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Report No.: SZEM161100987101

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## FCC REPORT

<b>Application No:</b>	HKEM1611009871CR
<b>Applicant:</b>	Clicka Holdings, Inc.
<b>Manufacturer:</b>	Shenzhen TAT Electronics Co., Ltd.
<b>Factory:</b>	Shenzhen TAT Electronics Co., Ltd.
<b>Product Name:</b>	Action Camera
<b>Model No.(EUT):</b>	CX
<b>Add Model No.:</b>	XCA10W, GCB10W, CX Gold, CX Gold Plus, Solar XG
<b>Trade Mark:</b>	ACTIVEON
<b>FCC ID:</b>	2AKGVXCA01
<b>Standards:</b>	47 CFR Part 15, Subpart C (2015)
<b>Date of Receipt:</b>	2016-11-21
<b>Date of Test:</b>	2016-12-02 to 2016-12-07
<b>Date of Issue:</b>	2016-12-14
<b>Test Result:</b>	<b>PASS *</b>

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

Authorized Signature:



Jack Zhang  
EMC Laboratory Manager

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

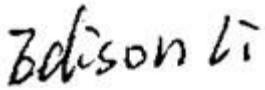
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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## 2 Version

<b>Revision Record</b>				
<b>Version</b>	<b>Chapter</b>	<b>Date</b>	<b>Modifier</b>	<b>Remark</b>
00		2016-12-14		Original

Authorized for issue by:				
Tested By		 (Edison Li) /Project Engineer		2016-12-07 Date
Checked By		 (Eric Fu) /Reviewer		2016-12-14 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 2013	PASS
<b>AC Power Line Conducted Emission</b>	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	PASS
<b>Conducted Peak Output Power</b>	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10 2013	PASS
<b>6dB Occupied Bandwidth</b>	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10 2013	PASS
<b>Power Spectral Density</b>	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10 2013	PASS
<b>Band-edge for RF Conducted Emissions</b>	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
<b>RF Conducted Spurious Emissions</b>	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
<b>Radiated Spurious Emissions</b>	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS
<b>Restricted bands around fundamental frequency (Radiated Emission)</b>	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS

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## 5 General Information

### 5.1 Client Information

Applicant:	Clicka Holdings, Inc.
Address of Applicant:	10905 Technology Pl., STE A, San Diego, CA 92127, USA
Manufacturer:	Shenzhen TAT Electronics Co., Ltd.
Address of Manufacturer:	F5-6, Building B, Hedong Industrial Park, Hangcheng Industrial Zone, Xixiang, Baoan District, Shenzhen 518101, China
Factory:	Shenzhen TAT Electronics Co., Ltd.
Address of Factory:	F5-6, Building B, Hedong Industrial Park, Hangcheng Industrial Zone, Xixiang, Baoan District, Shenzhen 518101, China

### 5.2 General Description of EUT

Product Name:	Action Camera
Model No.:	CX
Trade Mark:	ACTIVEON
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 product
Antenna Type:	PIFA
Antenna Gain:	2dBi
EUT Power Supply:	DC 3.7V, 1100mAh rechargeable battery which charged by USB Port
Cable:	USB cable: 45cm with two ferrite core AV cable: 47cm with two ferrite core MIC cable: 98cm unshielded HDMI cable: 110cm unshielded

Remark:

Model No.: XCA10W, GCB10W, CX, CX Gold, CX Gold Plus, Solar XG

Only the model CX was tested, since the electrical circuit design, PCB layout, components used and internal wiring were identical for the above models, with only difference being model number, structure and color.



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Shenzhen Branch**

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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



### **5.3 Test Environment and Mode**

<b>Operating Environment:</b>	
Temperature:	25.0 °C
Humidity:	55 % RH
Atmospheric Pressure:	1015 mbar
<b>Test mode:</b>	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.
Transmitting +Charge mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate and being charged with adapter.

### **5.4 Description of Support Units**

The EUT has been tested with associated equipment below.

<b>Description</b>	<b>Manufacturer</b>	<b>Model No.</b>
Adapter	Apple	A1357

### **5.5 Test Location**

All tests were performed at:

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

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

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

No tests were sub-contracted.



## **5.6 Test Facility**

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

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

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

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

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

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

## **5.7 Deviation from Standards**

None.

## **5.8 Abnormalities from Standard Conditions**

None.

## **5.9 Other Information Requested by the Customer**

None.



## 5.10 Equipment List

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2016-05-13	2017-05-13
2	LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
3	LISN	ETS-LINDGREN	3816/2	SEM007-02	2016-04-25	2017-04-25
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	EMC0120	2016-09-28	2017-09-28
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	EMC0121	2016-09-28	2017-09-28
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	EMC0122	2016-09-28	2017-09-28
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2016-04-25	2017-04-25
8	DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2016-10-09	2017-10-09

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2016-05-13	2017-05-13
2	EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2016-10-09	2017-10-09
3	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2014-11-01	2017-11-01
4	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEM003-11	2015-10-17	2018-10-17
5	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEM003-12	2014-11-24	2017-11-24
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2016-04-25	2017-04-25
7	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A
8	DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
9	Loop Antenna	Beijing Daze	ZN30401	SEM003-09	2015-05-13	2018-05-13



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RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2016-05-13	2017-05-13
2	EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-09	2016-07-19	2017-07-19
3	BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
4	Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
5	Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
6	Horn Antenna (18-26GHz)	ETS-Lindgren	3160	SEM003-12	2014-11-24	2017-11-24
7	Horn Antenna(26GHz-40GHz)	A.H.Systems, inc.	SAS-573	SEM003-13	2015-02-12	2018-02-12
8	Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09
9	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A

RF connected test						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
2	Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
3	Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2016-04-25	2017-04-25
4	Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

## 6 Test results and Measurement Data

### 6.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement:  An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	15.247(b) (4) requirement:  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.
EUT Antenna:	A photograph of a printed circuit board (PCB) with a ruler placed next to it for scale. The PCB is light blue with various electronic components. A red box highlights a specific area on the PCB, and the word "ANTENNA" is written in red capital letters next to the highlighted area. The ruler shows markings from 1 to 9 in centimeters (mm).

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.



## 6.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)		Limit (dBuV)
			Quasi-peak
	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: 2013 on conducted measurement.</li></ol>		

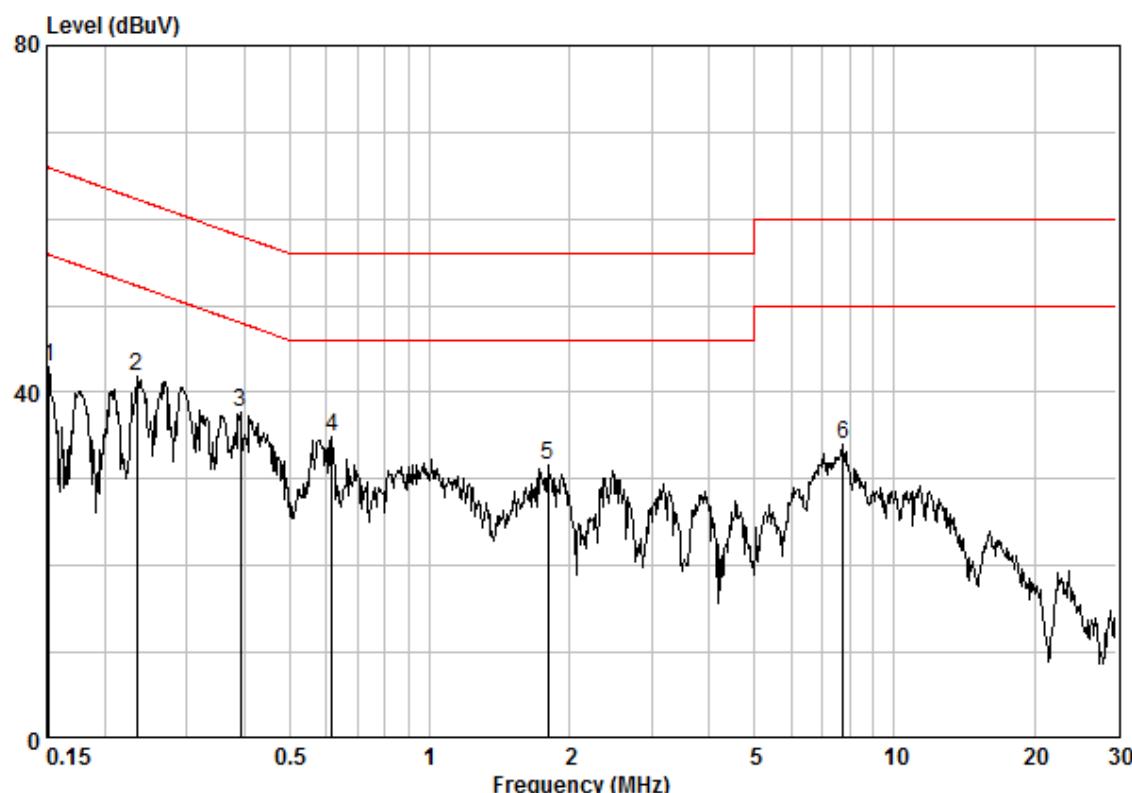
Test Setup:	
Exploratory Test Mode:	<p>Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.</p> <p>Charge + Transmitting mode.</p>
Final Test Mode:	<p>Through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case.</p> <p>Charge + Transmitting mode.</p> <p>Only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 5.10 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:



Site : Shielding Room

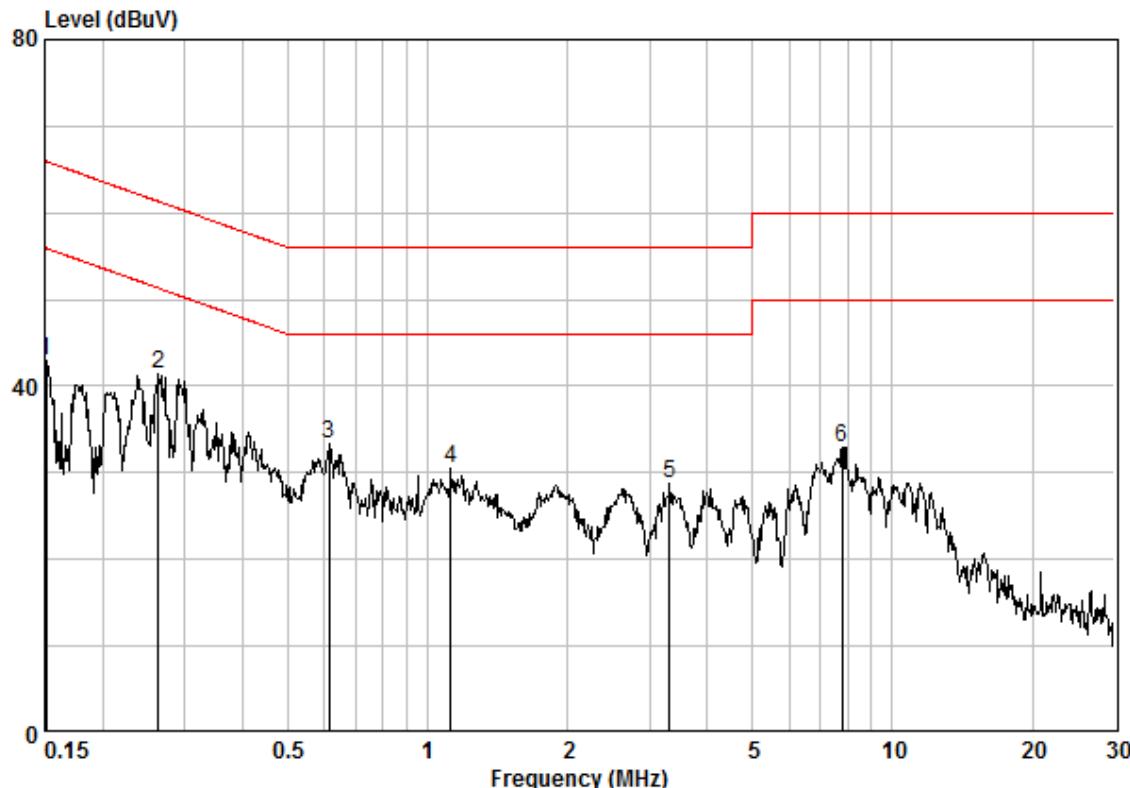
Condition : CE LINE

Job No. : 9871CR

Test Mode : Charge+TX

	Freq	Cable	LISN	Read	Limit	Over	Remark
		MHz	dB	dB	dBuV	dBuV	
1	0.15160	0.02	9.59	33.30	42.91	55.91	-13.01 Peak
2	0.23409	0.02	9.60	32.25	41.87	52.30	-10.43 Peak
3 @	0.39136	0.02	9.60	28.11	37.73	48.03	-10.30 Peak
4	0.61726	0.02	9.61	25.30	34.94	46.00	-11.06 Peak
5	1.80000	0.03	9.62	22.00	31.64	46.00	-14.36 Peak
6	7.76900	0.10	9.69	24.17	33.96	50.00	-16.04 Peak

Neutral Line:



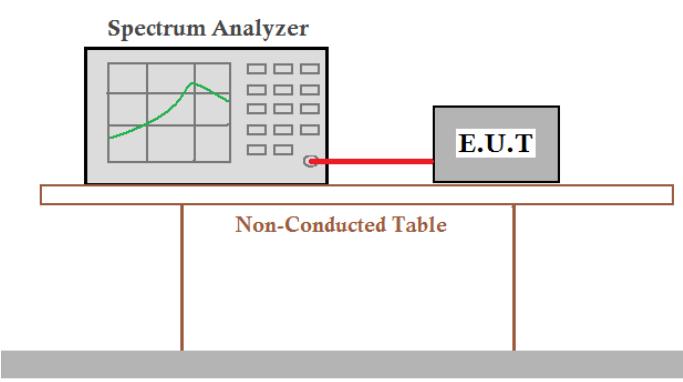
Site : Shielding Room  
 Condition : CE NEUTRAL  
 Job No. : 9871CR  
 Test Mode : Charge+TX

	Freq	Cable	LISN	Read	Limit	Over	Remark
		Loss	Factor	Level	Level	Line	
	MHz	dB	dB	dBuV	dBuV	dB	
1	0.15080	0.02	9.62	33.19	42.83	55.96	-13.12 Peak
2	0.26303	0.02	9.61	31.81	41.44	51.34	-9.89 Peak
3	0.61400	0.02	9.63	23.72	33.38	46.00	-12.62 Peak
4	1.123	0.03	9.65	20.82	30.50	46.00	-15.50 Peak
5	3.310	0.02	9.67	19.00	28.70	46.00	-17.30 Peak
6	7.810	0.10	9.75	23.06	32.91	50.00	-17.09 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:	ANSI C63.10 :2013 Section 11.9.1
Test Setup:	 <p><b>Spectrum Analyzer</b>  <b>E.U.T</b>  Non-Conducted Table  Ground Reference Plane</p>
	<p><i>Remark:</i>  <i>Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</i></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).
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)	9.7	9.66	9.62	9.60				
Mode	802.11g							
Data Rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Power (dBm)	9.2	9.11	9.03	9.14	9.05	9.01	9.00	9.00
Mode	802.11n(HT20)							
Data Rate	6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
Power (dBm)	7.22	7.21	7.20	7.12	7.15	7.08	7.11	7.02

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

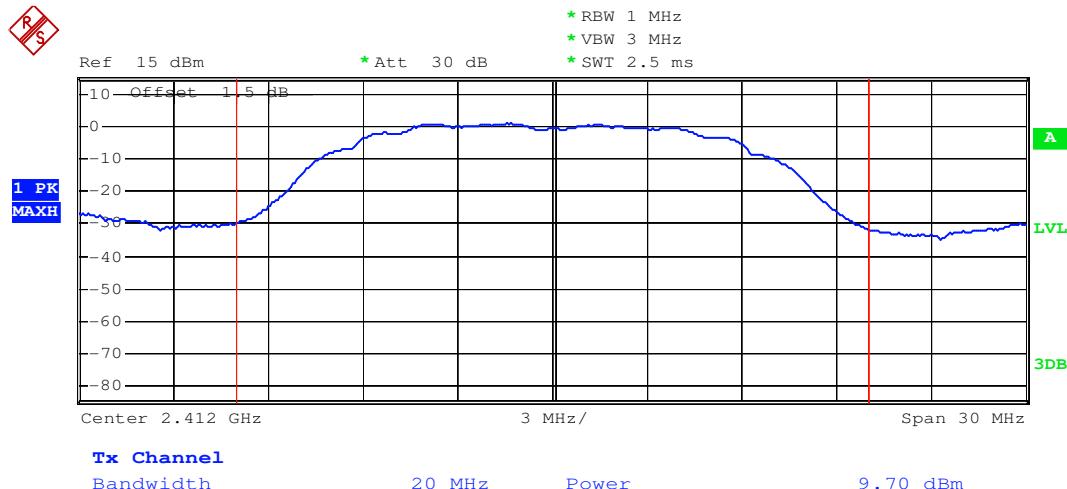
802.11b mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	9.70	30.00	Pass
Middle	9.30	30.00	Pass
Highest	8.78	30.00	Pass

802.11g mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	7.22	30.00	Pass
Middle	9.20	30.00	Pass
Highest	6.64	30.00	Pass

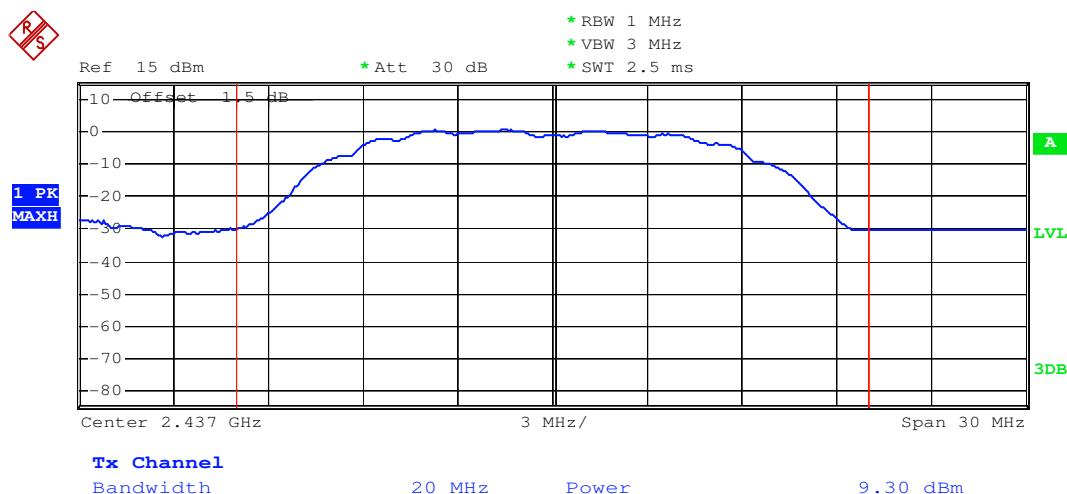
802.11n(HT20)mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	7.22	30.00	Pass
Middle	7.14	30.00	Pass
Highest	6.17	30.00	Pass

**Test plot as follows:**

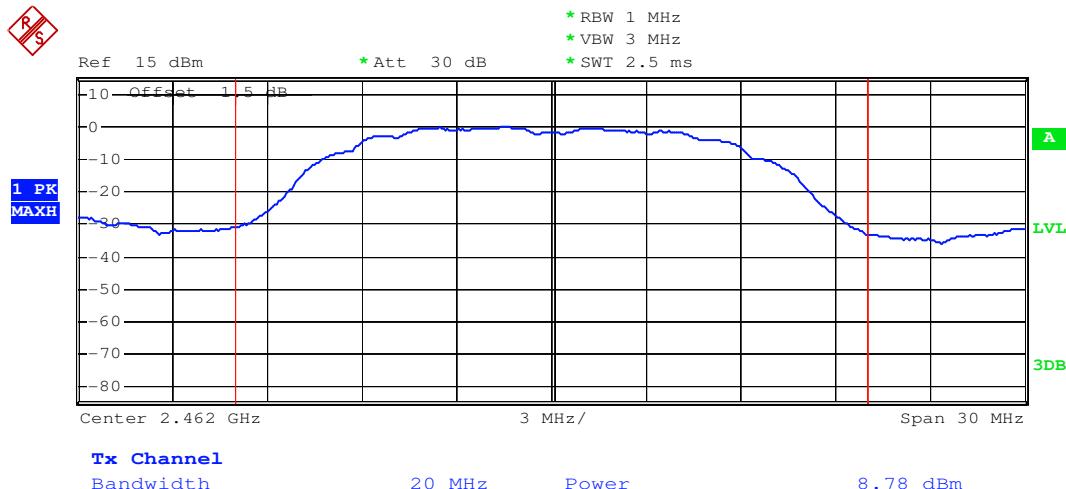
Test mode:	802.11b	Test channel:	Lowest
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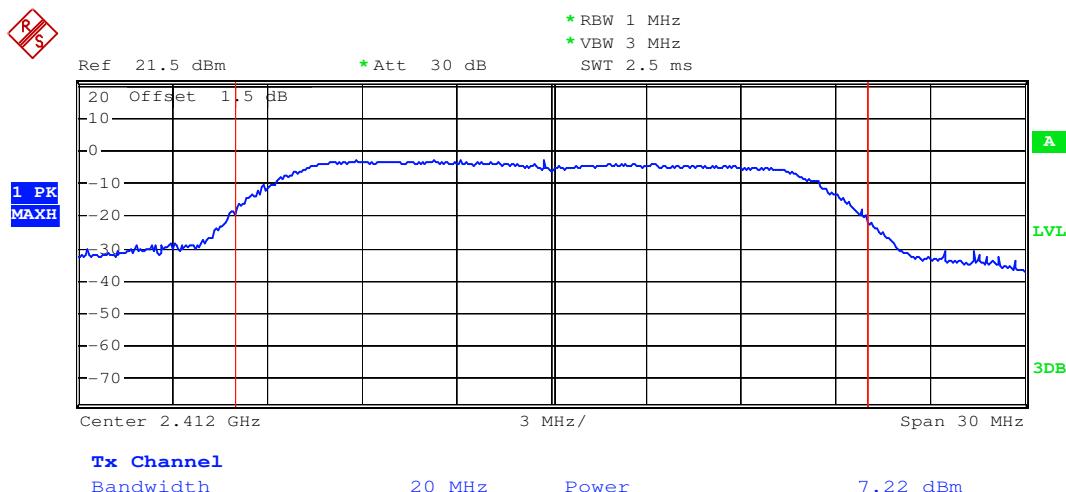
Test mode:	802.11b	Test channel:	Middle
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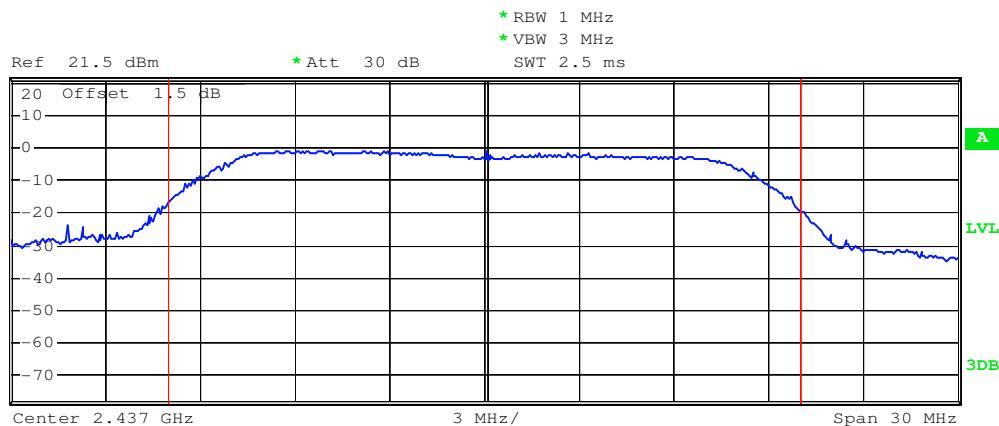
Test mode:	802.11b	Test channel:	Highest
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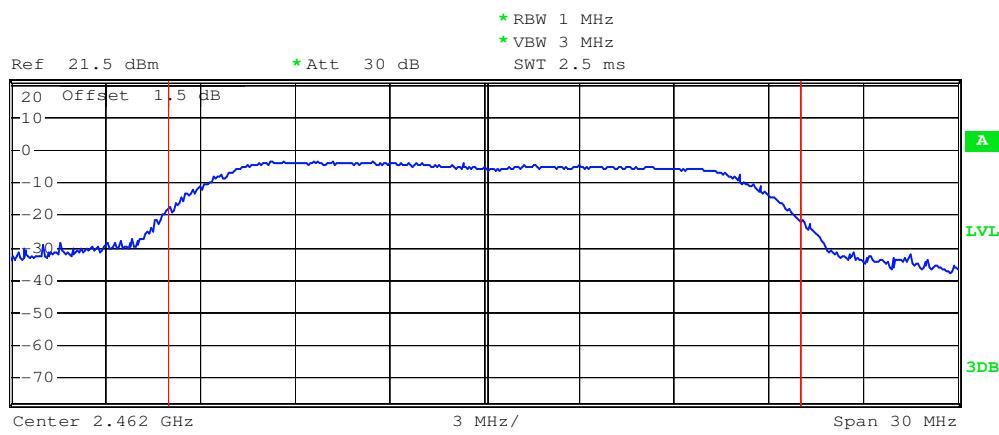
Test mode:	802.11g	Test channel:	Lowest
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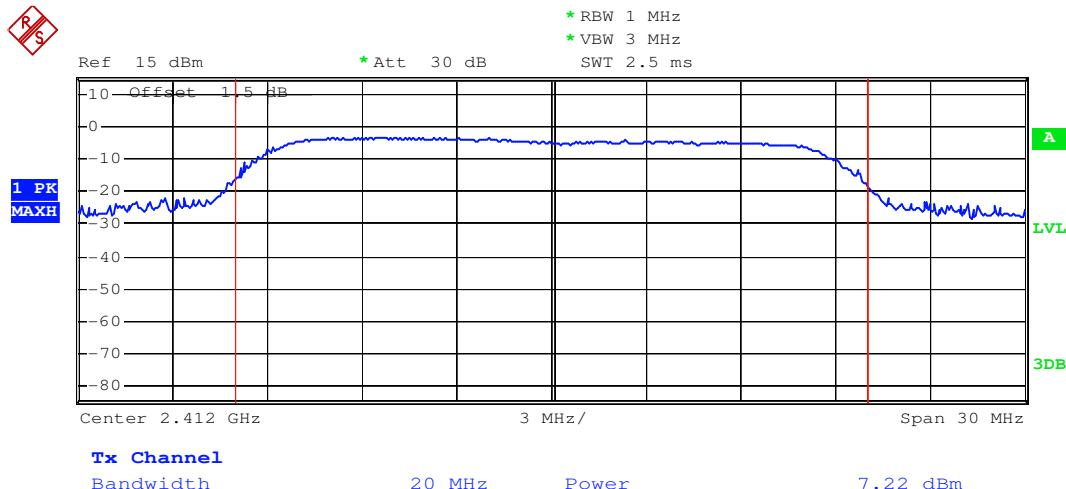
Test mode:	802.11g	Test channel:	Middle
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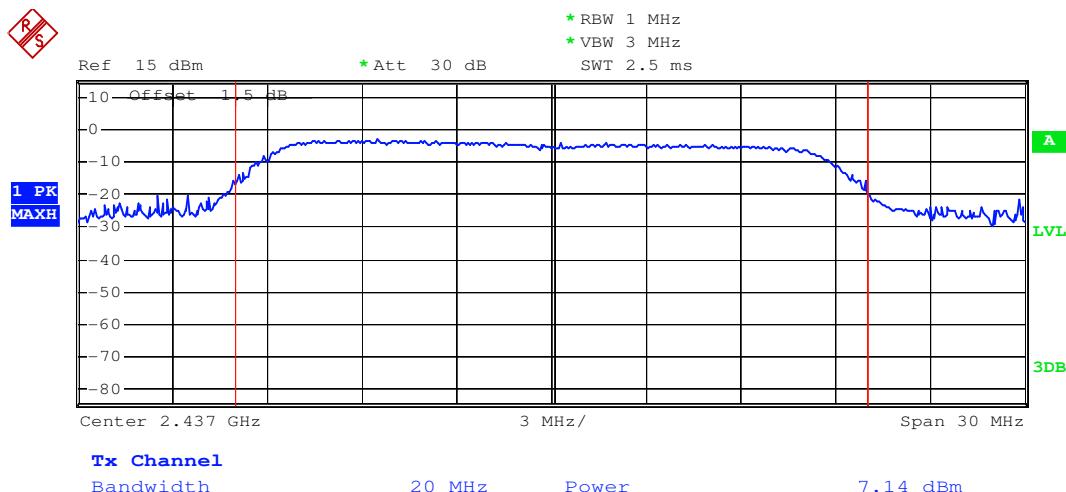
Test mode:	802.11g	Test channel:	Highest
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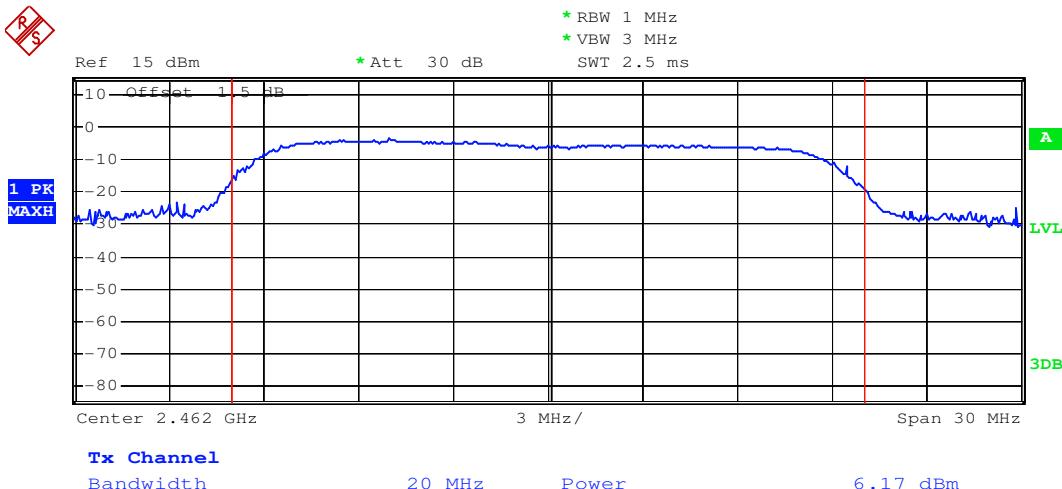
Test mode:	802.11n(HT20)	Test channel:	Lowest
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Test mode:	802.11n(HT20)	Test channel:	Middle
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Test mode:	802.11n(HT20)	Test channel:	Highest
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## 6.4 6dB Occupy Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013 Section 11.8
Test Setup:	<p style="text-align: center;"><b>Spectrum Analyzer</b></p> <p style="text-align: center;">Non-Conducted Table</p> <p style="text-align: center;">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).
Limit:	$\geq 500$ kHz
Test Results:	Pass



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## Measurement Data

802.11b mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	10.11	≥500	Pass
Middle	10.08	≥500	Pass
Highest	10.11	≥500	Pass

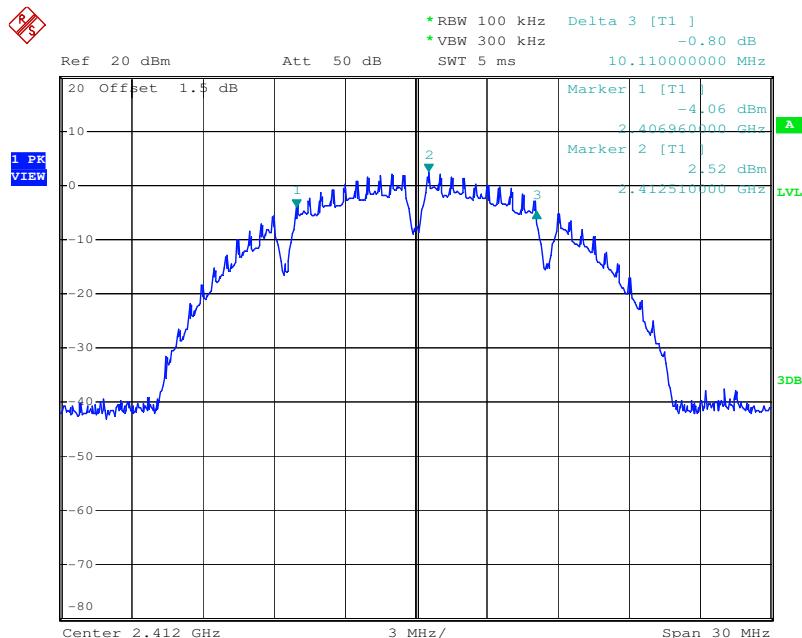
802.11g mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	16.41	≥500	Pass
Middle	16.41	≥500	Pass
Highest	16.44	≥500	Pass

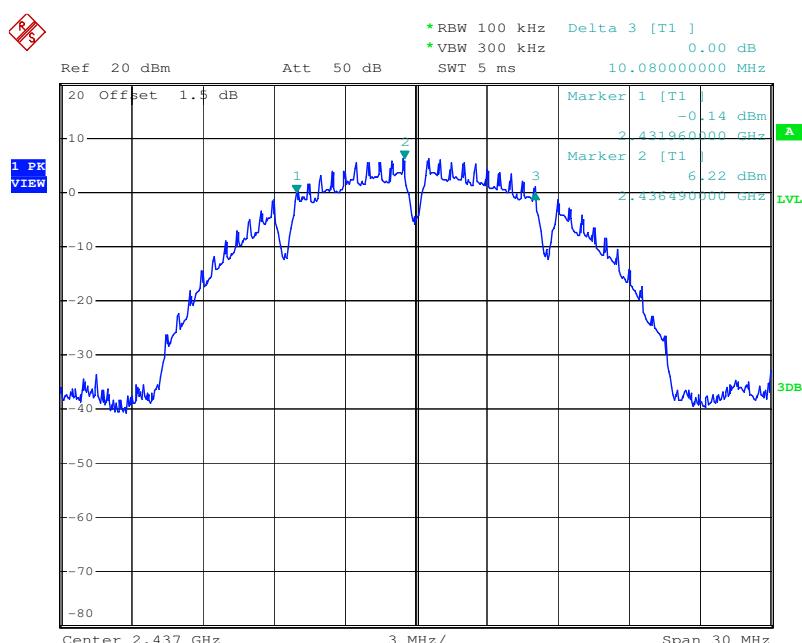
802.11n(HT20) mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	17.61	≥500	Pass
Middle	17.64	≥500	Pass
Highest	17.64	≥500	Pass

**Test plot as follows:**

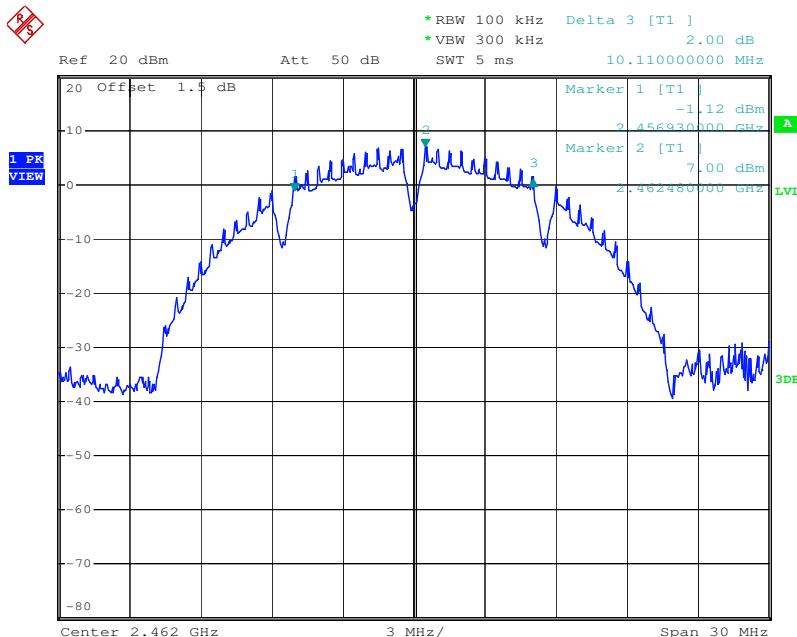
Test mode:	802.11b	Test channel:	Lowest
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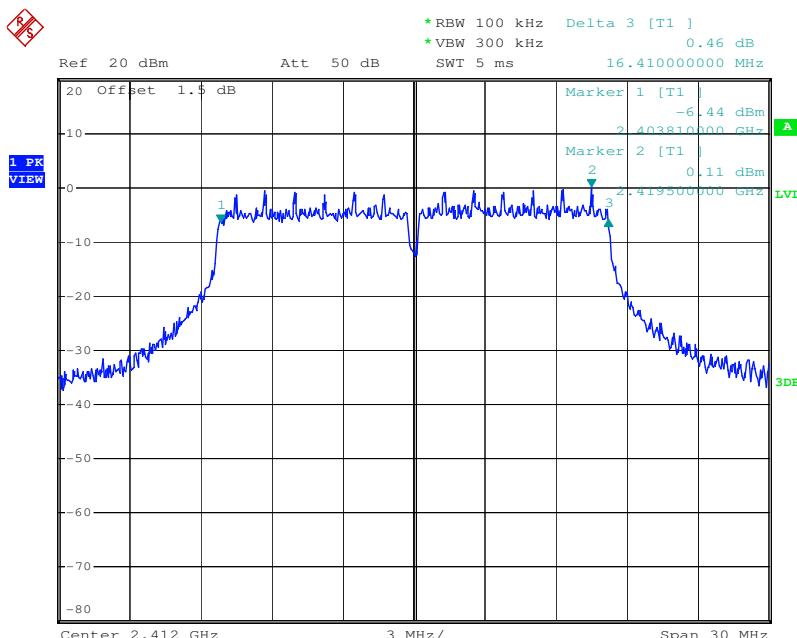
Test mode:	802.11b	Test channel:	Middle
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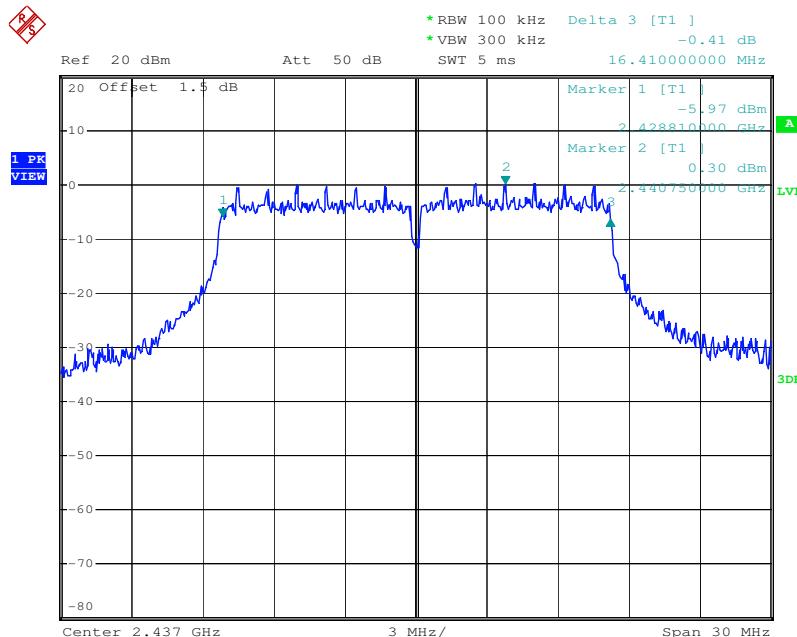
Test mode:	802.11b	Test channel:	Highest
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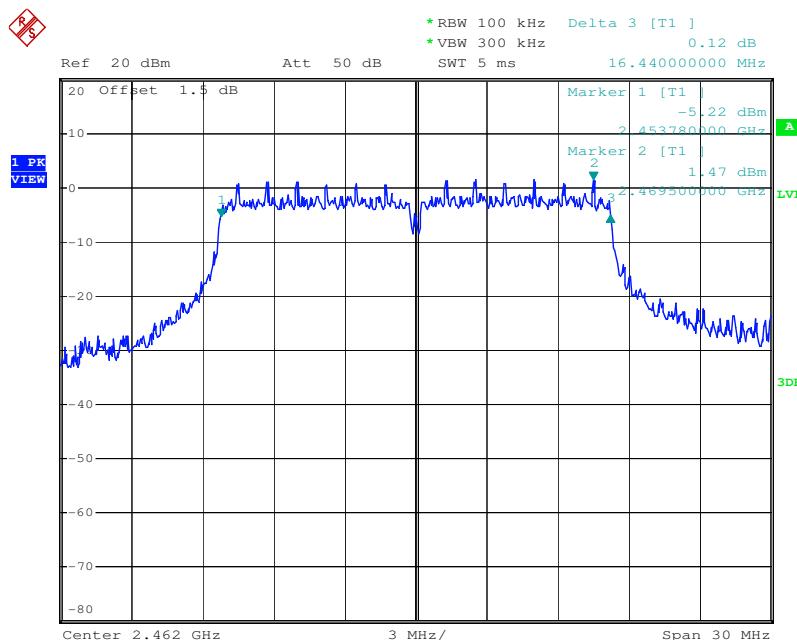
Test mode:	802.11g	Test channel:	Lowest
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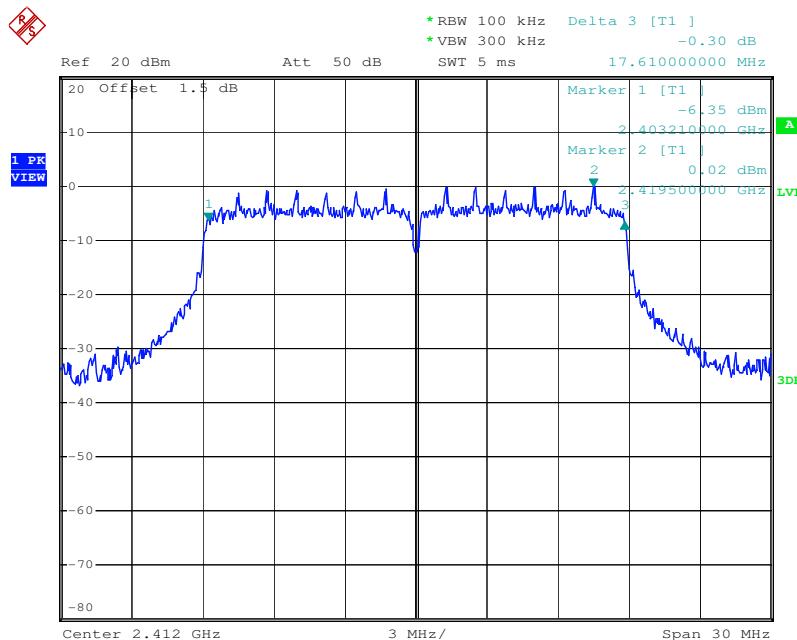
Test mode:	802.11g	Test channel:	Middle
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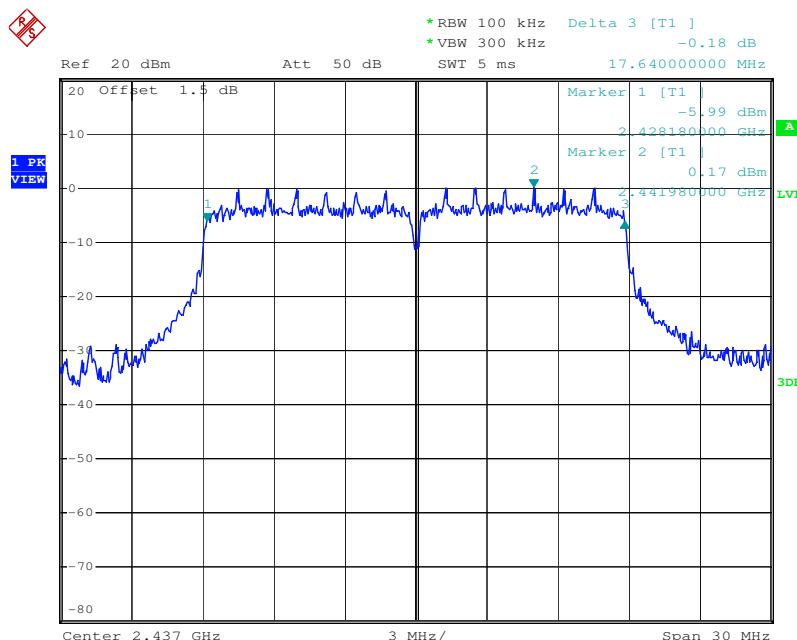
Test mode:	802.11g	Test channel:	Highest
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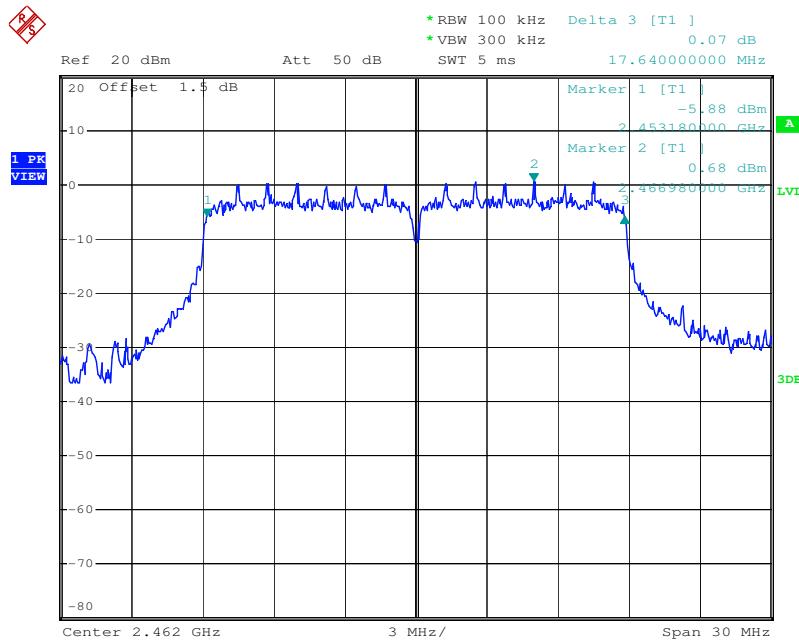
Test mode:	802.11n(HT20)	Test channel:	Lowest
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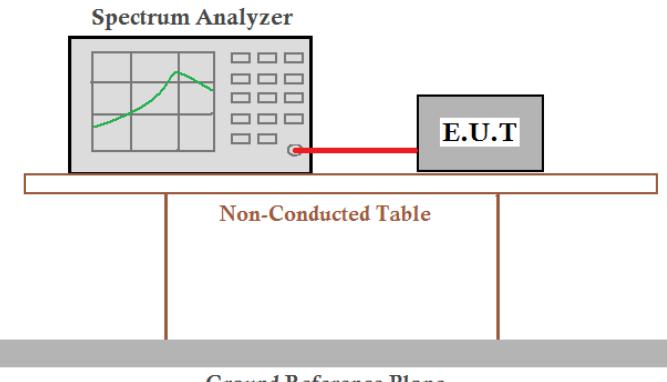
Test mode:	802.11n(HT20)	Test channel:	Middle
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Test mode:	802.11n(HT20)	Test channel:	Highest
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## 6.5 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 :2013 Section 11.10.2
Test Setup:	 <p><b>Remark:</b>  <i>Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</i></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).
Limit:	$\leq 8.00 \text{dBm}/3\text{kHz}$
Test Results:	Pass



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## Measurement Data

802.11b mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-17.68	≤8.00	Pass
Middle	-17.87	≤8.00	Pass
Highest	-18.55	≤8.00	Pass

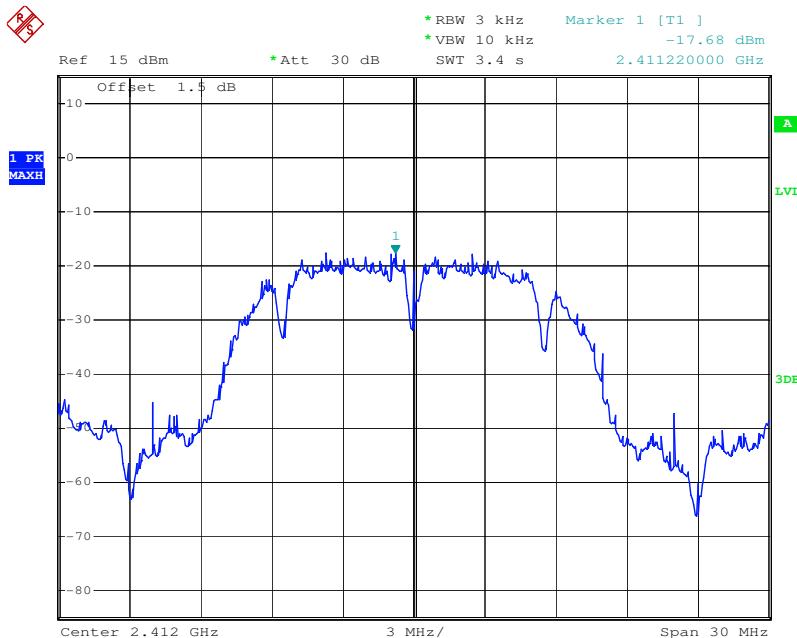
802.11g mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-26.41	≤8.00	Pass
Middle	-24.54	≤8.00	Pass
Highest	-26.80	≤8.00	Pass

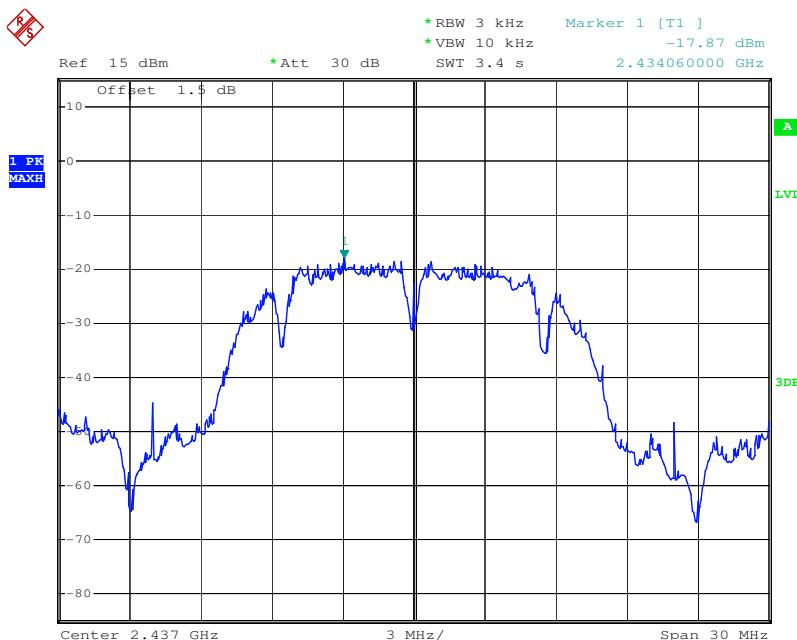
802.11n(HT20) mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-25.63	≤8.00	Pass
Middle	-25.64	≤8.00	Pass
Highest	-26.73	≤8.00	Pass

**Test plot as follows:**

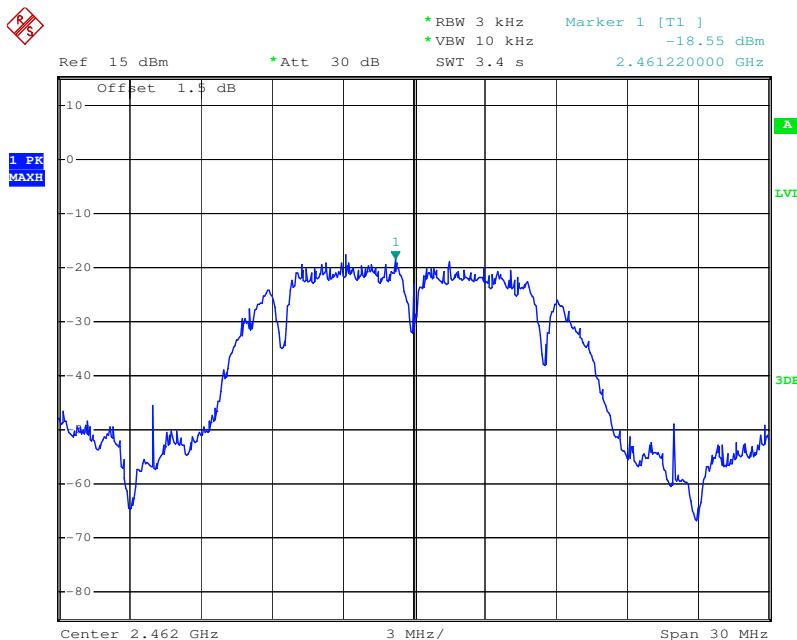
Test mode:	802.11b	Test channel:	Lowest
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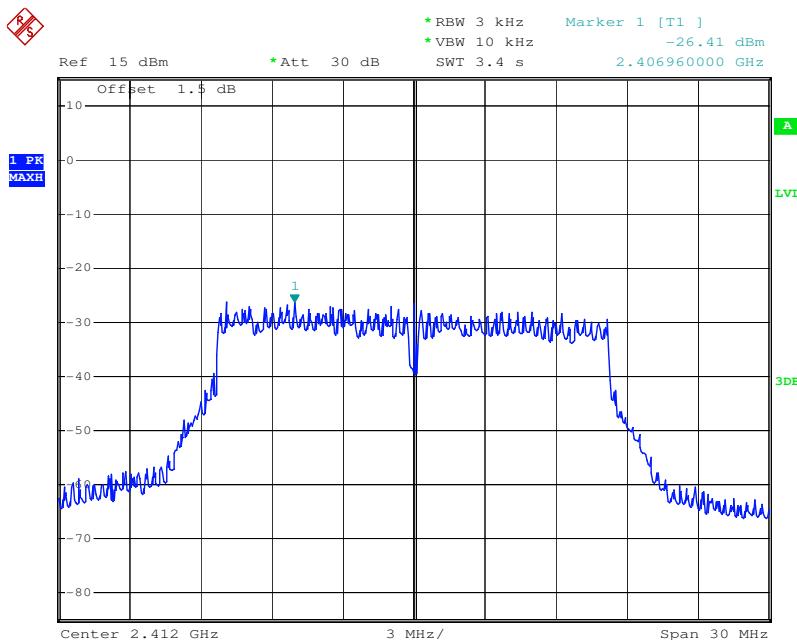
Test mode:	802.11b	Test channel:	Middle
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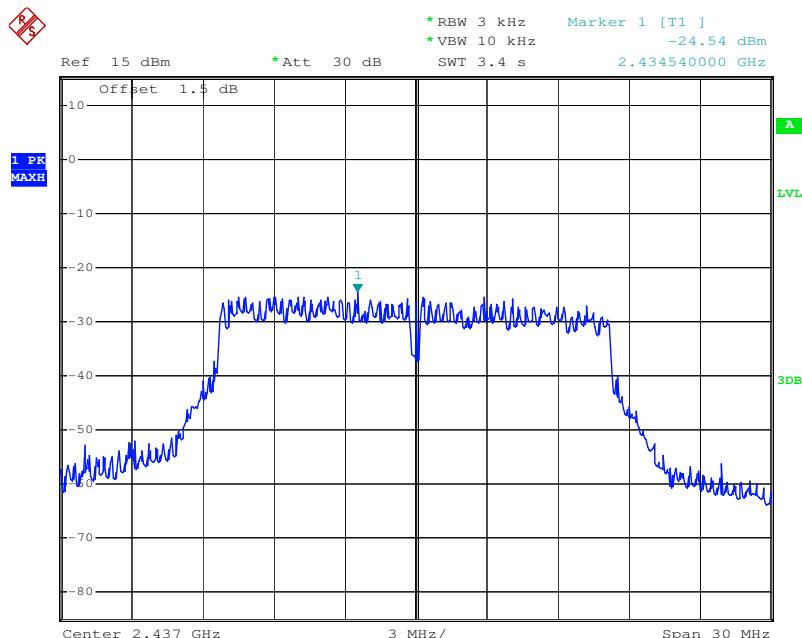
Test mode:	802.11b	Test channel:	Highest
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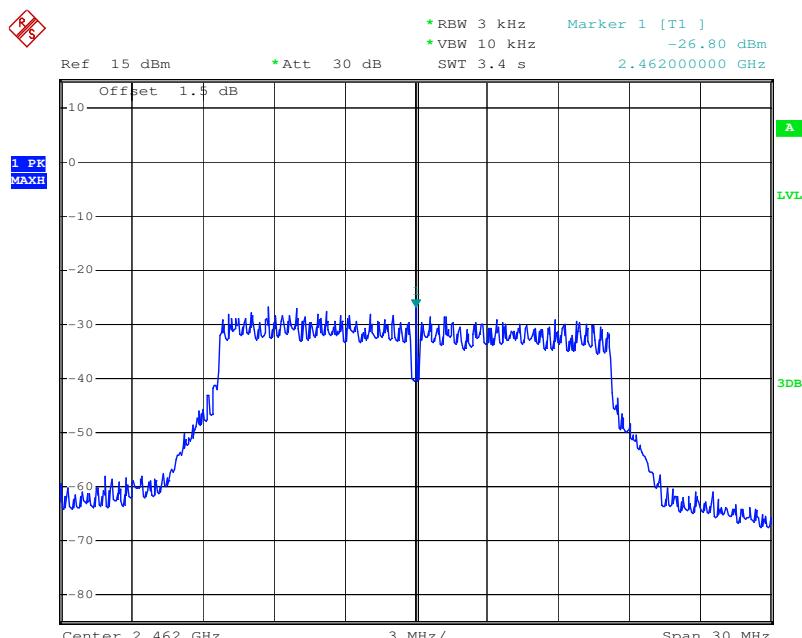
Test mode:	802.11g	Test channel:	Lowest
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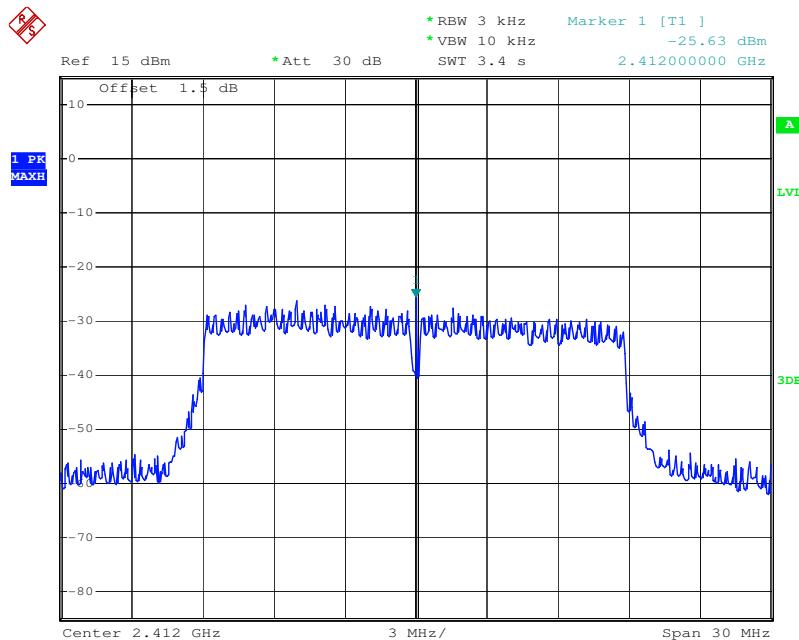
Test mode:	802.11g	Test channel:	Middle
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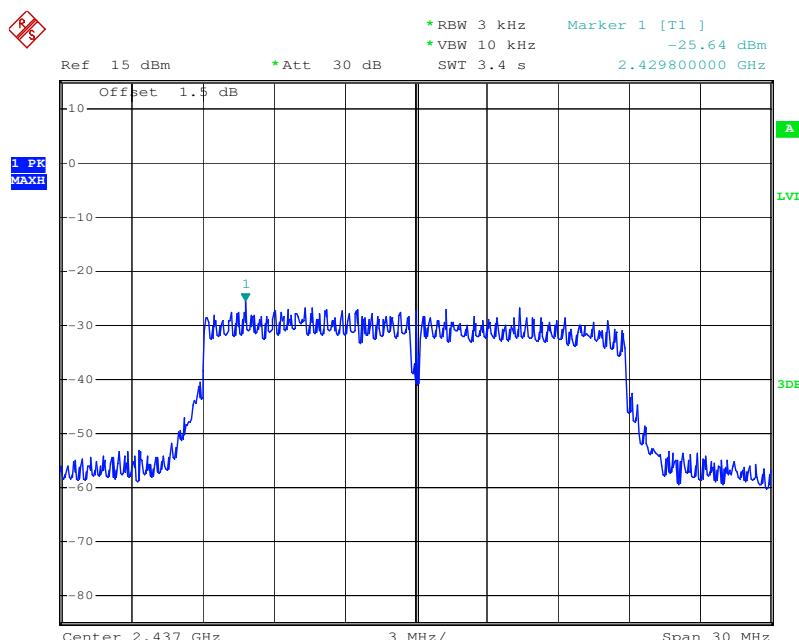
Test mode:	802.11g	Test channel:	Highest
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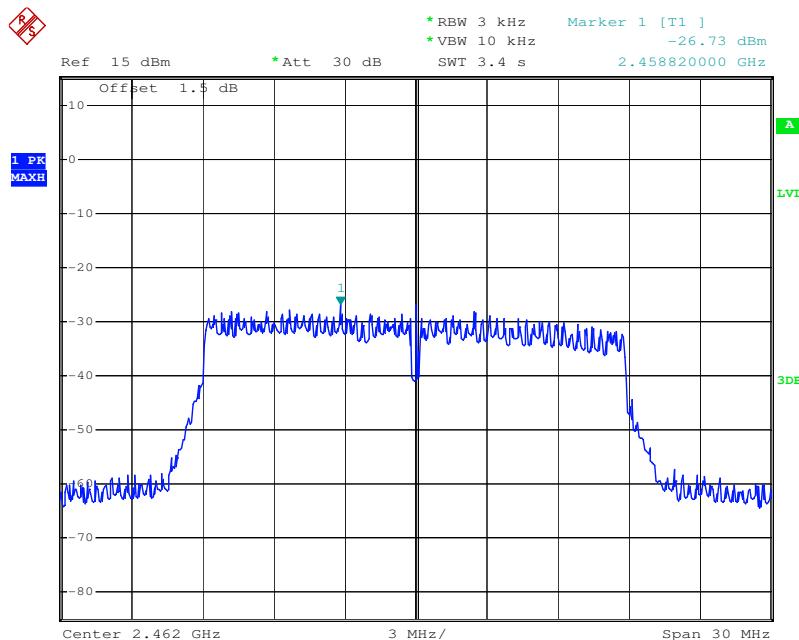
Test mode:	802.11n(HT20)	Test channel:	Lowest
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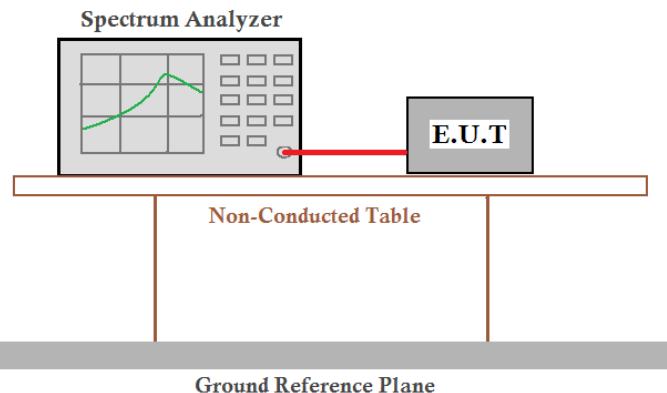
Test mode:	802.11n(HT20)	Test channel:	Middle
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Test mode:	802.11n(HT20)	Test channel:	Highest
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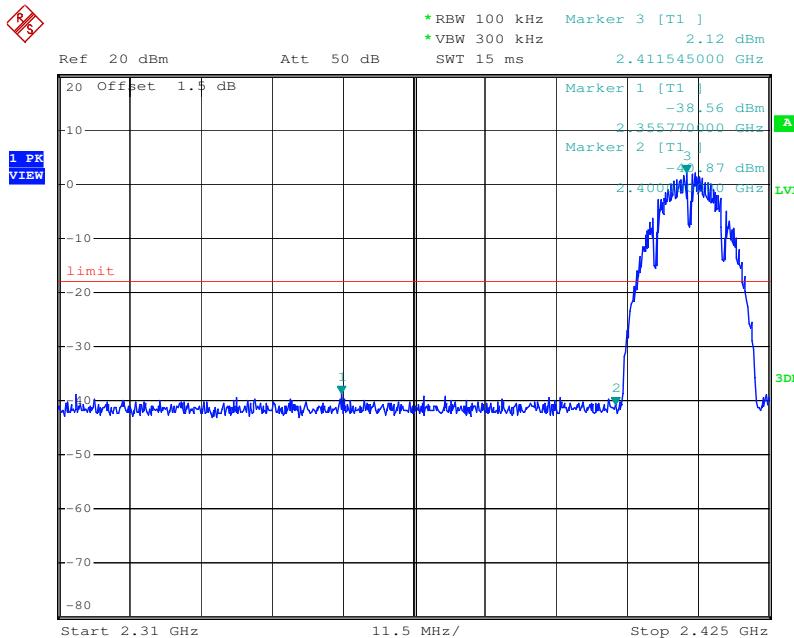


## 6.6 Band-edge for RF Conducted Emissions

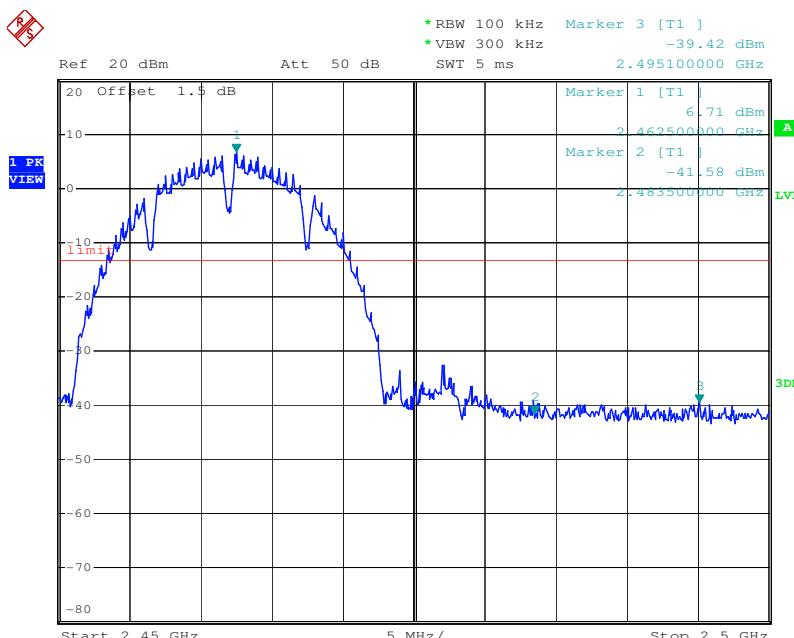
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.13
Test Setup:	 <p><b>Remark:</b>  <i>Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</i></p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	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).
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

**Test plot as follows:**

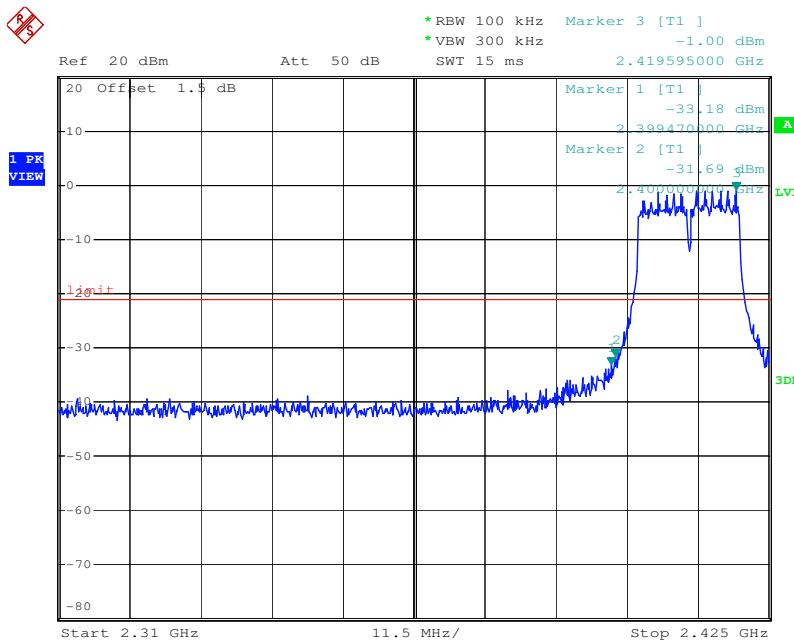
Test mode:	802.11b	Test channel:	Lowest
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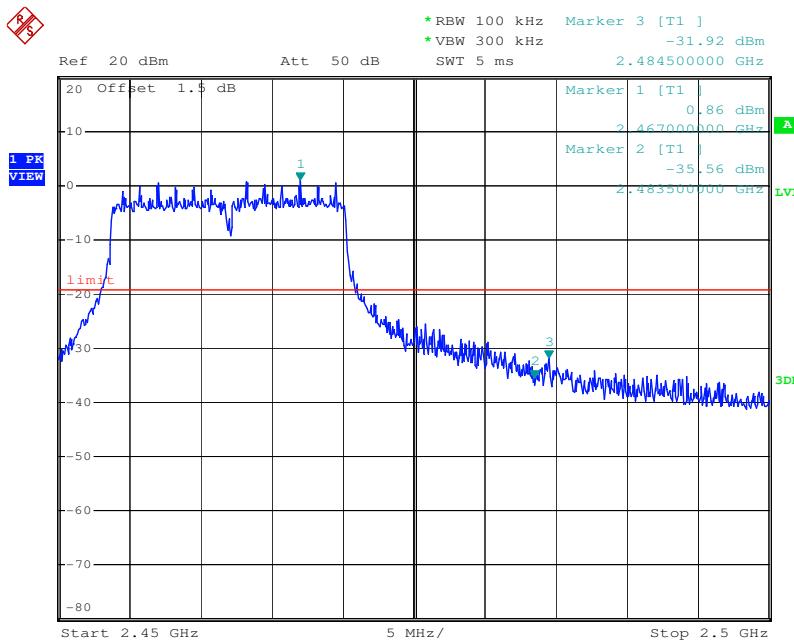
Test mode:	802.11b	Test channel:	Highest
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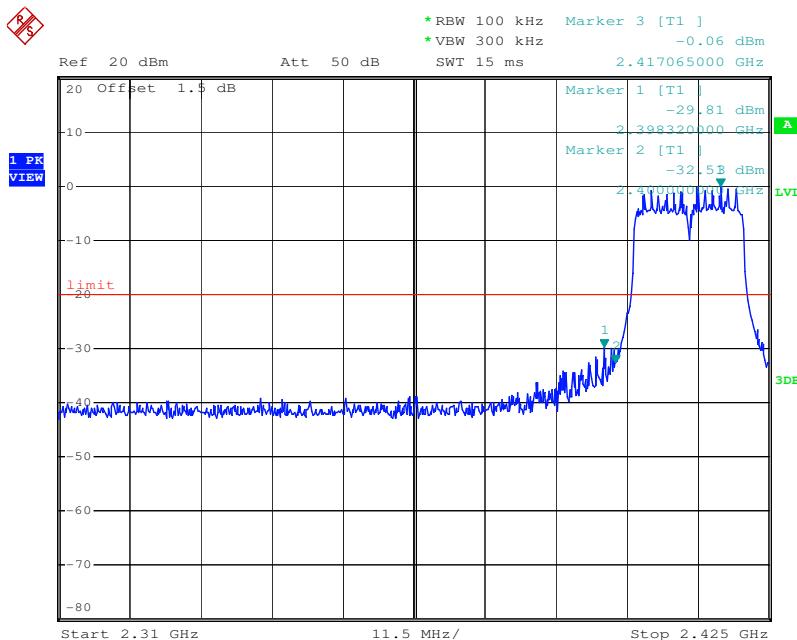
Test mode:	802.11g	Test channel:	Lowest
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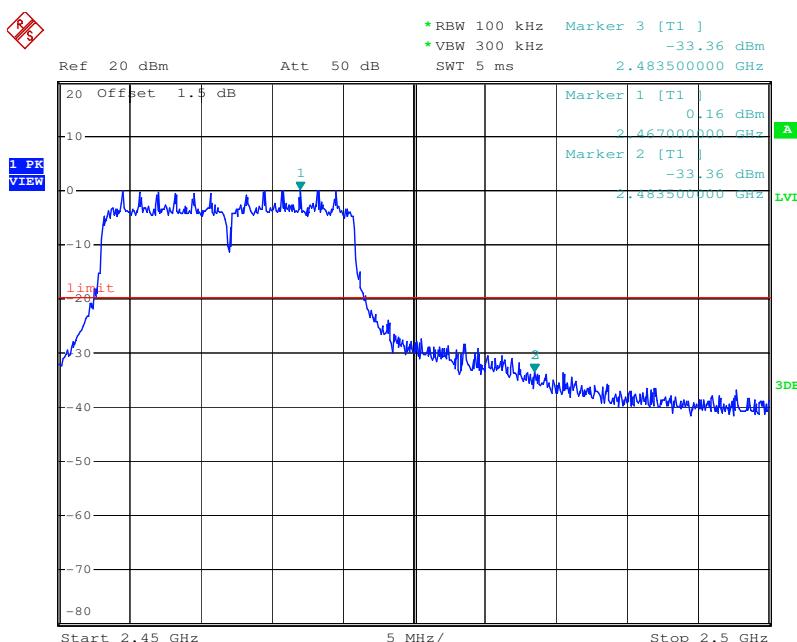
Test mode:	802.11g	Test channel:	Highest
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Test mode:	802.11n(HT20)	Test channel:	Lowest
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Test mode:	802.11n(HT20)	Test channel:	Highest
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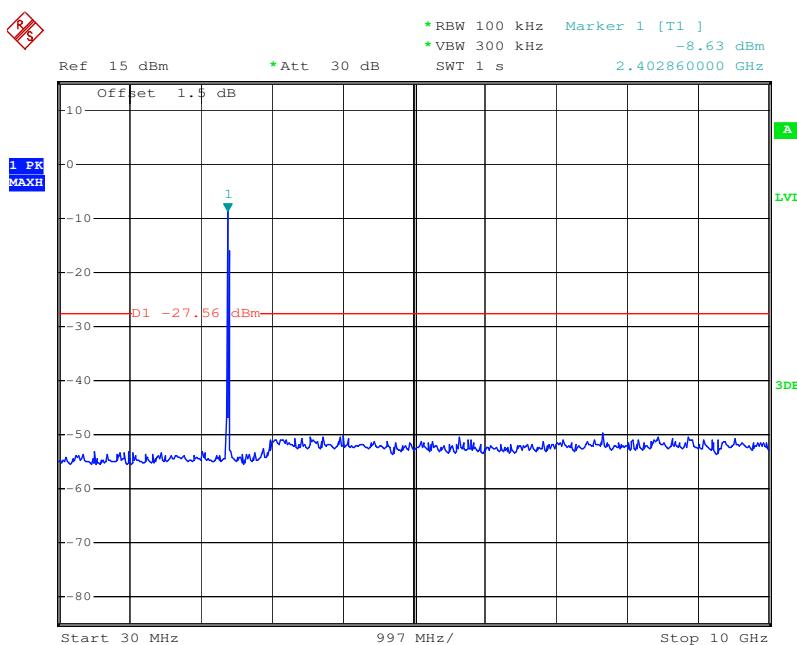
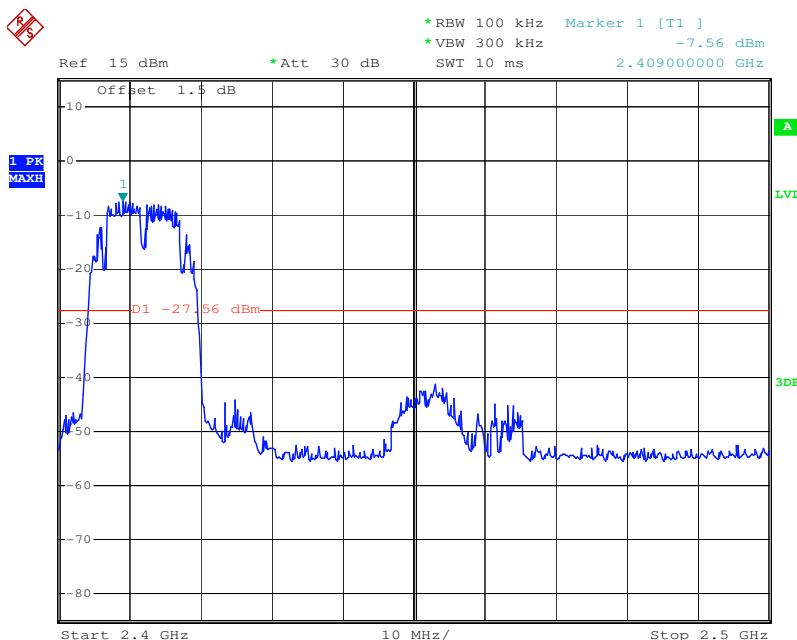


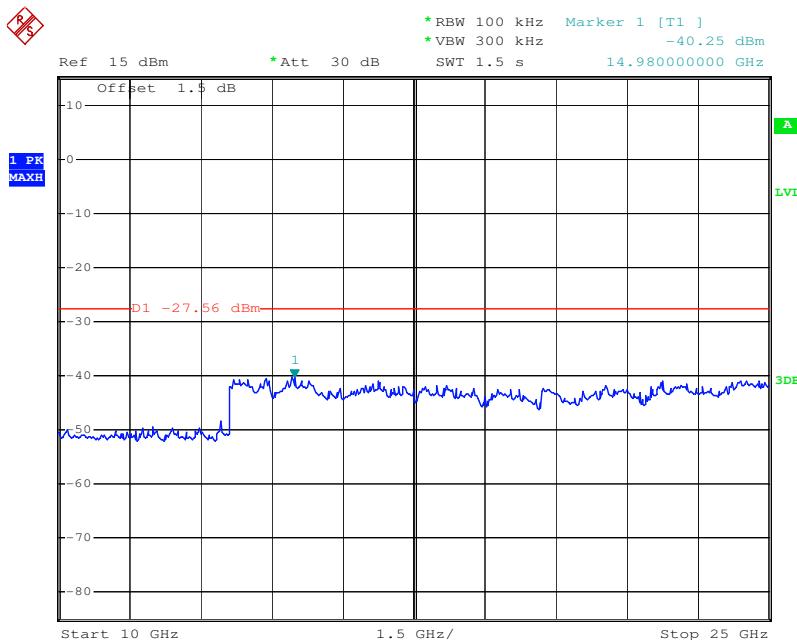
## 6.7 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
Test Setup:	<p style="text-align: center;"><b>Spectrum Analyzer</b></p> <p style="text-align: center;">Non-Conducted Table</p> <p style="text-align: center;">Ground Reference Plane</p>
	<p><i>Remark:</i></p> <p><i>Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</i></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).
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

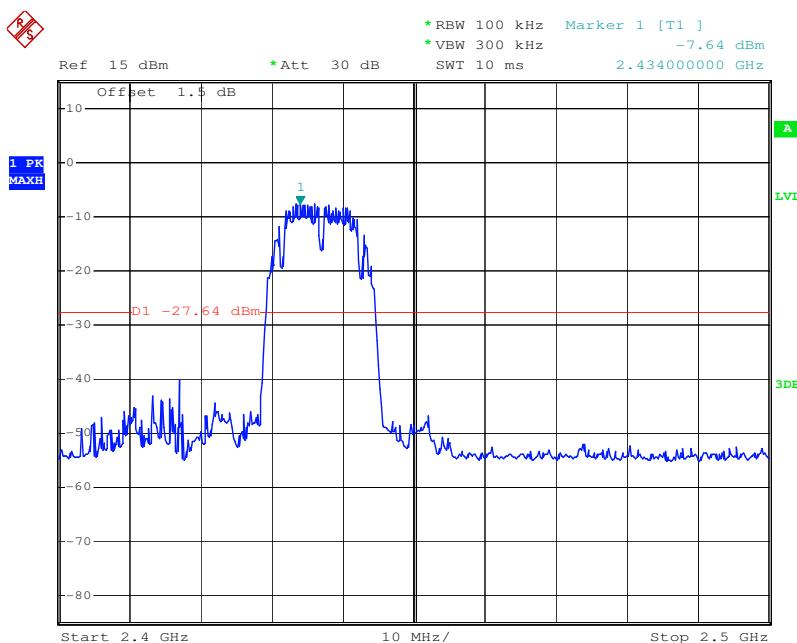
**Test plot as follows:**

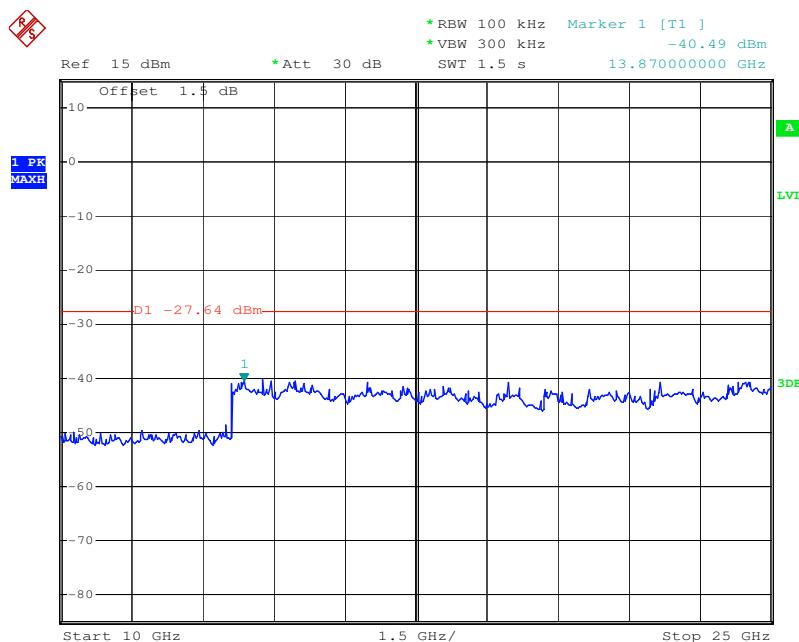
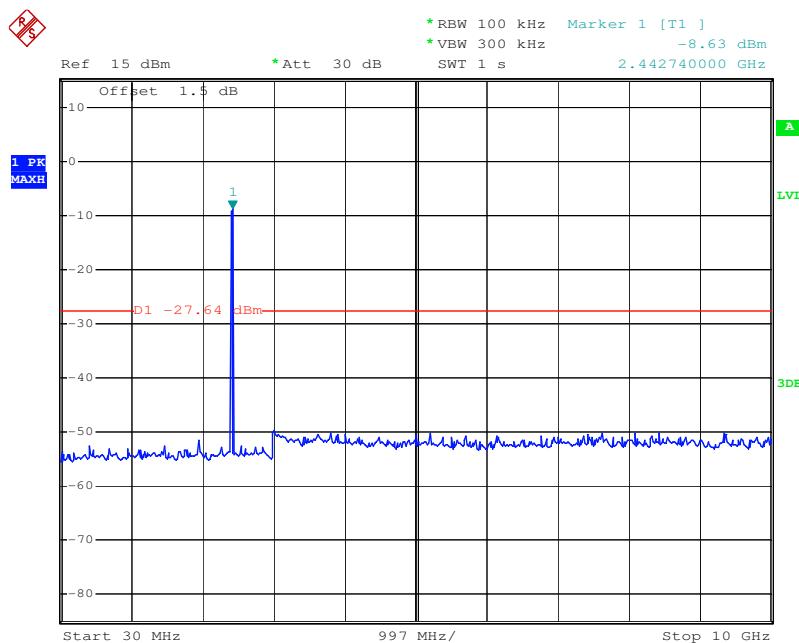
Test mode:	802.11b	Test channel:	Lowest
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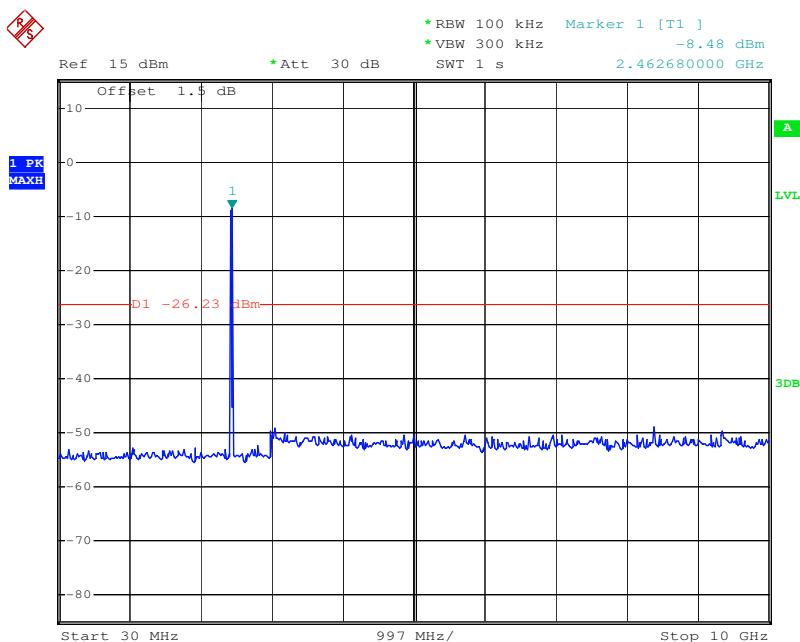
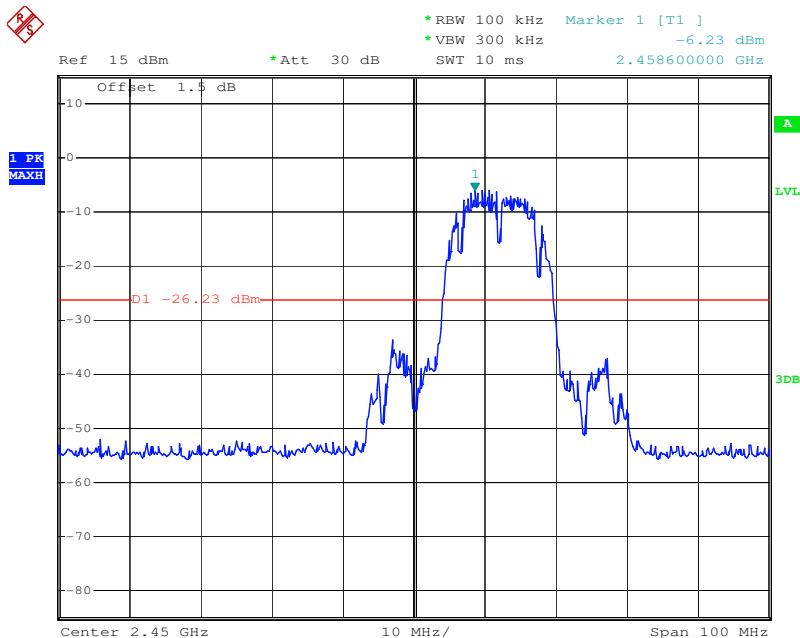


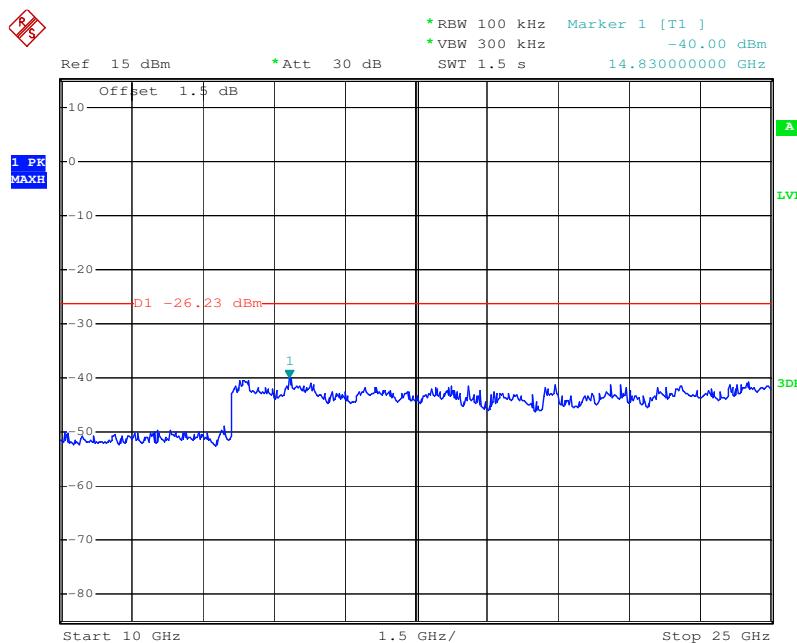
Test mode:	802.11b	Test channel:	Middle
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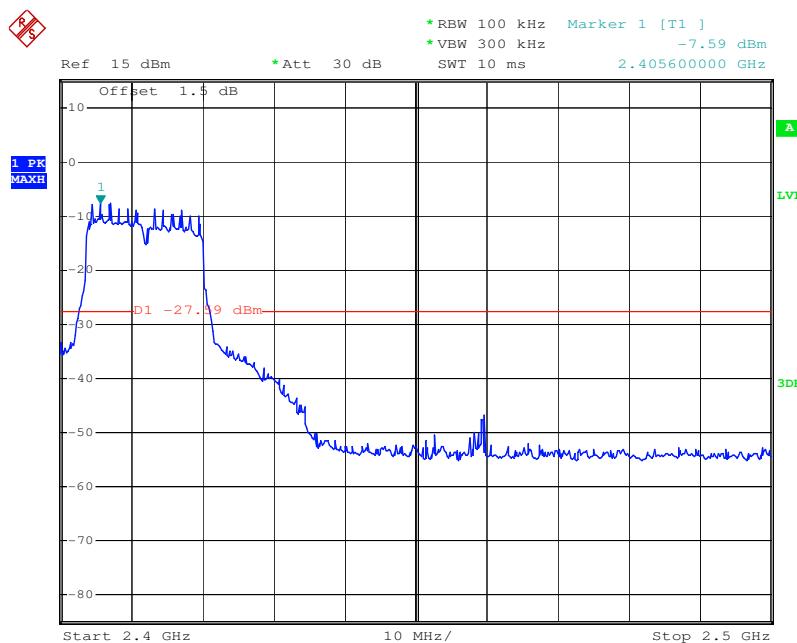


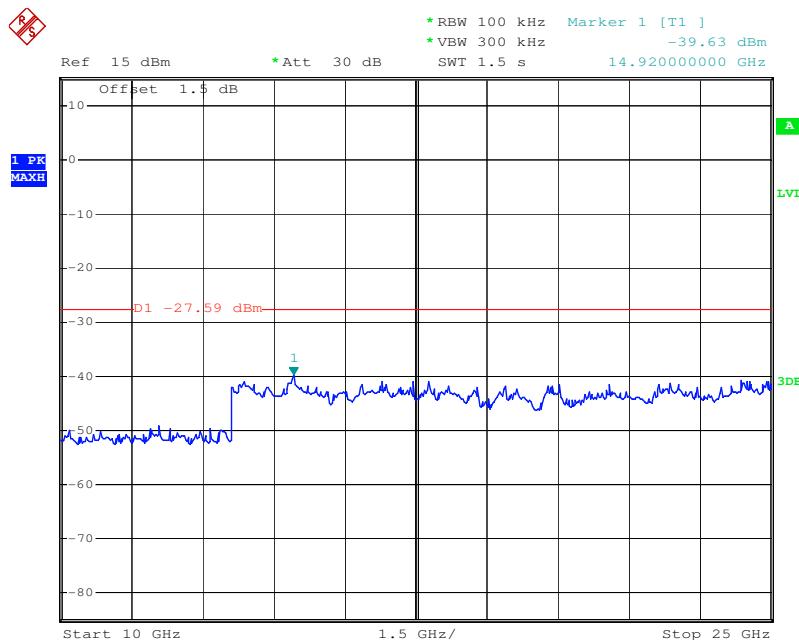
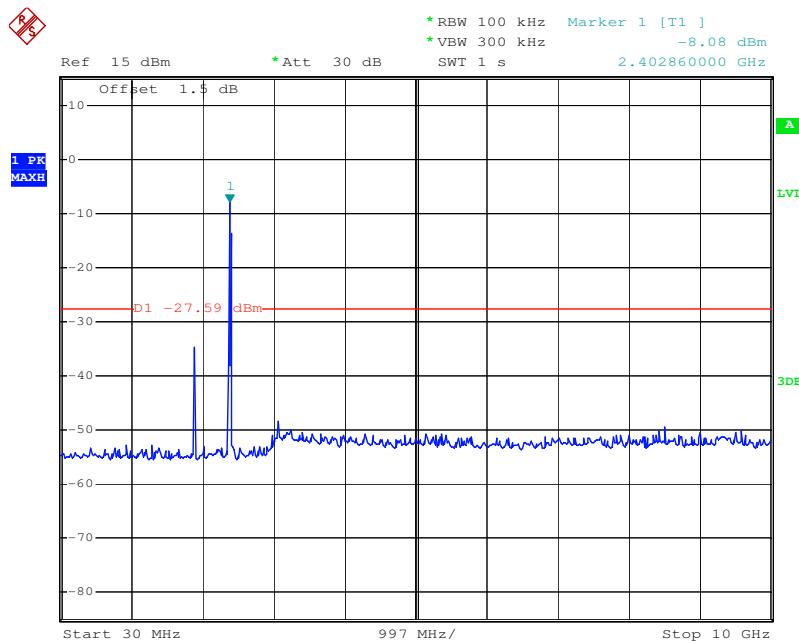
Test mode:	802.11b	Test channel:	Highest
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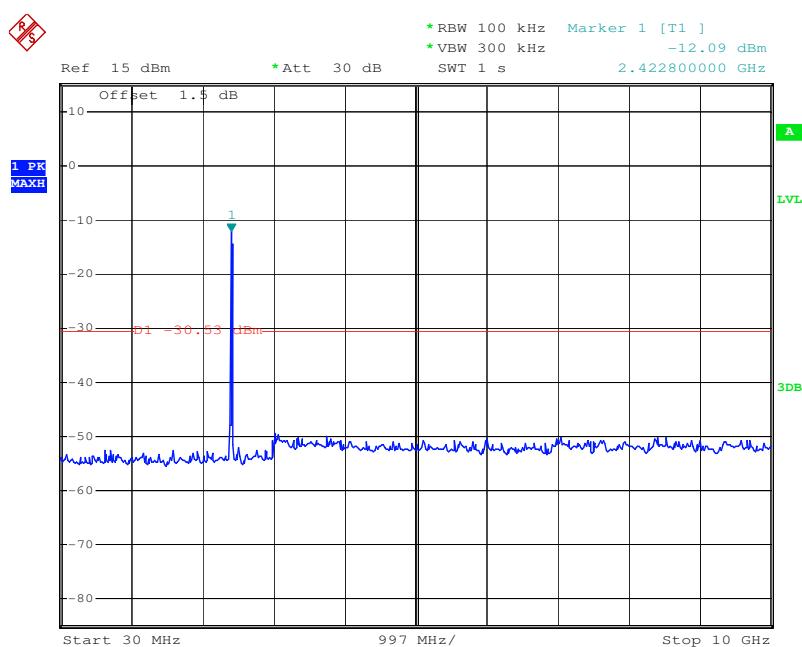
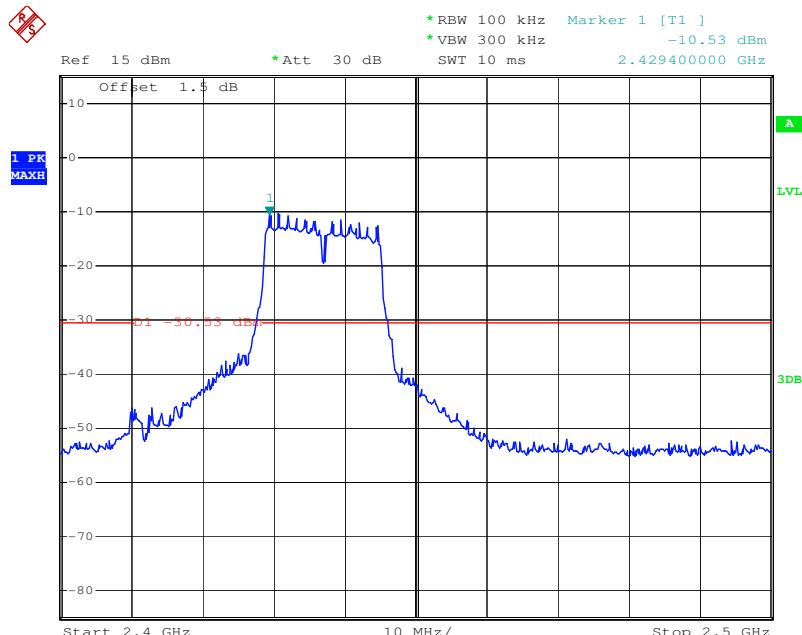


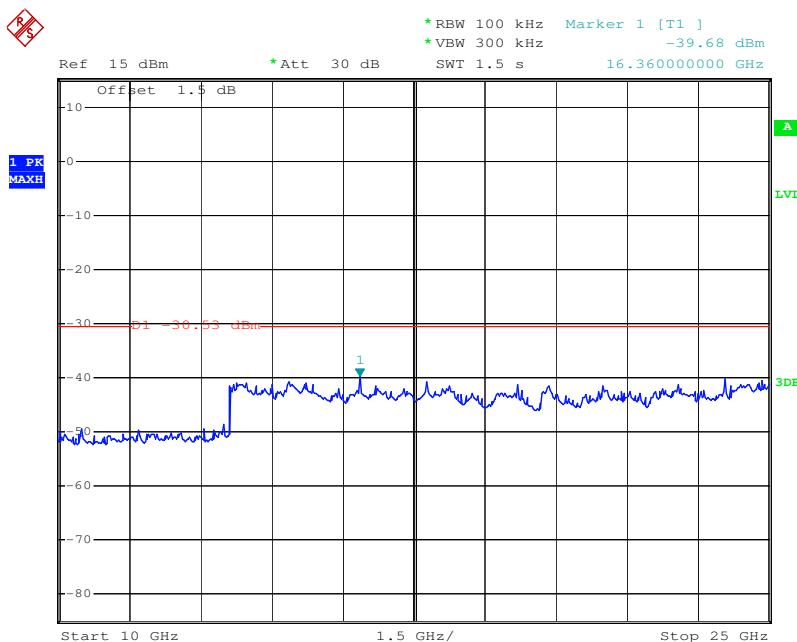
Test mode:	802.11g	Test channel:	Lowest
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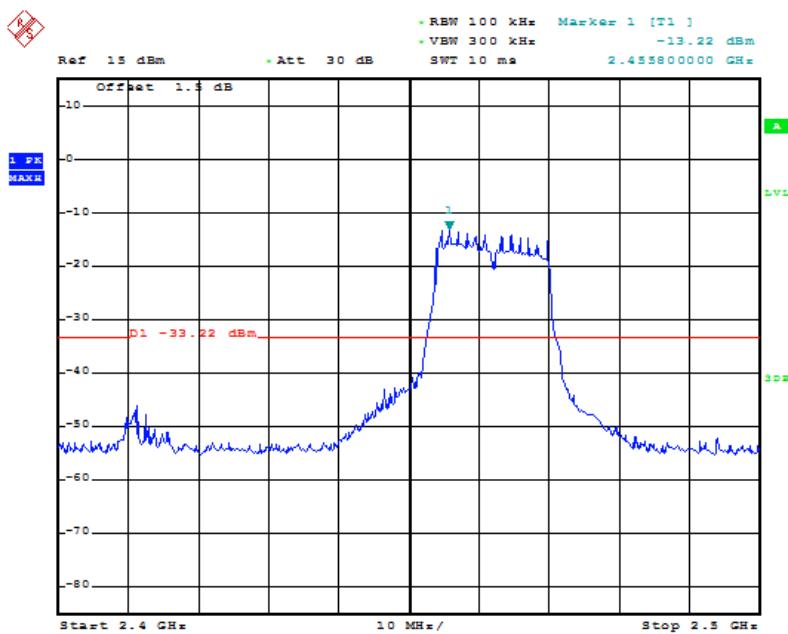


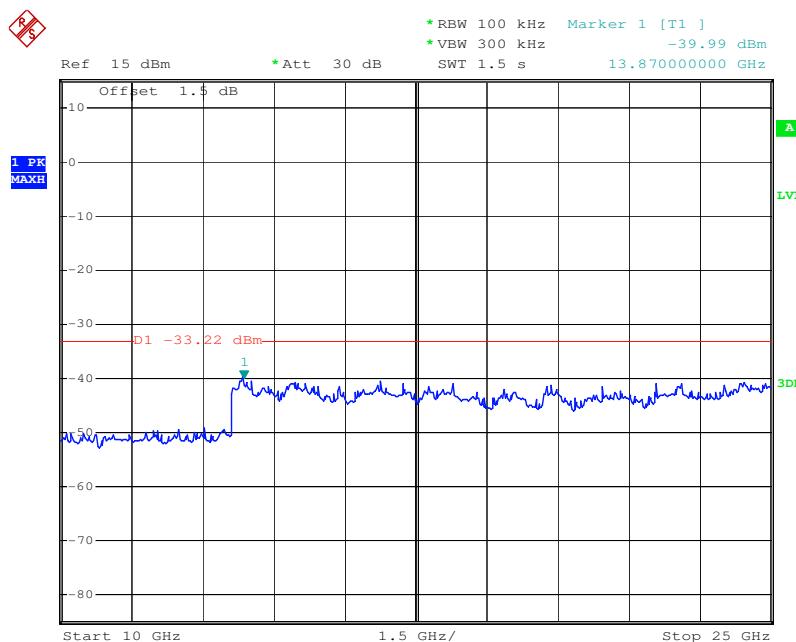
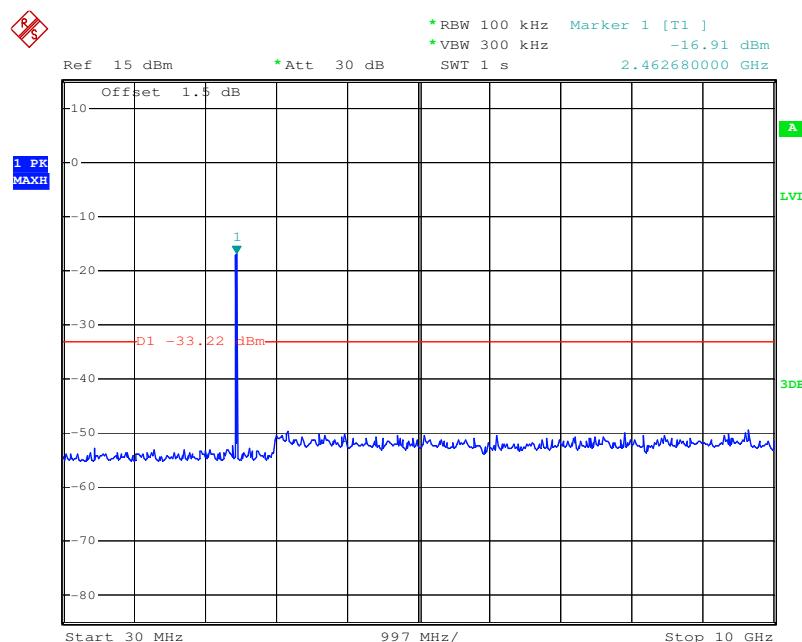
Test mode:	802.11g	Test channel:	Middle
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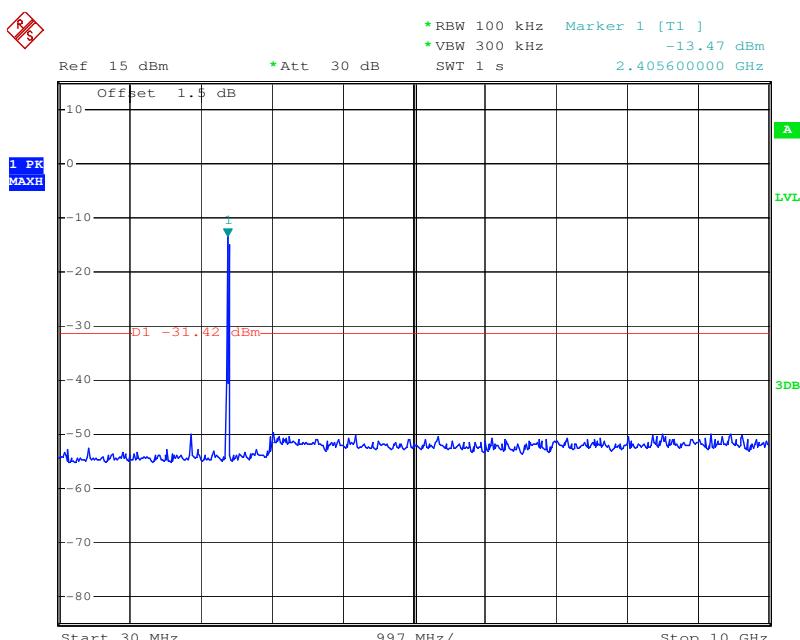
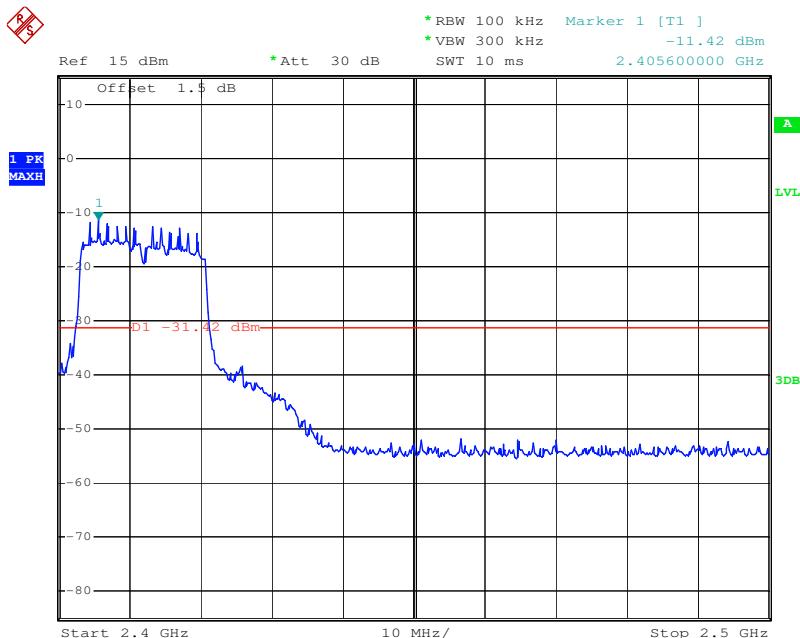


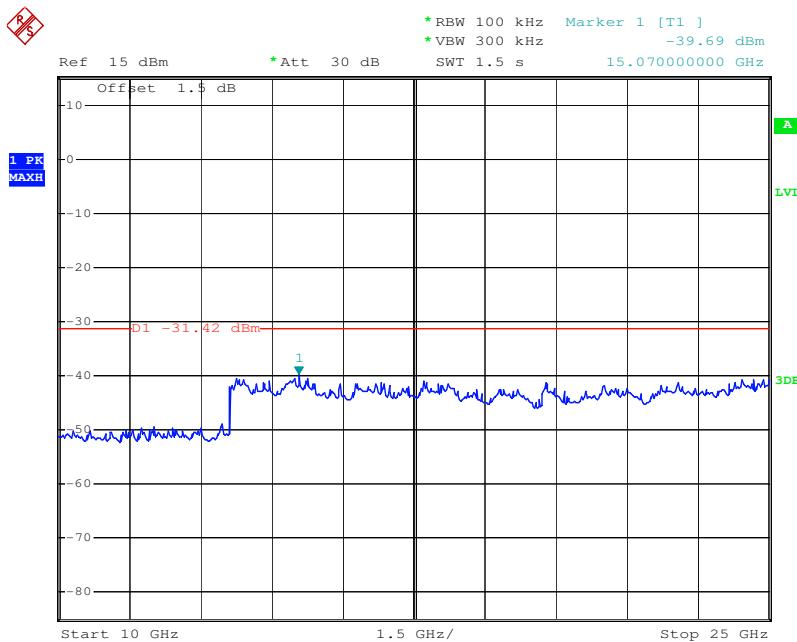
Test mode:	802.11g	Test channel:	Highest
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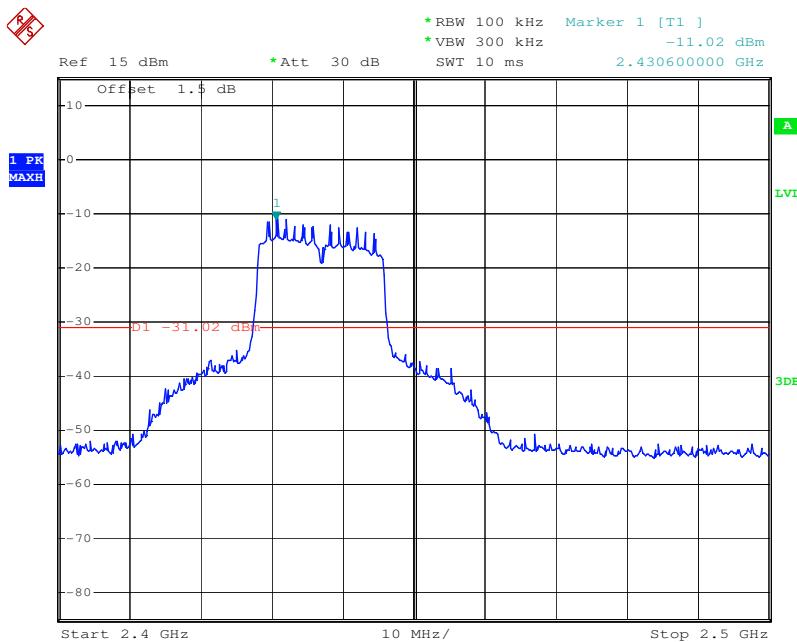


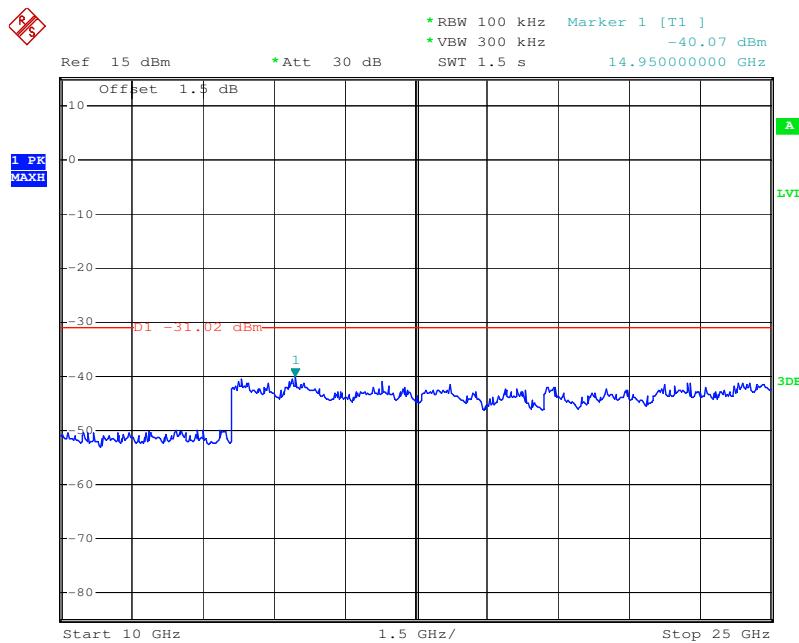
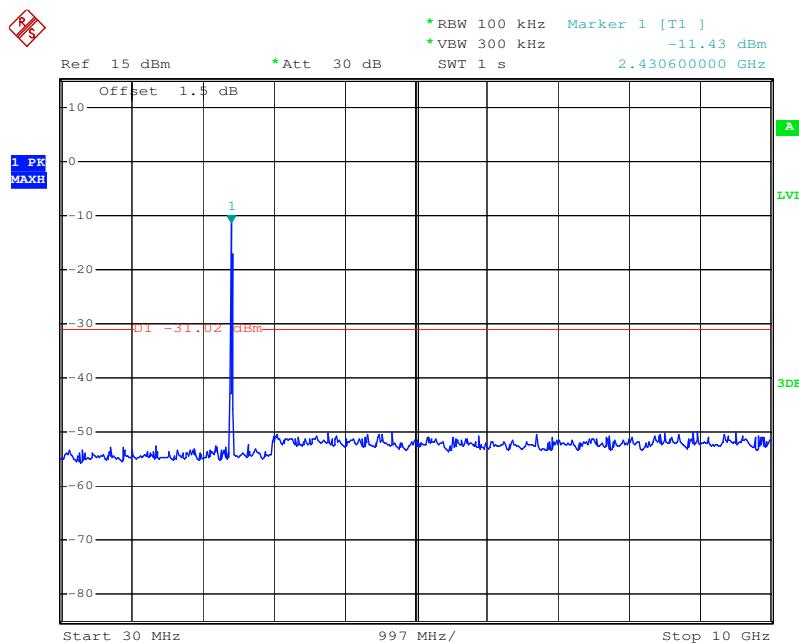
Test mode:	802.11n(HT20)	Test channel:	Lowest
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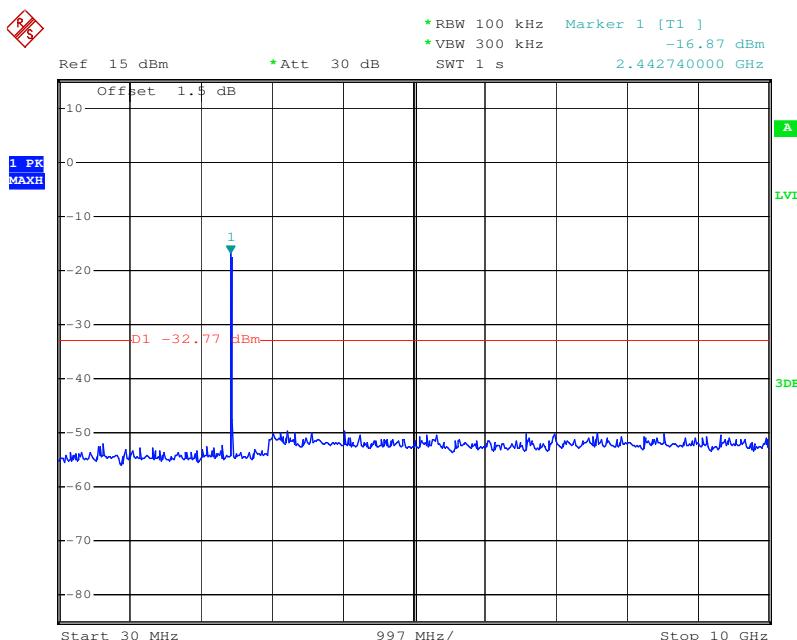
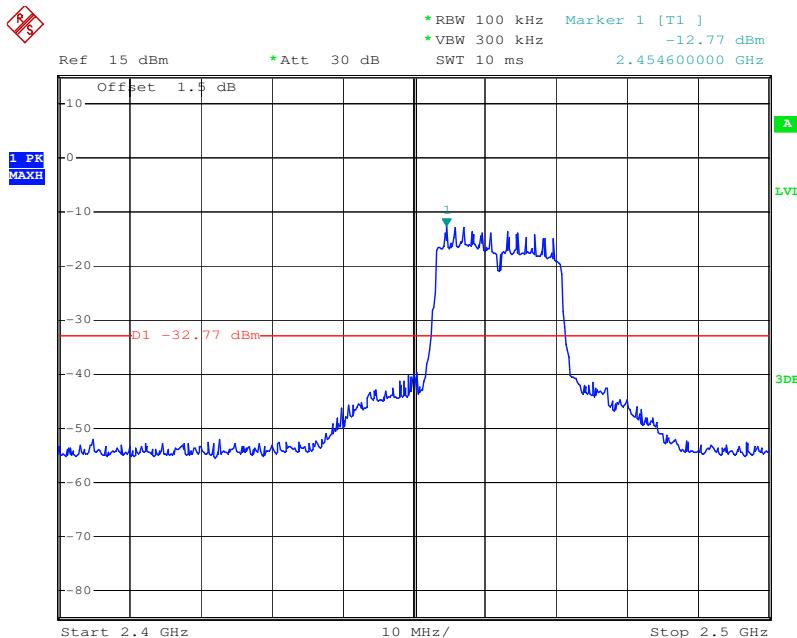


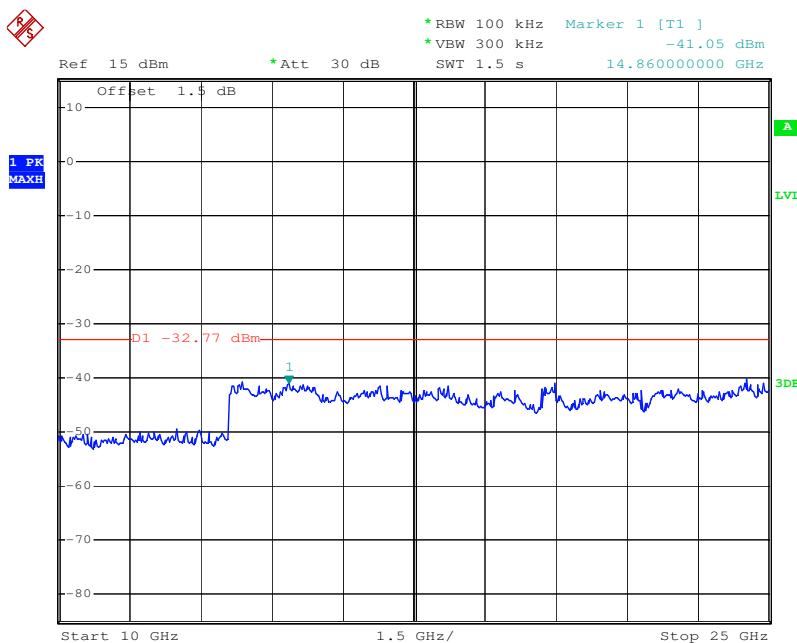
Test mode:	802.11n(HT20)	Test channel:	Middle
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Test mode:	802.11n(HT20)	Test channel:	Highest
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**Remark:**

Use 100kHz RBW to determine the relative limit in the band 2.4GHz to 2.5GHz, and Use 1MHz RBW to measure spurious emissions in the band 30MHz to 10GHz and 10GHz to 25GHz. The sweep points set to 30001.



## 6.8 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 :2013 Section 11.12				
Test Site:	Measurement Distance: 3m				
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:	
<b>Figure 1. Below 30MHz</b> <b>Figure 2. 30MHz to 1GHz</b> <b>Figure 3. Above 1 GHz</b>	
Test Procedure:	<ol style="list-style-type: none"> <li>For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation</li> <li>The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li> <li>The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li> <li>For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB</li> </ol>



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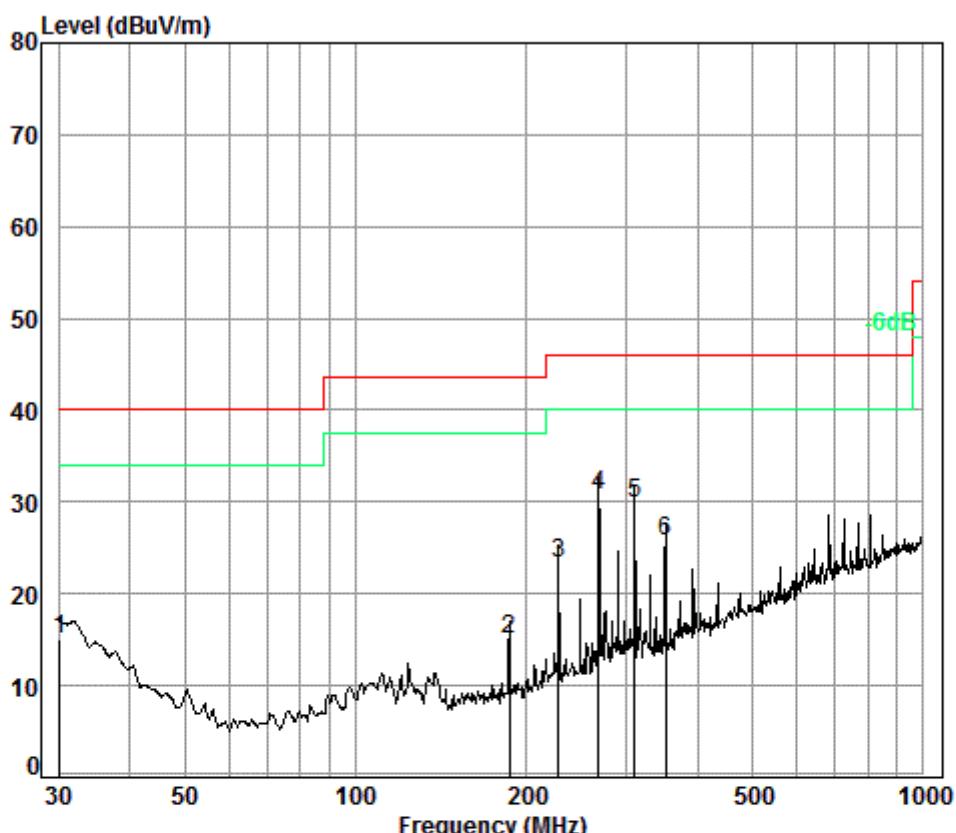
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	<p>margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p> <p>h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p>
Exploratory Test Mode:	<p>Transmitting with all kind of modulations, data rates.</p> <p>Transmitting mode</p> <p>Transmitting mode+ charge</p>
Final Test Mode:	<p>Pretest the EUT at Transmitting mode and Transmitting mode+ charge, found the Transmitting mode+ charge which it is worse case</p> <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).</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+ charge	Horizontal



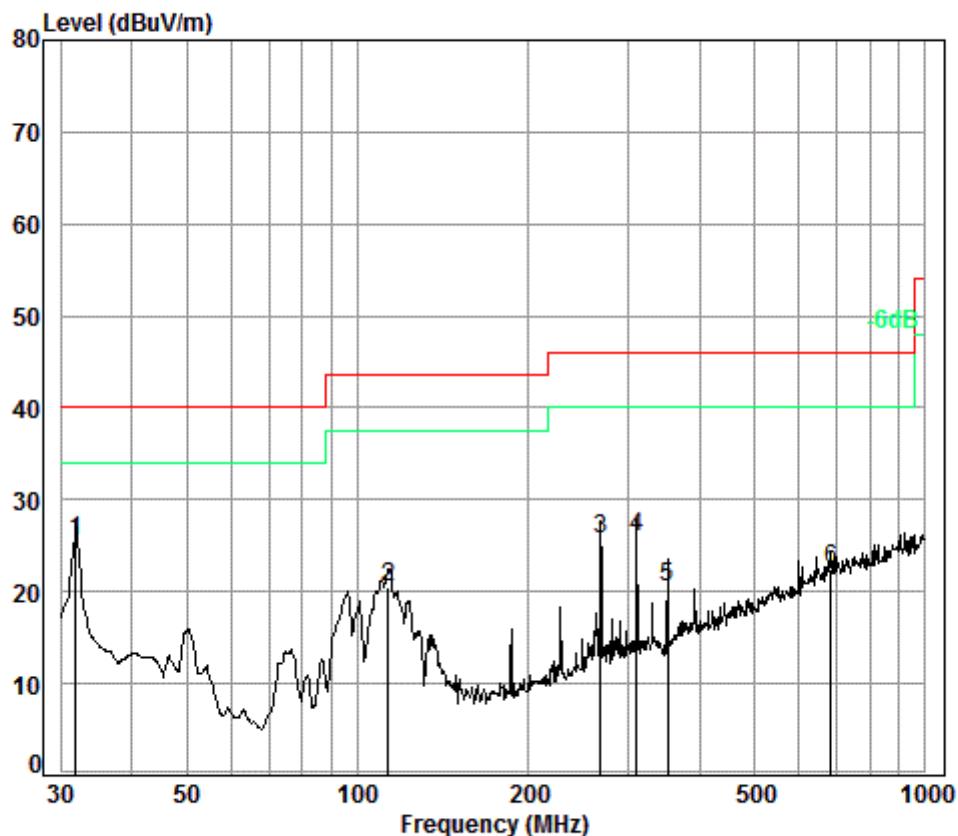
Condition: 3m Horizontal

Job No. : 9871CR

Test mode: TX + Charge

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level		Limit Line	Over Limit
				Level	Level		
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m
1	30.11	0.60	18.64	27.36	23.21	15.09	40.00 -24.91
2	186.44	1.38	10.03	26.75	30.32	14.98	43.50 -28.52
3	227.69	1.56	11.59	26.61	36.84	23.38	46.00 -22.62
4 pp	268.49	1.76	12.67	26.49	42.85	30.79	46.00 -15.21
5	310.00	1.93	14.26	26.48	40.05	29.76	46.00 -16.24
6	351.71	2.06	14.04	26.81	36.36	25.65	46.00 -20.35

Test mode:	Transmitting+ Charge	Vertical
------------	----------------------	----------



Condition: 3m Vertical

Job No. : 9871CR

Test mode: TX + Charge

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp	31.95	0.60	17.61	27.35	34.75	25.61	40.00	-14.39
2		113.32	1.24	8.37	27.11	38.05	20.55	43.50	-22.95
3		268.49	1.76	12.67	26.49	37.74	25.68	46.00	-20.32
4		310.00	1.93	14.26	26.48	36.15	25.86	46.00	-20.14
5		351.71	2.06	14.04	26.81	31.29	20.58	46.00	-25.42
6		682.35	2.87	21.46	27.43	25.55	22.45	46.00	-23.55



### 6.8.2 Transmitter emission above 1GHz

Test mode:	802.11b		Test channel:		Lowest		Remark:		Peak
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
3786.970	33.03	7.74	38.60	45.19	47.36	74.00	-26.64	Vertical	
4824.000	34.19	8.90	39.04	43.13	47.18	74.00	-26.82	Vertical	
5947.702	34.67	10.42	39.00	45.46	51.55	74.00	-22.45	Vertical	
7236.000	36.40	10.69	38.15	44.93	53.87	74.00	-20.13	Vertical	
9648.000	37.53	12.52	36.97	40.65	53.73	74.00	-20.27	Vertical	
11689.790	38.29	14.23	38.00	39.42	53.94	74.00	-20.06	Vertical	
3610.398	32.53	7.67	38.52	45.51	47.19	74.00	-26.81	Horizontal	
4824.000	34.19	8.90	39.04	41.71	45.76	74.00	-28.24	Horizontal	
5939.103	34.66	10.39	39.01	45.28	51.32	74.00	-22.68	Horizontal	
7236.000	36.40	10.69	38.15	42.62	51.56	74.00	-22.44	Horizontal	
9648.000	37.53	12.52	36.97	40.62	53.70	74.00	-20.30	Horizontal	
12120.390	38.67	14.46	38.42	39.22	53.93	74.00	-20.07	Horizontal	

Test mode:	802.11b		Test channel:		Middle		Remark:		Peak
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Polarization	
4012.615	33.60	7.83	38.71	43.89	46.61	74.00	-27.39	Vertical	
4874.000	34.28	8.97	39.05	42.80	47.00	74.00	-27.00	Vertical	
6078.201	34.76	10.46	38.95	45.43	51.70	74.00	-22.30	Vertical	
7311.000	36.37	10.72	38.07	41.42	50.44	74.00	-23.56	Vertical	
9748.000	37.55	12.58	36.92	39.33	52.54	74.00	-21.46	Vertical	
11505.210	38.11	14.02	37.82	39.39	53.70	74.00	-20.30	Vertical	
3610.398	32.53	7.67	38.52	45.51	47.19	74.00	-26.81	Horizontal	
4874.000	34.28	8.97	39.05	42.99	47.19	74.00	-26.81	Horizontal	
6104.642	34.79	10.42	38.93	45.48	51.76	74.00	-22.24	Horizontal	
7311.000	36.37	10.72	38.07	42.97	51.99	74.00	-22.01	Horizontal	
9748.000	37.55	12.58	36.92	39.25	52.46	74.00	-21.54	Horizontal	
12226.070	38.74	14.37	38.53	38.44	53.02	74.00	-20.98	Horizontal	



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Test mode:		802.11b		Test channel:	Highest		Remark:	Peak
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Polarization
3853.298	33.21	7.76	38.64	45.52	47.85	74.00	-26.15	Vertical
4924.000	34.37	9.04	39.07	43.40	47.74	74.00	-26.26	Vertical
6256.664	34.91	10.23	38.84	44.78	51.08	74.00	-22.92	Vertical
7386.000	36.34	10.75	38.00	42.40	51.49	74.00	-22.51	Vertical
9848.000	37.57	12.63	36.87	39.77	53.10	74.00	-20.90	Vertical
12033.020	38.62	14.53	38.33	39.15	53.97	74.00	-20.03	Vertical
3920.787	33.39	7.78	38.67	43.47	45.97	74.00	-28.03	Horizontal
4924.000	34.37	9.04	39.07	45.00	49.34	74.00	-24.66	Horizontal
6060.637	34.75	10.48	38.96	44.57	50.84	74.00	-23.16	Horizontal
7386.000	36.34	10.75	38.00	42.52	51.61	74.00	-22.39	Horizontal
9848.000	37.57	12.63	36.87	39.89	53.22	74.00	-20.78	Horizontal
12033.020	38.62	14.53	38.33	38.90	53.72	74.00	-20.28	Horizontal

Test mode:		802.11g		Test channel:	Lowest		Remark:	Peak
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Polarization
3853.298	33.21	7.76	38.64	45.02	47.35	74.00	-26.65	Vertical
4824.000	34.19	8.90	39.04	43.83	47.88	74.00	-26.12	Vertical
6069.413	34.76	10.47	38.96	45.57	51.84	74.00	-22.16	Vertical
7236.000	36.40	10.69	38.15	42.99	51.93	74.00	-22.07	Vertical
9648.000	37.53	12.52	36.97	38.99	52.07	74.00	-21.93	Vertical
12085.370	38.65	14.49	38.39	38.31	53.06	74.00	-20.94	Vertical
3847.726	33.19	7.76	38.63	44.81	47.13	74.00	-26.87	Horizontal
4824.000	34.19	8.90	39.04	43.49	47.54	74.00	-26.46	Horizontal
6034.386	34.73	10.52	38.98	45.32	51.59	74.00	-22.41	Horizontal
7236.000	36.40	10.69	38.15	43.83	52.77	74.00	-21.23	Horizontal
9648.000	37.53	12.52	36.97	39.49	52.57	74.00	-21.43	Horizontal
12155.510	38.69	14.43	38.46	38.42	53.08	74.00	-20.92	Horizontal



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Test mode:		802.11g		Test channel:		Middle		Remark:		Peak
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Polarization		
3853.298	33.21	7.76	38.64	44.94	47.27	74.00	-26.73	Vertical		
4874.000	34.28	8.97	39.05	43.81	48.01	74.00	-25.99	Vertical		
6043.124	34.74	10.50	38.97	44.70	50.97	74.00	-23.03	Vertical		
7311.000	36.37	10.72	38.07	41.56	50.58	74.00	-23.42	Vertical		
9748.000	37.55	12.58	36.92	39.83	53.04	74.00	-20.96	Vertical		
11372.800	38.00	13.88	37.68	39.43	53.63	74.00	-20.37	Vertical		
3842.163	33.18	7.76	38.63	45.74	48.05	74.00	-25.95	Horizontal		
4874.000	34.28	8.97	39.05	43.35	47.55	74.00	-26.45	Horizontal		
5956.314	34.67	10.44	39.00	45.47	51.58	74.00	-22.42	Horizontal		
7311.000	36.37	10.72	38.07	42.99	52.01	74.00	-21.99	Horizontal		
9748.000	37.55	12.58	36.92	40.14	53.35	74.00	-20.65	Horizontal		
12243.770	38.75	14.36	38.55	39.17	53.73	74.00	-20.27	Horizontal		

Test mode:		802.11g		Test channel:		Highest		Remark:		Peak
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Polarization		
3781.495	33.01	7.73	38.60	45.65	47.79	74.00	-26.21	Vertical		
4924.000	34.37	9.04	39.07	43.87	48.21	74.00	-25.79	Vertical		
5811.590	34.59	10.03	39.02	45.90	51.50	74.00	-22.50	Vertical		
7386.000	36.34	10.75	38.00	43.42	52.51	74.00	-21.49	Vertical		
9848.000	37.57	12.63	36.87	40.31	53.64	74.00	-20.36	Vertical		
12314.840	38.79	14.30	38.62	39.03	53.50	74.00	-20.50	Vertical		
3853.298	33.21	7.76	38.64	44.94	47.27	74.00	-26.73	Horizontal		
4924.000	34.37	9.04	39.07	44.19	48.53	74.00	-25.47	Horizontal		
6095.816	34.78	10.44	38.94	45.44	51.72	74.00	-22.28	Horizontal		
7386.000	36.34	10.75	38.00	42.14	51.23	74.00	-22.77	Horizontal		
9848.000	37.57	12.63	36.87	40.11	53.44	74.00	-20.56	Horizontal		
12386.320	38.83	14.24	38.70	39.46	53.83	74.00	-20.17	Horizontal		



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Test mode:		802.11n(HT20)		Test channel:		Lowest		Remark:		Peak
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Polarization		
3954.973	33.48	7.79	38.68	45.03	47.62	74.00	-26.38	Vertical		
4824.000	34.19	8.90	39.04	43.25	47.30	74.00	-26.70	Vertical		
6113.481	34.79	10.41	38.93	45.28	51.55	74.00	-22.45	Vertical		
7236.000	36.40	10.69	38.15	42.87	51.81	74.00	-22.19	Vertical		
9648.000	37.53	12.52	36.97	40.03	53.11	74.00	-20.89	Vertical		
12173.120	38.71	14.42	38.48	38.77	53.42	74.00	-20.58	Vertical		
3594.760	32.48	7.67	38.51	44.81	46.45	74.00	-27.55	Horizontal		
4824.000	34.19	8.90	39.04	42.09	46.14	74.00	-27.86	Horizontal		
6025.661	34.72	10.53	38.98	44.61	50.88	74.00	-23.12	Horizontal		
7236.000	36.40	10.69	38.15	42.54	51.48	74.00	-22.52	Horizontal		
9648.000	37.53	12.52	36.97	39.48	52.56	74.00	-21.44	Horizontal		
11963.580	38.56	14.52	38.27	38.72	53.53	74.00	-20.47	Horizontal		

Test mode:		802.11n(HT20)		Test channel:		Middle		Remark:		Peak
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Polarization		
3716.403	32.83	7.71	38.57	45.00	46.97	74.00	-27.03	Vertical		
4874.000	34.28	8.97	39.05	44.02	48.22	74.00	-25.78	Vertical		
6113.481	34.79	10.41	38.93	45.28	51.55	74.00	-22.45	Vertical		
7311.000	36.37	10.72	38.07	42.57	51.59	74.00	-22.41	Vertical		
9748.000	37.55	12.58	36.92	39.50	52.71	74.00	-21.29	Vertical		
12033.020	38.62	14.53	38.33	38.61	53.43	74.00	-20.57	Vertical		
3825.521	33.13	7.75	38.62	43.74	46.00	74.00	-28.00	Horizontal		
4874.000	34.28	8.97	39.05	42.63	46.83	74.00	-27.17	Horizontal		
5930.516	34.66	10.37	39.01	44.86	50.88	74.00	-23.12	Horizontal		
7311.000	36.37	10.72	38.07	41.77	50.79	74.00	-23.21	Horizontal		
9748.000	37.55	12.58	36.92	39.89	53.10	74.00	-20.90	Horizontal		
12102.870	38.66	14.47	38.41	38.72	53.44	74.00	-20.56	Horizontal		



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Test mode:		802.11n(HT20)		Test channel:	Highest		Remark:		Peak
Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Polarization	
3847.726	33.19	7.76	38.63	45.16	47.48	74.00	-26.52	Vertical	
4924.000	34.37	9.04	39.07	44.20	48.54	74.00	-25.46	Vertical	
6060.637	34.75	10.48	38.96	44.75	51.02	74.00	-22.98	Vertical	
7386.000	36.34	10.75	38.00	42.37	51.46	74.00	-22.54	Vertical	
9848.000	37.57	12.63	36.87	40.06	53.39	74.00	-20.61	Vertical	
12102.870	38.66	14.47	38.41	39.21	53.93	74.00	-20.07	Vertical	
3825.521	33.13	7.75	38.62	45.33	47.59	74.00	-26.41	Horizontal	
4824.000	34.19	8.90	39.04	43.99	48.04	74.00	-25.96	Horizontal	
6069.413	34.76	10.47	38.96	46.00	52.27	74.00	-21.73	Horizontal	
7386.000	36.34	10.75	38.00	42.53	51.62	74.00	-22.38	Horizontal	
9848.000	37.57	12.63	36.87	39.96	53.29	74.00	-20.71	Horizontal	
12085.370	38.65	14.49	38.39	39.08	53.83	74.00	-20.17	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.

## 6.9 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205					
Test Method:	ANSI C63.10: 2013 Section 11.12					
Test Site:	Measurement Distance: 3m					
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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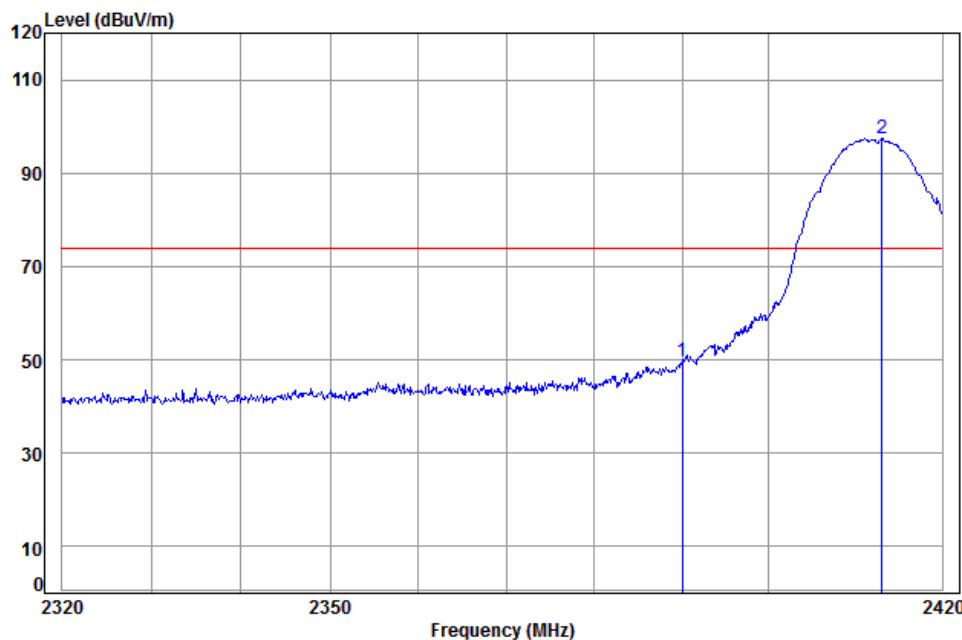
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Test Procedure:	<ol style="list-style-type: none"><li>a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li><li>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li><li>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li><li>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel</li><li>h. Test the EUT in the lowest channel , the Highest channel</li><li>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.</li><li>j. Repeat above procedures until all frequencies measured was complete.</li></ol>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Transmitting mode, Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Transmitting mode and Charge +Transmitting mode, found the Charge +Transmitting mode which it is worse case 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

**Test plot as follows:**

Worse case mode:	802.11b	Test channel:	Lowest	Remark:	Peak	Vertical
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Condition: 3m Vertical

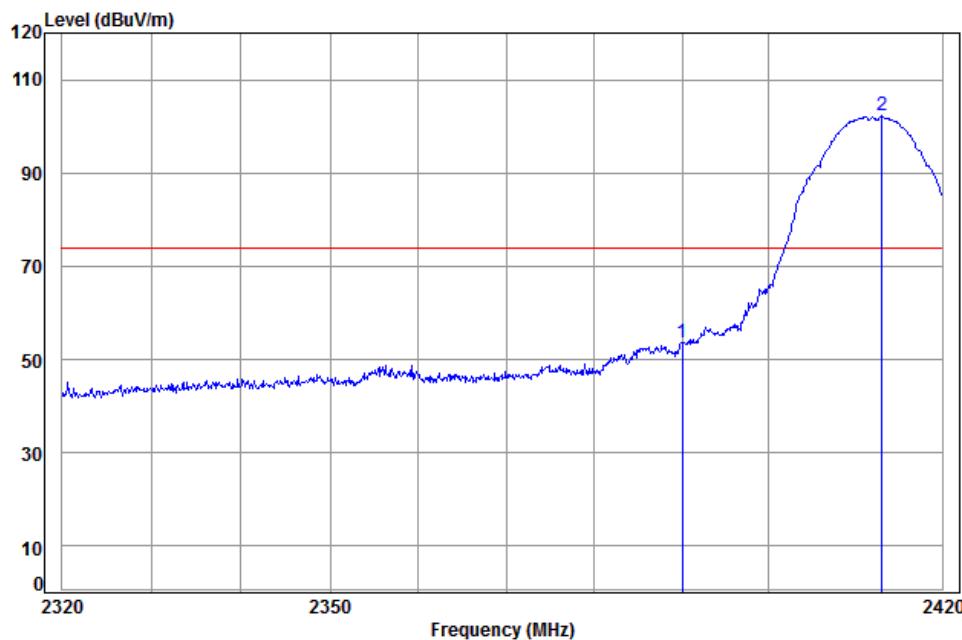
Job No: : 9871CR

Mode: : 2412 Band edge

: B

	Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	2390.000	5.34	29.08	38.14	53.26	49.54	74.00 -24.46
2 pp	2413.030	5.35	29.15	38.15	101.00	97.35	74.00 23.35

Worse case mode:	802.11b	Test channel:	Lowest	Remark:	Peak	Horizontal
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Condition: 3m Horizontal

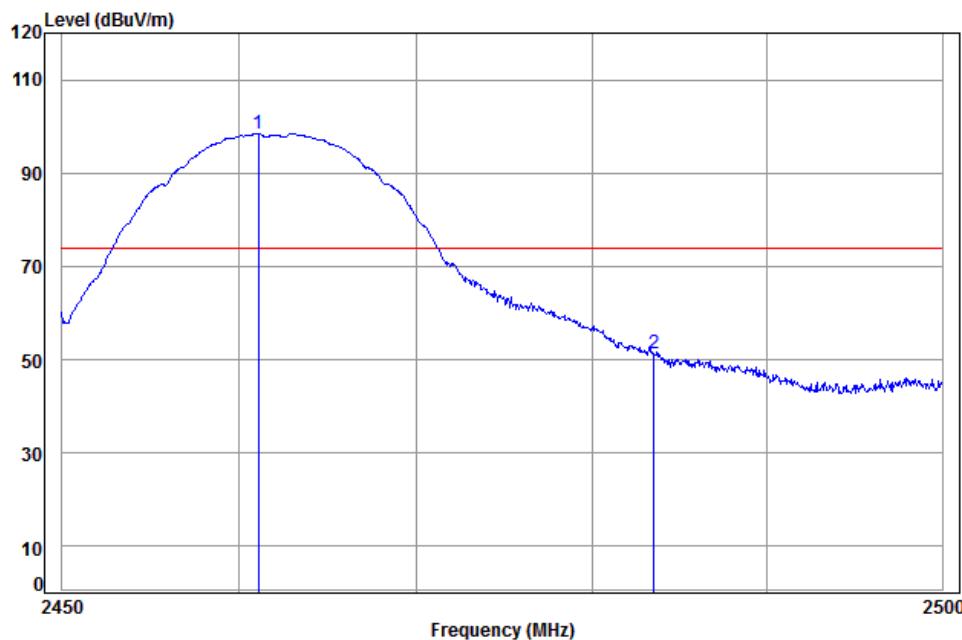
Job No: : 9871CR

Mode: : 2412 Bandedge

: B

	Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	5.34	29.08	38.14	57.31	53.59	74.00	-20.41
2 pp	2413.030	5.35	29.15	38.15	105.83	102.18	74.00	28.18

Worse case mode:	802.11b	Test channel:	Highest	Remark:	Peak	Vertical
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Condition: 3m Vertical

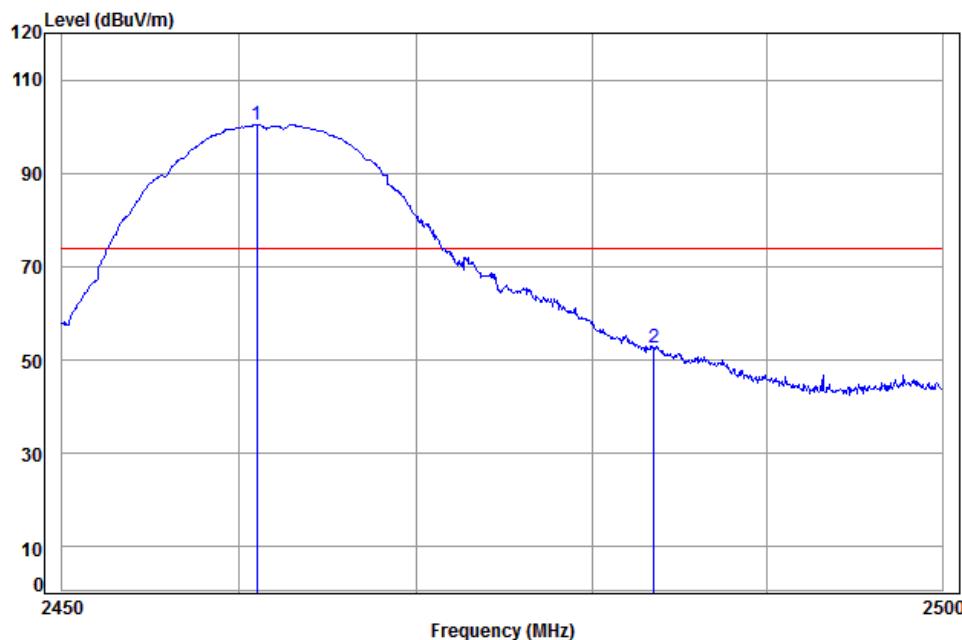
Job No: : 9871CR

Mode: : 2462 Band edge

: B

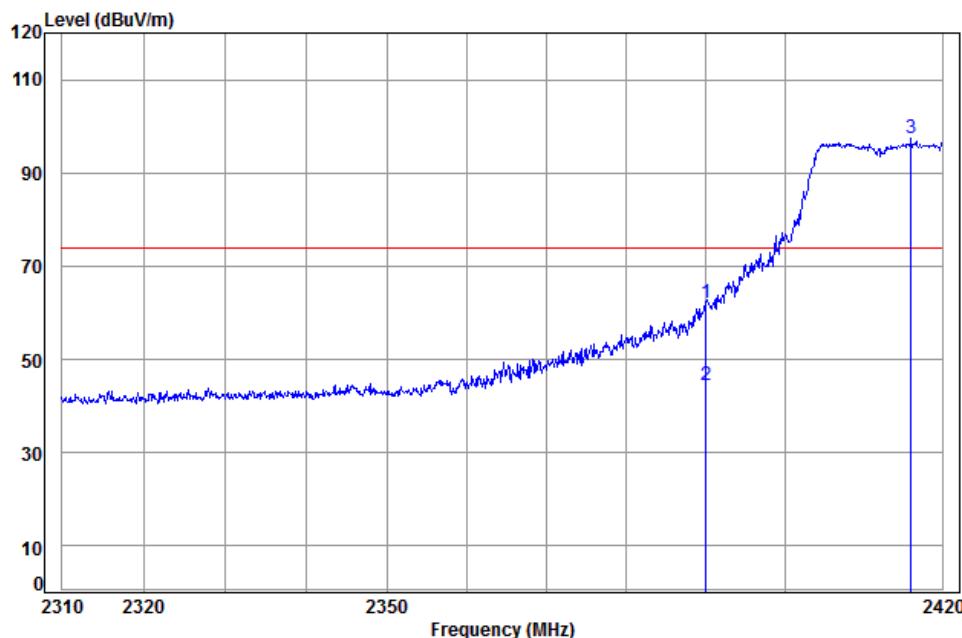
	Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1 pp	2461.063	5.39	29.29	38.15	102.00	98.53	74.00 24.53
2	2483.500	5.41	29.35	38.15	54.62	51.23	74.00 -22.77

Worse case mode:	802.11b	Test channel:	Highest	Remark:	Peak	Horizontal
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	Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Line Level	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2460.963	5.39	29.29	38.15	103.94	100.47	74.00	26.47
2	2483.500	5.41	29.35	38.15	56.00	52.61	74.00	-21.39

Worse case mode:	802.11g	Test channel:	Lowest	Remark:	Peak	Vertical
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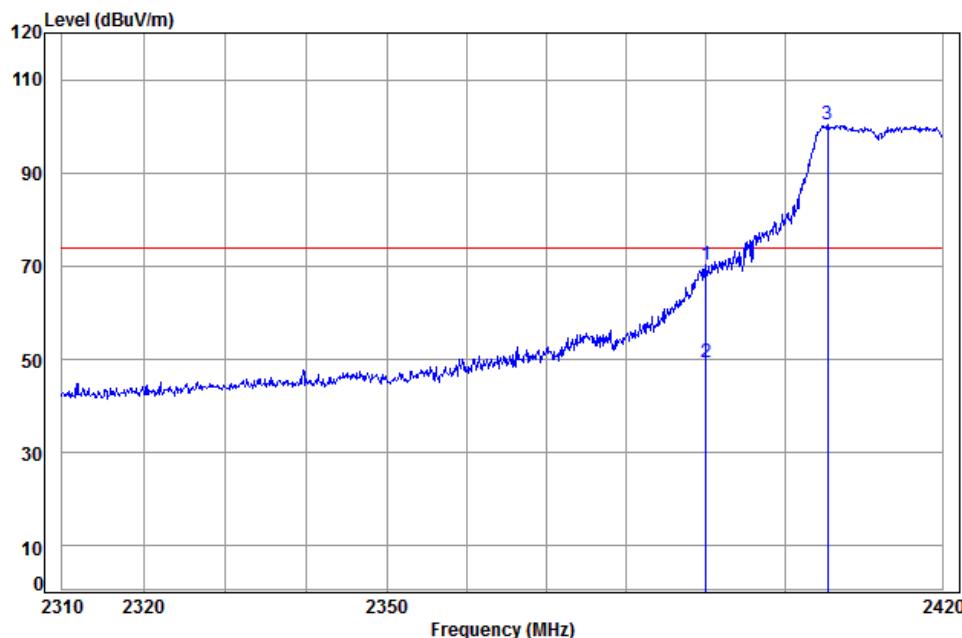
Condition: 3m Vertical

Job No: : 9871CR

Mode: : 2412 Band edge  
: G

	Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	5.34	29.08	38.14	65.93	62.21	74.00	-11.79
2 av	2390.000	5.34	29.08	38.14	48.32	44.60	54.00	-9.40 Average
3 pp	2416.063	5.36	29.16	38.15	101.02	97.39	74.00	23.39

Worse case mode:	802.11g	Test channel:	Lowest	Remark:	Peak	Horizontal
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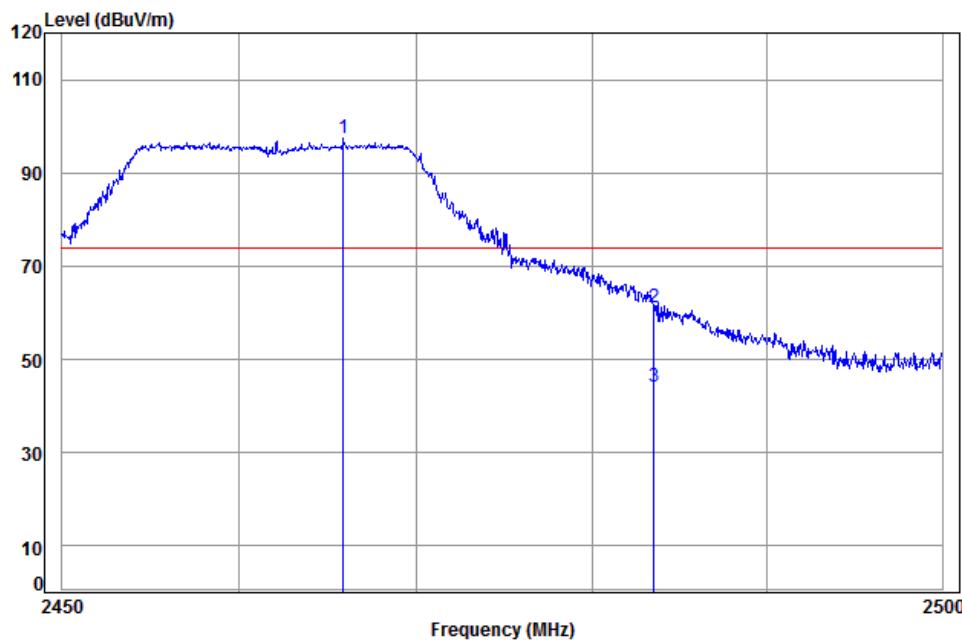
Condition: 3m Horizontal

Job No: : 9871CR

Mode: : 2412 Band edge  
: G

	Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	5.34	29.08	38.14	73.97	70.25	74.00	-3.75
2 av	2390.000	5.34	29.08	38.14	53.16	49.44	54.00	-4.56 Average
3 pp	2405.409	5.35	29.12	38.15	103.93	100.25	74.00	26.25

Worse case mode:	802.11g	Test channel:	Highest	Remark:	Peak	Vertical
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Condition: 3m Vertical

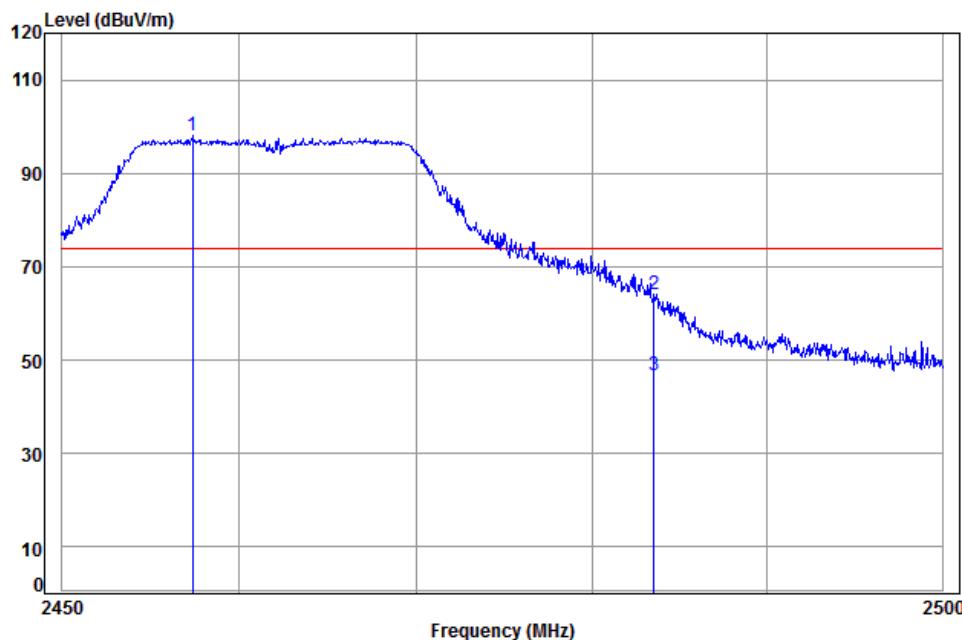
Job No: : 9871CR

Mode: : 2462 Band edge

: G

Freq	Cable	Ant	Preamp	Read	Limit	Over	Remark
	Freq	Loss	Factor	Level			
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp 2465.890	5.39	29.30	38.15	100.82	97.36	74.00	23.36
2 2483.500	5.41	29.35	38.15	64.45	61.06	74.00	-12.94
3 av 2483.500	5.41	29.35	38.15	47.59	44.20	54.00	-9.80
							Average

Worse case mode:	802.11g	Test channel:	Highest	Remark:	Peak	Horizontal
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Condition: 3m Horizontal

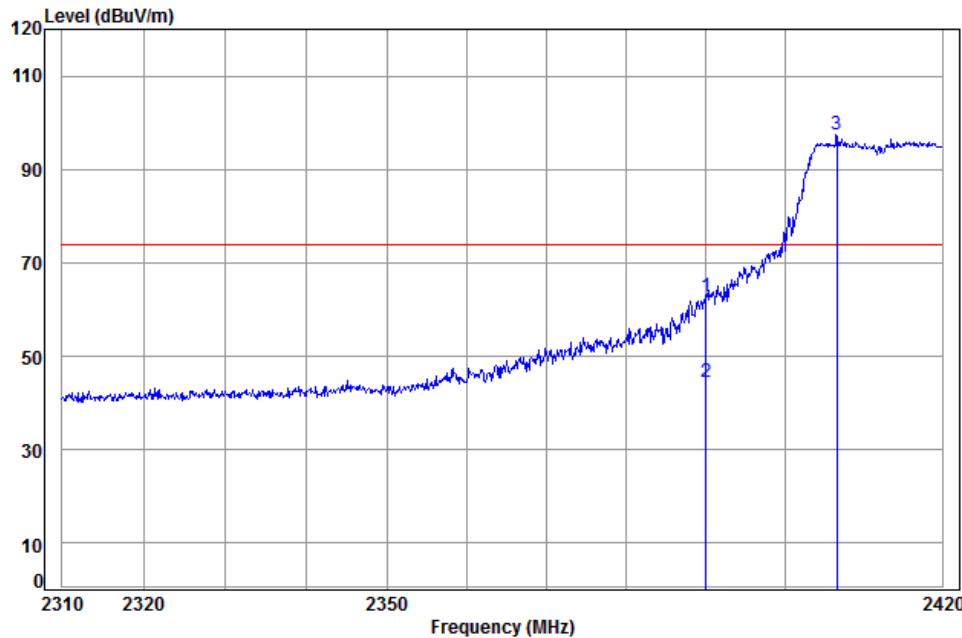
Job No: : 9871CR

Mode: : 2462 Band edge

: G

Freq	Cable	Ant	Preamp	Read	Limit	Over	Remark
	Freq	Loss	Factor	Level			
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp 2457.336	5.39	29.28	38.15	101.56	98.08	74.00	24.08
2 2483.500	5.41	29.35	38.15	67.45	64.06	74.00	-9.94
3 av 2483.500	5.41	29.35	38.15	50.25	46.86	54.00	-7.14 Average

Worse case mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Peak	Vertical
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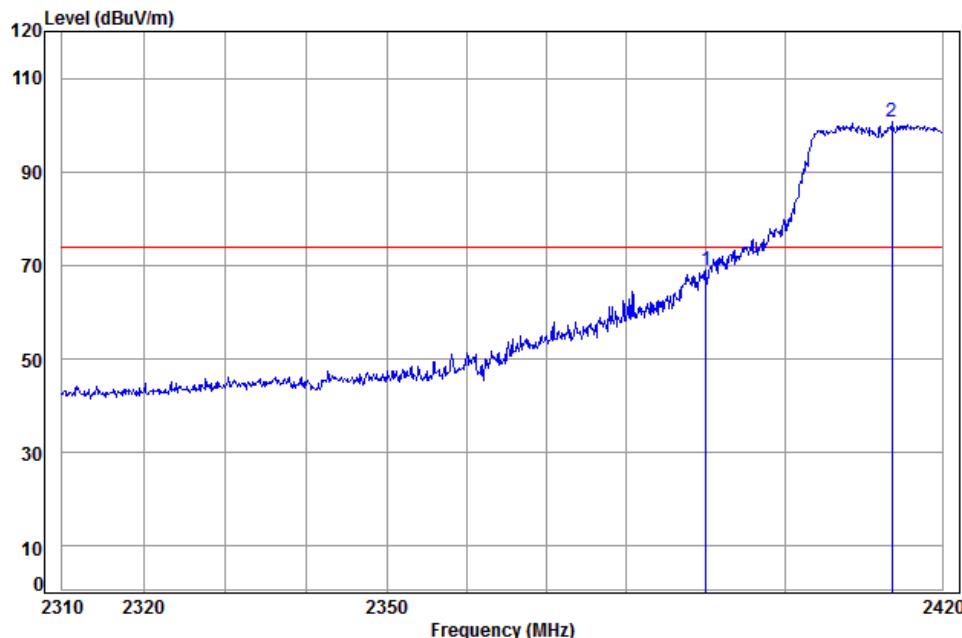


Condition: 3m Vertical

Job No: : 9871CR  
Mode: : 2412 Band edge  
: N20

Freq	Cable	Ant	Preamp	Read	Limit Line	Over Limit	Remark
	Loss	Factor	Factor	Level			
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 2390.000	5.34	29.08	38.14	66.40	62.68	74.00	-11.32
2 av 2390.000	5.34	29.08	38.14	48.28	44.56	54.00	-9.44 Average
3 pp 2406.528	5.35	29.13	38.15	101.07	97.40	74.00	23.40

Worse case mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Peak	Horizontal
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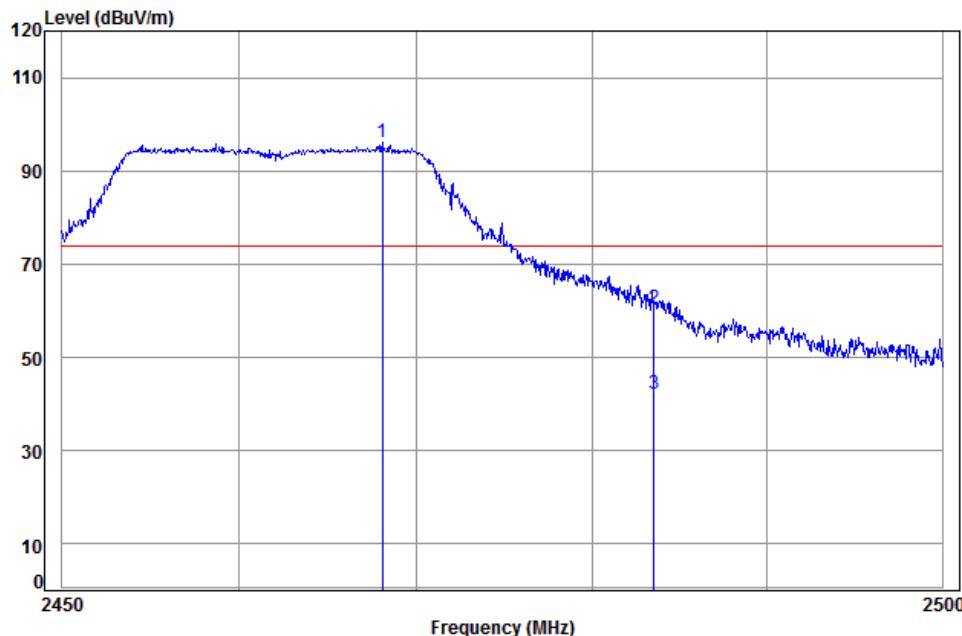


Condition: 3m Horizontal

Job No: : 9871CR  
Mode: : 2412 Band edge  
: N20

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level		Limit Line	Over Limit	Remark
				Level	Level			
1 2390.016	5.34	29.08	38.14	72.69	68.97	74.00	-5.03	
2 pp 2413.592	5.36	29.15	38.15	104.41	100.77	74.00	26.77	

Worse case mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Peak	Vertical
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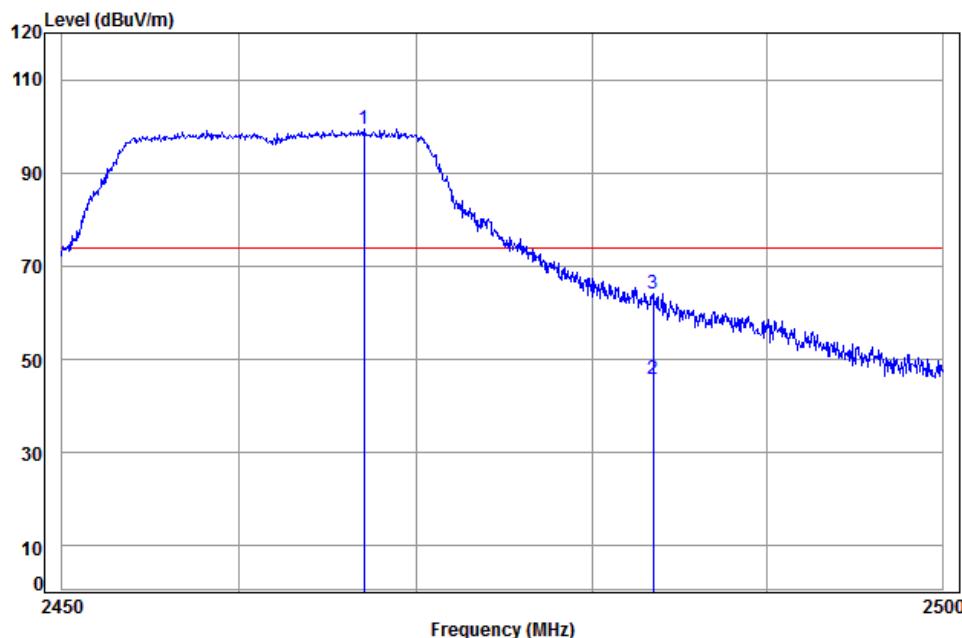
Condition: 3m Vertical

Job No: : 9871CR

Mode: : 2462 Band edge  
: N20

Freq	Cable Loss	Ant Factor	Preamp Factor	Read	Limit Line	Over Limit	Remark
				Level			
1 pp 2468.083	5.40	29.31	38.15	99.64	96.20	74.00	22.20
2 2483.500	5.41	29.35	38.15	63.76	60.37	74.00	-13.63
3 av 2483.500	5.41	29.35	38.15	45.59	42.20	54.00	-11.80
							Average

Worse case mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Peak	Horizontal
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Condition: 3m Horizontal

Job No: : 9871CR  
Mode: : 2462 Band edge  
: N20

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over
				dB	dBuV	dBuV/m	dB
1 pp 2467.036	5.40	29.30	38.15	103.01	99.56	74.00	25.56
2 av 2483.489	5.41	29.35	38.15	49.15	45.76	54.00	-8.24 Average
3 pk 2483.489	5.41	29.35	38.15	67.37	63.98	74.00	-10.02 Peak

**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

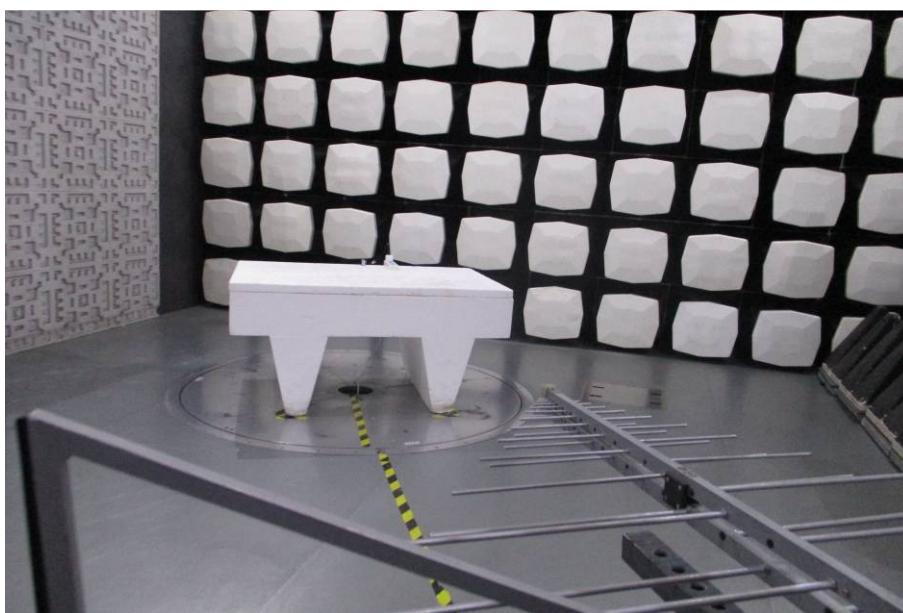
## 7 Photographs - EUT Test Setup

Test model No.:CX

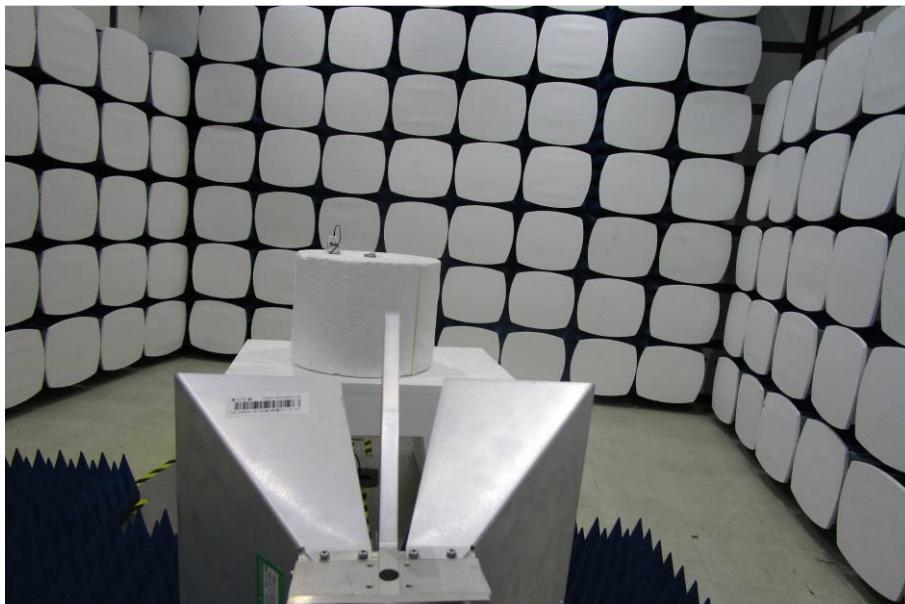
### 7.1 Conducted Emission



### 7.2 Radiated Emission



### 7.3 Radiated Spurious Emission



## 8 Photographs - EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1611009871CR.