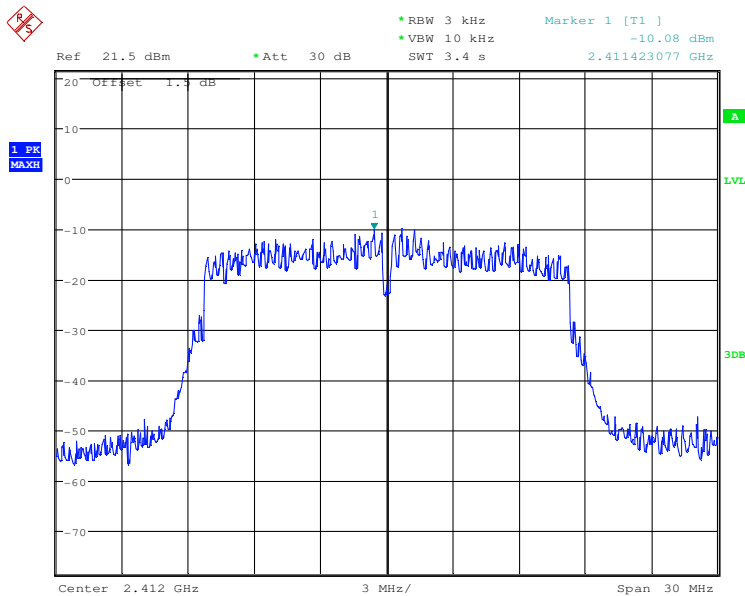
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Test mode:	802.11b	Test channel:	Highest
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Test mode:	802.11g	Test channel:	Lowest
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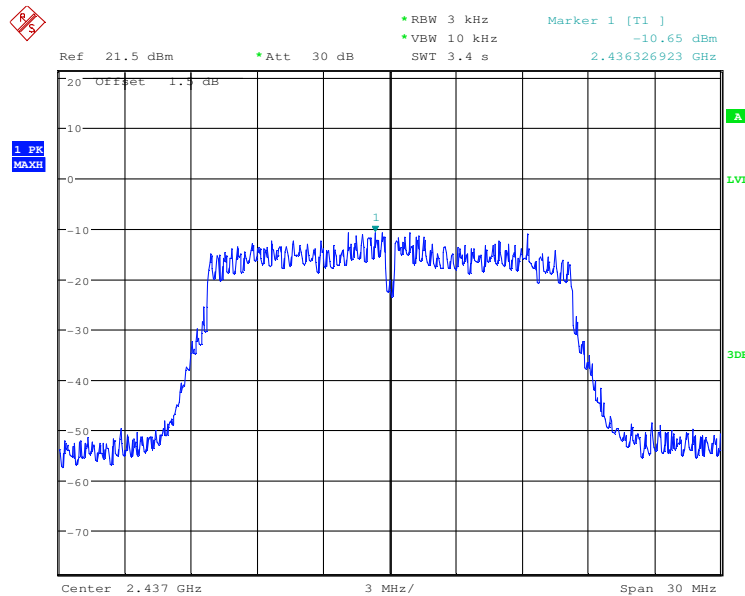


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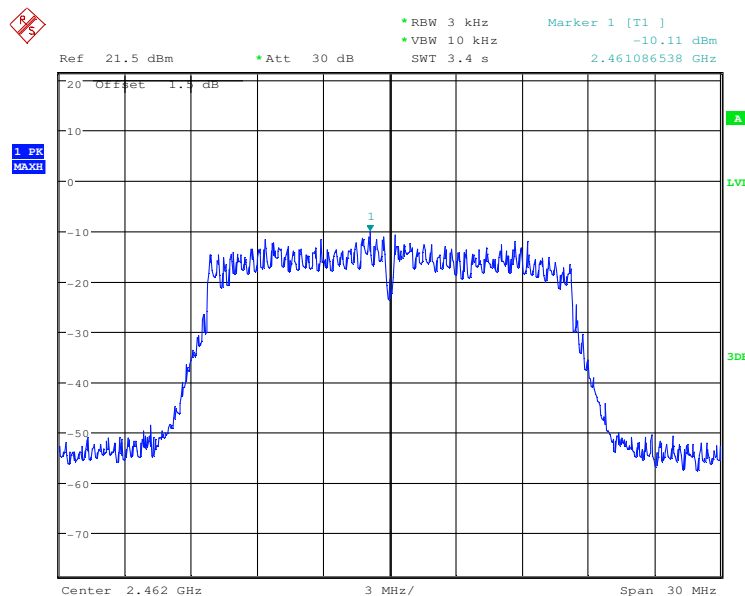
Report No.: SZEM131200680901

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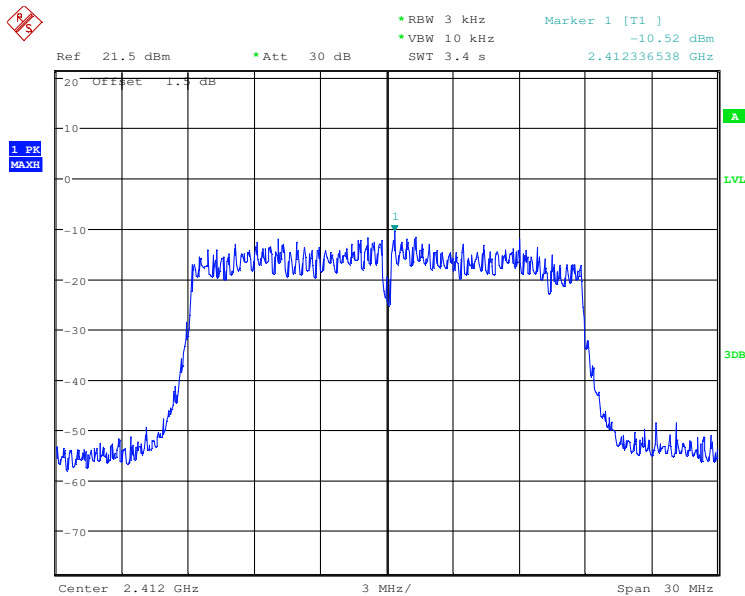
Test mode:	802.11g	Test channel:	Highest
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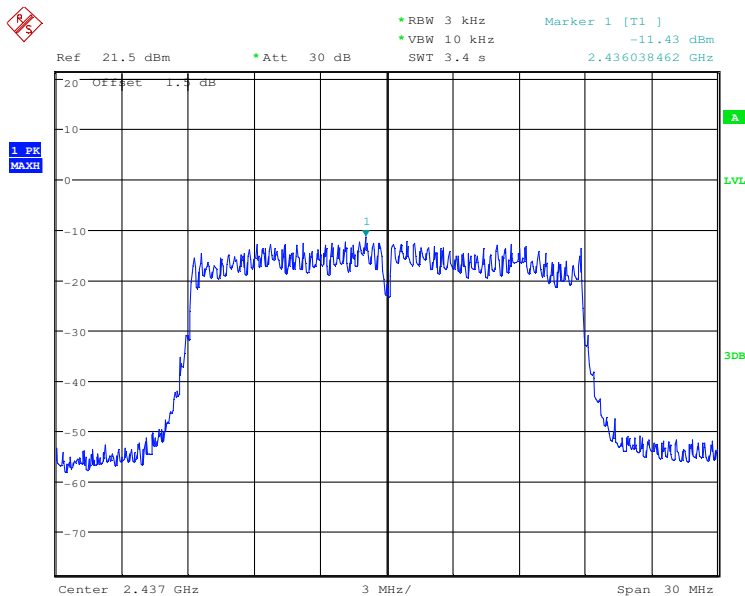
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Test mode:	802.11n(HT20)	Test channel:	Lowest
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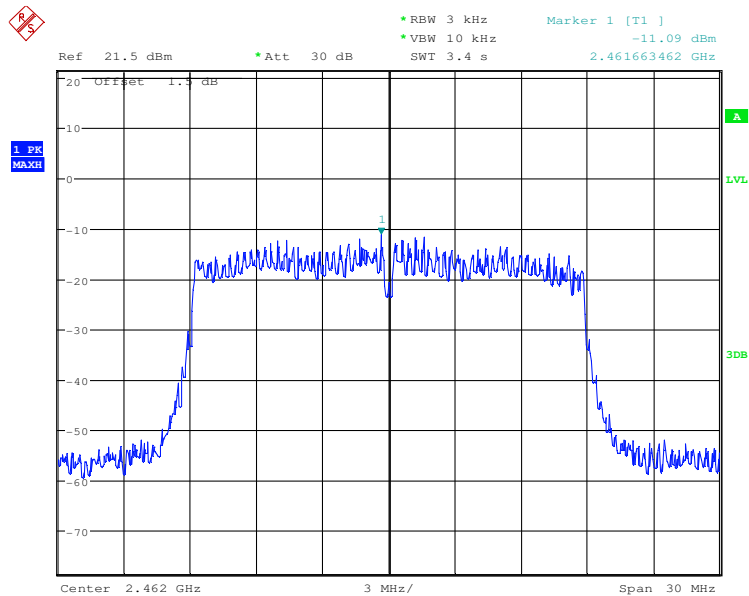
Test mode:	802.11n(HT20)	Test channel:	Middle
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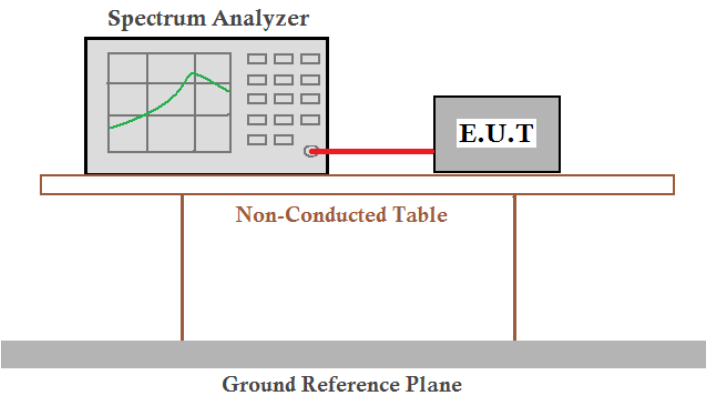


Test mode:	802.11n(HT20)	Test channel:	Highest
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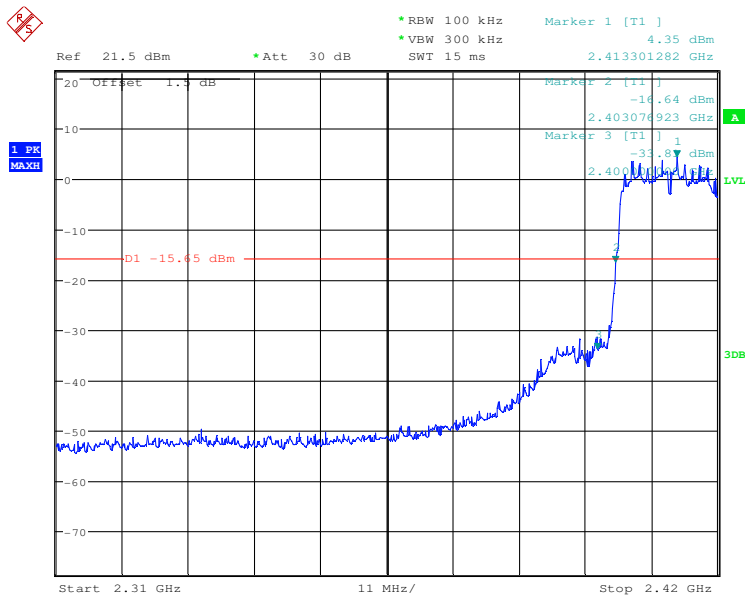
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5.6 Band-edge for RF Conducted Emissions

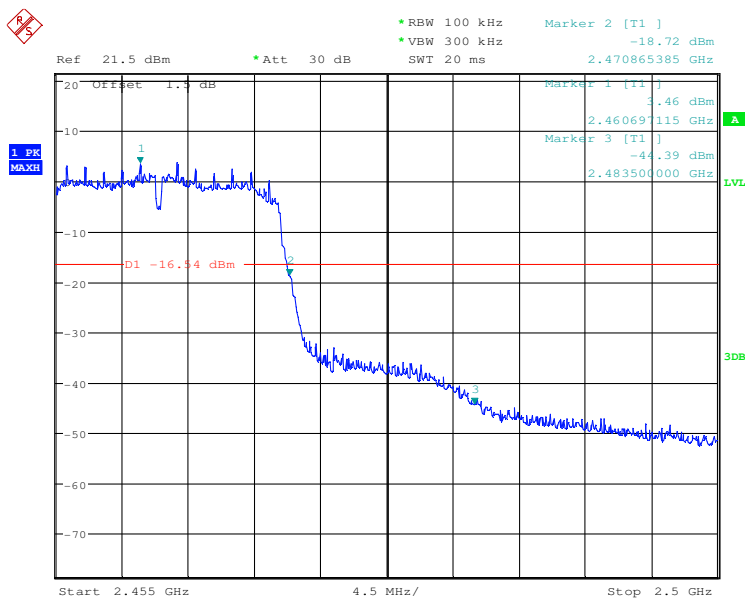
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	KDB558074 D01 v03r01
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Exploratory Test Mode:	Transmitting mode
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst 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).
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 4.10 for details
Test Results:	Pass



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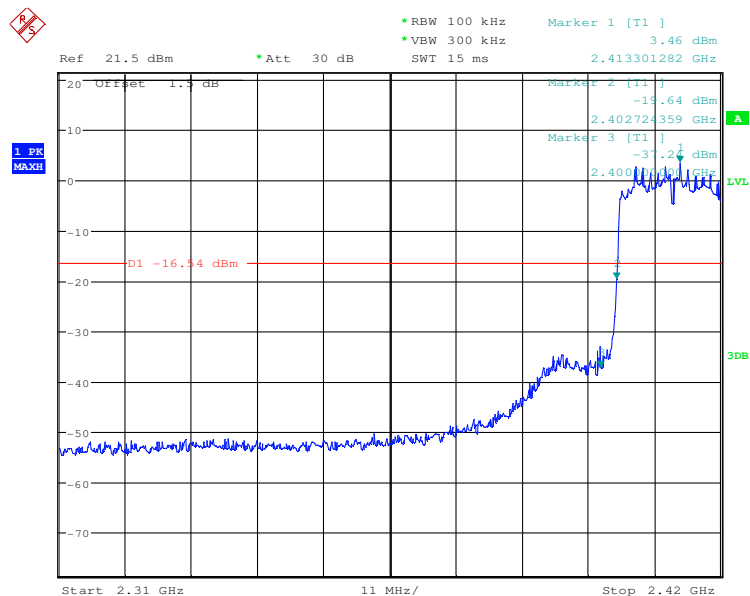


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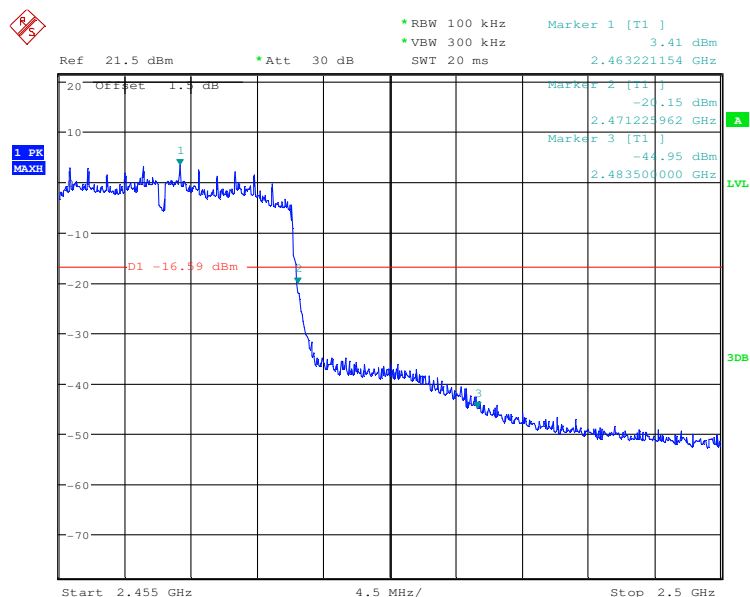
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Test mode:	802.11n(HT20)	Test channel:	Lowest
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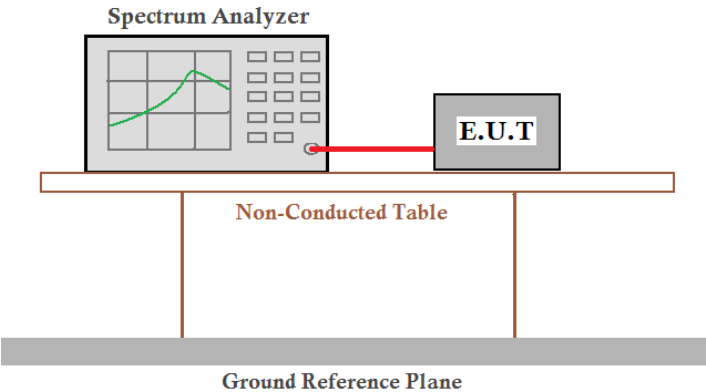


Test mode:	802.11n(HT20)	Test channel:	Highest
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5.7 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	KDB558074 D01 v03r011
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Exploratory Test Mode:	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) .
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 4.10 for details
Test Results:	Pass



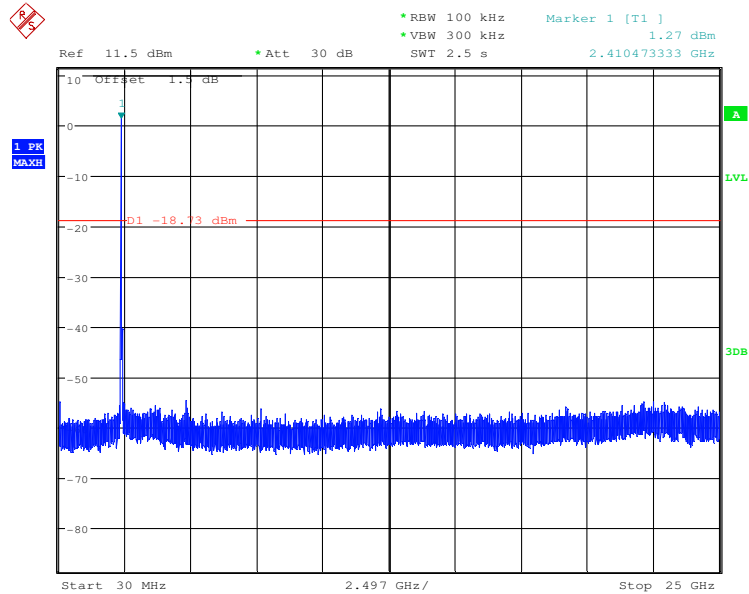
SGS-CSTC Standards Technical Services Ltd.

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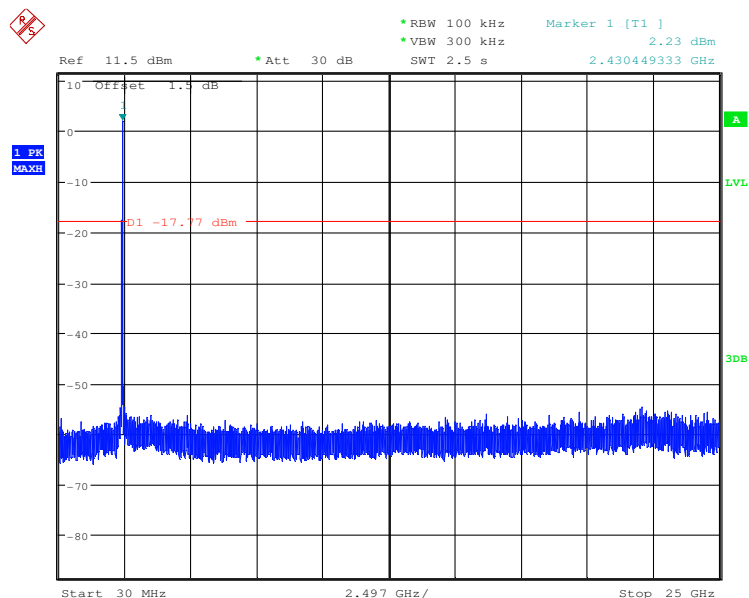
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Test plot as follows:

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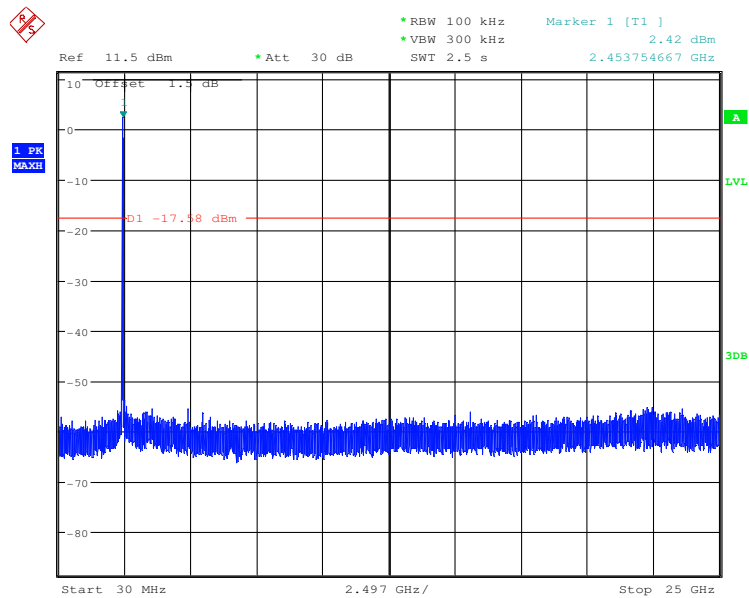


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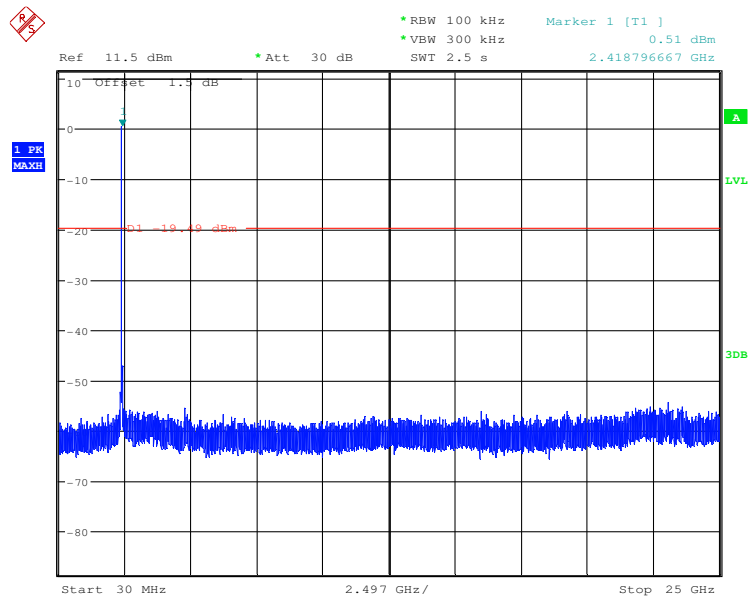
Report No.: SZEM131200680901

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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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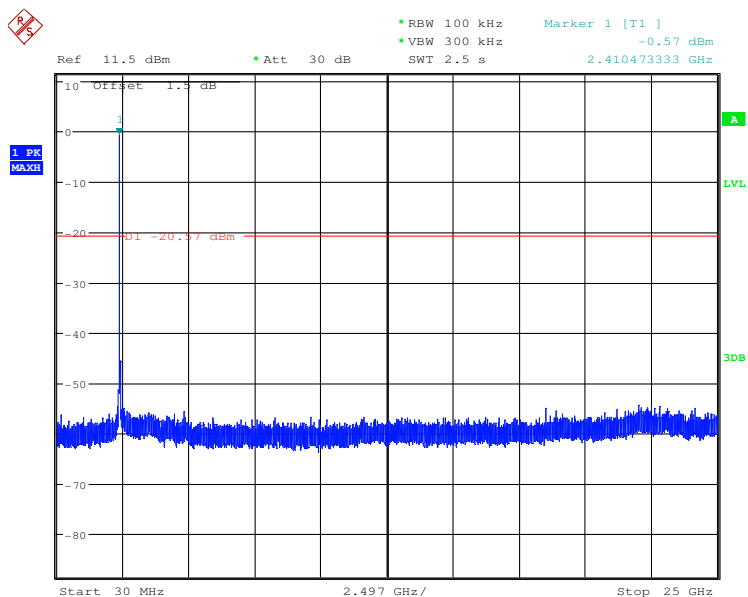


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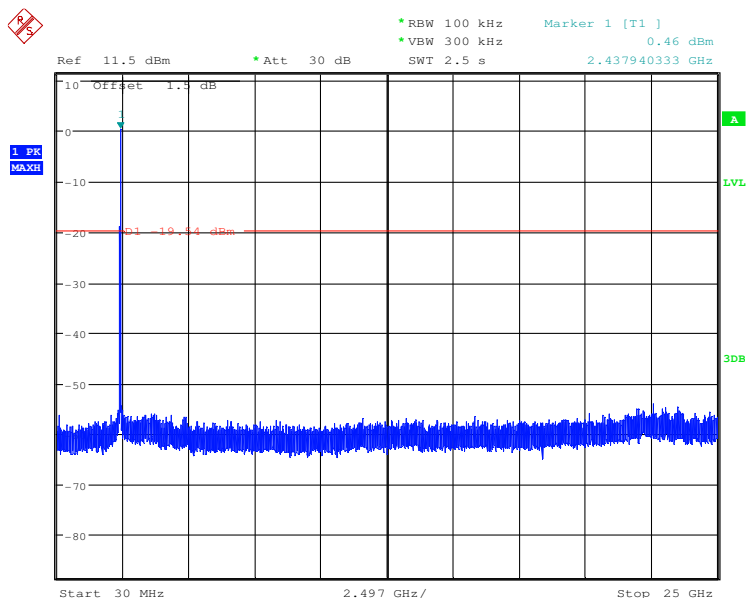
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Test mode:	802.11n(HT20)	Test channel:	Lowest
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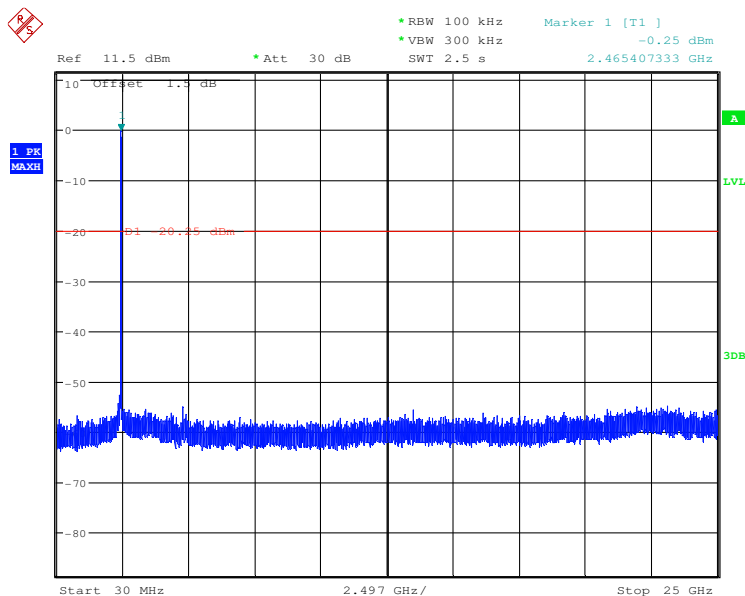


Test mode:	802.11n(HT20)	Test channel:	Middle
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Test mode:	802.11n(HT20)	Test channel:	Highest
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5.8 Radiated Spurious Emissions

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

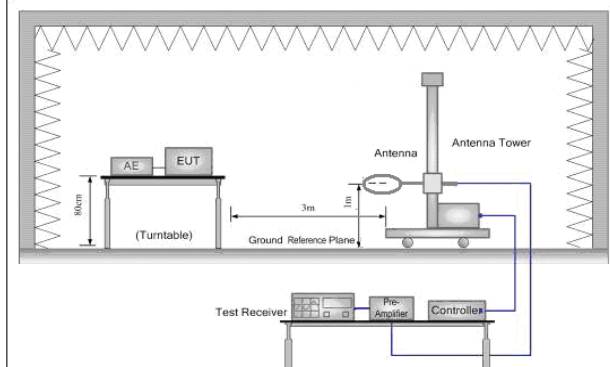


Figure 1. Below 30MHz

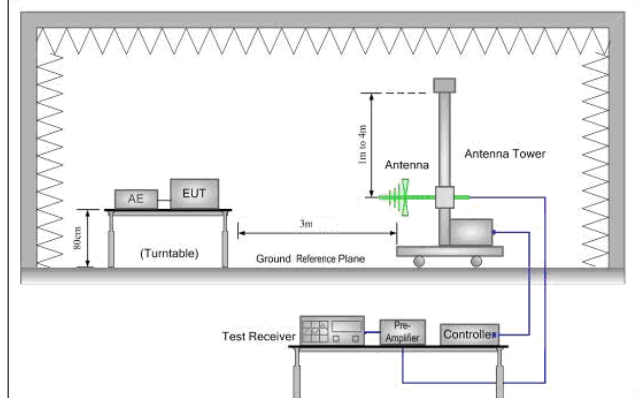


Figure 2. 30MHz to 1GHz

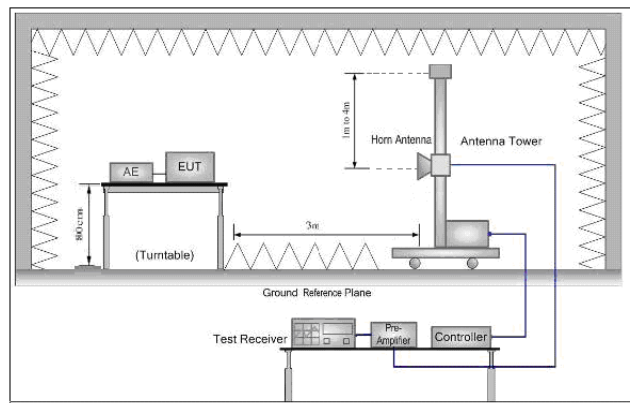


Figure 3. Above 1 GHz

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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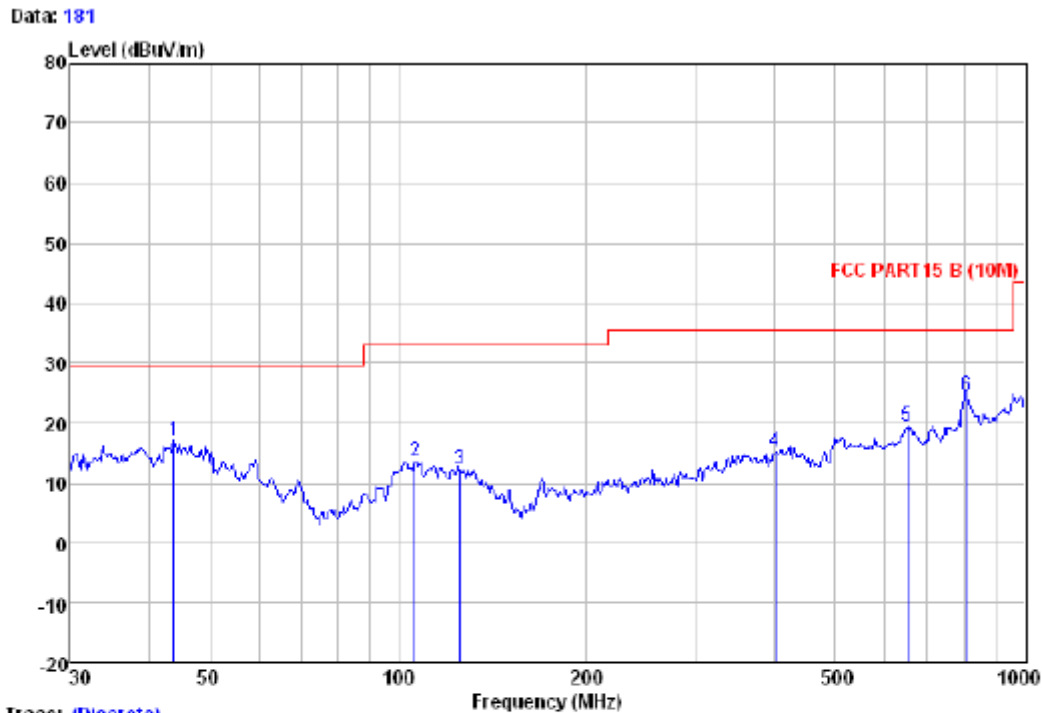
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	<p>method as specified and then reported in a data sheet.</p> <p>g. Test the EUT in the lowest channel ,the middle channel ,the Highest channel</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p>
Exploratory Test Mode:	Transmitting mode, AC charge + 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) .
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

5.8.1 Radiated emission below 1GHz

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



Trace: (Discrete)

Site : SGS

Condition : FCC PART15 B (10M) 10m VULB 9163 10M 2013 VERTICAL

Job :

Application :

Test Mode : AC Charge+TX

Product :

Model :

Engineer :

Remark : Level=Read Level + Cable loss
+ Antenna Factor - Preamp factor

AC Power :

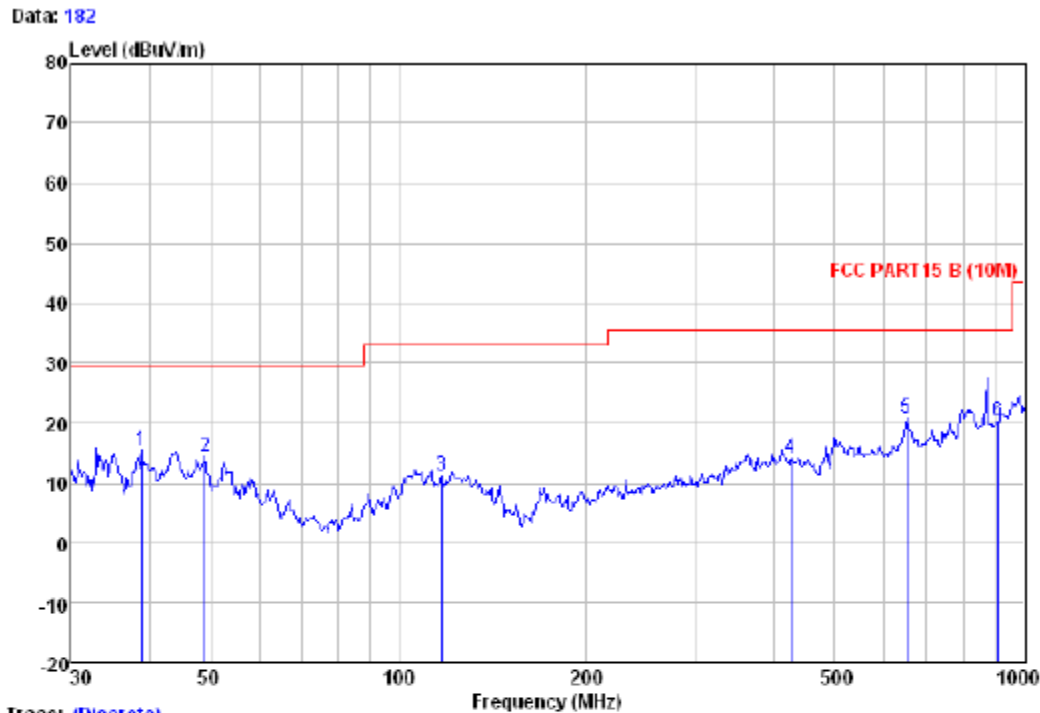
Memo :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	43.812	28.23	19.49	0.96	31.60	17.08	29.50	-12.42	QP
2	106.385	27.89	15.90	1.47	31.59	13.67	33.10	-19.43	QP
3	125.446	27.51	14.75	1.59	31.53	12.32	33.10	-20.78	QP
4	400.432	28.40	15.30	2.71	31.10	15.31	35.60	-20.29	QP
5	651.942	28.83	18.44	3.45	31.24	19.48	35.60	-16.12	QP
6	807.429	31.21	20.63	3.92	31.19	24.57	35.60	-11.03	QP





Test mode:	Transmitting	Horizontal
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Trace: (Discrete)

Site : SGS

Condition : FCC PART 15 B (10M) 10m VULB 9163 10M 2013 HORIZONTAL

Job :

Application:

Test Mode : AC Charge+TX

Product :

Model :

Engineer :

Remark : Level-Read Level + Cable loss
+ Antenna Factor - Preamp factor

AC Power :

Memo :

	Freq	ReadAntenna	Cable Preamp	Limit	Over	
	Level	Factor	Loss Factor	Level	Limit	Remark
	NHz	dBuV	dB/m	dB	dB	dBuV/m
1	38.888	26.96	19.20	0.92	31.60	15.48
2	49.014	26.70	18.30	0.99	31.60	14.39
3	117.360	26.17	15.10	1.54	31.55	11.26
4	425.028	27.15	15.40	2.82	31.12	14.25
5	651.942	30.05	18.44	3.45	31.24	20.70
6	906.482	28.14	18.90	4.18	31.02	20.20

**5.8.2 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	
2980.327	5.05	33.35	40.28	47.48	45.60	74	-28.40	Vertical	
4024.520	6.50	33.89	41.05	47.25	46.59	74	-27.41	Vertical	
4824.000	7.45	34.68	41.64	47.49	47.98	74	-26.02	Vertical	
7236.000	8.76	35.90	39.85	46.82	51.63	74	-22.37	Vertical	
9648.000	9.69	37.36	37.76	42.25	51.54	74	-22.46	Vertical	
12241.140	11.38	39.14	38.38	38.94	51.08	74	-22.92	Vertical	
2846.851	4.94	33.19	40.19	46.21	44.15	74	-29.85	Horizontal	
3863.900	6.28	33.63	40.94	47.29	46.26	74	-27.74	Horizontal	
4824.000	7.45	34.68	41.64	47.71	48.20	74	-25.80	Horizontal	
7236.000	8.76	35.90	39.85	46.50	51.31	74	-22.69	Horizontal	
9648.000	9.69	37.36	37.76	42.93	52.22	74	-21.78	Horizontal	
11963.890	11.26	38.87	38.26	40.05	51.92	74	-22.08	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	
2980.327	5.05	33.35	40.28	47.19	45.31	74	-28.69	Vertical	
3824.757	6.21	33.59	40.91	47.94	46.83	74	-27.17	Vertical	
4874.000	7.48	34.59	41.68	47.86	48.25	74	-25.75	Vertical	
7311.000	8.85	35.92	39.79	46.88	51.86	74	-22.14	Vertical	
9748.000	9.74	37.46	37.68	41.91	51.43	74	-22.57	Vertical	
12241.140	11.38	39.14	38.38	38.77	50.91	74	-23.09	Vertical	
2905.419	4.98	33.26	40.23	46.84	44.85	74	-29.15	Horizontal	
3834.506	6.23	33.61	40.91	48.08	47.01	74	-26.99	Horizontal	
4874.000	7.48	34.59	41.68	47.52	47.91	74	-26.09	Horizontal	
7311.000	8.85	35.92	39.79	47.98	52.96	74	-21.04	Horizontal	
9748.000	9.74	37.46	37.68	42.74	52.26	74	-21.74	Horizontal	
12148.020	11.35	39.06	38.34	39.44	51.51	74	-22.49	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	
2942.635	5.01	33.31	40.26	47.75	45.81	74	-28.19	Vertical	
3983.750	6.43	33.80	41.02	48.21	47.42	74	-26.58	Vertical	
4924.000	7.51	34.51	41.72	48.01	48.31	74	-25.69	Vertical	
7386.000	8.94	35.96	39.72	46.82	52.00	74	-22.00	Vertical	
9848.000	9.78	37.54	37.58	42.40	52.14	74	-21.86	Vertical	
12429.540	11.46	39.33	38.46	39.56	51.89	74	-22.11	Vertical	
3080.601	5.17	33.37	40.37	47.54	45.71	74	-28.29	Horizontal	
3983.750	6.43	33.80	41.02	47.36	46.57	74	-27.43	Horizontal	
4924.000	7.51	34.51	41.72	47.09	47.39	74	-26.61	Horizontal	
7386.000	8.94	35.96	39.72	47.42	52.60	74	-21.40	Horizontal	
9848.000	9.78	37.54	37.58	41.62	51.36	74	-22.64	Horizontal	
11933.470	11.24	38.83	38.24	38.24	50.07	74	-23.93	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	
2905.419	4.98	33.26	40.23	47.50	45.51	74	-28.49	Vertical	
3766.785	6.13	33.53	40.87	48.54	47.33	74	-26.67	Vertical	
4824.000	7.45	34.68	41.64	48.12	48.61	74	-25.39	Vertical	
7236.000	8.76	35.90	39.85	47.79	52.60	74	-21.40	Vertical	
9648.000	9.69	37.36	37.76	42.83	52.12	74	-21.88	Vertical	
12272.340	11.40	39.18	38.39	39.64	51.83	74	-22.17	Vertical	
2995.538	5.05	33.38	40.30	48.05	46.18	74	-27.82	Horizontal	
3983.750	6.43	33.80	41.02	46.94	46.15	74	-27.85	Horizontal	
4824.000	7.45	34.68	41.64	48.12	48.61	74	-25.39	Horizontal	
7236.000	8.76	35.90	39.85	46.75	51.56	74	-22.44	Horizontal	
9648.000	9.69	37.36	37.76	41.83	51.12	74	-22.88	Horizontal	
12210.020	11.37	39.11	38.36	39.45	51.57	74	-22.43	Horizontal	

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Test mode:		802.11g		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			
2875.986	4.97	33.21	40.21	46.55	44.52	74	-29.48	Vertical			
3747.656	6.11	33.51	40.86	46.78	45.54	74	-28.46	Vertical			
4874.000	7.48	34.59	41.68	47.96	48.35	74	-25.65	Vertical			
7311.000	8.85	35.92	39.79	47.92	52.90	74	-21.10	Vertical			
9748.000	9.74	37.46	37.68	40.89	50.41	74	-23.59	Vertical			
12272.340	11.40	39.18	38.39	39.38	51.57	74	-22.43	Vertical			
2957.654	5.02	33.33	40.27	47.58	45.66	74	-28.34	Horizontal			
3893.520	6.31	33.68	40.95	48.61	47.65	74	-26.35	Horizontal			
4874.000	7.48	34.59	41.68	47.25	47.64	74	-26.36	Horizontal			
7311.000	8.85	35.92	39.79	47.89	52.87	74	-21.13	Horizontal			
9748.000	9.74	37.46	37.68	42.02	51.54	74	-22.46	Horizontal			
12366.420	11.43	39.28	38.43	38.36	50.64	74	-23.36	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		
2927.691	5.01	33.28	40.24	46.99	45.04	74	-28.96	Vertical		
3993.903	6.46	33.80	41.04	46.29	45.51	74	-28.49	Vertical		
4924.000	7.51	34.51	41.72	48.24	48.54	74	-25.46	Vertical		
7386.000	8.94	35.96	39.72	46.27	51.45	74	-22.55	Vertical		
9848.000	9.78	37.54	37.58	43.21	52.95	74	-21.05	Vertical		
12366.420	11.43	39.28	38.43	40.08	52.36	74	-21.64	Vertical		
2890.665	4.98	33.24	40.23	47.67	45.66	74	-28.34	Horizontal		
3824.757	6.21	33.59	40.91	48.17	47.06	74	-26.94	Horizontal		
4924.000	7.51	34.51	41.72	47.82	48.12	74	-25.88	Horizontal		
7386.000	8.94	35.96	39.72	45.91	51.09	74	-22.91	Horizontal		
9848.000	9.78	37.54	37.58	41.00	50.74	74	-23.26	Horizontal		
12366.420	11.43	39.28	38.43	38.96	51.24	74	-22.76	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	
2875.986	4.97	33.21	40.21	47.89	45.86	74	-28.14	Vertical	
3815.033	6.21	33.59	40.90	48.89	47.79	74	-26.21	Vertical	
4824.000	7.45	34.68	41.64	49.15	49.64	74	-24.36	Vertical	
7236.000	8.76	35.90	39.85	48.08	52.89	74	-21.11	Vertical	
9648.000	9.69	37.36	37.76	42.97	52.26	74	-21.74	Vertical	
12556.750	11.51	39.43	38.50	39.52	51.96	74	-22.04	Vertical	
2890.665	4.98	33.24	40.23	47.55	45.54	74	-28.46	Horizontal	
3700.260	6.05	33.45	40.81	48.81	47.50	74	-26.50	Horizontal	
4824.000	7.45	34.68	41.64	48.38	48.87	74	-25.13	Horizontal	
7236.000	8.76	35.90	39.85	46.67	51.48	74	-22.52	Horizontal	
9648.000	9.69	37.36	37.76	41.89	51.18	74	-22.82	Horizontal	
12241.140	11.38	39.14	38.38	40.48	52.62	74	-21.38	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	
2942.635	5.01	33.31	40.26	47.48	45.54	74	-28.46	Vertical	
3883.622	6.31	33.68	40.95	48.11	47.15	74	-26.85	Vertical	
4874.000	7.48	34.59	41.68	48.73	49.12	74	-24.88	Vertical	
7311.000	8.85	35.92	39.79	45.83	50.81	74	-23.19	Vertical	
9748.000	9.74	37.46	37.68	42.57	52.09	74	-21.91	Vertical	
12178.980	11.36	39.09	38.35	40.83	52.93	74	-21.07	Vertical	
2818.011	4.92	33.14	40.17	47.70	45.59	74	-28.41	Horizontal	
3776.385	6.16	33.53	40.87	48.17	46.99	74	-27.01	Horizontal	
4874.000	7.48	34.59	41.68	47.50	47.89	74	-26.11	Horizontal	
7311.000	8.85	35.92	39.79	46.77	51.75	74	-22.25	Horizontal	
9748.000	9.74	37.46	37.68	41.83	51.35	74	-22.65	Horizontal	
12366.420	11.43	39.28	38.43	39.09	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			
2898.032	4.98	33.26	40.23	47.60	45.61	74	-28.39	Vertical			
3913.393	6.33	33.70	40.97	48.11	47.17	74	-26.83	Vertical			
4924.000	7.51	34.51	41.72	47.94	48.24	74	-25.76	Vertical			
7386.000	8.94	35.96	39.72	45.60	50.78	74	-23.22	Vertical			
9848.000	9.78	37.54	37.58	41.46	51.20	74	-22.80	Vertical			
12241.140	11.38	39.14	38.38	39.84	51.98	74	-22.02	Vertical			
2920.248	5.00	33.28	40.24	47.49	45.53	74	-28.47	Horizontal			
3863.900	6.28	33.63	40.94	47.85	46.82	74	-27.18	Horizontal			
4924.000	7.51	34.51	41.72	48.86	49.16	74	-24.84	Horizontal			
7386.000	8.94	35.96	39.72	46.51	51.69	74	-22.31	Horizontal			
9848.000	9.78	37.54	37.58	41.08	50.82	74	-23.18	Horizontal			
12117.140	11.33	39.02	38.32	39.12	51.15	74	-22.85	Horizontal			

Remark:

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

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

- 2) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported .
- 3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

5.9 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:			

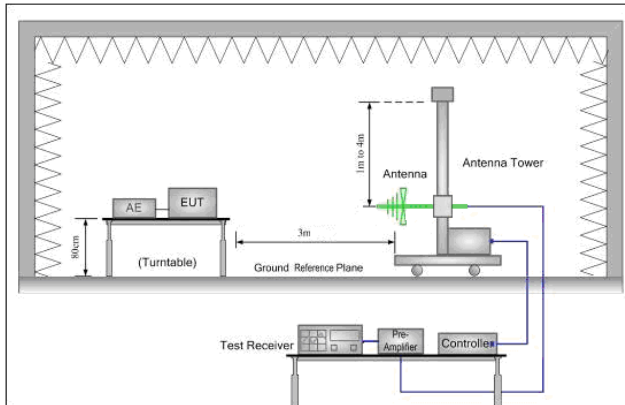


Figure 1. 30MHz to 1GHz

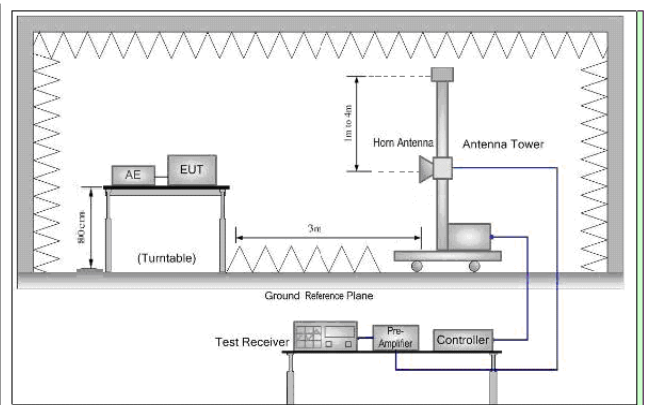


Figure 2. Above 1 GHz



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



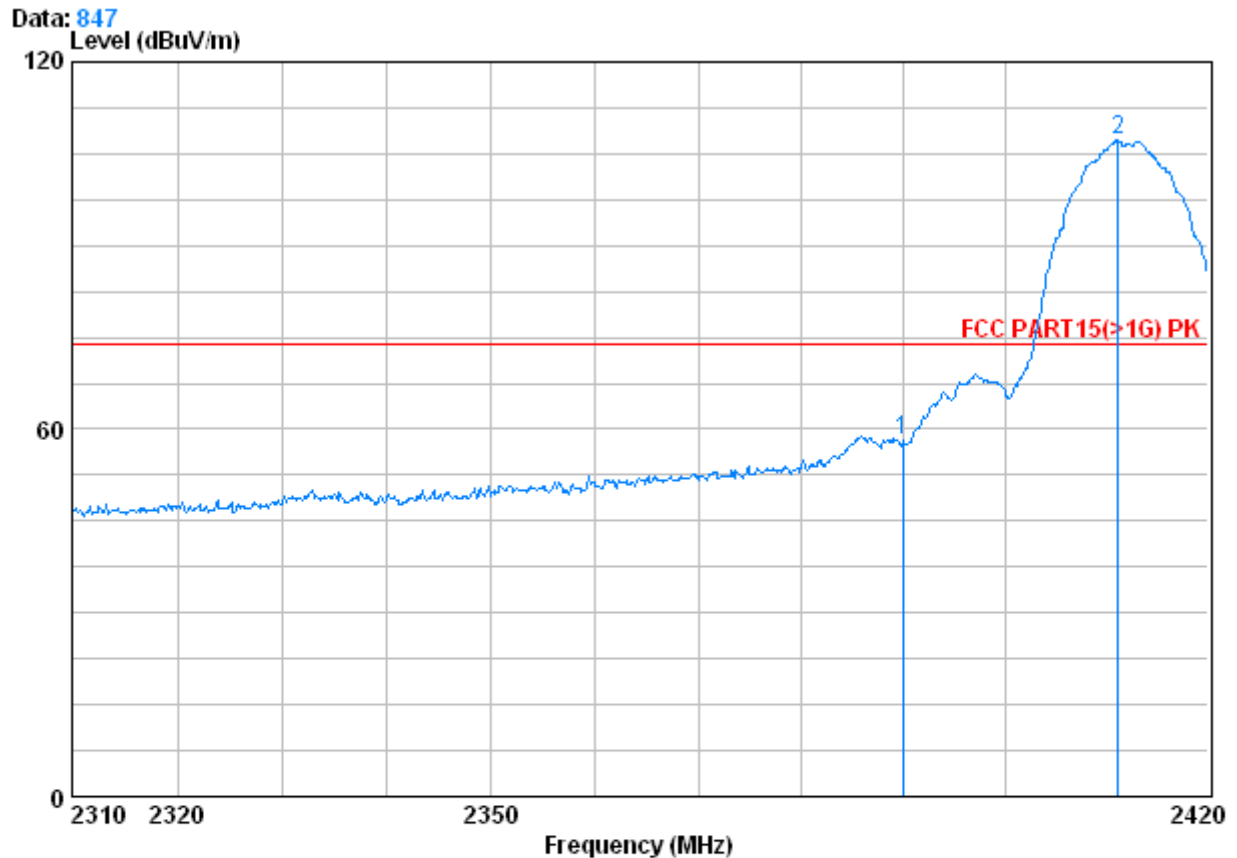
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Test plot as follows:

Worse case mode:	802.11b	Test channel:	Lowest	Remark:	Peak	Vertical
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Condition : FCC PART15(>1G) PK 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2412 Bandedge B

	Freq	Cable	Antenna	Preamp	Read	Limit	Over
		Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	62.55	58.20	74.00 -15.80
2 X	2411.090	2.99	32.54	39.86	111.46	107.13	74.00 33.13

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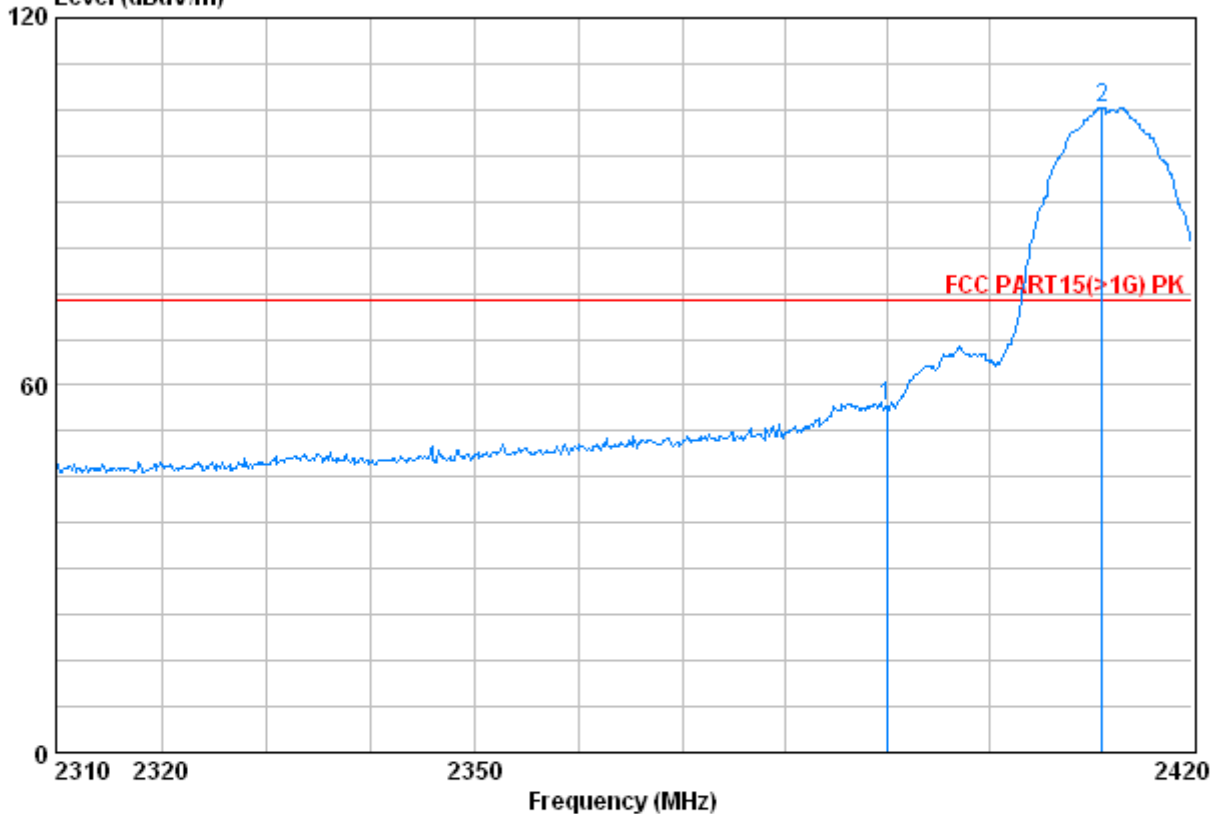
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Worse case mode:	802.11b	Test channel:	Lowest	Remark:	Peak	Horizontal
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Data: 845
Level (dBuV/m)



Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 6809RF 1#

Mode : 2412 Bandedge B

	Freq	Cable Loss	Antenna Factor	Preamplifier Factor	Read Level	Level	Limit	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	61.04	56.68	74.00	-17.32
2 X	2411.090	2.99	32.54	39.86	109.76	105.43	74.00	31.43



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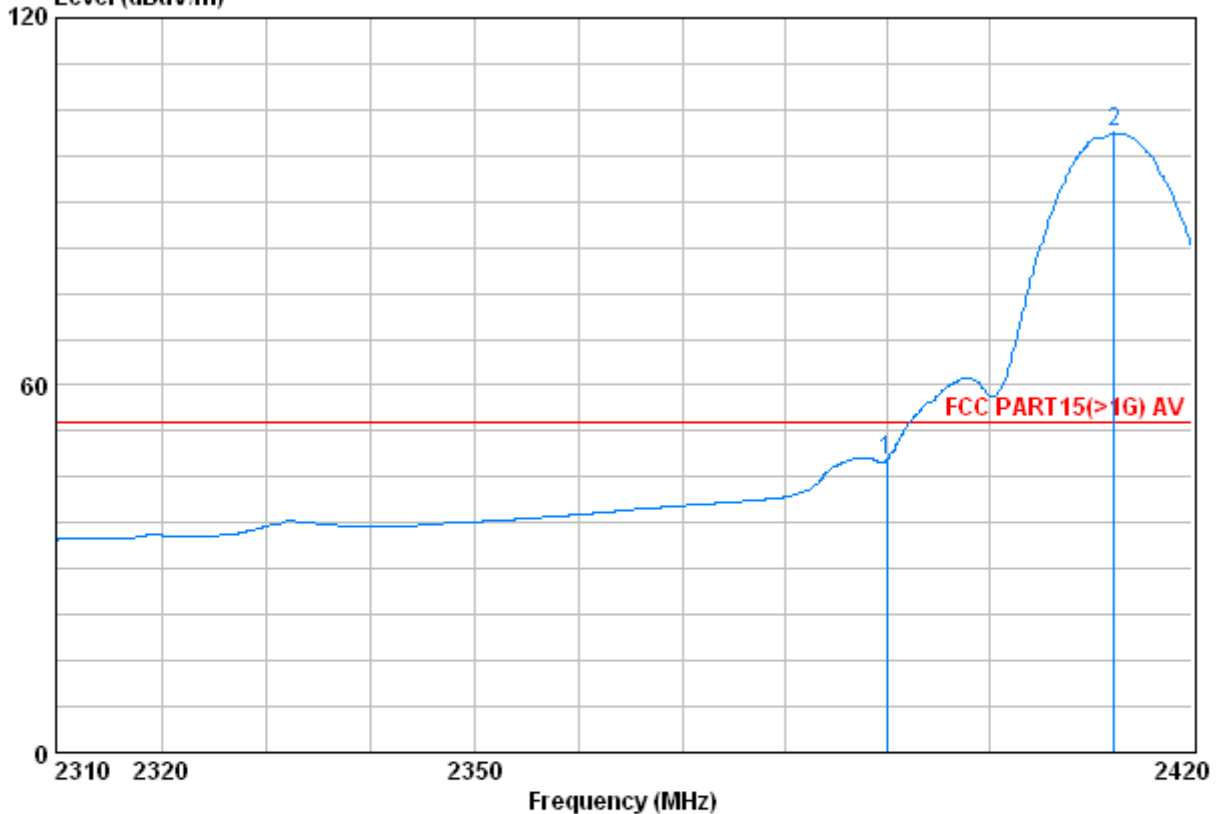
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Worse case mode:	802.11b	Test channel:	Lowest	Remark:	Average	Vertical
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Data: 848
Level (dBuV/m)



Condition : FCC PART15(>1G) AV 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2412 Bandedge B

	Freq	Cable Loss	Antenna Factor	Preamplifier	Read Level	Level	Limit	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	52.25	47.89	54.00	-6.11
2	2412.300	2.99	32.54	39.86	105.53	101.20	54.00	47.20

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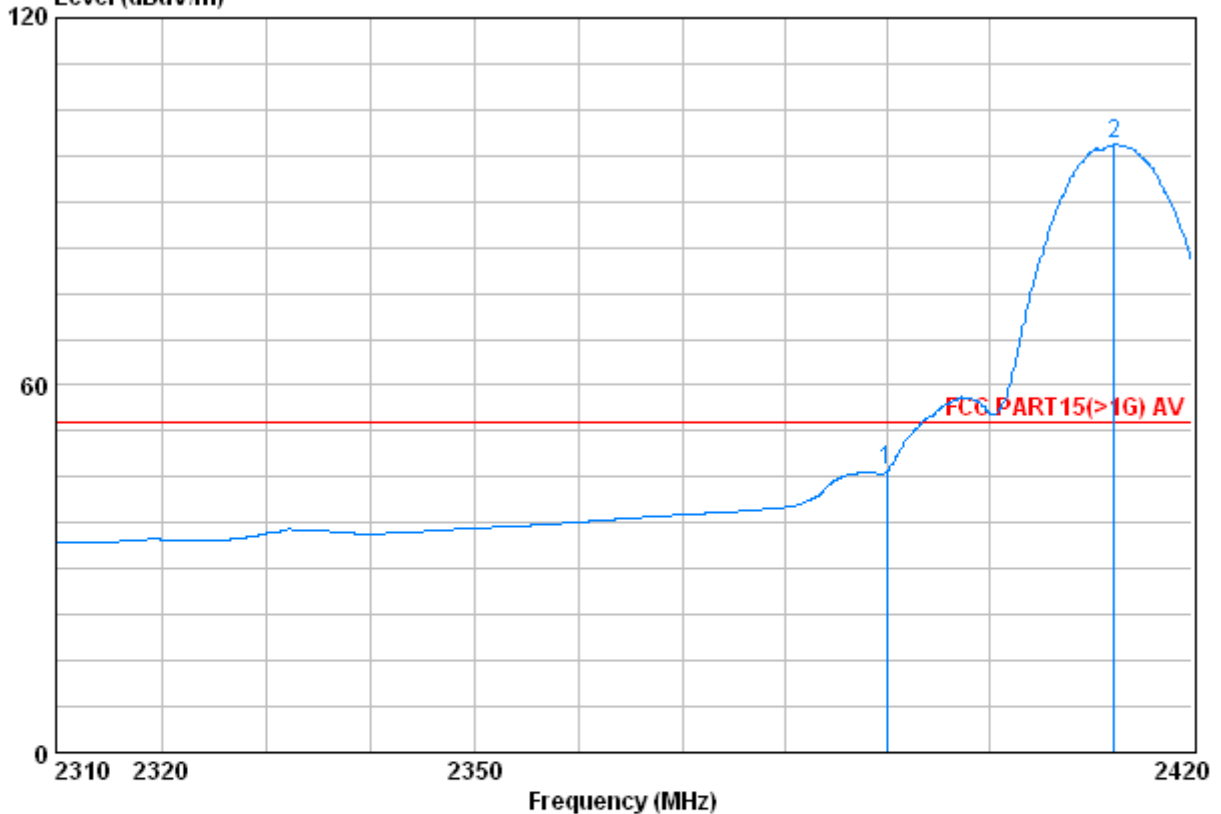
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Worse case mode:	802.11b	Test channel:	Lowest	Remark:	Average	Horizontal
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Data: 846
Level (dBuV/m)



Condition : FCC PART15(>1G) AV 3m HORIZONTAL

Job No. : 6809RF 1#

Mode : 2412 Bandedge B

	Freq	Cable Loss	Antenna Factor	Preamplifier	Read Level	Level	Limit	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	50.30	45.94	54.00	-8.06
2	2412.300	2.99	32.54	39.86	103.63	99.31	54.00	45.31

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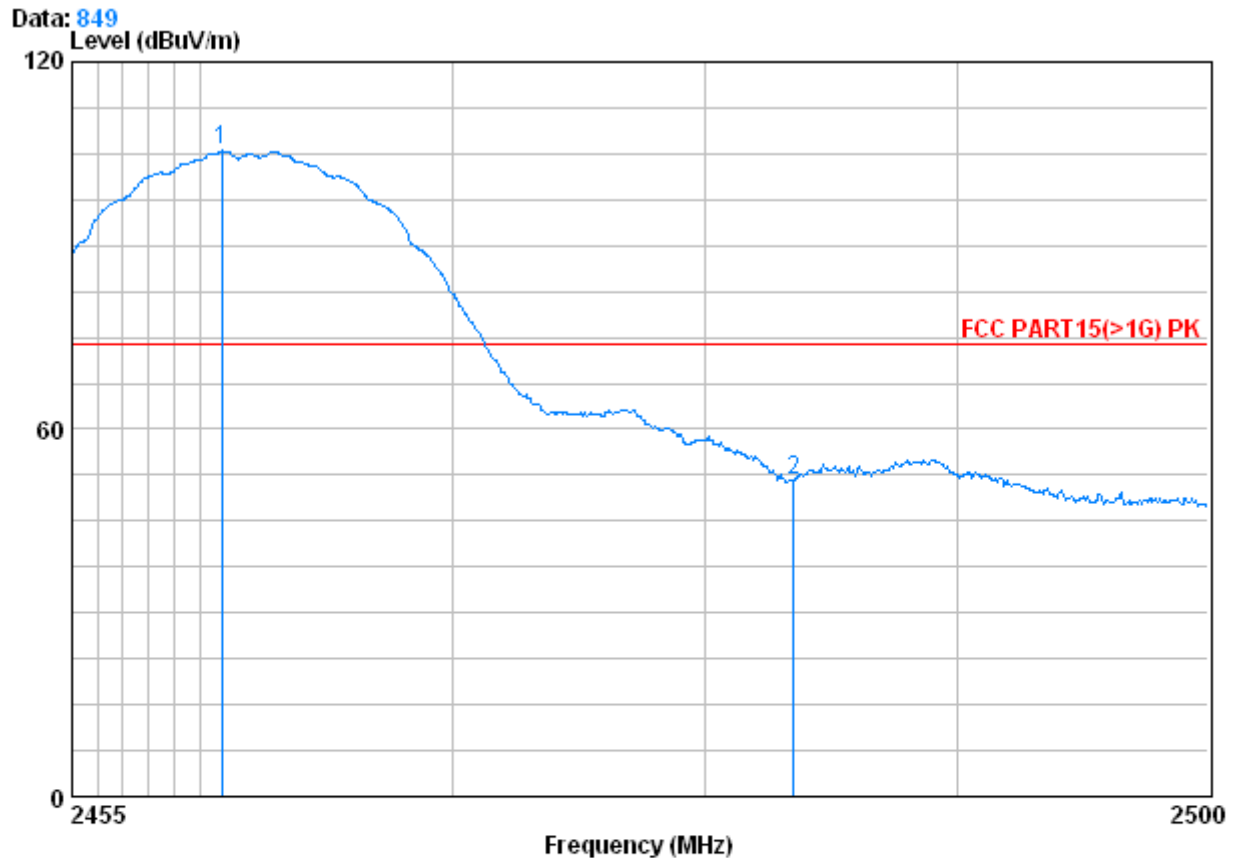


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Worse case mode:	802.11b	Test channel:	Highest	Remark:	Peak	Vertical
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Condition : FCC PART15(>1G) PK 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge B

		CableAntenna			Preamplifier		Read	Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m		dB
1 X	2460.895	3.02	32.64	39.91	109.74	105.49	74.00	31.49	
2	2483.500	3.03	32.67	39.92	55.90	51.68	74.00	-22.32	

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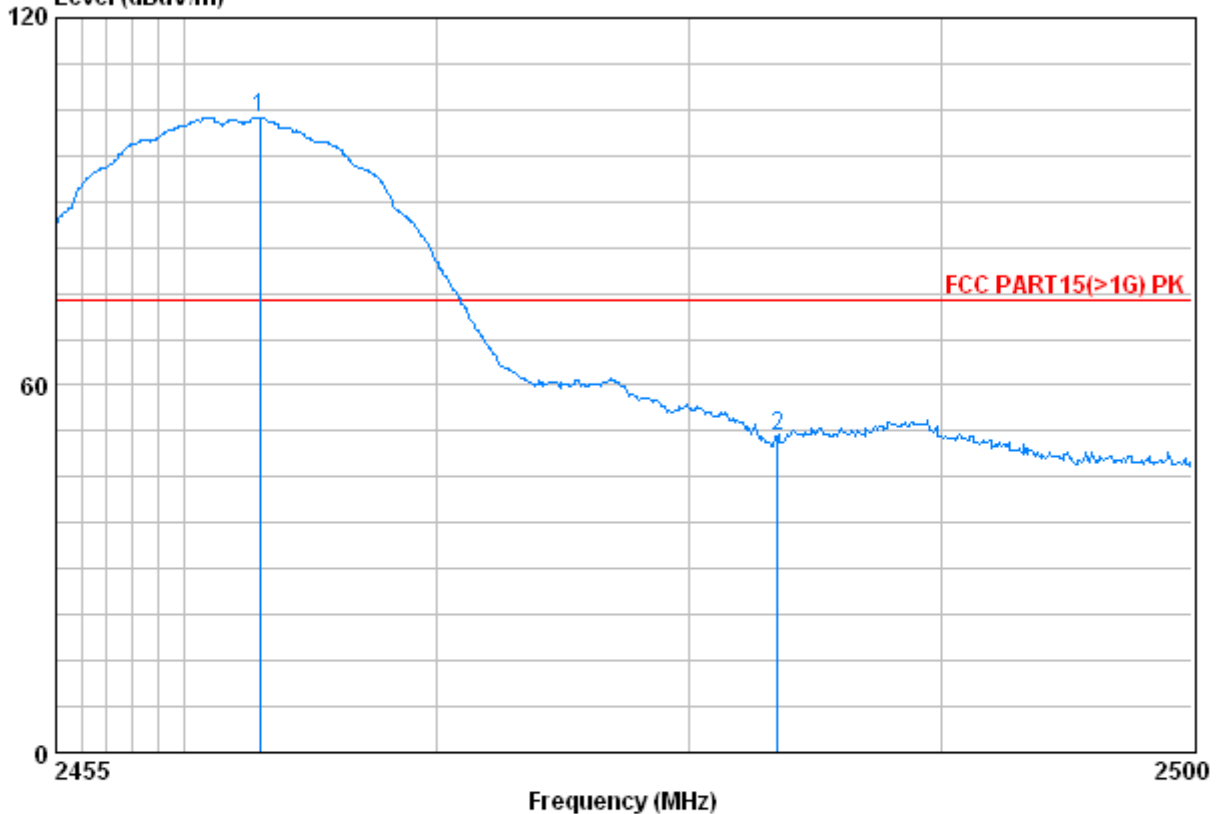
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Worse case mode:	802.11b	Test channel:	Highest	Remark:	Peak	Horizontal
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Data: 851
Level (dBuV/m)



Condition : FCC PART15(>1G) PK 3m HORIZONTAL
Job No. : 6809RF 1#
Mode : 2462 Bandedge B

		Cable	Antenna	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 X	2463.010	3.02	32.64	39.91	108.04	103.79	74.00	29.79
2	2483.500	3.03	32.67	39.92	56.00	51.78	74.00	-22.22

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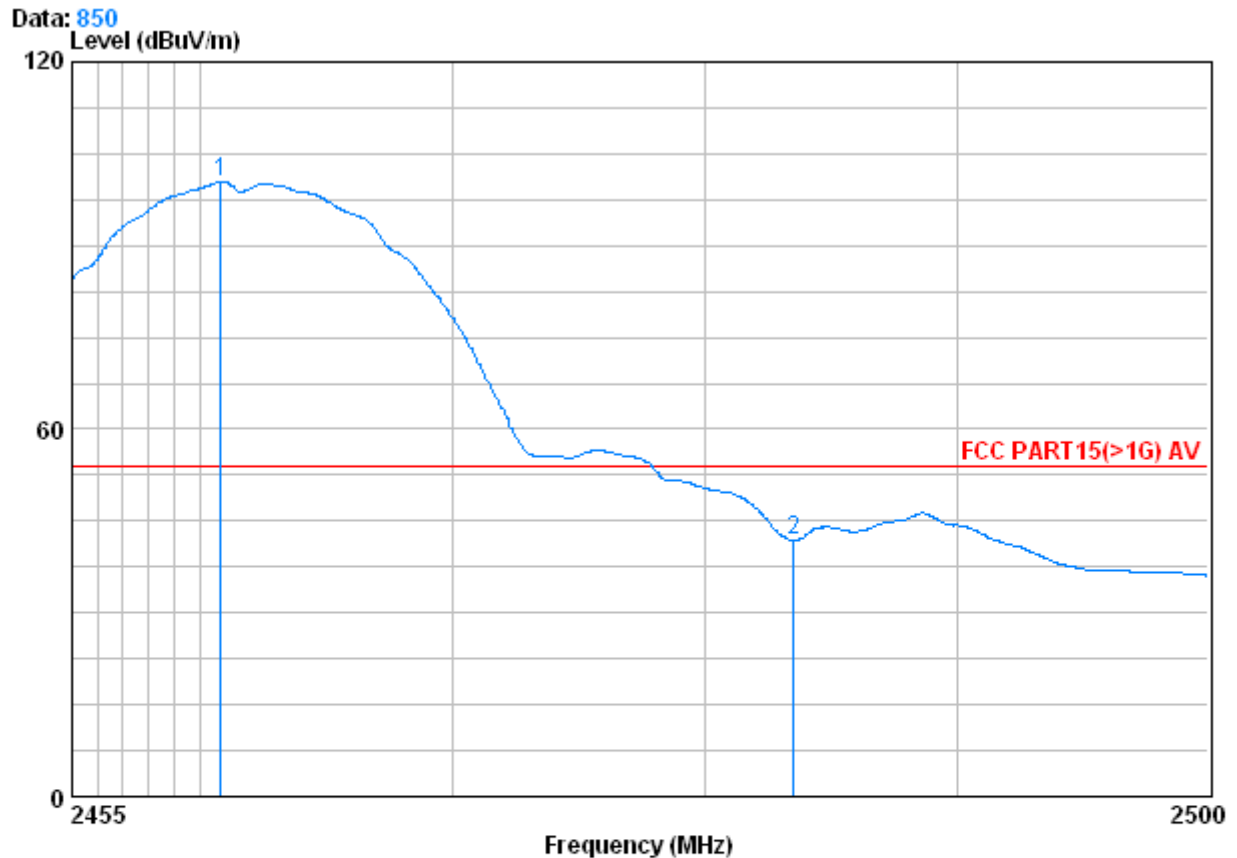


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Worse case mode:	802.11b	Test channel:	Highest	Remark:	Average	Vertical
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Condition : FCC PART15(>1G) AV 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge B

	Freq	Cable Loss	Antenna Factor	Preamplifier Factor	Read Level	Level	Limit	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2460.850	3.02	32.64	39.91	104.68	100.44	54.00	46.44
2	2483.500	3.03	32.67	39.92	46.07	41.85	54.00	-12.15

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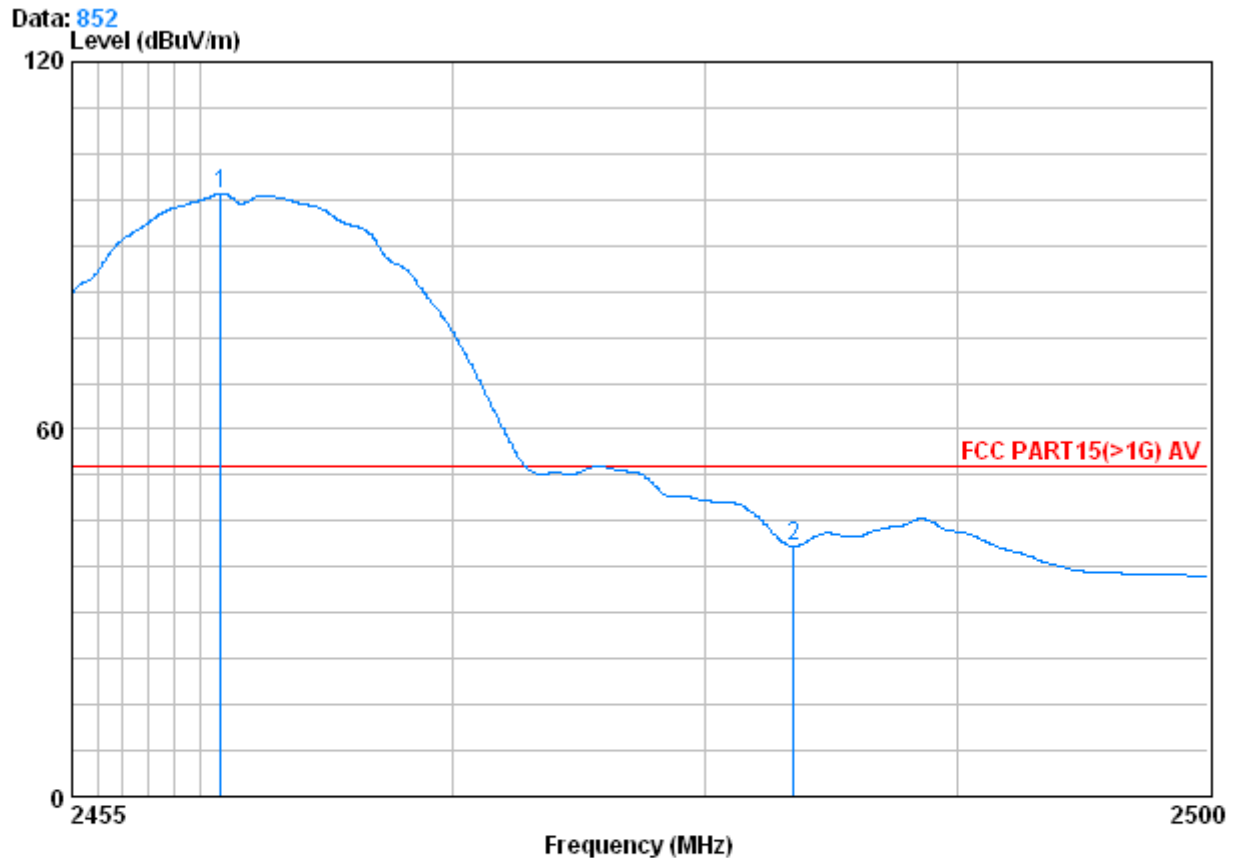


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Worse case mode:	802.11b	Test channel:	Highest	Remark:	Average	Horizontal
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Condition : FCC PART15(>1G) AV 3m HORIZONTAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge B

	Freq	Cable Loss	Antenna Factor	Preamplifier	Read Level	Level	Limit	Over
	MHz	dB	dB/m	Factor	dBuV	dBuV/m	dBuV/m	Limit
				dB				dB
1	2460.850	3.02	32.64	39.91	102.73	98.49	54.00	44.49
2	2483.500	3.03	32.67	39.92	45.01	40.79	54.00	-13.21

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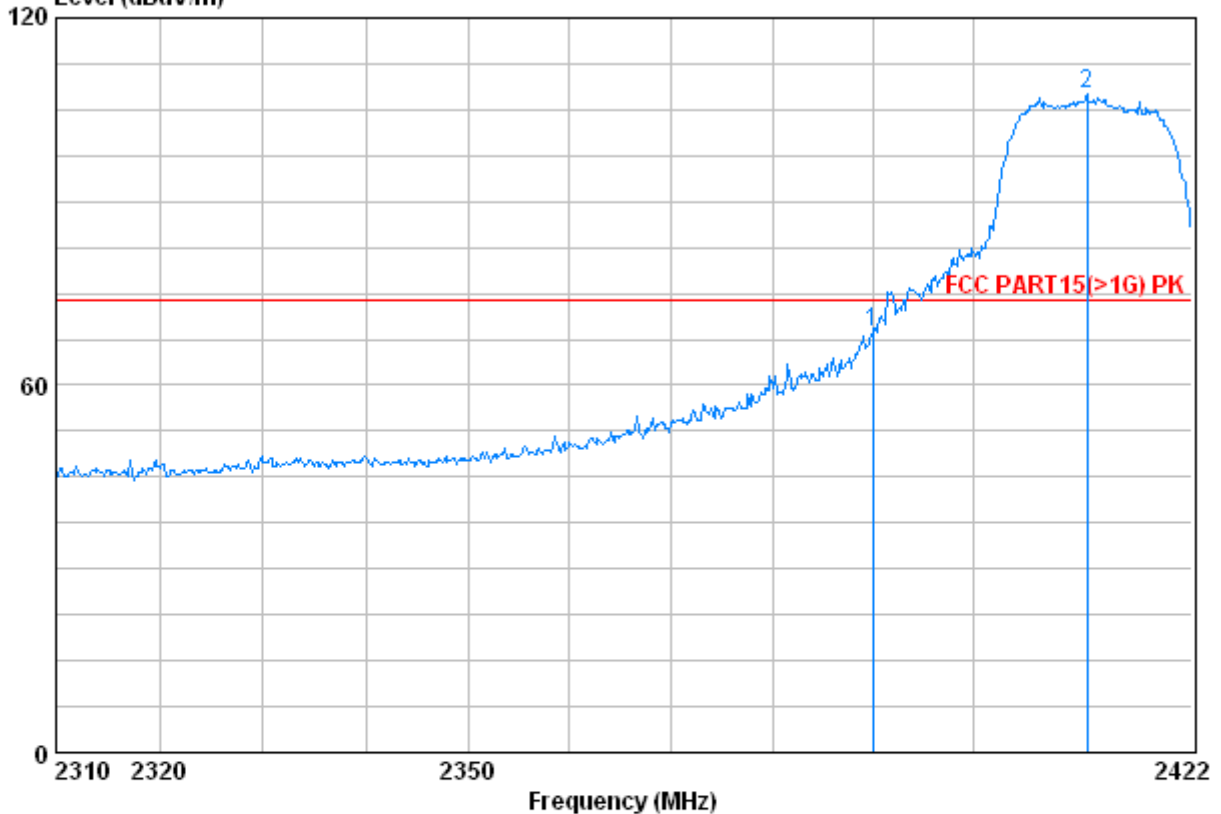
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Worse case mode:	802.11g	Test channel:	Lowest	Remark:	Peak	Vertical
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Data: 831
Level (dBuV/m)



Condition : FCC PART15(>1G) PK 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2412 Bandedge G

	Freq	Cable	Antenna	Preamp	Read	Limit	Over
		Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	73.07	68.72	-5.28
2 @	2411.472	2.99	32.54	39.86	111.78	107.45	33.45

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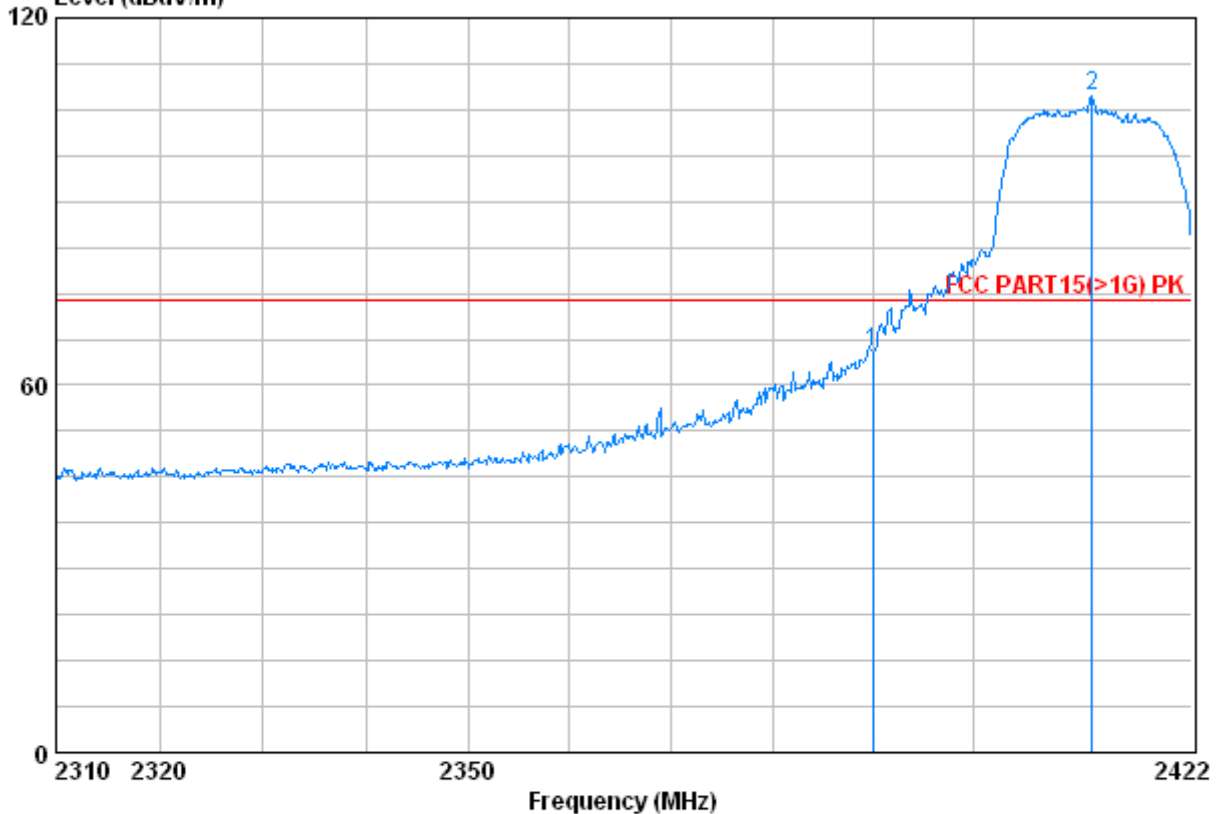
SGS-CSTC Standards Technical Services Ltd.

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Worse case mode:	802.11g	Test channel:	Lowest	Remark:	Peak	Horizontal
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Data: 829
Level (dBuV/m)



Condition : FCC PART15(>1G) PK 3m HORIZONTAL
Job No. : 6809RF 1#
Mode : 2412 Bandedge G

	Freq	Cable Loss	Antenna Factor	Preamplifier Factor	Read Level	Level	Limit	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	69.89	65.54	74.00	-8.46
2	2411.920	2.99	32.54	39.86	111.62	107.29	74.00	33.29

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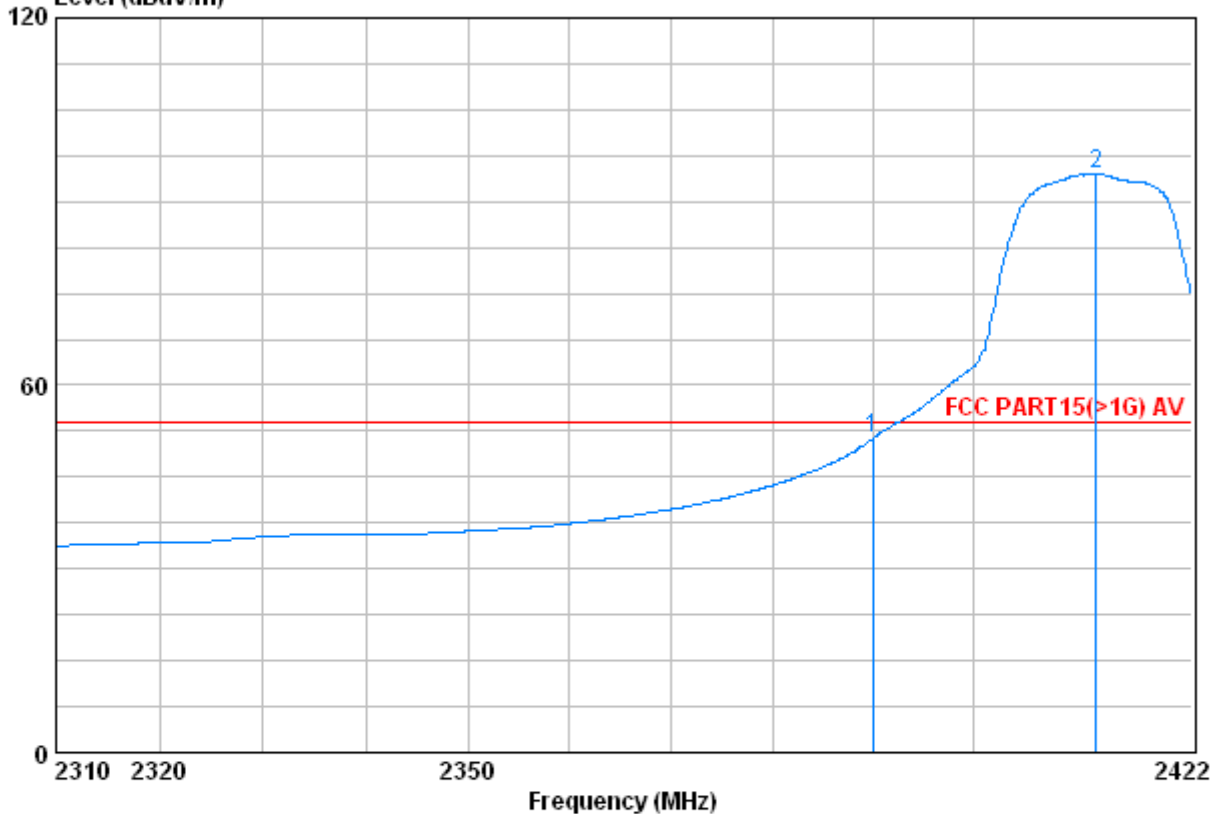
SGS-CSTC Standards Technical Services Ltd.

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Worse case mode:	802.11g	Test channel:	Lowest	Remark:	Average	Vertical
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Data: 832
Level (dBuV/m)



Condition : FCC PART15(>1G) AV 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2412 Bandedge G

	Freq	Cable	Antenna	Preamp	Read	Limit	Over
		Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	55.61	51.25	54.00
2 0	2412.368	2.99	32.54	39.86	98.84	94.51	54.00

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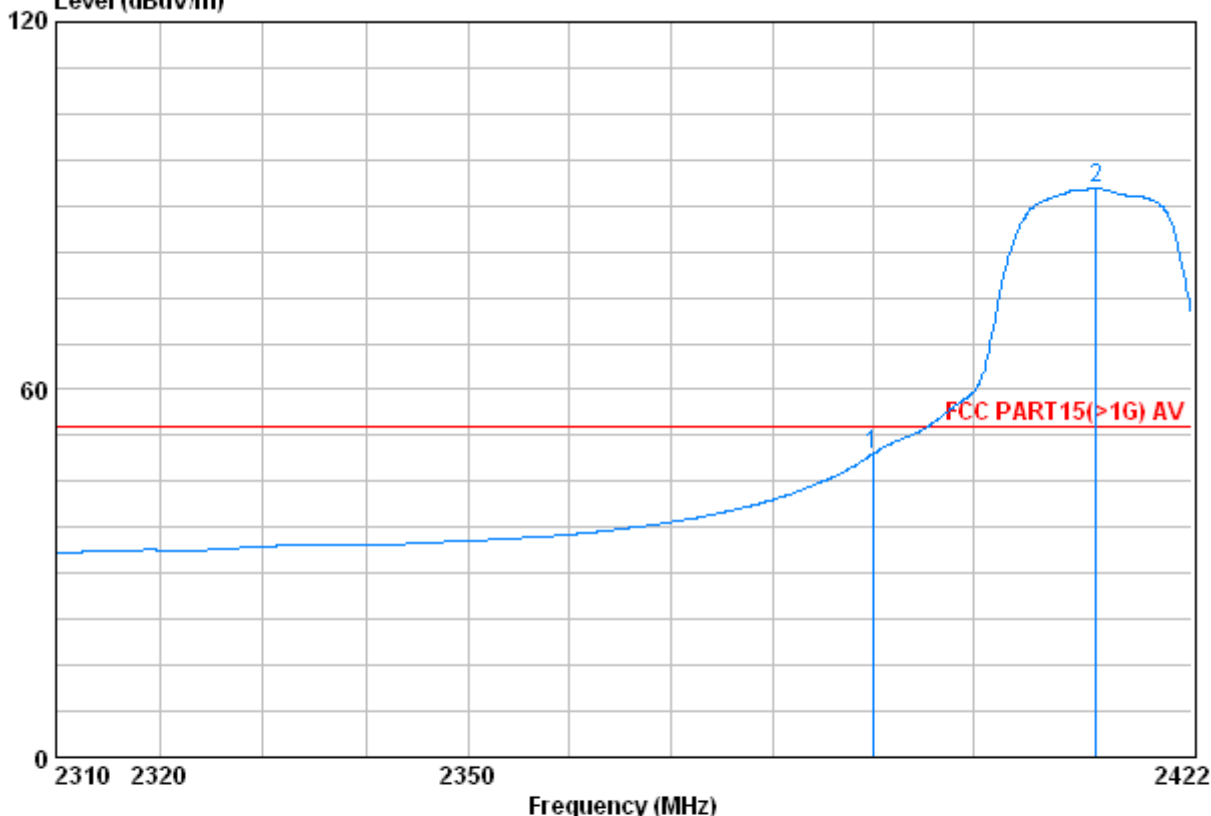


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Worse case mode:	802.11g	Test channel:	Lowest	Remark:	Average	Horizontal
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Data: 830
Level (dBuV/m)



Condition : FCC PART15(>1G) AV 3m HORIZONTAL
Job No. : 6809RF 1#
Mode : 2412 Bandedge G

	Freq	Cable	Antenna	Preamp	Read	Limit	Over
		Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	53.73	49.38	-4.62
2 0	2412.368	2.99	32.54	39.86	97.18	92.85	38.85



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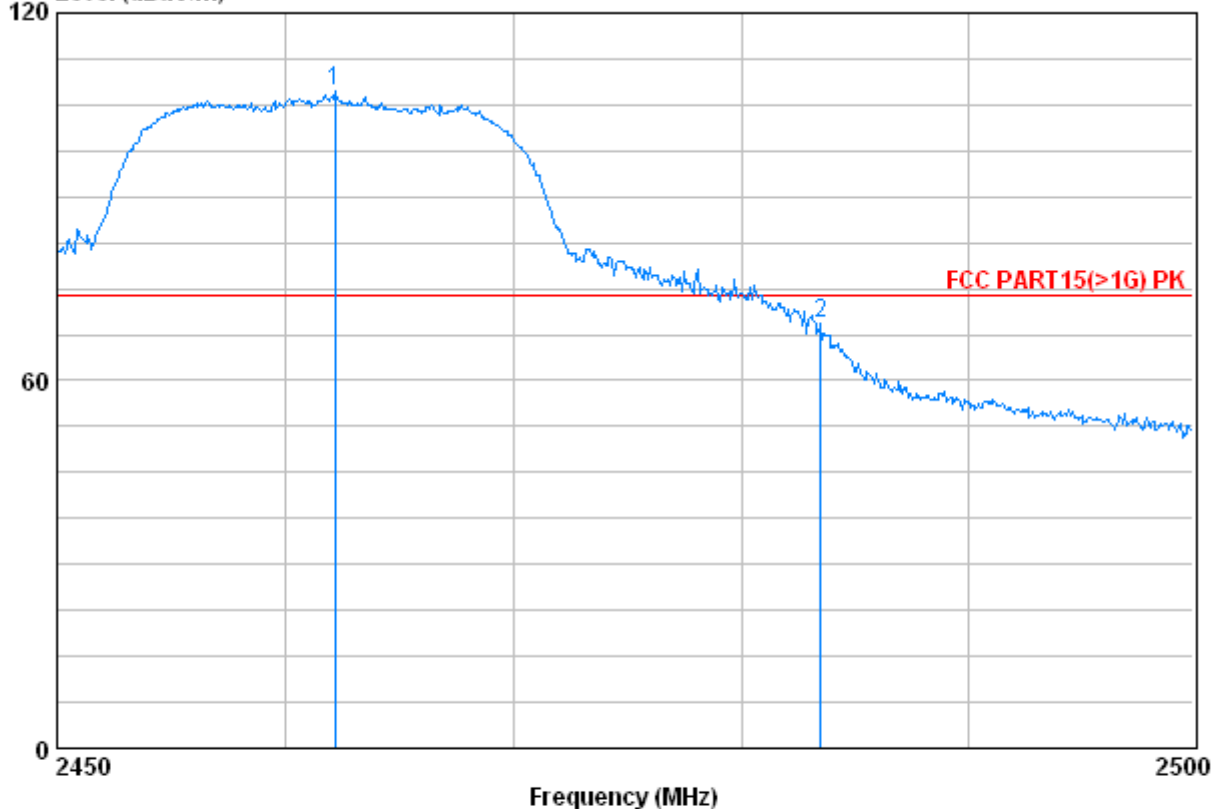
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Worse case mode:	802.11g	Test channel:	Highest	Remark:	Peak	Vertical
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Data: 833

Level (dBuV/m)



Condition : FCC PART15(>1G) PK 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge G

	Freq	Cable	Antenna	Preamp	Read	Limit	Over
		Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1 @	2462.150	3.02	32.64	39.91	111.65	107.40	74.00 33.40
2	2483.500	3.03	32.67	39.92	73.49	69.27	74.00 -4.73

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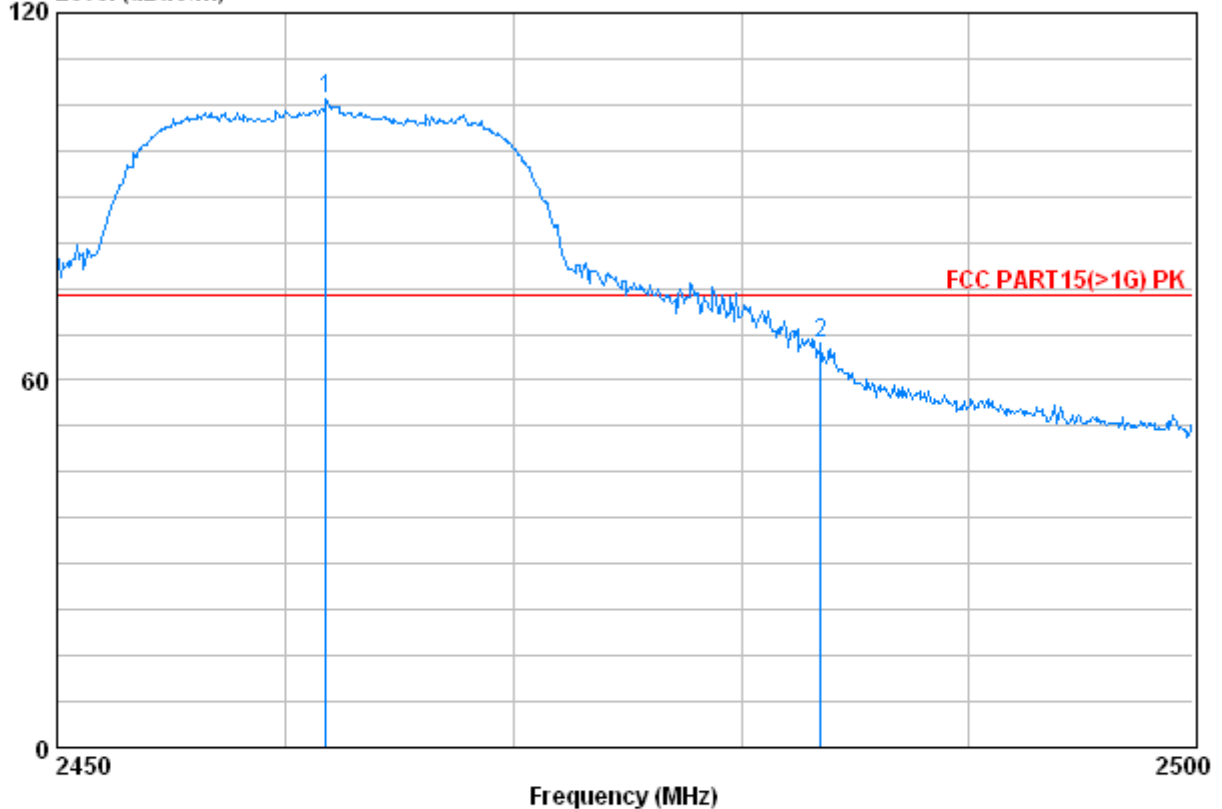
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Worse case mode:	802.11g	Test channel:	Highest	Remark:	Peak	Horizontal
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Data: 835

Level (dBuV/m)



Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge G

		Cable	Antenna	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 X	2461.750	3.02	32.64	39.91	110.32	106.08	74.00	32.08
2	2483.500	3.03	32.67	39.92	70.21	65.99	74.00	-8.01

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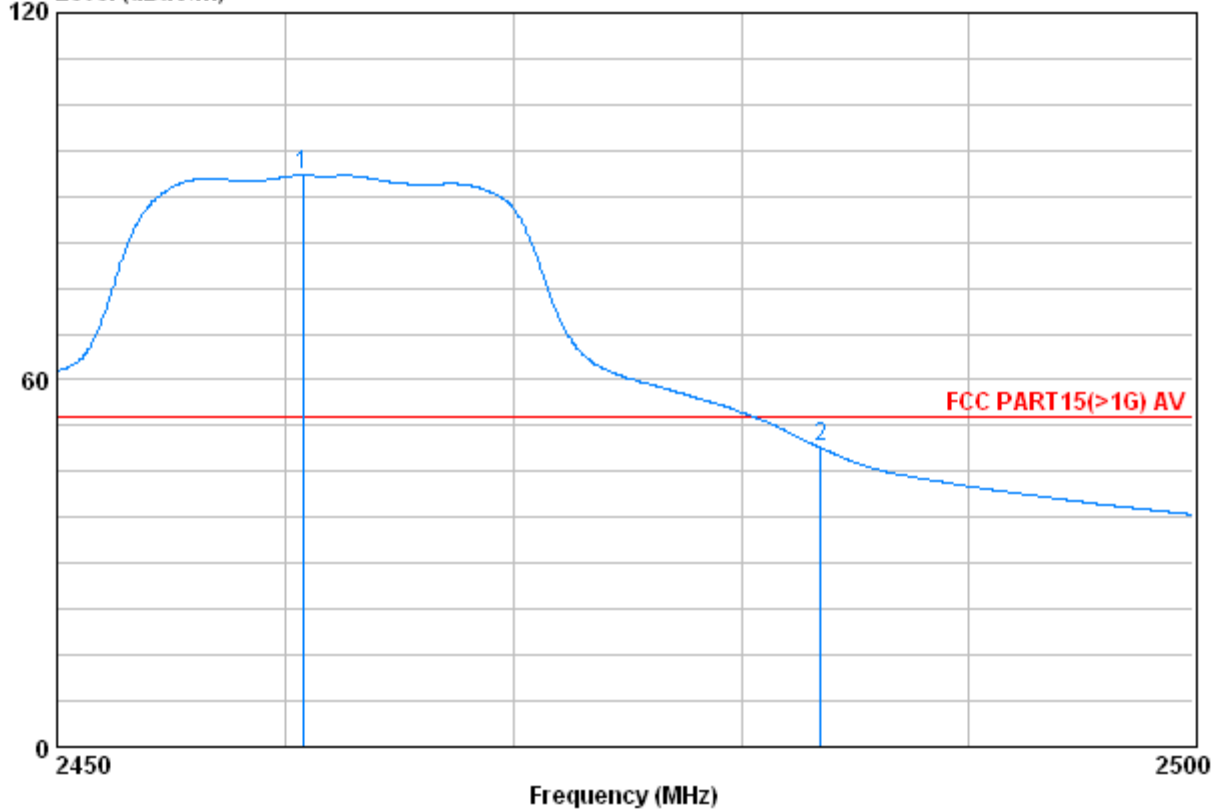
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Worse case mode:	802.11g	Test channel:	Highest	Remark:	Average	Vertical
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Data: 834

Level (dBuV/m)



Condition : FCC PART15(>1G) AV 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge G

	Freq	Cable	Antenna	Preamp	Read		Limit	Over
		Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 @	2460.750	3.02	32.64	39.91	97.71	93.46	54.00	39.46
2	2483.500	3.03	32.67	39.92	53.18	48.96	54.00	-5.04

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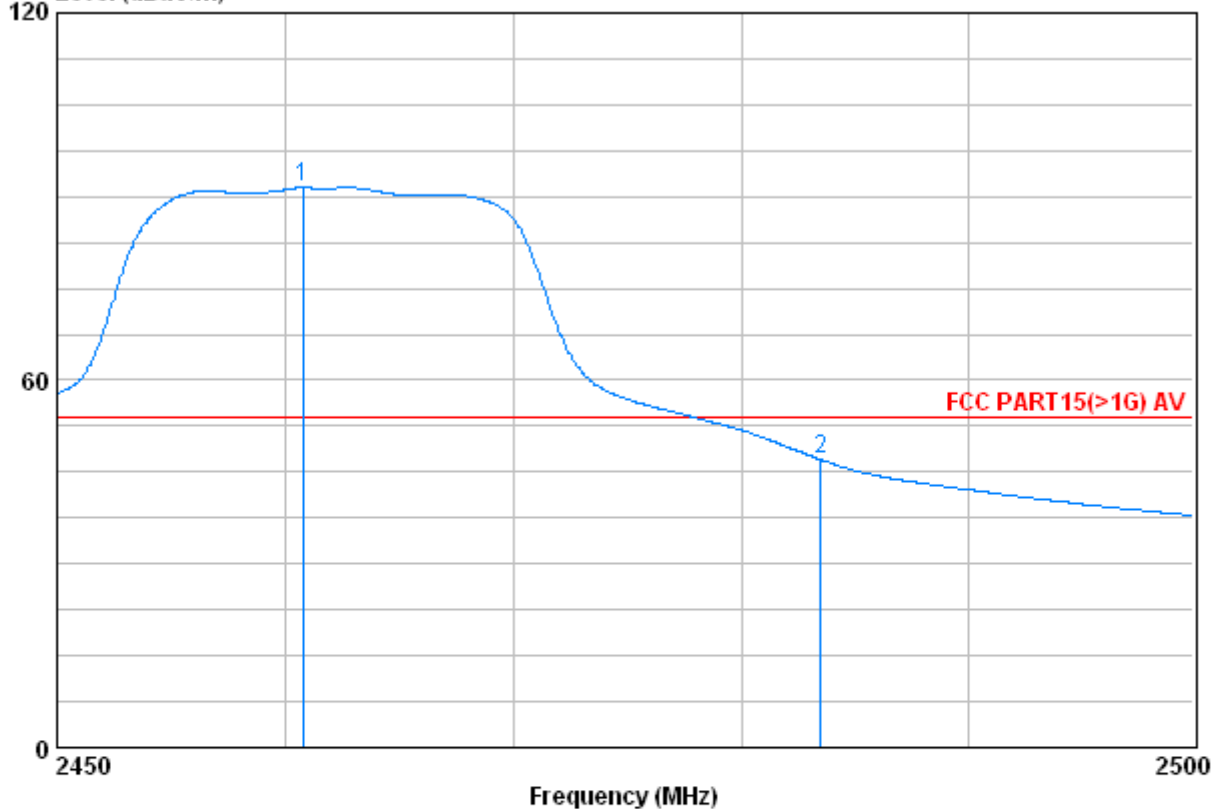
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Worse case mode:	802.11g	Test channel:	Highest	Remark:	Average	Horizontal
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Data: 836

Level (dBuV/m)



Condition : FCC PART15(>1G) AV 3m HORIZONTAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge G

	Freq	Cable	Antenna	Preamp	Read	Limit	Over
		Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	2460.750	3.02	32.64	39.91	95.72	91.48	54.00
2	2483.500	3.03	32.67	39.92	51.30	47.08	54.00

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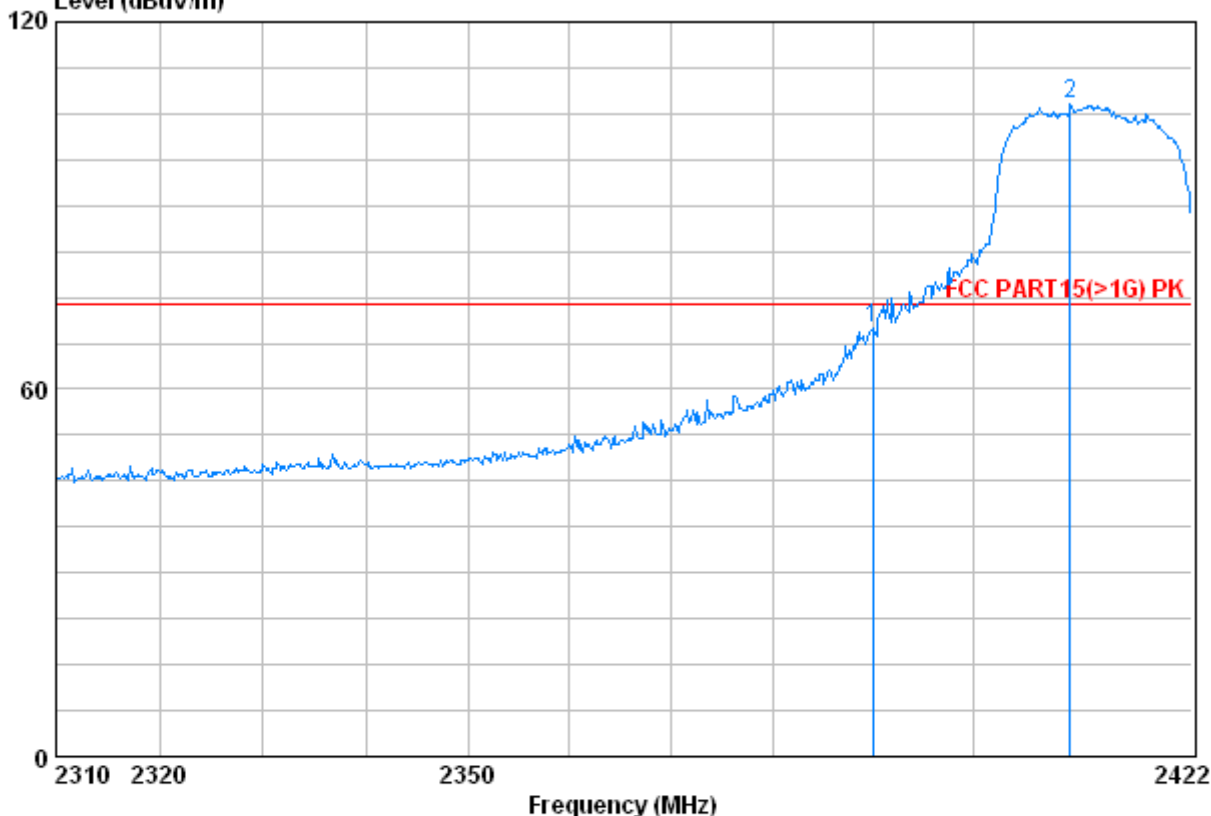


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Worse case mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Peak	Vertical
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Data: 841
Level (dBuV/m)



Condition : FCC PART15(>1G) PK 3m VERTICAL
Job No. : 6809RF 1#
Mode : 2412 Bandedge N

	Freq	Cable	Antenna	Preamp	Read		Limit	Over
		Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	74.34	69.99	74.00	-4.01
2 X	2409.792	2.99	32.54	39.86	110.93	106.61	74.00	32.61

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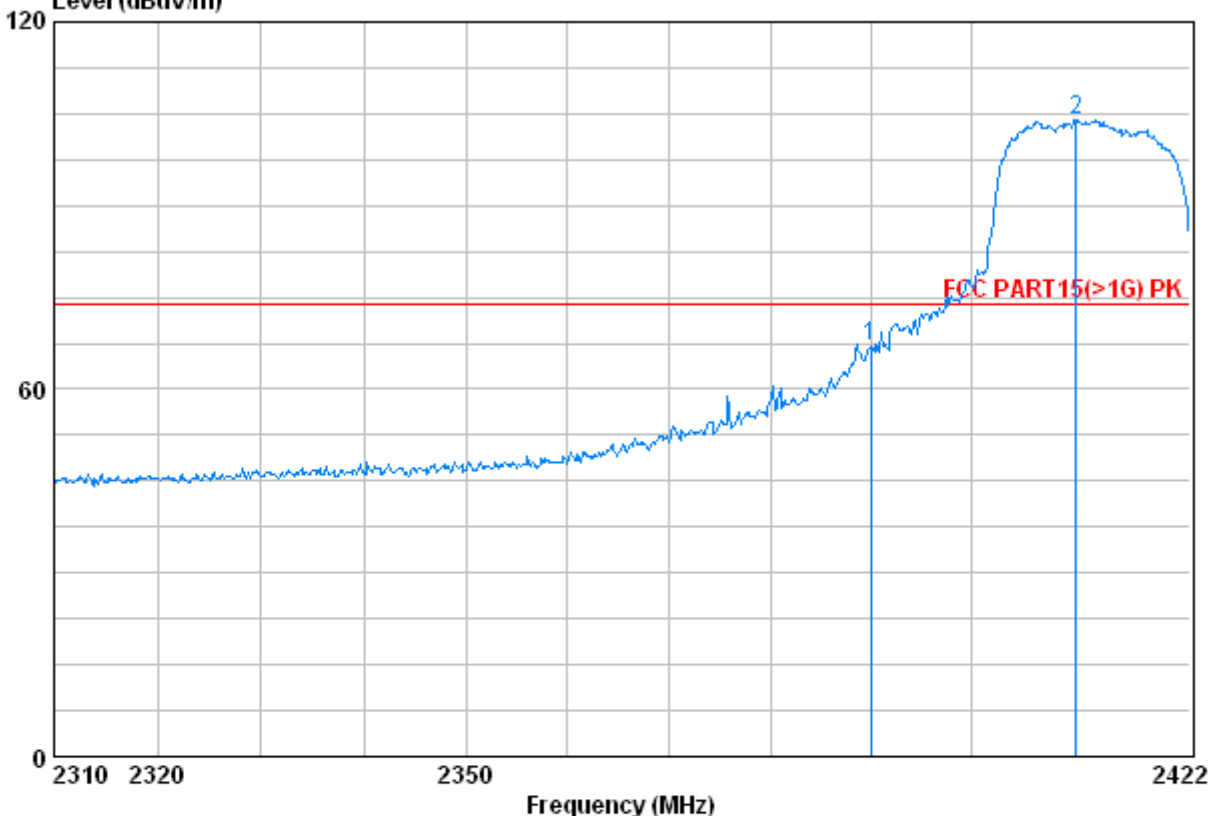


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Worse case mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Peak	Horizontal
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Data: 843
Level (dBuV/m)



Condition : FCC PART15(>1G) PK 3m HORIZONTAL
Job No. : 6809RF 1#
Mode : 2412 Bandedge N

	Freq	Cable	Antenna	Preamp	Read	Limit	Over
		Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	71.36	67.00	-7.00
2 X	2410.576	2.99	32.54	39.86	108.31	103.98	29.98

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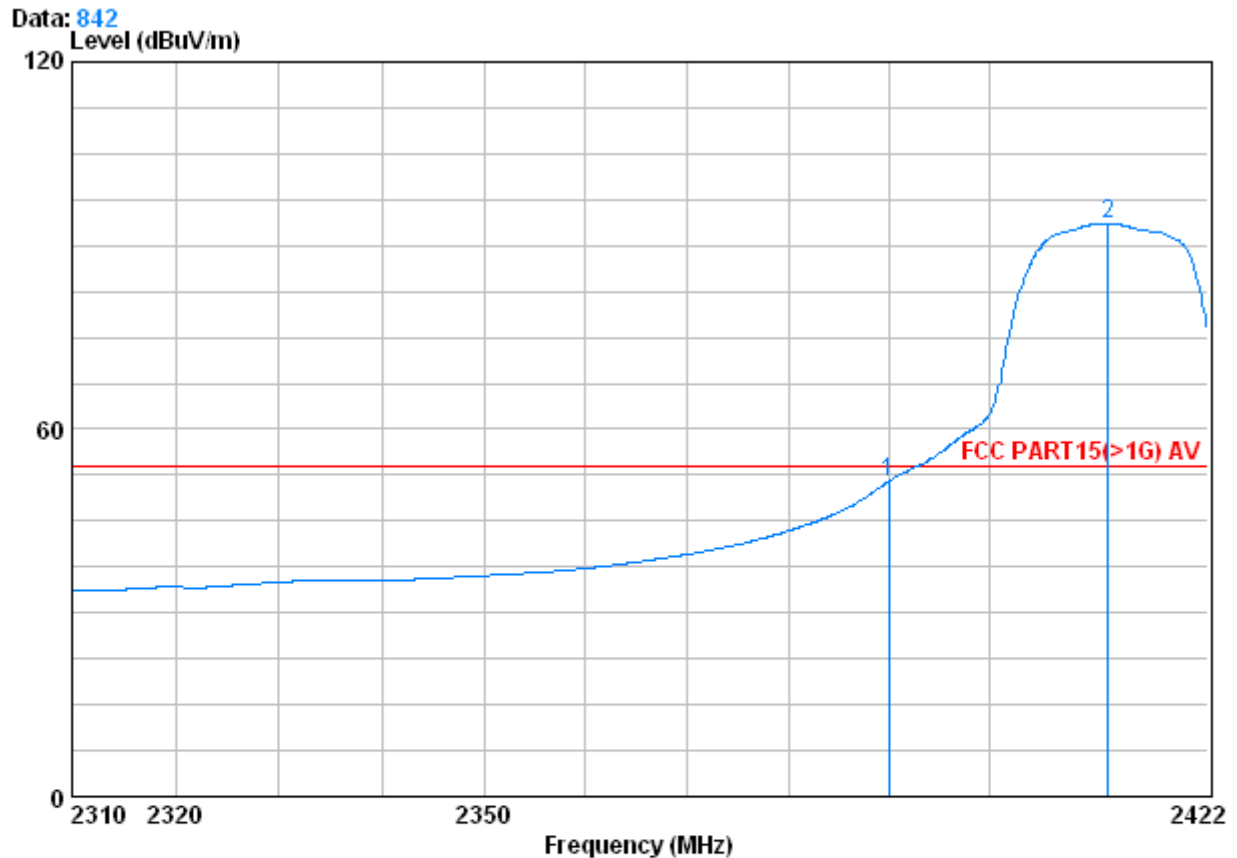


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Worse case mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Average	Vertical
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Condition : FCC PART15(>1G) AV 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2412 Bandedge N

	Freq	Cable	Antenna	Preamp	Read		Limit	Over
		Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	55.76	51.40	54.00	-2.60
2 0	2411.920	2.99	32.54	39.86	98.00	93.67	54.00	39.67

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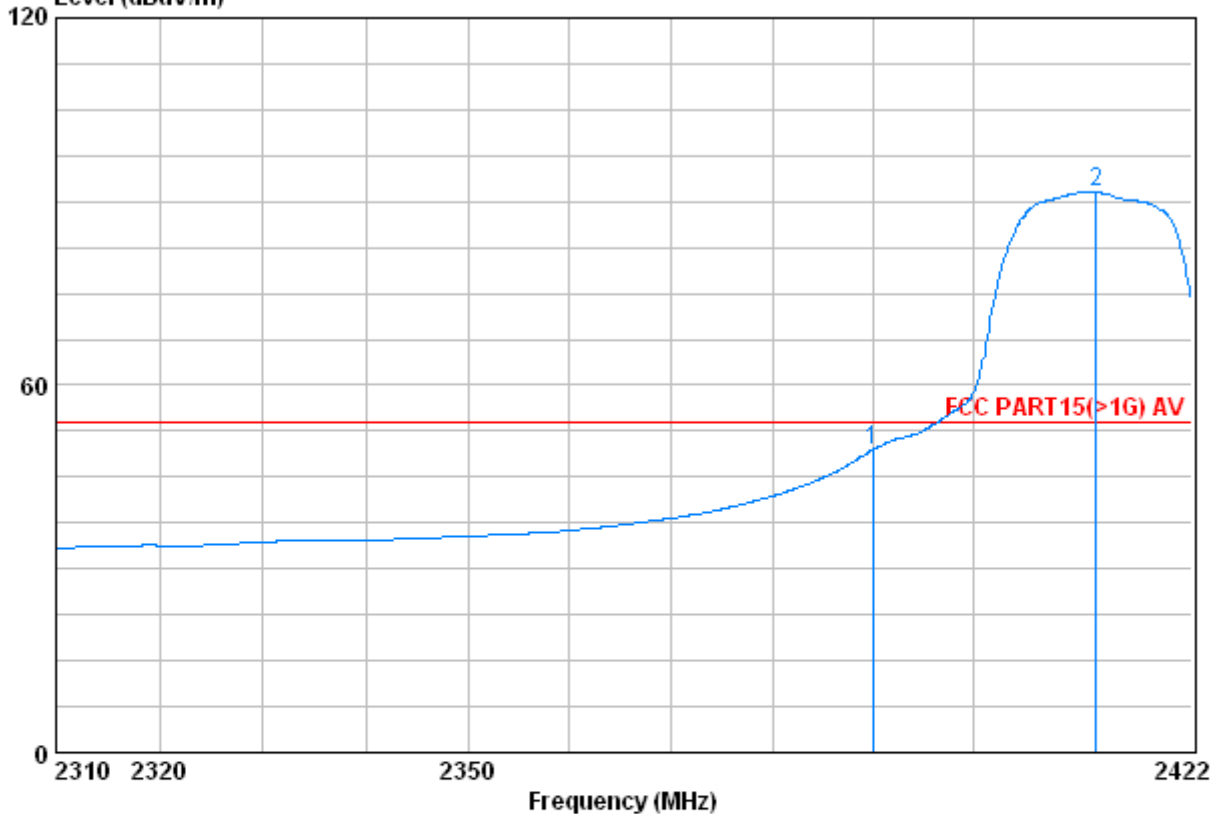
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Worse case mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Average	Horizontal
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Data: 844
Level (dBuV/m)



Condition : FCC PART15(>1G) AV 3m HORIZONTAL

Job No. : 6809RF 1#

Mode : 2412 Bandedge N

	Freq	Cable	Antenna	Preamp	Read	Limit	Over
		Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	2390.000	2.98	32.51	39.85	53.76	49.40	-4.60
2 0	2412.368	2.99	32.54	39.86	95.89	91.56	37.56

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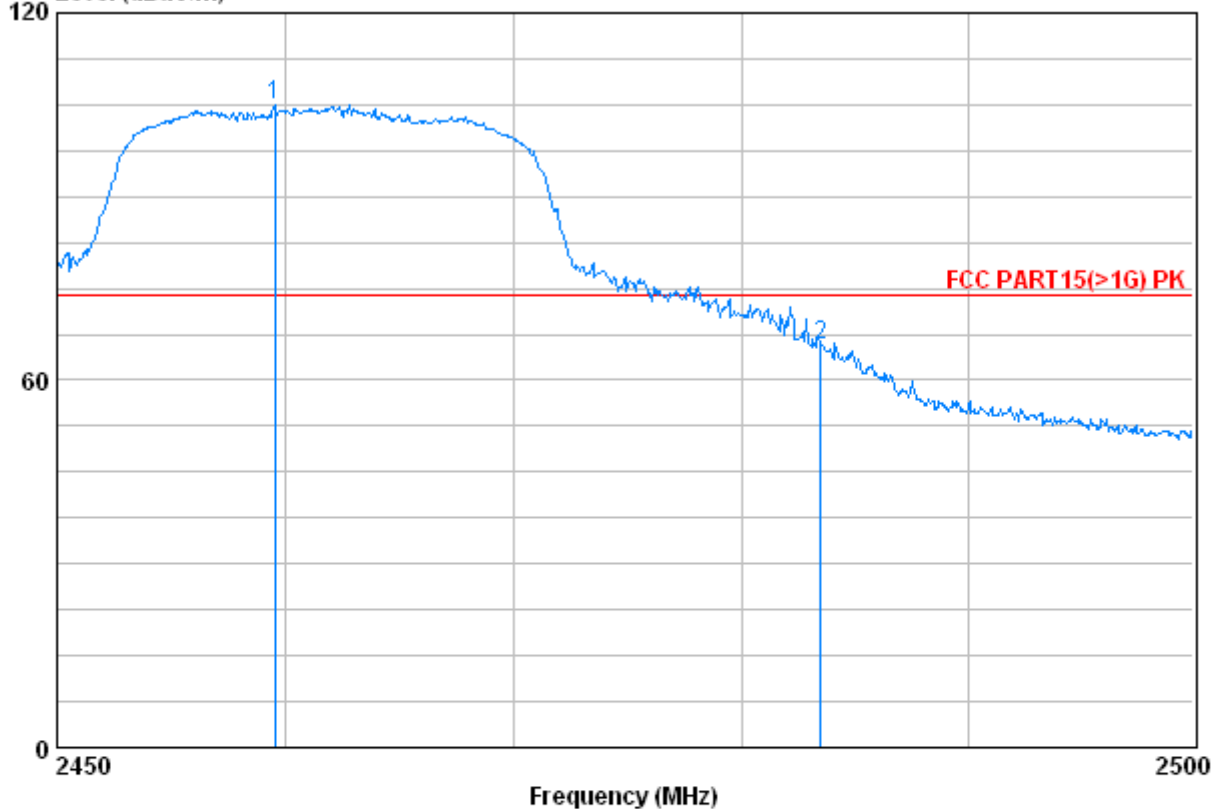
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Worse case mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Peak	Vertical
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Data: 839

Level (dBuV/m)



Condition : FCC PART15(>1G) PK 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge N

		CableAntenna			Preamplifier		Read	Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m		dB
1 X	2459.500	3.02	32.64	39.91	109.33	105.09	74.00	31.09	
2	2483.500	3.03	32.67	39.92	69.97	65.75	74.00	-8.25	

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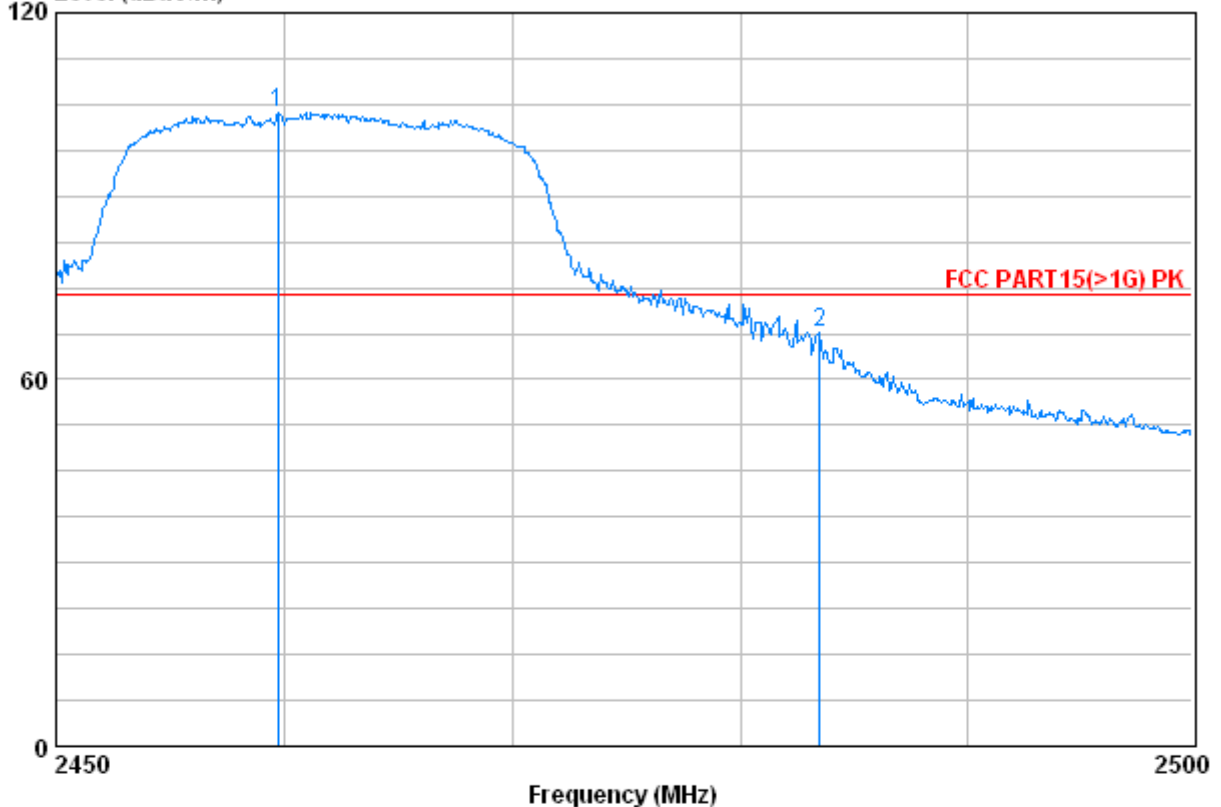
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Worse case mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Peak	Horizontal
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Data: 837

Level (dBuV/m)



Condition : FCC PART15(>1G) PK 3m HORIZONTAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge N

		CableAntenna			Preampl		Read	Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m		dB
1 X	2459.700	3.02	32.64	39.91	107.87	103.62	74.00	29.62	
2	2483.500	3.03	32.67	39.92	71.95	67.73	74.00	-6.27	



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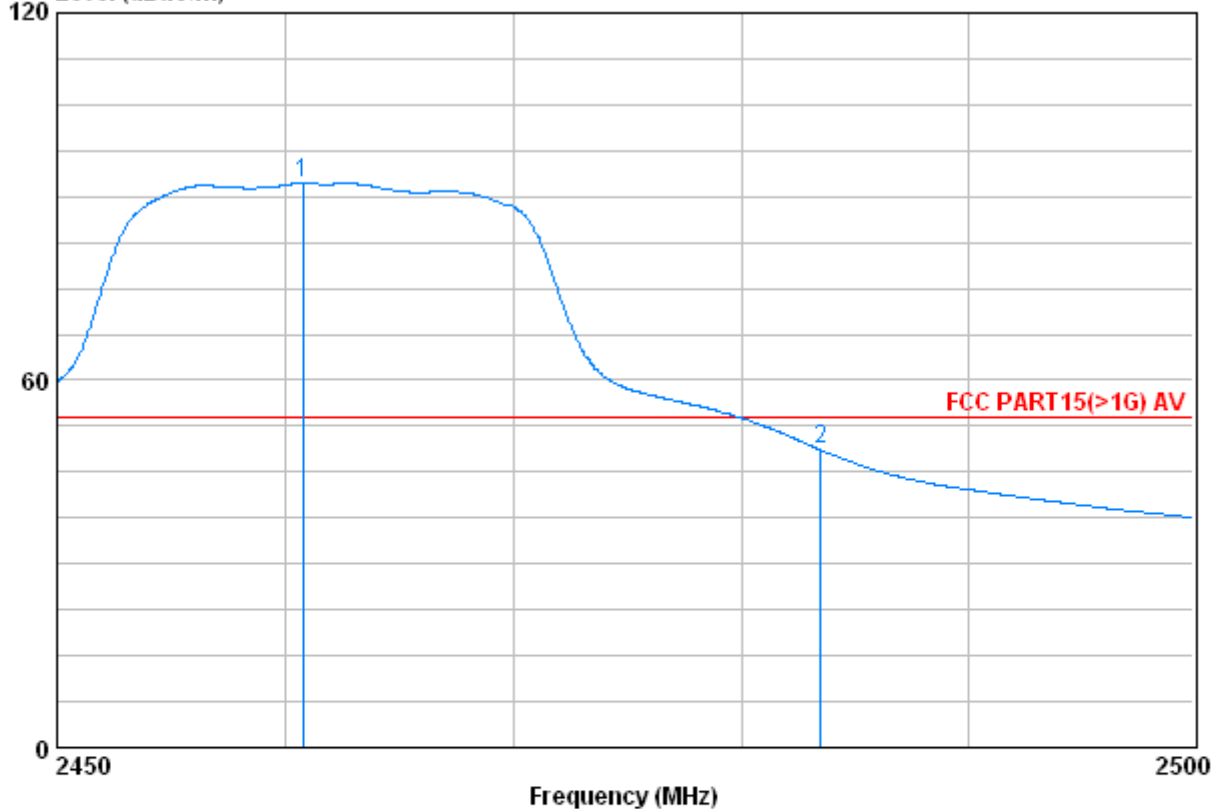
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Worse case mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Average	Vertical
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Data: 840

Level (dBuV/m)



Condition : FCC PART15(>1G) AV 3m VERTICAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge N

	Freq	Cable	Antenna	Preamplifier	Read	Limit	Over
	MHz	Loss	Factor	Factor	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	2460.750	3.02	32.64	39.91	96.48	92.23	54.00
2	2483.500	3.03	32.67	39.92	52.91	48.69	54.00

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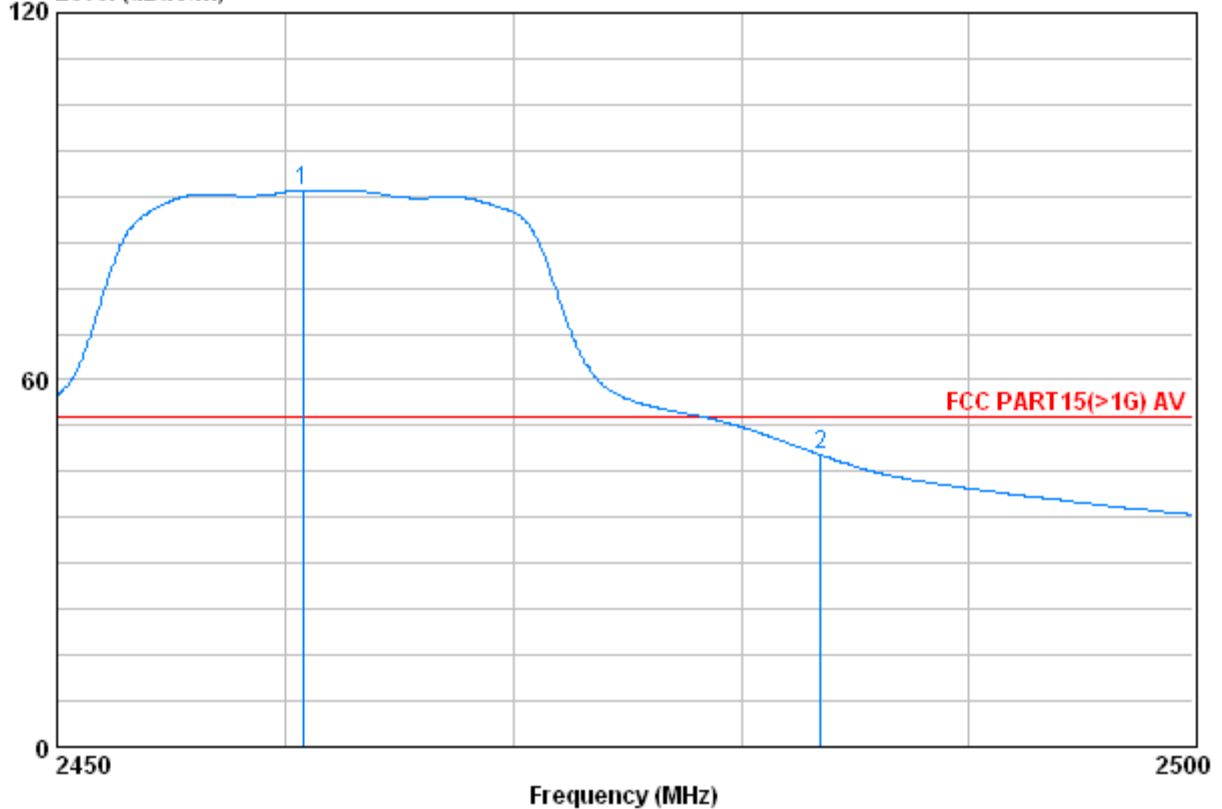
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Worse case mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Average	Horizontal
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Data: 838

Level (dBuV/m)



Condition : FCC PART15(>1G) AV 3m HORIZONTAL

Job No. : 6809RF 1#

Mode : 2462 Bandedge N

	Freq	Cable	Antenna	Preamp	Read		Limit	Over
		Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2460.750	3.02	32.64	39.91	95.30	91.05	54.00	37.05
2	2483.500	3.03	32.67	39.92	51.99	47.77	54.00	-6.23

Note:

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

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

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