



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

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Report No.: SZEM150500298102  
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# FCC REPORT

**Application No:** SZEM1505002981CR  
**Applicant:** ZMODO Technology Shenzhen Corp. Ltd.  
**Manufacturer/Factory:** ZMODO Technology Shenzhen Corp. Ltd.  
**Product Name:** Smart doorbell  
**Model No.(EUT):** ZH-CJAED  
**Add Model No.:** ZH-CJXXX (The X is variables, X=A~Z)  
**Trade mark:** ZMODO  
**FCC ID:** ZK8-CJAED  
**Standards:** 47 CFR Part 15, Subpart C (2014)  
**Date of Receipt:** 2015-06-08  
**Date of Test:** 2015-06-16 to 2015-06-25  
**Date of Issue:** 2015-07-01

<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		2015-07-01		Original

<b>Authorized for issue by:</b>				
<b>Tested By</b>		<i>Eric Fu</i>		2015-06-25
		(Eric Fu) /Project Engineer		<b>Date</b>
<b>Prepared By</b>		<i>Jade Chen</i>		2015-07-01
		(Jade Chen) /Clerk		<b>Date</b>
<b>Checked By</b>		<i>Emen-Li</i>		2015-07-01
		(Emen Li) /Reviewer		<b>Date</b>



### 3 Test Summary

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

Remark:

Model No.: ZH-CJAED, ZH-CJXXX (The X is variables, X=A~Z)

Only the Model ZH-CJAED was tested, since the electrical circuit design, layout, components used and internal wiring were identical for all above models. With difference being the color of appearance and size.



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## 5 General Information

### 5.1 Client Information

Applicant:	ZMODO Technology Shenzhen Corp. Ltd.
Address of Applicant:	25/F, Office Tower A, Financial Technology Building, 11 Keyuan Road, Nanshan District, Shenzhen, China
Manufacturer:	ZMODO Technology Shenzhen Corp. Ltd.
Address of Manufacturer:	25/F, Office Tower A, Financial Technology Building, 11 Keyuan Road, Nanshan District, Shenzhen, China
Factory:	ZMODO Technology Shenzhen Corp. Ltd.
Address of Factory:	25/F, Office Tower A, Financial Technology Building, 11 Keyuan Road, Nanshan District, Shenzhen, China

### 5.2 General Description of EUT

Product Name:	Smart doorbell
Model No.:	ZH-CJAED
Trade Mark:	ZMODO
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM, 16QAM, QPSK,BPSK)
Sample Type:	Fixed production
Test Power Grade:	802.11b: 19 dBm; 802.11g: 18 dBm; 802.11n (20MHz): 17 dBm; 802.11n(40MHz): 16 dBm; (manufacturer declare )
Test Software of EUT:	art_v08_b136ALL (manufacturer declare )
Antenna Type and Gain:	Type: Dedicated Gain: 3.1dBi
Power Supply:	AC 10-36V Battery: Li-ion Rechargeable Battery 7.4V 300mAh



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

Operation Frequency each of channel(802.11n HT40)					
Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2422MHz	4	2437MHz	7	2452MHz
2	2427MHz	5	2442MHz		
3	2432MHz	6	2447MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

For 802.11b/g/n (HT20):

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

For 802.11n (HT40):

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

### 5.3 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1015 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

### 5.4 Description of Support Units

The EUT has been tested independent unit.

### 5.5 Test Location

All tests were performed at:

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

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

No tests were sub-contracted.





## **5.6 Test Facility**

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

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

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

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

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

- **Industry Canada (IC)**

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

## **5.7 Deviation from Standards**

None.

## **5.8 Abnormalities from Standard Conditions**

None.

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

None.



## 5.10 Equipment List

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Due date (yyyy-mm-dd)
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2016-05-13
2	LISN	Rohde & Schwarz	ENV216	SEL0152	2015-10-24
3	LISN	ETS-LINDGREN	3816/2	SEL0021	2016-05-13
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	SEL0162	2015-08-30
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	SEL0163	2015-08-30
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	SEL0164	2015-08-30
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2016-05-13
8	Coaxial Cable	SGS	N/A	SEL0025	2016-05-13
9	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24
10	Humidity/ Temperature Indicator	Shanghai Qixiang	ZJ1-2B	SEL0103	2015-10-24
11	Barometer	Chang Chun	DYM3	SEL0088	2016-05-13
12	Variable Transformer	Shanghai Meitian electrical appliance Co., LTE	TDGC2J-5	SEA4710D	2015-10-24



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<b>RE in Chamber</b>					
<b>Item</b>	<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Inventory No.</b>	<b>Cal.Due date (yyyy-mm-dd)</b>
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2016-05-13
2	EMI Test Receiver	Agilent Technologies	N9038A	SEL0312	2015-09-16
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2015-10-24
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2015-10-24
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2015-10-24
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2016-05-13
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2015-10-24
9	Coaxial cable	SGS	N/A	SEL0027	2016-05-13
10	Coaxial cable	SGS	N/A	SEL0189	2016-05-13
11	Coaxial cable	SGS	N/A	SEL0121	2016-05-13
12	Coaxial cable	SGS	N/A	SEL0178	2016-05-13
13	Band filter	Amindeon	82346	SEL0094	2016-05-13
14	Barometer	Chang Chun	DYM3	SEL0088	2016-05-13
15	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24
16	Humidity/ Temperature Indicator	Shanghai Qixiang	ZJ1-2B	SEL0103	2015-10-24
17	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2016-05-13
18	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2015-10-24
19	Loop Antenna	Beijing Daze	ZN30401	SEL0203	2016-05-13
20	Variable Transformer	Shanghai Meitian electrical appliance Co., LTE	TDGC2J-5	SEA4710D	2015-10-24

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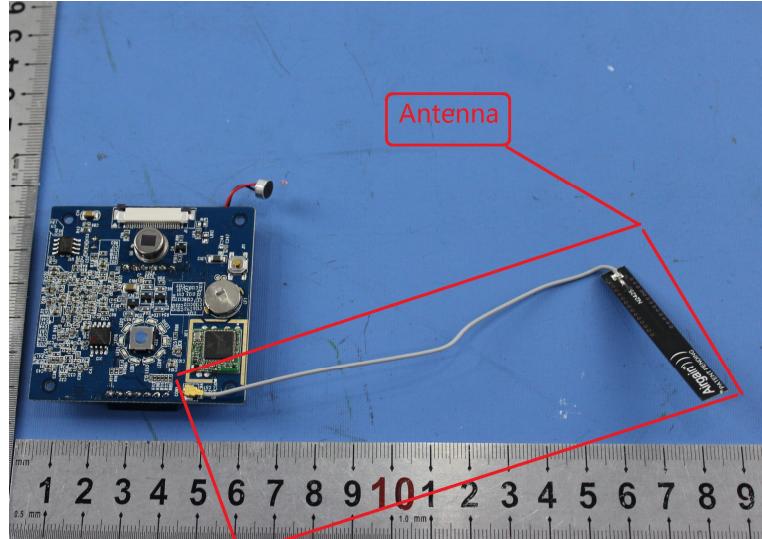
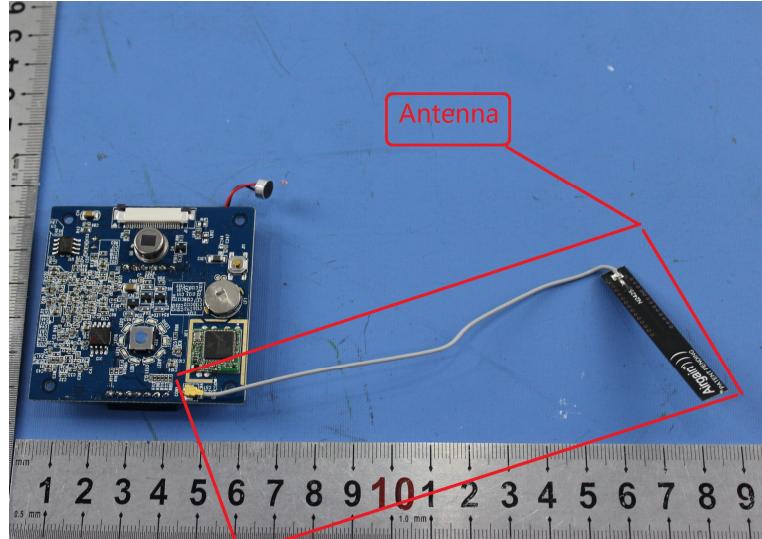
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<b>RF connected test</b>					
<b>Item</b>	<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Inventory No.</b>	<b>Cal.Due date (yyyy-mm-dd)</b>
1	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2015-10-24
2	Humidity/ Temperature Indicator	HYGRO	ZJ1-2B	SEL0033	2015-10-24
3	Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2015-10-24
4	Coaxial cable	SGS	N/A	SEL0178	2016-05-13
5	Coaxial cable	SGS	N/A	SEL0179	2016-05-13
6	Barometer	ChangChun	DYM3	SEL0088	2016-05-13
7	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2016-04-25
8	Band filter	amideon	82346	SEL0094	2016-05-13
9	POWER METER	R & S	NRVS	SEL0144	2015-10-24
10	Attenuator	Beijin feihang taida	TST-2-6dB	SEL0205	2016-04-25
11	Power Divider(splitter)	Agilent Technologies	11636B	SEL0130	2015-10-24
12	Variable Transformer	Shanghai Meitian electrical appliance Co., LTE	TDGC2J-5	SEA4710D	2015-10-24

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

## 6 Test results and Measurement Data

### 6.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203 /247(c)
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.	15.203 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.
<b>EUT Antenna:</b>    The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 3.1dBi.	<b>EUT Antenna:</b>    The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 3.1dBi.



## 6.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2009		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)		Limit (dBuV)
			Quasi-peak
	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 the variable transformer, then to the LISN to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a <math>50\Omega/50\mu\text{H} + 5\Omega</math> linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</li><li>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,</li><li>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</li><li>5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.</li></ol>		

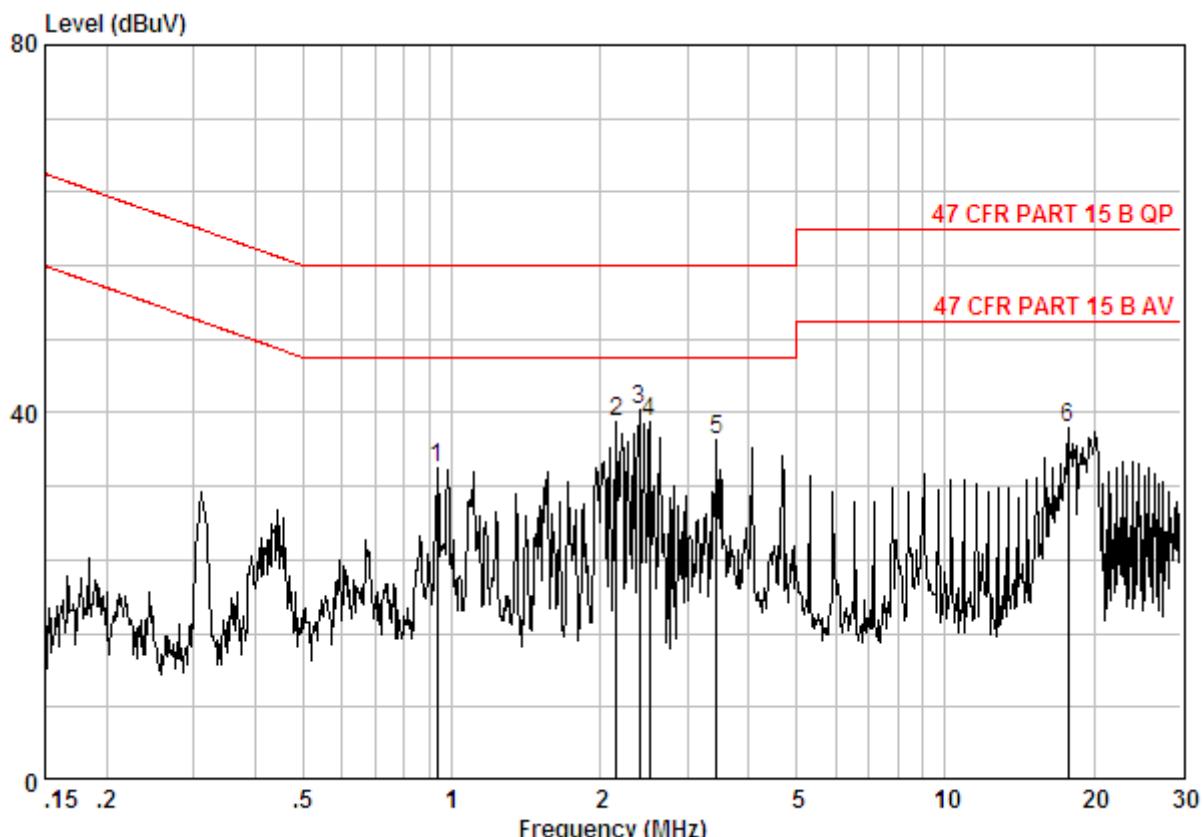
Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case. Only the worst case is recorded in the report.
Instruments Used:	Refer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

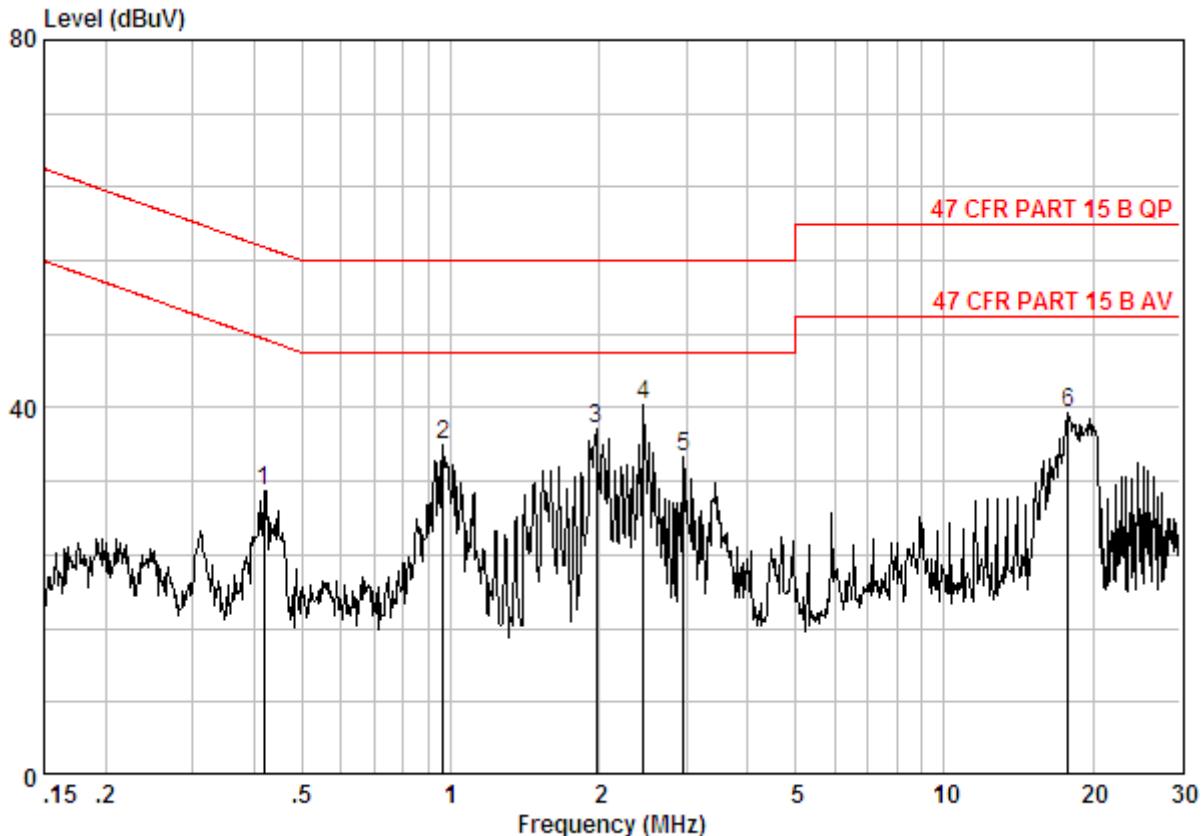
Live Line:



Site : Shielding Room  
 Condition : 47 CFR PART 15 B AV CE LINE  
 Job No. : 2981CR  
 Test mode : TX

	Freq	Cable	LISN	Read	Limit	Over	Remark
		Loss	Factor	Level			
	MHz	dB	dB	dBuV	dBuV	dBuV	dB
1	0.93314	0.02	9.89	24.02	33.92	46.00	-12.08 Peak
2	2.155	0.02	9.96	29.06	39.04	46.00	-6.96 Peak
3	2.396	0.02	9.98	30.23	40.24	46.00	-5.76 Peak
4	2.513	0.02	9.99	29.09	39.10	46.00	-6.90 Peak
5	3.436	0.02	10.05	27.02	37.08	46.00	-8.92 Peak
6	17.755	0.02	10.24	28.17	38.43	50.00	-11.57 Peak

Neutral Line:



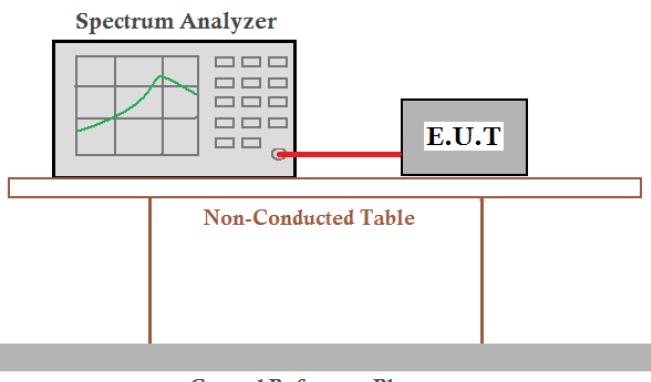
Site : Shielding Room  
Condition : 47 CFR PART 15 B AV CE NEUTRAL  
Job No. : 2981CR  
Test mode : TX

	Freq	Cable	LISN	Read	Limit	Over	Remark
		Loss	Factor	Level			
	MHz	dB	dB	dBuV	dBuV	dBuV	dB
1	0.41927	0.01	9.87	21.16	31.05	47.46	-16.41 Peak
2	0.96328	0.02	10.01	25.89	35.93	46.00	-10.07 Peak
3	1.970	0.02	10.12	27.65	37.79	46.00	-8.21 Peak
4 @	2.461	0.02	10.12	30.17	40.31	46.00	-5.69 Peak
5	2.962	0.02	10.12	24.42	34.57	46.00	-11.43 Peak
6	17.849	0.02	10.32	29.08	39.42	50.00	-10.58 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 2009
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) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	30dBm
Test Results:	Pass





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Pre-scan under all rate at lowest channel 1								
Mode	802.11b							
Data Rate	1Mbps	2Mbps	5.5Mbps	11Mbps				
Power (dBm)	18.31	18.05	17.78	16.56				
Mode	802.11g							
Data Rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Power (dBm)	20.91	20.79	20.66	20.54	20.51	20.44	20.32	19.02
Mode	802.11n(HT20)							
Data Rate	6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
Power (dBm)	16.38	16.19	16.02	15.93	15.80	15.66	15.45	14.34
Mode	802.11n(HT40)							
Data Rate	13.5Mbps	27Mbps	40.5Mbps	54Mbps	81Mbps	108Mbps	121.5Mbps	135Mbps
Power (dBm)	15.25	15.02	14.87	14.79	14.55	14.23	14.11	13.01
Through Pre-scan, 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40).								



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**Measurement Data**

802.11b mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	18.31	30.00	Pass
Middle	19.00	30.00	Pass
Highest	19.55	30.00	Pass

802.11g mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	20.91	30.00	Pass
Middle	20.45	30.00	Pass
Highest	19.56	30.00	Pass

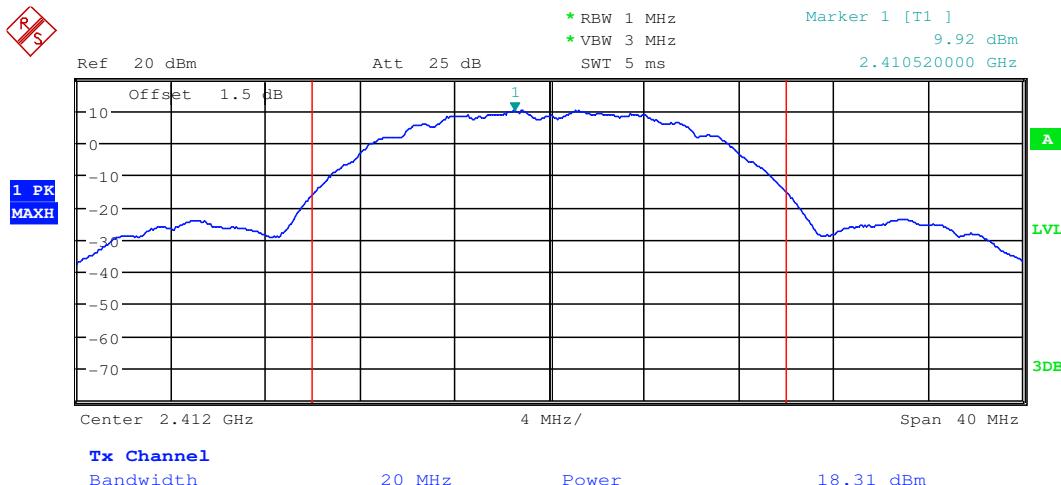
802.11n(HT20)mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	16.38	30.00	Pass
Middle	15.76	30.00	Pass
Highest	14.76	30.00	Pass

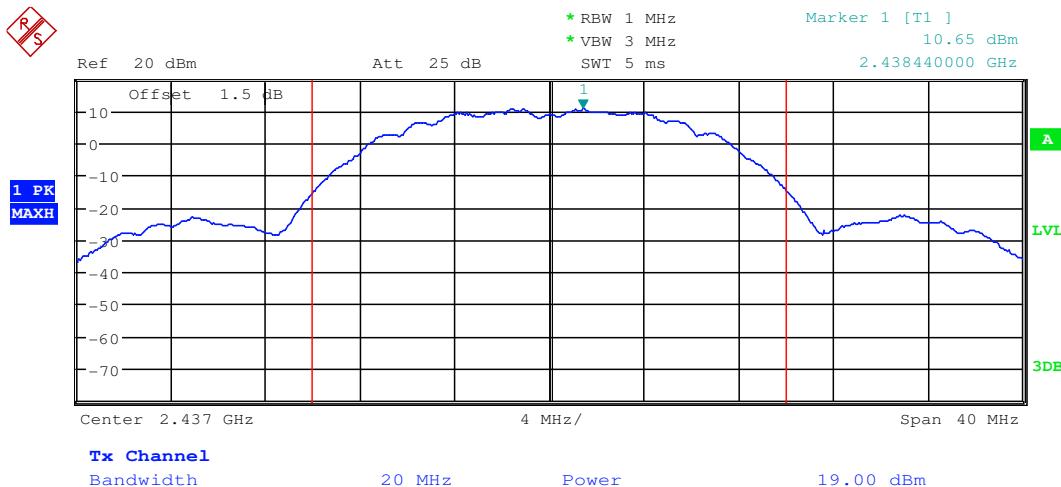
802.11n(HT40)mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	15.25	30.00	Pass
Middle	14.93	30.00	Pass
Highest	14.44	30.00	Pass

**Test plot as follows:**

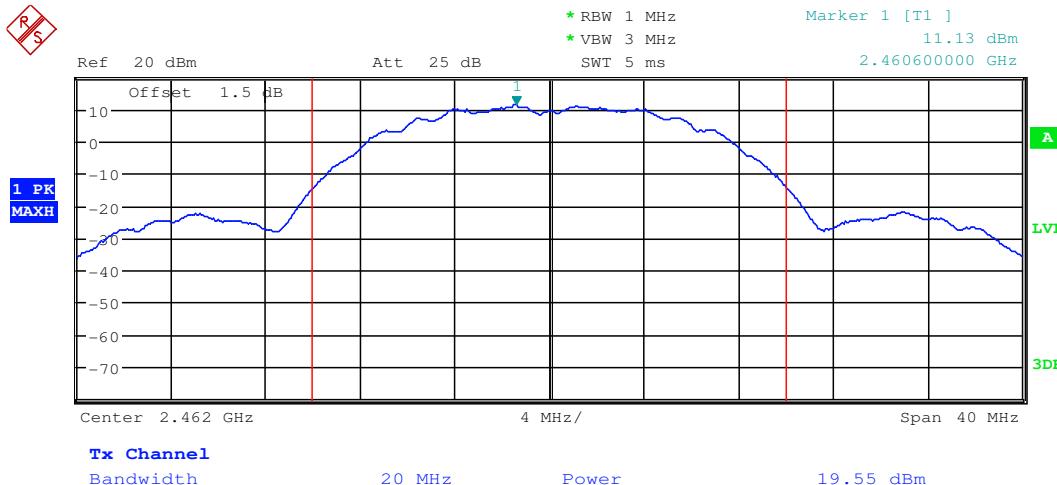
Test mode:	802.11b	Test channel:	Lowest
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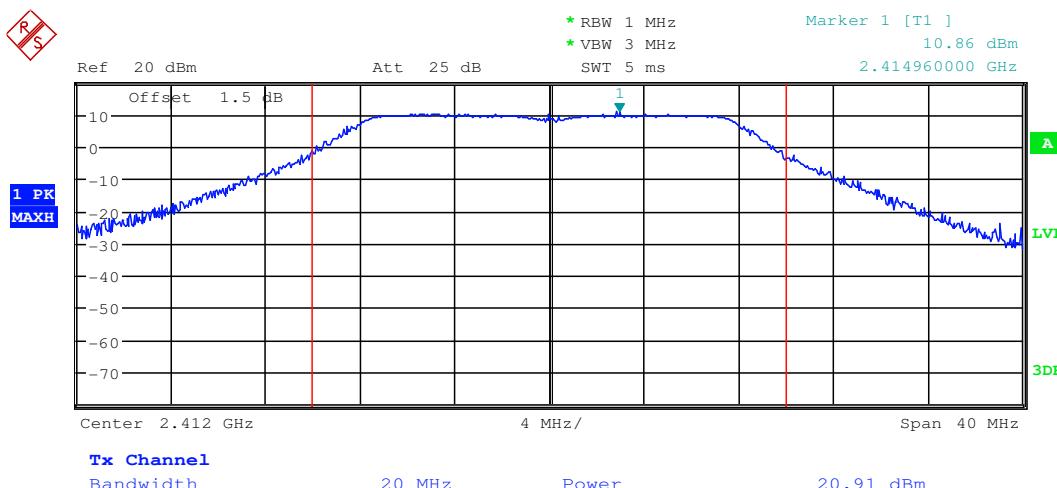
Test mode:	802.11b	Test channel:	Middle
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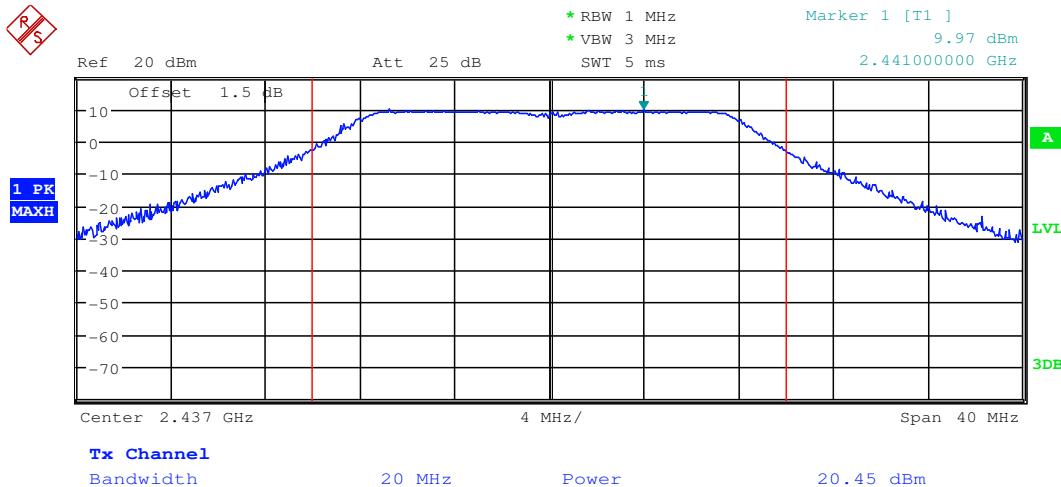
Test mode:	802.11b	Test channel:	Highest
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Test mode:	802.11g	Test channel:	Lowest
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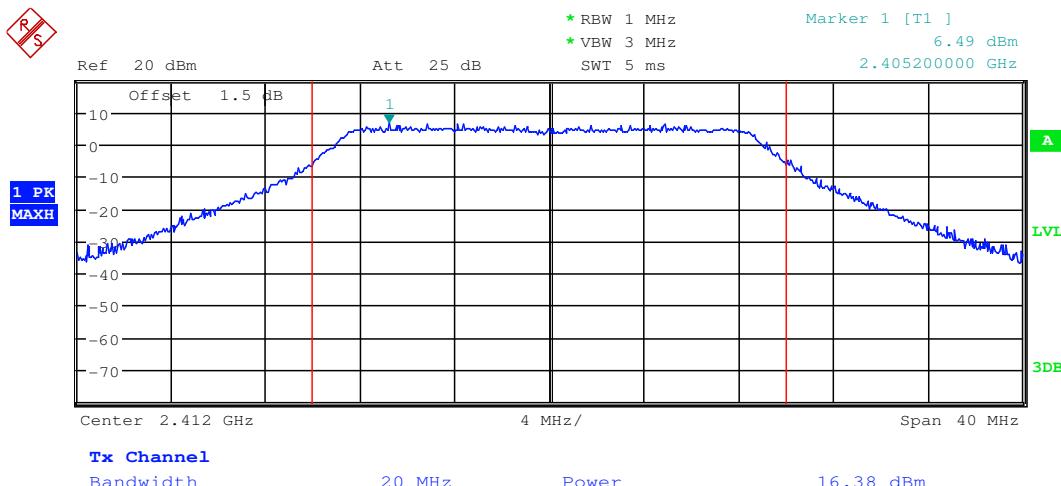
Test mode:	802.11g	Test channel:	Middle
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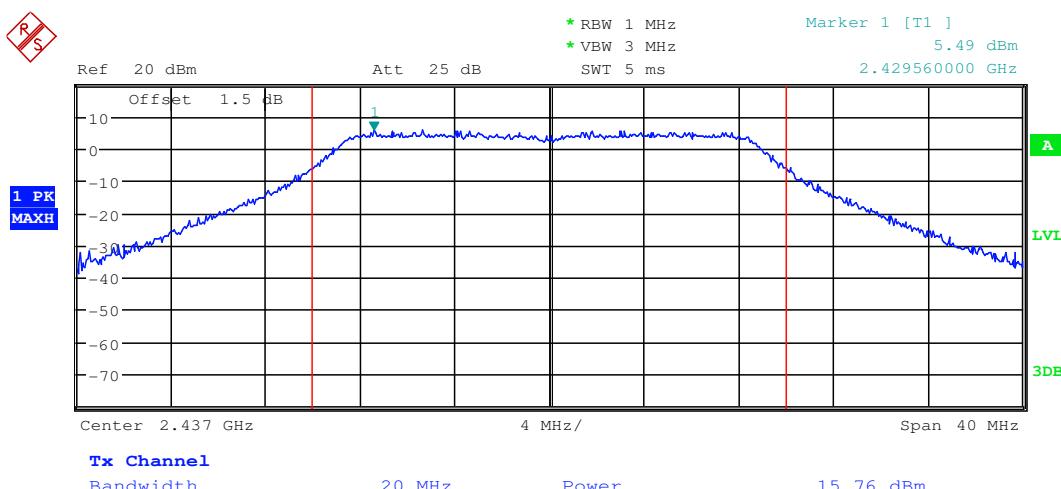
Test mode:	802.11g	Test channel:	Highest
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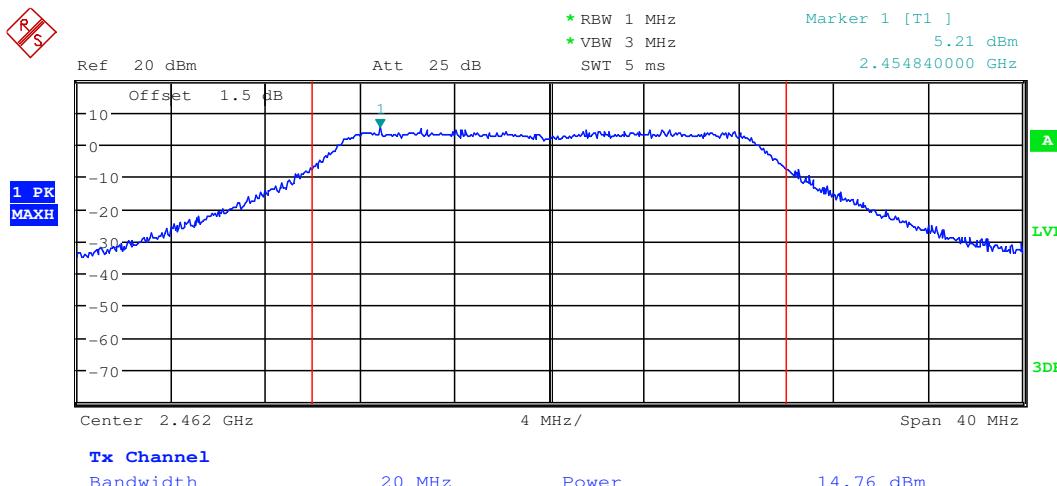
Test mode:	802.11n(HT20)	Test channel:	Lowest
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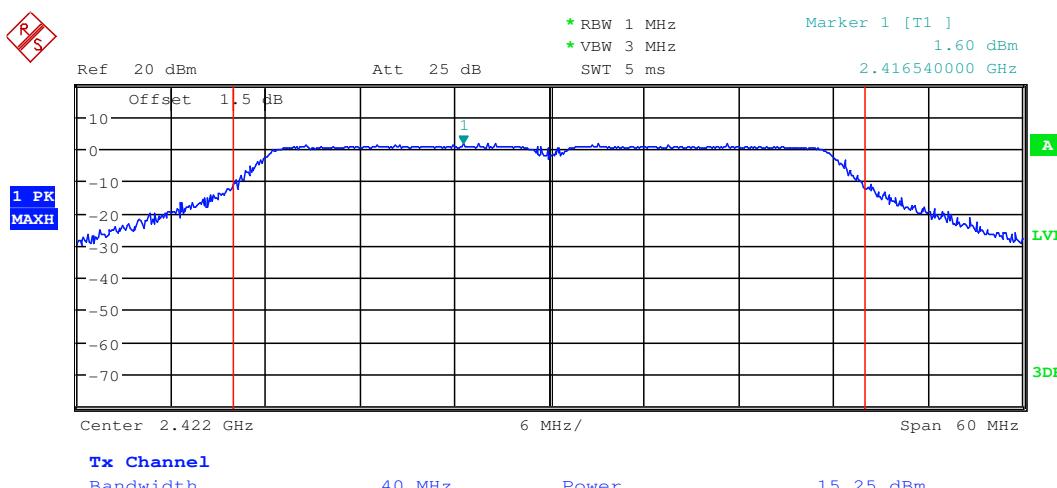
Test mode:	802.11n(HT20)	Test channel:	Middle
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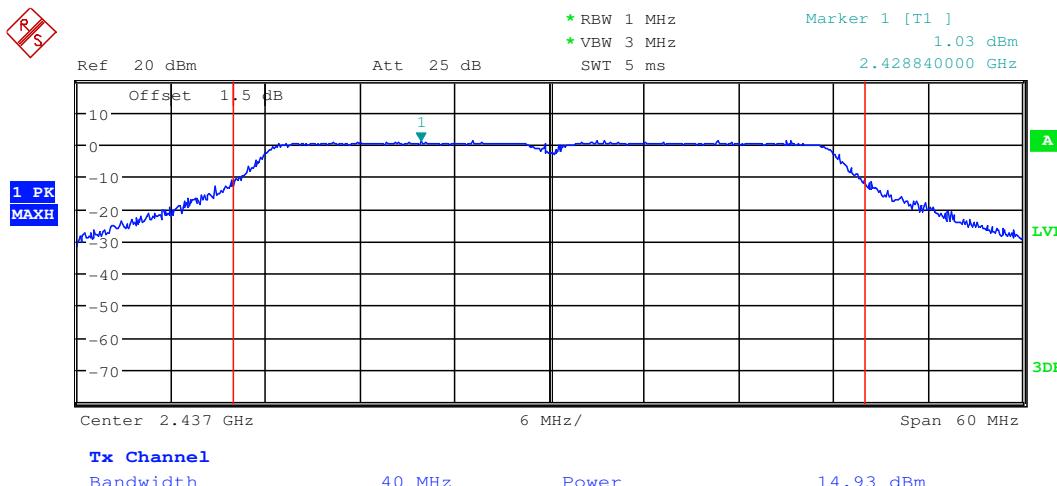
Test mode:	802.11n(HT20)	Test channel:	Highest
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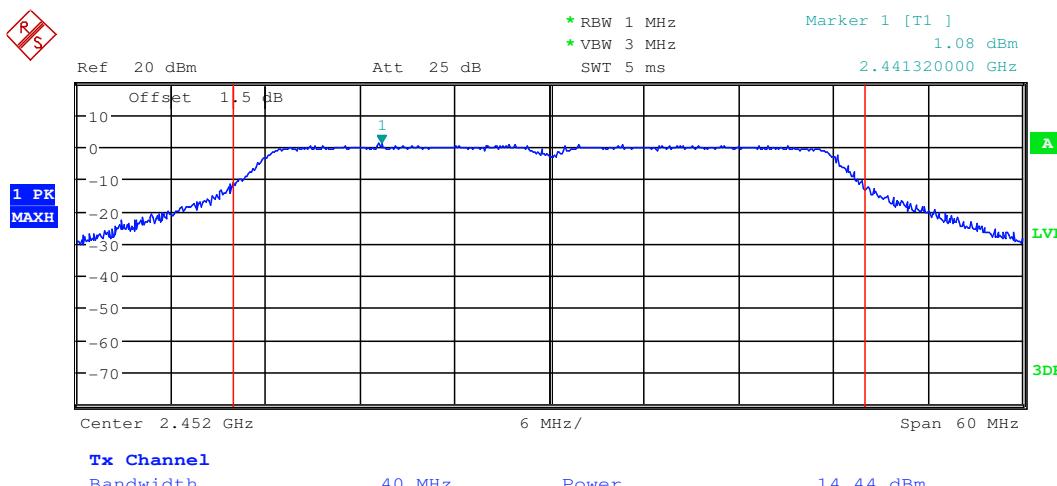
Test mode:	802.11n(HT40)	Test channel:	Lowest
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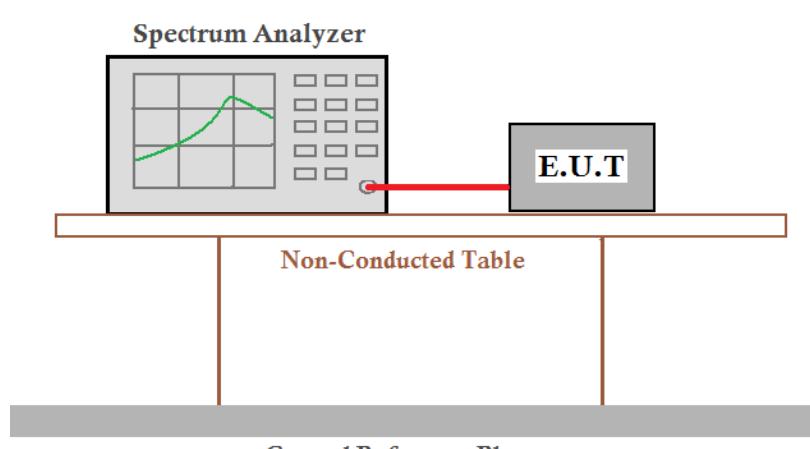
Test mode:	802.11n(HT40)	Test channel:	Middle
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Test mode:	802.11n(HT40)	Test channel:	Highest
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## 6.4 6dB Occupy Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10 2009
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	$\geq 500$ kHz
Test Results:	Pass

**Measurement Data**

802.11b mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	12.12	≥500	Pass
Middle	12.12	≥500	Pass
Highest	12.12	≥500	Pass

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

802.11n(HT20) mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	17.79	≥500	Pass
Middle	17.79	≥500	Pass
Highest	17.82	≥500	Pass

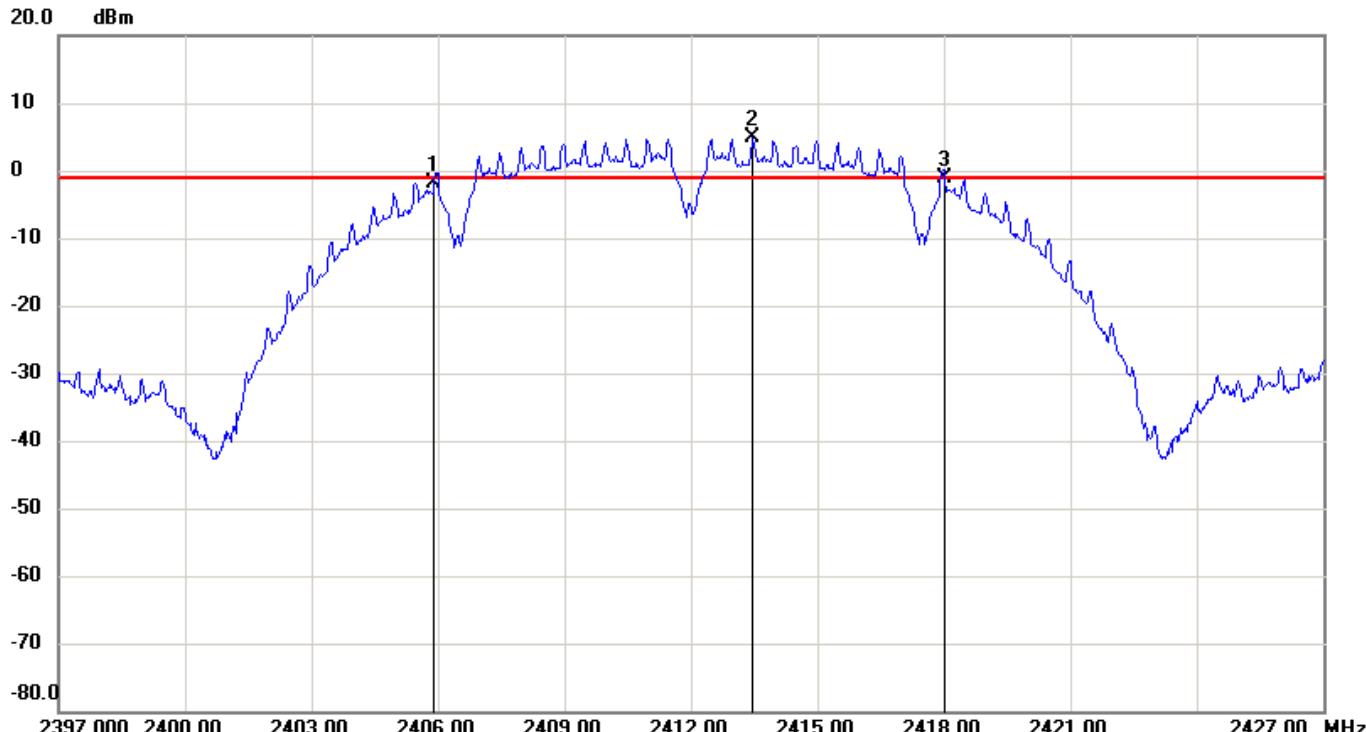
  

802.11n(HT40) mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	36.48	≥500	Pass
Middle	36.42	≥500	Pass
Highest	36.48	≥500	Pass



**Test plot as follows:**

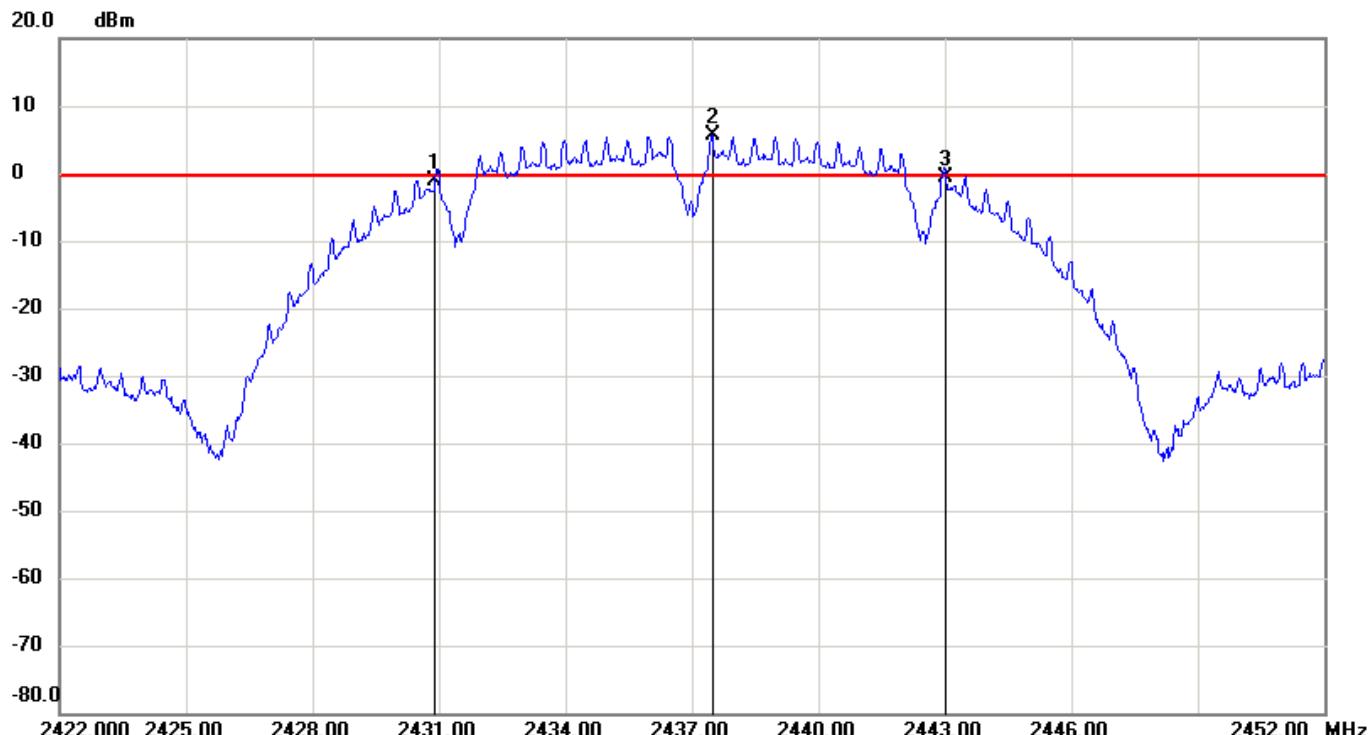
Test mode:	802.11b	Test channel:	Lowest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2405.9100	-1.98	-1.16	-0.82
2	2413.4700	4.84	-1.16	6.00
3	2418.0300	-1.20	-1.16	-0.04

No.		› Frequency(MHz)	› Level(dB)
1	mk3-mk1	12.12	0.78

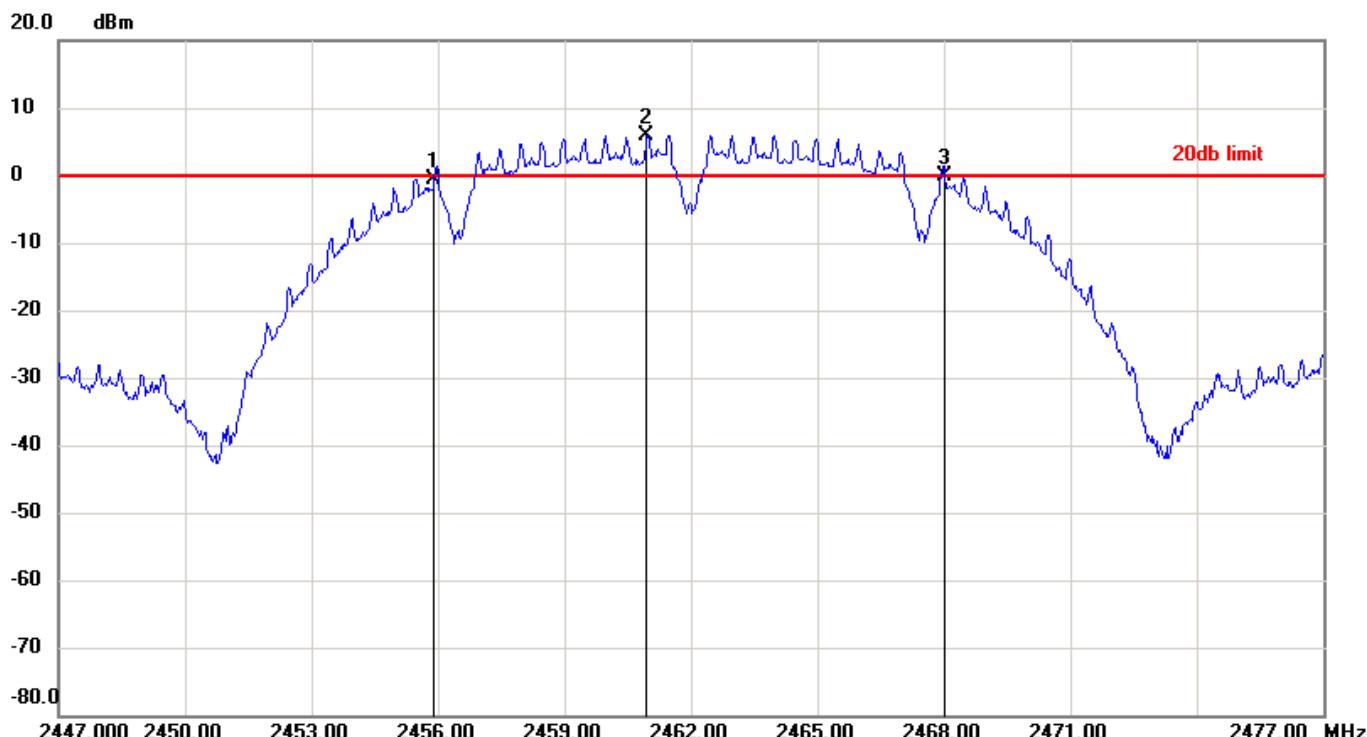
Test mode:	802.11b	Test channel:	Middle
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2430.9100	-1.12	-0.44	-0.68
2	2437.4800	5.56	-0.44	6.00
3	2443.0300	-0.62	-0.44	-0.18

No.	Frequency(MHz)	Level(dB)
1	mk3-mk1	12.12

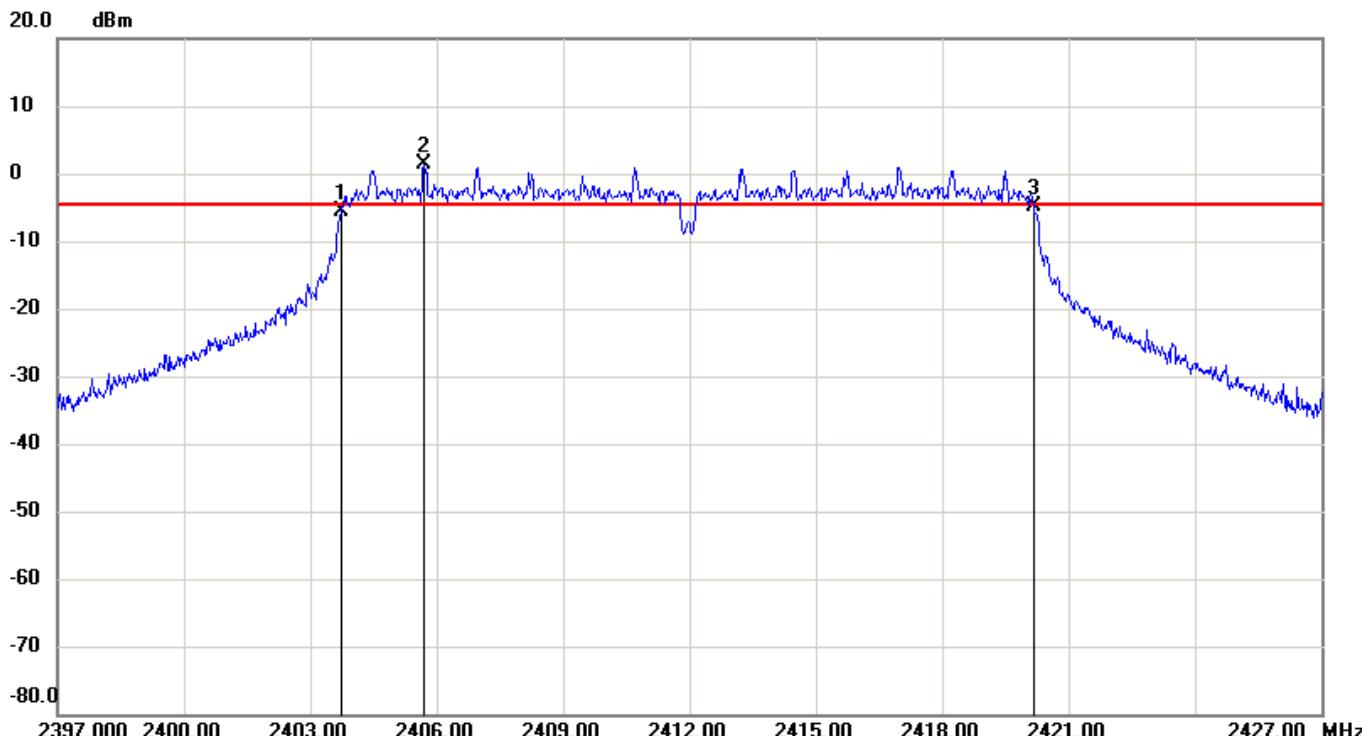
Test mode:	802.11b	Test channel:	Highest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2455.9100	-0.70	0.00	-0.70
2	2460.9500	6.00	0.00	6.00
3	2468.0300	-0.13	0.00	-0.13

No.	Frequency(MHz)	Level(dB)
1	mk3-mk1	12.12

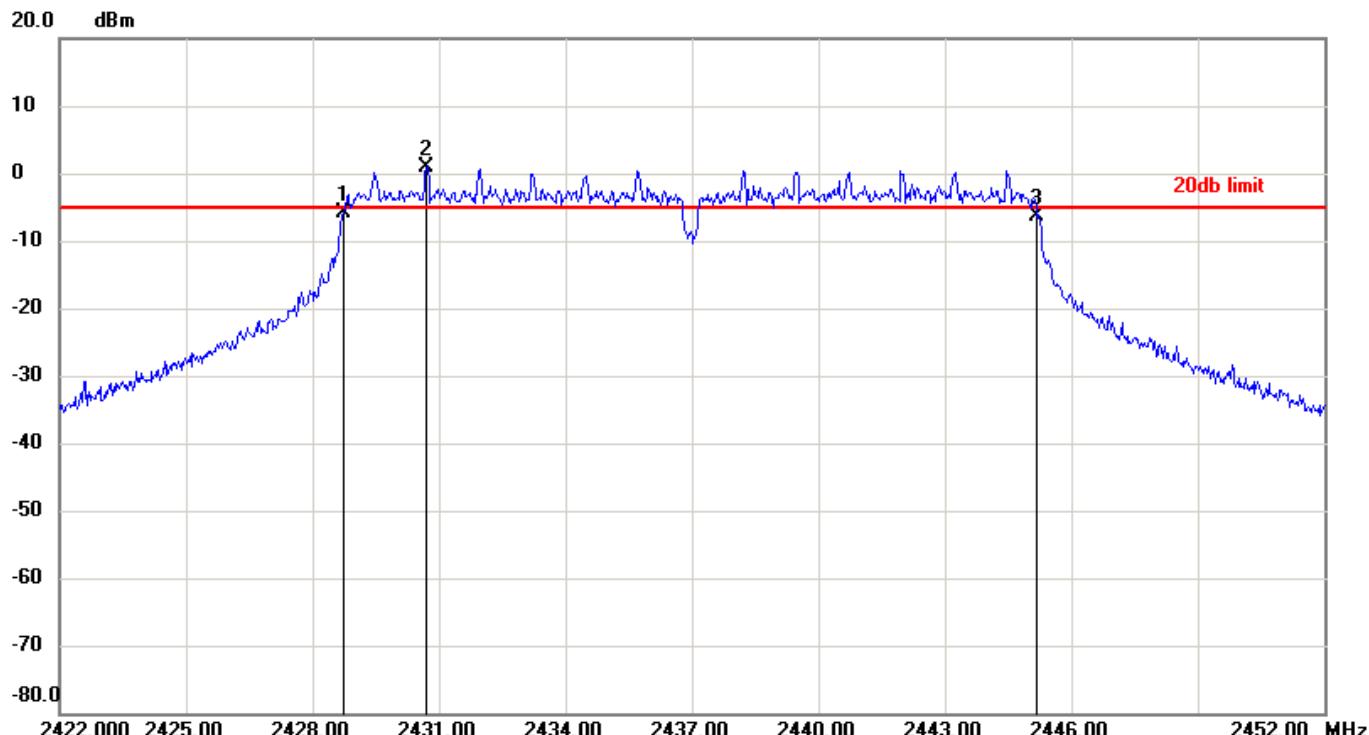
Test mode:	802.11g	Test channel:	Lowest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2403.7500	-5.60	-4.69	-0.91
2	2405.7000	1.31	-4.69	6.00
3	2420.1600	-4.84	-4.69	-0.15

No.	Frequency(MHz)	Level(dB)
1	mk3-mk1	16.41

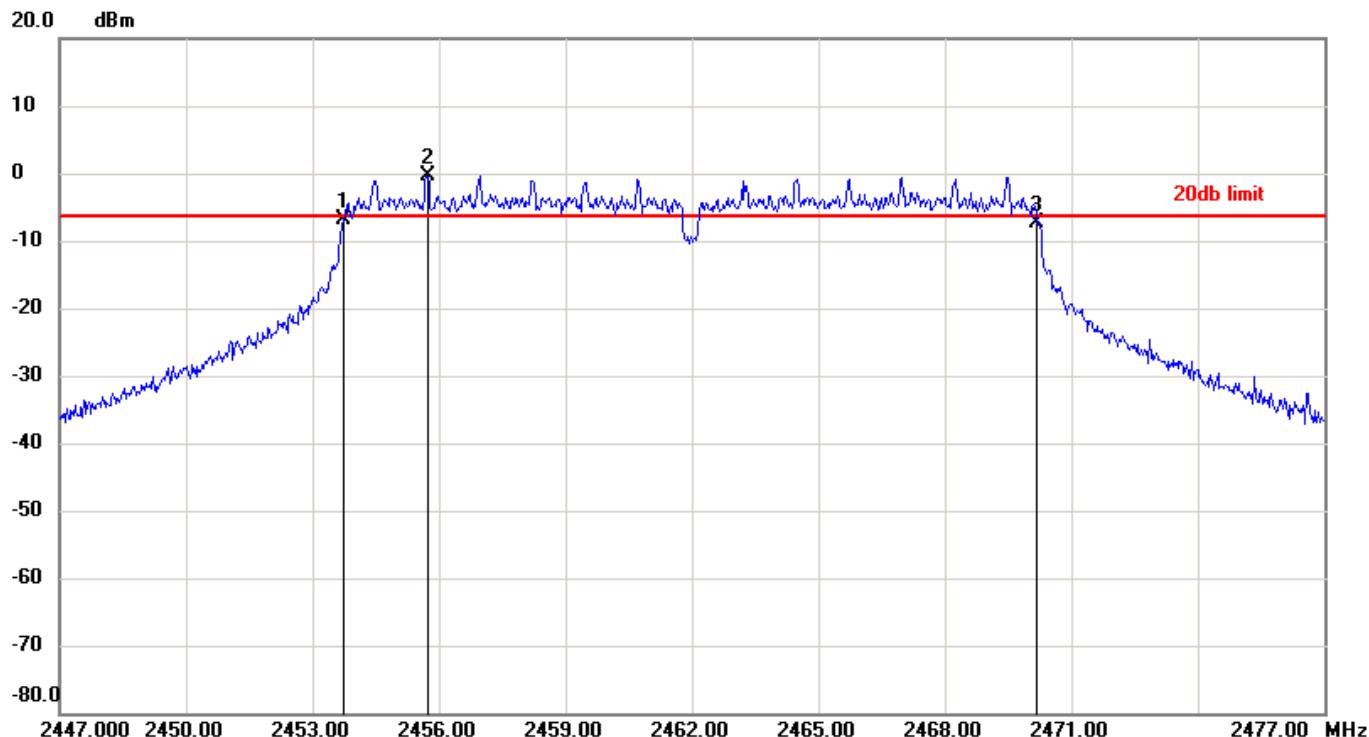
Test mode:	802.11g	Test channel:	Middle
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2428.7500	-5.88	-5.14	-0.74
2	2430.7000	0.86	-5.14	6.00
3	2445.1900	-6.36	-5.14	-1.22

No.	Frequency(MHz)	Level(dB)
1	mk3-mk1	-0.48

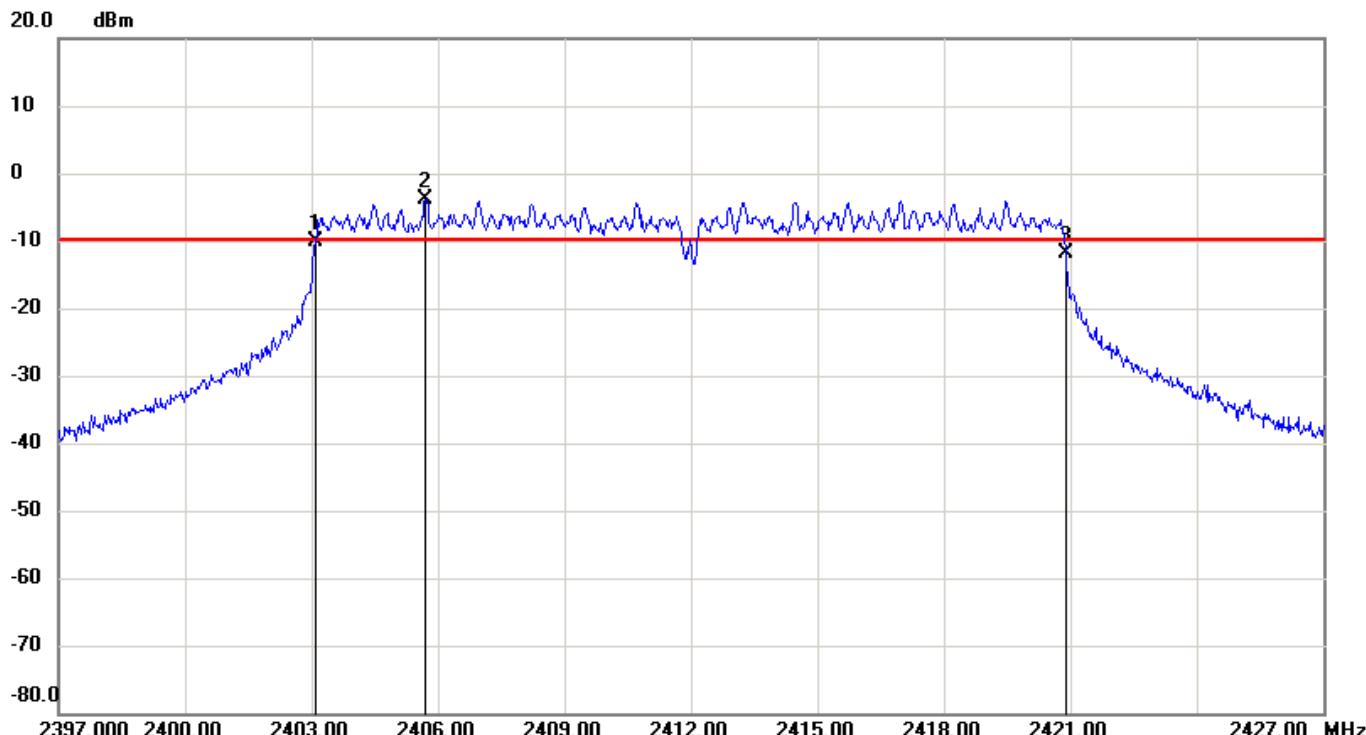
Test mode:	802.11g	Test channel:	Highest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2453.7500	-6.93	-6.27	-0.66
2	2455.7300	-0.27	-6.27	6.00
3	2470.1900	-7.39	-6.27	-1.12

No.	Frequency(MHz)	Level(dB)
1	mk3-mk1	-0.46

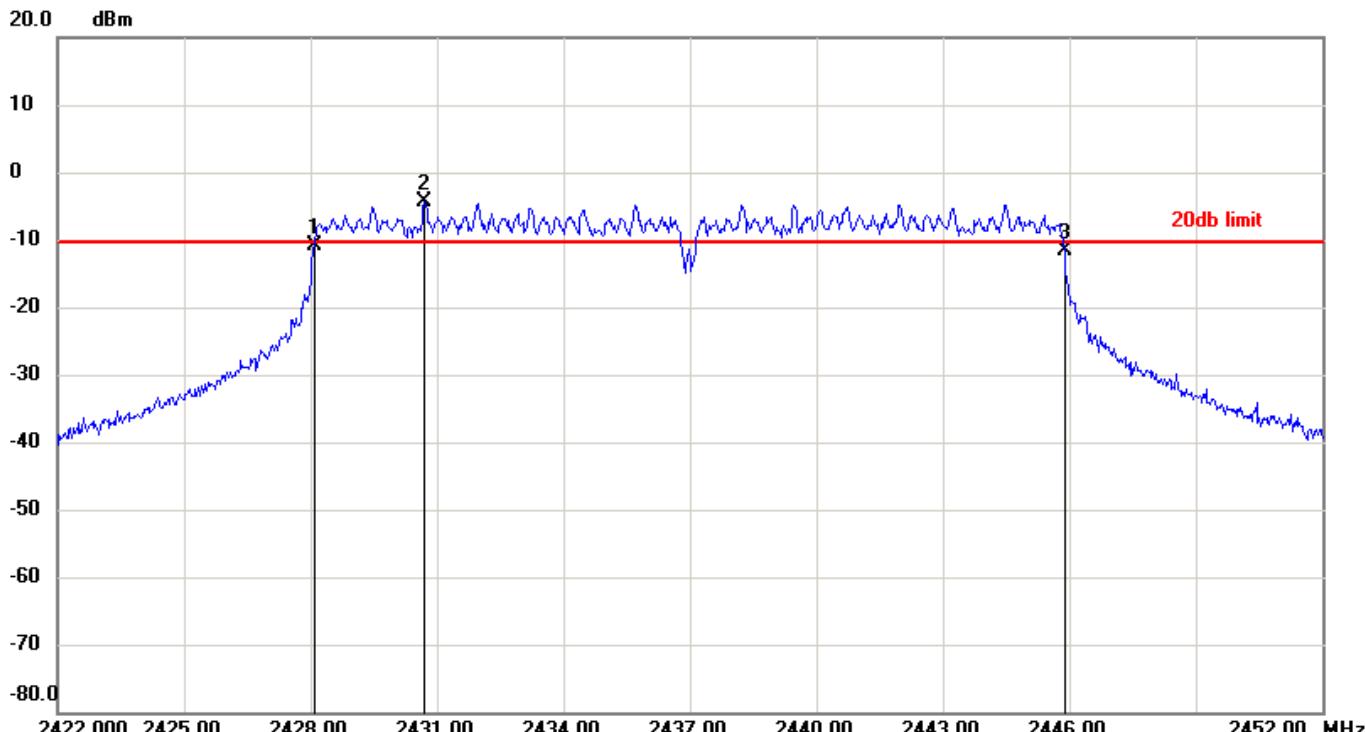
Test mode:	802.11n(HT20)	Test channel:	Lowest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2403.0900	-10.12	-9.85	-0.27
2	2405.7000	-3.85	-9.85	6.00
3	2420.8800	-11.87	-9.85	-2.02

No.	Frequency(MHz)	Level(dB)
1	mk3-mk1	-1.75

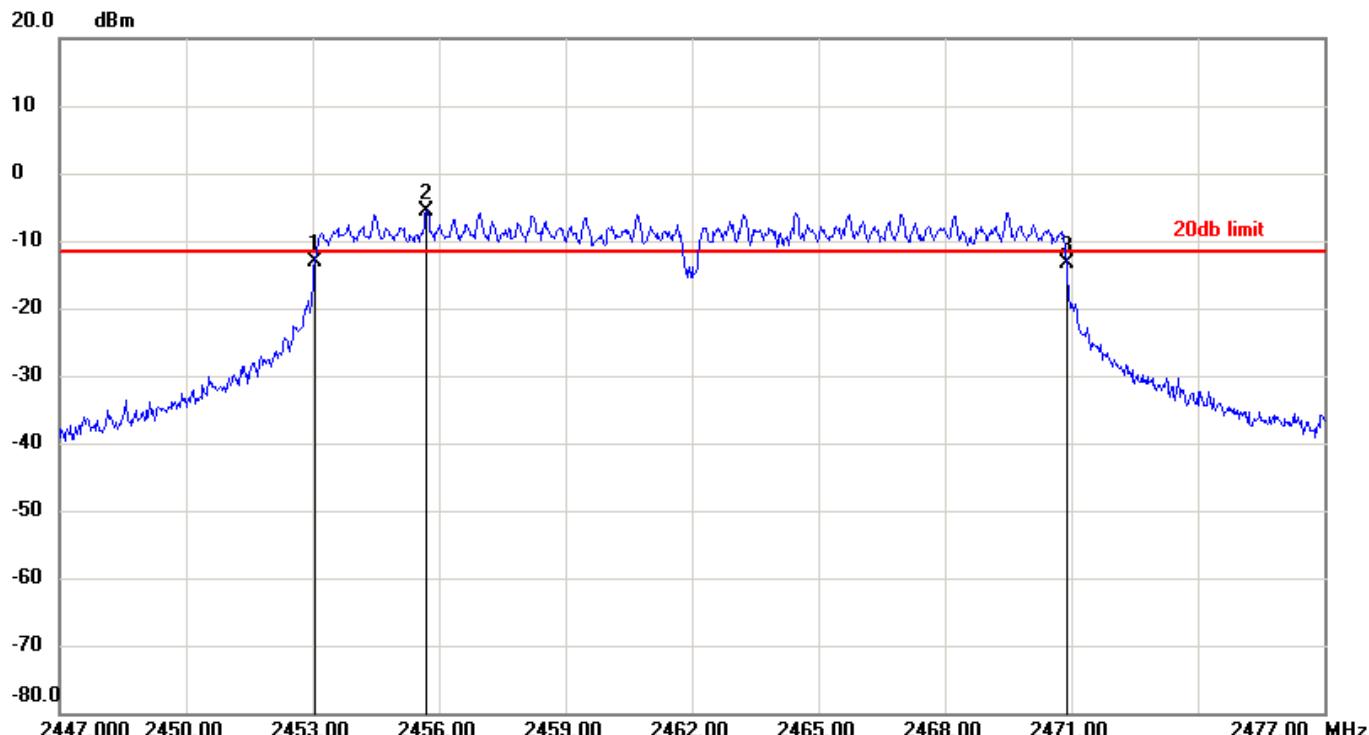
Test mode:	802.11n(HT20)	Test channel:	Middle
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2428.0900	-10.76	-10.46	-0.30
2	2430.7000	-4.46	-10.46	6.00
3	2445.8800	-11.68	-10.46	-1.22

No.	Frequency(MHz)	Level(dB)
1	mk3-mk1	17.79

Test mode:	802.11n(HT20)	Test channel:	Highest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2453.0600	-13.14	-11.57	-1.57
2	2455.7000	-5.57	-11.57	6.00
3	2470.8800	-13.42	-11.57	-1.85

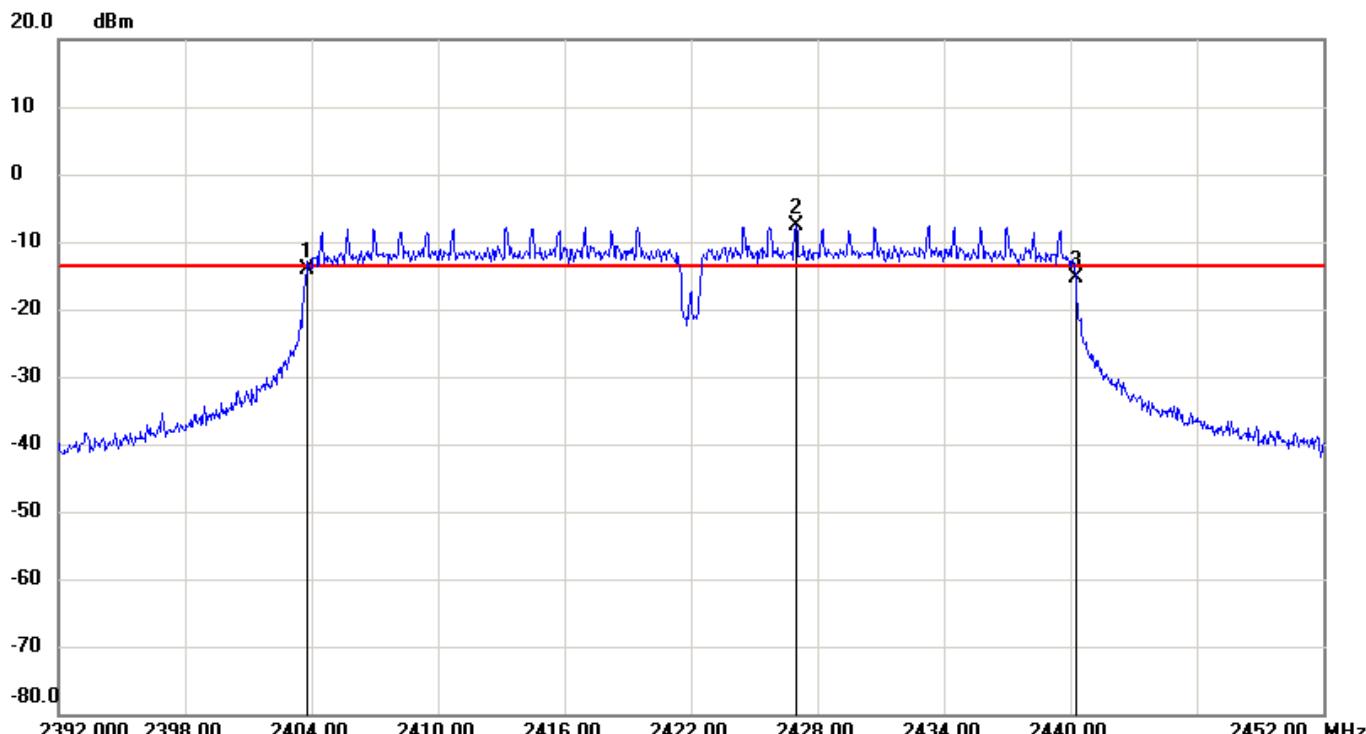
No.	Frequency(MHz)	Level(dB)
1	mk3-mk1	-0.28



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Test mode:	802.11n(HT40)	Test channel:	Lowest
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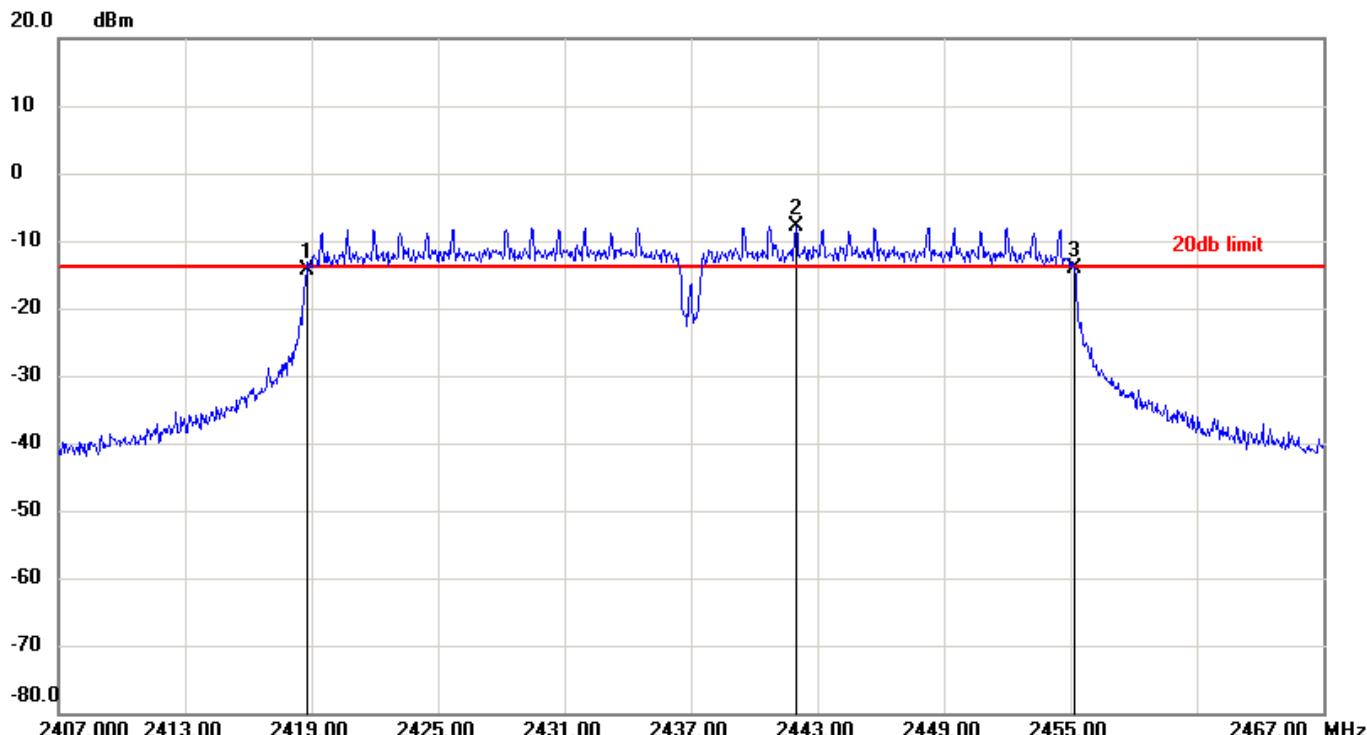
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2403.7600	-14.24	-13.59	-0.65
2	2426.9800	-7.59	-13.59	6.00
3	2440.2400	-15.30	-13.59	-1.71

No.		› Frequency(MHz)	› Level(dB)
1	mk3-mk1	36.48	-1.06



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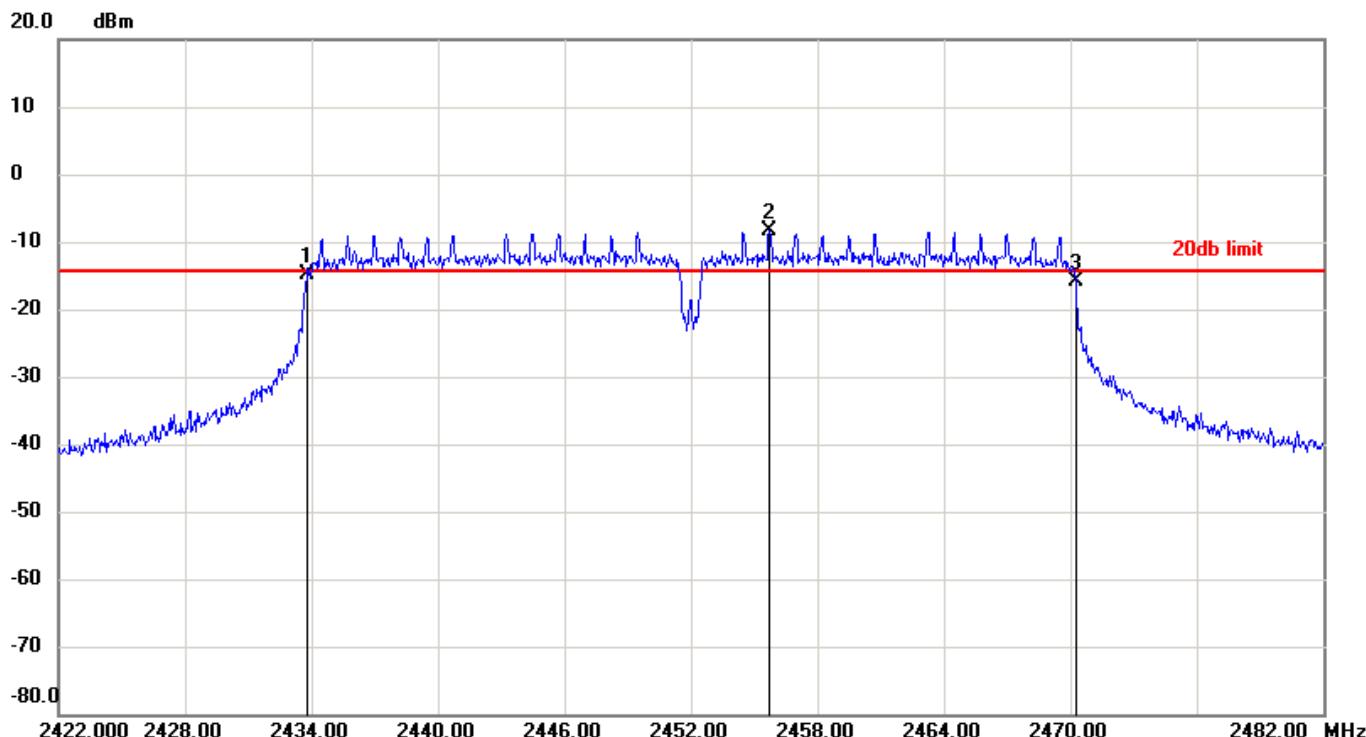
Test mode:	802.11n(HT40)	Test channel:	Middle
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2418.7600	-14.34	-13.81	-0.53
2	2441.9800	-7.81	-13.81	6.00
3	2455.1800	-14.05	-13.81	-0.24

No.	Frequency(MHz)	Level(dB)
1	mk3-mk1	36.42

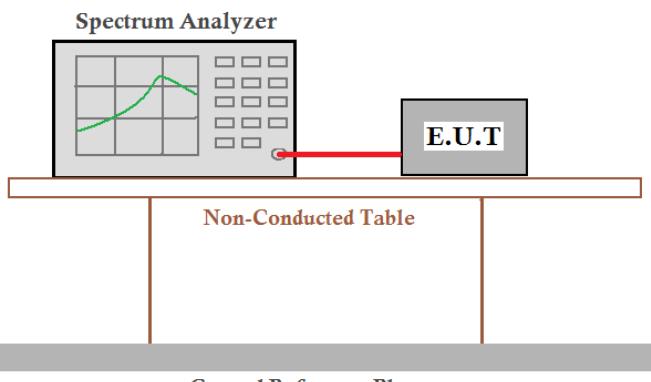
Test mode:	802.11n(HT40)	Test channel:	Highest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2433.7600	-14.80	-14.42	-0.38
2	2455.7200	-8.42	-14.42	6.00
3	2470.2400	-15.89	-14.42	-1.47

No.	Frequency(MHz)	Level(dB)
1	mk3-mk1	36.48

## 6.5 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 2009
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) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
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	-9.64	≤8.00	Pass
Middle	-8.94	≤8.00	Pass
Highest	-8.76	≤8.00	Pass

802.11g mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-12.24	≤8.00	Pass
Middle	-12.91	≤8.00	Pass
Highest	-14.76	≤8.00	Pass

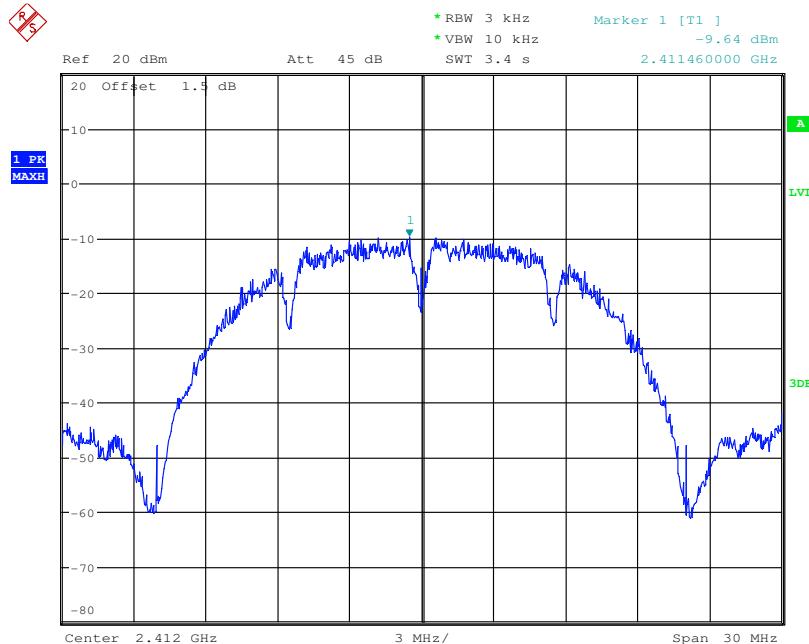
802.11n(HT20) mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-17.45	≤8.00	Pass
Middle	-18.88	≤8.00	Pass
Highest	-19.32	≤8.00	Pass

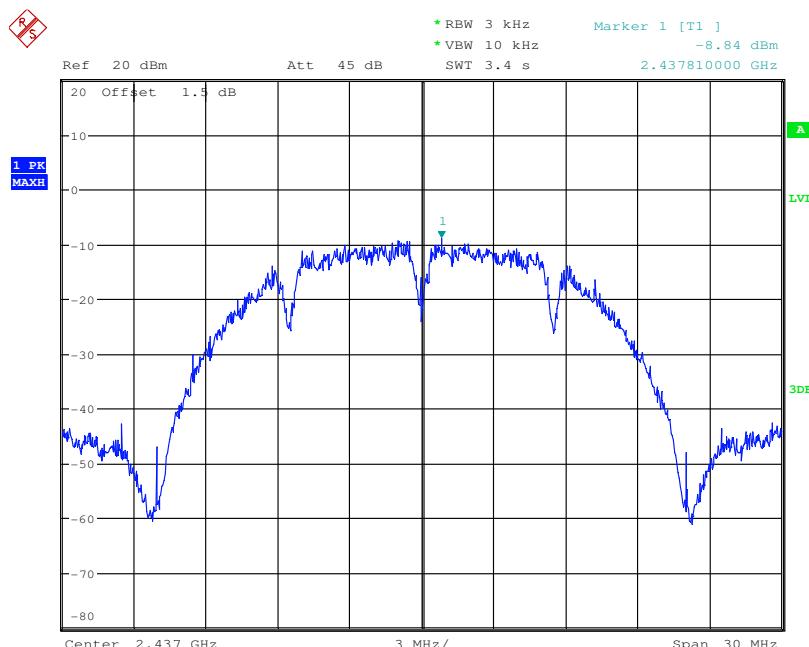
802.11n(HT40) mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-22.00	≤8.00	Pass
Middle	-20.34	≤8.00	Pass
Highest	-22.37	≤8.00	Pass

**Test plot as follows:**

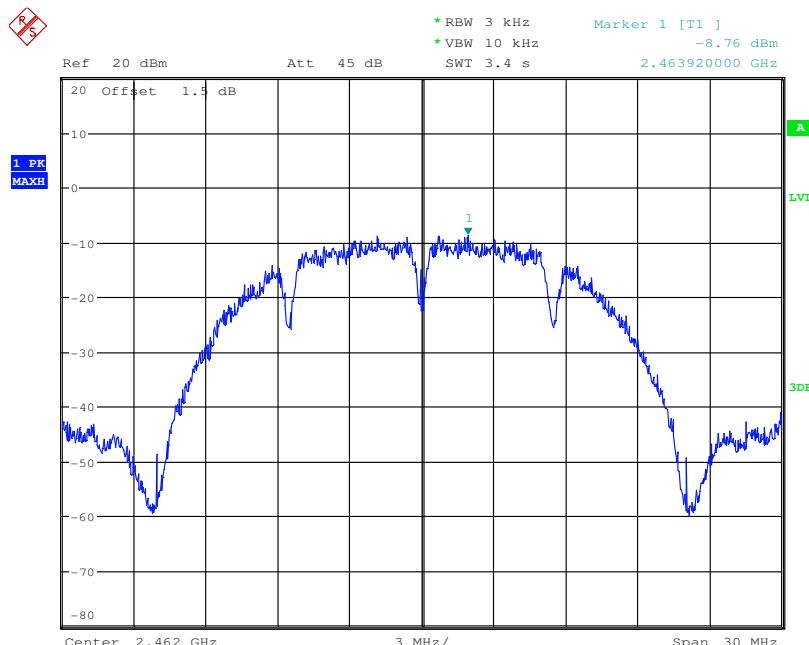
Test mode:	802.11b	Test channel:	Lowest
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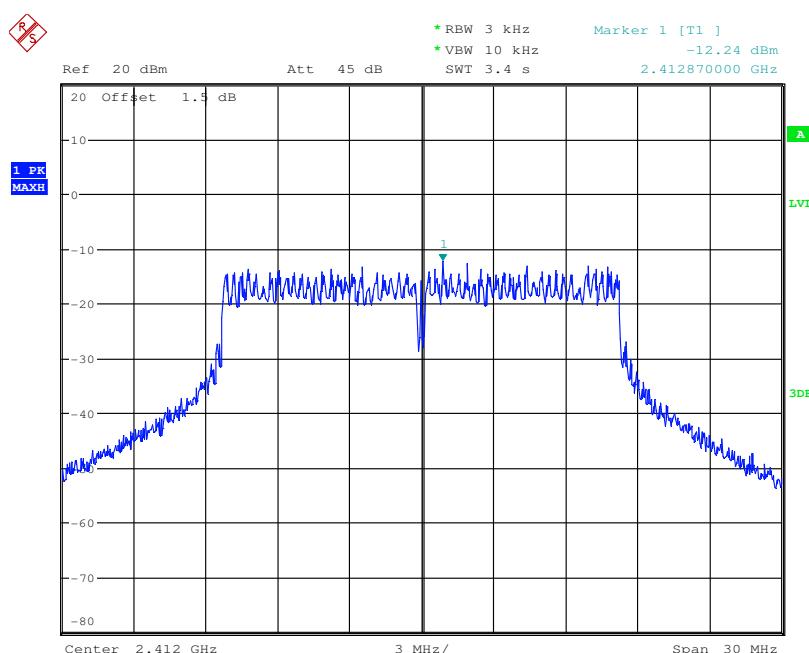
Test mode:	802.11b	Test channel:	Middle
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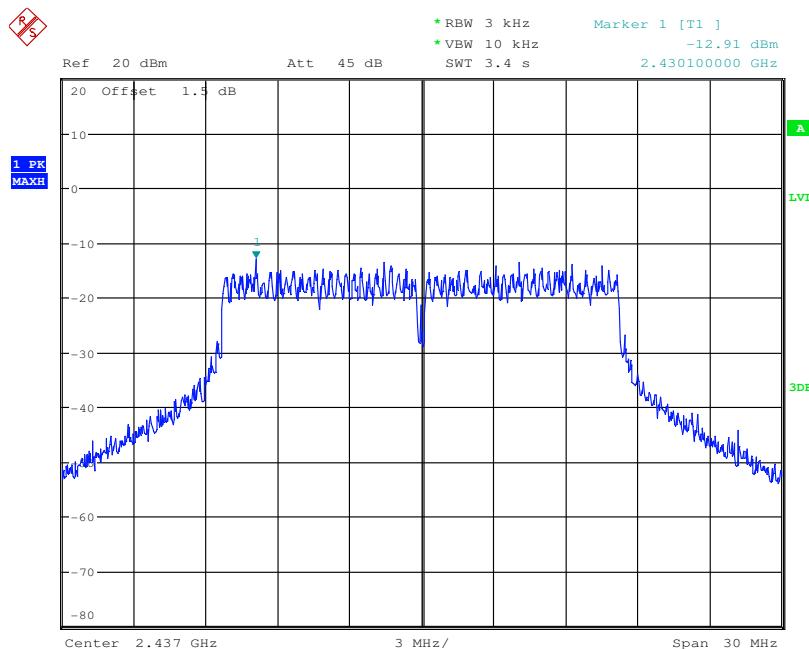
Test mode:	802.11b	Test channel:	Highest
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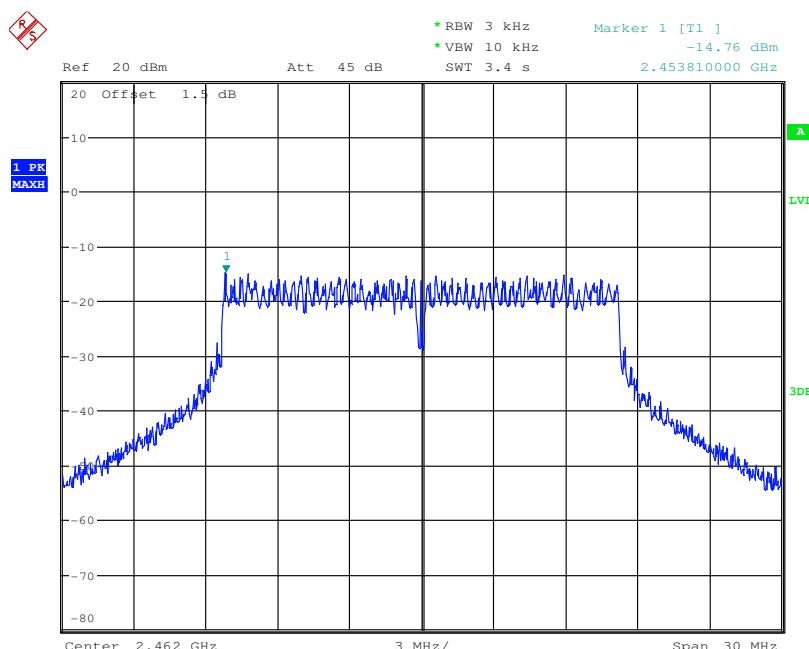
Test mode:	802.11g	Test channel:	Lowest
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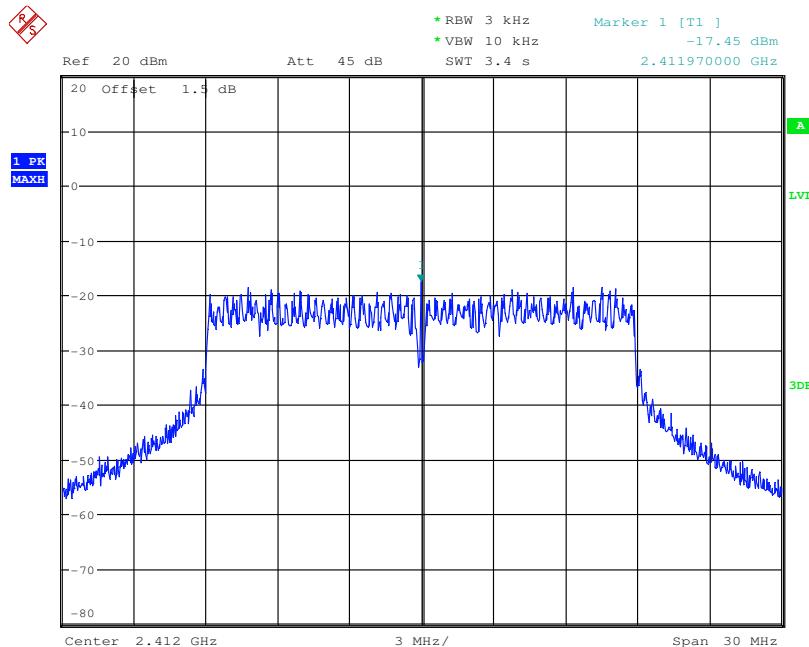
Test mode:	802.11g	Test channel:	Middle
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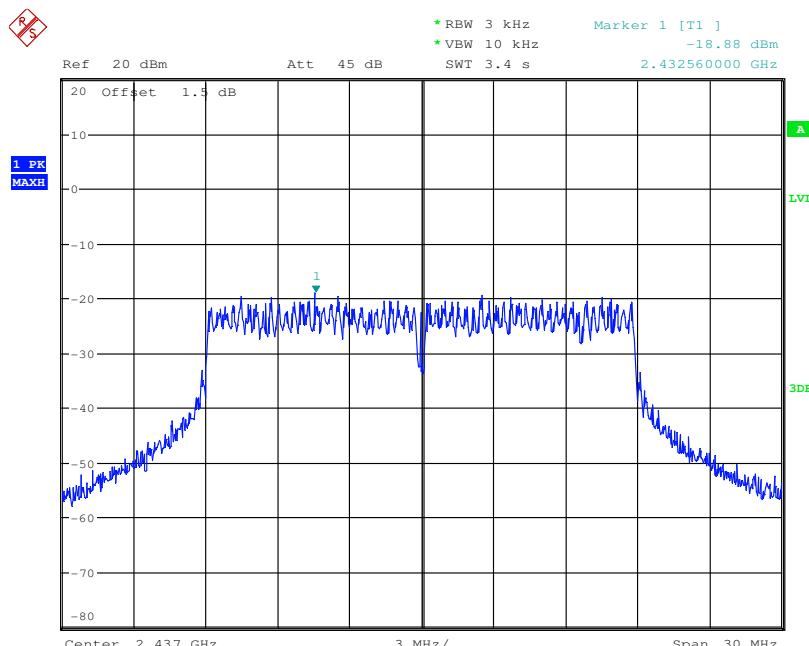
Test mode:	802.11g	Test channel:	Highest
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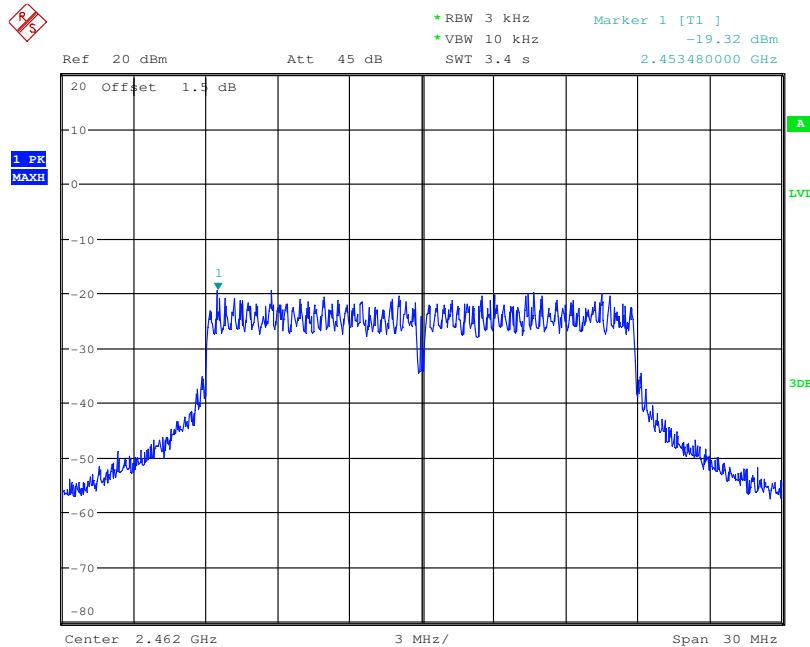
Test mode:	802.11n(HT20)	Test channel:	Lowest
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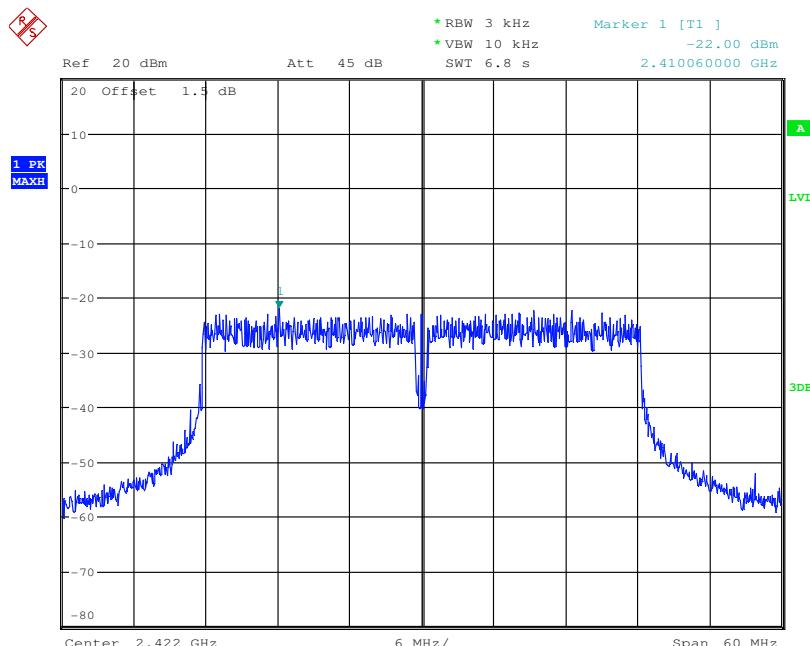
Test mode:	802.11n(HT20)	Test channel:	Middle
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Test mode: 802.11n(HT20) Test channel: Highest



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

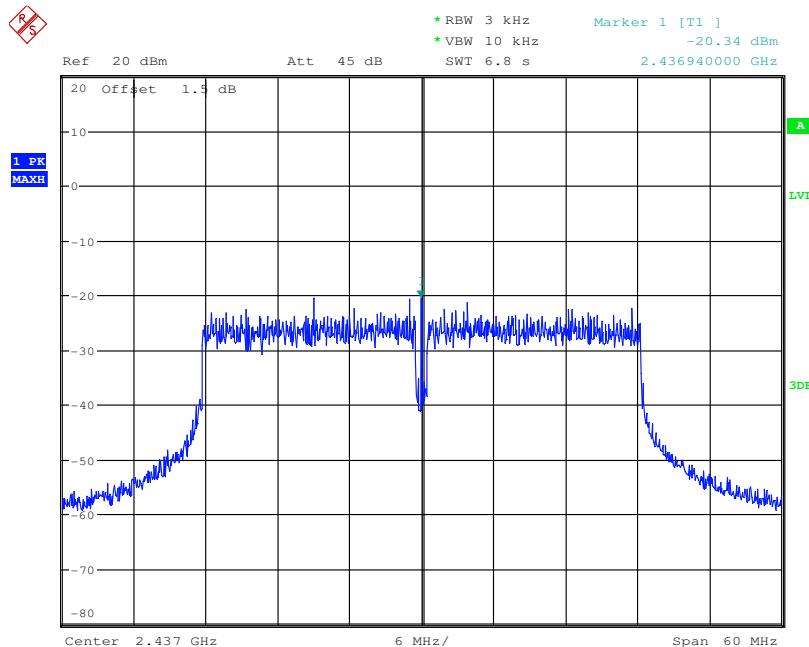




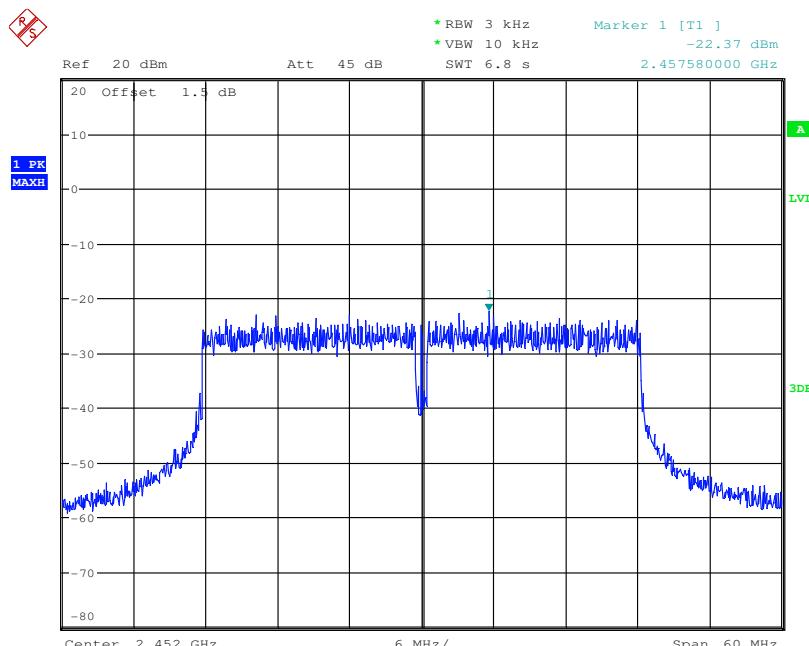
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Test mode:	802.11n(HT40)	Test channel:	Middle
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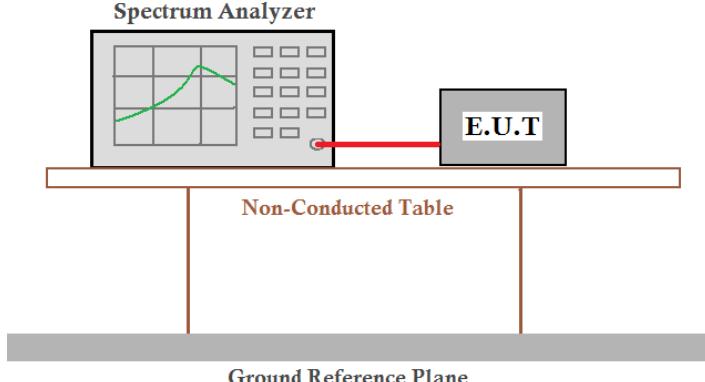


Test mode:	802.11n(HT40)	Test channel:	Highest
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## 6.6 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10 2009
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) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

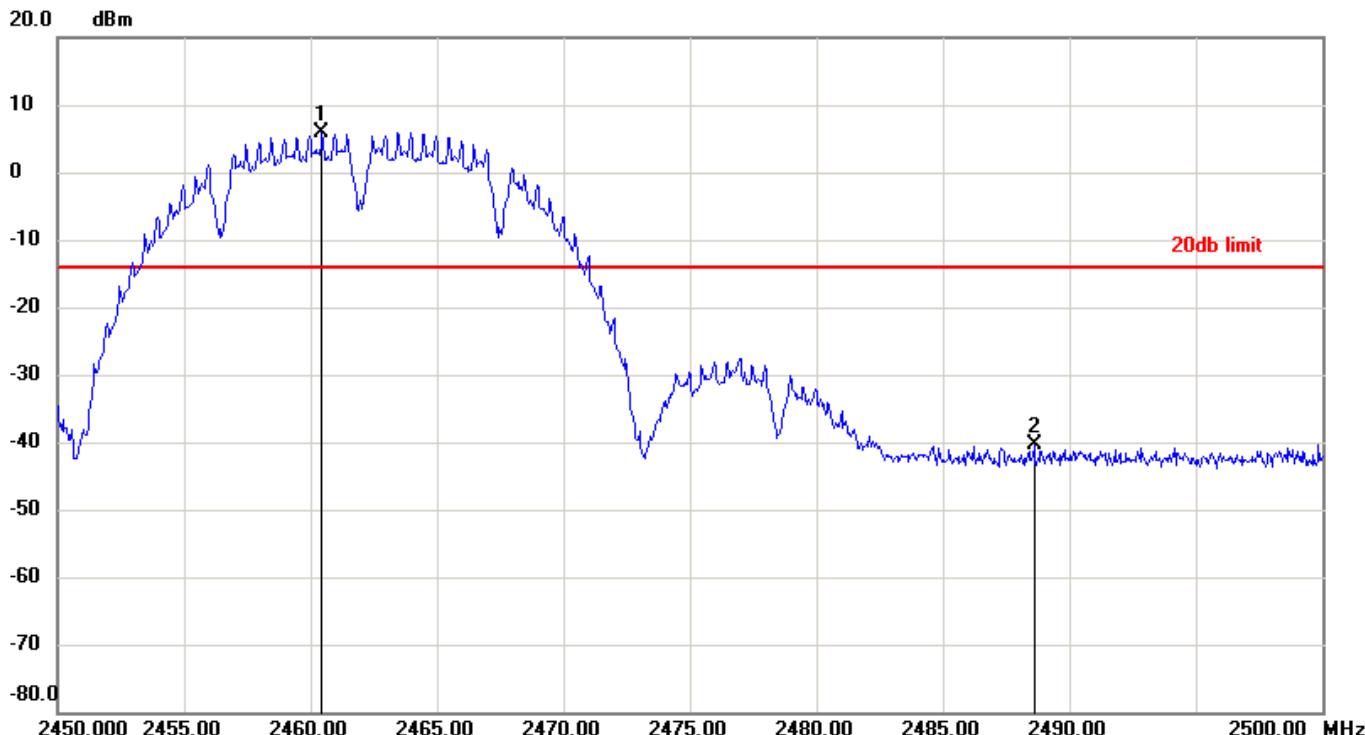
**Test plot as follows:**

Test mode:	802.11b	Test channel:	Lowest
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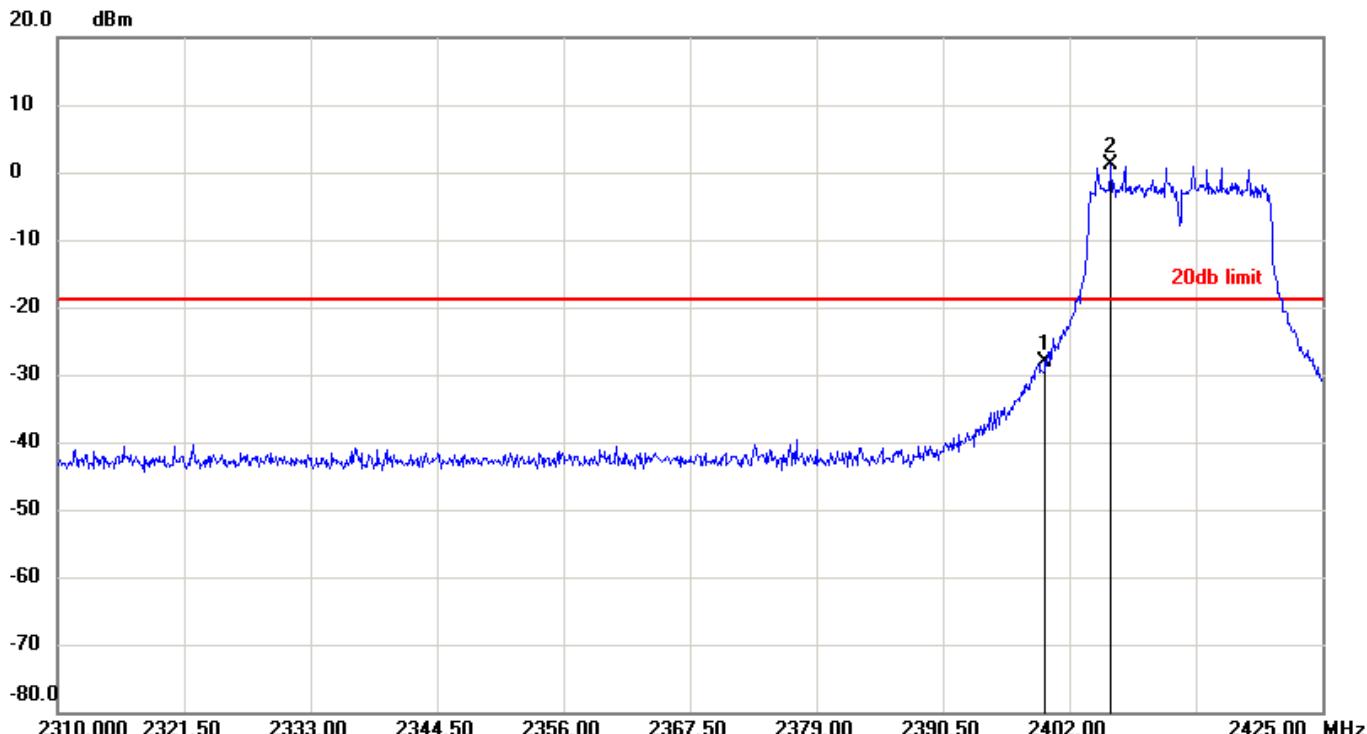
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2397.0550	-29.38	-15.14	-14.24
2	2410.5100	4.86	-15.14	20.00

Test mode:	802.11b	Test channel:	Highest
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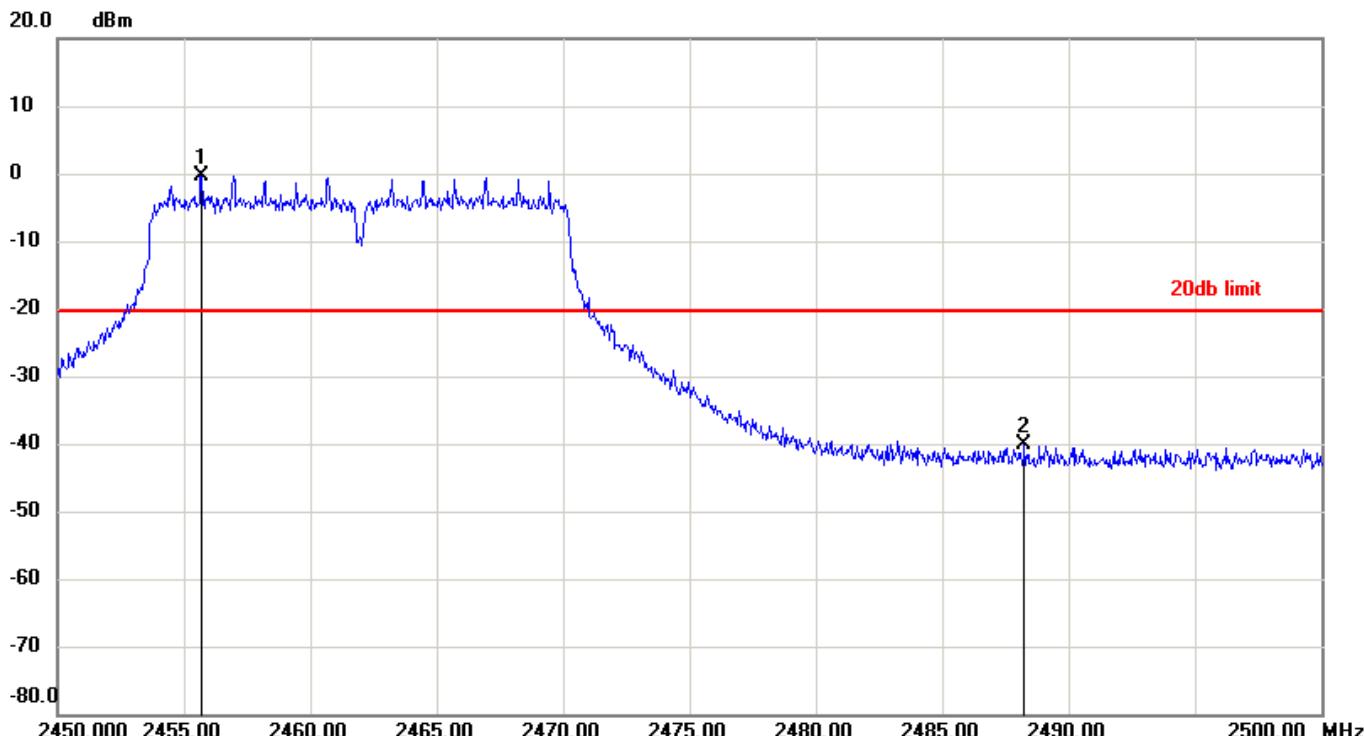
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2460.4500	5.87	-14.13	20.00
2	2488.6000	-40.38	-14.13	-26.25

Test mode:	802.11g	Test channel:	Lowest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2399.8150	-28.03	-18.92	-9.11
2	2405.7950	1.08	-18.92	20.00

Test mode:	802.11g	Test channel:	Highest
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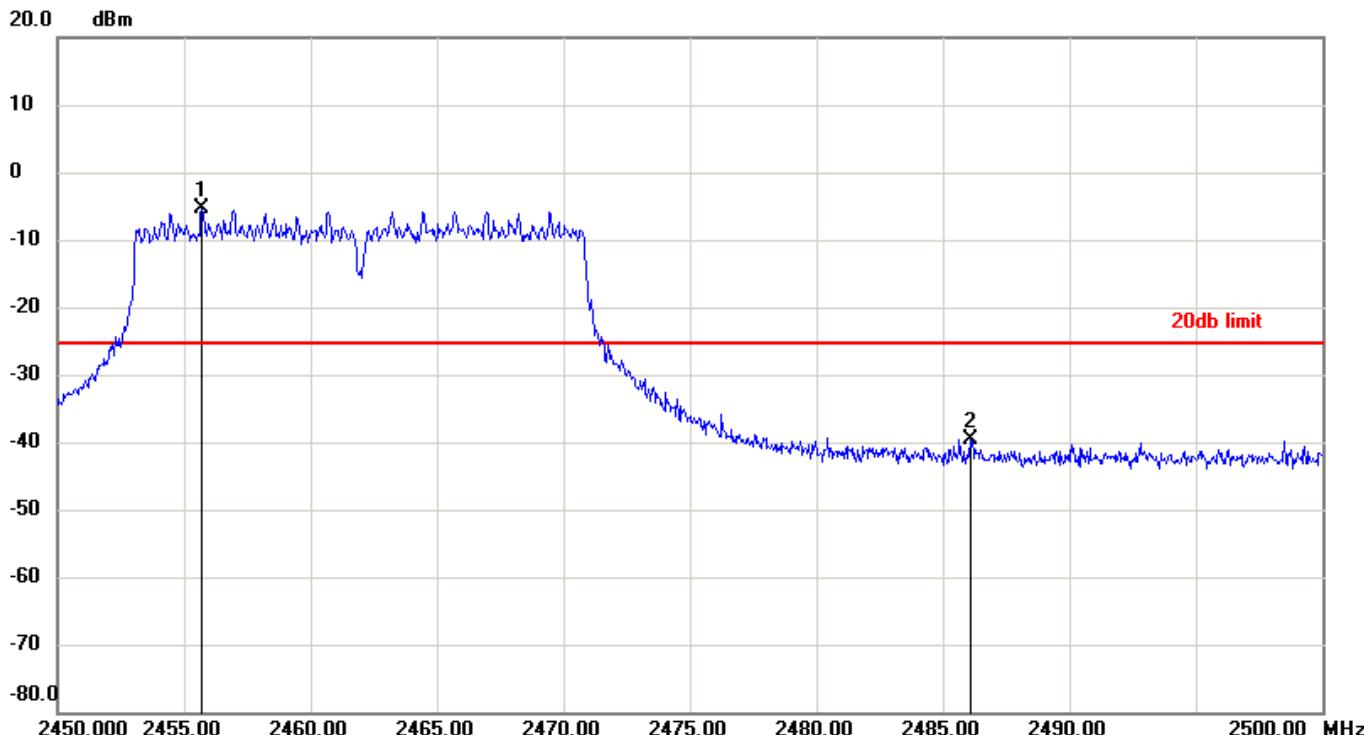
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2455.7000	-0.29	-20.29	20.00
2	2488.2500	-40.02	-20.29	-19.73

Test mode:	802.11n(HT20)	Test channel:	Lowest
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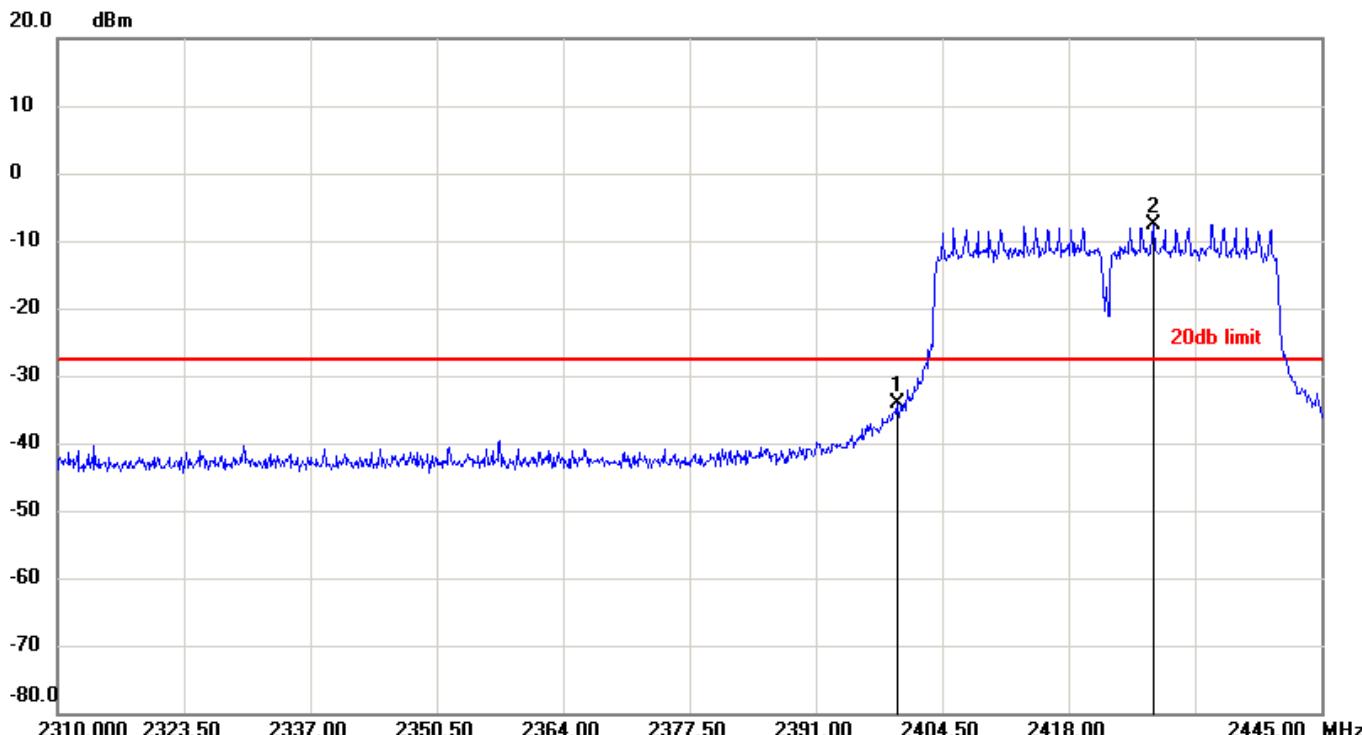
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2399.9300	-31.30	-23.94	-7.36
2	2405.7950	-3.94	-23.94	20.00

Test mode:	802.11n(HT20)	Test channel:	Highest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2455.7000	-5.40	-25.40	20.00
2	2486.1000	-39.74	-25.40	-14.34

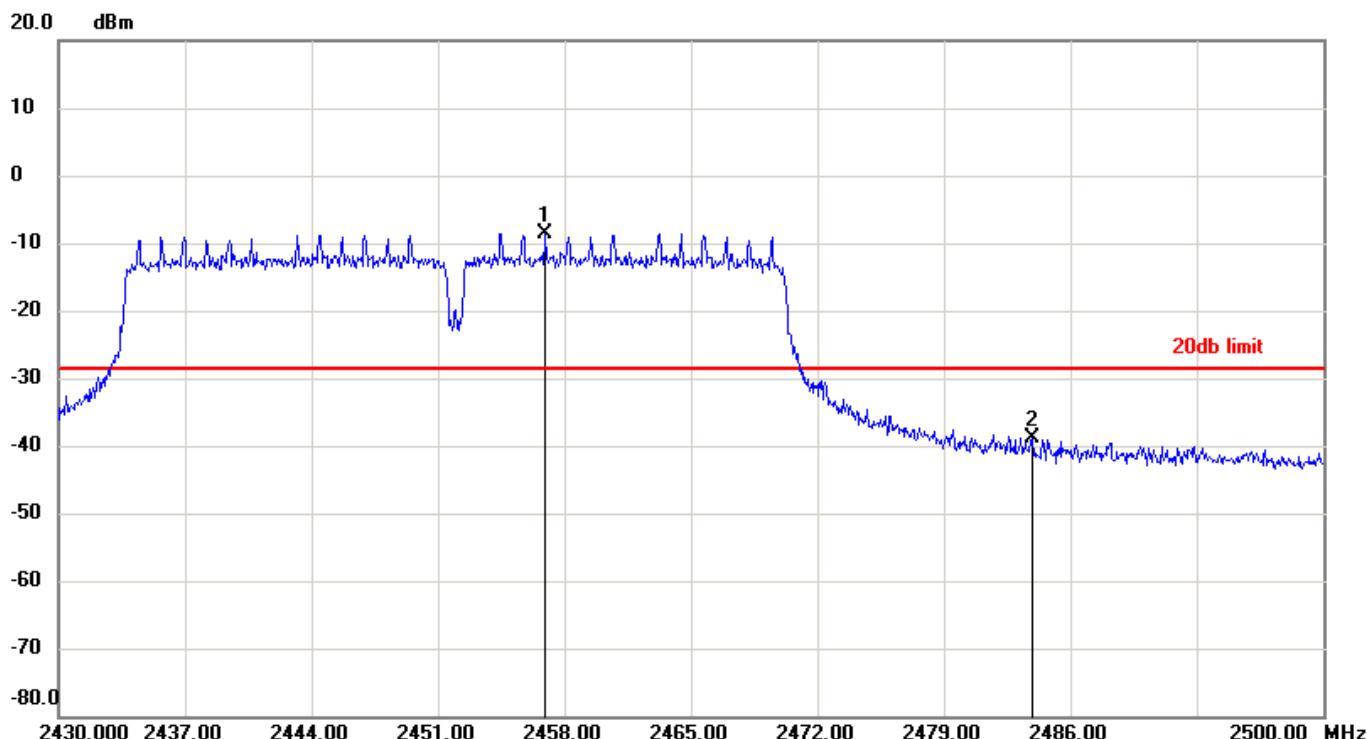
Test mode:	802.11n(HT40)	Test channel:	Lowest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2399.6400	-34.05	-27.73	-6.32
2	2427.0450	-7.73	-27.73	20.00

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Test mode:	802.11n(HT40)	Test channel:	Highest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2456.9500	-8.60	-28.60	20.00
2	2483.9000	-38.90	-28.60	-10.30

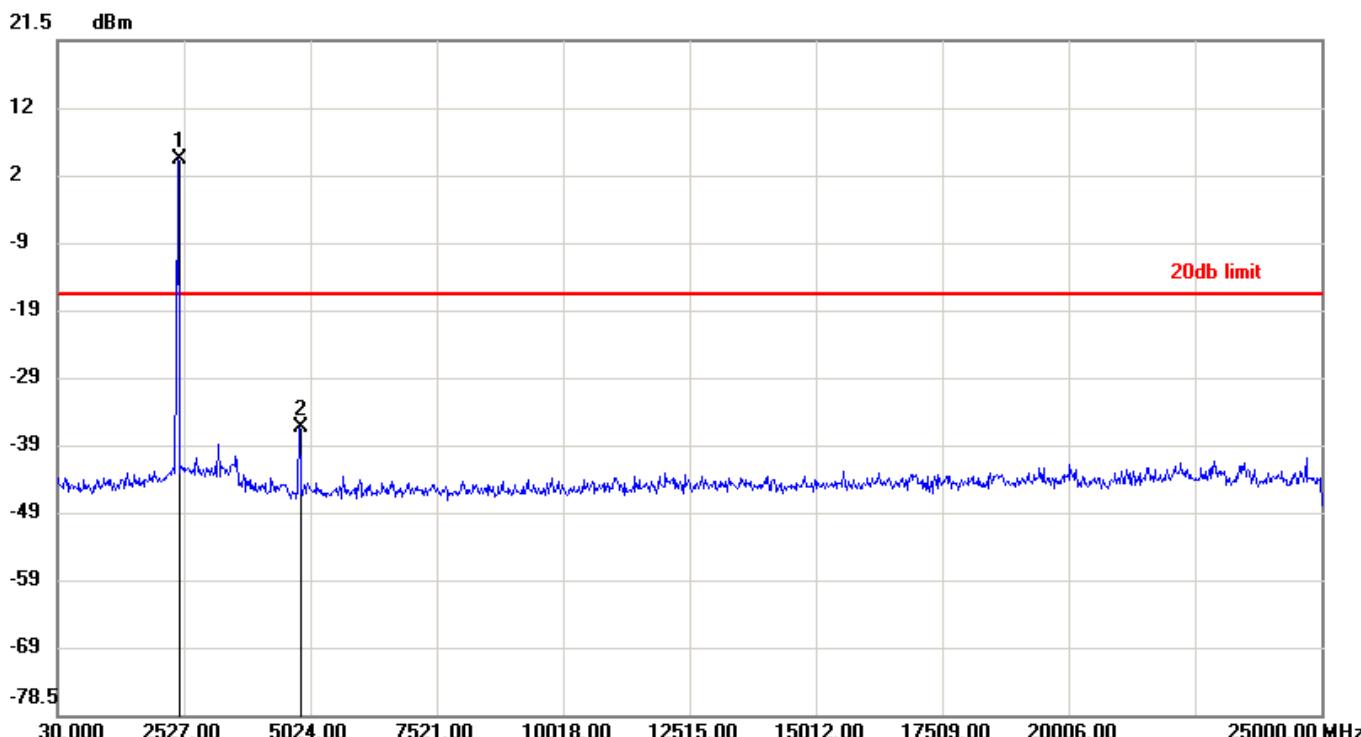
## 6.7 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10 2009
Test Setup:	<p style="text-align: center;"> <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>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



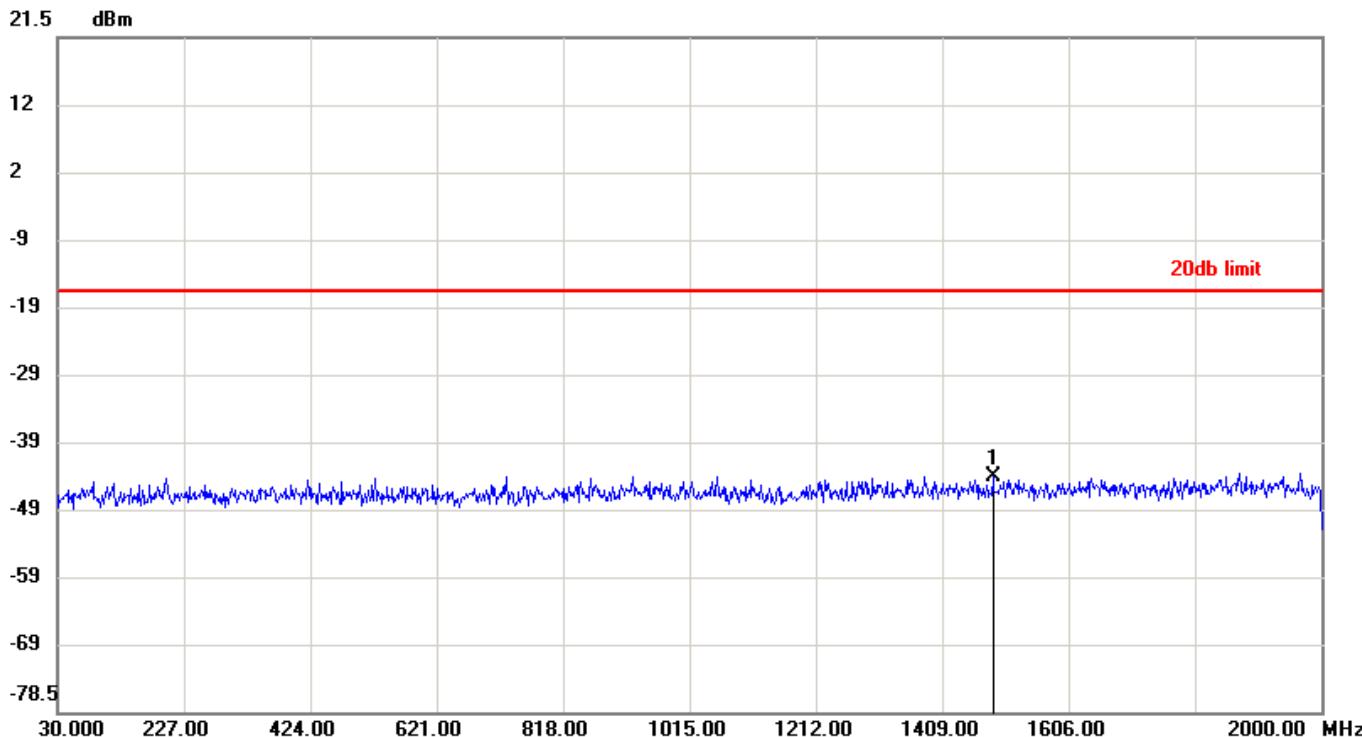
**Test plot as follows:**

Test mode:	802.11b	Test channel:	Lowest
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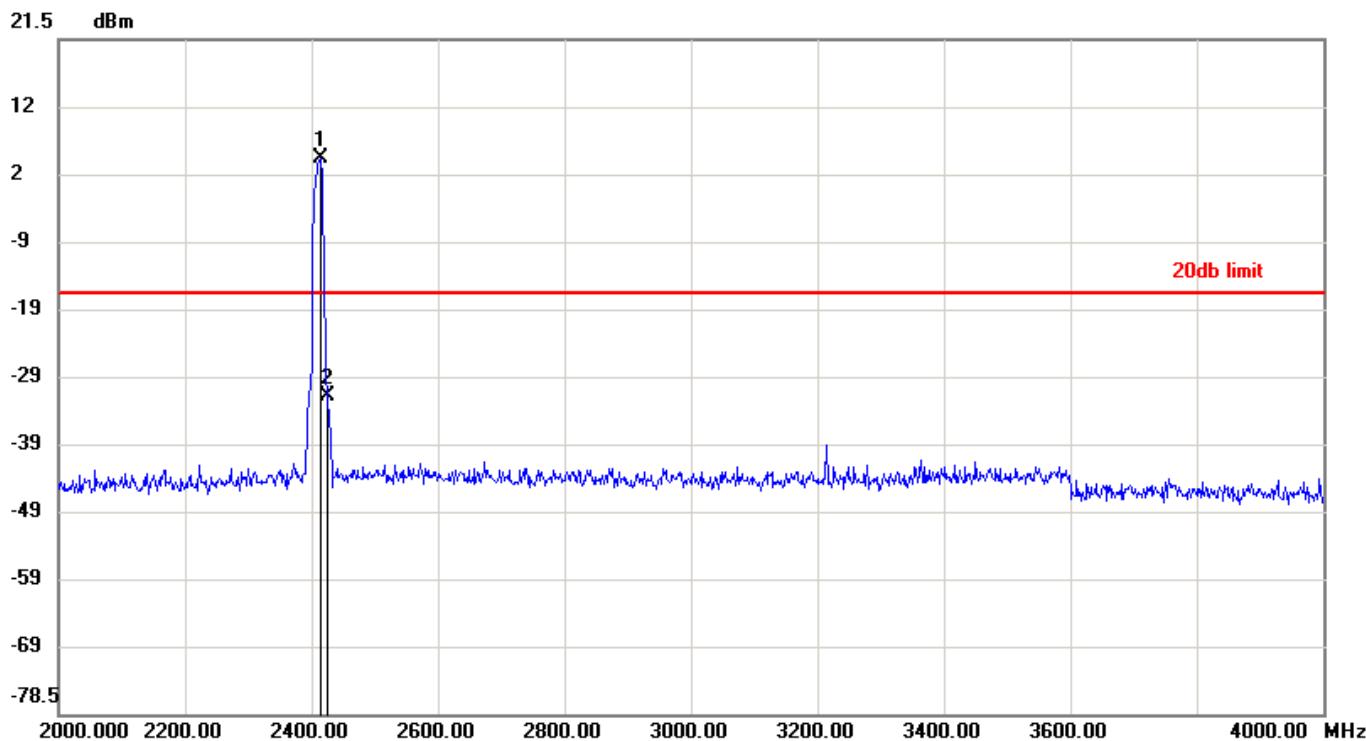
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2408.8087	3.87	-16.13	20.00
2	4823.4077	-35.93	-16.13	-19.80

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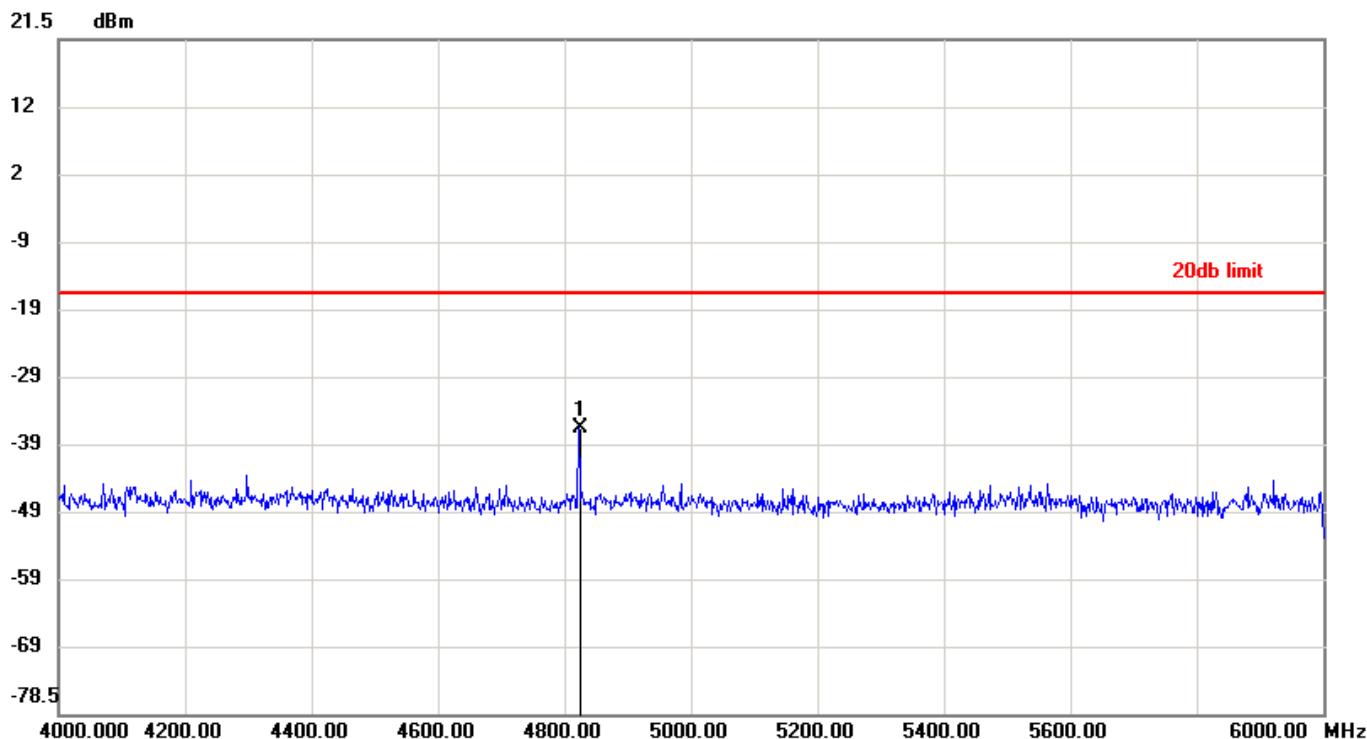


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1488.0627	-43.51	-16.03	-27.48

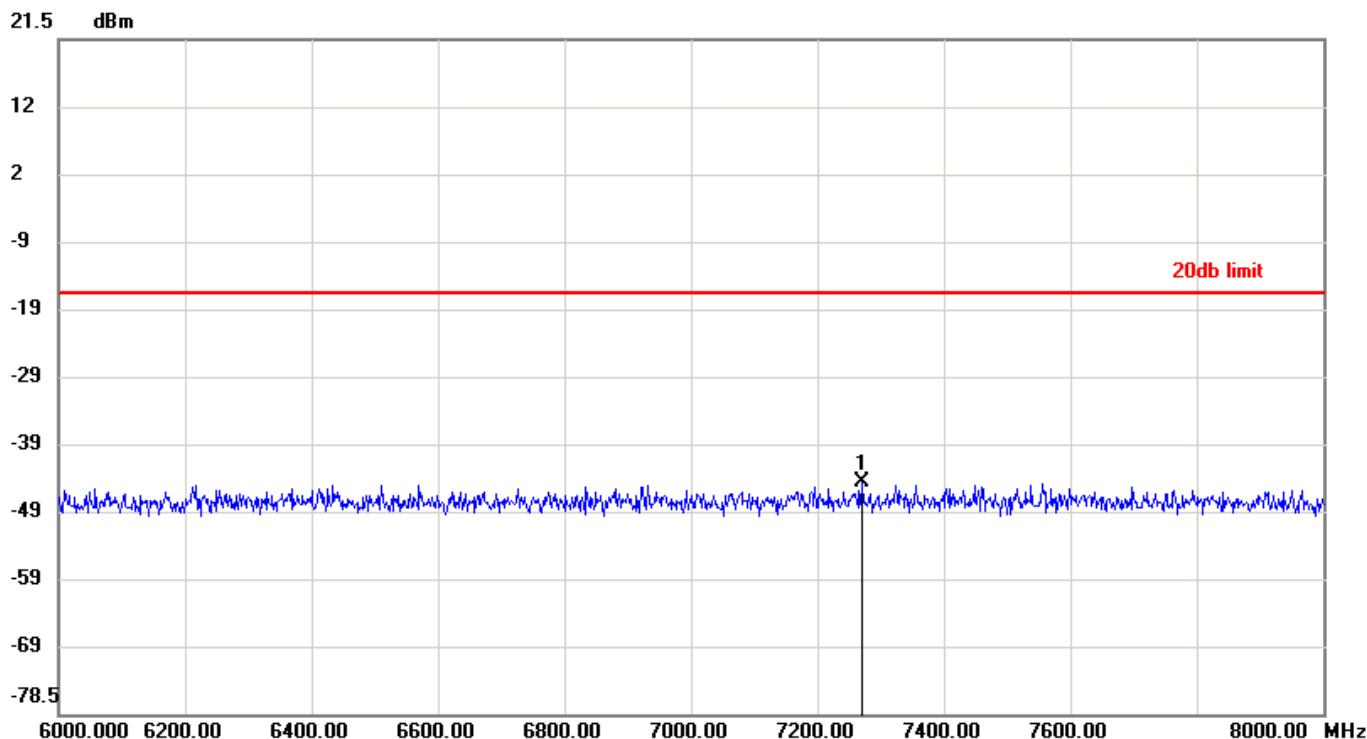
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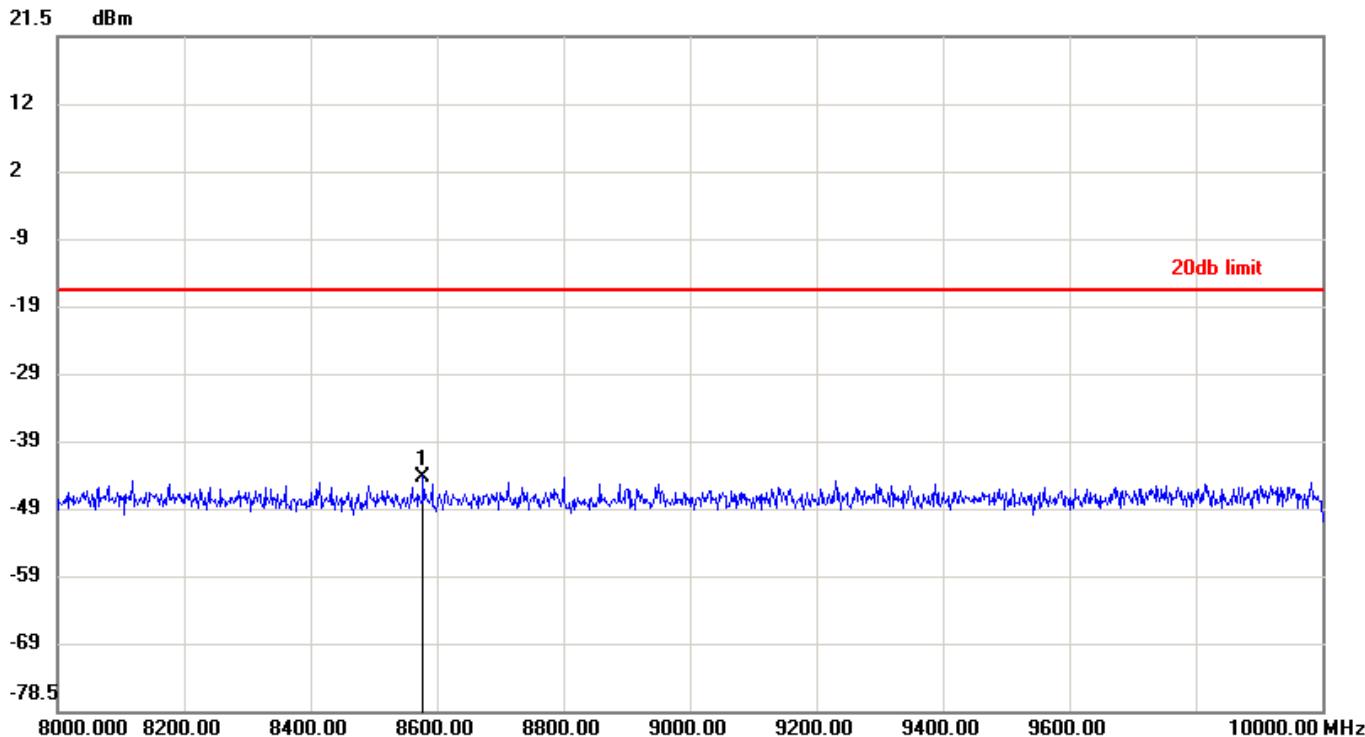
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2414.9333	3.97	-16.03	20.00
2	2426.4000	-31.40	-16.03	-15.37

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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	4823.8667	-36.16	-16.03	-20.13



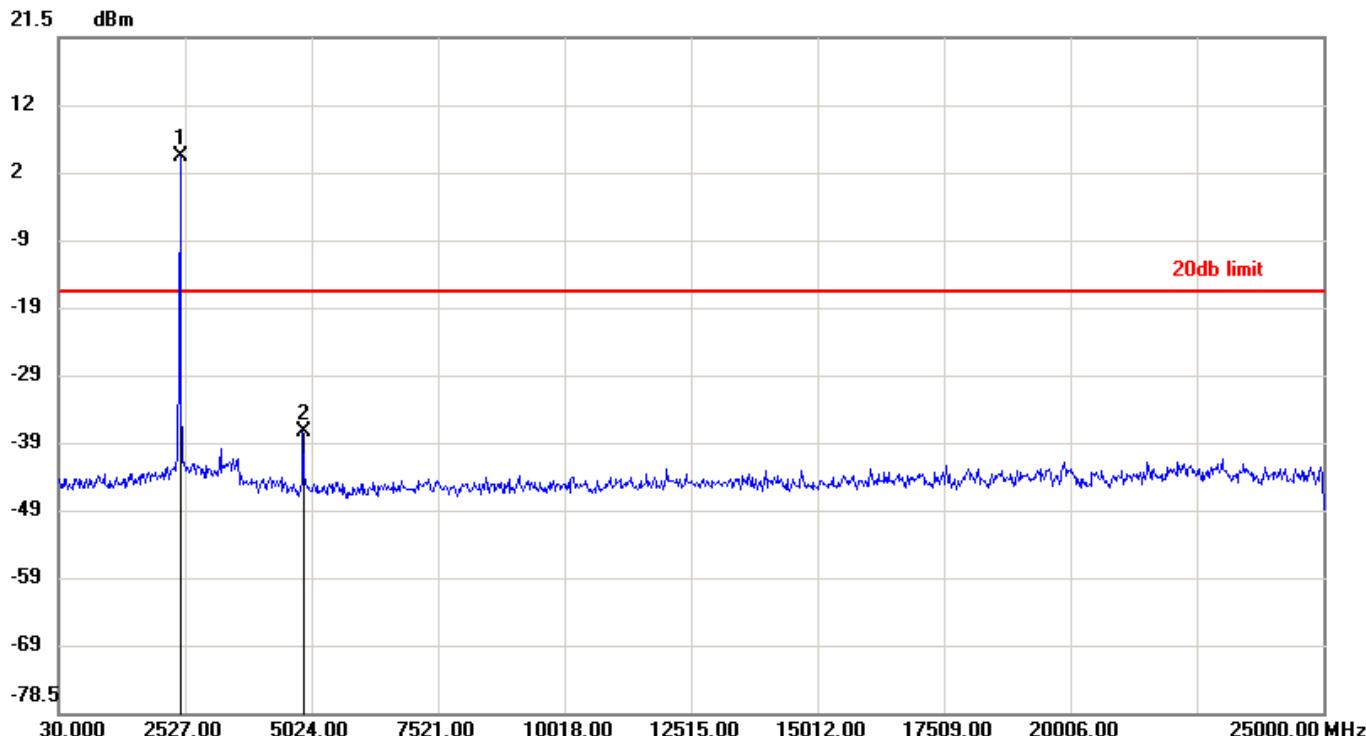
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	7271.0000	-44.22	-16.03	-28.19

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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	8578.3333	-43.75	-16.03	-27.72

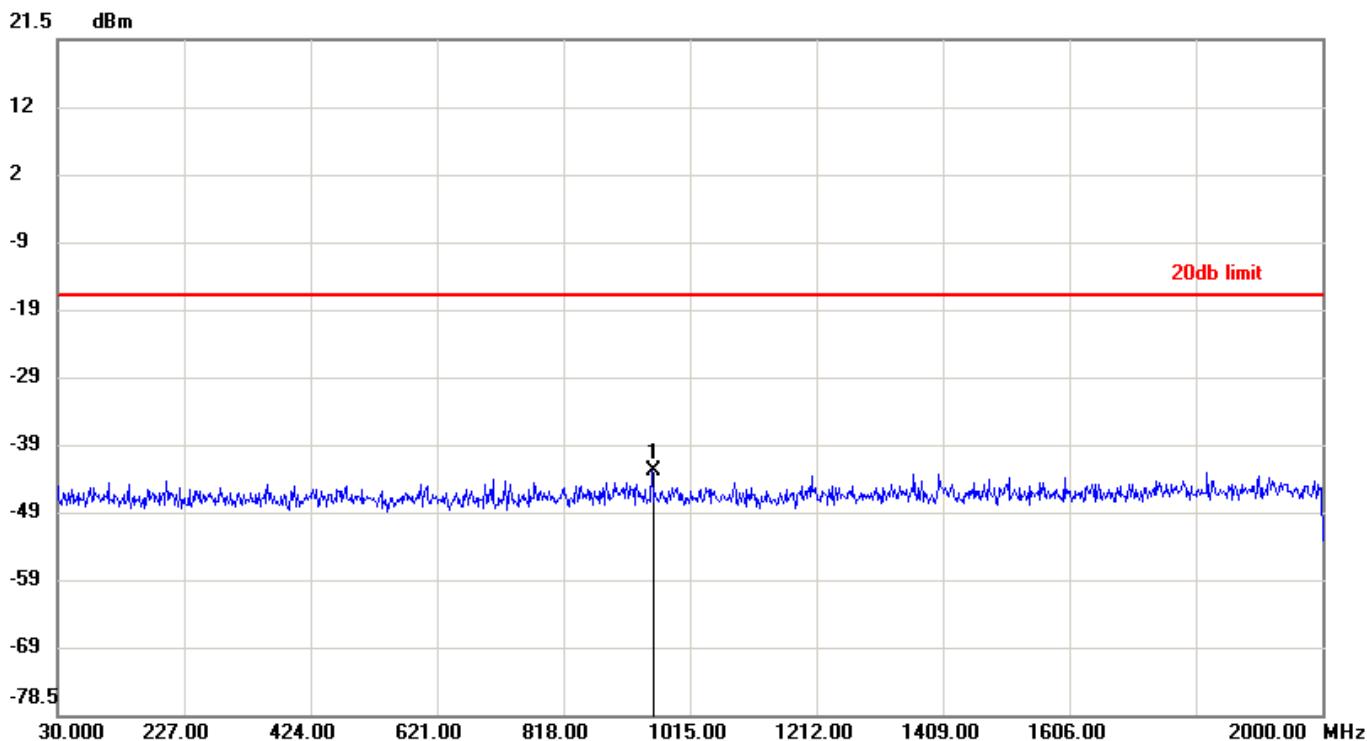
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Test mode:	802.11b	Test channel:	Middle
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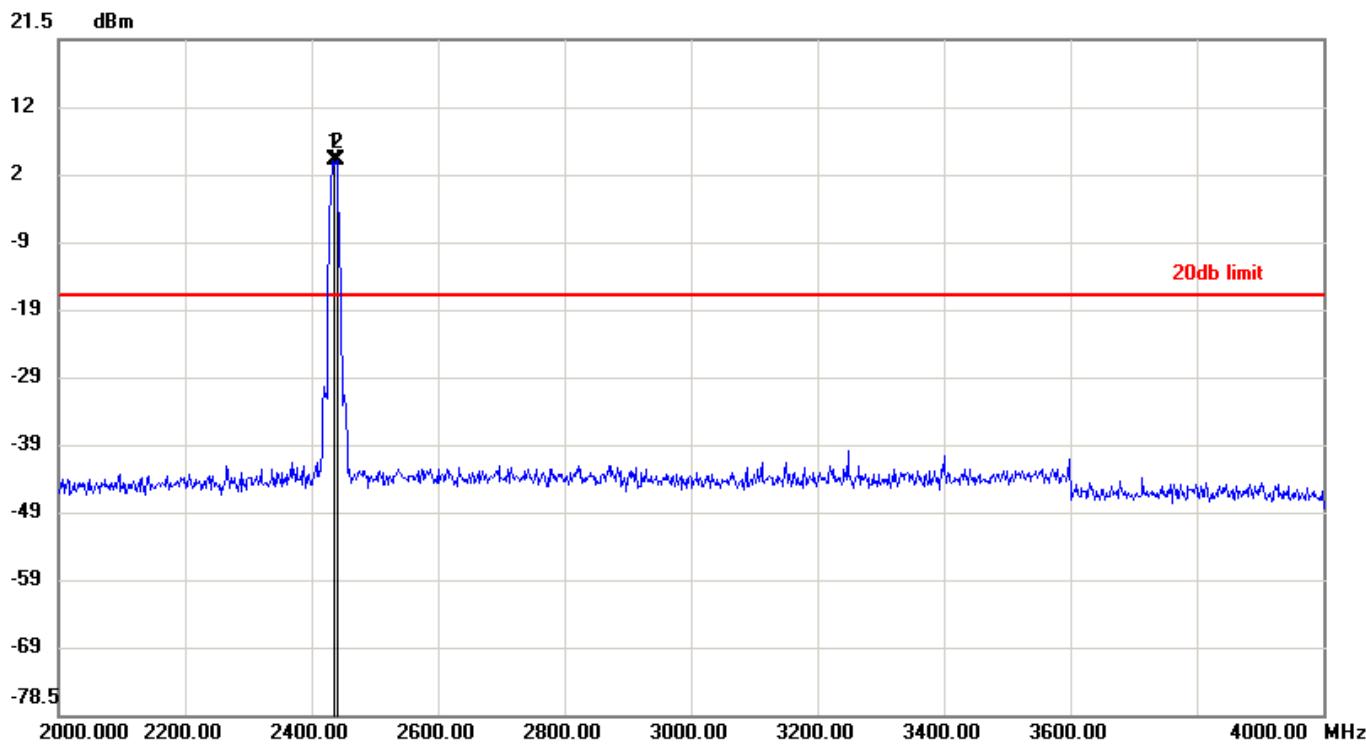
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2435.4433	3.85	-16.15	20.00
2	4873.3477	-36.79	-16.15	-20.64

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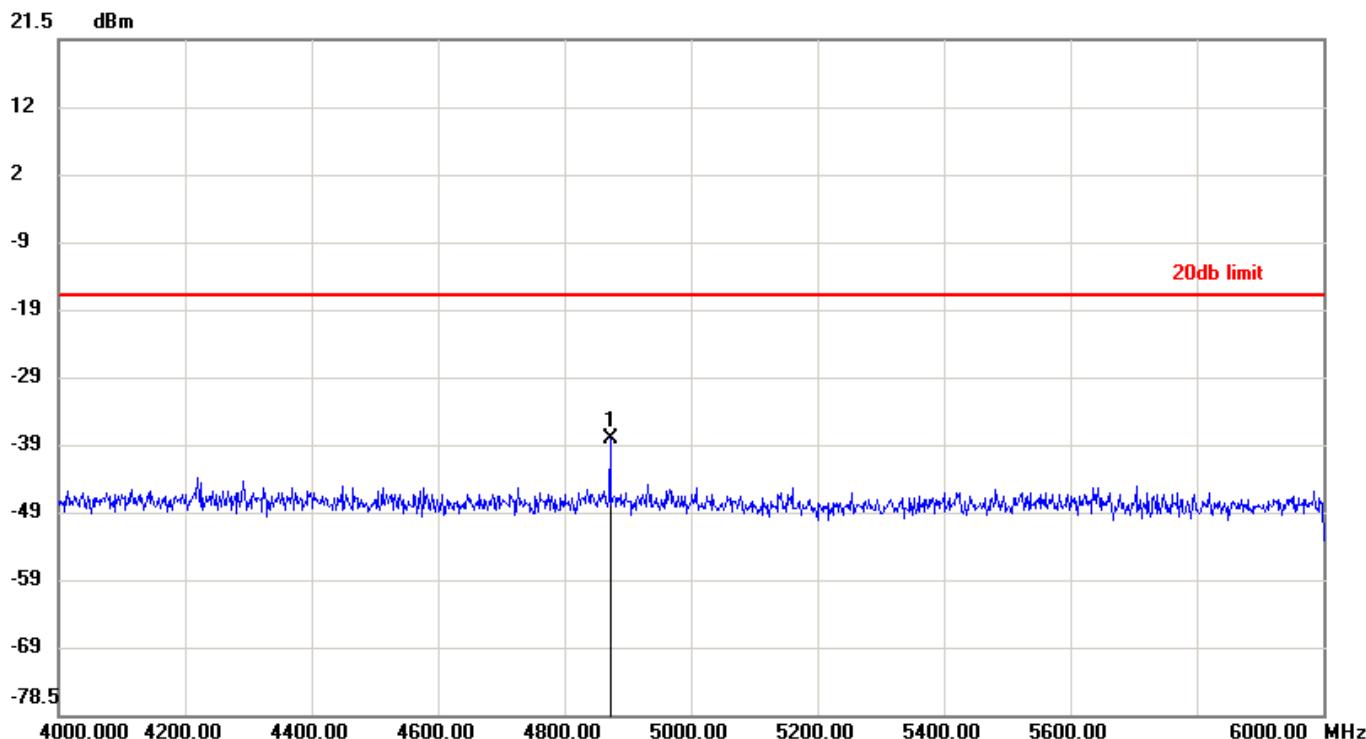
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	957.7387	-42.36	-16.25	-26.11

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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2435.8667	3.75	-16.25	20.00
2	2440.4000	3.55	-16.25	19.80

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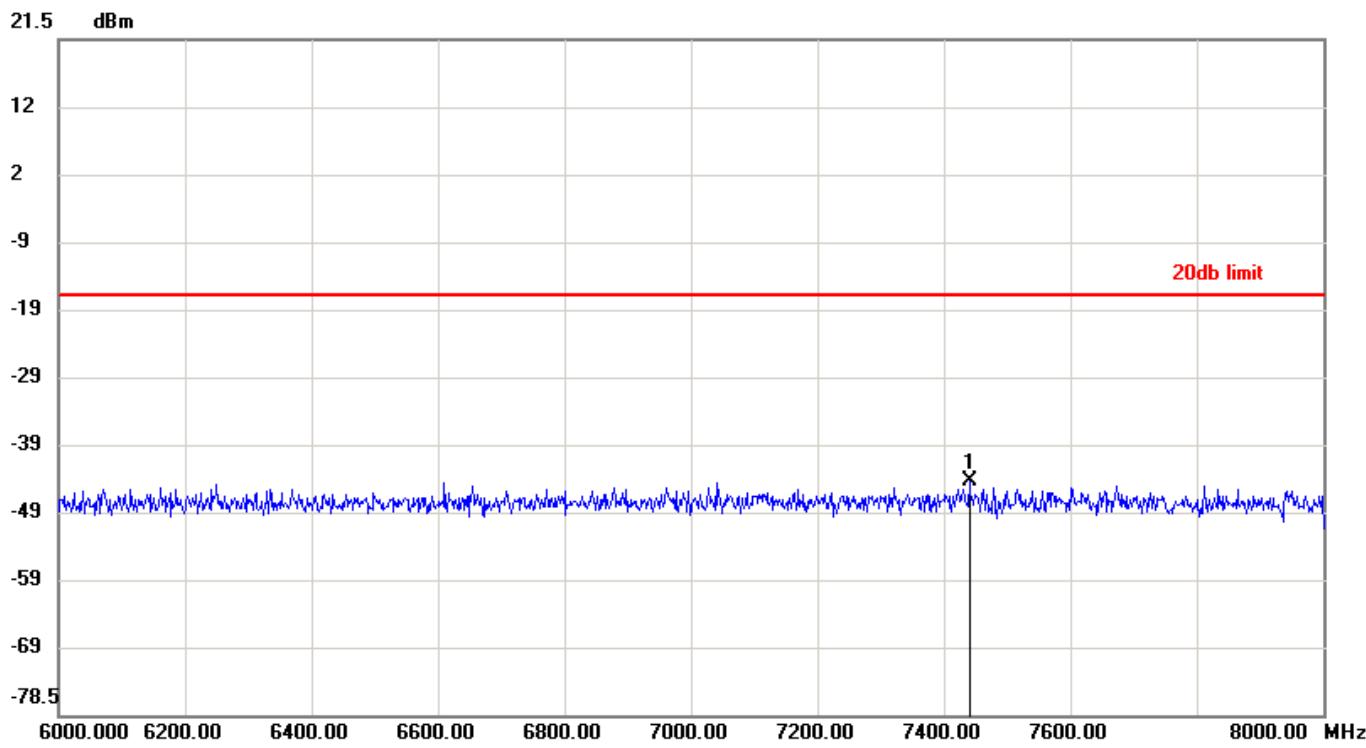


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	4873.8667	-37.54	-16.25	-21.29



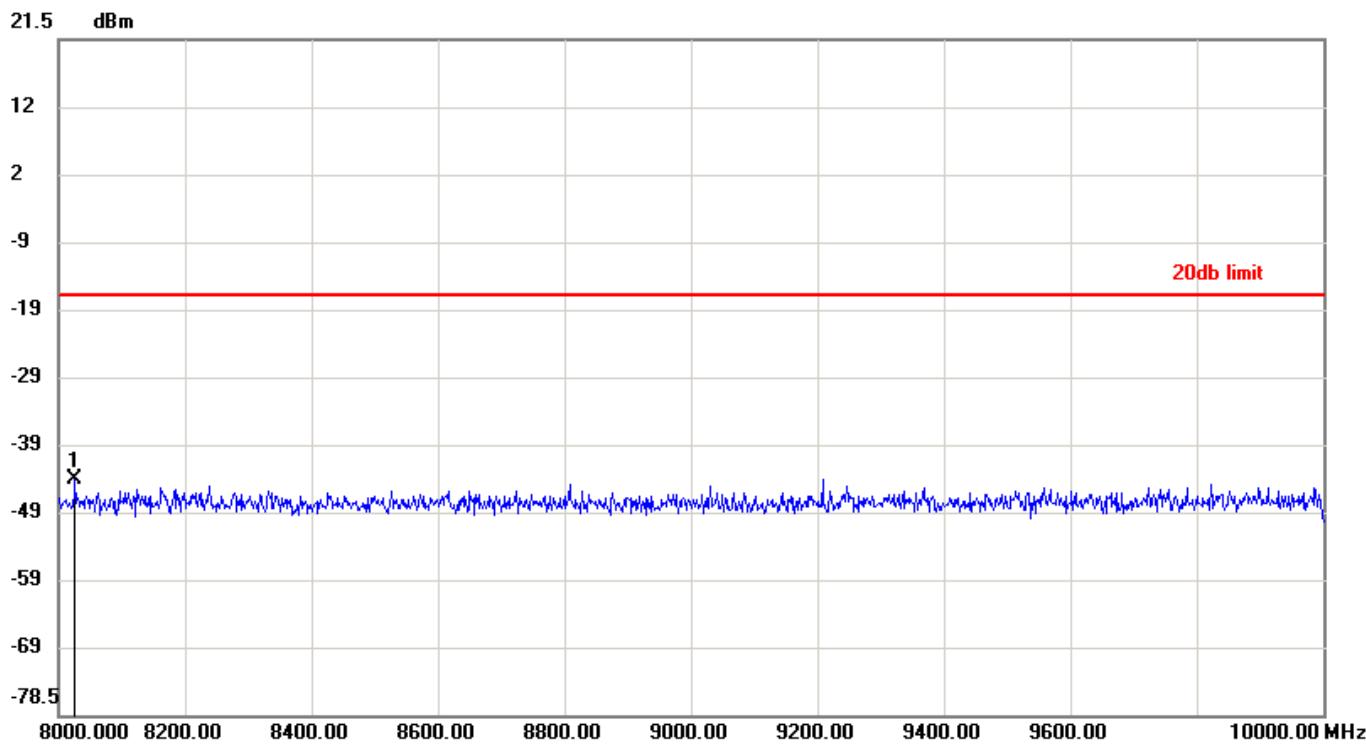
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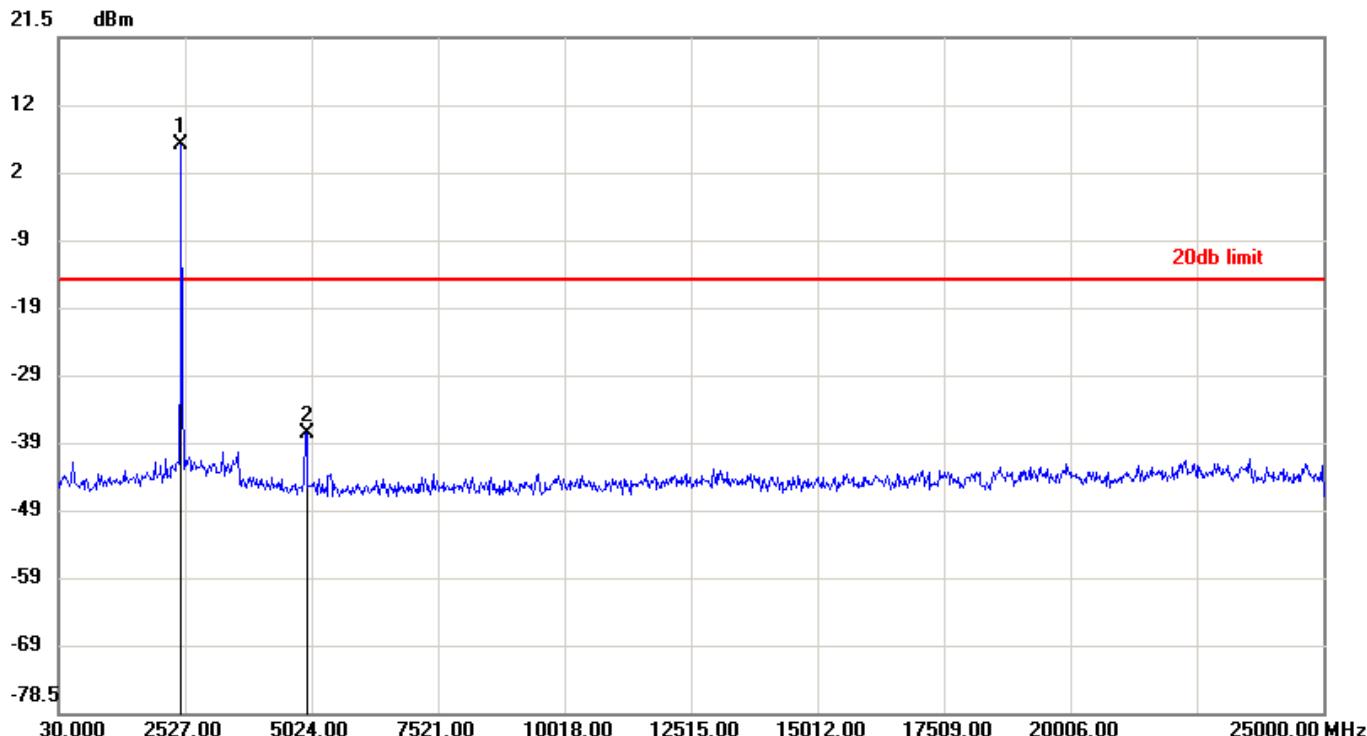
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	7441.2667	-43.94	-16.25	-27.69

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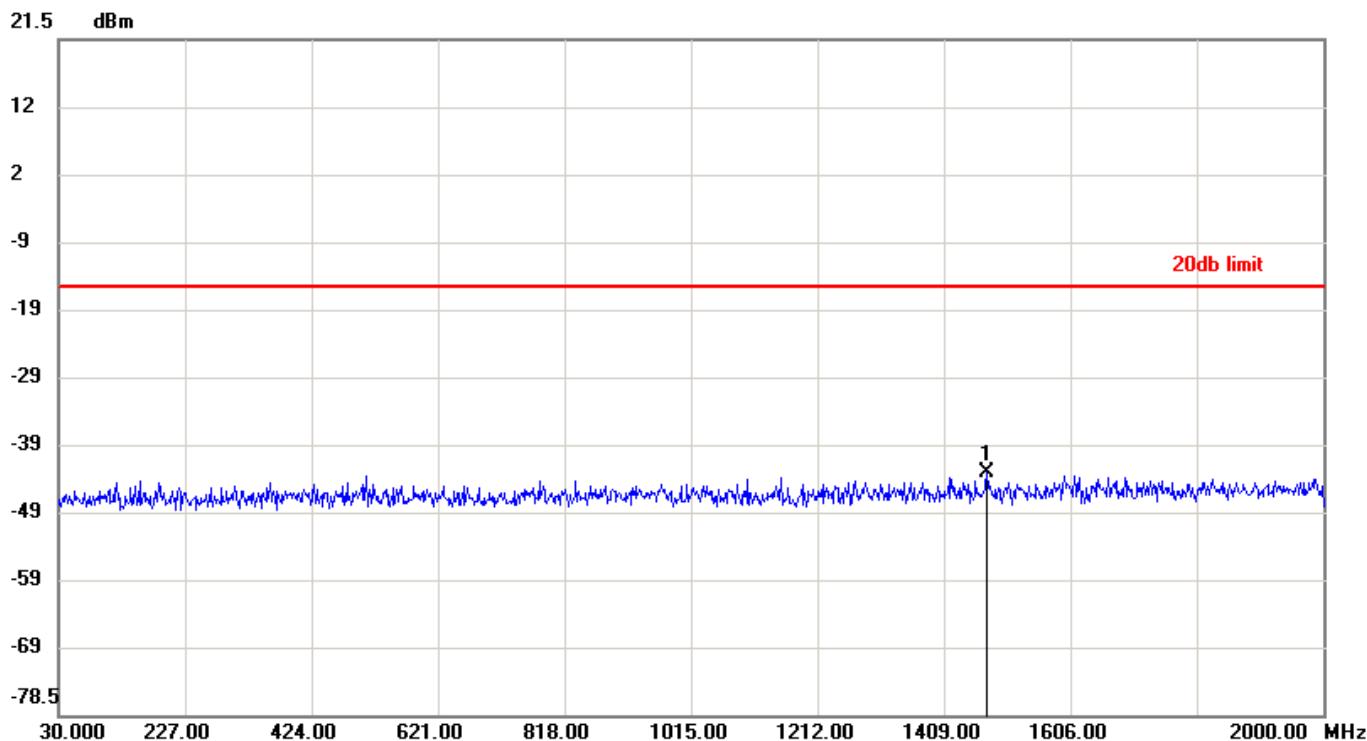
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	8026.7333	-43.60	-16.25	-27.35

Test mode:	802.11b	Test channel:	Highest
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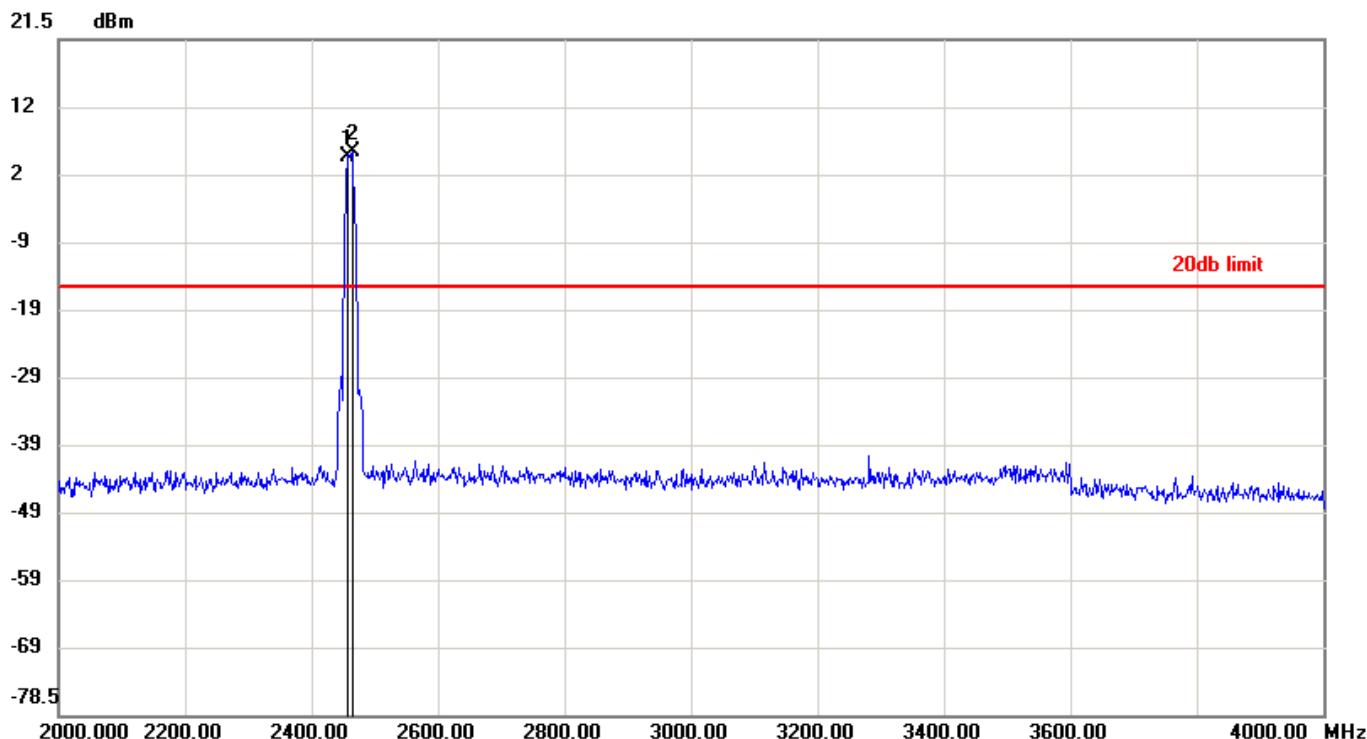


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2460.4133	5.74	-14.26	20.00
2	4924.1200	-37.13	-14.26	-22.87

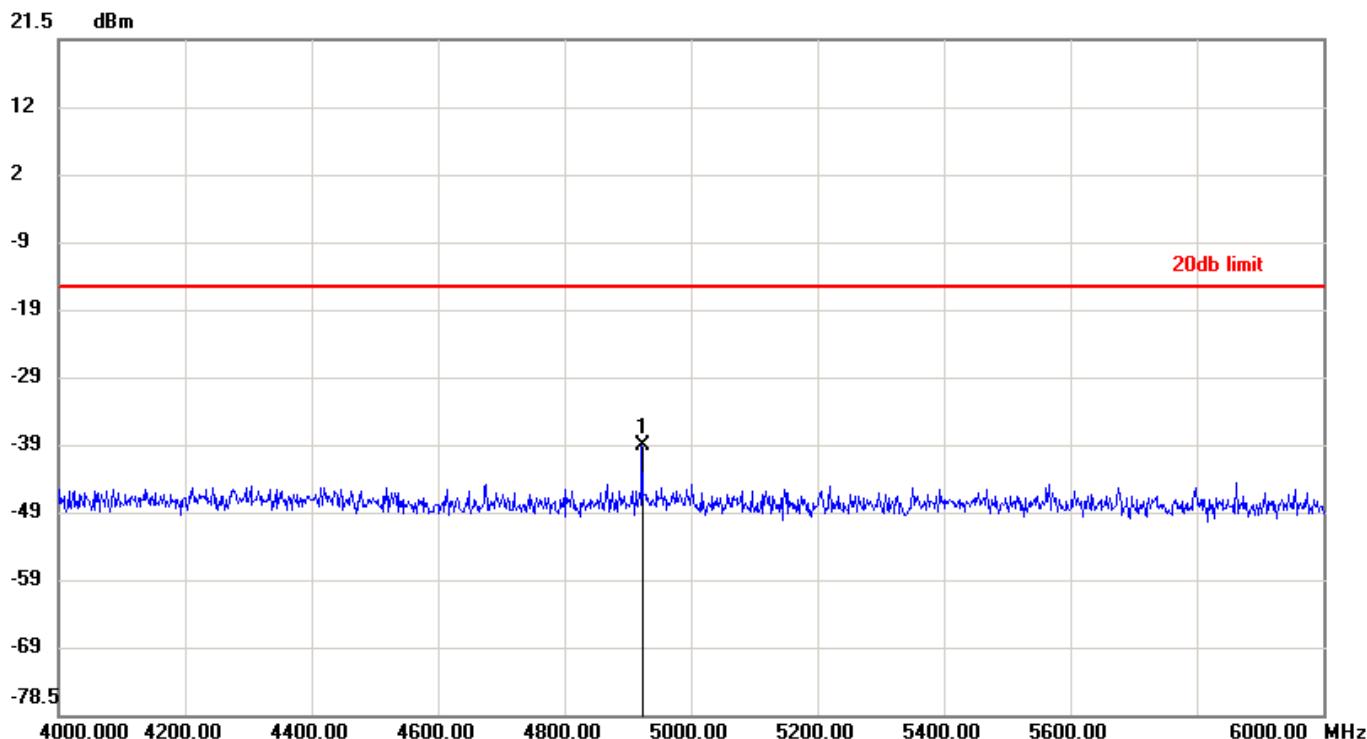
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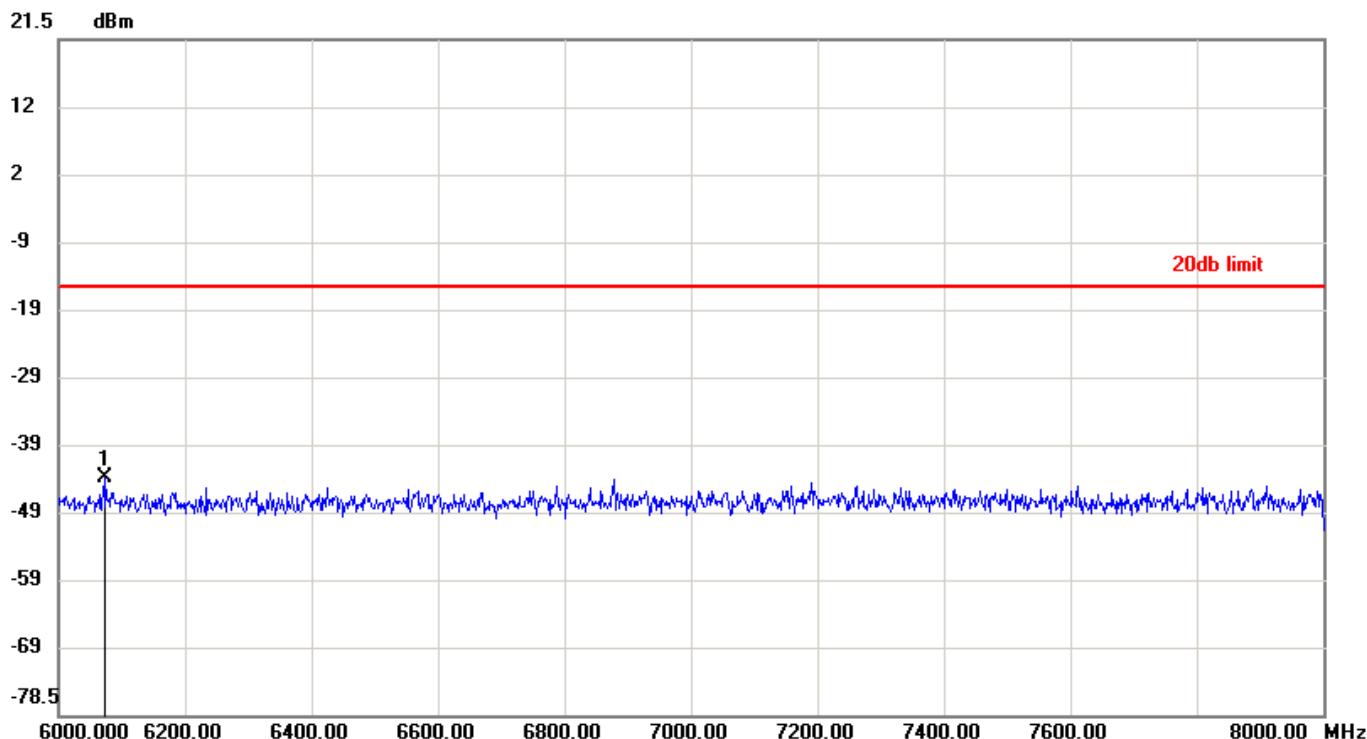
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1476.9650	-42.69	-15.17	-27.52



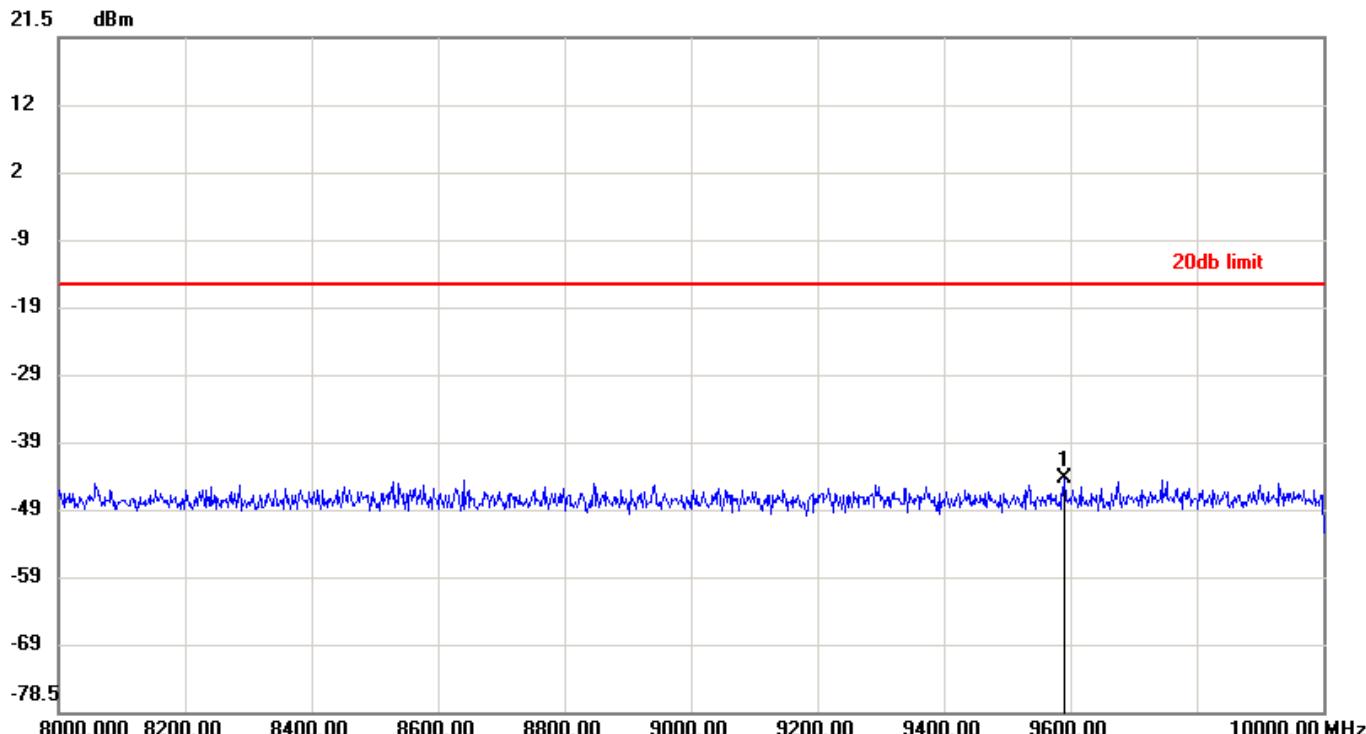
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2457.4000	4.25	-15.17	19.42
2	2465.4000	4.83	-15.17	20.00



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	4923.8667	-38.66	-15.17	-23.49

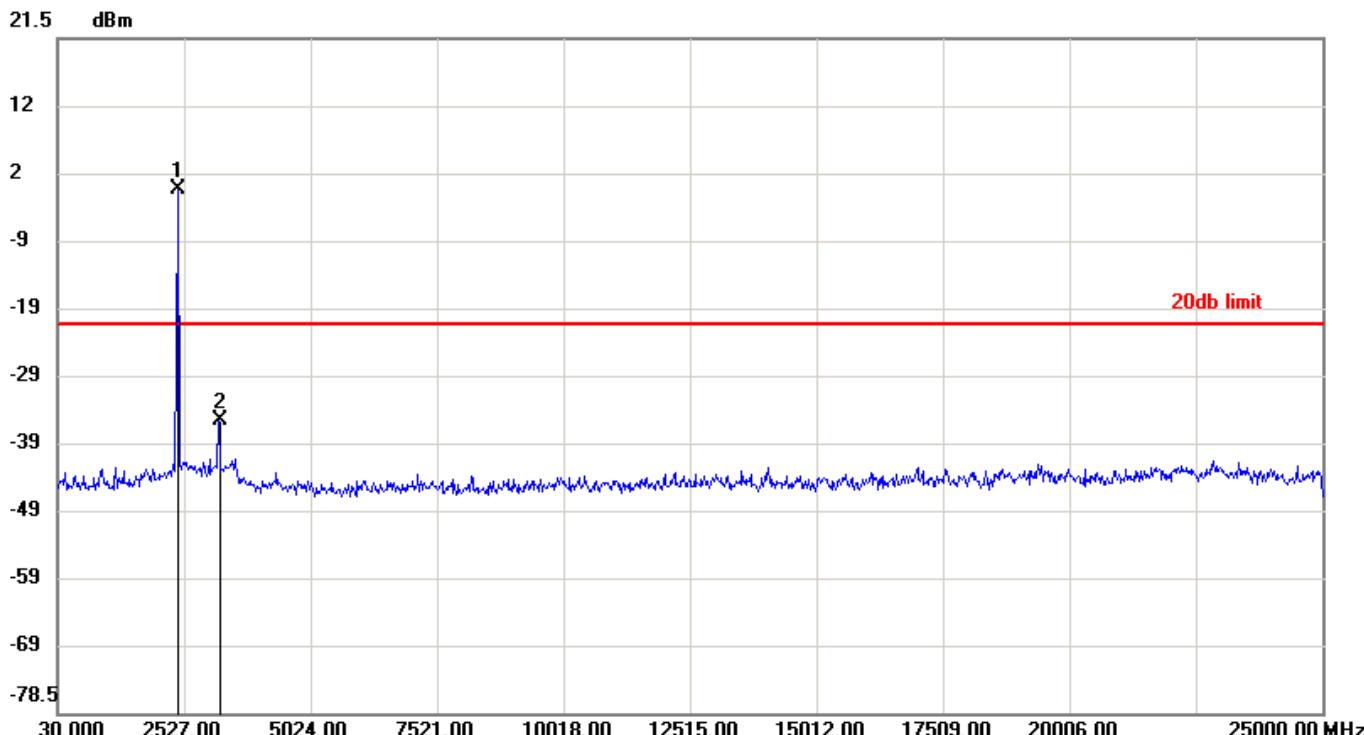
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	6075.2000	-43.27	-15.17	-28.10



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	9591.5333	-43.88	-15.17	-28.71

Test mode:	802.11g	Test channel:	Lowest
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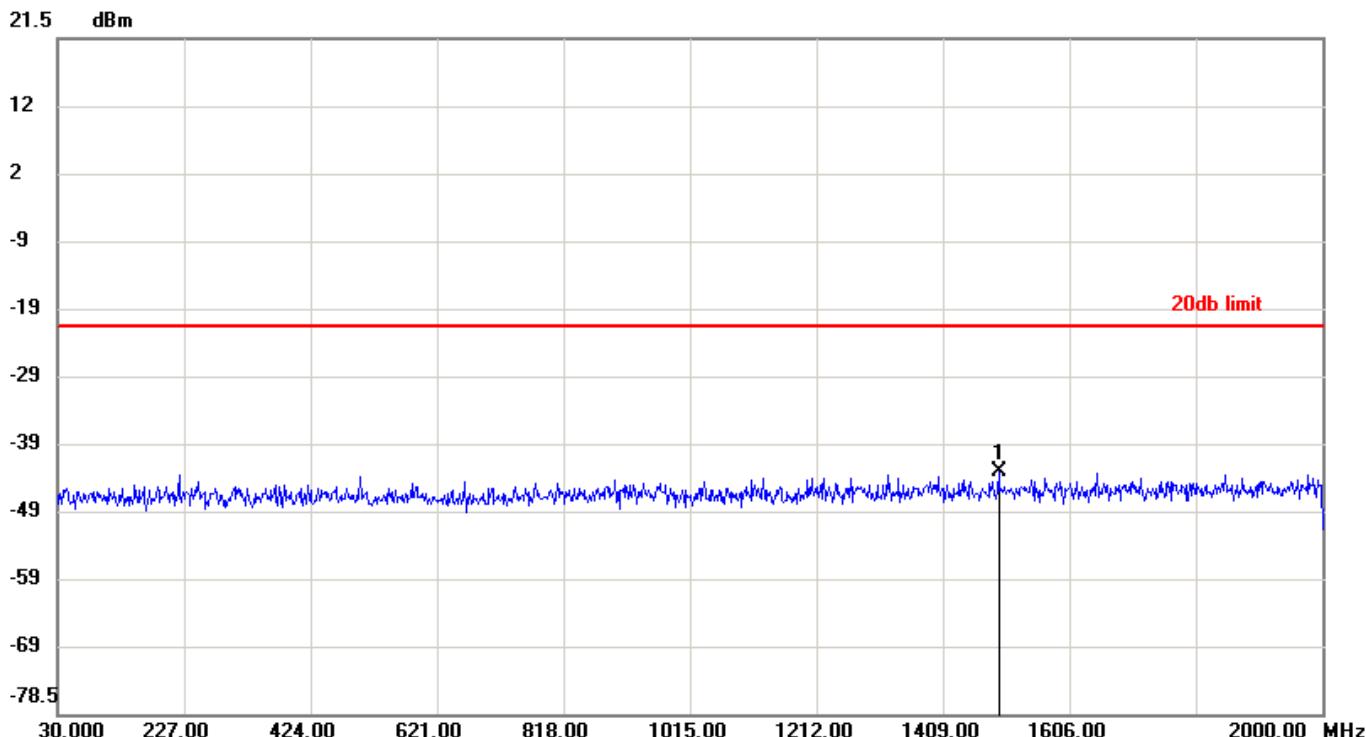


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2417.9643	-0.93	-20.93	20.00
2	3215.3397	-35.09	-20.93	-14.16



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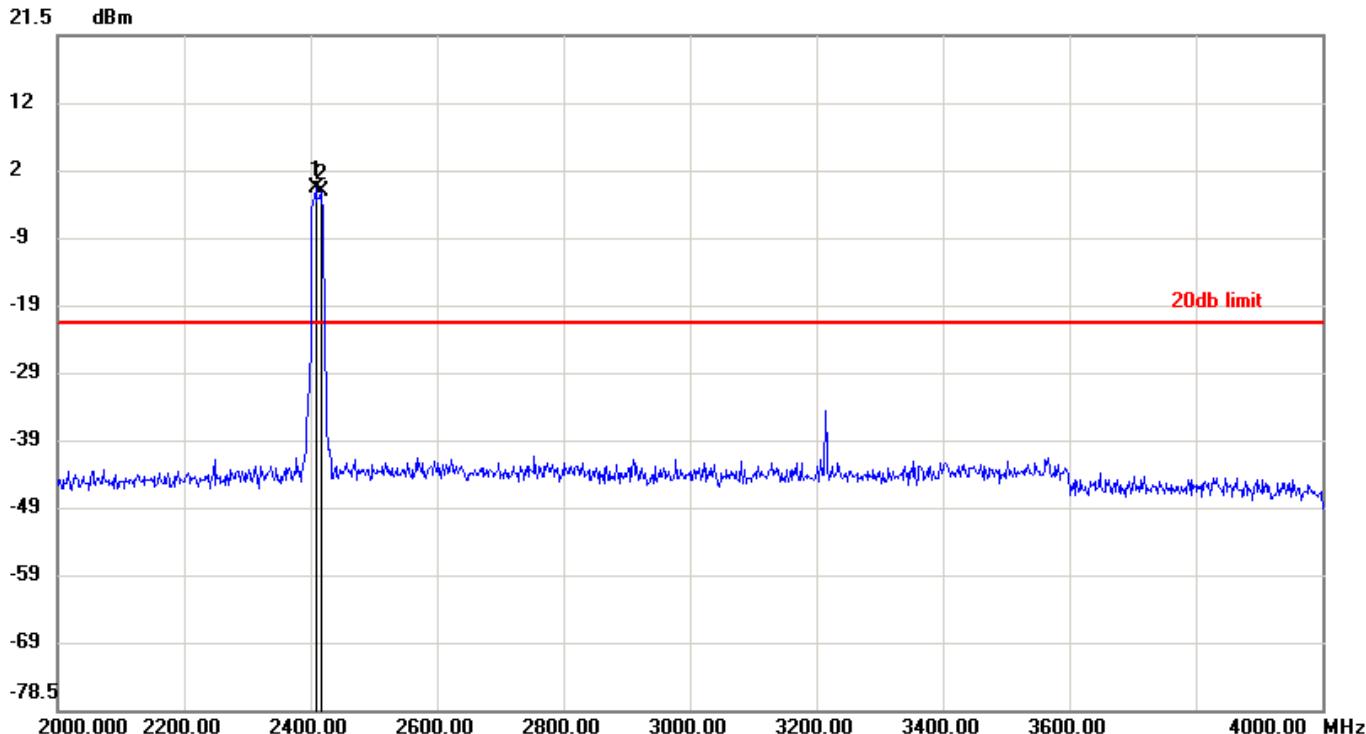
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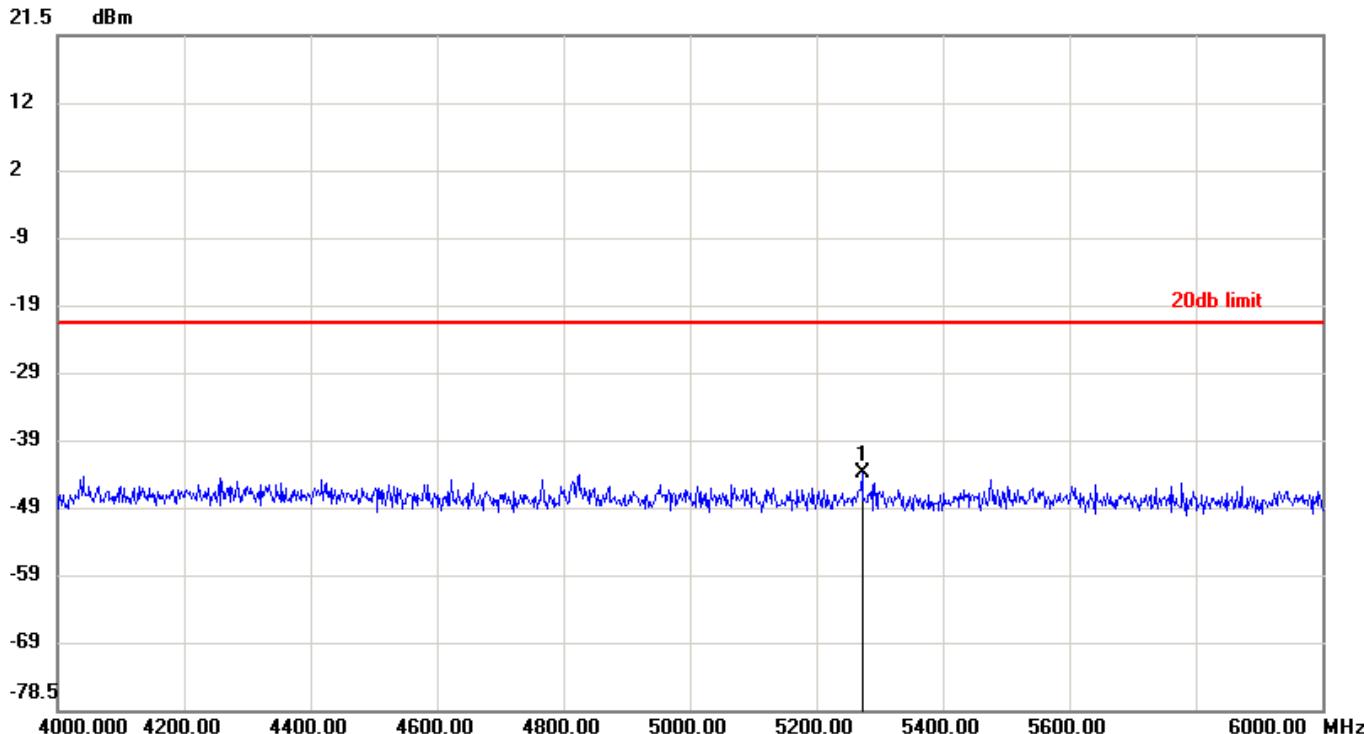
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1496.7307	-42.65	-21.21	-21.44



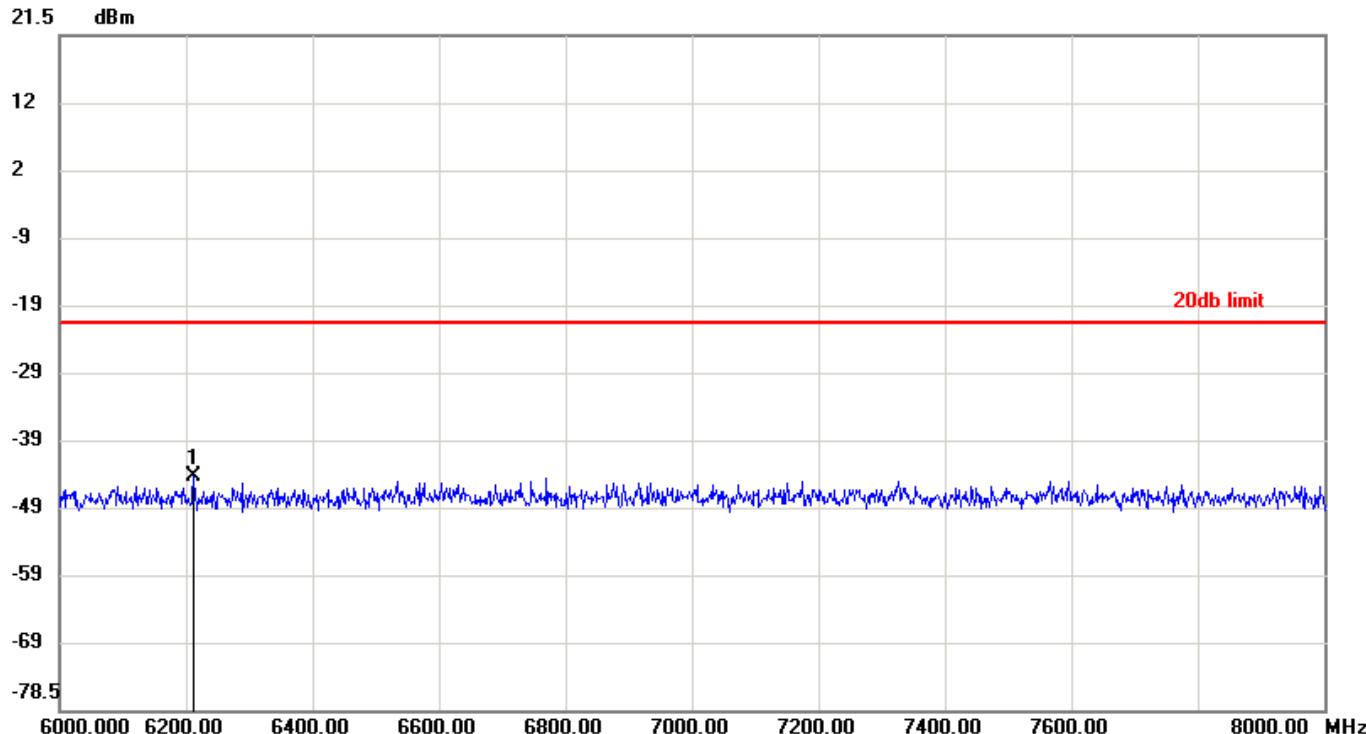
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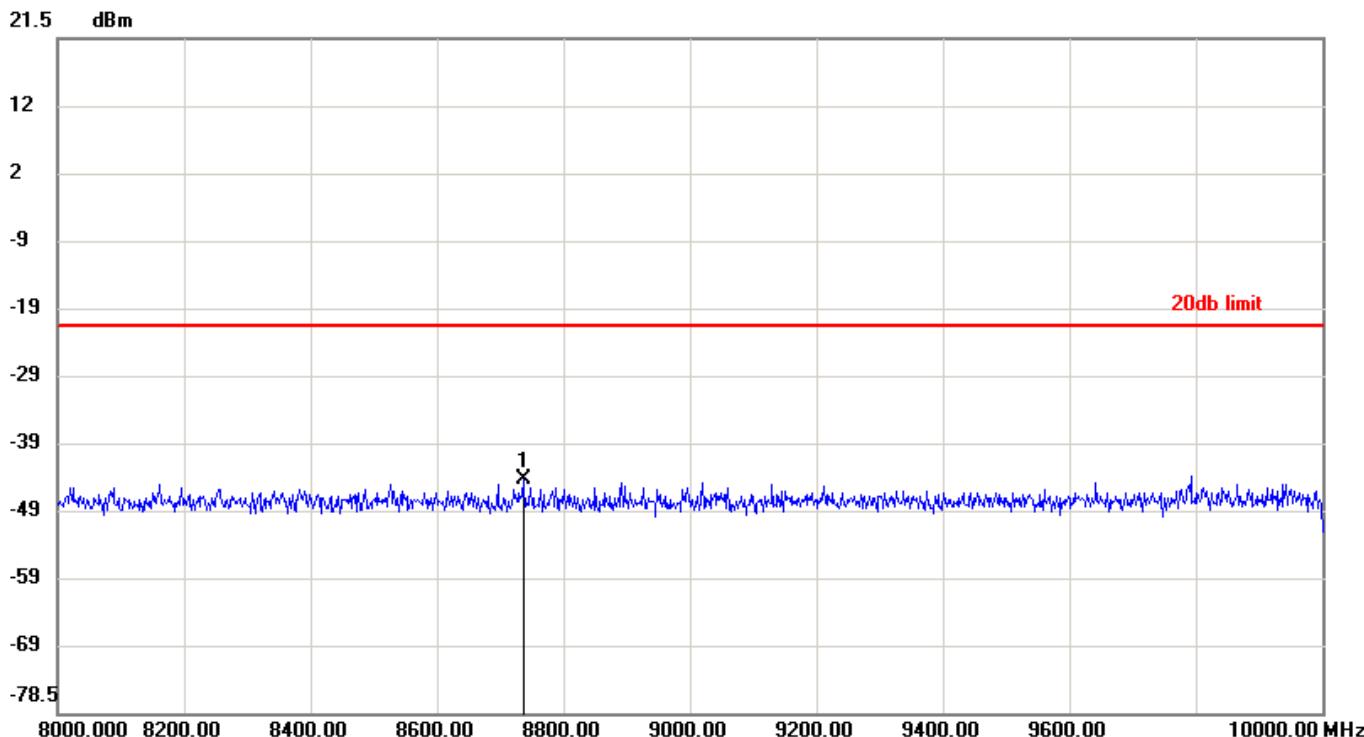
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2408.1333	-1.21	-21.21	20.00
2	2416.9333	-1.56	-21.21	19.65



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5273.1333	-43.41	-21.21	-22.20

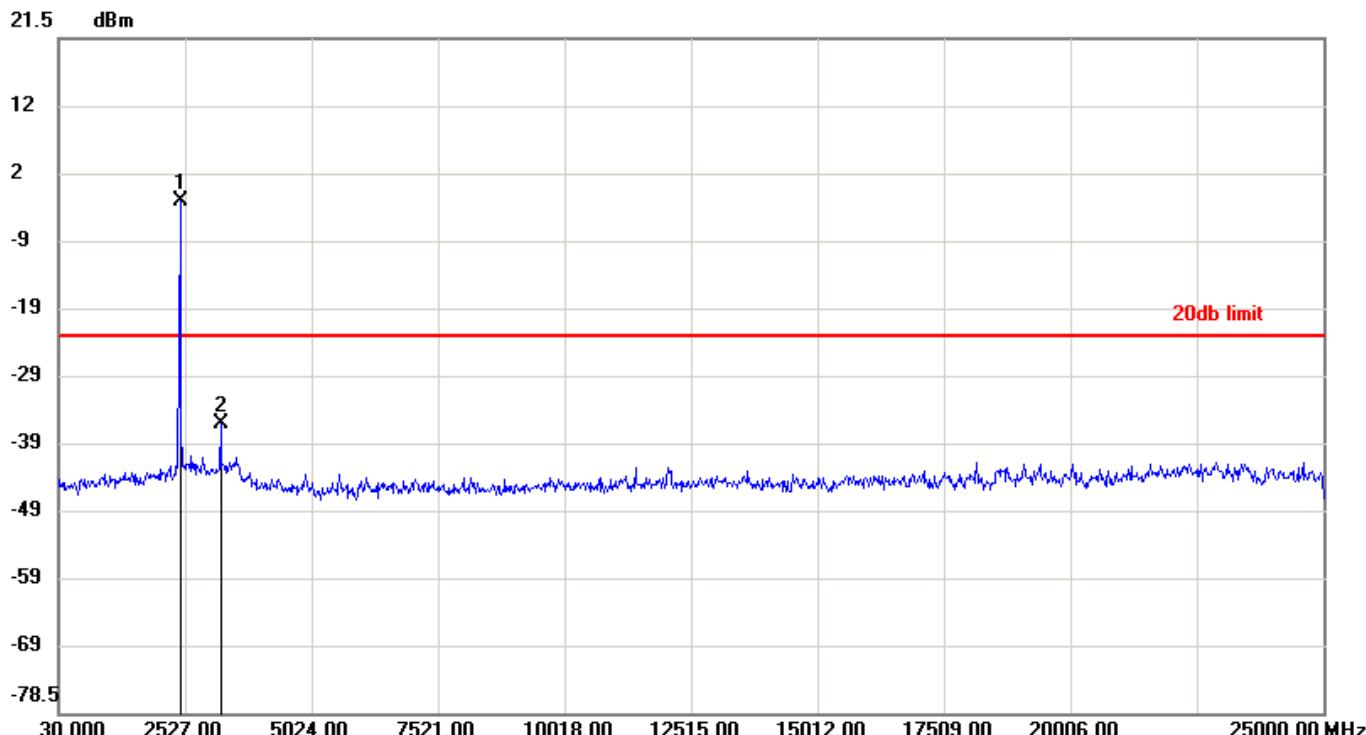


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	6213.6000	-43.77	-21.21	-22.56

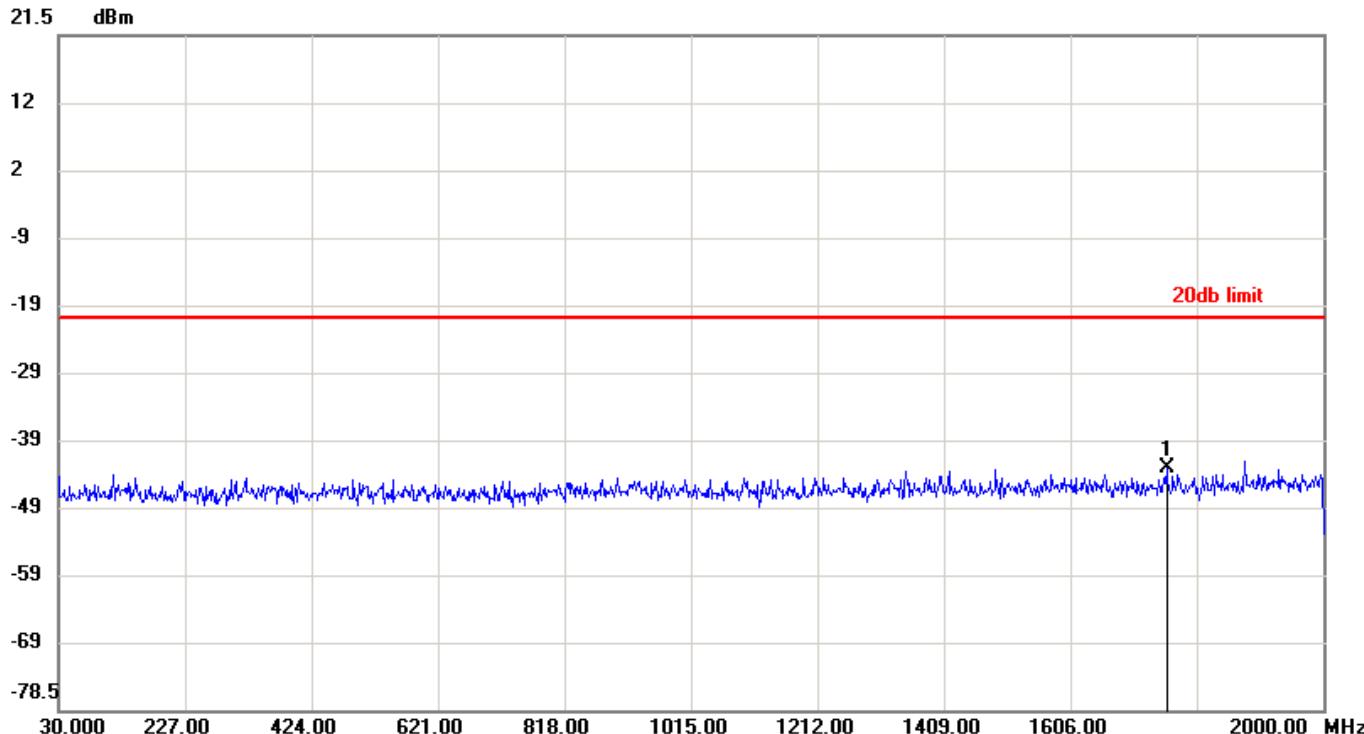


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	8736.8667	-43.95	-21.21	-22.74

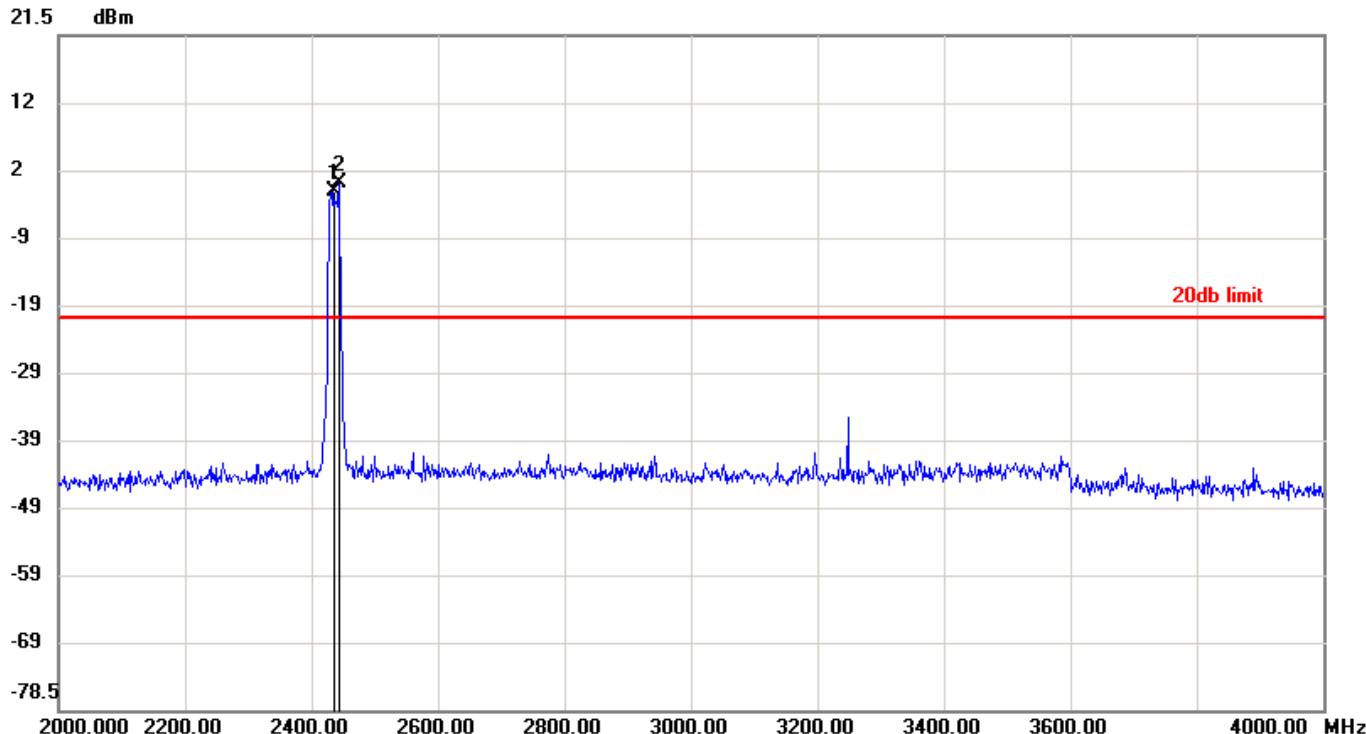
Test mode:	802.11g	Test channel:	Middle
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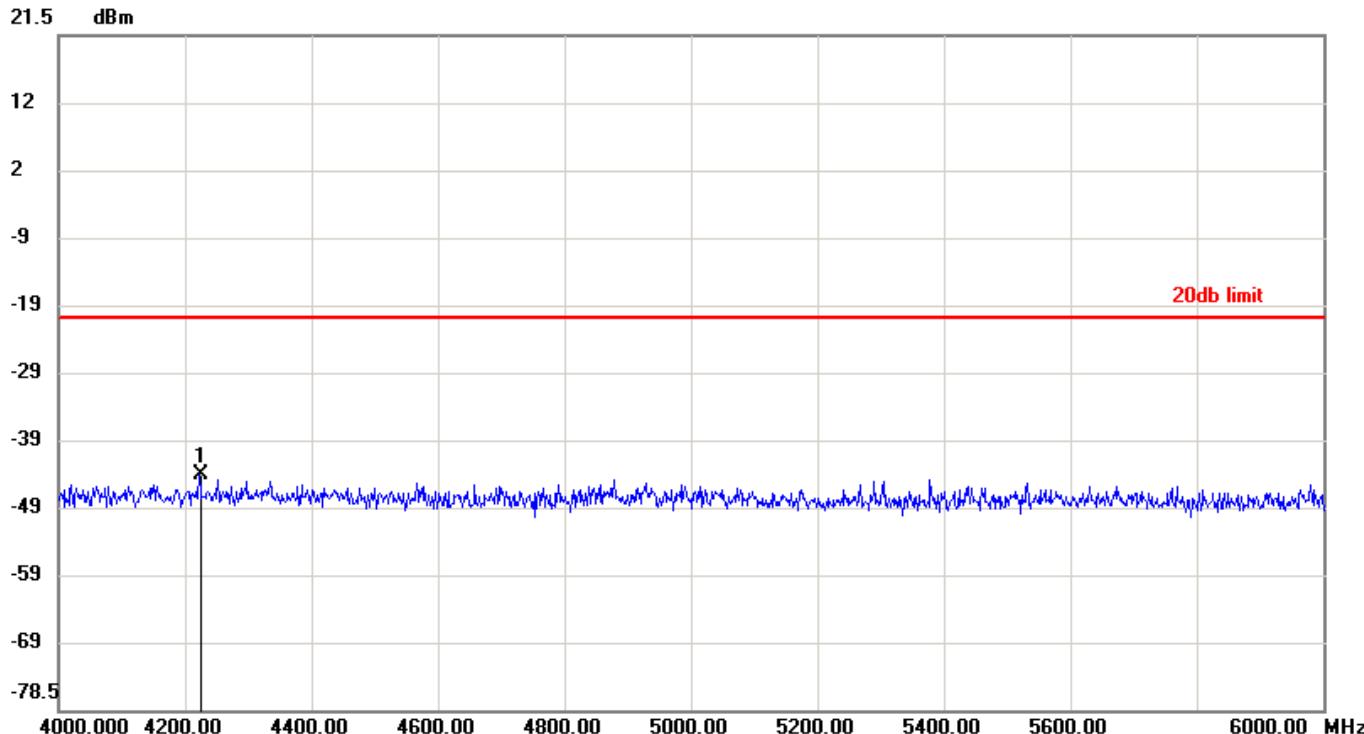
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2431.2817	-2.62	-22.62	20.00
2	3248.6330	-35.72	-22.62	-13.10



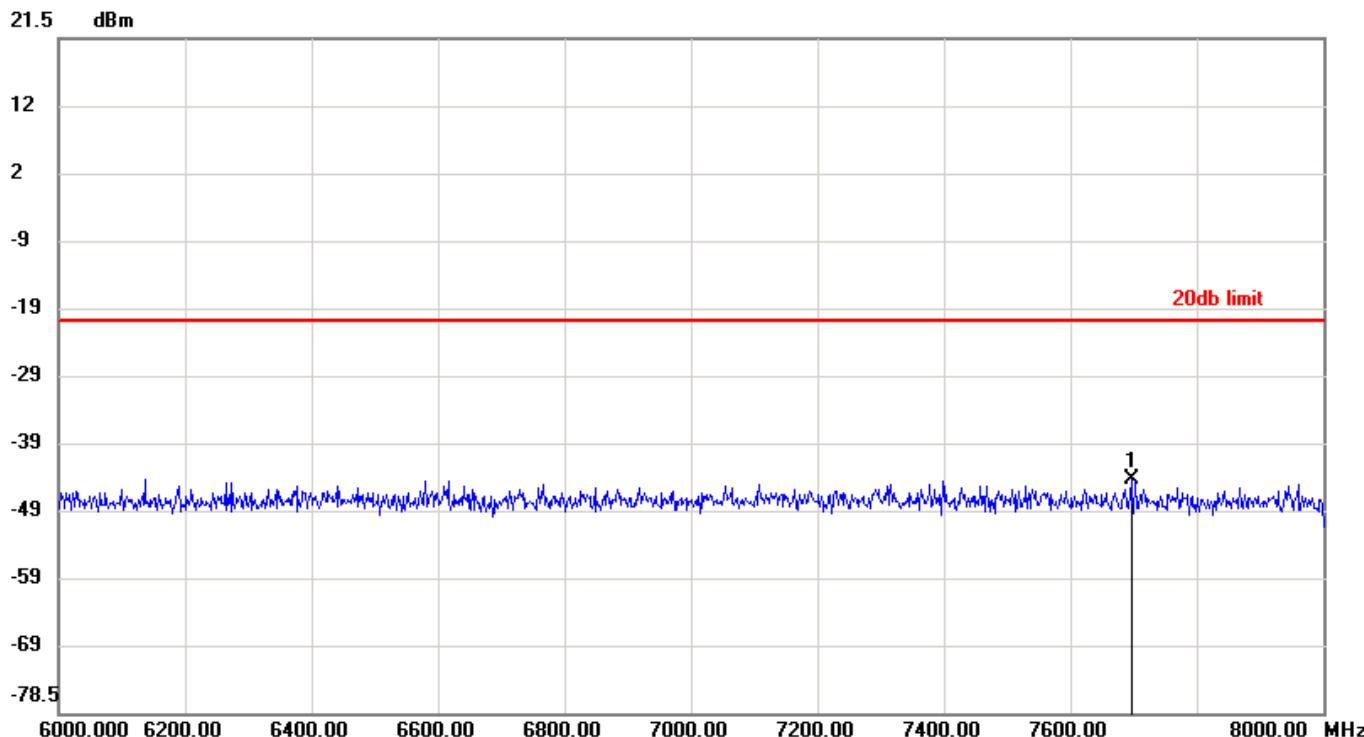
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1755.7200	-42.62	-20.45	-22.17



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2435.6667	-1.69	-20.45	18.76
2	2444.4000	-0.45	-20.45	20.00



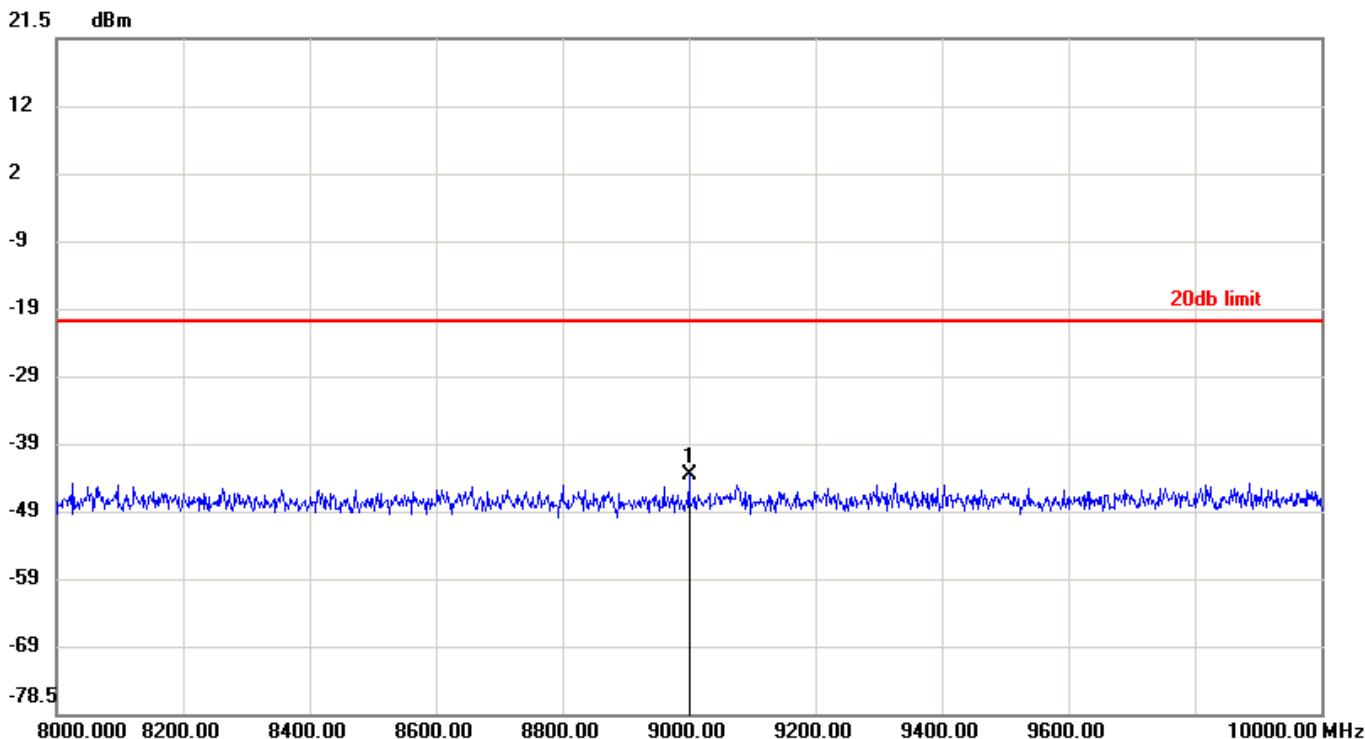
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	4222.8667	-43.73	-20.45	-23.28



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	7696.8667	-43.96	-20.45	-23.51



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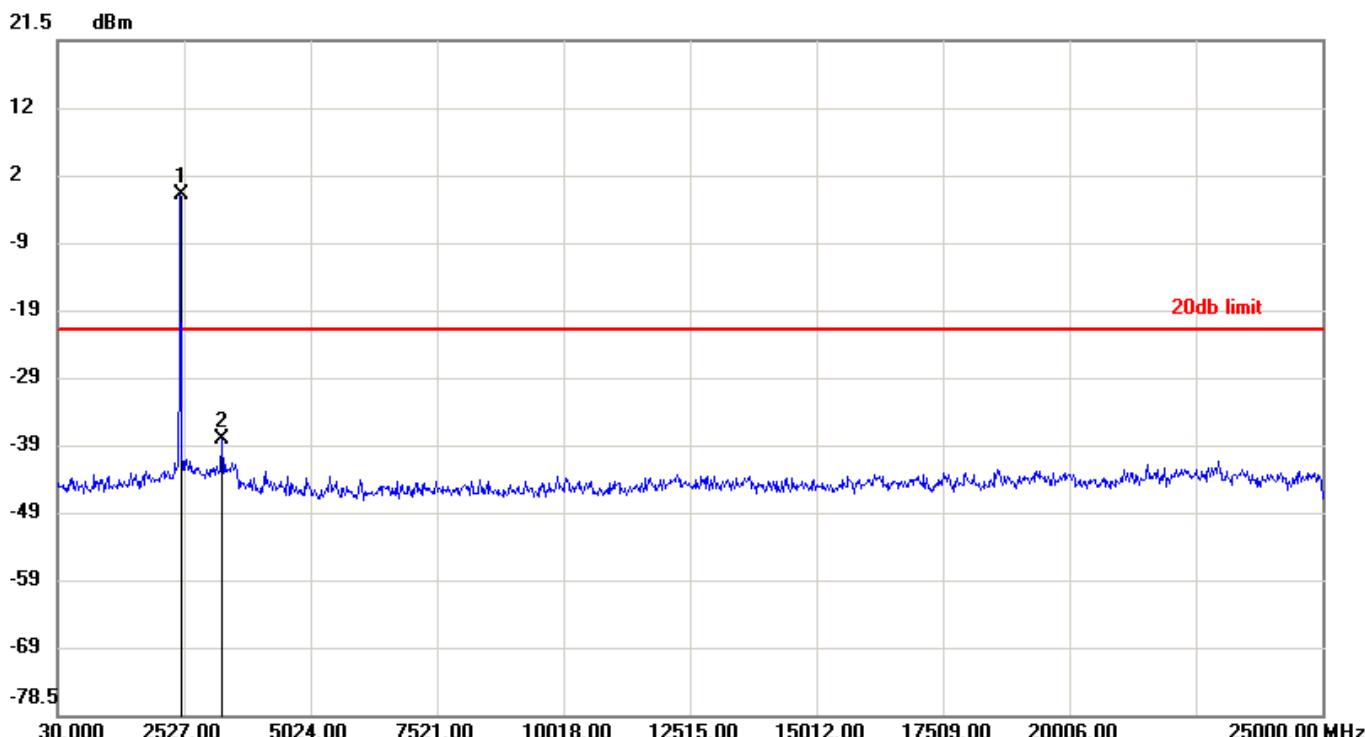


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	9001.4000	-43.20	-20.45	-22.75

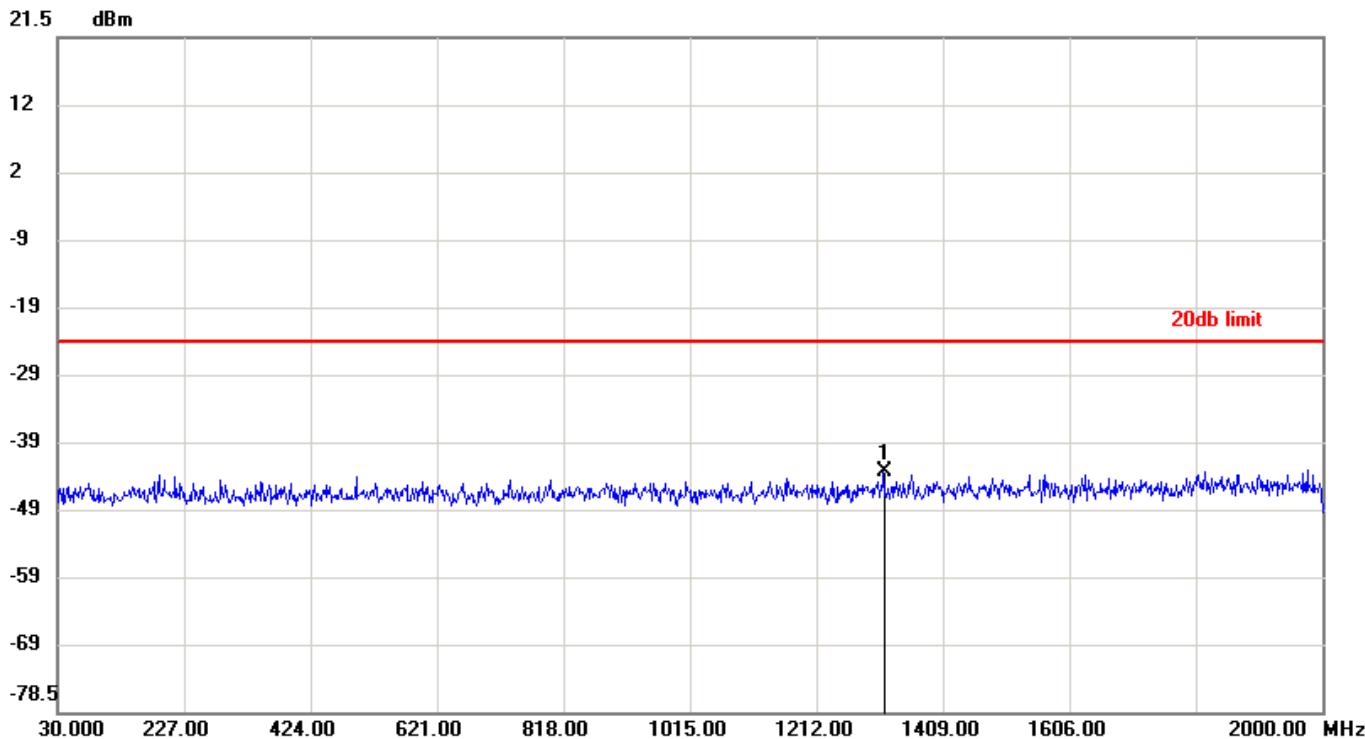


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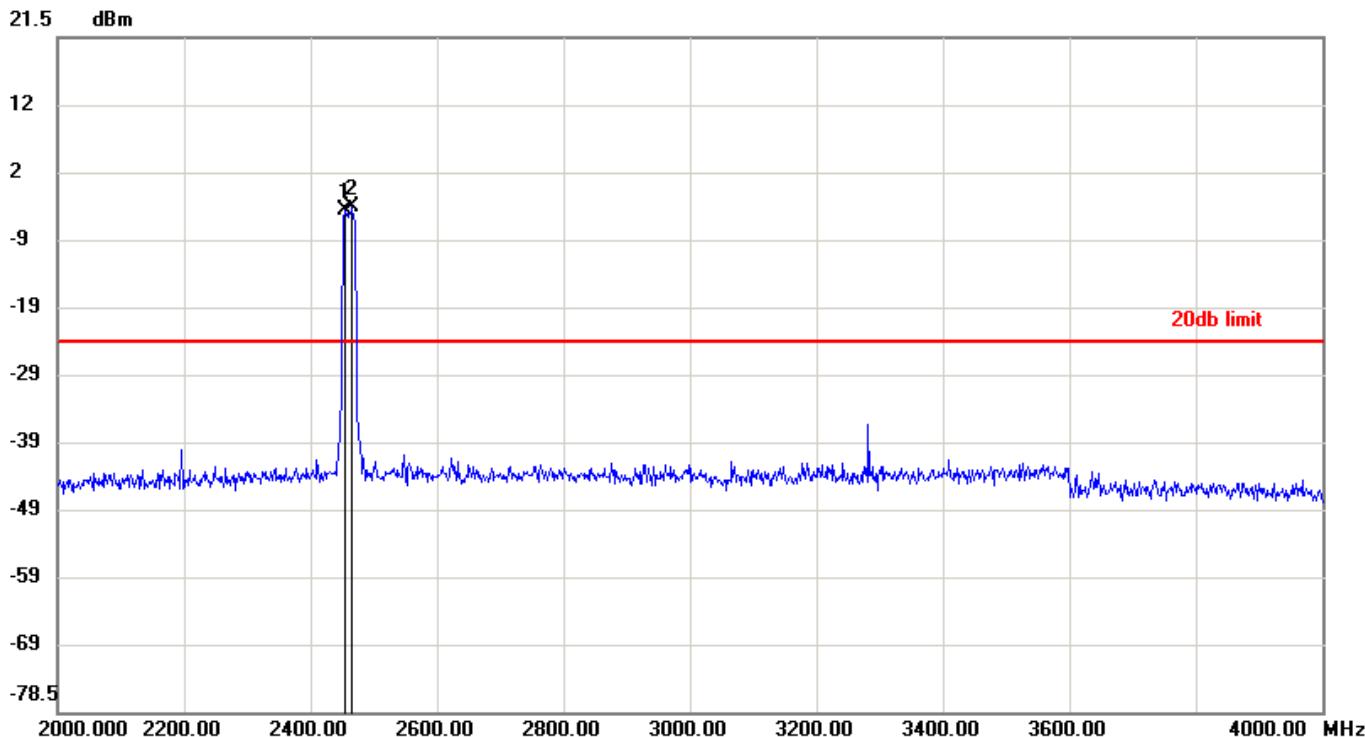
Test mode:	802.11g	Test channel:	Highest
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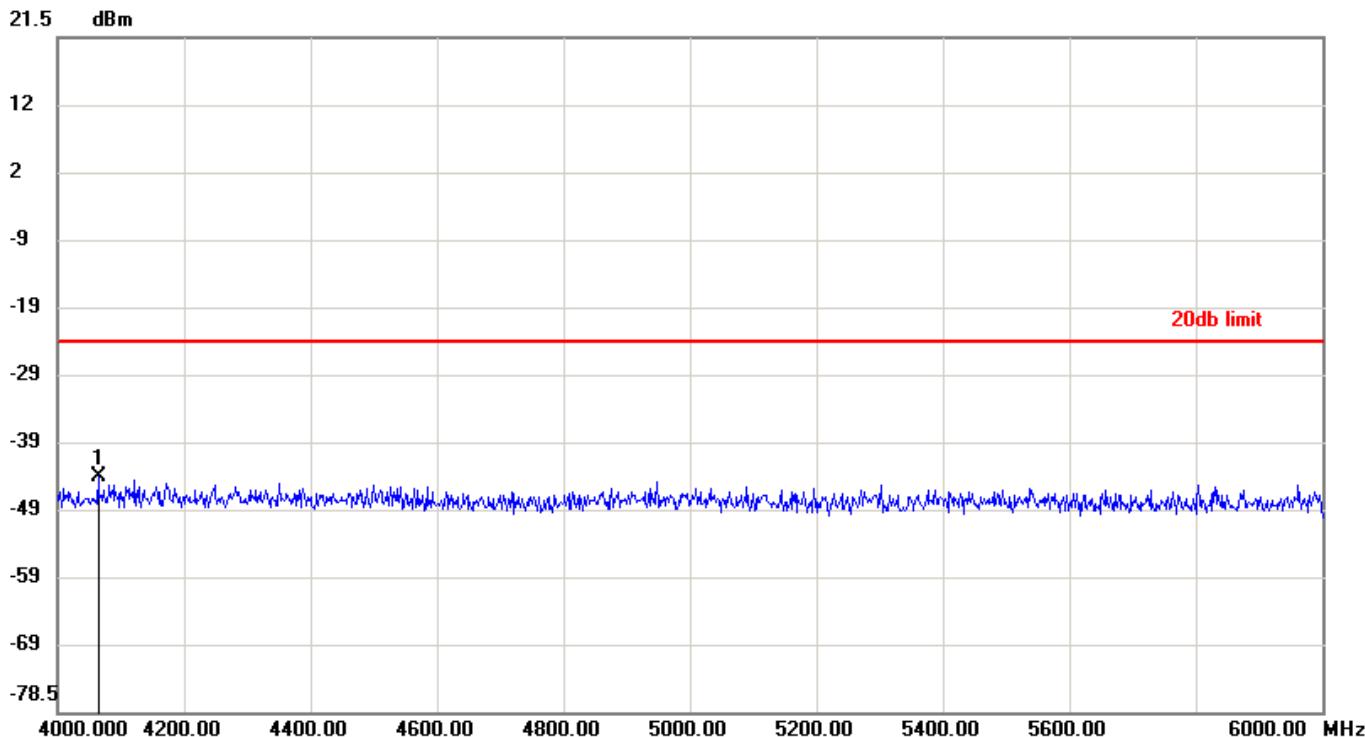
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2463.7427	-1.46	-21.46	20.00
2	3281.9263	-37.64	-21.46	-16.18



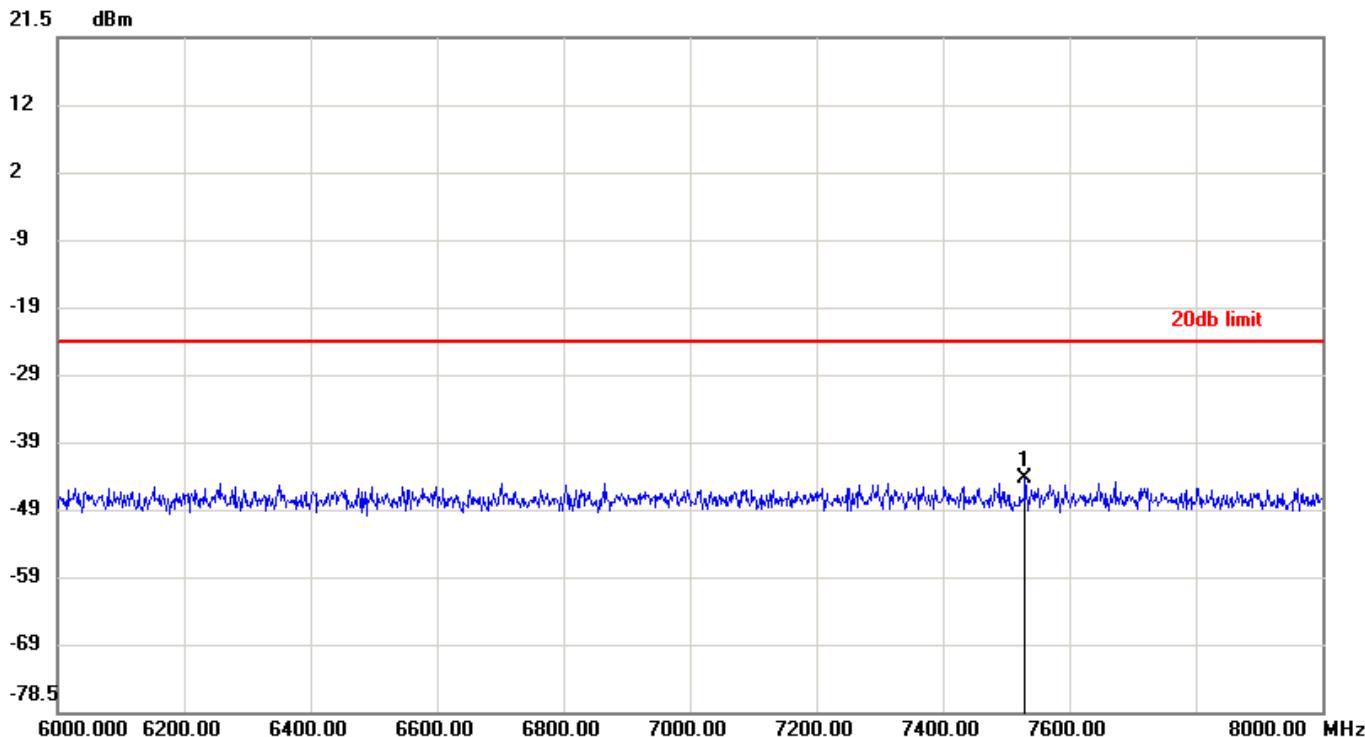
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1318.2487	-42.87	-23.60	-19.27



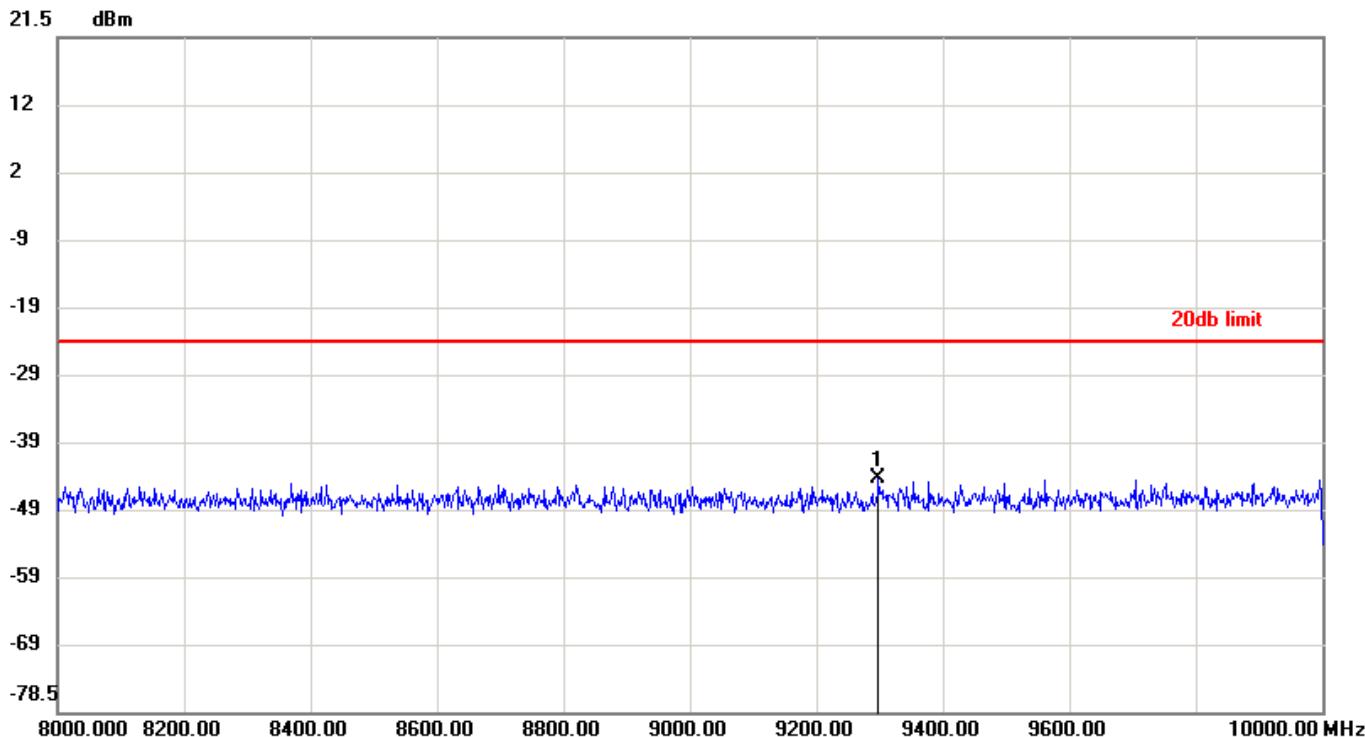
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2455.0000	-4.16	-23.60	19.44
2	2467.8000	-3.60	-23.60	20.00



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	4064.7333	-43.61	-23.60	-20.01

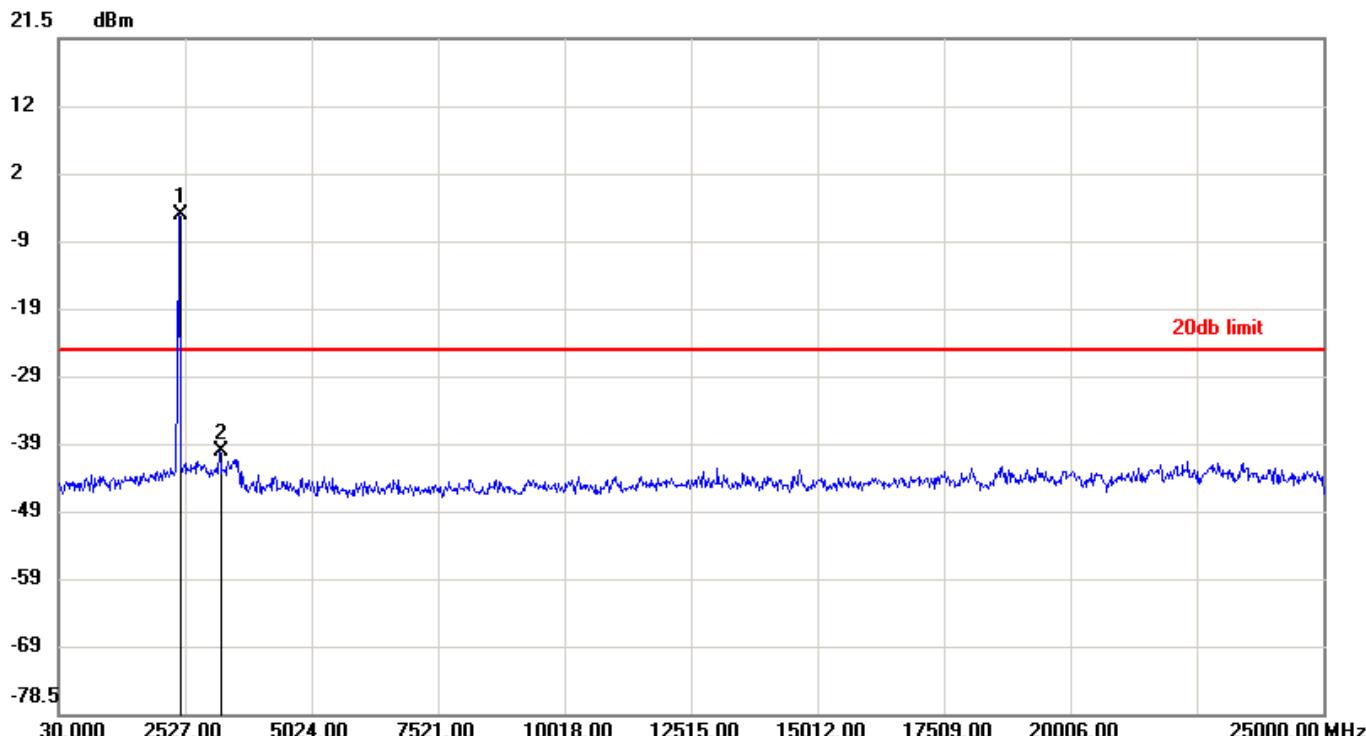


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	7530.5333	-43.97	-23.60	-20.37

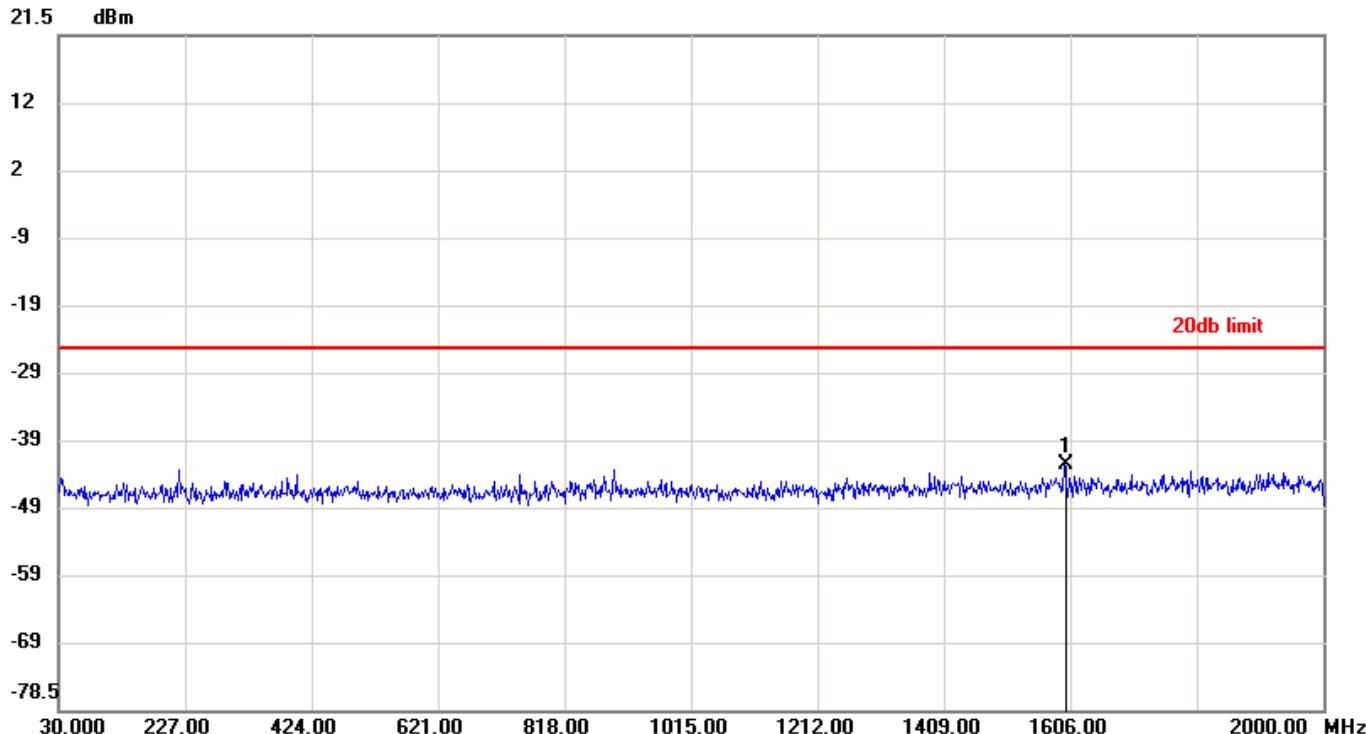


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	9299.6000	-43.87	-23.60	-20.27

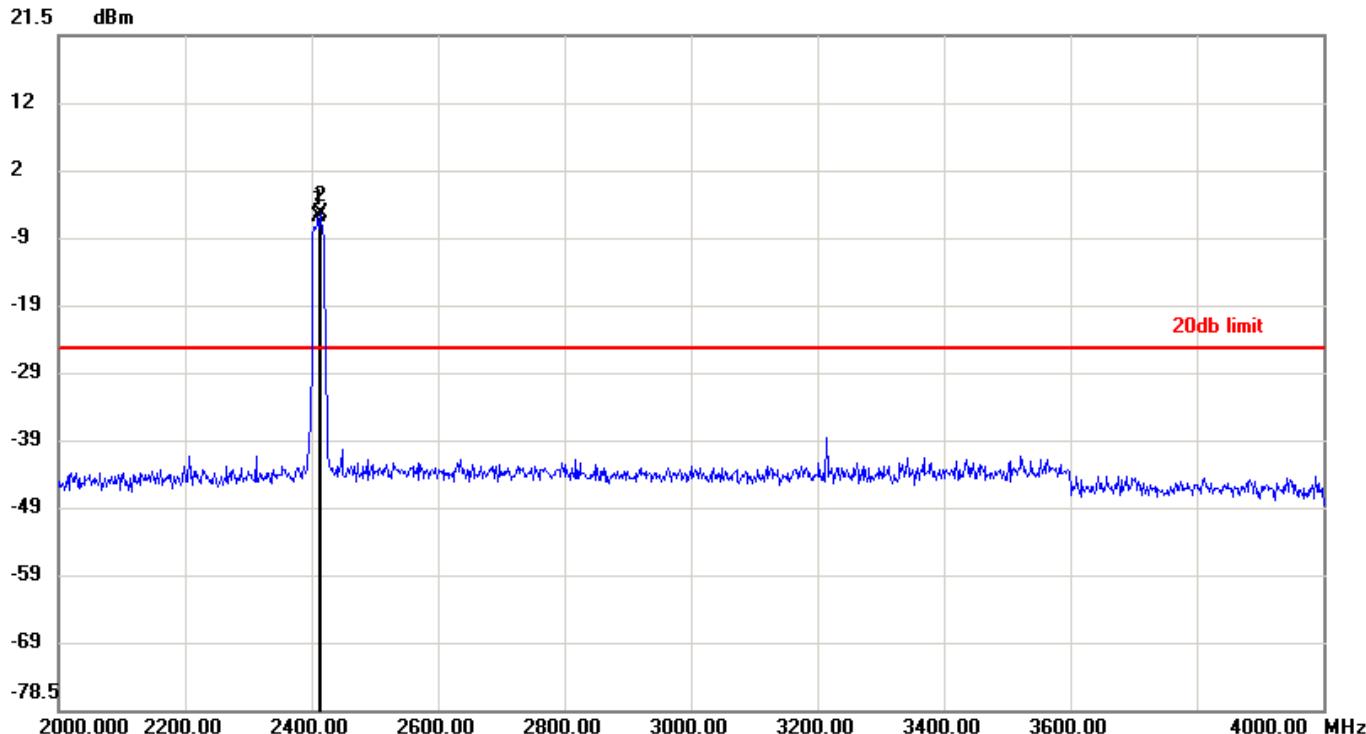
Test mode:	802.11n(HT20)	Test channel:	Lowest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2416.2997	-4.72	-24.72	20.00
2	3215.3397	-39.54	-24.72	-14.82



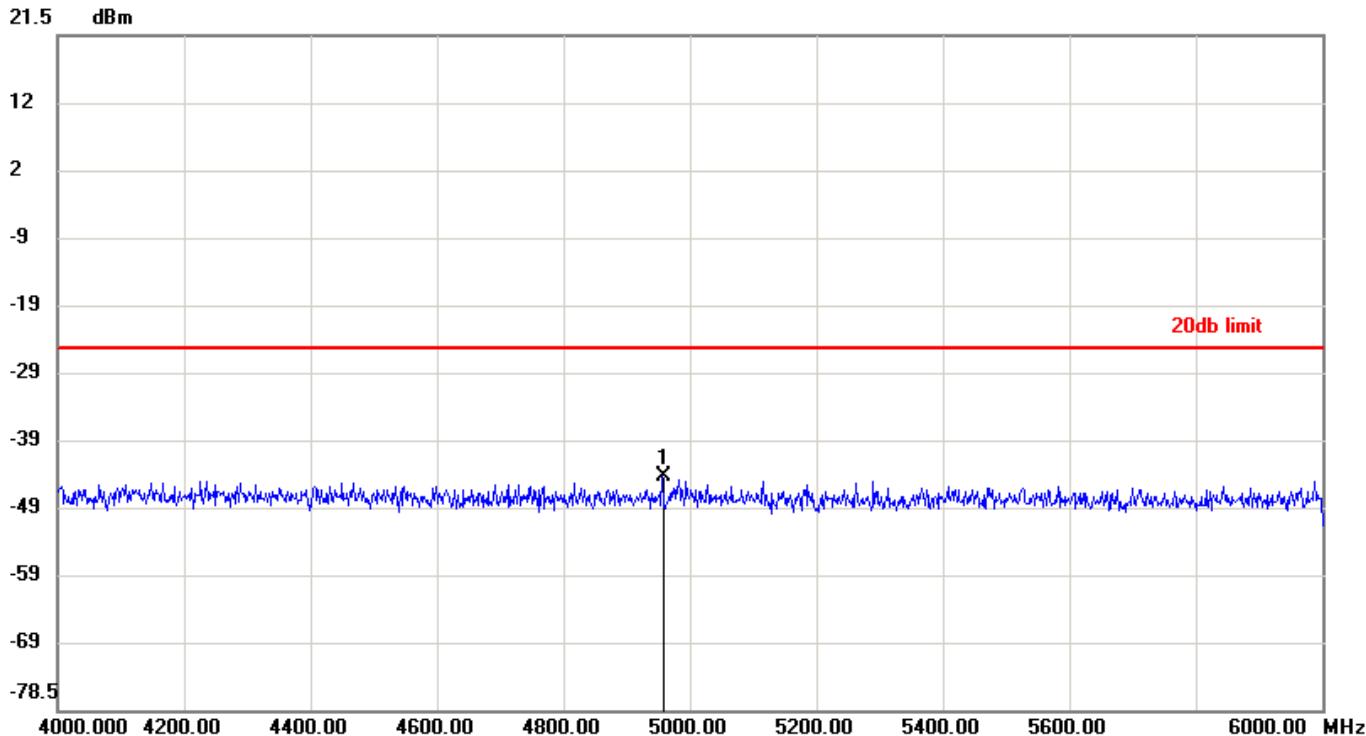
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1596.8067	-42.04	-24.85	-17.19



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2410.6667	-5.33	-24.85	19.52
2	2414.4000	-4.85	-24.85	20.00



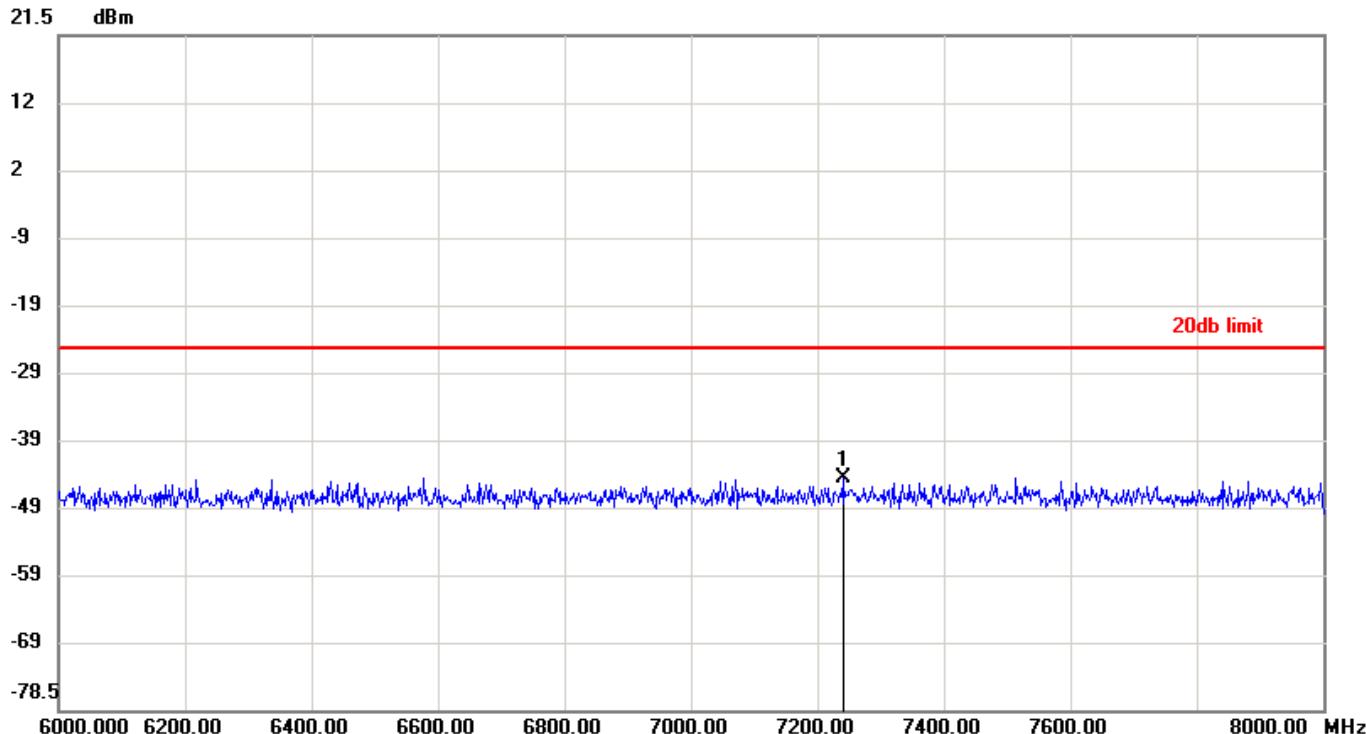
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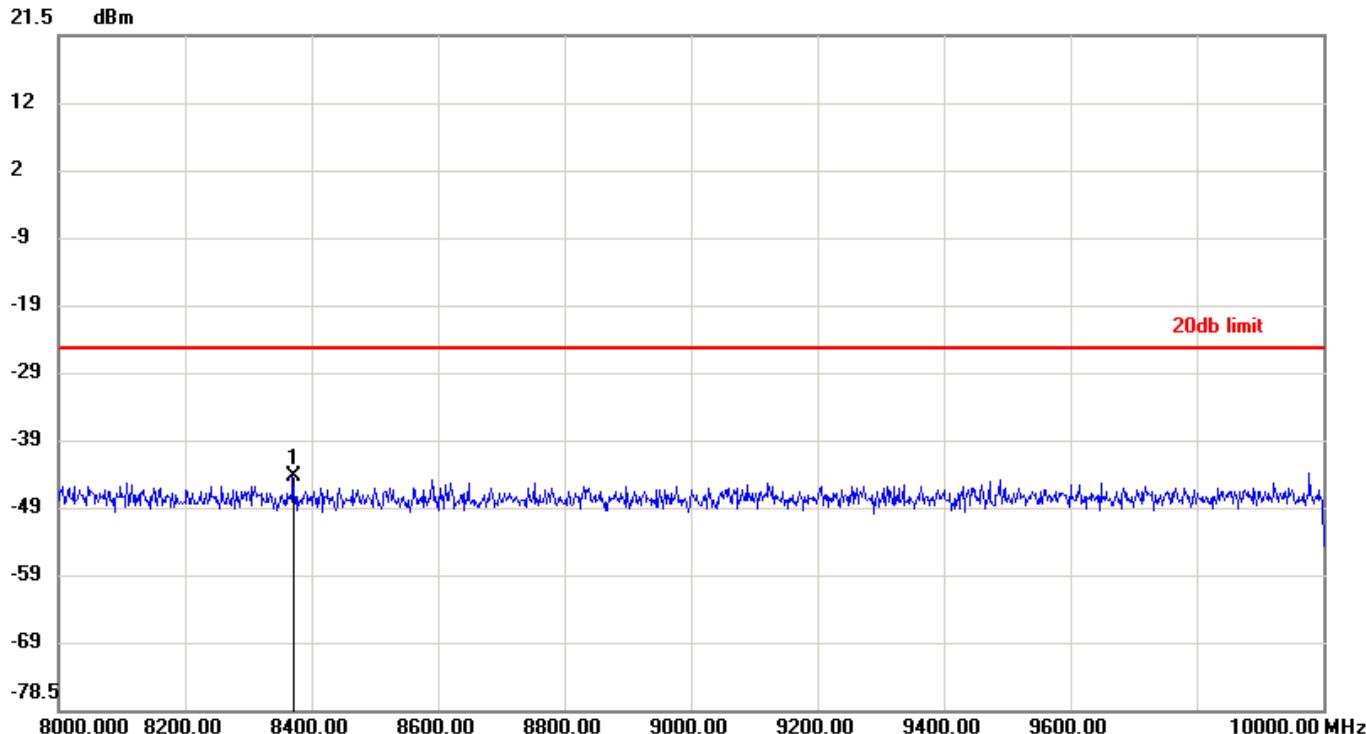
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	4957.4667	-43.87	-24.85	-19.02



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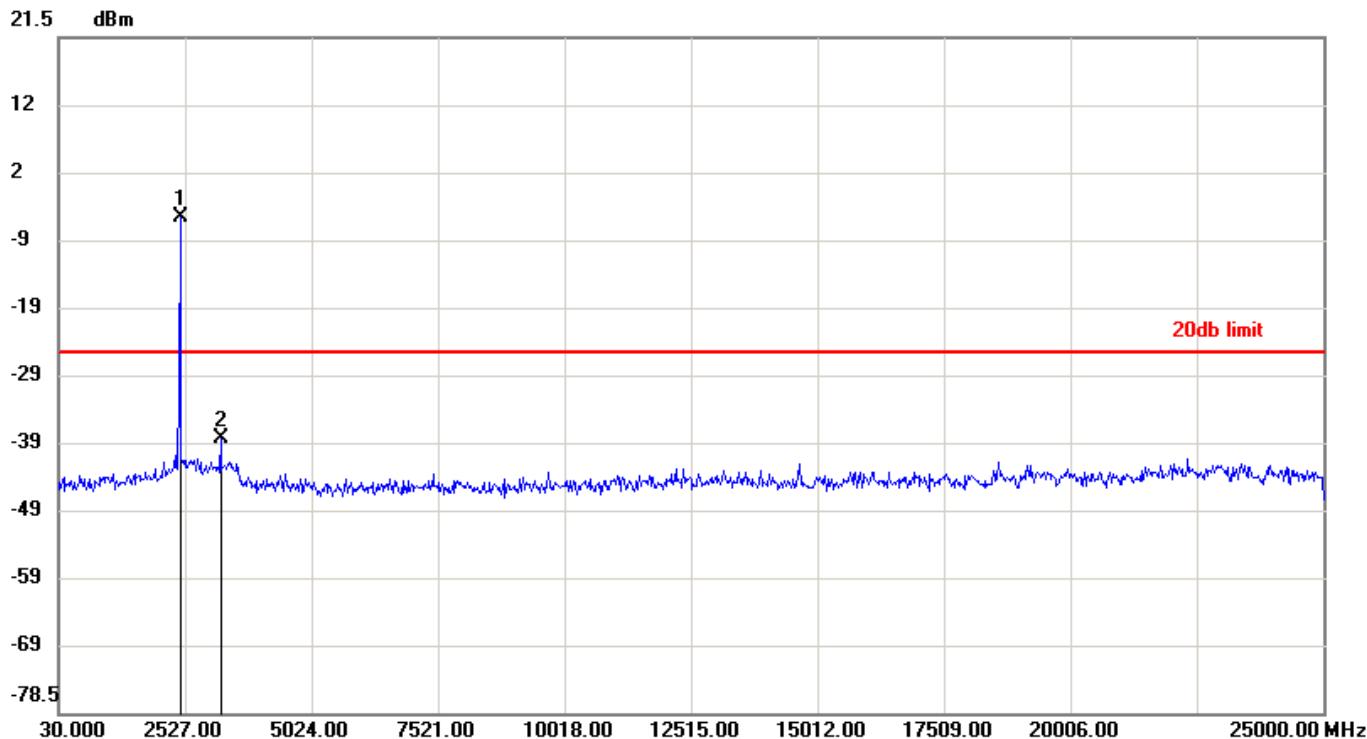
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	7241.7333	-44.22	-24.85	-19.37



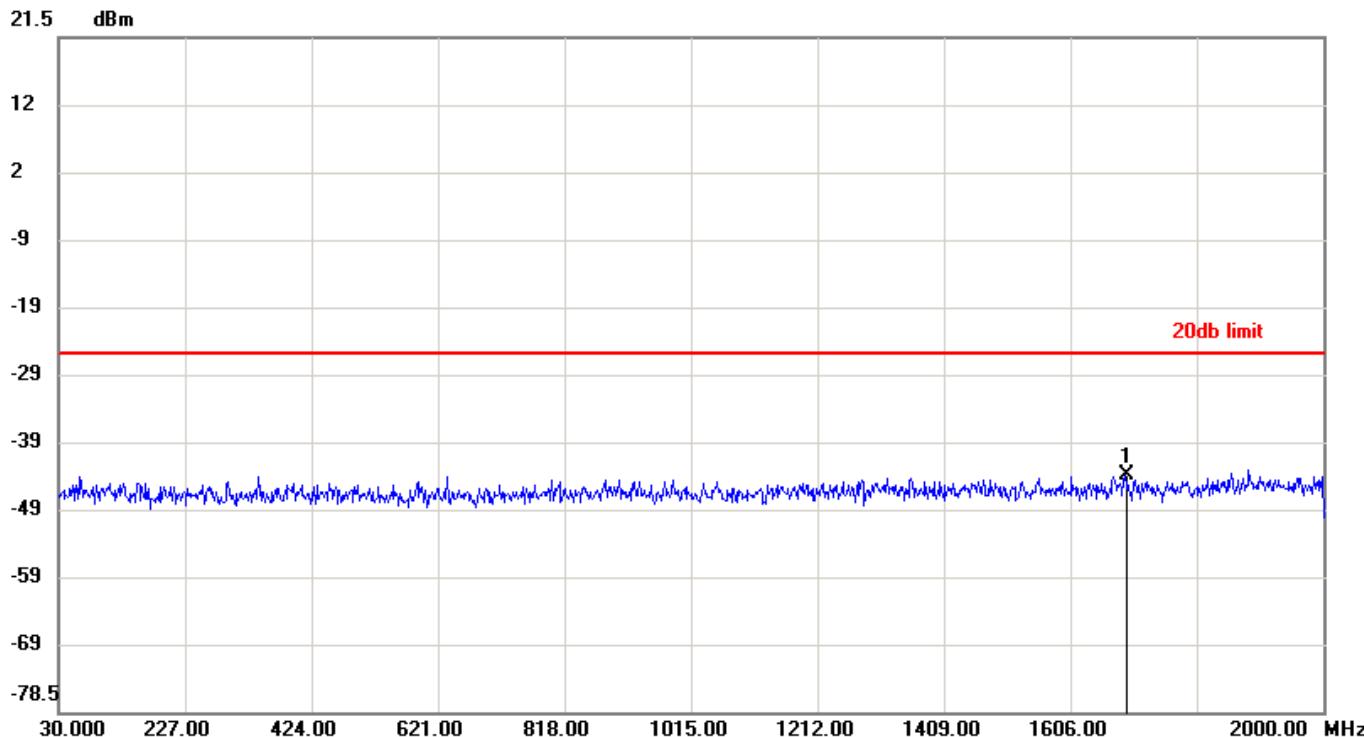
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	8370.0667	-43.93	-24.85	-19.08

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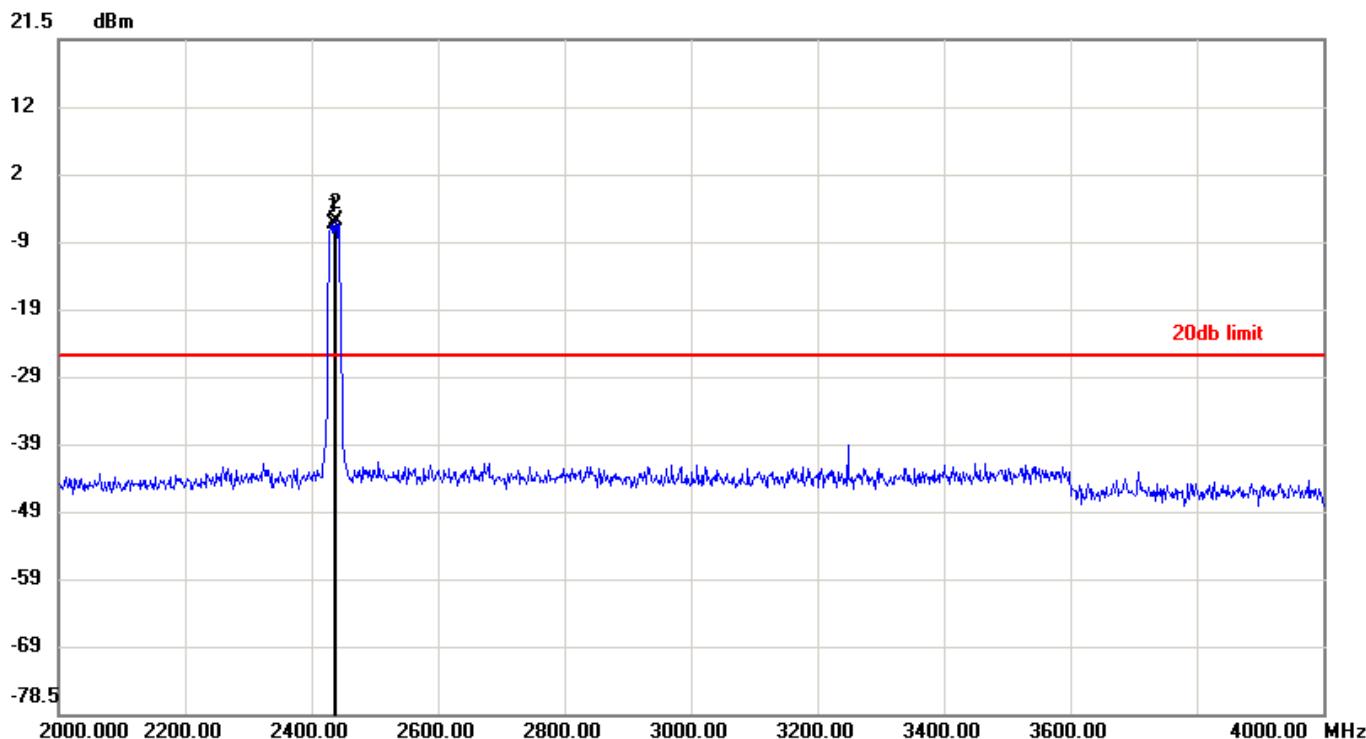
Test mode:	802.11n(HT20)	Test channel:	Middle
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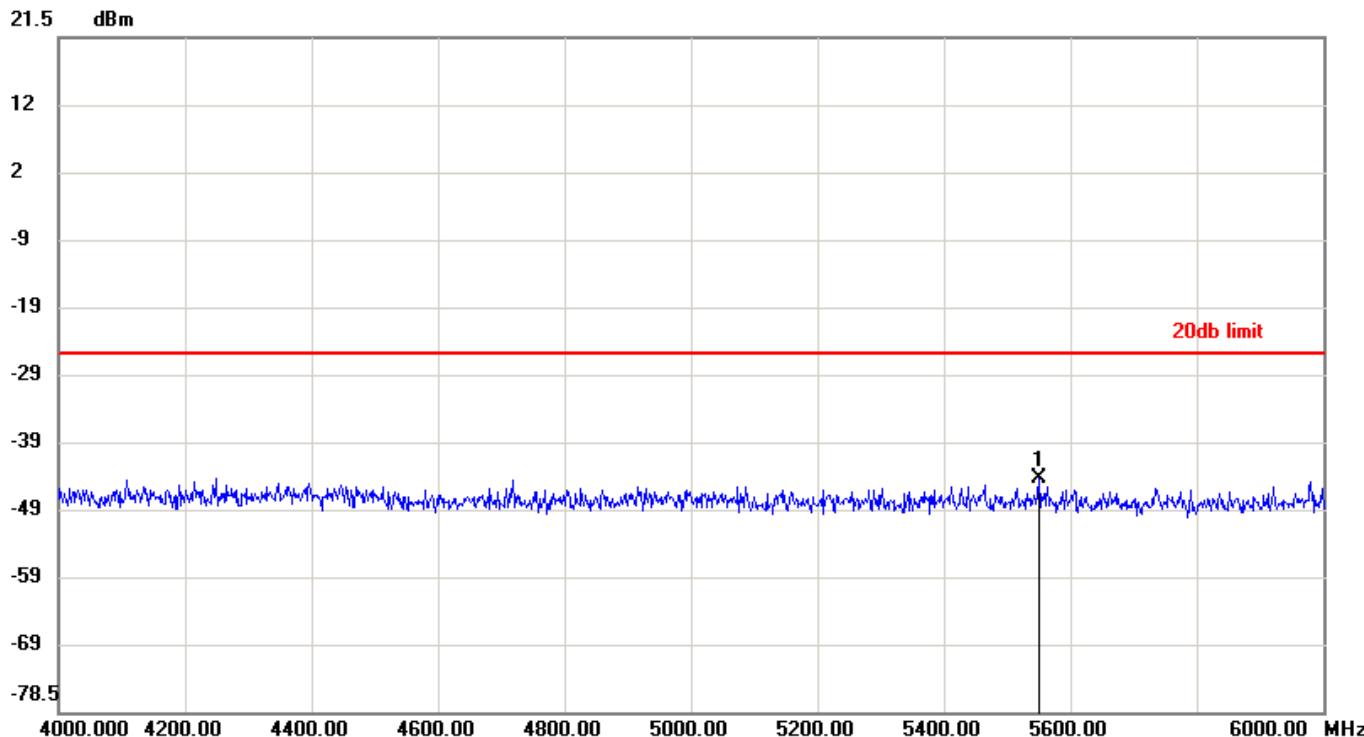
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2437.9403	-5.01	-25.01	20.00
2	3248.6330	-37.97	-25.01	-12.96



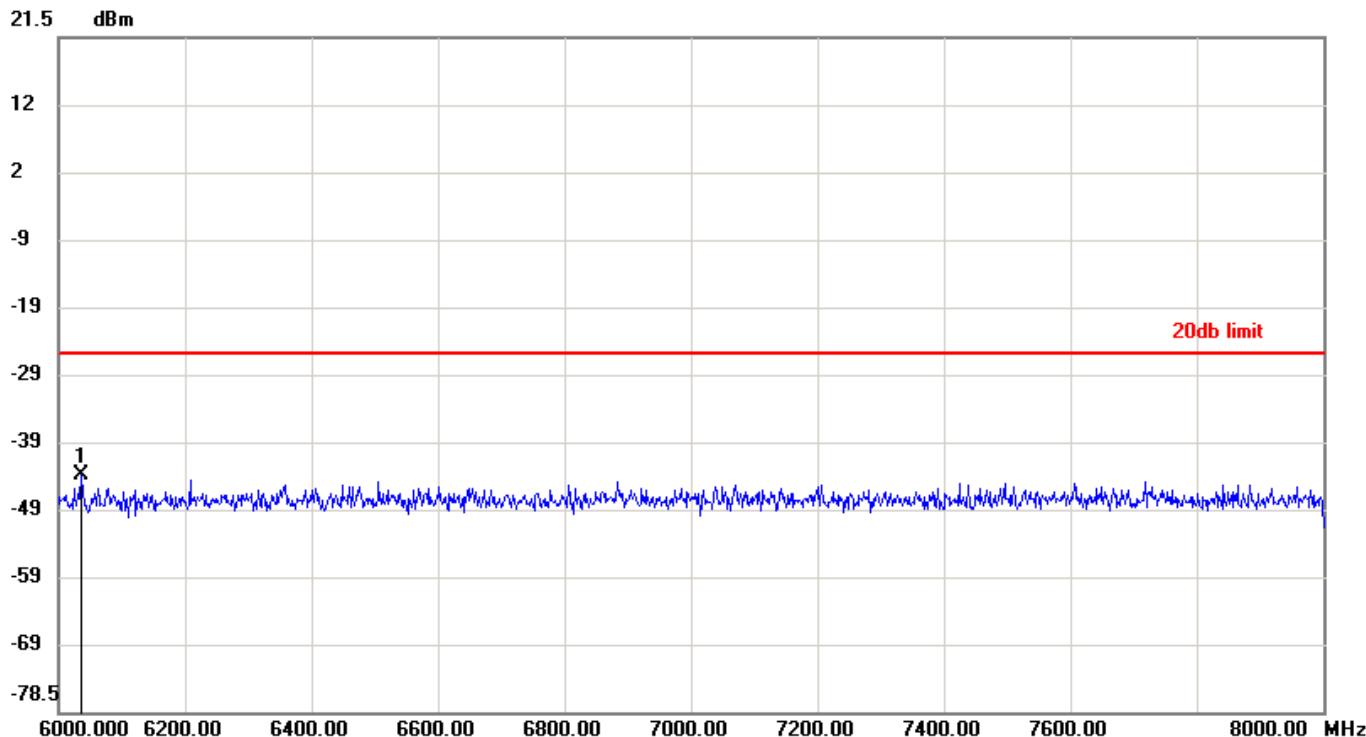
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1691.1697	-43.49	-25.46	-18.03



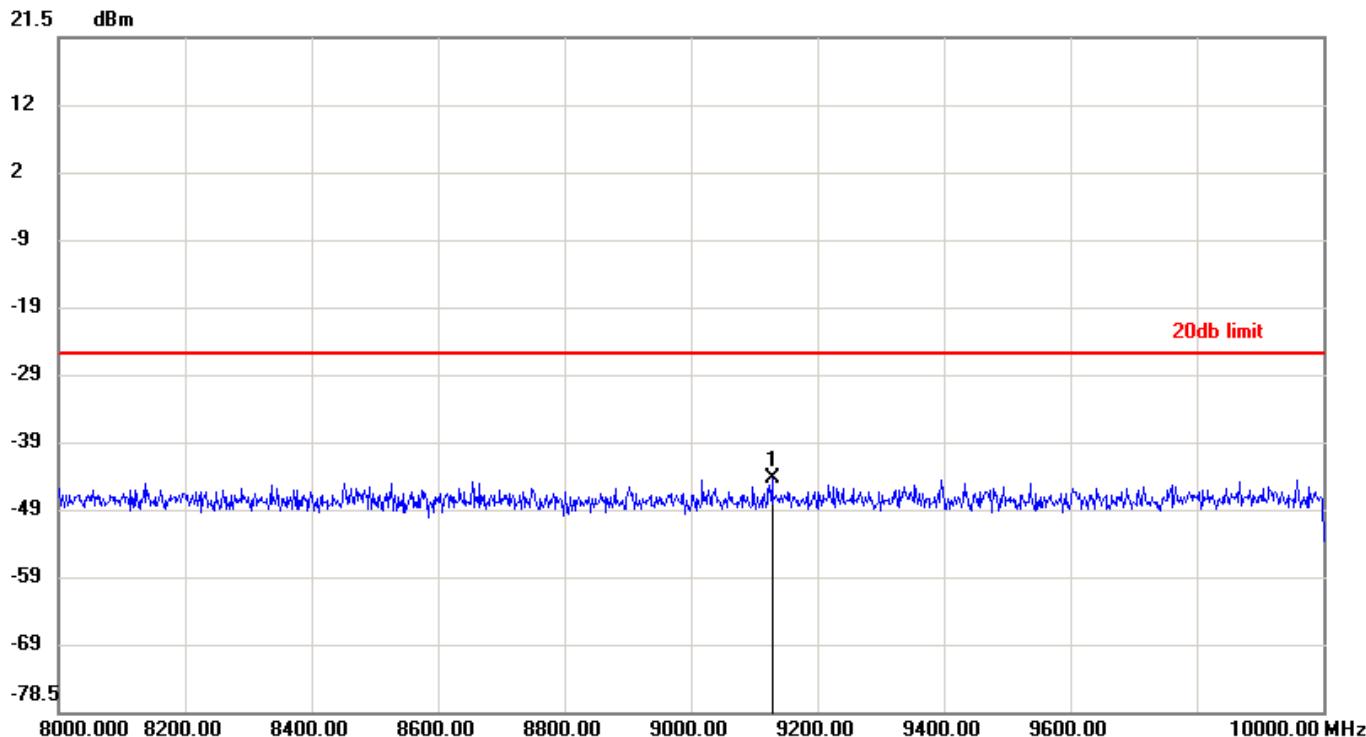
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2435.6667	-5.78	-25.46	19.68
2	2438.2000	-5.46	-25.46	20.00



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5551.7333	-43.80	-25.46	-18.34

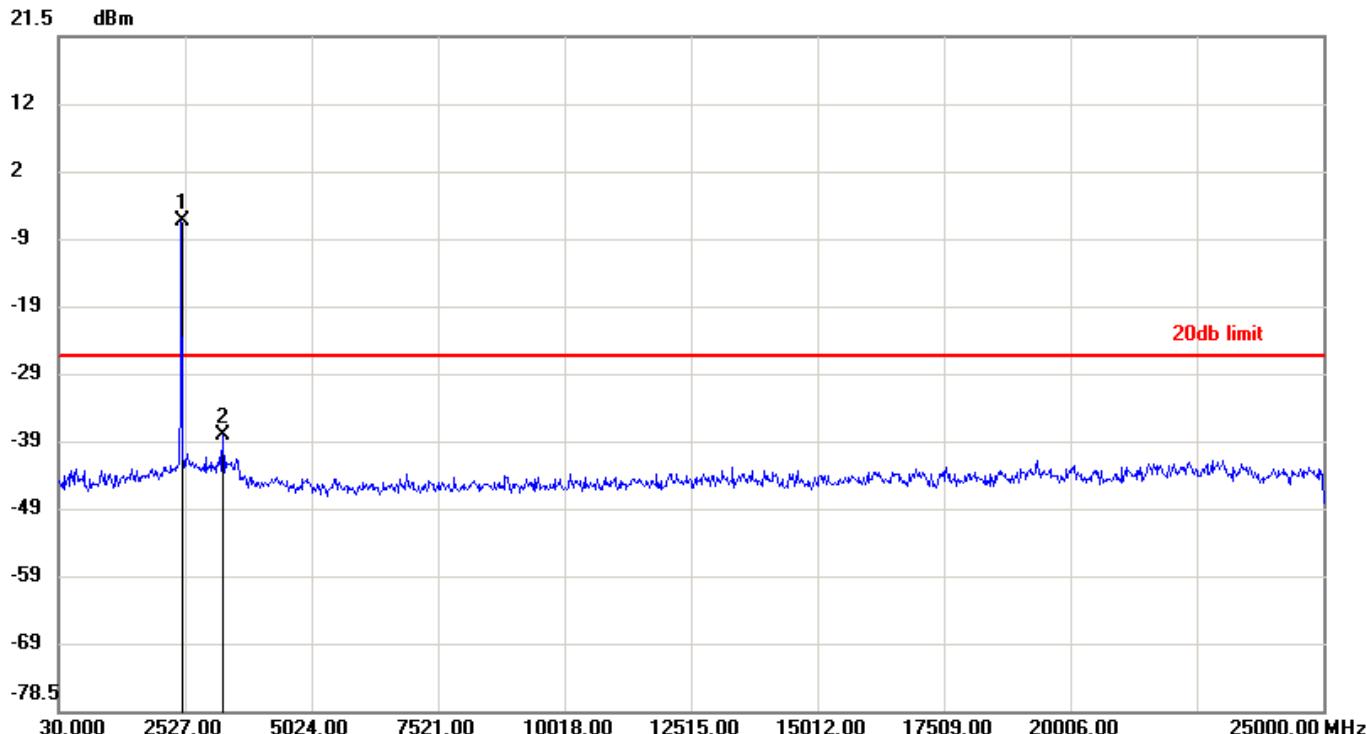


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	6036.2000	-43.39	-25.46	-17.93



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	9128.2667	-43.98	-25.46	-18.52

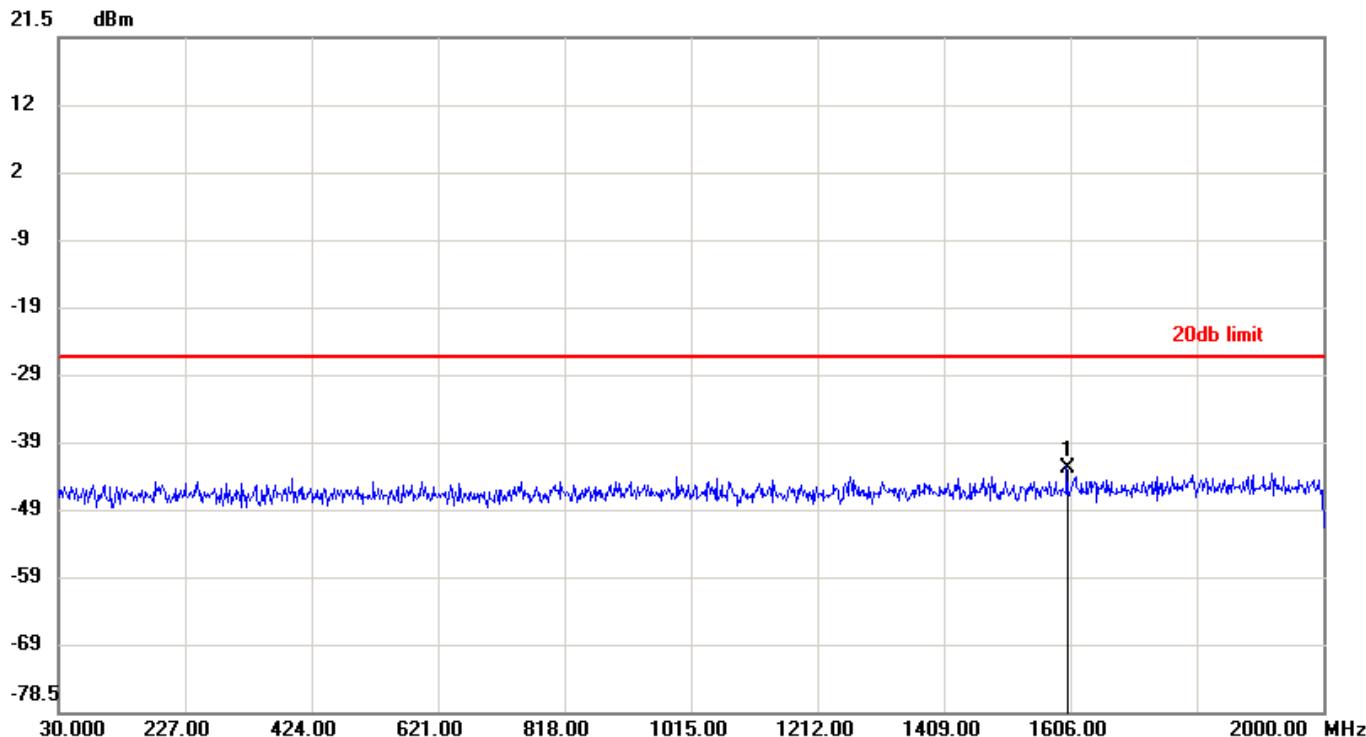
Test mode:	802.11n(HT20)	Test channel:	Highest
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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2453.7547	-5.87	-25.87	20.00
2	3281.9263	-37.64	-25.87	-11.77



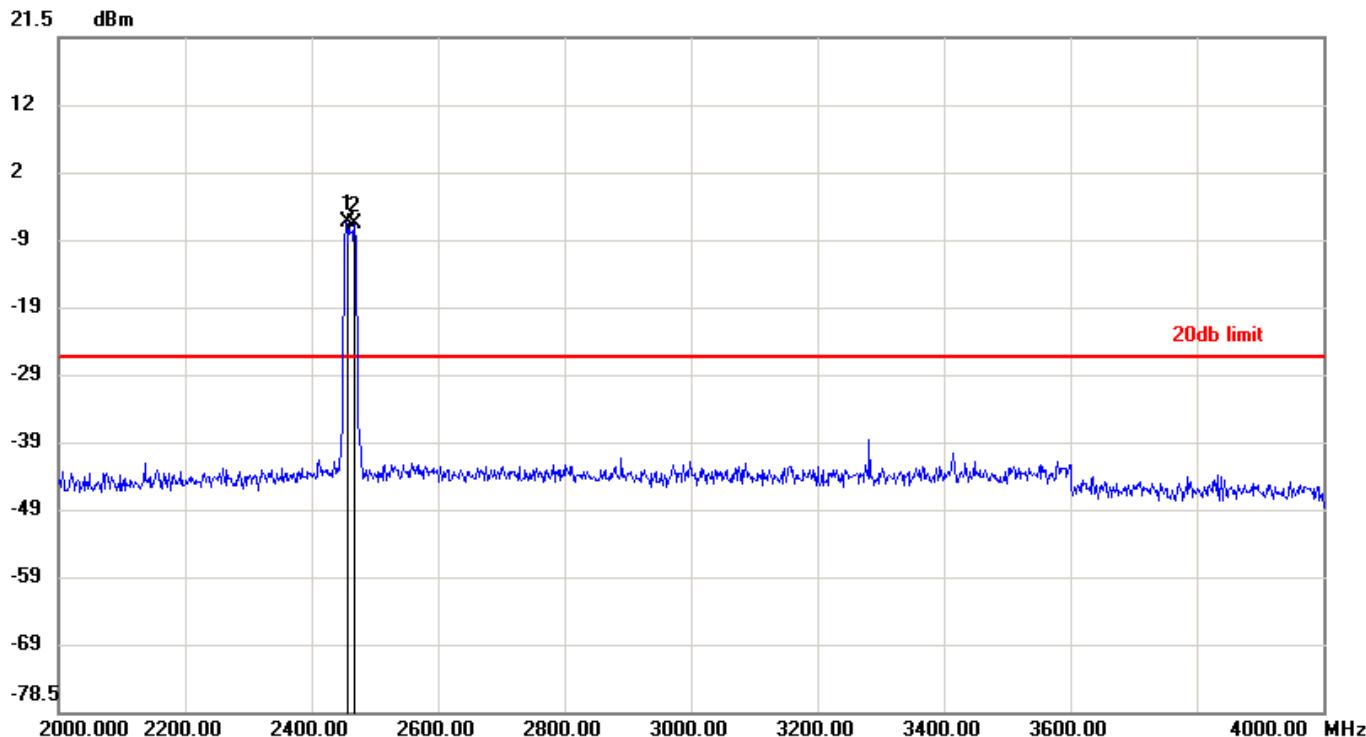
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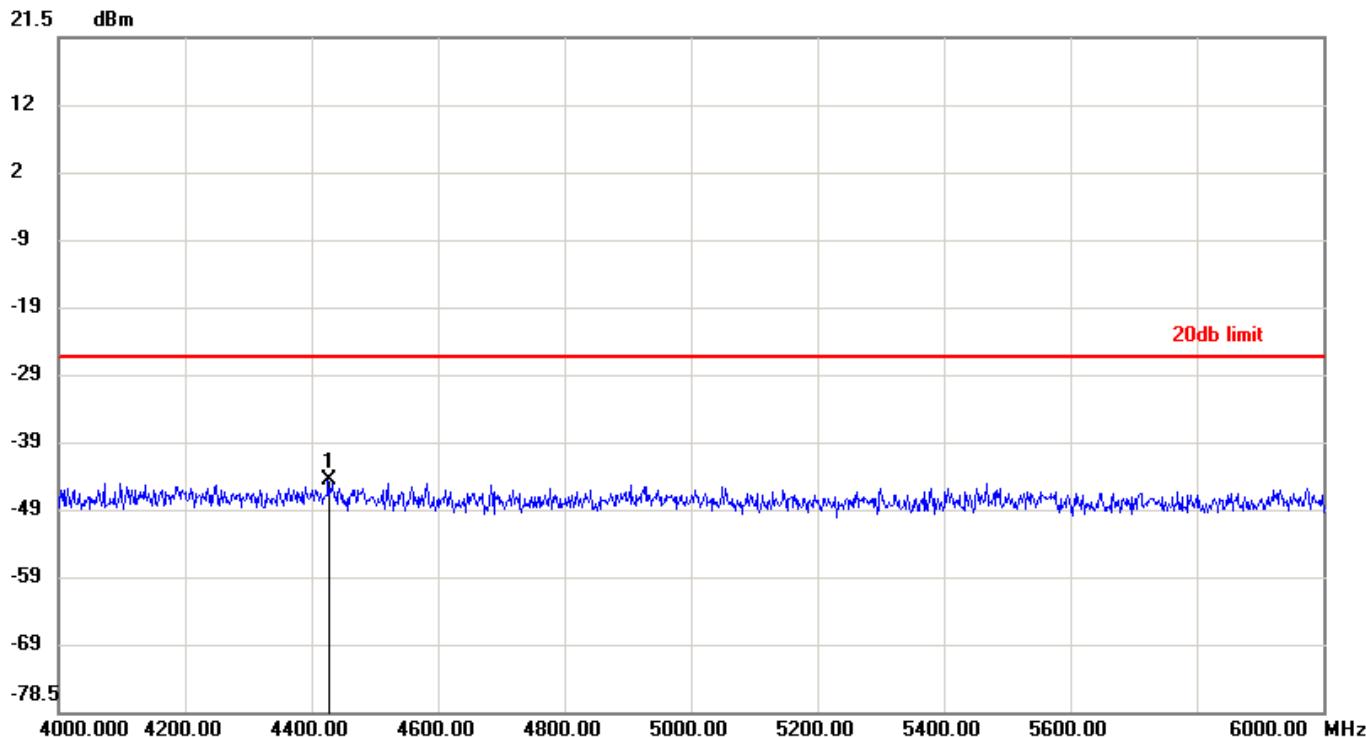
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1601.9287	-42.25	-25.79	-16.46



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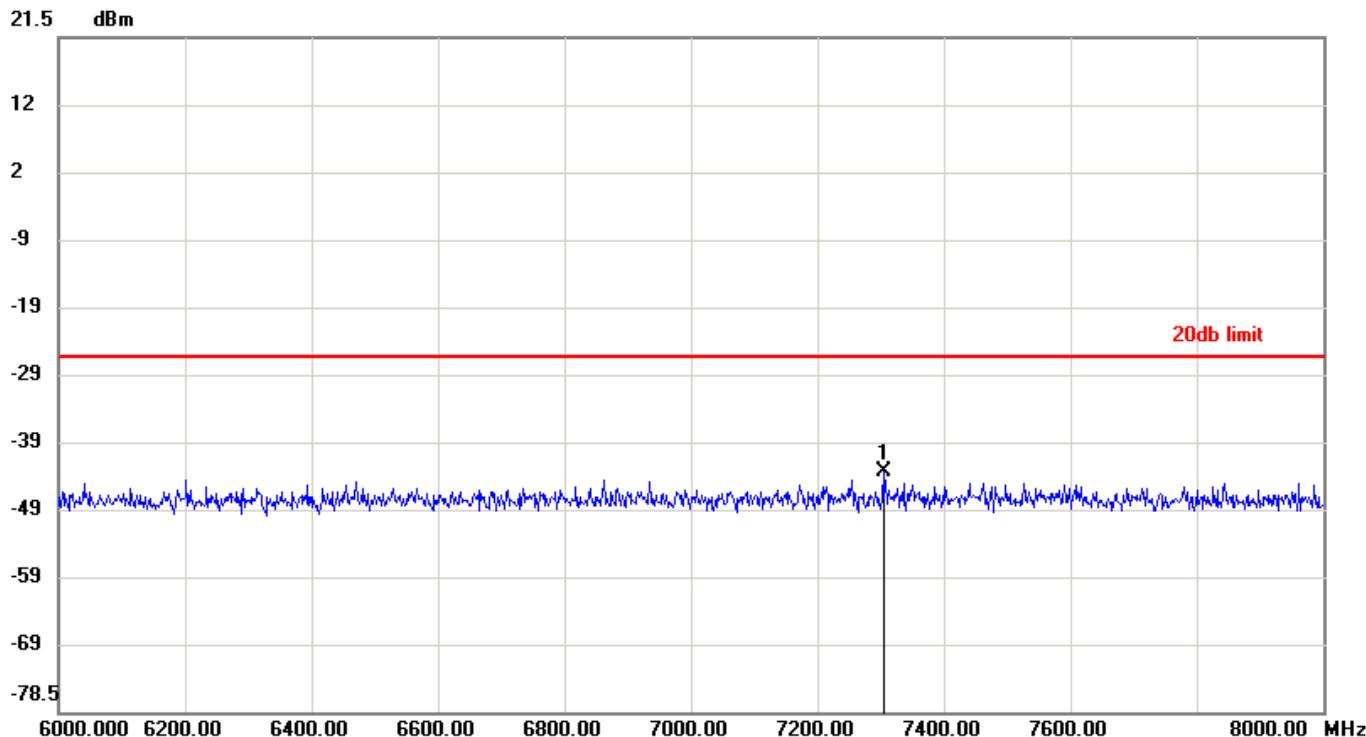


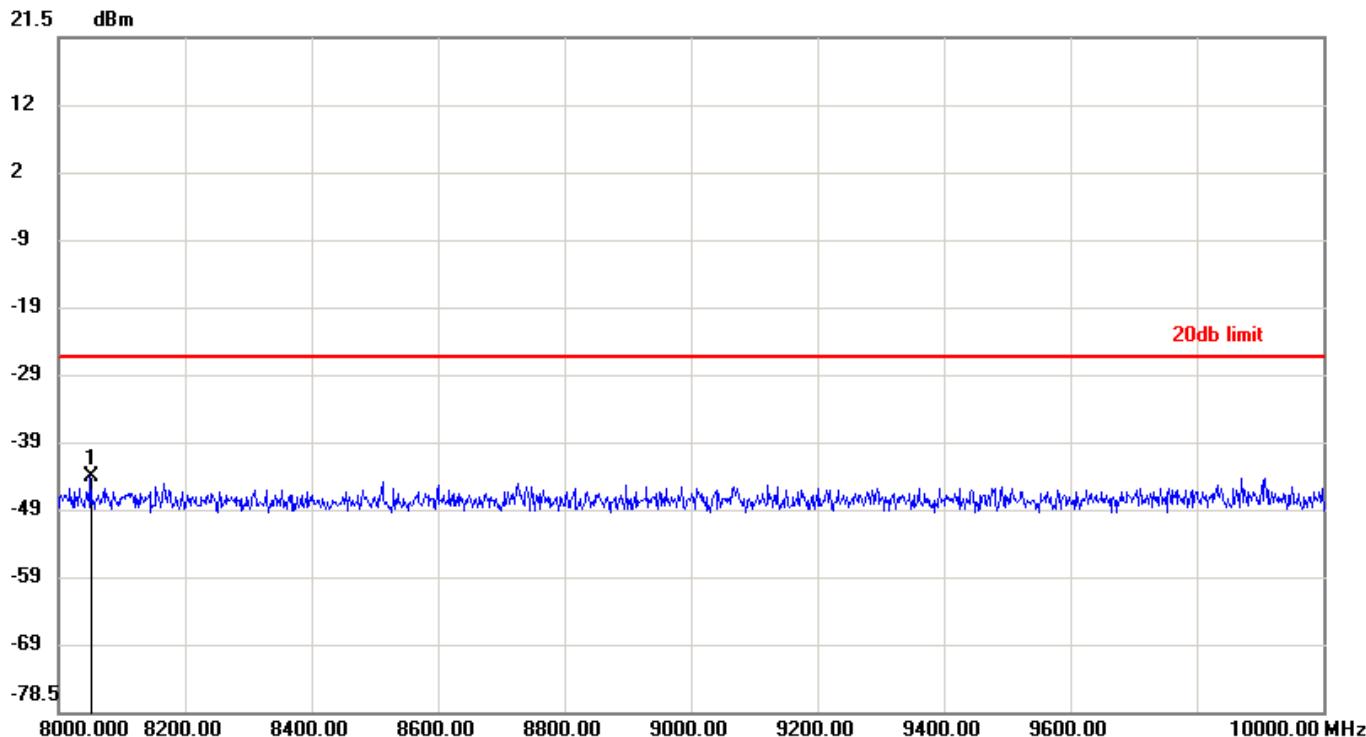
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2455.6667	-5.79	-25.79	20.00
2	2468.2000	-6.01	-25.79	19.78



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	4427.6667	-44.13	-25.79	-18.34

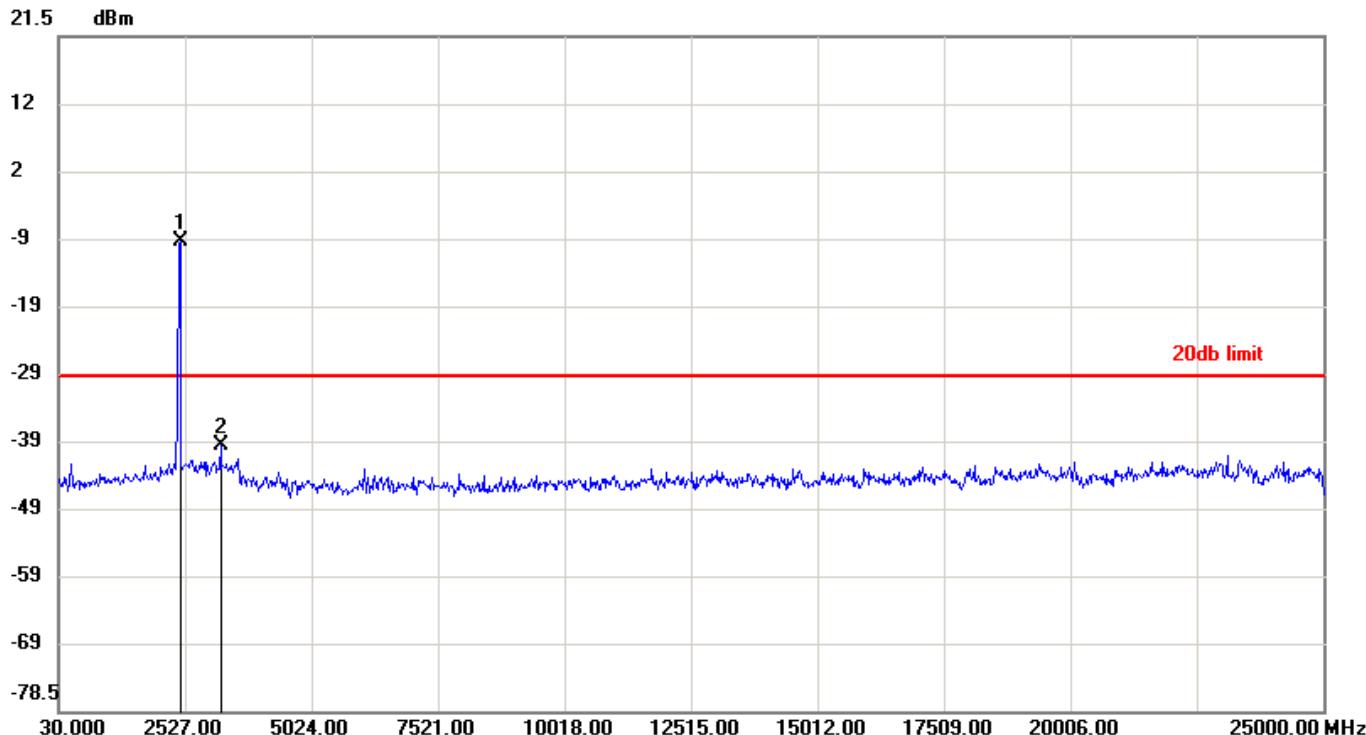
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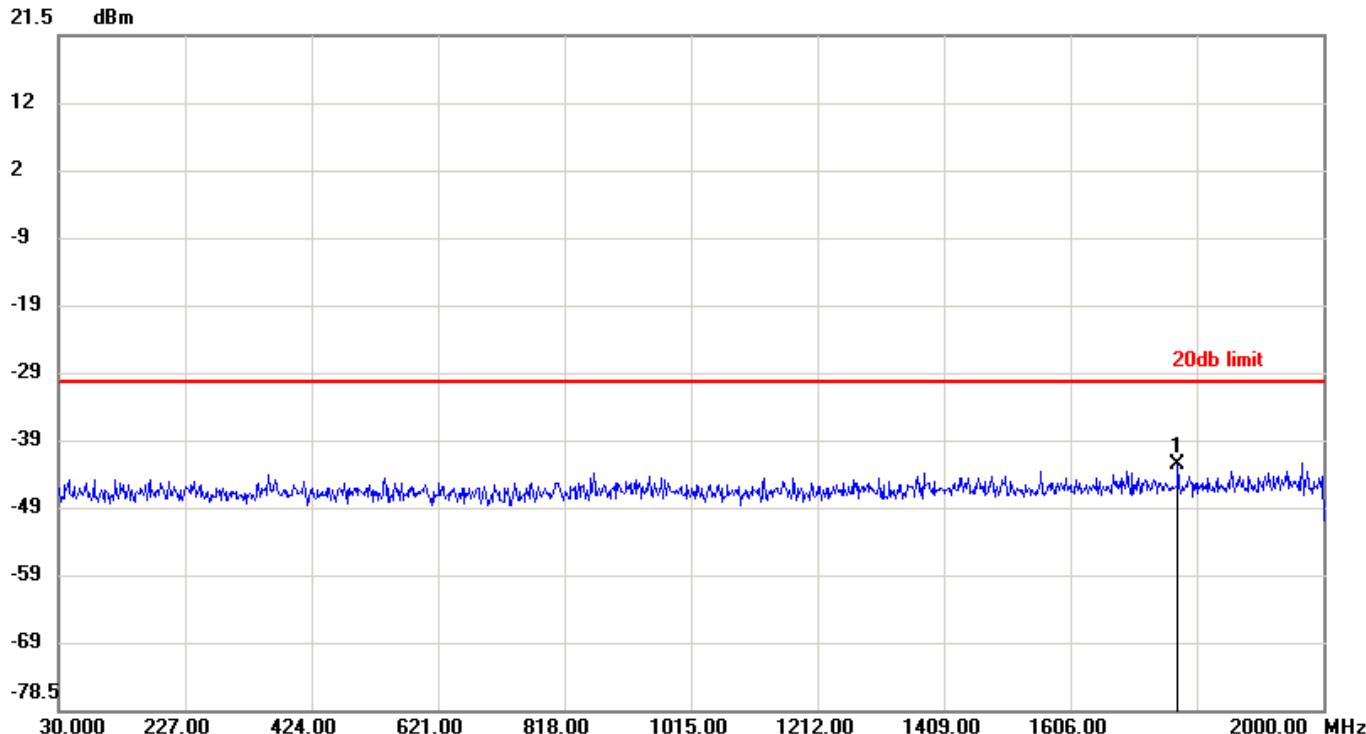


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	8051.4667	-43.72	-25.79	-17.93

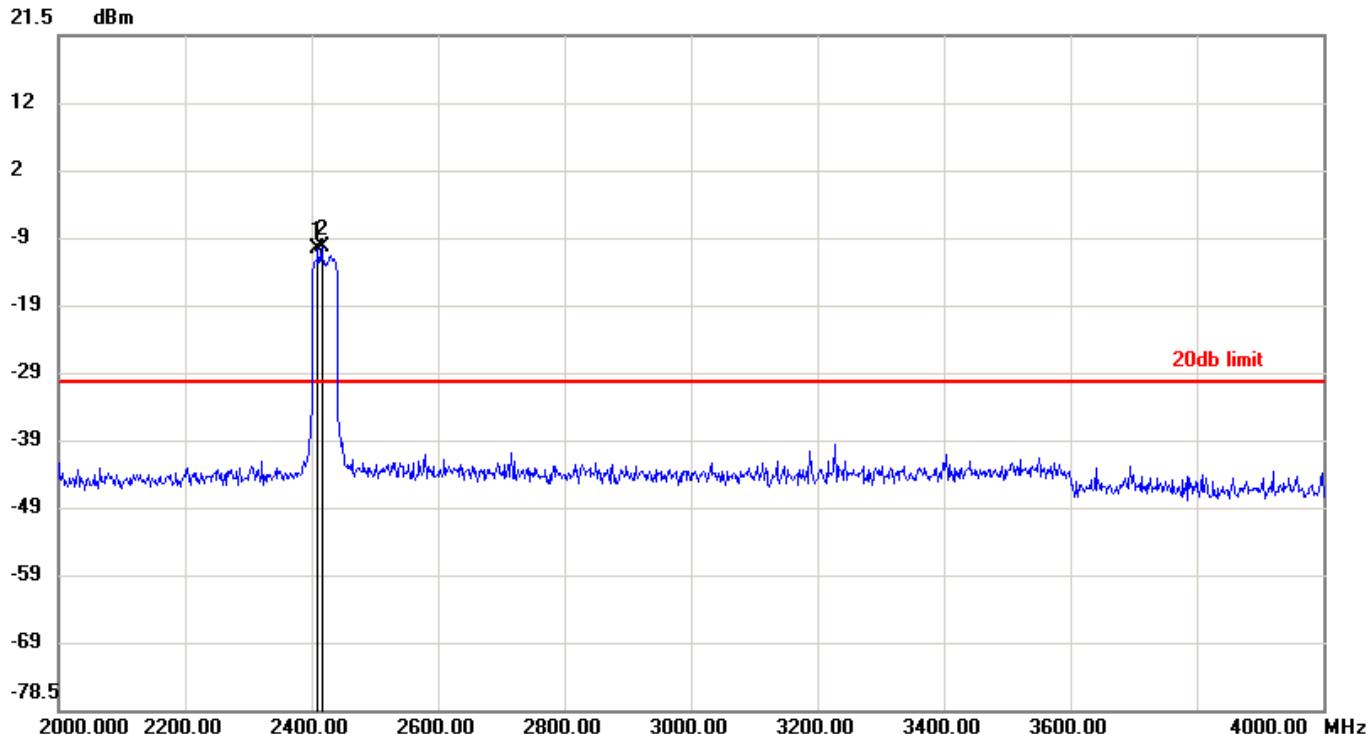
Test mode:	802.11n(HT40)	Test channel:	Lowest
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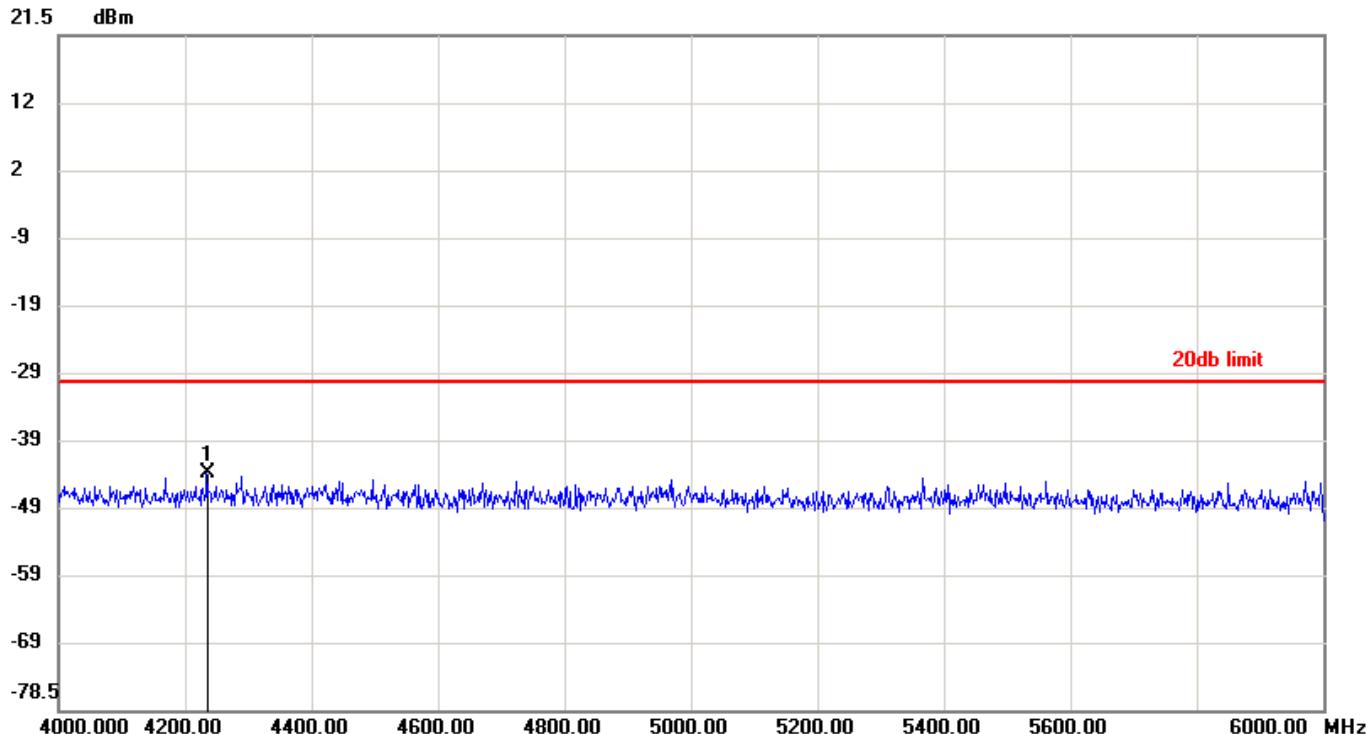
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2433.7787	-8.86	-28.86	20.00
2	3228.6570	-39.05	-28.86	-10.19



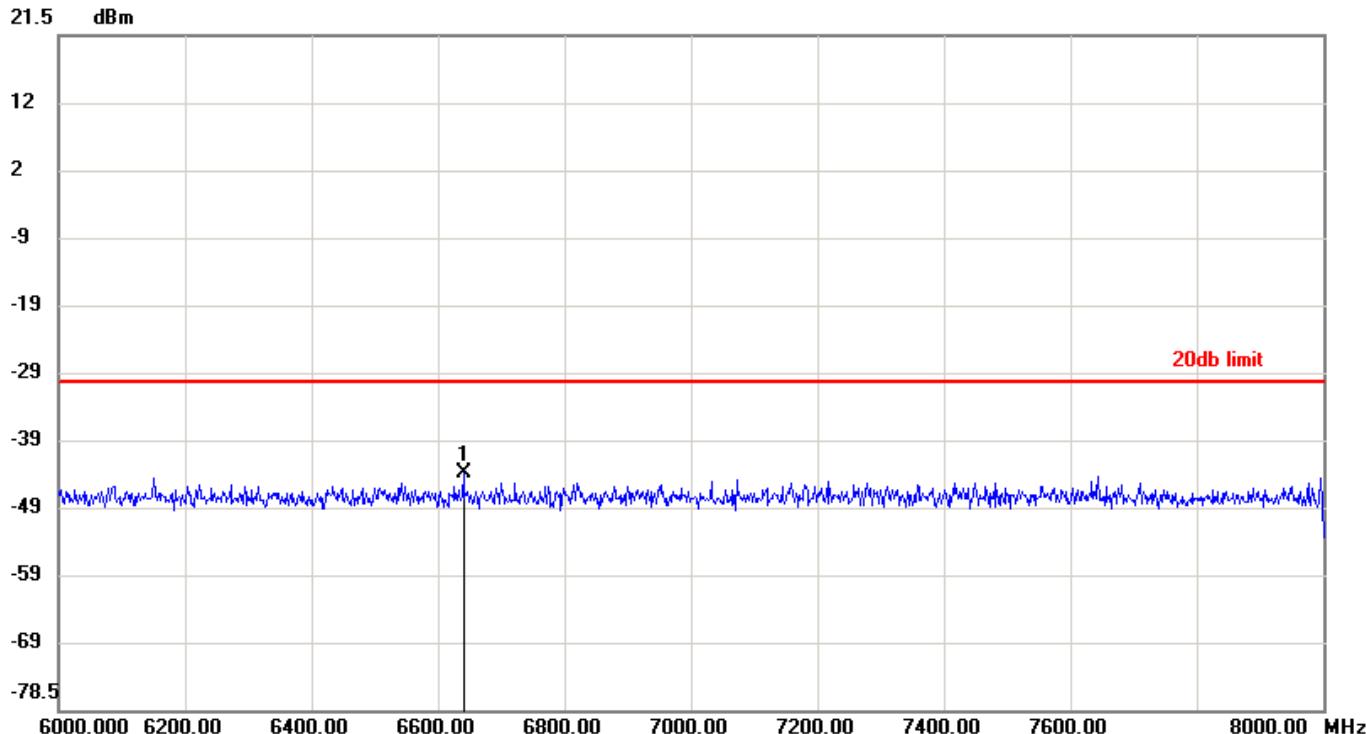
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1773.4500	-42.15	-29.84	-12.31



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2410.6000	-10.01	-29.84	19.83
2	2416.8667	-9.84	-29.84	20.00



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	4234.4667	-43.47	-29.84	-13.63

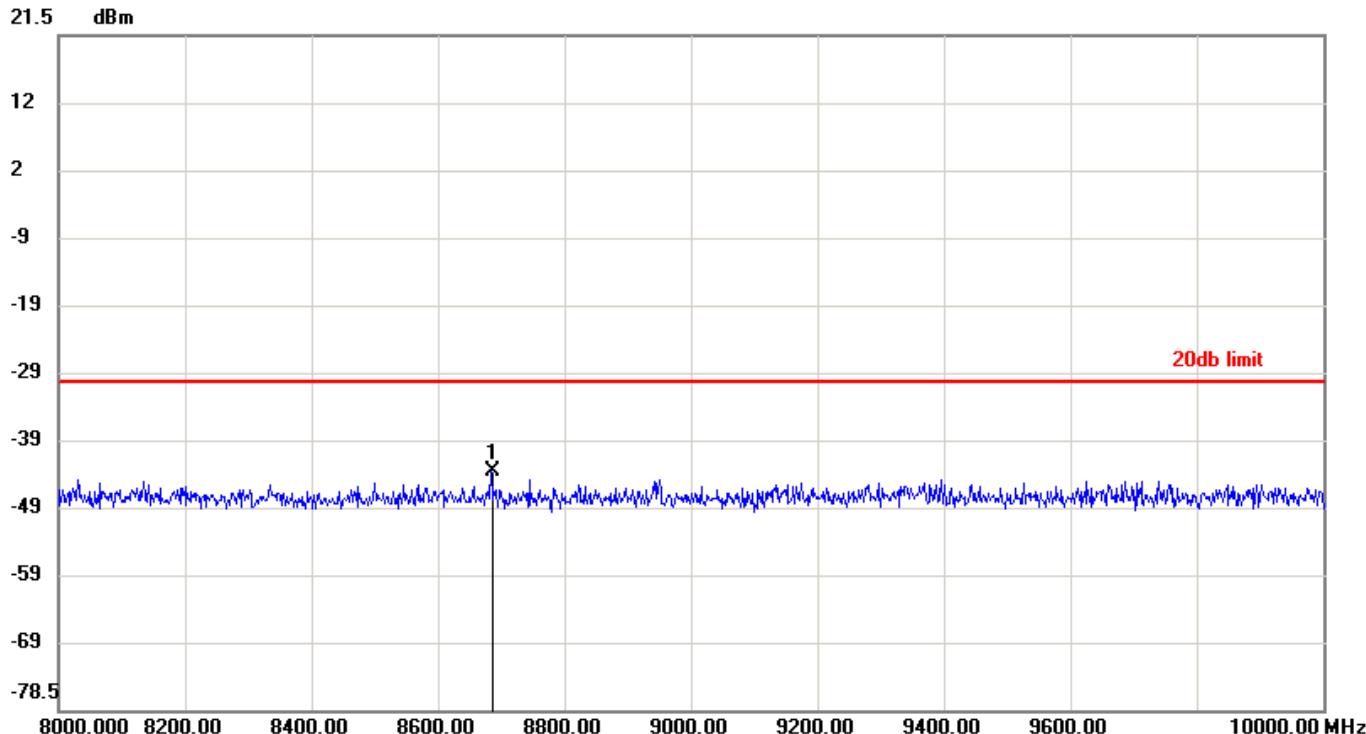


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	6641.8667	-43.48	-29.84	-13.64



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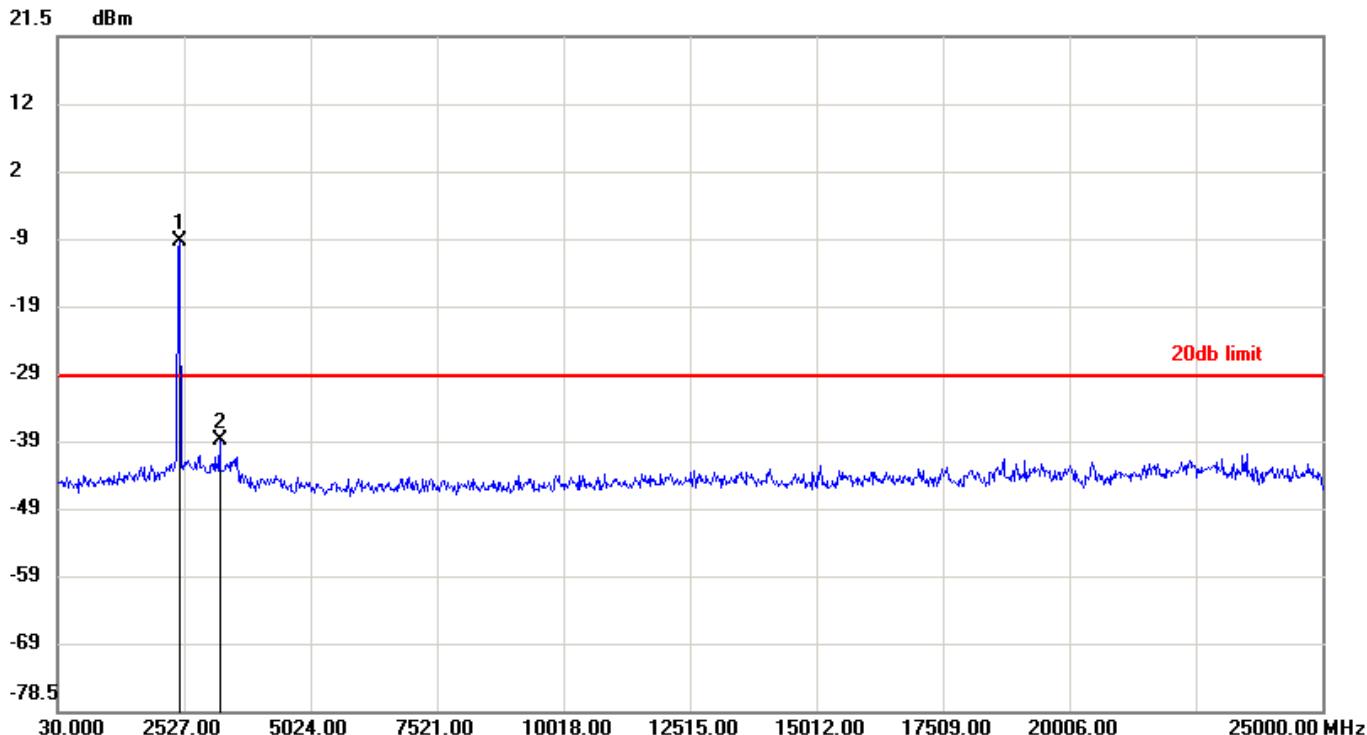


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	8685.4667	-43.14	-29.84	-13.30

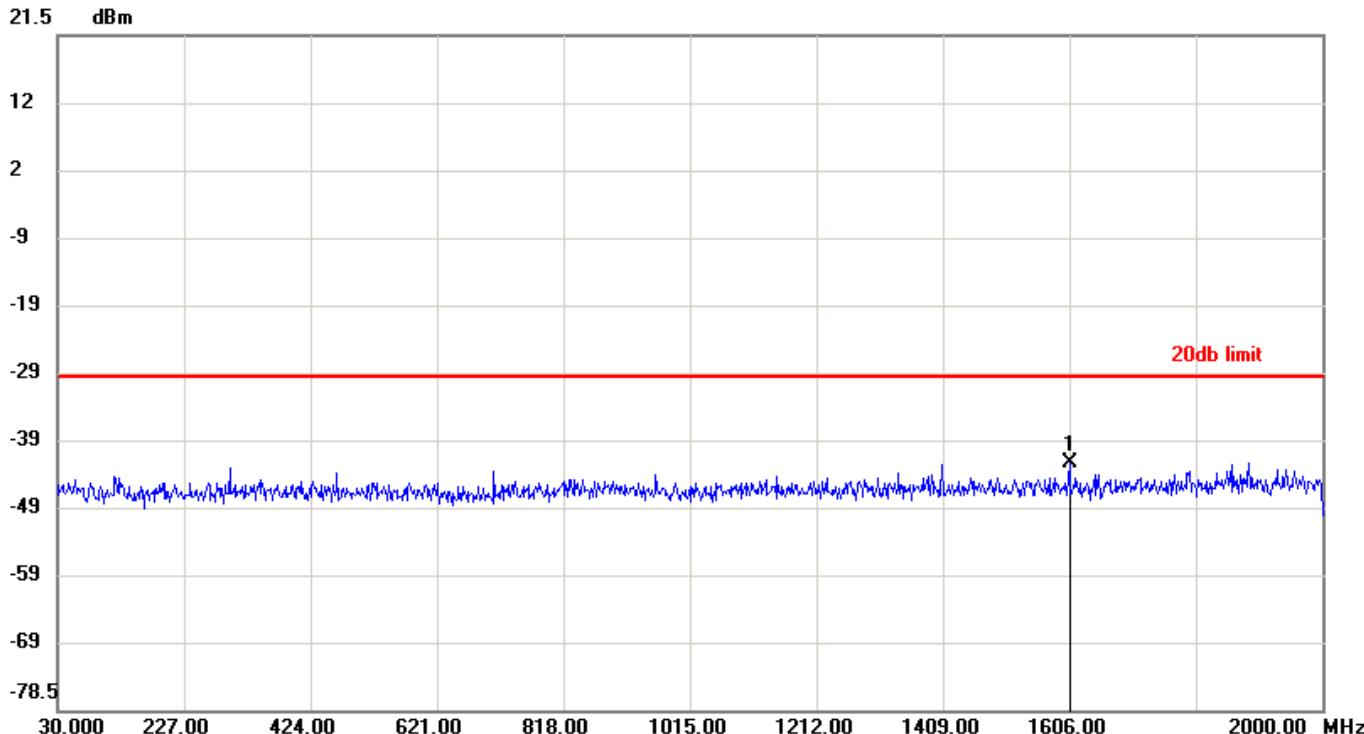


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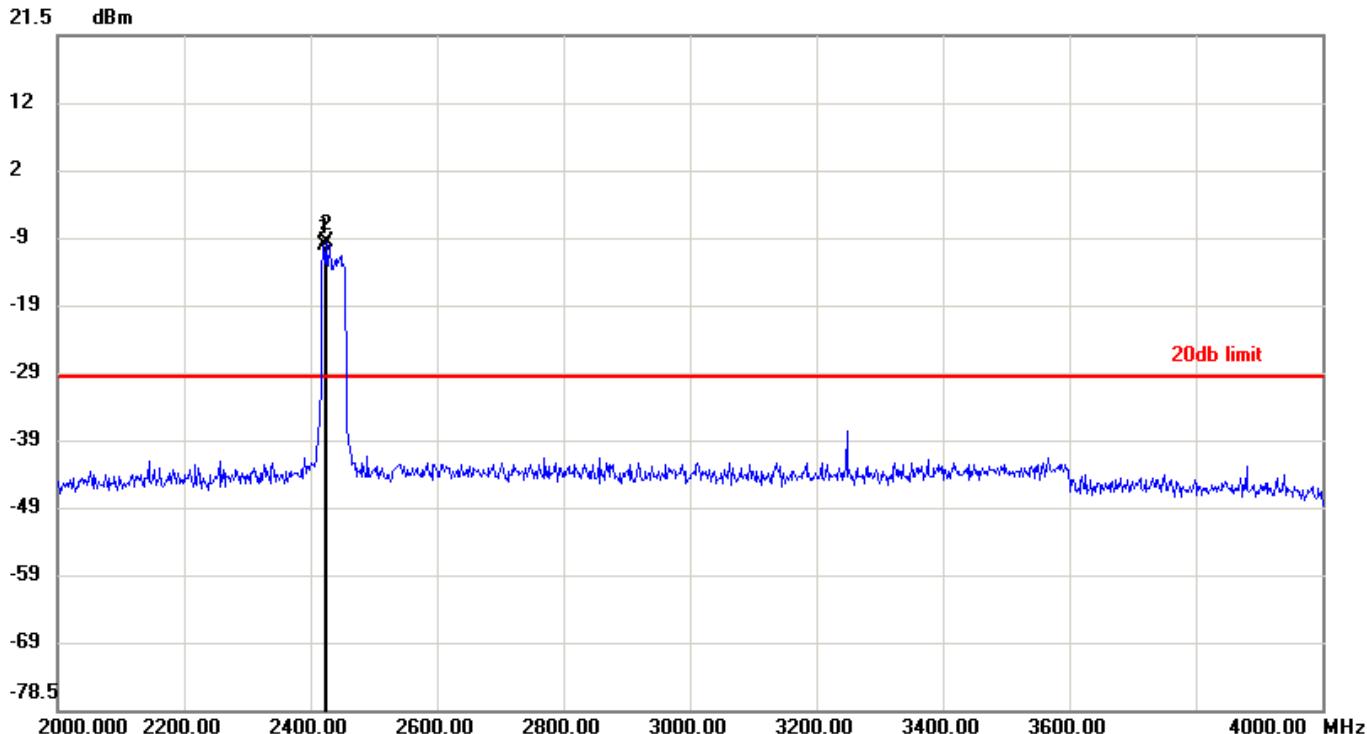
Test mode:	802.11n(HT40)	Test channel:	Middle
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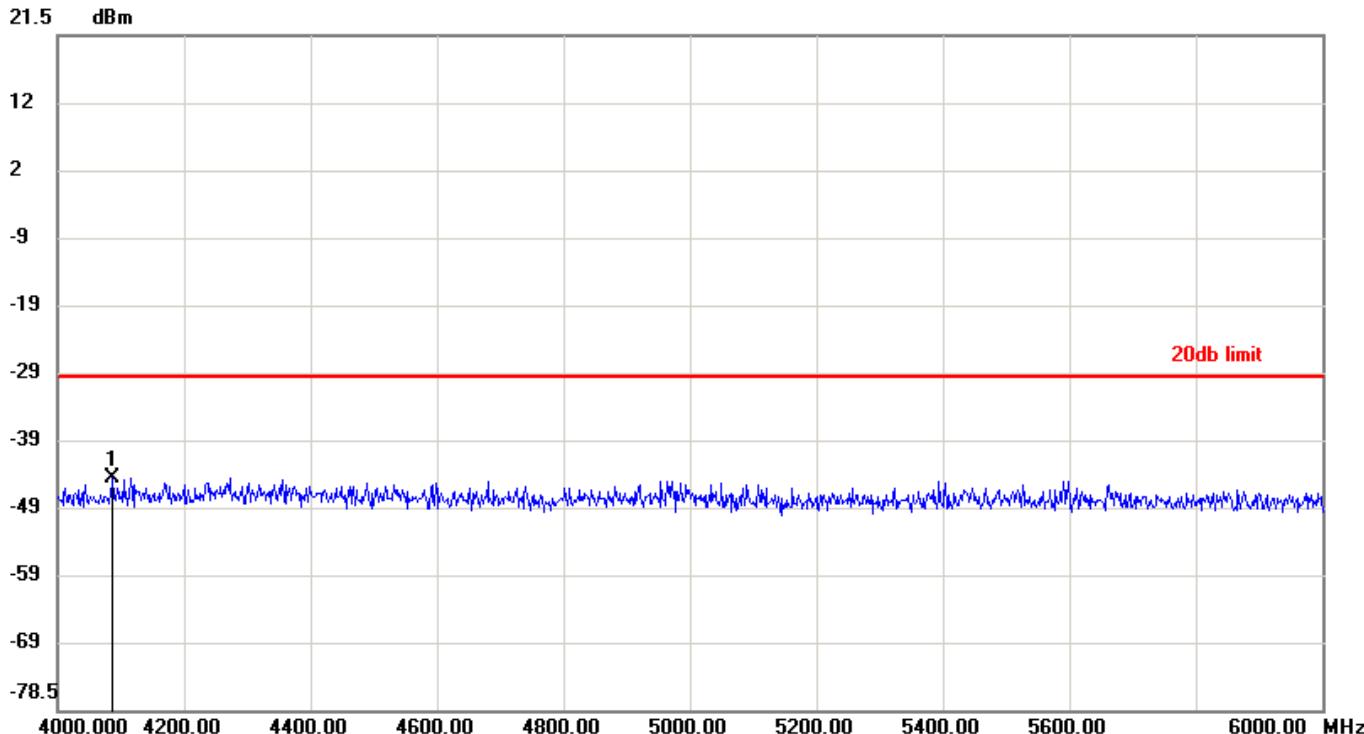
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2443.7667	-8.98	-28.98	20.00
2	3248.6330	-38.28	-28.98	-9.30



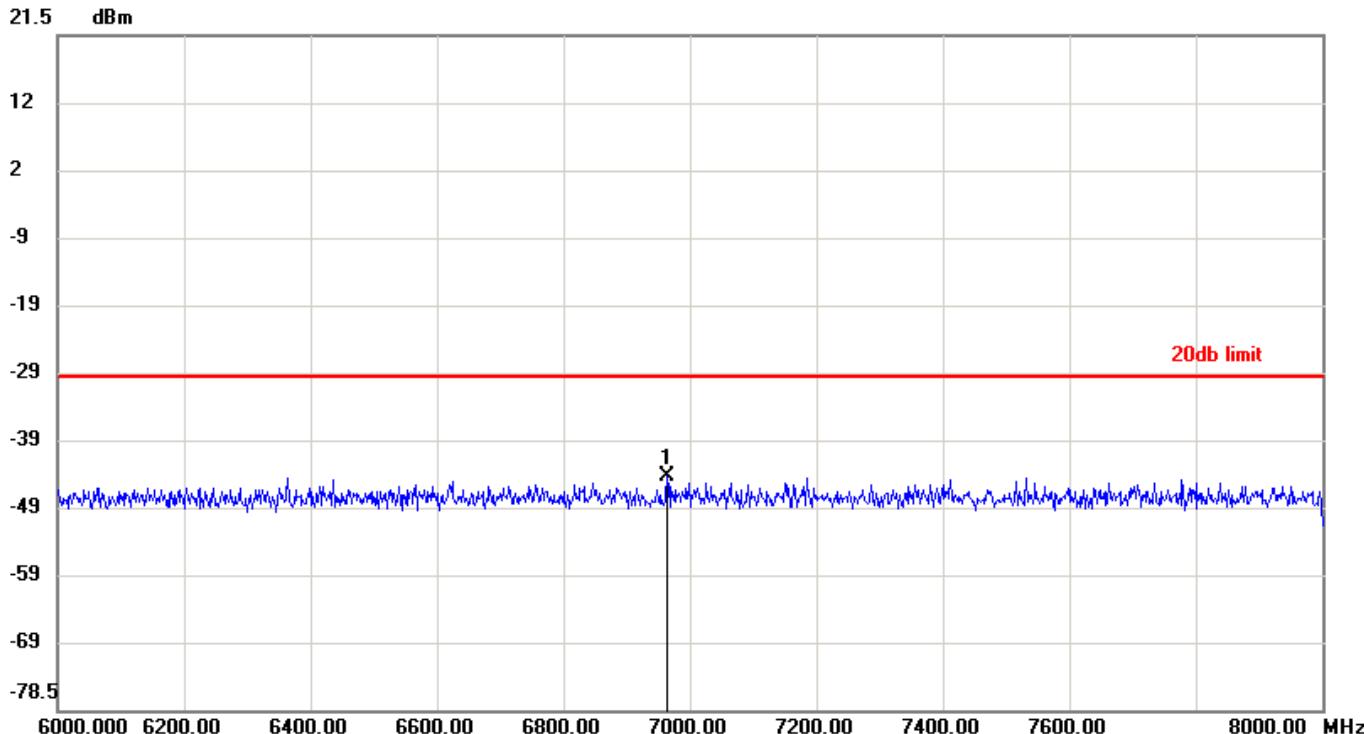
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	1607.6417	-41.76	-29.02	-12.74



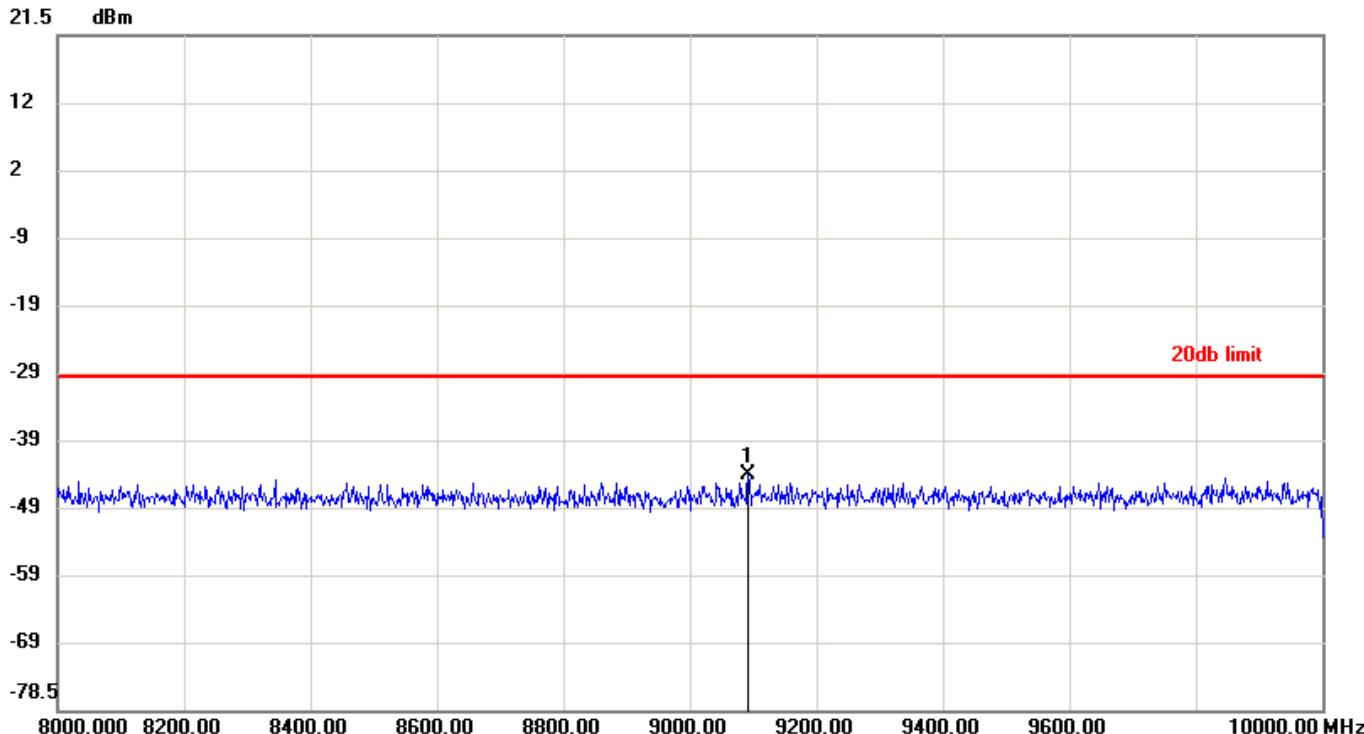
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2420.6667	-9.50	-29.02	19.52
2	2425.6667	-9.02	-29.02	20.00



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	4087.2000	-44.09	-29.02	-15.07

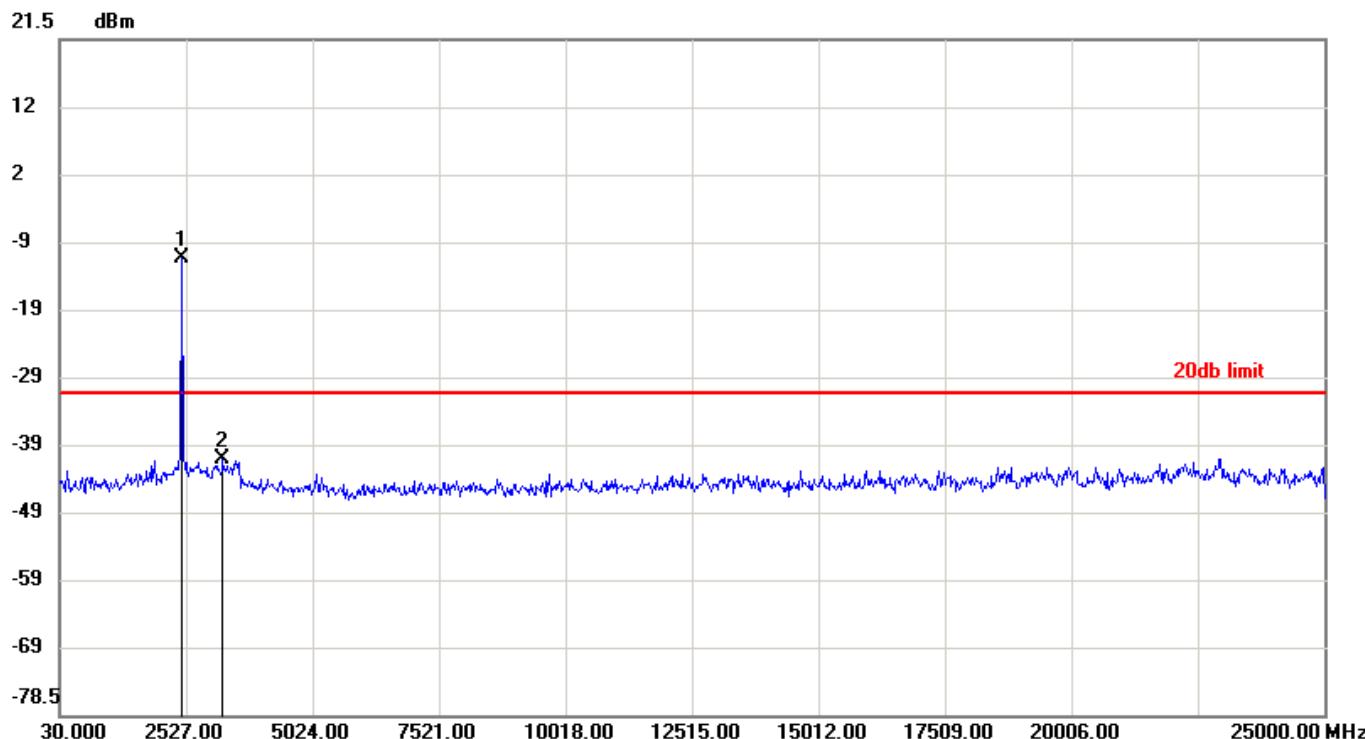


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	6965.3333	-43.78	-29.02	-14.76

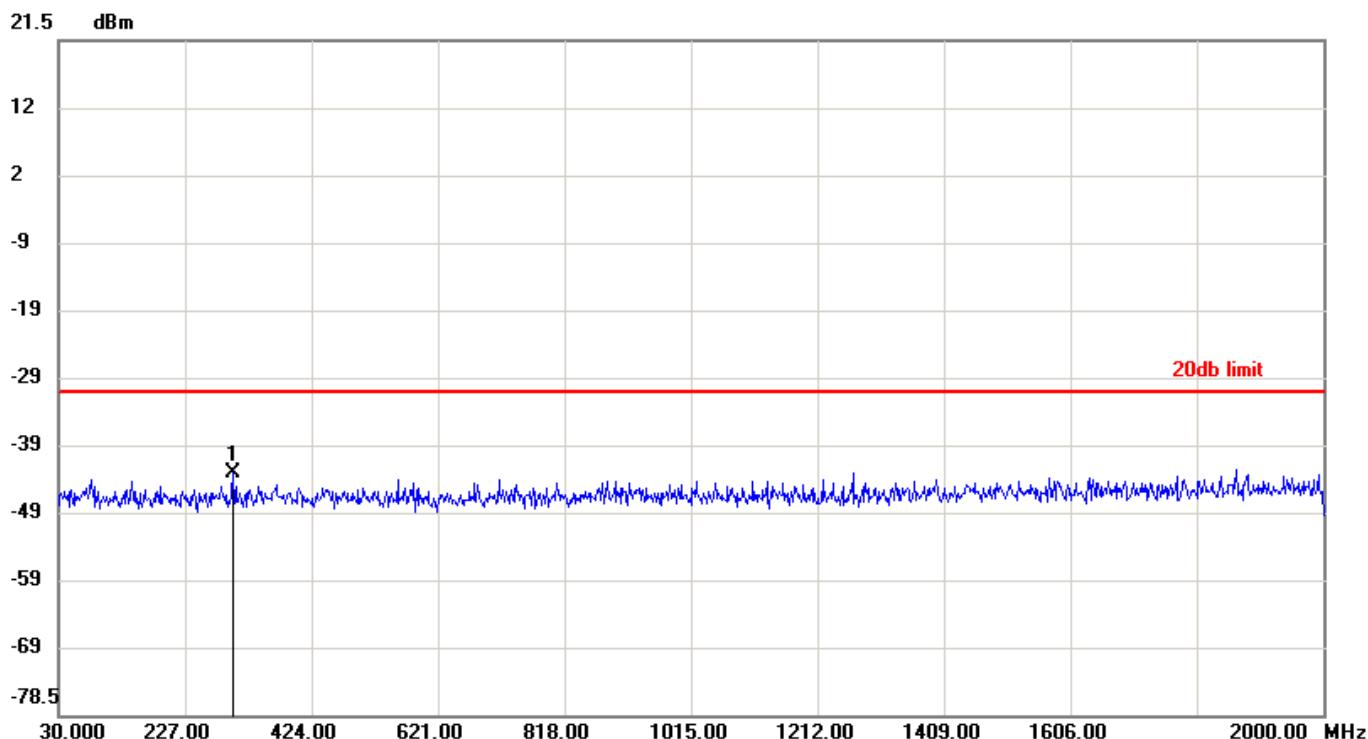


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	9092.9333	-43.61	-29.02	-14.59

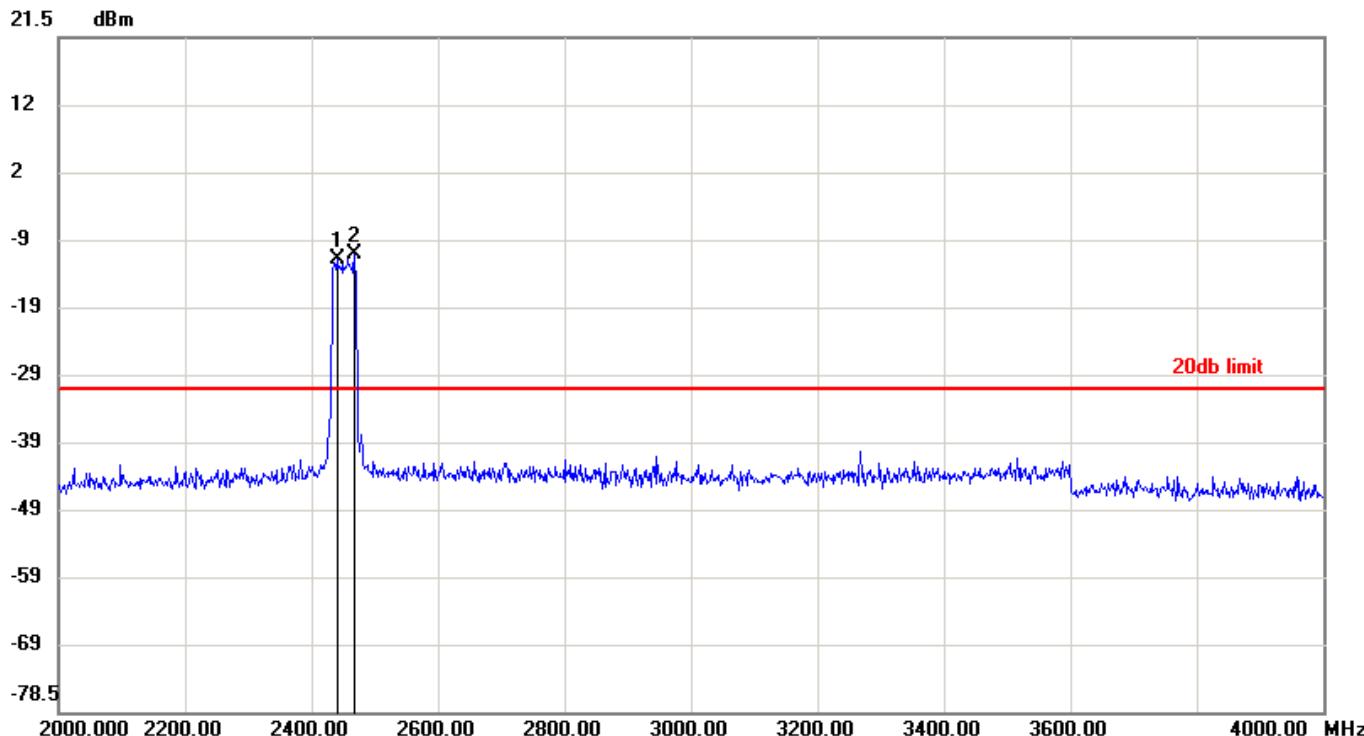
Test mode:	802.11n(HT40)	Test channel:	Highest
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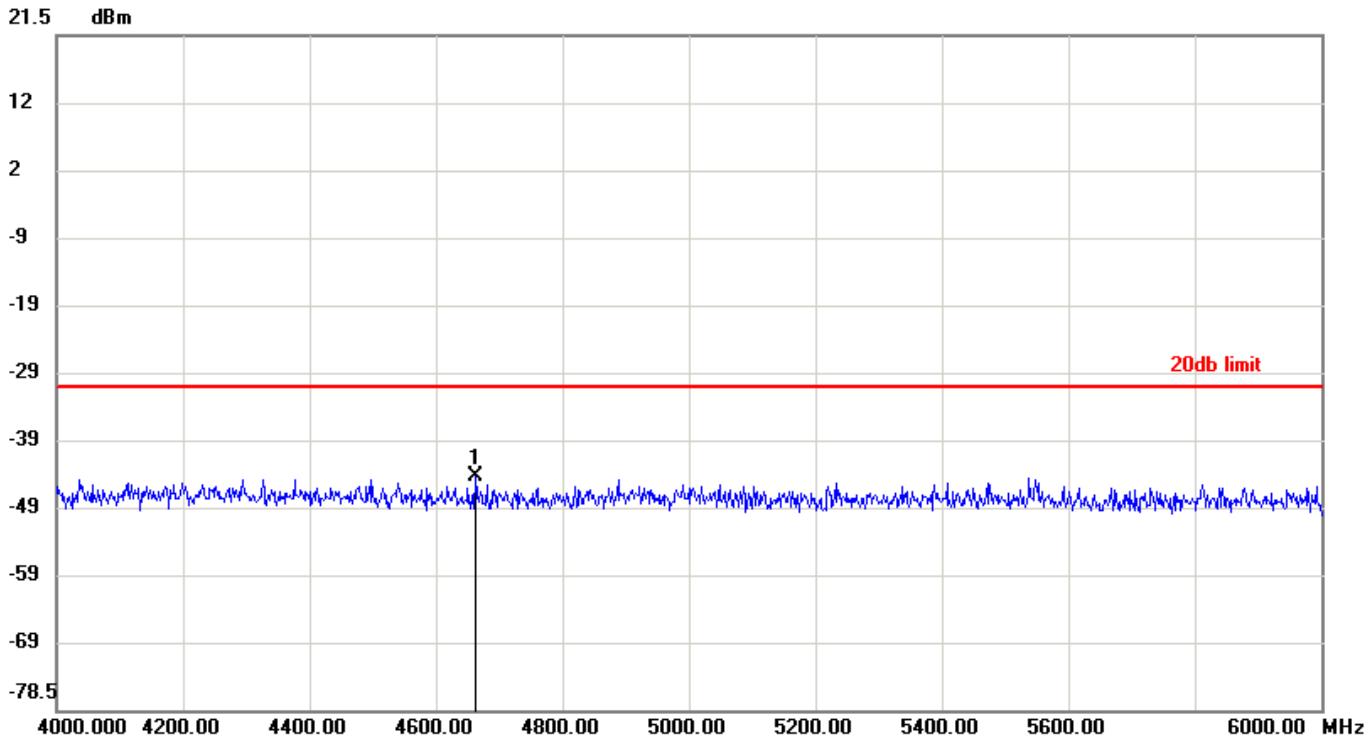
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2457.9163	-10.98	-30.98	20.00
2	3268.6090	-40.56	-30.98	-9.58

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No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	302.4510	-42.58	-30.52	-12.06

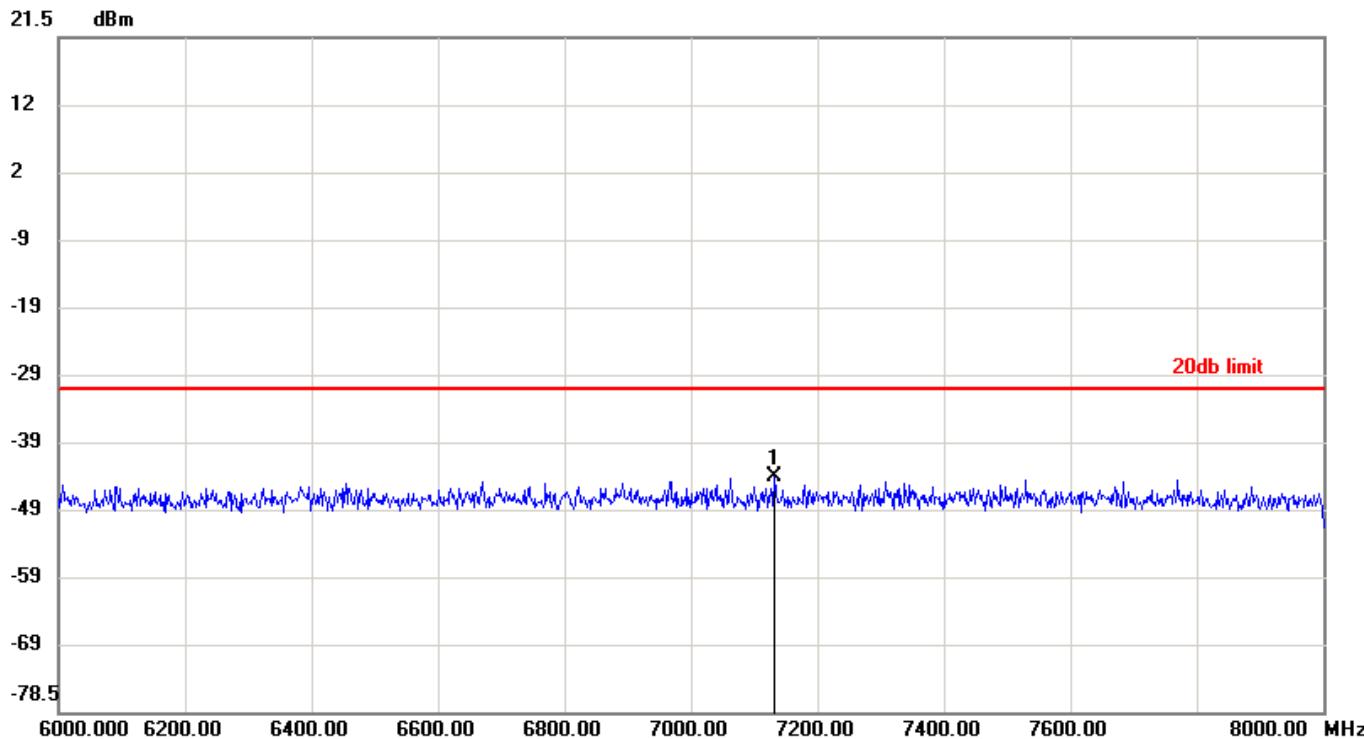


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	2440.6000	-11.35	-30.52	19.17
2	2468.1333	-10.52	-30.52	20.00

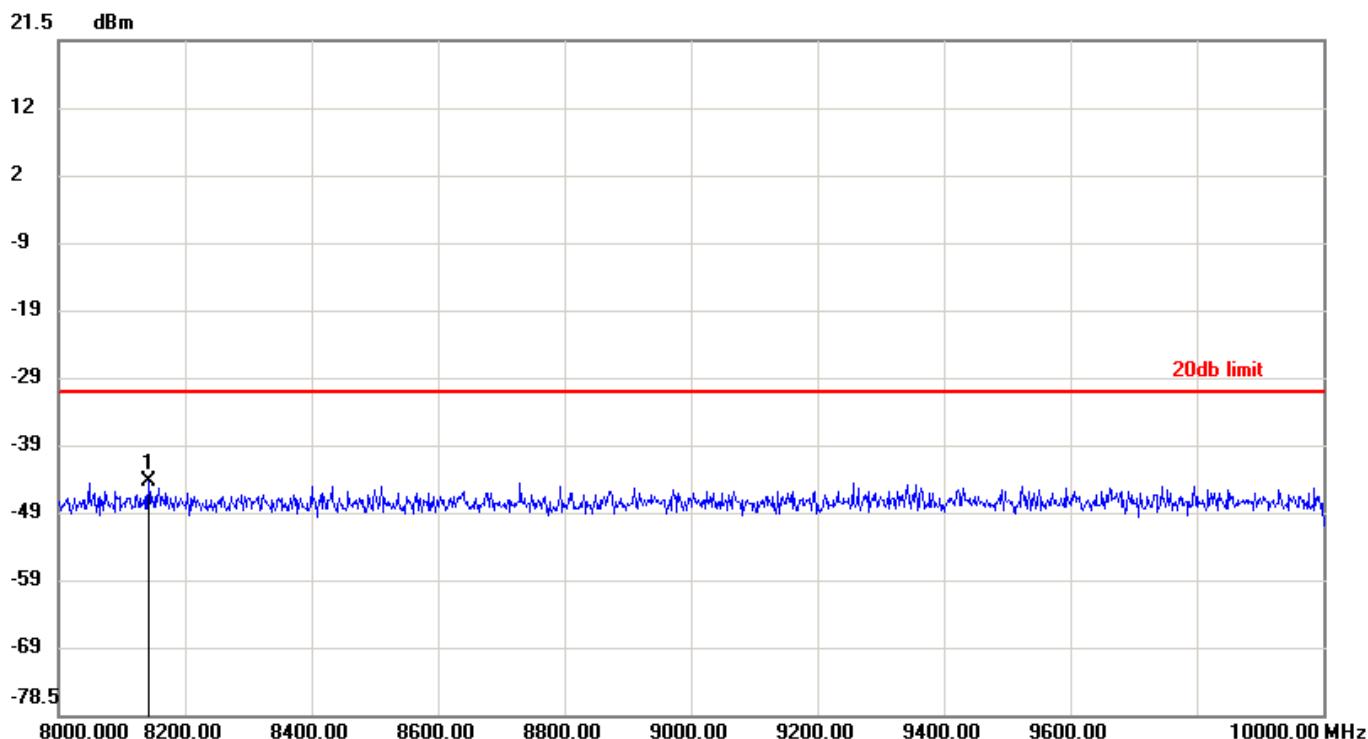


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	4663.0000	-43.97	-30.52	-13.45





No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	7132.6000	-43.69	-30.52	-13.17



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	8142.7333	-43.85	-30.52	-13.33

Remark:

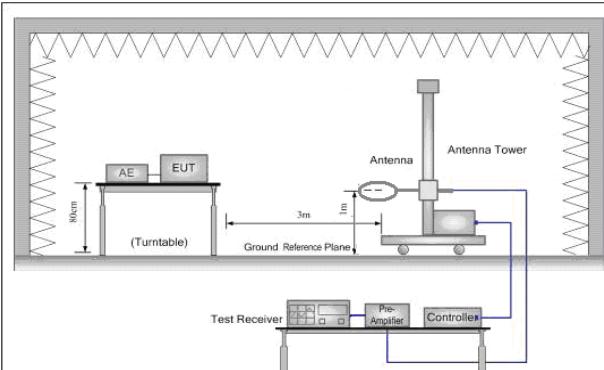
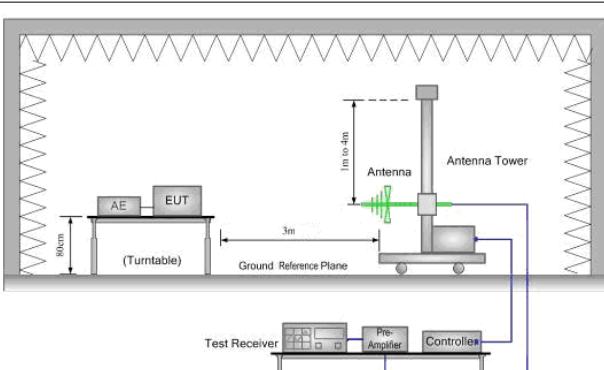
Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported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



## 6.8 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 2009				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Test Setup:	 	
Test Procedure:	<p>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.</p> <p>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.</p> <p>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.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB</p>	



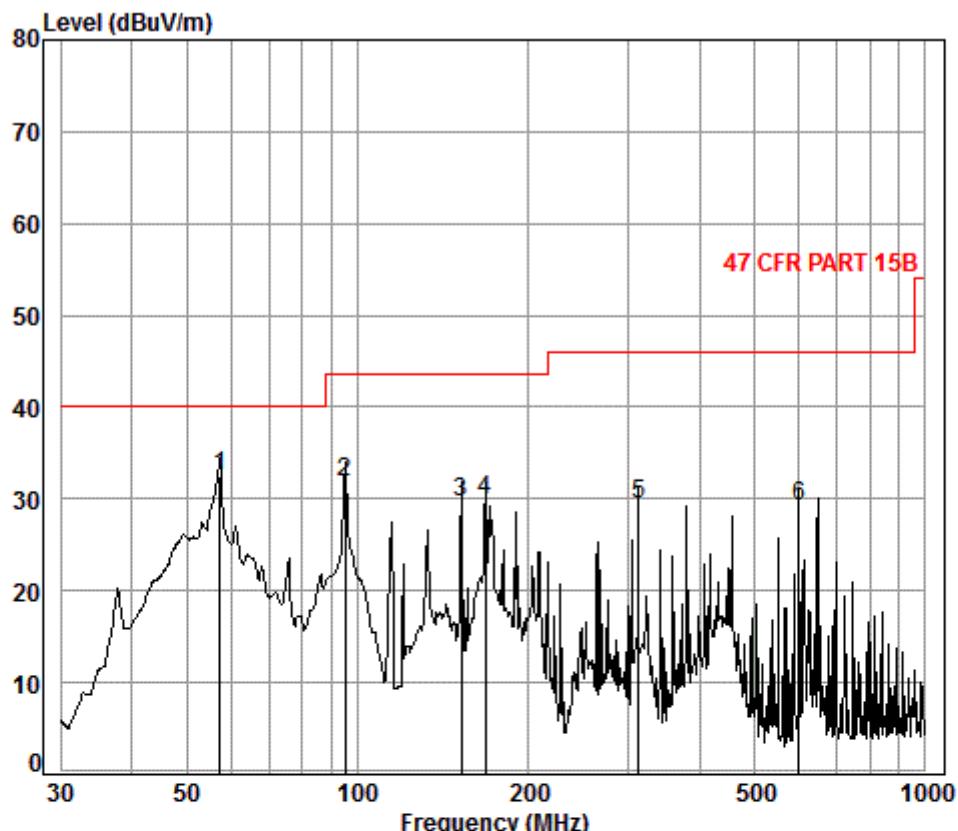
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Shenzhen Branch**

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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>g. Test the EUT in the lowest channel ,the middle channel ,the Highest channel</p> <p>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Transmitting mode.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40) For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

**6.8.1 Radiated emission below 1GHz**

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

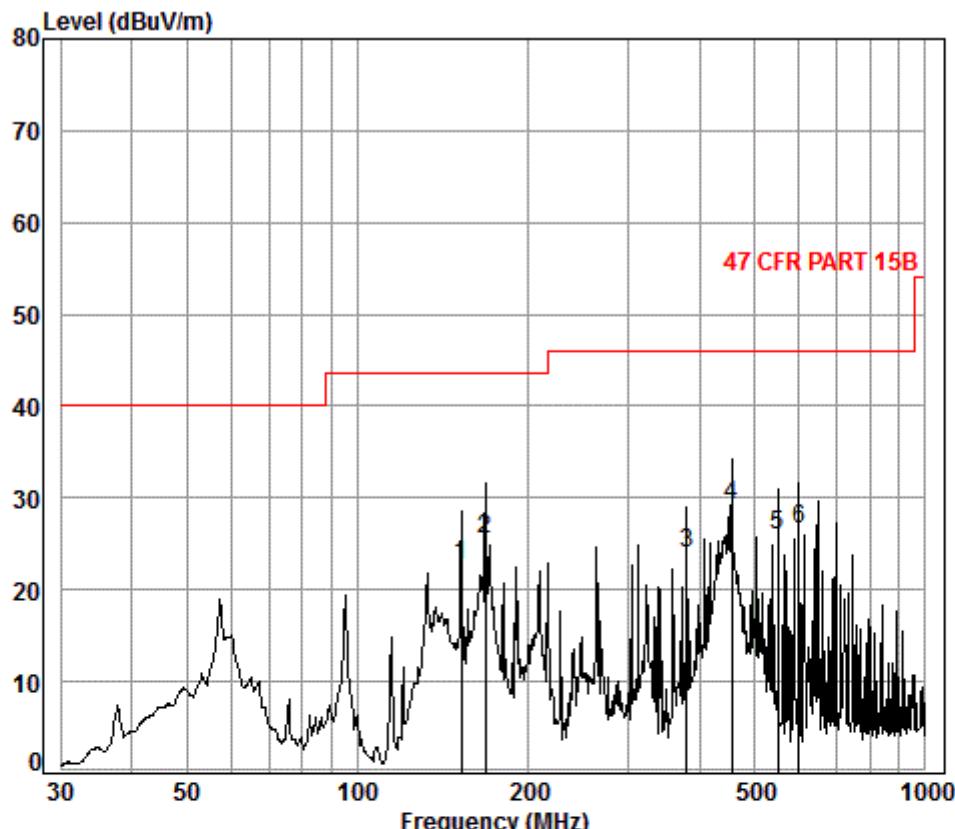


Condition: 47 CFR PART 15B 3m Vertical

Job No. : 2981CR

Freq	Cable	Ant	Preamp	Read	Limit	Over	Over	
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	57.19	0.80	0.00	27.27	58.85	32.38	40.00	-7.62
2	95.09	1.15	0.00	27.21	57.99	31.93	43.50	-11.57
3	152.13	1.32	0.00	26.90	55.32	29.74	43.50	-13.76
4	167.82	1.35	0.00	26.82	55.25	29.78	43.50	-13.72
5	312.18	1.94	0.00	26.50	53.92	29.36	46.00	-16.64
6	599.32	2.70	0.00	27.54	54.07	29.23	46.00	-16.77

Test mode:	Transmitting	Horizontal
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Condition: 47 CFR PART 15B 3m Horizontal  
Job No. : 2981CR

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit		Over Limit
					Level	Line	
1	152.13	1.32	0.00	26.90	48.24	22.66	43.50 -20.84
2	167.82	1.35	0.00	26.82	51.01	25.54	43.50 -17.96
3	379.91	2.15	0.00	27.01	48.81	23.95	46.00 -22.05
4	455.91	2.43	0.00	27.48	54.27	29.22	46.00 -16.78
5	550.95	2.65	0.00	27.61	50.90	25.94	46.00 -20.06
6	599.32	2.70	0.00	27.54	51.43	26.59	46.00 -19.41



### 6.8.2 Transmitter emission above 1GHz

Test mode:		802.11b		Test channel:	Lowest		Remark:		Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
3810.000	-32.40	33.10	0.00	41.70	42.40	74.00	-31.60	Vertical	
4824.000	-31.80	34.40	0.00	43.70	46.30	74.00	-27.70	Vertical	
5970.000	-30.30	34.80	0.00	41.70	46.20	74.00	-27.80	Vertical	
7236.000	-30.10	35.80	0.00	40.50	46.20	74.00	-27.80	Vertical	
9648.000	-27.80	37.20	0.00	37.70	47.10	74.00	-26.90	Vertical	
12480.000	-26.50	38.00	0.00	38.50	50.00	74.00	-24.00	Vertical	
3810.000	-32.40	33.10	0.00	43.10	43.80	74.00	-30.20	Horizontal	
4824.000	-31.80	34.40	0.00	47.20	49.80	74.00	-24.20	Horizontal	
5970.000	-30.30	34.80	0.00	41.60	46.10	74.00	-27.90	Horizontal	
7236.000	-30.10	35.80	0.00	41.00	46.70	74.00	-27.30	Horizontal	
9648.000	-27.80	37.20	0.00	38.80	48.20	74.00	-25.80	Horizontal	
12645.000	-26.50	38.10	0.00	38.40	50.00	74.00	-24.00	Horizontal	

Test mode:		802.11b		Test channel:	Middle		Remark:		Peak
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Polarization	
3855.000	-32.50	33.30	0.00	42.20	43.00	74.00	-31.00	Vertical	
4874.000	-31.80	34.50	0.00	44.20	46.90	74.00	-27.10	Vertical	
5955.000	-30.40	34.70	0.00	43.00	47.30	74.00	-26.70	Vertical	
7311.000	-30.10	35.70	0.00	40.50	46.10	74.00	-27.90	Vertical	
9748.000	-27.40	37.30	0.00	37.60	47.50	74.00	-26.50	Vertical	
12570.000	-26.40	38.00	0.00	37.60	49.20	74.00	-24.80	Vertical	
3825.000	-32.50	33.20	0.00	42.90	43.60	74.00	-30.40	Horizontal	
4874.000	-31.80	34.50	0.00	49.50	52.20	74.00	-21.80	Horizontal	
6000.000	-30.30	34.90	0.00	42.50	47.10	74.00	-26.90	Horizontal	
7311.000	-30.10	35.70	0.00	40.40	46.00	74.00	-28.00	Horizontal	
9748.000	-27.40	37.30	0.00	37.00	46.90	74.00	-27.10	Horizontal	
12645.000	-26.50	38.10	0.00	37.40	49.00	74.00	-25.00	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	
3825.000	-32.50	33.20	0.00	42.70	43.40	74.00	-30.60		Vertical	
4924.000	-31.80	34.60	0.00	43.90	46.70	74.00	-27.30		Vertical	
5940.000	-30.40	34.70	0.00	41.70	46.00	74.00	-28.00		Vertical	
7386.000	-30.00	35.70	0.00	39.80	45.50	74.00	-28.50		Vertical	
9848.000	-26.90	37.30	0.00	36.90	47.30	74.00	-26.70		Vertical	
12660.000	-26.60	38.10	0.00	37.00	48.50	74.00	-25.50		Vertical	
3870.000	-32.50	33.30	0.00	43.20	44.00	74.00	-30.00		Horizontal	
4924.000	-31.80	34.60	0.00	48.70	51.50	74.00	-22.50		Horizontal	
6015.000	-30.30	34.90	0.00	41.90	46.50	74.00	-27.50		Horizontal	
7386.000	-30.00	35.70	0.00	40.40	46.10	74.00	-27.90		Horizontal	
9848.000	-26.90	37.30	0.00	36.60	47.00	74.00	-27.00		Horizontal	
12795.000	-27.00	38.20	0.00	37.30	48.50	74.00	-25.50		Horizontal	

Test mode:		802.11g		Test channel:		Lowest		Remark:		Peak
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)		Polarization	
3585.000	-32.40	32.40	0.00	49.50	49.50	74.00	-24.50		Vertical	
4824.000	-31.80	34.40	0.00	41.80	44.40	74.00	-29.60		Vertical	
5970.000	-30.30	34.80	0.00	42.00	46.50	74.00	-27.50		Vertical	
7236.000	-30.10	35.80	0.00	39.90	45.60	74.00	-28.40		Vertical	
9648.000	-27.80	37.20	0.00	36.80	46.20	74.00	-27.80		Vertical	
12825.000	-27.10	38.20	0.00	38.00	49.10	74.00	24.90		Vertical	
3588.694	-32.40	32.40	0.00	45.50	45.50	74.00	-28.50		Horizontal	
4824.000	-31.80	34.40	0.00	42.00	44.60	74.00	-29.40		Horizontal	
5970.000	-30.30	34.80	0.00	41.50	46.00	74.00	-28.00		Horizontal	
7236.000	-30.10	35.80	0.00	40.50	46.20	74.00	-27.80		Horizontal	
9648.000	-27.80	37.20	0.00	36.80	46.20	74.00	-27.80		Horizontal	
13185.000	-27.60	38.50	0.00	38.80	49.70	74.00	-24.30		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	
3870.000	-32.50	33.30	0.00	41.70	42.50	74.00	-31.50		Vertical	
4874.000	-31.80	34.50	0.00	41.70	44.40	74.00	-29.60		Vertical	
6015.000	-30.30	34.90	0.00	41.20	45.80	74.00	-28.20		Vertical	
7311.000	-30.10	35.70	0.00	39.60	45.20	74.00	-28.80		Vertical	
9748.000	-27.40	37.30	0.00	37.30	47.20	74.00	-26.80		Vertical	
13170.000	-27.60	38.40	0.00	37.90	48.70	74.00	-25.30		Vertical	
3825.000	-32.50	33.20	0.00	41.60	42.30	74.00	-31.70		Horizontal	
4874.000	-31.80	34.50	0.00	41.40	44.10	74.00	-29.90		Horizontal	
5955.000	-30.40	34.70	0.00	41.30	45.60	74.00	-28.40		Horizontal	
7311.000	-30.10	35.70	0.00	41.20	46.80	74.00	-27.20		Horizontal	
9748.000	-27.40	37.30	0.00	37.10	47.00	74.00	-27.00		Horizontal	
13275.000	-27.80	38.50	0.00	38.10	48.80	74.00	-25.20		Horizontal	

Test mode:		802.11g		Test channel:		Highest		Remark:		Peak
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)		Polarization	
3855.338	-32.50	33.30	0.00	41.60	42.40	74.00	-31.60		Vertical	
4924.000	-31.80	34.60	0.00	42.20	45.00	74.00	-29.00		Vertical	
6015.000	-30.30	34.90	0.00	40.90	45.50	74.00	-28.50		Vertical	
7386.000	-30.00	35.70	0.00	39.60	45.30	74.00	-28.70		Vertical	
9848.000	-26.90	37.30	0.00	36.40	46.80	74.00	-27.20		Vertical	
13275.000	-27.80	38.50	0.00	37.80	48.50	74.00	-25.50		Vertical	
3825.000	-32.50	33.20	0.00	41.60	42.30	74.00	-31.70		Horizontal	
4924.000	-31.80	34.60	0.00	42.00	44.80	74.00	-29.20		Horizontal	
6075.000	-30.50	35.00	0.00	42.40	46.90	74.00	-27.10		Horizontal	
7386.000	-30.00	35.70	0.00	40.00	45.70	74.00	-28.30		Horizontal	
9848.000	-26.90	37.30	0.00	36.80	47.20	74.00	-26.80		Horizontal	
13125.000	-27.60	38.40	0.00	38.20	49.00	74.00	-25.00		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
3750.000	-32.40	32.90	0.00	42.90	43.40	74.00	-30.60	Vertical
4824.000	-31.80	34.40	0.00	42.10	44.70	74.00	-29.30	Vertical
5970.000	-30.30	34.80	0.00	41.50	46.00	74.00	-28.00	Vertical
7236.000	-30.10	35.80	0.00	40.30	46.00	74.00	-28.00	Vertical
9648.000	-27.80	37.20	0.00	38.00	47.40	74.00	-26.60	Vertical
12615.000	-26.50	38.10	0.00	37.00	48.60	74.00	-25.40	Vertical
3862.252	-32.50	33.30	0.00	41.30	42.10	74.00	-31.90	Horizontal
4824.000	-31.80	34.40	0.00	42.20	44.80	74.00	-29.20	Horizontal
5940.000	-30.40	34.70	0.00	41.20	45.50	74.00	-28.50	Horizontal
7236.000	-30.10	35.80	0.00	40.60	46.30	74.00	-27.70	Horizontal
9648.000	-27.80	37.20	0.00	38.20	47.60	74.00	-26.40	Horizontal
12015.000	-26.50	37.80	0.00	38.70	50.00	74.00	-24.00	Horizontal

Test mode:		802.11n(HT20)		Test channel:	Middle		Remark:	Peak
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dB $\mu$ V)	Emission Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Polarization
3900.000	-32.50	33.20	0.00	41.90	42.60	74.00	-31.40	Vertical
4874.000	-31.80	34.50	0.00	41.40	44.10	74.00	-29.90	Vertical
6000.000	-30.30	34.90	0.00	40.90	45.50	74.00	-28.50	Vertical
7311.000	-30.10	35.70	0.00	40.40	46.00	74.00	-28.00	Vertical
9748.000	-27.40	37.30	0.00	37.10	47.00	74.00	-27.00	Vertical
13080.000	-27.60	38.30	0.00	37.80	48.50	74.00	-25.50	Vertical
3885.000	-32.50	33.20	0.00	41.50	42.20	74.00	-31.80	Horizontal
4874.000	-31.80	34.50	0.00	42.10	44.80	74.00	-29.20	Horizontal
6075.000	-30.50	35.00	0.00	40.90	45.40	74.00	-28.60	Horizontal
7311.000	-30.10	35.70	0.00	39.40	45.00	74.00	-29.00	Horizontal
9748.000	-27.40	37.30	0.00	37.30	47.20	74.00	-26.80	Horizontal
12435.000	-26.50	38.00	0.00	37.10	48.60	74.00	-25.40	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	
3795.000	-32.40	33.10	0.00	41.80	42.50	74.00	-31.50		Vertical	
4924.000	-31.80	34.60	0.00	41.30	44.10	74.00	-29.90		Vertical	
6045.000	-30.40	35.00	0.00	41.20	45.80	74.00	-28.20		Vertical	
7386.000	-30.00	35.70	0.00	39.90	45.60	74.00	-28.40		Vertical	
9848.000	-26.90	37.30	0.00	36.20	46.60	74.00	-27.40		Vertical	
13170.000	-27.60	38.40	0.00	38.00	48.80	74.00	-25.20		Vertical	
3855.000	-32.50	33.30	0.00	41.80	42.60	74.00	-31.40		Horizontal	
4924.000	-31.80	34.60	0.00	42.90	45.70	74.00	-28.30		Horizontal	
6000.000	-30.30	34.90	0.00	41.00	45.60	74.00	-28.40		Horizontal	
7386.000	-30.00	35.70	0.00	41.00	46.70	74.00	-27.30		Horizontal	
9848.000	-26.90	37.30	0.00	37.20	47.60	74.00	-26.40		Horizontal	
13170.000	-27.60	38.40	0.00	38.60	49.40	74.00	-24.60		Horizontal	

Test mode:		802.11n(HT40)		Test channel:		Lowest		Remark:		Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)		Polarization	
3885.000	-32.50	33.20	0.00	42.00	42.70	74.00	-31.30		Vertical	
4844.000	-31.80	34.50	0.00	41.70	44.40	74.00	-29.60		Vertical	
6075.000	-30.50	35.00	0.00	41.30	45.80	74.00	-28.20		Vertical	
7266.000	-30.10	35.70	0.00	41.00	46.60	74.00	-27.40		Vertical	
9688.000	-27.60	37.20	0.00	37.50	47.10	74.00	-26.90		Vertical	
12510.000	-26.50	38.00	0.00	37.70	49.20	74.00	-24.80		Vertical	
3900.000	-32.50	33.20	0.00	41.90	42.60	74.00	-31.40		Horizontal	
4844.000	-31.80	34.50	0.00	42.10	44.80	74.00	-29.20		Horizontal	
6015.000	-30.30	34.90	0.00	42.60	47.20	74.00	-26.80		Horizontal	
7266.000	-30.10	35.70	0.00	40.30	45.90	74.00	-28.10		Horizontal	
9688.000	-27.60	37.20	0.00	37.50	47.10	74.00	-26.90		Horizontal	
12540.000	-26.40	38.00	0.00	37.00	48.60	74.00	-25.40		Horizontal	



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Test mode:		802.11n(HT40)		Test channel:		Middle		Remark:		Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
3840.000	-32.50	33.30	0.00	41.80	42.60	74.00	-31.40	Vertical		
4874.000	-31.80	34.50	0.00	41.30	44.00	74.00	-30.00	Vertical		
6075.000	-30.50	35.00	0.00	41.00	45.50	74.00	-28.50	Vertical		
7311.000	-30.10	35.70	0.00	40.30	45.90	74.00	-28.10	Vertical		
9748.000	-27.40	37.30	0.00	37.40	47.30	74.00	-26.70	Vertical		
12660.000	-26.60	38.10	0.00	37.50	49.00	74.00	-25.00	Vertical		
3840.000	-32.50	33.30	0.00	41.40	42.20	74.00	-31.80	Horizontal		
4874.000	-31.80	34.50	0.00	42.20	44.90	74.00	-29.10	Horizontal		
5985.000	-30.30	34.80	0.00	40.90	45.40	74.00	-28.60	Horizontal		
7311.000	-30.10	35.70	0.00	40.00	45.60	74.00	-28.40	Horizontal		
9748.000	-27.40	37.30	0.00	37.40	47.30	74.00	-26.70	Horizontal		
12645.000	-26.50	38.10	0.00	37.30	48.90	74.00	-25.10	Horizontal		

Test mode:		802.11n(HT40)		Test channel:		Highest		Remark:		Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization		
3870.000	-32.50	33.30	0.00	41.60	42.40	74.00	-31.60	Vertical		
4904.000	-31.80	34.60	0.00	41.40	44.20	74.00	-29.80	Vertical		
5955.000	-30.40	34.70	0.00	41.40	45.70	74.00	-28.30	Vertical		
7356.000	-30.10	35.70	0.00	40.30	45.90	74.00	-28.10	Vertical		
9808.000	-27.10	37.30	0.00	37.50	47.70	74.00	-26.30	Vertical		
12525.000	-26.50	38.00	0.00	37.40	48.90	74.00	-25.10	Vertical		
3810.000	-32.40	33.10	0.00	41.70	42.40	74.00	-31.60	Horizontal		
4904.000	-31.80	34.60	0.00	41.60	44.40	74.00	-29.60	Horizontal		
6075.000	-30.50	35.00	0.00	40.80	45.30	74.00	-28.70	Horizontal		
7356.000	-30.10	35.70	0.00	39.90	45.50	74.00	-28.50	Horizontal		
9808.000	-27.10	37.30	0.00	37.20	47.40	74.00	-26.60	Horizontal		
12630.000	-26.50	38.10	0.00	37.20	48.80	74.00	-25.20	Horizontal		

Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 2) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

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Shenzhen Branch**

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- 3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

## 6.9 Restricted bands around fundamental frequency

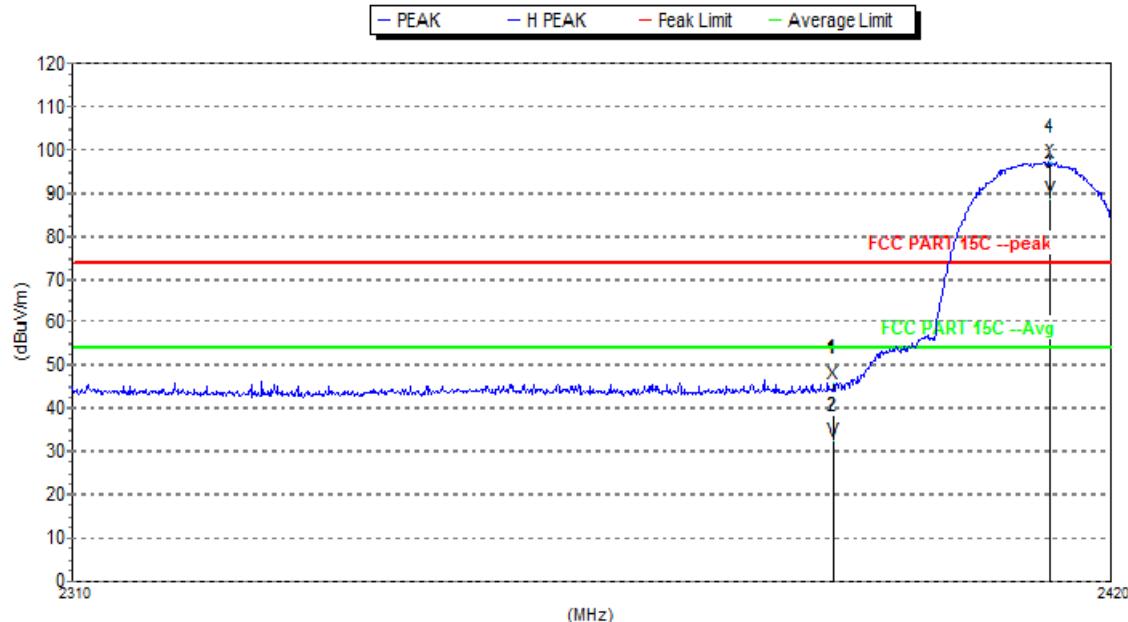
Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205					
Test Method:	ANSI C63.10 2009					
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)					
Limit:	Frequency	Limit (dBuV/m @3m)	Remark			
	30MHz-88MHz	40.0	Quasi-peak Value			
	88MHz-216MHz	43.5	Quasi-peak Value			
	216MHz-960MHz	46.0	Quasi-peak Value			
	960MHz-1GHz	54.0	Quasi-peak Value			
	Above 1GHz	54.0	Average Value			
		74.0	Peak Value			
Test Setup:						

Figure 1. 30MHz to 1GHz

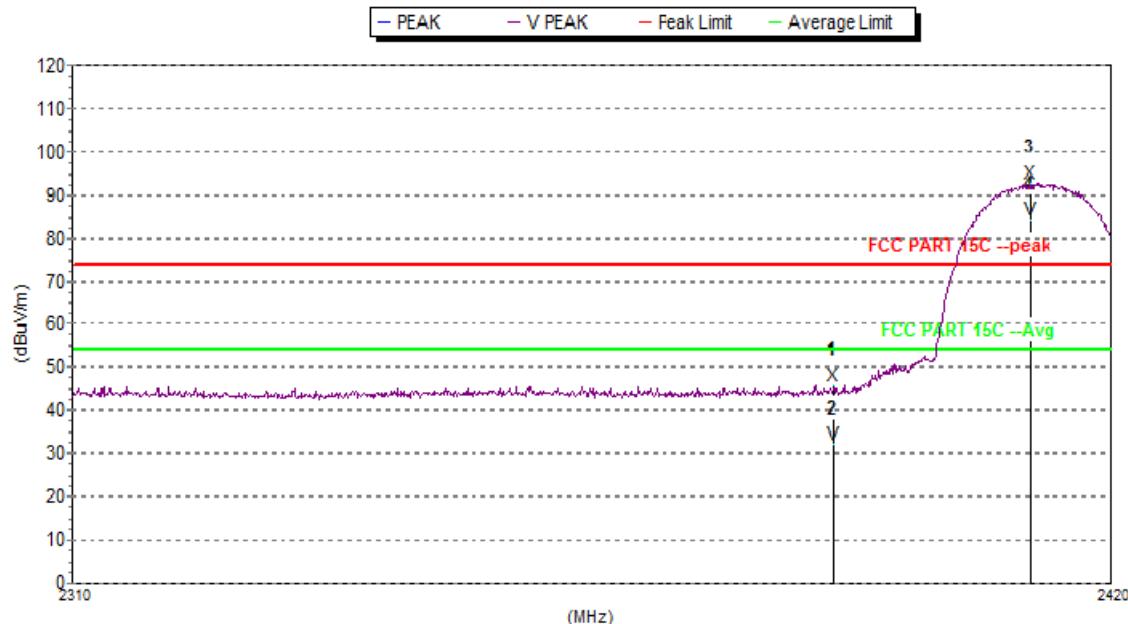
Figure 2. Above 1 GHz



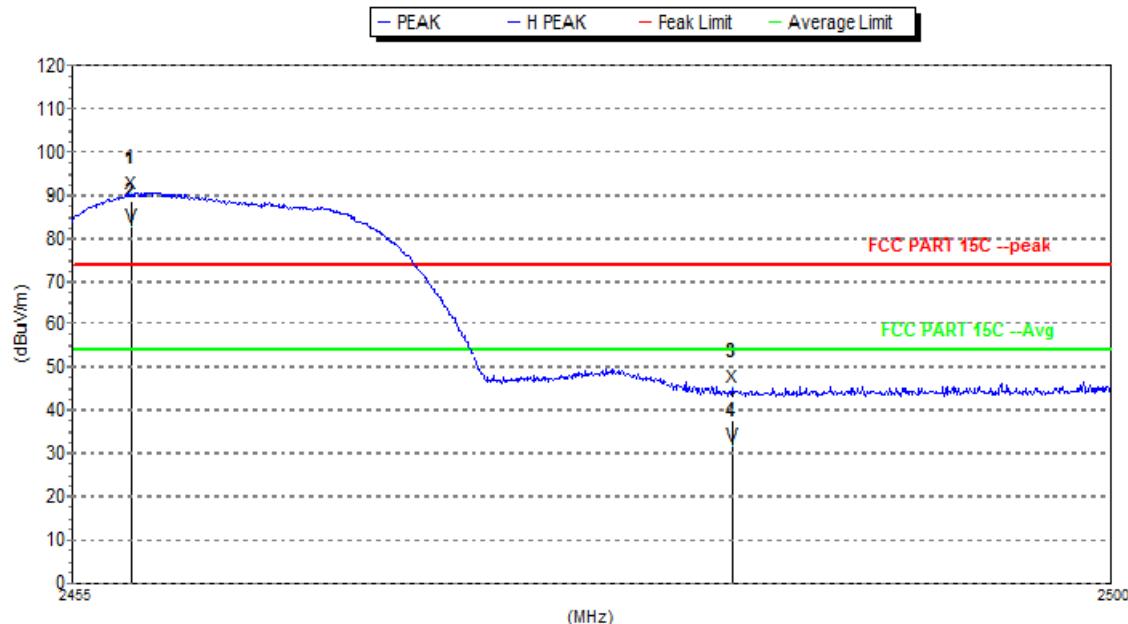
Test Procedure:	<ol style="list-style-type: none"><li>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li><li>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li><li>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li><li>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>f. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel</li><li>g. Test the EUT in the lowest channel , the Highest channel</li><li>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</li><li>i. Repeat above procedures until all frequencies measured was complete.</li></ol>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Transmitting mode.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40) Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

**Test plot as follows:**


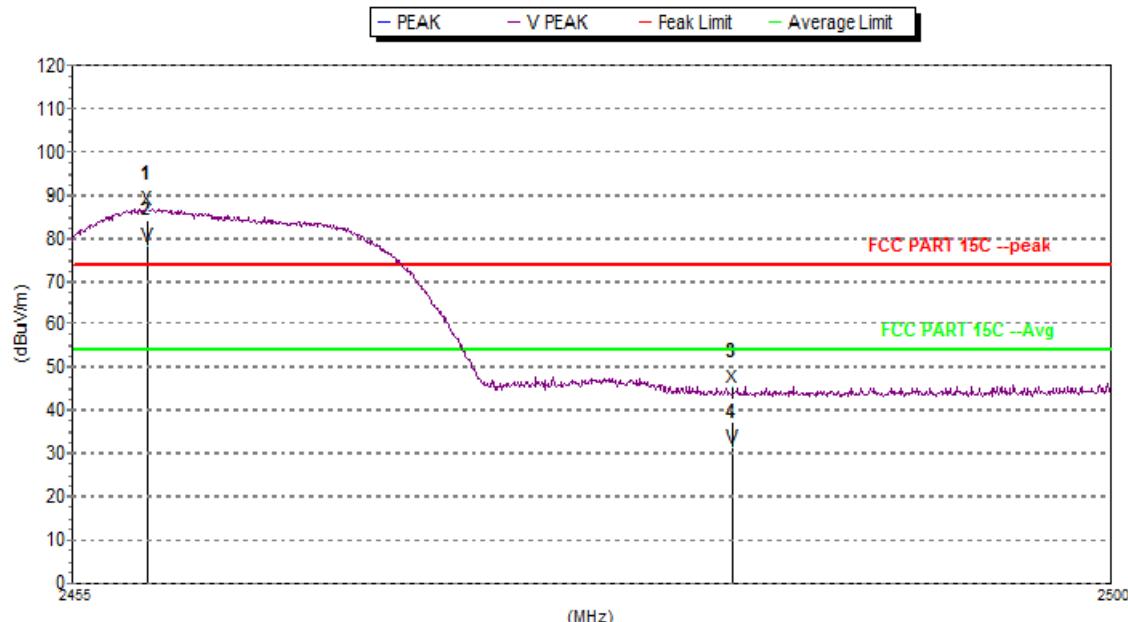
Mk.	Freq.(MHz)	Leve l(dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2390	45.9	74.0	28.1	32.5	0.0	-20.8	H
4	2413.400	97.3	74.0	-23.3	32.6	0.0	-21.2	H
Avg								
2	2390	32.5	54.0	21.5	32.5	0.0	-20.8	H
3	2413.400	88.6	54.0	-34.6	32.6	0.0	-21.2	H



Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2390	45.6	74.0	28.4	32.5	0.0	-20.8	V
3	2411.310	92.6	74.0	-18.6	32.6	0.0	-21.2	V
Avg								
2	2390	32.0	54.0	22.0	32.5	0.0	-20.8	V
4	2411.310	84.4	54.0	-30.4	32.6	0.0	-21.2	V

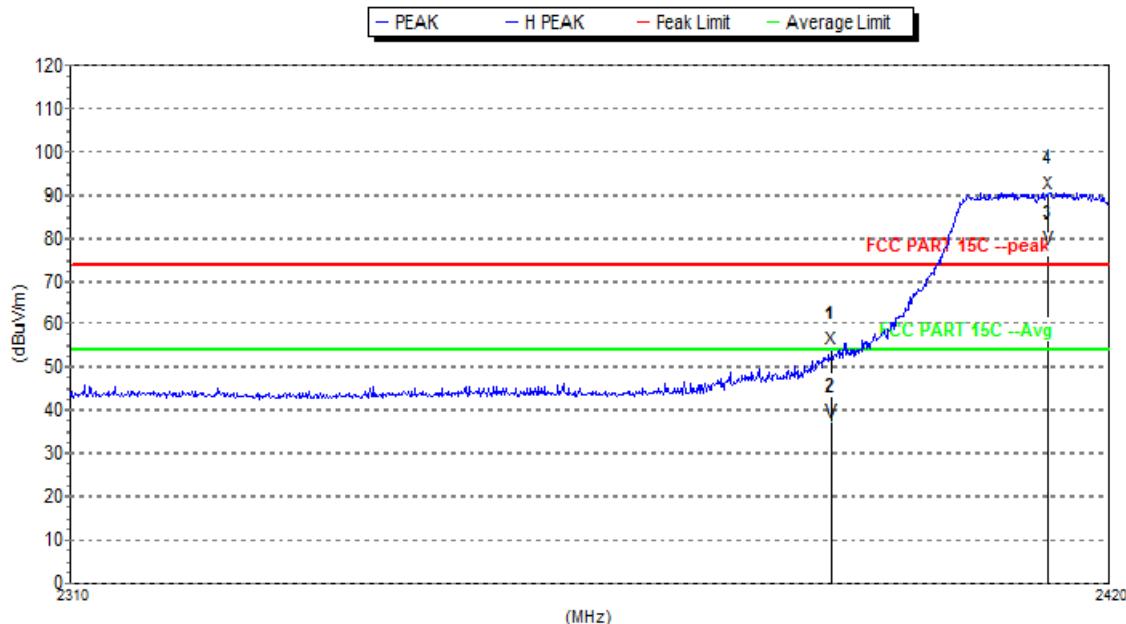


Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2457.565	90.5	74.0	-16.5	32.5	0.0	-20.8	H
3	2483.5	45.4	74.0	28.6	32.5	0.0	-20.8	H
Avg								
2	2457.565	82.6	54.0	-28.6	32.5	0.0	-20.8	--
4	2483.5	31.6	54.0	22.4	32.5	0.0	-20.5	H

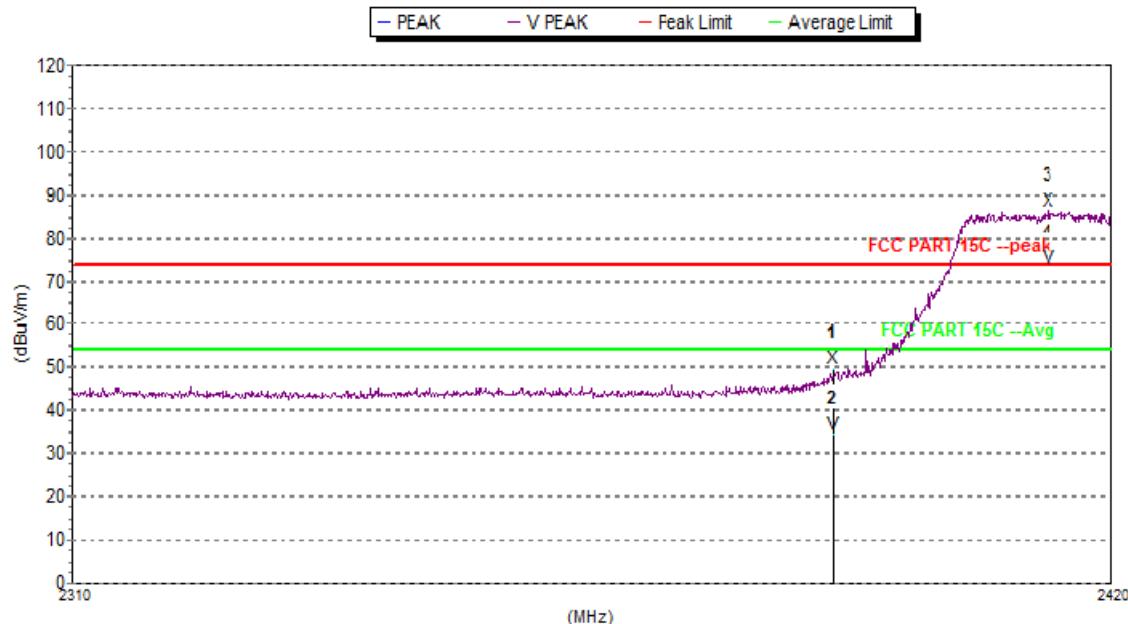


Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2458.285	86.7	74.0	-12.7	32.5	0.0	-20.7	V
3	2483.5	45.2	74.0	28.8	32.5	0.0	-20.7	V
Avg								
2	2458.285	78.3	54.0	-24.3	32.5	0.0	-20.7	--
4	2483.5	31.5	54.0	22.5	32.5	0.0	-20.5	V

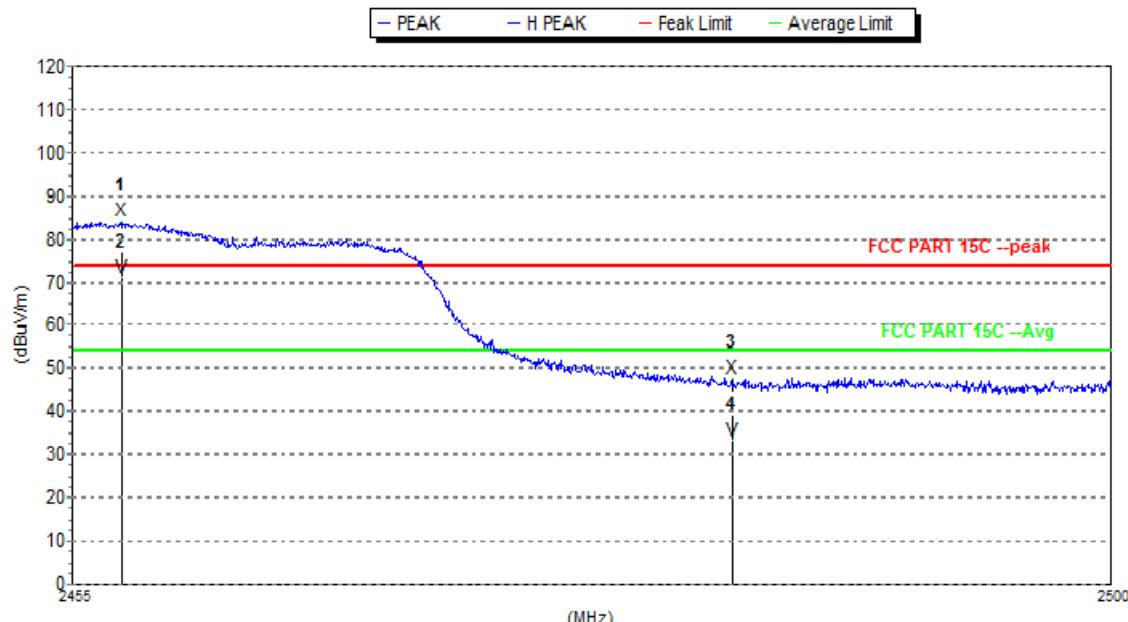




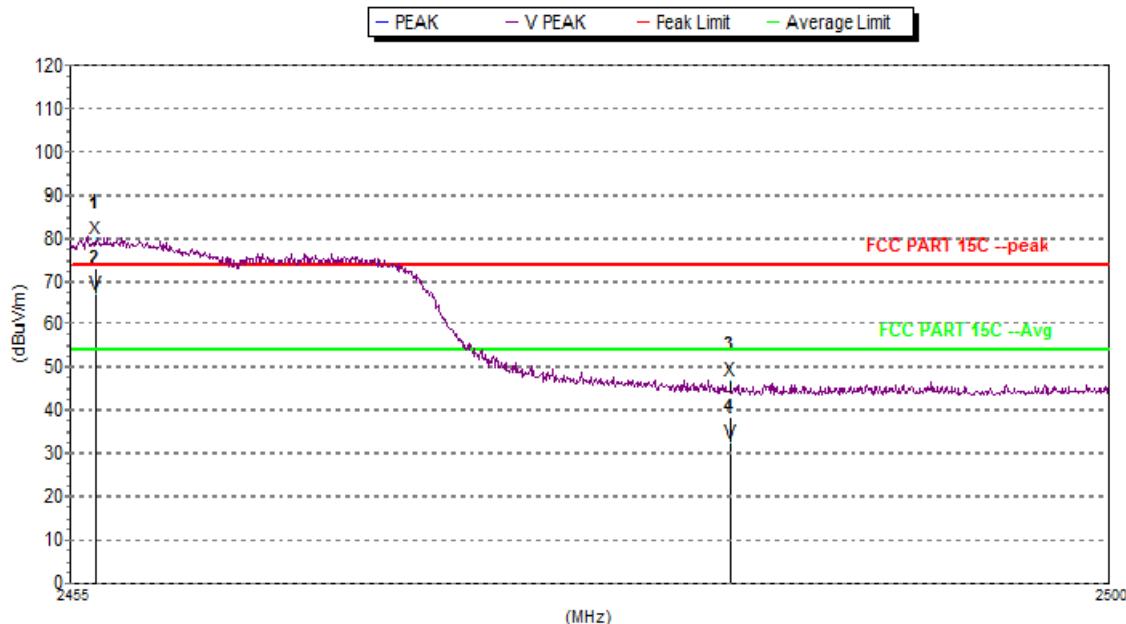
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2390	54.1	74.0	19.9	32.5	0.0	-20.8	H
4	2413.510	90.4	74.0	-16.4	32.6	0.0	-21.2	H
Avg								
2	2390	37.4	54.0	16.6	32.5	0.0	-20.8	H
3	2413.510	77.4	54.0	-23.4	32.6	0.0	-21.2	--



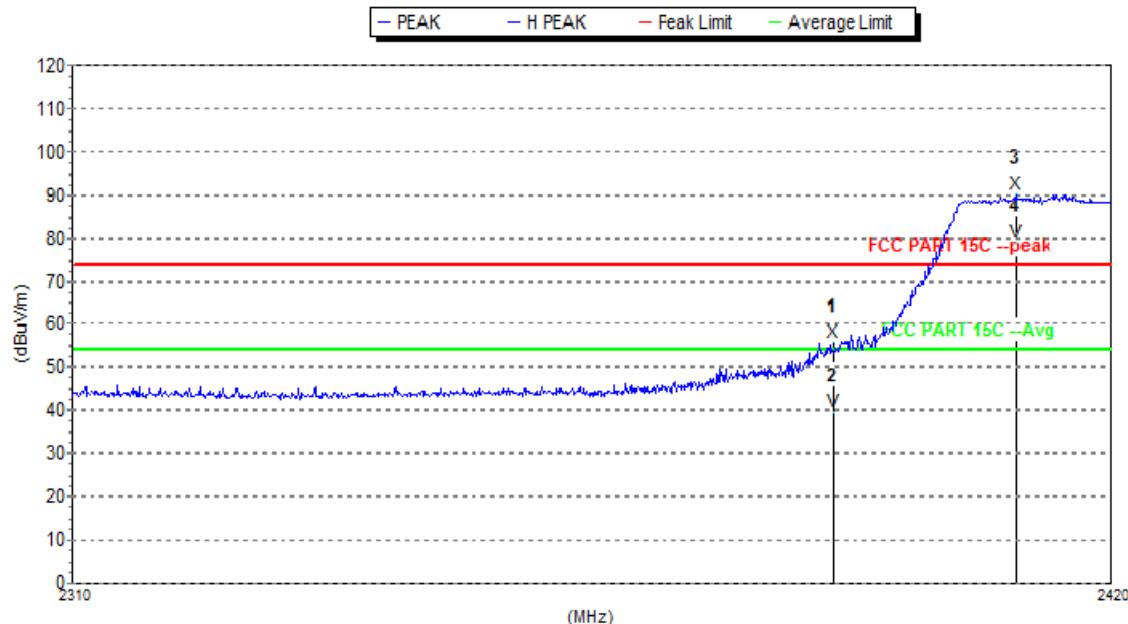
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2390	49.7	74.0	24.3	32.5	0.0	-20.8	V
3	2413.290	86.4	74.0	-12.4	32.5	0.0	-20.8	V
Avg								
2	2390	34.6	54.0	19.4	32.5	0.0	-20.8	--
4	2413.290	73.1	54.0	-19.1	32.6	0.0	-21.2	V



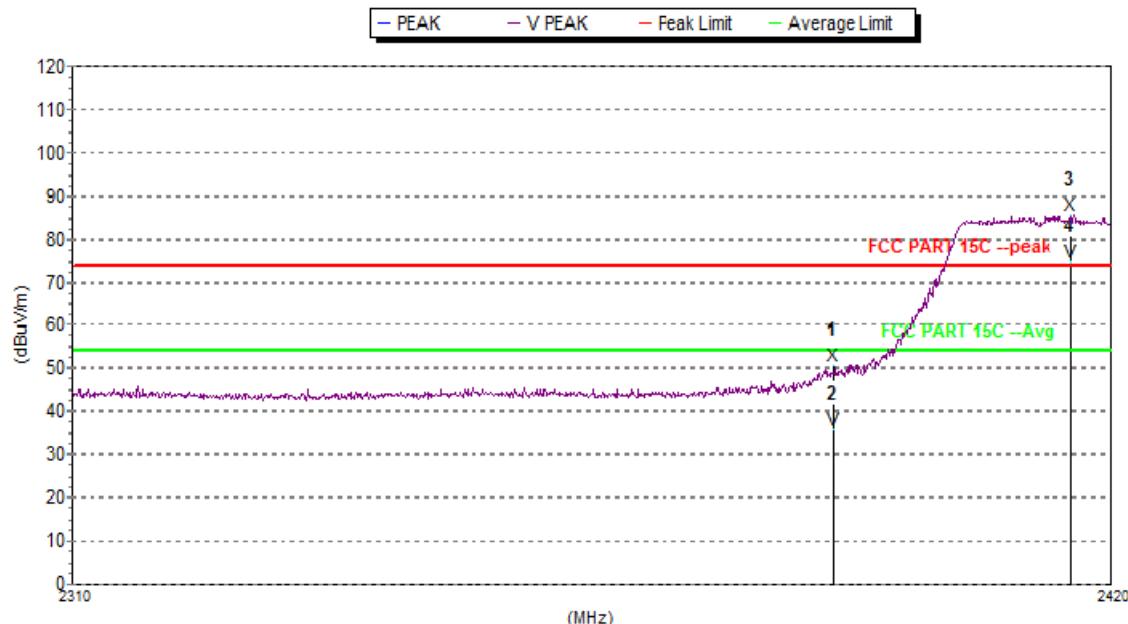
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2457.160	84.1	74.0	-10.1	32.5	0.0	-20.8	H
3	2483.5	47.8	74.0	26.2	32.5	0.0	-20.8	H
Avg								
2	2457.160	70.9	54.0	-16.9	32.5	0.0	-20.8	--
4	2483.5	33.4	54.0	20.6	32.5	0.0	-20.5	H



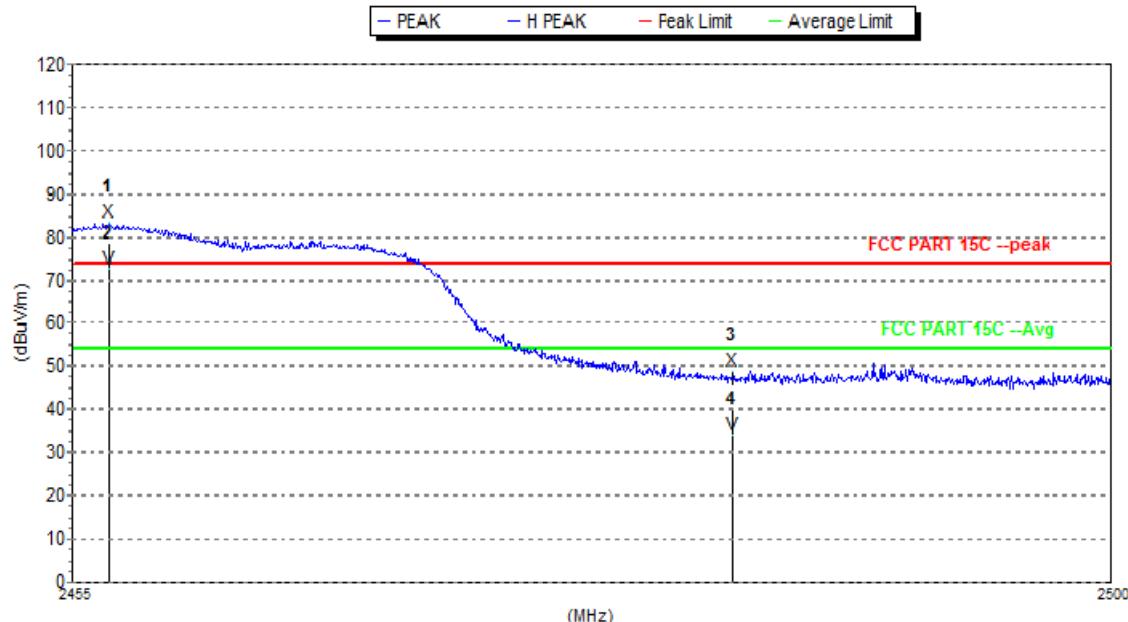
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2456.170	79.9	74.0	-5.9	32.5	0.0	-20.8	V
3	2483.5	46.8	74.0	27.2	32.5	0.0	-20.8	V
Avg								
2	2456.170	66.9	54.0	-12.9	32.5	0.0	-20.8	--
4	2483.5	32.5	54.0	21.5	32.5	0.0	-20.5	V



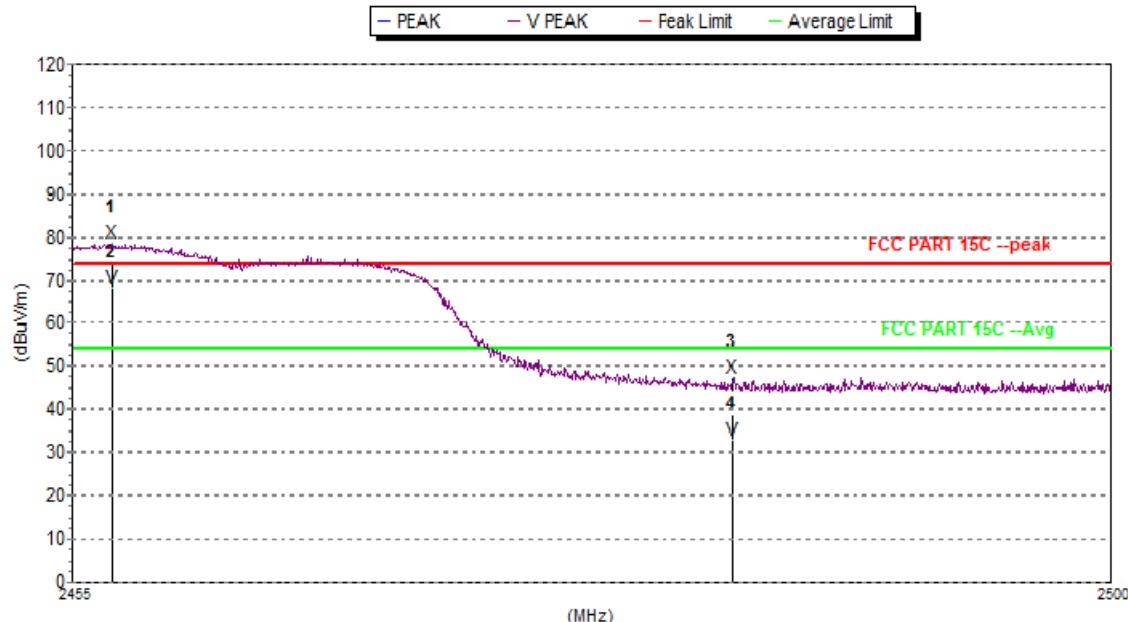
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2390	55.9	74.0	18.1	32.5	0.0	-20.8	H
3	2409.660	90.3	74.0	-16.3	32.5	0.0	-20.8	H
Avg								
2	2390	39.6	54.0	14.4	32.5	0.0	-20.8	--
4	2409.660	79.2	54.0	-25.2	32.6	0.0	-21.1	H



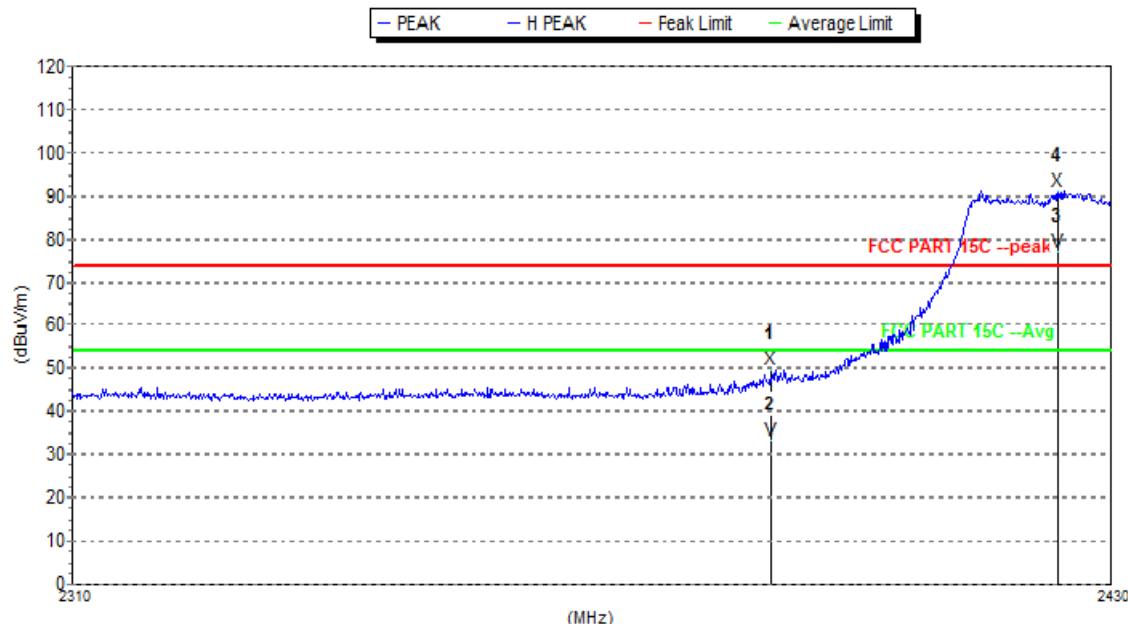
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2390	50.7	74.0	23.3	32.5	0.0	-20.8	V
3	2415.710	85.5	74.0	-11.5	32.6	0.0	-21.2	V
Avg								
2	2390	35.8	54.0	18.2	32.5	0.0	-20.8	V
4	2415.710	74.7	54.0	-20.7	32.6	0.0	-21.2	V



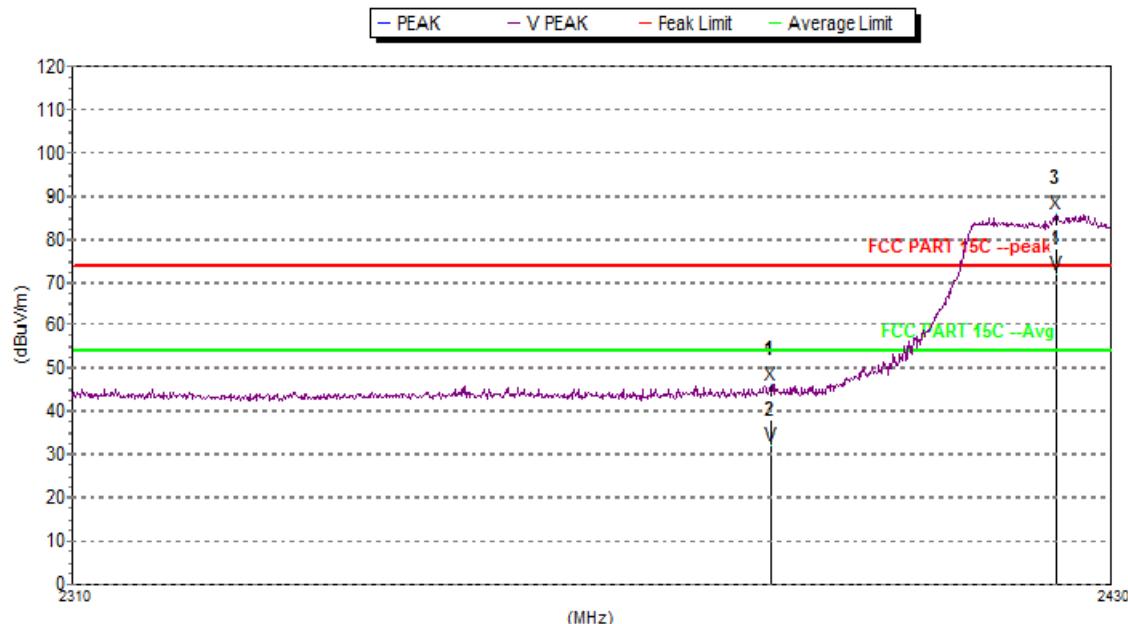
Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2456.665	83.4	74.0	-9.4	32.5	0.0	-20.8	H
3	2483.5	48.8	74.0	25.2	32.5	0.0	-20.5	H
Avg								
2	2456.665	72.5	54.0	-18.5	32.5	0.0	-20.8	H
4	2483.5	34.3	54.0	19.7	32.5	0.0	-20.5	H



Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2456.755	78.7	74.0	-4.7	32.5	0.0	-20.8	V
3	2483.5	47.3	74.0	26.7	32.5	0.0	-20.5	V
Avg								
2	2456.755	68.3	54.0	-14.3	32.5	0.0	-20.8	V
4	2483.5	33.0	54.0	21.0	32.5	0.0	-20.5	V

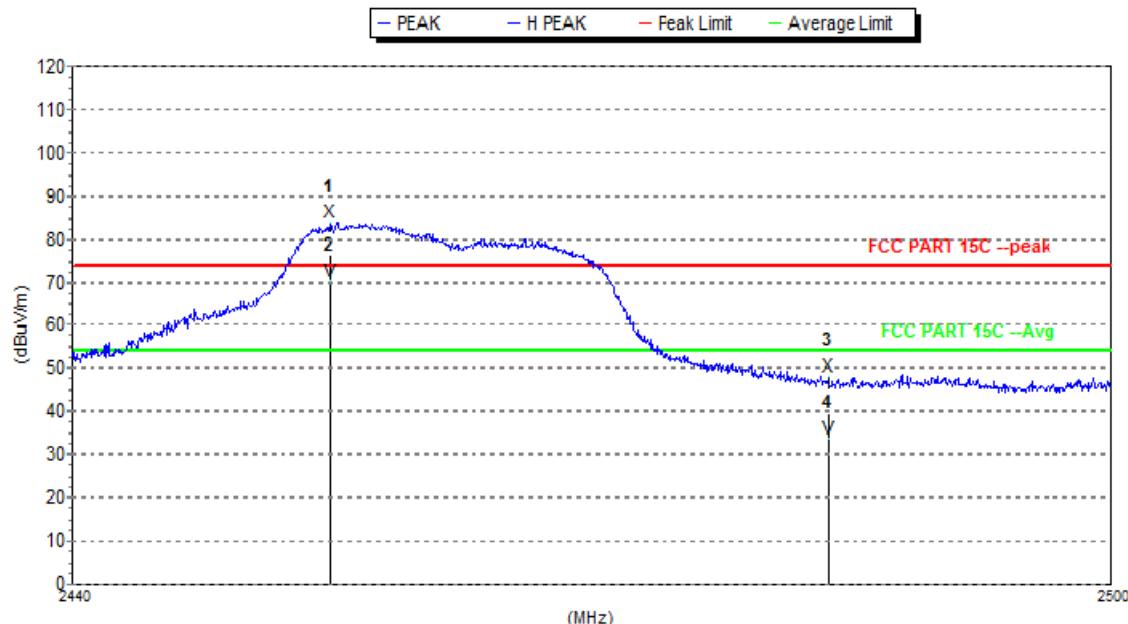


Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2390	49.7	74.0	24.3	32.5	0.0	-20.8	H
4	2423.760	91.1	74.0	-17.1	32.5	0.0	-21.4	H
Avg								
2	2390	33.4	54.0	20.6	32.5	0.0	-20.8	H
3	2423.760	77.2	54.0	-23.2	32.5	0.0	-21.4	H

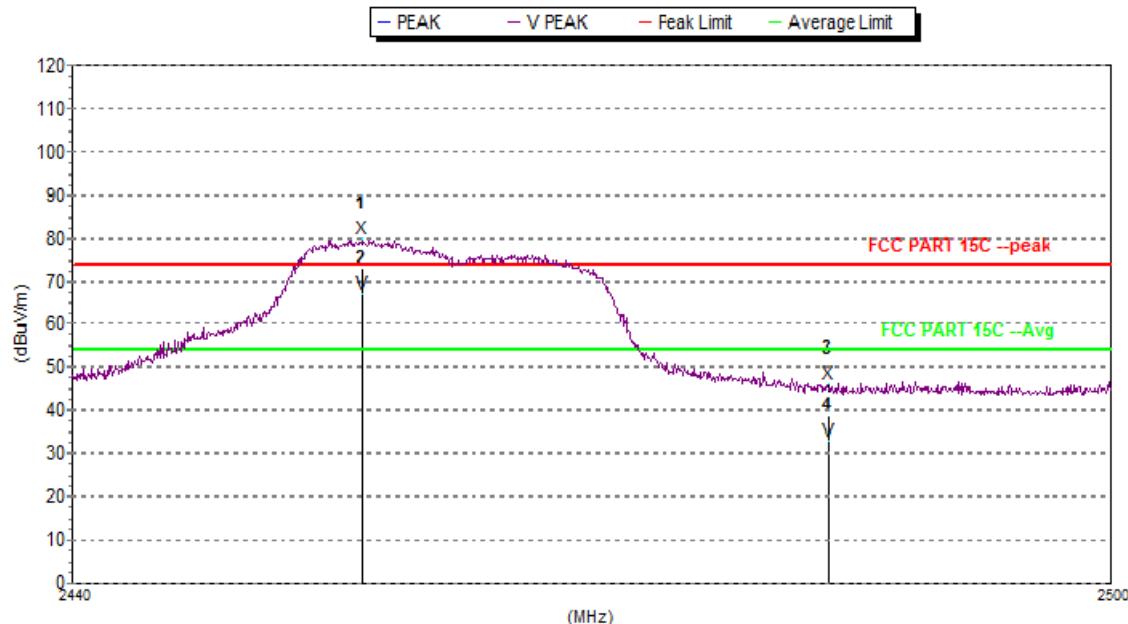


Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2390	46.1	74.0	27.9	32.5	0.0	-20.8	V
3	2423.640	85.7	74.0	-11.7	32.5	0.0	-20.8	V
Avg								
2	2390	32.2	54.0	21.8	32.5	0.0	-20.8	--
4	2423.640	72.0	54.0	-18.0	32.5	0.0	-21.3	V





Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2454.820	83.7	74.0	-9.7	32.5	0.0	-20.8	H
3	2483.5	48.2	74.0	25.8	32.5	0.0	-20.8	H
Avg								
2	2454.820	70.1	54.0	-16.1	32.5	0.0	-20.8	--
4	2483.5	33.7	54.0	20.3	32.5	0.0	-20.5	H



Mk.	Freq.(MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin(dB)	Ant.F. (dB/m)	Amp.G. (dB)	Cbl.L. (dB)	Pol.
Peak:								
1	2456.680	80.0	74.0	-6.0	32.5	0.0	-20.8	V
3	2483.5	46.1	74.0	27.9	32.5	0.0	-20.8	V
Avg								
2	2456.680	67.0	54.0	-13.0	32.5	0.0	-20.8	--
4	2483.5	32.8	54.0	21.2	32.5	0.0	-20.5	V

**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.: ZH-CJAED

### 7.1 Radiated Emission



### 7.2 Radiated Spurious Emission



### 7.3 Conducted Emission



## 8 Photographs - EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1505002981CR.