




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

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Report No.: SZEM160800738903
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FCC REPORT

Application No.: SZEM1608007389CR
Applicant: LM Technologies Ltd
Manufacturer: LM Technologies Ltd
Factory: LM Technologies Shenzhen
Product Name: LM811
Model No.(EUT): LM811-04XX
Trade Mark: 
FCC ID: VVX-LM811-04XX
Standards: 47 CFR Part 15, Subpart C (2015)
Date of Receipt: 2016-09-02
Date of Test: 2016-09-14 to 2016-09-22
Date of Issue: 2016-09-23

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

Authorized Signature:



Jack Zhang
EMC Laboratory Manager

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

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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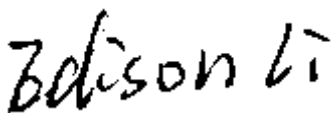
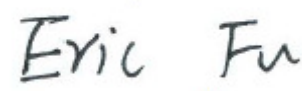
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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2016-09-23		Original

Authorized for issue by:			
Tested By	 <hr/>		2016-09-22
			Date
Checked By	 <hr/>		2016-09-23
			Date



3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2013	PASS
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10 2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10 2013	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10 2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS



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5 General Information

5.1 Client Information

Applicant:	LM Technologies Ltd
Address of Applicant:	19 Spectrum House, Gordon House Rd, Gospel Oak, London, NW5 1LP, UK
Manufacturer:	LM Technologies Ltd
Address of Manufacturer:	19 Spectrum House, Gordon House Rd, Gospel Oak, London, NW5 1LP, UK
Factory:	LM Technologies Shenzhen
Address of Factory:	26D Guo sheng tai Guozhan Block, Buji Town, Shenzhen, China

5.2 General Description of EUT

Product Name:	LM811
Model No.:	LM811-04XX
Trade Mark:	
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)
Antenna Type:	External antenna
Antenna Gain:	2dBi
EUT Power Supply:	DC 5V from external power



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Operation Frequency each of channel(802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		
Operation Frequency each of channel(802.11n HT40)							
Channel		Frequency		Channel		Frequency	
3		2422MHz		6		2437MHz	
4		2427MHz		7		2442MHz	
5		2432MHz		8		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:	24.0 °C
Humidity:	55 % RH
Atmospheric Pressure:	1010 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 with associated equipment below.

Description	Manufacturer	Model No.
Tablet PC	ASUS	N/A

5.5 Test Location

All tests were performed at:

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518057.

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

No tests were sub-contracted.



5.6 Test Facility

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

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

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

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

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

- **VCCI**

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

- **FCC – Registration No.: 556682**

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

- **Industry Canada (IC)**

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

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.



5.10 Equipment List

RF connected test						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2015-10-09	2016-10-09
2	Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2015-10-17	2016-10-17
3	Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2016-04-25	2017-04-25
4	Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2015-10-09	2016-10-09

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2016-05-13	2017-05-13
2	EMI Test Receiver (9k-3GHz)	Rohde & Schwarz	ESCI	SEM004-01	2016-04-25	2017-04-25
3	Trilog-Broadband Antenna(30M-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-06-29	2019-06-29
4	Pre-amplifier	Sonoma Instrument Co	310N	SEM005-03	2016-07-06	2017-07-06
5	Loop Antenna	ETS-Lindgren	6502	SEM003-08	2015-08-14	2018-08-14



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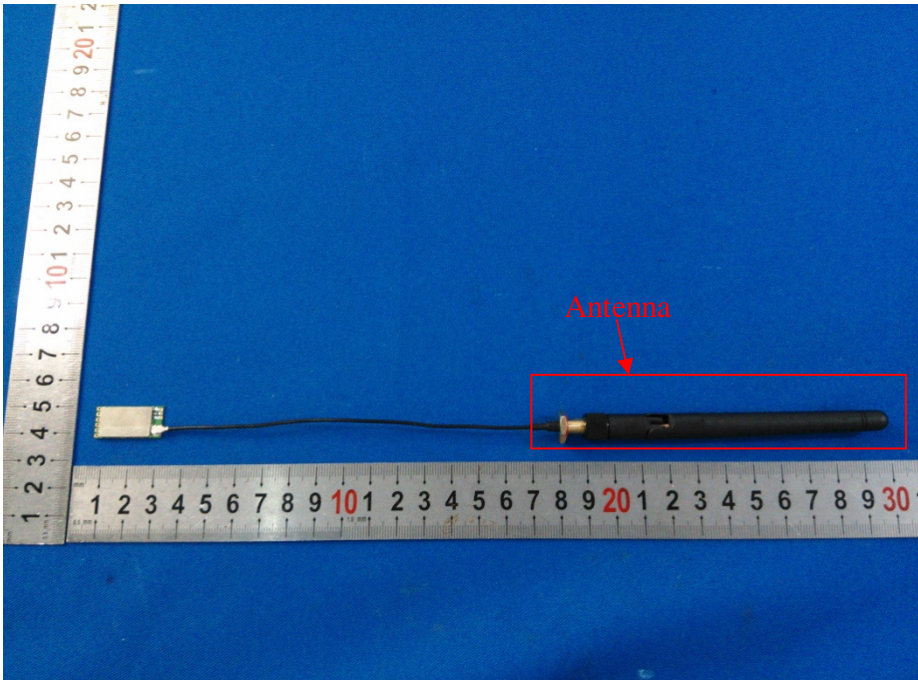
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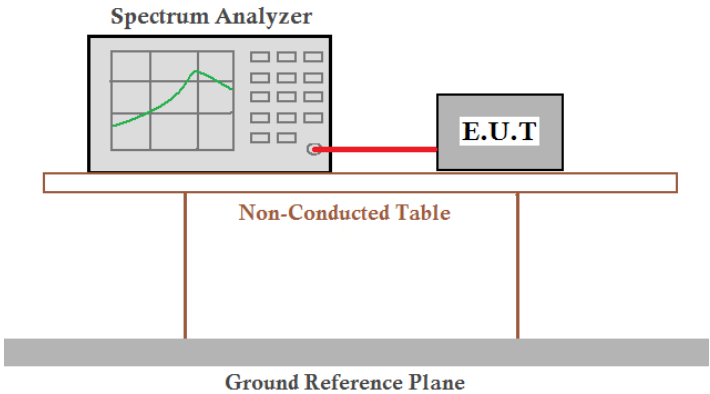
RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2016-05-13	2017-05-13
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEM004-04	2016-04-25	2017-04-25
3	BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
4	Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2015-10-09	2016-10-09
5	Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
6	Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2015-10-09	2016-10-09
7	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A
8	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2014-11-24	2017-11-24

6 Test results and Measurement Data

6.1 Antenna Requirement

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

6.2 Conducted Peak Output Power

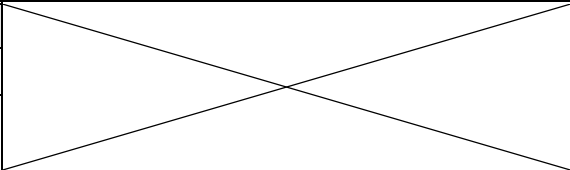
Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10 :2013 Section 11.9.1
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Test Instruments:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	30dBm
Test Results:	Pass



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Pre-scan under all rate at lowest channel 1								
Mode	802.11b							
Data Rate	1Mbps	2Mbps	5.5Mbps	11Mbps				
Power (dBm)	21.97	21.92	21.80	21.85				
Mode	802.11g							
Data Rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
Power (dBm)	22.0	21.91	21.96	21.96	21.99	21.90	21.92	21.87
Mode	802.11n(HT20)							
Data Rate	6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
Power (dBm)	22.11	21.98	21.91	21.99	21.93	21.95	21.95	21.82
Mode	802.11n(HT40)							
Data Rate	13.5Mbps	27Mbps	40.5Mbps	54Mbps	81Mbps	108Mbps	121.5Mbps	135Mbps
Power (dBm)	24.66	24.61	24.57	24.59	24.58	24.51	24.57	24.52
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

6.2.1.1 802.11b mode

Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	21.25	30.00	Pass
Middle	21.57	30.00	Pass
Highest	21.82	30.00	Pass
802.11g mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	21.46	30.00	Pass
Middle	21.73	30.00	Pass
Highest	21.99	30.00	Pass
802.11n(HT20)mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	21.49	30.00	Pass
Middle	21.75	30.00	Pass
Highest	22.09	30.00	Pass
802.11n(HT40)mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result
Lowest	24.73	30.00	Pass
Middle	24.42	30.00	Pass
Highest	24.61	30.00	Pass



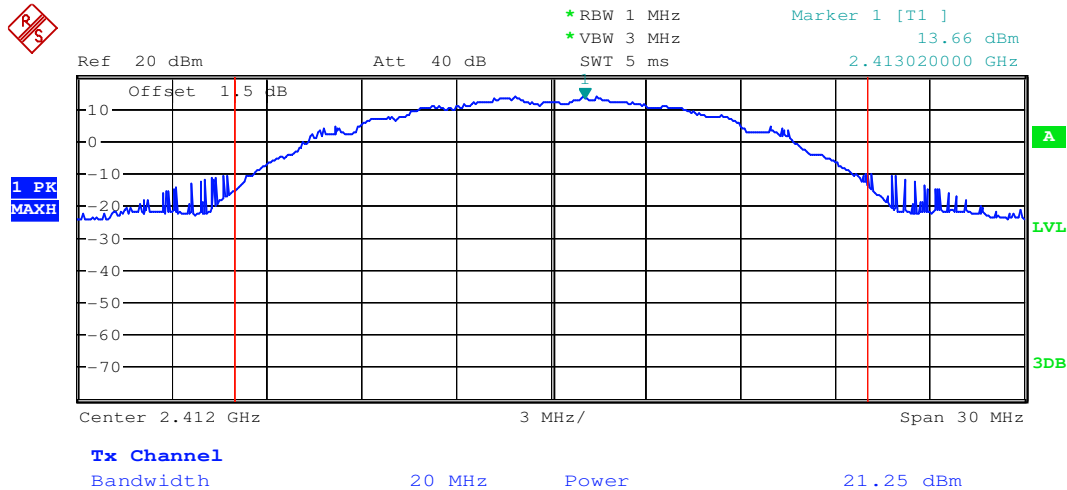
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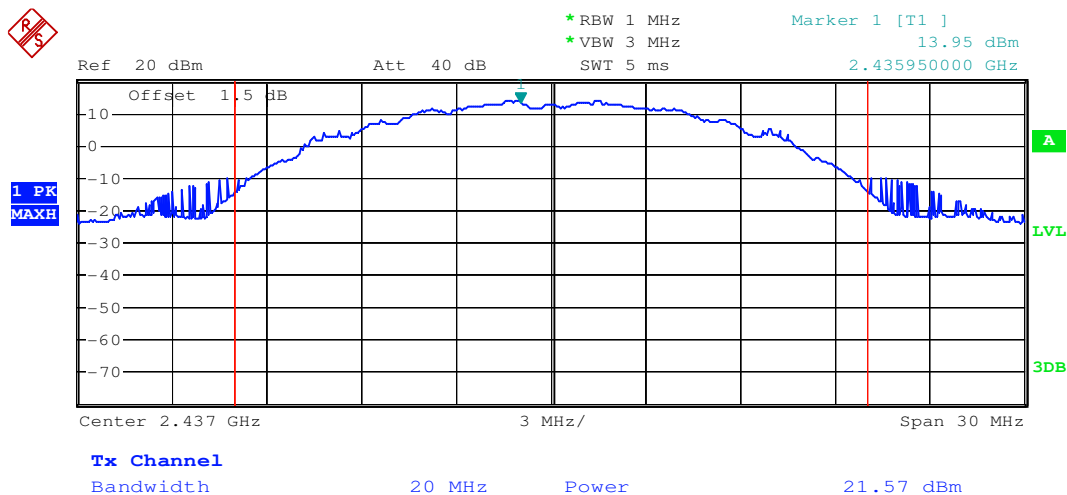
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Test plot as follows:

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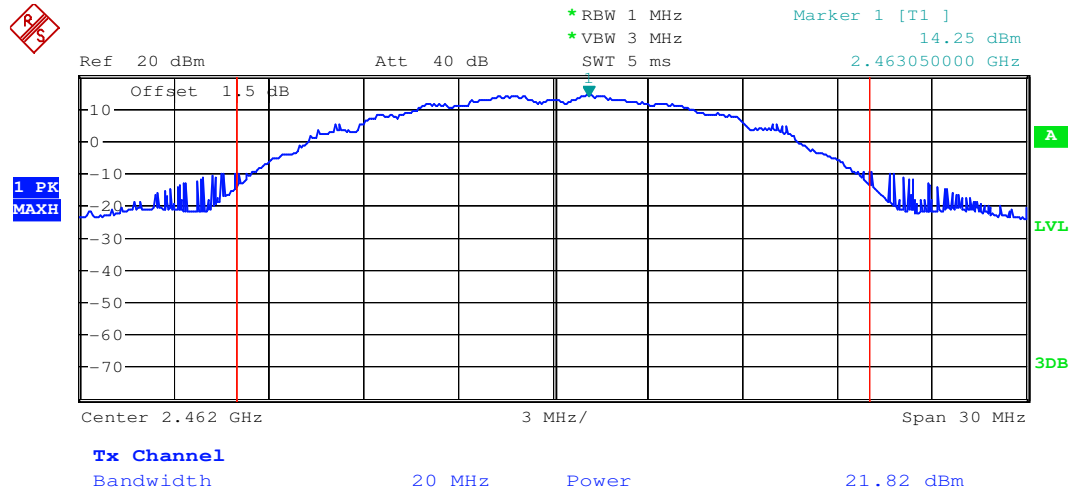


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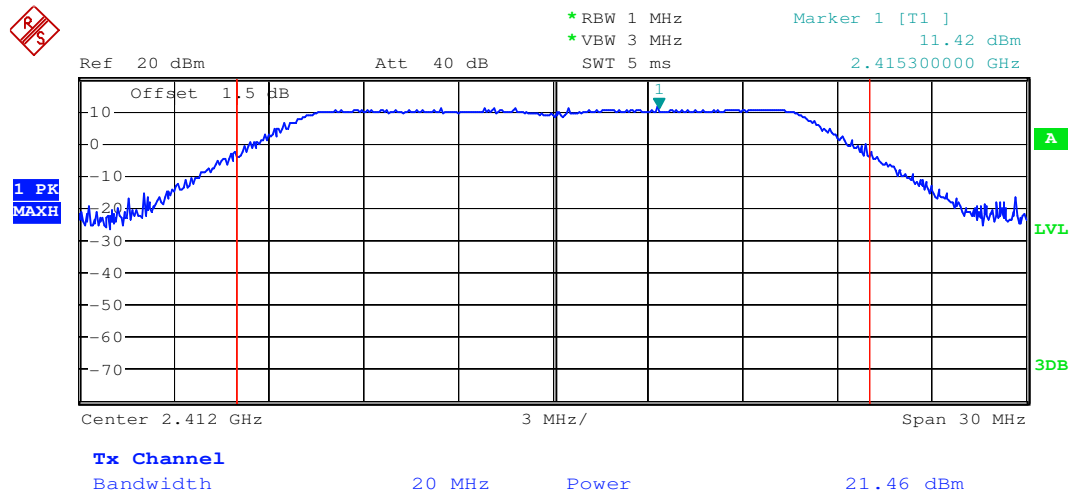
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Test mode:	802.11b	Test channel:	Highest
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Test mode:	802.11g	Test channel:	Lowest
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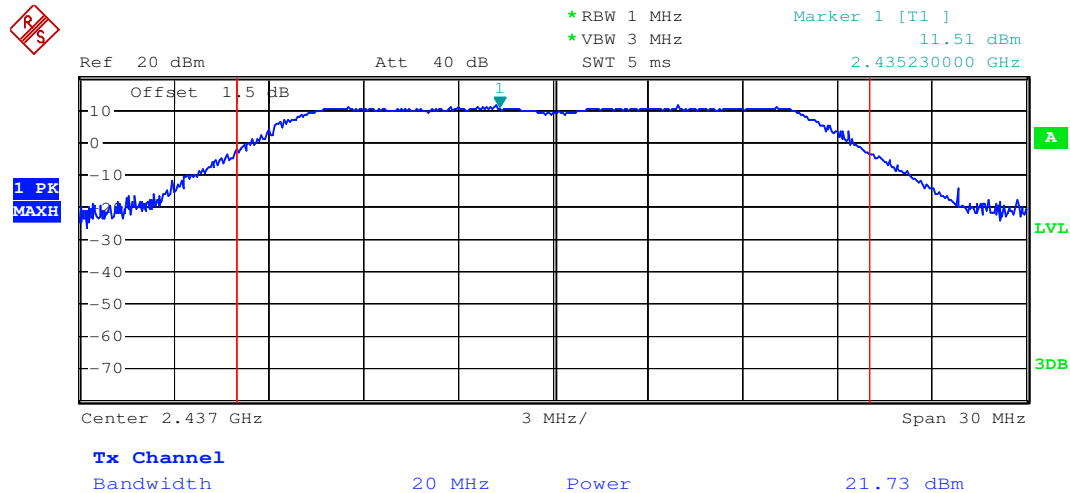


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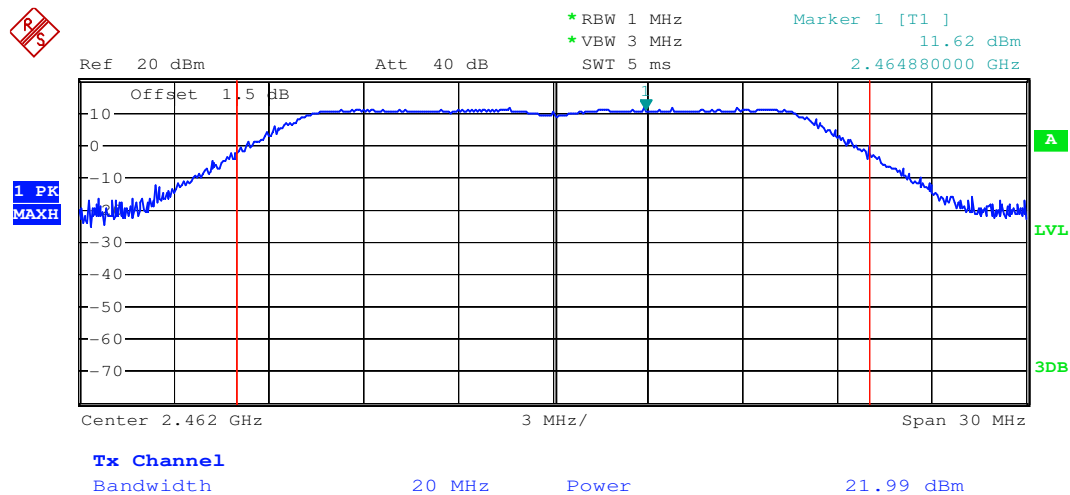
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Test mode:	802.11g	Test channel:	Middle
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Test mode:	802.11g	Test channel:	Highest
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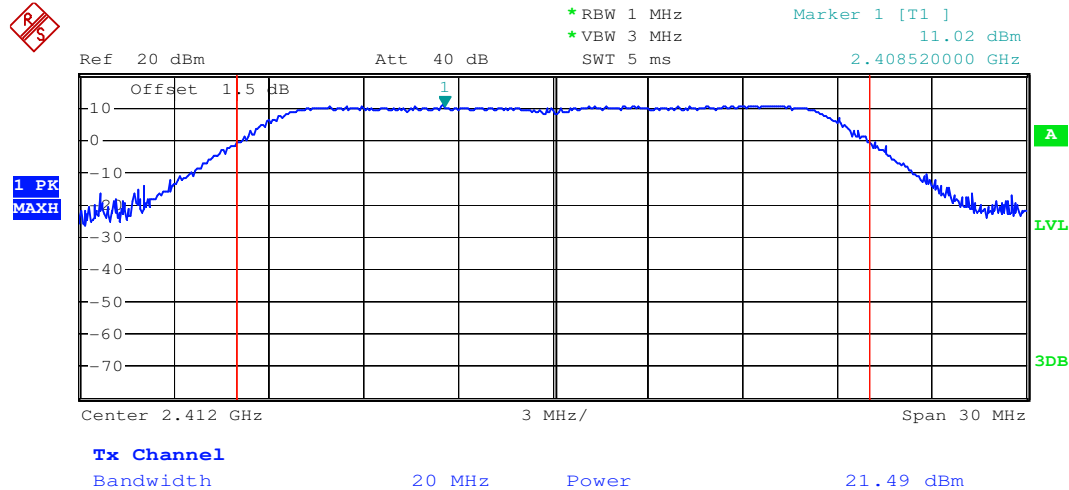


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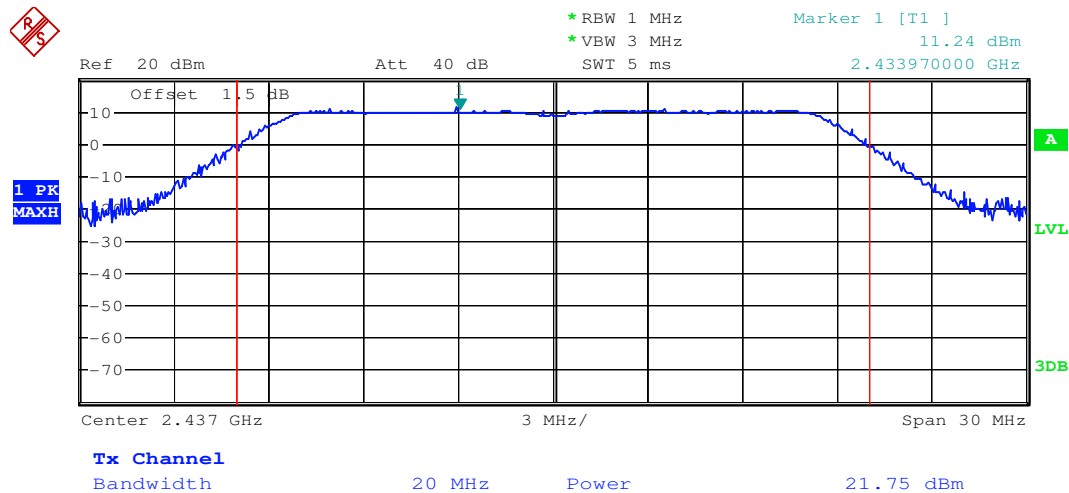
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Test mode:	802.11n(HT20)	Test channel:	Lowest
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Test mode:	802.11n(HT20)	Test channel:	Middle
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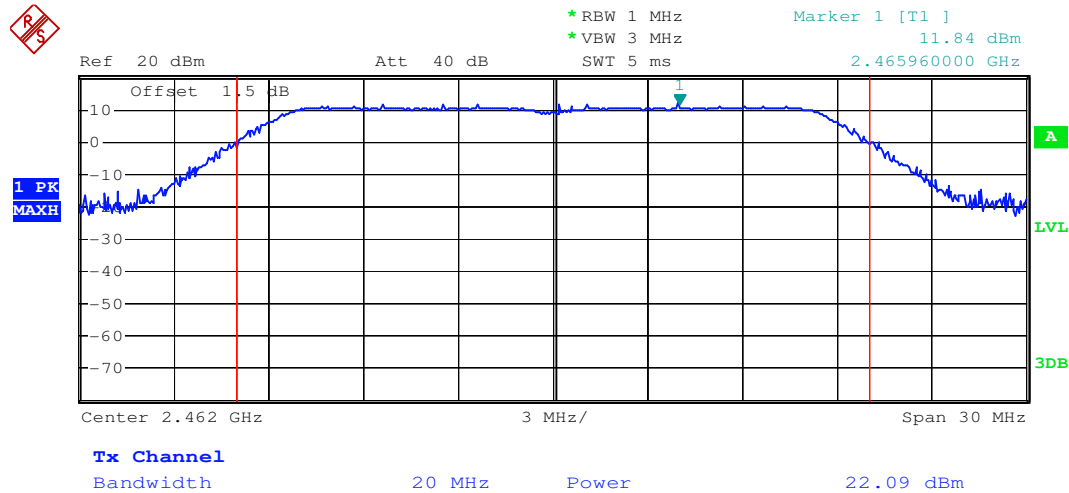


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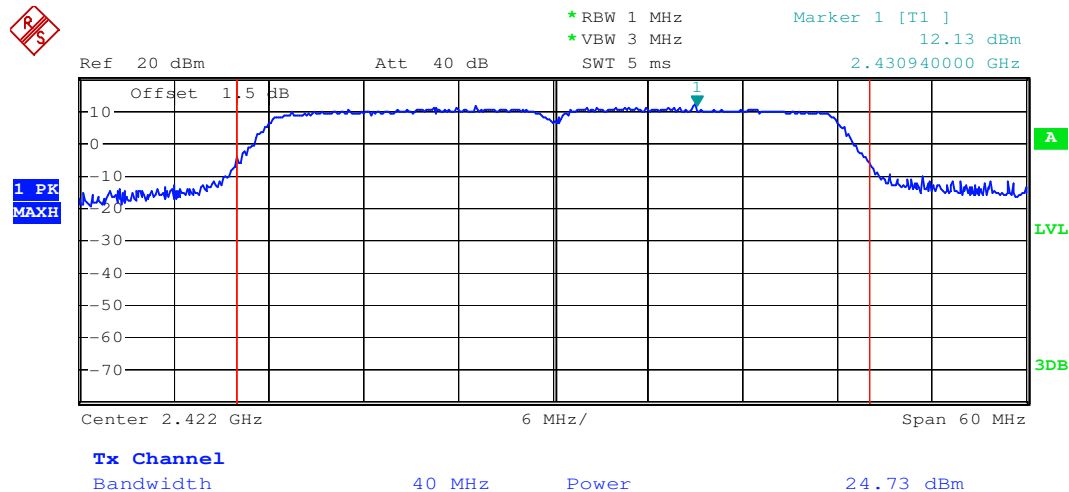
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Test mode:	802.11n(HT20)	Test channel:	Highest
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Test mode:	802.11n(HT40)	Test channel:	Lowest
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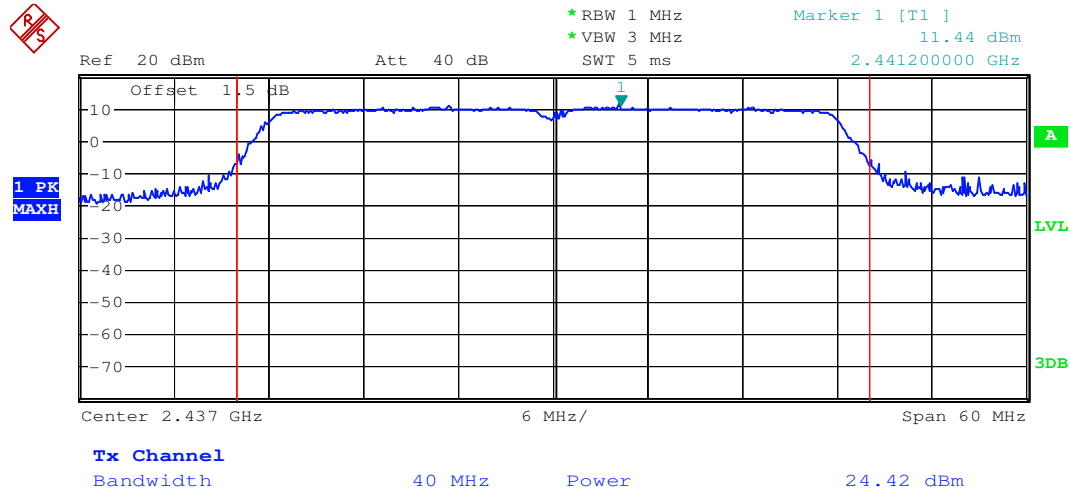


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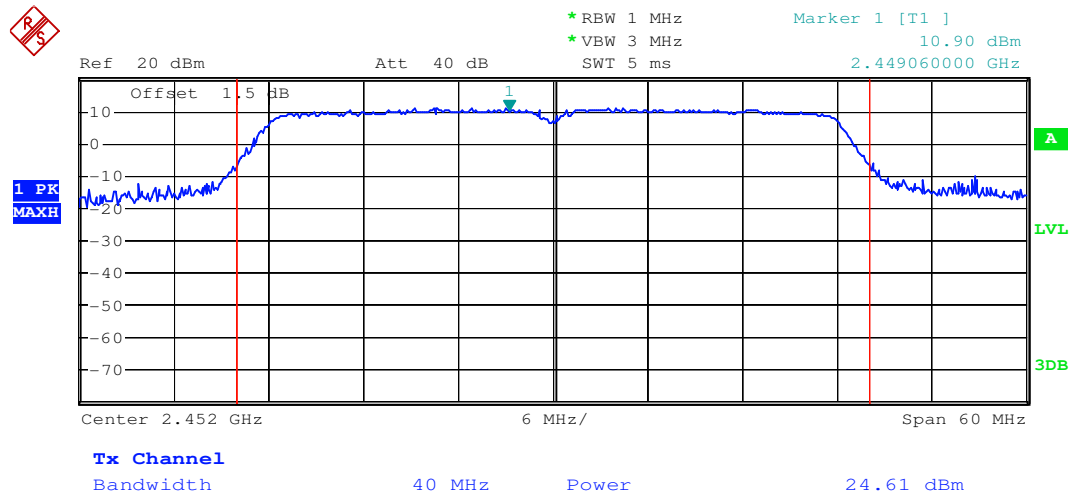
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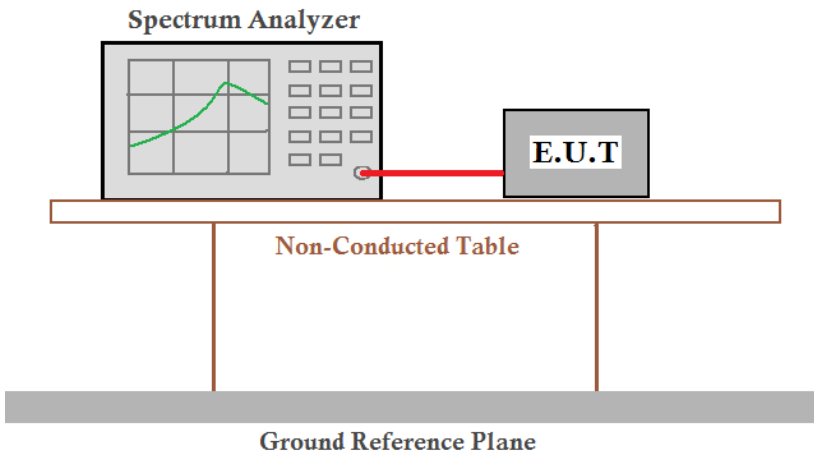
Test mode:	802.11n(HT40)	Test channel:	Middle
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Test mode:	802.11n(HT40)	Test channel:	Highest
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6.3 6dB Occupy Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013 Section 11.8
Test Setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two vertical legs. Below the table is a Ground Reference Plane.</p>
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	≥ 500 kHz
Test Results:	Pass



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Measurement Data

802.11b mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	10.11	≥500	Pass
Middle	10.11	≥500	Pass
Highest	10.11	≥500	Pass
802.11g mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	16.41	≥500	Pass
Middle	16.41	≥500	Pass
Highest	16.41	≥500	Pass
802.11n(HT20) mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	17.61	≥500	Pass
Middle	17.61	≥500	Pass
Highest	17.61	≥500	Pass
802.11n(HT40) mode			
Test channel	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
Lowest	35.46	≥500	Pass
Middle	35.28	≥500	Pass
Highest	35.28	≥500	Pass



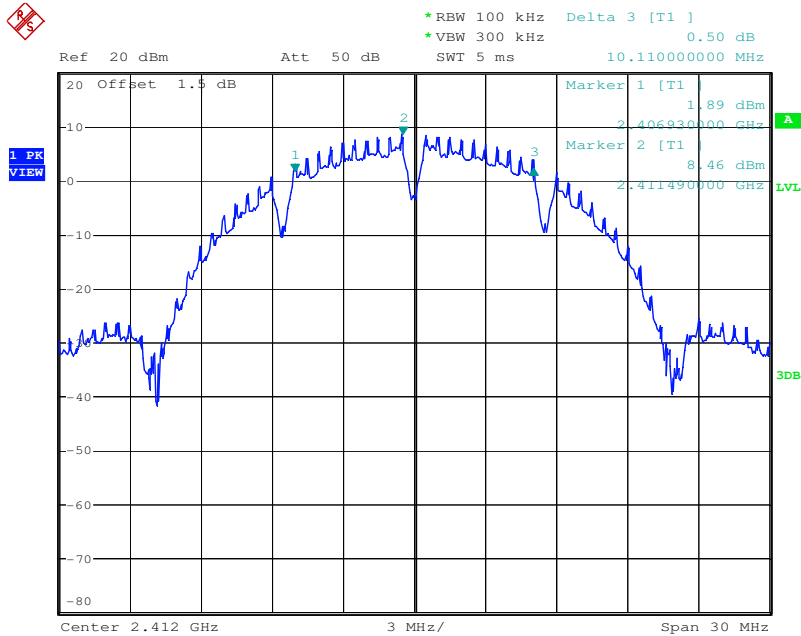
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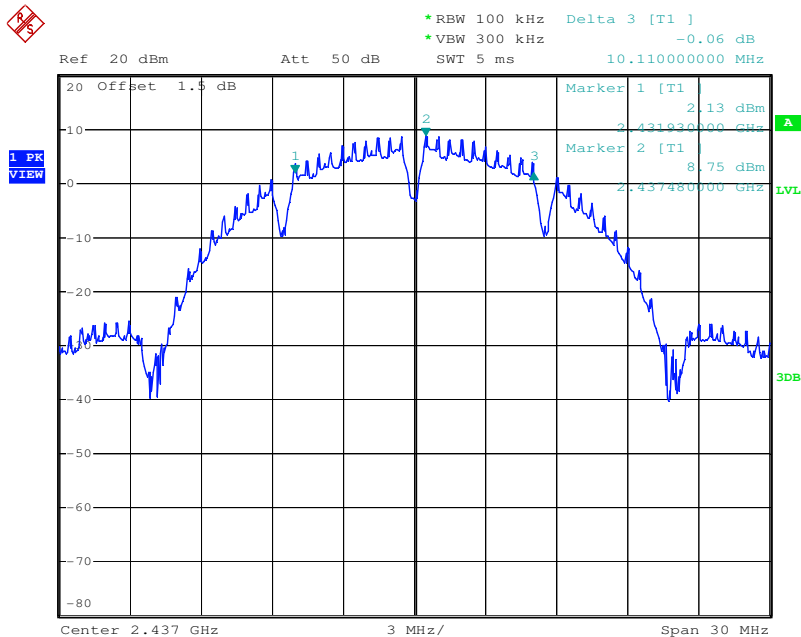
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Test plot as follows:

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



Test mode:	802.11b	Test channel:	Middle
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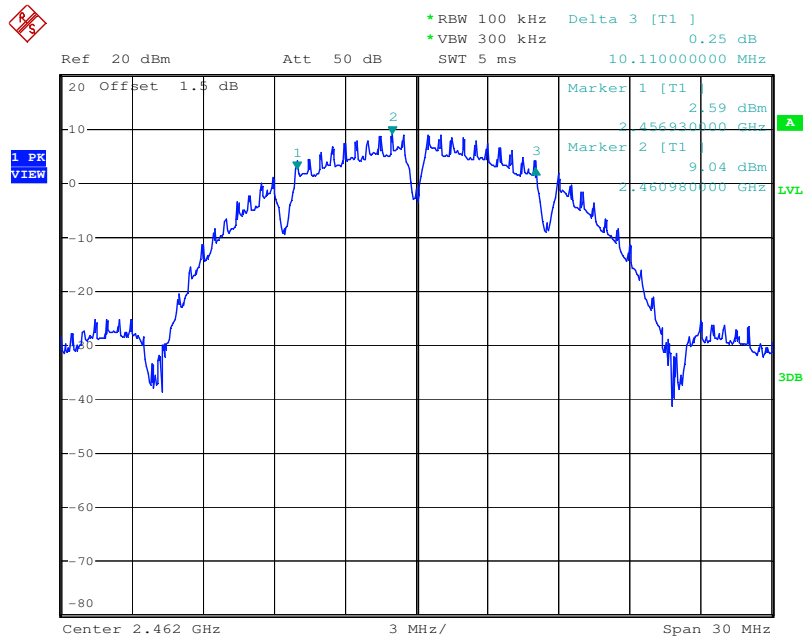


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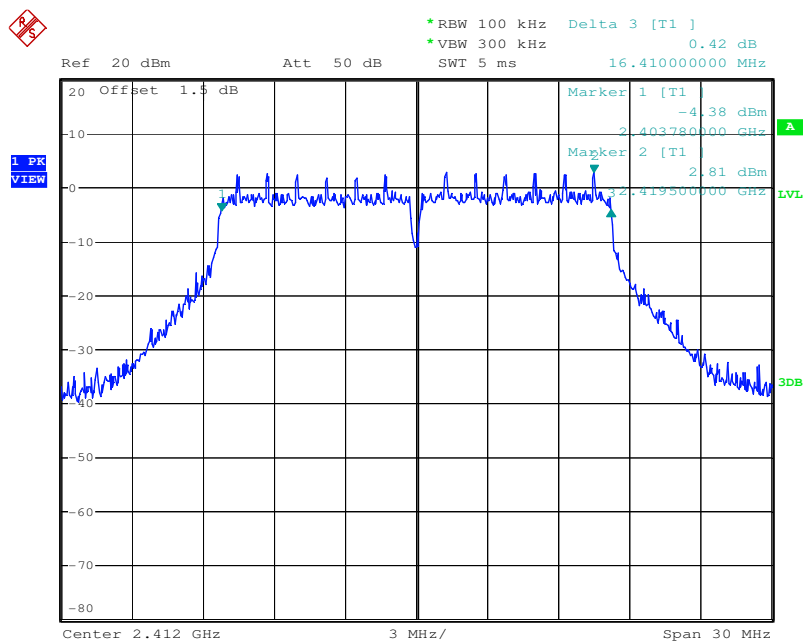
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Test mode:	802.11b	Test channel:	Highest
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Test mode:	802.11g	Test channel:	Lowest
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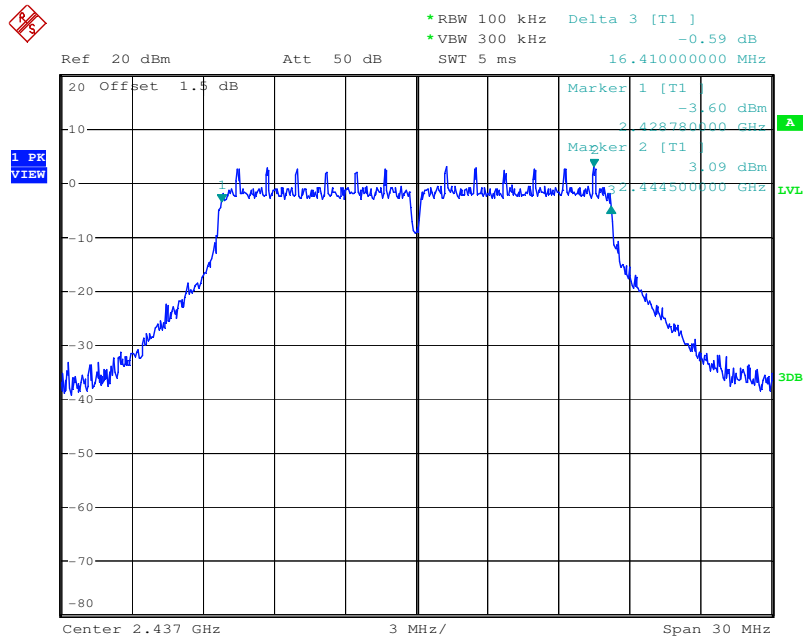


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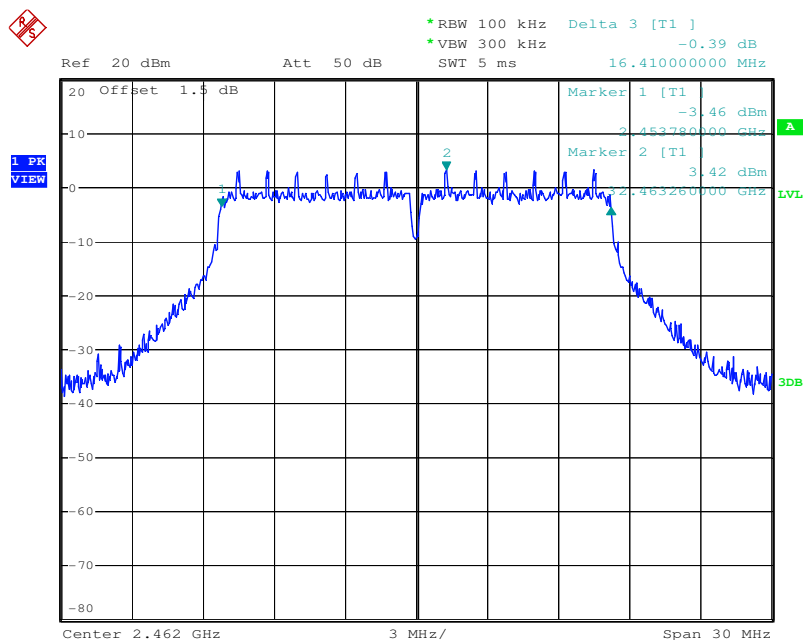
Report No.: SZEM160800738903

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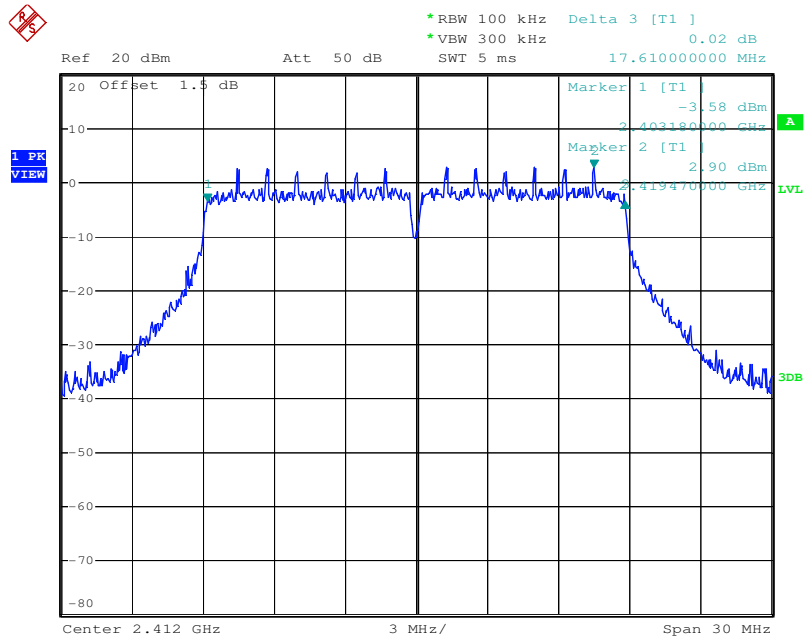


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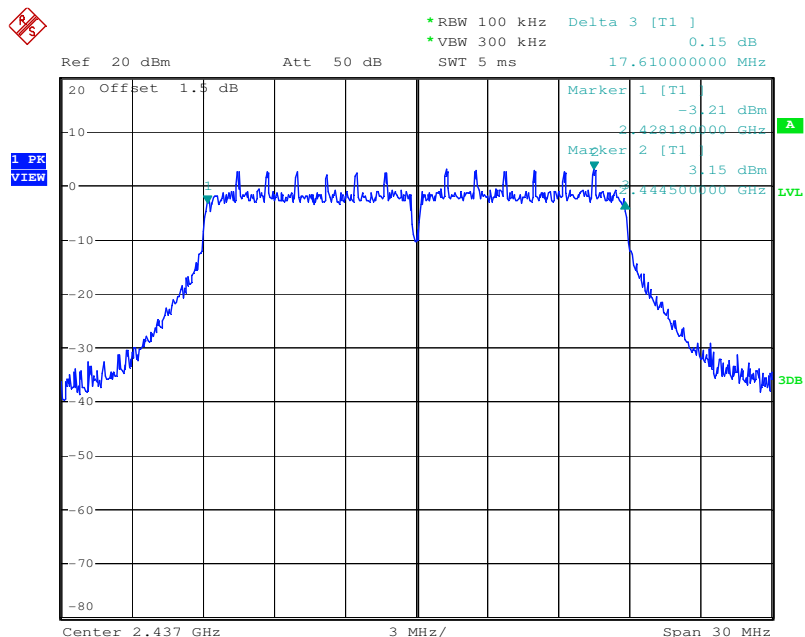
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Test mode:	802.11n(HT20)	Test channel:	Lowest
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Test mode:	802.11n(HT20)	Test channel:	Middle
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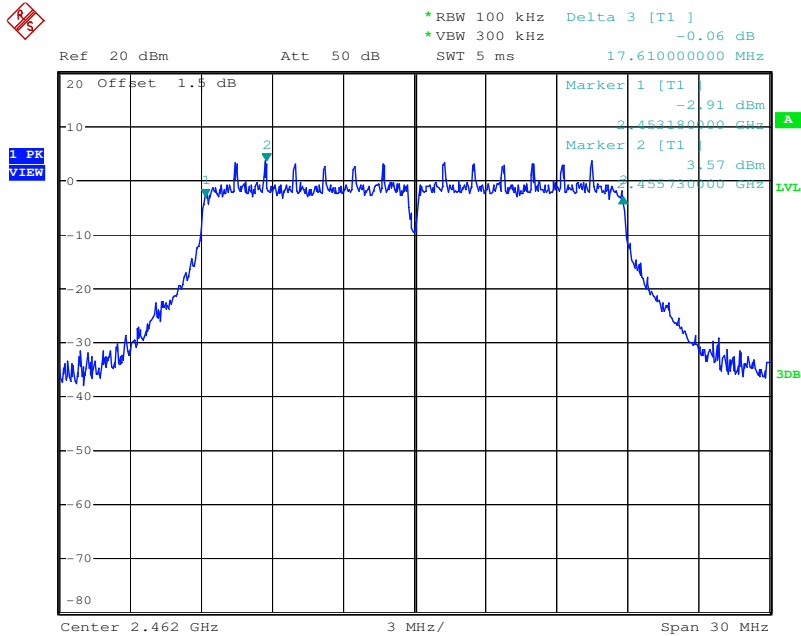


SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

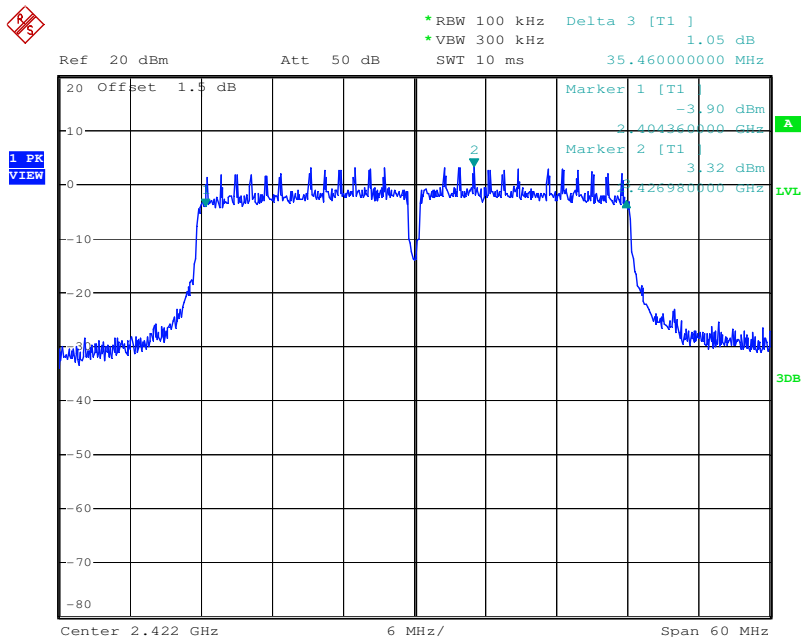
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Test mode:	802.11n(HT20)	Test channel:	Highest
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Test mode:	802.11n(HT40)	Test channel:	Lowest
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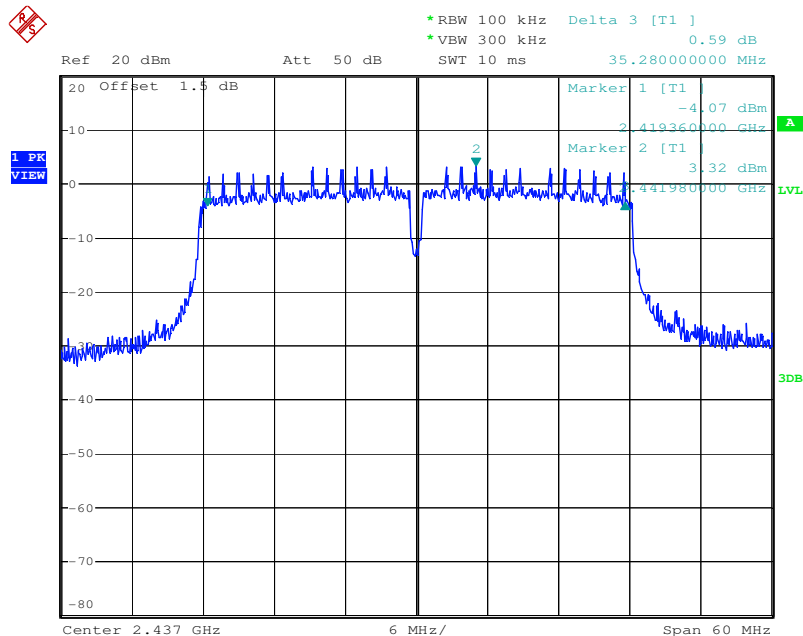


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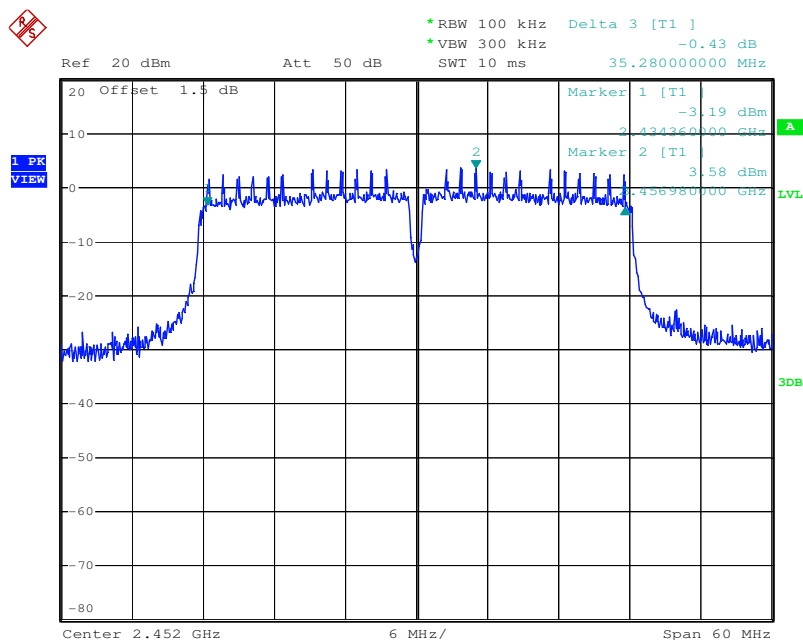
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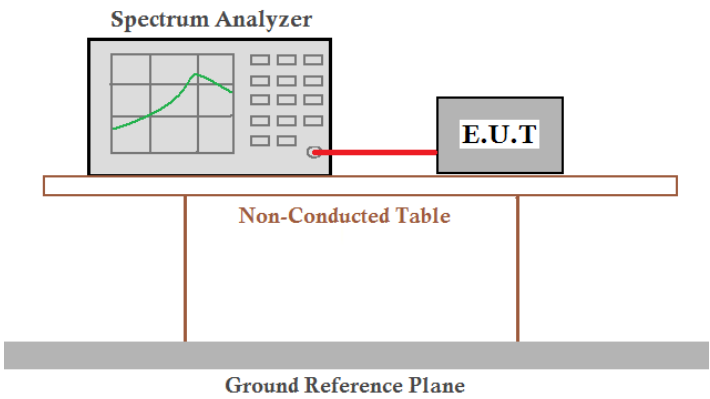
Test mode:	802.11n(HT40)	Test channel:	Middle
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Test mode:	802.11n(HT40)	Test channel:	Highest
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6.4 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 :2013 Section 11.10.2
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Test Instruments:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	≤8.00dBm/3kHz
Test Results:	Pass



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Measurement Data

802.11b mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-5.31	≤8.00	Pass
Middle	-5.08	≤8.00	Pass
Highest	-5.79	≤8.00	Pass
802.11g mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-11.45	≤8.00	Pass
Middle	-11.27	≤8.00	Pass
Highest	-11.90	≤8.00	Pass
802.11n (HT20) mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-13.35	≤8.00	Pass
Middle	-11.94	≤8.00	Pass
Highest	-10.59	≤8.00	Pass
802.11n(HT40) mode			
Test channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-12.24	≤8.00	Pass
Middle	-11.18	≤8.00	Pass
Highest	-11.32	≤8.00	Pass



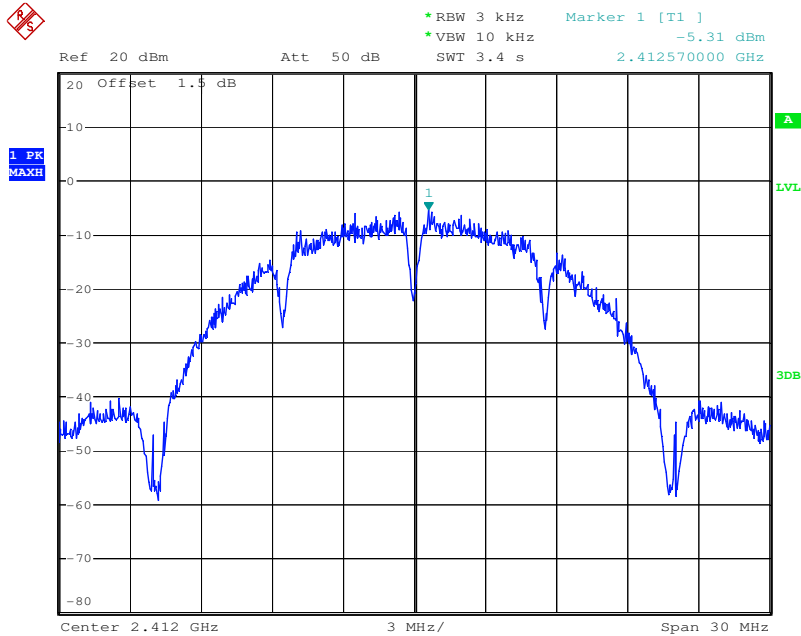
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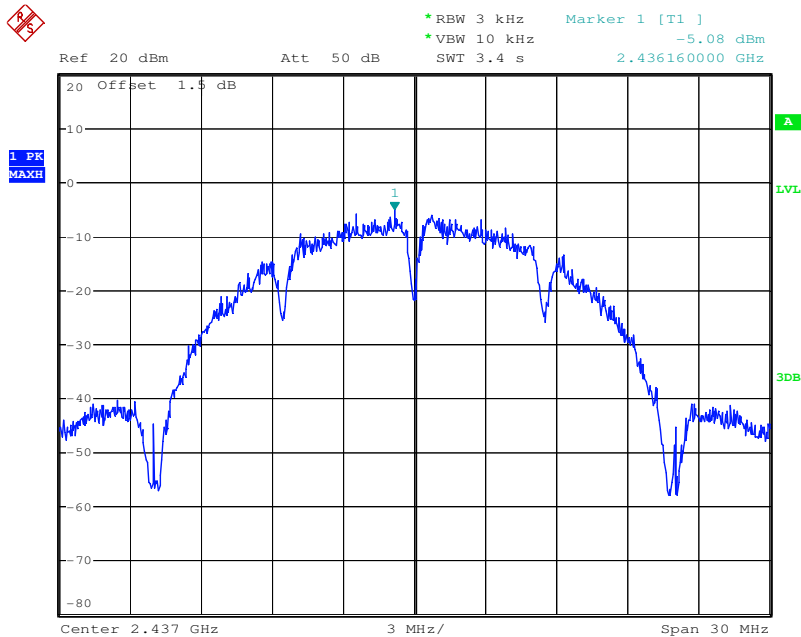
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Test plot as follows:

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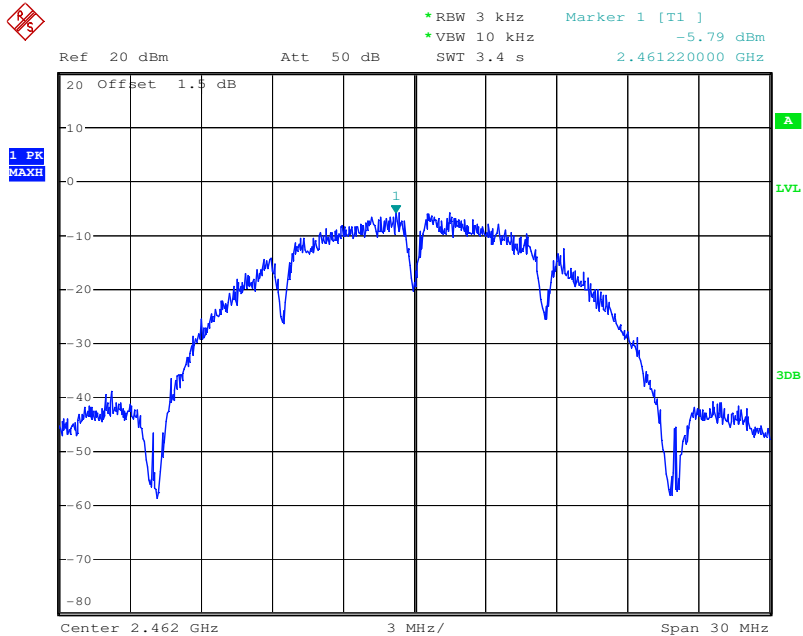


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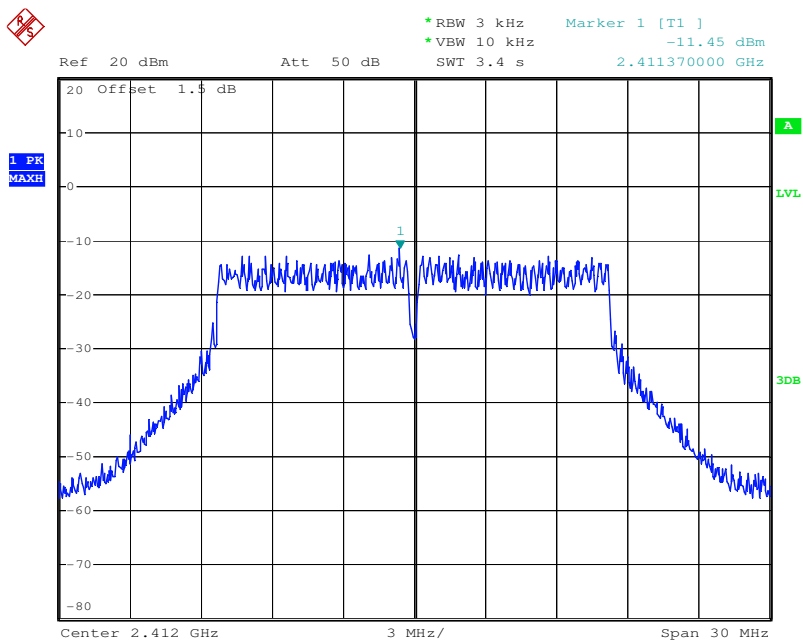
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Test mode:	802.11b	Test channel:	Highest
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Test mode:	802.11g	Test channel:	Lowest
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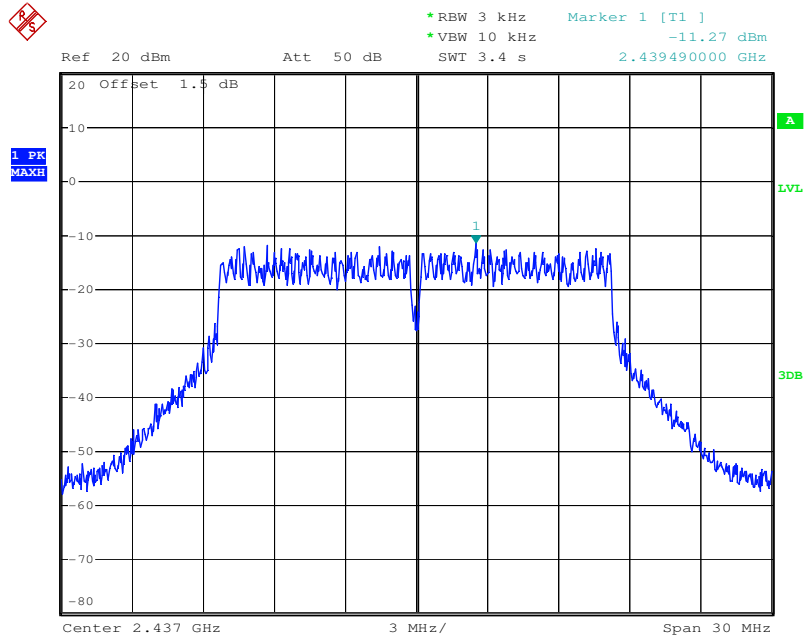


SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

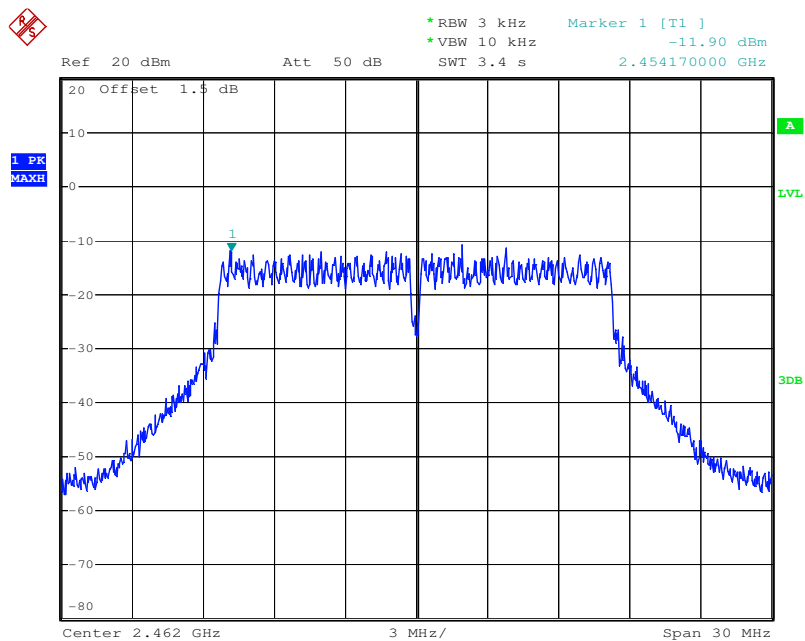
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Test mode:	802.11g	Test channel:	Middle
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Test mode:	802.11g	Test channel:	Highest
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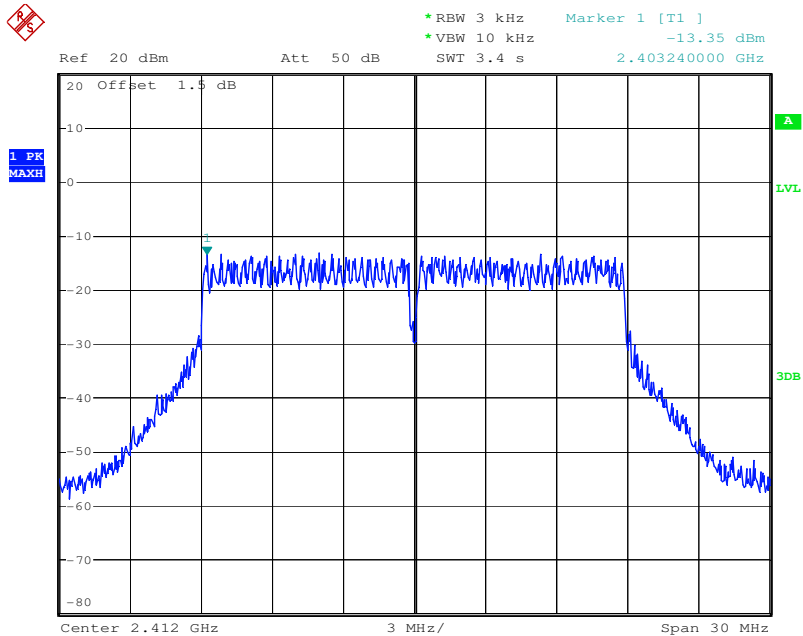


SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

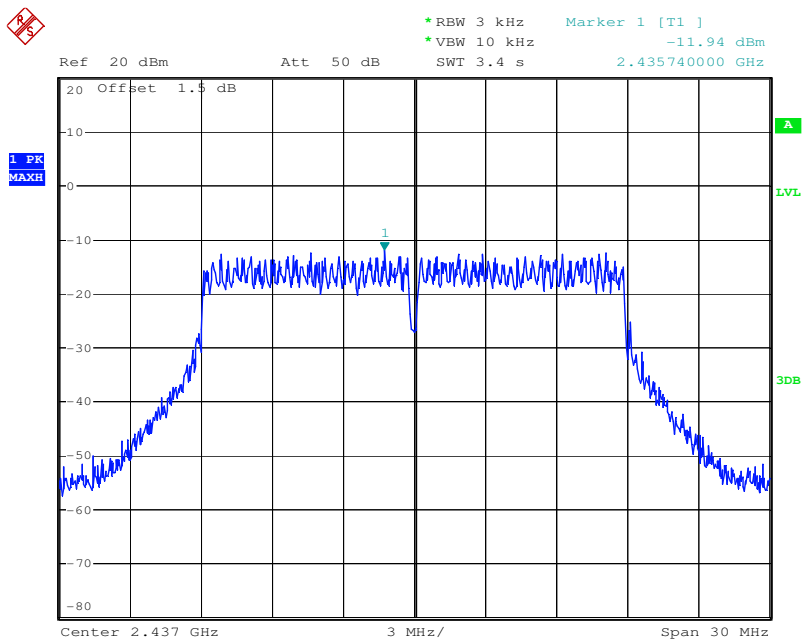
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Test mode:	802.11n (HT20)	Test channel:	Lowest
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Test mode:	802.11n (HT20)	Test channel:	Middle
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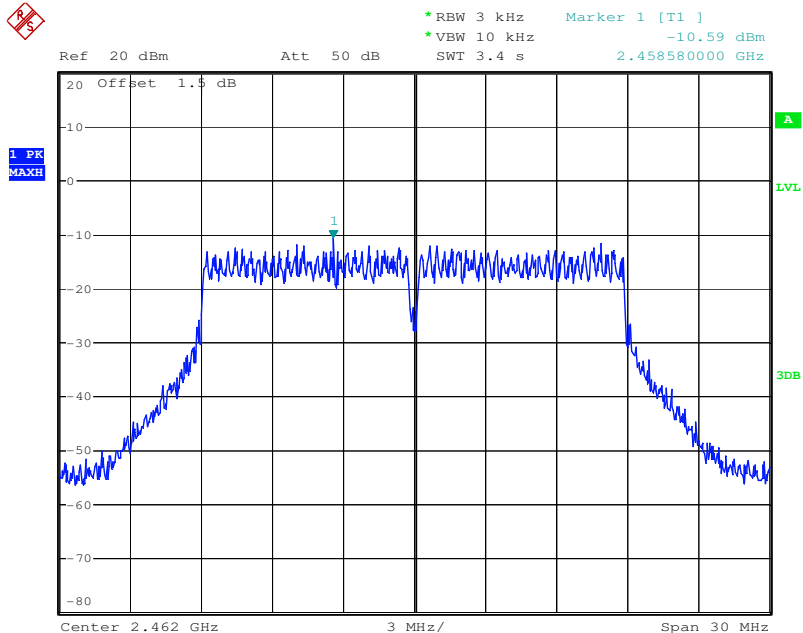


SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

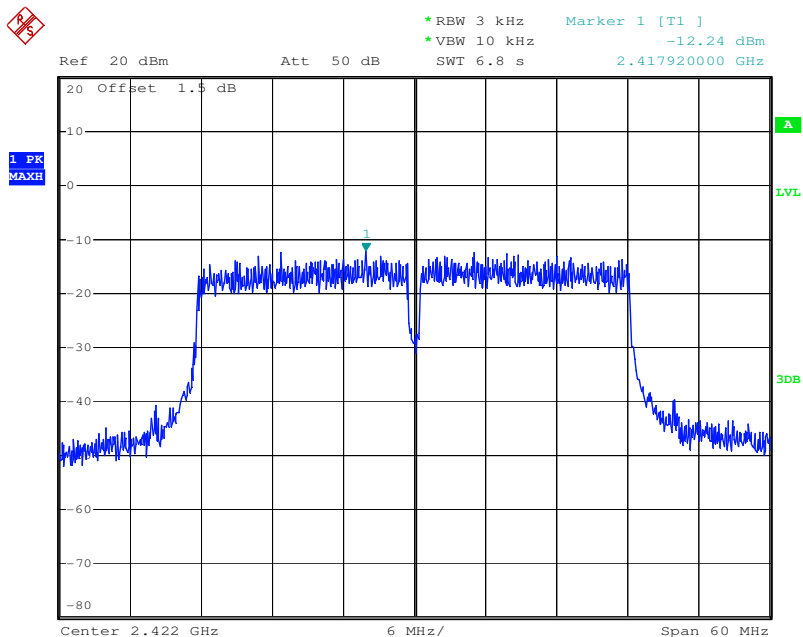
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Test mode:	802.11n (HT20)	Test channel:	Highest
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Test mode:	802.11n (HT40)	Test channel:	Lowest
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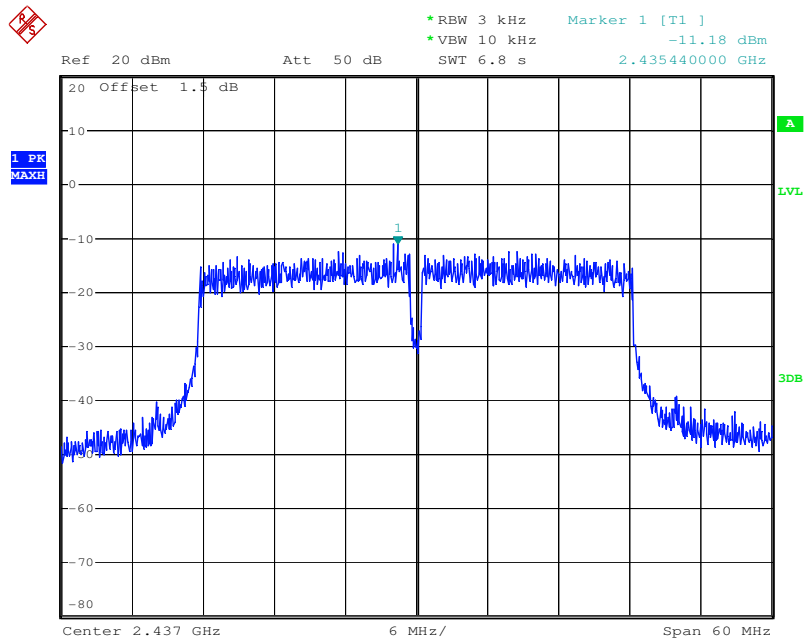


SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

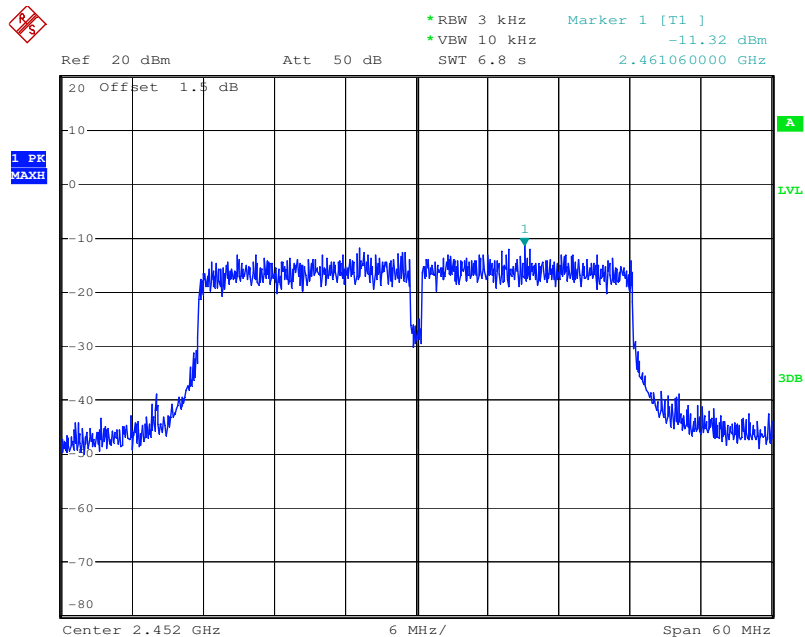
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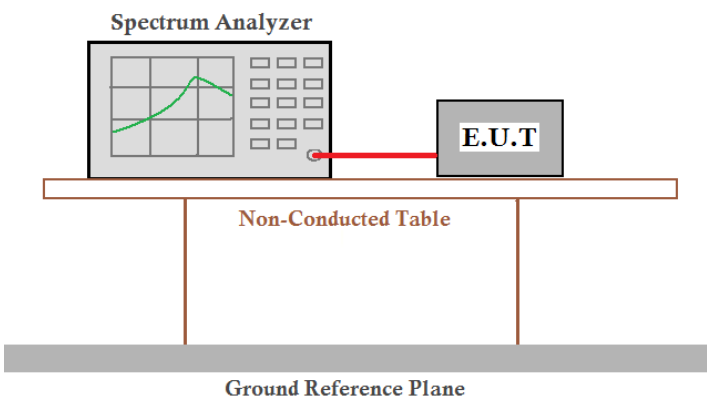
Test mode:	802.11n (HT40)	Test channel:	Middle
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Test mode:	802.11n (HT40)	Test channel:	Highest
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6.5 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.13
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



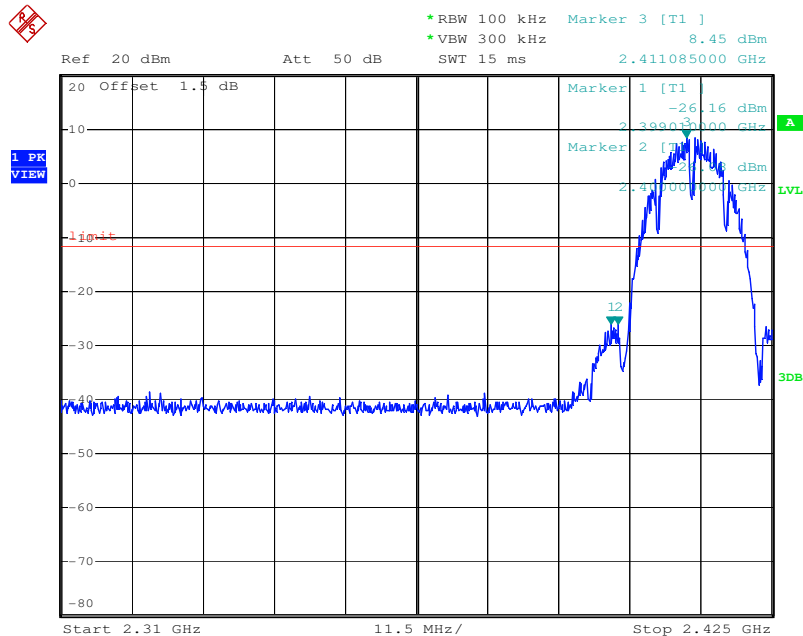
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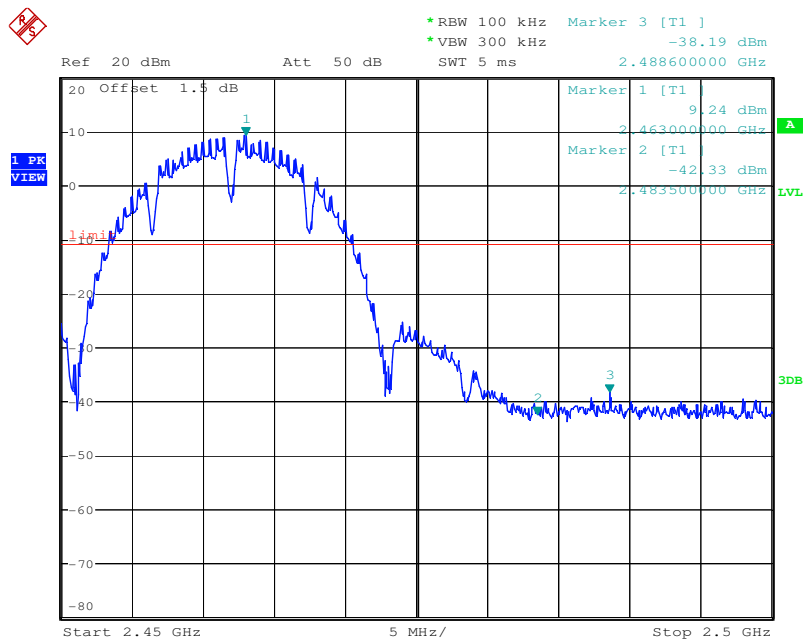
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Test plot as follows:

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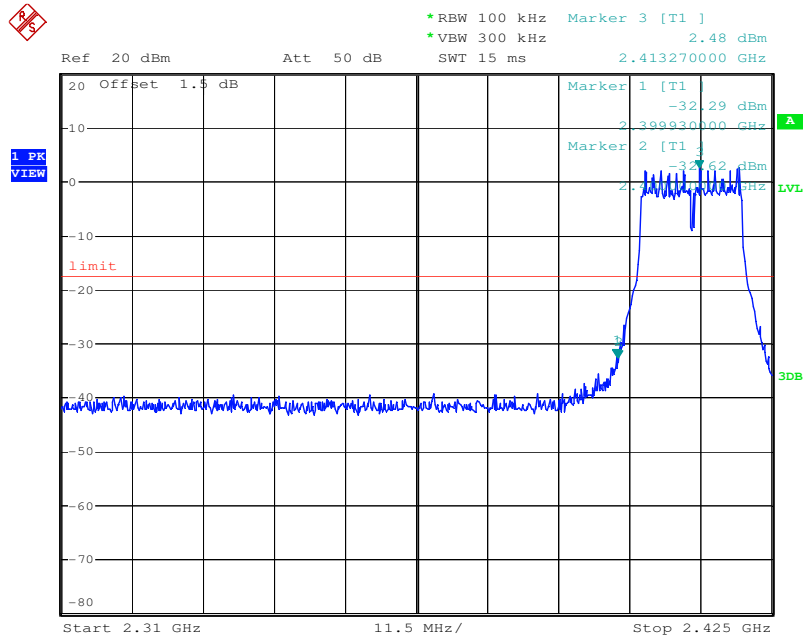


SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

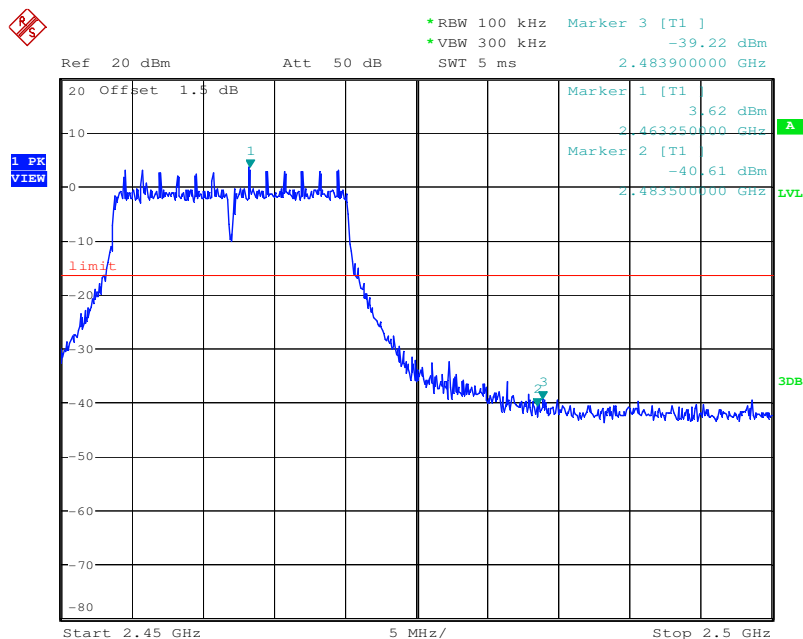
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Test mode:	802.11g	Test channel:	Lowest
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Test mode:	802.11g	Test channel:	Highest
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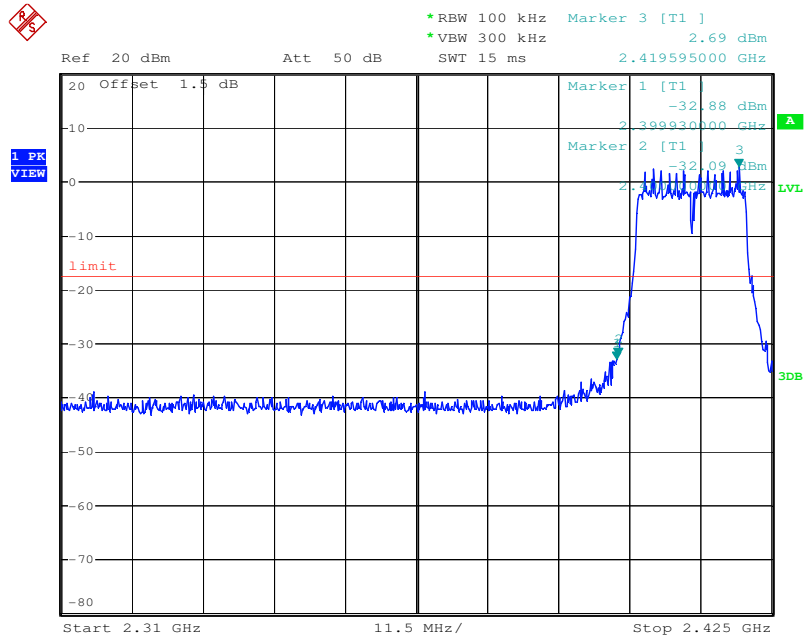


SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

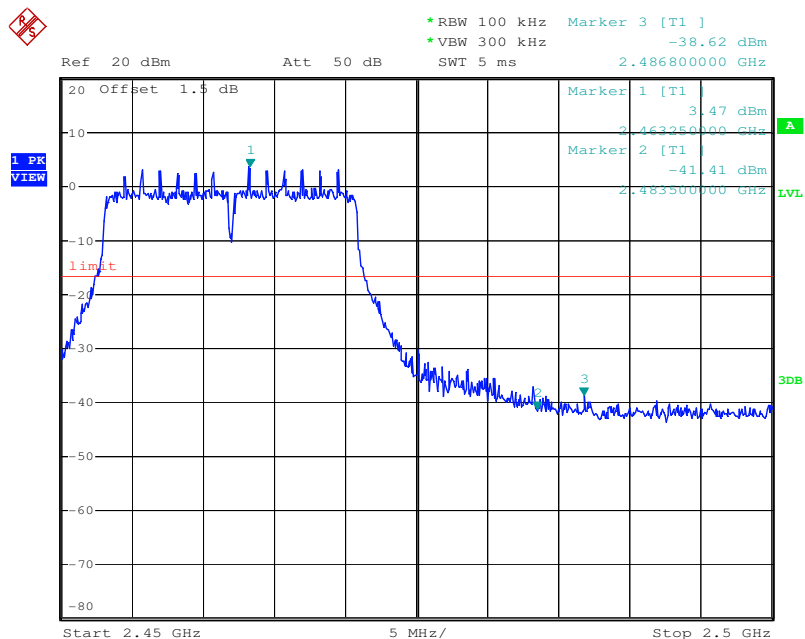
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Test mode:	802.11n (HT20)	Test channel:	Lowest
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Test mode:	802.11n (HT20)	Test channel:	Highest
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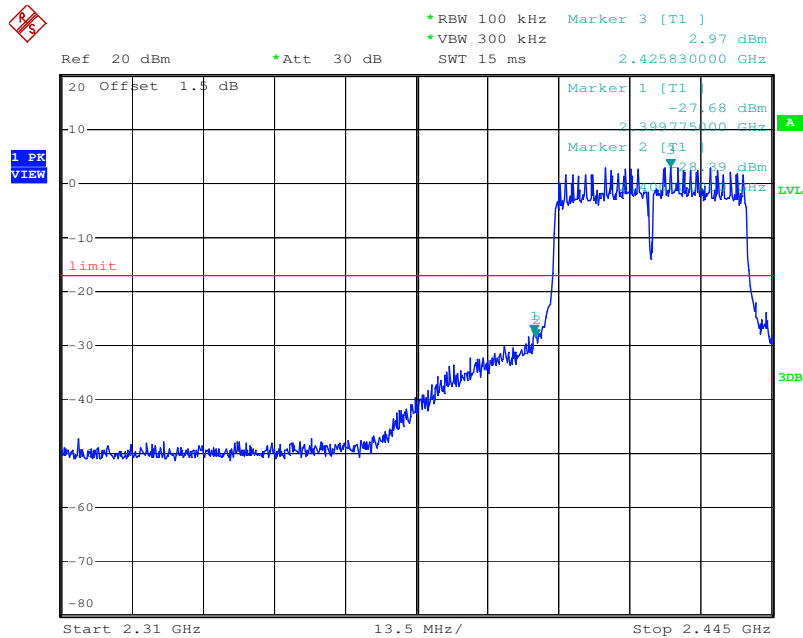


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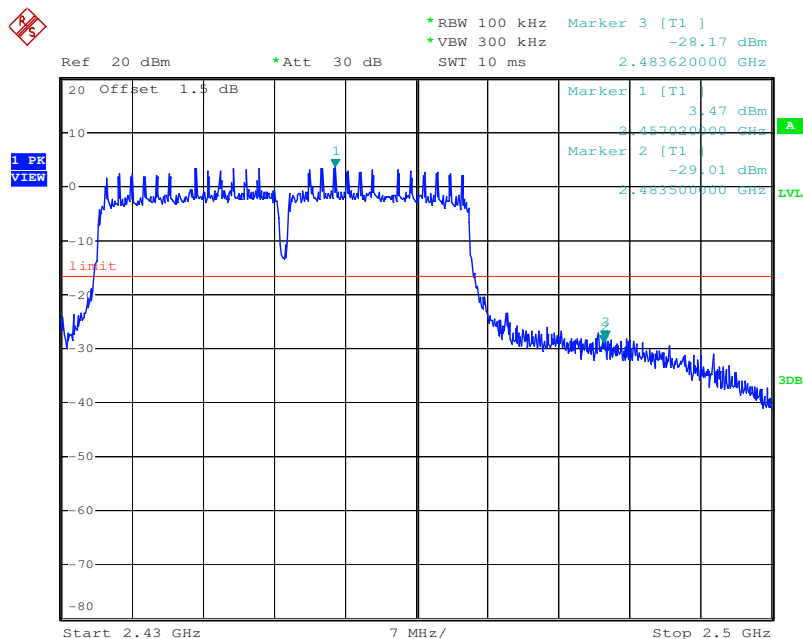
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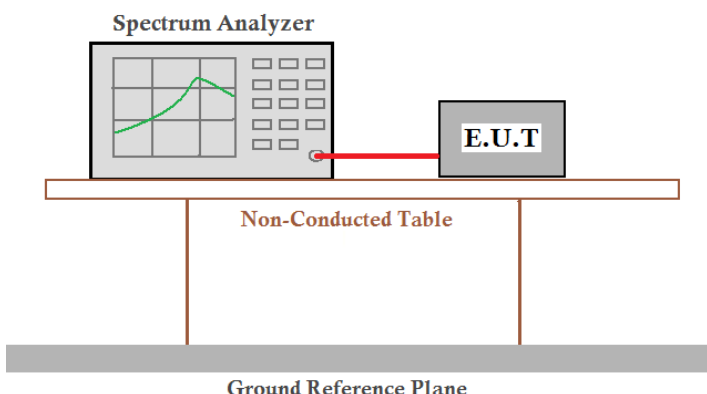
Test mode:	802.11n (HT40)	Test channel:	Lowest
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Test mode:	802.11n (HT40)	Test channel:	Highest
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6.6 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
Test Setup:	 <p><i>Remark:</i> Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20) ; 13.5Mbps of rate is the worst case of 802.11n(HT40)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



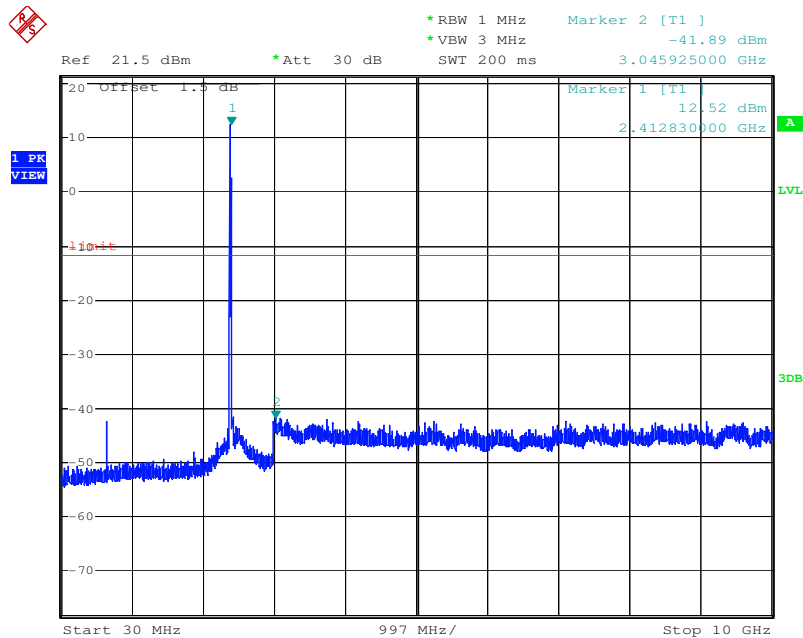
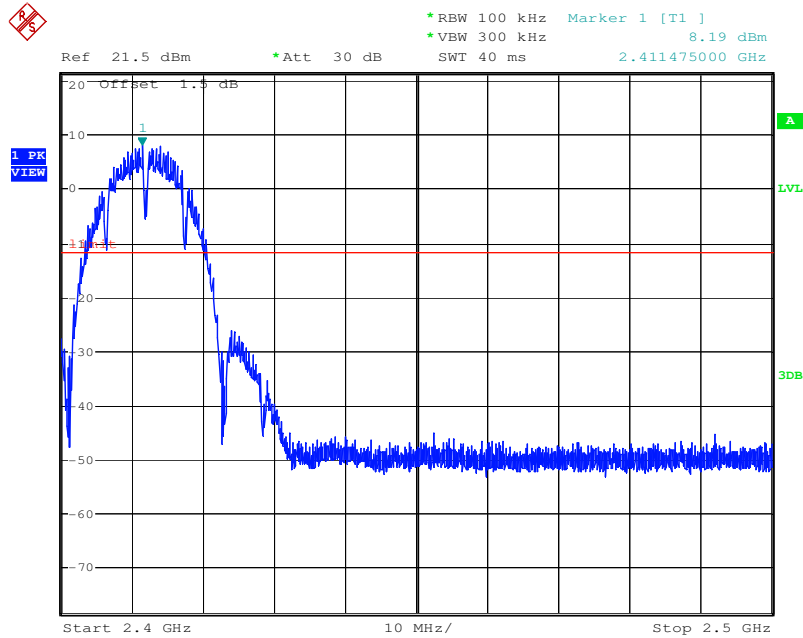
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Test plot as follows:

Test mode:	802.11b	Test channel:	Lowest
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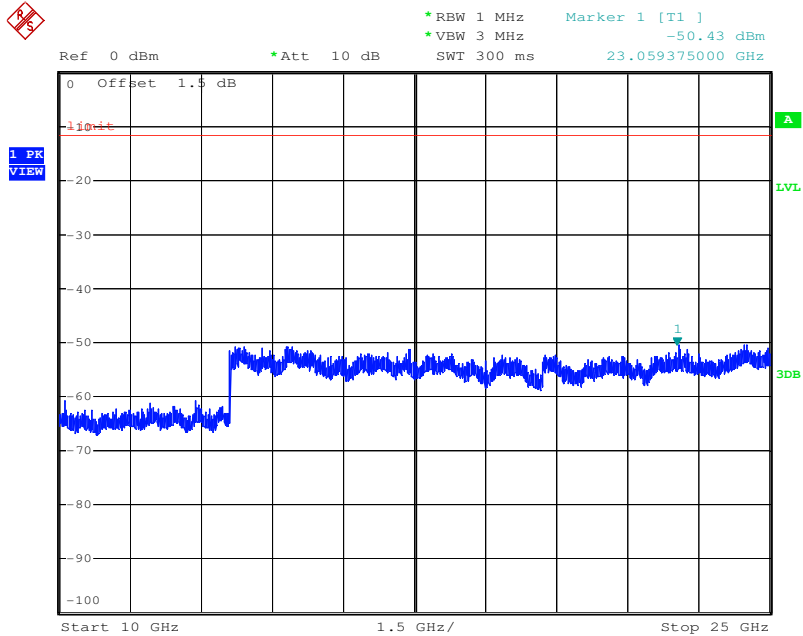




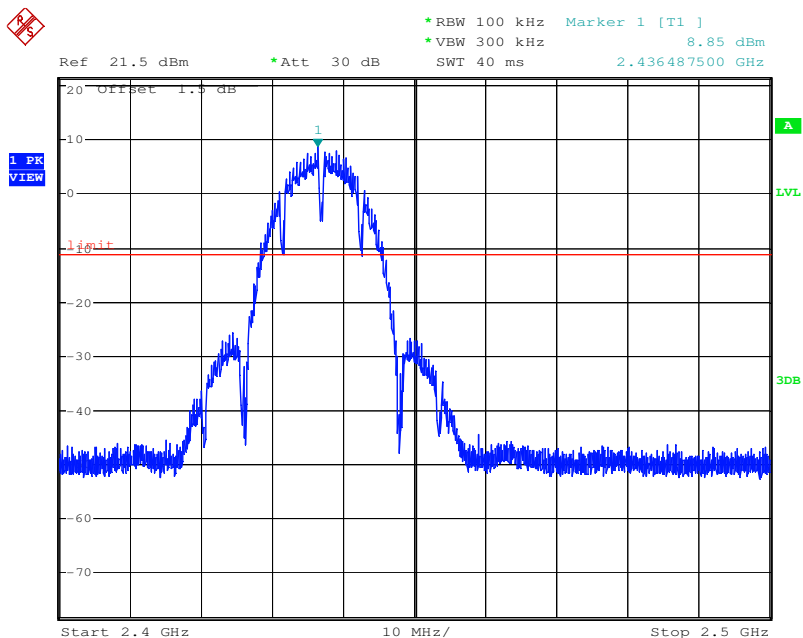
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Test mode:	802.11b	Test channel:	Middle
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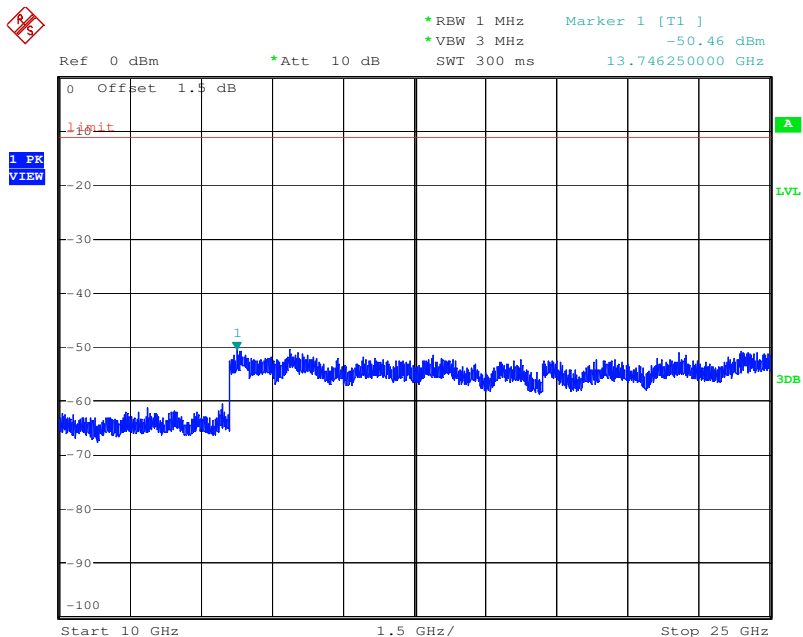
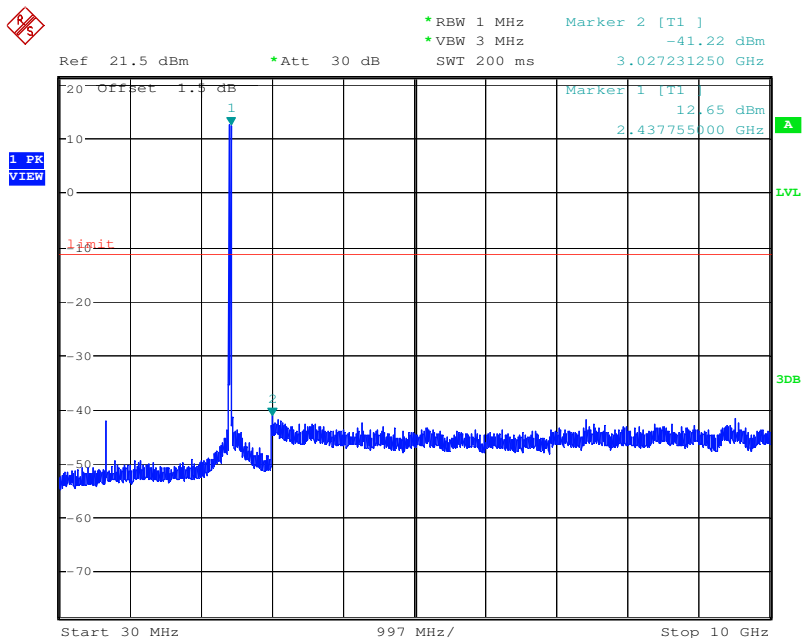




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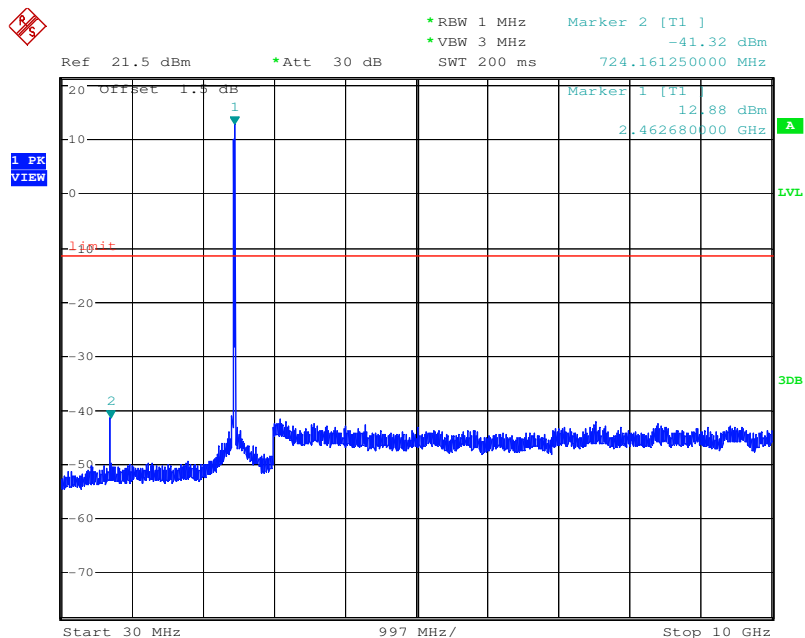
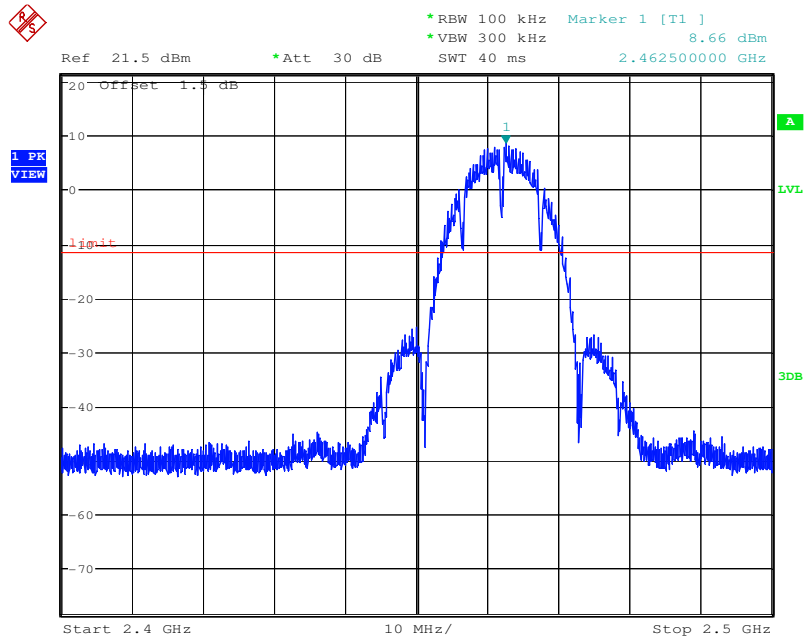


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Test mode:	802.11b	Test channel:	Highest
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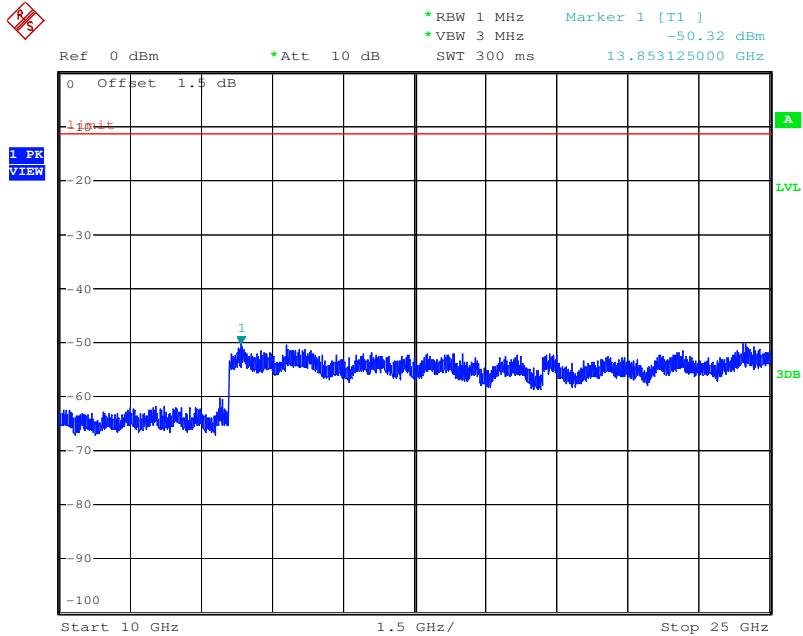




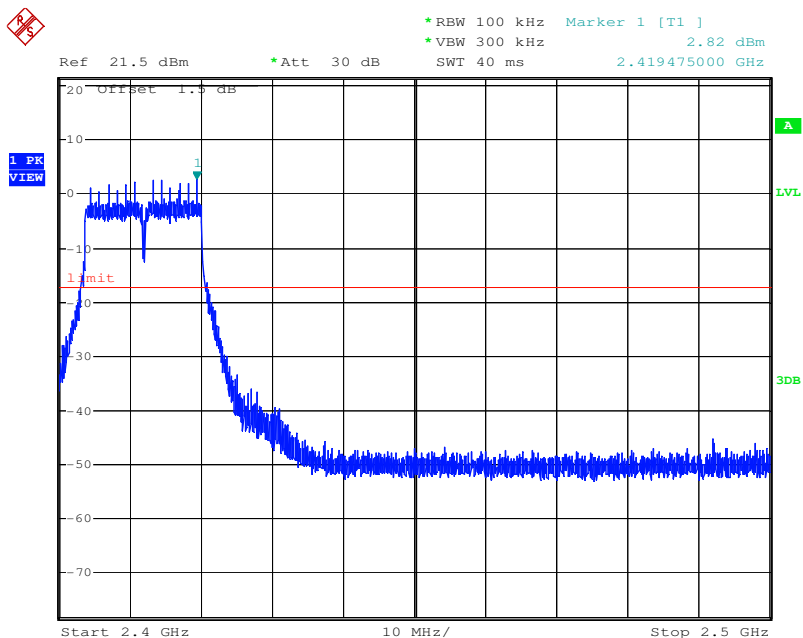
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Test mode:	802.11g	Test channel:	Lowest
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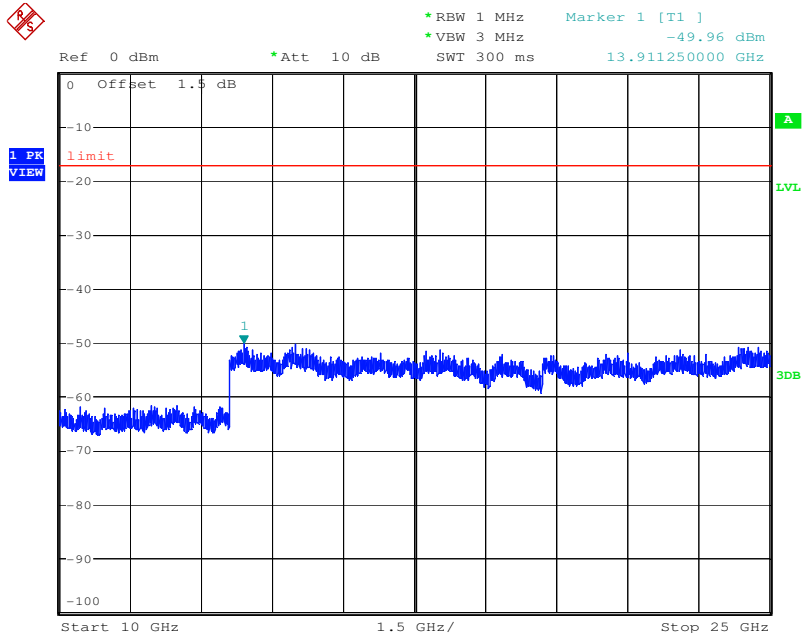
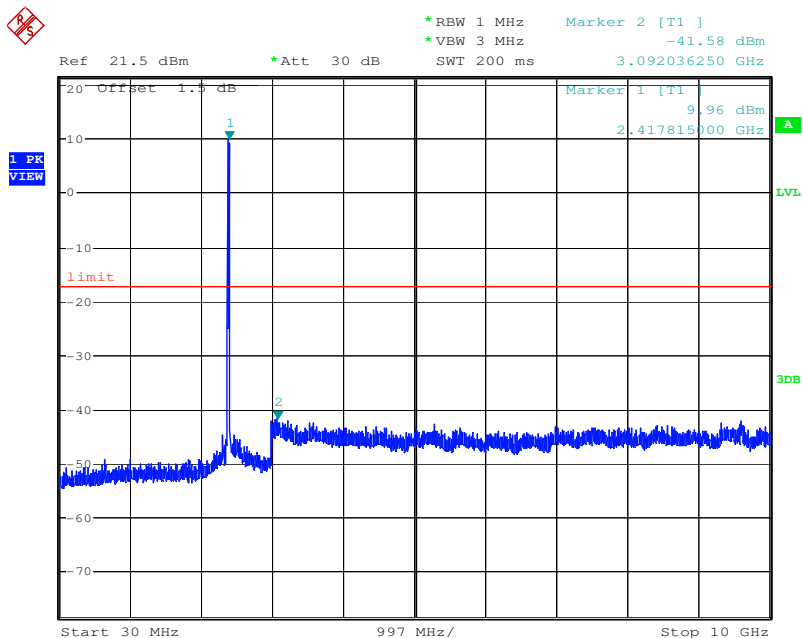




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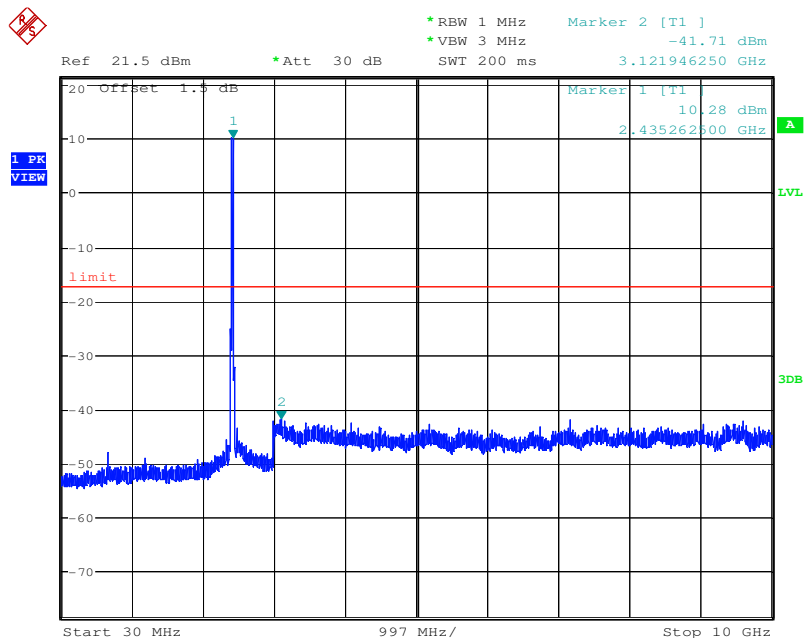
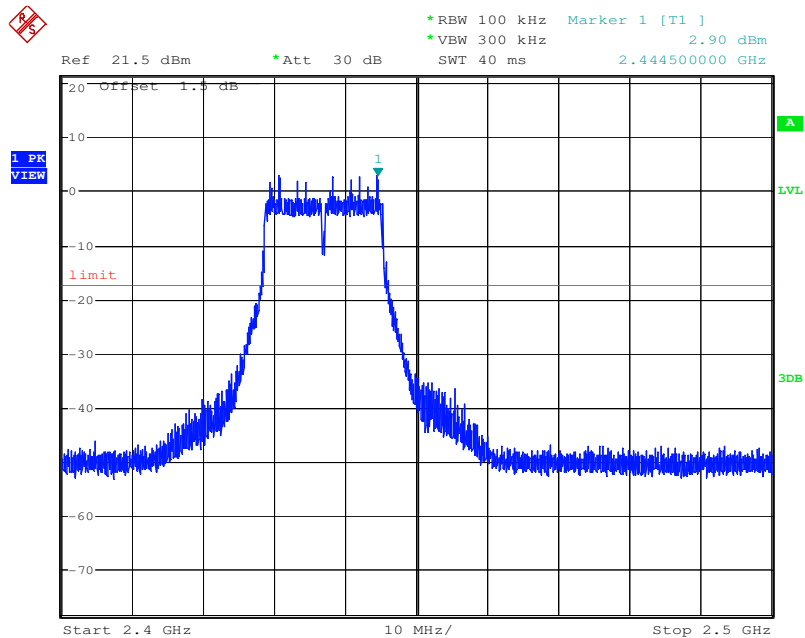


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Test mode:	802.11g	Test channel:	Middle
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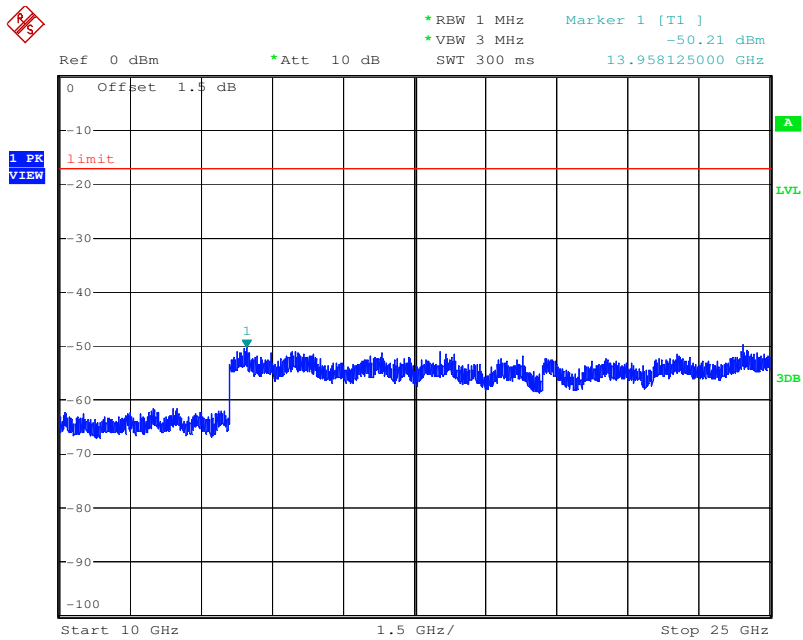




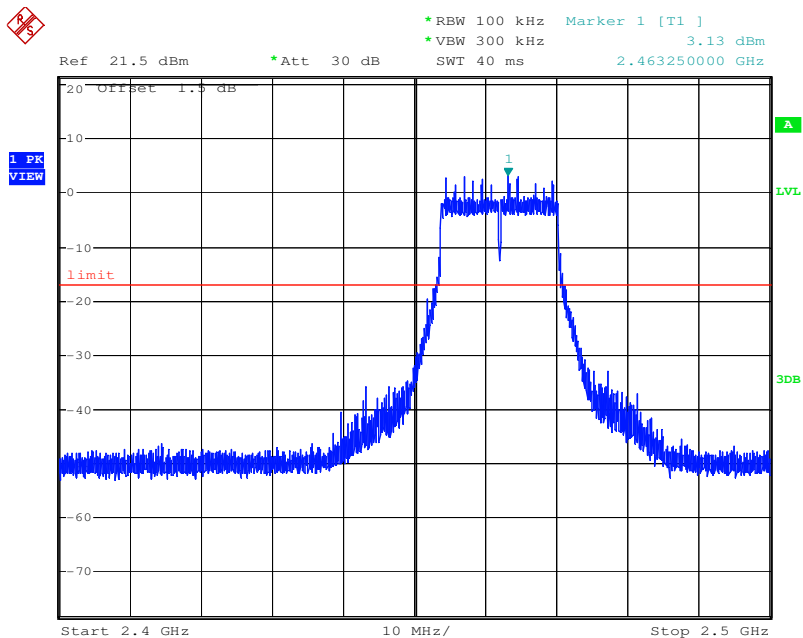
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Test mode:	802.11g	Test channel:	Highest
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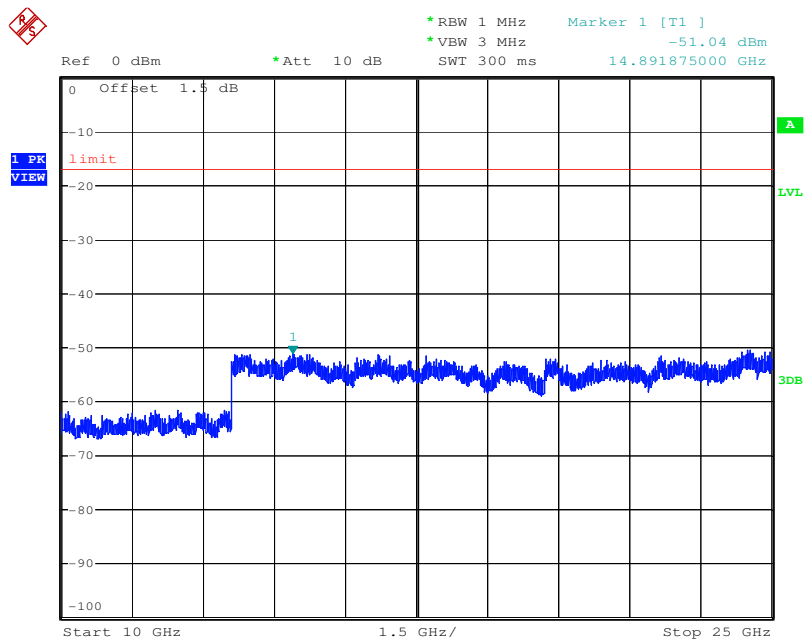
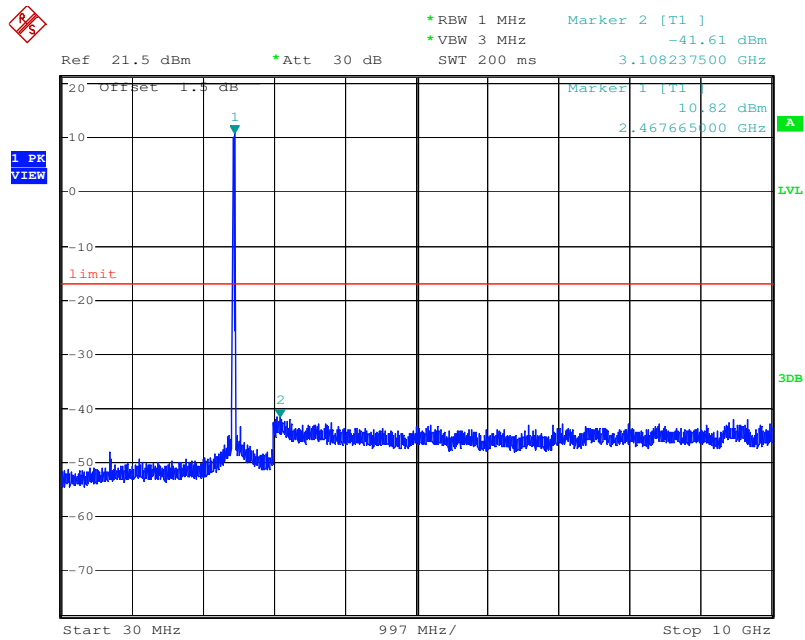




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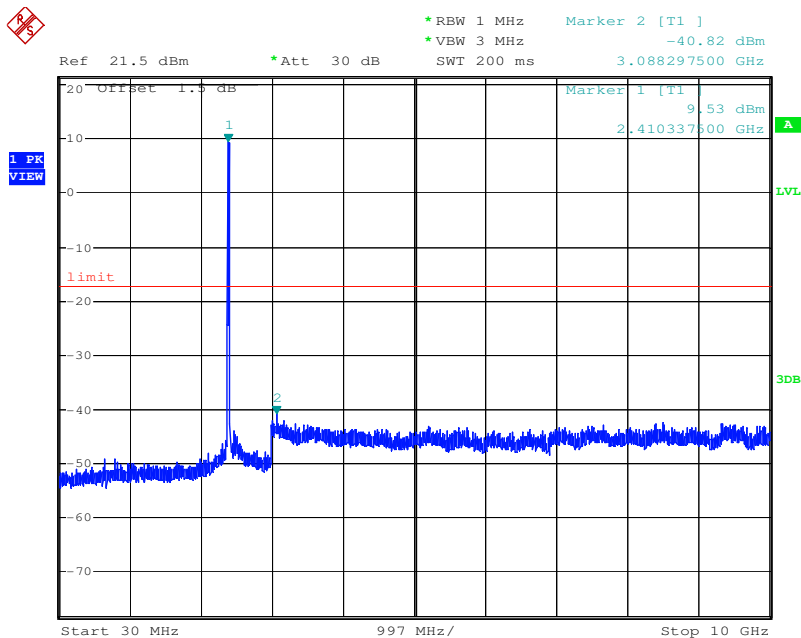
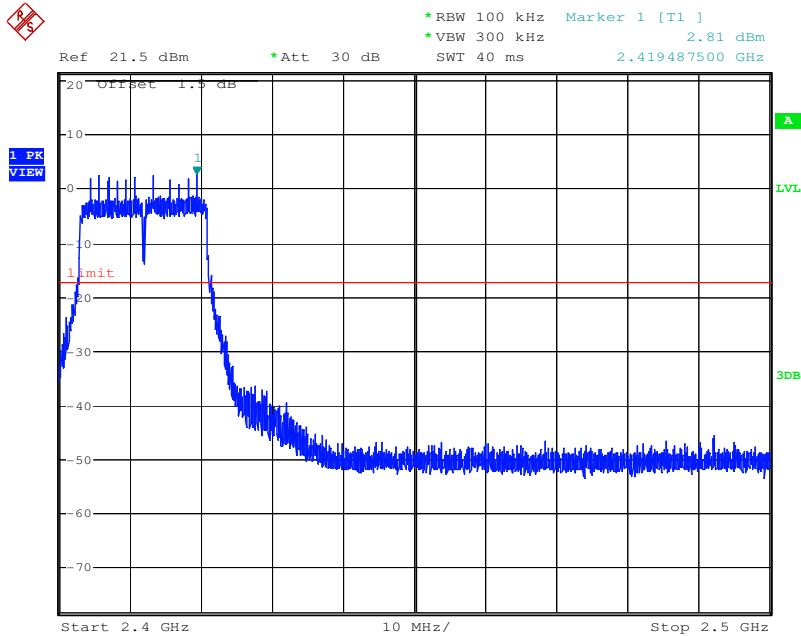


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Test mode:	802.11n (HT20)	Test channel:	Lowest
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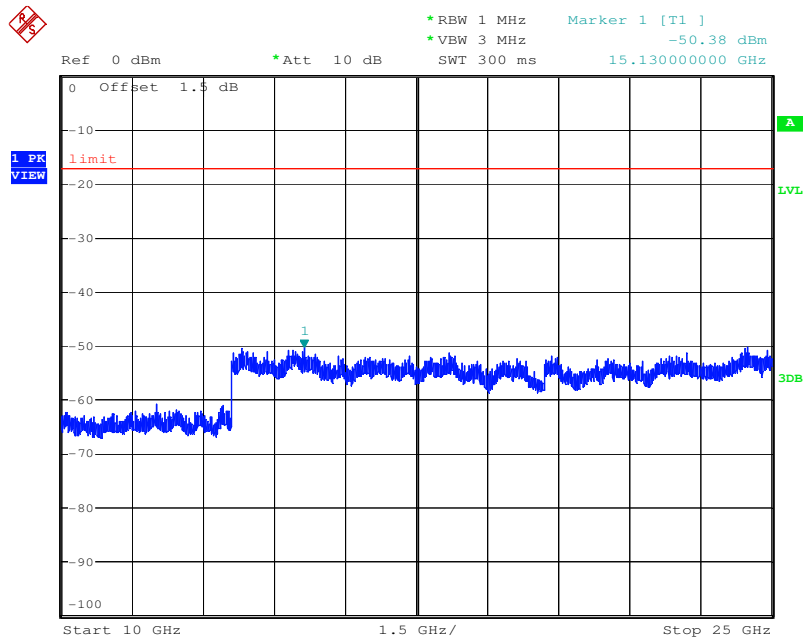




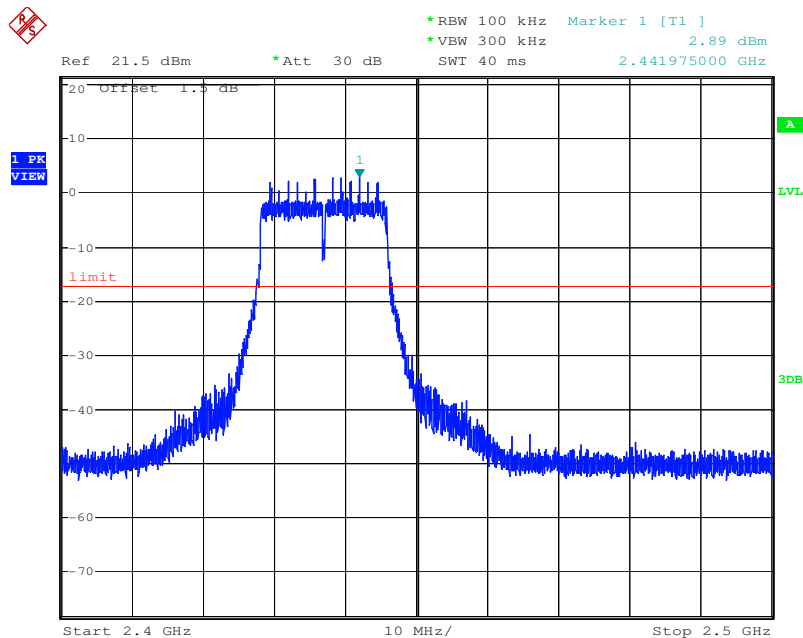
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Test mode:	802.11n (HT20)	Test channel:	Middle
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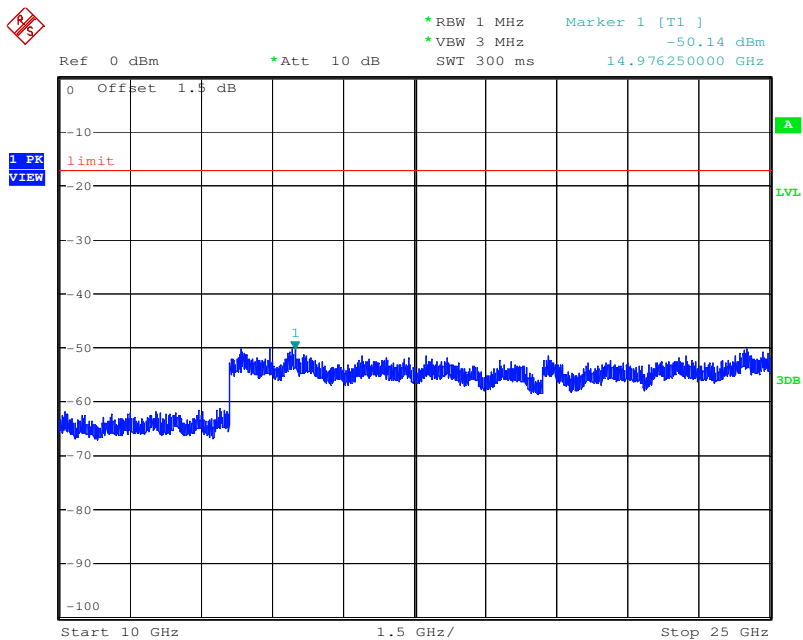
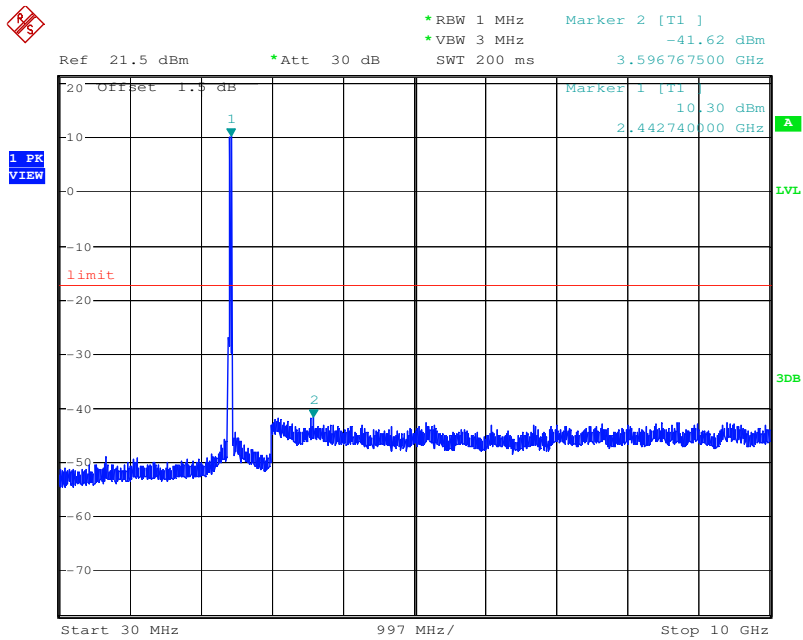




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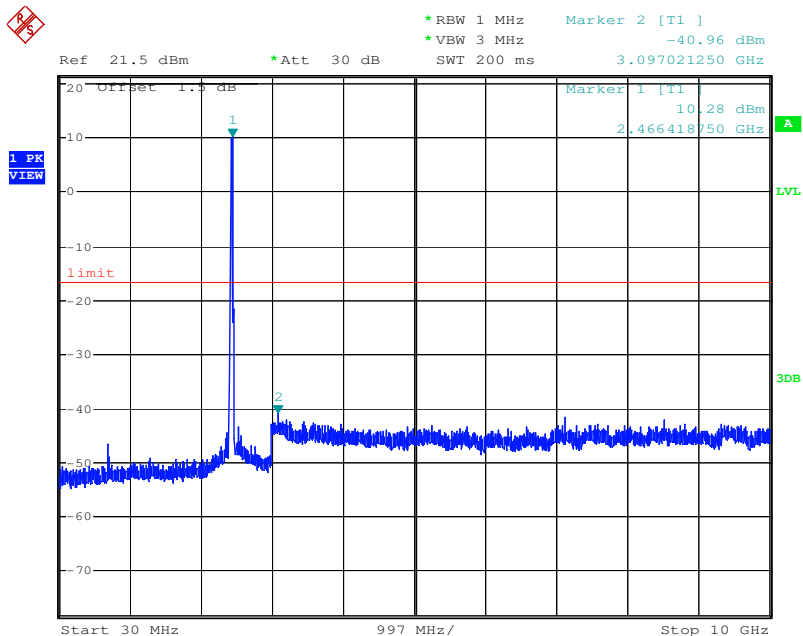
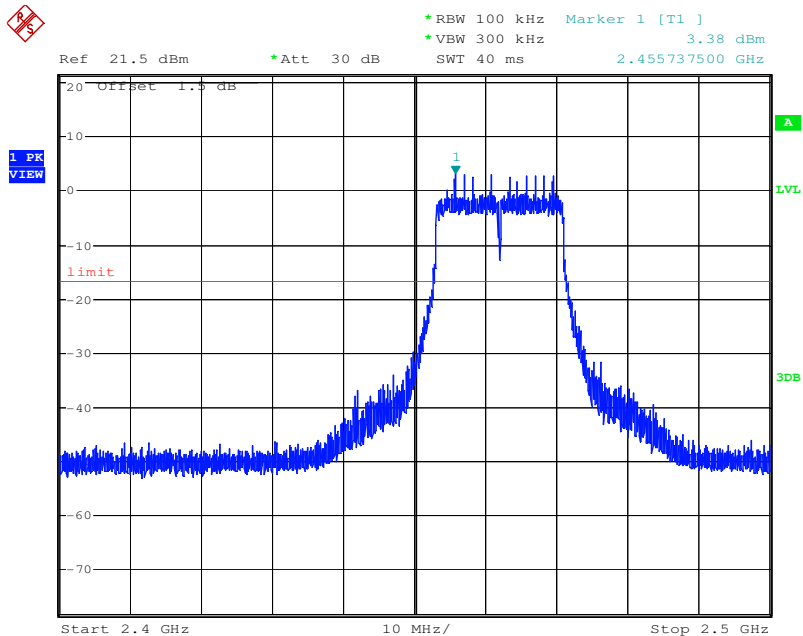


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Test mode:	802.11n (HT20)	Test channel:	Highest
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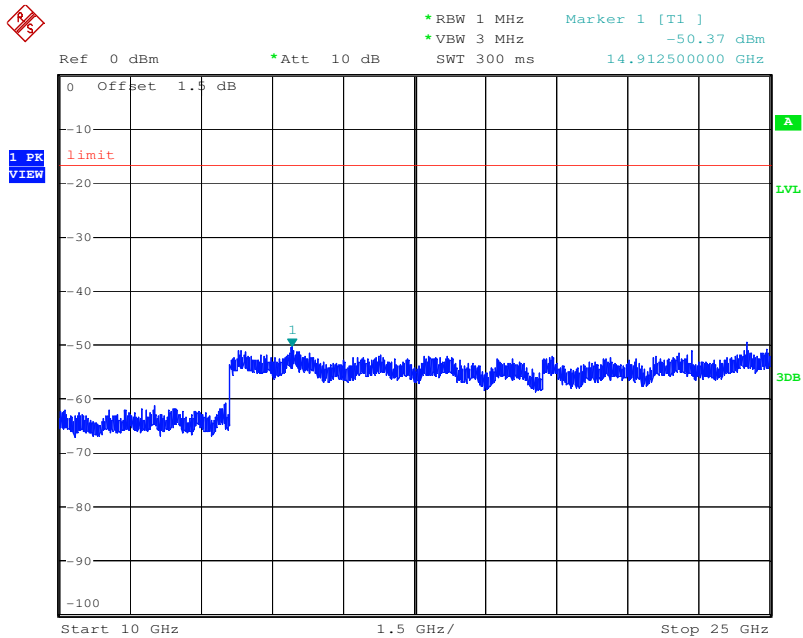




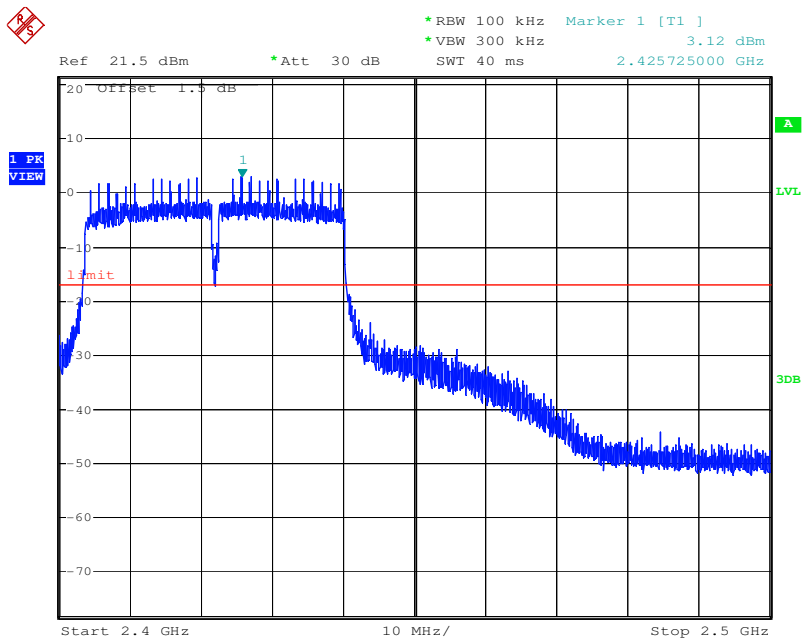
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Test mode:	802.11n (HT40)	Test channel:	Lowest
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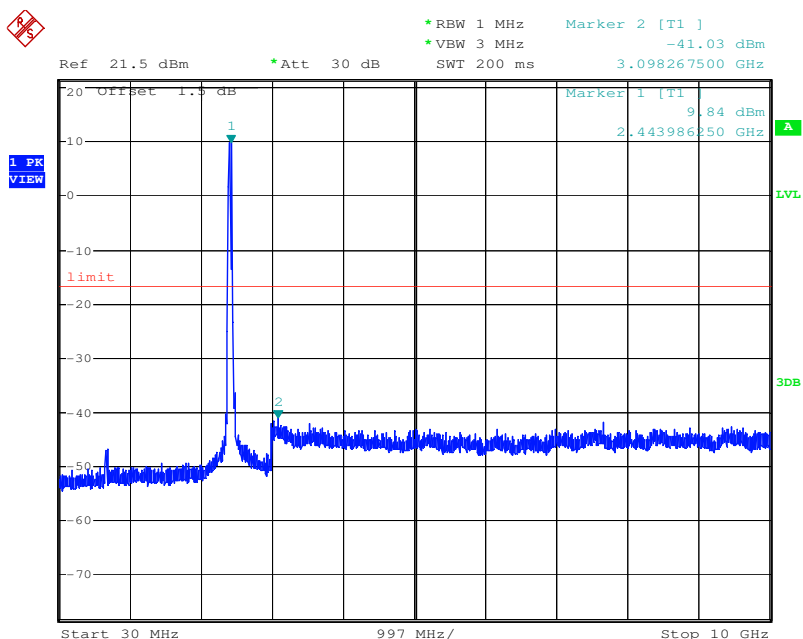
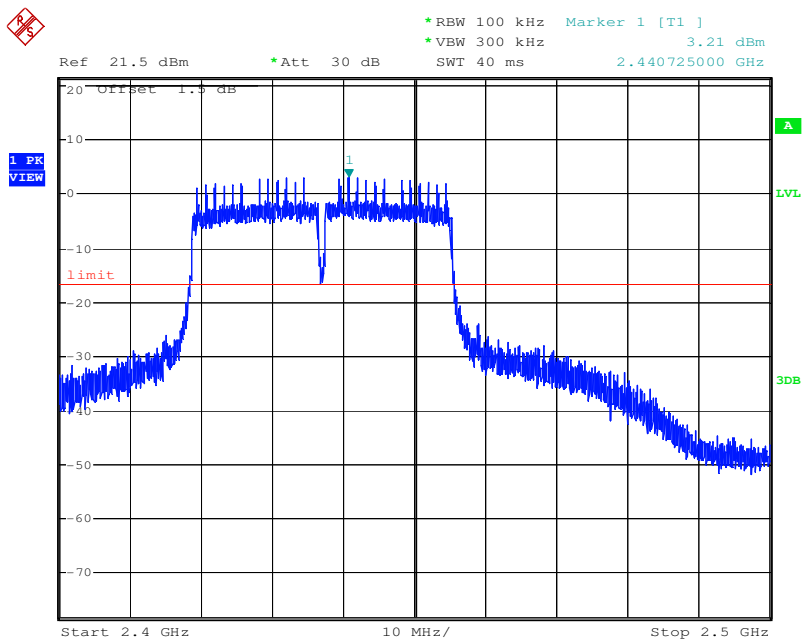


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Test mode:	802.11n (HT40)	Test channel:	Middle
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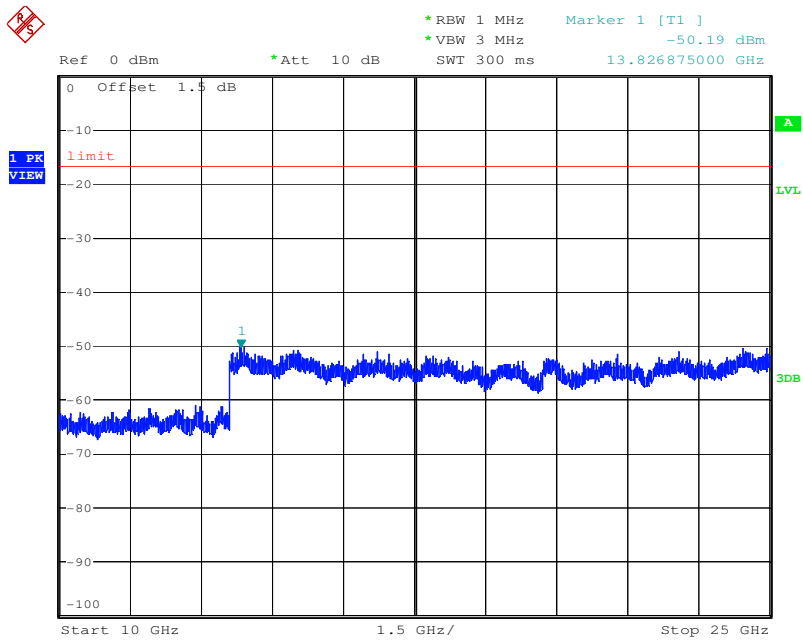




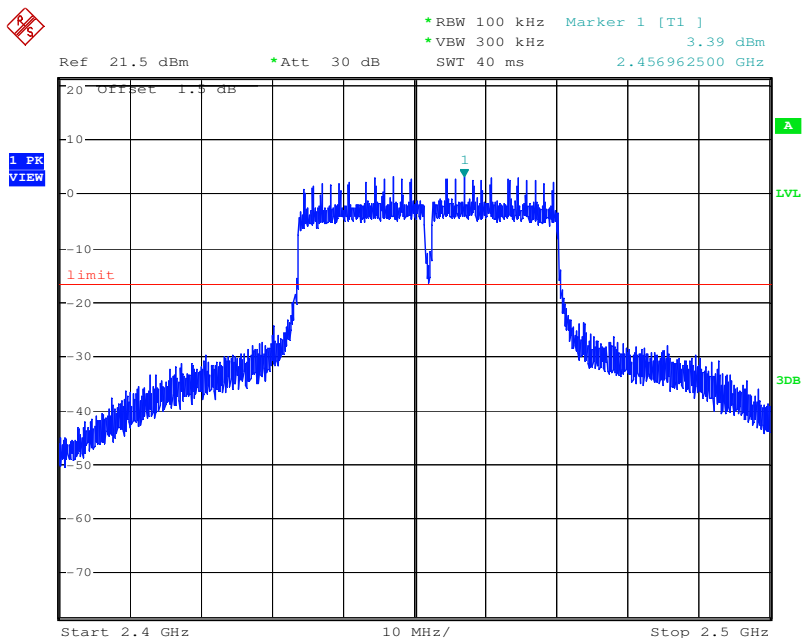
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Test mode:	802.11n (HT40)	Test channel:	Highest
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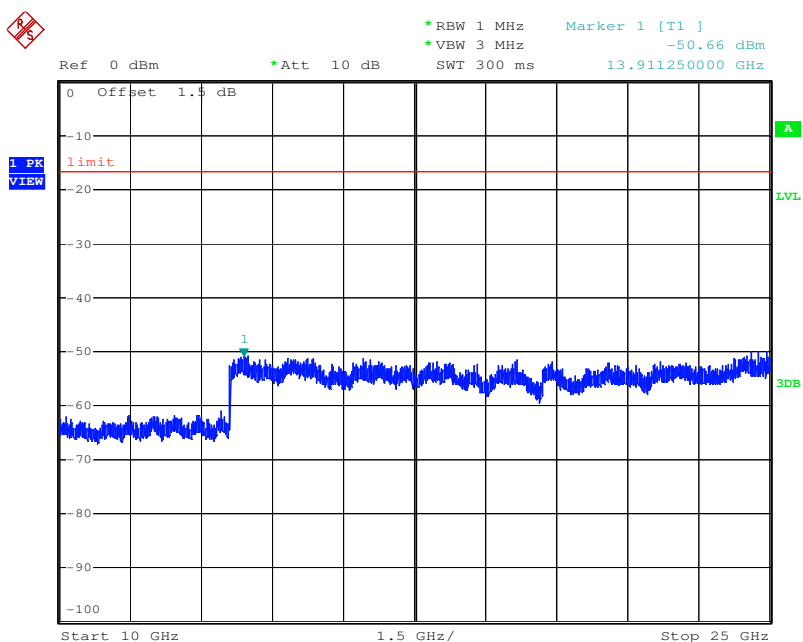
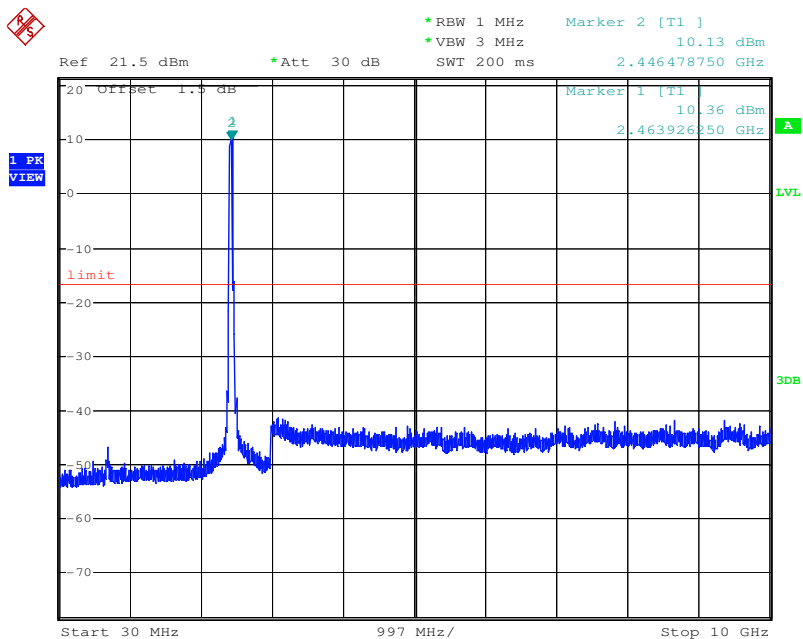




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Remark:

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



6.7 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 :2013 Section 11.12				
Test Site:	Measurement Distance: 3m (fully Anechoic Chamber) Measurement Distance: 10m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	29.9	29.5	Quasi-peak	10
	88MHz-216MHz	44.7	33	Quasi-peak	10
	216MHz-960MHz	60.3	35.5	Quasi-peak	10
	960MHz-1GHz	100	43.5	Quasi-peak	10
	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. 10m limit= 3m limit- 20*log(10/3)				

Test Setup:

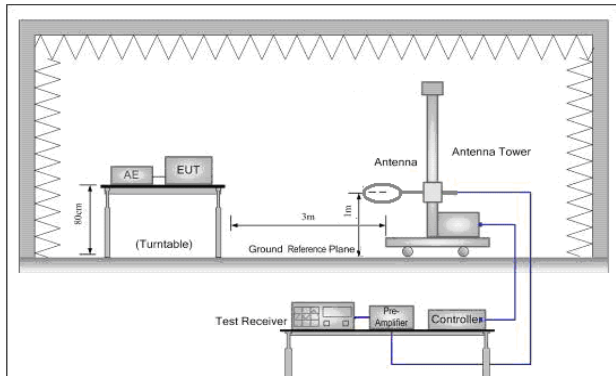


Figure 1. Below 30MHz

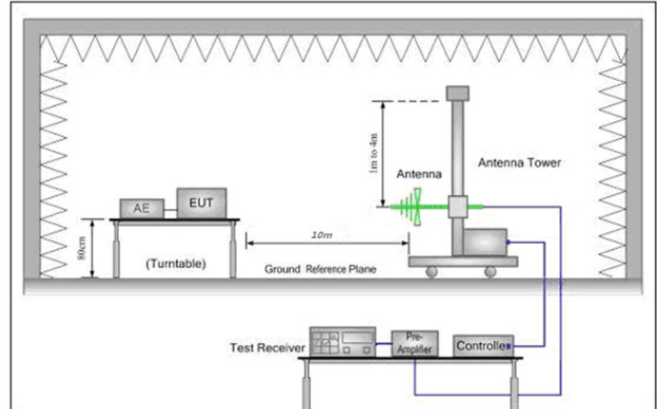


Figure 2. 30MHz to 1GHz

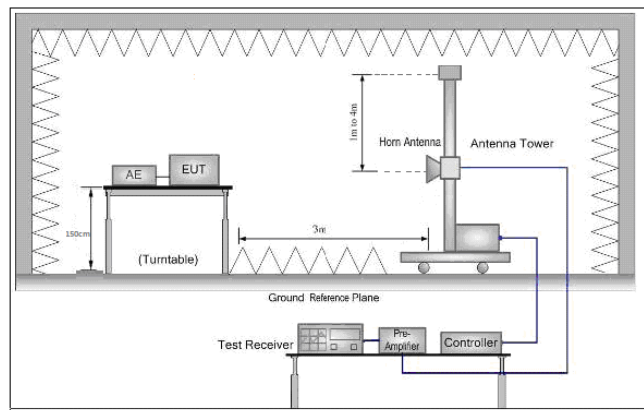


Figure 3. Above 1 GHz

Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



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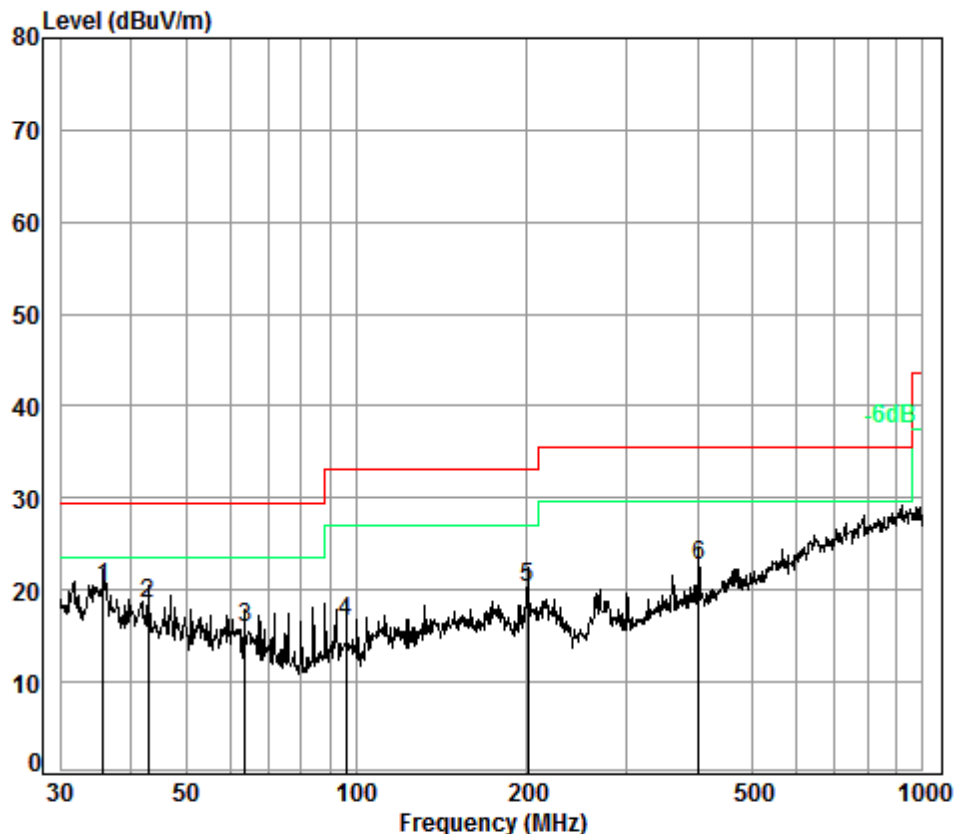
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	<p>g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p> <p>h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p>
Exploratory Test Mode:	<p>Transmitting with all kind of modulations, data rates.</p> <p>Transmitting mode</p>
Final Test Mode:	<p>Pretest the EUT at Transmitting mode, found the Transmitting mode which it is worse case</p> <p>Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40)</p> <p>For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case.</p> <p>Only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



6.7.1 Radiated emission below 1GHz

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



Condition: 10m VERTICAL

Job No. : 7389CR

Test Mode: TX Mode

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	35.75	6.72	12.75	32.98	33.72	20.21	29.50	-9.29
2	42.90	6.80	13.07	32.99	31.55	18.43	29.50	-11.07
3	63.54	7.00	11.28	32.93	30.46	15.81	29.50	-13.69
4	96.10	7.20	9.13	32.81	33.15	16.67	33.10	-16.43
5	200.69	7.60	9.31	32.70	36.17	20.38	33.10	-12.72
6	401.84	8.30	14.91	32.60	32.07	22.68	35.60	-12.92

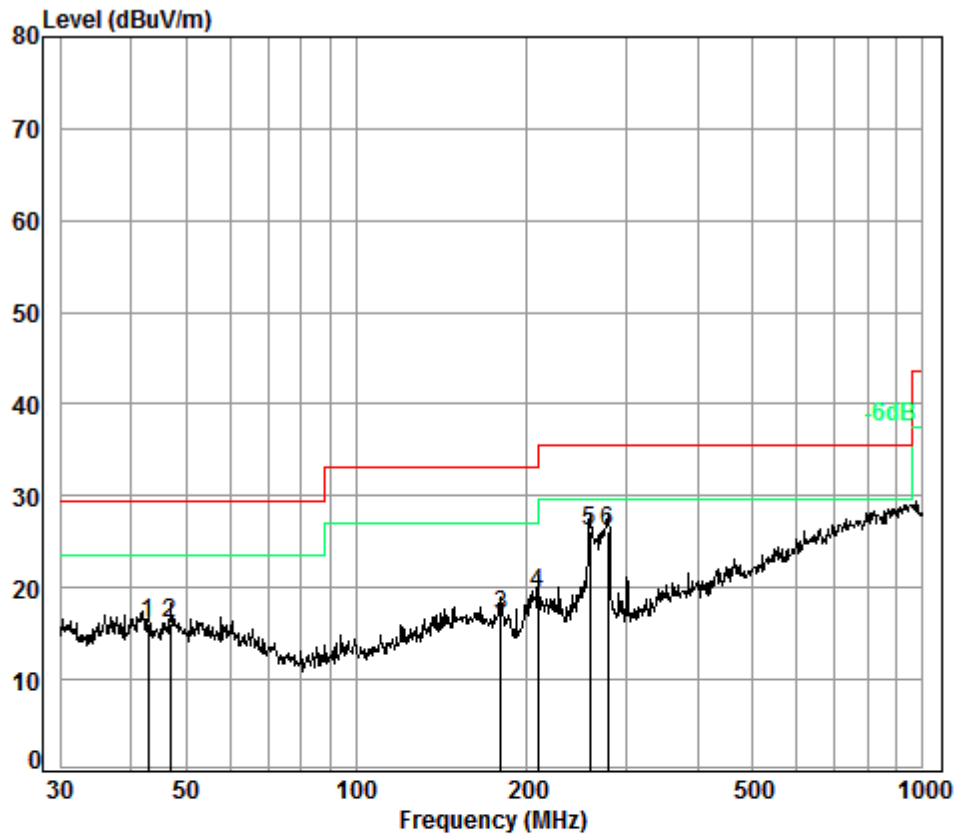


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Test mode:	Transmitting	Horizontal
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Condition: 10m HORIZONTAL

Job No. : 7389CR

Test Mode: TX Mode

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m
1	42.90	6.80	13.07	32.99	29.14	16.02	29.50	-13.48
2	46.99	6.84	12.85	33.00	29.53	16.22	29.50	-13.28
3	180.02	7.50	10.92	32.72	31.24	16.94	33.10	-16.16
4	209.31	7.65	9.51	32.69	34.89	19.36	33.10	-13.74
5 pp	258.33	7.90	11.44	32.64	39.49	26.19	35.60	-9.41
6	278.07	7.99	12.10	32.62	38.60	26.07	35.60	-9.53



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6.7.2 Transmitter emission above 1GHz

Test mode:		802.11b		Test channel:		Lowest		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preampl Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3781.495	33.01	7.73	38.60	44.11	46.25	74.00	-27.75	Vertical			
4824.000	34.19	8.90	39.04	44.79	48.84	74.00	-25.16	Vertical			
6025.661	34.72	10.53	38.98	45.39	51.66	74.00	-22.34	Vertical			
7236.000	36.40	10.69	38.15	42.60	51.54	74.00	-22.46	Vertical			
9648.000	37.53	12.52	36.97	39.53	52.61	74.00	-21.39	Vertical			
12314.840	38.79	14.30	38.62	38.66	53.13	74.00	-20.87	Vertical			
3568.847	32.40	7.66	38.50	45.26	46.82	74.00	-27.18	Horizontal			
4824.000	34.19	8.90	39.04	42.91	46.96	74.00	-27.04	Horizontal			
5803.188	34.59	10.01	39.02	45.13	50.71	74.00	-23.29	Horizontal			
7236.000	36.40	10.69	38.15	42.35	51.29	74.00	-22.71	Horizontal			
9648.000	37.53	12.52	36.97	39.79	52.87	74.00	-21.13	Horizontal			
12350.530	38.81	14.27	38.66	39.37	53.79	74.00	-20.21	Horizontal			

Test mode:		802.11b		Test channel:		Middle		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3831.060	33.15	7.75	38.62	44.35	46.63	74.00	-27.37	Vertical			
4874.000	34.28	8.97	39.05	39.98	44.18	74.00	-29.82	Vertical			
5939.103	34.66	10.39	39.01	44.69	50.73	74.00	-23.27	Vertical			
7311.000	36.37	10.72	38.07	40.19	49.21	74.00	-24.79	Vertical			
9748.000	37.55	12.58	36.92	37.63	50.84	74.00	-23.16	Vertical			
12033.020	38.62	14.53	38.33	38.03	52.85	74.00	-21.15	Vertical			
3776.027	33.00	7.73	38.60	44.19	46.32	74.00	-27.68	Horizontal			
4874.000	34.28	8.97	39.05	42.61	46.81	74.00	-27.19	Horizontal			
5999.562	34.70	10.56	39.00	43.89	50.15	74.00	-23.85	Horizontal			
7311.000	36.37	10.72	38.07	40.00	49.02	74.00	-24.98	Horizontal			
9748.000	37.55	12.58	36.92	39.15	52.36	74.00	-21.64	Horizontal			
12350.530	38.81	14.27	38.66	38.82	53.24	74.00	-20.76	Horizontal			



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Test mode:		802.11b		Test channel:		Highest		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3864.464	33.24	7.76	38.64	43.77	46.13	74.00	-27.87	Vertical			
4924.000	34.37	9.04	39.07	42.35	46.69	74.00	-27.31	Vertical			
6148.967	34.82	10.37	38.90	44.47	50.76	74.00	-23.24	Vertical			
7386.000	36.34	10.75	38.00	40.40	49.49	74.00	-24.51	Vertical			
9848.000	37.57	12.63	36.87	39.47	52.80	74.00	-21.20	Vertical			
12350.530	38.81	14.27	38.66	39.20	53.62	74.00	-20.38	Vertical			
3568.847	32.40	7.66	38.50	44.86	46.42	74.00	-27.58	Horizontal			
4924.000	34.37	9.04	39.07	43.54	47.88	74.00	-26.12	Horizontal			
6095.816	34.78	10.44	38.94	44.52	50.80	74.00	-23.20	Horizontal			
7386.000	36.34	10.75	38.00	40.45	49.54	74.00	-24.46	Horizontal			
9848.000	37.57	12.63	36.87	38.95	52.28	74.00	-21.72	Horizontal			
12208.390	38.73	14.39	38.52	38.25	52.85	74.00	-21.15	Horizontal			

Test mode:		802.11g		Test channel:		Lowest		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3759.672	32.95	7.73	38.59	45.12	47.21	74.00	-26.79	Vertical			
4824.000	34.19	8.90	39.04	43.85	47.90	74.00	-26.10	Vertical			
5794.797	34.58	9.98	39.02	44.65	50.19	74.00	-23.81	Vertical			
7236.000	36.40	10.69	38.15	42.56	51.50	74.00	-22.50	Vertical			
9648.000	37.53	12.52	36.97	39.10	52.18	74.00	-21.82	Vertical			
11622.330	38.22	14.15	37.93	38.41	52.85	74.00	-21.15	Vertical			
3727.173	32.86	7.71	38.58	43.61	45.60	74.00	-28.40	Horizontal			
4824.000	34.19	8.90	39.04	40.78	44.83	74.00	-29.17	Horizontal			
6069.413	34.76	10.47	38.96	43.71	49.98	74.00	-24.02	Horizontal			
7236.000	36.40	10.69	38.15	41.96	50.90	74.00	-23.10	Horizontal			
9648.000	37.53	12.52	36.97	38.09	51.17	74.00	-22.83	Horizontal			
12033.020	38.62	14.53	38.33	38.13	52.95	74.00	-21.05	Horizontal			



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Test mode:		802.11g		Test channel:		Middle		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3847.726	33.19	7.76	38.63	44.14	46.46	74.00	-27.54	Vertical			
4874.000	34.28	8.97	39.05	41.88	46.08	74.00	-27.92	Vertical			
6078.201	34.76	10.46	38.95	44.54	50.81	74.00	-23.19	Vertical			
7311.000	36.37	10.72	38.07	40.56	49.58	74.00	-24.42	Vertical			
9748.000	37.55	12.58	36.92	38.56	51.77	74.00	-22.23	Vertical			
12368.410	38.82	14.26	38.68	38.27	52.67	74.00	-21.33	Vertical			
3792.453	33.04	7.74	38.61	44.07	46.24	74.00	-27.76	Horizontal			
4874.000	34.28	8.97	39.05	41.25	45.45	74.00	-28.55	Horizontal			
5845.324	34.61	10.13	39.01	45.22	50.95	74.00	-23.05	Horizontal			
7311.000	36.37	10.72	38.07	40.39	49.41	74.00	-24.59	Horizontal			
9748.000	37.55	12.58	36.92	38.03	51.24	74.00	-22.76	Horizontal			
12226.070	38.74	14.37	38.53	38.96	53.54	74.00	-20.46	Horizontal			

Test mode:		802.11g		Test channel:		Highest		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3781.495	33.01	7.73	38.60	43.73	45.87	74.00	-28.13	Vertical			
4924.000	34.37	9.04	39.07	43.39	47.73	74.00	-26.27	Vertical			
5990.888	34.69	10.53	39.00	43.81	50.03	74.00	-23.97	Vertical			
7386.000	36.34	10.75	38.00	40.24	49.33	74.00	-24.67	Vertical			
9748.000	37.55	12.58	36.92	38.20	51.41	74.00	-22.59	Vertical			
12440.210	38.86	14.20	38.75	38.28	52.59	74.00	-21.41	Vertical			
3803.444	33.07	7.74	38.61	44.35	46.55	74.00	-27.45	Horizontal			
4924.000	34.37	9.04	39.07	43.83	48.17	74.00	-25.83	Horizontal			
6311.218	34.95	10.16	38.80	44.98	51.29	74.00	-22.71	Horizontal			
7386.000	36.34	10.75	38.00	40.96	50.05	74.00	-23.95	Horizontal			
9748.000	37.55	12.58	36.92	38.69	51.90	74.00	-22.10	Horizontal			
12226.070	38.74	14.37	38.53	38.59	53.17	74.00	-20.83	Horizontal			



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Test mode:		802.11n(HT20)		Test channel:		Lowest		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3972.178	33.53	7.80	38.69	44.97	47.61	74.00	-26.39	Vertical			
4824.000	34.19	8.90	39.04	41.52	45.57	74.00	-28.43	Vertical			
6025.661	34.72	10.53	38.98	43.91	50.18	74.00	-23.82	Vertical			
7236.000	36.40	10.69	38.15	41.60	50.54	74.00	-23.46	Vertical			
9648.000	37.53	12.52	36.97	39.19	52.27	74.00	-21.73	Vertical			
11894.540	38.50	14.45	38.20	38.01	52.76	74.00	-21.24	Vertical			
3842.163	33.18	7.76	38.63	44.97	47.28	74.00	-26.72	Horizontal			
4824.000	34.19	8.90	39.04	42.29	46.34	74.00	-27.66	Horizontal			
5947.702	34.67	10.42	39.00	44.43	50.52	74.00	-23.48	Horizontal			
7236.000	36.40	10.69	38.15	42.28	51.22	74.00	-22.78	Horizontal			
9648.000	37.53	12.52	36.97	39.88	52.96	74.00	-21.04	Horizontal			
11639.160	38.24	14.17	37.95	38.61	53.07	74.00	-20.93	Horizontal			

Test mode:		802.11n(HT20)		Test channel:		Middle		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3831.060	33.15	7.75	38.62	43.43	45.71	74.00	-28.29	Vertical			
4874.000	34.28	8.97	39.05	41.66	45.86	74.00	-28.14	Vertical			
5853.787	34.61	10.15	39.01	43.72	49.47	74.00	-24.53	Vertical			
7311.000	36.37	10.72	38.07	40.26	49.28	74.00	-24.72	Vertical			
9748.000	37.55	12.58	36.92	37.92	51.13	74.00	-22.87	Vertical			
12386.320	38.83	14.24	38.70	38.10	52.47	74.00	-21.53	Vertical			
3803.444	33.07	7.74	38.61	44.87	47.07	74.00	-26.93	Horizontal			
4874.000	34.28	8.97	39.05	41.60	45.80	74.00	-28.20	Horizontal			
6025.661	34.72	10.53	38.98	44.41	50.68	74.00	-23.32	Horizontal			
7311.000	36.37	10.72	38.07	41.43	50.45	74.00	-23.55	Horizontal			
9748.000	37.55	12.58	36.92	38.51	51.72	74.00	-22.28	Horizontal			
12085.370	38.65	14.49	38.39	37.28	52.03	74.00	-21.97	Horizontal			



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Test mode:		802.11n(HT20)		Test channel:		Highest		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3797.945	33.06	7.74	38.61	44.16	46.35	74.00	-27.65	Vertical			
4924.000	34.37	9.04	39.07	43.15	47.49	74.00	-26.51	Vertical			
5896.291	34.64	10.27	39.01	44.71	50.61	74.00	-23.39	Vertical			
7386.000	36.34	10.75	38.00	40.44	49.53	74.00	-24.47	Vertical			
9848.000	37.57	12.63	36.87	39.71	53.04	74.00	-20.96	Vertical			
12261.500	38.76	14.34	38.57	38.37	52.90	74.00	-21.10	Vertical			
3853.298	33.21	7.76	38.64	44.90	47.23	74.00	-26.77	Horizontal			
4924.000	34.37	9.04	39.07	44.06	48.40	74.00	-25.60	Horizontal			
6078.201	34.76	10.46	38.95	44.44	50.71	74.00	-23.29	Horizontal			
7386.000	36.34	10.75	38.00	41.24	50.33	74.00	-23.67	Horizontal			
9848.000	37.57	12.63	36.87	39.23	52.56	74.00	-21.44	Horizontal			
12243.770	38.75	14.36	38.55	38.92	53.48	74.00	-20.52	Horizontal			

Test mode:		802.11n(HT40)		Test channel:		Lowest		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3574.015	32.42	7.66	38.50	45.05	46.63	74.00	-27.37	Vertical			
4824.000	34.19	8.90	39.04	42.32	46.37	74.00	-27.63	Vertical			
6078.201	34.76	10.46	38.95	44.99	51.26	74.00	-22.74	Vertical			
7236.000	36.40	10.69	38.15	44.06	53.00	74.00	-21.00	Vertical			
9648.000	37.53	12.52	36.97	39.87	52.95	74.00	-21.05	Vertical			
12137.940	38.68	14.45	38.44	38.95	53.64	74.00	-20.36	Vertical			
3589.562	32.46	7.66	38.51	44.54	46.15	74.00	-27.85	Horizontal			
4824.000	34.19	8.90	39.04	41.74	45.79	74.00	-28.21	Horizontal			
5947.702	34.67	10.42	39.00	43.21	49.30	74.00	-24.70	Horizontal			
7236.000	36.40	10.69	38.15	41.13	50.07	74.00	-23.93	Horizontal			
9648.000	37.53	12.52	36.97	39.40	52.48	74.00	-21.52	Horizontal			
11723.670	38.33	14.26	38.03	38.56	53.12	74.00	-20.88	Horizontal			



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Test mode:		802.11n(HT40)		Test channel:		Middle		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3937.843	33.44	7.79	38.67	44.88	47.44	74.00	-26.56	Vertical			
4874.000	34.28	8.97	39.05	41.87	46.07	74.00	-27.93	Vertical			
6034.386	34.73	10.52	38.98	44.55	50.82	74.00	-23.18	Vertical			
7311.000	36.37	10.72	38.07	41.28	50.30	74.00	-23.70	Vertical			
9748.000	37.55	12.58	36.92	38.35	51.56	74.00	-22.44	Vertical			
11911.760	38.51	14.47	38.22	37.86	52.62	74.00	-21.38	Vertical			
3920.787	33.39	7.78	38.67	43.93	46.43	74.00	-27.57	Horizontal			
4874.000	34.28	8.97	39.05	41.87	46.07	74.00	-27.93	Horizontal			
6320.356	34.96	10.15	38.80	44.81	51.12	74.00	-22.88	Horizontal			
7311.000	36.37	10.72	38.07	40.95	49.97	74.00	-24.03	Horizontal			
9748.000	37.55	12.58	36.92	39.12	52.33	74.00	-21.67	Horizontal			
12015.620	38.61	14.55	38.32	38.02	52.86	74.00	-21.14	Horizontal			

Test mode:		802.11n(HT40)		Test channel:		Highest		Remark:		Peak	
Frequency (MHz)	Antenna Factor (dB/m)	Cable loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3641.878	32.62	7.68	38.54	43.50	45.26	74.00	-28.74	Vertical			
4924.000	34.37	9.04	39.07	43.10	47.44	74.00	-26.56	Vertical			
6166.787	34.84	10.34	38.89	44.53	50.82	74.00	-23.18	Vertical			
7386.000	36.34	10.75	38.00	41.60	50.69	74.00	-23.31	Vertical			
9848.000	37.57	12.63	36.87	38.69	52.02	74.00	-21.98	Vertical			
12261.500	38.76	14.34	38.57	38.22	52.75	74.00	-21.25	Vertical			
3831.060	33.15	7.75	38.62	43.56	45.84	74.00	-28.16	Horizontal			
4924.000	34.37	9.04	39.07	42.15	46.49	74.00	-27.51	Horizontal			
5939.103	34.66	10.39	39.01	43.98	50.02	74.00	-23.98	Horizontal			
7386.000	36.34	10.75	38.00	40.74	49.83	74.00	-24.17	Horizontal			
9848.000	37.57	12.63	36.87	38.32	51.65	74.00	-22.35	Horizontal			
12155.510	38.69	14.43	38.46	37.76	52.42	74.00	-21.58	Horizontal			



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Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 2) Scan from 9kHz to 25GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported .
- 3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

6.8 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10: 2013 Section 11.12		
Test Site:	Measurement Distance: 3m (fully Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m @3m)	Remark
	30MHz-88MHz	40.0	Quasi-peak Value
	88MHz-216MHz	43.5	Quasi-peak Value
	216MHz-960MHz	46.0	Quasi-peak Value
	960MHz-1GHz	54.0	Quasi-peak Value
	Above 1GHz	54.0	Average Value
		74.0	Peak Value
Test Setup:			

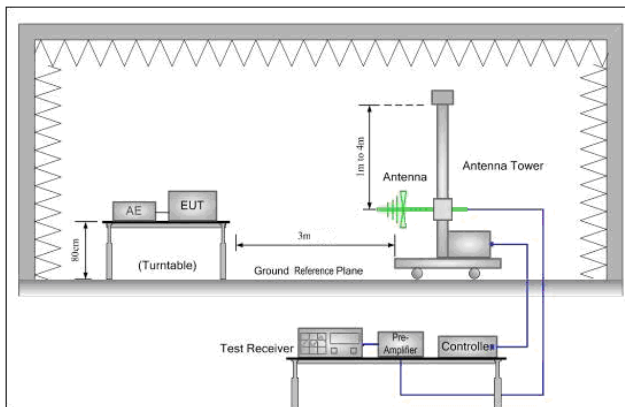


Figure 1. 30MHz to 1GHz

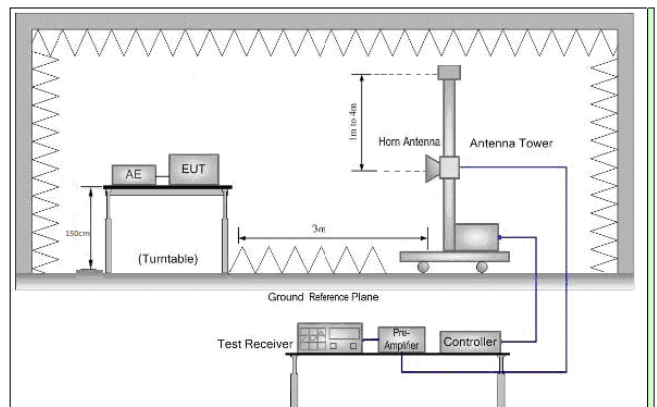


Figure 2. Above 1 GHz



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Test Procedure:	<ul style="list-style-type: none"> a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. c. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel h. Test the EUT in the lowest channel , the Highest channel i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. j. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Transmitting mode.
Final Test Mode:	<p>Pretest the EUT at Transmitting mode, found the Transmitting mode which it is worse case</p> <p>Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40)</p> <p>Only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



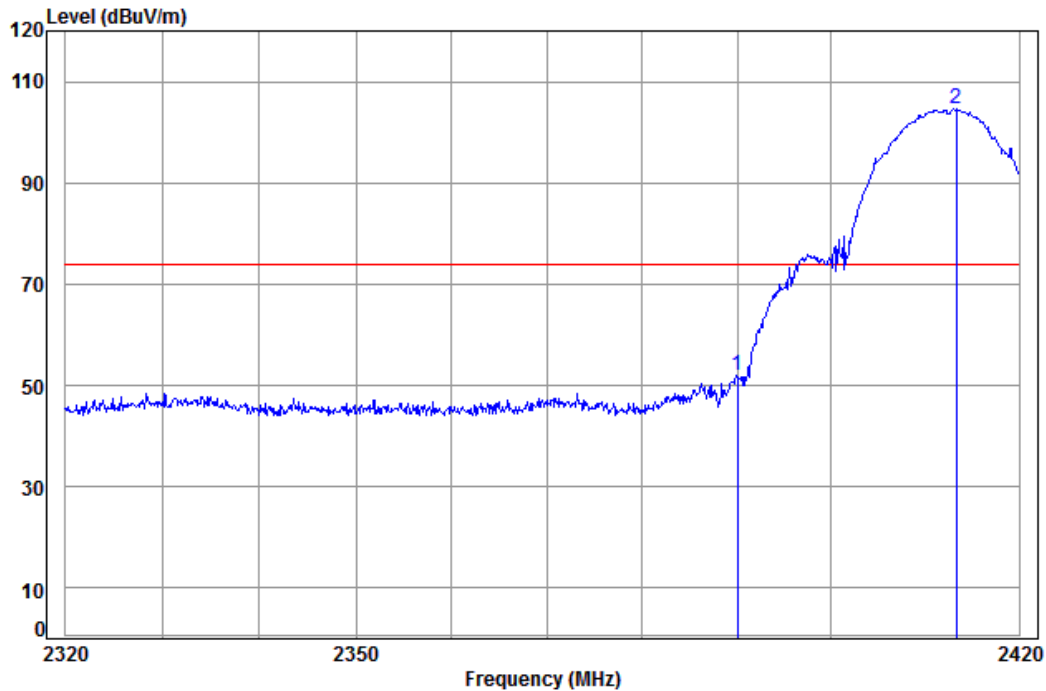
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Test plot as follows:

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

Job No: : 7389CR

Mode: : 2412 Band edge

: WIFI-B

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	5.34	29.08	38.14	55.82	52.10	74.00	-21.90	
2 pp	2413.269	5.36	29.15	38.15	108.32	104.68	74.00	30.68	

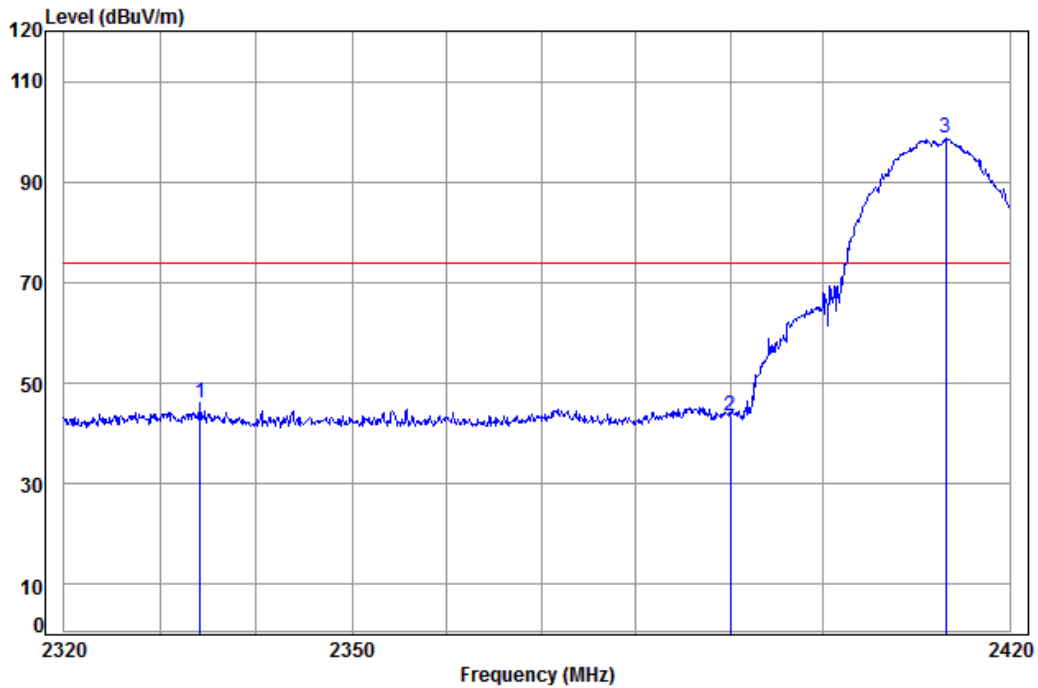


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Worse case mode:	802.11b	Test channel:	Lowest	Remark:	Peak	Horizontal
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Condition: 3m Horizontal

Job No: : 7389CR

Mode: : 2412 Band edge

: WIFI-B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2334.141	5.29	28.91	38.14	49.93	45.99	74.00	-28.01	
2	2390.000	5.34	29.08	38.14	47.18	43.46	74.00	-30.54	
3 pp	2413.167	5.36	29.15	38.15	102.33	98.69	74.00	24.69	

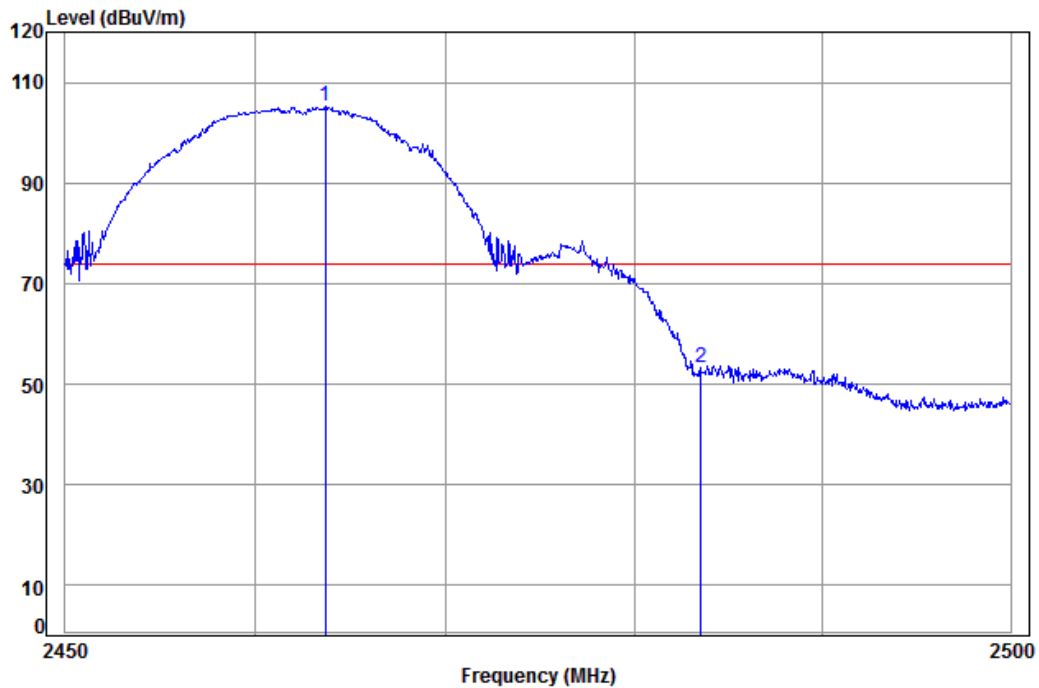


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Worse case mode:	802.11b	Test channel:	Highest	Remark:	Peak	Vertical
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Condition: 3m Vertical

Job No: : 7389CR

Mode: : 2462 Band edge

: WIFI-B

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2463.649	5.39	29.29	38.15	108.63	105.16	74.00	31.16
2	2483.500	5.41	29.35	38.15	56.53	53.14	74.00	-20.86

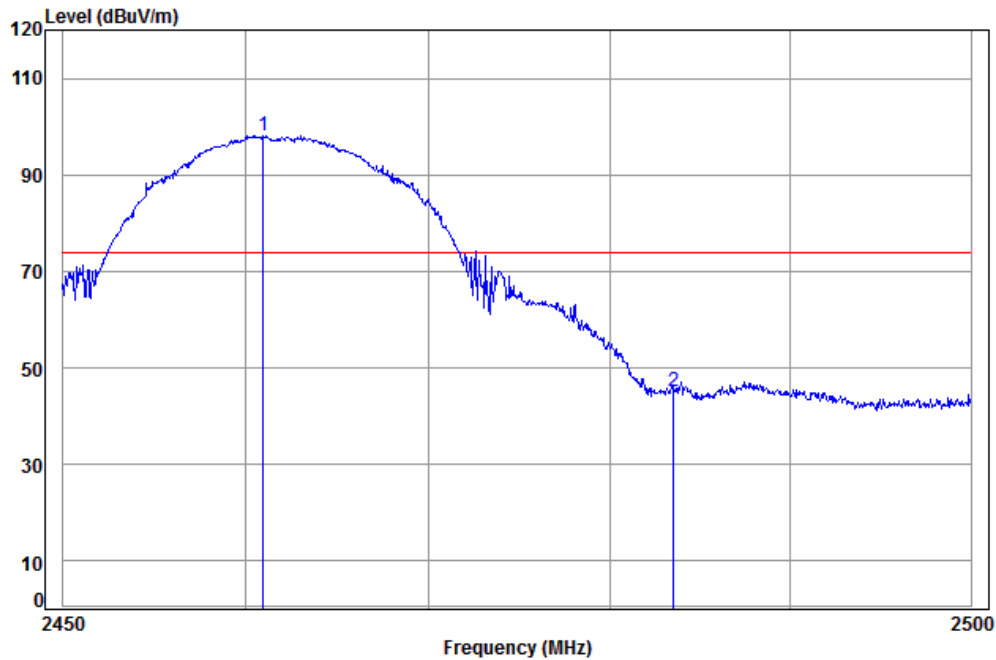


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Worse case mode:	802.11b	Test channel:	Highest	Remark:	Peak	Horizontal
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Condition: 3m HORIZONTAL

Job No: : 7389CR

Mode: : 2462 Band edge

: WIFI-B

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp 2460.914	5.39	29.29	38.15	101.51	98.04	74.00	24.04
2	2483.500	5.41	29.35	38.15	48.43	45.04	74.00	-28.96

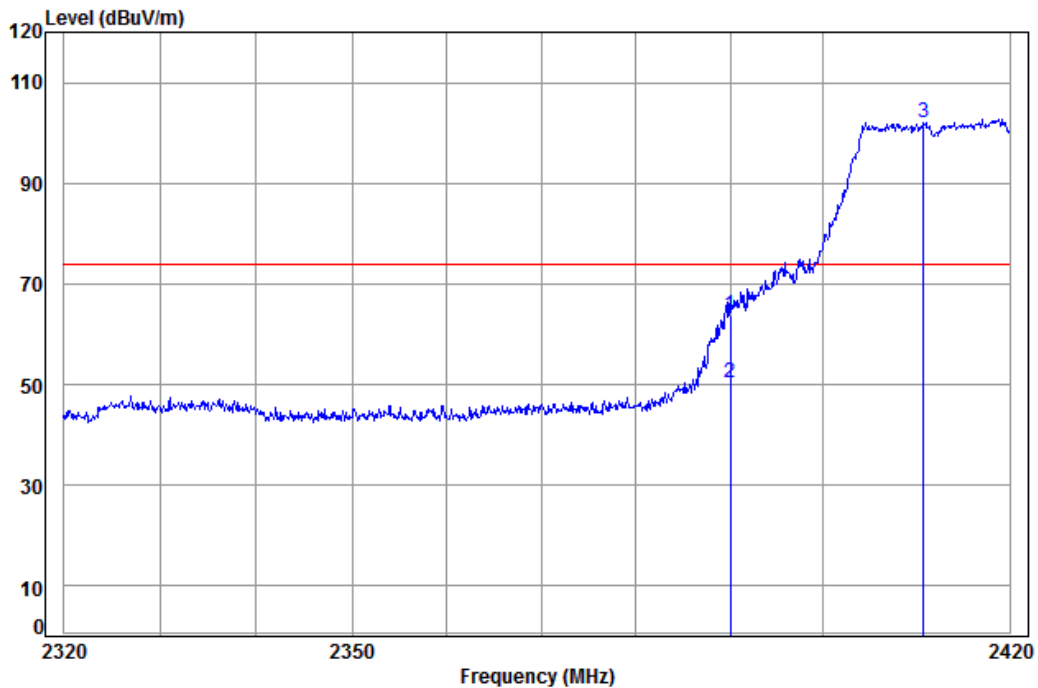


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Worse case mode:	802.11g	Test channel:	Lowest	Remark:	Peak	Vertical
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Condition: 3m Vertical

Job No: : 7389CR

Mode: : 2412 Band edge

: WIFI-G

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	5.34	29.08	38.14	67.47	63.75	74.00	-10.25	
2 av	2390.000	5.34	29.08	38.14	54.11	50.39	54.00	-3.61	Average
3 pp	2410.724	5.35	29.14	38.15	105.76	102.10	74.00	28.10	

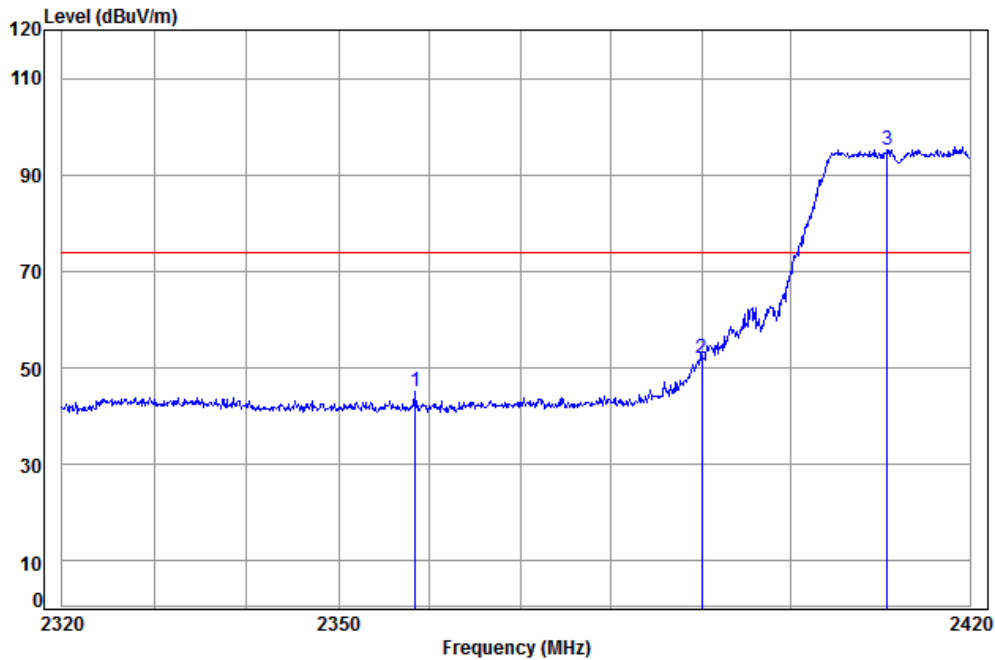


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Worse case mode:	802.11g	Test channel:	Lowest	Remark:	Peak	Horizontal
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Condition: 3m HORIZONTAL
Job No: : 7389CR
Mode: : 2412 Band edge
: WIFI-G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2358.399	5.31	28.98	38.14	48.90	45.05	74.00	-28.95	
2	2390.000	5.34	29.08	38.14	55.73	52.01	74.00	-21.99	
3 pp	2410.724	5.35	29.14	38.15	98.93	95.27	74.00	21.27	

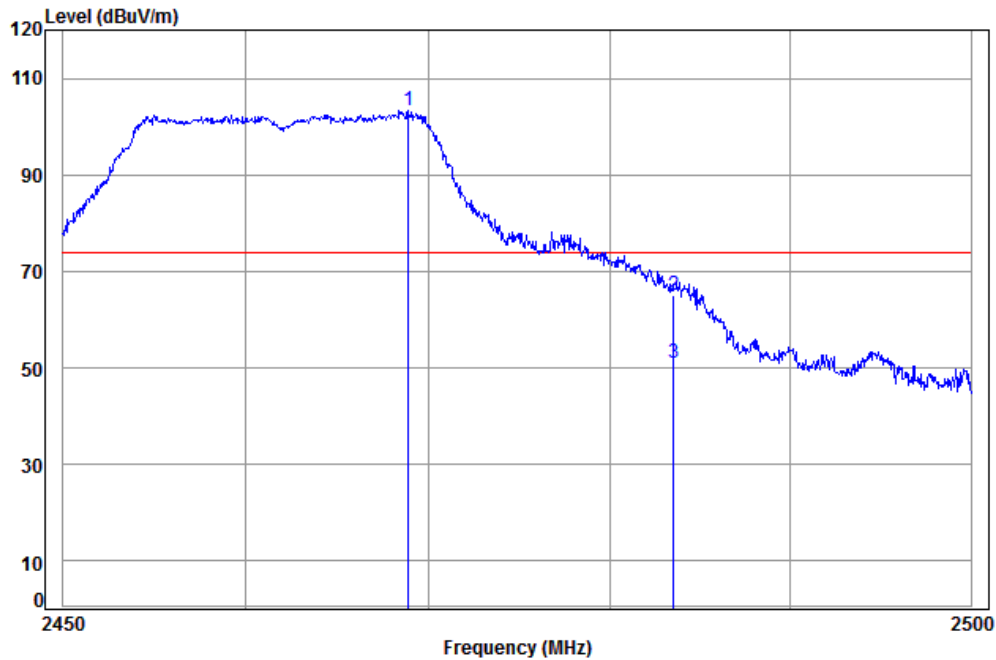


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Worse case mode:	802.11g	Test channel:	Highest	Remark:	Peak	Vertical
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Condition: 3m VERTICAL

Job No: : 7389CR

Mode: : 2462 Band edge

: WIFI-G

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp 2468.881	5.40	29.31	38.15	106.87	103.43	74.00	29.43	
2 2483.500	5.41	29.35	38.15	68.59	65.20	74.00	-8.80	
3 av 2483.500	5.41	29.35	38.15	54.36	50.97	54.00	-3.03	Average

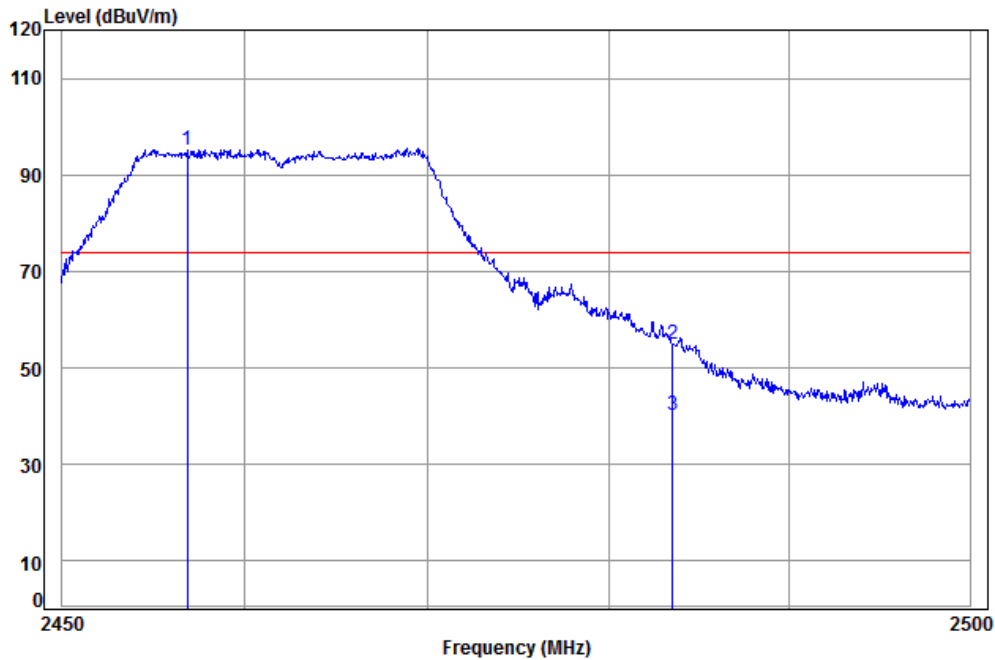


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Worse case mode:	802.11g	Test channel:	Highest	Remark:	Peak	Horizontal
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Condition: 3m Horizontal
Job No: : 7389CR
Mode: : 2462 Band edge
: WIFI-G

		Cable	Ant	Preamp	Read	Limit	Over	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp 2456.840	5.39	29.28	38.15	98.78	95.30	74.00	21.30	
2 2483.500	5.41	29.35	38.15	58.36	54.97	74.00	-19.03	
3 av 2483.500	5.41	29.35	38.15	43.71	40.32	54.00	-13.68	Average

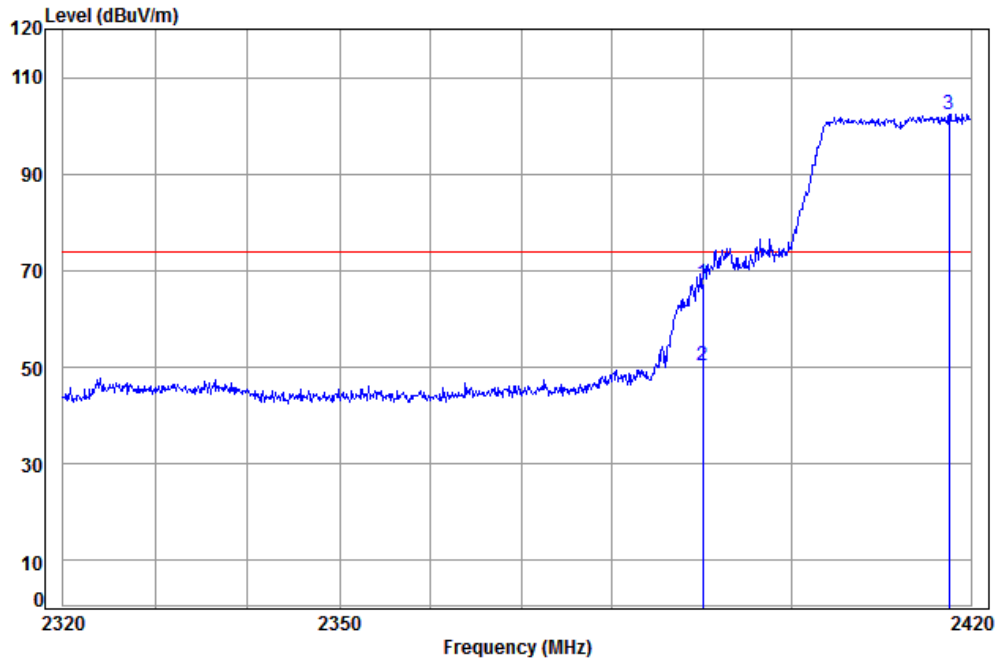


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Worse case mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Peak	Vertical
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Condition: 3m VERTICAL

Job No: : 7389CR

Mode: : 2412 Band edge

: WIFI-N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	5.34	29.08	38.14	70.99	67.27	74.00	-6.73	
2	av 2390.000	5.34	29.08	38.14	54.03	50.31	54.00	-3.69	Average
3	pp 2417.550	5.36	29.16	38.15	106.01	102.38	74.00	28.38	

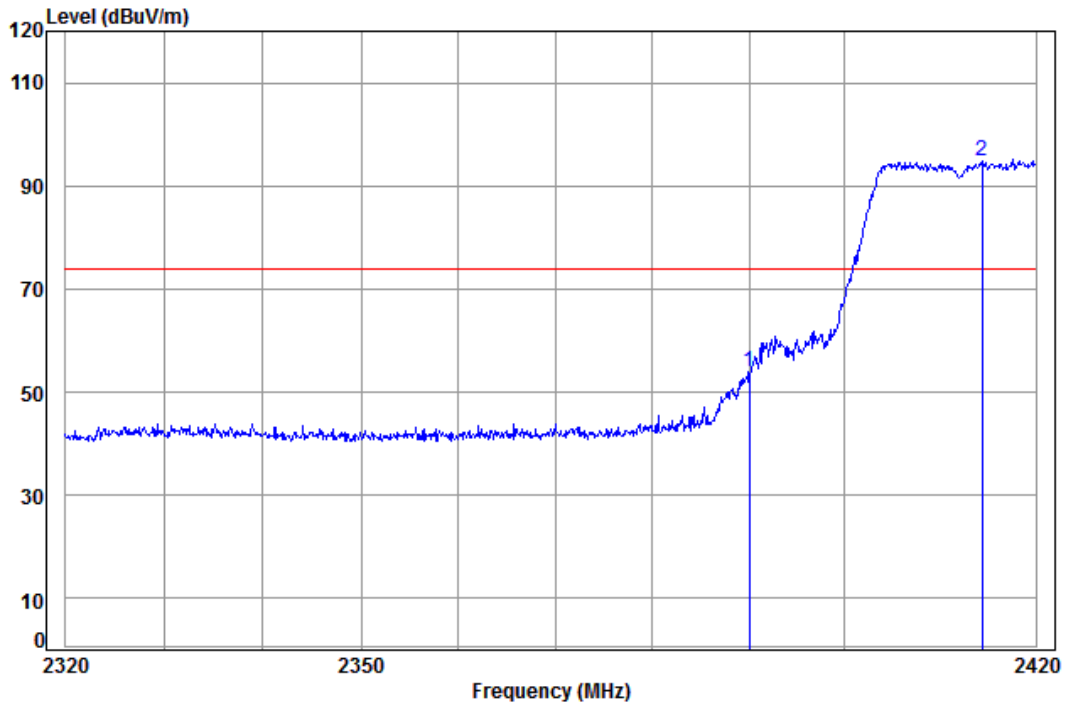


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Worse case mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Peak	Horizontal
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Condition: 3m HORIZONTAL

Job No: : 7389CR

Mode: : 2412 Band edge

: WIFI-N20

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	5.34	29.08	38.14	57.63	53.91	74.00	-20.09
2 pp	2414.390	5.36	29.15	38.15	98.31	94.67	74.00	20.67

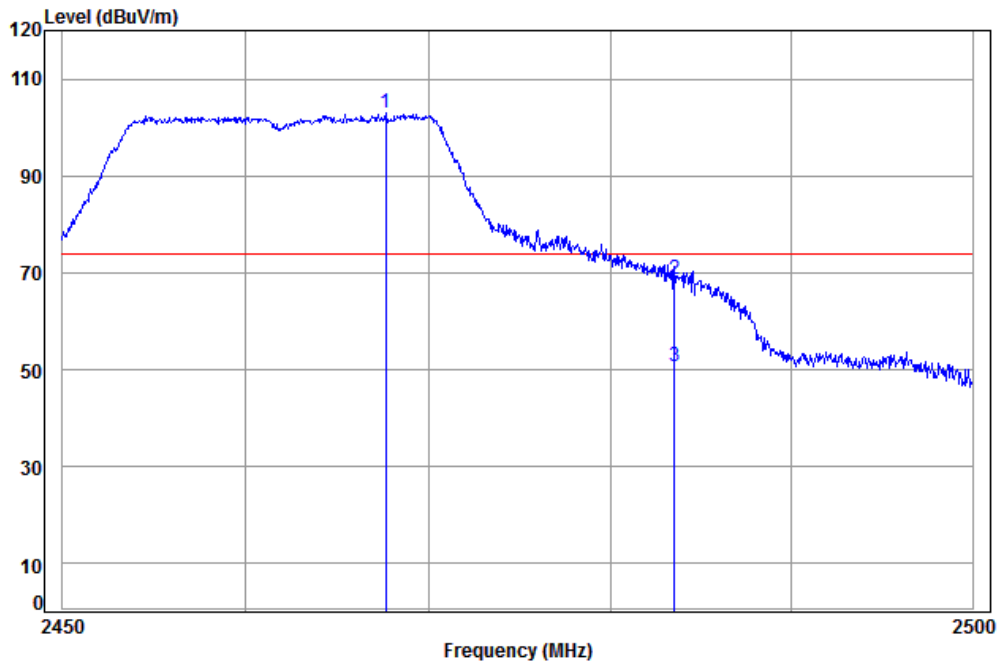


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Worse case mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Peak	Vertical
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Condition: 3m Vertical

Job No: : 7389CR

Mode: : 2462 Band edge

: WIFI-N20

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp 2467.635	5.40	29.31	38.15	106.32	102.88	74.00	28.88
2	2483.500	5.41	29.35	38.15	72.15	68.76	74.00	-5.24
3	av 2483.500	5.41	29.35	38.15	54.06	50.67	74.00	-23.33 Average

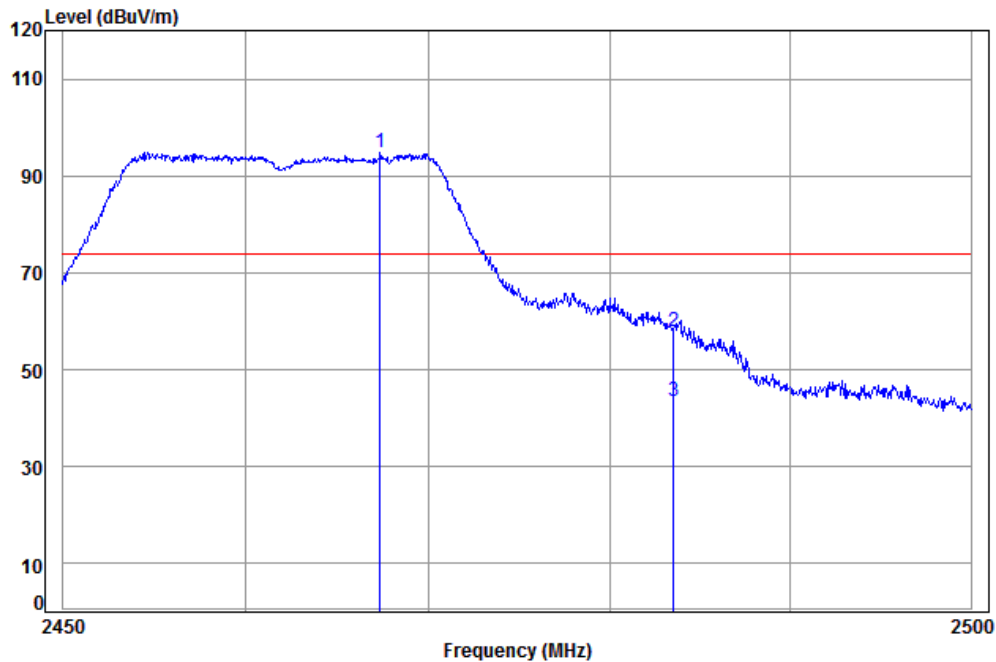


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Worse case mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Peak	Horizontal
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Condition: 3m HORIZONTAL
Job No: : 7389CR
Mode: : 2462 Band edge
: WIFI-N20

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp 2467.335	5.40	29.31	38.15	98.23	94.79	74.00	20.79
2	2483.500	5.41	29.35	38.15	61.34	57.95	74.00	-16.05
3	av 2483.500	5.41	29.35	38.15	46.83	43.44	54.00	-10.56 Average

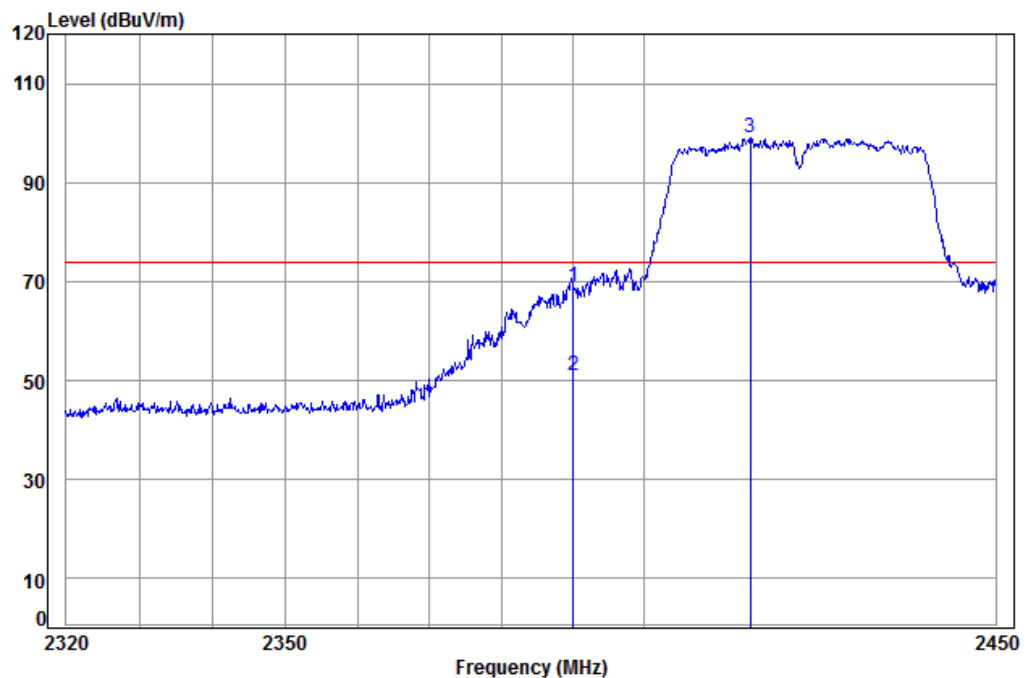


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Worse case mode:	802.11n(HT40)	Test channel:	Lowest	Remark:	Peak	Vertical
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Condition: 3m VERTICAL

Job No: : 7389CR

Mode: : 2412 Band edge

: WIFI-N40

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	5.34	29.08	38.14	72.66	68.94	74.00	-5.06
2 av	2390.000	5.34	29.08	38.14	54.65	50.93	54.00	-3.07 Average
3 pp	2414.989	5.36	29.15	38.15	102.62	98.98	74.00	24.98

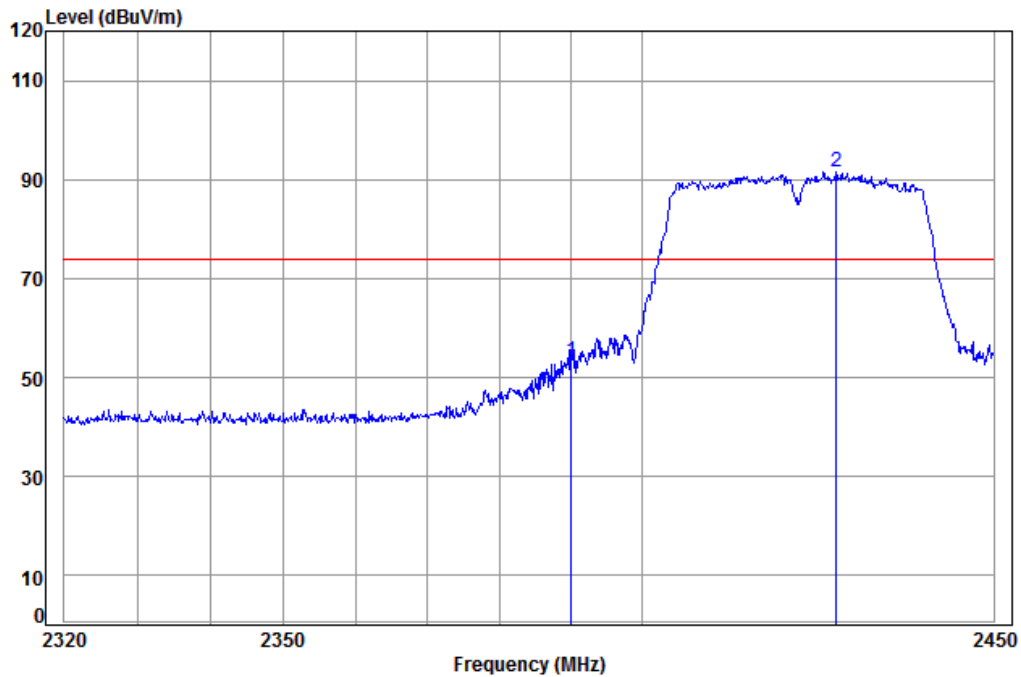


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Worse case mode:	802.11n(HT40)	Test channel:	Lowest	Remark:	Peak	Horizontal
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Condition: 3m Horizontal

Job No: : 7389CR

Mode: : 2412 Band edge

: WIFI-N40

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	5.34	29.08	38.14	56.91	53.19	74.00	-20.81
2	pp 2427.529	5.37	29.19	38.15	95.19	91.60	74.00	17.60

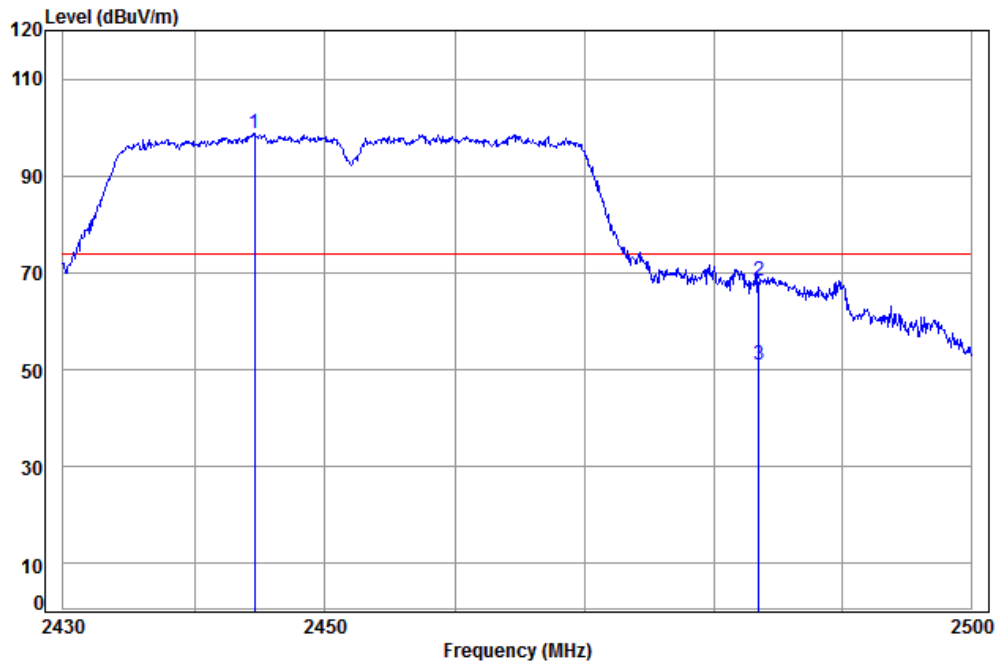


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Worse case mode:	802.11n(HT40)	Test channel:	Highest	Remark:	Peak	Vertical
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Condition: 3m Vertical

Job No: : 7389CR

Mode: : 2462 Band edge

: WIFI-N40

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp 2444.605	5.38	29.24	38.15	102.37	98.84	74.00	24.84
2	2483.500	5.41	29.35	38.15	71.75	68.36	74.00	-5.64
3	av 2483.500	5.41	29.35	38.15	54.28	50.89	54.00	-3.11 Average

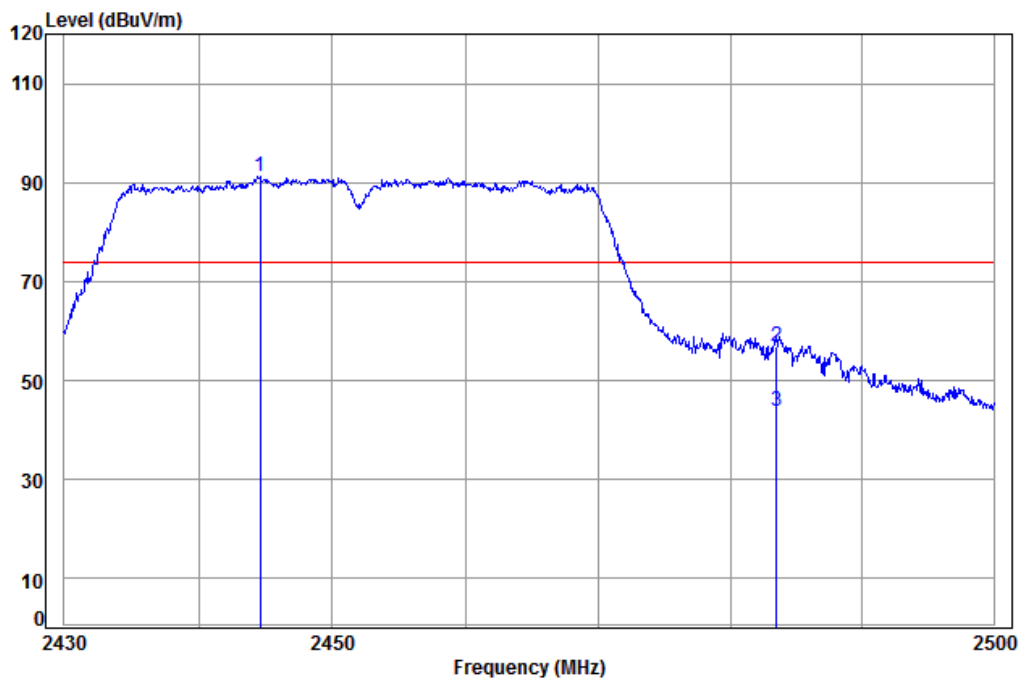


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Worse case mode:	802.11n(HT40)	Test channel:	Highest	Remark:	Peak	Horizontal
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Condition: 3m Horizontal
Job No: : 7389CR
Mode: : 2462 Band edge
: WIFI-N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2444.605	5.38	29.24	38.15	94.89	91.36	74.00	17.36	
2	2483.500	5.41	29.35	38.15	60.13	56.74	74.00	-17.26	
3 av	2483.500	5.41	29.35	38.15	47.19	43.80	54.00	-10.20	Average

Note:

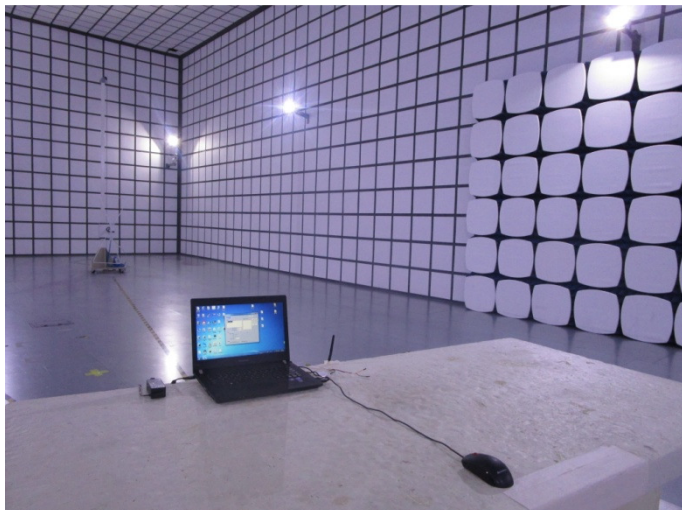
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

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

7 Photographs - EUT Test Setup

Test Model No.: LM811-04XX

7.1 Radiated Emission



7.2 Radiated Spurious Emission



8 Photographs - EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1608007389CR.