



FCC TEST REPORT

Application No: AR/2020/A0003
Applicant: Xiaomi Communications Co., Ltd.
Address of Applicant: #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
Manufacturer: Xiaomi Communications Co., Ltd.
Address of Manufacturer: #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085
EUT Description: Mobile Phone
Model No.: M2007J22R
Trade Mark: Redmi
FCC ID: 2AFZZJ22G
Standards: 47 CFR FCC Part 2, Subpart J
47 CFR Part 15, Subpart C
Test Method: KDB558074 D01 15.247 Meas Guidance v05r02
ANSI C63.10 (2013)
Date of Receipt: 2020/9/11
Date of Test: 2020/9/11 to 2020/9/24(for original report AR/2020/8000502-01)
2020/10/25 to 2020/11/6 (for new report AR/2020/A000302-01)
Date of Issue: 2021/4/20

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

Authorized Signature:

Derek Yang
Wireless Laboratory Manager



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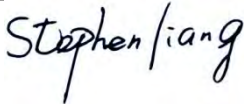
SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch (Wired) Wireless Laboratory

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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/11/6		Original
02		2021/4/20		1.Add test site Information 2.Modify data conversion error of antenna height 3.Update equipment list

Authorized for issue by:		
Prepared By		 (Stephen liang) / Engineer
Checked By		 (David Chen) /Reviewer





2 Test Summary

Test Item	Test Requirement	Test method	Test Result	Result	Test Lab*
AC Power Line Conducted Emission	15.207	ANSI C63.10 2013	Clause 4.2	PASS	B
Duty Cycle	--	--	Clause 4.3	PASS	A
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2013	Clause 4.4	PASS	A
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2013	Clause 4.5	PASS	A
Power Spectral Density	15.247 (e)	ANSI C63.10 2013	Clause 4.6	PASS	A
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.7	PASS	A
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.8	PASS	A
Radiated Spurious Emissions	15.247(d);15.205/15.209	ANSI C63.10 2013	Clause 4.9	PASS	B
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d);15.205/15.209	ANSI C63.10 2013	Clause 4.10	PASS	B

Remark:

This test report (Report No.: AR/2020/A000302-01) is base on the original test report (Report No.: AR/2020/8000502-01).

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report only radiated spurious emissions were performed based on the worst case of the original report with report number AR/2020/8000502-01 and other test data in this report are base on the previous report with report number AR/2020/8000502-01.

All test were performed by Lab A and B.

Parts of test items above were subcontracted to Lab B.

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

Lab B SGS-CSTC STANDARDS TECHNICAL SERVICES (XI'AN) CO., LTD.



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3 General Information

3.1 Client Information

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Manufacturer:	Xiaomi Communications Co., Ltd.
Address of Manufacturer:	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 100085

3.2 Test Location

Lab A:

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
Post code:	518057
Test engineer:	Dee Zheng, Mike Hu

Lab B:

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China
Post code:	710086
Test engineer:	Ben Huang, Leah Chen



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3.4 Test Facility

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

Lab A:

• 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 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

A2LA (Certificate No. 4854.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

• FCC –Designation Number: CN1271



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3.5 General Description of EUT

EUT Description::	Mobile Phone
Model No.:	M2007J22R
Trade Mark:	Redmi
Hardware Version:	P2
Software Version:	MIUI12
IEEE 802.11 WLAN Mode Supported	☒ 802.11B (20 MHz channel bandwidth), ☒ 802.11G (20 MHz channel bandwidth) ☒ 802.11N (20 MHz channel bandwidth), ☒ 802.11N (40 MHz channel bandwidth)
Operation Frequency:	2400 MHz -2483.5MHz $f_c = 2407 \text{ MHz} + N * 5 \text{ MHz}$, where: - f_c = "Operating Frequency" in MHz, - N = "Channel Number" with the range from 1 to 11 for the 20 MHz channel bandwidth, or 3 to 9 for the 40 MHz channel bandwidth.
Type of Modulation:	IEEE for 802.11B: DSSS IEEE for 802.11G : OFDM IEEE for 802.11N(HT20) : OFDM IEEE for 802.11N(HT40) : OFDM
Sample Type:	☒ Portable Device, ☐ Module
Antenna Type:	PIFA Antenna
Antenna Ports	☒ Ant 1, ☐ Ant 2, ☐ Ant 3
Smart System	☒ SISO (for 802.11B/G/N), ☐ MIMO (for 802.11N): 2 Tx & 2 Rx, ☐ Diversity (for 802.11B/G) : Tx & Rx
Antenna Gain:	0dBi
Power Supply	☒ AC/DC Adapter; ☐ Battery ☐ PoE; ☐ Other:

Operation Frequency of each 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 of each channel (802.11N HT40)							
Channel	Frequency	Channel	Frequency	Channel	Frequency		
3	2422MHz	6	2437MHz	9	2452MHz		
4	2427MHz	7	2442MHz				
5	2432MHz	8	2447MHz				

Remark:



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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:

Channel	Frequency for 802.11B/G/N (HT20)	Frequency for 802.11N (HT40)
The Lowest channel	2412MHz	2422MHz
The Middle channel	2437MHz	2437MHz
The Highest channel	2462MHz	2452MHz

3.6 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	50 % RH
Atmospheric Pressure:	101.30 KPa
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

3.7 Description of Support Units

The EUT has been tested independent unit.



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4 Test results and Measurement Data

4.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.	



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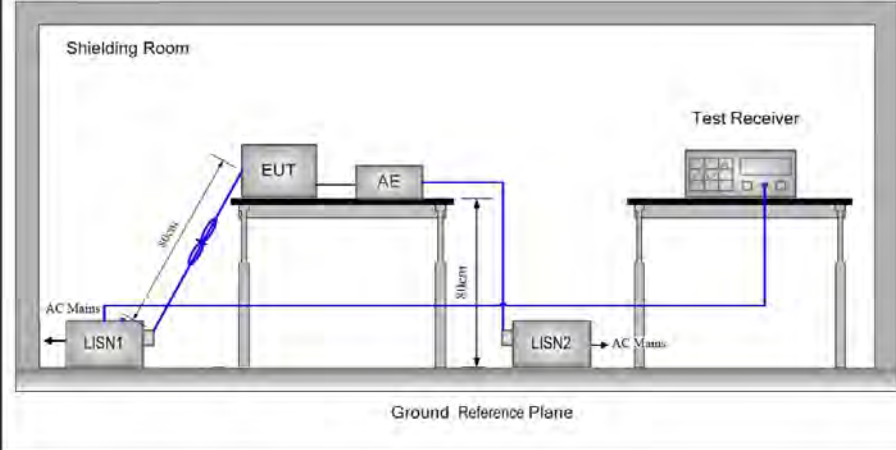
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4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		



Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Charge + Transmitting mode.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate of 802.11B at lowest channel is the worst case. Charge + Transmitting mode. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass



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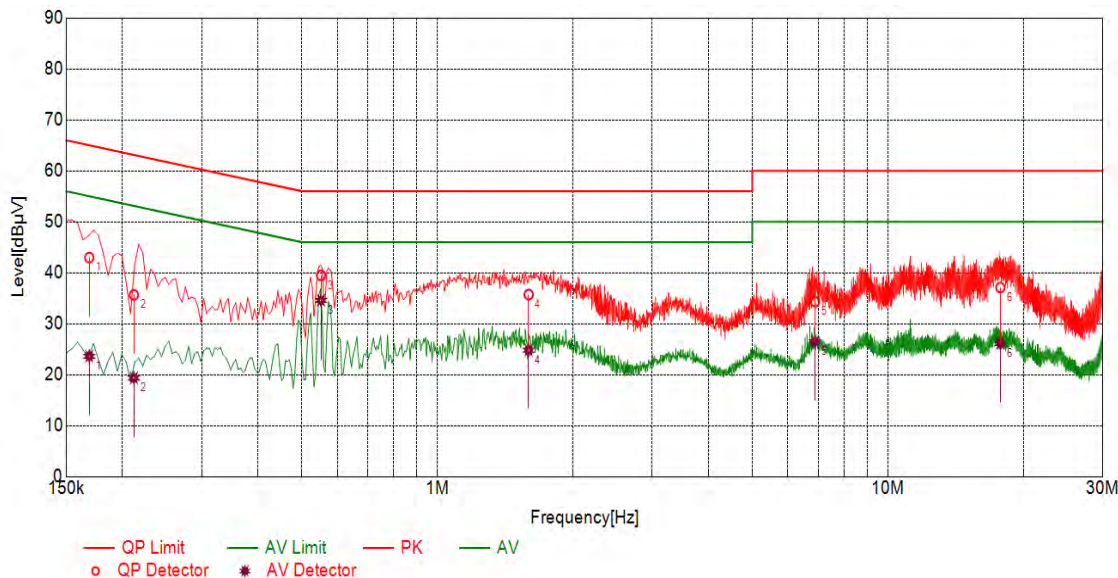


Measurement Data

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:

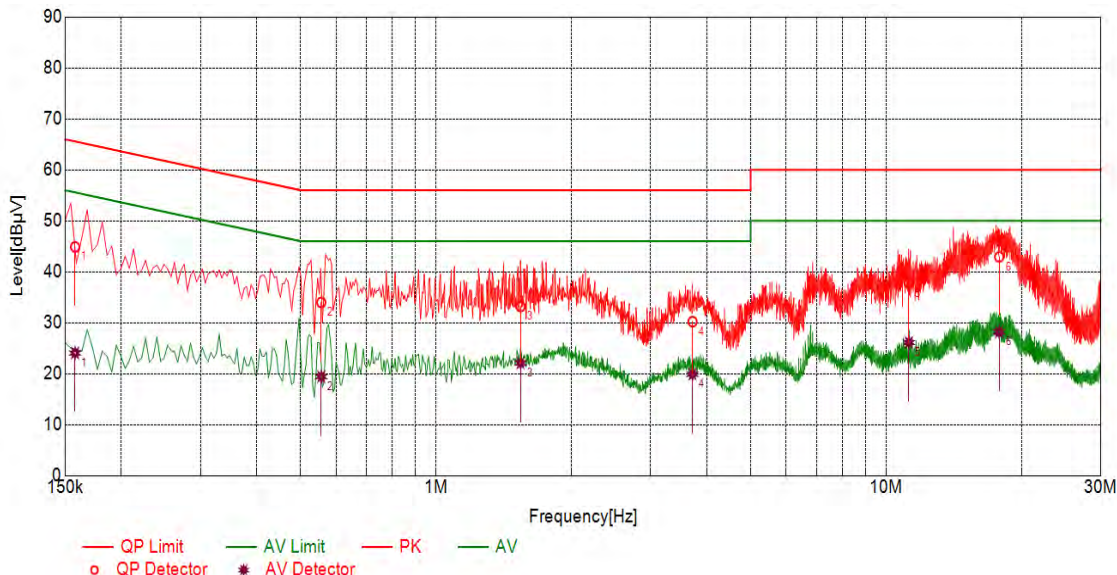


Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Type
1	0.1688	10.10	42.99	65.02	22.03	23.61	55.02	31.41	L
2	0.2121	10.10	35.65	63.12	27.47	19.36	53.12	33.76	L
3	0.5519	10.10	39.47	56.00	16.53	34.58	46.00	11.42	L
4	1.5950	10.10	35.72	56.00	20.28	24.82	46.00	21.18	L
5	6.8922	10.10	34.38	60.00	25.62	26.47	50.00	23.53	L
6	17.7654	10.11	37.10	60.00	22.90	26.10	50.00	23.90	L



Neutral Line:



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Type
1	0.1579	10.10	44.89	65.57	20.68	24.05	55.57	31.52	N
2	0.5564	10.10	33.99	56.00	22.01	19.41	46.00	26.59	N
3	1.5421	10.10	33.21	56.00	22.79	22.10	46.00	23.90	N
4	3.7153	10.10	30.22	56.00	25.78	19.89	46.00	26.11	N
5	11.2376	10.10	37.74	60.00	22.26	26.13	50.00	23.87	N
6	17.8275	10.11	42.92	60.00	17.08	28.19	50.00	21.81	N

Remarks:

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



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4.3 Duty Cycle

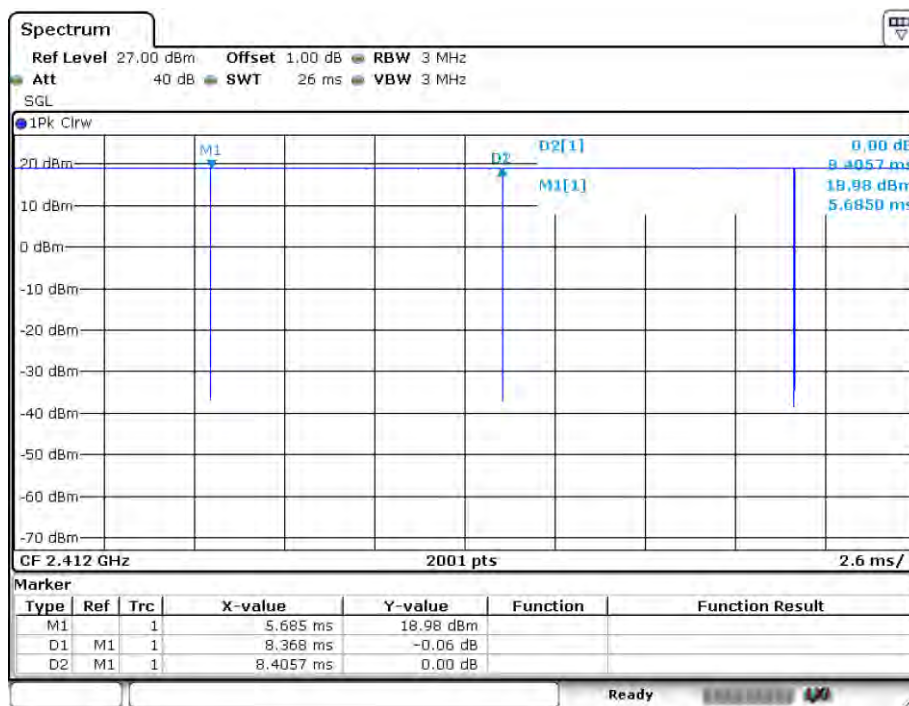
4.3.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
11B	Ant 1: CH1,CH6,CH11	99.55
11G	Ant 1: CH1,CH6,CH11	96.77
11N20	Ant 1: CH1,CH6,CH11	96.97
11N40	Ant 1: CH3,CH6,CH9	94.87

4.3.1 Test Plots

4.3.1.1 ANT1

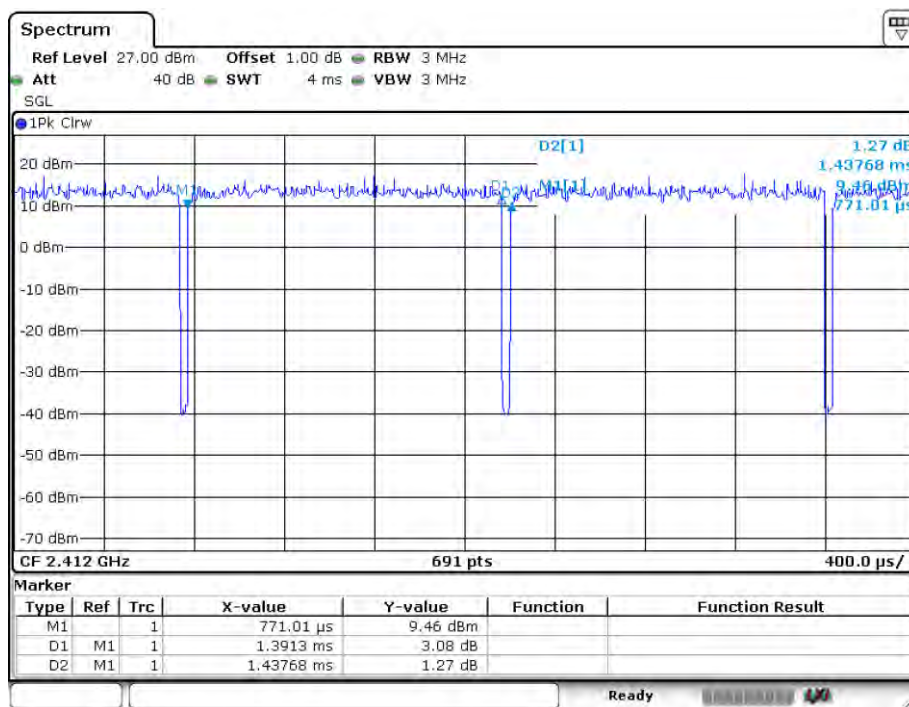
4.3.1.1.1 11B



Date: 18.SEP.2020 21:11:49

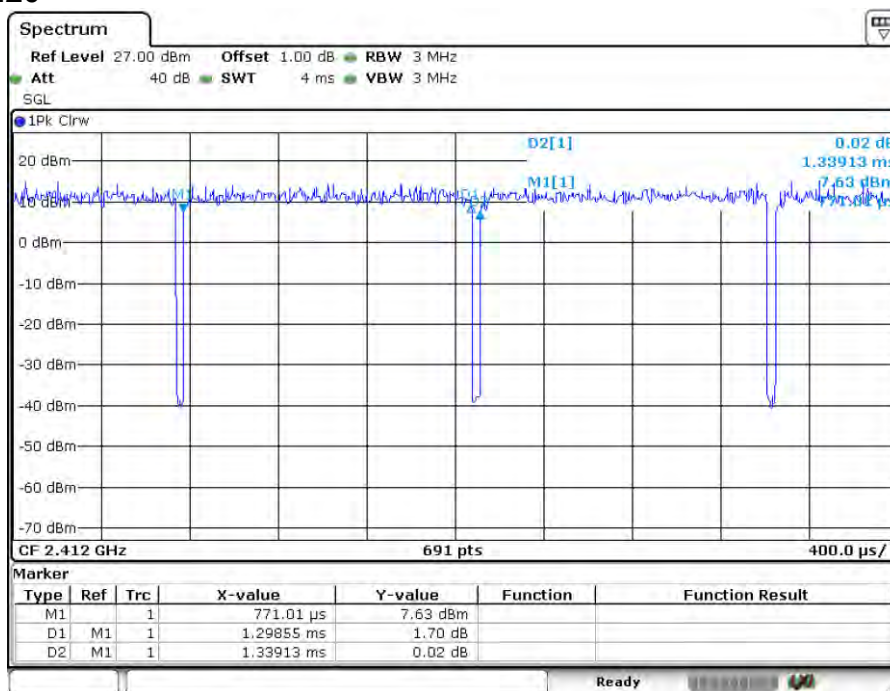


4.3.1.1.2 11G



Date: 18.SEP.2020 21:10:17

4.3.1.1.3 11N20



Date: 18.SEP.2020 21:09:50

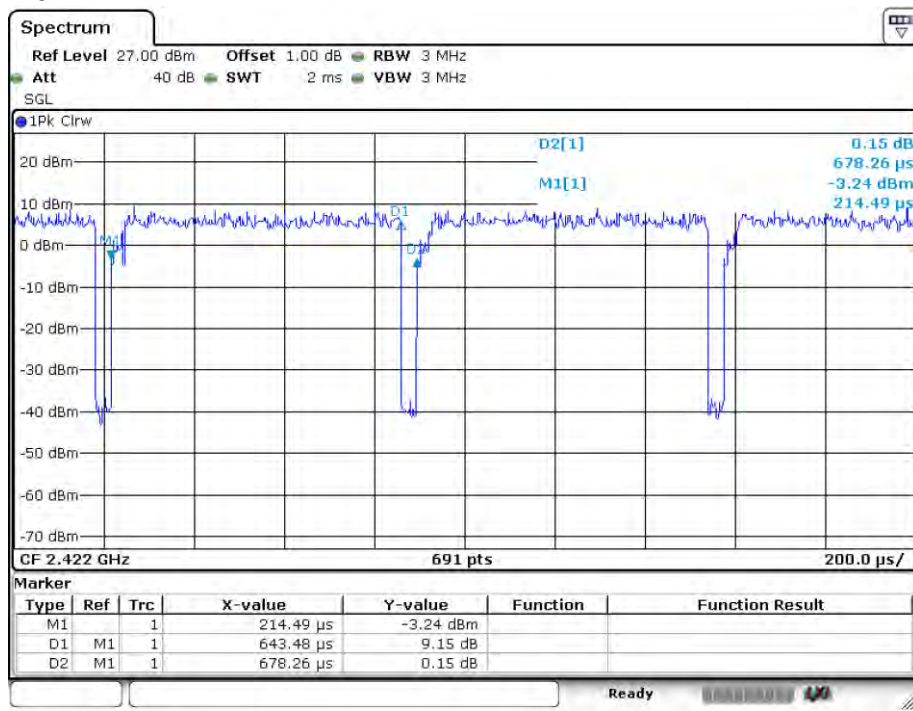


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4.3.1.1.4 11N40



Date: 18.SEP.2020 21:09:12

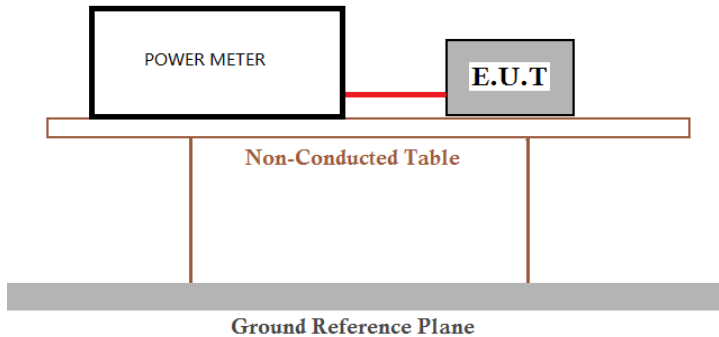


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4.4 Conducted Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10 :2013 Section 11.9.1.3
Test Setup:	
Test Instruments:	Refer to section 6 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





4.4.1 Test Results

Mode	Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result
802.11B	Lowest	18.36	30.00	Pass
	Middle	19.15	30.00	Pass
	Highest	18.78	30.00	Pass
802.11G	Lowest	14.56	30.00	Pass
	Middle	15.18	30.00	Pass
	Highest	14.94	30.00	Pass
802.11N20	Lowest	12.44	30.00	Pass
	Middle	13.13	30.00	Pass
	Highest	12.84	30.00	Pass
802.11N40	Lowest	10.91	30.00	Pass
	Middle	11.13	30.00	Pass
	Highest	11.17	30.00	Pass

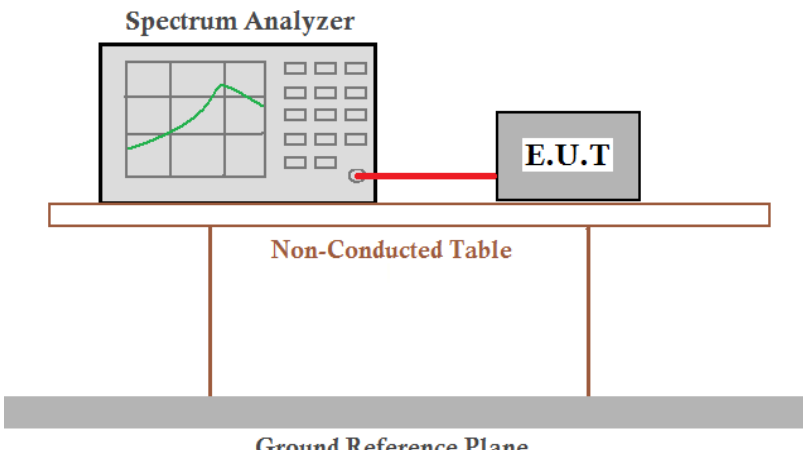


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4.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013 Section 11.8.1 Option 1
Test Setup:	
Instruments Used:	Refer to section 6 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

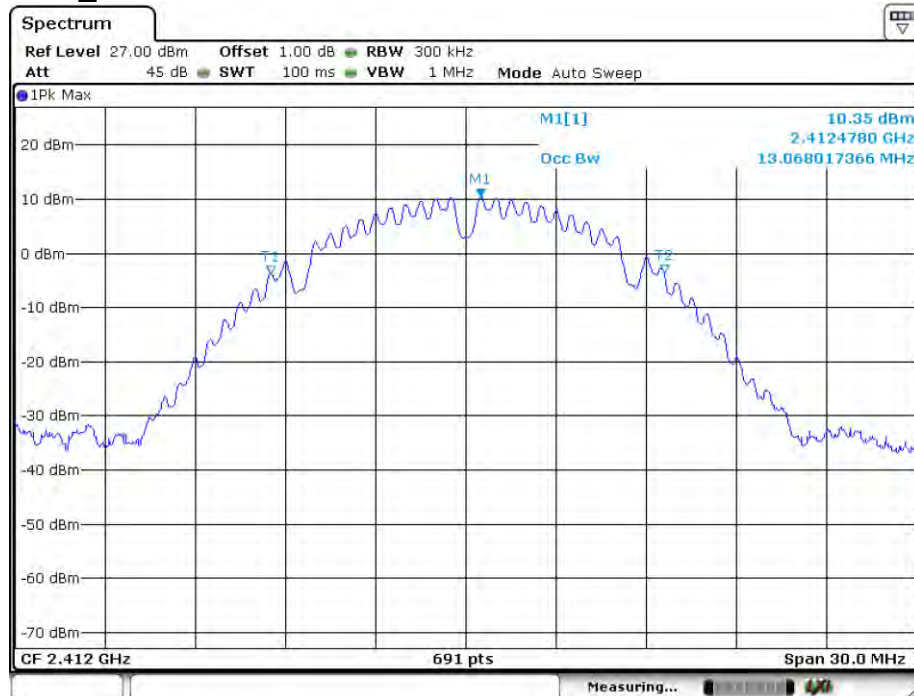
4.5.1 Test Results

Mode	Test Channel	Occupied Bandwidth (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
802.11B	Lowest	13.07	9.03	≥500	Pass
	Middle	13.20	9.03	≥500	Pass
	Highest	13.11	9.03	≥500	Pass
802.11G	Lowest	16.80	16.02	≥500	Pass
	Middle	16.85	16.28	≥500	Pass
	Highest	16.89	16.06	≥500	Pass
802.11N20	Lowest	17.80	17.28	≥500	Pass
	Middle	17.80	17.28	≥500	Pass
	Highest	17.76	17.15	≥500	Pass
802.11N40	Lowest	36.12	35.27	≥500	Pass
	Middle	36.21	35.10	≥500	Pass
	Highest	36.21	35.69	≥500	Pass

4.5.2 Test plots

4.5.2.1 ANT1

4.5.2.1.1 802.11B_Lowest Channel



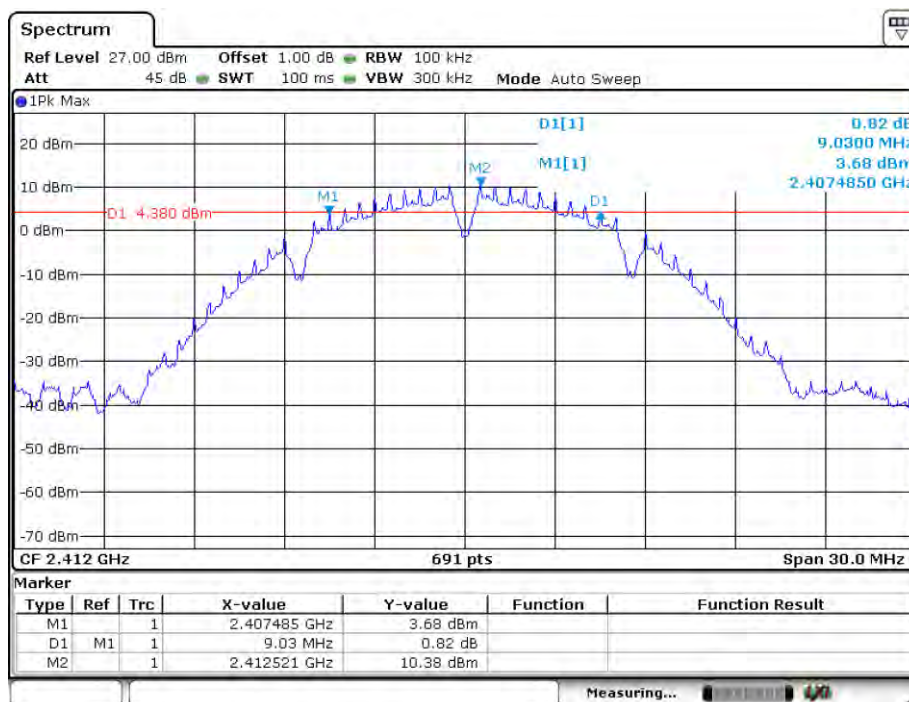
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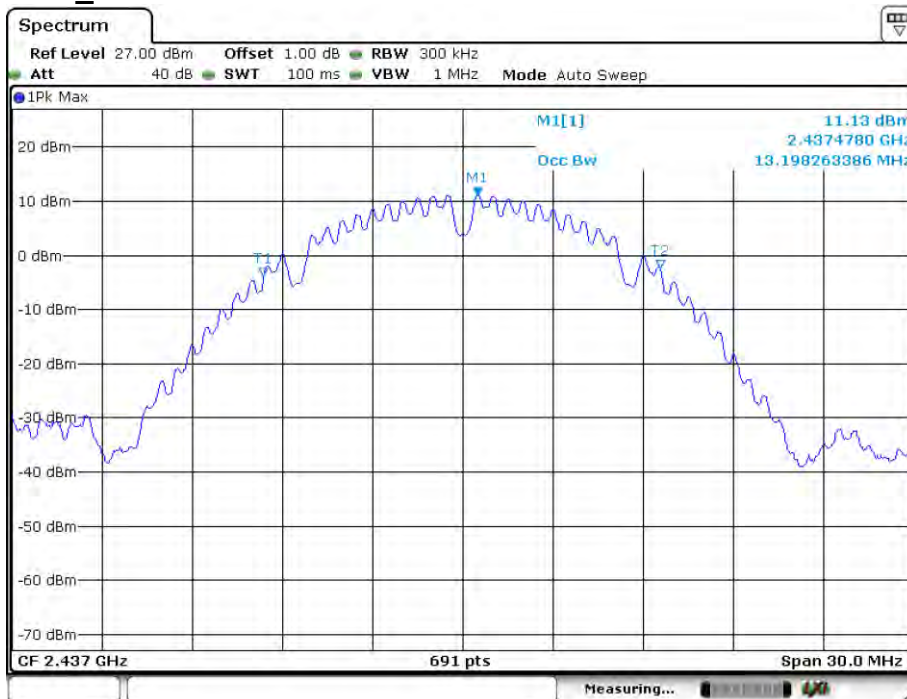
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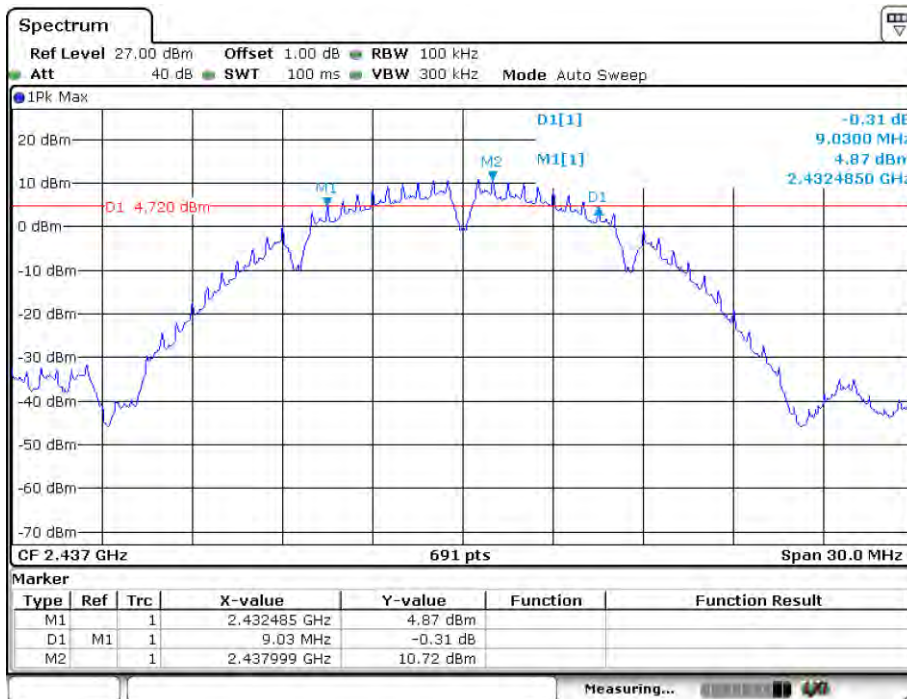
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4.5.2.1.2 802.11B_ Middle Channel



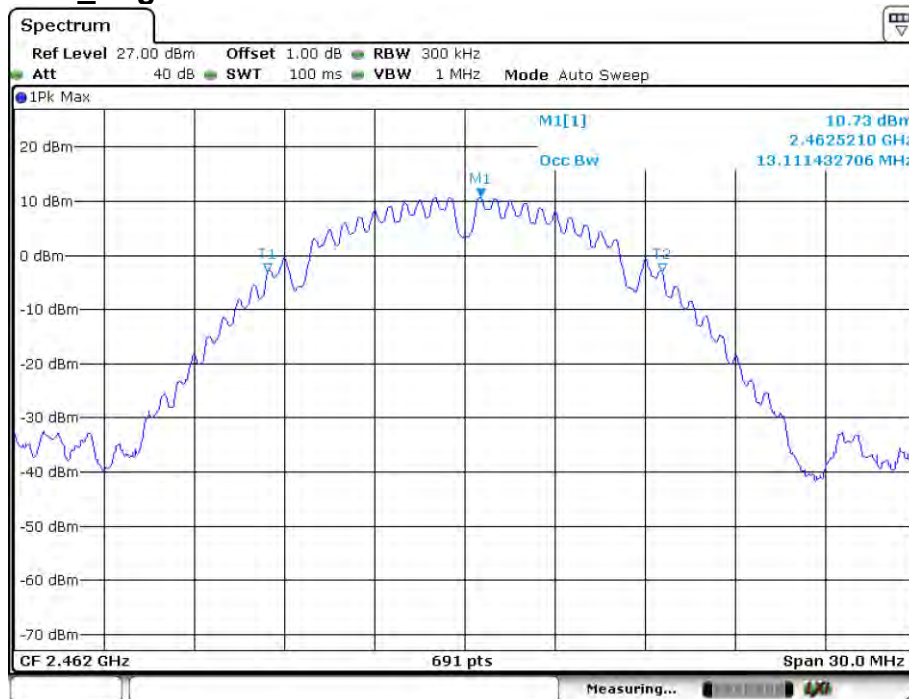
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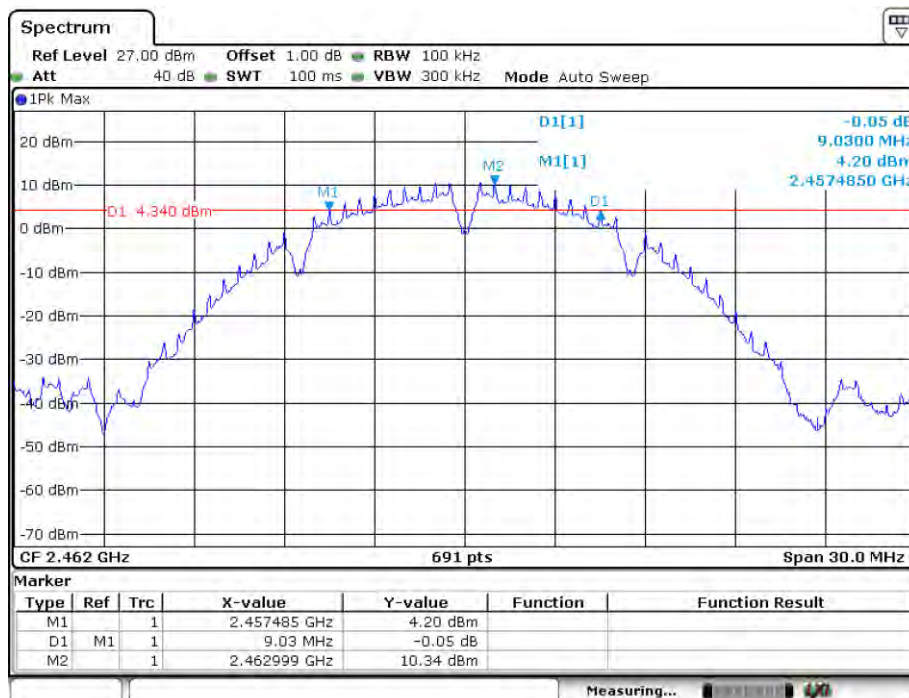
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4.5.2.1.3 802.11B_ Highest Channel



Date: 18.SEP.2020 20:33:55



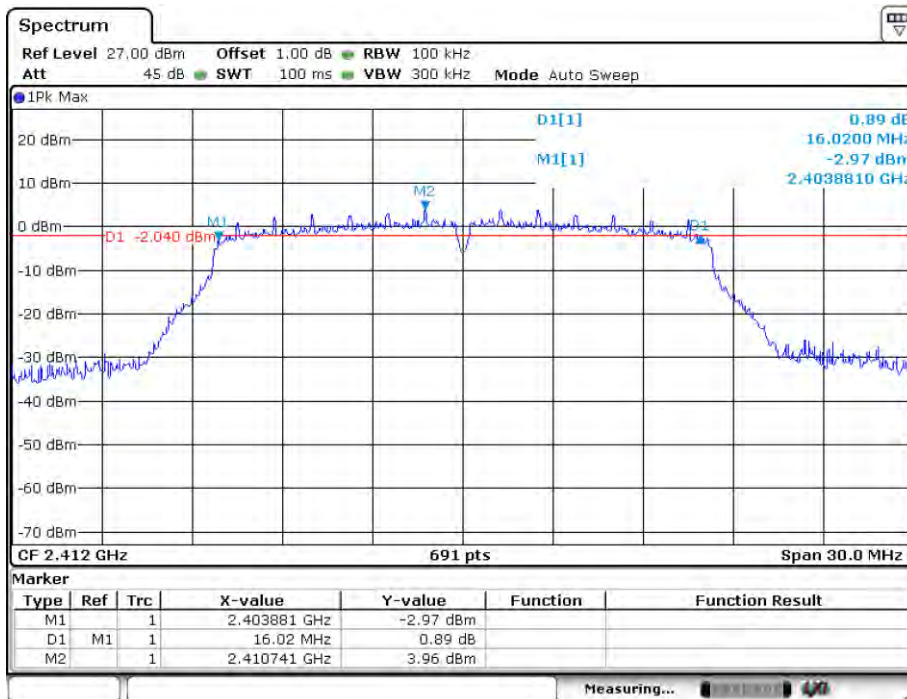
Date: 18.SEP.2020 20:33:36



4.5.2.1.4 802.11G_Lowest Channel



Date: 18.SEP.2020 18:03:01



Date: 18.SEP.2020 19:36:37



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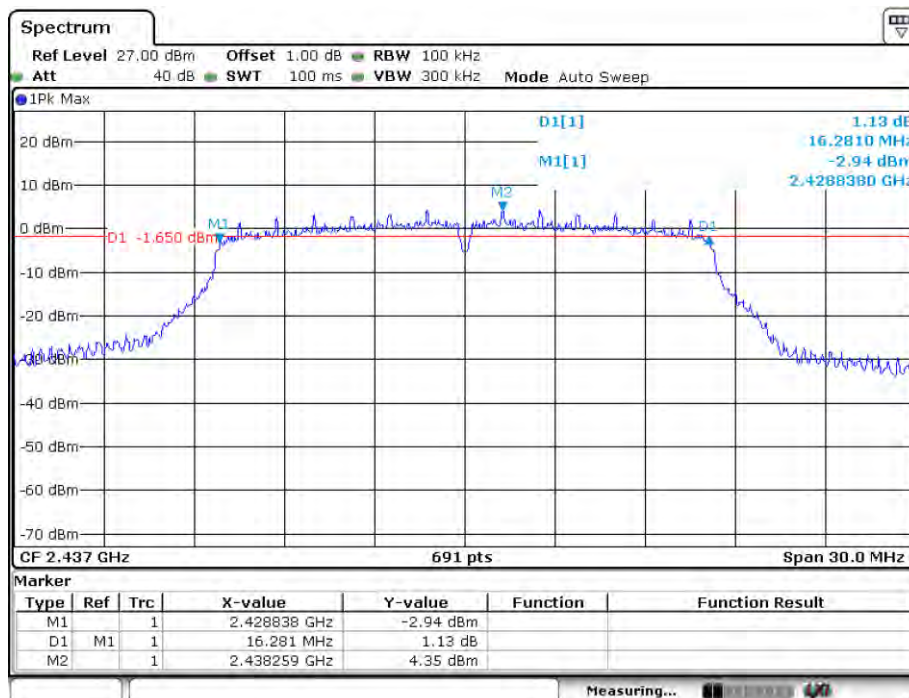
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4.5.2.1.5 802.11G_ Middle Channel



Date: 18.SEP.2020 20:53:00



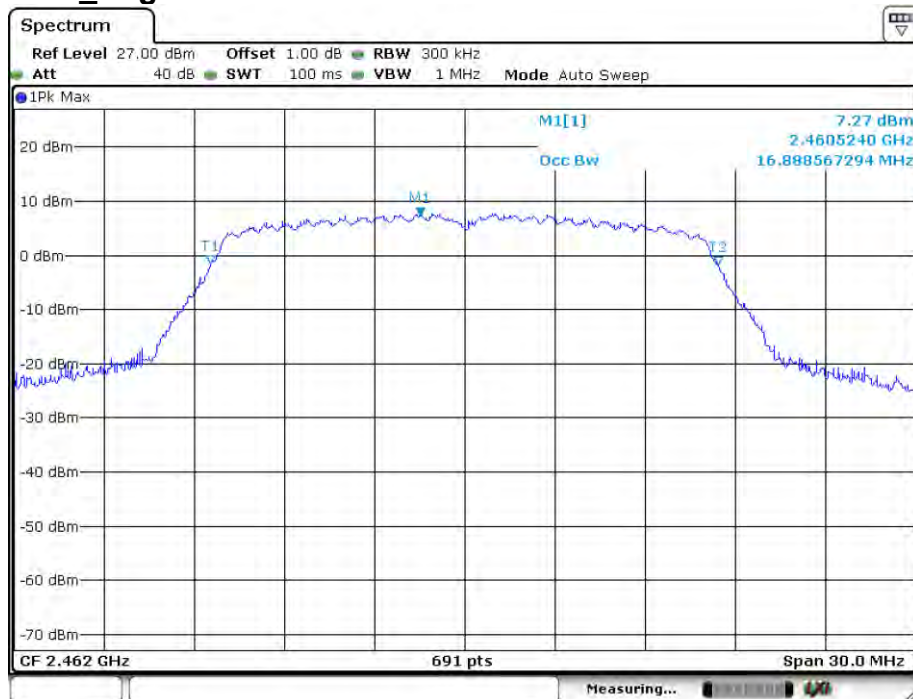
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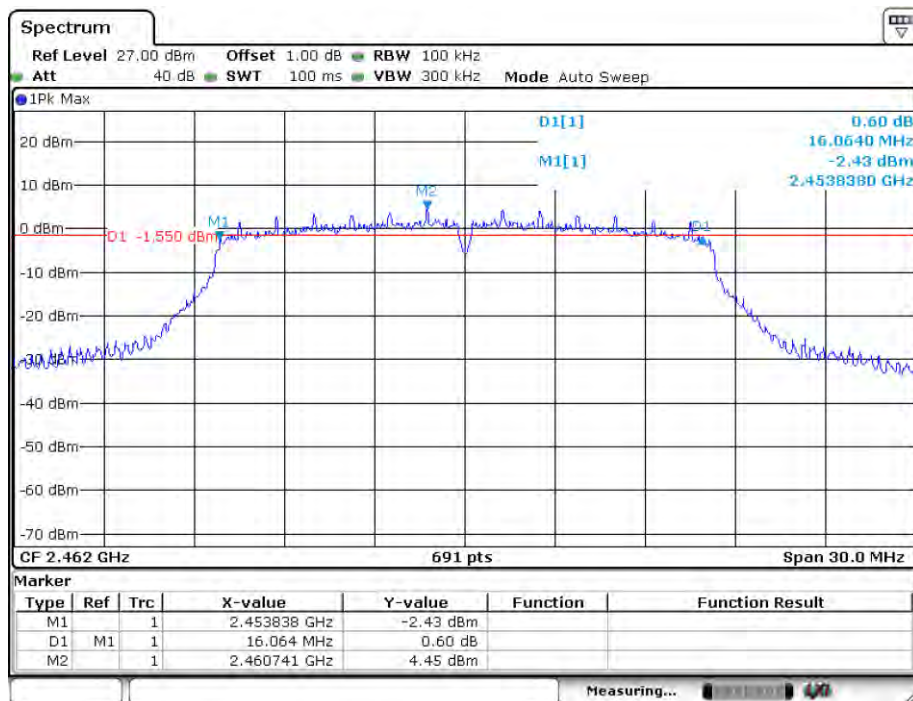
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4.5.2.1.6 802.11G_Highest Channel



Date: 18.SEP.2020 20:52:38



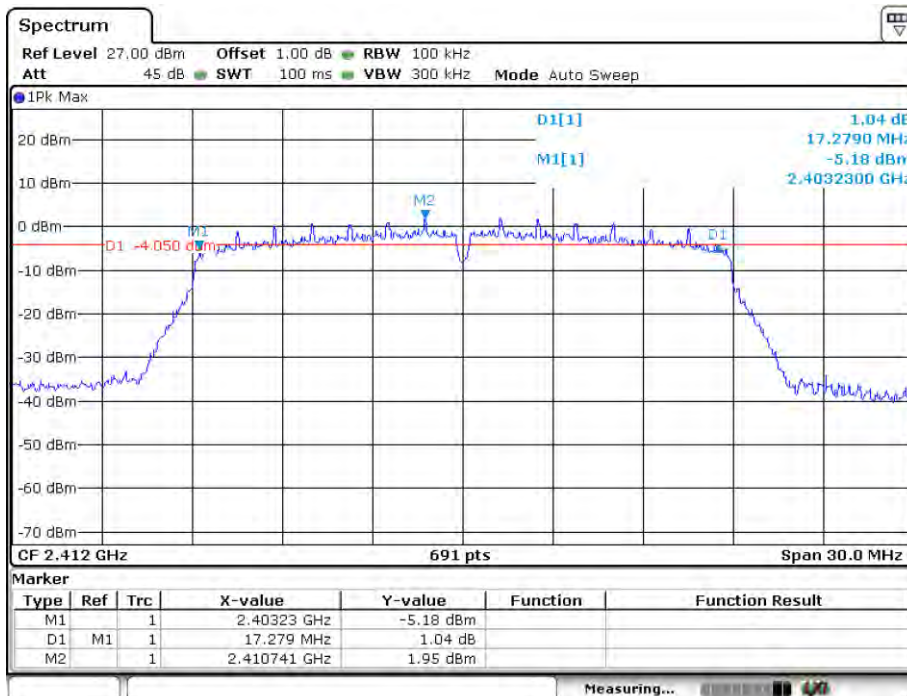
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4.5.2.1.7 802.11N20_Lowest Channel



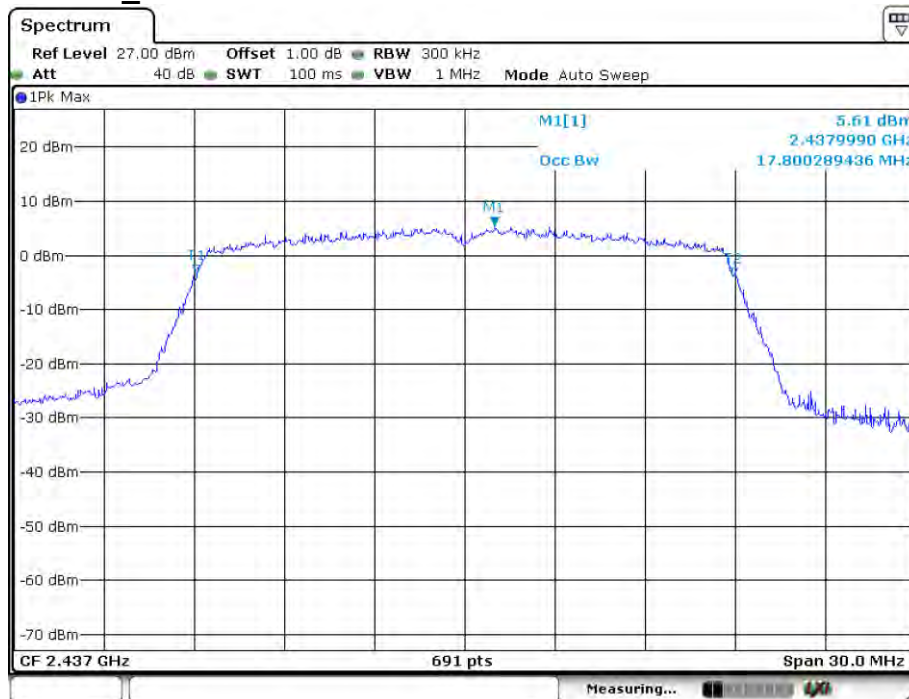
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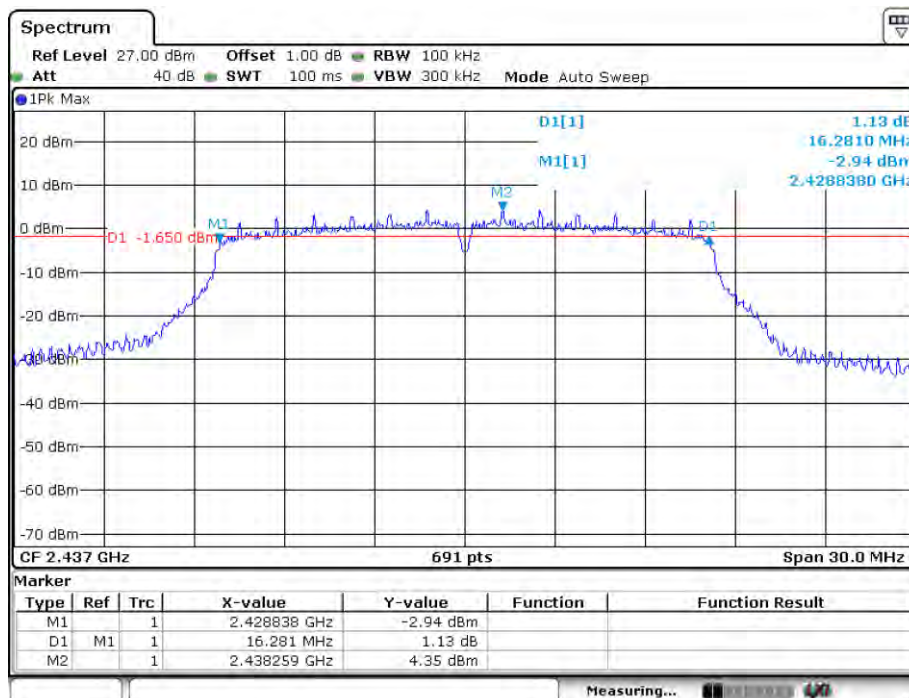
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4.5.2.1.8 802.11 N20_ Middle Channel



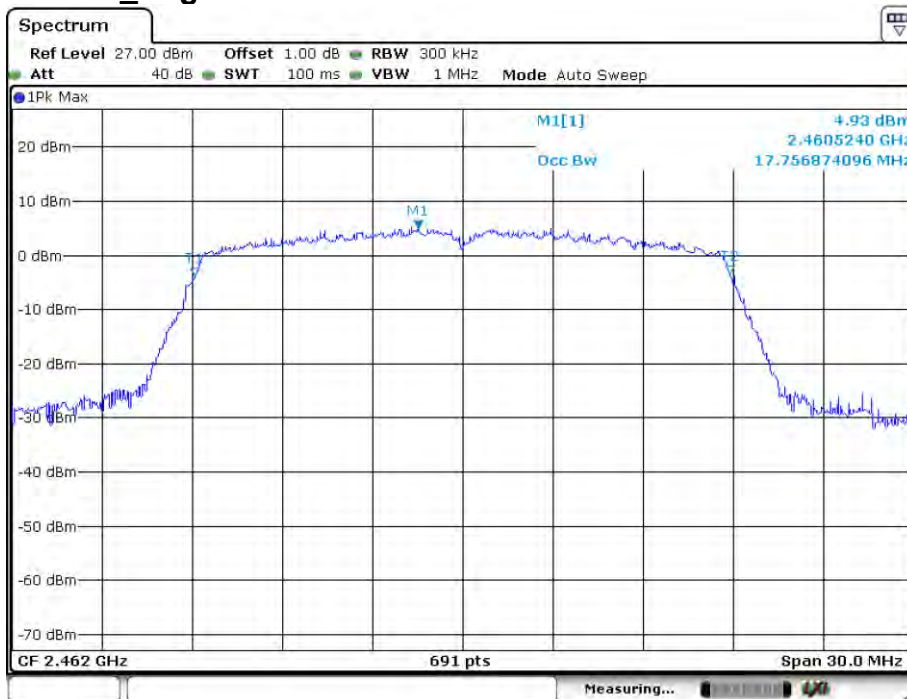
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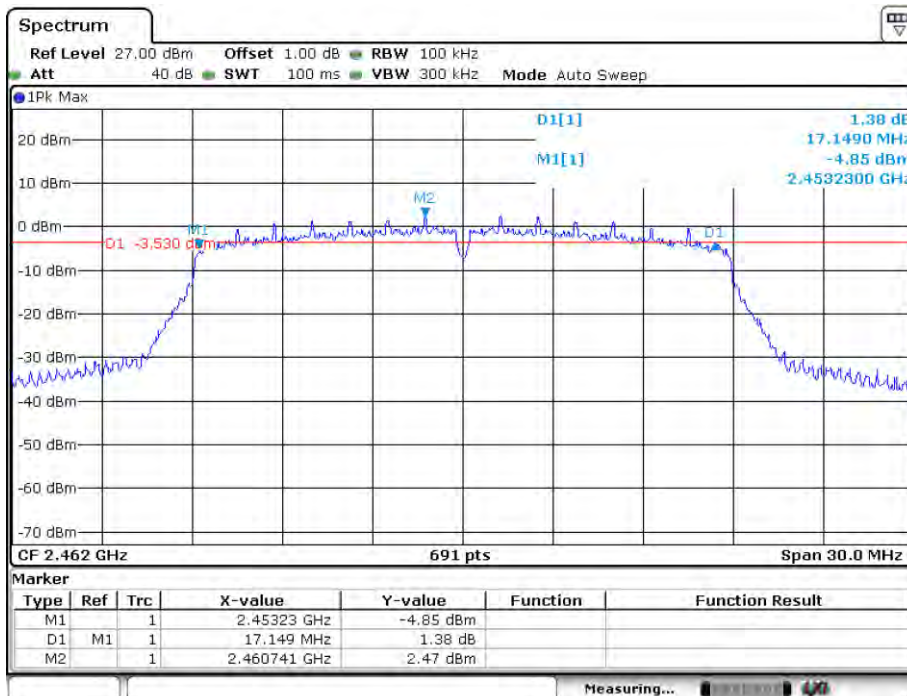
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4.5.2.1.9 802.11 N20_ Highest Channel



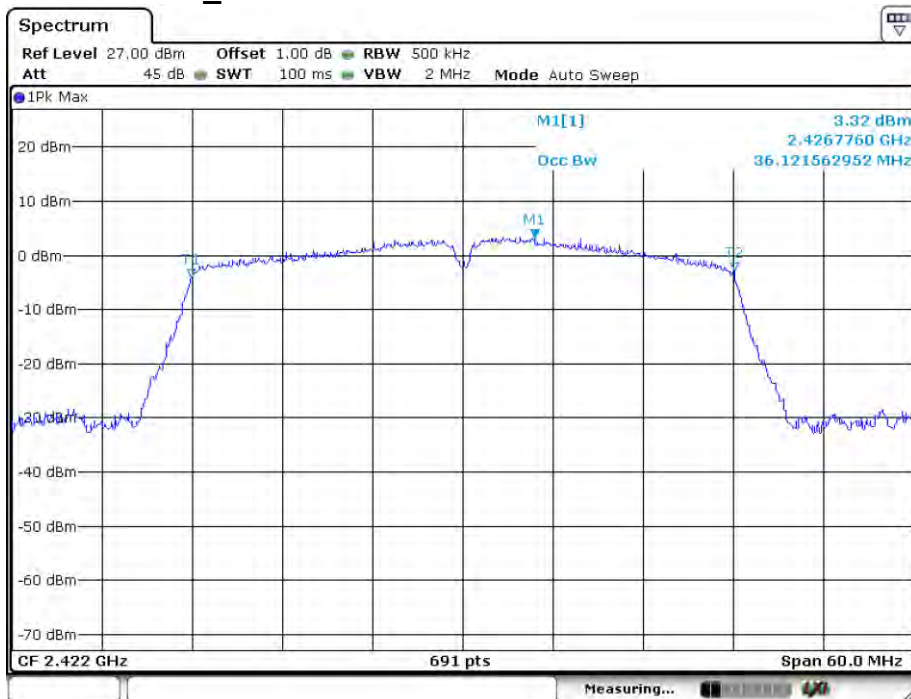
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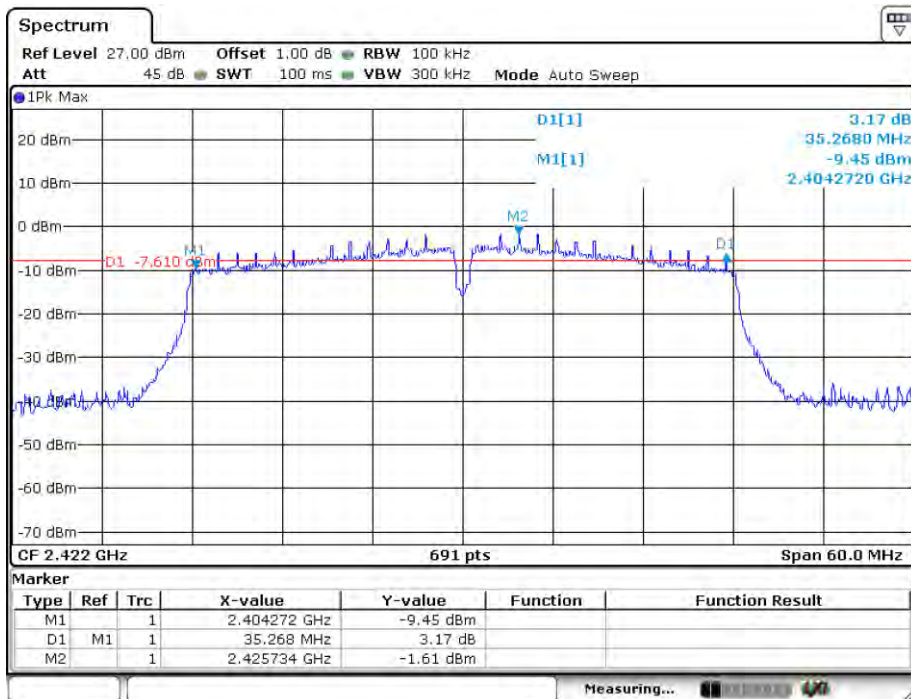
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4.5.2.1.10 802.11N40_Lowest Channel



Date: 18.SEP.2020 18:06:01



Date: 18.SEP.2020 19:26:11

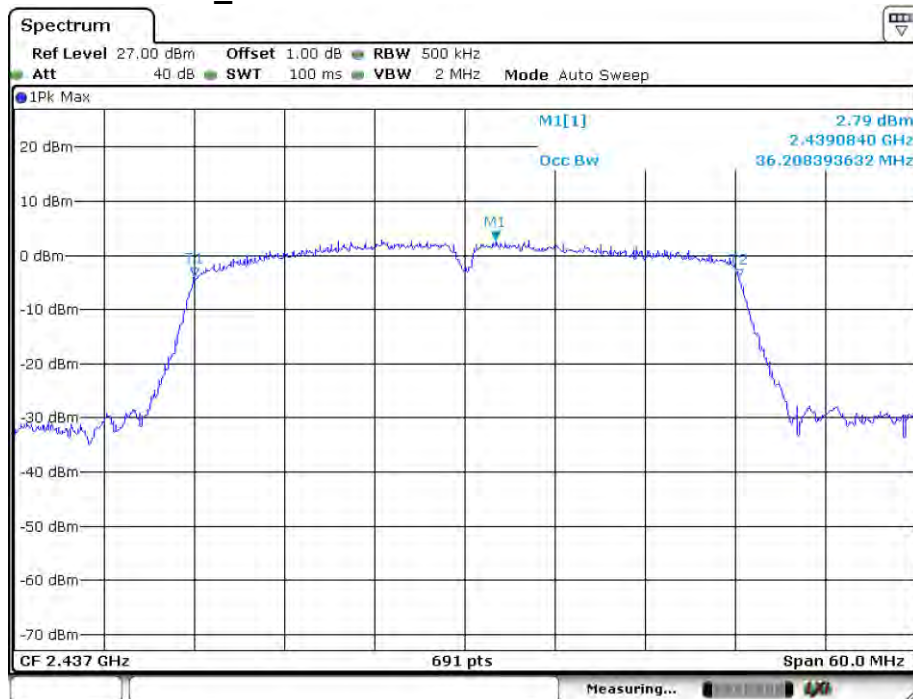


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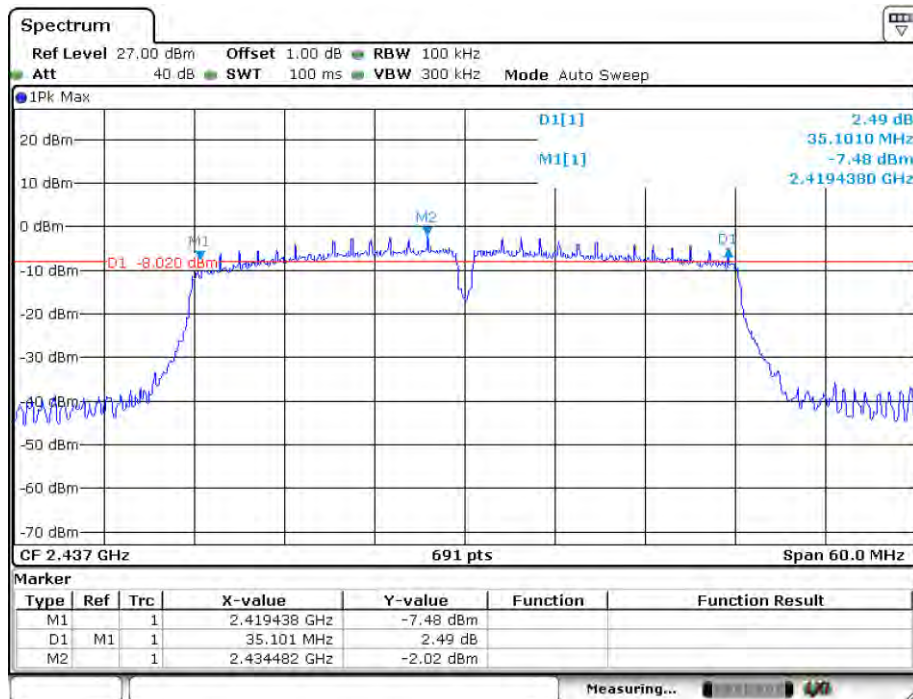
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4.5.2.1.11 802.11 N40_ Middle Channel



Date: 18.SEP.2020 20:54:19



Date: 18.SEP.2020 20:25:21

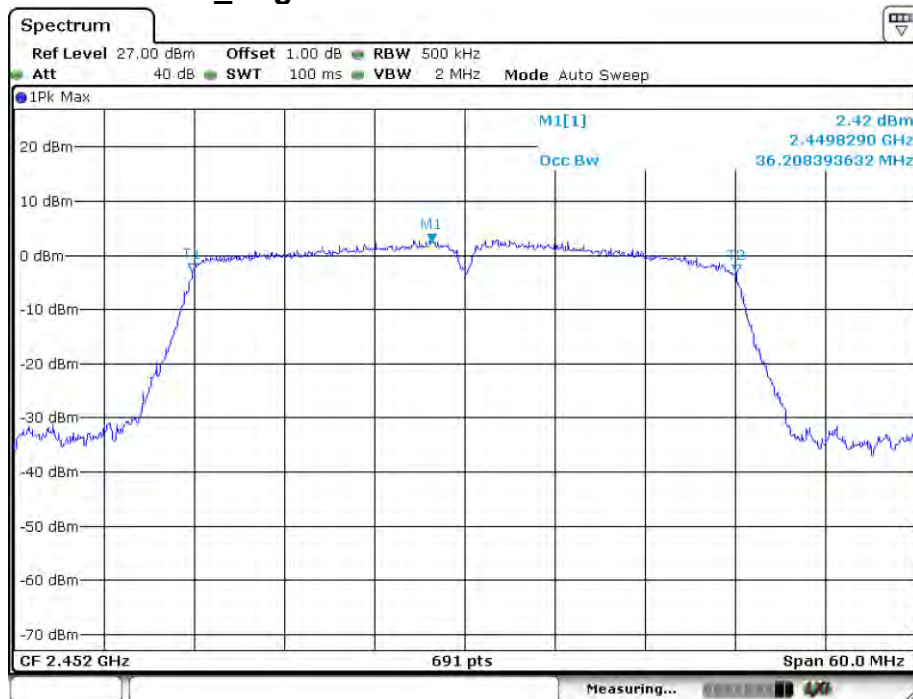


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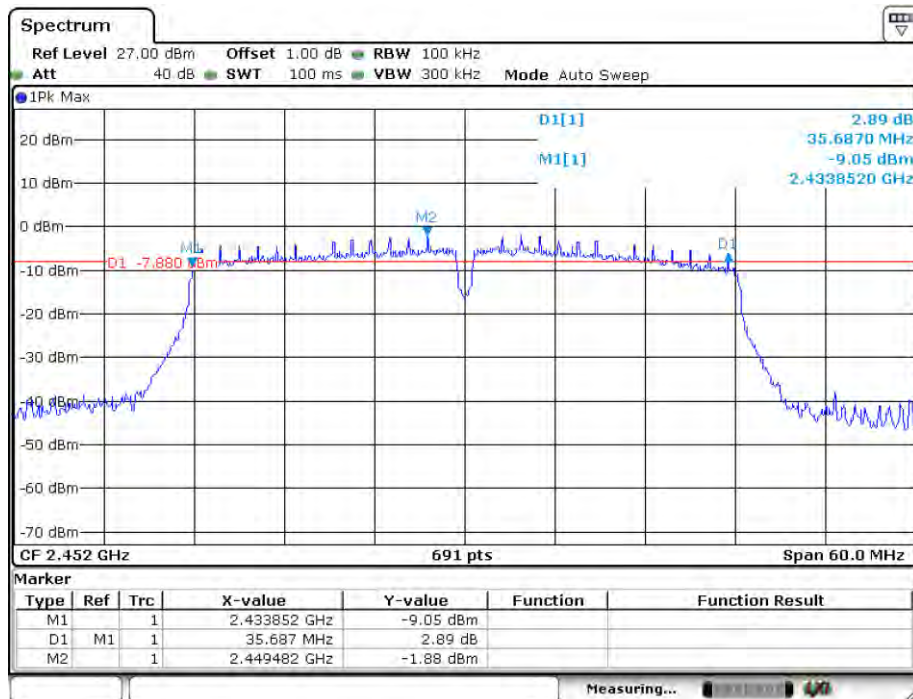
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4.5.2.1.12 802.11 N40_ Highest Channel



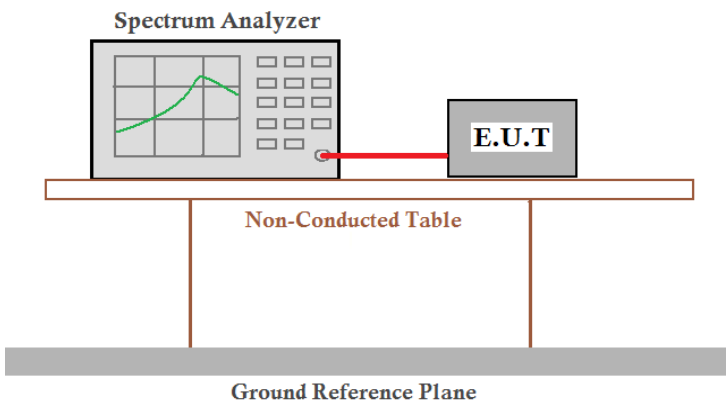
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Date: 18.SEP.2020 20:24:07



4.6 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:	
Test Instruments:	Refer to section 6 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

4.6.1 Test Results

Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11B	Lowest	-2.01	≤8.00	Pass
	Middle	-2.09	≤8.00	Pass
	Highest	-1.89	≤8.00	Pass
802.11G	Lowest	-7.22	≤8.00	Pass
	Middle	-8.11	≤8.00	Pass
	Highest	-6.94	≤8.00	Pass
802.11N20	Lowest	-10.40	≤8.00	Pass
	Middle	-9.25	≤8.00	Pass
	Highest	-9.56	≤8.00	Pass
802.11N40	Lowest	-14.49	≤8.00	Pass
	Middle	-13.96	≤8.00	Pass
	Highest	-14.29	≤8.00	Pass



4.6.2 Test plots

4.6.2.1 ANT1

4.6.2.1.1 802.11B_Lowest Channel



Date: 18.SEP.2020 18:00:14



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4.6.2.1.2 802.11B_ Middle Channel



Date: 18.SEP.2020 20:18:55

4.6.2.1.3 802.11B_ Highest Channel



Date: 18.SEP.2020 20:19:44

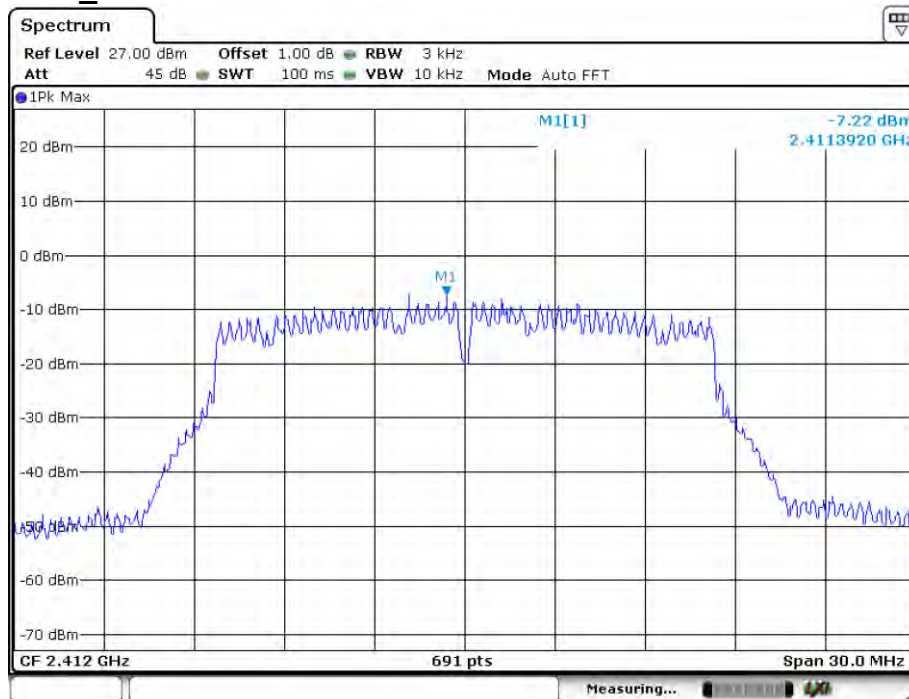


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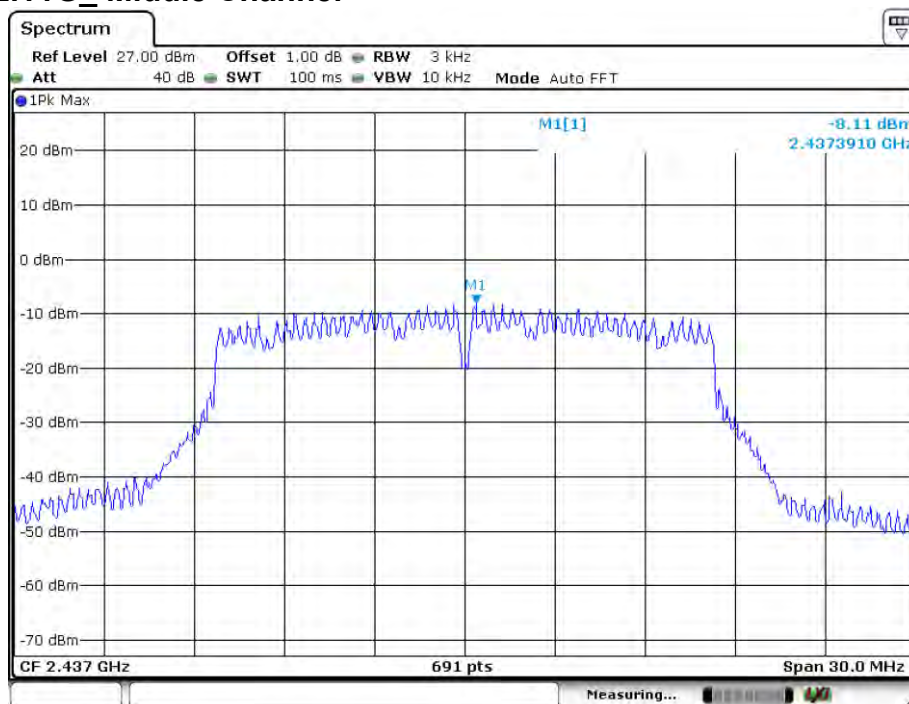
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4.6.2.1.4 802.11G_Lowest Channel



Date: 18.SEP.2020 17:59:47

4.6.2.1.5 802.11G_Middle Channel



Date: 18.SEP.2020 20:20:53

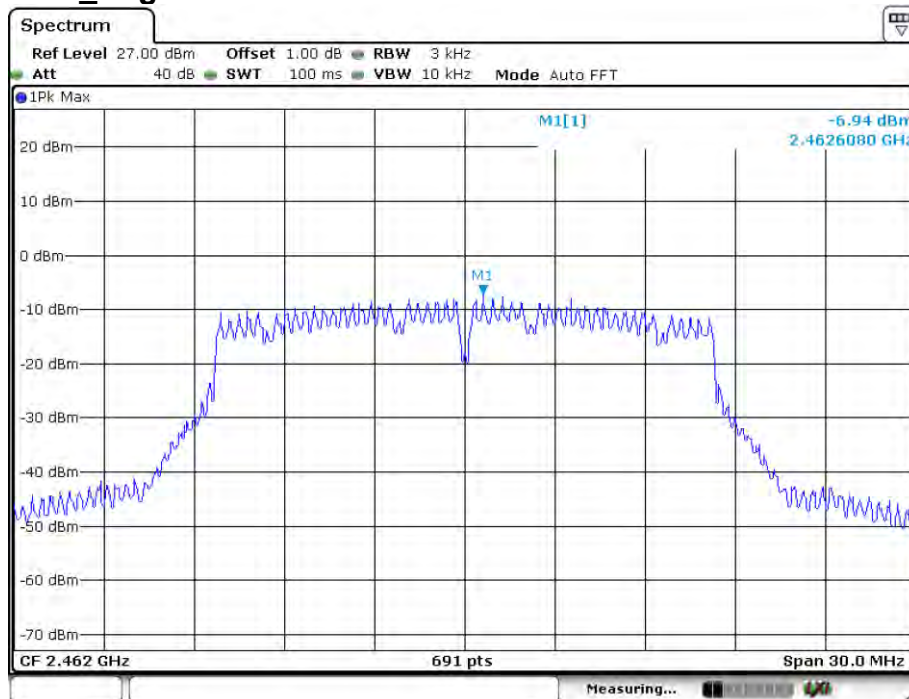


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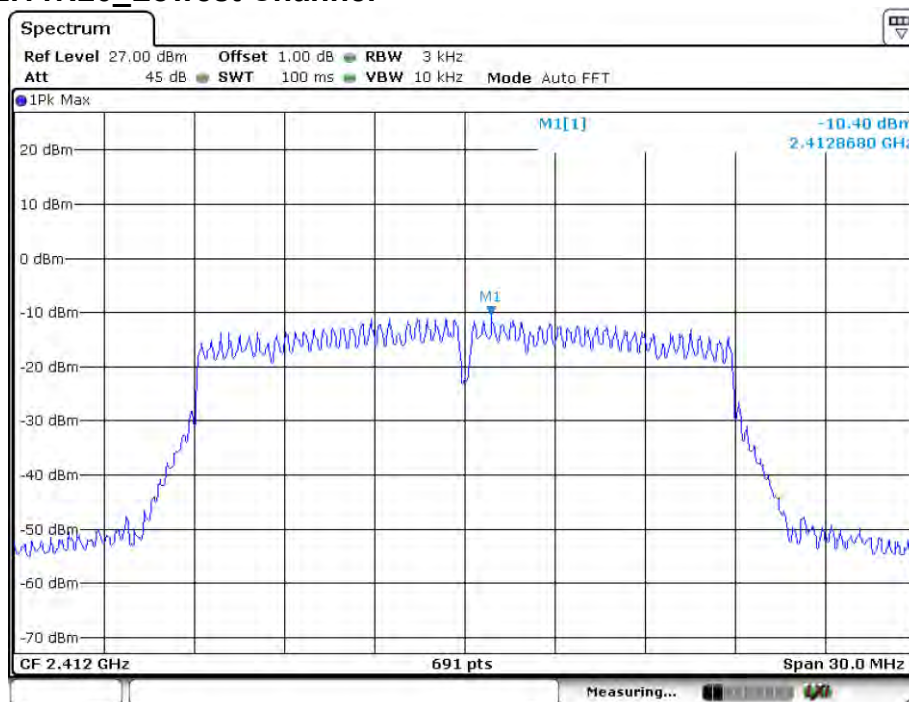
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4.6.2.1.6 802.11G_Highest Channel



Date: 18.SEP.2020 20:20:35

4.6.2.1.7 802.11N20_Lowest Channel



Date: 18.SEP.2020 17:55:13

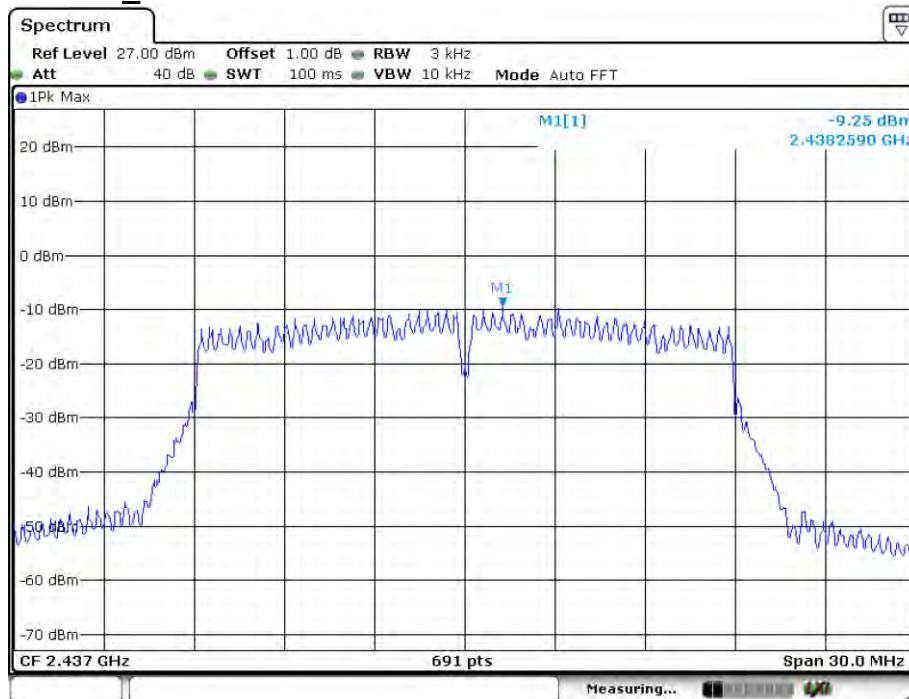


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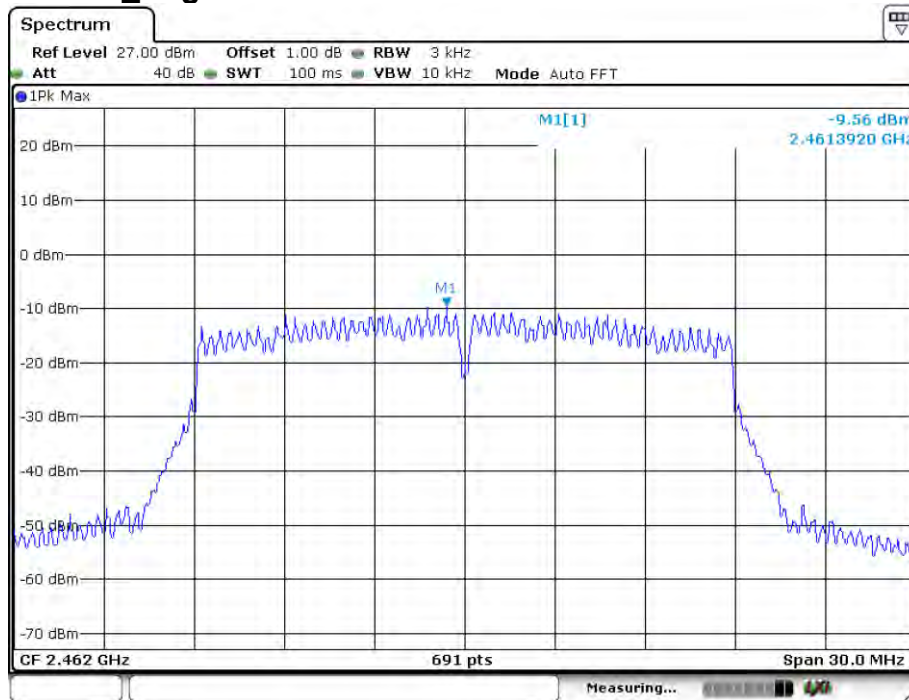
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4.6.2.1.8 802.11 N20_ Middle Channel



Date: 18.SEP.2020 20:21:29

4.6.2.1.9 802.11 N20_ Highest Channel



Date: 18.SEP.2020 20:21:58

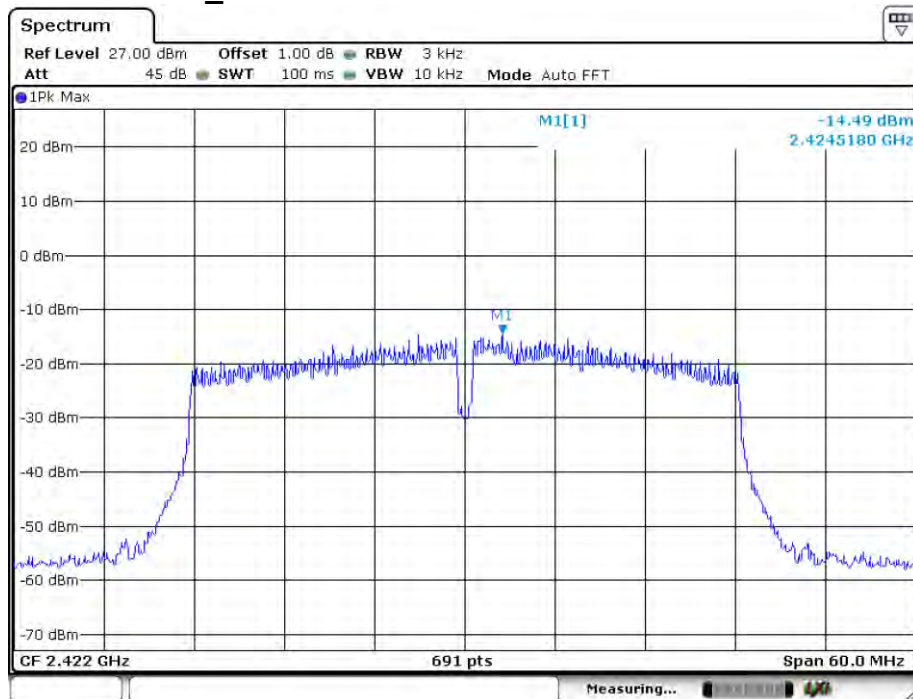


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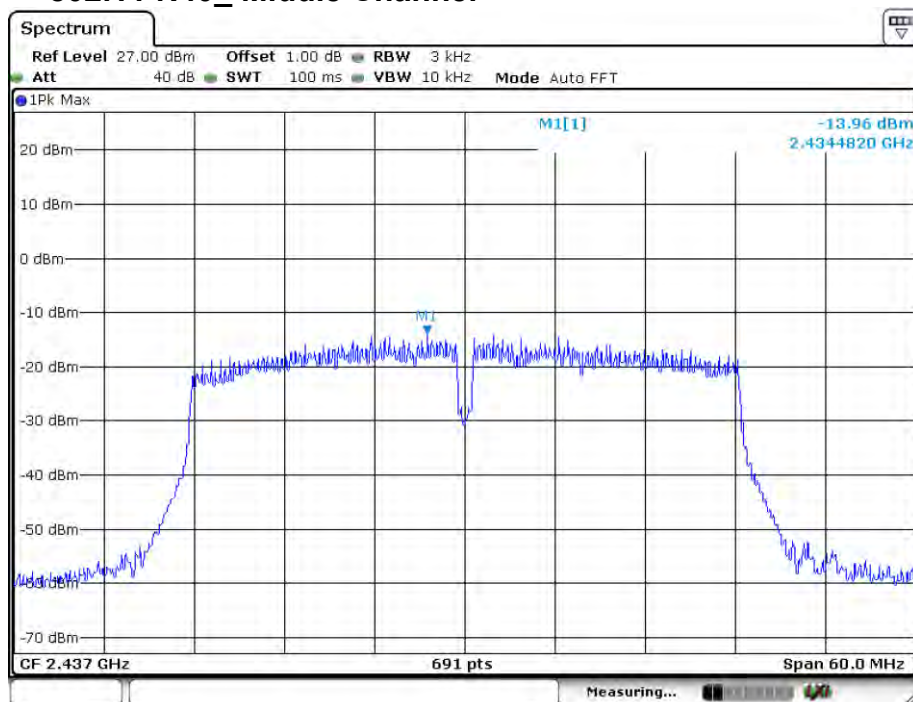
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4.6.2.1.10 802.11N40_Lowest Channel



Date: 18.SEP.2020 17:54:49

4.6.2.1.11 802.11 N40_ Middle Channel



Date: 18.SEP.2020 20:22:37

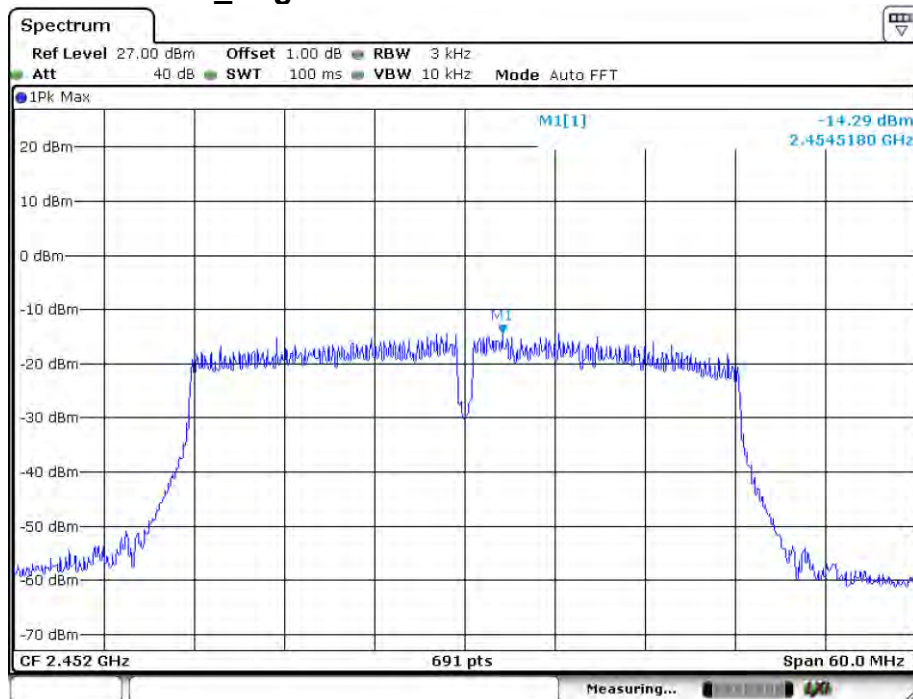


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4.6.2.1.12 802.11 N40_ Highest Channel



Date: 18.SEP.2020 20:23:26



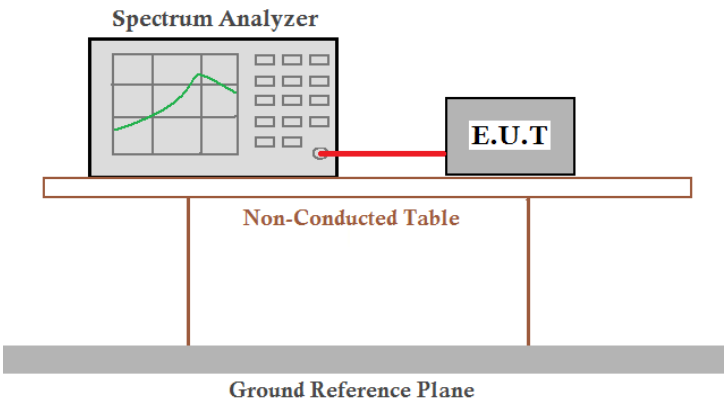
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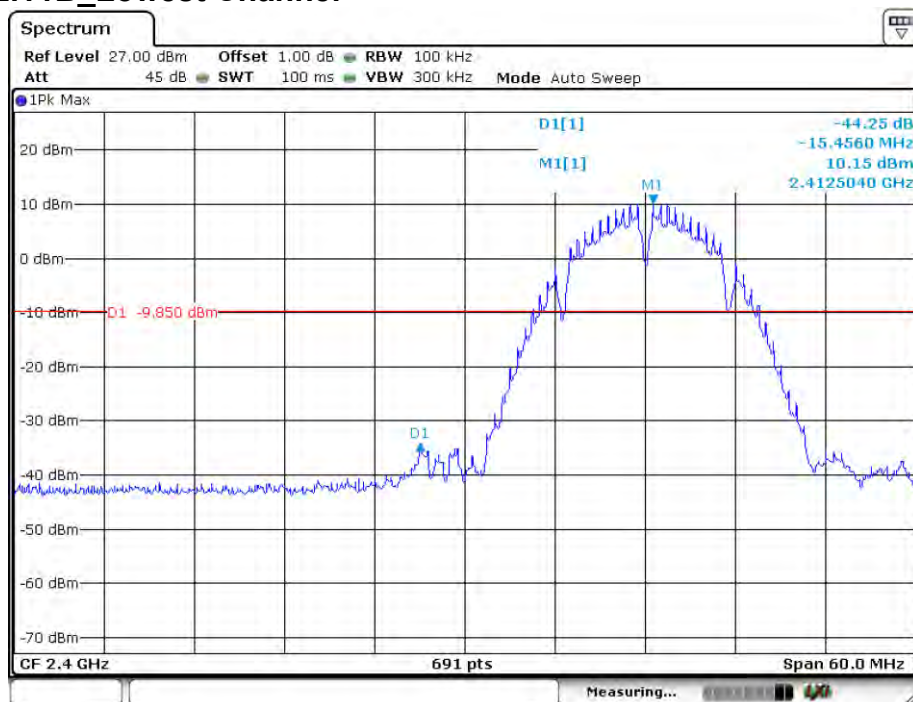
4.7 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.13
Test Setup:	
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 6 for details
Test Results:	Pass

4.7.1 Test plots

4.7.1.1 ANT1

4.7.1.1.1 802.11B_Lowest Channel



Date: 18.SEP.2020 19:48:05



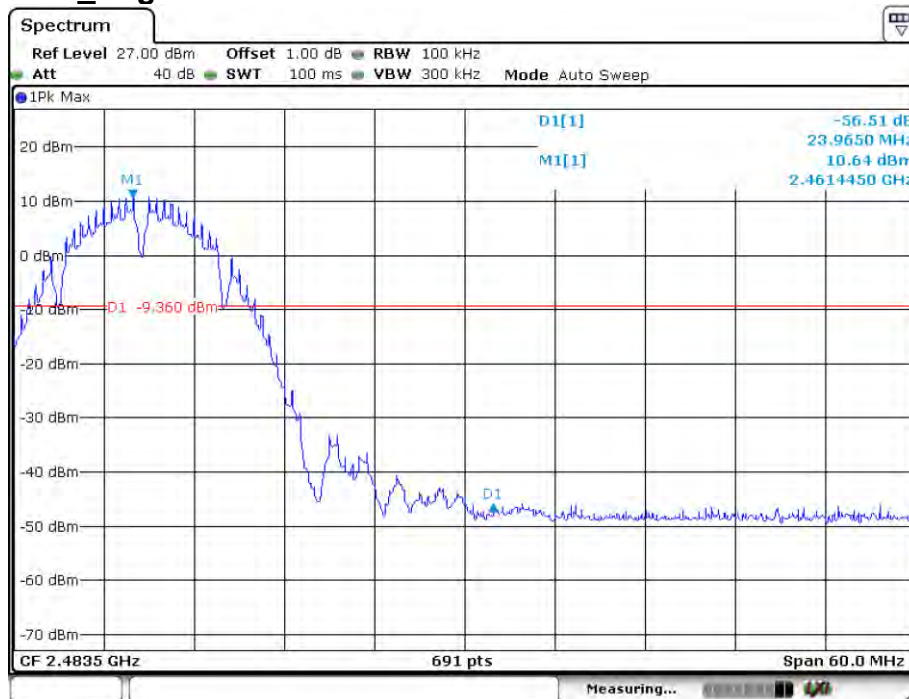
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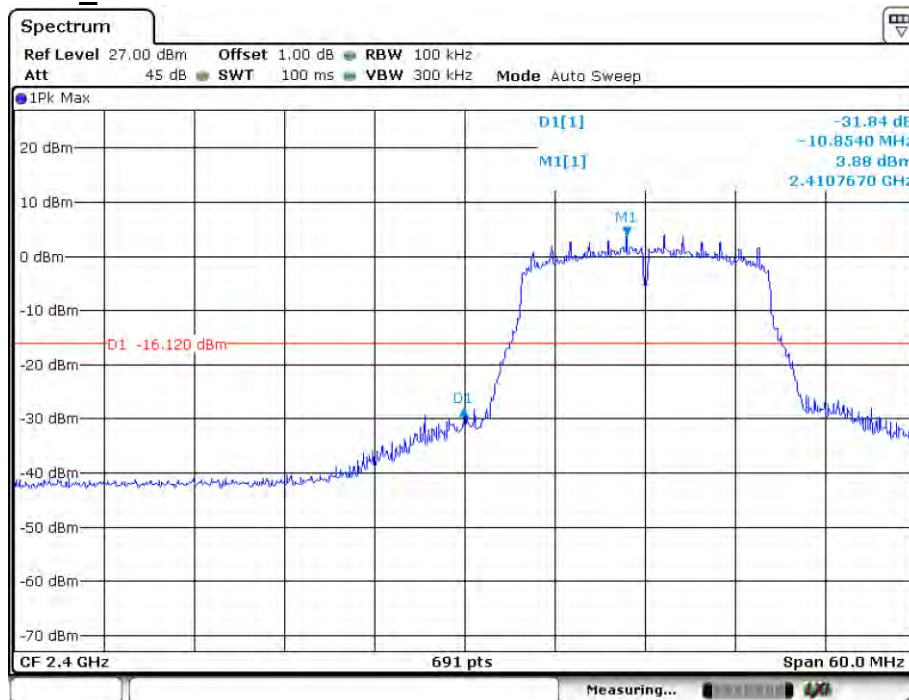
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4.7.1.1.2 802.11B_Highest Channel



Date: 18.SEP.2020 20:57:44

4.7.1.1.3 802.11G_Lowest Channel



Date: 18.SEP.2020 19:47:11

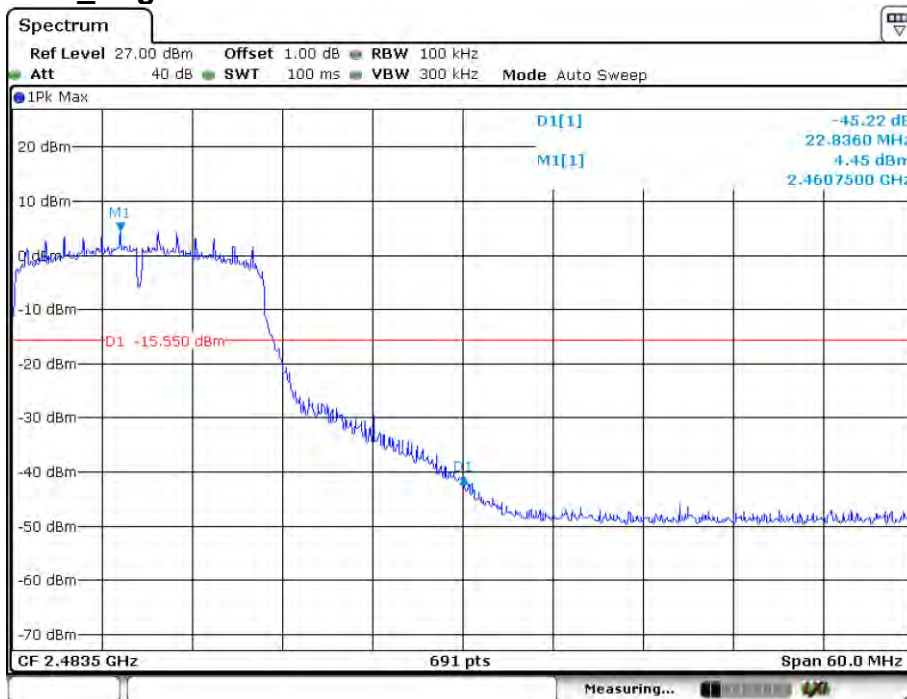


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4.7.1.1.4 802.11G_Highest Channel



Date: 18.SEP.2020 20:56:51

4.7.1.1.5 802.11N20_Lowest Channel



Date: 18.SEP.2020 19:52:46

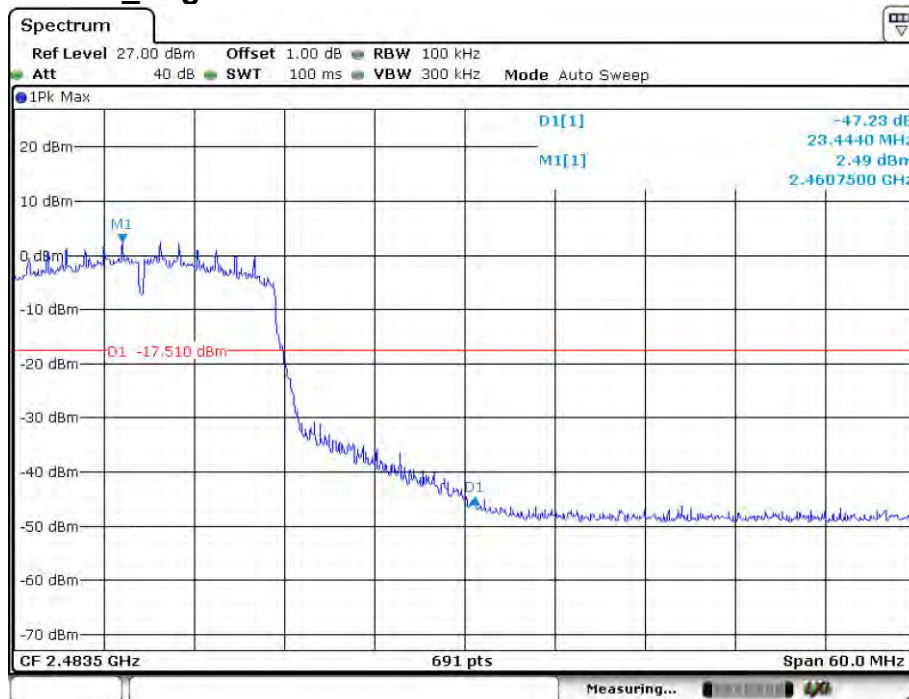


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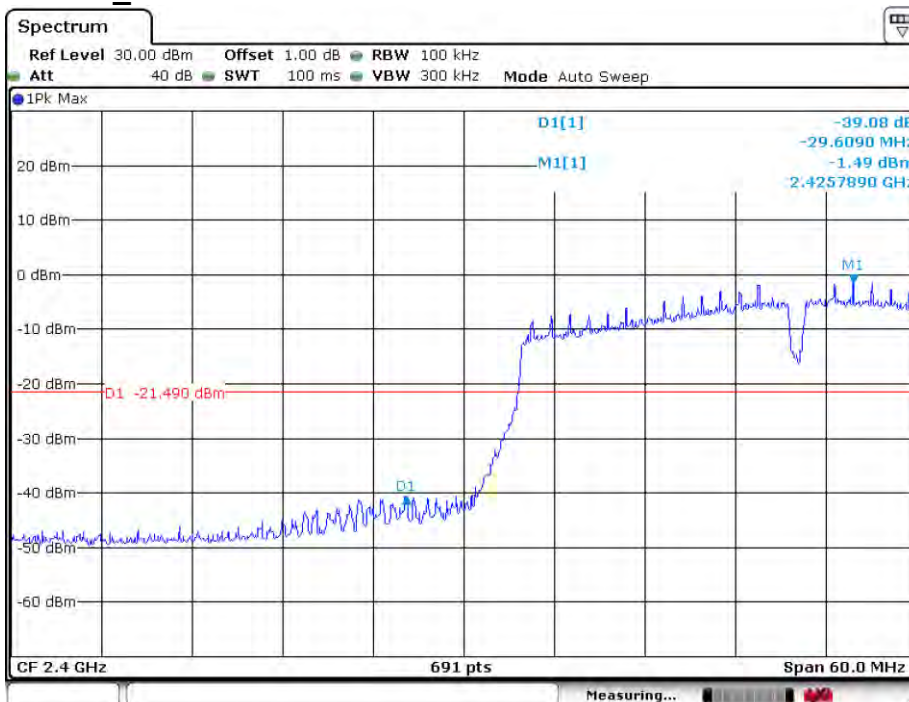
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4.7.1.1.6 802.11 N20_ Highest Channel



Date: 18.SEP.2020 20:56:15

4.7.1.1.7 802.11N40_ Lowest Channel



Date: 25.SEP.2020 19:22:47

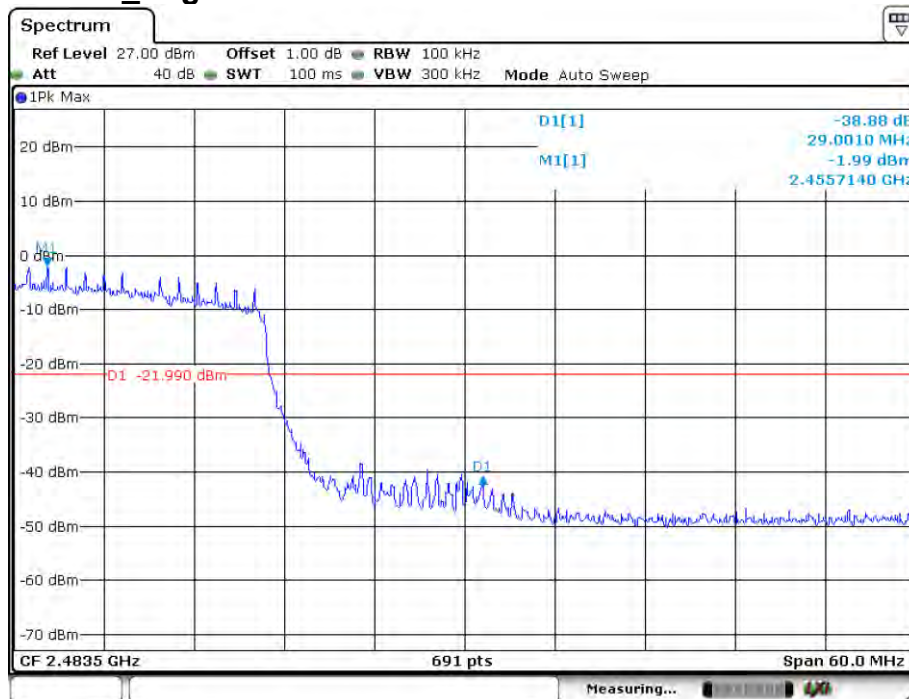


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4.7.1.1.8 802.11 N40_ Highest Channel



Date: 18.SEP.2020 20:55:16

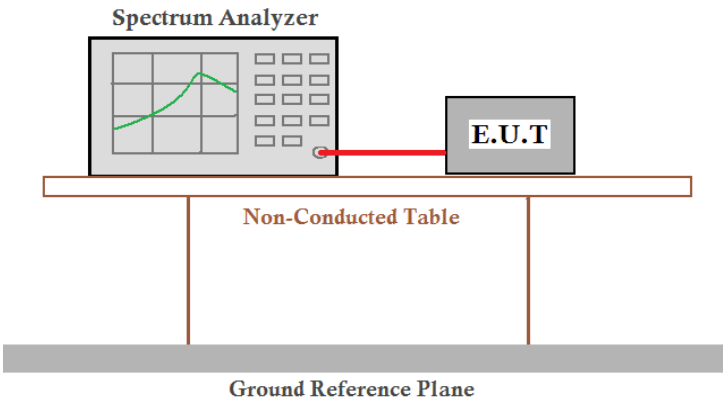


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4.8 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
Test Setup:	
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 6 for details
Test Results:	Pass



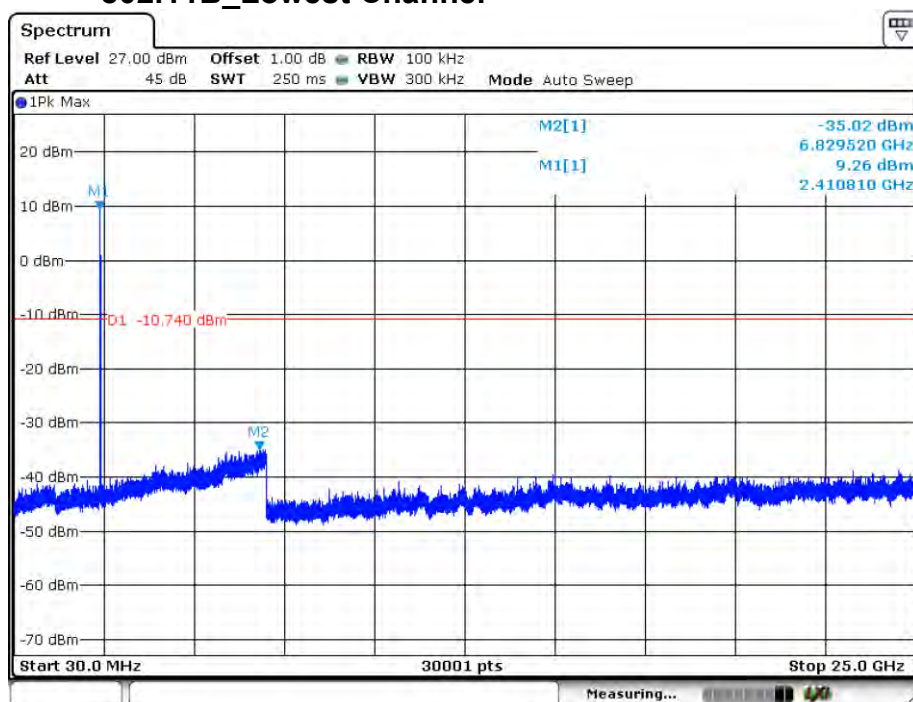
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4.8.1 Test plots

4.8.1.1 ANT1

4.8.1.1.1 802.11B_Lowest Channel



Date: 18.SEP.2020 20:17:52

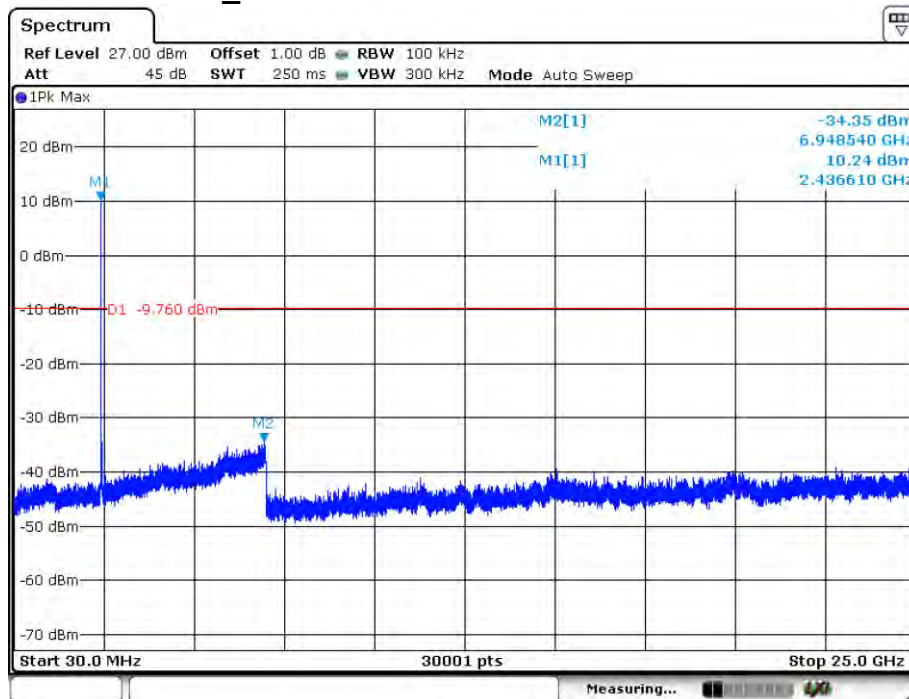


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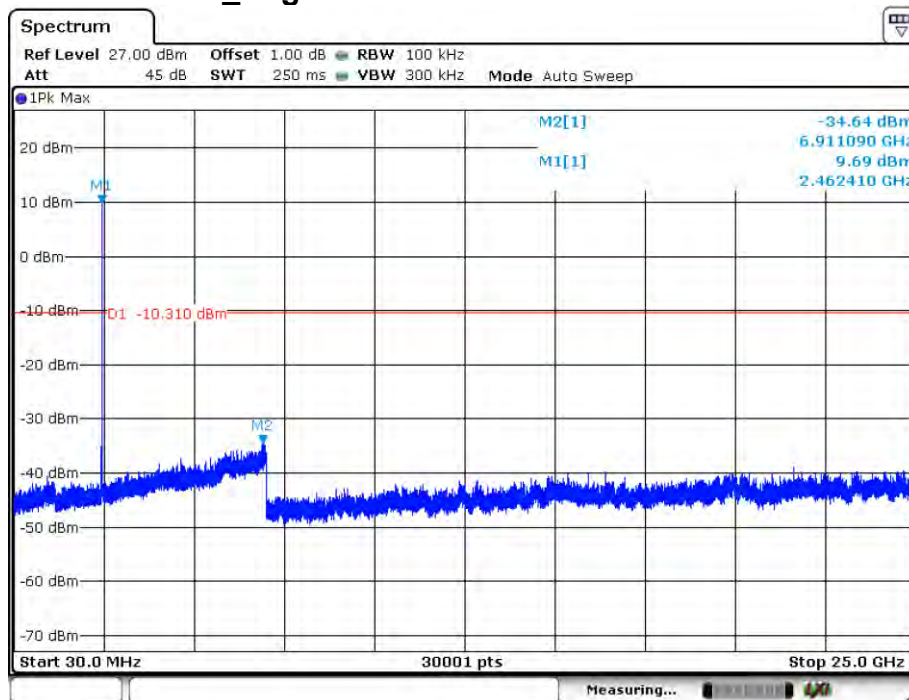
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4.8.1.1.2 802.11B_ Middle Channel



Date: 18.SEP.2020 20:16:52

4.8.1.1.3 802.11B_ Highest Channel



Date: 18.SEP.2020 20:16:10



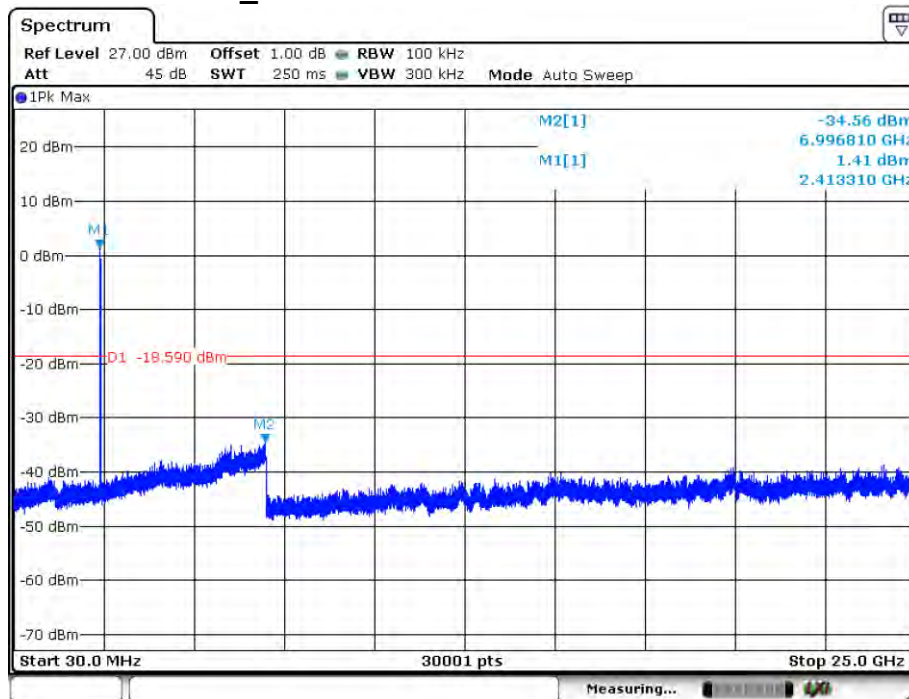
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4.8.1.1.4

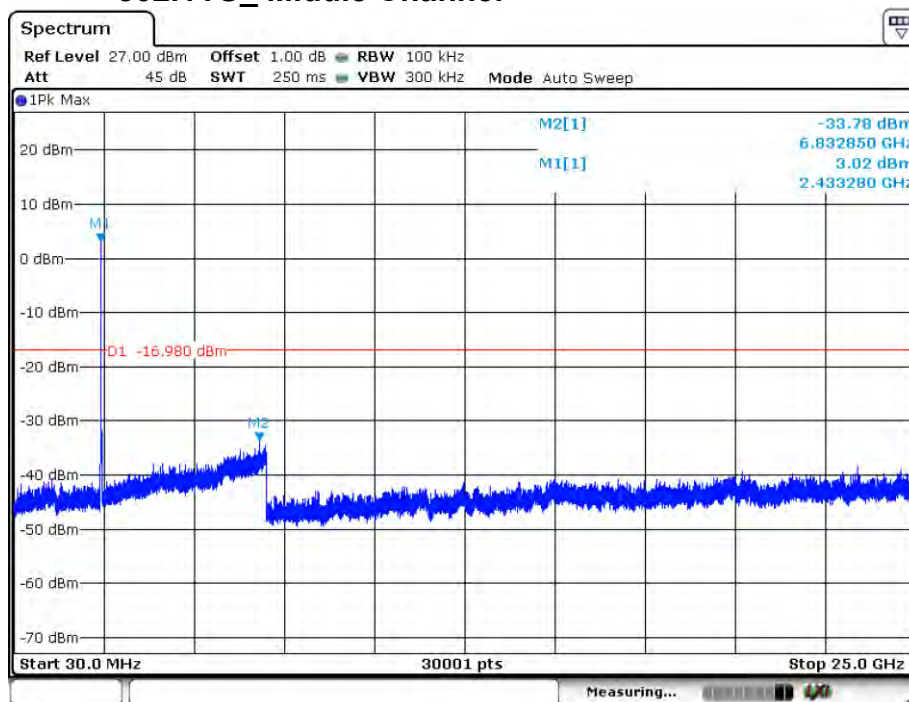
802.11G_Lowest Channel



Date: 18.SEP.2020 20:14:43

4.8.1.1.5

802.11G_Middle Channel



Date: 18.SEP.2020 20:13:50



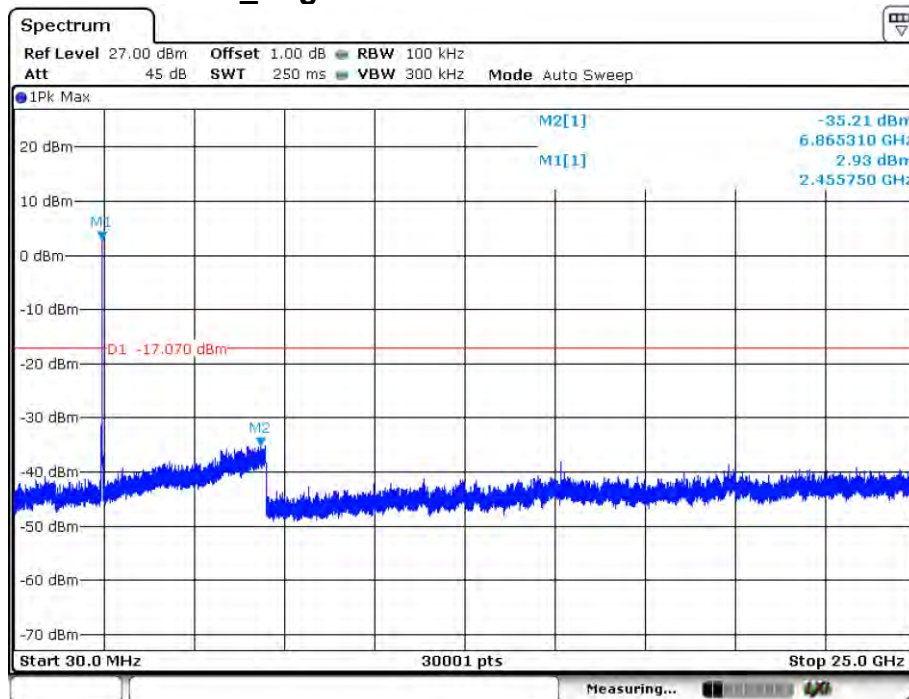
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4.8.1.1.6

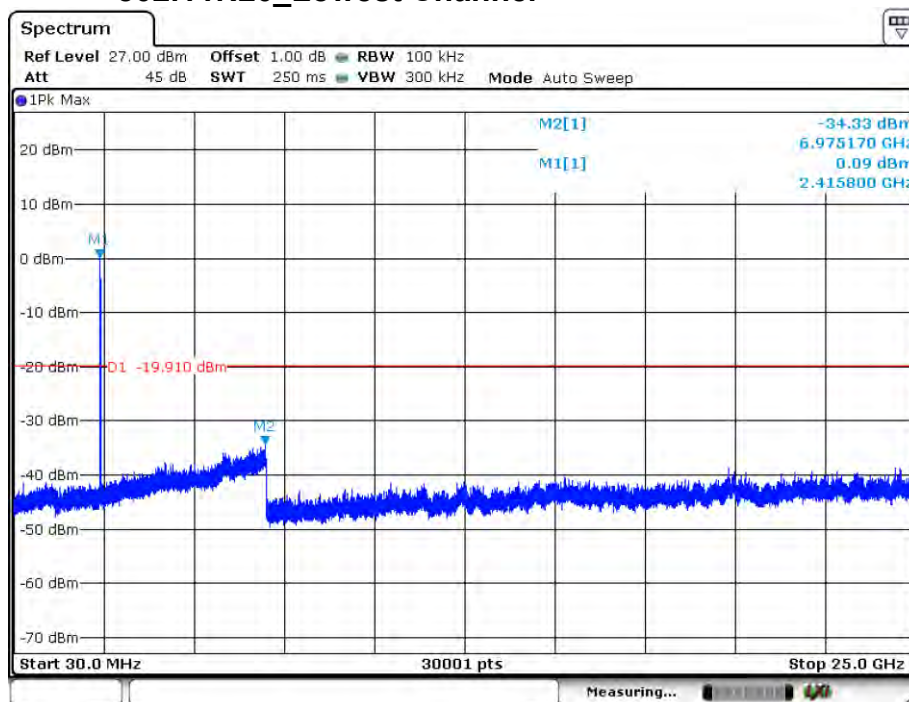
802.11G_Highest Channel



Date: 18.SEP.2020 20:15:33

4.8.1.1.7

802.11N20_Lowest Channel



Date: 18.SEP.2020 20:08:08



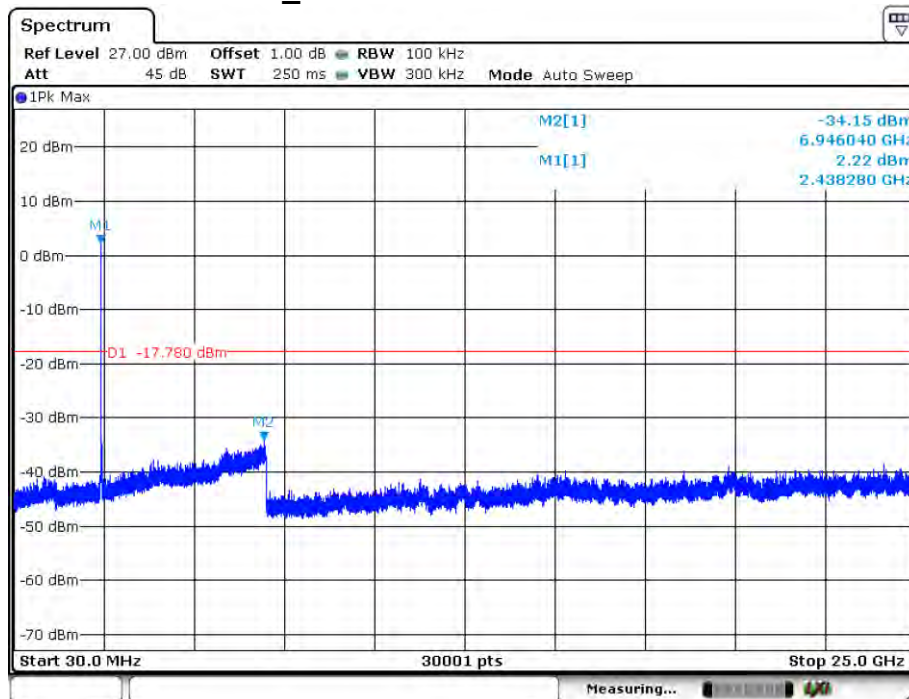
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4.8.1.1.8

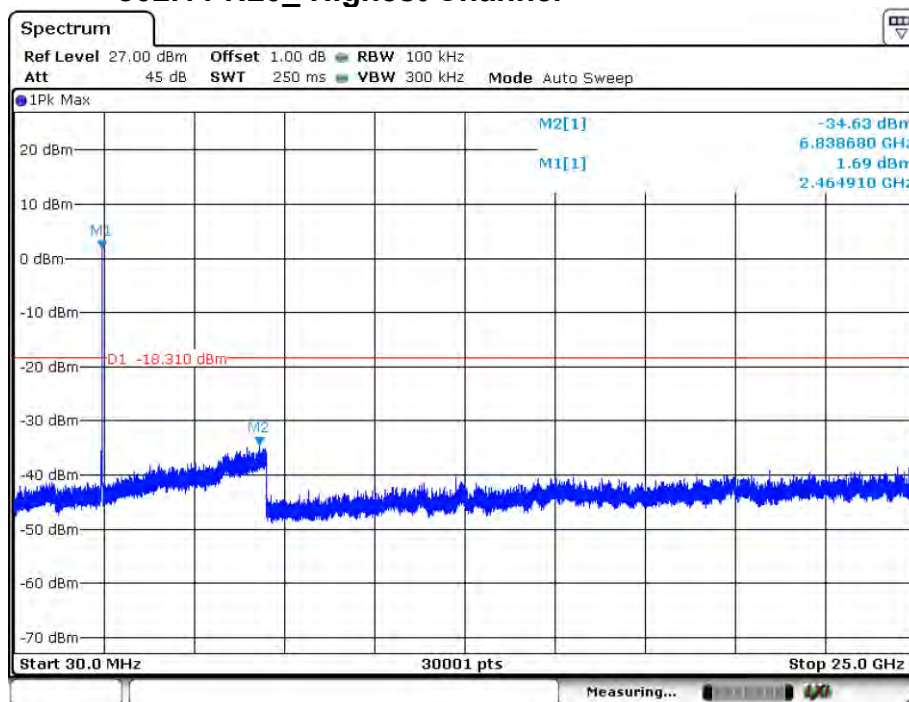
802.11 N20_ Middle Channel



Date: 18.SEP.2020 20:12:39

4.8.1.1.9

802.11 N20_ Highest Channel



Date: 18.SEP.2020 20:11:29

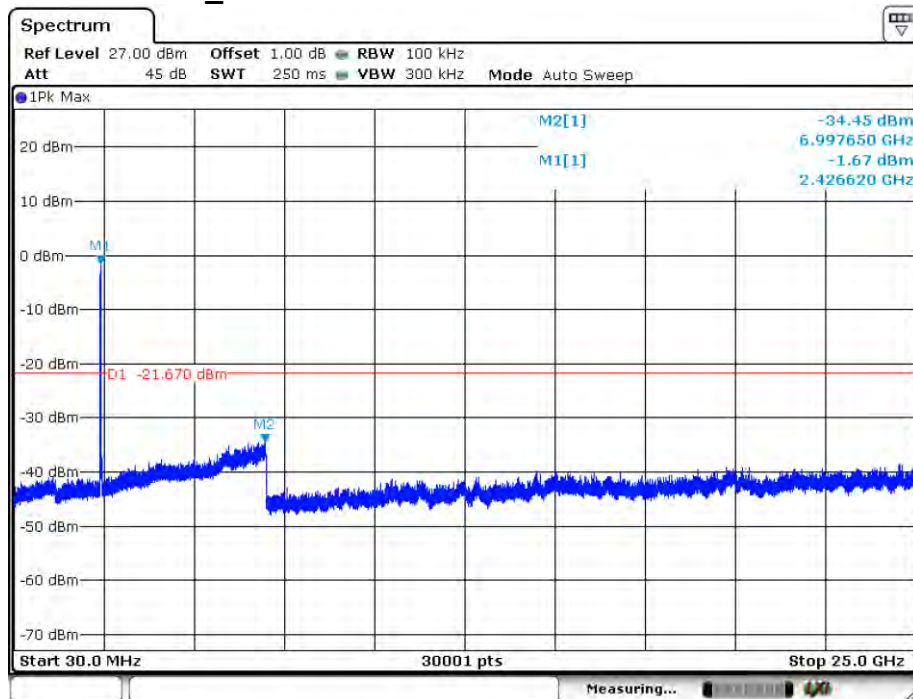


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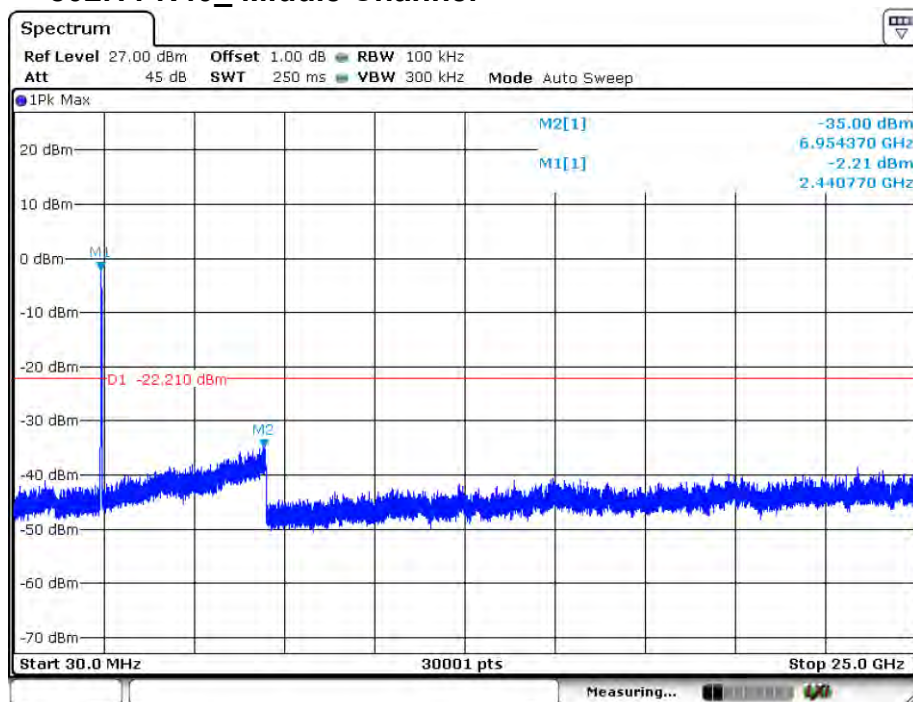
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4.8.1.1.10 802.11N40_Lowest Channel



Date: 18.SEP.2020 20:06:49

4.8.1.1.11 802.11 N40_ Middle Channel



Date: 18.SEP.2020 20:04:18

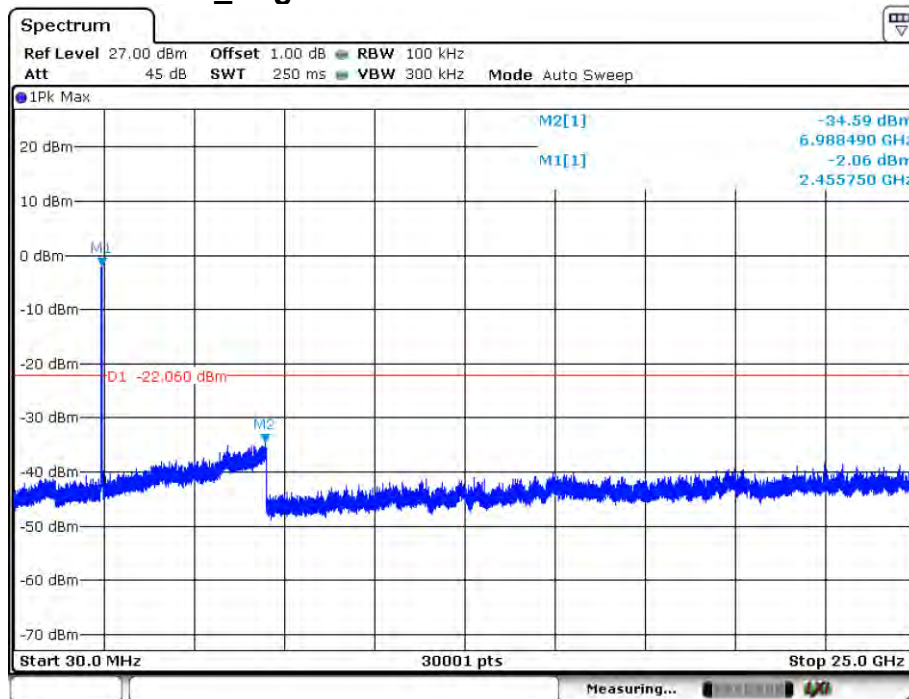


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4.8.1.1.12 802.11 N40_ Highest Channel



Date: 18 SEP. 2020 20:03:45

Remark:

Scan from 9kHz to 25GHz, the disturbance between 9KHz to 30MHz was very low, and the above harmonics were the highest point could be found when testing, 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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4.9 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 or 10m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Remark: 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:	
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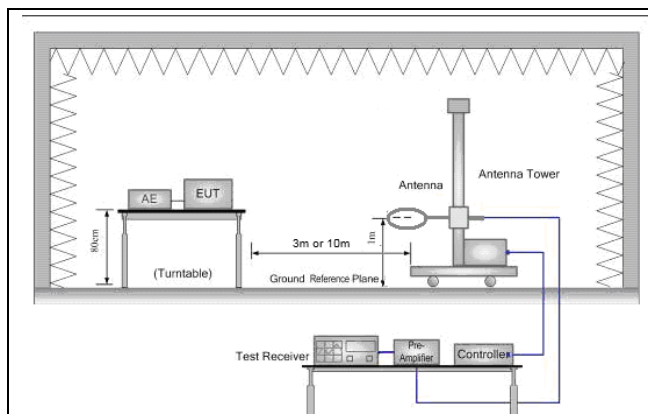


Figure 1. Below 30MHz

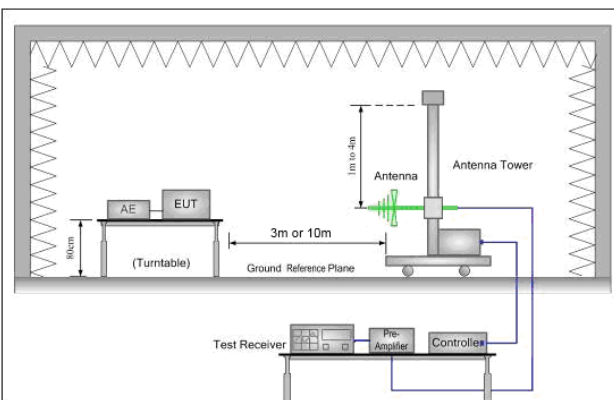


Figure 2. 30MHz to 1GHz

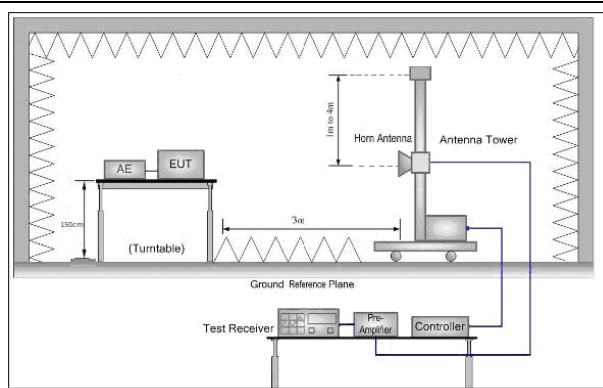


Figure 3. Above 1 GHz

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 semi-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.
- Use the following spectrum analyzer settings:
 - Span shall wide enough to fully capture the emission being measured;
 - Set RBW=100 kHz for $f < 1$ GHz, RBW=1MHz for $f > 1$ GHz ;
VBW $\geq$ RBW; Sweep = auto;
Detector function = peak; Trace = max hold for peak
 - For average measurement: use duty cycle correction factor method per 15.35(c).
Duty cycle = On time/100 milliseconds
On time = $N_1 * L_1 + N_2 * L_2 + \dots + N_{n-1} * L_{n-1} + N_n * L_n$
Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.



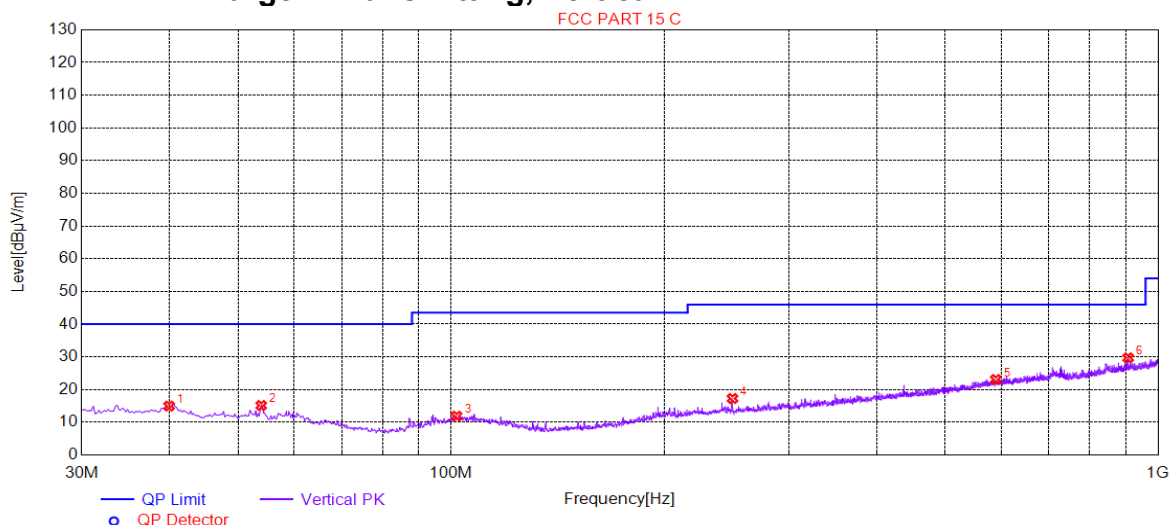
	Average Emission Level = Peak Emission Level + 20*log(Duty cycl f. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. g. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. h. 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. i. Test the EUT in the lowest channel, the middle channel ,the Highest channel j. 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. k. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Charge + Transmitting 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 6 for details
Test Results:	Pass





4.9.1 Radiated emission below 1GHz

4.9.1.1 Charge + Transmitting, Vertical

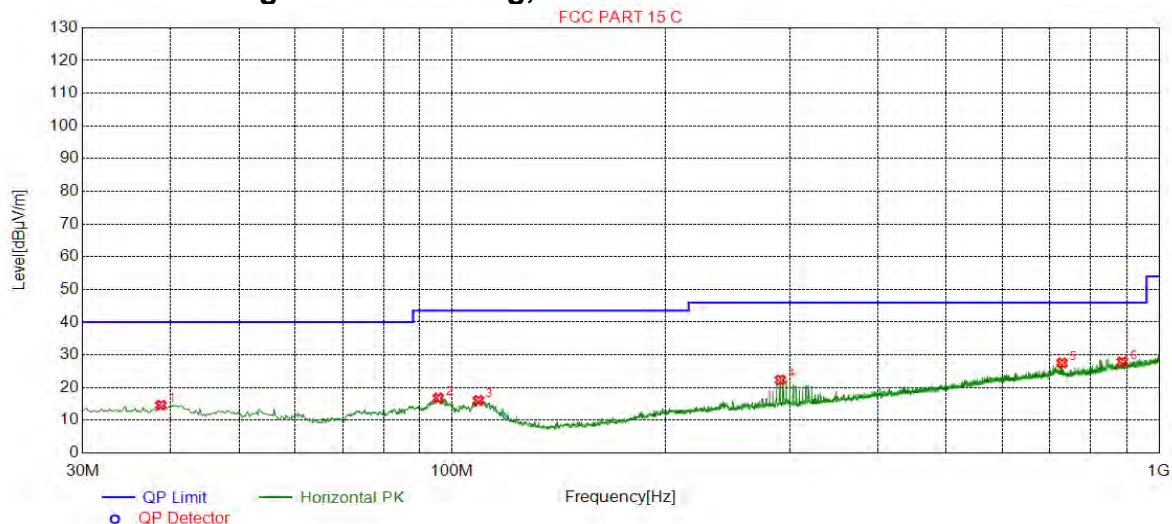


Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	39.8960	14.96	-28.37	40.00	25.04	240	72	Vertical
2	53.8668	15.15	-30.95	40.00	24.85	293	292	Vertical
3	101.7944	11.90	-32.00	43.50	31.60	176	232	Vertical
4	250.0400	17.28	-29.66	46.00	28.72	283	31	Vertical
5	589.4139	23.11	-20.93	46.00	22.89	190	22	Vertical
6	907.0554	29.73	-15.95	46.00	16.27	233	14	Vertical



4.9.1.2 Charge + Transmitting, Horizontal



Suspected List

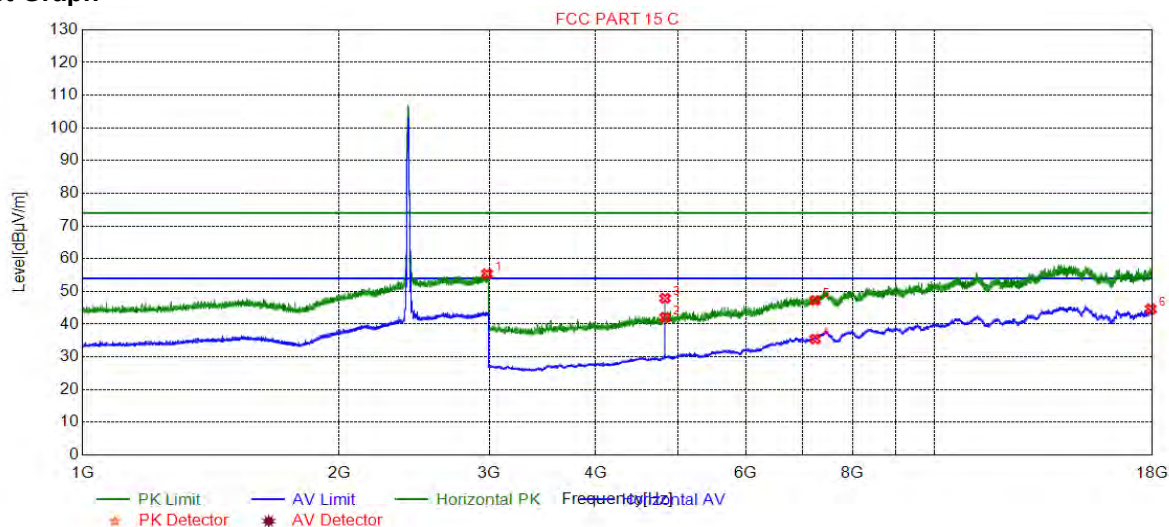
Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	38.7317	14.64	-28.75	40.00	25.36	220	229	Horizontal
2	95.5851	16.80	-32.79	43.50	26.70	206	329	Horizontal
3	108.9738	16.09	-32.00	43.50	27.41	201	346	Horizontal
4	291.1762	22.37	-28.60	46.00	23.63	111	267	Horizontal
5	729.1218	27.52	-18.82	46.00	18.48	218	360	Horizontal
6	887.2635	27.86	-16.25	46.00	18.14	158	144	Horizontal



4.9.2 Transmitter emission above 1GHz

4.9.2.1 802.11B_Channel 1

Test Graph



Suspected List

Suspected List

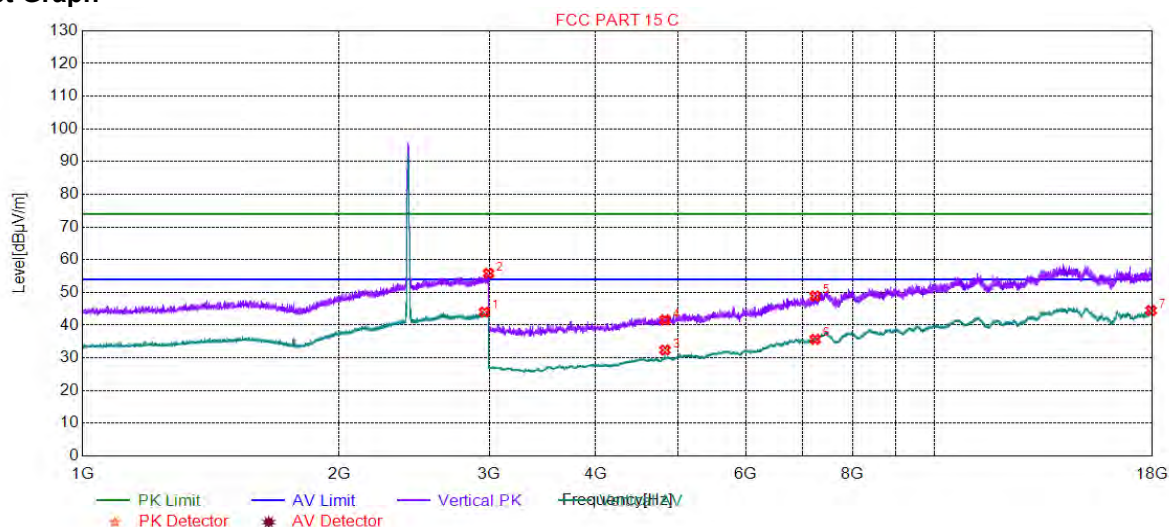
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2982.4956	55.40	9.53	74.00	18.60	128	238	Horizontal
2	4824.0000	42.09	-18.21	54.00	11.91	110	45	Horizontal
3	4824.0000	47.94	-18.21	74.00	26.06	130	347	Horizontal
4	7236.0000	35.47	-9.76	54.00	18.53	220	292	Horizontal
5	7236.0000	47.27	-9.76	74.00	26.73	117	265	Horizontal
6	17918.9919	44.64	-1.30	54.00	9.36	231	182	Horizontal

Final Data List



4.9.2.2 802.11B_Channel 1

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2960.9902	44.02	9.63	54.00	9.98	203	123	Vertical
2	2994.9988	55.85	9.47	74.00	18.15	247	2	Vertical
3	4824.0000	32.39	-18.21	54.00	21.61	287	12	Vertical
4	4824.0000	41.61	-18.21	74.00	32.39	253	259	Vertical
5	7236.0000	48.92	-9.76	74.00	25.08	259	67	Vertical
6	7236.0000	35.68	-9.76	54.00	18.32	243	12	Vertical
7	17930.9931	44.50	-1.30	54.00	9.50	191	67	Vertical

Final Data List

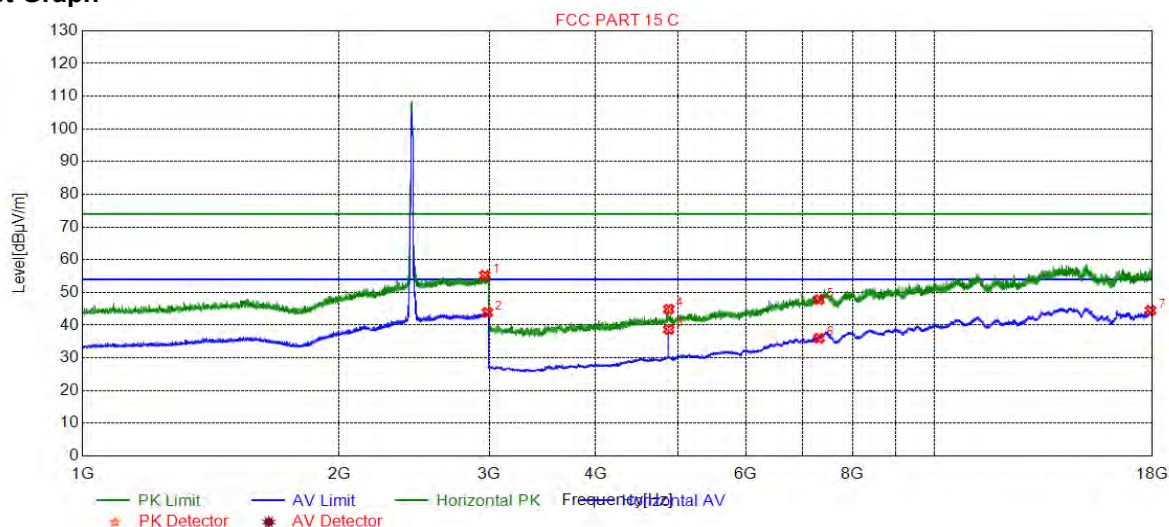


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4.9.2.3 802.11B_Channel 6

Test Graph



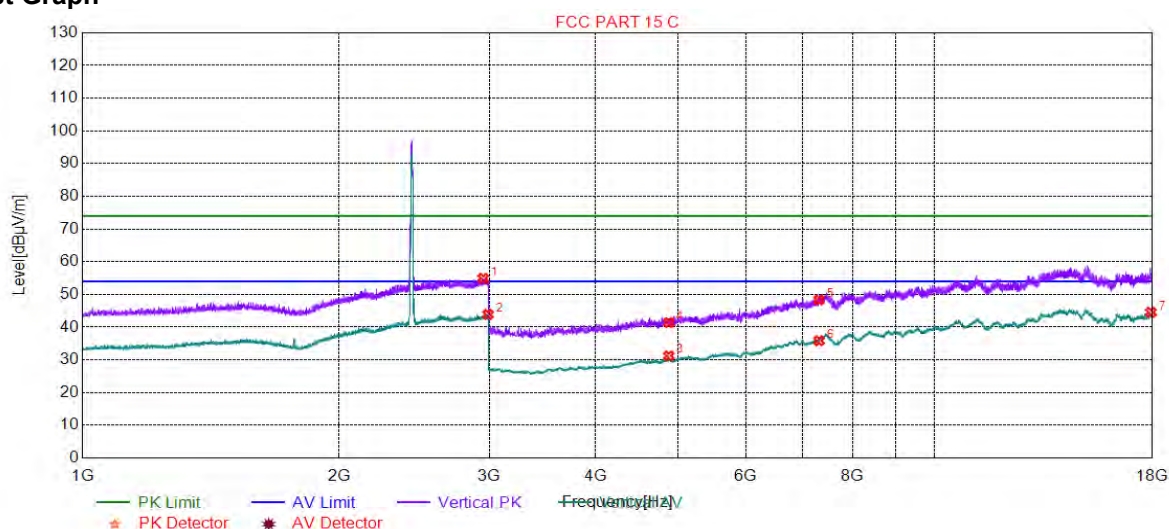
Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2964.9912	55.23	9.61	74.00	18.77	152	32	Horizontal
2	2985.4964	43.91	9.52	54.00	10.09	146	86	Horizontal
3	4874.0000	38.70	-17.99	54.00	15.30	157	360	Horizontal
4	4874.0000	44.89	-17.99	74.00	29.11	130	346	Horizontal
5	7311.0000	47.80	-9.59	74.00	26.20	237	100	Horizontal
6	7311.0000	36.02	-9.59	54.00	17.98	211	209	Horizontal
7	17906.9907	44.51	-1.31	54.00	9.49	199	18	Horizontal

Final Data List

4.9.2.4 802.11B_Channel 6

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2951.9880	54.95	9.67	74.00	19.05	231	342	Vertical
2	2990.4976	43.90	9.49	54.00	10.10	230	342	Vertical
3	4874.0000	31.25	-17.99	54.00	22.75	186	287	Vertical
4	4874.0000	41.41	-17.99	74.00	32.59	209	233	Vertical
5	7311.0000	48.30	-9.59	74.00	25.70	292	41	Vertical
6	7311.0000	35.87	-9.59	54.00	18.13	208	314	Vertical
7	17921.9922	44.55	-1.30	54.00	9.45	214	14	Vertical

Final Data List

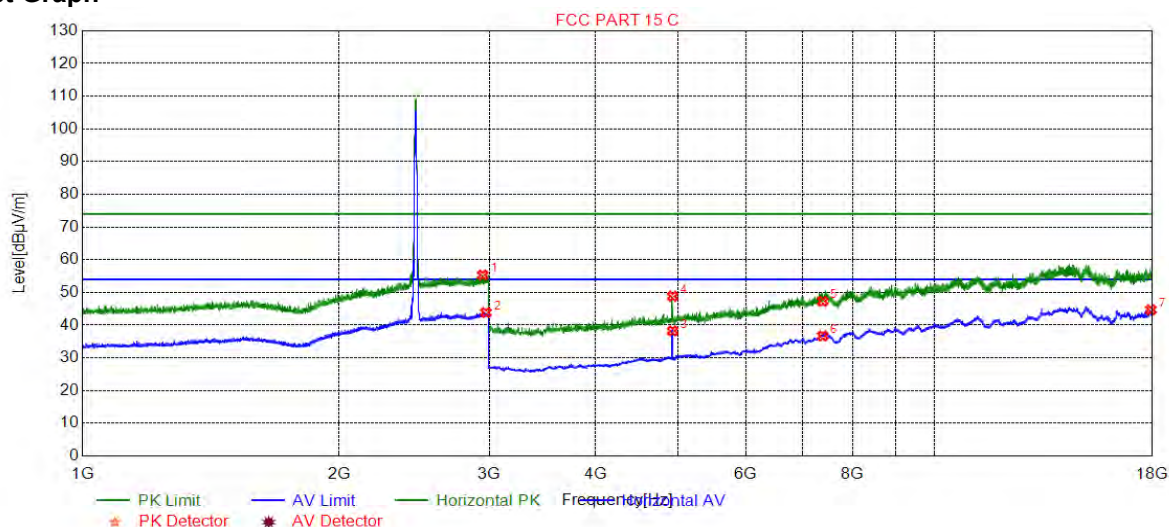


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4.9.2.5 802.11B_Channel 11

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2948.4871	55.34	9.66	74.00	18.66	138	210	Horizontal
2	2973.4934	43.89	9.57	54.00	10.11	204	292	Horizontal
3	4924.0000	38.23	-17.71	54.00	15.77	223	346	Horizontal
4	4924.0000	48.84	-17.71	74.00	25.16	194	360	Horizontal
5	7386.0000	47.30	-9.20	74.00	26.70	115	291	Horizontal
6	7386.0000	36.69	-9.20	54.00	17.31	136	319	Horizontal
7	17920.4920	44.69	-1.30	54.00	9.31	181	155	Horizontal

Final Data List

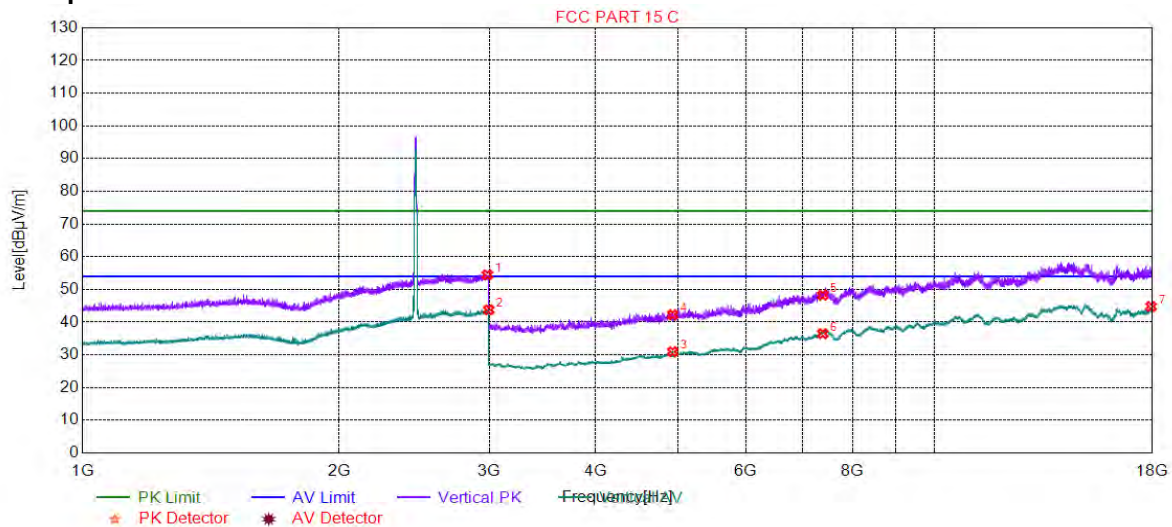


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4.9.2.6 802.11B_Channel 11

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2985.4964	54.50	9.52	74.00	19.50	283	164	Vertical
2	2995.9990	43.78	9.47	54.00	10.22	202	315	Vertical
3	4924.0000	30.98	-17.71	54.00	23.02	177	205	Vertical
4	4924.0000	42.27	-17.71	74.00	31.73	260	178	Vertical
5	7386.0000	48.27	-9.20	74.00	25.73	277	288	Vertical
6	7386.0000	36.49	-9.20	54.00	17.51	208	314	Vertical
7	17930.9931	44.78	-1.30	54.00	9.22	264	68	Vertical

Final Data List



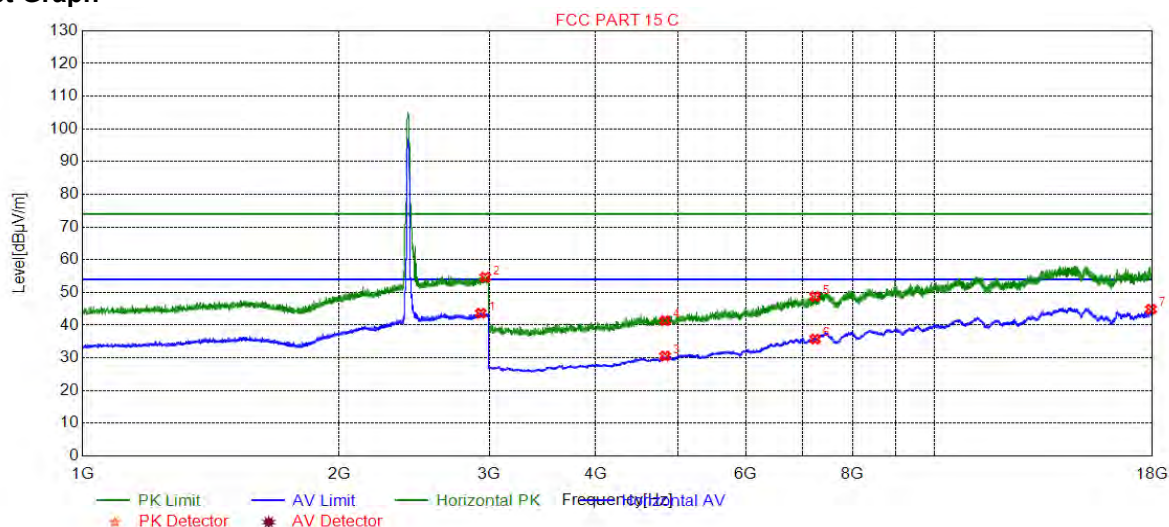
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4.9.2.7 802.11G_Channel 1

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2932.4831	43.65	9.49	54.00	10.35	189	358	Horizontal
2	2968.4921	54.68	9.59	74.00	19.32	133	183	Horizontal
3	4824.0000	30.57	-18.21	54.00	23.43	200	45	Horizontal
4	4824.0000	41.37	-18.21	74.00	32.63	144	73	Horizontal
5	7236.0000	48.74	-9.76	74.00	25.26	145	210	Horizontal
6	7236.0000	35.75	-9.76	54.00	18.25	143	348	Horizontal
7	17924.9925	44.89	-1.30	54.00	9.11	161	45	Horizontal

Final Data List



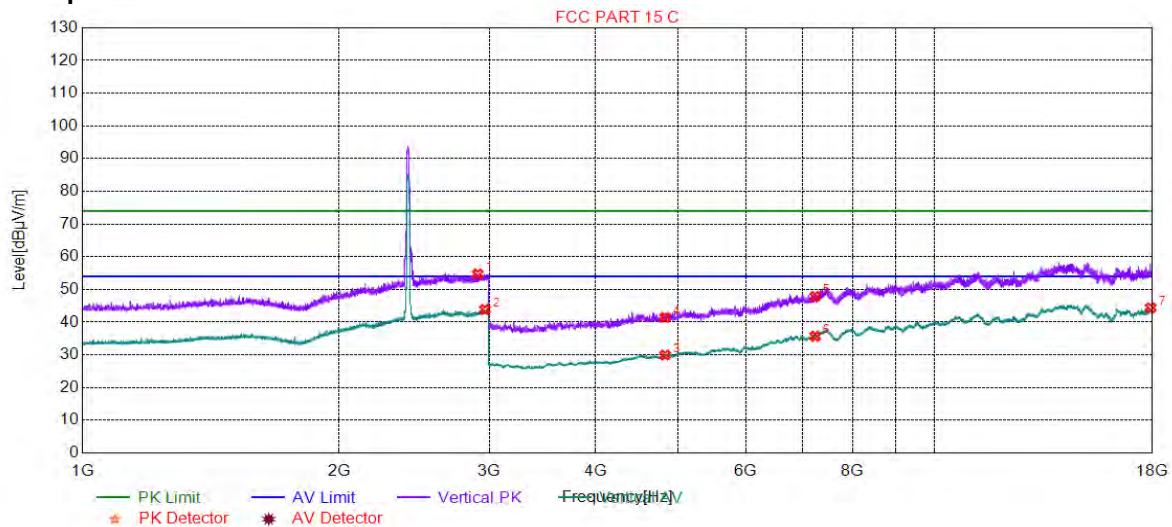
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4.9.2.8 802.11G_Channel 1

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2908.4771	54.74	9.23	74.00	19.26	282	261	Vertical
2	2964.9912	43.91	9.61	54.00	10.09	299	28	Vertical
3	4824.0000	29.97	-18.21	54.00	24.03	290	233	Vertical
4	4824.0000	41.45	-18.21	74.00	32.55	157	14	Vertical
5	7236.0000	47.89	-9.76	74.00	26.11	159	14	Vertical
6	7236.0000	35.71	-9.76	54.00	18.29	211	41	Vertical
7	17915.9916	44.42	-1.31	54.00	9.58	277	68	Vertical

Final Data List



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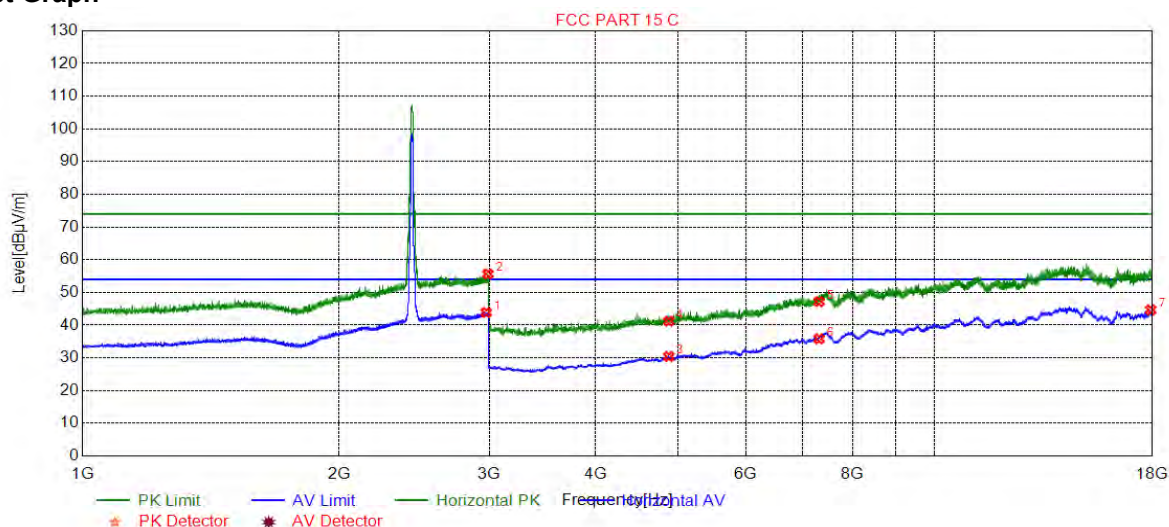
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4.9.2.9 802.11G_Channel 6

Test Graph



Suspected List

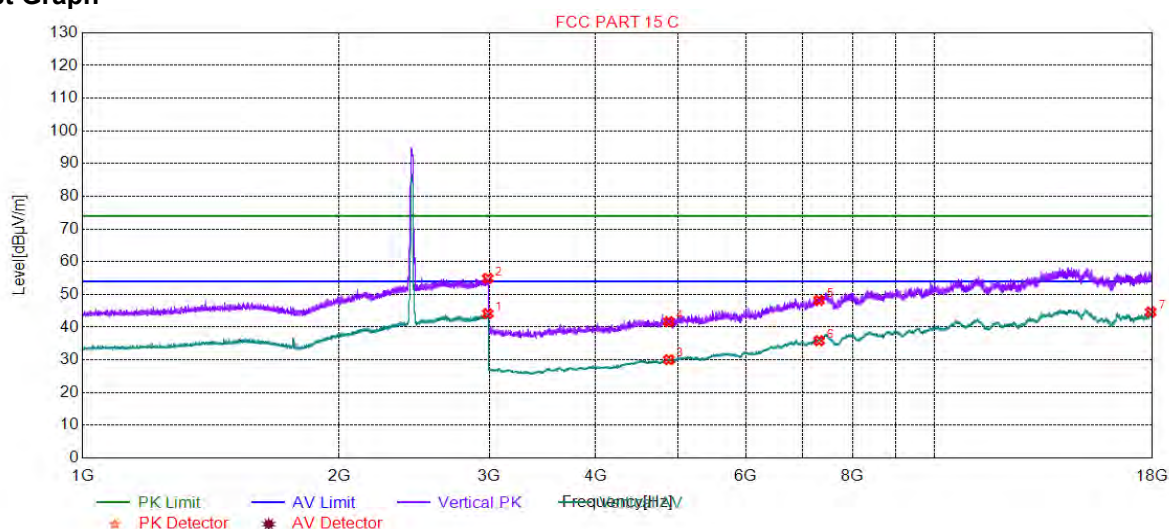
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2975.9940	43.91	9.56	54.00	10.09	282	261	Horizontal
2	2989.9975	55.66	9.50	74.00	18.34	299	28	Horizontal
3	4874.0000	30.43	-17.99	54.00	23.57	290	233	Horizontal
4	4874.0000	41.22	-17.99	74.00	32.78	157	14	Horizontal
5	7311.0000	47.20	-9.59	74.00	26.80	159	14	Horizontal
6	7311.0000	35.83	-9.59	54.00	18.17	211	41	Horizontal
7	17917.4917	44.66	-1.30	54.00	9.34	277	68	Horizontal

Final Data List



4.9.2.10 802.11G_Channel 6

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2987.9970	44.17	9.51	54.00	9.83	245	123	Vertical
2	2988.4971	54.94	9.50	74.00	19.06	204	246	Vertical
3	4874.0000	30.05	-17.99	54.00	23.95	159	260	Vertical
4	4874.0000	41.69	-17.99	74.00	32.31	175	123	Vertical
5	7311.0000	48.21	-9.59	74.00	25.79	224	260	Vertical
6	7311.0000	35.86	-9.59	54.00	18.14	176	233	Vertical
7	17915.9916	44.65	-1.31	54.00	9.35	159	178	Vertical

Final Data List

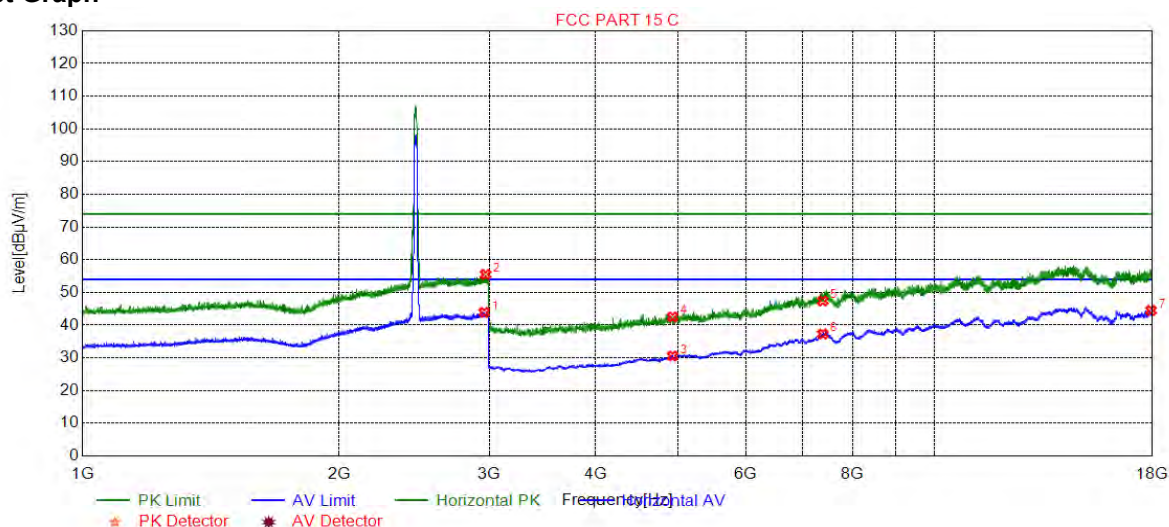


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4.9.2.11 802.11G_Channel 11

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2959.4899	43.92	9.64	54.00	10.08	144	46	Horizontal
2	2970.4926	55.51	9.59	74.00	18.49	125	156	Horizontal
3	4924.0000	30.59	-17.71	54.00	23.41	129	45	Horizontal
4	4924.0000	42.53	-17.71	74.00	31.47	142	45	Horizontal
5	7386.0000	47.41	-9.20	74.00	26.59	209	72	Horizontal
6	7386.0000	37.30	-9.20	54.00	16.70	185	182	Horizontal
7	17929.4929	44.52	-1.30	54.00	9.48	105	182	Horizontal

Final Data List

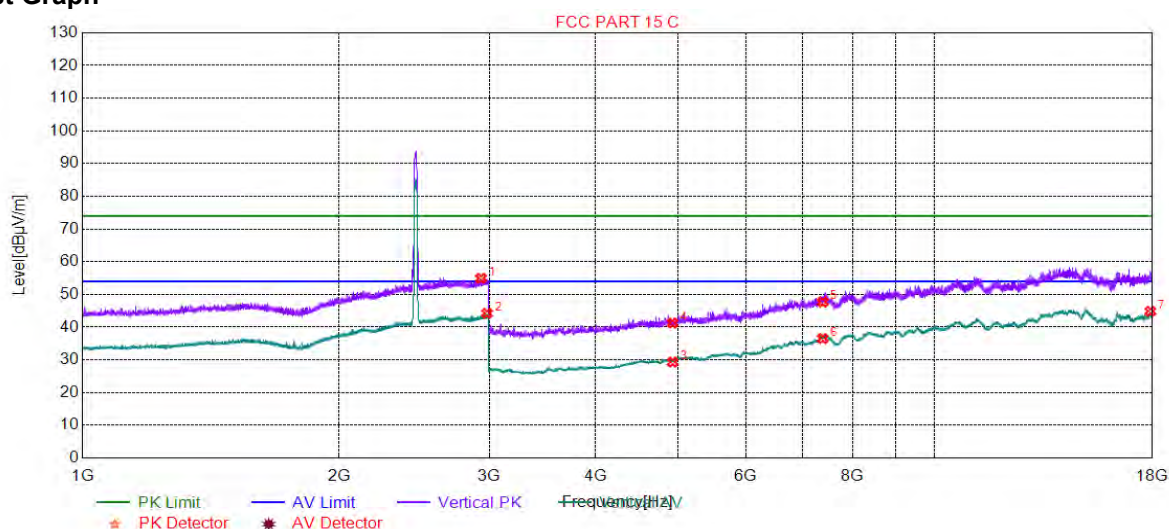


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4.9.2.12 802.11G_Channel 11

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2933.9835	54.94	9.51	74.00	19.06	280	260	Vertical
2	2982.4956	44.24	9.53	54.00	9.76	296	246	Vertical
3	4924.0000	29.33	-17.71	54.00	24.67	298	287	Vertical
4	4924.0000	41.25	-17.71	74.00	32.75	163	14	Vertical
5	7386.0000	47.69	-9.20	74.00	26.31	225	287	Vertical
6	7386.0000	36.52	-9.20	54.00	17.48	185	287	Vertical
7	17899.4899	44.86	-1.32	54.00	9.14	160	260	Vertical

Final Data List

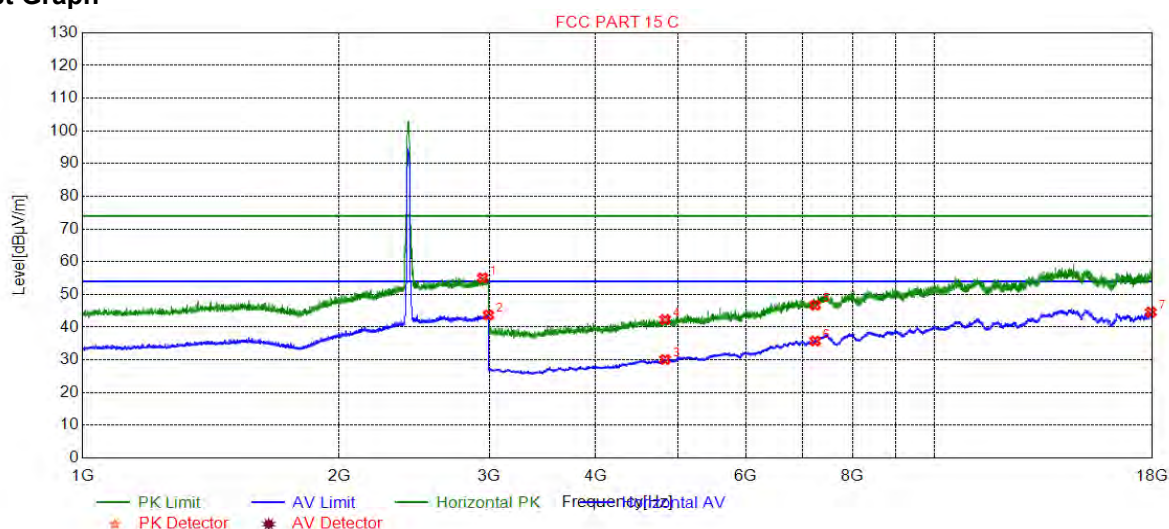


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4.9.2.13 802.11N20_Channel 1

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2947.4869	55.10	9.65	74.00	18.90	224	360	Horizontal
2	2993.9985	43.70	9.48	54.00	10.30	161	114	Horizontal
3	4824.0000	30.13	-18.21	54.00	23.87	218	18	Horizontal
4	4824.0000	42.31	-18.21	74.00	31.69	193	210	Horizontal
5	7236.0000	46.71	-9.76	74.00	27.29	228	46	Horizontal
6	7236.0000	35.77	-9.76	54.00	18.23	152	360	Horizontal
7	17918.9919	44.61	-1.30	54.00	9.39	224	46	Horizontal

Final Data List

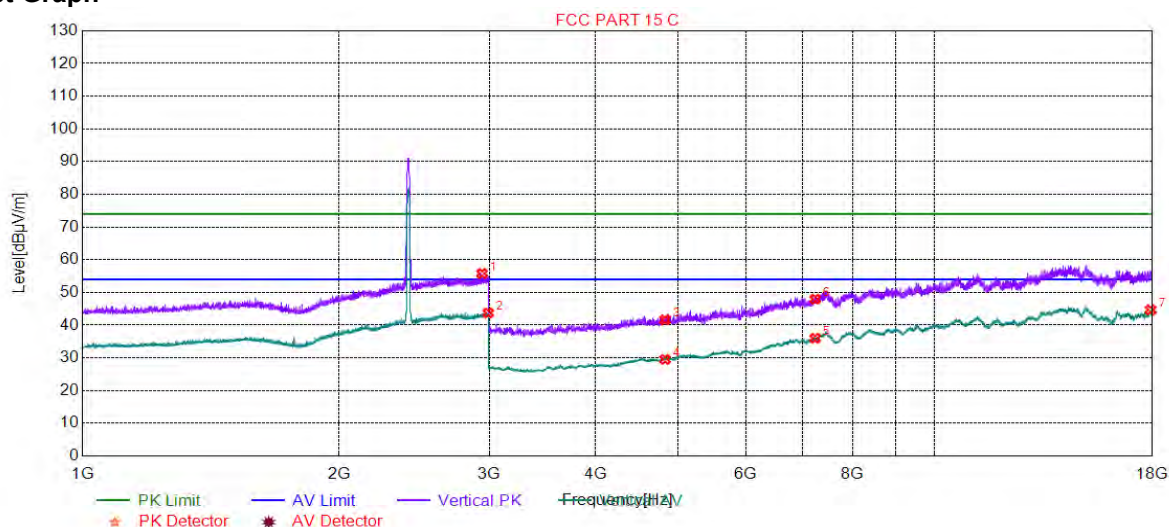


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4.9.2.14 802.11N20_Channel 1

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2941.9855	55.83	9.59	74.00	18.17	289	302	Vertical
2	2991.4979	43.74	9.49	54.00	10.26	204	302	Vertical
3	4824.0000	41.65	-18.21	74.00	32.35	177	315	Vertical
4	4824.0000	29.54	-18.21	54.00	24.46	216	315	Vertical
5	7236.0000	36.01	-9.76	54.00	17.99	208	233	Vertical
6	7236.0000	47.98	-9.76	74.00	26.02	242	178	Vertical
7	17911.4911	44.68	-1.31	54.00	9.32	171	40	Vertical

Final Data List



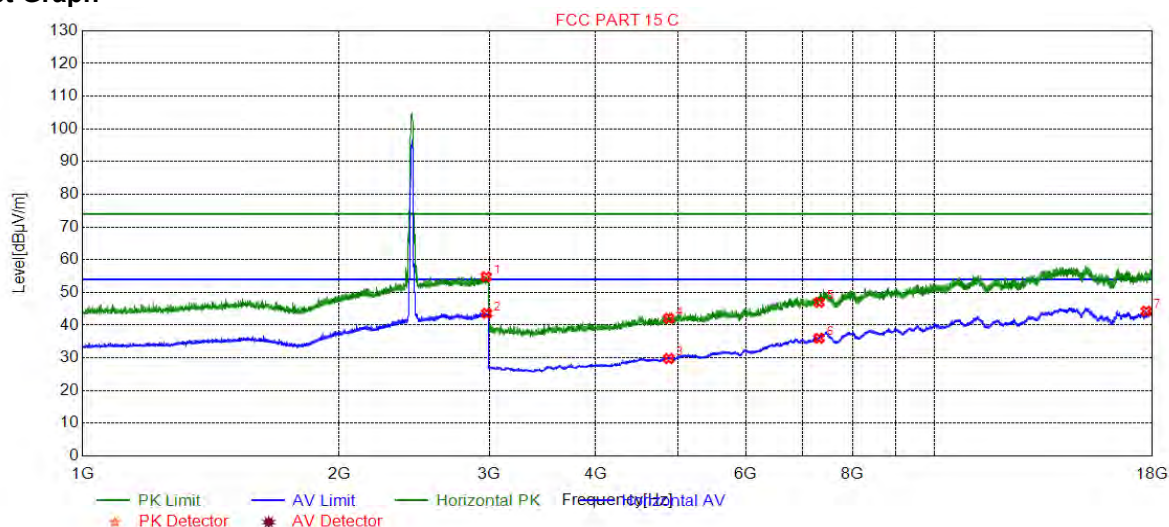
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4.9.2.15 802.11N20_Channel 6

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2975.4939	54.82	9.56	74.00	19.18	168	58	Horizontal
2	2979.9950	43.63	9.54	54.00	10.37	225	141	Horizontal
3	4874.0000	29.79	-17.99	54.00	24.21	198	360	Horizontal
4	4874.0000	42.12	-17.99	74.00	31.88	155	100	Horizontal
5	7311.0000	46.97	-9.59	74.00	27.03	225	317	Horizontal
6	7311.0000	36.01	-9.59	54.00	17.99	186	262	Horizontal
7	17701.4701	44.30	-0.67	54.00	9.70	181	73	Horizontal

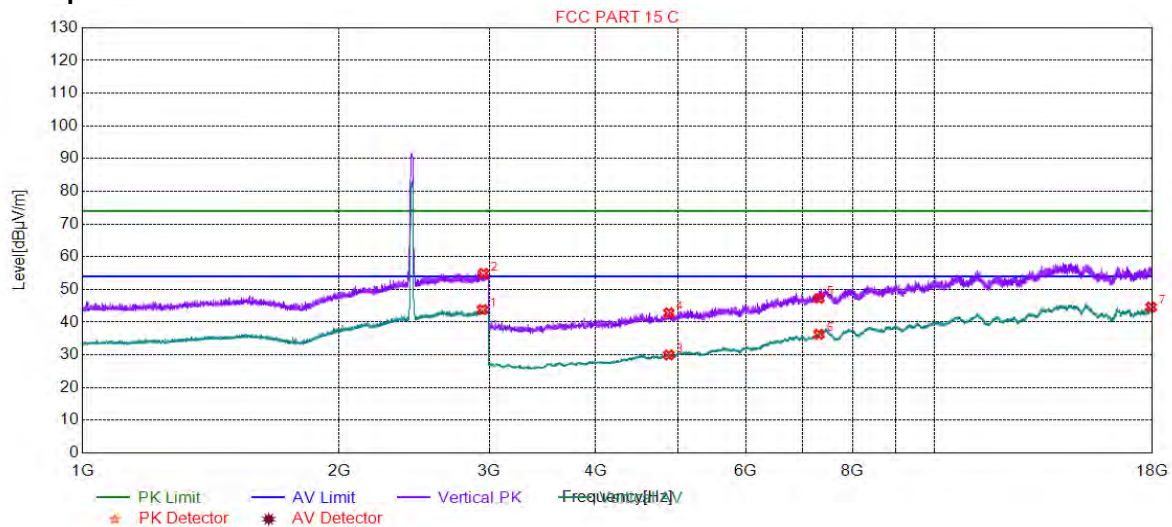
Final Data List





4.9.2.16 802.11N20_Channel 6

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2945.9865	43.86	9.64	54.00	10.14	153	328	Vertical
2	2953.9885	54.91	9.66	74.00	19.09	158	342	Vertical
3	4874.0000	29.96	-17.99	54.00	24.04	274	68	Vertical
4	4874.0000	42.84	-17.99	74.00	31.16	207	96	Vertical
5	7311.0000	47.29	-9.59	74.00	26.71	244	260	Vertical
6	7311.0000	36.29	-9.59	54.00	17.71	167	178	Vertical
7	17935.4935	44.62	-1.30	54.00	9.38	271	260	Vertical

Final Data List

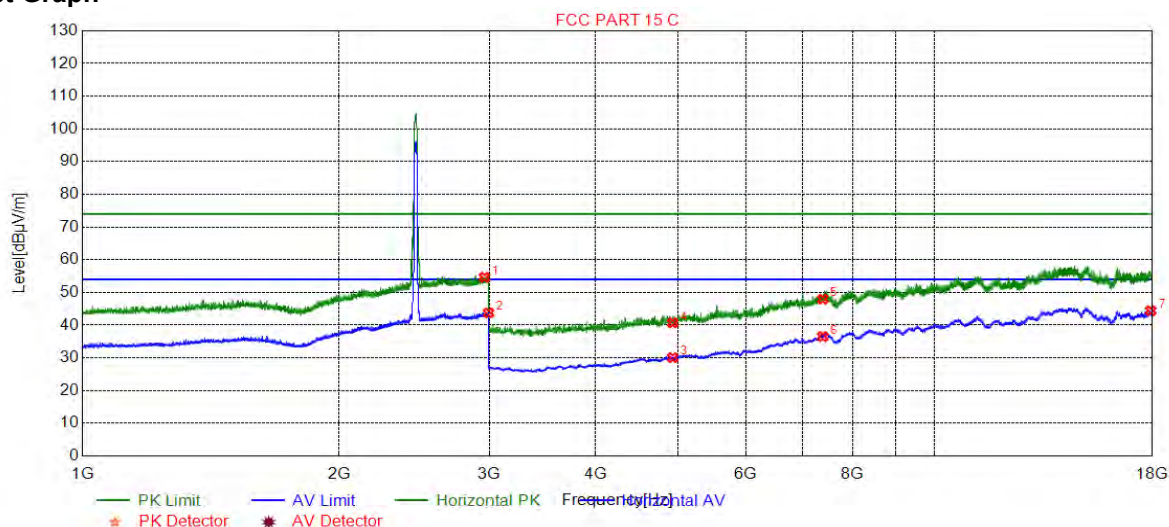


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4.9.2.17 802.11N20_Channel 11

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2961.9905	54.66	9.62	74.00	19.34	170	346	Horizontal
2	2995.4989	43.78	9.47	54.00	10.22	203	101	Horizontal
3	4924.0000	30.11	-17.71	54.00	23.89	175	18	Horizontal
4	4924.0000	40.71	-17.71	74.00	33.29	155	184	Horizontal
5	7386.0000	47.96	-9.20	74.00	26.04	149	184	Horizontal
6	7386.0000	36.52	-9.20	54.00	17.48	123	18	Horizontal
7	17915.9916	44.42	-1.31	54.00	9.58	157	266	Horizontal

Final Data List



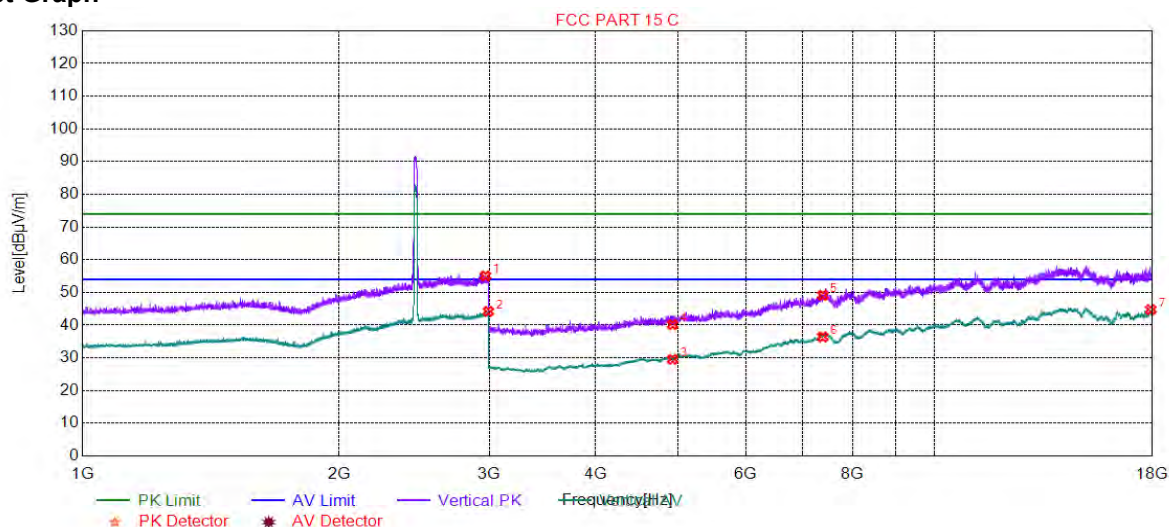
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4.9.2.18 802.11N20_Channel 11

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2970.4926	55.08	9.59	74.00	18.92	151	12	Vertical
2	2992.9983	44.23	9.48	54.00	9.77	174	288	Vertical
3	4924.0000	29.54	-17.71	54.00	24.46	254	342	Vertical
4	4924.0000	40.17	-17.71	74.00	33.83	202	315	Vertical
5	7386.0000	49.17	-9.20	74.00	24.83	279	123	Vertical
6	7386.0000	36.41	-9.20	54.00	17.59	284	96	Vertical
7	17918.9919	44.75	-1.30	54.00	9.25	166	14	Vertical

Final Data List



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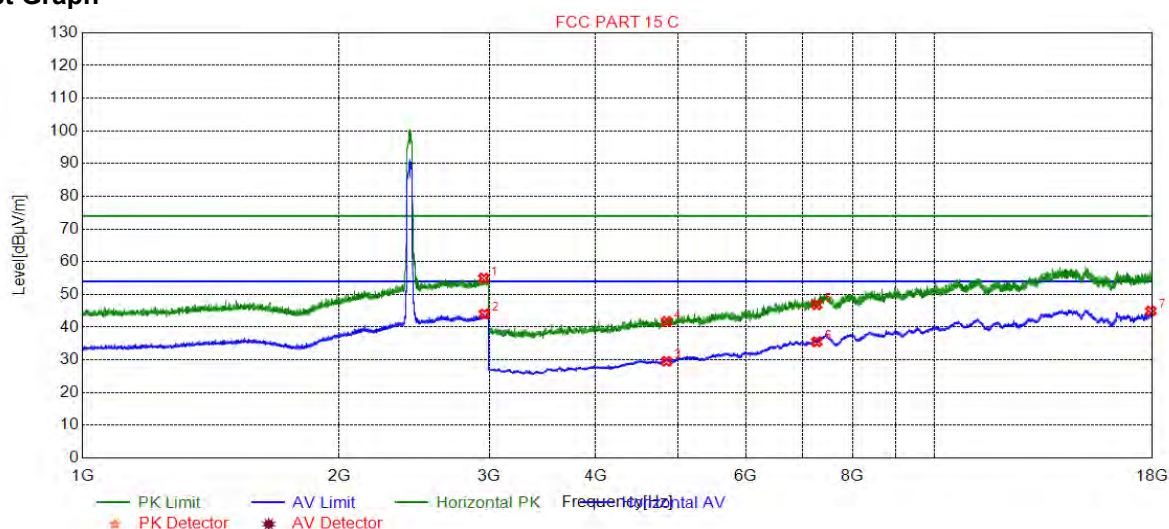
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4.9.2.19 802.11N40_Channel 3

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2955.9890	54.97	9.65	74.00	19.03	247	305	Horizontal
2	2960.9902	44.03	9.63	54.00	9.97	159	141	Horizontal
3	4844.0000	29.57	-18.12	54.00	24.43	141	209	Horizontal
4	4844.0000	41.77	-18.12	74.00	32.23	137	101	Horizontal
5	7266.0000	46.87	-9.71	74.00	27.13	130	263	Horizontal
6	7266.0000	35.55	-9.71	54.00	18.45	226	317	Horizontal
7	17915.9916	44.96	-1.31	54.00	9.04	111	18	Horizontal

Final Data List



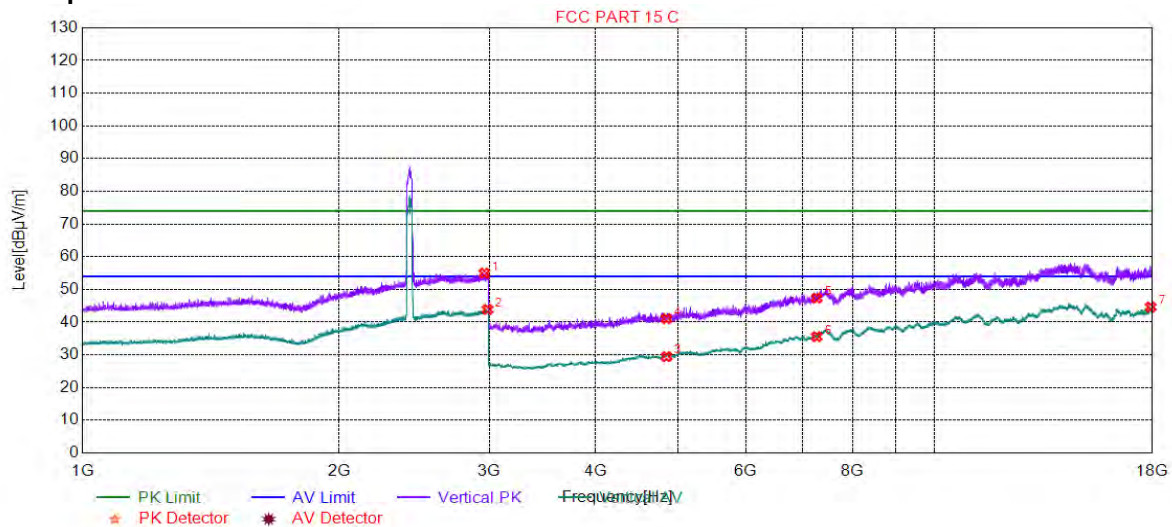
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4.9.2.20 802.11N40_Channel 3

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2960.9902	54.98	9.63	74.00	19.02	194	151	Vertical
2	2986.4966	43.88	9.51	54.00	10.12	170	191	Vertical
3	4844.0000	29.46	-18.12	54.00	24.54	202	122	Vertical
4	4844.0000	41.07	-18.12	74.00	32.93	281	314	Vertical
5	7266.0000	47.36	-9.71	74.00	26.64	227	204	Vertical
6	7266.0000	35.59	-9.71	54.00	18.41	172	41	Vertical
7	17915.9916	44.62	-1.31	54.00	9.38	262	204	Vertical

Final Data List

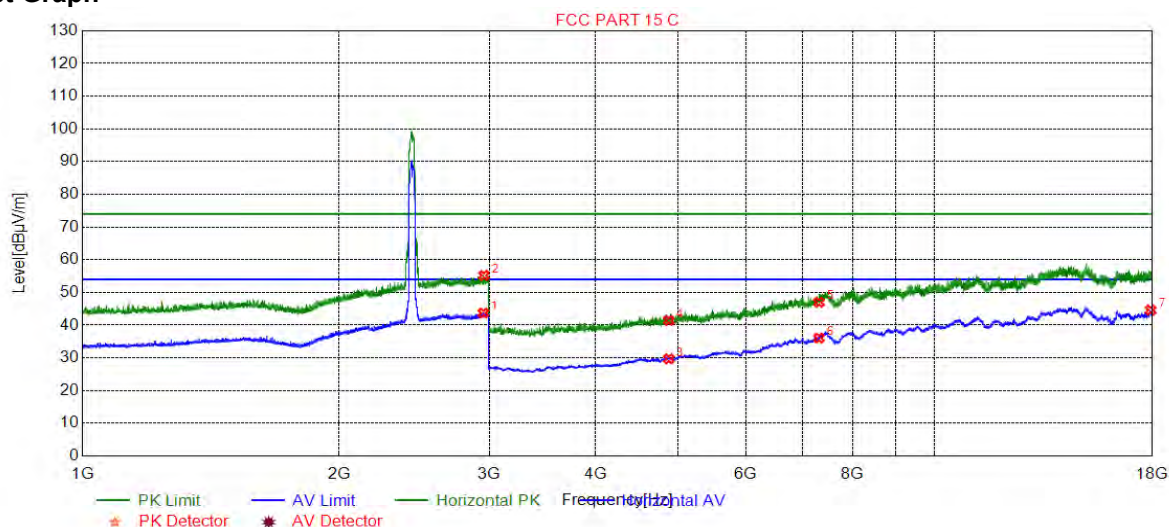


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4.9.2.21 802.11N40_Channel 6

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2952.9882	43.71	9.67	54.00	10.29	140	18	Horizontal
2	2957.4894	55.22	9.65	74.00	18.78	175	86	Horizontal
3	4874.0000	29.70	-17.99	54.00	24.30	170	128	Horizontal
4	4874.0000	41.45	-17.99	74.00	32.55	249	238	Horizontal
5	7311.0000	47.00	-9.59	74.00	27.00	177	183	Horizontal
6	7311.0000	36.06	-9.59	54.00	17.94	149	238	Horizontal
7	17911.4911	44.63	-1.31	54.00	9.37	181	46	Horizontal

Final Data List

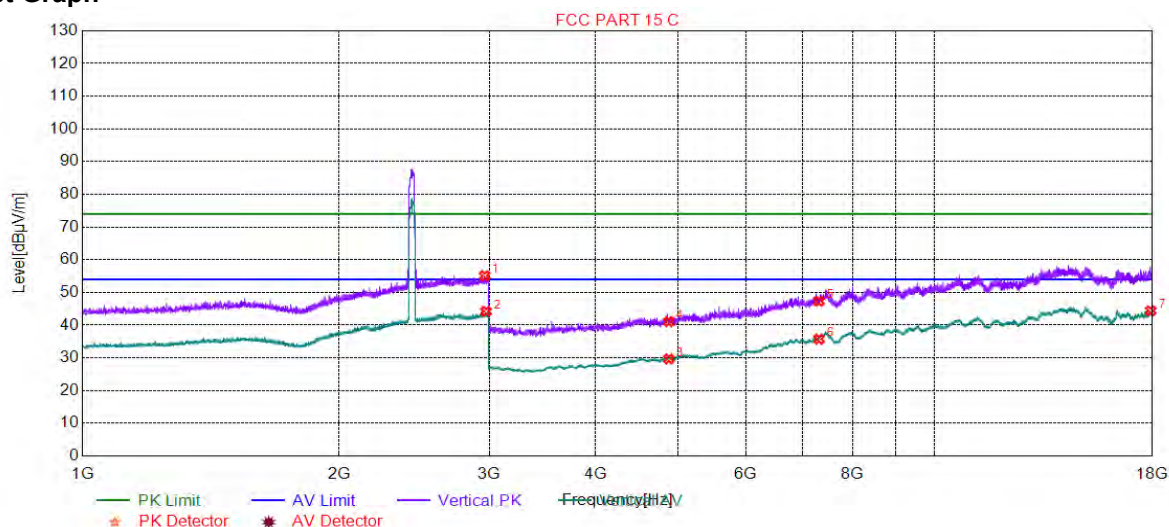


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4.9.2.22 802.11N40_Channel 6

Test Graph



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2963.4909	55.14	9.62	74.00	18.86	276	316	Vertical
2	2974.4936	44.24	9.57	54.00	9.76	280	12	Vertical
3	4874.0000	29.69	-17.99	54.00	24.31	221	261	Vertical
4	4874.0000	41.06	-17.99	74.00	32.94	270	96	Vertical
5	7311.0000	47.32	-9.59	74.00	26.68	281	0	Vertical
6	7311.0000	35.74	-9.59	54.00	18.26	222	342	Vertical
7	17915.9916	44.42	-1.31	54.00	9.58	154	178	Vertical

Final Data List



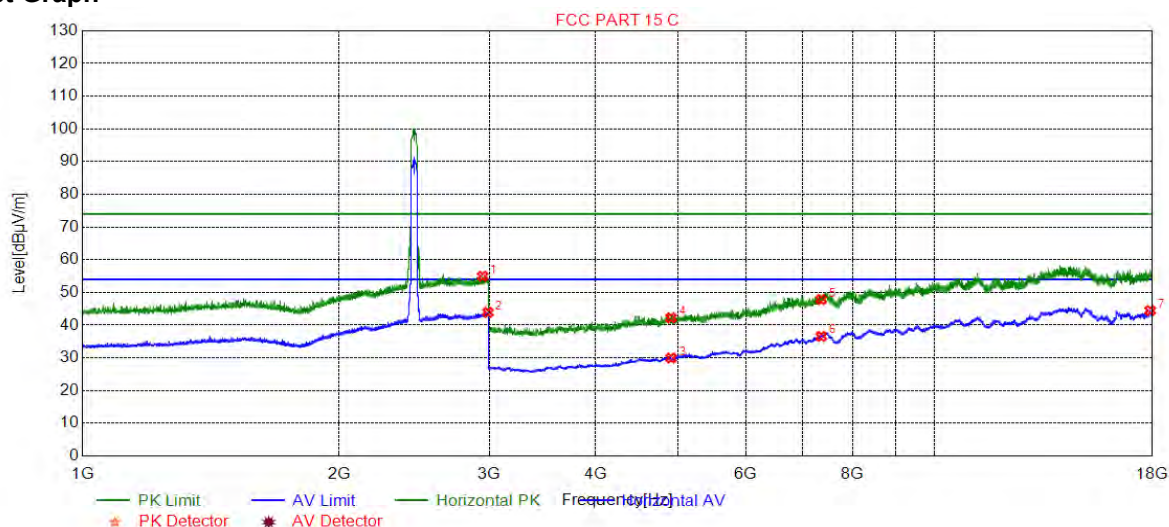
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4.9.2.23 802.11N40_Channel 9

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2946.9867	54.96	9.65	74.00	19.04	209	169	Horizontal
2	2989.4974	43.93	9.50	54.00	10.07	101	334	Horizontal
3	4904.0000	29.95	-17.84	54.00	24.05	240	293	Horizontal
4	4904.0000	42.25	-17.84	74.00	31.75	237	238	Horizontal
5	7356.0000	47.82	-9.36	74.00	26.18	131	18	Horizontal
6	7356.0000	36.57	-9.36	54.00	17.43	246	238	Horizontal
7	17890.4890	44.49	-1.44	54.00	9.51	227	128	Horizontal

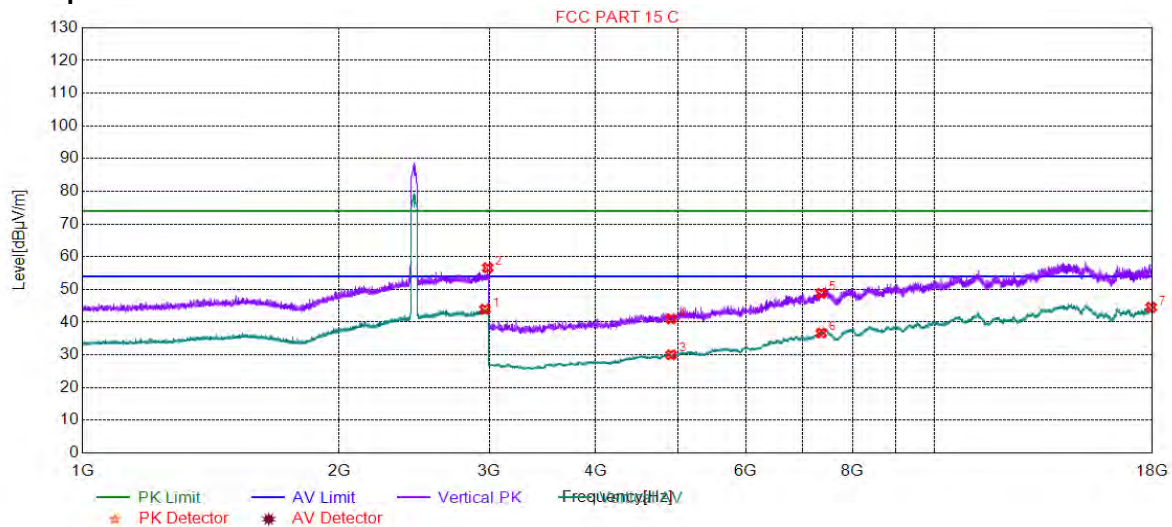
Final Data List





4.9.2.24 802.11N40_Channel 9

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2965.4914	43.95	9.61	54.00	10.05	251	233	Vertical
2	2987.9970	56.64	9.51	74.00	17.36	232	274	Vertical
3	4904.0000	30.02	-17.84	54.00	23.98	216	123	Vertical
4	4904.0000	40.99	-17.84	74.00	33.01	222	342	Vertical
5	7356.0000	48.80	-9.36	74.00	25.20	241	40	Vertical
6	7356.0000	36.70	-9.36	54.00	17.30	236	12	Vertical
7	17930.9931	44.54	-1.30	54.00	9.46	264	233	Vertical

Final Data List



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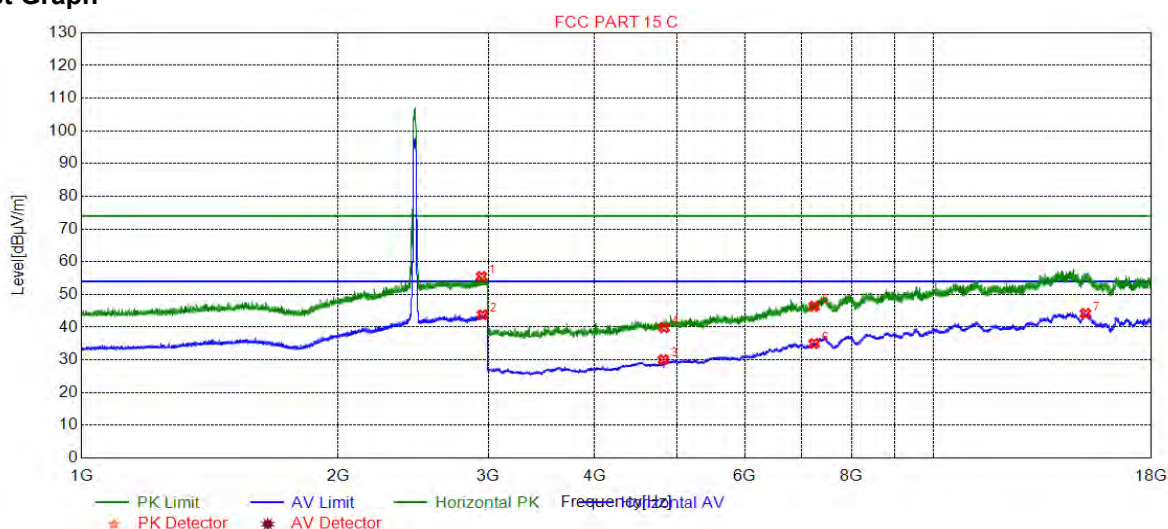


Test on the worst case:

4.9.1 Transmitter emission above 1GHz

4.9.1.1 802.11B_Channel 11

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2946.48	55.48	9.64	74.00	18.52	145	236	Horizontal
2	2954.48	43.79	9.66	54.00	10.21	119	318	Horizontal
3	4816.68	30.07	-18.25	54.00	23.93	115	155	Horizontal
4	4824.00	39.85	-18.21	74.00	34.15	234	45	Horizontal
5	7236.00	46.38	-9.76	74.00	27.62	124	263	Horizontal
6	7236.00	35.01	-9.76	54.00	18.99	225	345	Horizontal
7	15058.2	44.21	2.65	54.00	9.79	109	18	Horizontal

Final Data List



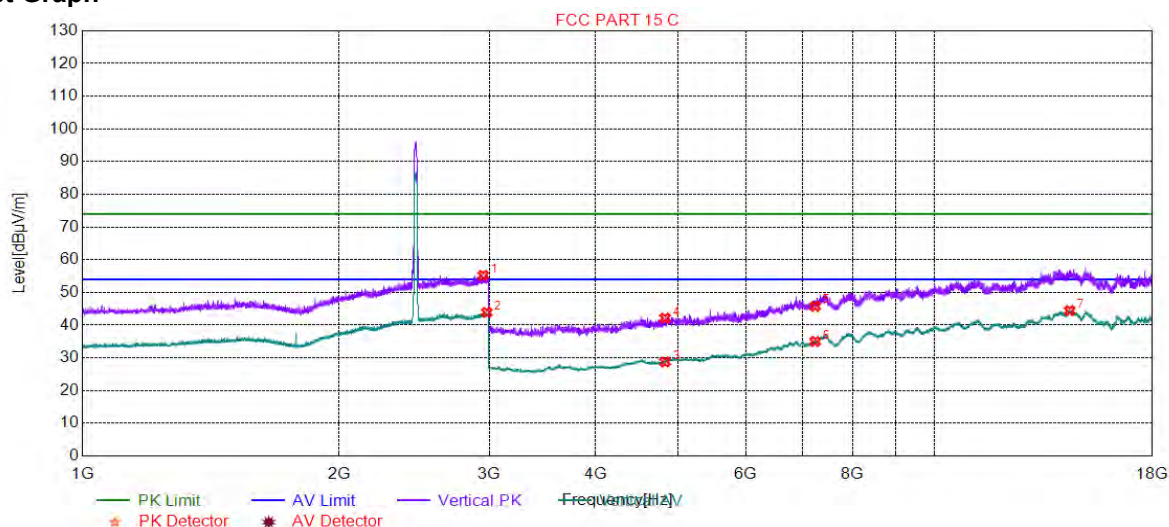
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4.9.1.2 802.11B_Channel 11

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2951.48	55.24	9.67	74.00	18.76	232	111	Vertical
2	2980.99	43.92	9.54	54.00	10.08	239	179	Vertical
3	4824.00	28.78	-18.21	54.00	25.22	201	42	Vertical
4	4824.00	42.18	-18.21	74.00	31.82	169	178	Vertical
5	7236.00	45.79	-9.76	74.00	28.21	216	97	Vertical
6	7236.00	35.03	-9.76	54.00	18.97	262	42	Vertical
7	14393.6	44.45	2.76	54.00	9.55	279	287	Vertical

Final Data List

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 between 9KHz to 30MHz and 18GHz to 25GHz was very low, and the above harmonics were the highest point could be found when testing, 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.
- 4) All Modes have been tested, but only the worst case data displayed in this report.



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4.10 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 or 10m (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:			

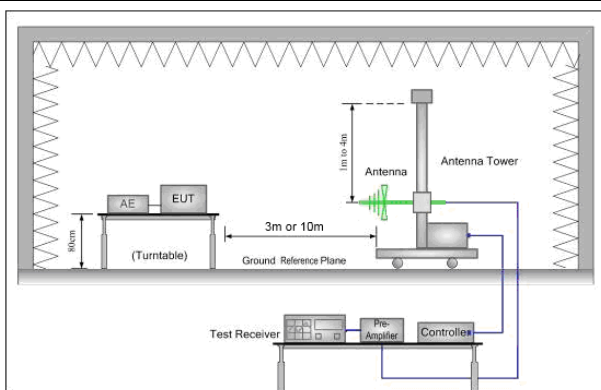


Figure 1. 30MHz to 1GHz

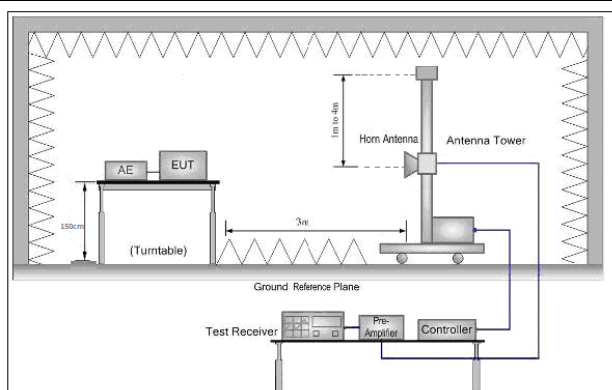


Figure 2. Above 1 GHz



Test Procedure:	a. 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 camber. 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 semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. c. 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. 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. Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Charge +Transmitting 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 6 for details
Test Results:	Pass



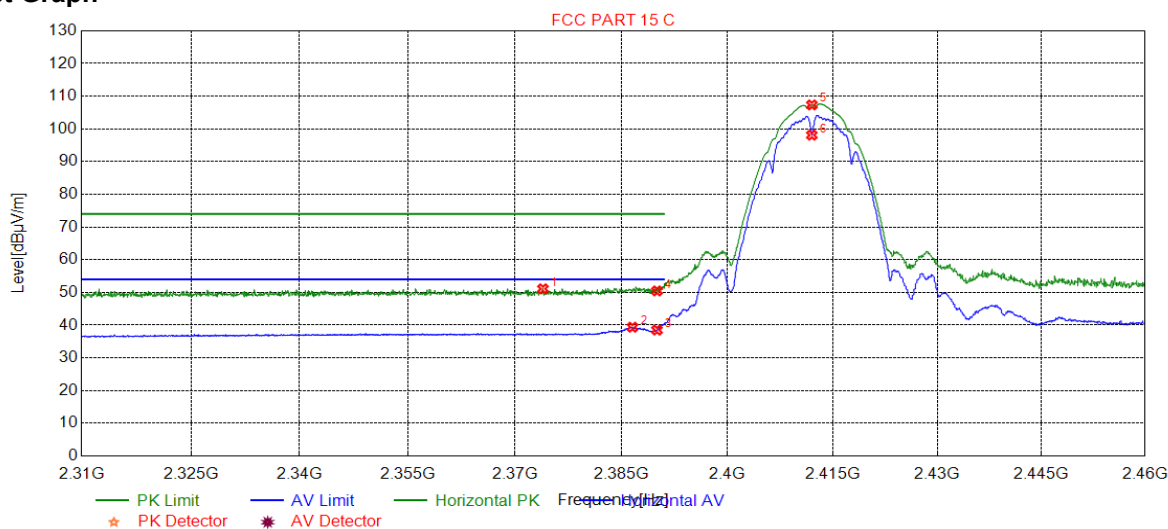


Test plot as follows:

4.10.1 Test Plots

4.10.1.1 802.11B_Channel 1

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2373.9320	51.12	7.79	74.00	22.88	146	283	Horizontal
2	2386.5383	39.39	7.77	54.00	14.61	204	200	Horizontal
3	2390.0000	38.51	7.77	54.00	15.49	221	200	Horizontal
4	2390.0000	50.48	7.77	74.00	23.52	149	222	Horizontal
5	2412.0000	107.35	7.81	0.00	-107.35	248	200	Horizontal
6	2412.0000	98.11	7.81	0.00	-98.11	155	200	Horizontal

Final Data List



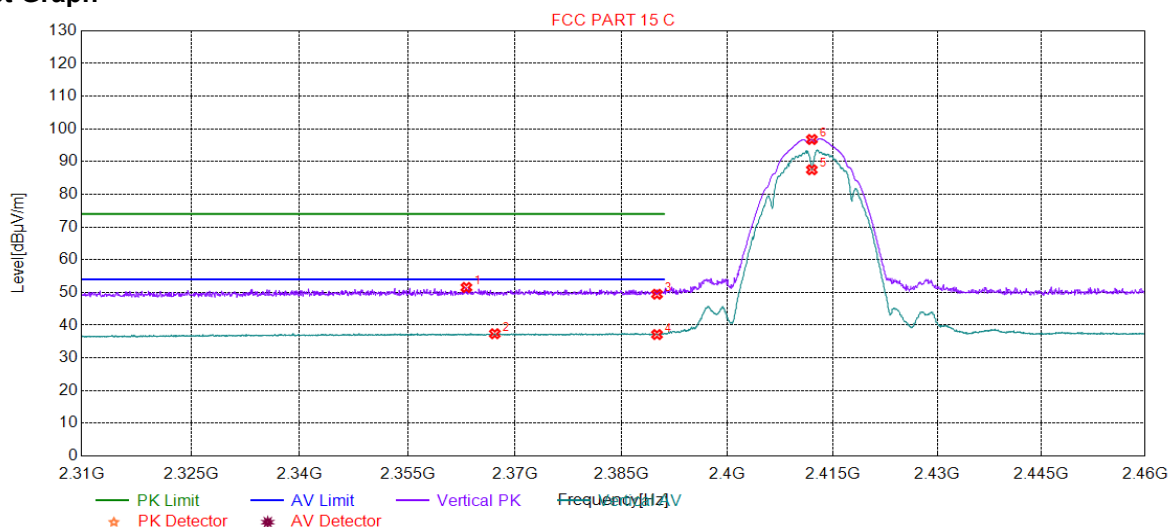
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4.10.1.2 802.11B_Channel 1

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2363.2016	51.54	7.80	74.00	22.46	226	49	Vertical
2	2367.1786	37.39	7.79	54.00	16.61	161	204	Vertical
3	2390.0000	49.47	7.77	74.00	24.53	175	176	Vertical
4	2390.0000	37.14	7.77	54.00	16.86	217	215	Vertical
5	2412.0000	87.51	7.81	0.00	-87.51	250	325	Vertical
6	2412.0000	96.78	7.81	0.00	-96.78	238	325	Vertical

Final Data List



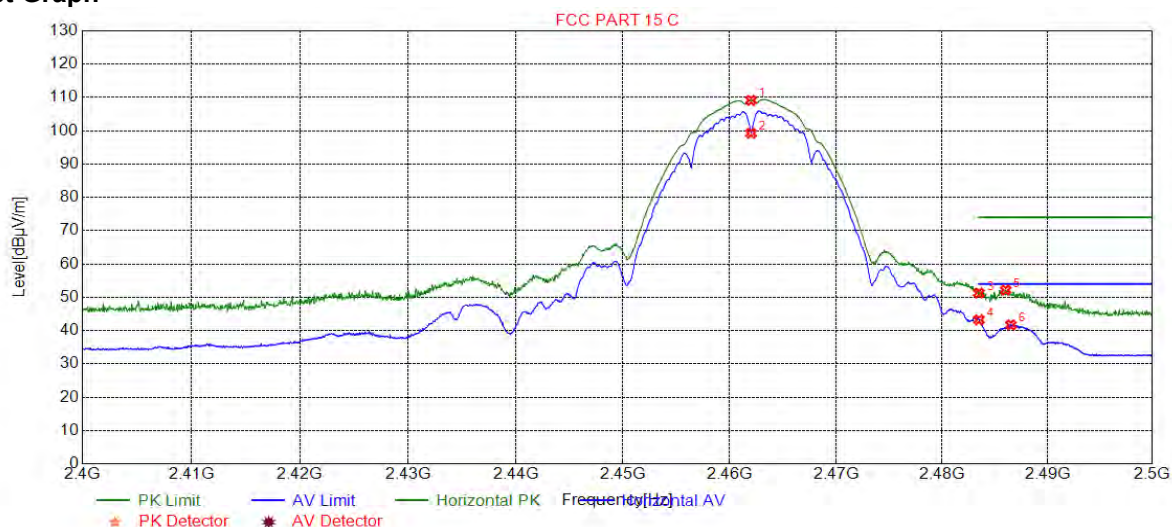
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4.10.1.3 802.11B_Channel 11

Test Graph



Suspected List

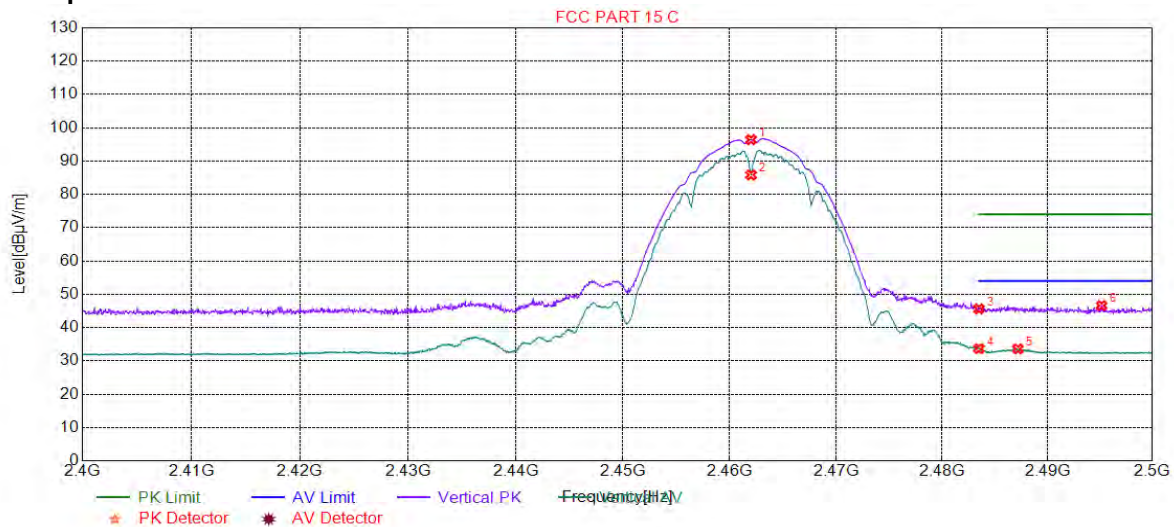
Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.0000	109.15	7.98	0.00	-109.15	192	216	Horizontal
2	2462.0000	99.26	7.98	0.00	-99.26	228	216	Horizontal
3	2483.5000	51.30	8.01	74.00	22.70	144	199	Horizontal
4	2483.5000	43.25	8.01	54.00	10.75	160	221	Horizontal
5	2486.0430	52.18	8.01	74.00	21.82	215	216	Horizontal
6	2486.5433	41.74	8.01	54.00	12.26	201	216	Horizontal

Final Data List



4.10.1.4 802.11B_Channel 11

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.0000	96.42	7.98	0.00	-96.42	248	325	Vertical
2	2462.0000	85.84	7.98	0.00	-85.84	294	325	Vertical
3	2483.5000	45.65	8.01	74.00	28.35	151	88	Vertical
4	2483.5000	33.70	8.01	54.00	20.30	263	1	Vertical
5	2487.1936	33.63	8.01	54.00	20.37	264	1	Vertical
6	2495.1476	46.65	8.02	74.00	27.35	195	204	Vertical

Final Data List



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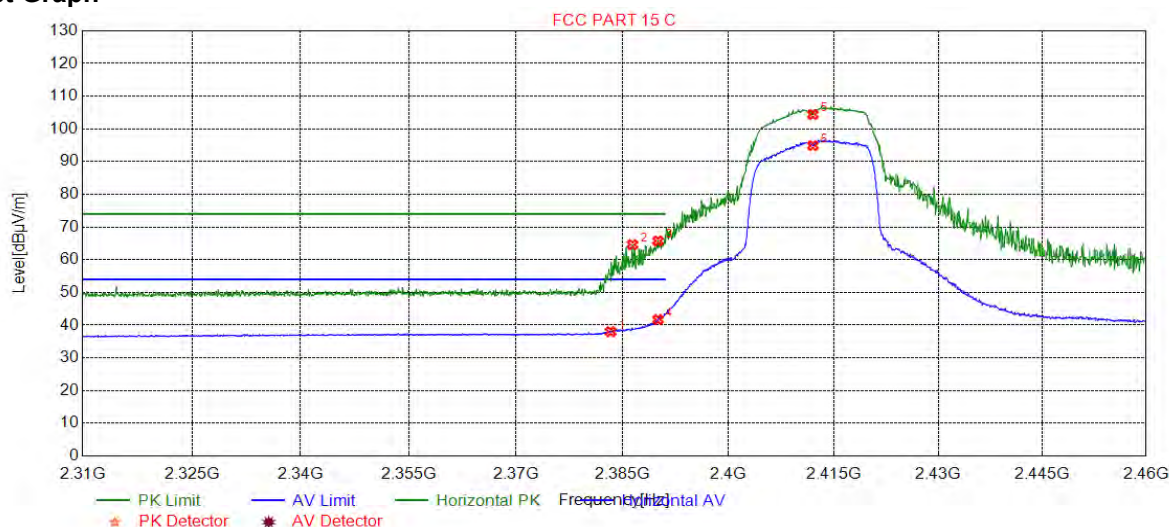
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4.10.1.5 802.11G_Channel 1

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2383.3117	38.03	7.78	54.00	15.97	118	209	Horizontal
2	2386.3882	64.64	7.77	74.00	9.36	196	198	Horizontal
3	2390.0000	65.78	7.77	74.00	8.22	105	209	Horizontal
4	2390.0000	41.71	7.77	54.00	12.29	139	198	Horizontal
5	2412.0000	104.40	7.81	0.00	-104.40	172	220	Horizontal
6	2412.0000	94.92	7.81	0.00	-94.92	107	215	Horizontal

Final Data List



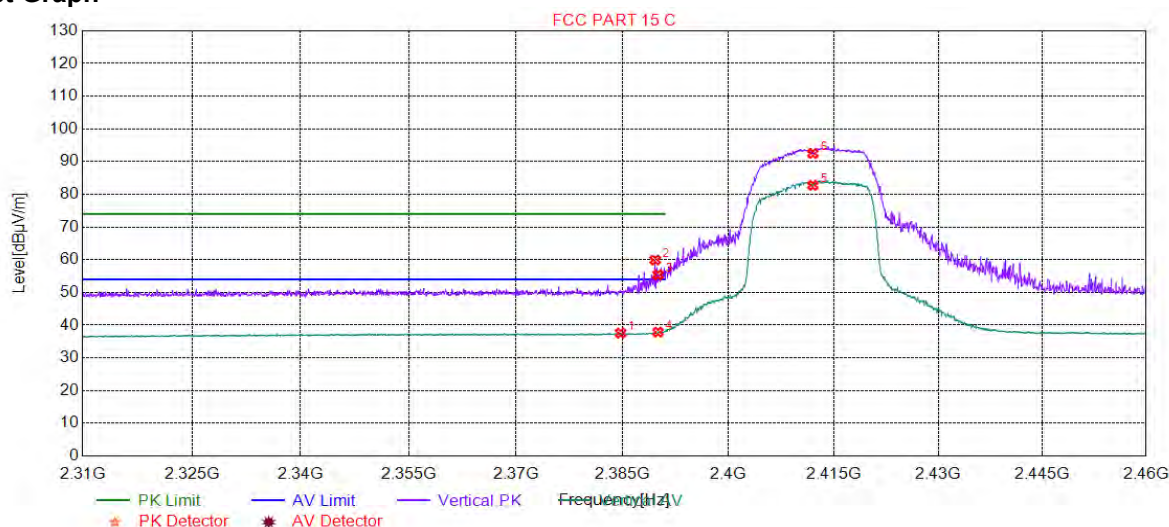
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4.10.1.6 802.11G_Channel 1

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2384.7374	37.58	7.78	54.00	16.42	180	308	Vertical
2	2389.6148	59.95	7.77	74.00	14.05	157	43	Vertical
3	2390.0000	55.41	7.77	74.00	18.59	157	65	Vertical
4	2390.0000	37.90	7.77	54.00	16.10	261	308	Vertical
5	2412.0000	82.75	7.81	0.00	-82.75	239	286	Vertical
6	2412.0000	92.51	7.81	0.00	-92.51	154	314	Vertical

Final Data List



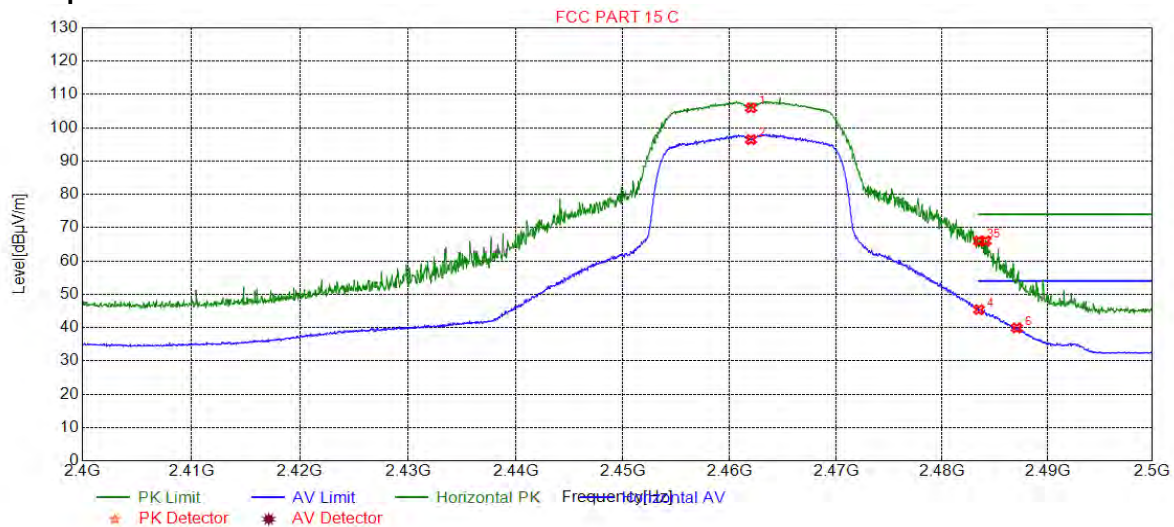
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4.10.1.7 802.11G_Channel 11

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.0000	105.96	7.98	0.00	-105.96	232	216	Horizontal
2	2462.0000	96.44	7.98	0.00	-96.44	186	222	Horizontal
3	2483.5000	66.05	8.01	74.00	7.95	164	222	Horizontal
4	2483.5000	45.40	8.01	54.00	8.60	138	216	Horizontal
5	2484.1421	66.02	8.01	74.00	7.98	147	216	Horizontal
6	2487.0935	39.92	8.01	54.00	14.08	191	216	Horizontal

Final Data List



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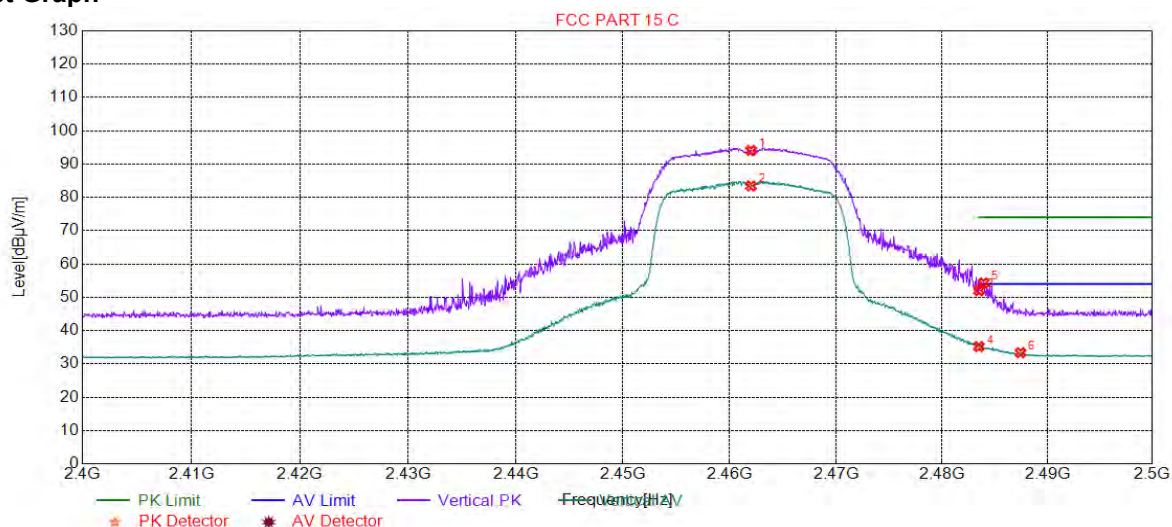
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4.10.1.8 802.11G_Channel 11

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.0000	94.08	7.98	0.00	-94.08	185	303	Vertical
2	2462.0000	83.43	7.98	0.00	-83.43	264	303	Vertical
3	2483.5000	52.01	8.01	74.00	21.99	183	297	Vertical
4	2483.5000	35.21	8.01	54.00	18.79	296	0	Vertical
5	2483.9420	54.32	8.01	74.00	19.68	264	3	Vertical
6	2487.4437	33.38	8.01	54.00	20.62	183	0	Vertical

Final Data List



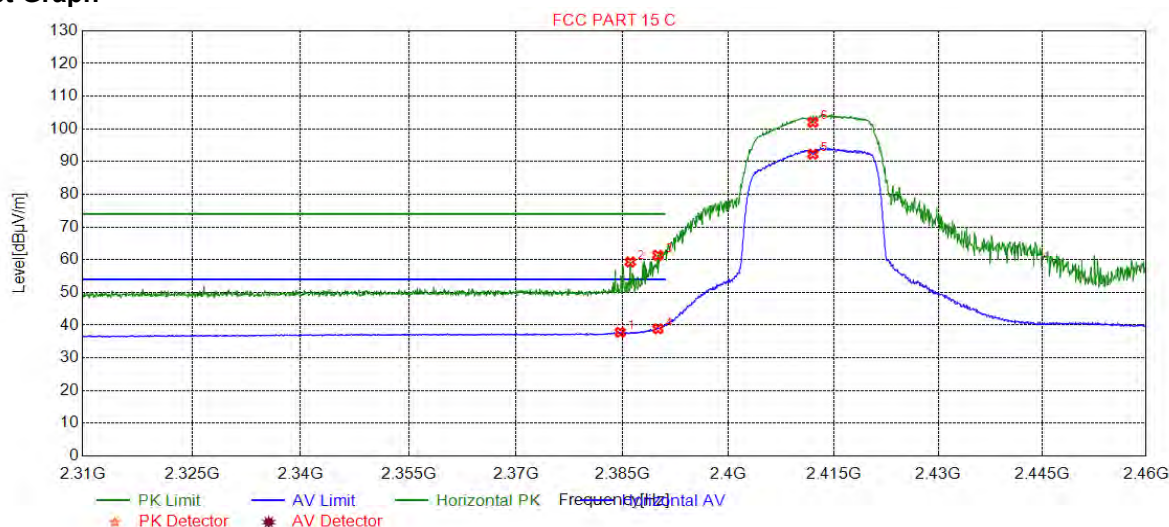
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4.10.1.9 802.11N20_Channel 1

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2384.6623	37.83	7.78	54.00	16.17	101	199	Horizontal
2	2386.0880	59.33	7.77	74.00	14.67	114	260	Horizontal
3	2389.9900	61.37	7.77	74.00	12.63	201	67	Horizontal
4	2390.0000	38.90	7.77	54.00	15.10	228	199	Horizontal
5	2412.0000	92.26	7.81	0.00	-92.26	165	216	Horizontal
6	2412.0000	102.00	7.81	0.00	-102.00	239	221	Horizontal

Final Data List



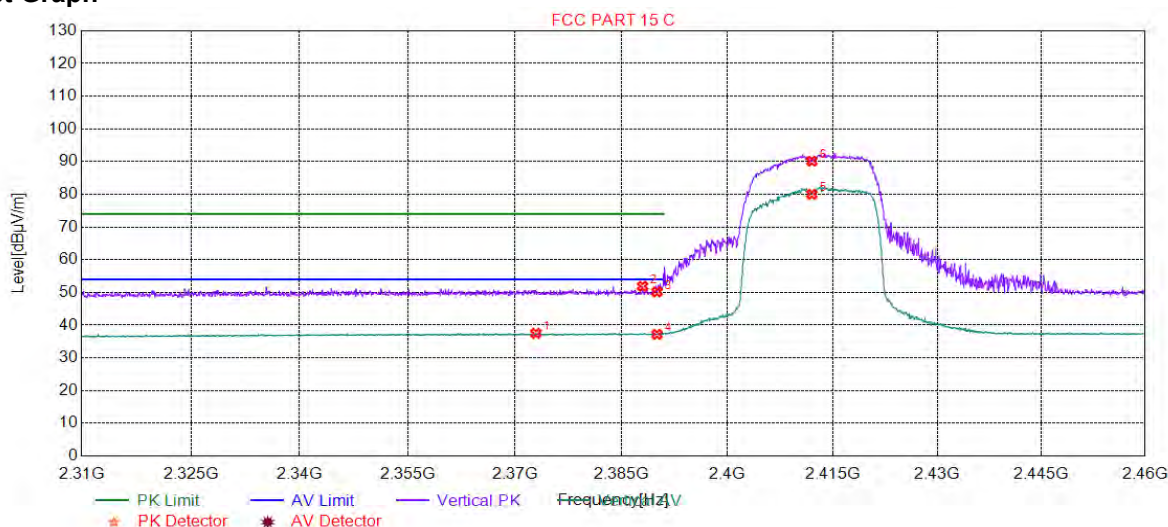
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4.10.1.10 802.11N20_Channel 1

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2372.9565	37.51	7.79	54.00	16.49	278	116	Vertical
2	2387.9640	51.90	7.77	74.00	22.10	235	330	Vertical
3	2390.0000	50.17	7.77	74.00	23.83	191	55	Vertical
4	2390.0000	37.20	7.77	54.00	16.80	190	319	Vertical
5	2412.0000	80.00	7.81	0.00	-80.00	218	199	Vertical
6	2412.0000	90.14	7.81	0.00	-90.14	262	199	Vertical

Final Data List



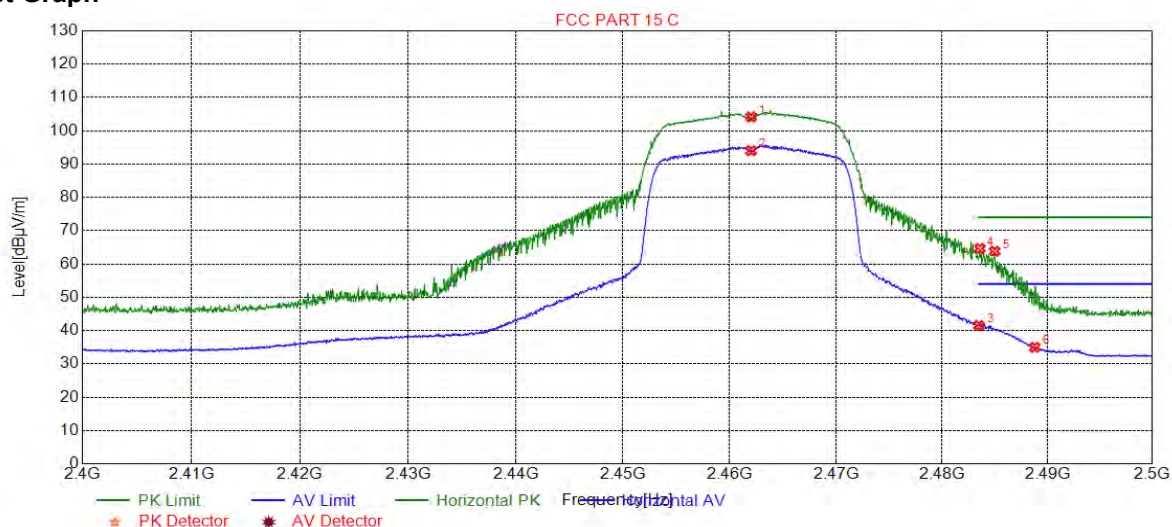
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4.10.1.11 802.11N20_Channel 11

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.0000	104.14	7.98	0.00	-104.14	151	215	Horizontal
2	2462.0000	94.01	7.98	0.00	-94.01	180	215	Horizontal
3	2483.5000	41.53	8.01	54.00	12.47	108	215	Horizontal
4	2483.5918	64.67	8.01	74.00	9.33	150	220	Horizontal
5	2484.9925	63.84	8.01	74.00	10.16	171	215	Horizontal
6	2488.7944	35.00	8.02	54.00	19.00	128	215	Horizontal

Final Data List



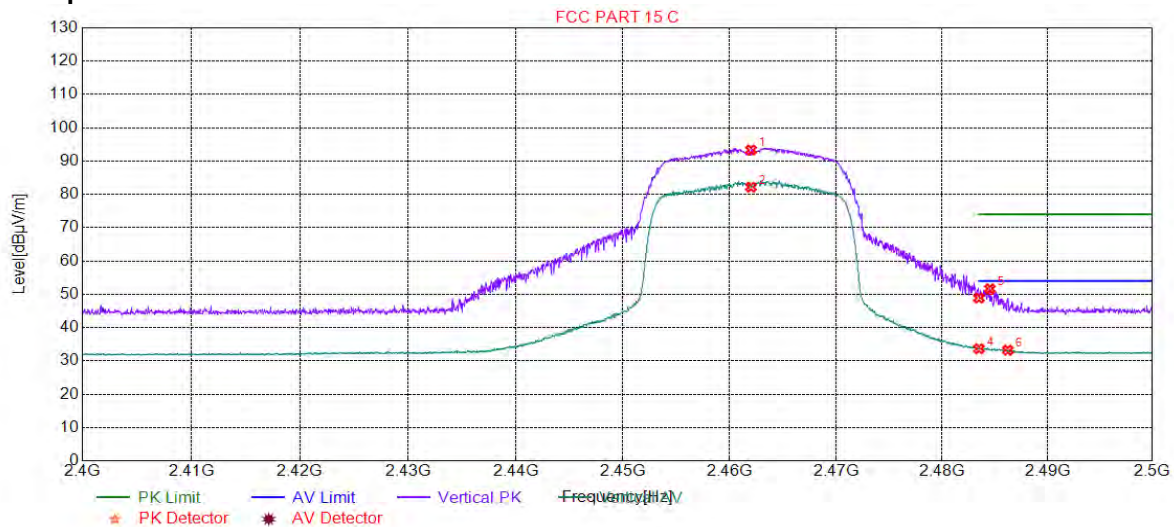
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4.10.1.12 802.11N20_Channel 11

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.0000	93.36	7.98	0.00	-93.36	220	308	Vertical
2	2462.0000	82.20	7.98	0.00	-82.20	199	308	Vertical
3	2483.5000	48.88	8.01	74.00	25.12	283	198	Vertical
4	2483.5000	33.66	8.01	54.00	20.34	192	308	Vertical
5	2484.5423	51.67	8.01	74.00	22.33	255	132	Vertical
6	2486.2431	33.25	8.01	54.00	20.75	150	60	Vertical

Final Data List



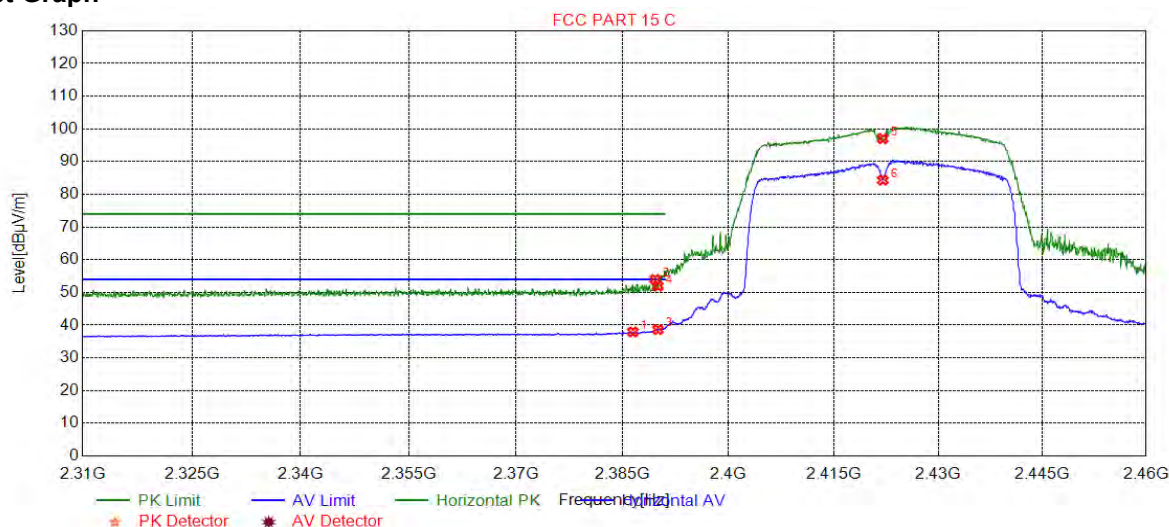
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4.10.1.13 802.11N40_Channel 3

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2386.4632	37.96	7.77	54.00	16.04	210	262	Horizontal
2	2389.6148	54.00	7.77	74.00	20.00	117	213	Horizontal
3	2390.0000	38.65	7.77	54.00	15.35	135	213	Horizontal
4	2390.0000	51.97	7.77	74.00	22.03	233	218	Horizontal
5	2422.0000	97.04	7.85	0.00	-97.04	128	218	Horizontal
6	2422.0000	84.35	7.85	0.00	-84.35	172	213	Horizontal

Final Data List



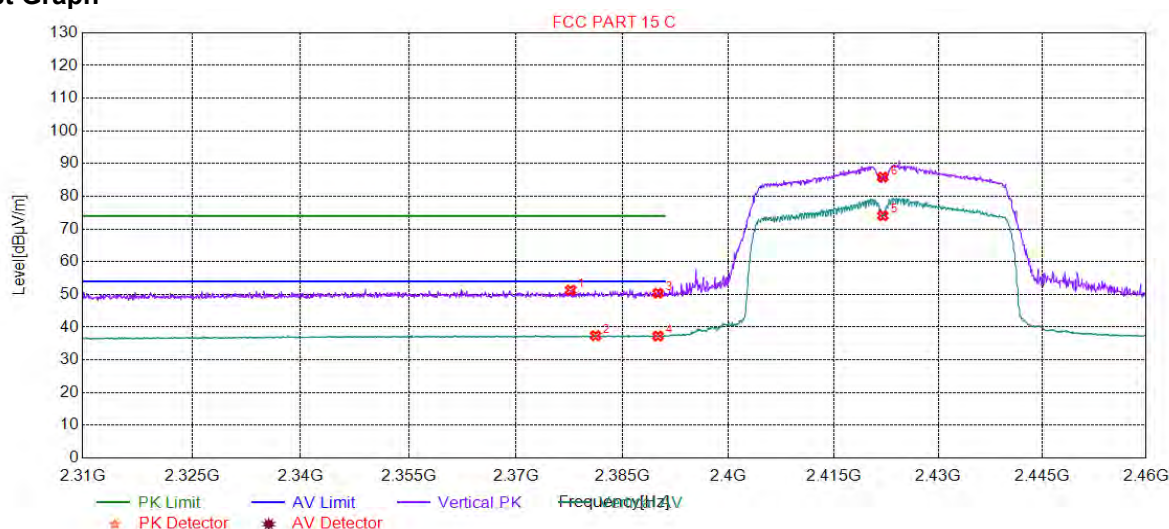
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4.10.1.14 802.11N40_Channel 3

Test Graph



Suspected List

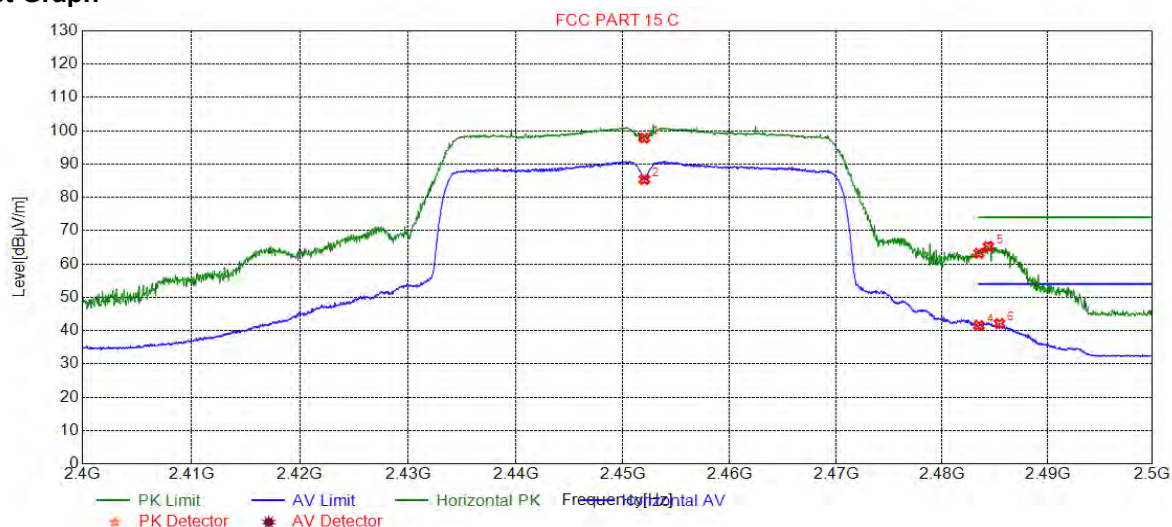
Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2377.6838	51.33	7.78	74.00	22.67	153	88	Vertical
2	2381.2106	37.40	7.78	54.00	16.60	228	6	Vertical
3	2390.0000	50.39	7.77	74.00	23.61	218	88	Vertical
4	2390.0000	37.29	7.77	54.00	16.71	195	310	Vertical
5	2422.0000	74.09	7.85	0.00	-74.09	271	310	Vertical
6	2422.0000	85.89	7.85	0.00	-85.89	282	310	Vertical

Final Data List



4.10.1.15 802.11N40_Channel 9

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2452.0000	97.84	7.97	0.00	-97.84	211	213	Horizontal
2	2452.0000	85.41	7.97	0.00	-85.41	197	213	Horizontal
3	2483.5000	63.23	8.01	74.00	10.77	239	213	Horizontal
4	2483.5000	41.56	8.01	54.00	12.44	115	213	Horizontal
5	2484.3922	65.28	8.01	74.00	8.72	118	218	Horizontal
6	2485.4427	42.14	8.01	54.00	11.86	124	218	Horizontal

Final Data List

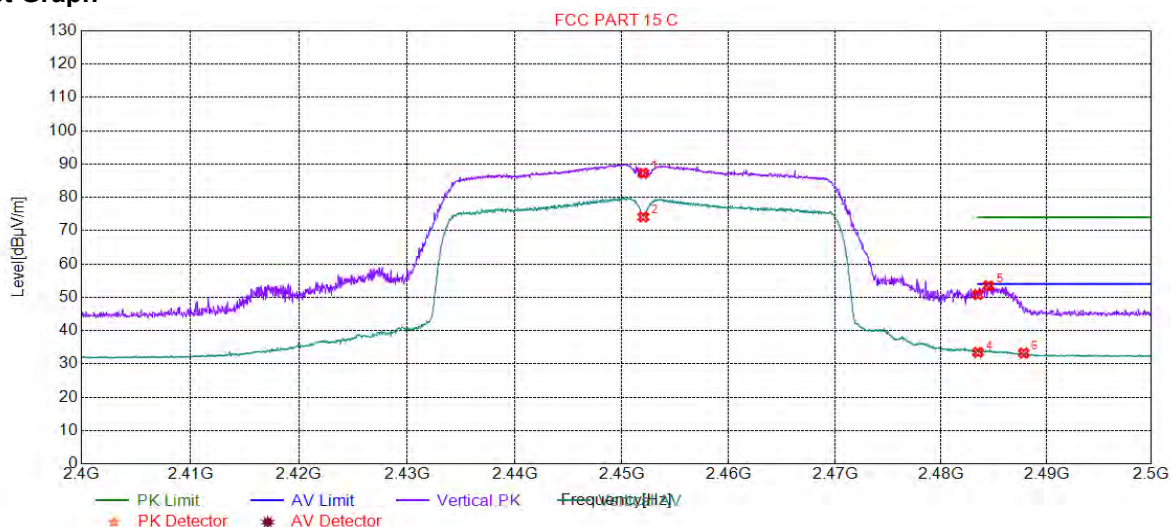
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4.10.1.16 802.11N40_Channel 9

Test Graph

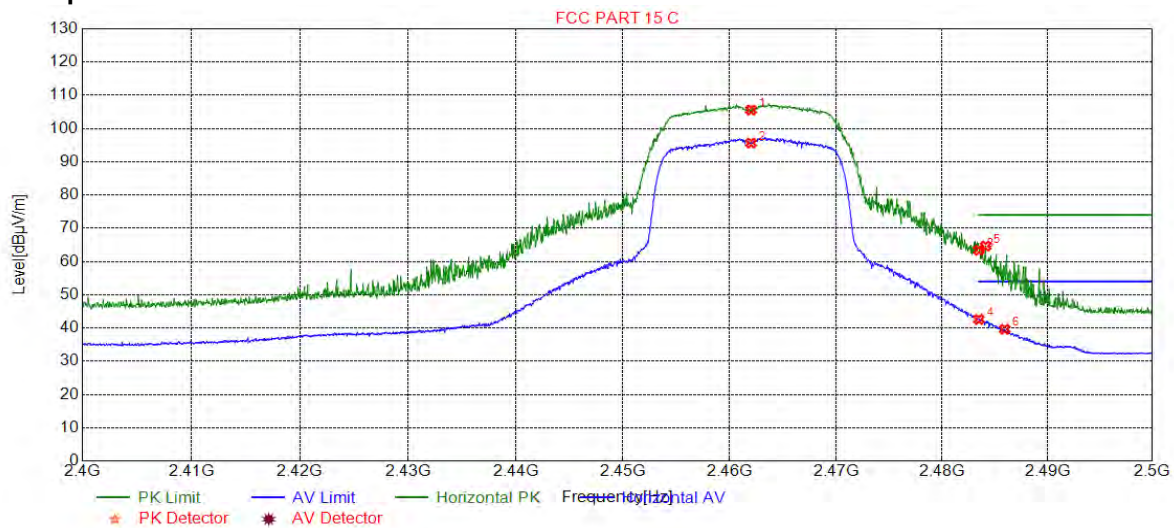


Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2452.0000	87.27	7.97	0.00	-87.27	227	12	Vertical
2	2452.0000	74.15	7.97	0.00	-74.15	299	12	Vertical
3	2483.5000	50.83	8.01	74.00	23.17	232	67	Vertical
4	2483.5000	33.49	8.01	54.00	20.51	276	321	Vertical
5	2484.4922	53.49	8.01	74.00	20.51	295	62	Vertical
6	2487.8439	33.26	8.02	54.00	20.74	240	51	Vertical

Final Data List



Test on the worst case:**4.10.1.17 802.11G_Channel 11****Test Graph****Suspected List**

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.00	105.58	7.98	0.00	-105.58	130	217	Horizontal
2	2462.00	95.64	7.98	0.00	-95.64	248	217	Horizontal
3	2483.50	63.38	8.01	74.00	10.62	181	222	Horizontal
4	2483.50	42.61	8.01	54.00	11.39	220	217	Horizontal
5	2484.14	64.67	8.01	74.00	9.33	187	217	Horizontal
6	2485.94	39.65	8.01	54.00	14.35	139	222	Horizontal

Final Data List

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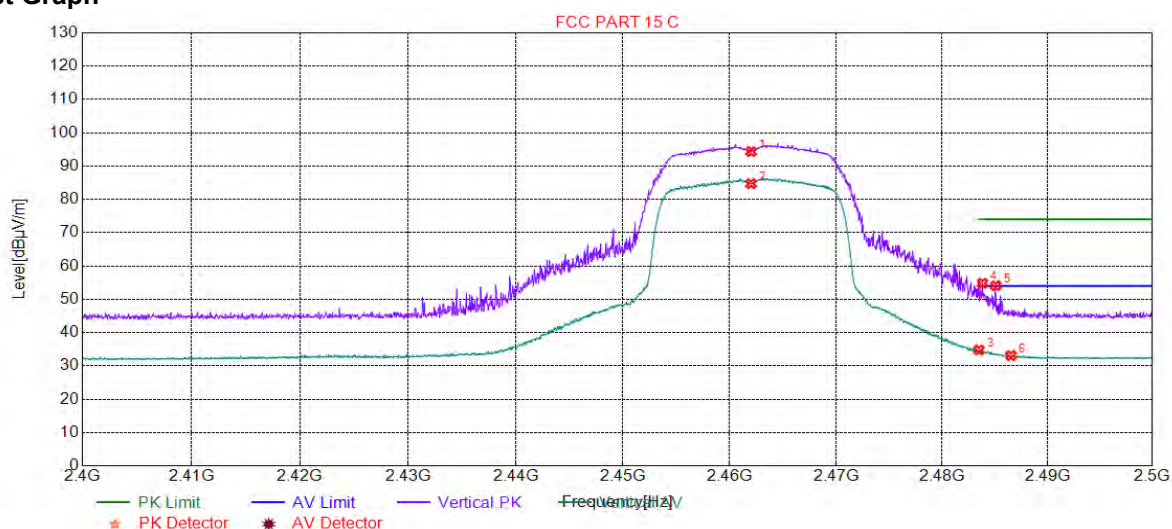
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4.10.1.18 802.11G_Channel 11

Test Graph



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.00	94.38	7.98	0.00	-94.38	264	69	Vertical
2	2462.00	84.73	7.98	0.00	-84.73	247	69	Vertical
3	2483.50	34.82	8.01	54.00	19.18	288	330	Vertical
4	2483.84	54.84	8.01	74.00	19.16	284	324	Vertical
5	2485.09	54.12	8.01	74.00	19.88	197	243	Vertical
6	2486.54	33.12	8.01	54.00	20.88	268	156	Vertical

Final Data List

Remark:

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

All Modes have been tested, but only the worst case data displayed in this report.



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5 Measurement Uncertainty (95% confidence levels, k=2)

Lab A:

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	$\pm 0.75\text{dB}$
2	RF power density, conducted	$\pm 2.84\text{dB}$
3	Spurious emissions, conducted	$\pm 0.75\text{dB}$
4	Temperature test	$\pm 1^{\circ}\text{C}$
5	Humidity test	$\pm 3\%$
6	DC and low frequency voltages	$\pm 0.5\%$

Lab B:

No.	Item	Measurement Uncertainty
1	Conduct emission test	$\pm 3.0\text{dB}$ (150kHz to 30MHz)
2	Radiated Spurious emission test	$\pm 4.8\text{dB}$ (Below 1GHz)
		$\pm 4.8\text{dB}$ (1GHz to 6GHz)
		$\pm 4.5\text{dB}$ (6GHz to 18GHz)
		$\pm 5.02\text{dB}$ (Above 18GHz)



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

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6 Equipment List

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal.Duedate
				(yyyy-mm-dd)	(yyyy-mm-dd)
DC Power Supply	Agilent Technologies Inc	66311B	W009-09	2020/7/15	2021/7/15
Signal Analyzer	Rohde & Schwarz	FSV	W025-05	2020/1/3	2021/1/2
Coaxial Cable	SGS	N/A	SEM031-01	2020/6/12	2021/6/11
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2020/7/14	2021/7/14
Temperature Chamber	GIANT FORCE	ICT-150-40-CP-AR	W027-03	2020/10/27	2021/10/27
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2020/7/14	2021/7/14

CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR





RSE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2020-04-02	2021-04-01
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
Receiving antenna (30MHz~3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2019-12-03	2020-12-02
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2019-11-18	2020-11-17
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR



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7 Photographs - EUT Constructional Details

Refer to Appendix A - Photographs of Set-Up for AR/2020/A0003.

The End



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