



FCC TEST REPORT

Application No: ZR/2020/90032
Applicant: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address of Applicant: Floor 21, Block A, Coolpad Building, Intersection of Keyuan Avenue and Baoshen Road, North High-Tech Industrial Park, Nanshan District, Shenzhen
Manufacturer: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address of Manufacturer: Floor 21, Block A, Coolpad Building, Intersection of Keyuan Avenue and Baoshen Road, North High-Tech Industrial Park, Nanshan District, Shenzhen
EUT Description: Mobile Hotspot
Model No.: CP337AS
Trade Mark: coolpad
FCC ID: R38YLCP337AS
Standards: 47 CFR FCC Part 2, Subpart J
47 CFR Part 15, Subpart C
KDB558074 D01 15.247 Meas Guidance v05r02
Test Method: ANSI C63.10 (2013)
Date of Receipt: 2020/10/8
Date of Test: 2020/10/21 to 2020/12/31
Date of Issue: 2021/4/18

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



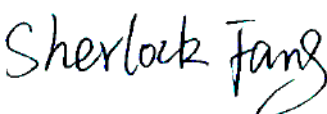

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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021/1/5		Original
02		2021/4/18	Sherlock Fang	1.Add test site Information 2. Modify data conversion error of antenna height 3.Update equipment list

This report supersedes our previous report ZR/2020/9003202, issued on 2021-01-05, which is hereby deemed null and void.

Authorized for issue by:		
Prepared By		(Sherlock Fang) / Engineer
Checked By		(Jim Huang) / Reviewer



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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: 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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Remark:

The differences between Main Supply and Secondary Supply are showed in the following table.

Main Supply:

Part Name	Model Name	supplier
Battery	CPLD-440	Jiade
Memory	FS702B2R1DH2A2KDE	FORESEE
PCB	CP337AS MAINBOARD P3-ZH	Zhihao

Secondary Supply:

Part Name	Model Name	supplier
Battery	CPLD-440	Ganfeng
Memory	NM1282KSLAXAL-3B	Nanya
PCB	CP337AS MAINBOARD P3_SUNTAK	Suntak

Note:

According to the difference description above, only the worst case data displayed in this report.



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3 General Information

3.1 Client Information

Applicant:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address of Applicant:	Floor 21, Block A, Coolpad Building, Intersection of Keyuan Avenue and Baoshen Road, North High-Tech Industrial Park, Nanshan District, Shenzhen
Manufacturer:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address of Manufacturer:	Floor 21, Block A, Coolpad Building, Intersection of Keyuan Avenue and Baoshen Road, North High-Tech Industrial Park, Nanshan District, Shenzhen

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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3.3 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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3.4 General Description of EUT

EUT Description::	Mobile Hotspot
Model No.:	CP337AS
Trade Mark:	coolpad
Hardware Version:	P3
Software Version:	3.18.054.P3.201216.CP337AS
IEEE 802.11 WLAN Mode Supported	<input checked="" type="checkbox"/> 802.11B (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11G (20 MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11N (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11N (40 MHz channel bandwidth)
Operation Frequency:	2400 MHz -2483.5MHz fc = 2407 MHz + N * 5 MHz, where: -fc = "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:	<input checked="" type="checkbox"/> Portable Device, <input type="checkbox"/> Module
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated
Antenna Ports	<input checked="" type="checkbox"/> Ant 1, <input type="checkbox"/> Ant 2, <input type="checkbox"/> Ant 3
Smart System	<input checked="" type="checkbox"/> SISO (for 802.11B/G/N), <input type="checkbox"/> MIMO (for 802.11N): 2 Tx & 2 Rx, <input type="checkbox"/> Diversity (for 802.11B/G) : Tx & Rx
Antenna Gain:	2.82dBi
Power Supply	<input checked="" type="checkbox"/> AC/DC Adapter; <input checked="" type="checkbox"/> Battery <input type="checkbox"/> PoE;; <input type="checkbox"/> 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:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the



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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

3.5 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.

3.6 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)
<p>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.</p> <p>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.</p>	
<p>The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.82dBi.</p>	



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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:	<ol style="list-style-type: none"> 1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 		



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<p>Test Setup:</p>	
<p>Exploratory Test Mode:</p>	<p>Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Charge + Transmitting mode.</p>
<p>Final Test Mode:</p>	<p>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.</p>
<p>Instruments Used:</p>	<p>Refer to section 5.10 for details</p>
<p>Test Results:</p>	<p>Pass</p>



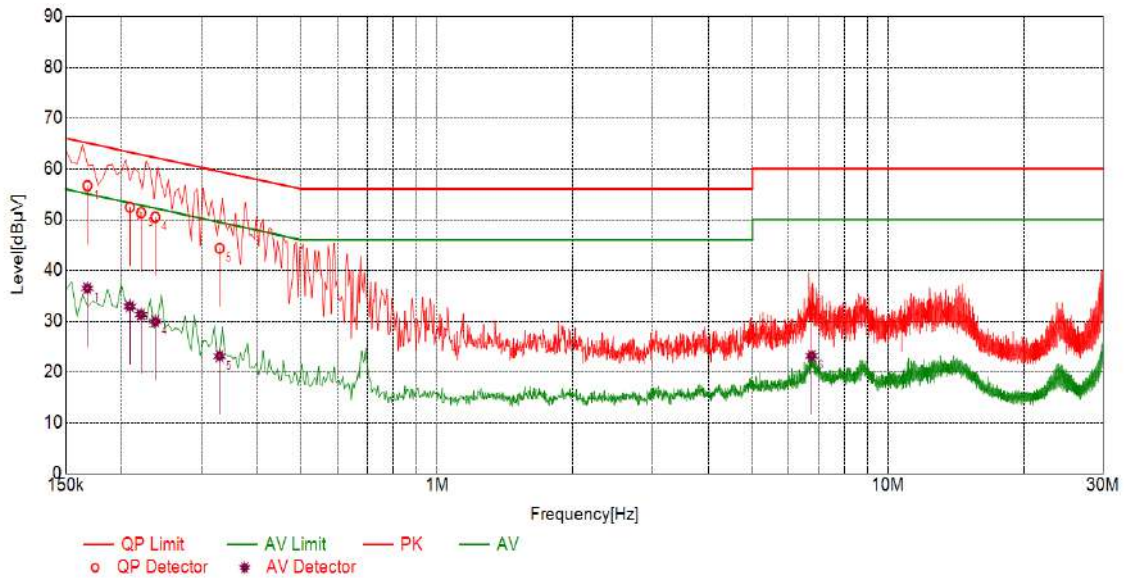
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Measurement Data

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:



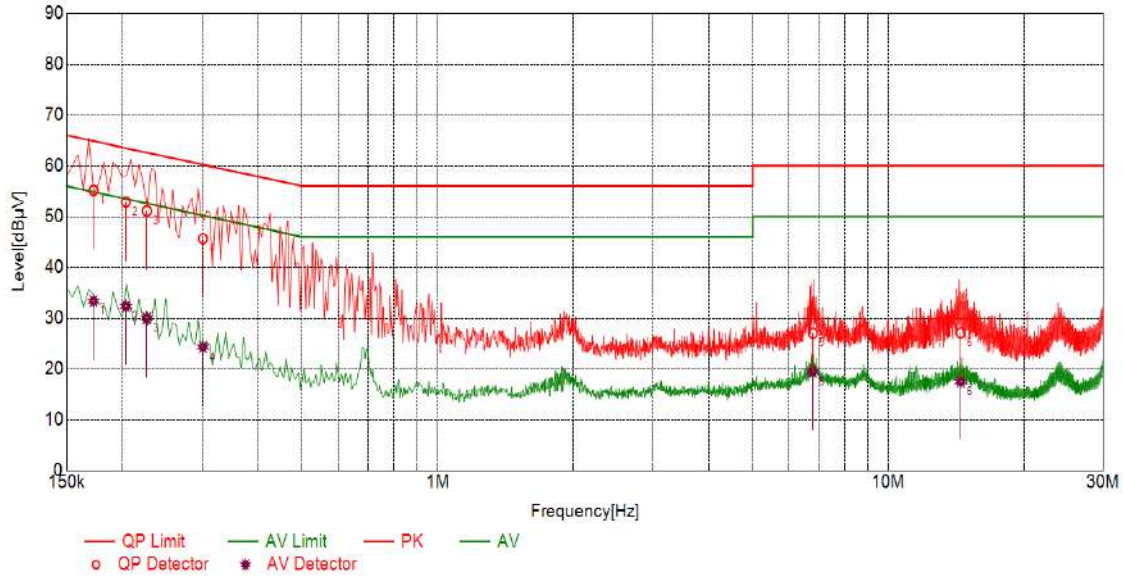
Test Graph

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	0.1676	10.10	56.67	65.08	8.41	36.43	55.08	18.65	L
2	0.2084	10.10	52.40	63.27	10.87	32.90	53.27	20.37	L
3	0.2208	10.10	51.33	62.79	11.46	31.29	52.79	21.50	L
4	0.2370	10.10	50.47	62.20	11.73	29.93	52.20	22.27	L
5	0.3296	10.10	44.33	59.46	15.13	23.12	49.46	26.34	L
6	6.7730	10.10	32.05	60.00	27.95	23.16	50.00	26.84	L



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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	0.1722	10.10	55.16	64.85	9.69	33.37	54.85	21.48	N
2	0.2033	10.10	52.87	63.47	10.60	32.31	53.47	21.16	N
3	0.2261	10.10	51.11	62.59	11.48	29.97	52.59	22.62	N
4	0.3013	10.10	45.65	60.21	14.56	24.29	50.21	25.92	N
5	6.8079	10.10	27.03	60.00	32.97	19.46	50.00	30.54	N
6	14.4782	10.11	27.09	60.00	32.91	17.51	50.00	32.49	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.



4.3 Duty Cycle

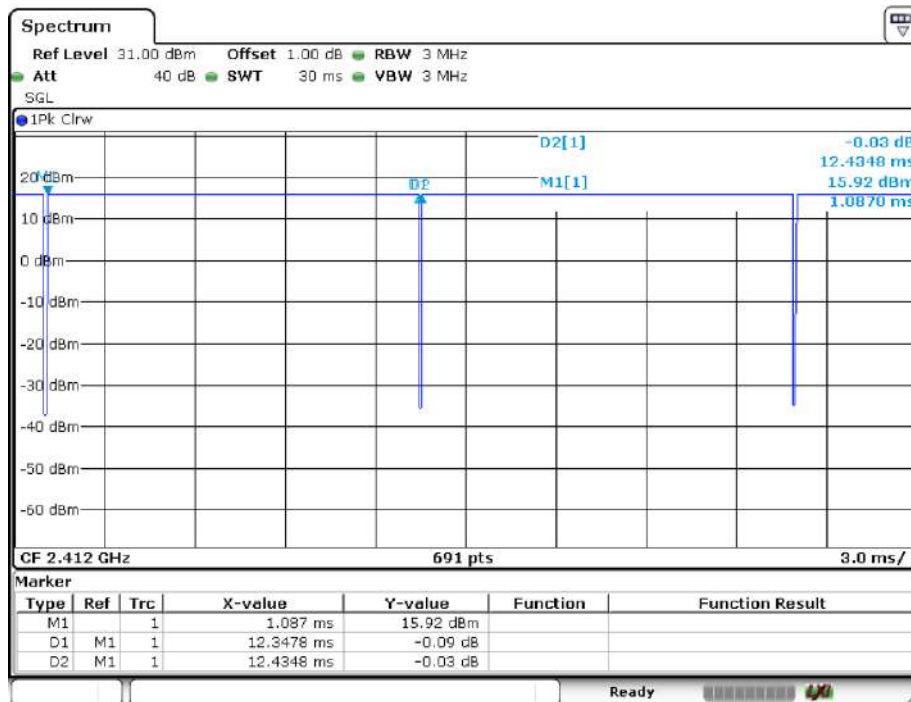
4.3.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
11B	Ant 1: CH1,CH6,CH11	99.30
11G	Ant 1: CH1,CH6,CH11	95.16
11N20	Ant 1: CH1,CH6,CH11	94.40
11N40	Ant 1: CH3,CH6,CH9	90.38

4.3.1 Test Plots

4.3.1.1 ANT1

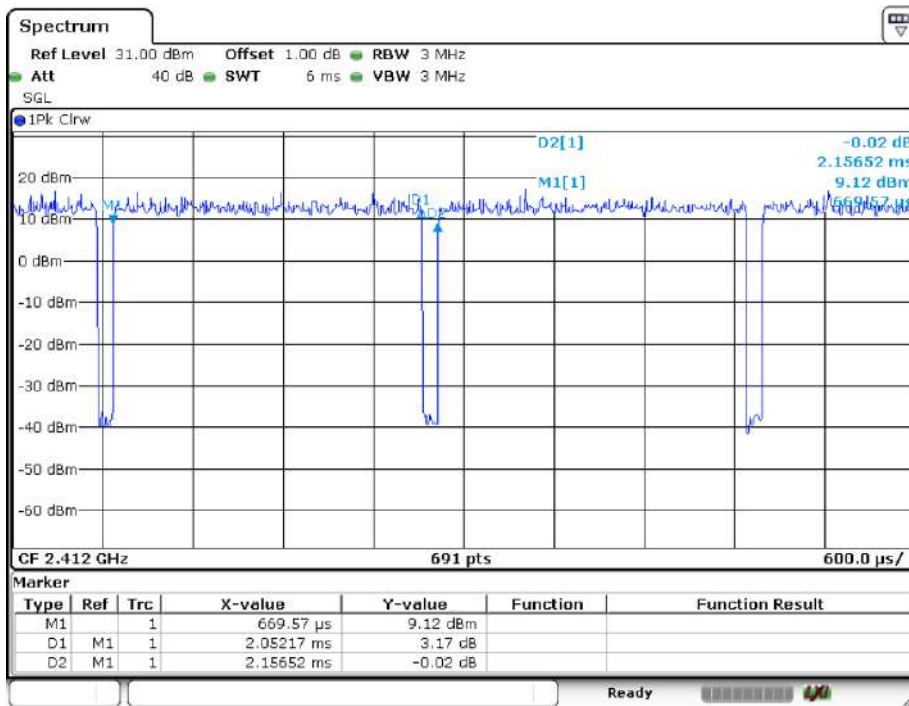
4.3.1.1.1 11B



Date: 29. SEP 2020 14:38:32

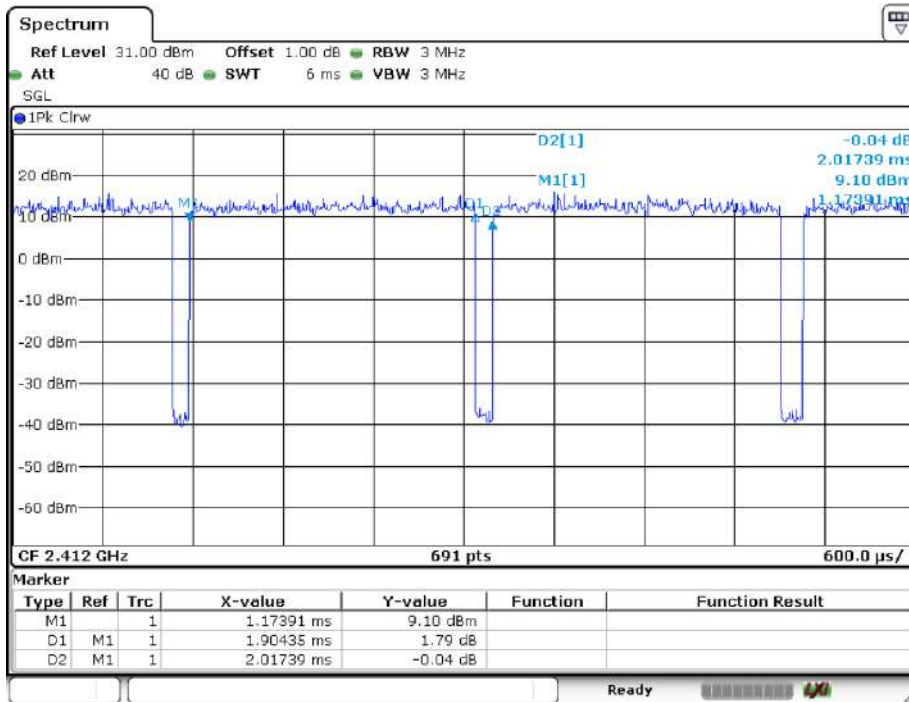


4.3.1.1.2 11G



Date: 29. SEP. 2020 14:39:10

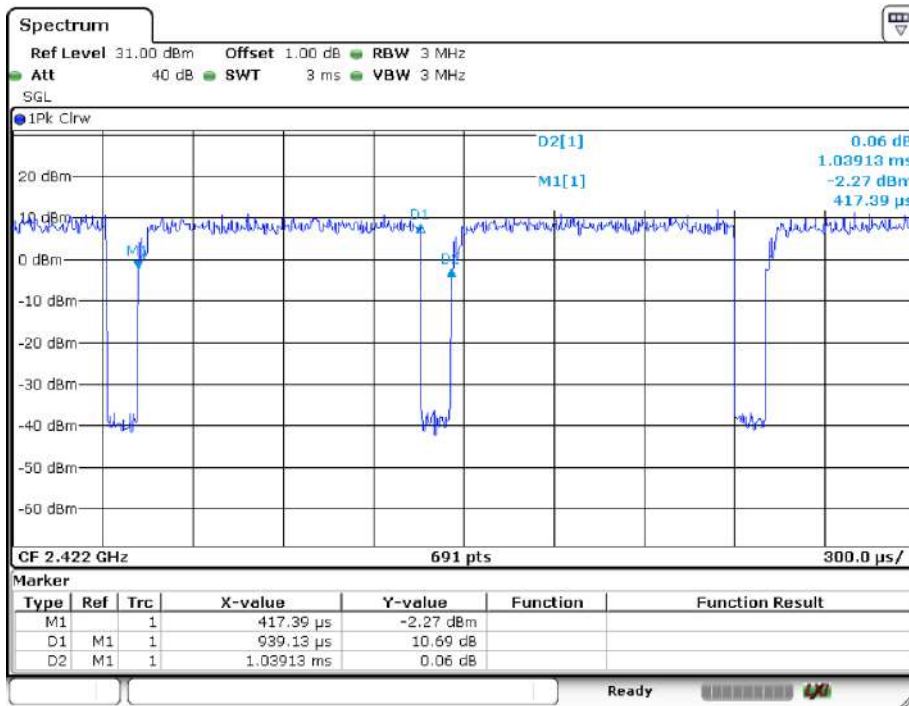
4.3.1.1.3 11N20



Date: 29. SEP. 2020 14:39:35



4.3.1.1.4 11N40



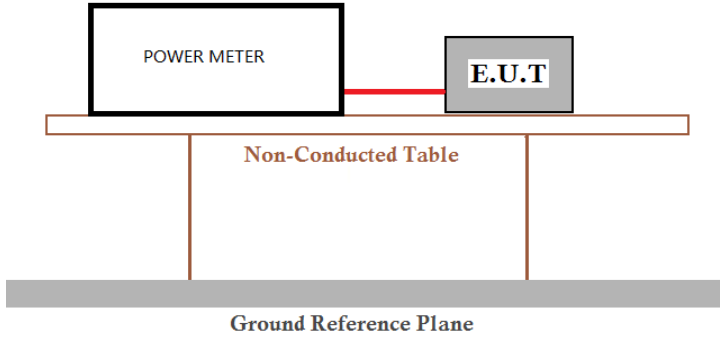
Date: 29. SEP 2020 14:40:21



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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 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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4.4.1 Test Results

Measurement Data of Peak Power:

Mode	Test Channel	Peak Output Power (dBm)	Limit (dBm)	Result
802.11B	Lowest	15.47	30.00	Pass
	Middle	15.53	30.00	Pass
	Highest	14.90	30.00	Pass
802.11G	Lowest	12.98	30.00	Pass
	Middle	13.18	30.00	Pass
	Highest	12.77	30.00	Pass
802.11N20	Lowest	12.91	30.00	Pass
	Middle	13.07	30.00	Pass
	Highest	12.57	30.00	Pass
802.11N40	Lowest	12.04	30.00	Pass
	Middle	12.14	30.00	Pass
	Highest	12.01	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 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

4.5.1 Test Results

Mode	Test Channel	Occupied Bandwidth (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
802.11B	Lowest	13.07	8.08	≥500	Pass
	Middle	12.98	8.55	≥500	Pass
	Highest	13.02	8.03	≥500	Pass
802.11G	Lowest	16.54	16.32	≥500	Pass
	Middle	16.50	16.28	≥500	Pass
	Highest	16.45	16.28	≥500	Pass
802.11N20	Lowest	17.67	17.54	≥500	Pass
	Middle	17.63	17.24	≥500	Pass
	Highest	17.63	17.28	≥500	Pass
802.11N40	Lowest	36.30	36.26	≥500	Pass
	Middle	36.21	36.04	≥500	Pass
	Highest	36.30	36.41	≥500	Pass



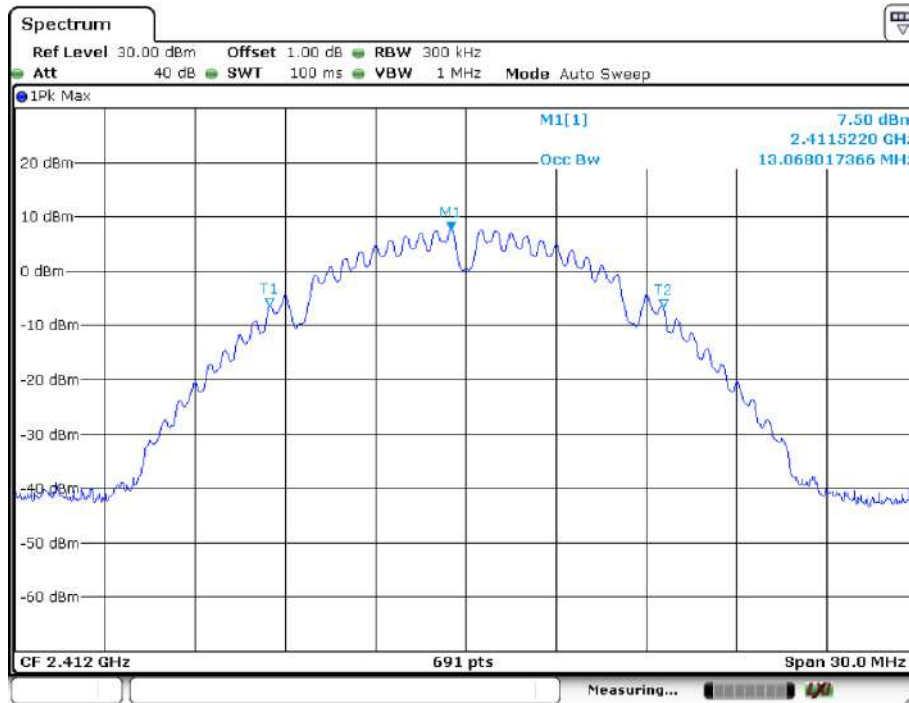
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4.5.2 Test plots

4.5.2.1 ANT1

4.5.2.1.1 802.11B_Lowest Channel

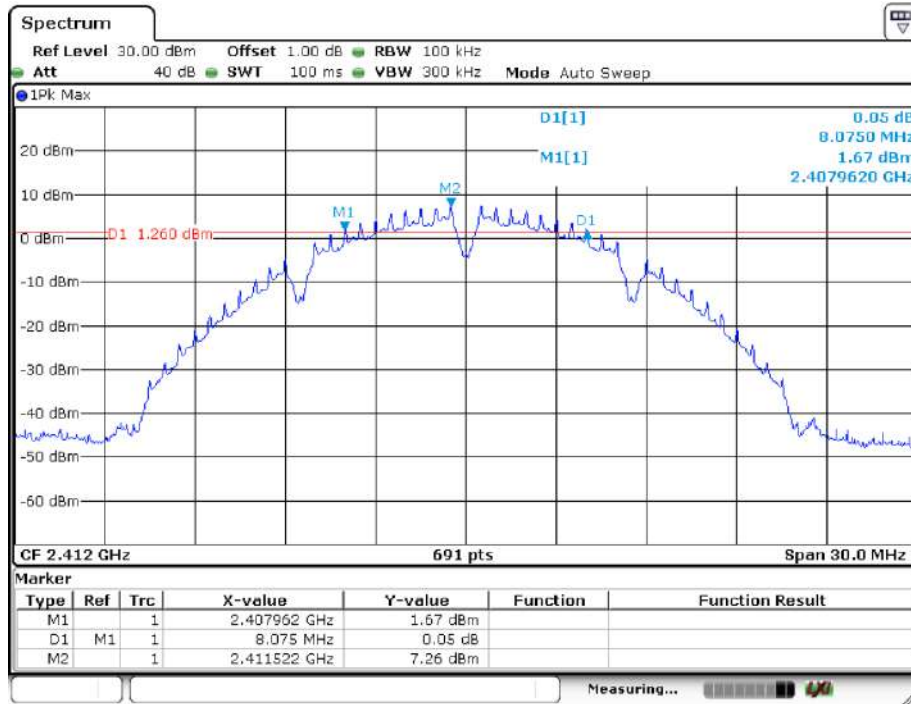


Date: 29.SEP.2020 14:07:08



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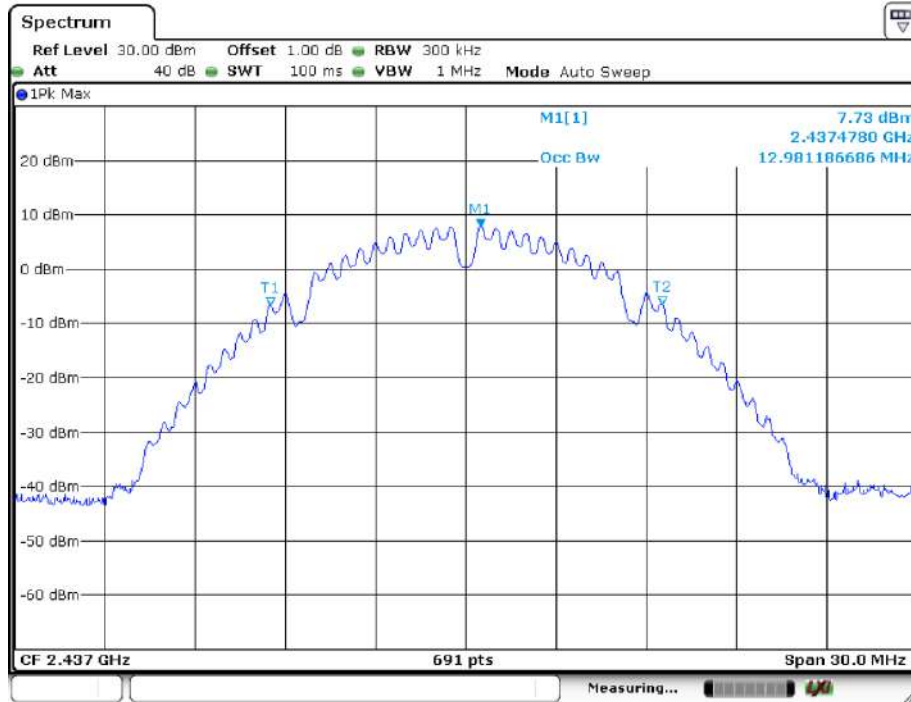
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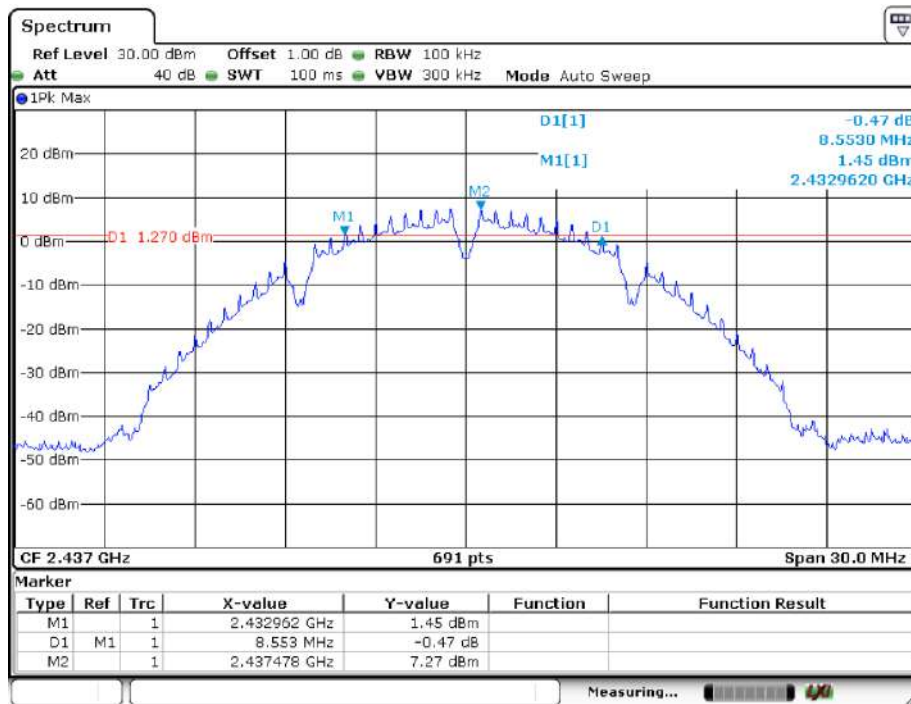
Date: 29. SEP 2020 11:58:15



4.5.2.1.2 802.11B_ Middle Channel



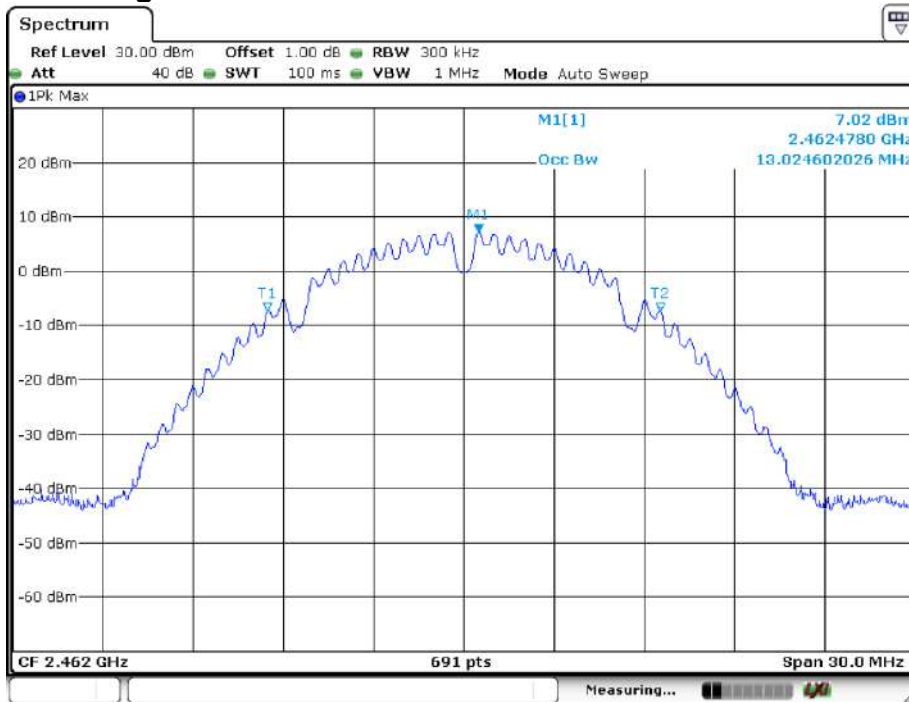
Date: 29.SEP.2020 14:07:56



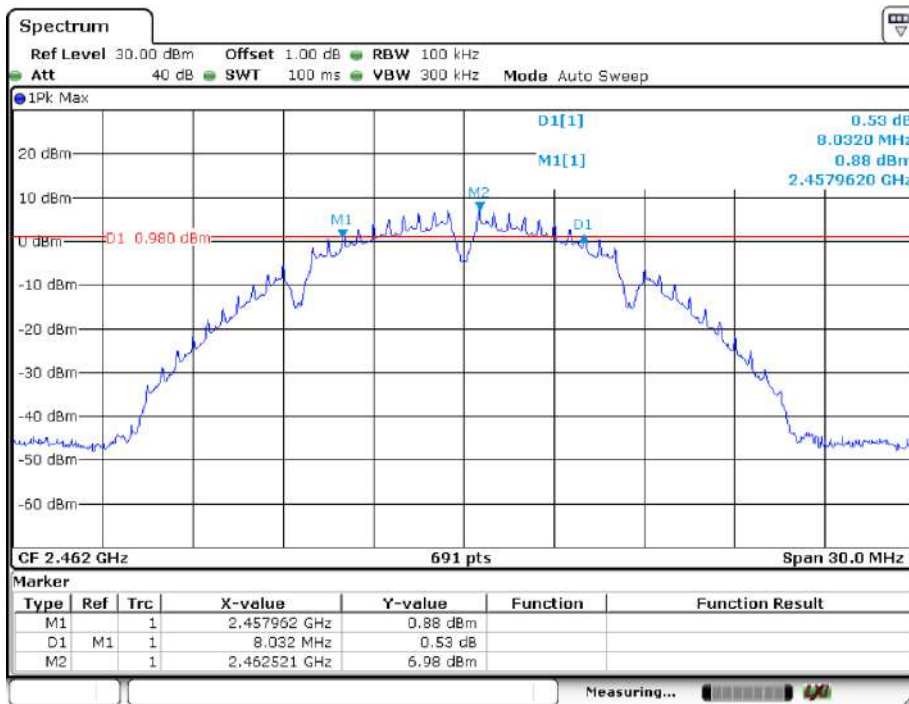
Date: 29.SEP.2020 11:57:35



4.5.2.1.3 802.11B_Highest Channel



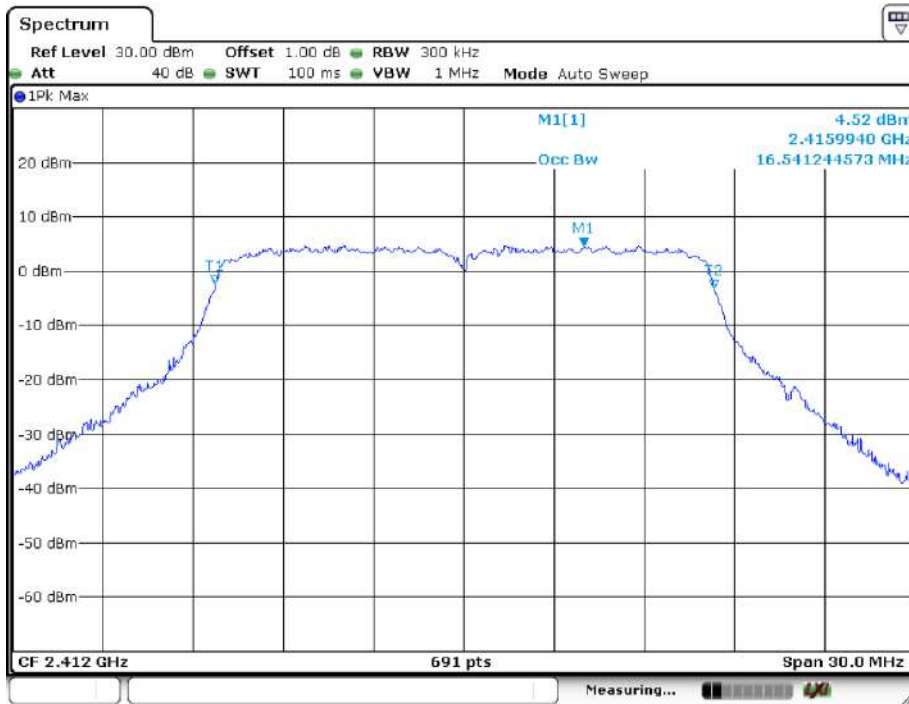
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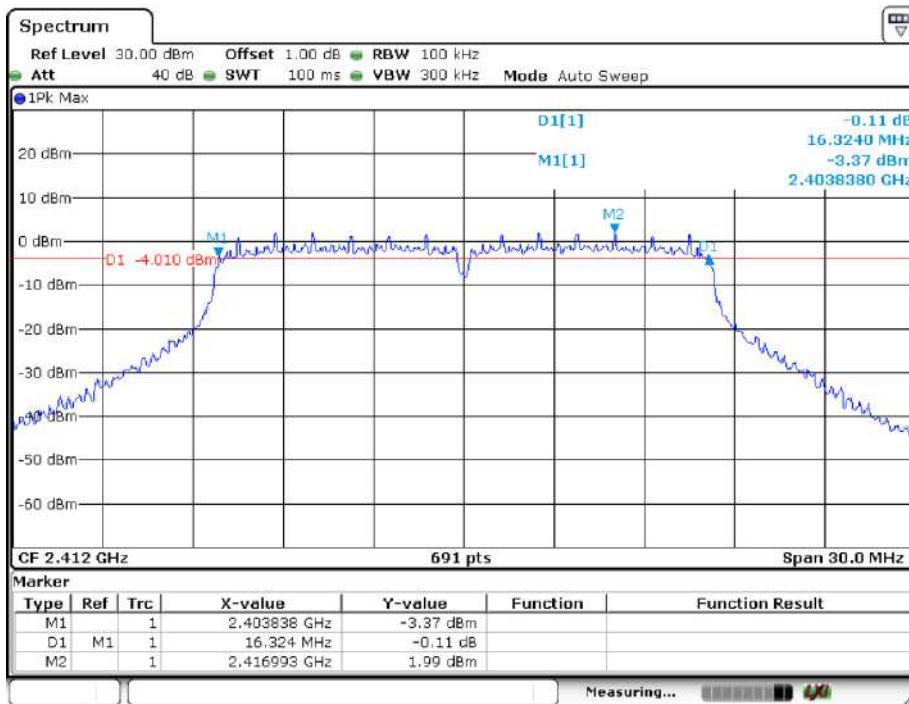
Date: 29.SEP.2020 11:56:52



4.5.2.1.4 802.11G_Lowest Channel



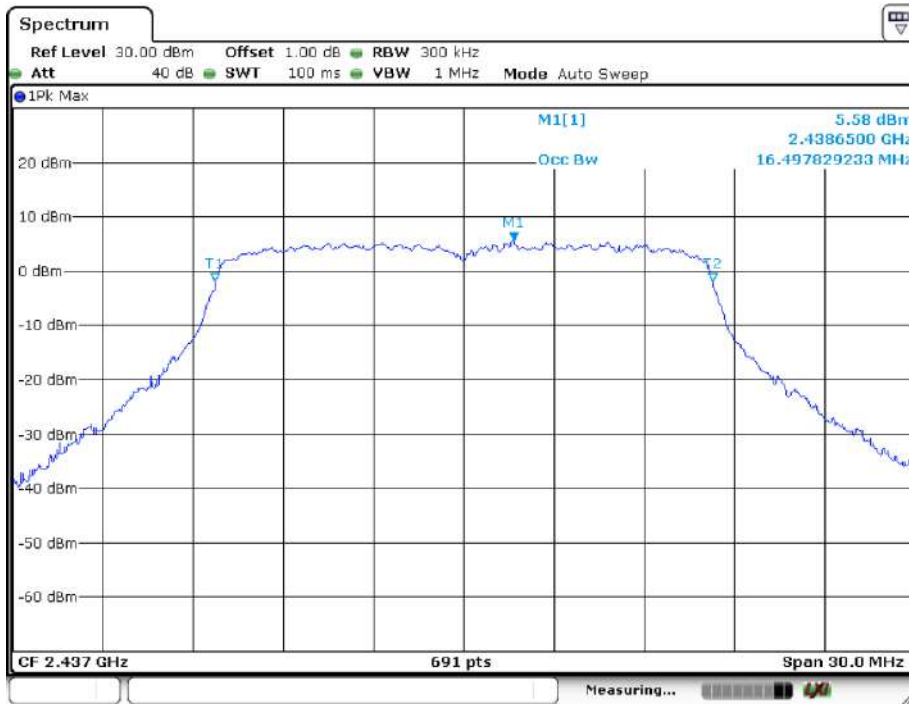
Date: 29.SEP.2020 14:06:39



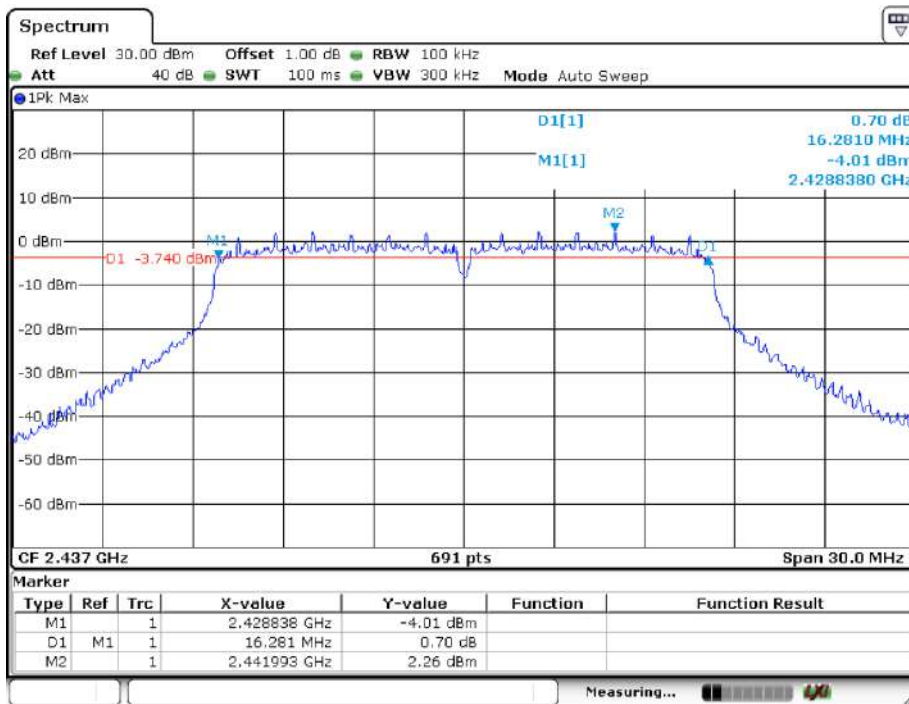
Date: 29.SEP.2020 12:00:00



4.5.2.1.5 802.11G_Middle Channel



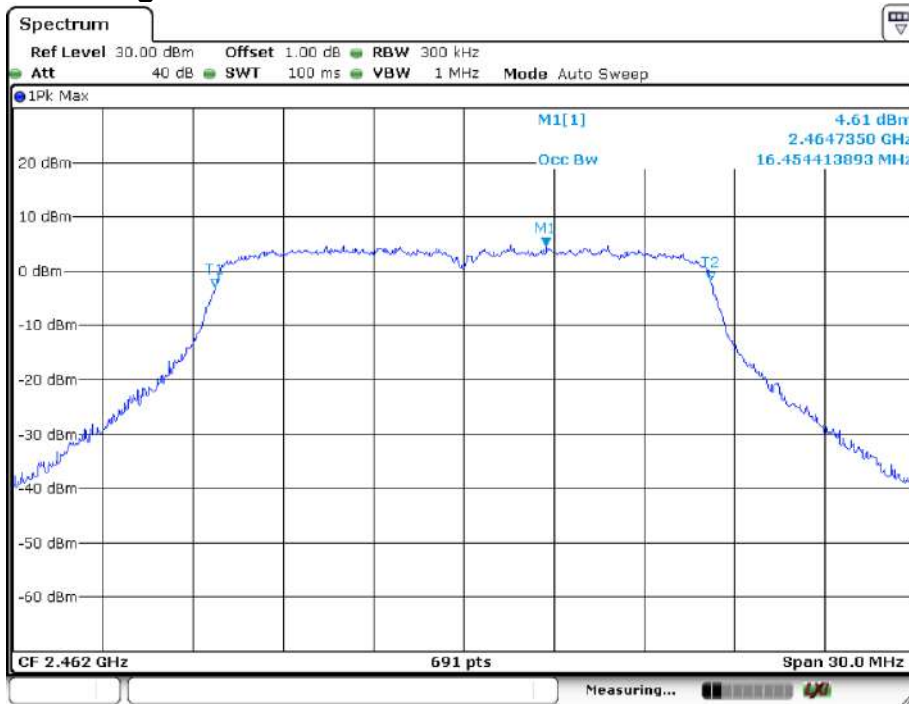
Date: 29.SEP 2020 14:05:42



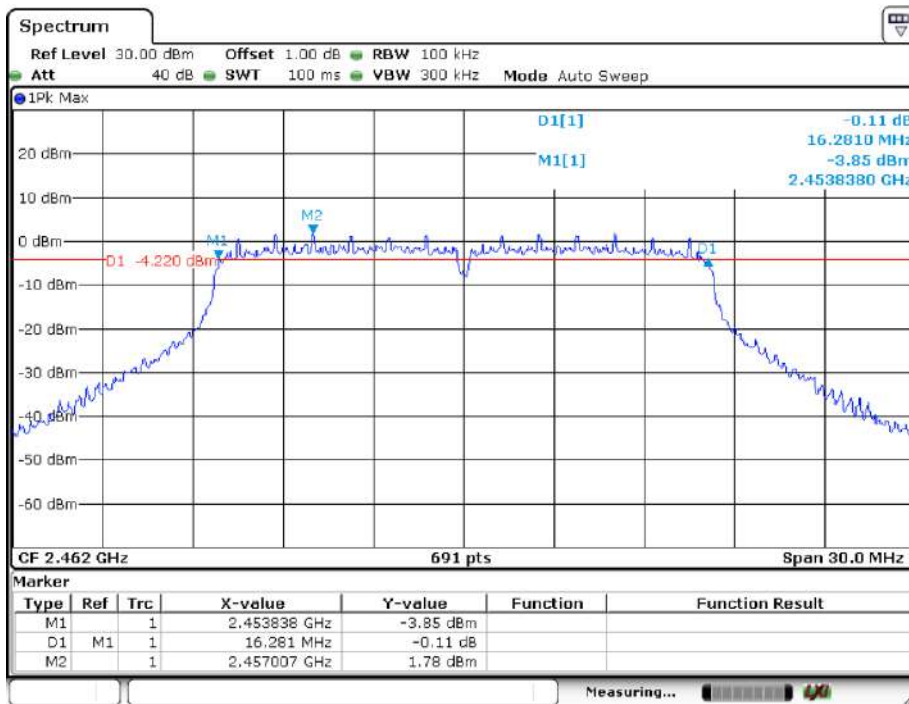
Date: 29.SEP 2020 12:00:48



4.5.2.1.6 802.11G_Highest Channel



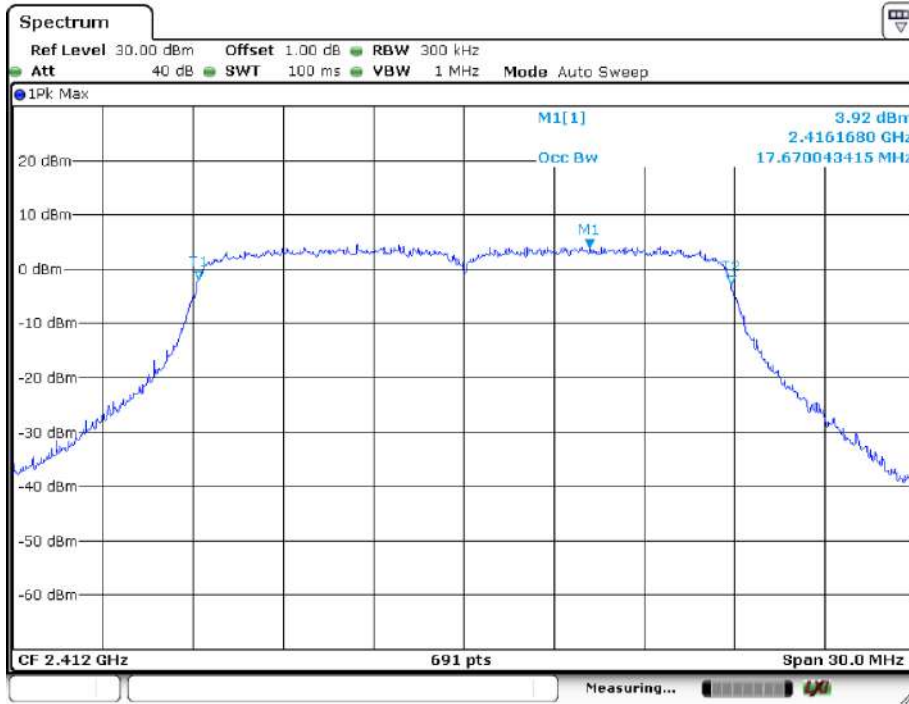
Date: 29. SEP 2020 14:04:38



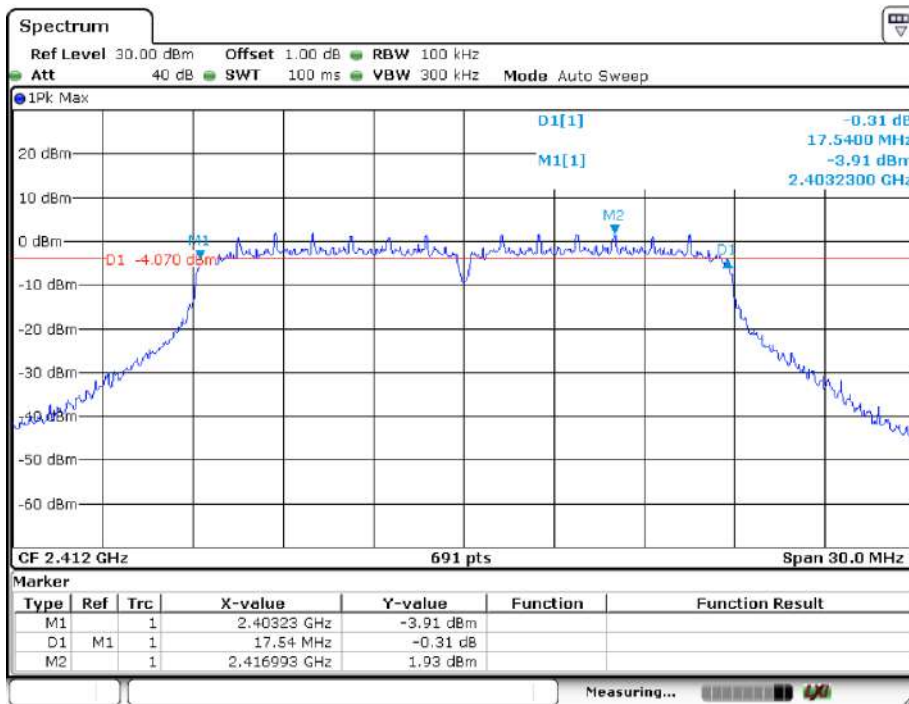
Date: 29. SEP 2020 12:02:50



4.5.2.1.7 802.11N20_Lowest Channel



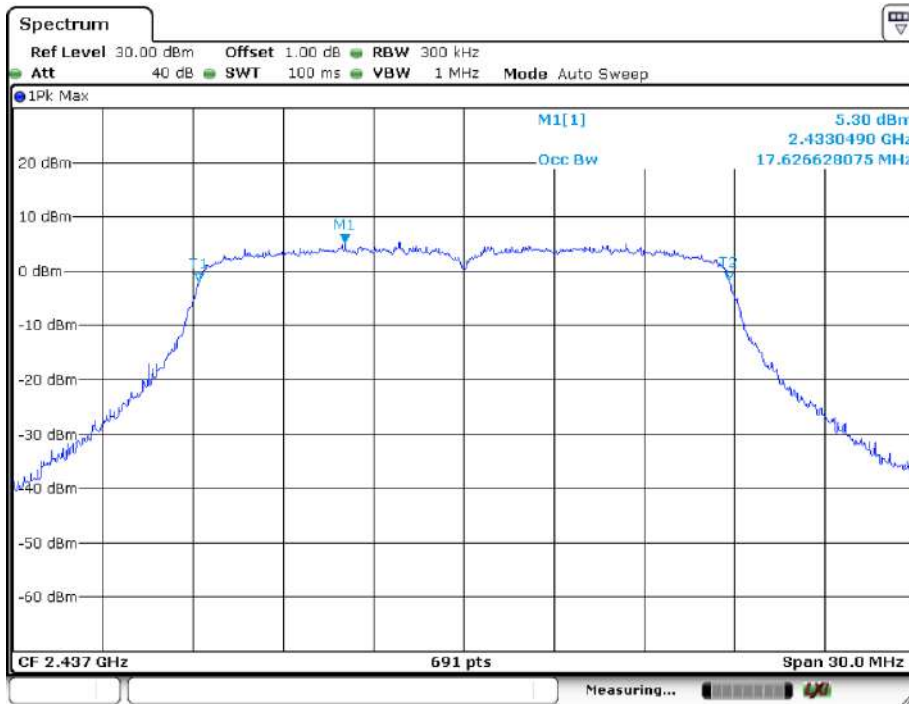
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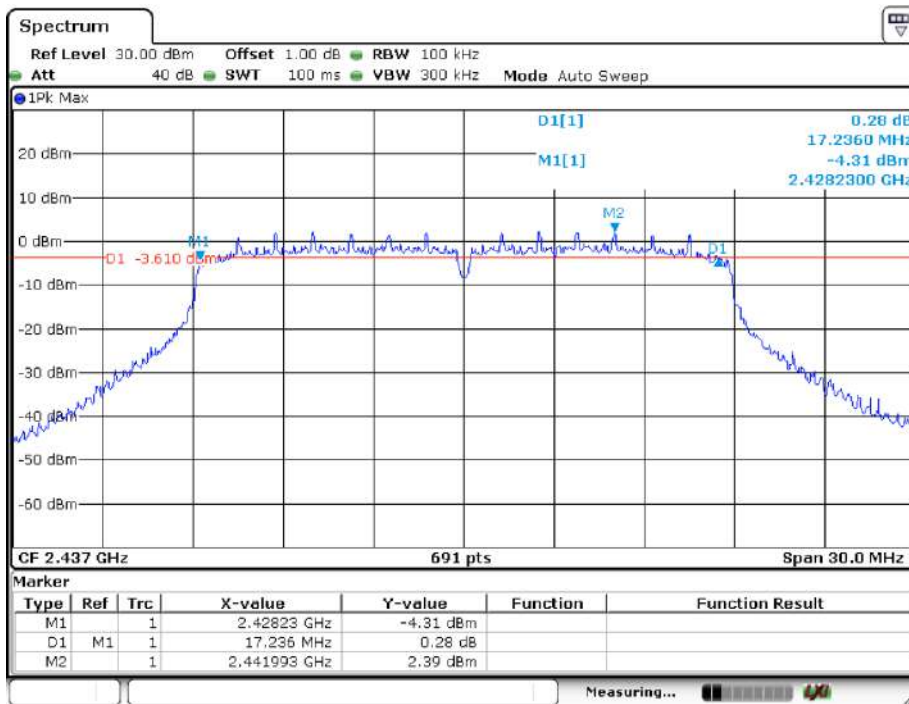
Date: 29.SEP 2020 12:07:46



4.5.2.1.8 802.11 N20_ Middle Channel



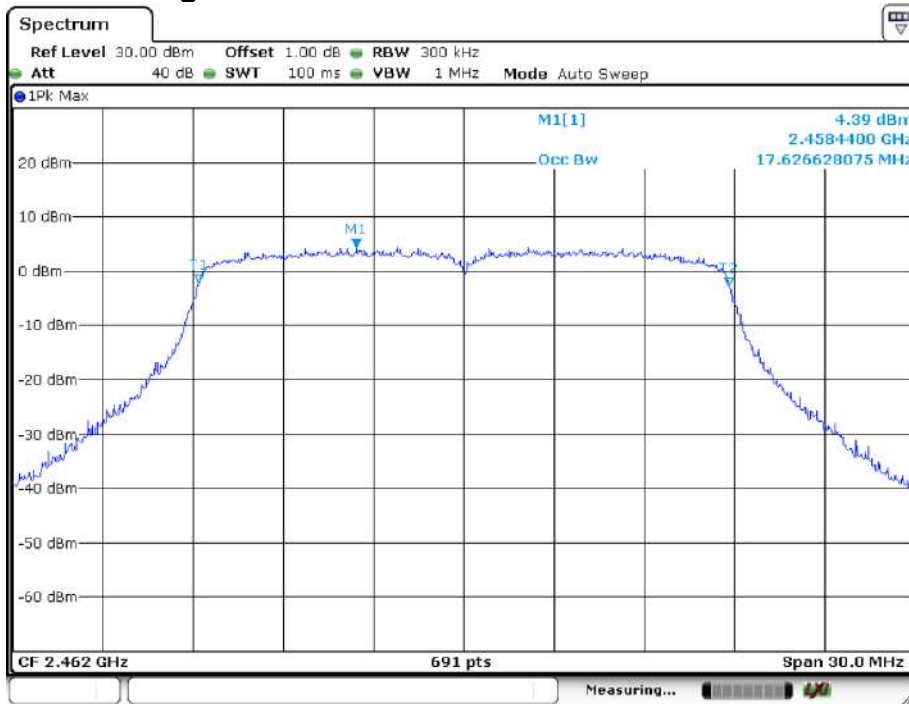
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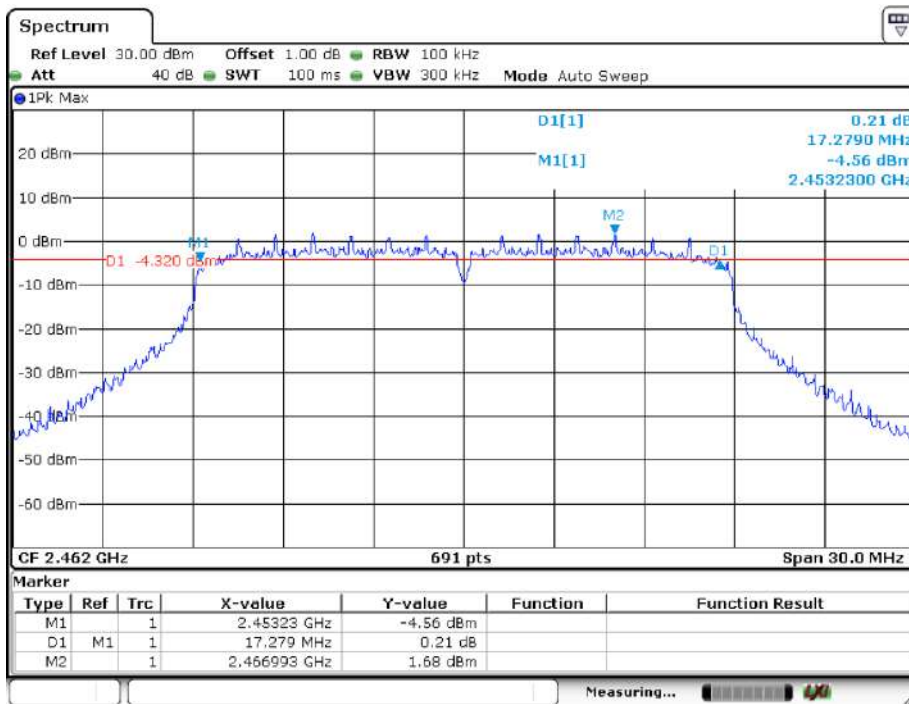
Date: 29. SEP 2020 12:07:07



4.5.2.1.9 802.11 N20_ Highest Channel



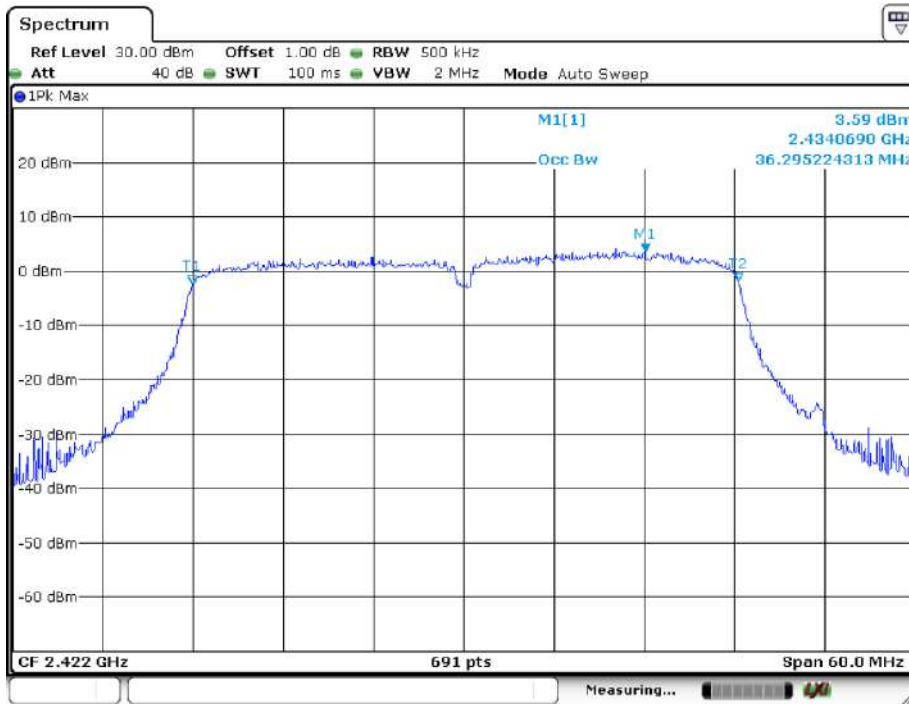
Date: 29. SEP 2020 14:04:09



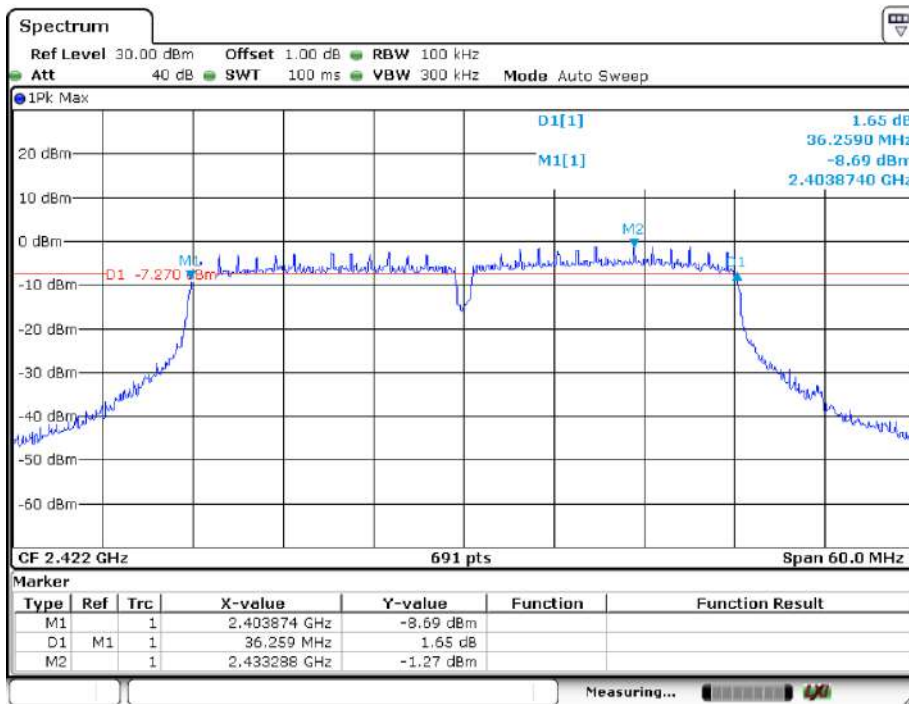
Date: 29. SEP 2020 12:06:27



4.5.2.1.10 802.11N40_Lowest Channel



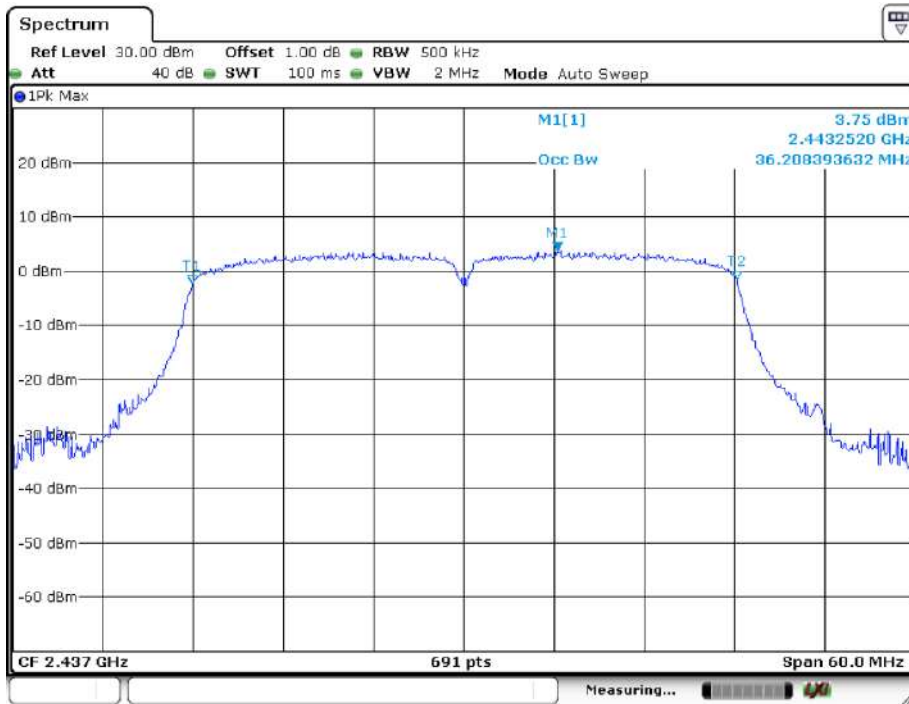
Date: 29.SEP 2020 12:11:30



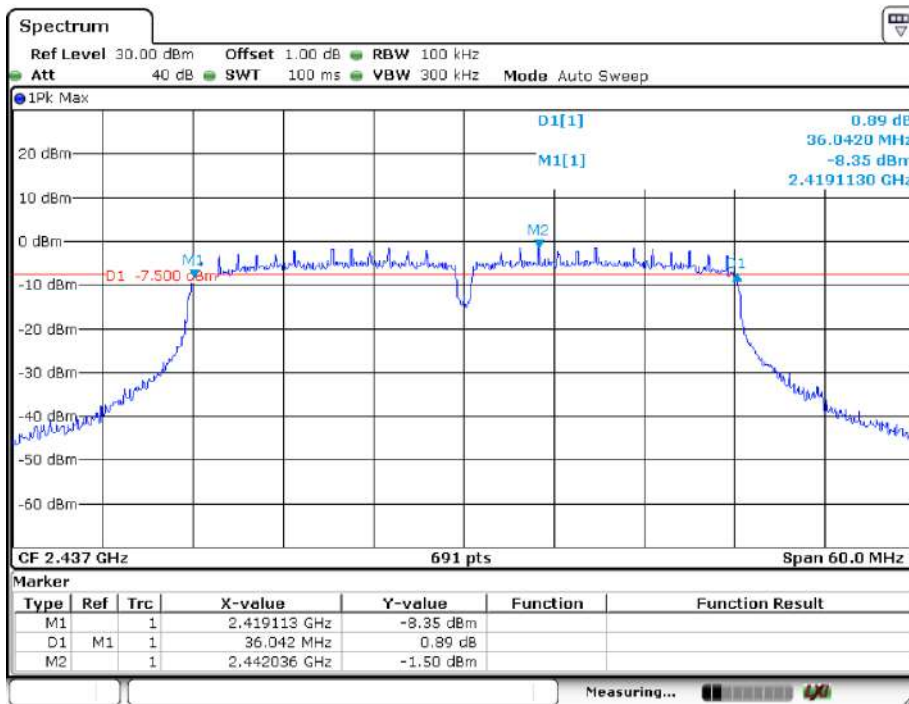
Date: 29.SEP 2020 12:08:49



4.5.2.1.11 802.11 N40_ Middle Channel



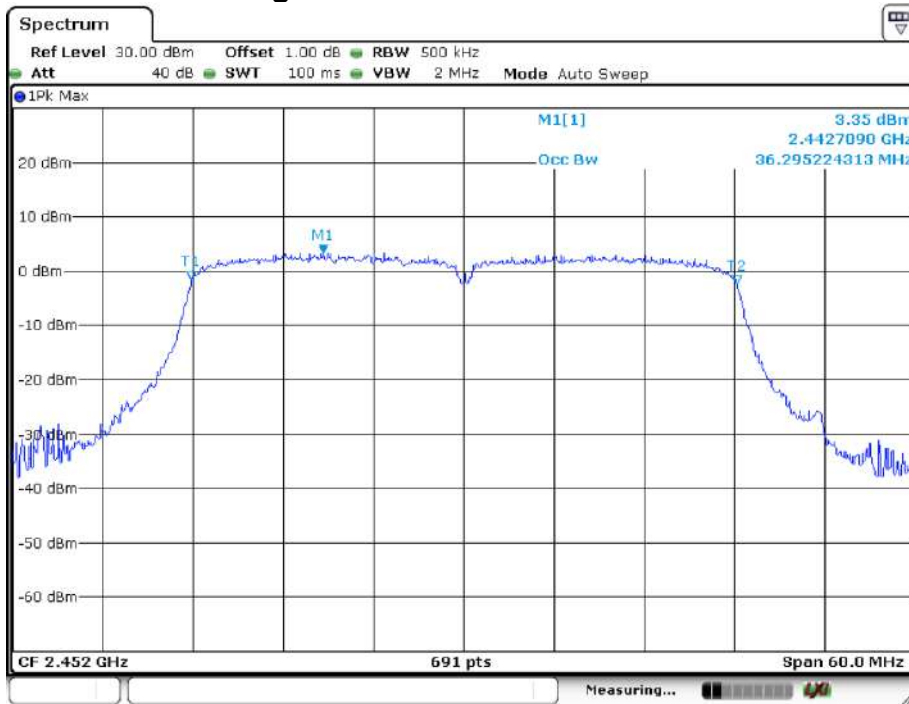
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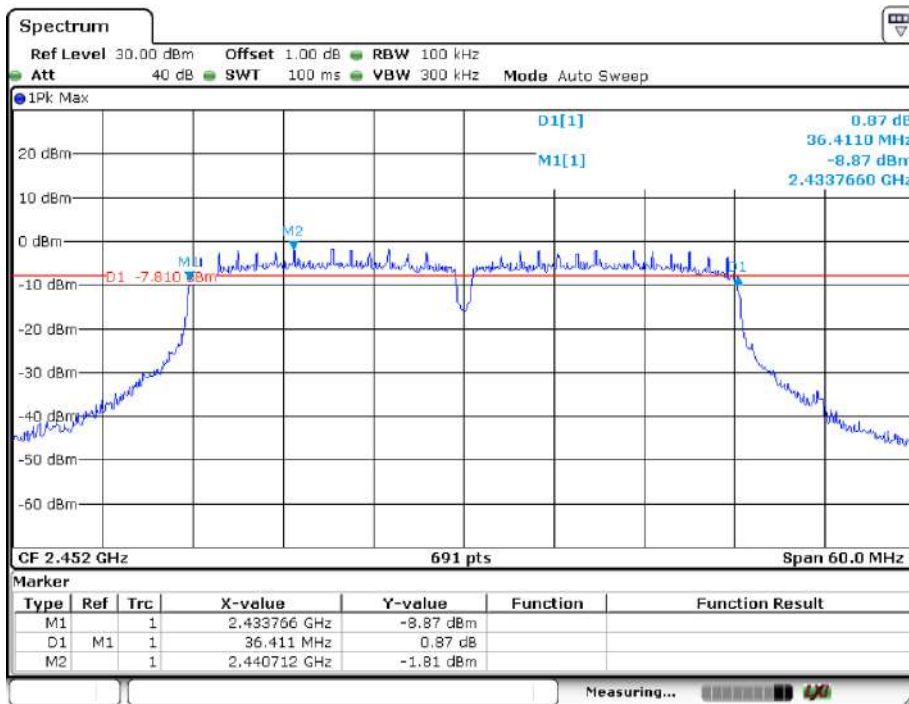
Date: 29.SEP 2020 12:09:47



4.5.2.1.12 802.11 N40_ Highest Channel



Date: 29.SEP 2020 12:10:44



Date: 29.SEP 2020 12:10:25



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 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

4.6.1 Test Results

Mode	Test Channel	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11B	Lowest	-5.60	≤8.00	Pass
	Middle	-5.37	≤8.00	Pass
	Highest	-5.97	≤8.00	Pass
802.11G	Lowest	-12.12	≤8.00	Pass
	Middle	-10.96	≤8.00	Pass
	Highest	-12.48	≤8.00	Pass
802.11N20	Lowest	-11.87	≤8.00	Pass
	Middle	-11.62	≤8.00	Pass
	Highest	-12.25	≤8.00	Pass
802.11N40	Lowest	-14.31	≤8.00	Pass
	Middle	-14.78	≤8.00	Pass
	Highest	-14.93	≤8.00	Pass



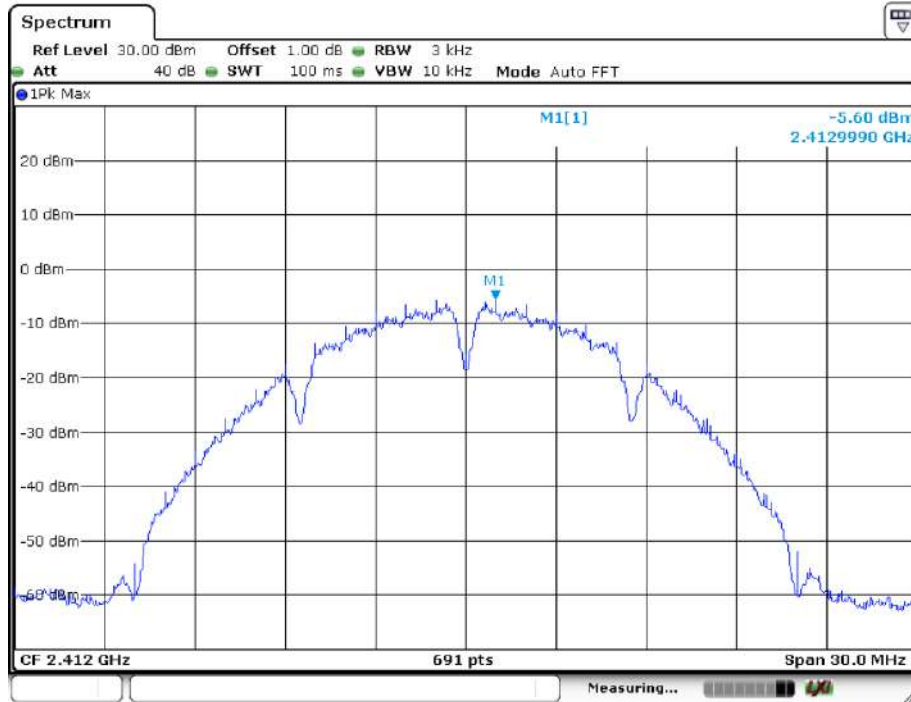
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4.6.2 Test plots

4.6.2.1 ANT1

4.6.2.1.1 802.11B_Lowest Channel



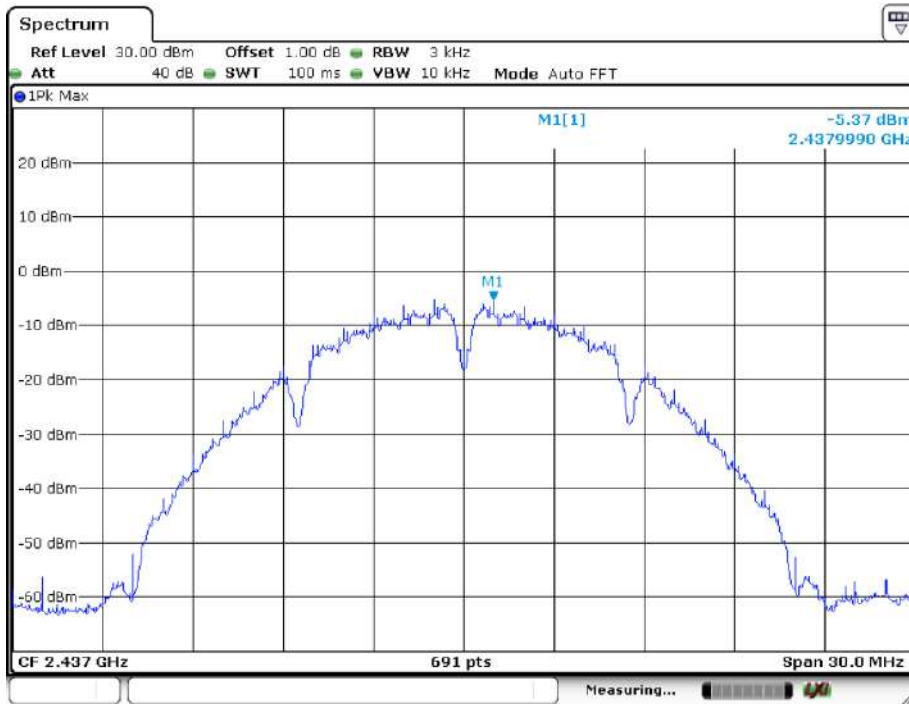
Date: 29. SEP 2020 11:54:59



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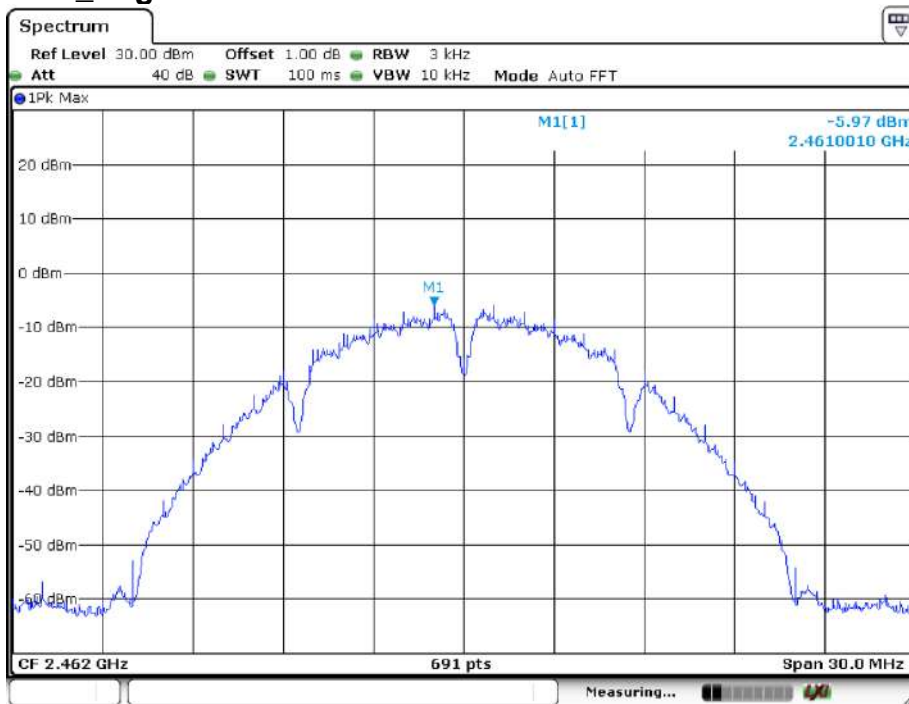
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4.6.2.1.2 802.11B_ Middle Channel



Date: 29. SEP 2020 11:56:58

4.6.2.1.3 802.11B_ Highest Channel

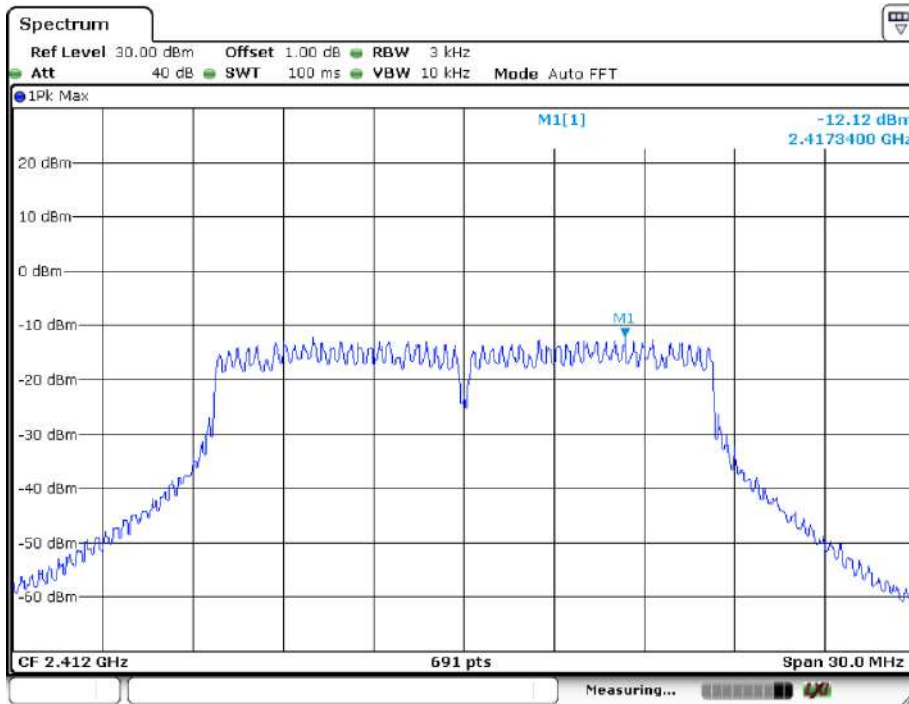


Date: 29. SEP 2020 11:56:17



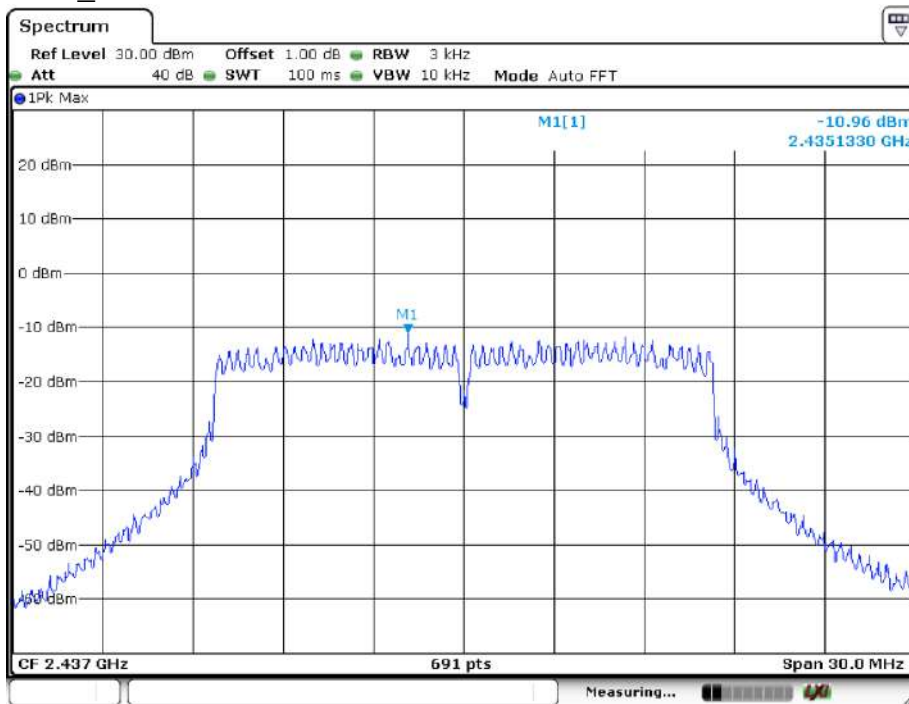
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4.6.2.1.4 802.11G_Lowest Channel



Date: 29.SEP.2020 11:54:26

4.6.2.1.5 802.11G_Middle Channel



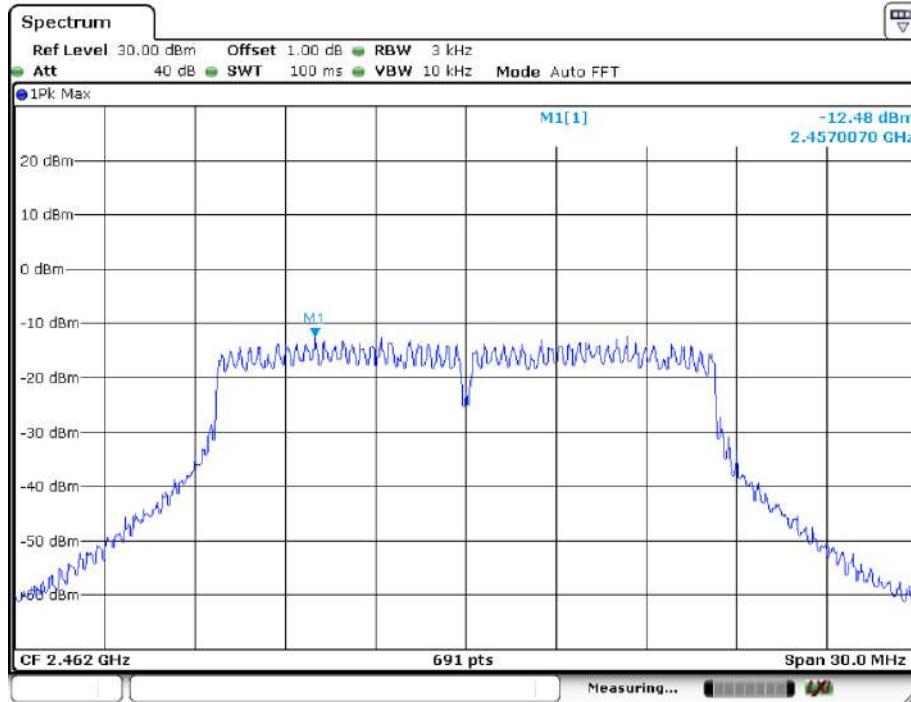
Date: 29.SEP.2020 11:54:07



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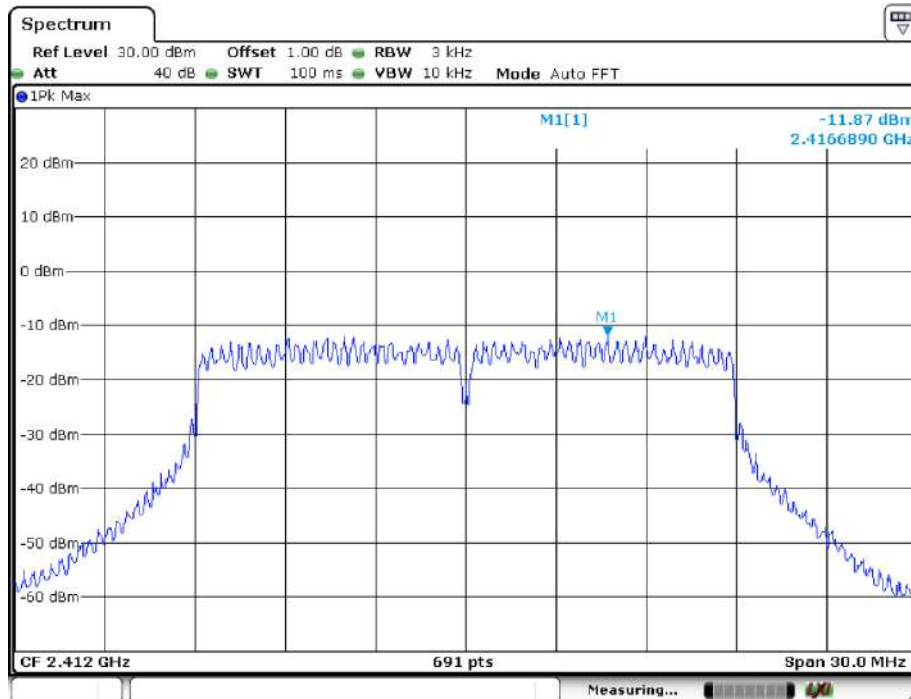
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4.6.2.1.6 802.11G_Highest Channel



Date: 29. SEP 2020 11:53:43

4.6.2.1.7 802.11N20_Lowest Channel



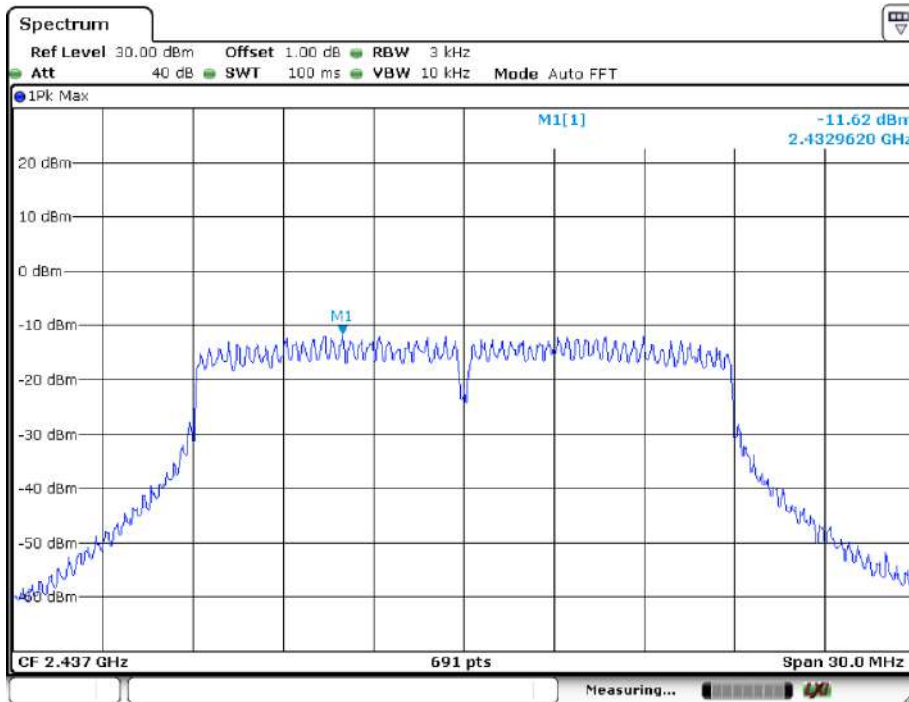
Date: 29. SEP 2020 11:52:33



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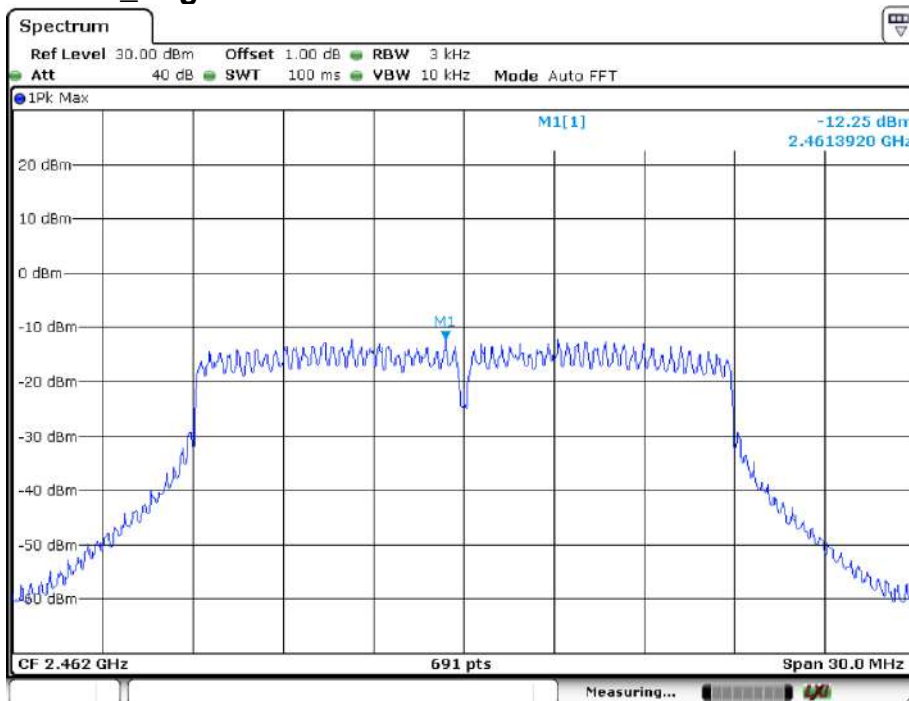
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4.6.2.1.8 802.11 N20_ Middle Channel



Date: 29. SEP 2020 11:53:01

4.6.2.1.9 802.11 N20_ Highest Channel



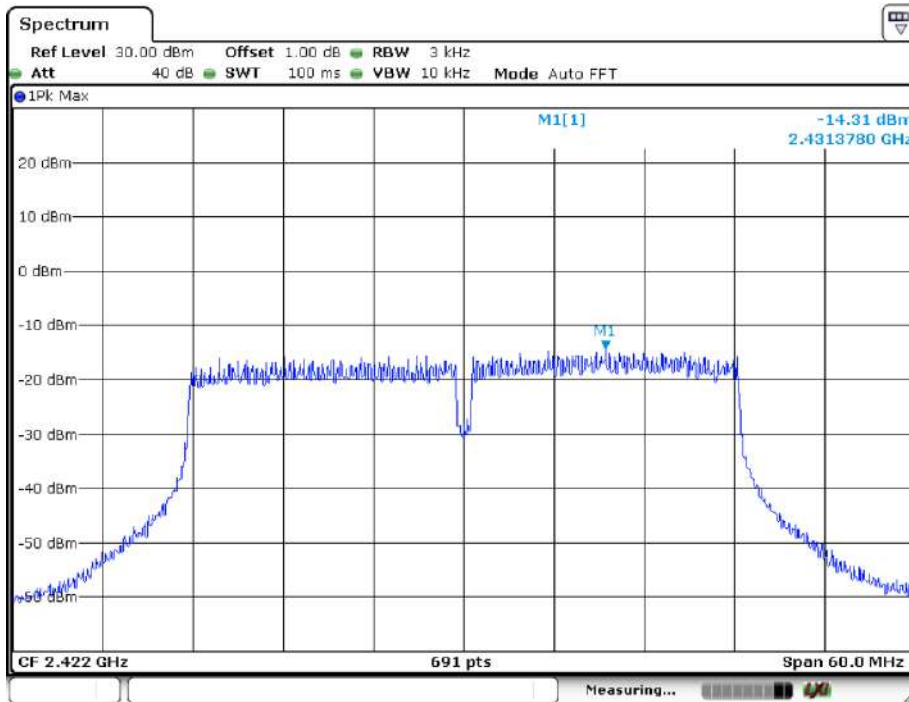
Date: 29. SEP 2020 11:53:18



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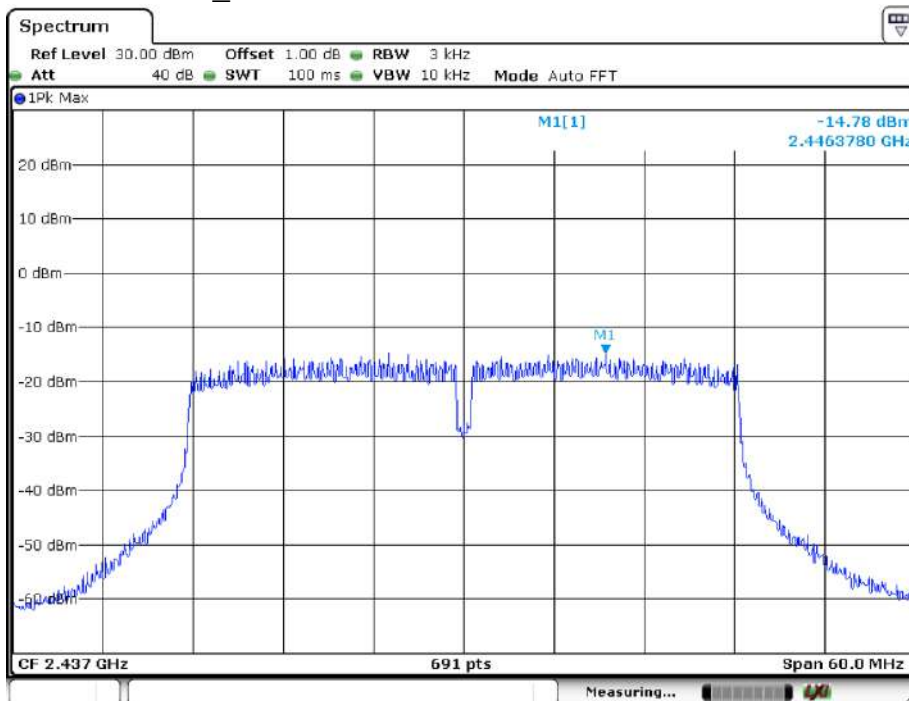
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4.6.2.1.10 802.11N40_Lowest Channel



Date: 29. SEP 2020 11:48:34

4.6.2.1.11 802.11 N40_ Middle Channel



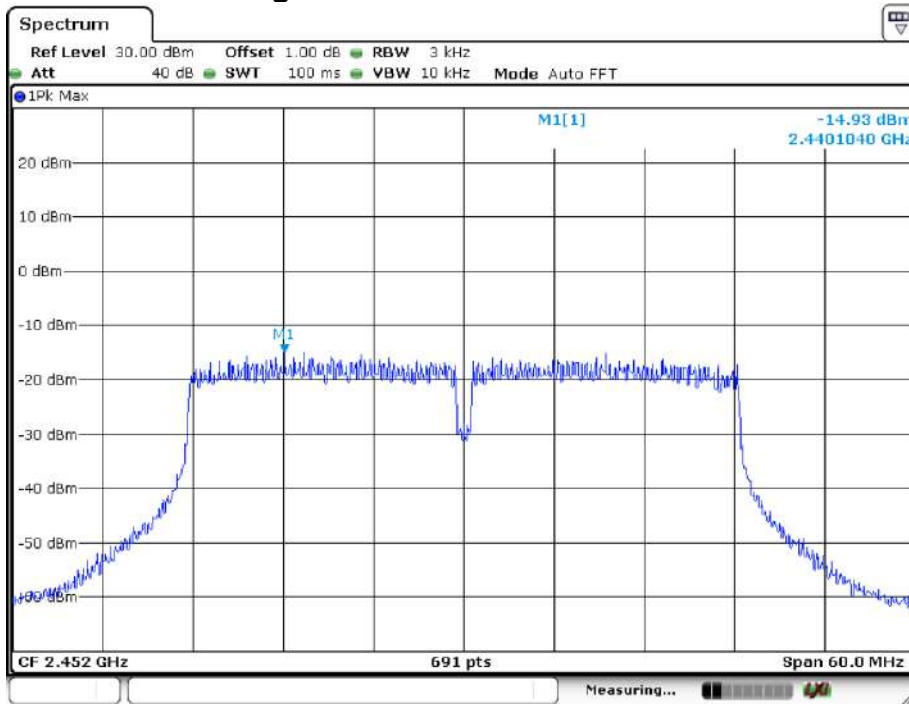
Date: 29. SEP 2020 11:47:53



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4.6.2.1.12 802.11 N40_ Highest Channel



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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 5.10 for details
Test Results:	Pass

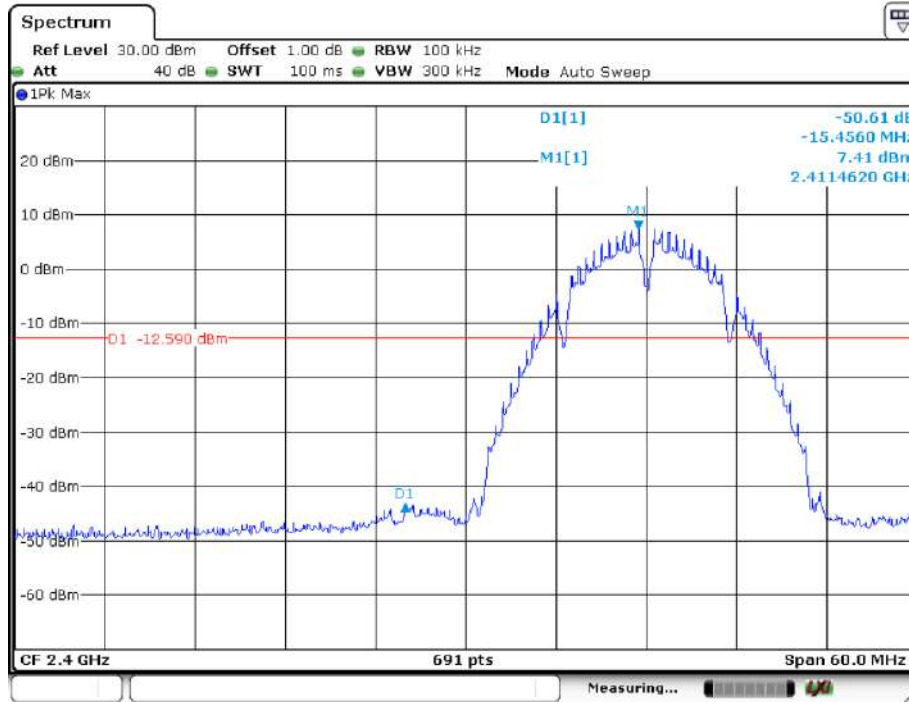


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4.7.1 Test plots

4.7.1.1 ANT1

4.7.1.1.1 802.11B_Lowest Channel



Date: 29.SEP.2020 14:11:21



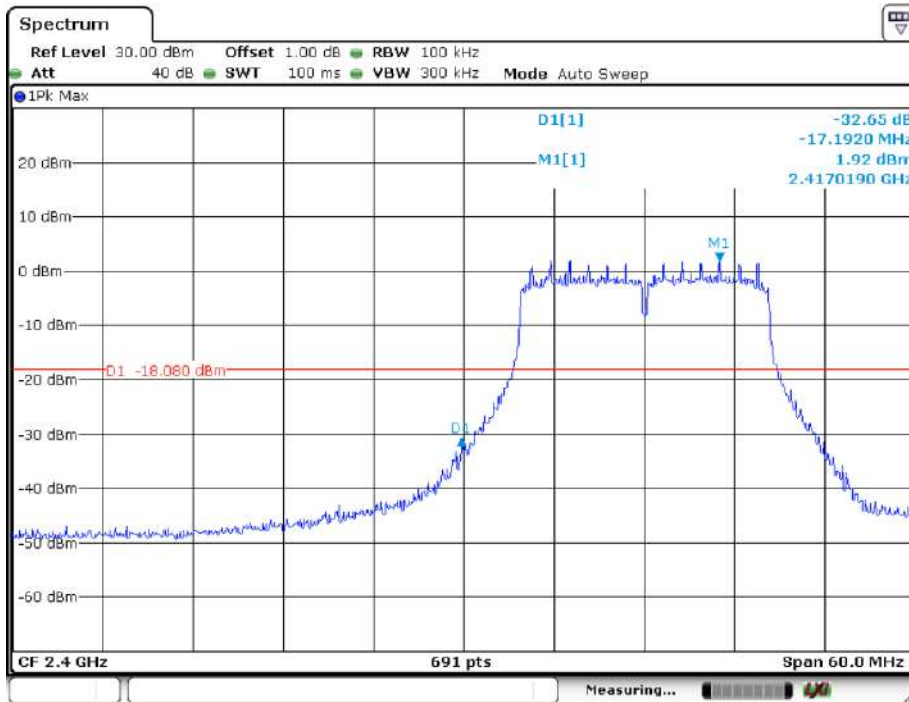
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4.7.1.1.2 802.11B_Highest Channel



Date: 29.SEP.2020 14:09:55

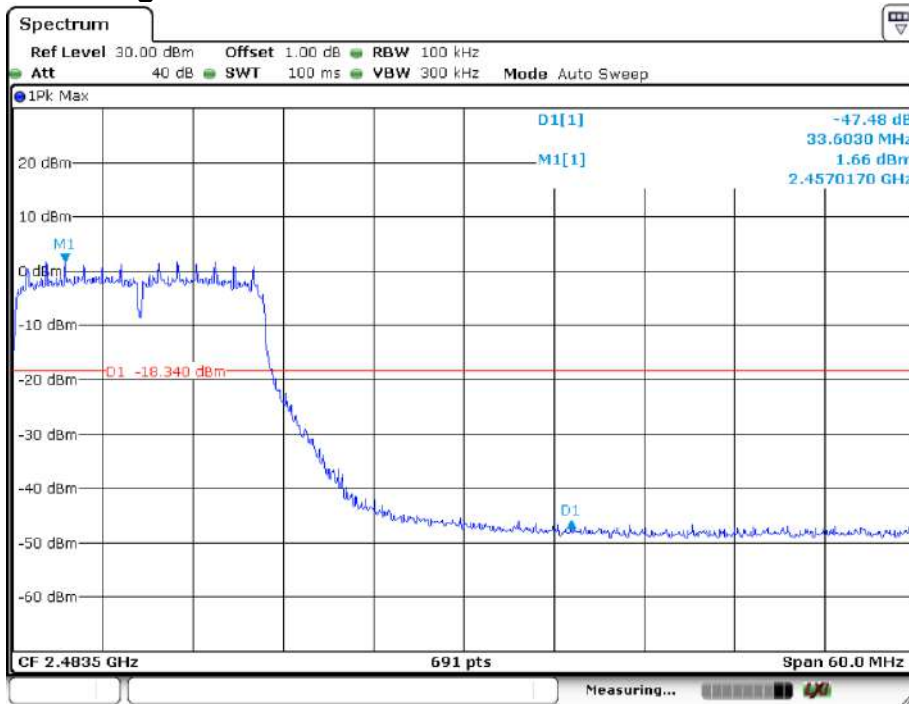
4.7.1.1.3 802.11G_Lowest Channel



Date: 29.SEP.2020 14:12:28

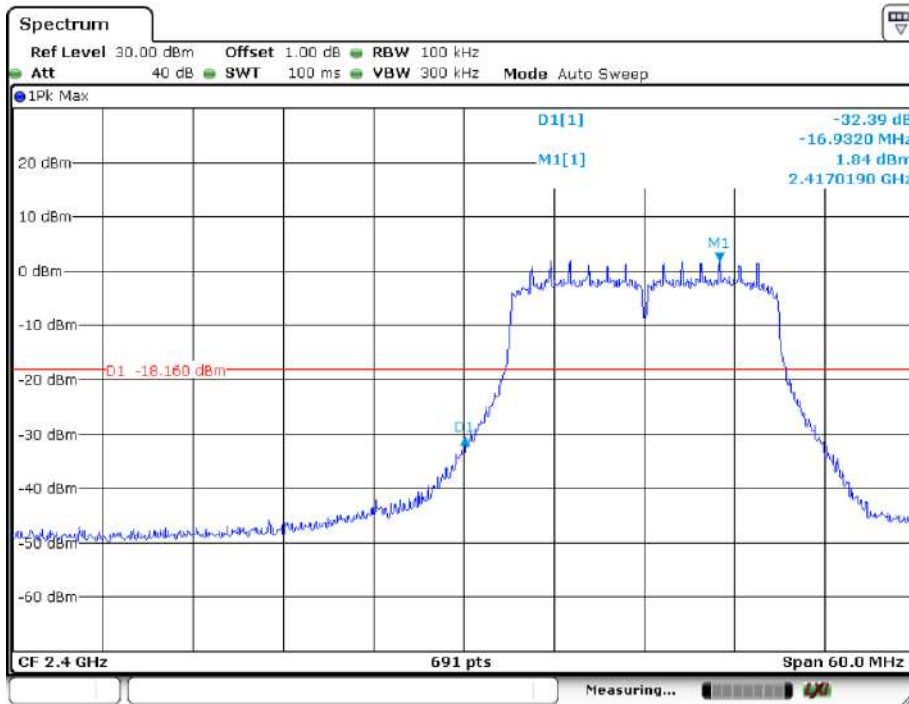


4.7.1.1.4 802.11G_Highest Channel



Date: 29.SEP.2020 14:13:41

4.7.1.1.5 802.11N20_Lowest Channel



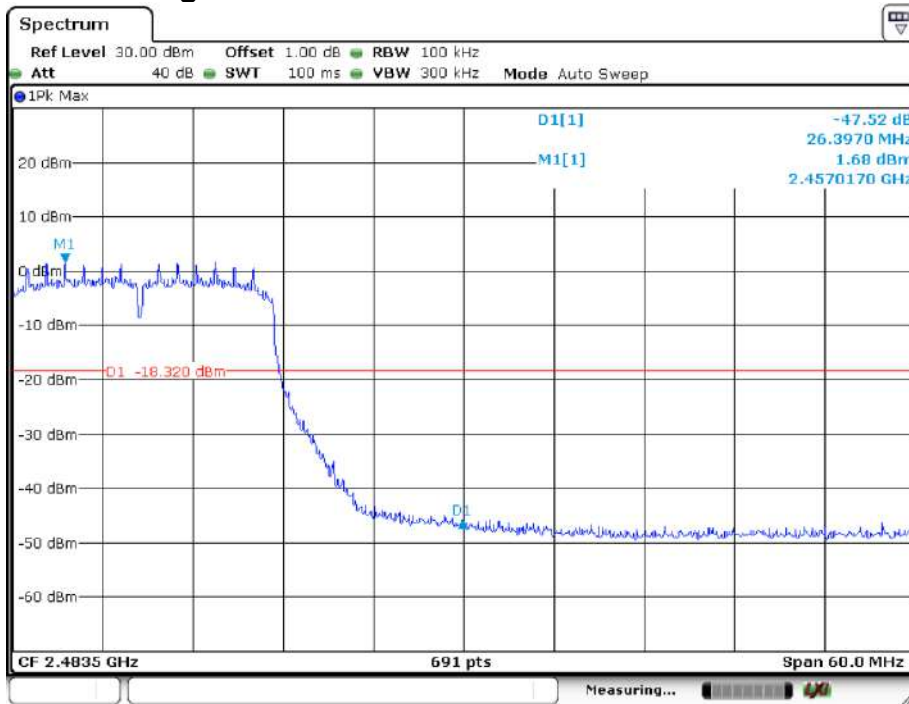
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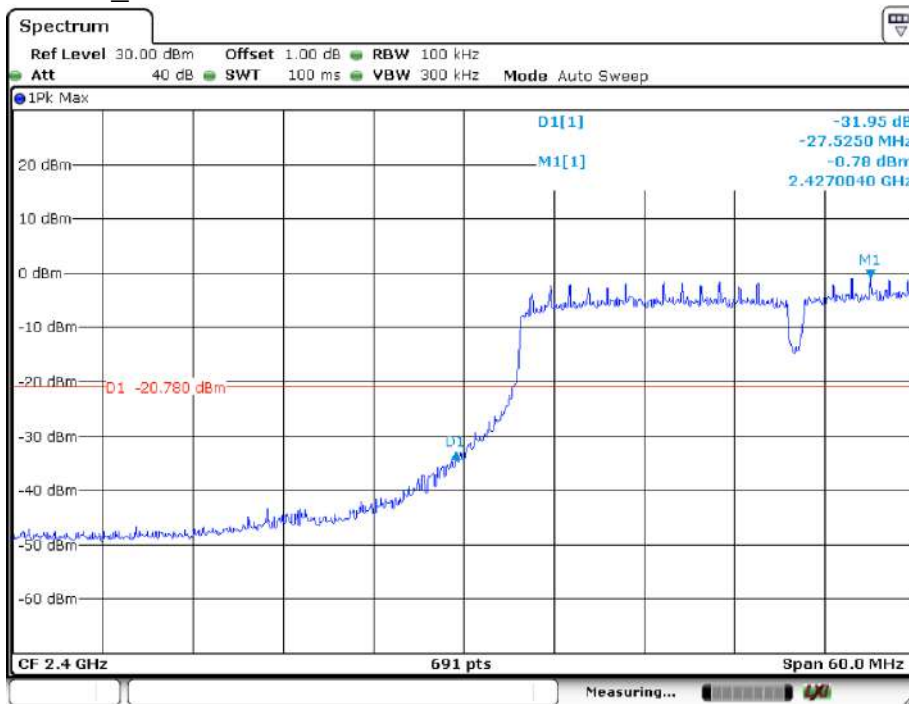
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4.7.1.1.6 802.11 N20_ Highest Channel



Date: 29. SEP 2020 14:14:41

4.7.1.1.7 802.11N40_ Lowest Channel



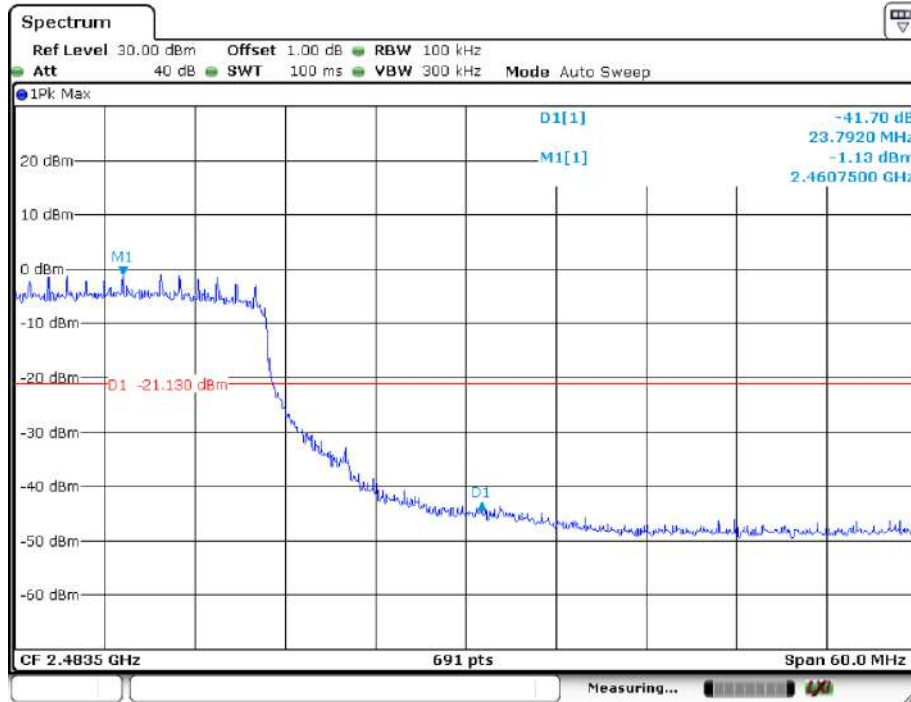
Date: 29. SEP 2020 14:18:27



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4.7.1.1.8 802.11 N40_ Highest Channel



Date: 29. SEP 2020 14:19:42



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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 5.10 for details
Test Results:	Pass



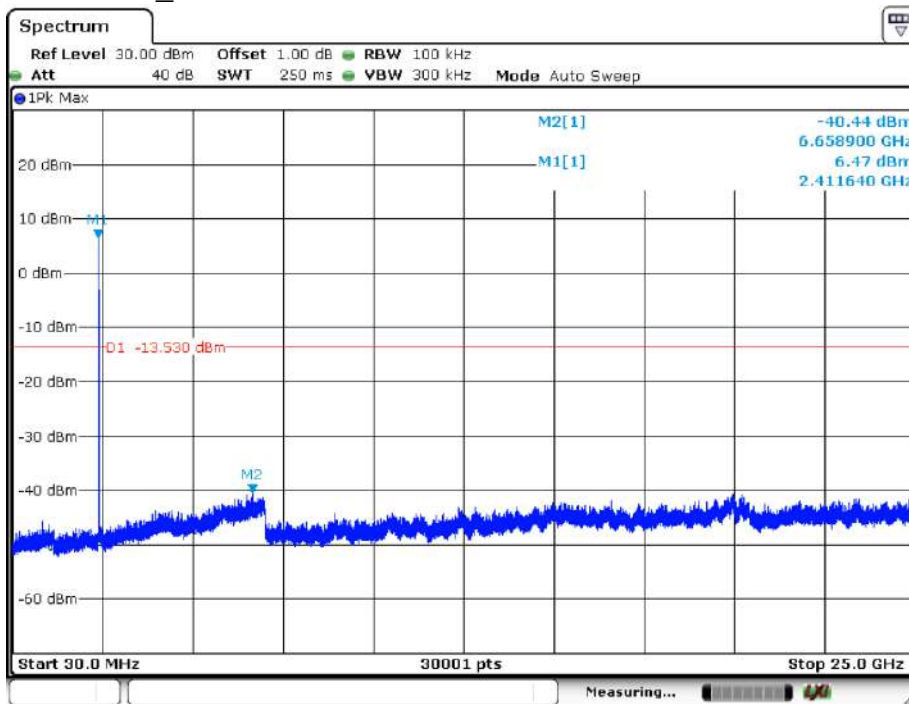
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4.8.1 Test plots

4.8.1.1 ANT1

4.8.1.1.1 802.11B_Lowest Channel

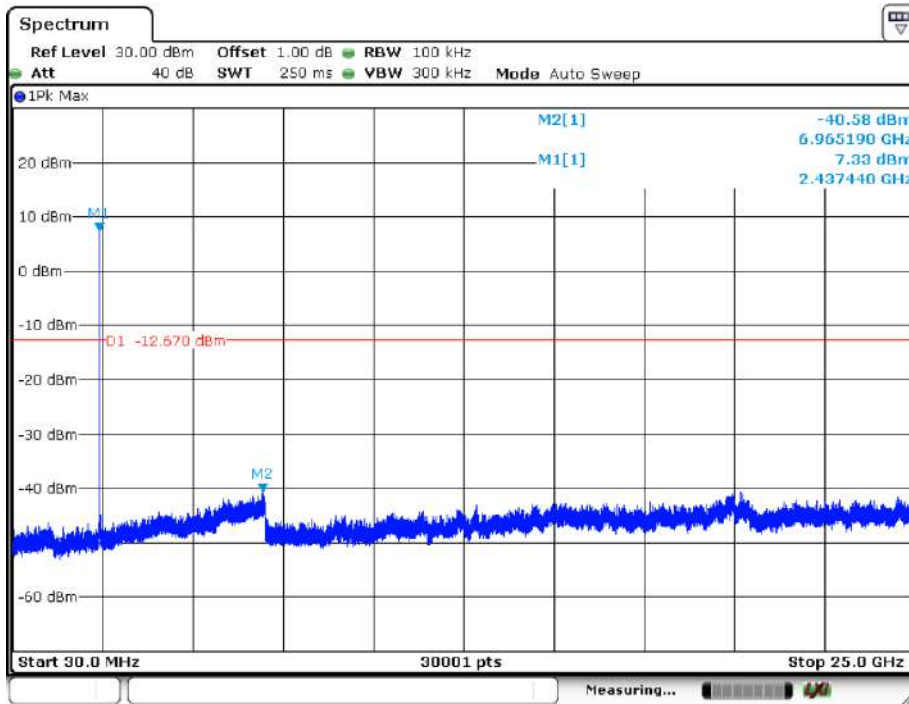


Date: 29. SEP 2020 14:34:50



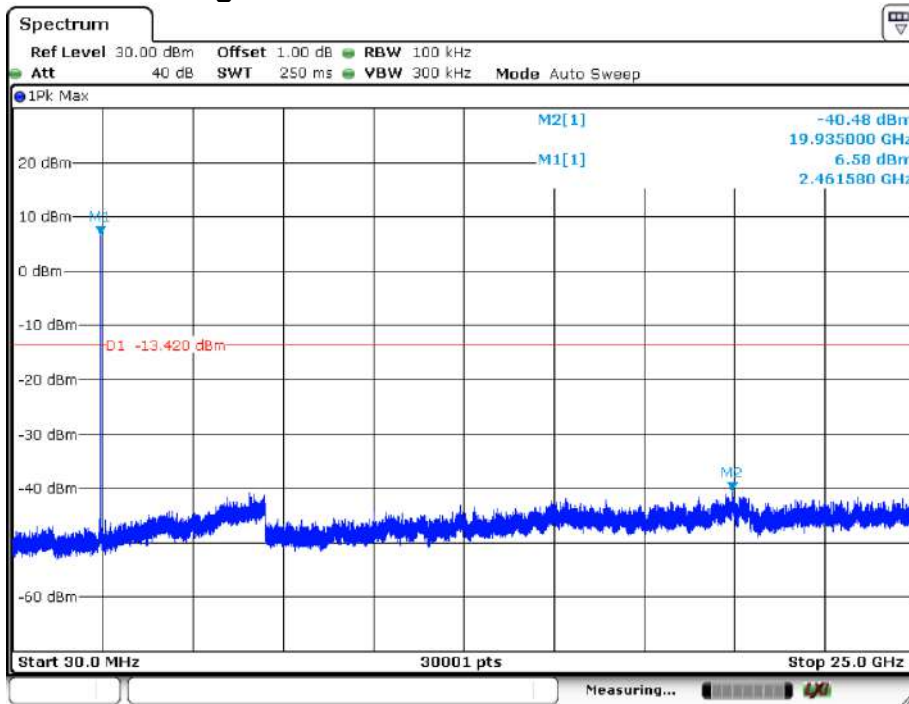
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4.8.1.1.2 802.11B_ Middle Channel



Date: 29. SEP 2020 14:35:56

4.8.1.1.3 802.11B_ Highest Channel



Date: 29. SEP 2020 14:36:53

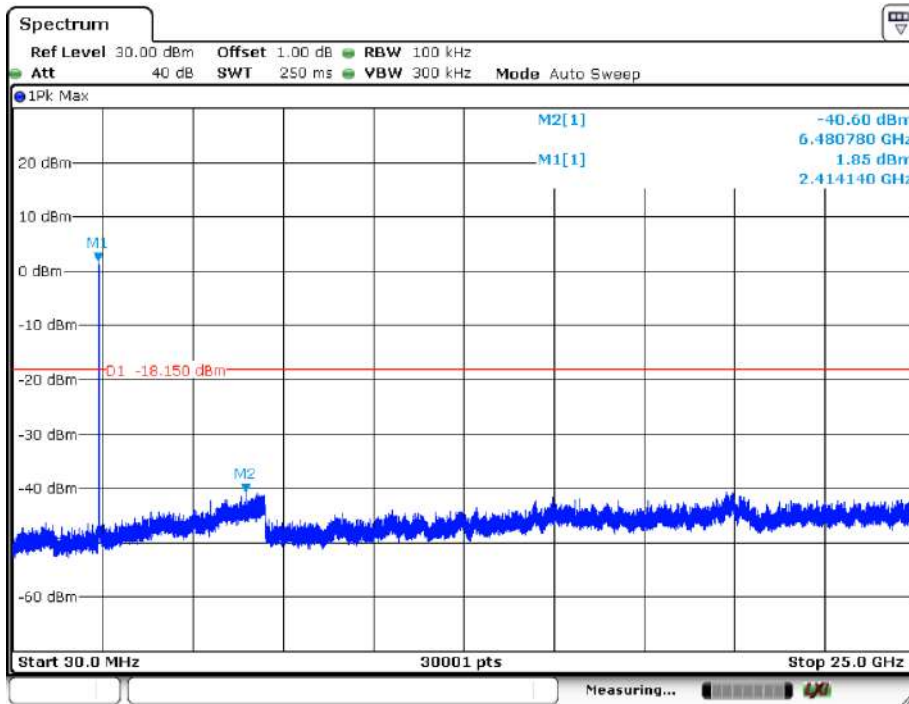


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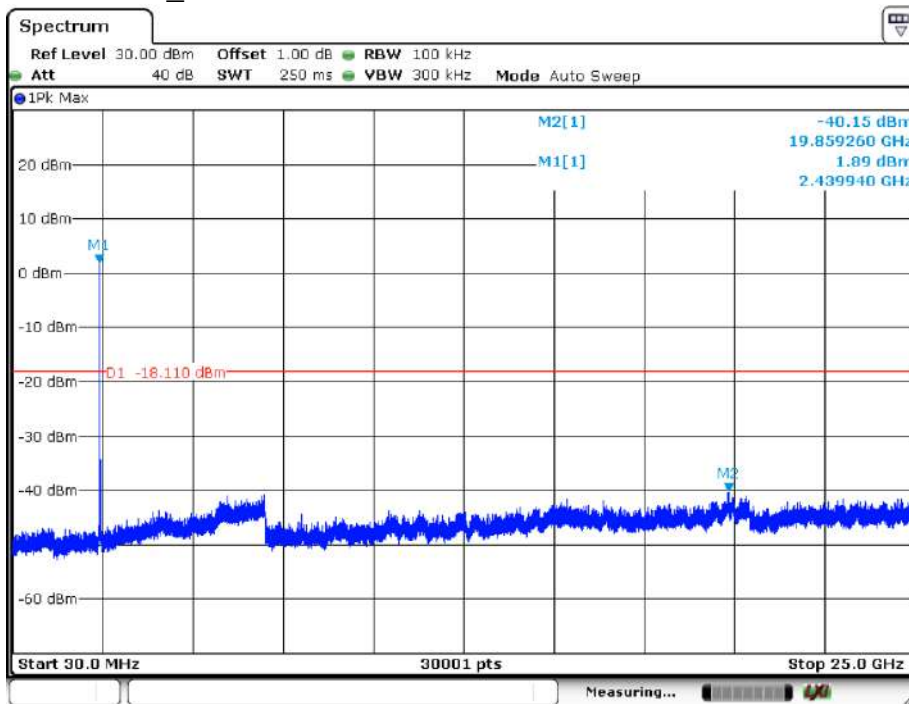
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4.8.1.1.4 802.11G_Lowest Channel



Date: 29. SEP 2020 14:33:06

4.8.1.1.5 802.11G_Middle Channel

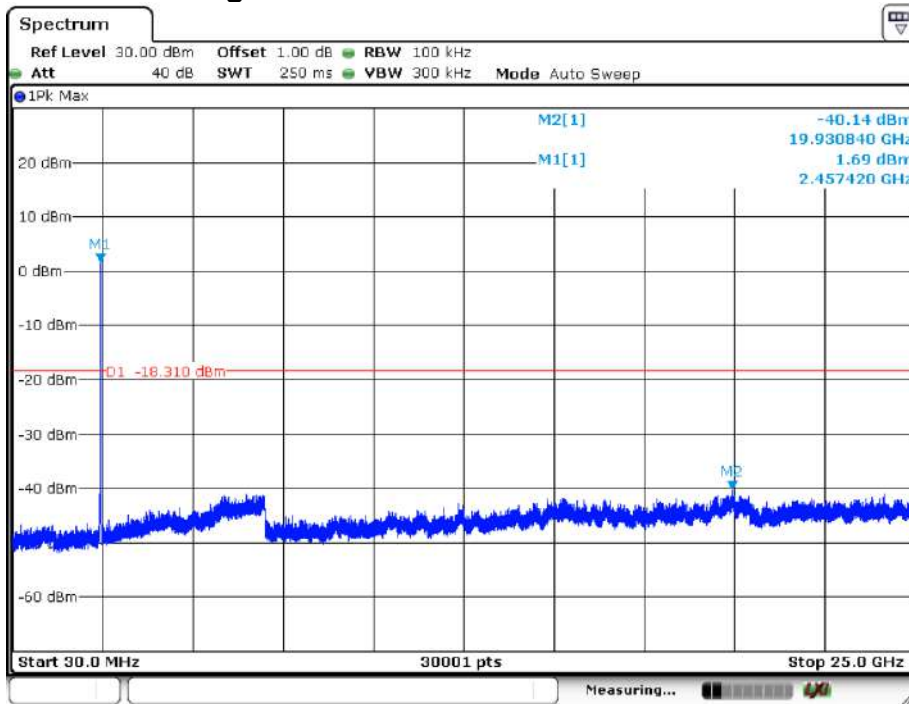


Date: 29. SEP 2020 14:31:52



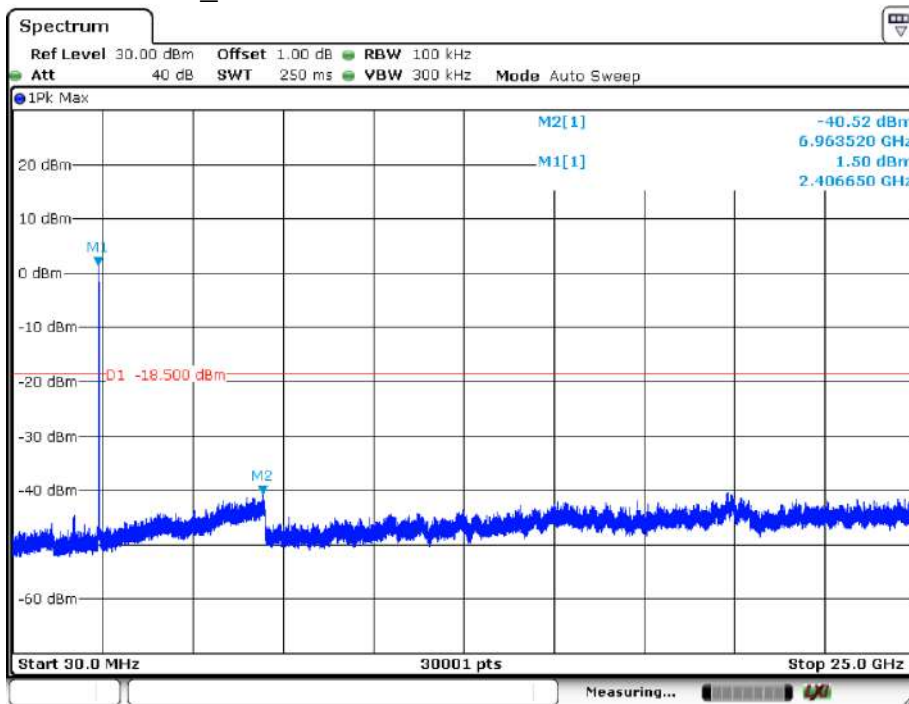
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4.8.1.1.6 802.11G_Highest Channel



Date: 29. SEP 2020 14:28:42

4.8.1.1.7 802.11N20_Lowest Channel



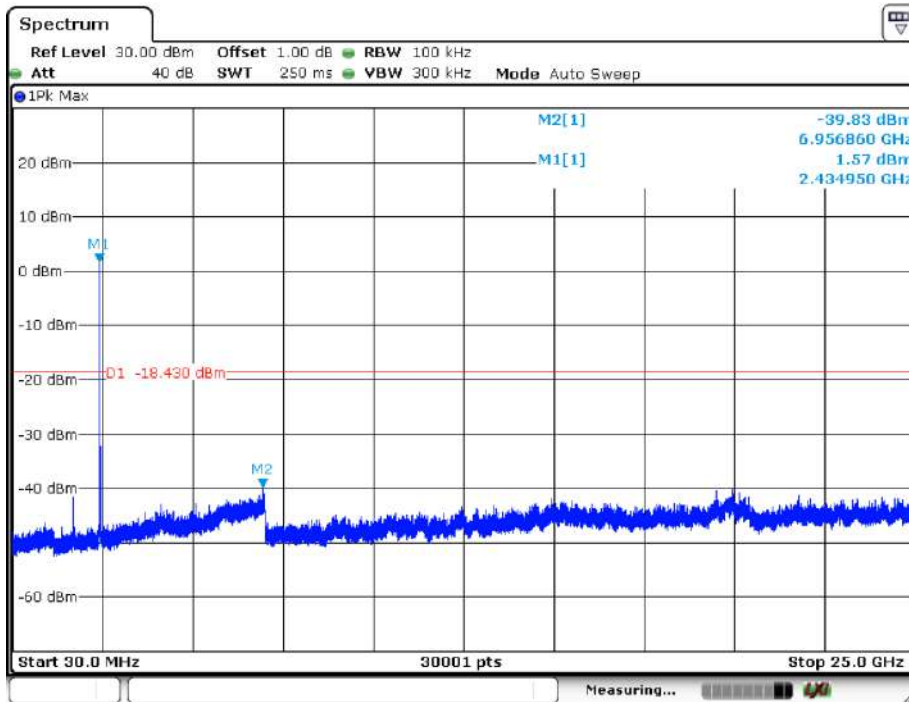
Date: 29. SEP 2020 14:24:10



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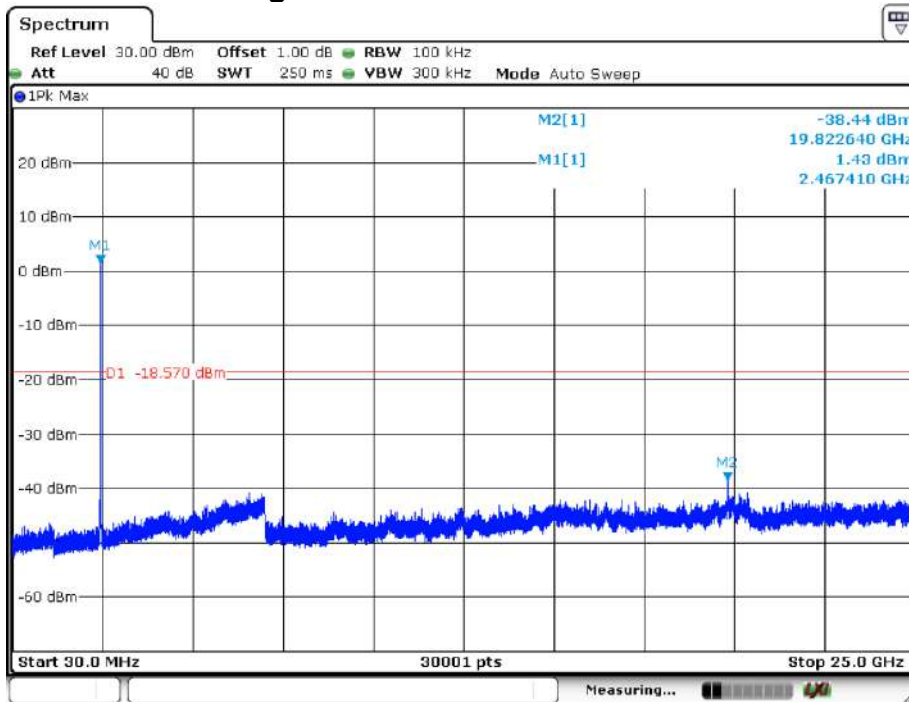
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4.8.1.1.8 802.11 N20_ Middle Channel



Date: 29. SEP 2020 14:25:21

4.8.1.1.9 802.11 N20_ Highest Channel



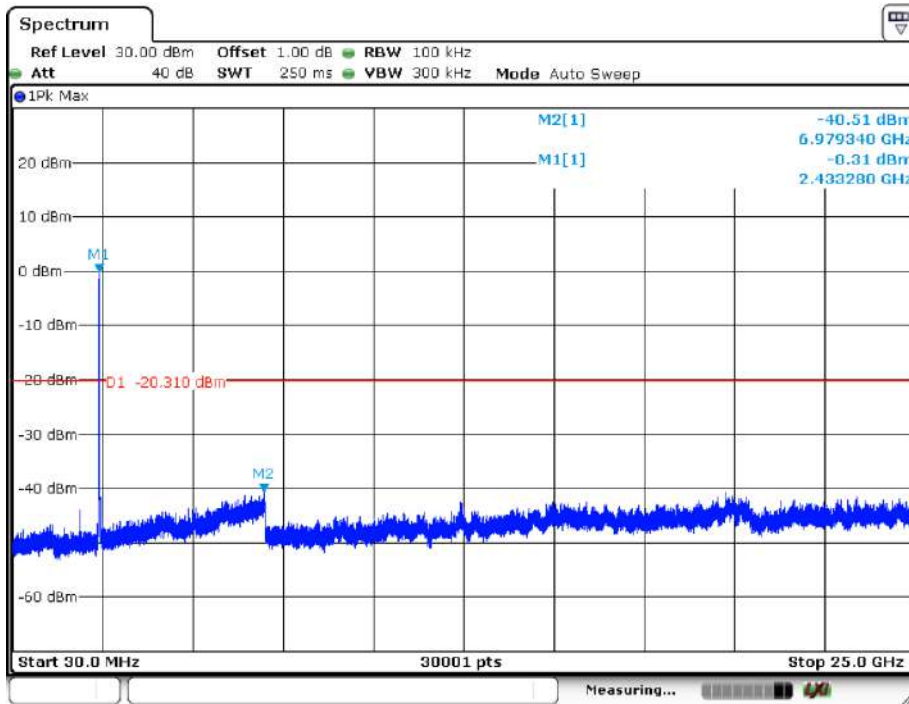
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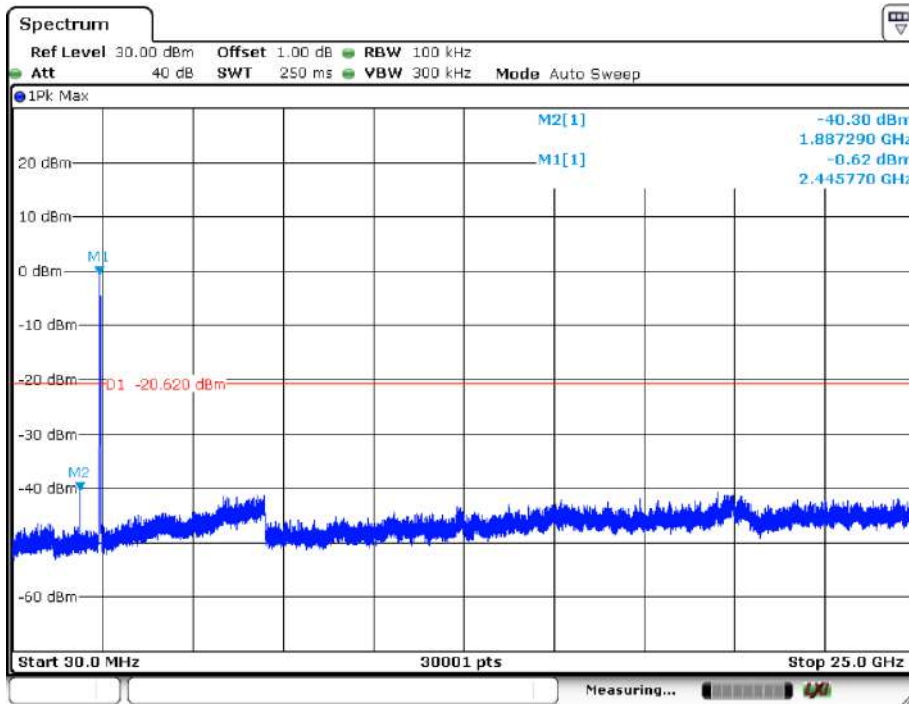
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4.8.1.1.10 802.11N40_Lowest Channel



Date: 29. SEP 2020 14:22:35

4.8.1.1.11 802.11 N40_ Middle Channel

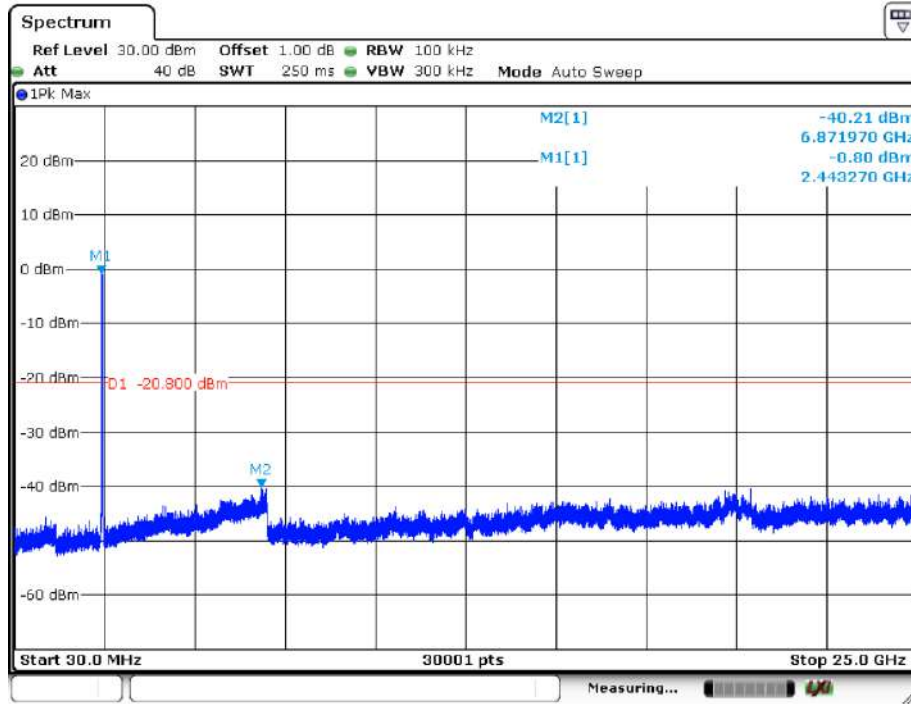


Date: 29. SEP 2020 14:21:42



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4.8.1.1.12 802.11 N40_ Highest Channel



Date: 29. SEP 2020 14:20:45

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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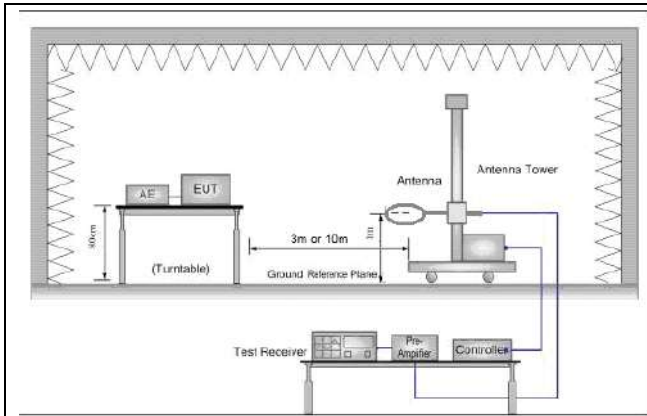


Figure 1. Below 30MHz

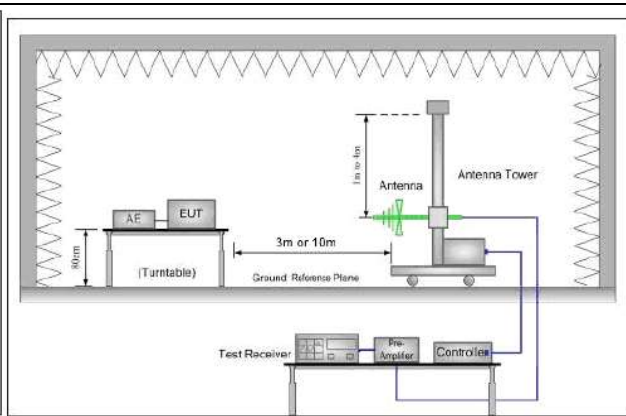


Figure 2. 30MHz to 1GHz

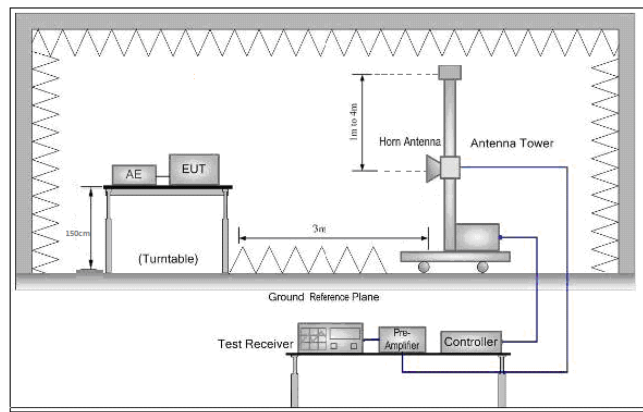


Figure 3. Above 1 GHz

Test Procedure:

- 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 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 semi-anechoic chamber. 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. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) 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
 - (3) For average measurement: use duty cycle correction factor method per 15.35(c).

Duty cycle = On time/100 milliseconds



	<p>On time = $N_1 * L_1 + N_2 * L_2 + \dots + N_{n-1} * L_{n-1} + N_n * L_n$</p> <p>Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.</p> <p>Average Emission Level = Peak Emission Level + $20 * \log(\text{Duty cycl})$</p> <p>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.</p> <p>g. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>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.</p> <p>i. Test the EUT in the lowest channel, the middle channel, the Highest channel</p> <p>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.</p> <p>k. Repeat above procedures until all frequencies measured was complete.</p>
Exploratory Test Mode:	<p>Transmitting with all kind of modulations, data rates.</p> <p>Charge + Transmitting mode.</p>
Final Test Mode:	<p>Pretest the EUT at Charge + Transmitting mode.</p> <p>Through Pre-scan, find the</p> <p>1Mbps of rate is the worst case of 802.11B;</p> <p>6Mbps of rate is the worst case of 802.11G;</p> <p>6.5Mbps of rate is the worst case of 802.11N(HT20);</p> <p>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. Only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



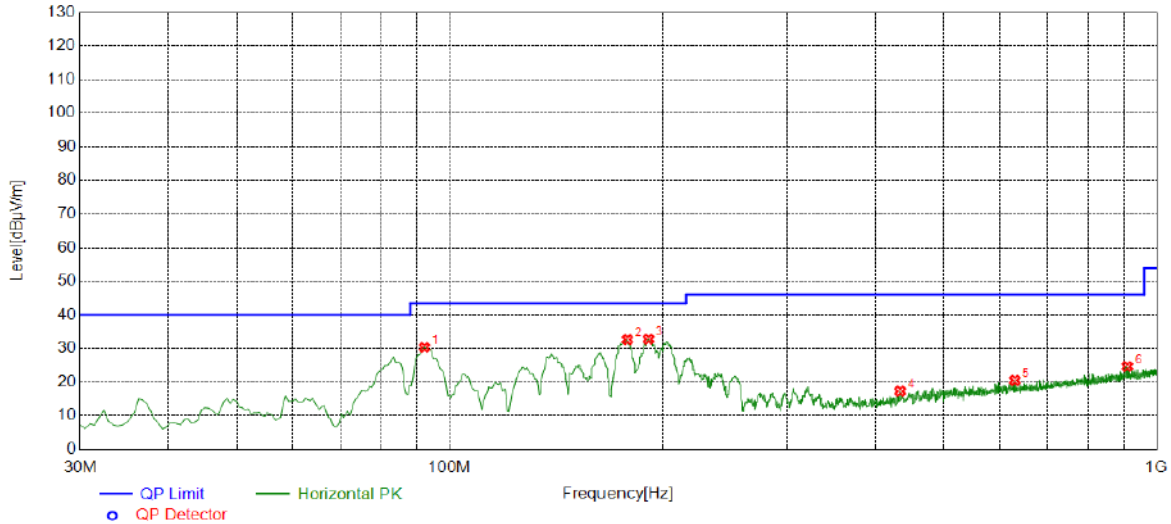
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4.9.1 Radiated emission below 1GHz

4.9.1.1 Charge + Transmitting

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	92.1111	30.35	-33.06	43.50	13.15	172	25	Horizontal
2	178.484	32.70	-33.02	43.50	10.80	159	76	Horizontal
3	191.100	32.83	-31.76	43.50	10.67	207	51	Horizontal
4	433.721	17.35	-24.18	46.00	28.65	198	232	Horizontal
5	630.245	20.53	-19.66	46.00	25.47	169	104	Horizontal
6	908.774	24.71	-15.10	46.00	21.29	111	282	Horizontal

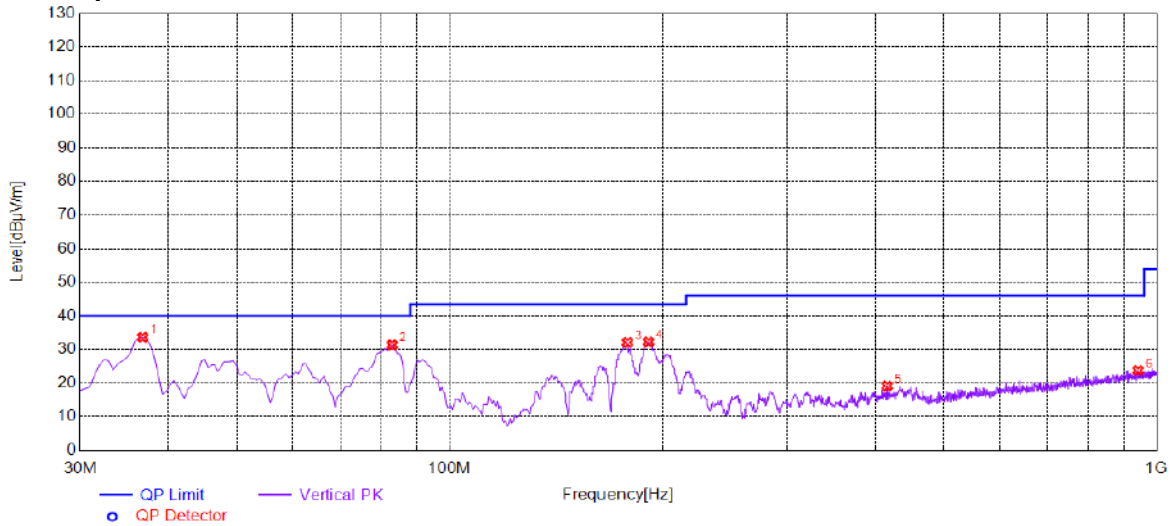
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Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.7934	33.68	-32.19	40.00	6.32	226	16	Vertical
2	82.8914	31.40	-35.16	40.00	8.60	167	249	Vertical
3	178.484	32.14	-33.02	43.50	11.36	207	137	Vertical
4	191.100	32.29	-31.76	43.50	11.21	293	152	Vertical
5	415.767	19.17	-24.55	46.00	26.83	196	149	Vertical
6	941.285	23.82	-14.60	46.00	22.18	257	324	Vertical

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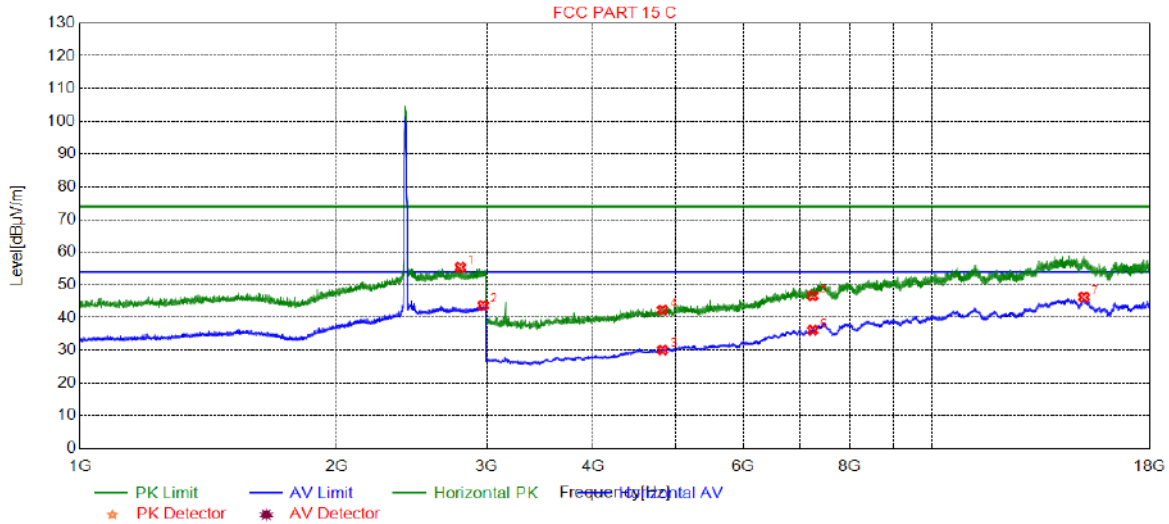
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4.9.2 Transmitter emission above 1GHz

4.9.2.1 802.11B_Channel 1

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2793.44	55.39	9.00	74.00	18.61	138	13	Horizontal
2	2970.99	43.76	9.58	54.00	10.24	240	27	Horizontal
3	4824.00	30.08	-18.21	54.00	23.92	191	259	Horizontal
4	4824.00	42.33	-18.21	74.00	31.67	104	259	Horizontal
5	7236.00	46.70	-9.76	74.00	27.30	246	342	Horizontal
6	7236.00	36.16	-9.76	54.00	17.84	157	259	Horizontal
7	15055.2	46.27	2.64	54.00	7.73	101	177	Horizontal

Final Data List

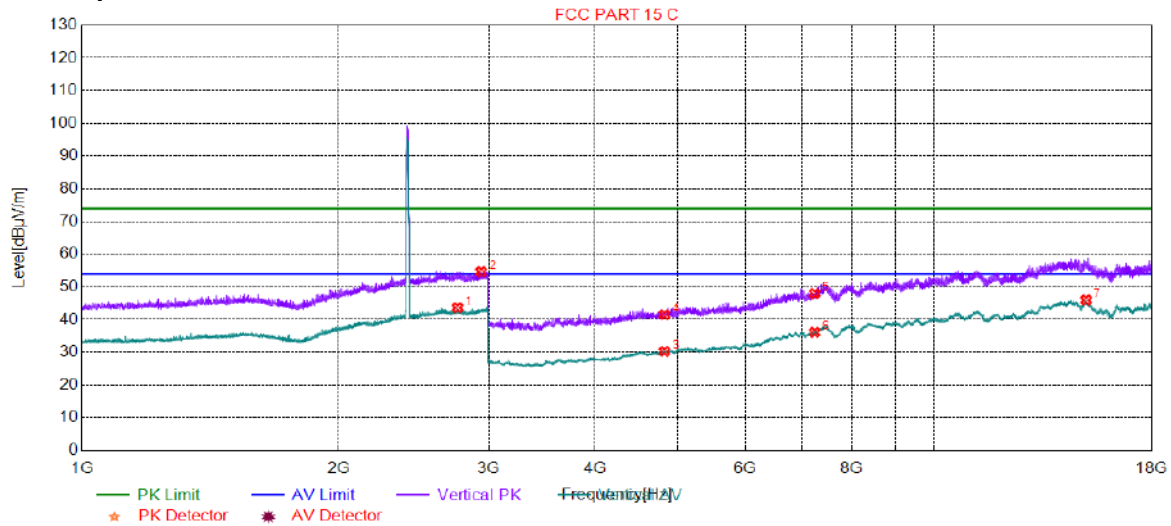


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4.9.2.2 802.11B_Channel 1
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2757.43	43.69	9.09	54.00	10.31	261	237	Vertical
2	2939.98	54.69	9.57	74.00	19.31	269	59	Vertical
3	4824.00	30.29	-18.21	54.00	23.71	156	156	Vertical
4	4824.00	41.55	-18.21	74.00	32.45	189	237	Vertical
5	7236.00	47.99	-9.76	74.00	26.01	250	360	Vertical
6	7236.00	36.14	-9.76	54.00	17.86	160	156	Vertical
7	15064.2	46.02	2.66	54.00	7.98	209	347	Vertical

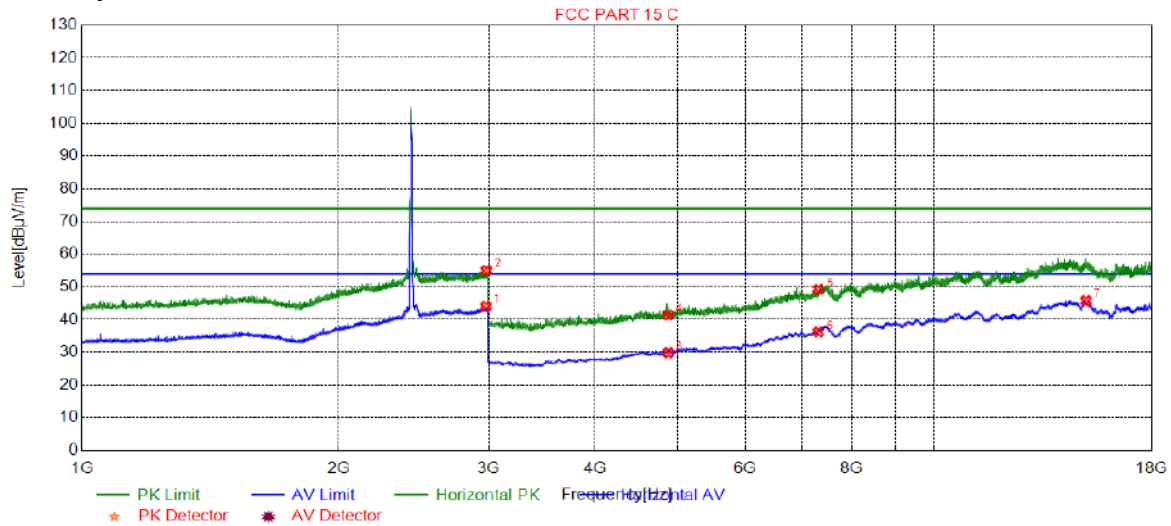
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4.9.2.3 802.11B_Channel 6
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2977.99	44.11	9.55	54.00	9.89	141	342	Horizontal
2	2981.99	55.02	9.53	74.00	18.98	103	14	Horizontal
3	4874.00	29.90	-17.99	54.00	24.10	166	315	Horizontal
4	4874.00	41.44	-17.99	74.00	32.56	176	68	Horizontal
5	7311.00	49.26	-9.59	74.00	24.74	133	287	Horizontal
6	7311.00	36.23	-9.59	54.00	17.77	117	178	Horizontal
7	15059.7	45.80	2.65	54.00	8.20	141	150	Horizontal

Final Data List

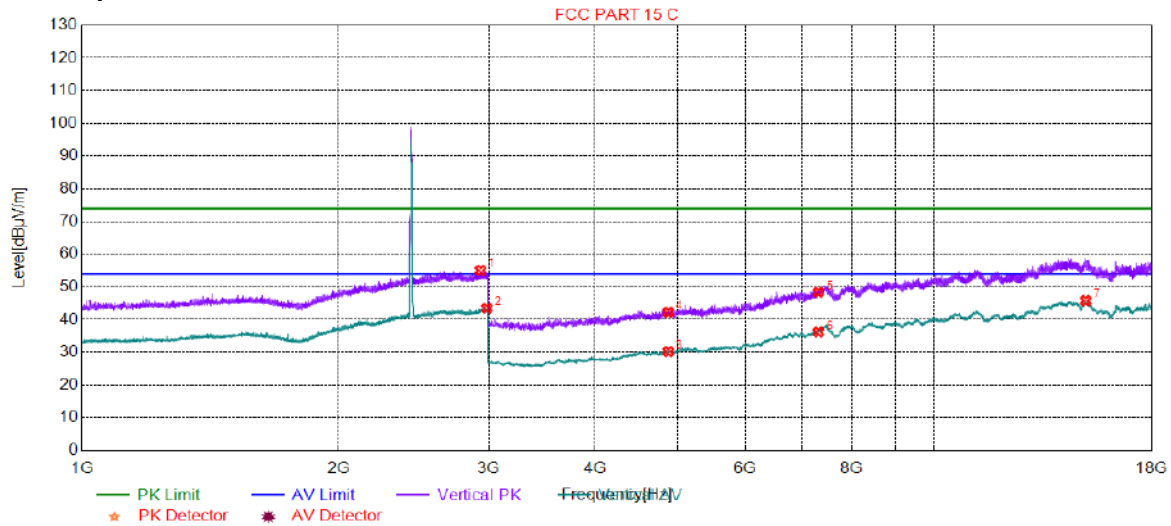


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4.9.2.4 802.11B_Channel 6

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2935.98	55.07	9.53	74.00	18.93	275	210	Vertical
2	2985.99	43.52	9.51	54.00	10.48	170	32	Vertical
3	4874.00	30.24	-17.99	54.00	23.76	201	320	Vertical
4	4874.00	42.25	-17.99	74.00	31.75	257	128	Vertical
5	7311.00	48.39	-9.59	74.00	25.61	284	46	Vertical
6	7311.00	36.23	-9.59	54.00	17.77	248	265	Vertical
7	15046.2	45.83	2.63	54.00	8.17	153	101	Vertical

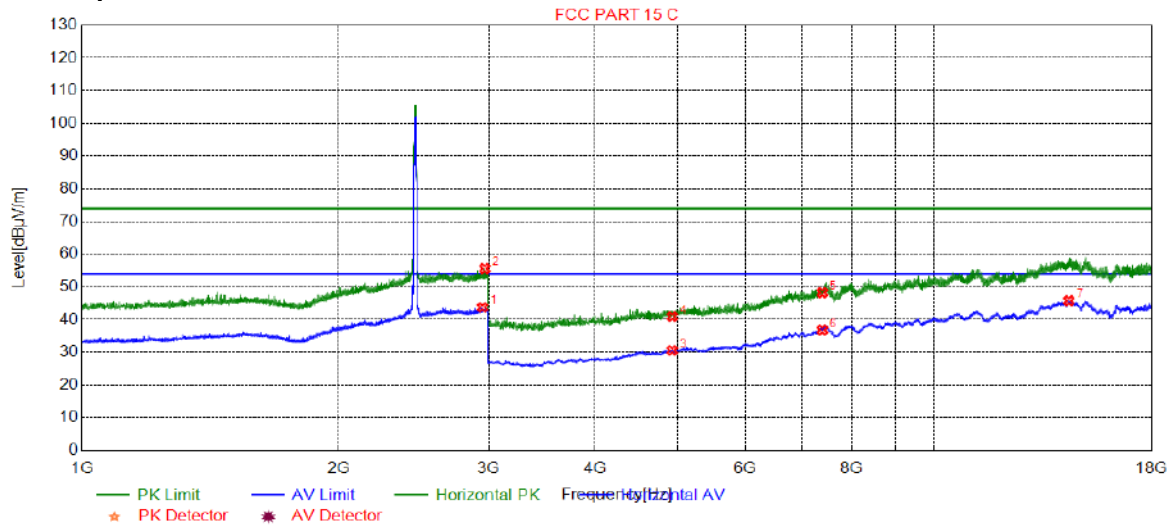
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4.9.2.5 802.11B_Channel 11
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2949.98	43.78	9.68	54.00	10.22	243	149	Horizontal
2	2967.99	55.60	9.60	74.00	18.40	132	177	Horizontal
3	4924.00	30.57	-17.71	54.00	23.43	232	152	Horizontal
4	4924.00	40.93	-17.71	74.00	33.07	113	124	Horizontal
5	7386.00	48.25	-9.20	74.00	25.75	221	0	Horizontal
6	7386.00	36.83	-9.20	54.00	17.17	243	0	Horizontal
7	14380.1	45.80	2.68	54.00	8.20	133	179	Horizontal

Final Data List



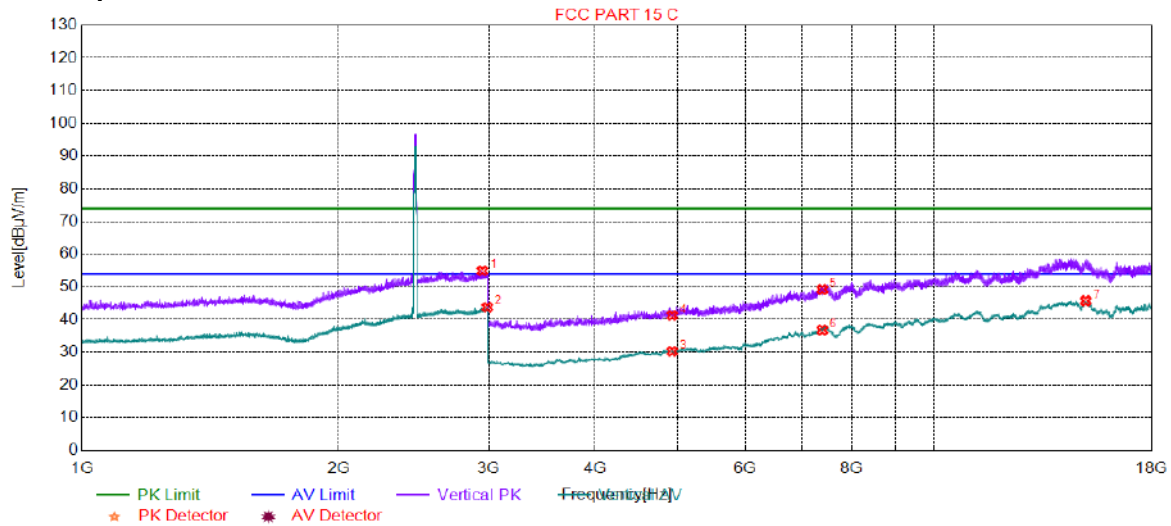
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4.9.2.6 802.11B_Channel 11
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2949.48	54.93	9.67	74.00	19.07	198	280	Vertical
2	2988.99	43.80	9.50	54.00	10.20	203	266	Vertical
3	4924.00	30.29	-17.71	54.00	23.71	160	182	Vertical
4	4924.00	41.29	-17.71	74.00	32.71	257	209	Vertical
5	7386.00	49.19	-9.20	74.00	24.81	176	100	Vertical
6	7386.00	36.81	-9.20	54.00	17.19	209	127	Vertical
7	15047.7	45.77	2.63	54.00	8.23	225	100	Vertical

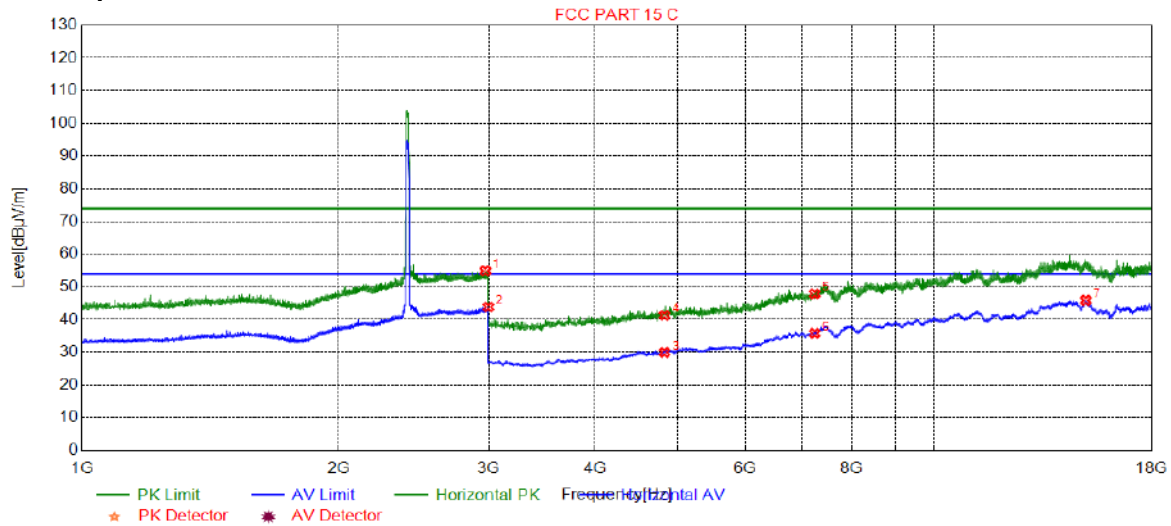
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4.9.2.7 802.11G_Channel 1
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2972.99	54.92	9.57	74.00	19.08	236	286	Horizontal
2	2997.49	43.89	9.46	54.00	10.11	115	218	Horizontal
3	4824.00	29.98	-18.21	54.00	24.02	171	342	Horizontal
4	4824.00	41.33	-18.21	74.00	32.67	148	13	Horizontal
5	7236.00	47.89	-9.76	74.00	26.11	173	342	Horizontal
6	7236.00	35.84	-9.76	54.00	18.16	131	95	Horizontal
7	15050.7	45.92	2.64	54.00	8.08	122	95	Horizontal

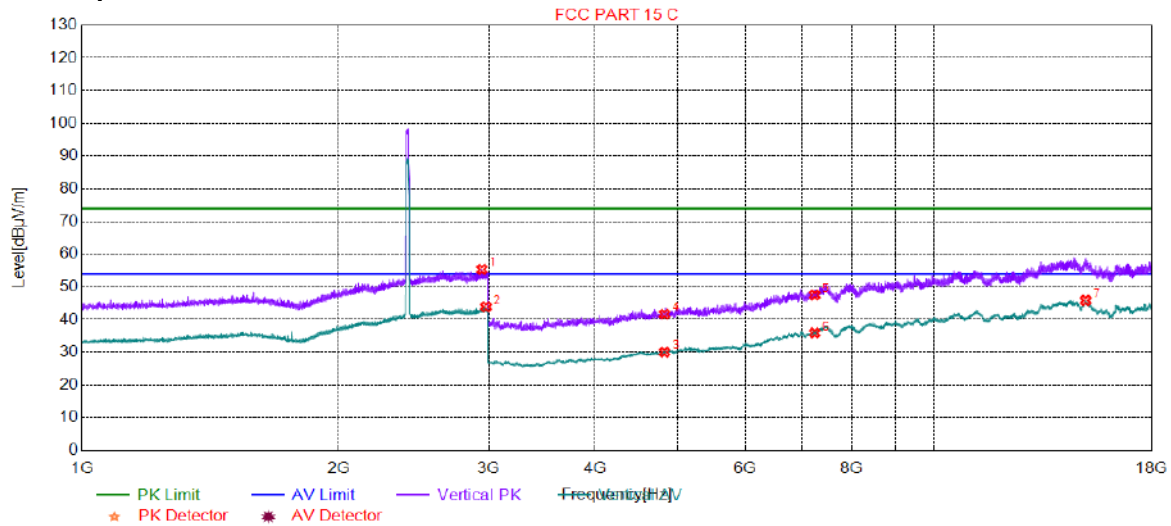
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4.9.2.8 802.11G_Channel 1
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2945.98	55.37	9.64	74.00	18.63	252	183	Vertical
2	2977.99	43.94	9.55	54.00	10.06	283	210	Vertical
3	4824.00	30.05	-18.21	54.00	23.95	257	18	Vertical
4	4824.00	41.68	-18.21	74.00	32.32	197	208	Vertical
5	7236.00	47.55	-9.76	74.00	26.45	292	18	Vertical
6	7236.00	35.95	-9.76	54.00	18.05	211	236	Vertical
7	15044.7	45.91	2.63	54.00	8.09	261	290	Vertical

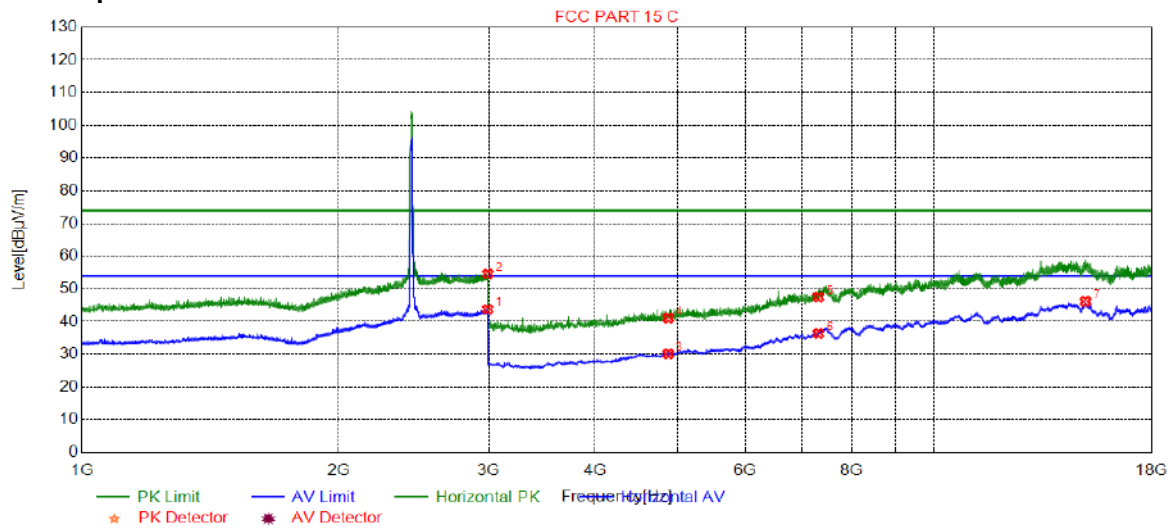
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4.9.2.9 802.11G_Channel 6
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2992.49	43.78	9.48	54.00	10.22	155	150	Horizontal
2	2993.99	54.62	9.48	74.00	19.38	210	342	Horizontal
3	4874.00	30.15	-17.99	54.00	23.85	131	260	Horizontal
4	4874.00	41.09	-17.99	74.00	32.91	219	150	Horizontal
5	7311.00	47.52	-9.59	74.00	26.48	219	260	Horizontal
6	7311.00	36.37	-9.59	54.00	17.63	166	123	Horizontal
7	15037.2	46.18	2.61	54.00	7.82	208	314	Horizontal

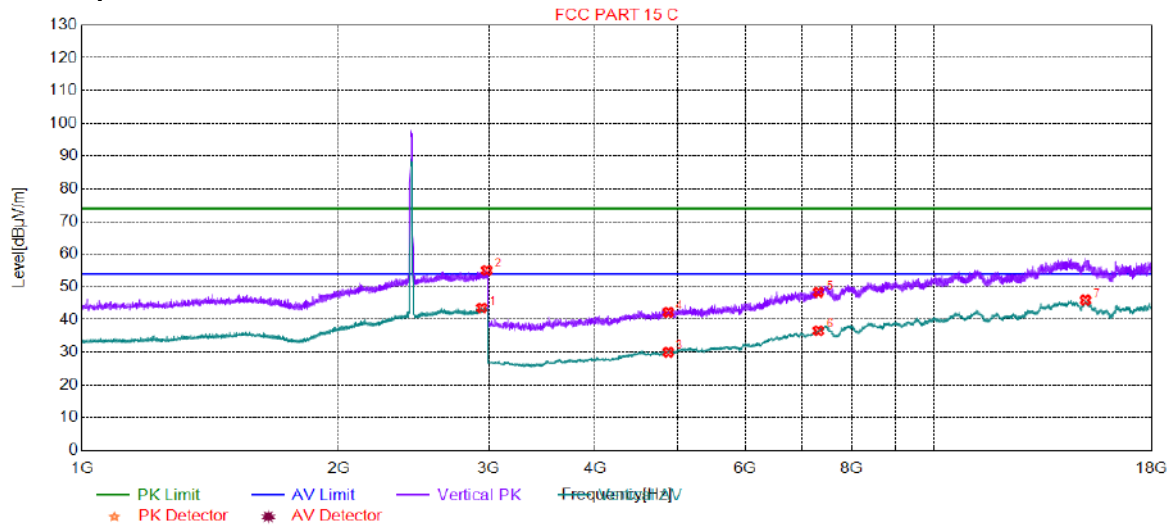
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4.9.2.10 802.11G_Channel 6
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2944.98	43.59	9.63	54.00	10.41	183	45	Vertical
2	2984.99	55.07	9.52	74.00	18.93	268	290	Vertical
3	4874.00	30.04	-17.99	54.00	23.96	291	293	Vertical
4	4874.00	42.25	-17.99	74.00	31.75	207	128	Vertical
5	7311.00	48.39	-9.59	74.00	25.61	241	46	Vertical
6	7311.00	36.59	-9.59	54.00	17.41	277	18	Vertical
7	15038.7	46.00	2.62	54.00	8.00	205	350	Vertical

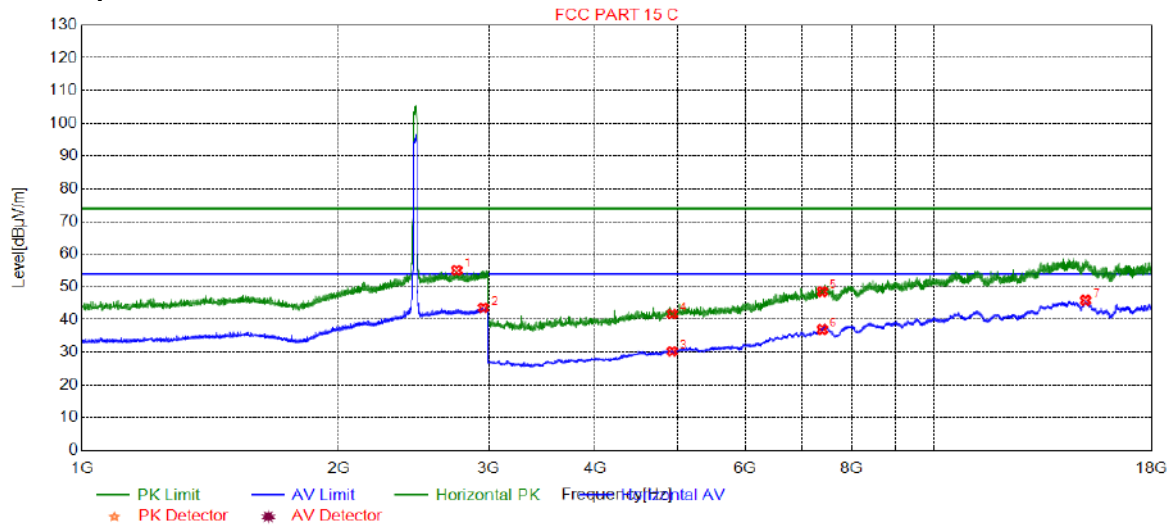
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4.9.2.11 802.11G_Channel 11
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2750.93	55.08	9.11	74.00	18.92	133	328	Horizontal
2	2956.48	43.64	9.65	54.00	10.36	243	164	Horizontal
3	4924.00	30.29	-17.71	54.00	23.71	165	42	Horizontal
4	4924.00	41.73	-17.71	74.00	32.27	246	342	Horizontal
5	7386.00	48.54	-9.20	74.00	25.46	218	206	Horizontal
6	7386.00	36.99	-9.20	54.00	17.01	201	178	Horizontal
7	15040.2	45.94	2.62	54.00	8.06	194	260	Horizontal

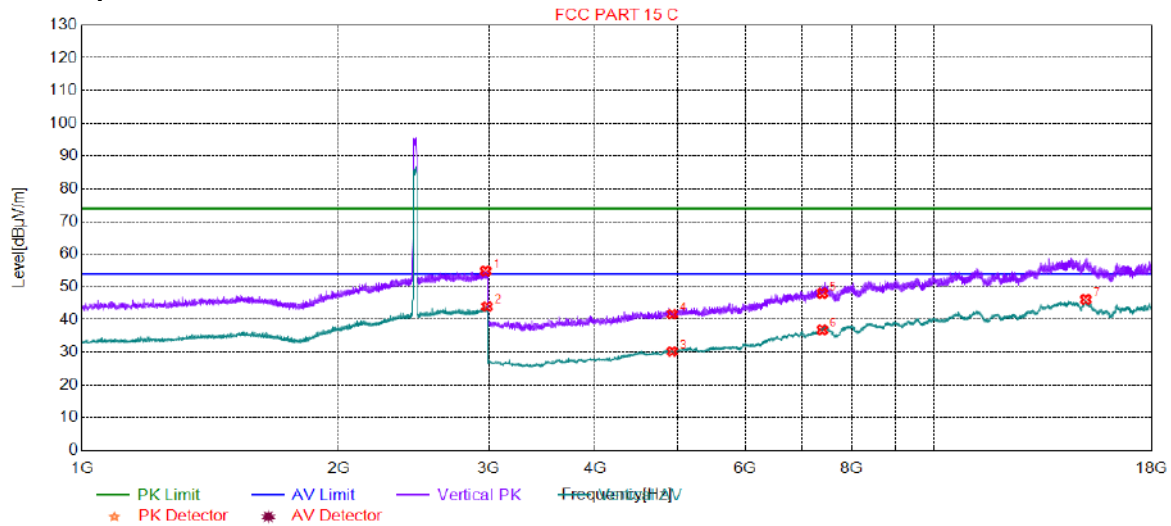
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4.9.2.12 802.11G_Channel 11
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2974.99	54.86	9.57	74.00	19.14	181	307	Vertical
2	2986.99	44.04	9.51	54.00	9.96	263	238	Vertical
3	4924.00	30.25	-17.71	54.00	23.75	223	18	Vertical
4	4924.00	41.68	-17.71	74.00	32.32	255	183	Vertical
5	7386.00	48.06	-9.20	74.00	25.94	294	347	Vertical
6	7386.00	36.88	-9.20	54.00	17.12	278	210	Vertical
7	15050.7	46.18	2.64	54.00	7.82	253	347	Vertical

Final Data List

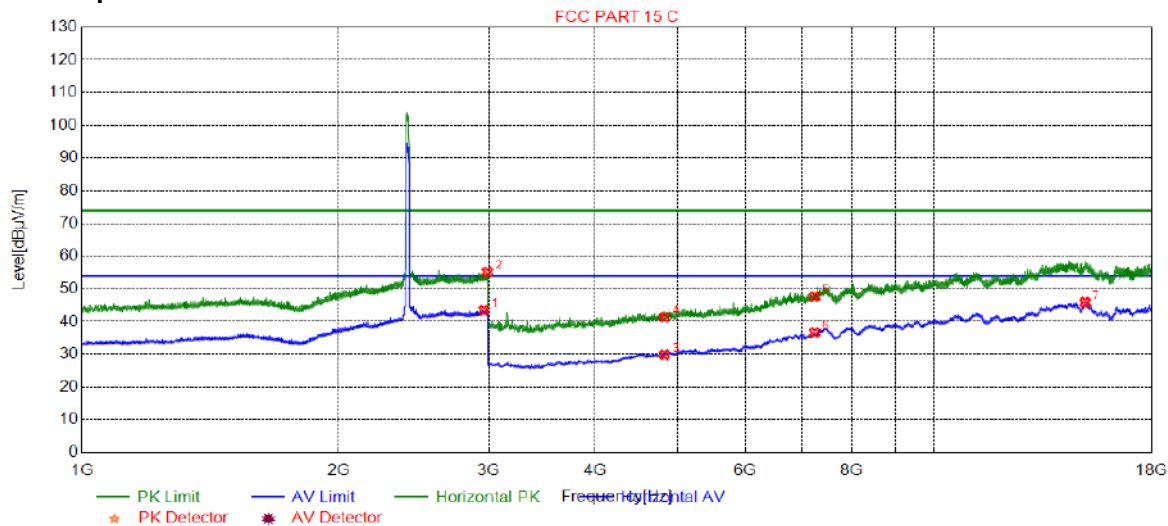


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4.9.2.13 802.11N20_Channel 1

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2960.99	43.52	9.63	54.00	10.48	100	178	Horizontal
2	2989.99	55.20	9.50	74.00	18.80	175	207	Horizontal
3	4824.00	29.87	-18.21	54.00	24.13	103	152	Horizontal
4	4824.00	41.38	-18.21	74.00	32.62	196	14	Horizontal
5	7236.00	47.66	-9.76	74.00	26.34	106	68	Horizontal
6	7236.00	36.67	-9.76	54.00	17.33	126	261	Horizontal
7	15022.2	45.90	2.59	54.00	8.10	156	96	Horizontal

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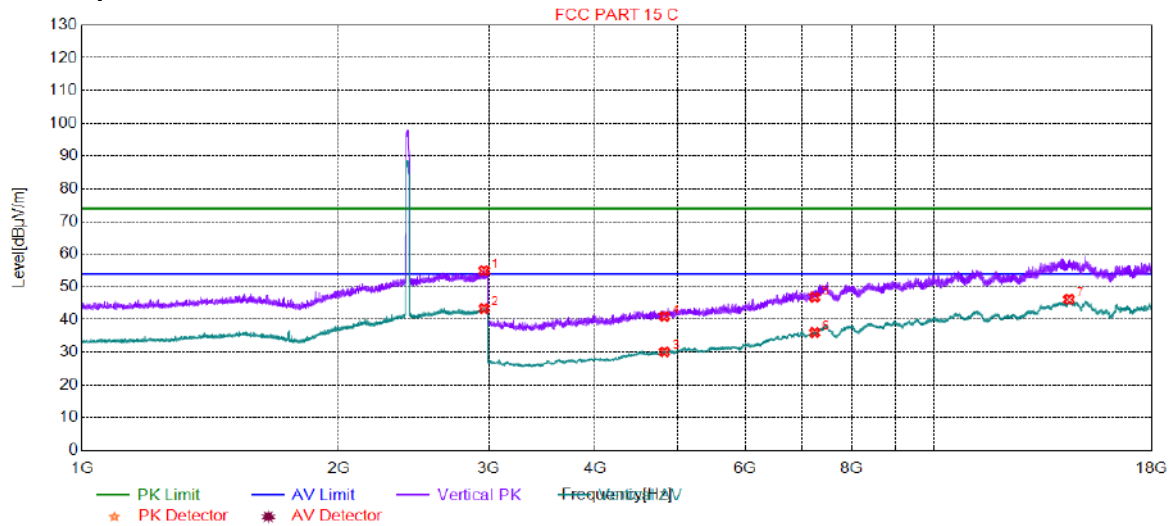


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4.9.2.14 802.11N20_Channel 1

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2961.99	54.98	9.62	74.00	19.02	178	265	Vertical
2	2961.99	43.43	9.62	54.00	10.57	289	292	Vertical
3	4824.00	30.13	-18.21	54.00	23.87	291	320	Vertical
4	4824.00	40.96	-18.21	74.00	33.04	294	155	Vertical
5	7236.00	46.88	-9.76	74.00	27.12	252	347	Vertical
6	7236.00	36.06	-9.76	54.00	17.94	189	73	Vertical
7	14389.1	46.21	2.73	54.00	7.79	161	210	Vertical

Final Data List



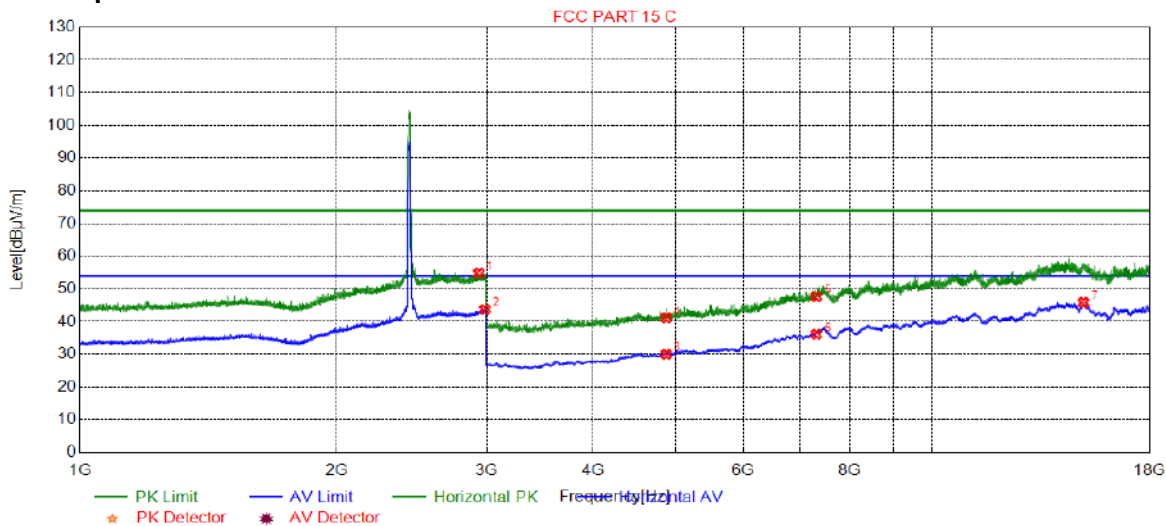
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4.9.2.15 802.11N20_Channel 6

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2938.98	54.83	9.56	74.00	19.17	174	259	Horizontal
2	2986.49	43.75	9.51	54.00	10.25	247	232	Horizontal
3	4874.00	30.02	-17.99	54.00	23.98	195	204	Horizontal
4	4874.00	41.16	-17.99	74.00	32.84	118	314	Horizontal
5	7311.00	47.63	-9.59	74.00	26.37	245	260	Horizontal
6	7311.00	36.17	-9.59	54.00	17.83	135	150	Horizontal
7	15038.7	45.89	2.62	54.00	8.11	146	232	Horizontal

Final Data List

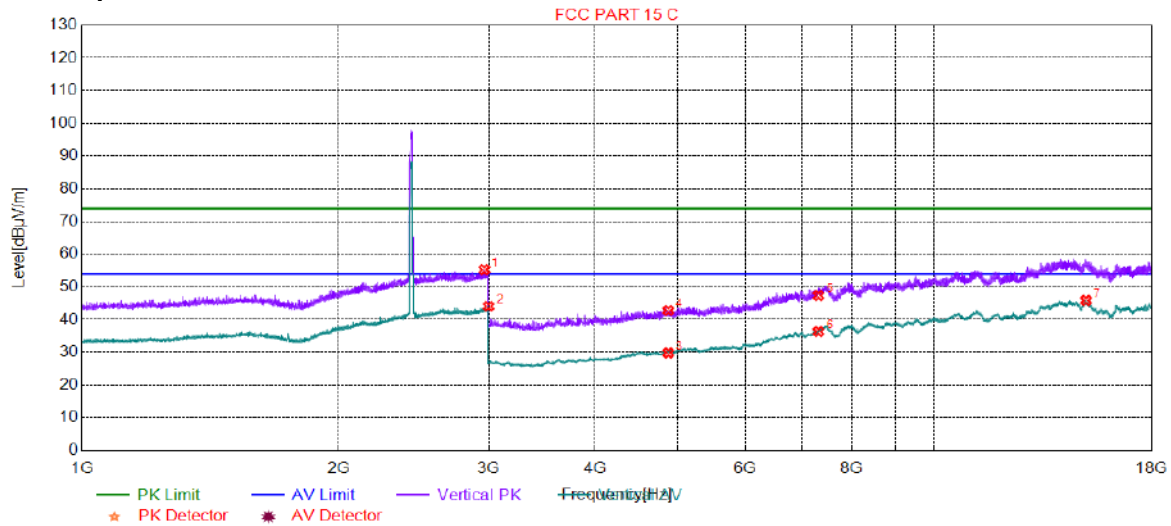


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4.9.2.16 802.11N20_Channel 6 Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2964.49	55.27	9.61	74.00	18.73	257	350	Vertical
2	2998.99	44.10	9.45	54.00	9.90	160	211	Vertical
3	4874.00	29.84	-17.99	54.00	24.16	206	346	Vertical
4	4874.00	42.81	-17.99	74.00	31.19	173	291	Vertical
5	7311.00	47.38	-9.59	74.00	26.62	268	45	Vertical
6	7311.00	36.37	-9.59	54.00	17.63	192	18	Vertical
7	15059.7	45.90	2.65	54.00	8.10	234	236	Vertical

Final Data List

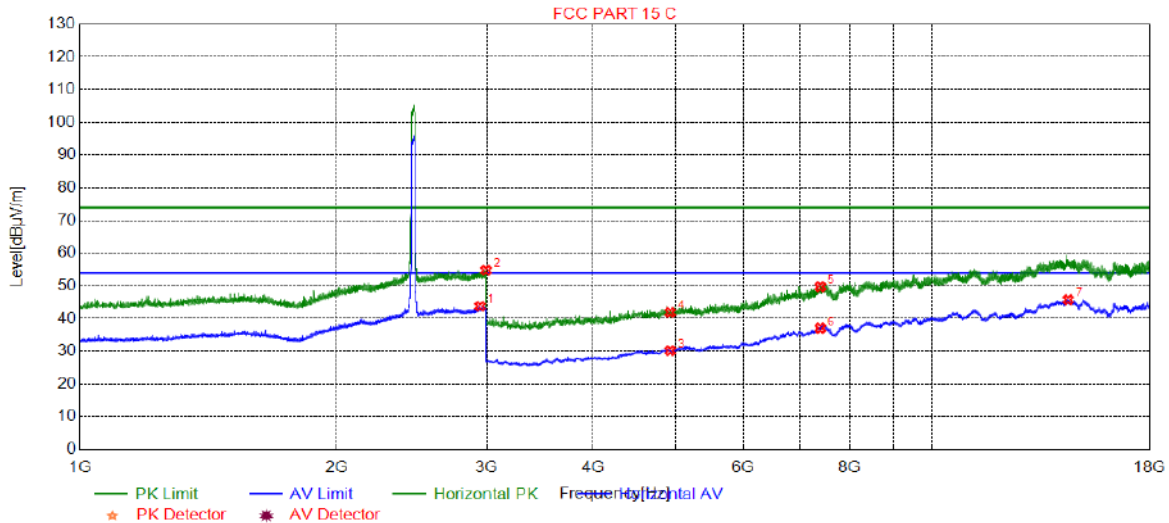


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4.9.2.17 802.11N20_Channel 11

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2946.98	43.82	9.65	54.00	10.18	104	2	Horizontal
2	2994.99	54.79	9.47	74.00	19.21	108	342	Horizontal
3	4924.00	30.18	-17.71	54.00	23.82	171	259	Horizontal
4	4924.00	41.92	-17.71	74.00	32.08	244	122	Horizontal
5	7386.00	49.76	-9.20	74.00	24.24	208	205	Horizontal
6	7386.00	37.09	-9.20	54.00	16.91	152	232	Horizontal
7	14432.6	45.81	2.60	54.00	8.19	219	177	Horizontal

Final Data List



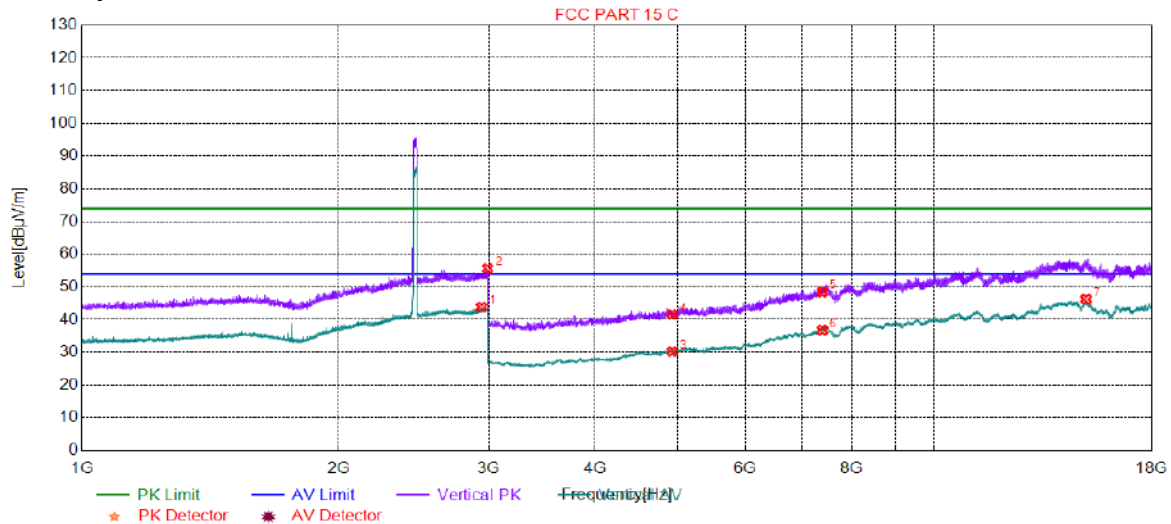
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4.9.2.18 802.11N20_Channel 11

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2943.48	43.88	9.61	54.00	10.12	206	156	Vertical
2	2990.99	55.65	9.49	74.00	18.35	288	308	Vertical
3	4924.00	30.22	-17.71	54.00	23.78	208	293	Vertical
4	4924.00	41.61	-17.71	74.00	32.39	158	128	Vertical
5	7386.00	48.46	-9.20	74.00	25.54	212	128	Vertical
6	7386.00	36.79	-9.20	54.00	17.21	202	238	Vertical
7	15062.7	46.26	2.66	54.00	7.74	229	18	Vertical

Final Data List



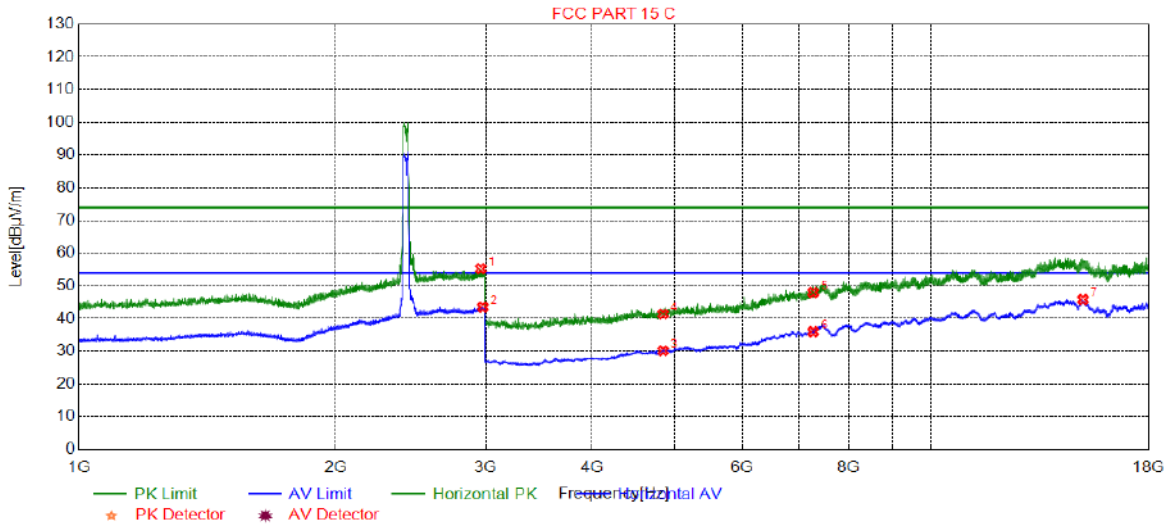
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4.9.2.19 802.11N40_Channel 3

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2959.99	55.28	9.63	74.00	18.72	149	84	Horizontal
2	2976.49	43.55	9.56	54.00	10.45	180	204	Horizontal
3	4844.00	30.15	-18.12	54.00	23.85	204	122	Horizontal
4	4844.00	41.42	-18.12	74.00	32.58	106	39	Horizontal
5	7266.00	47.99	-9.71	74.00	26.01	169	122	Horizontal
6	7266.00	36.01	-9.71	54.00	17.99	172	314	Horizontal
7	15058.2	45.86	2.65	54.00	8.14	137	122	Horizontal

Final Data List



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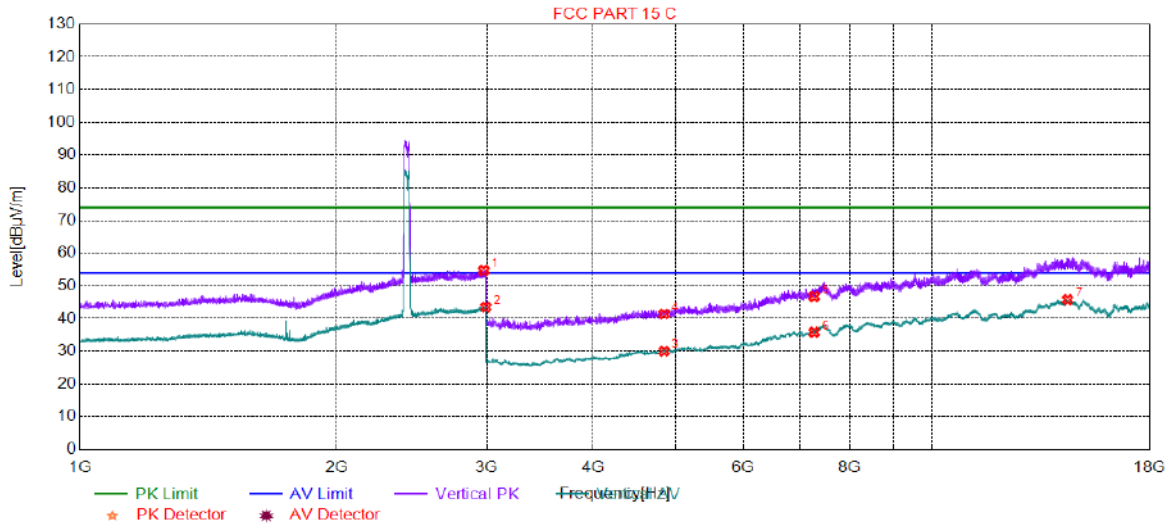
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4.9.2.20 802.11N40_Channel 3

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2975.99	54.70	9.56	74.00	19.30	236	59	Vertical
2	2993.49	43.54	9.48	54.00	10.46	193	72	Vertical
3	4844.00	30.03	-18.12	54.00	23.97	261	347	Vertical
4	4844.00	41.44	-18.12	74.00	32.56	258	293	Vertical
5	7266.00	46.79	-9.71	74.00	27.21	194	18	Vertical
6	7266.00	35.86	-9.71	54.00	18.14	247	182	Vertical
7	14410.1	45.82	2.73	54.00	8.18	215	154	Vertical

Final Data List



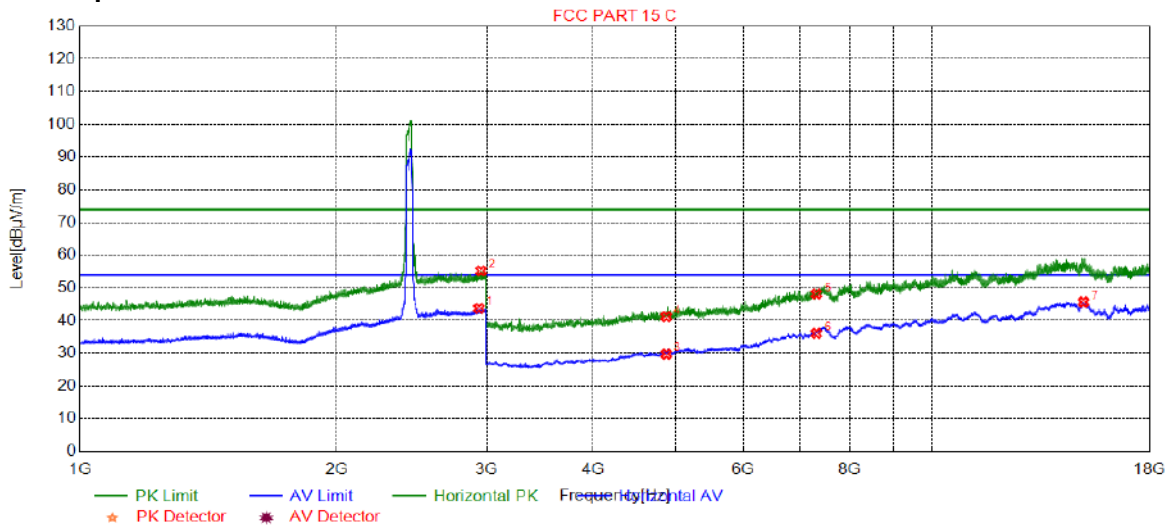
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4.9.2.21 802.11N40_Channel 6

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2938.48	43.78	9.56	54.00	10.22	138	218	Horizontal
2	2954.48	55.23	9.66	74.00	18.77	144	54	Horizontal
3	4874.00	29.77	-17.99	54.00	24.23	117	0	Horizontal
4	4874.00	41.24	-17.99	74.00	32.76	244	41	Horizontal
5	7311.00	48.15	-9.59	74.00	25.85	179	95	Horizontal
6	7311.00	36.13	-9.59	54.00	17.87	180	13	Horizontal
7	15038.7	45.71	2.62	54.00	8.29	101	342	Horizontal

Final Data List



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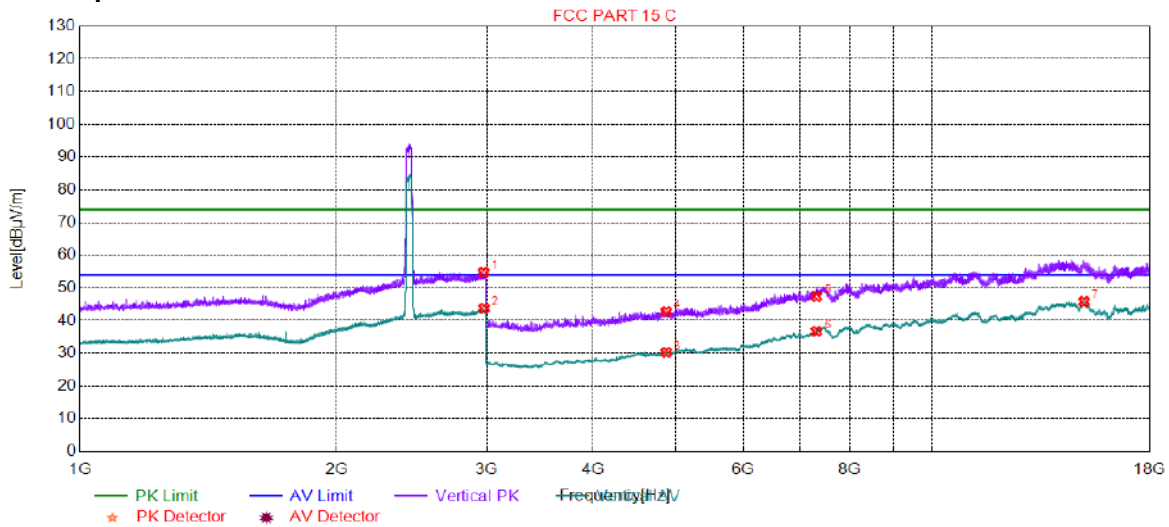
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4.9.2.22 802.11N40_Channel 6

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2974.99	54.74	9.57	74.00	19.26	282	253	Vertical
2	2978.99	43.82	9.55	54.00	10.18	243	198	Vertical
3	4874.00	30.29	-17.99	54.00	23.71	233	100	Vertical
4	4874.00	42.81	-17.99	74.00	31.19	256	291	Vertical
5	7311.00	47.38	-9.59	74.00	26.62	245	45	Vertical
6	7311.00	36.73	-9.59	54.00	17.27	284	18	Vertical
7	15059.7	45.84	2.65	54.00	8.16	227	291	Vertical

Final Data List



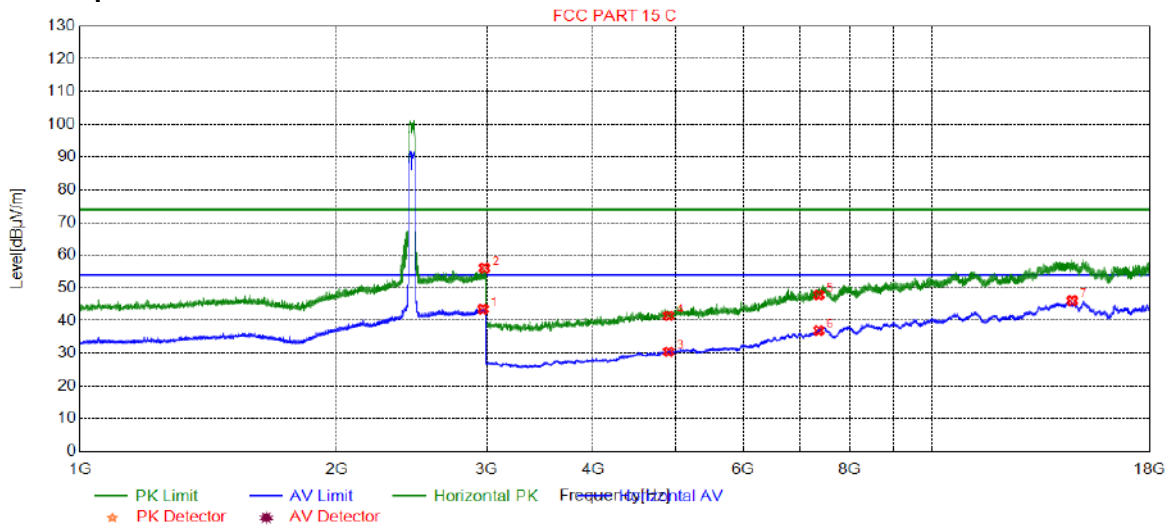
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4.9.2.23 802.11N40_Channel 9

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2969.99	43.54	9.59	54.00	10.46	231	52	Horizontal
2	2981.49	56.05	9.54	74.00	17.95	196	39	Horizontal
3	4904.00	30.46	-17.84	54.00	23.54	126	342	Horizontal
4	4904.00	41.47	-17.84	74.00	32.53	104	259	Horizontal
5	7356.00	47.87	-9.36	74.00	26.13	193	0	Horizontal
6	7356.00	36.98	-9.36	54.00	17.02	197	42	Horizontal
7	14585.6	46.12	2.25	54.00	7.88	199	204	Horizontal

Final Data List



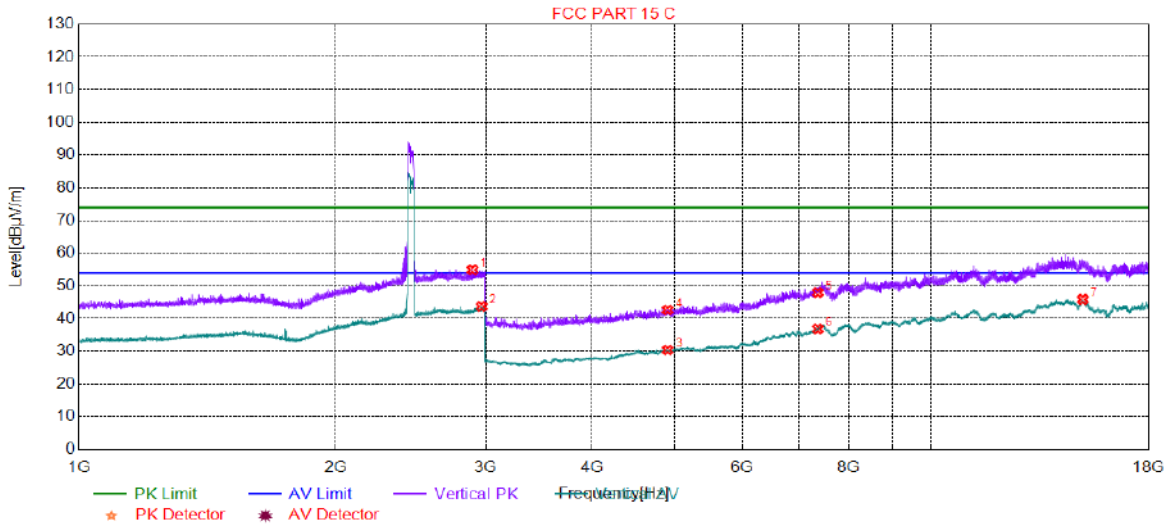
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4.9.2.24 802.11N40_Channel 9

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2895.47	54.94	9.15	74.00	19.06	290	346	Vertical
2	2965.99	43.76	9.61	54.00	10.24	250	264	Vertical
3	4904.00	30.40	-17.84	54.00	23.60	151	18	Vertical
4	4904.00	42.68	-17.84	74.00	31.32	222	182	Vertical
5	7356.00	47.97	-9.36	74.00	26.03	274	319	Vertical
6	7356.00	36.86	-9.36	54.00	17.14	275	292	Vertical
7	15050.7	45.90	2.64	54.00	8.10	249	155	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:			

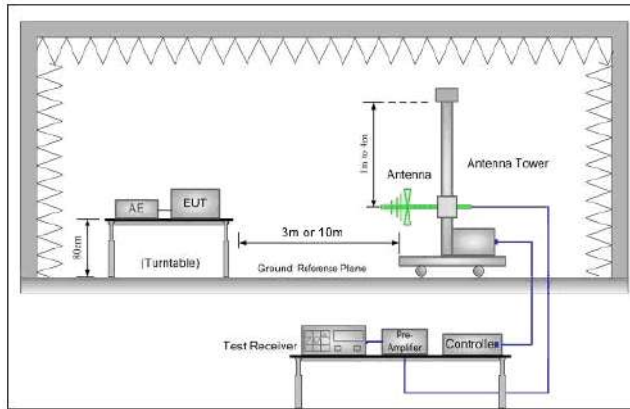


Figure 1. 30MHz to 1GHz

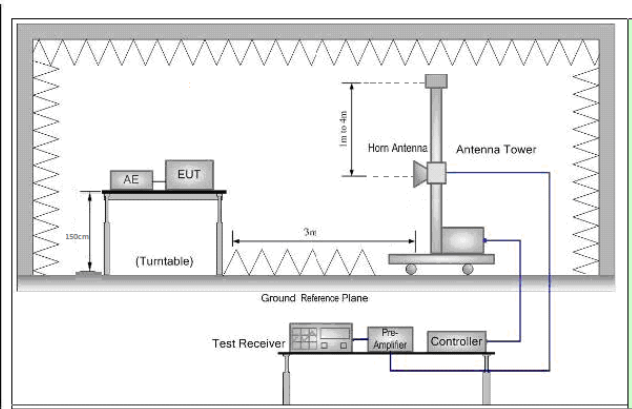


Figure 2. Above 1 GHz



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<p>Test Procedure:</p>	<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 or 10 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 semi-anechoic chamber. 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.
<p>Exploratory Test Mode:</p>	<p>Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.</p>
<p>Final Test Mode:</p>	<p>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.</p>
<p>Instruments Used:</p>	<p>Refer to section 5.10 for details</p>
<p>Test Results:</p>	<p>Pass</p>



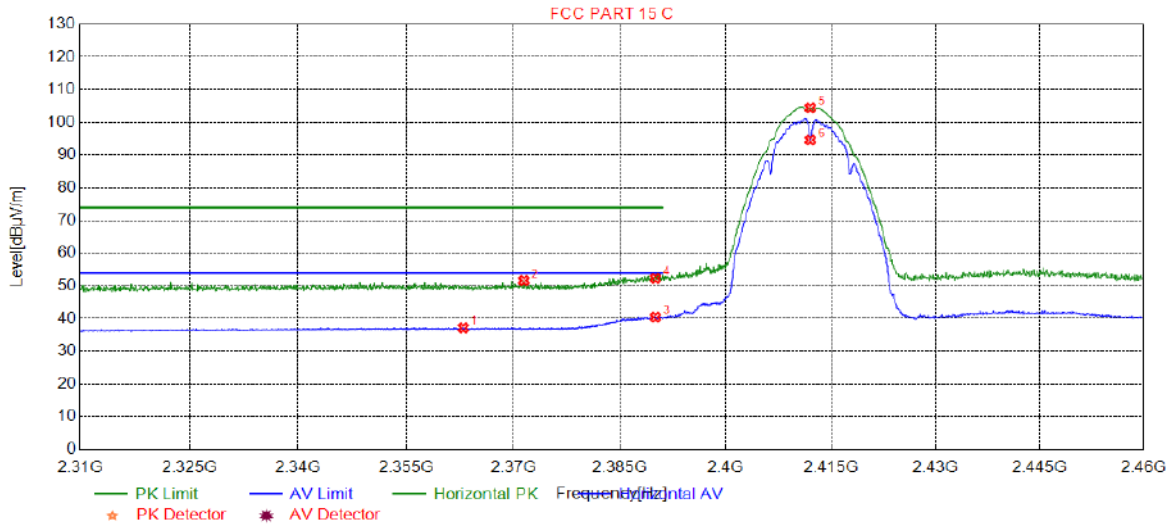
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4.10.1.1 802.11B_Channel 1

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2362.97	37.18	7.80	54.00	16.82	121	6	Horizontal
2	2371.45	51.65	7.79	74.00	22.35	185	346	Horizontal
3	2390.00	40.44	7.77	54.00	13.56	127	325	Horizontal
4	2390.00	52.36	7.77	74.00	21.64	151	319	Horizontal
5	2412.00	104.44	7.81	0.00	-104.44	115	319	Horizontal
6	2412.00	94.62	7.81	0.00	-94.62	149	319	Horizontal

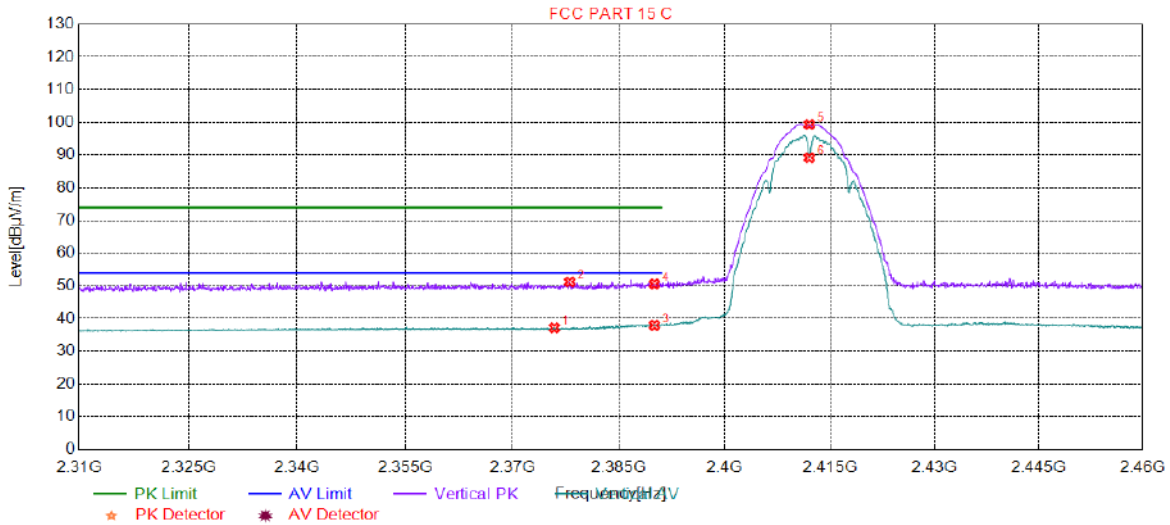
Final Data List



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4.10.1.2 802.11B_Channel 1

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2375.88	37.19	7.78	54.00	16.81	247	125	Vertical
2	2378.05	51.25	7.78	74.00	22.75	208	52	Vertical
3	2390.00	37.95	7.77	54.00	16.05	159	252	Vertical
4	2390.00	50.61	7.77	74.00	23.39	291	317	Vertical
5	2412.00	99.39	7.81	0.00	-99.39	197	257	Vertical
6	2412.00	89.22	7.81	0.00	-89.22	225	252	Vertical

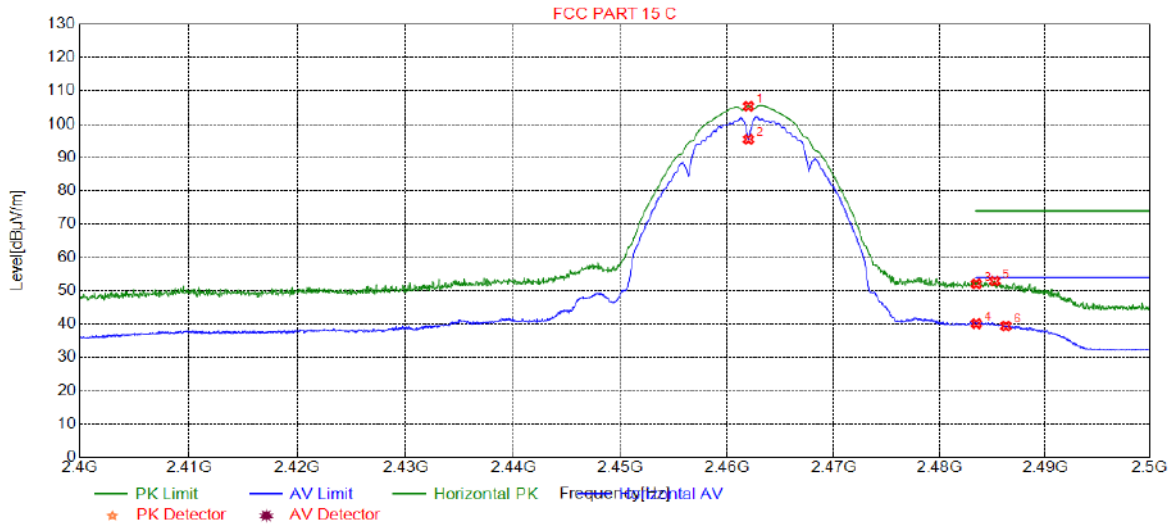
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4.10.1.3 802.11B_Channel 11

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.00	105.40	7.98	0.00	-105.40	215	286	Horizontal
2	2462.00	95.43	7.98	0.00	-95.43	217	297	Horizontal
3	2483.50	52.10	8.01	74.00	21.90	228	291	Horizontal
4	2483.50	40.14	8.01	54.00	13.86	218	286	Horizontal
5	2485.24	52.94	8.01	74.00	21.06	165	297	Horizontal
6	2486.29	39.42	8.01	54.00	14.58	234	297	Horizontal

Final Data List



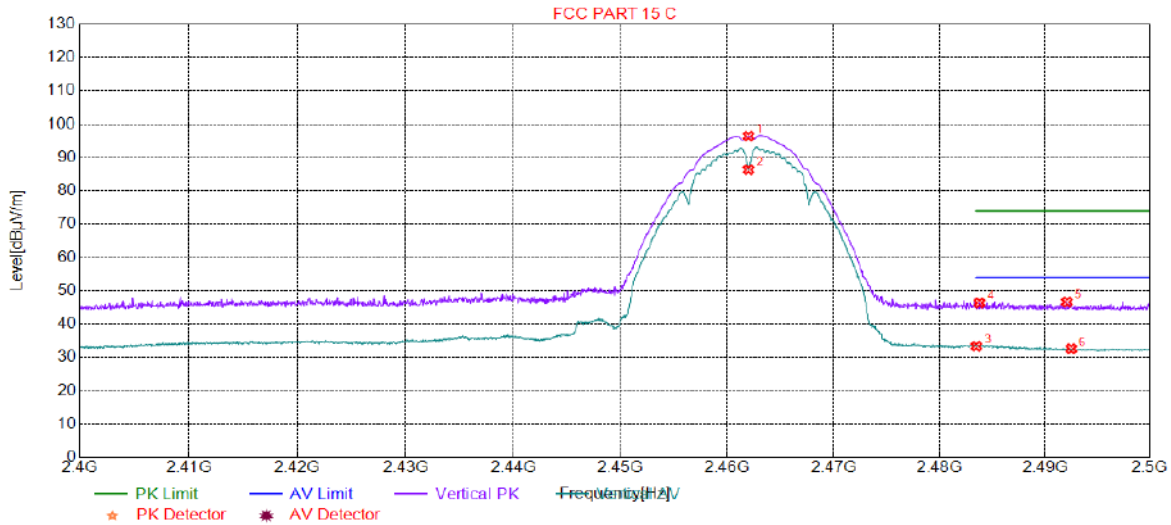
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4.10.1.4 802.11B_Channel 11

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.00	96.43	7.98	0.00	-96.43	154	255	Vertical
2	2462.00	86.35	7.98	0.00	-86.35	294	255	Vertical
3	2483.50	33.36	8.01	54.00	20.64	222	250	Vertical
4	2483.79	46.42	8.01	74.00	27.58	249	261	Vertical
5	2492.09	46.68	8.02	74.00	27.32	171	24	Vertical
6	2492.49	32.60	8.02	54.00	21.40	261	156	Vertical

Final Data List

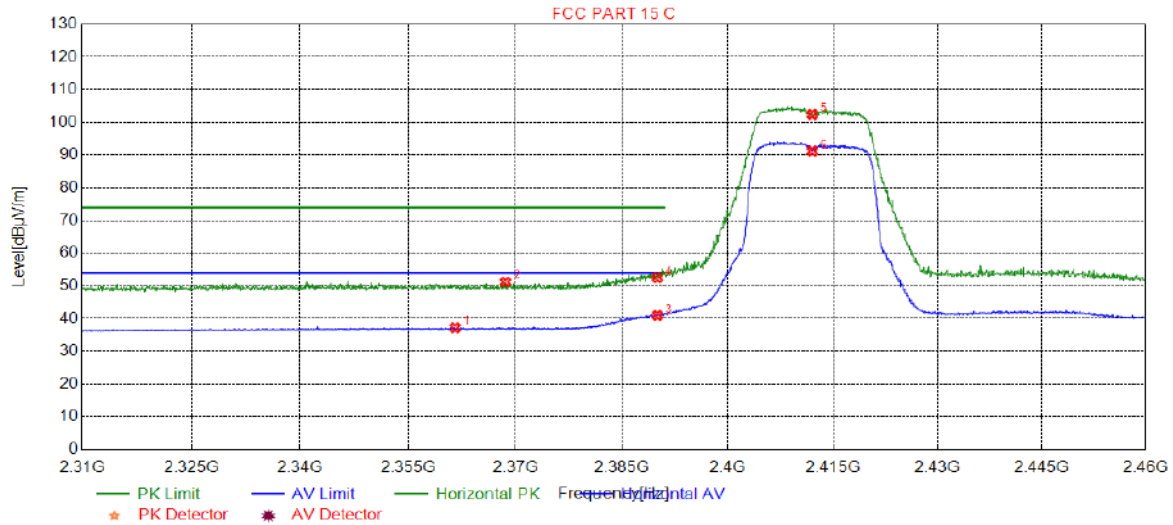


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4.10.1.5 802.11G_Channel 1

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2361.55	37.21	7.80	54.00	16.79	164	291	Horizontal
2	2368.60	51.22	7.79	74.00	22.78	196	319	Horizontal
3	2390.00	41.01	7.77	54.00	12.99	202	324	Horizontal
4	2390.00	52.56	7.77	74.00	21.44	113	4	Horizontal
5	2412.00	102.45	7.81	0.00	-102.45	215	313	Horizontal
6	2412.00	91.26	7.81	0.00	-91.26	233	319	Horizontal

Final Data List

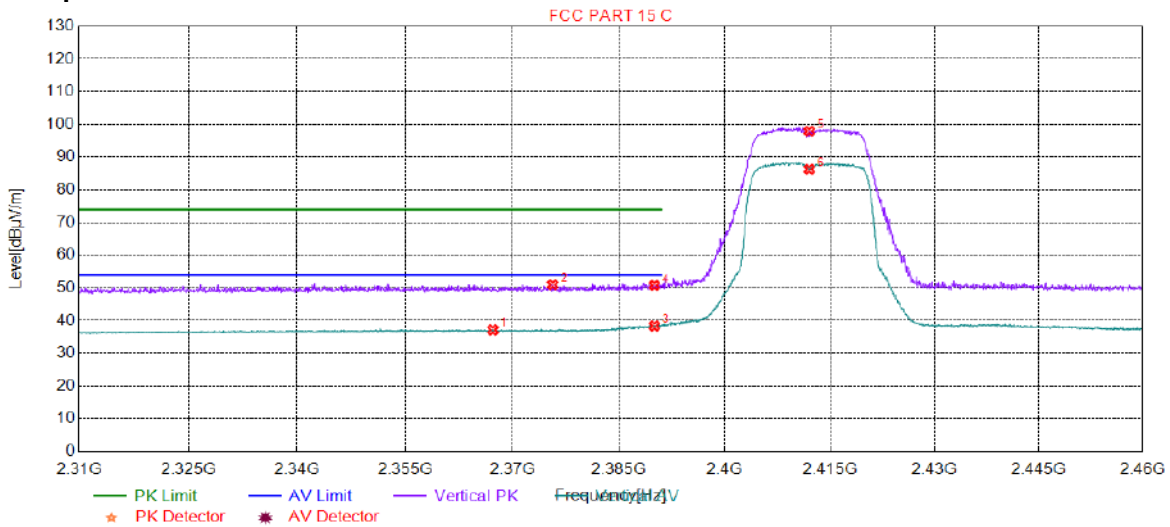


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4.10.1.6 802.11G_Channel 1

Test Graph



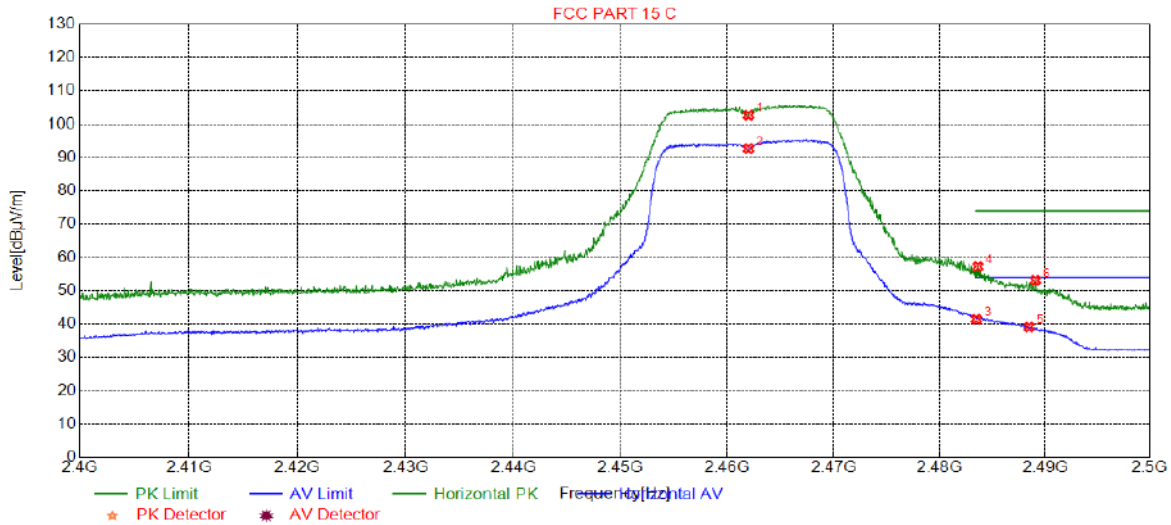
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2367.25	37.17	7.79	54.00	16.83	155	89	Vertical
2	2375.65	51.01	7.78	74.00	22.99	154	177	Vertical
3	2390.00	38.35	7.77	54.00	15.65	296	254	Vertical
4	2390.00	50.81	7.77	74.00	23.19	256	266	Vertical
5	2412.00	97.93	7.81	0.00	-97.93	240	260	Vertical
6	2412.00	86.28	7.81	0.00	-86.28	251	254	Vertical

Final Data List



4.10.1.7 802.11G_Channel 11

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.00	102.71	7.98	0.00	-102.71	102	292	Horizontal
2	2462.00	92.70	7.98	0.00	-92.70	119	298	Horizontal
3	2483.50	41.48	8.01	54.00	12.52	136	303	Horizontal
4	2483.64	57.27	8.01	74.00	16.73	123	303	Horizontal
5	2488.49	39.13	8.02	54.00	14.87	222	298	Horizontal
6	2489.09	53.15	8.02	74.00	20.85	118	287	Horizontal

Final Data List

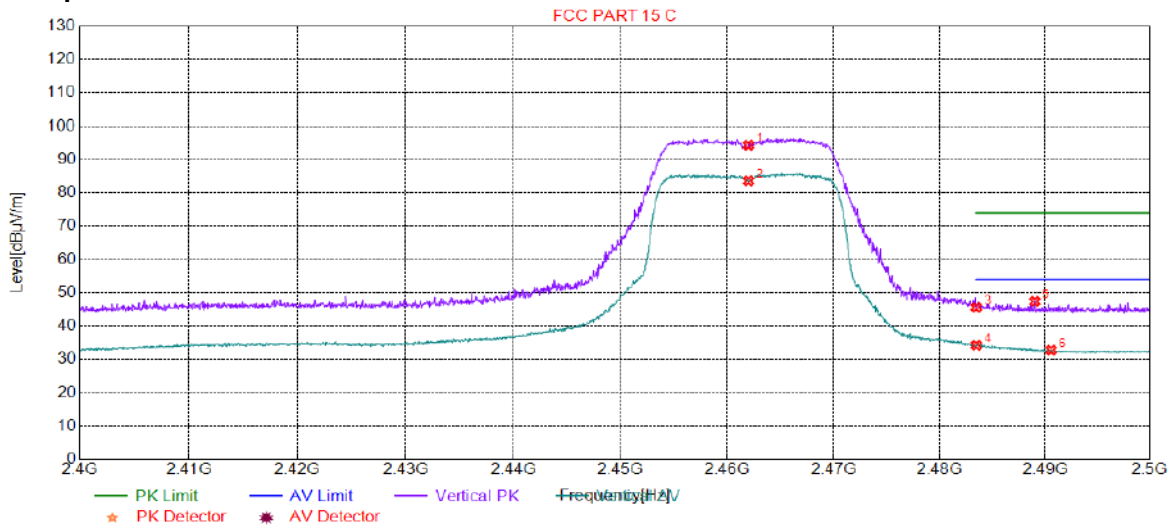


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4.10.1.8 802.11G_Channel 11

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.00	94.28	7.98	0.00	-94.28	291	256	Vertical
2	2462.00	83.60	7.98	0.00	-83.60	243	251	Vertical
3	2483.50	45.66	8.01	74.00	28.34	294	351	Vertical
4	2483.50	34.25	8.01	54.00	19.75	165	251	Vertical
5	2489.04	47.45	8.02	74.00	26.55	163	30	Vertical
6	2490.59	32.80	8.02	54.00	21.20	176	251	Vertical

Final Data List

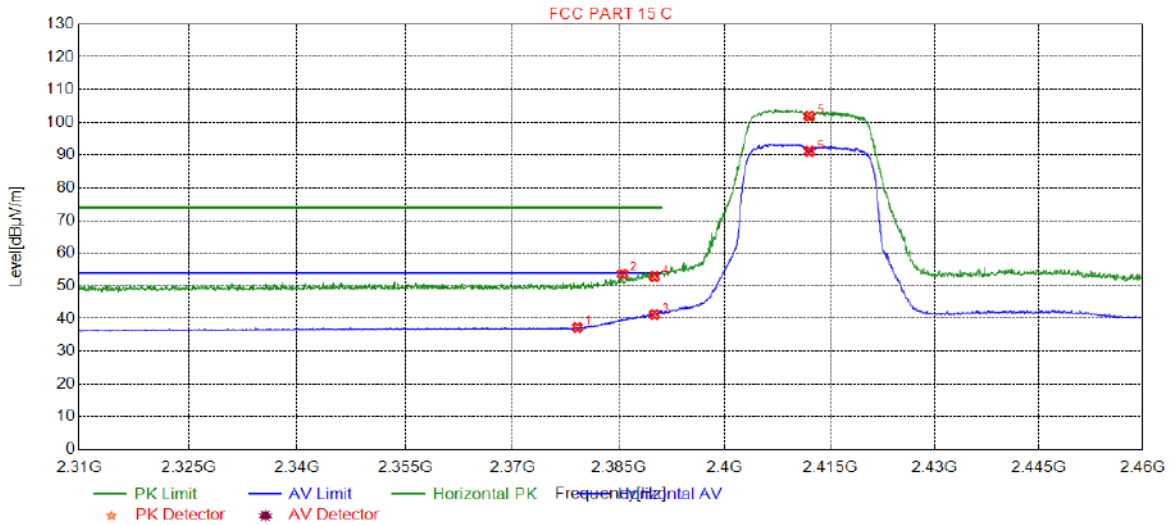


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4.10.1.9 802.11N20_Channel 1

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2379.10	37.29	7.78	54.00	16.71	125	265	Horizontal
2	2385.48	53.69	7.77	74.00	20.31	125	320	Horizontal
3	2390.00	41.26	7.77	54.00	12.74	166	320	Horizontal
4	2390.00	52.88	7.77	74.00	21.12	158	172	Horizontal
5	2412.00	101.94	7.81	0.00	-101.94	108	320	Horizontal
6	2412.00	91.18	7.81	0.00	-91.18	238	320	Horizontal

Final Data List

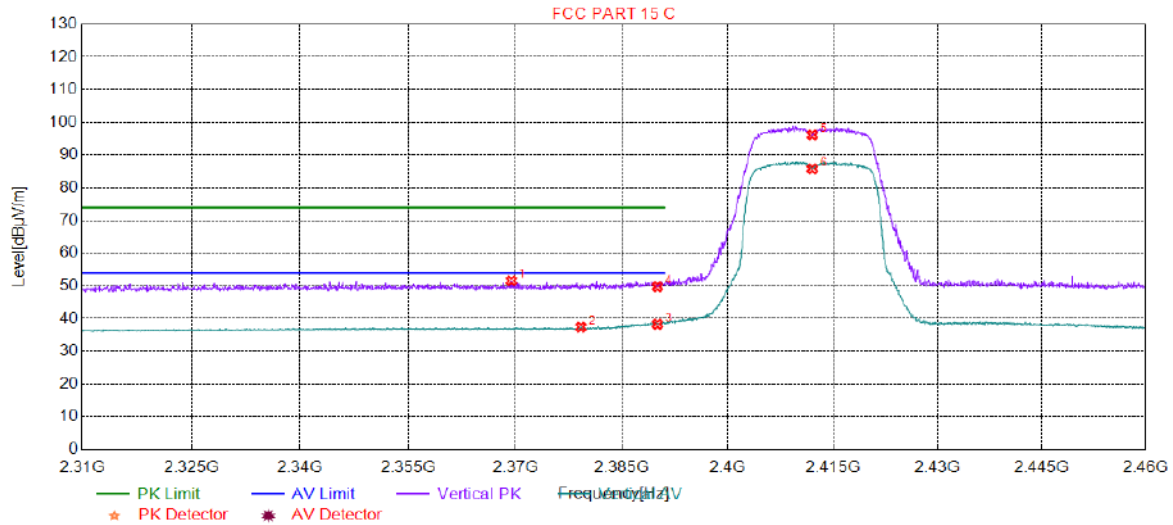


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4.10.1.10 802.11N20_Channel 1

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2369.42	51.60	7.79	74.00	22.40	261	358	Vertical
2	2379.18	37.42	7.78	54.00	16.58	199	354	Vertical
3	2390.00	38.28	7.77	54.00	15.72	205	284	Vertical
4	2390.00	49.77	7.77	74.00	24.23	233	305	Vertical
5	2412.00	96.16	7.81	0.00	-96.16	271	256	Vertical
6	2412.00	85.79	7.81	0.00	-85.79	277	256	Vertical

Final Data List

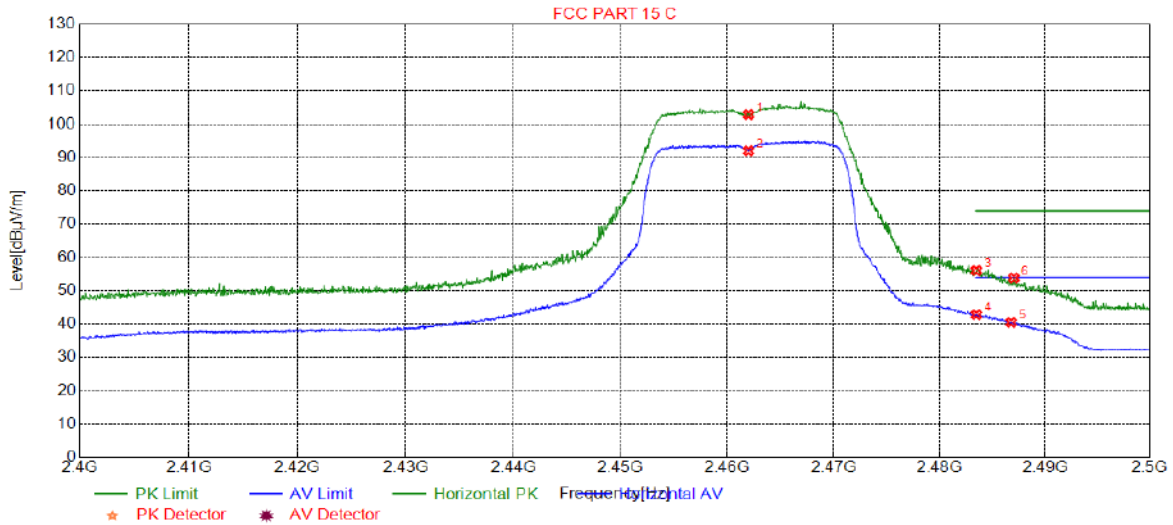


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4.10.1.11 802.11N20_Channel 11

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.00	102.90	7.98	0.00	-102.90	185	302	Horizontal
2	2462.00	92.03	7.98	0.00	-92.03	130	297	Horizontal
3	2483.50	56.10	8.01	74.00	17.90	111	297	Horizontal
4	2483.50	42.86	8.01	54.00	11.14	127	297	Horizontal
5	2486.79	40.51	8.01	54.00	13.49	189	297	Horizontal
6	2487.04	53.86	8.01	74.00	20.14	200	286	Horizontal

Final Data List



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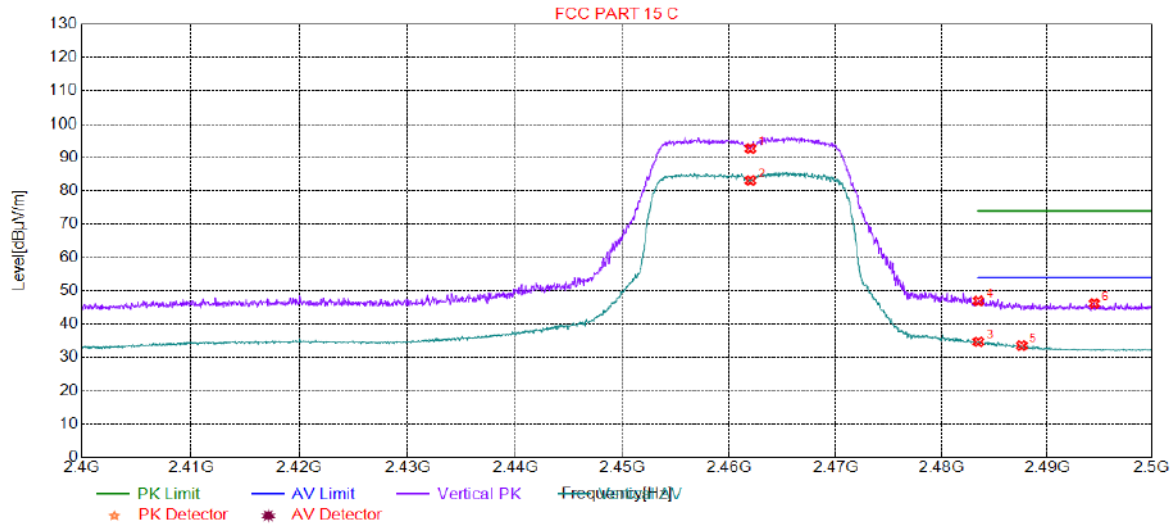
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4.10.1.12 802.11N20_Channel 11

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.00	92.70	7.98	0.00	-92.70	298	256	Vertical
2	2462.00	83.11	7.98	0.00	-83.11	298	250	Vertical
3	2483.50	34.71	8.01	54.00	19.29	242	256	Vertical
4	2483.50	47.02	8.01	74.00	26.98	229	250	Vertical
5	2487.59	33.56	8.02	54.00	20.44	204	256	Vertical
6	2494.49	46.23	8.02	74.00	27.77	206	321	Vertical

Final Data List



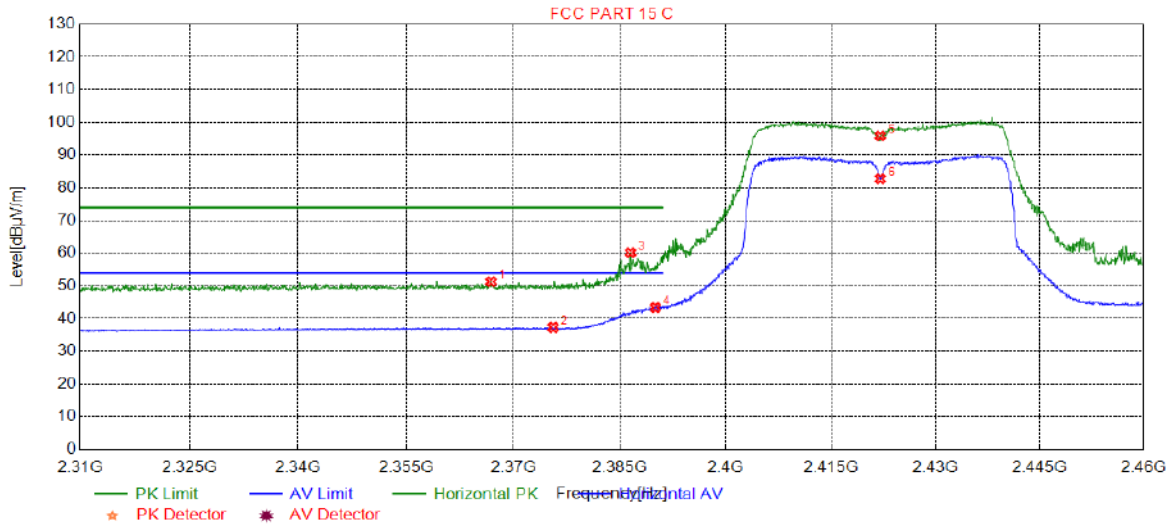
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4.10.1.13 802.11N40_Channel 3

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2366.87	51.32	7.79	74.00	22.68	109	160	Horizontal
2	2375.58	37.34	7.78	54.00	16.66	147	204	Horizontal
3	2386.46	60.17	7.77	74.00	13.83	242	325	Horizontal
4	2390.00	43.43	7.77	54.00	10.57	215	319	Horizontal
5	2422.00	95.90	7.85	0.00	-95.90	192	319	Horizontal
6	2422.00	82.77	7.85	0.00	-82.77	203	319	Horizontal

Final Data List



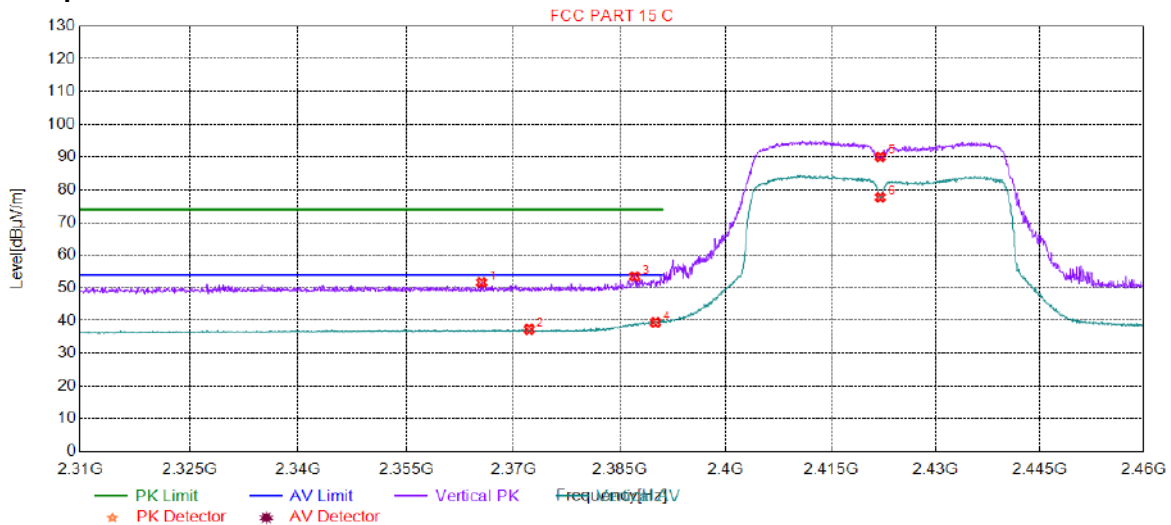
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4.10.1.14 802.11N40_Channel 3

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2365.52	51.69	7.79	74.00	22.31	259	146	Vertical
2	2372.20	37.36	7.79	54.00	16.64	177	124	Vertical
3	2387.06	53.50	7.77	74.00	20.50	192	285	Vertical
4	2390.00	39.41	7.77	54.00	14.59	178	257	Vertical
5	2422.00	90.09	7.85	0.00	-90.09	223	257	Vertical
6	2422.00	77.70	7.85	0.00	-77.70	209	257	Vertical

Final Data List

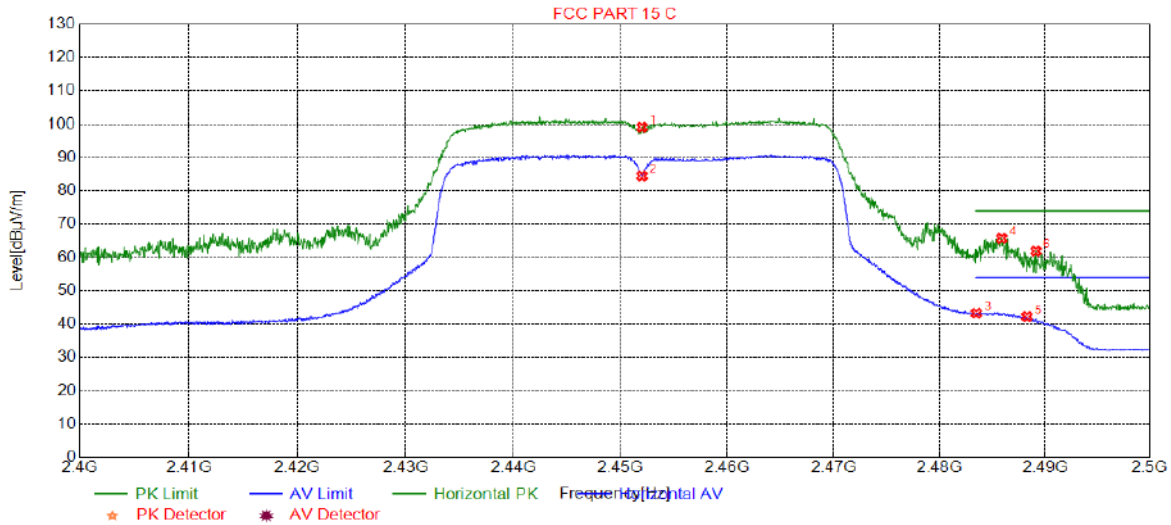


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4.10.1.15 802.11N40_Channel 9

Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2452.00	99.13	7.97	0.00	-99.13	135	307	Horizontal
2	2452.00	84.46	7.97	0.00	-84.46	141	307	Horizontal
3	2483.50	43.28	8.01	54.00	10.72	110	296	Horizontal
4	2485.89	65.75	8.01	74.00	8.25	136	296	Horizontal
5	2488.29	42.24	8.02	54.00	11.76	235	296	Horizontal
6	2489.14	61.95	8.02	74.00	12.05	225	285	Horizontal

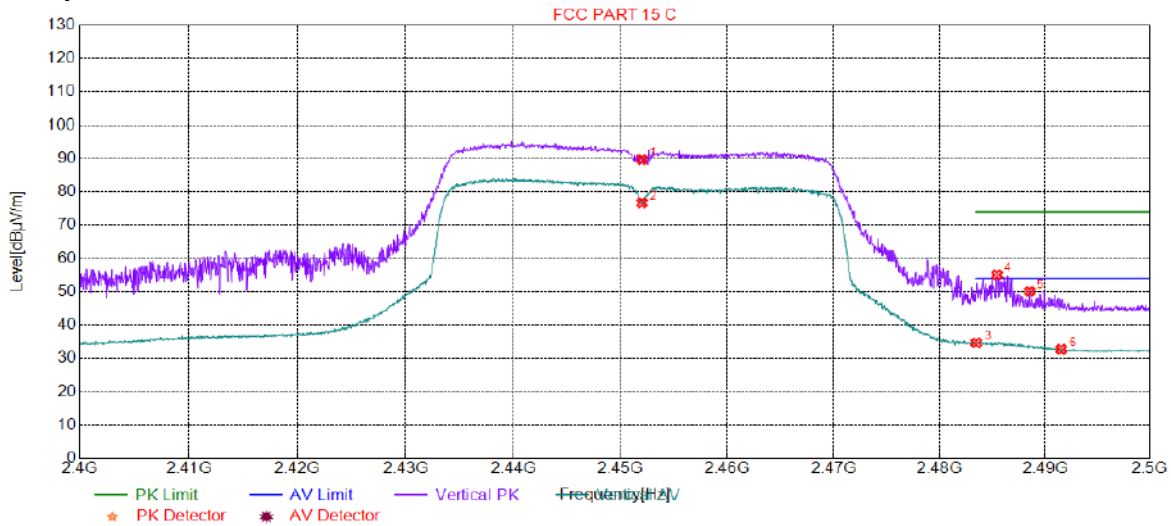
Final Data List



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4.10.1.16 802.11N40_Channel 9
Test Graph



Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2452.00	89.72	7.97	0.00	-89.72	200	257	Vertical
2	2452.00	76.68	7.97	0.00	-76.68	255	257	Vertical
3	2483.50	34.69	8.01	54.00	19.31	267	257	Vertical
4	2485.44	55.12	8.01	74.00	18.88	284	257	Vertical
5	2488.54	50.11	8.02	74.00	23.89	189	251	Vertical
6	2491.54	32.74	8.02	54.00	21.26	247	257	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	±0.75dB
2	RF power density, conducted	±2.84dB
3	Spurious emissions, conducted	±0.75dB
4	Temperature test	±1°C
5	Humidity test	±3%
6	DC and low frequency voltages	±0.5%

Lab B:

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)
2	Radiated Emission	± 4.8dB (Below 1GHz)
		± 4.8dB (1GHz to 6GHz)
		± 4.5dB (6GHz to 18GHz)
		± 5.02dB (Above 18GHz)



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6 Equipment List

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal. Due date
				(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
				2019/10/27	2020/10/27
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
				2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR



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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
				2020-10-26	2021-10-25
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2019-11-18	2020-11-17
				2020-10-26	2021-10-25
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2019-12-03	2020-12-02
				2020-10-27	2021-10-26
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2019-11-18	2020-11-17
				2020-10-26	2021-10-25
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
				2020-11-06	2021-11-05
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 ZR/2020/90032.

The End



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