FCC TEST REPORT

Application No:	ZR/2020/60037
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.:	M2007J17G
Trade Mark:	MI
FCC ID:	2AFZZJ17G
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:	2020/8/3
Date of Test:	2020/8/17 to 2020/8/24
Date of Issue:	2020/8/25
Test Result:	**PASS ***

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

Authorized Signature:

Derek Yang

Derek Yang
Wireless Laboratory Manager

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1 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2020/8/25		Original

Authorized for issue by:				
Tested By		Mike Hu **(Mike Hu) /Project Engineer**		
Checked By		David Chen **(David Chen) /Reviewer**		

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2 Test Summary

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

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3 General Information

3.1 Client Information

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

3.2 Test Location

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
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Post code:	518057
Telephone:	+86 (0) 755 2601 2053
Fax:	+86 (0) 755 2671 0594
E-mail:	ee.shenzhen@sgs.com

3.3 Test Facility

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

• CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 3816.01)

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

• VCCI

The 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.

• Industry Canada (IC)

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

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3.4 General Description of EUT

EUT Description::	Mobile Phone
Model No.:	M2007J17G
Trade Mark:	MI
Hardware Version:	P2
Software Version:	MIUI 12
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 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:	☒ Portable Device, ☐Module
Antenna Type:	Fixed Internal 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:	1.5dBi(ANT1);-1.3 dBi(ANT2);
Power Supply	☒ AC/DC Adapter; ☒ Battery ☐ PoE:; ☐ Other:

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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 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)
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 1.5dBi.	

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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.		

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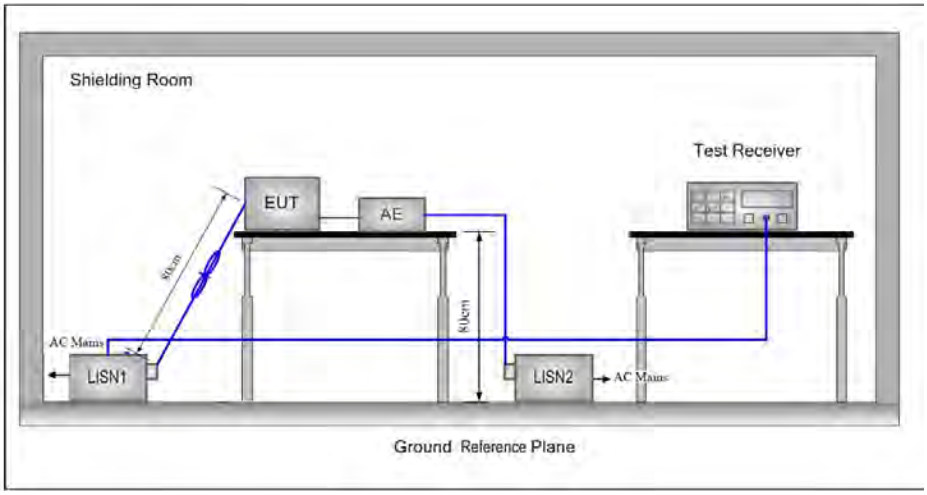
Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Charge + Transmitting mode.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate of 802.11B at lowest channel is the worst case. Charge + Transmitting mode. Only the worst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

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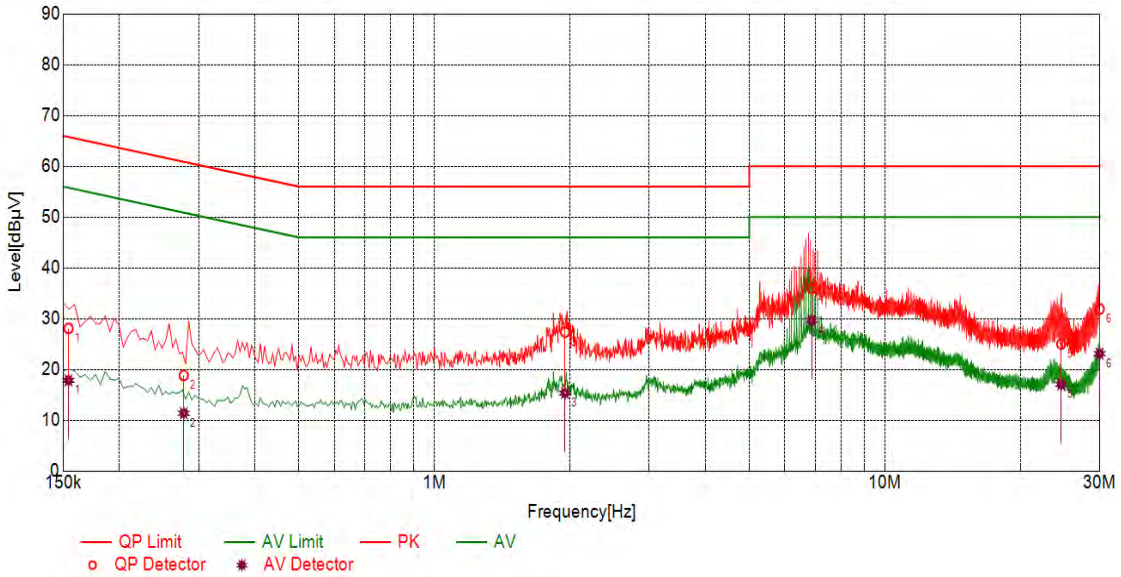
Live Line:



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Type
1	0.1542	10.10	28.08	65.77	37.69	17.86	55.77	37.91	L
2	0.2779	10.10	18.83	60.88	42.05	11.38	50.88	39.50	L
3	1.9505	10.10	27.36	56.00	28.64	15.37	46.00	30.63	L
4	6.8805	10.10	35.90	60.00	24.10	29.64	50.00	20.36	L
5	24.6153	10.11	25.02	60.00	34.98	17.06	50.00	32.94	L
6	29.9794	10.11	31.90	60.00	28.10	23.11	50.00	26.89	L

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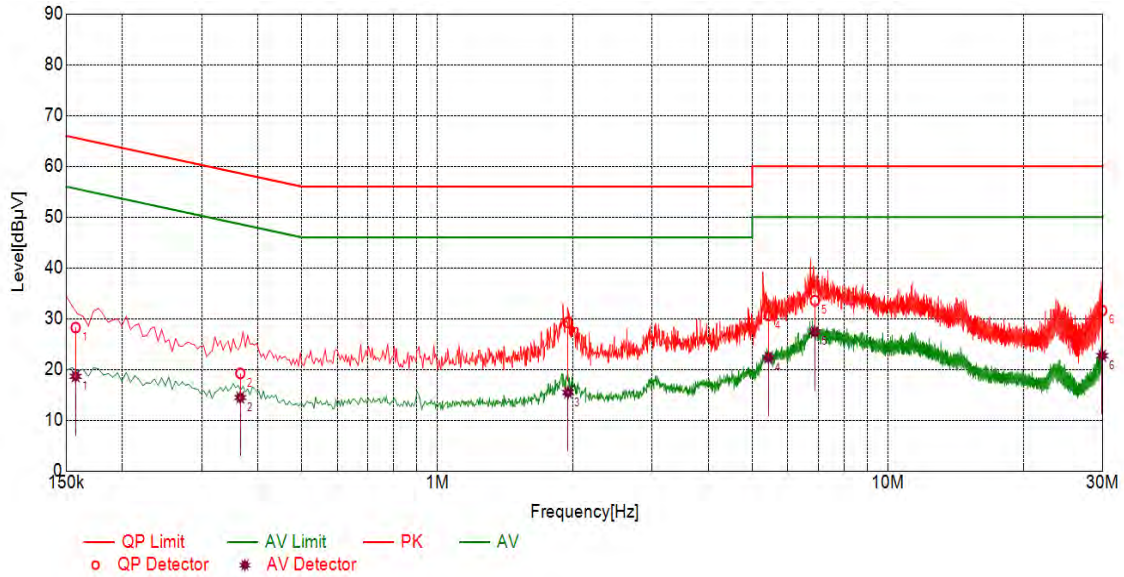
Neutral Line:



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Type
1	0.1575	10.10	28.24	65.60	37.36	18.65	55.60	36.95	N
2	0.3654	10.10	19.22	58.60	39.38	14.47	48.60	34.13	N
3	1.9504	10.10	29.26	56.00	26.74	15.45	46.00	30.55	N
4	5.4326	10.10	30.60	60.00	29.40	22.35	50.00	27.65	N
5	6.8879	10.10	33.54	60.00	26.46	27.38	50.00	22.62	N
6	29.9103	10.11	31.61	60.00	28.39	22.72	50.00	27.28	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

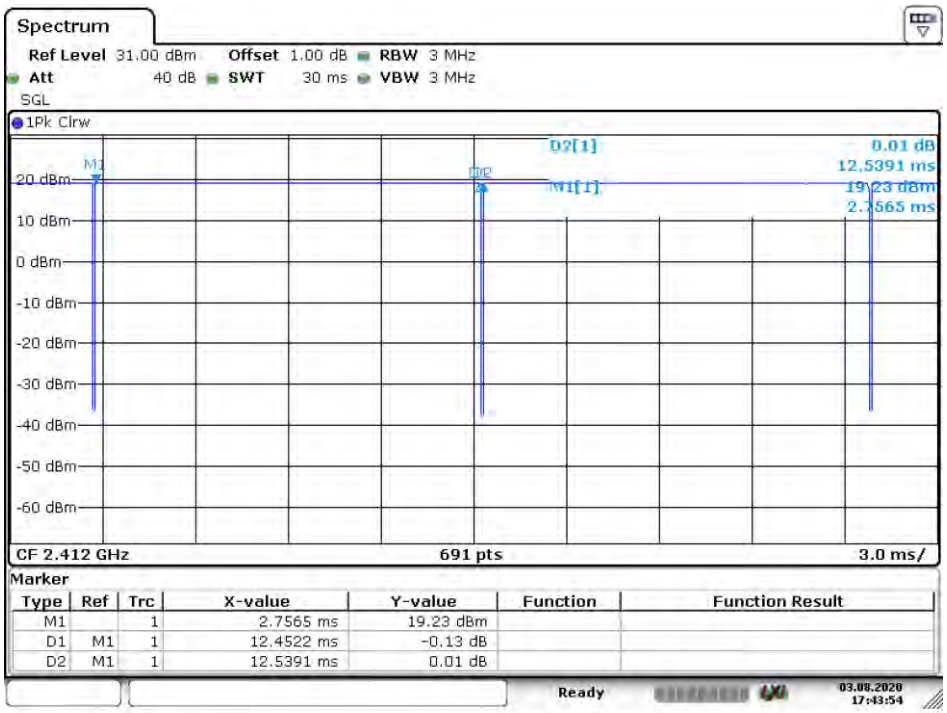
4.3.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
11B_CDD	Ant 1: CH1,CH6,CH11	99.31
11G_CDD	Ant 1: CH1,CH6,CH11	97.93
11N20_MIMO	Ant 1: CH1,CH6,CH11	98.22
11N40_MIMO	Ant 1: CH3,CH6,CH9	93.91
11B_CDD	Ant 2: CH1,CH6,CH11	98.96
11G_CDD	Ant 2: CH1,CH6,CH11	98.35
11N20_MIMO	Ant 2: CH1,CH6,CH11	97.79
11N40_MIMO	Ant 2: CH3,CH6,CH9	94.35

4.3.1 Test Plots

4.3.1.1 ANT1

4.3.1.1.1 11B_CDD



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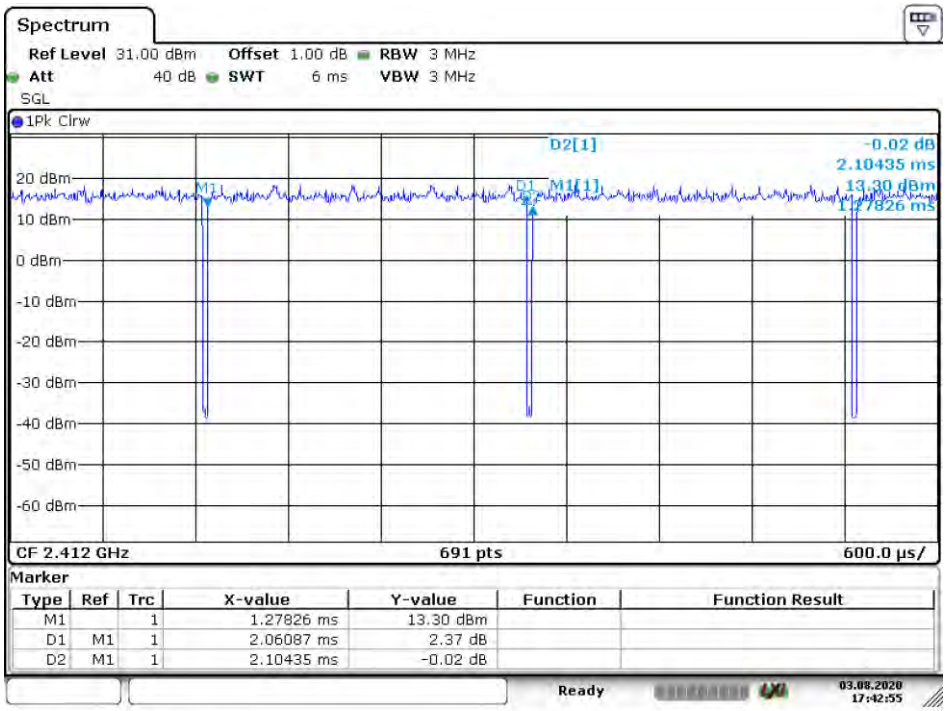
4.3.1.1.2 11G_CDD



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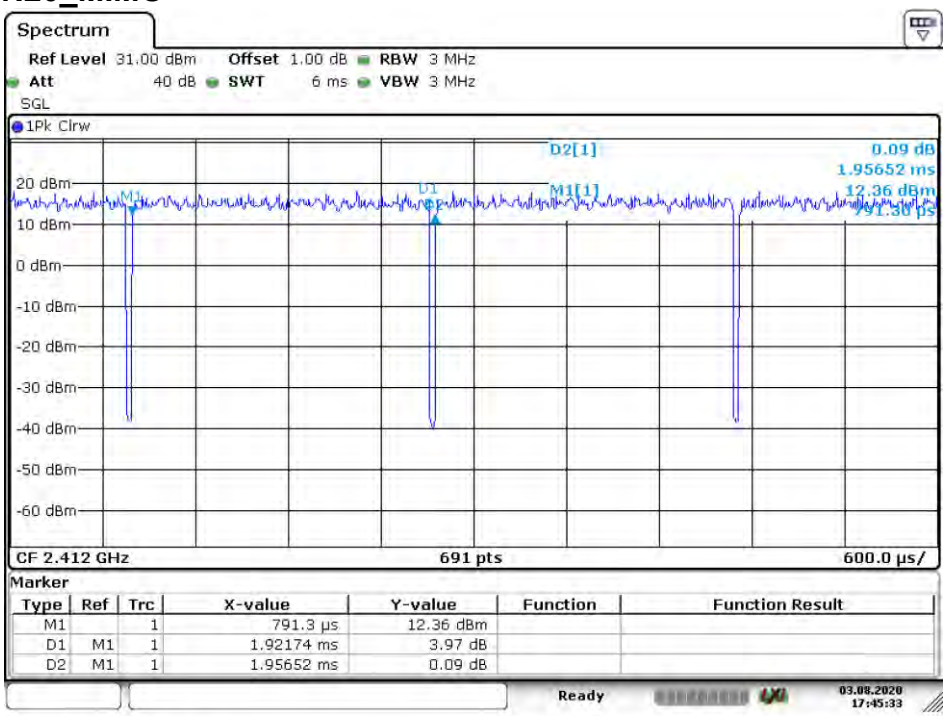
4.3.1.1.3 11N20_MIMO



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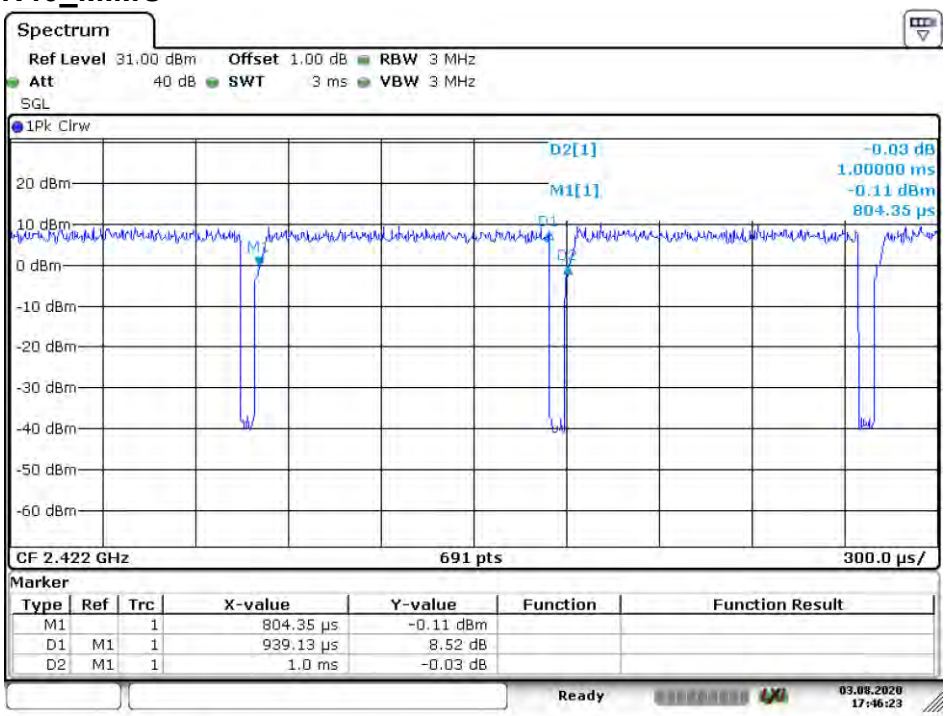
4.3.1.1.4 11N40_MIMO



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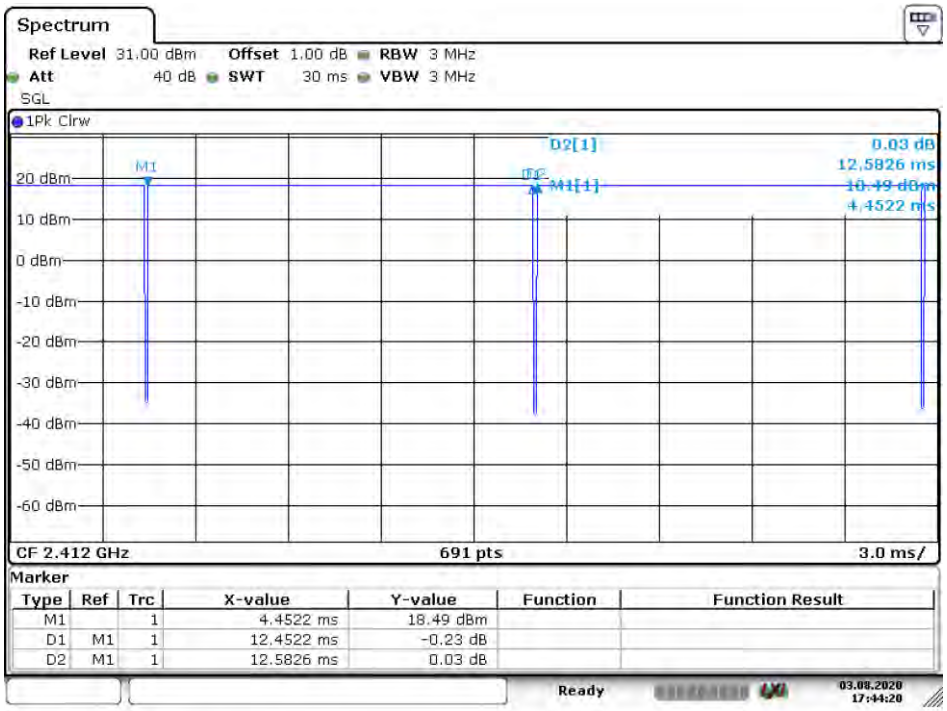
4.3.1.2 ANT2

4.3.1.2.1 11B_CDD



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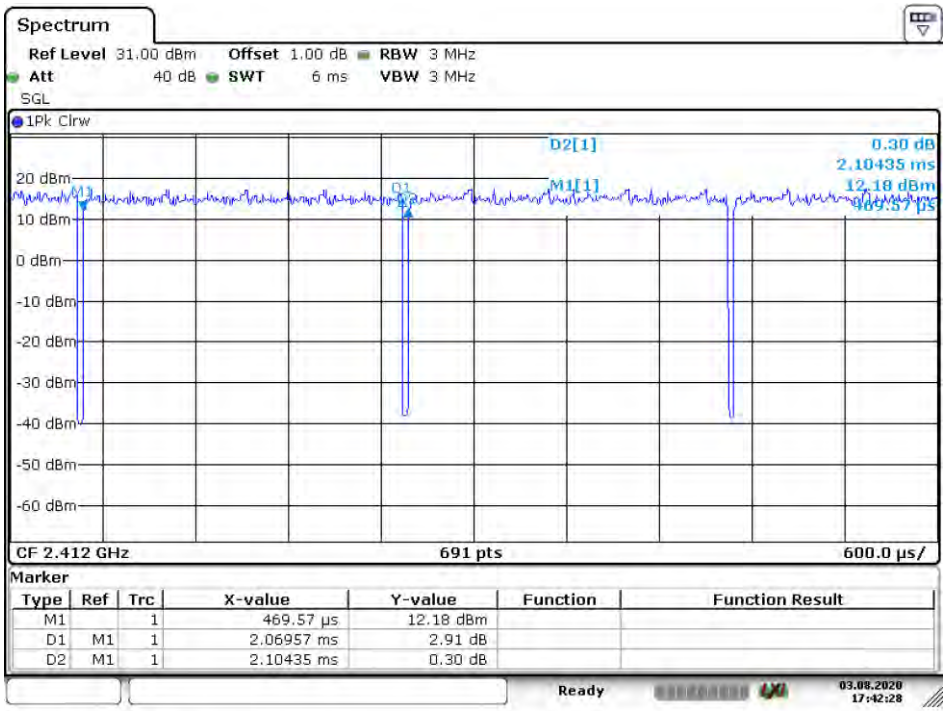
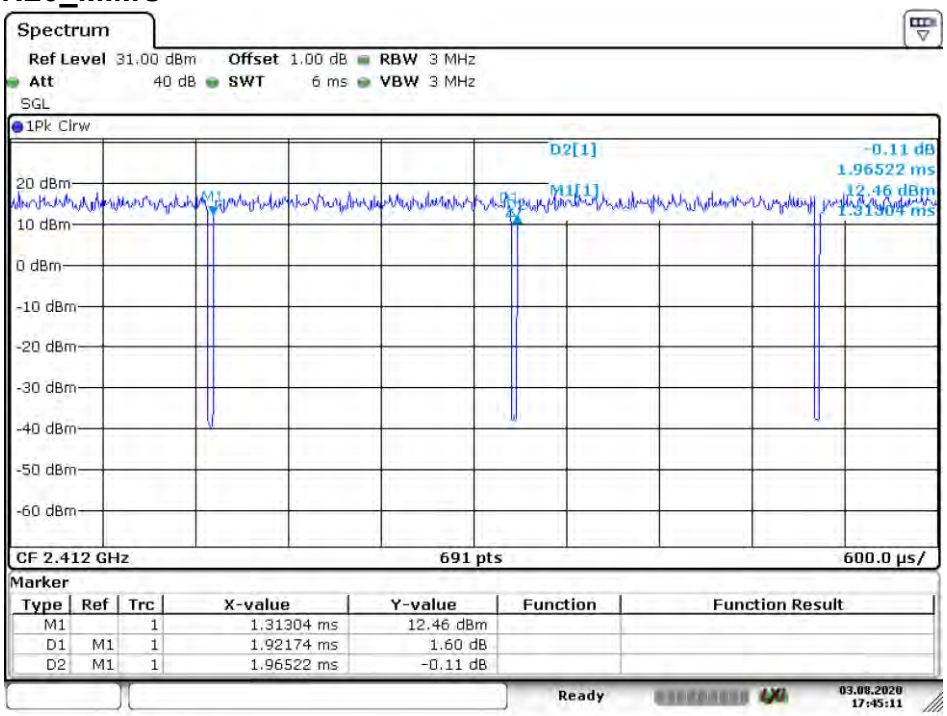
4.3.1.2.2 11G_CDD



Date: 3.AUG.2020 17:42:28

4.3.1.2.3 11N20_MIMO



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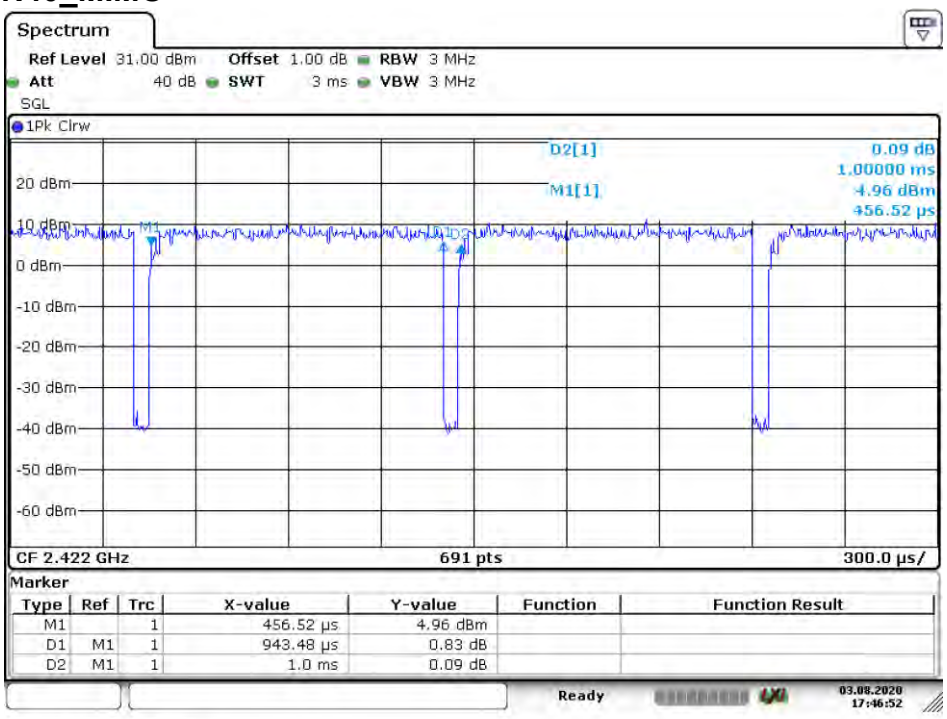
4.3.1.2.4 11N40_MIMO



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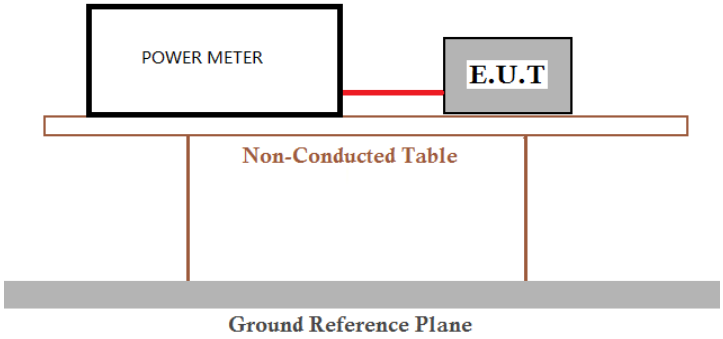
4.4 Conducted Output Power

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
		ANT1	ANT2	SUM		
802.11B_CDD	Lowest	19.03	18.45	21.76	30.00	Pass
	Middle	19.07	17.70	21.45	30.00	Pass
	Highest	19.06	17.97	21.56	30.00	Pass
802.11G_CDD	Lowest	17.17	16.49	19.85	30.00	Pass
	Middle	17.25	15.88	19.63	30.00	Pass
	Highest	17.07	16.08	19.61	30.00	Pass
802.11N20_MIMO	Lowest	16.96	16.47	19.73	30.00	Pass
	Middle	17.05	15.79	19.48	30.00	Pass
	Highest	16.85	16.15	19.52	30.00	Pass
802.11N40_MIMO	Lowest	13.43	13.01	16.24	30.00	Pass
	Middle	14.13	12.60	16.44	30.00	Pass
	Highest	13.47	13.07	16.28	30.00	Pass

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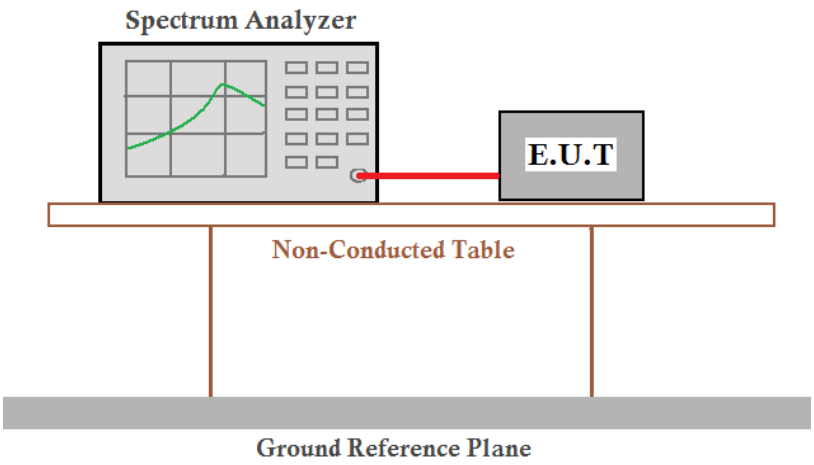
4.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

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

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4.5.1 Test Results

Mode	Test Channel	Occupied Bandwidth (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
802.11B_CDD	Lowest	13.81	8.08	≥500	Pass
	Middle	13.89	8.12	≥500	Pass
	Highest	13.76	8.08	≥500	Pass
802.11G_CDD	Lowest	16.67	16.02	≥500	Pass
	Middle	16.67	16.28	≥500	Pass
	Highest	16.63	15.72	≥500	Pass
802.11N20_MIMO	Lowest	17.76	17.11	≥500	Pass
	Middle	17.80	17.19	≥500	Pass
	Highest	17.71	16.32	≥500	Pass
802.11N40_MIMO	Lowest	36.21	35.69	≥500	Pass
	Middle	36.38	36.30	≥500	Pass
	Highest	36.21	35.70	≥500	Pass
802.11B_CDD	Lowest	13.50	8.08	≥500	Pass
	Middle	13.50	8.08	≥500	Pass
	Highest	13.81	8.12	≥500	Pass
802.11G_CDD	Lowest	16.54	16.06	≥500	Pass
	Middle	16.54	15.72	≥500	Pass
	Highest	16.54	15.72	≥500	Pass
802.11N20_MIMO	Lowest	17.67	17.15	≥500	Pass
	Middle	17.71	17.19	≥500	Pass
	Highest	17.76	16.37	≥500	Pass
802.11N40_MIMO	Lowest	36.47	35.69	≥500	Pass
	Middle	36.56	35.71	≥500	Pass
	Highest	36.38	35.64	≥500	Pass

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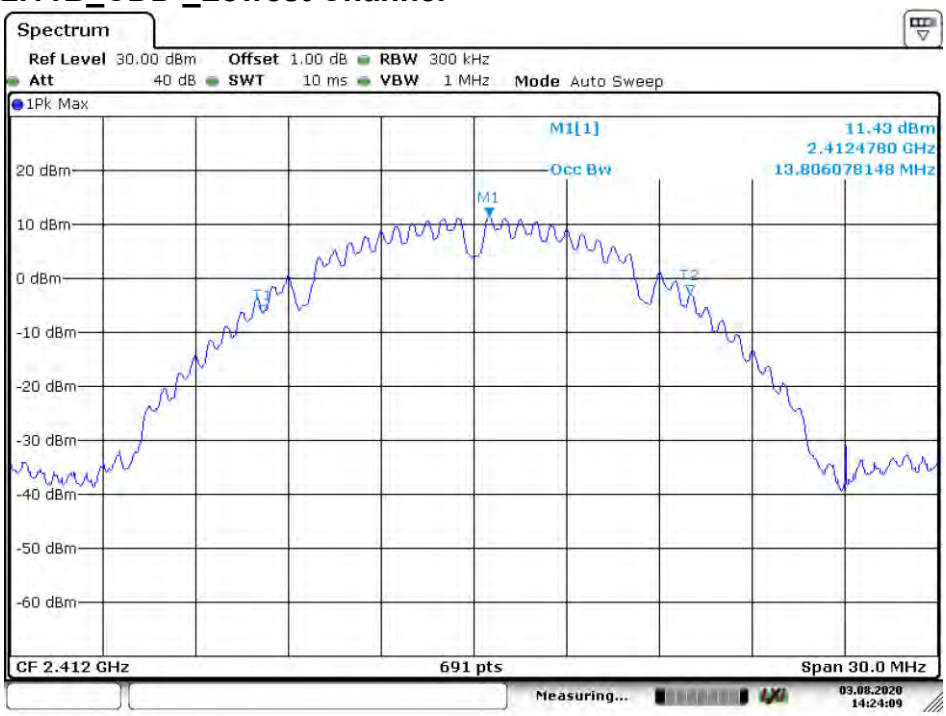
4.5.2 Test plots

4.5.2.1 ANT1

4.5.2.1.1 802.11B_CDD _Lowest Channel



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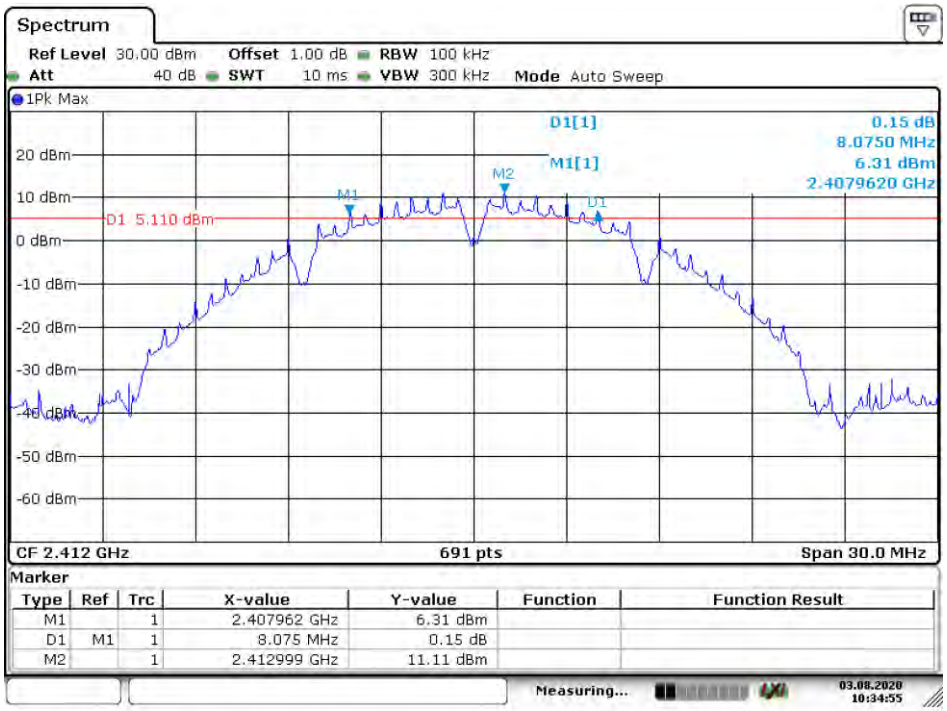

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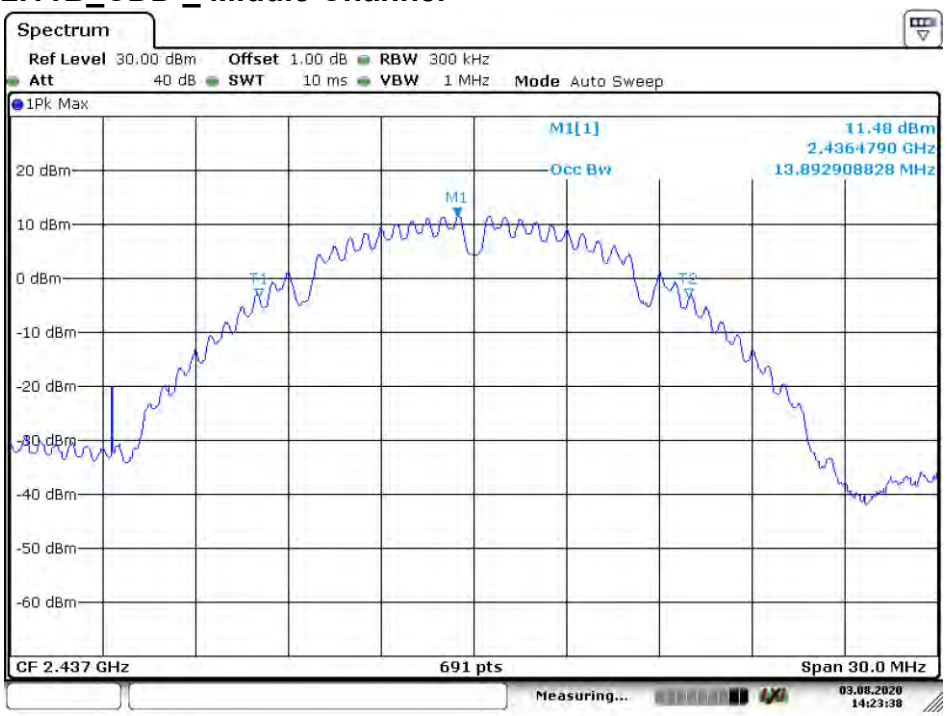
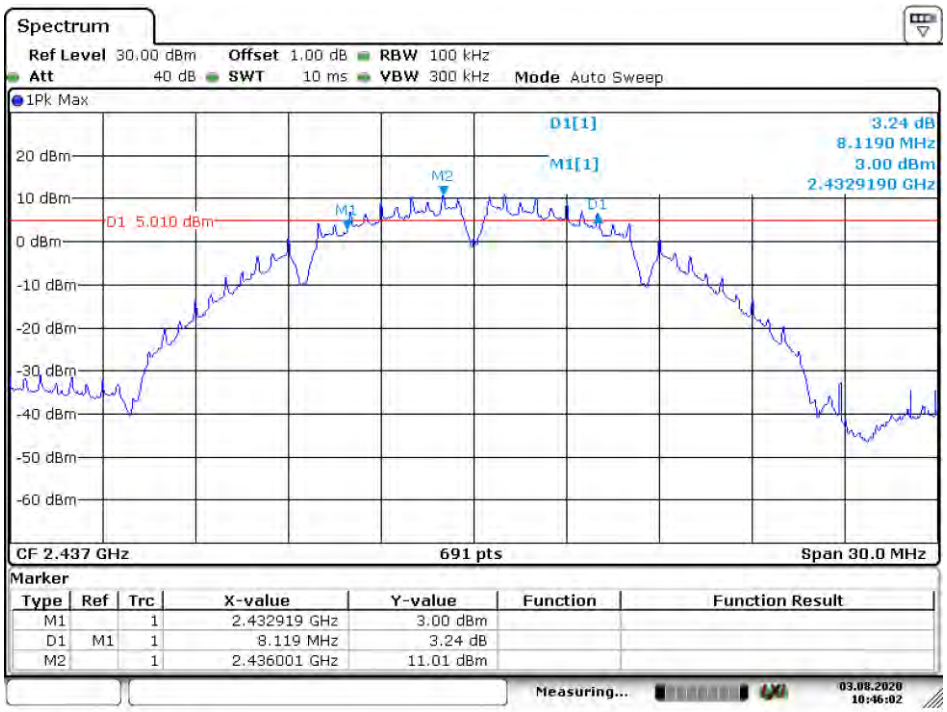
4.5.2.1.2 802.11B_CDD _ Middle Channel



Date: 3.AUG.2020 14:23:39



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.432919 GHz	3.00 dBm		
D1	M1	1	8.119 MHz	3.24 dB		
M2		1	2.436001 GHz	11.01 dBm		

Date: 3.AUG.2020 10:46:02

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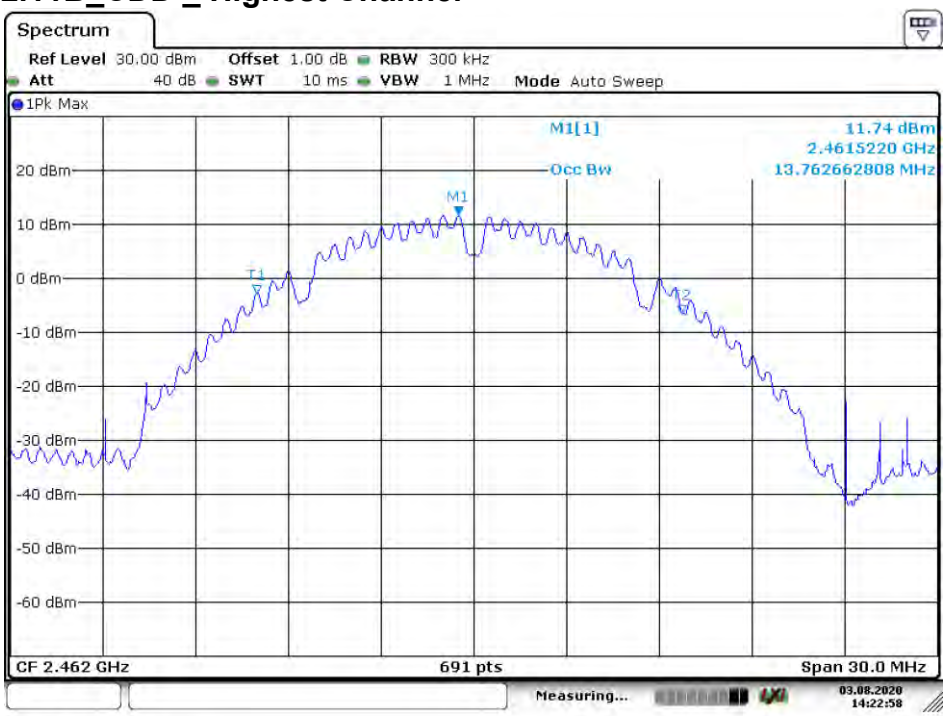
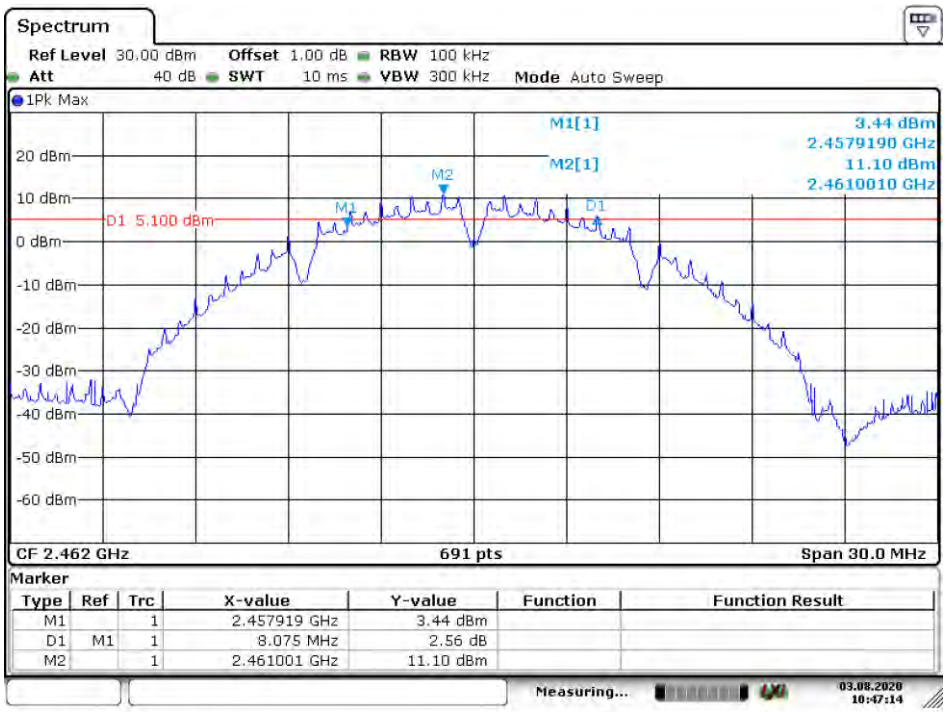
4.5.2.1.3 802.11B_CDD _ Highest Channel



Date: 3.AUG.2020 14:22:59



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.457919 GHz	3.44 dBm		
D1	M1	1	8.075 MHz	2.56 dB		
M2		1	2.461001 GHz	11.10 dBm		

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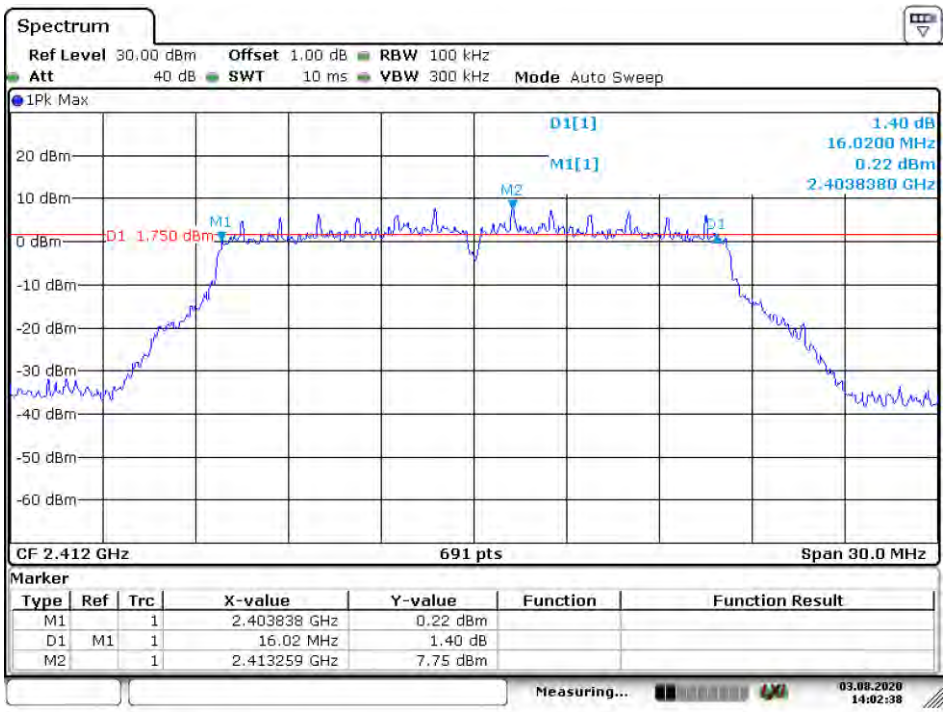
4.5.2.1.4 802.11G_CDD _Lowest Channel

Date: 3.AUG.2020 14:17:18



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.403838 GHz	0.22 dBm		
D1	M1	1	16.02 MHz	1.40 dB		
M2		1	2.413259 GHz	7.75 dBm		

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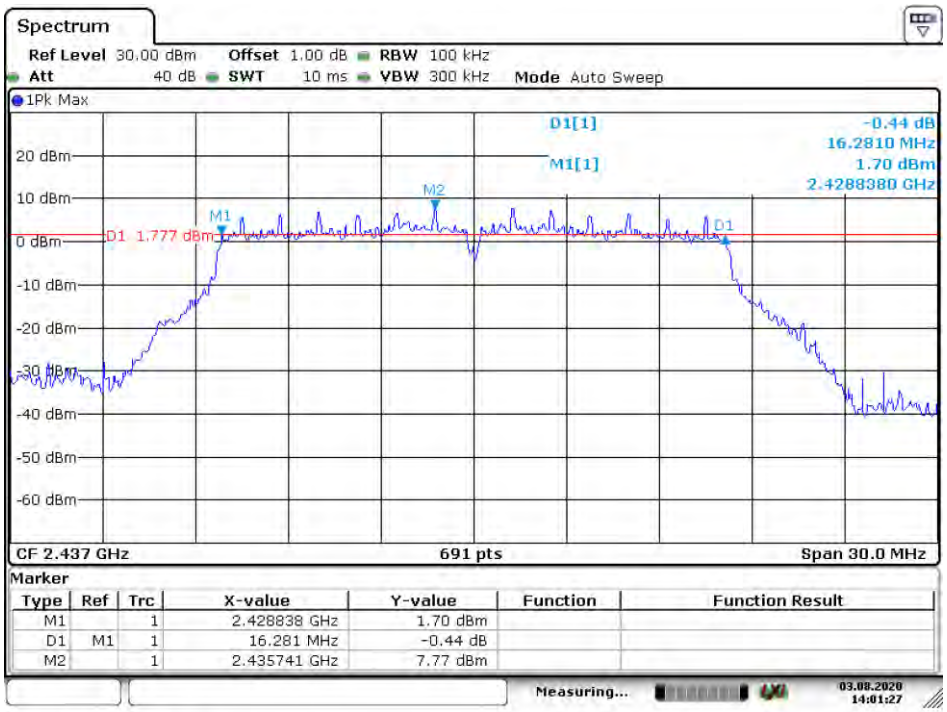
4.5.2.1.5 802.11G_CDD _ Middle Channel

Date: 3.AUG.2020 14:20:29



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.428838 GHz	1.70 dBm		
D1	M1	1	16.281 MHz	-0.44 dB		
M2		1	2.435741 GHz	7.77 dBm		

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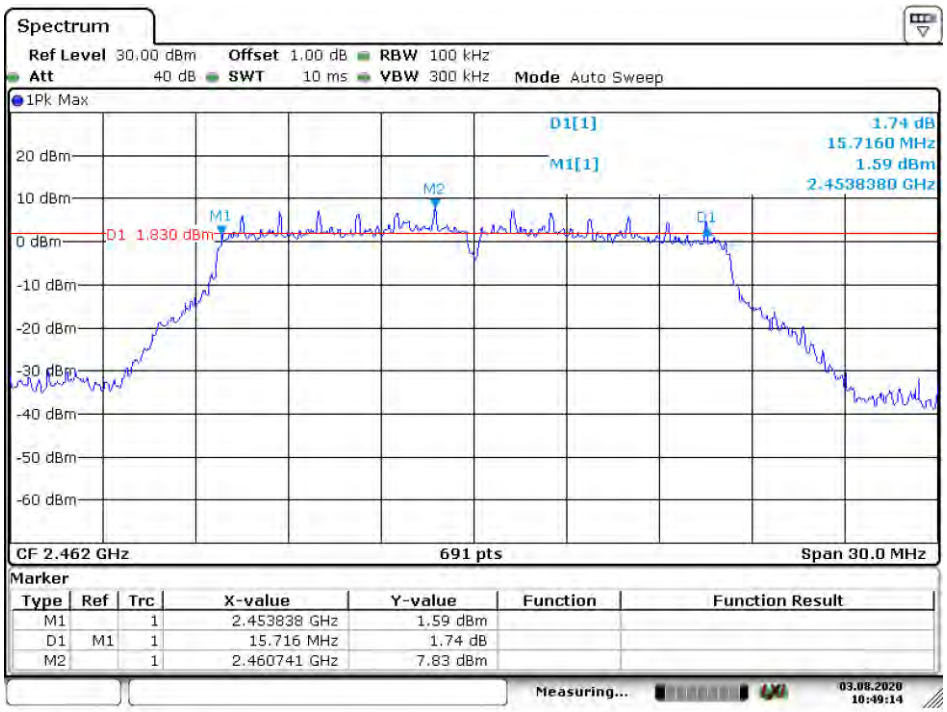
4.5.2.1.6 802.11G_CDD_ Highest Channel

Date: 3.AUG.2020 14:21:24



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.453838 GHz	1.59 dBm		
D1	M1	1	15.716 MHz	1.74 dB		
M2		1	2.460741 GHz	7.83 dBm		

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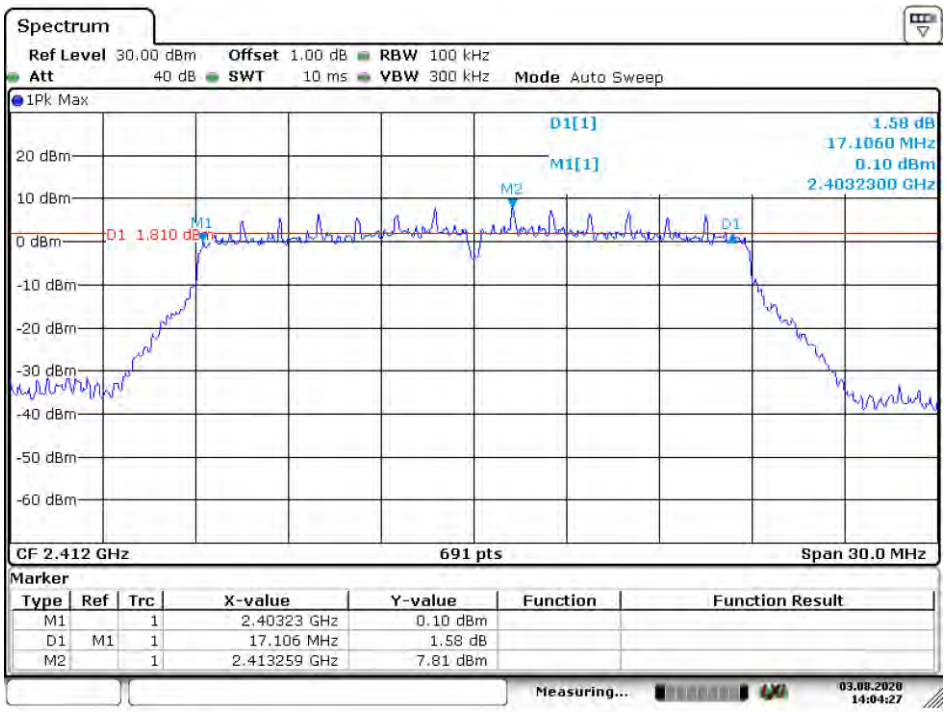
4.5.2.1.7 802.11N20_MIMO _Lowest Channel

Date: 3.AUG.2020 14:36:53



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40323 GHz	0.10 dBm		
D1	M1	1	17.106 MHz	1.58 dB		
M2		1	2.413259 GHz	7.81 dBm		

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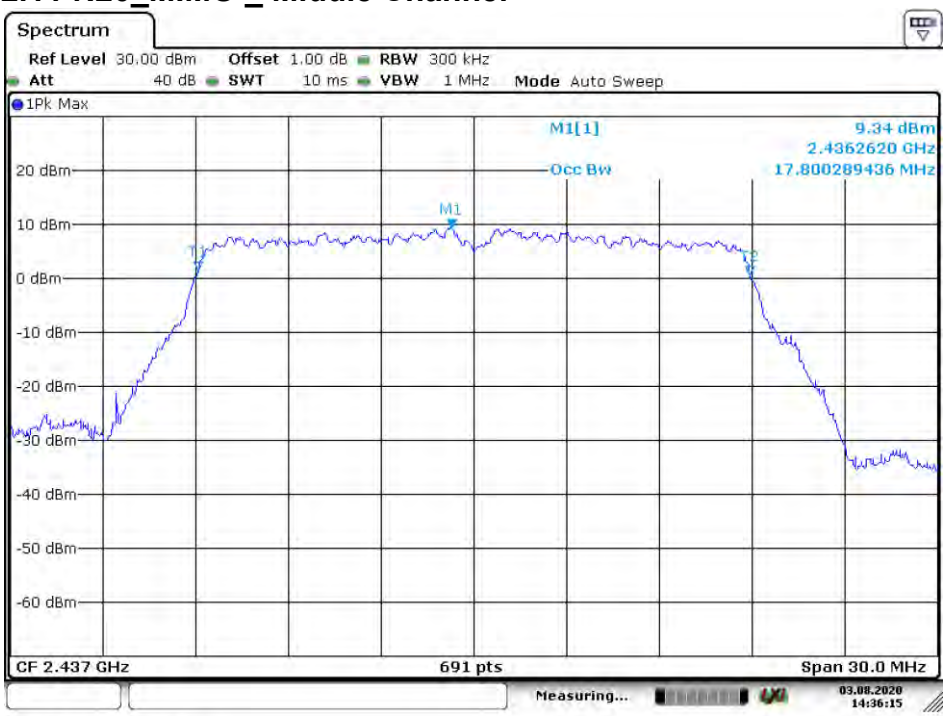
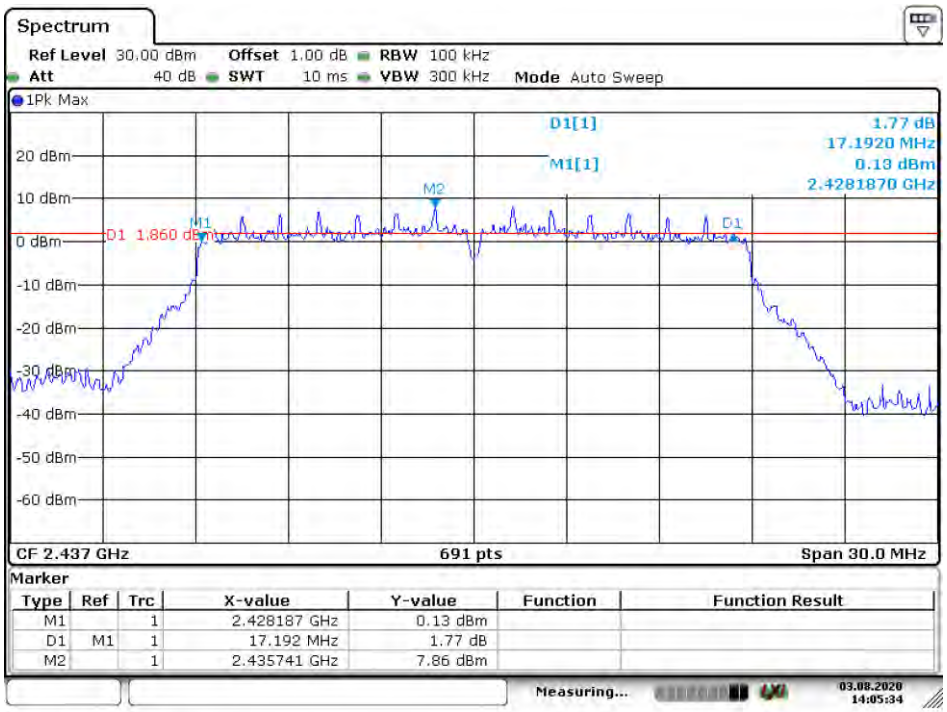
4.5.2.1.8 802.11 N20_MIMO _ Middle Channel



Date: 3.AUG.2020 14:36:15



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.428187 GHz	0.13 dBm		
D1	M1	1	17.192 MHz	1.77 dB		
M2		1	2.435741 GHz	7.86 dBm		

Date: 3.AUG.2020 14:05:35

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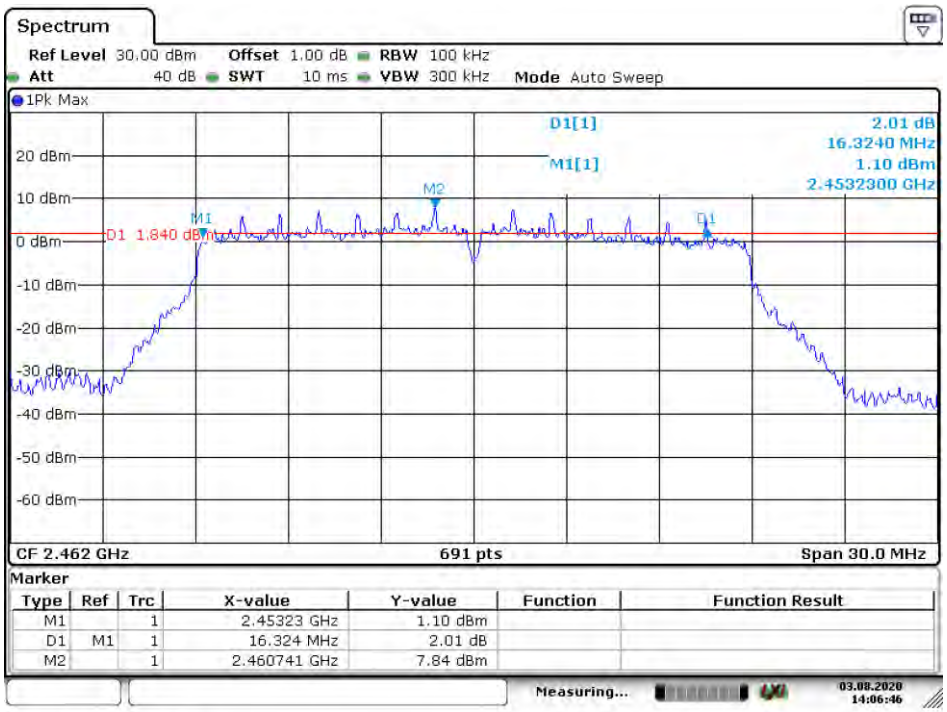
4.5.2.1.9 802.11 N20_MIMO _ Highest Channel

Date: 3.AUG.2020 14:35:22



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.45323 GHz	1.10 dBm		
D1	M1	1	16.324 MHz	2.01 dB		
M2		1	2.460741 GHz	7.84 dBm		

Date: 3.AUG.2020 14:06:47

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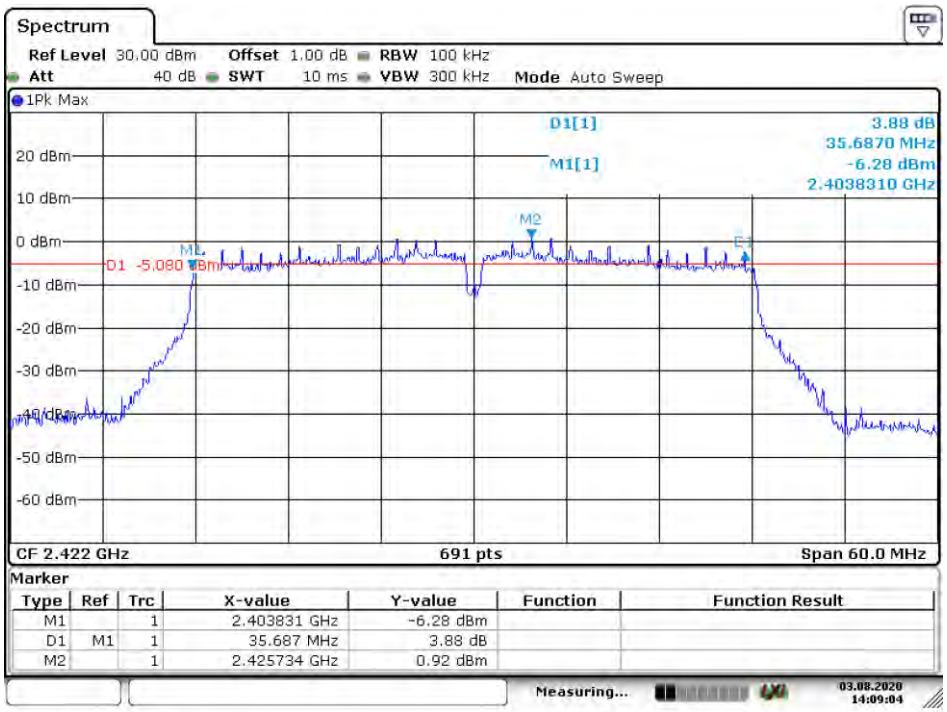
4.5.2.1.10 802.11N40_MIMO _Lowest Channel

Date: 3.AUG.2020 14:16:27



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.403831 GHz	-6.28 dBm		
D1	M1	1	35.687 MHz	3.88 dB		
M2		1	2.425734 GHz	0.92 dBm		

Date: 3.AUG.2020 14:09:05

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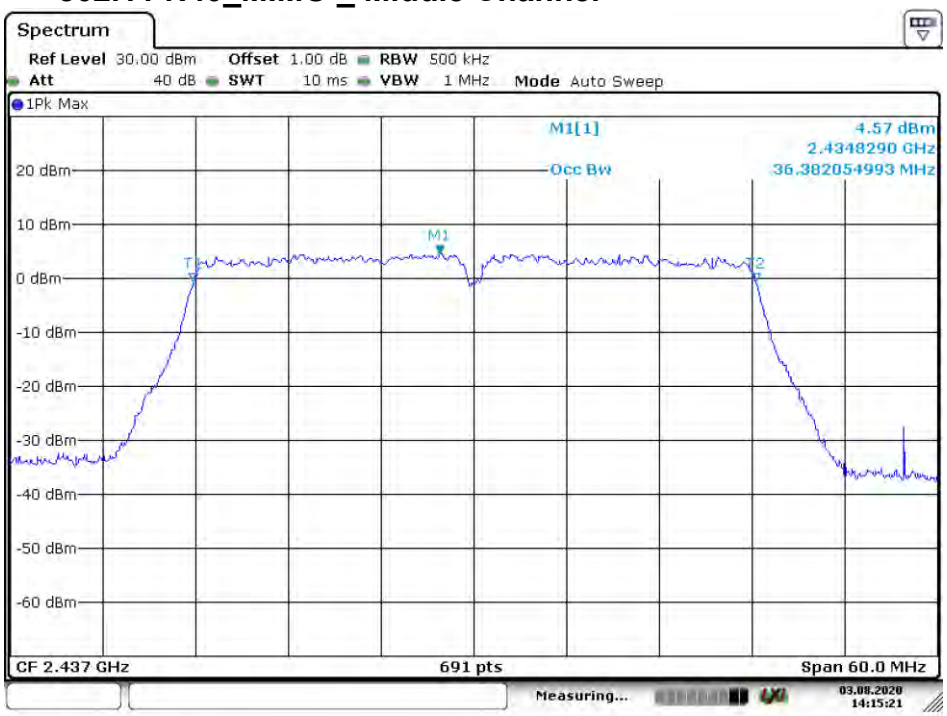
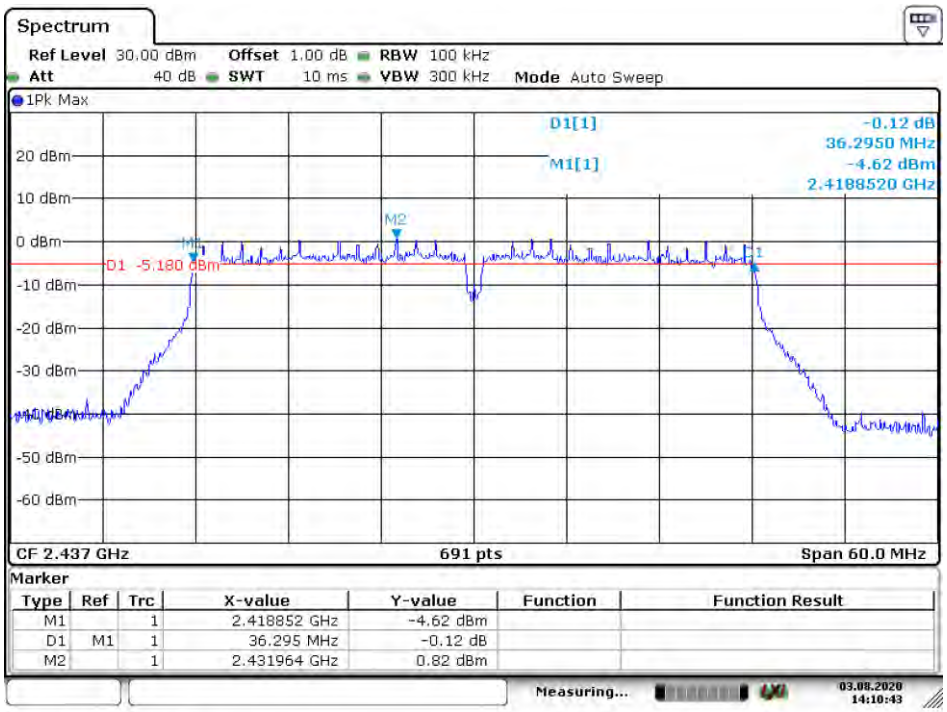
4.5.2.1.11 802.11 N40_MIMO _ Middle Channel



Date: 3.AUG.2020 14:15:20



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.418852 GHz	-4.62 dBm		
D1	M1	1	36.295 MHz	-0.12 dB		
M2		1	2.431964 GHz	0.82 dBm		

Date: 3.AUG.2020 14:10:43

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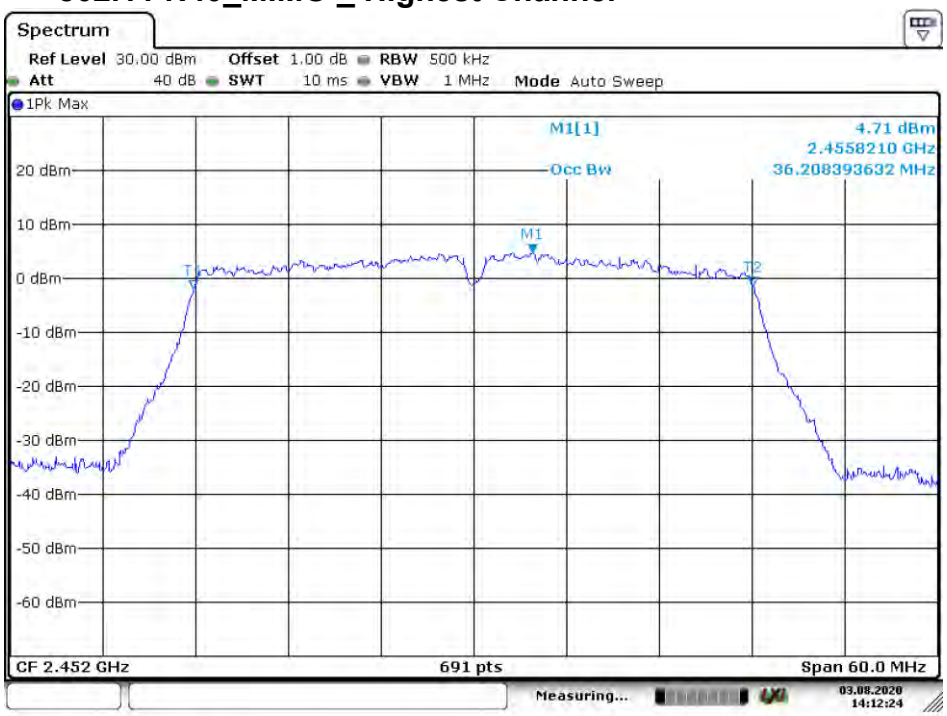
4.5.2.1.12 802.11 N40_MIMO _ Highest Channel



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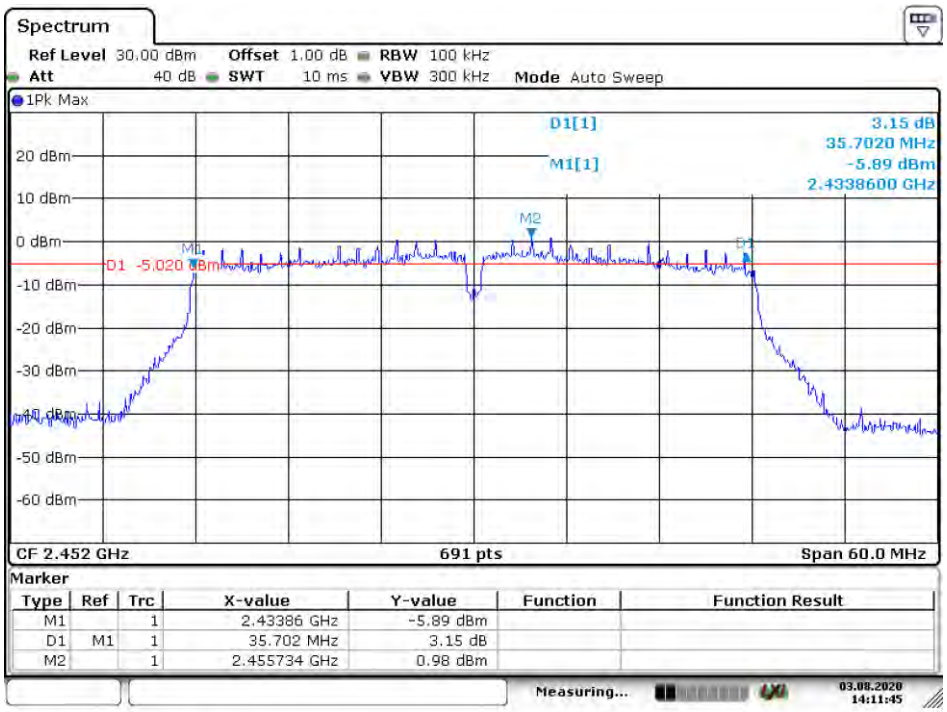

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.43386 GHz	-5.89 dBm		
D1	M1	1	35.702 MHz	3.15 dB		
M2		1	2.455734 GHz	0.98 dBm		

Date: 3.AUG.2020 14:11:44

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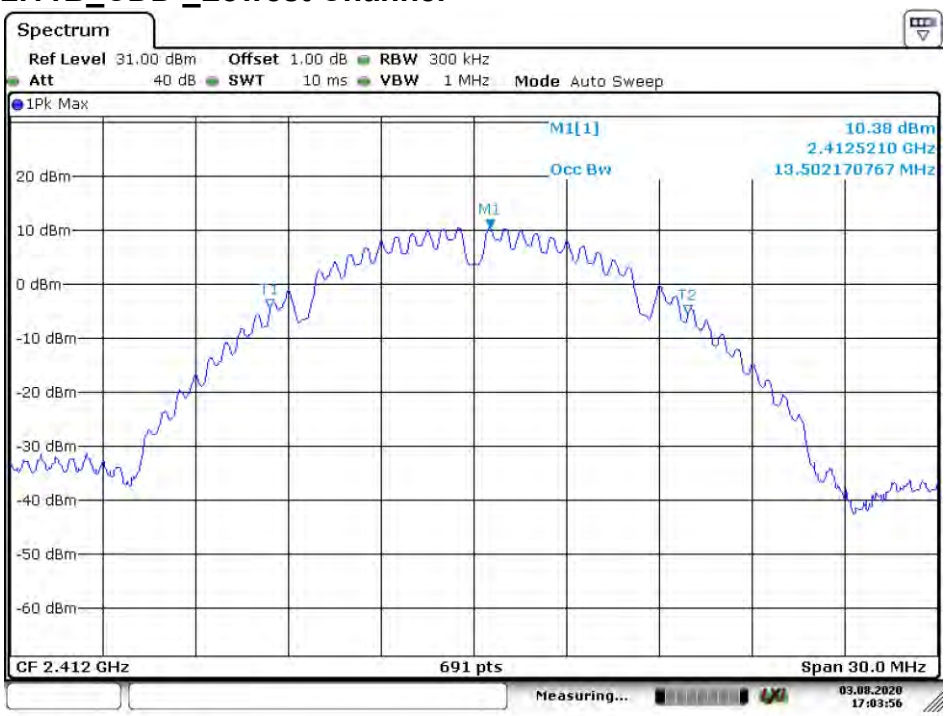
4.5.2.2 ANT2

4.5.2.2.1 802.11B_CDD _Lowest Channel



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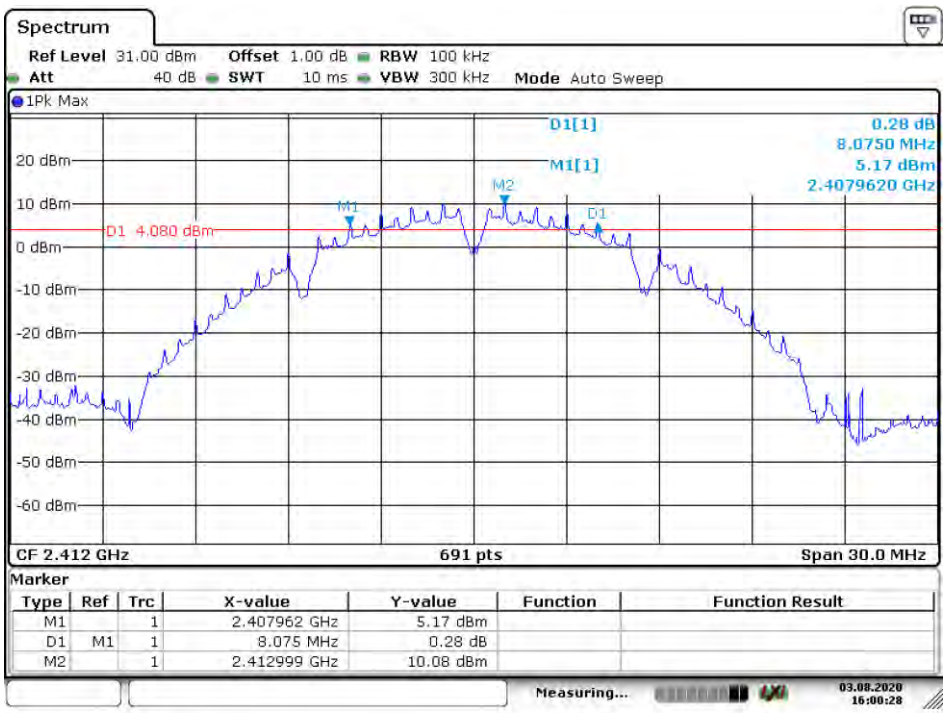

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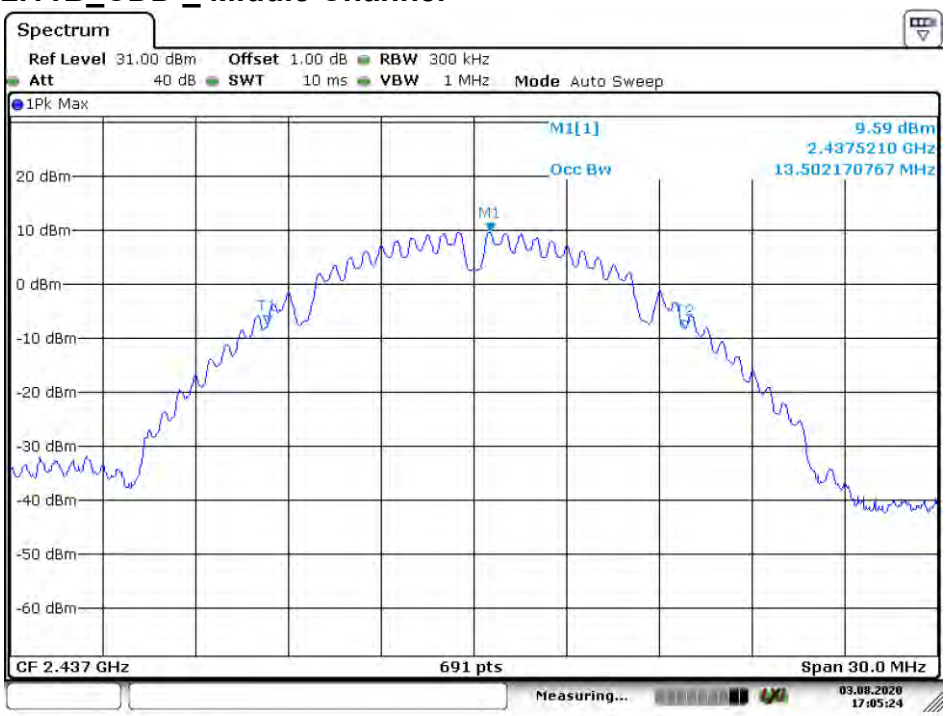
4.5.2.2.2 802.11B_CDD _ Middle Channel



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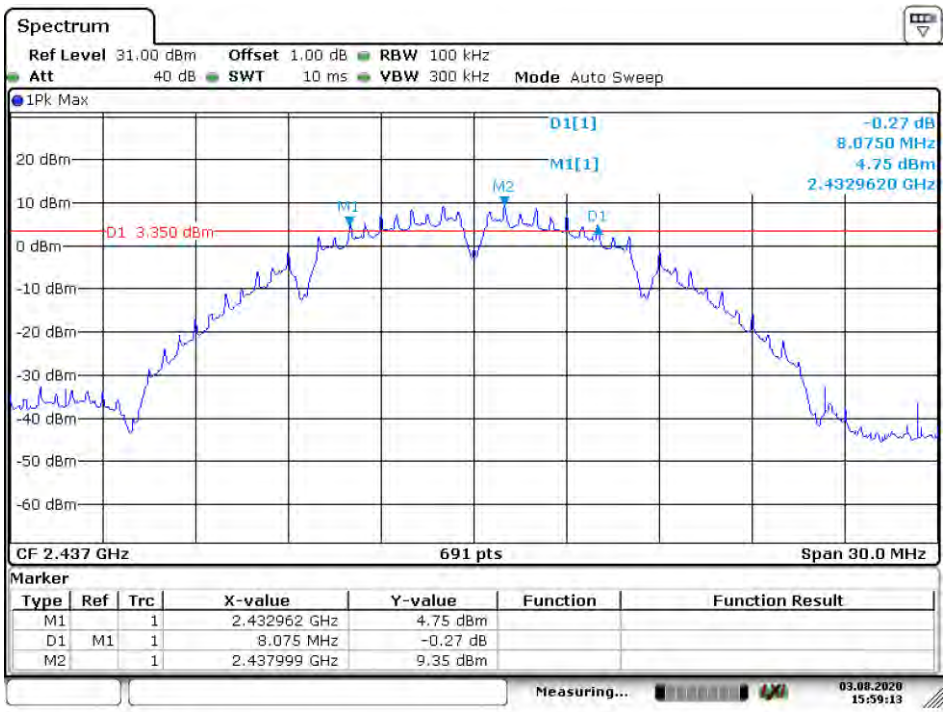

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.432962 GHz	4.75 dBm		
D1	M1	1	8.075 MHz	-0.27 dB		
M2		1	2.437999 GHz	9.35 dBm		

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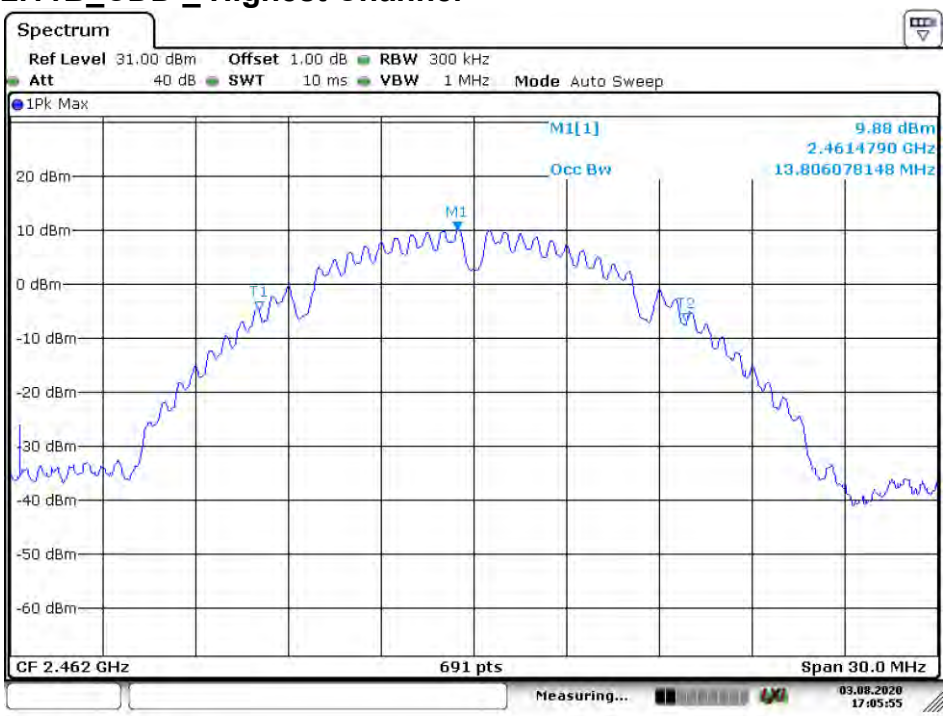
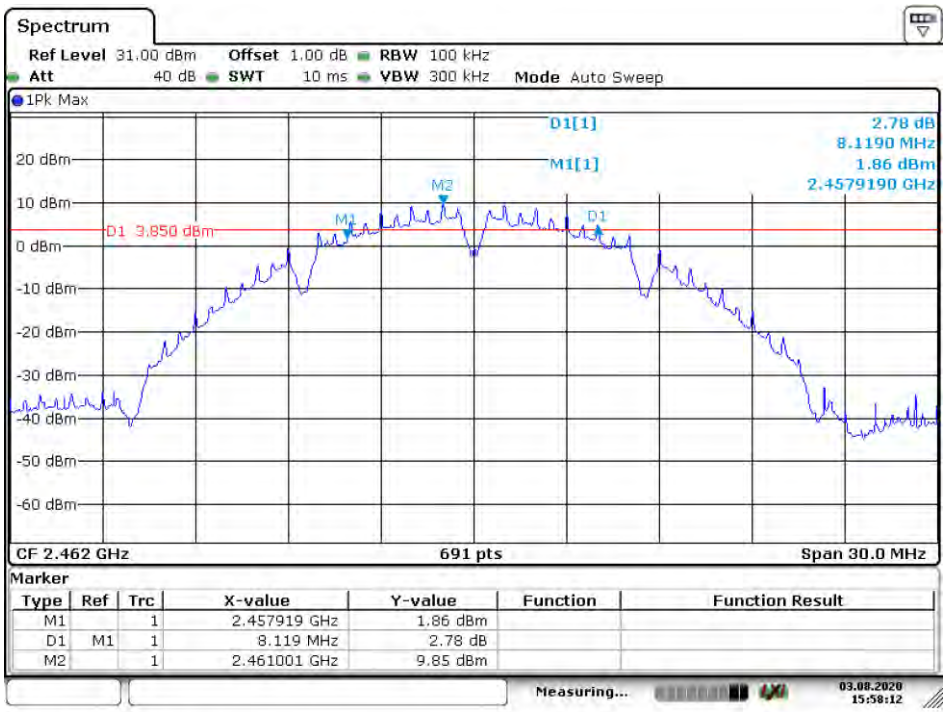
4.5.2.2.3 802.11B_CDD _ Highest Channel



Date: 3.AUG.2020 17:05:56



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.457919 GHz	1.86 dBm		
D1	M1	1	8.119 MHz	2.78 dB		
M2		1	2.461001 GHz	9.85 dBm		

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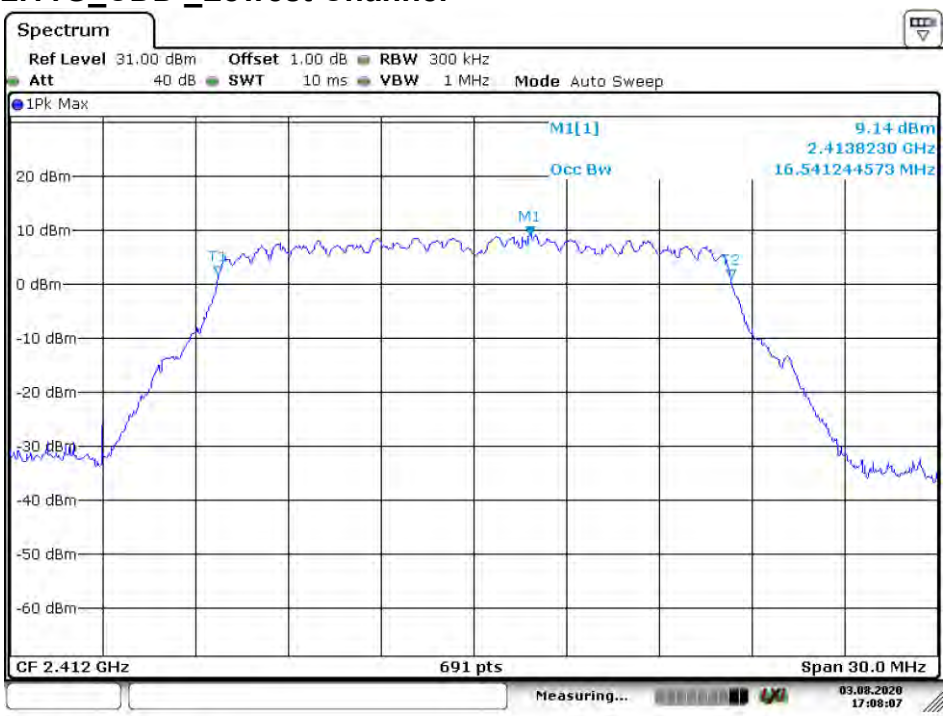
4.5.2.2.4 802.11G_CDD _Lowest Channel



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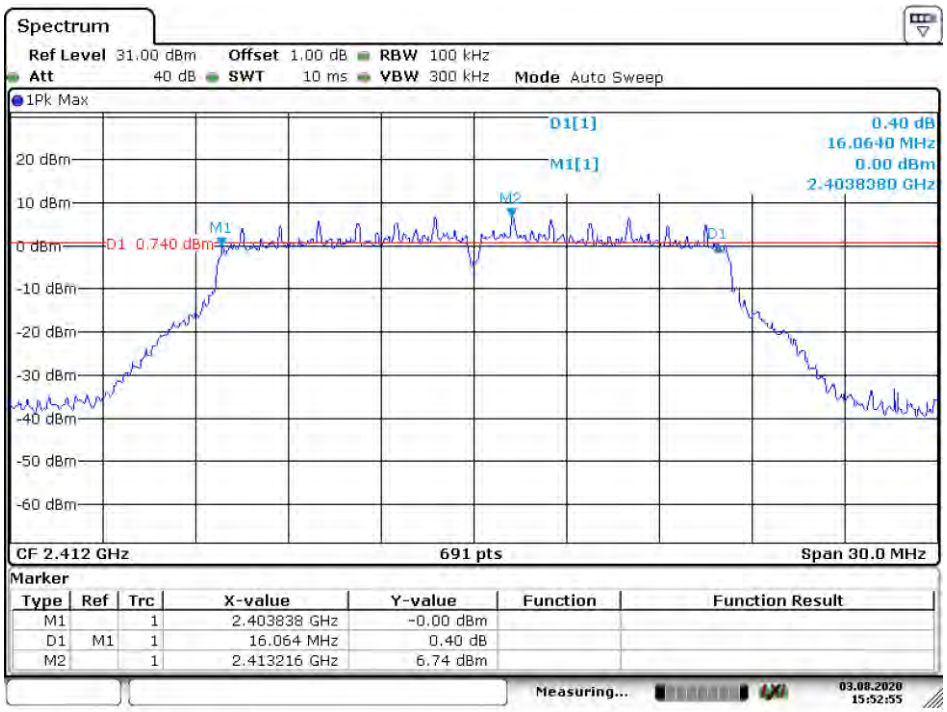

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.403838 GHz	-0.00 dBm		
D1	M1	1	16.064 MHz	0.40 dB		
M2		1	2.413216 GHz	6.74 dBm		

Date: 3.AUG.2020 15:52:55

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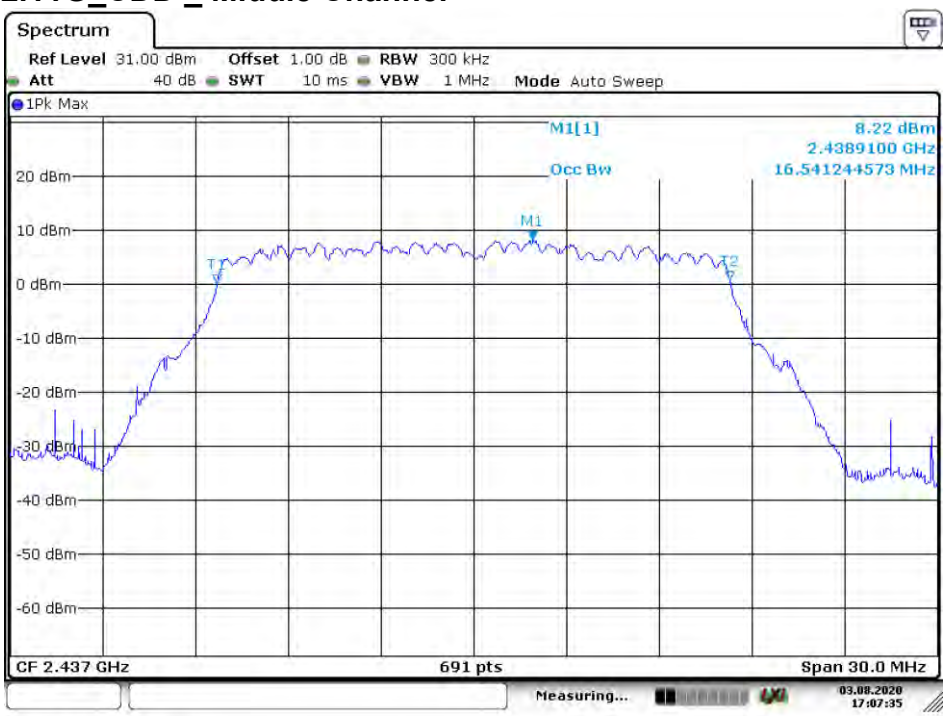
4.5.2.2.5 802.11G_CDD _ Middle Channel



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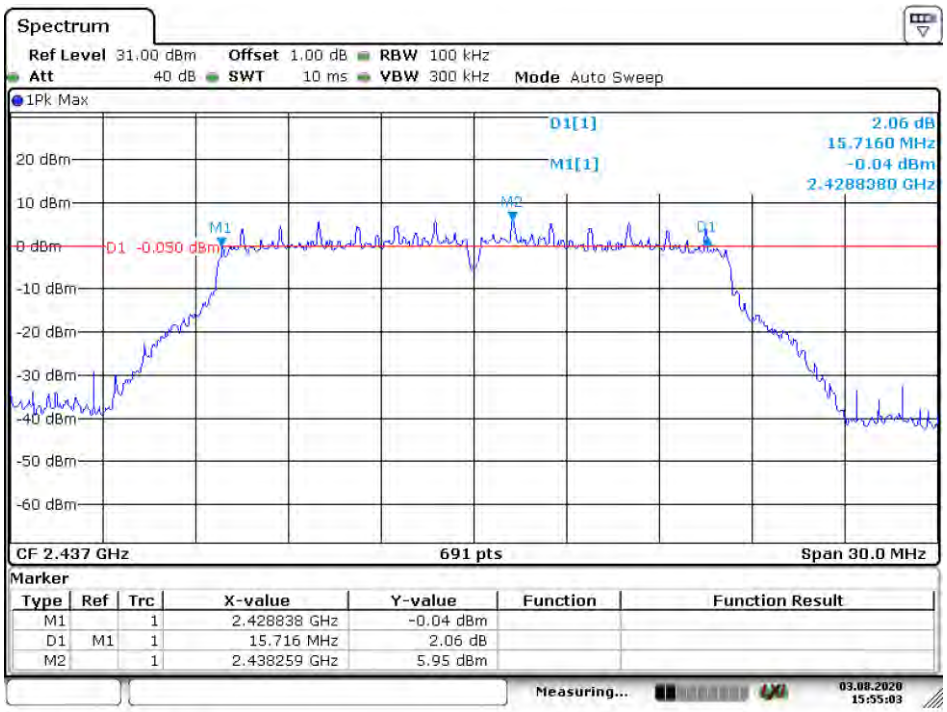

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.428838 GHz	-0.04 dBm		
D1	M1	1	15.716 MHz	2.06 dB		
M2		1	2.438259 GHz	5.95 dBm		

Date: 3.AUG.2020 15:55:04

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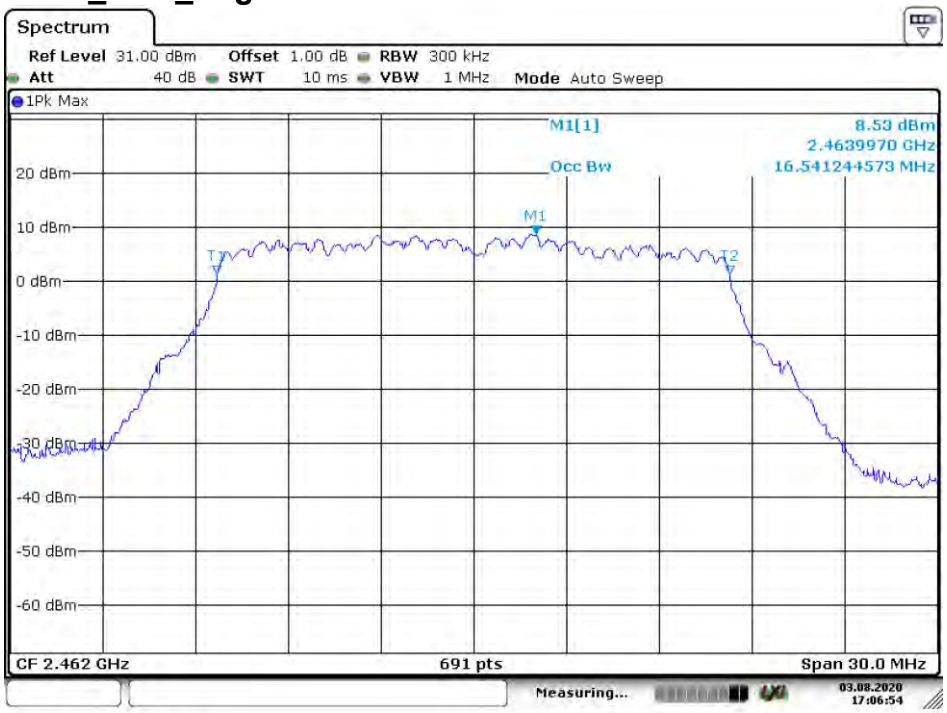
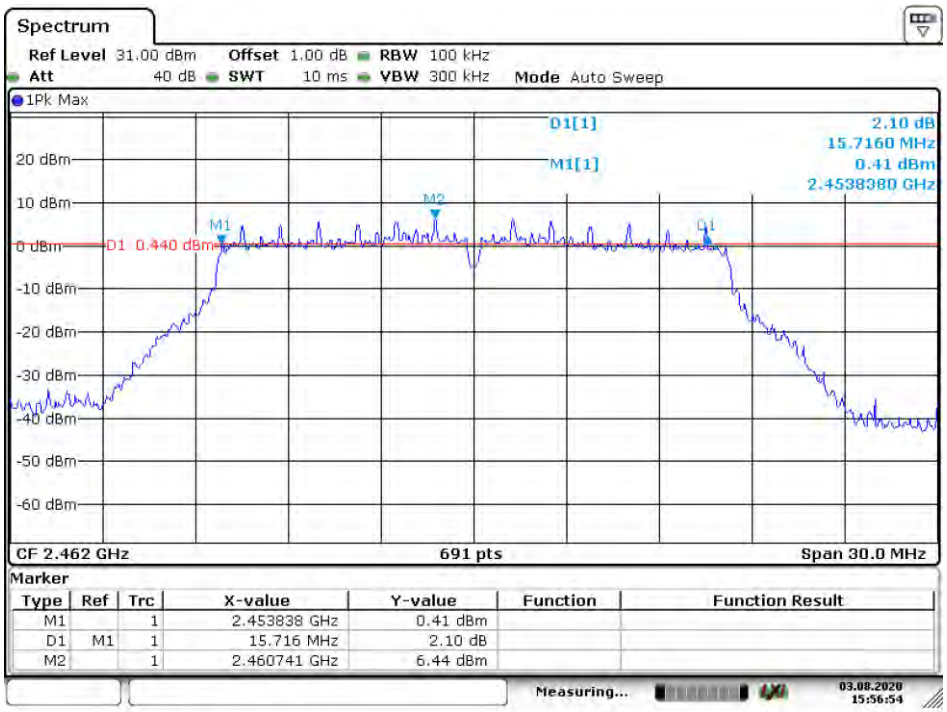
4.5.2.2.6 802.11G_CDD_ Highest Channel



Date: 3.AUG.2020 17:06:54



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.453838 GHz	0.41 dBm		
D1	M1	1	15.716 MHz	2.10 dB		
M2		1	2.460741 GHz	6.44 dBm		

Date: 3.AUG.2020 15:56:54

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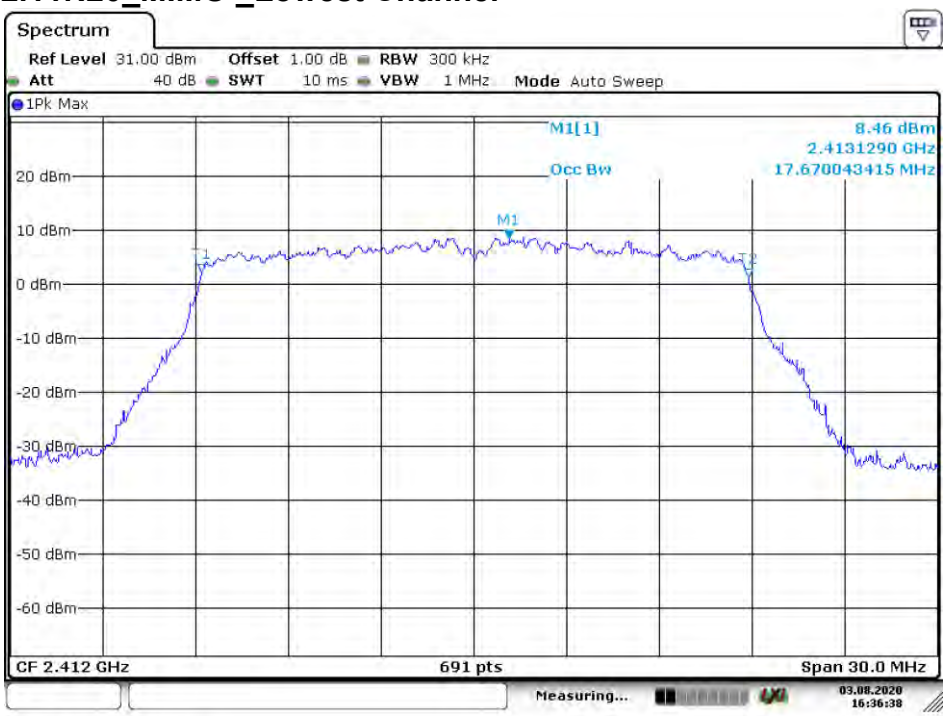
4.5.2.2.7 802.11N20_MIMO _Lowest Channel



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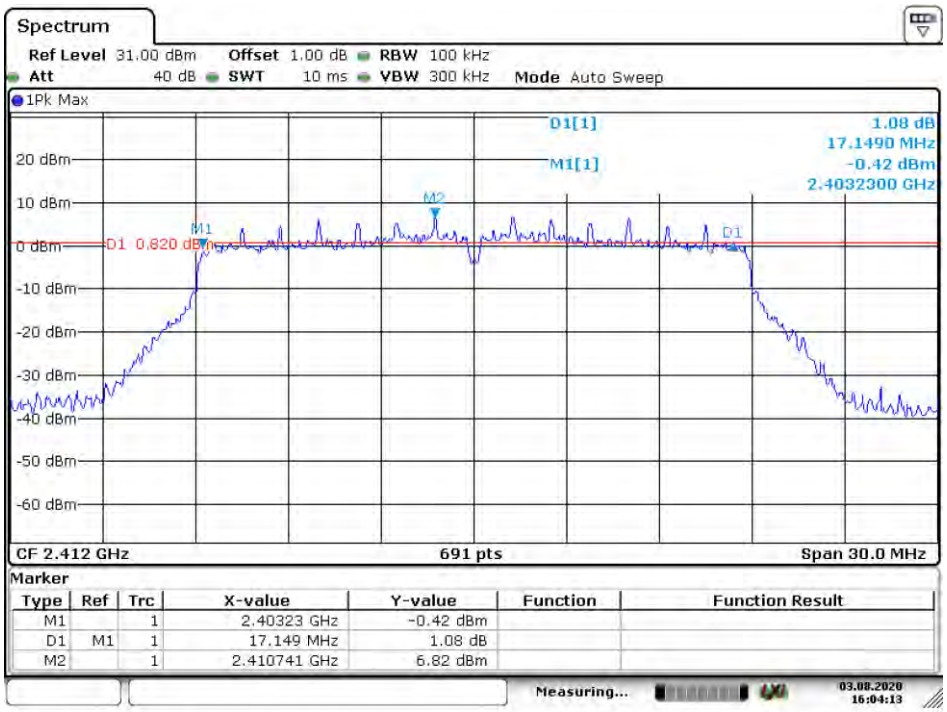

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40323 GHz	-0.42 dBm		
D1	M1	1	17.149 MHz	1.08 dB		
M2		1	2.410741 GHz	6.82 dBm		

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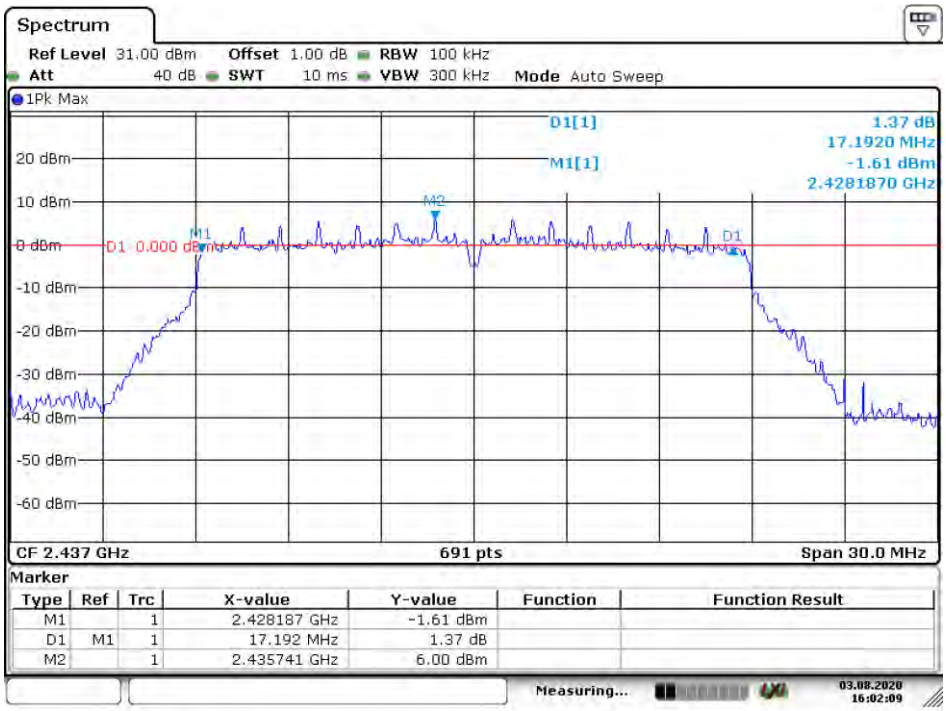
4.5.2.2.8 802.11 N20_MIMO _ Middle Channel

Date: 3.AUG.2020 16:38:12



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.428187 GHz	-1.61 dBm		
D1	M1	1	17.192 MHz	1.37 dB		
M2		1	2.435741 GHz	6.00 dBm		

Date: 3.AUG.2020 16:02:09

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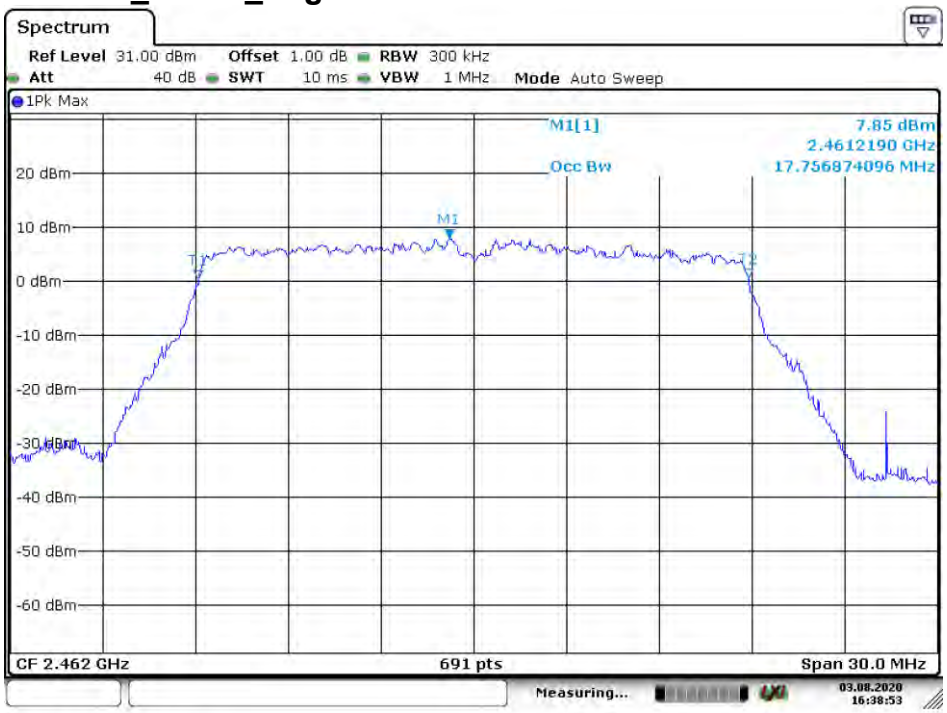
4.5.2.2.9 802.11 N20_MIMO _ Highest Channel



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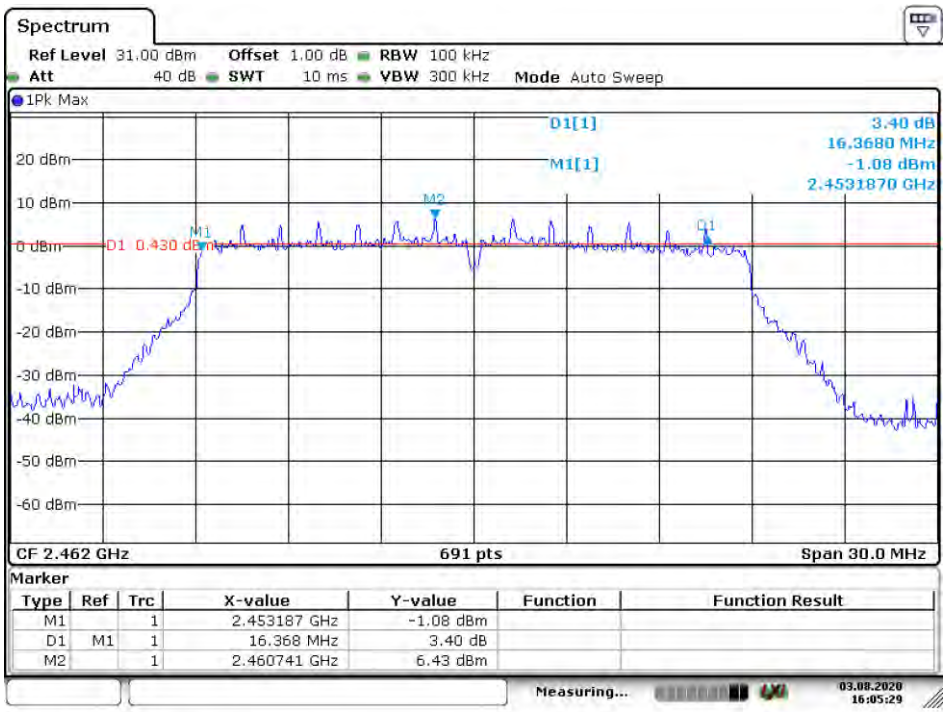

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.453187 GHz	-1.08 dBm		
D1	M1	1	16.368 MHz	3.40 dB		
M2		1	2.460741 GHz	6.43 dBm		

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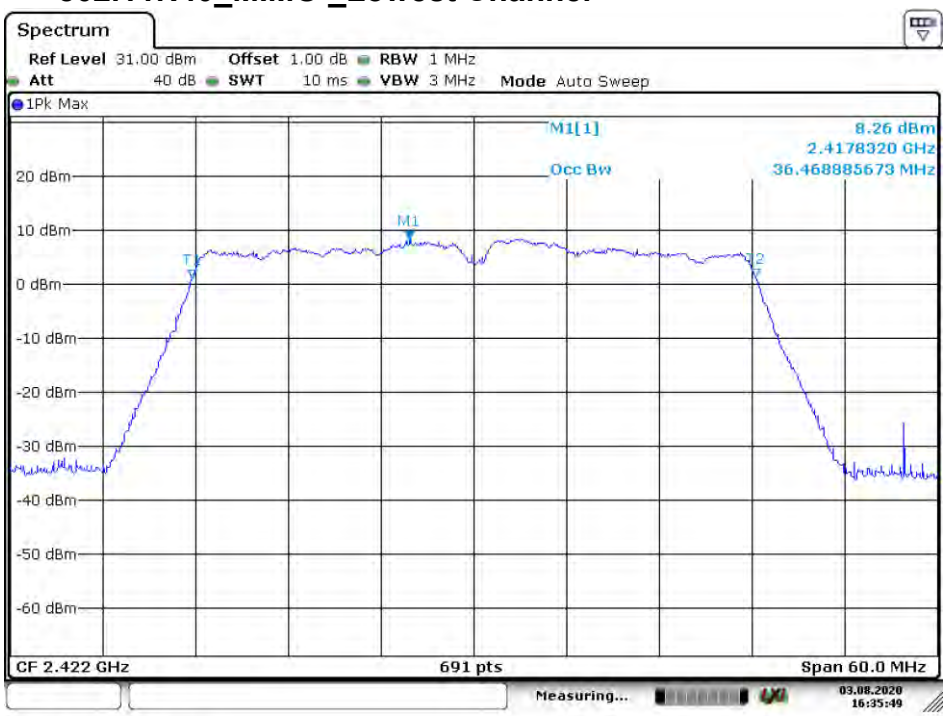
4.5.2.2.10 802.11N40_MIMO _Lowest Channel



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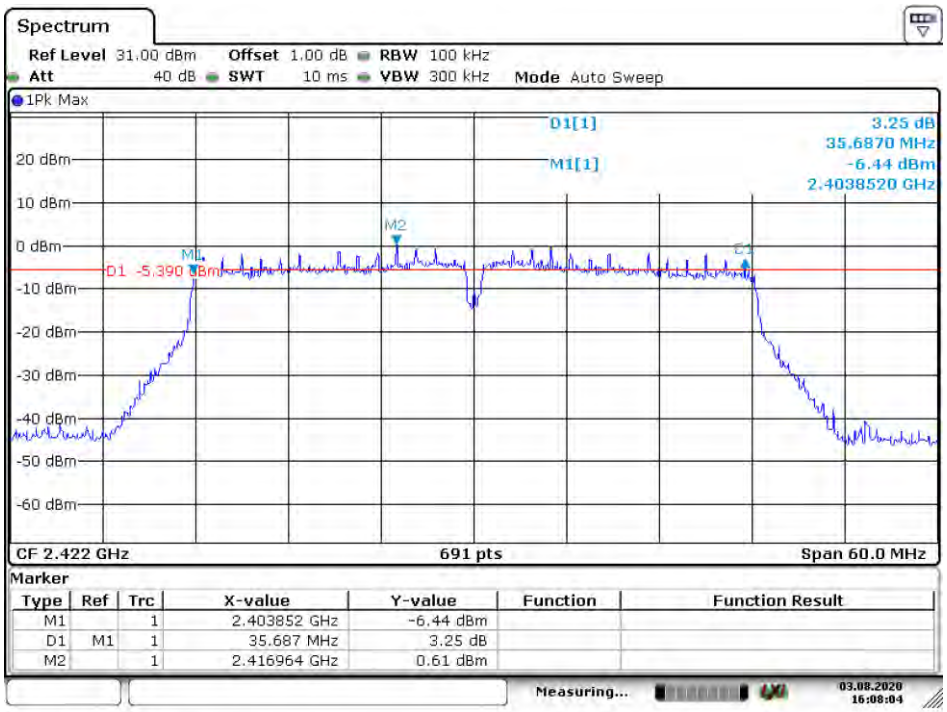

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.403852 GHz	-6.44 dBm		
D1	M1	1	35.687 MHz	3.25 dB		
M2		1	2.416964 GHz	0.61 dBm		

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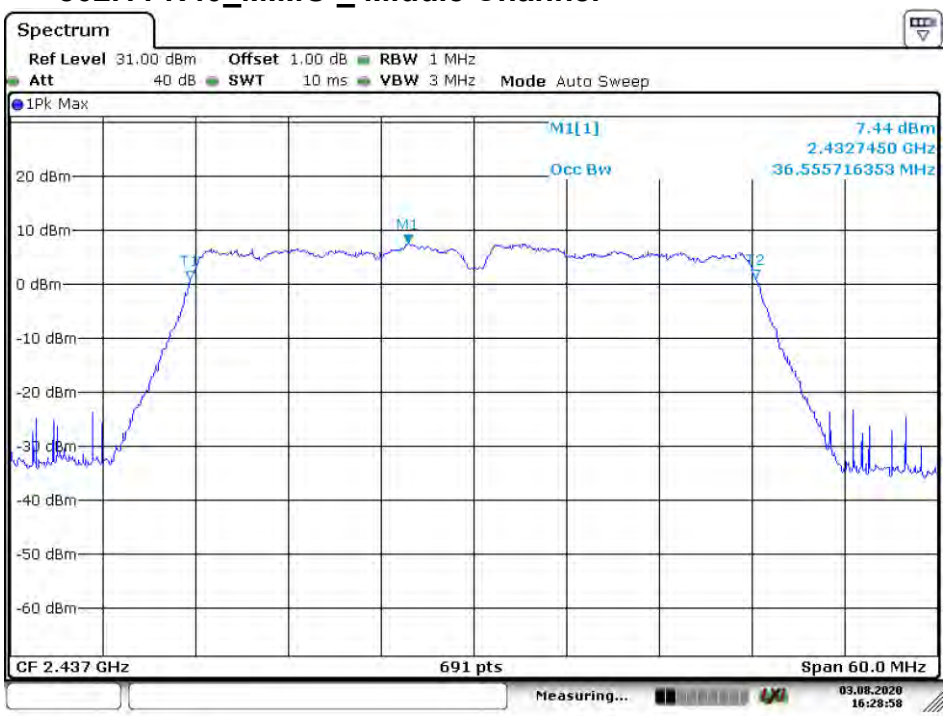
4.5.2.2.11 802.11 N40_MIMO _ Middle Channel



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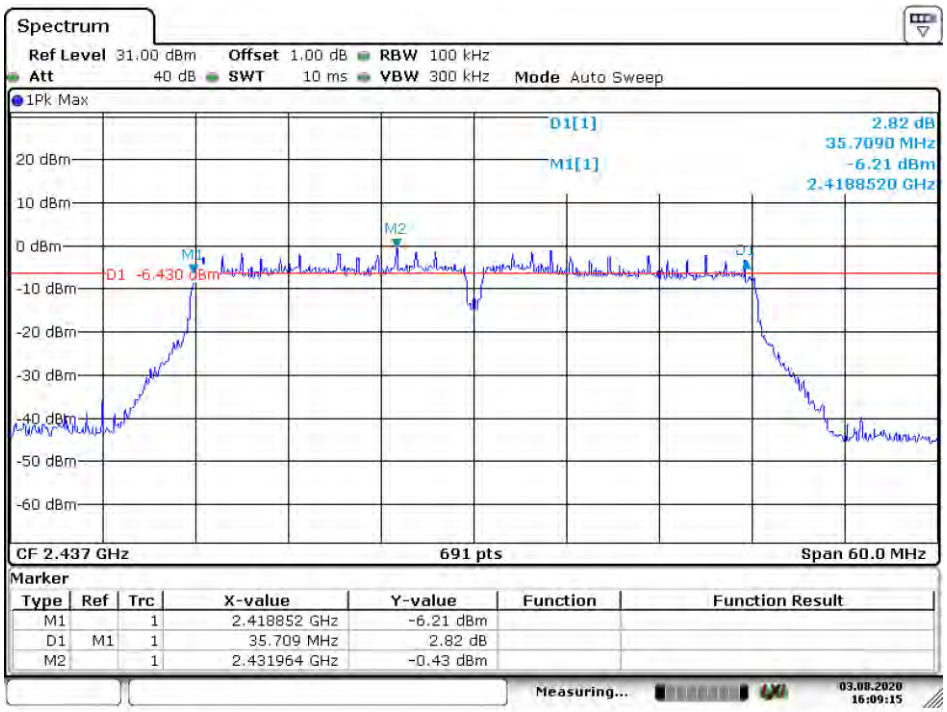

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.418852 GHz	-6.21 dBm		
D1	M1	1	35.709 MHz	2.82 dB		
M2		1	2.431964 GHz	-0.43 dBm		

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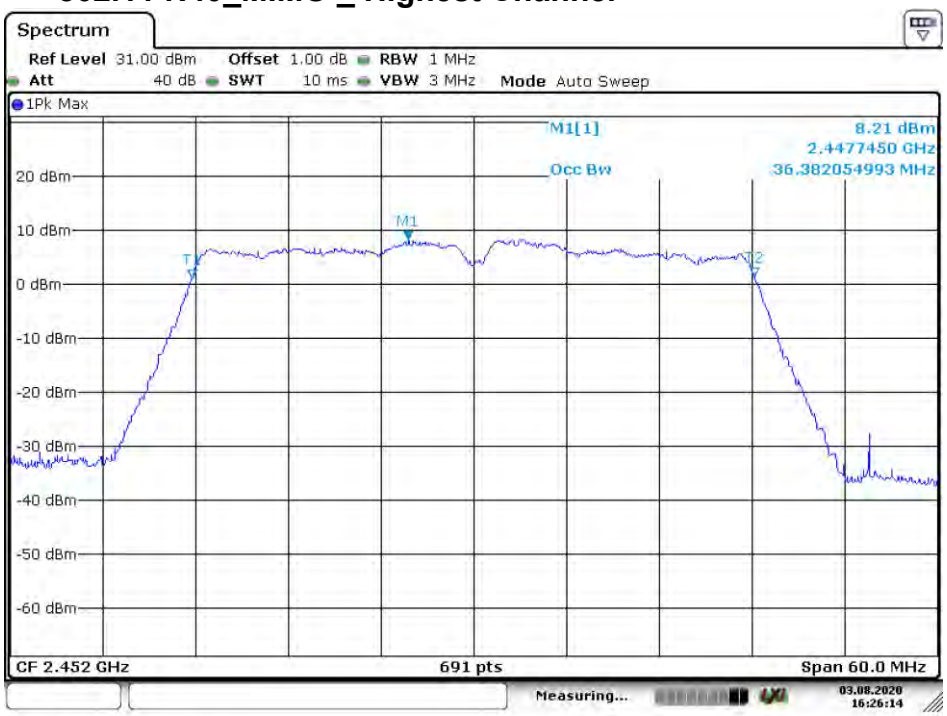
4.5.2.2.12 802.11 N40_MIMO _ Highest Channel



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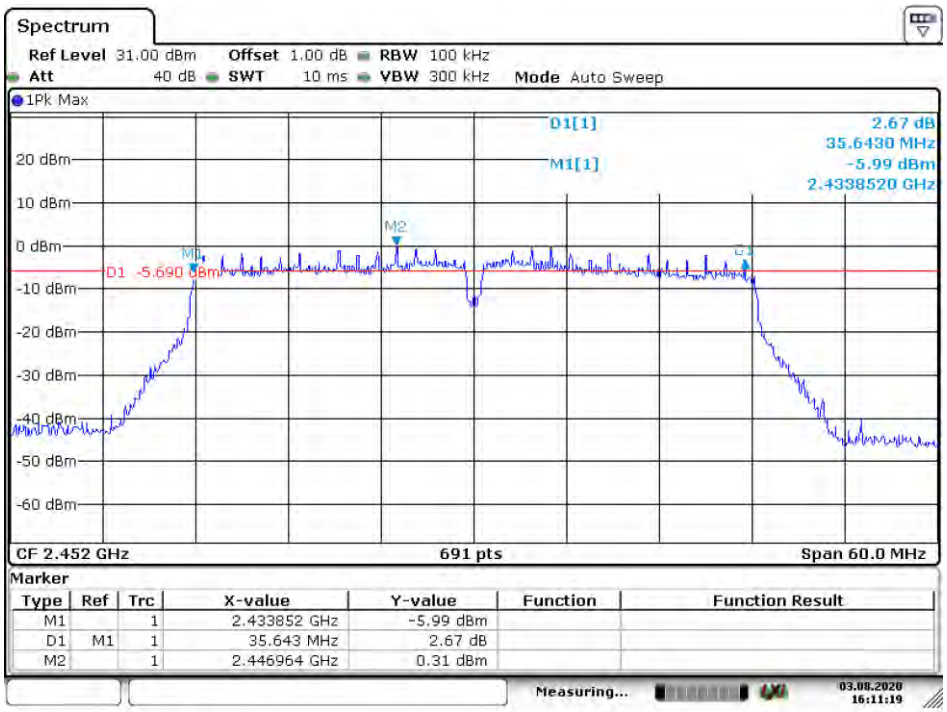

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.433852 GHz	-5.99 dBm		
D1	M1	1	35.643 MHz	2.67 dB		
M2		1	2.446964 GHz	0.31 dBm		

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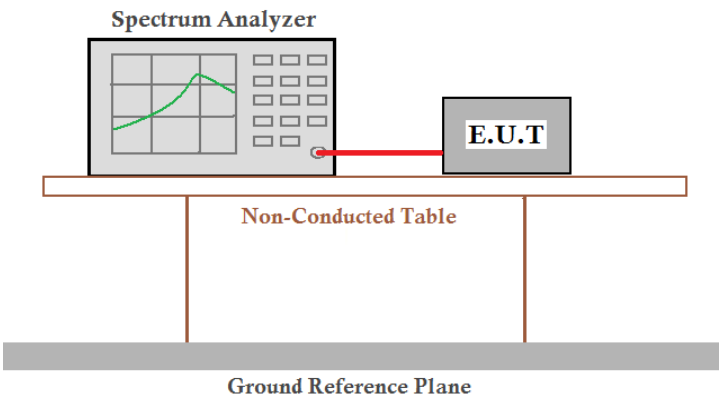
4.6 Power Spectral Density

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

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4.6.1 Test Results

Mode	Test Channel	Power Spectral Density (dBm/3kHz)			Limit (dBm/3kHz)	Result
		ANT1	ANT2	SUM		
802.11B _CDD	Lowest	-4.76	-5.71	-2.20	≤8.00	Pass
	Middle	-4.36	-6.88	-2.43	≤8.00	Pass
	Highest	-4.88	-6.10	-2.44	≤8.00	Pass
802.11G_CDD	Lowest	-6.44	-7.64	-3.99	≤8.00	Pass
	Middle	-7.75	-9.17	-5.39	≤8.00	Pass
	Highest	-7.46	-9.42	-5.32	≤8.00	Pass
802.11N20_MIMO	Lowest	-6.75	-7.63	-4.16	≤8.00	Pass
	Middle	-7.13	-9.13	-5.01	≤8.00	Pass
	Highest	-8.32	-7.51	-4.89	≤8.00	Pass
802.11N40_MIMO	Lowest	-13.69	-13.95	-10.81	≤8.00	Pass
	Middle	-13.11	-14.93	-10.92	≤8.00	Pass
	Highest	-13.64	-14.62	-11.09	≤8.00	Pass

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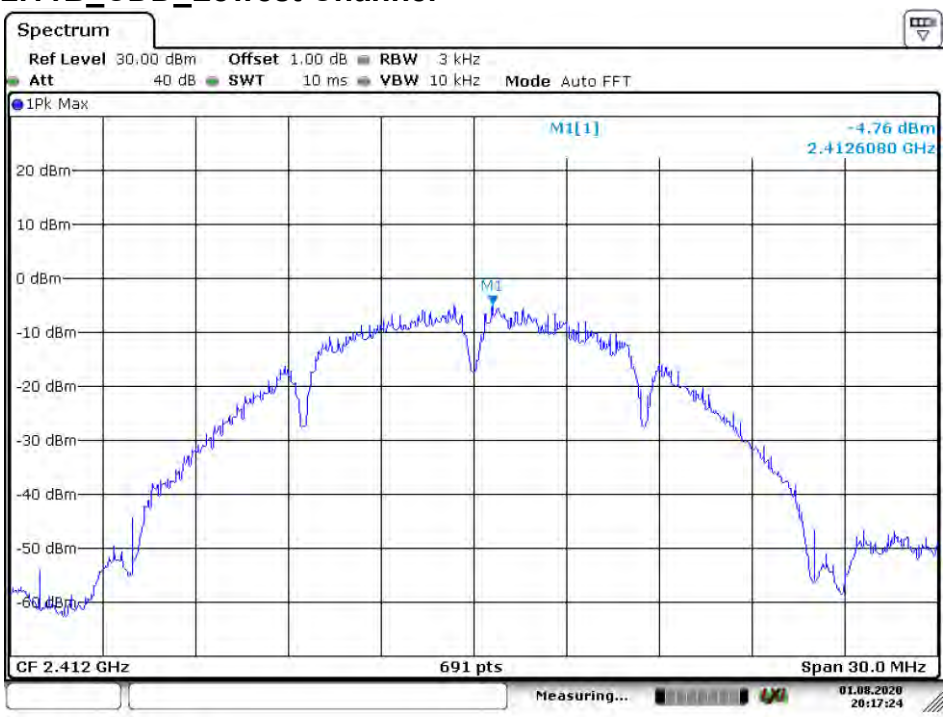
4.6.2 Test plots

4.6.2.1 ANT1

4.6.2.1.1 802.11B_CDD_Lowest Channel



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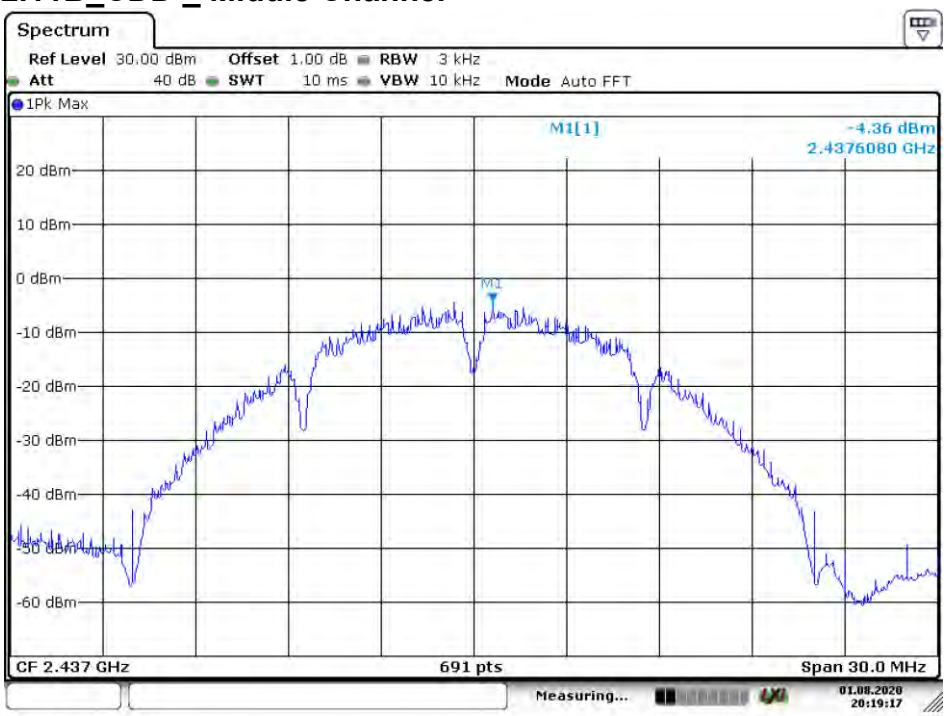
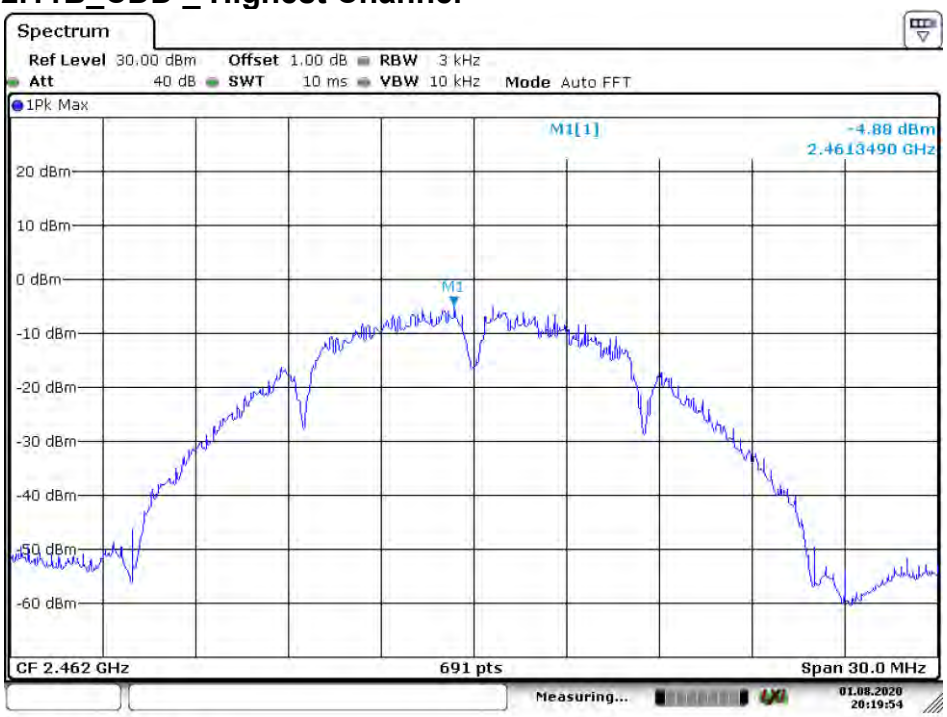
4.6.2.1.2 802.11B_CDD _ Middle Channel



Date: 1.AUG.2020 20:19:17

4.6.2.1.3 802.11B_CDD _ Highest Channel



Date: 1.AUG.2020 20:19:54

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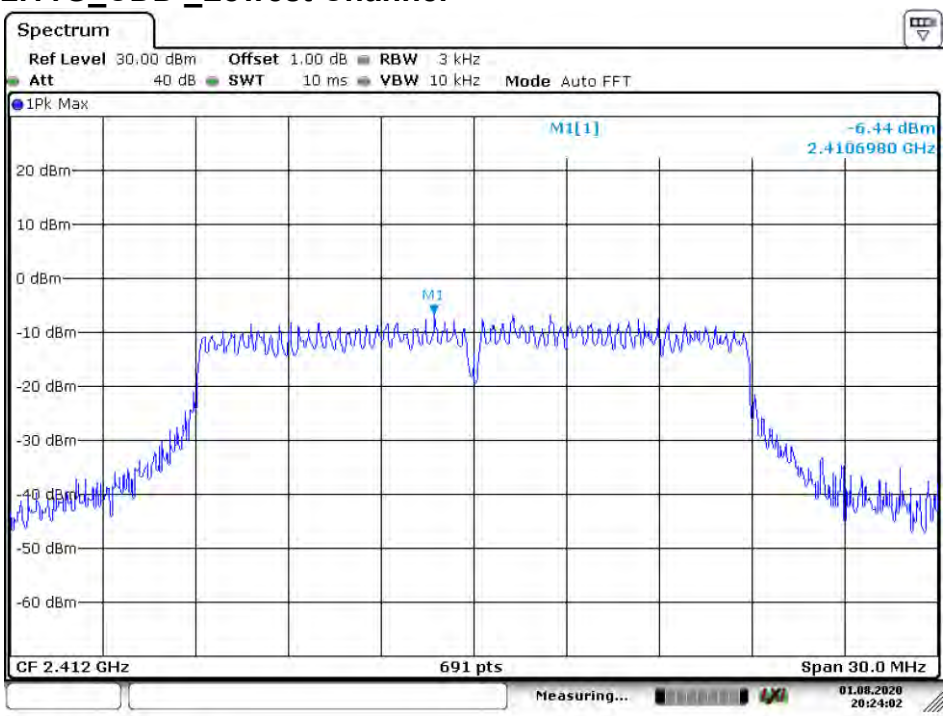
4.6.2.1.4 802.11G_CDD _Lowest Channel



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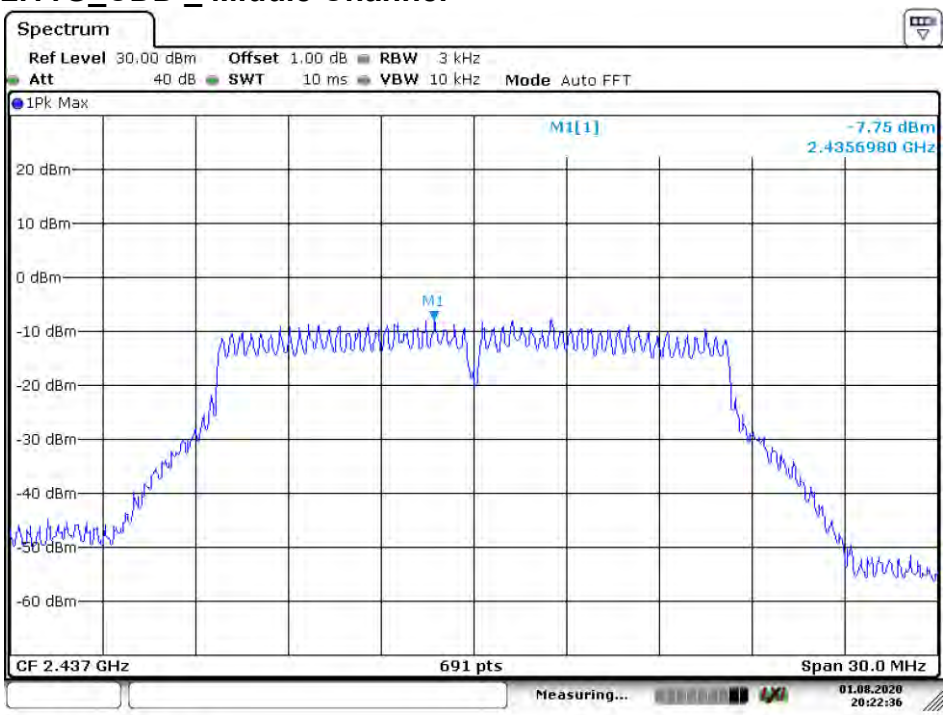
4.6.2.1.5 802.11G_CDD _ Middle Channel



Date: 1.AUG.2020 20:22:37

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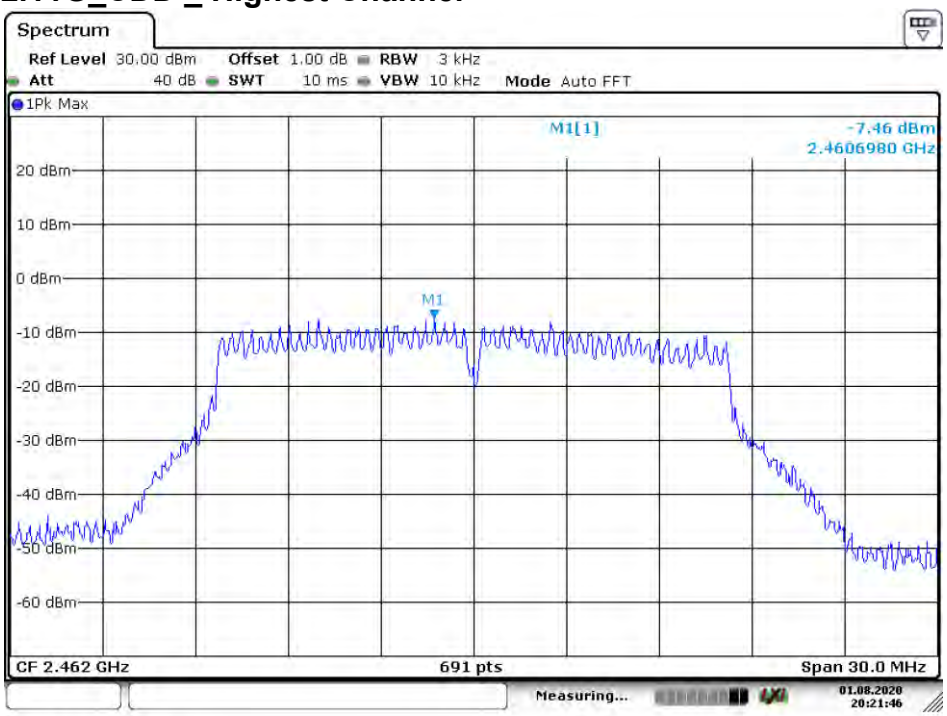
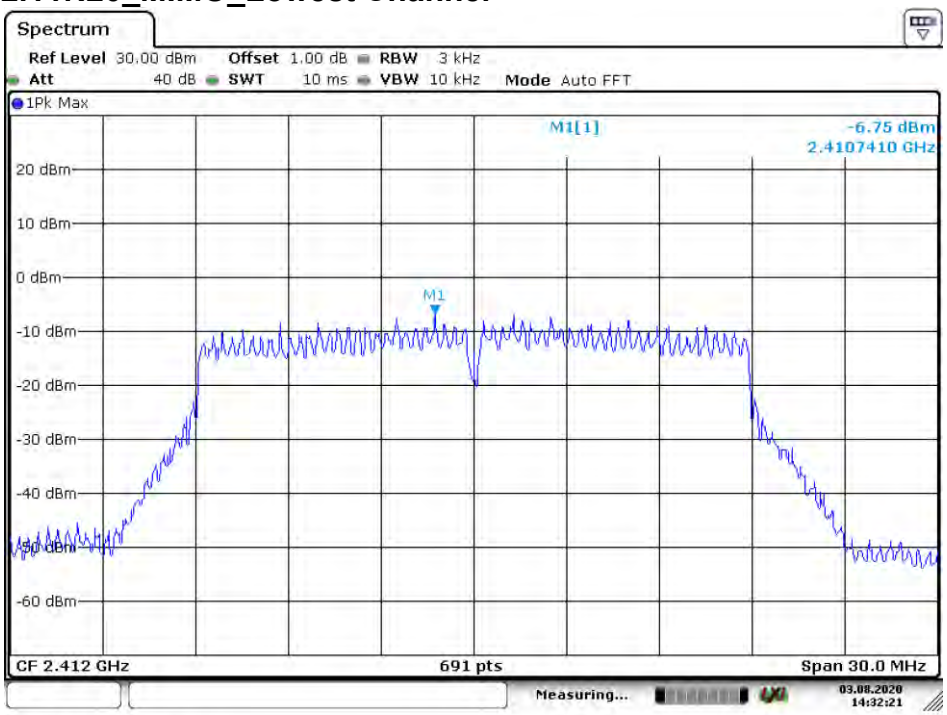
4.6.2.1.6 802.11G_CDD _ Highest Channel



Date: 1.AUG.2020 20:21:46

4.6.2.1.7 802.11N20_MIMO_Lowest Channel



Date: 3.AUG.2020 14:32:21

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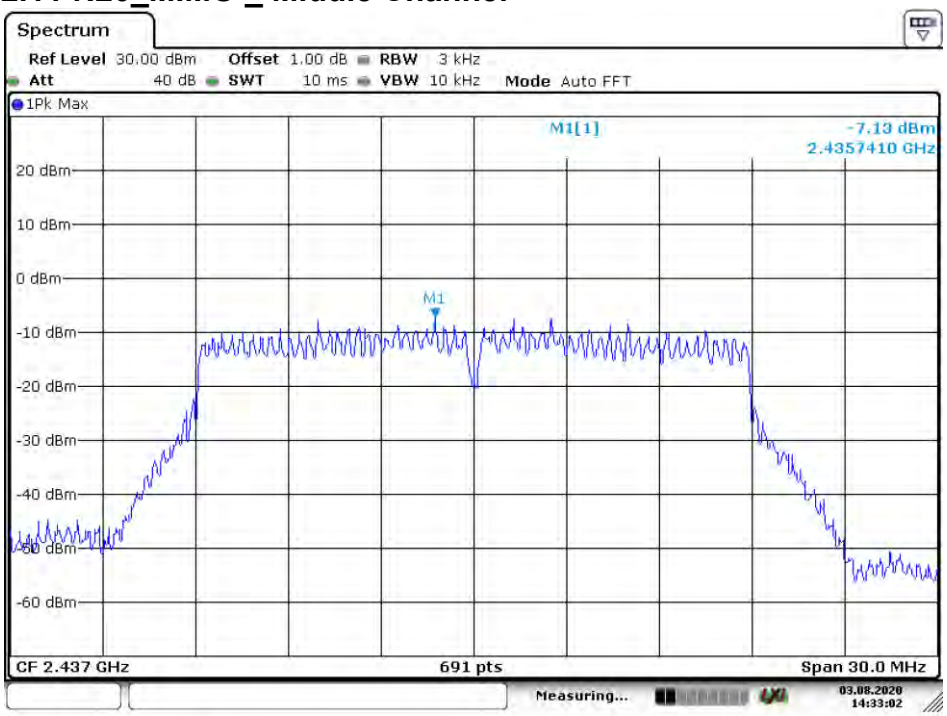
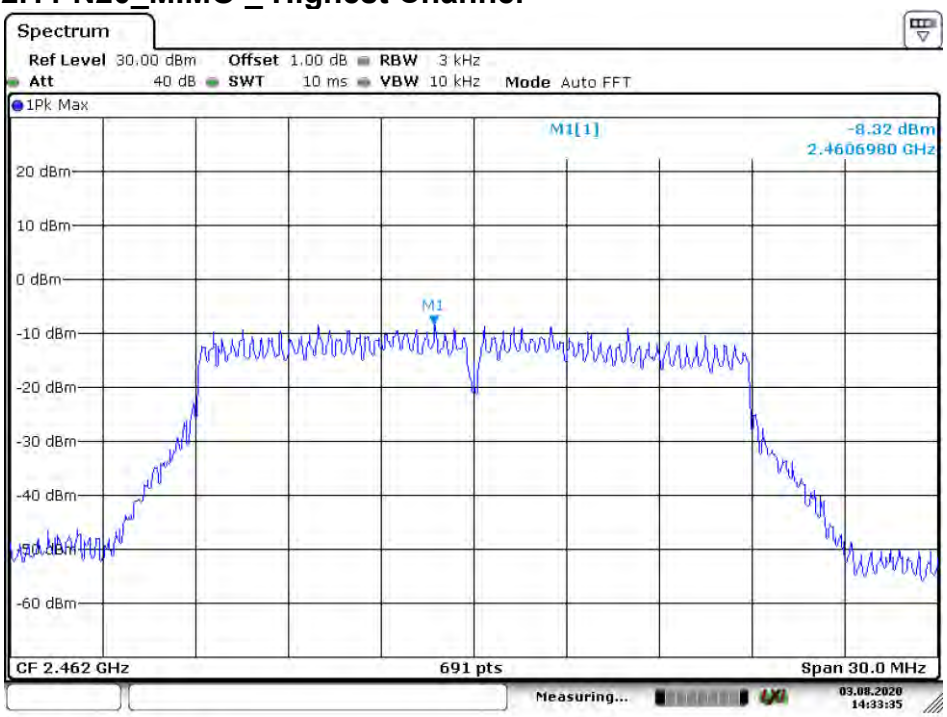
4.6.2.1.8 802.11 N20_MIMO _ Middle Channel



Date: 3.AUG.2020 14:33:03

4.6.2.1.9 802.11 N20_MIMO _ Highest Channel



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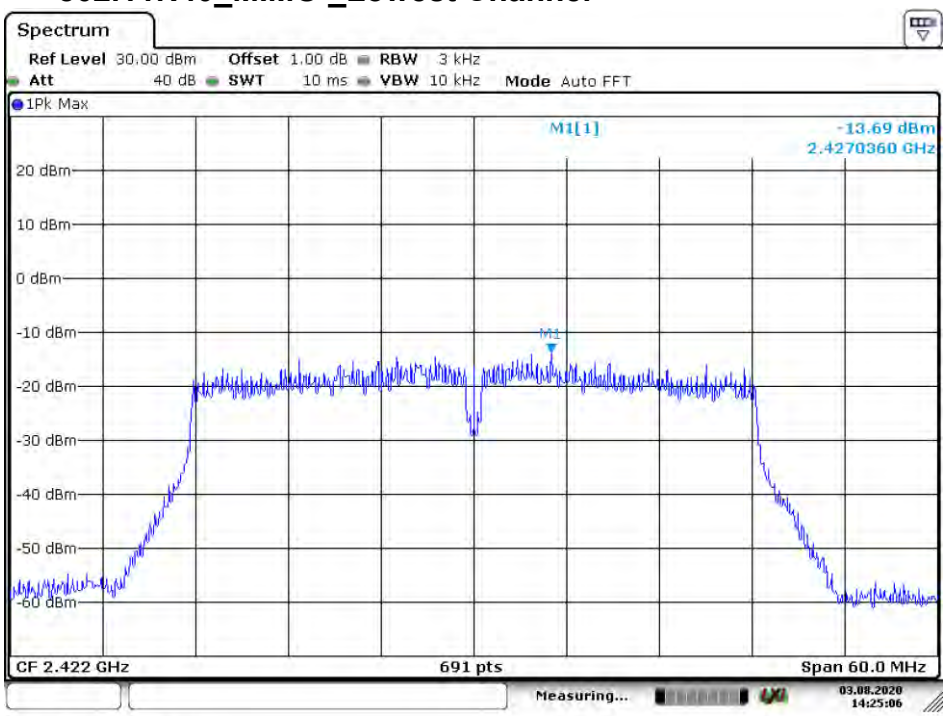
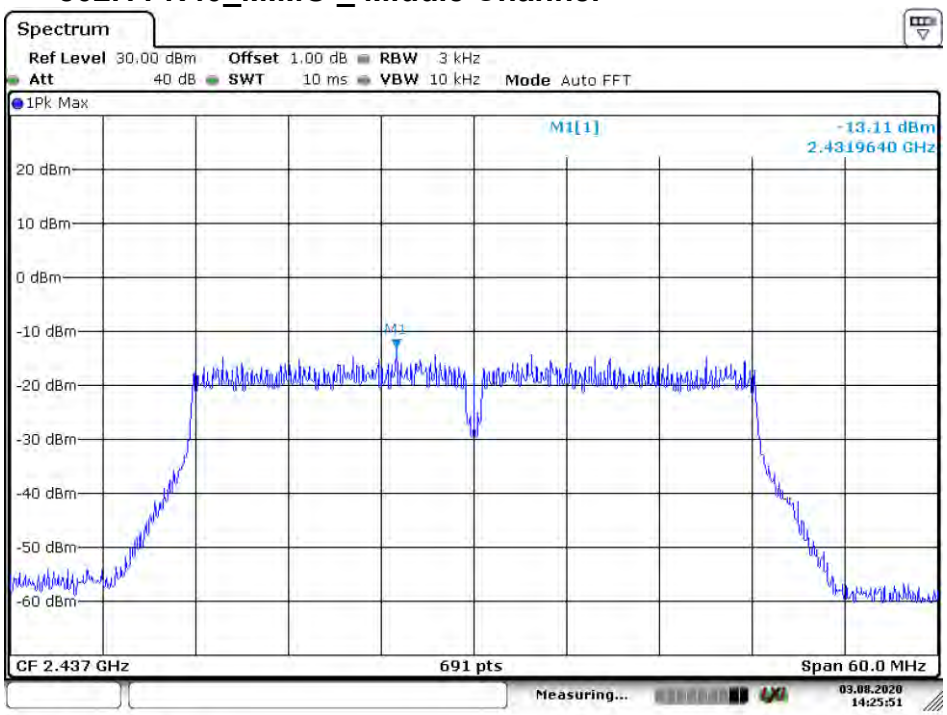
4.6.2.1.10 802.11N40_MIMO _Lowest Channel



Date: 3.AUG.2020 14:25:06

4.6.2.1.11 802.11 N40_MIMO _ Middle Channel



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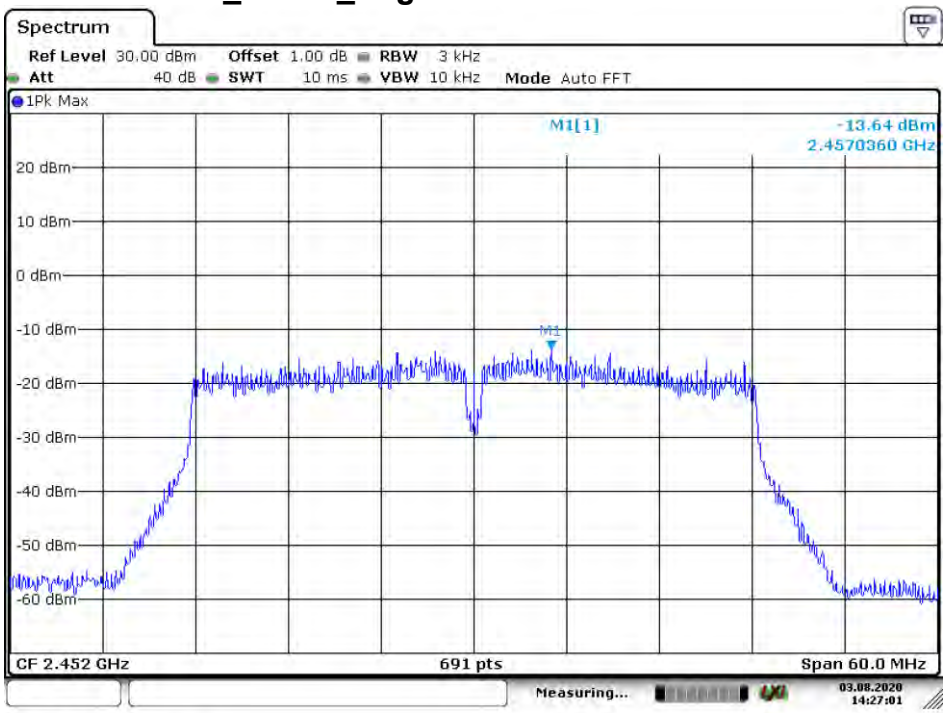
4.6.2.1.12 802.11 N40_MIMO _ Highest Channel



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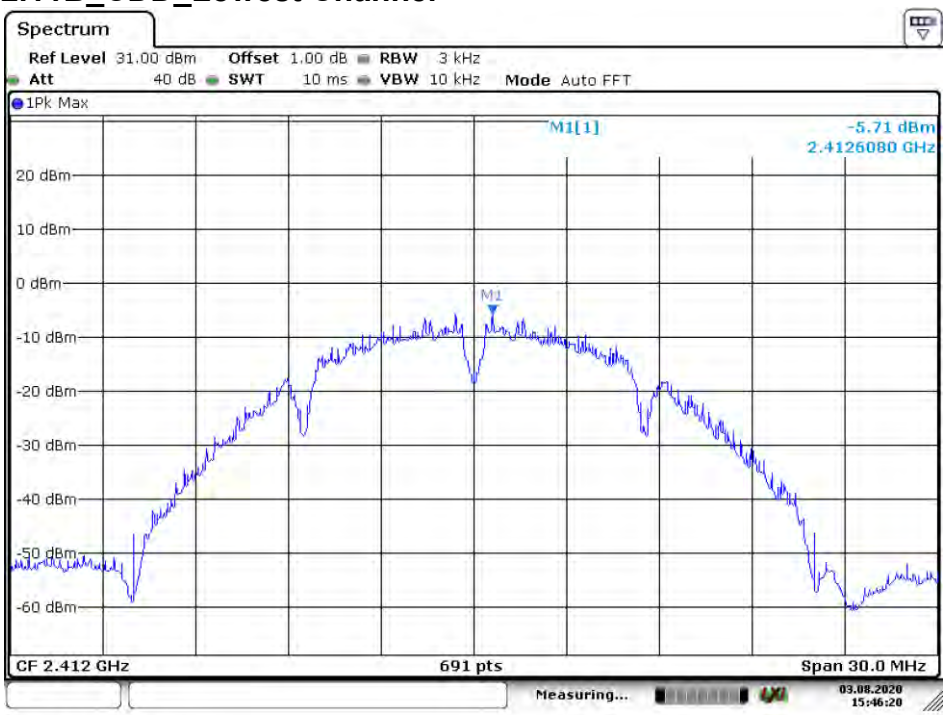
4.6.2.2 ANT2

4.6.2.2.1 802.11B_CDD_Lowest Channel



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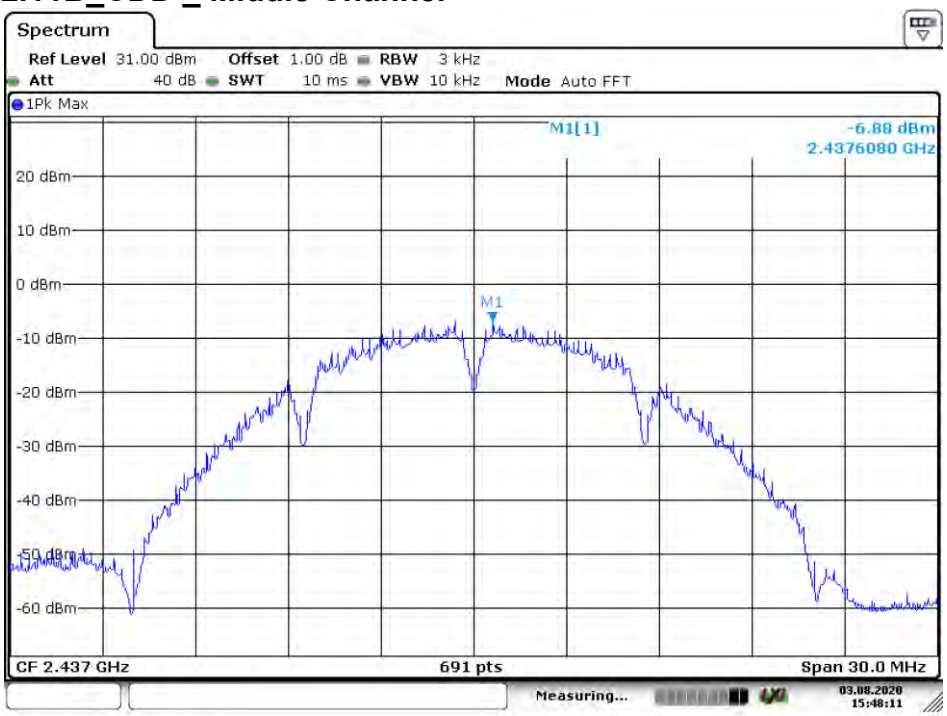
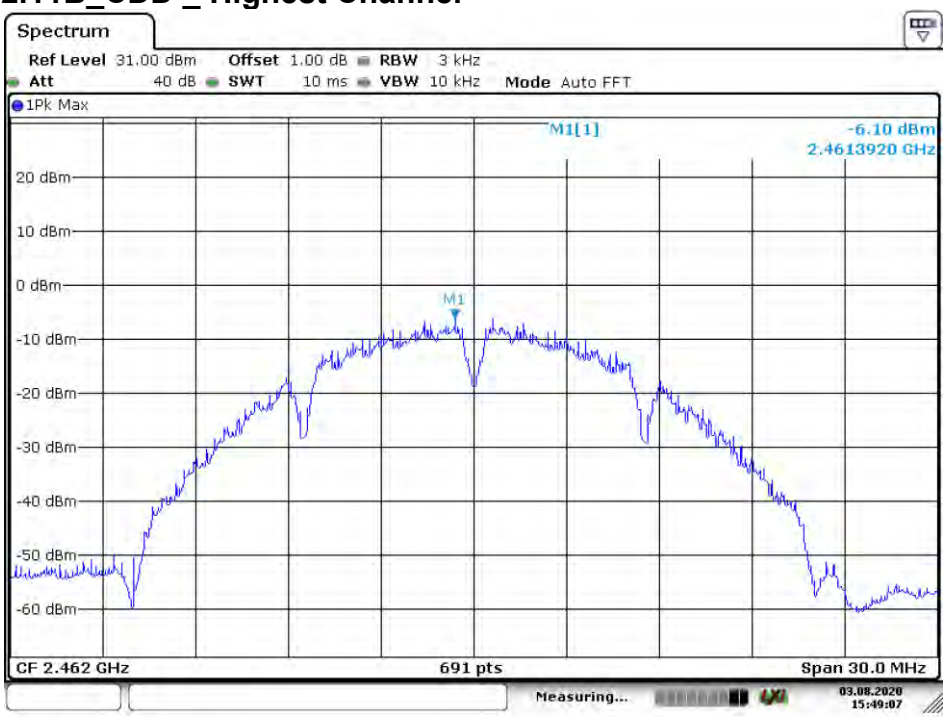
4.6.2.2.2 802.11B_CDD _ Middle Channel



Date: 3.AUG.2020 15:48:10

4.6.2.2.3 802.11B_CDD _ Highest Channel



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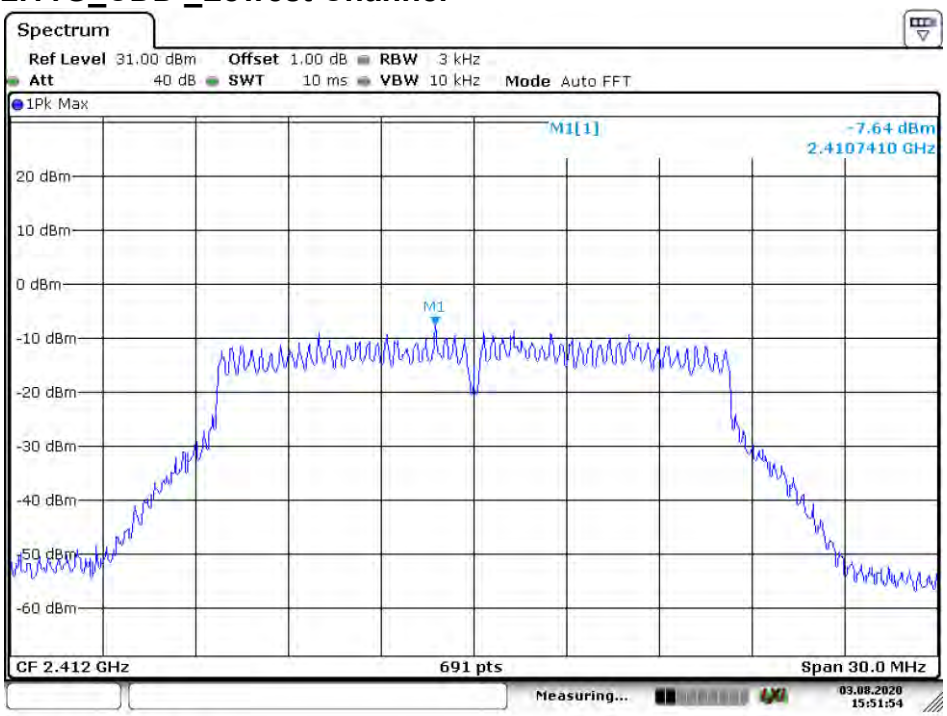
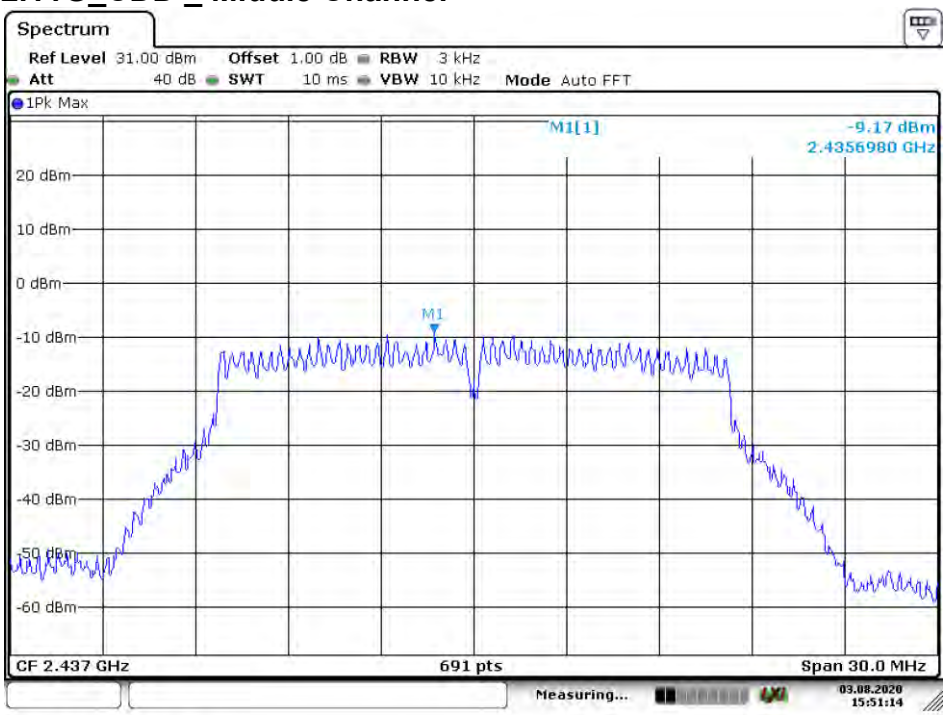
4.6.2.2.4 802.11G_CDD _Lowest Channel



Date: 3.AUG.2020 15:51:54

4.6.2.2.5 802.11G_CDD _ Middle Channel



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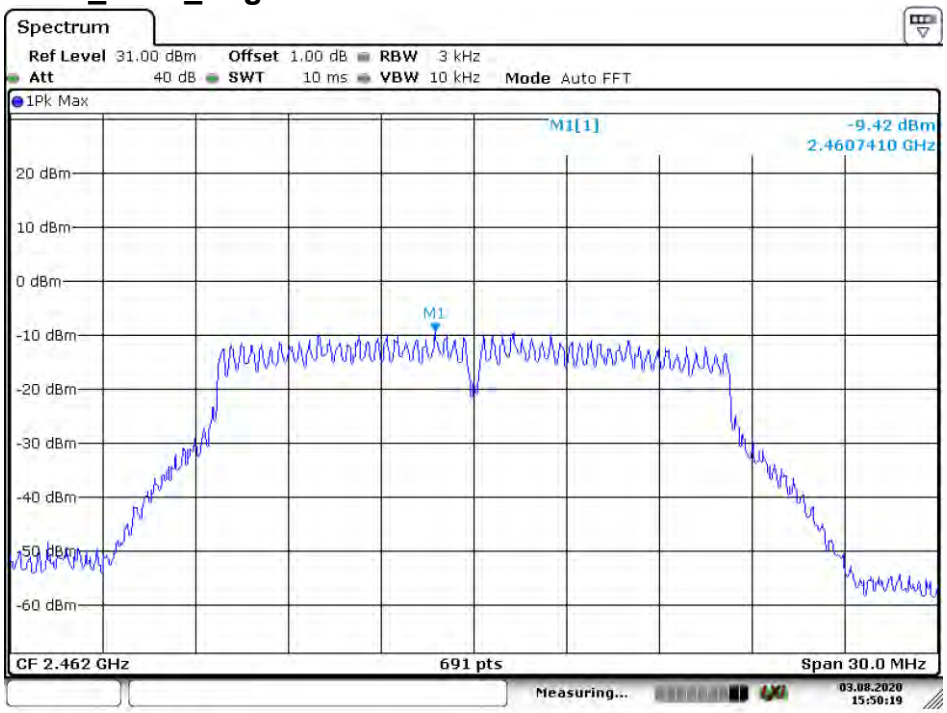
4.6.2.2.6 802.11G_CDD _ Highest Channel



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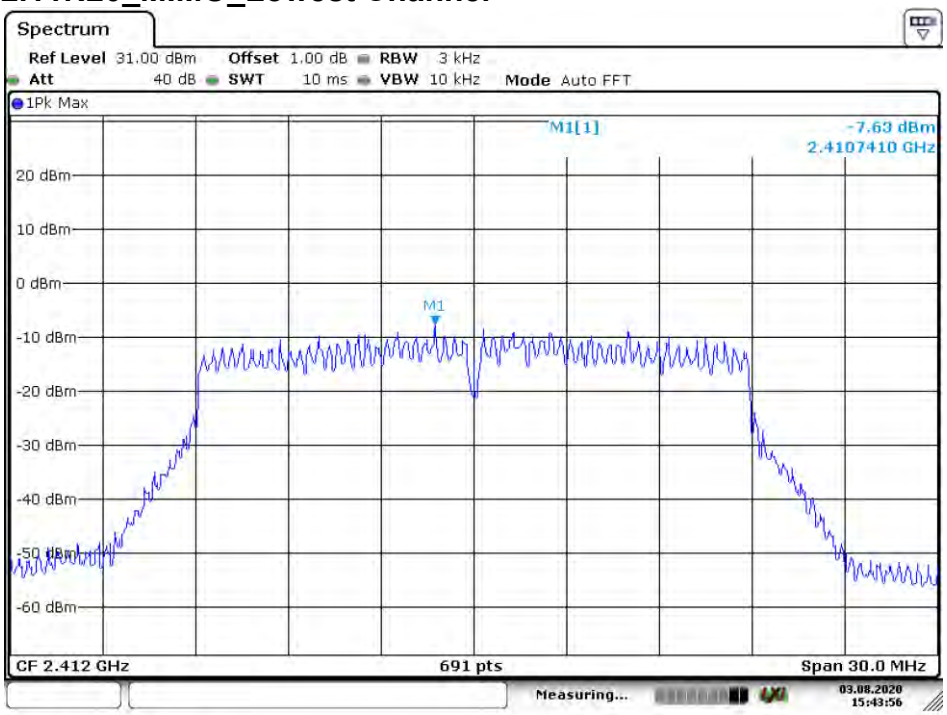
4.6.2.2.7 802.11N20_MIMO_Lowest Channel



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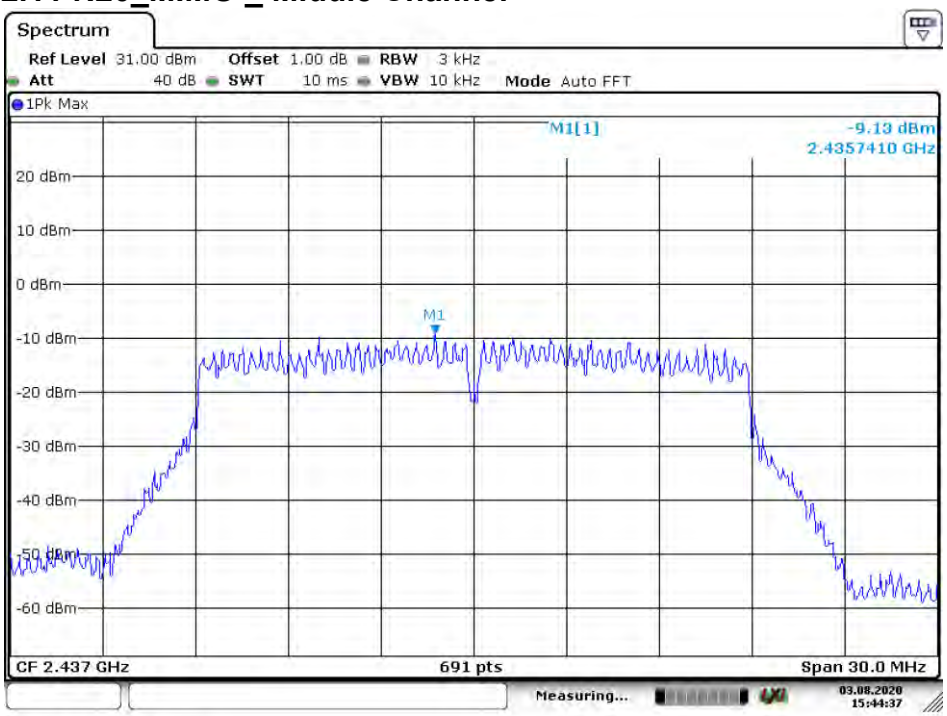
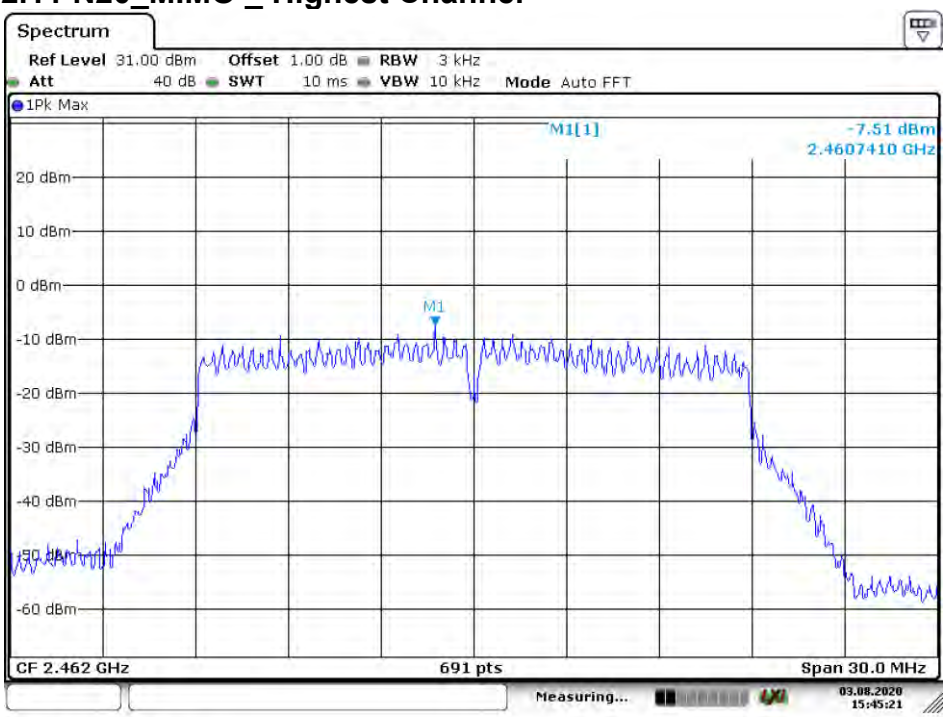
4.6.2.2.8 802.11 N20_MIMO _ Middle Channel



Date: 3.AUG.2020 15:44:37

4.6.2.2.9 802.11 N20_MIMO _ Highest Channel



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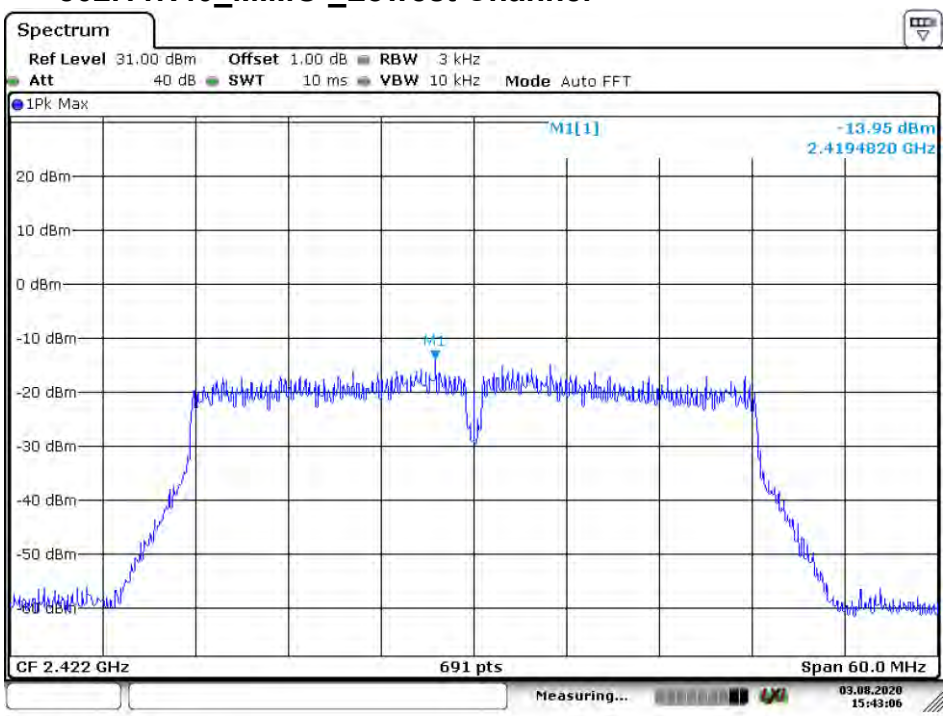
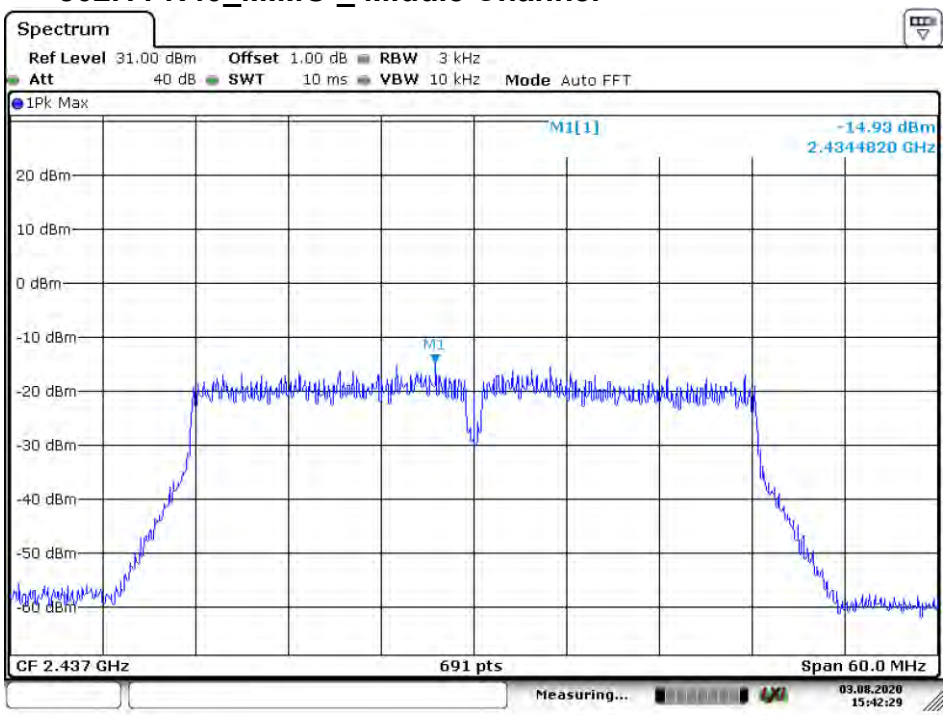
4.6.2.2.10 802.11N40_MIMO _Lowest Channel



Date: 3.AUG.2020 15:43:07

4.6.2.2.11 802.11 N40_MIMO _ Middle Channel



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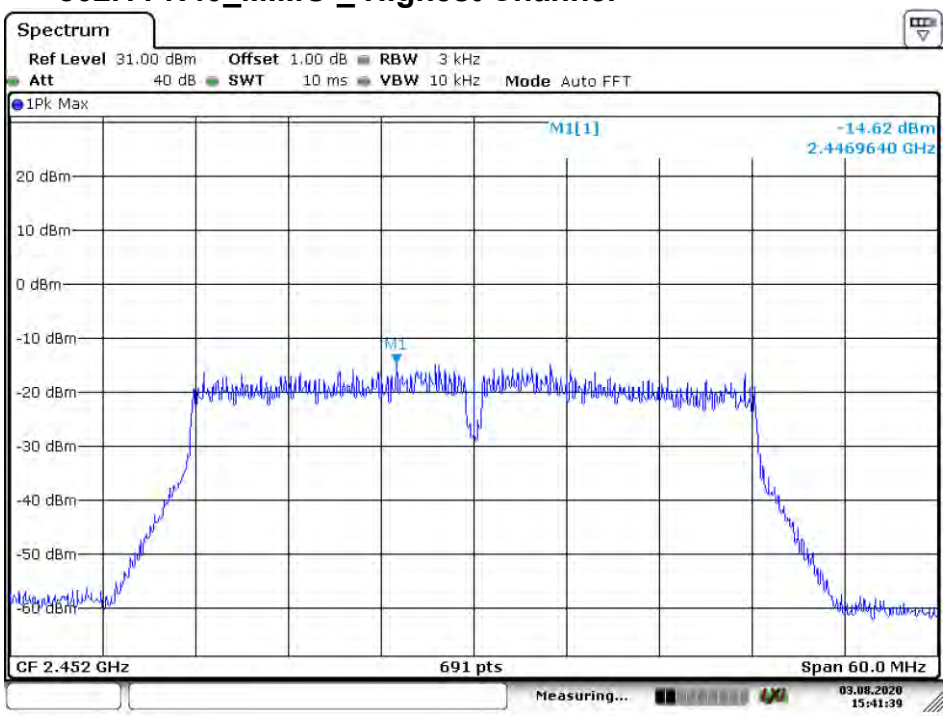
4.6.2.2.12 802.11 N40_MIMO _ Highest Channel



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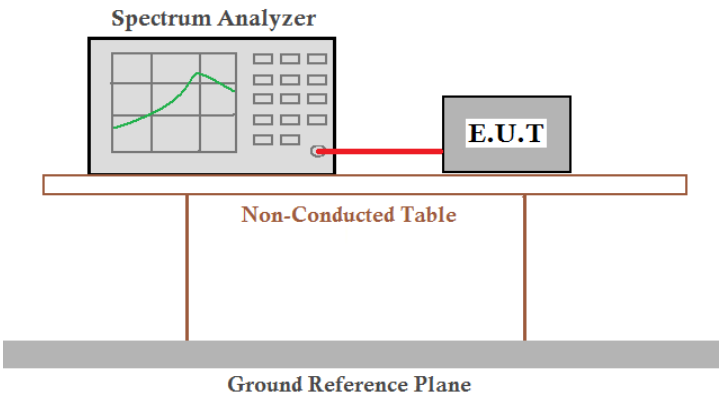
4.7 Band-edge for RF Conducted Emissions

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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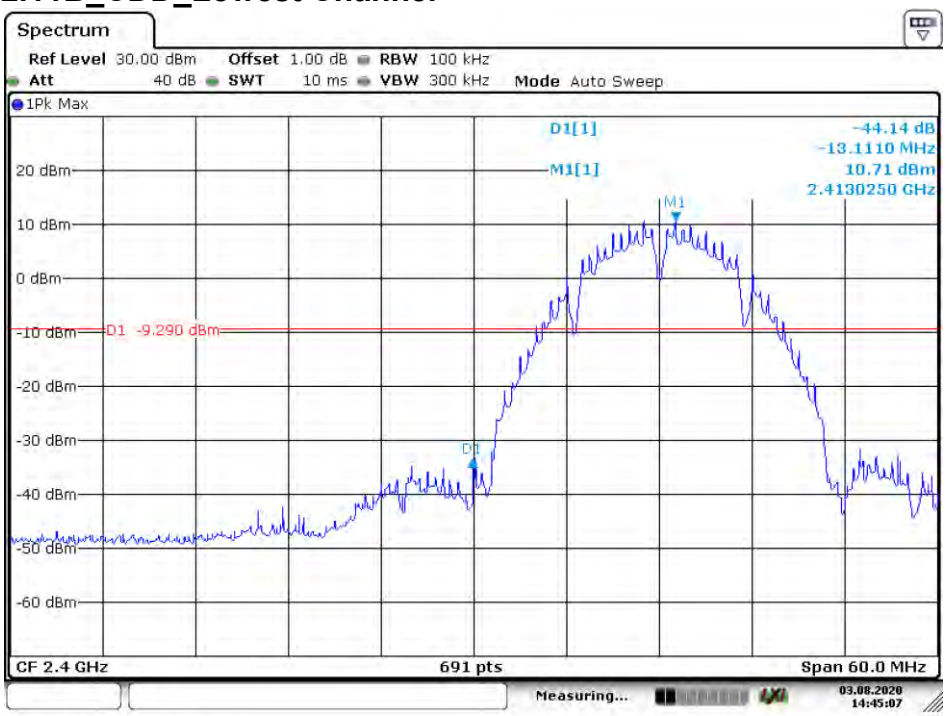
4.7.1 Test plots

4.7.1.1 ANT1

4.7.1.1.1 802.11B_CDD_Lowest Channel



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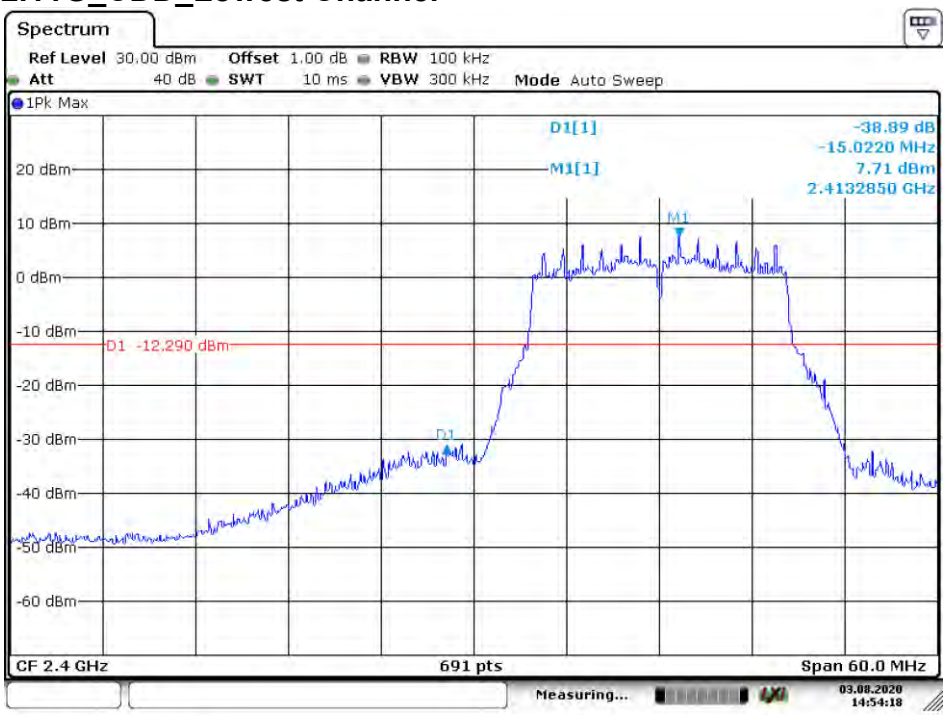
4.7.1.1.2 802.11B_CDD_ Highest Channel

Date: 3.AUG.2020 14:46:49

4.7.1.1.3 802.11G_CDD_Lowest Channel



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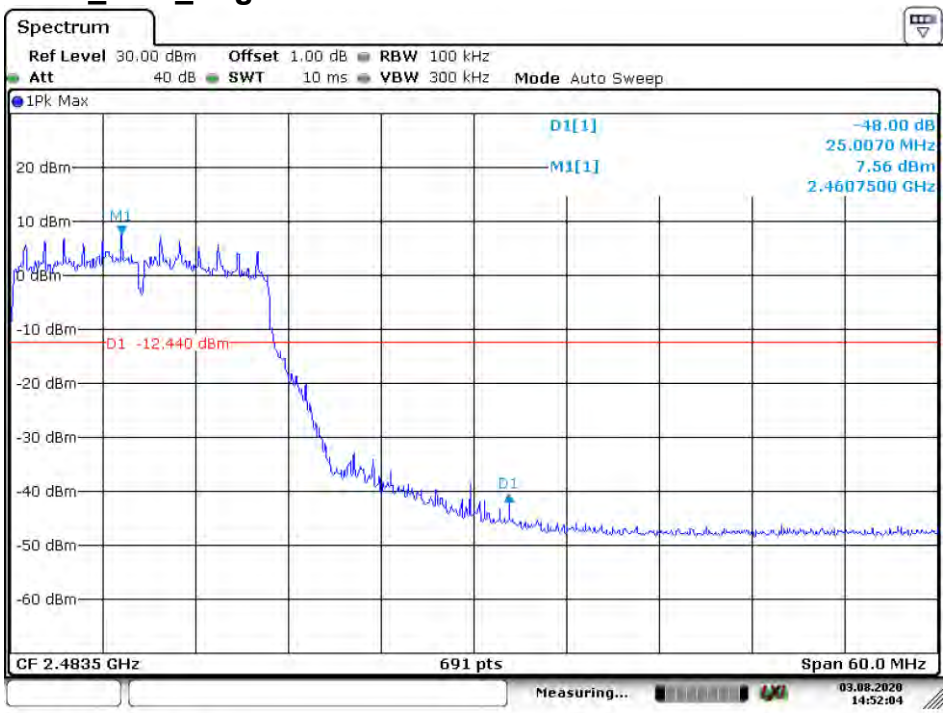
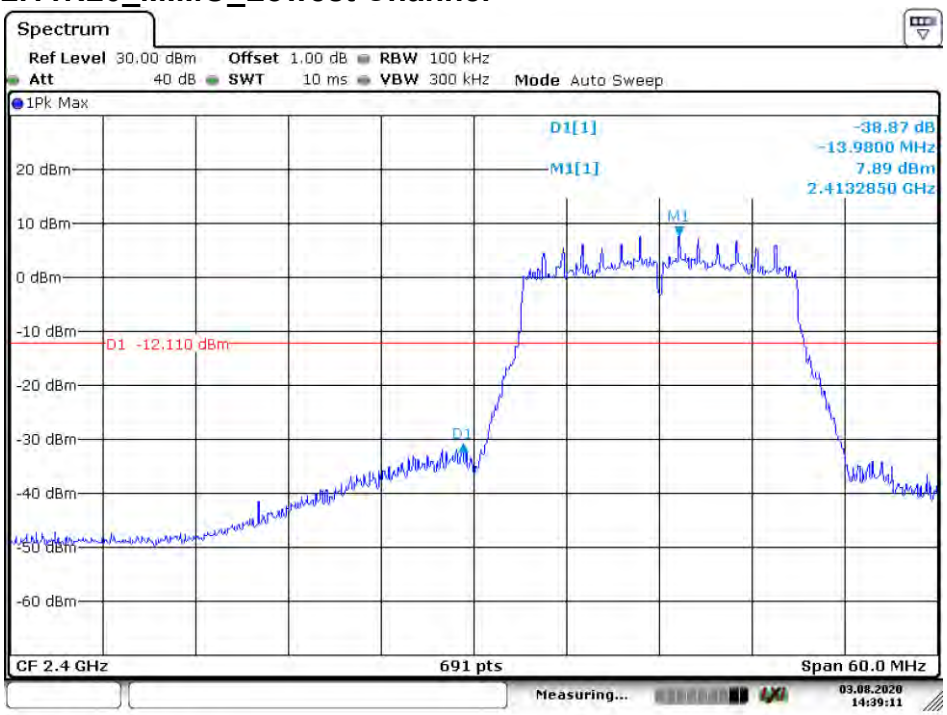
4.7.1.1.4 802.11G_CDD_ Highest Channel



Date: 3.AUG.2020 14:52:04

4.7.1.1.5 802.11N20_MIMO_Lowest Channel



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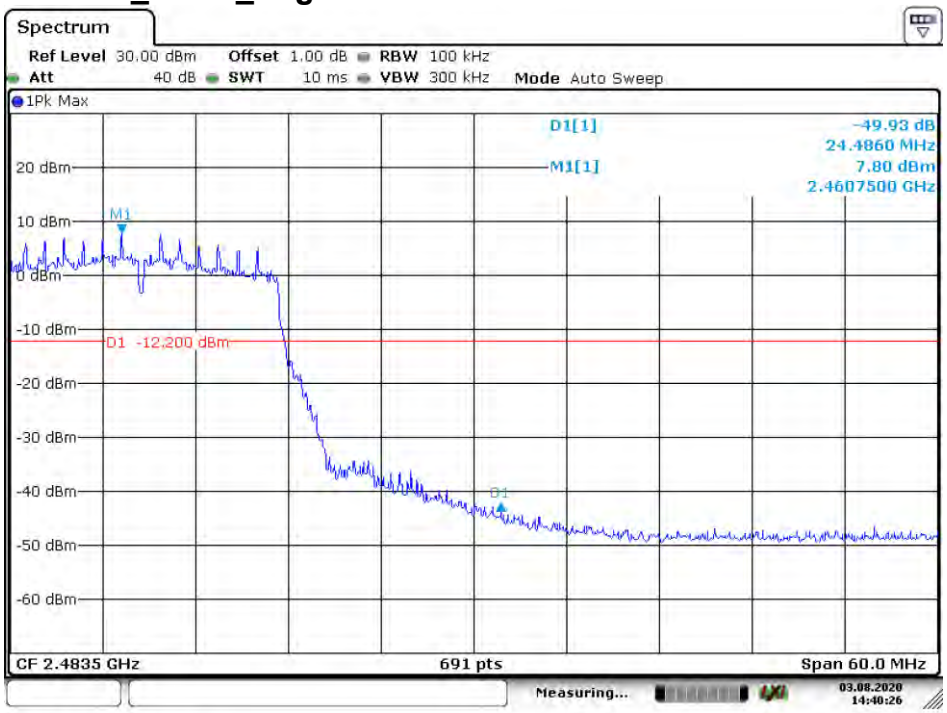
4.7.1.1.6 802.11 N20_MIMO_ Highest Channel



Date: 3.AUG.2020 14:40:27

4.7.1.1.7 802.11N40_MIMO_Lowest Channel

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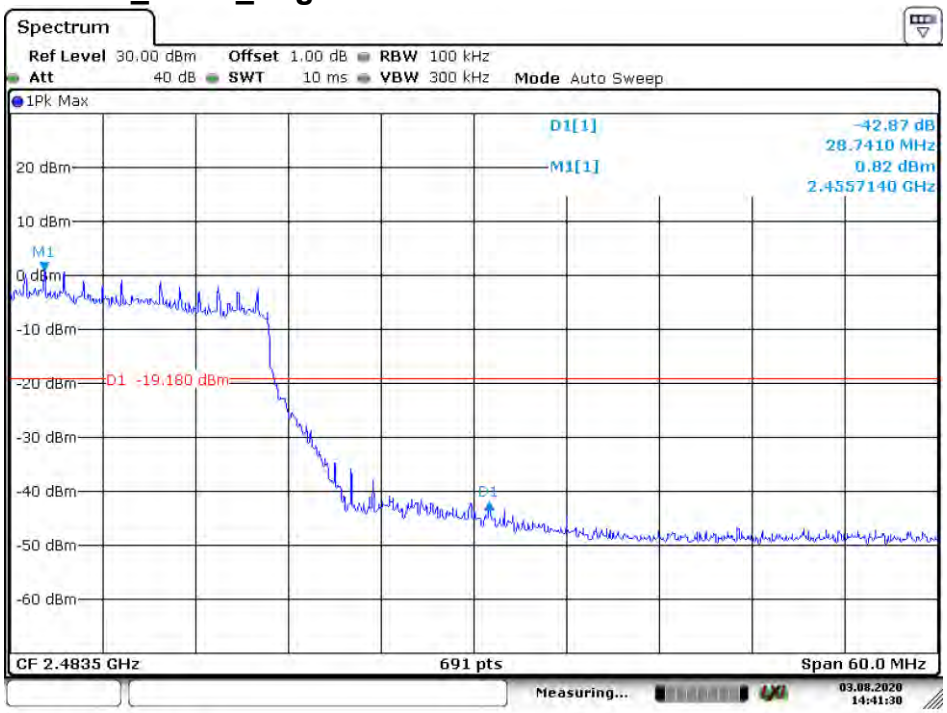
4.7.1.1.8 802.11 N40_MIMO_ Highest Channel



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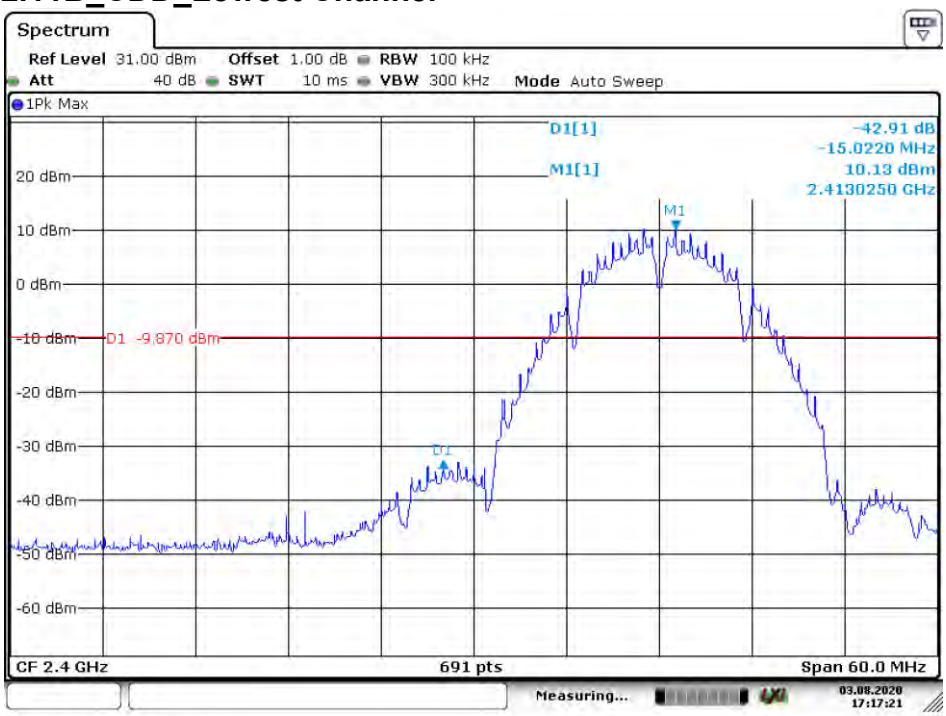
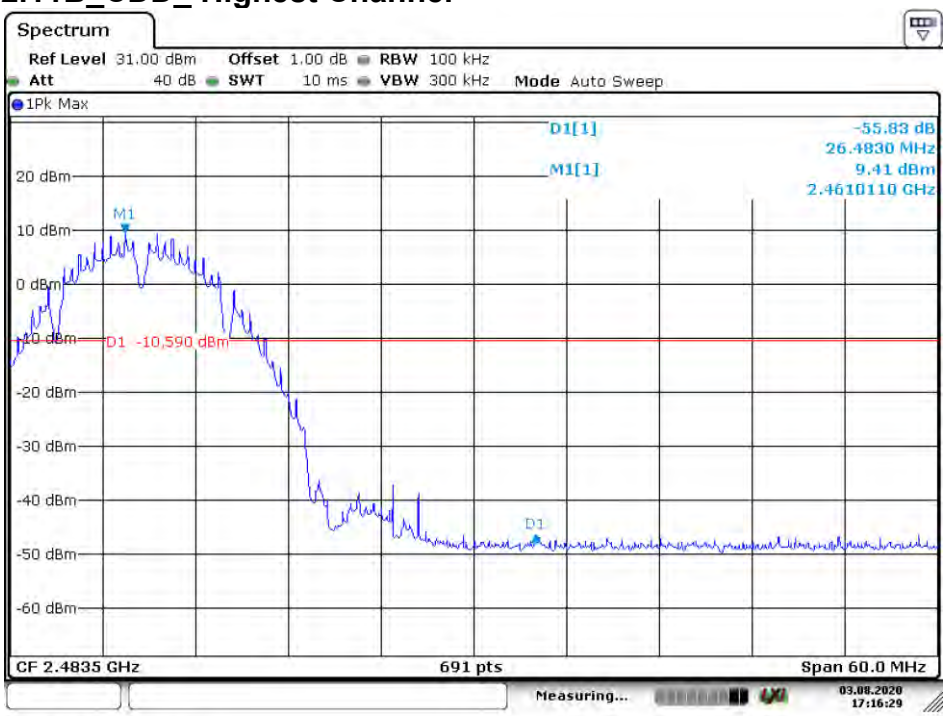
4.7.1.2 ANT2

4.7.1.2.1 802.11B_CDD_Lowest Channel



Date: 3.AUG.2020 17:17:21

4.7.1.2.2 802.11B_CDD_ Highest Channel



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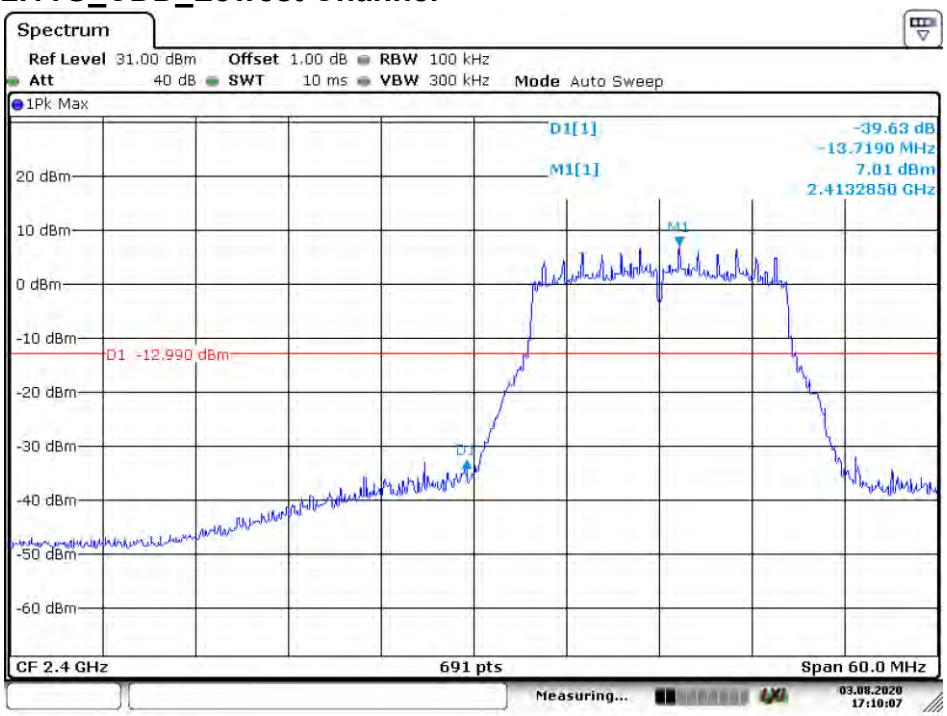
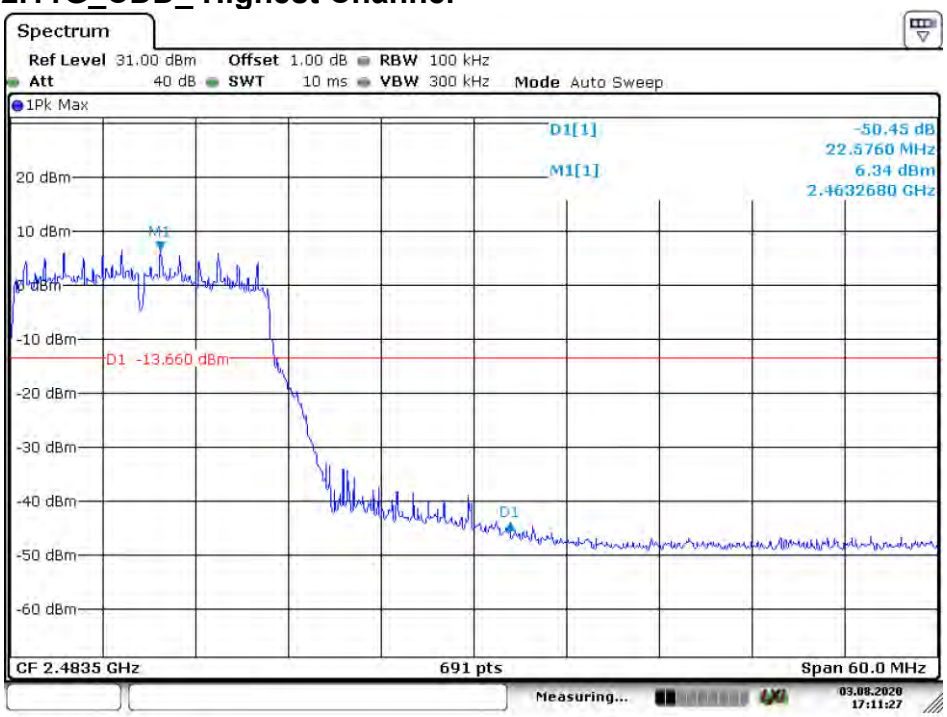
4.7.1.2.3 802.11G_CDD_Lowest Channel



Date: 3.AUG.2020 17:10:08

4.7.1.2.4 802.11G_CDD_ Highest Channel



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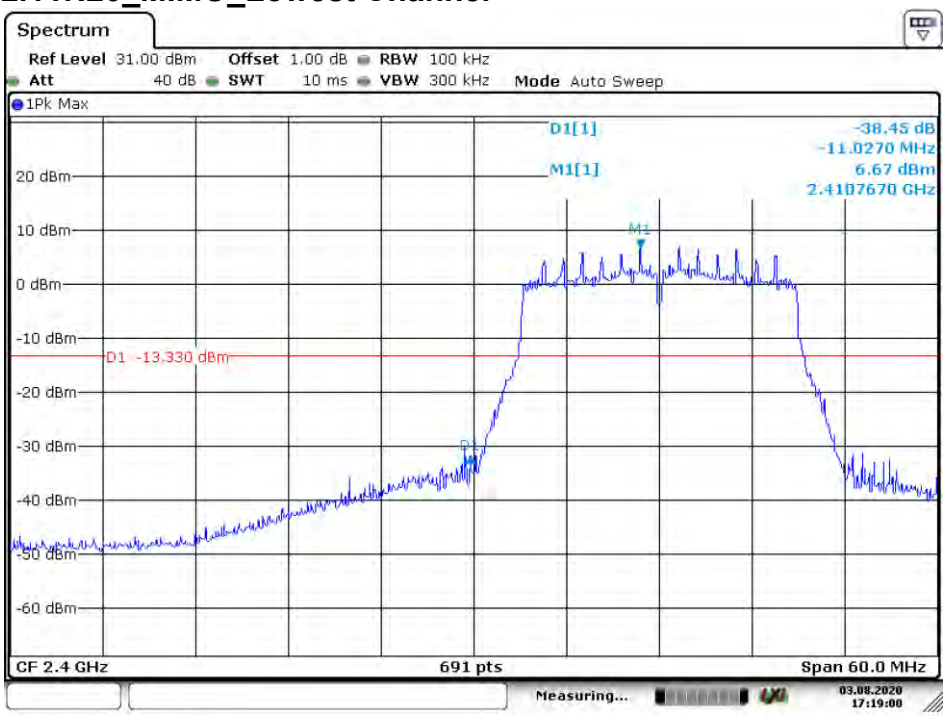
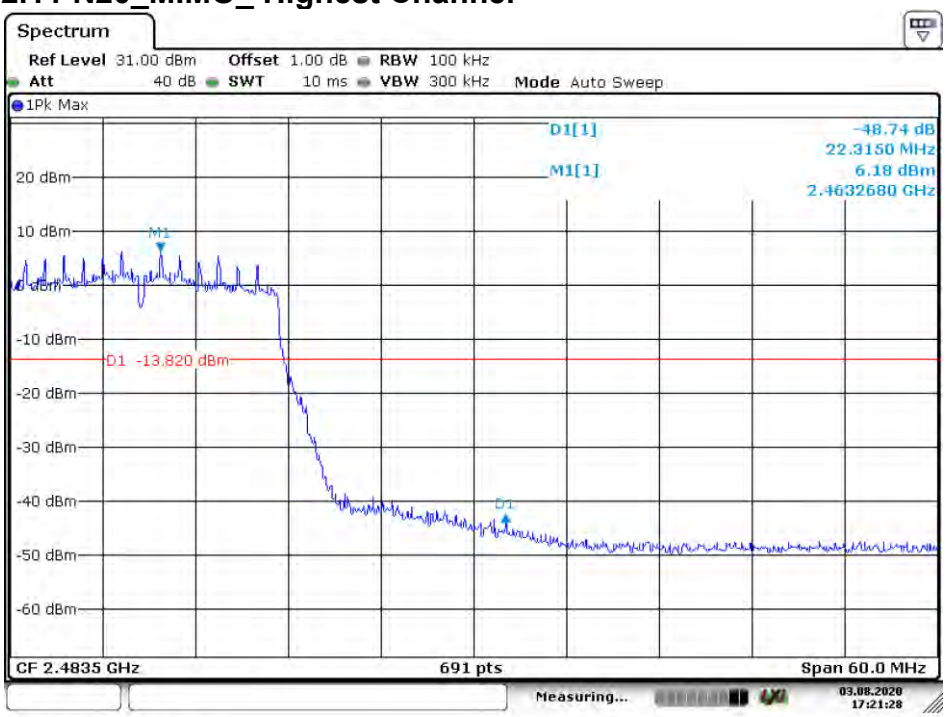
4.7.1.2.5 802.11N20_MIMO_Lowest Channel



Date: 3.AUG.2020 17:19:00

4.7.1.2.6 802.11 N20_MIMO_ Highest Channel



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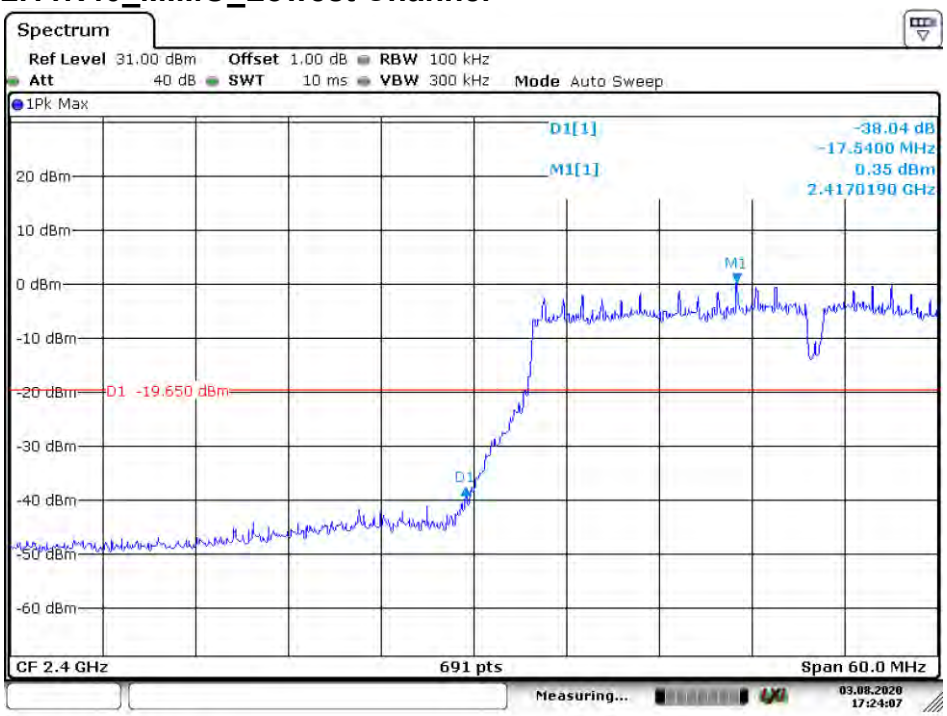
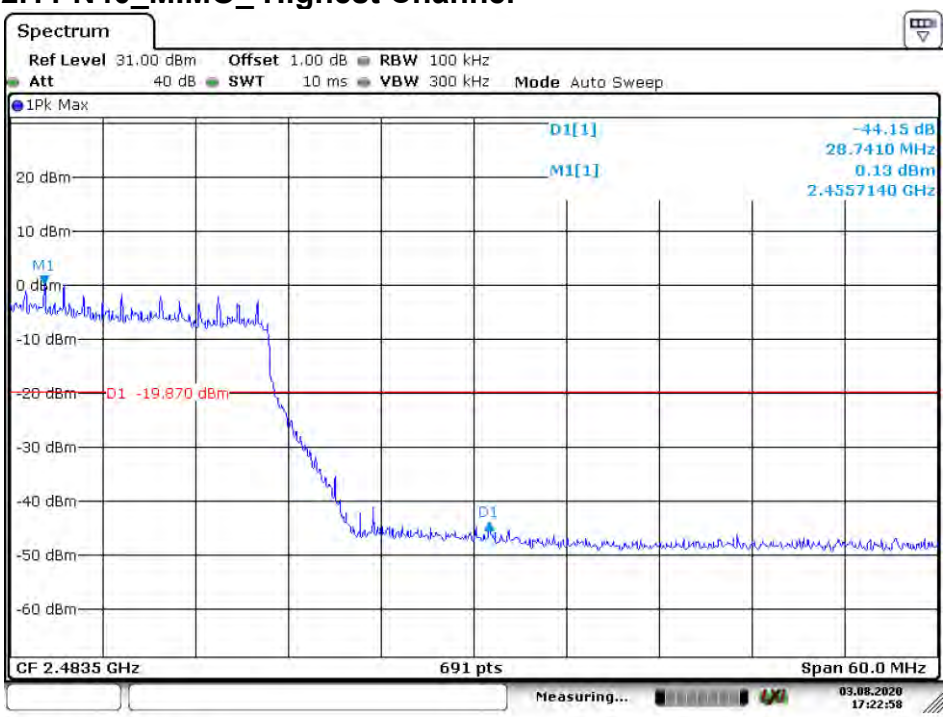
4.7.1.2.7 802.11N40_MIMO_Lowest Channel



Date: 3.AUG.2020 17:24:07

4.7.1.2.8 802.11 N40_MIMO_ Highest Channel



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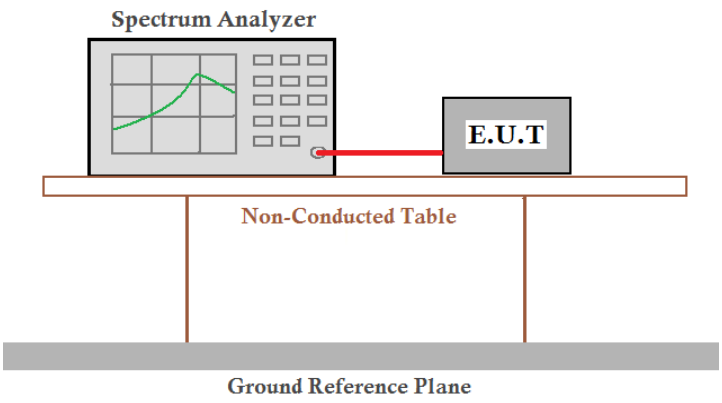
4.8 RF Conducted Spurious Emissions

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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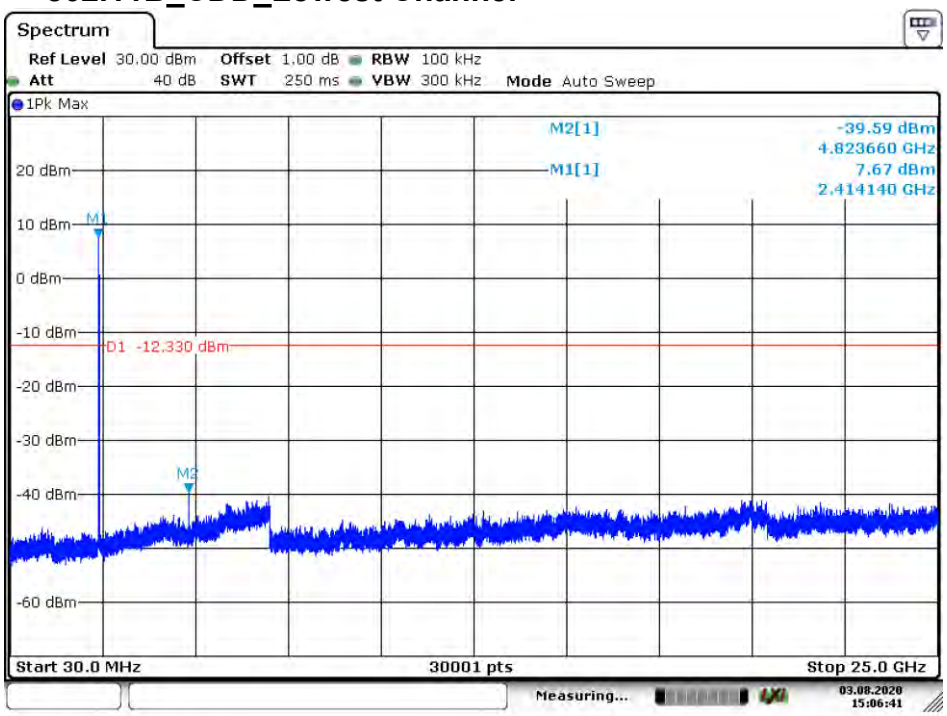
4.8.1 Test plots

4.8.1.1 ANT1

4.8.1.1.1 802.11B_CDD_Lowest Channel



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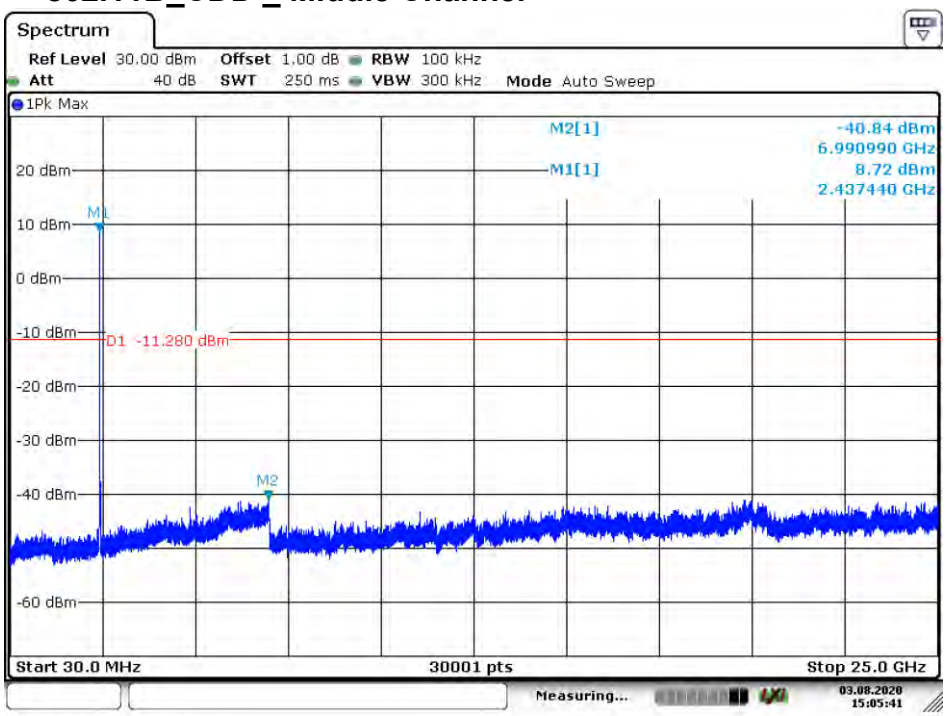
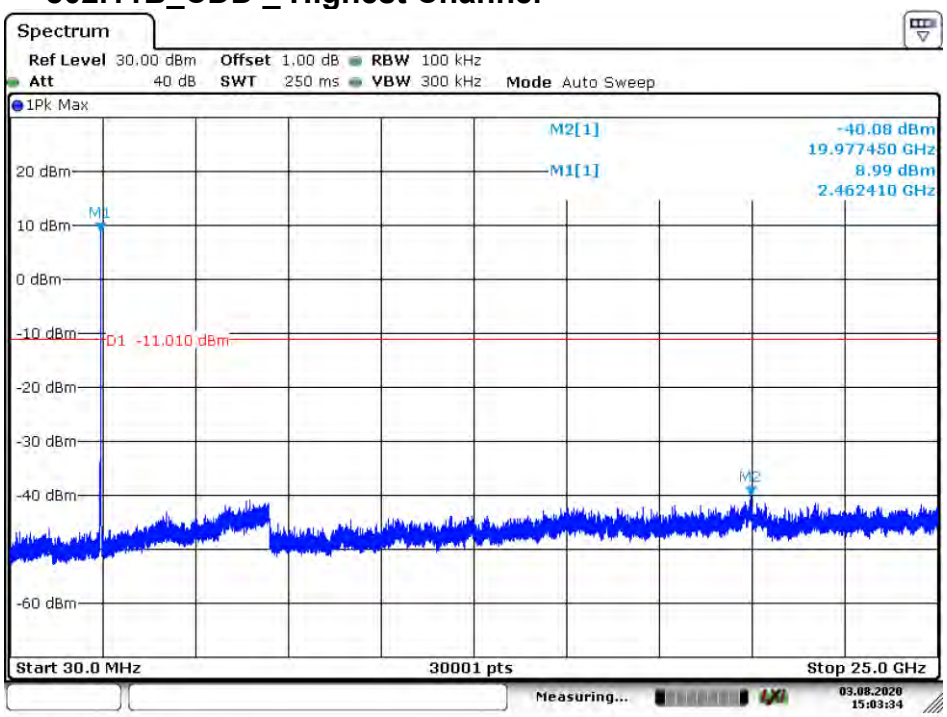
4.8.1.1.2 802.11B_CDD _ Middle Channel



Date: 3.AUG.2020 15:05:41

4.8.1.1.3 802.11B_CDD _ Highest Channel



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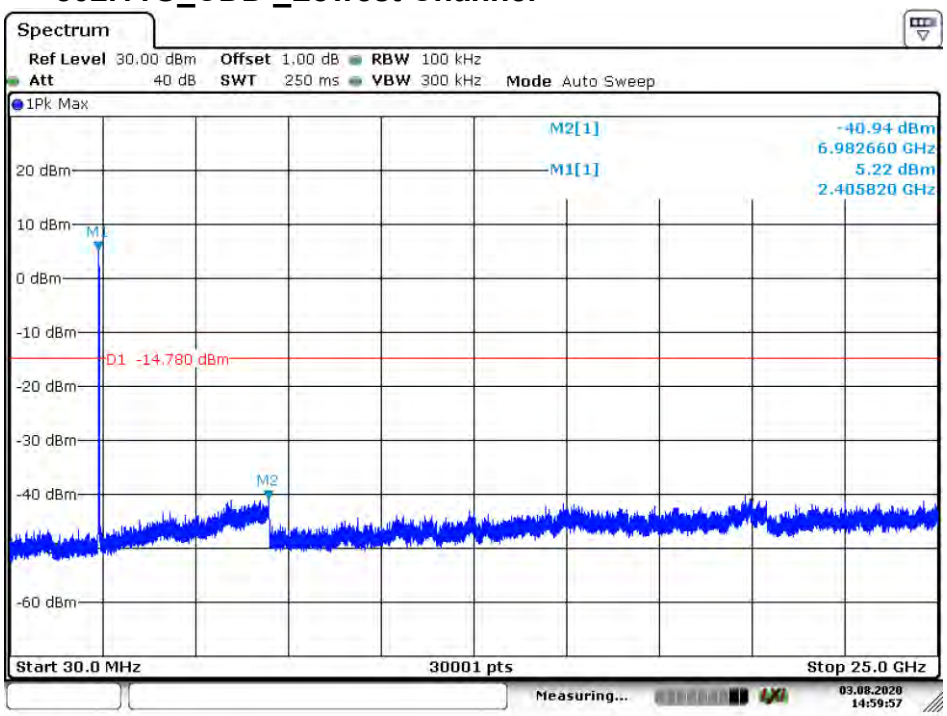
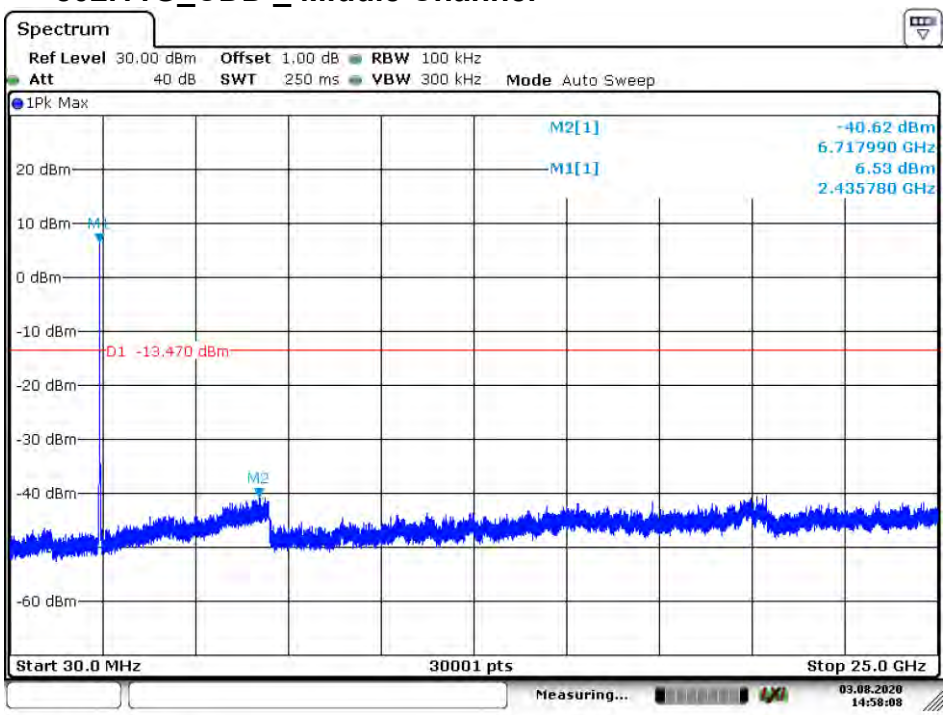
4.8.1.1.4 802.11G_CDD _Lowest Channel



Date: 3.AUG.2020 14:59:57

4.8.1.1.5 802.11G_CDD _ Middle Channel



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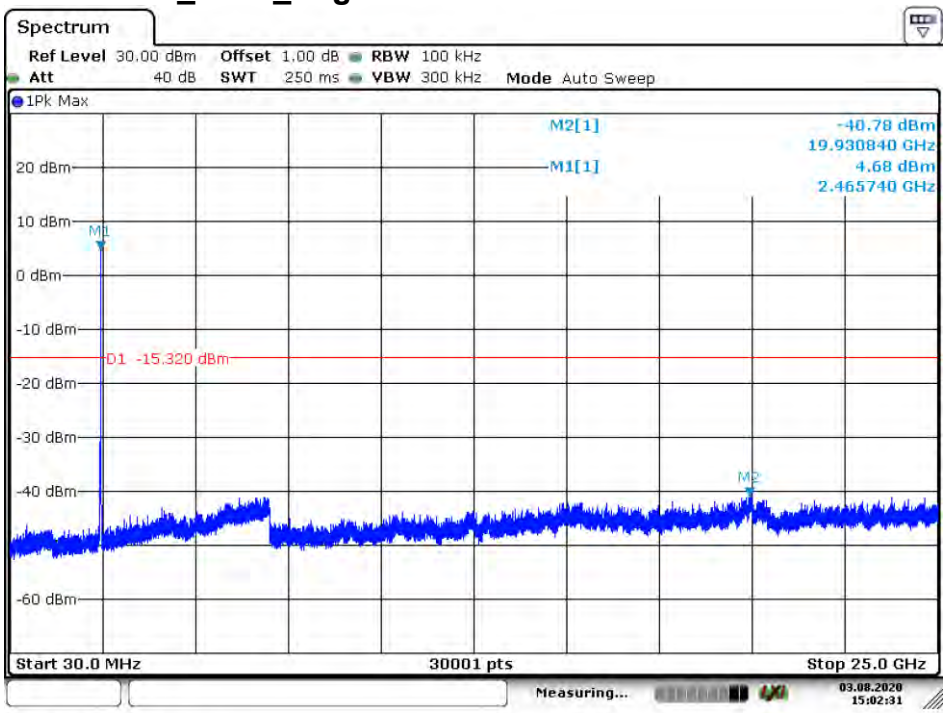
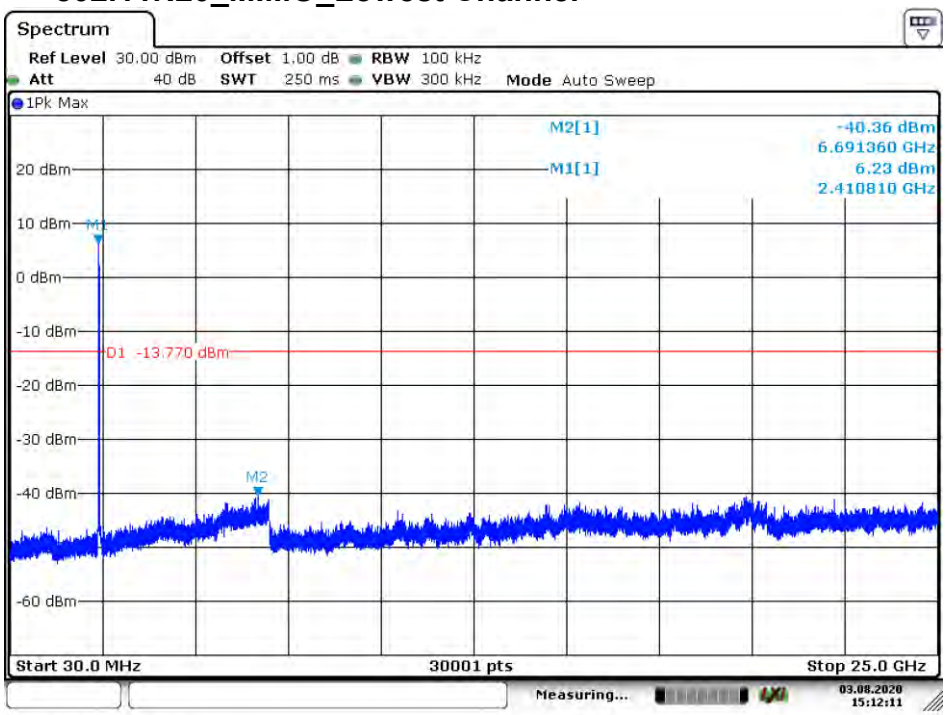
4.8.1.1.6 802.11G_CDD _ Highest Channel



Date: 3.AUG.2020 15:02:31

4.8.1.1.7 802.11N20_MIMO_Lowest Channel



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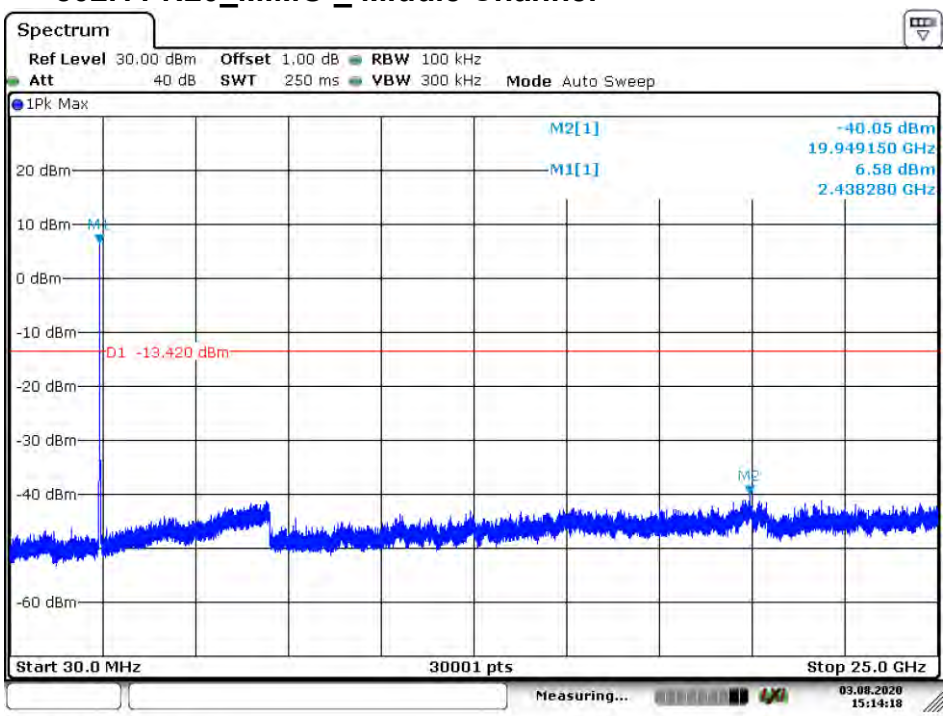
4.8.1.1.8 802.11 N20_MIMO _ Middle Channel



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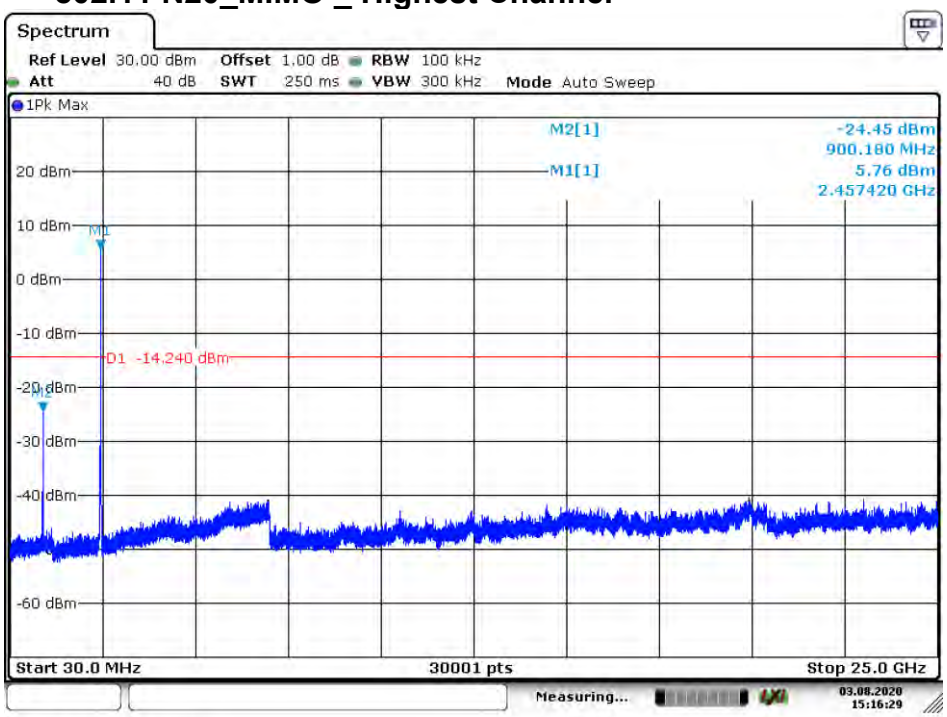
4.8.1.1.9 802.11 N20_MIMO _ Highest Channel



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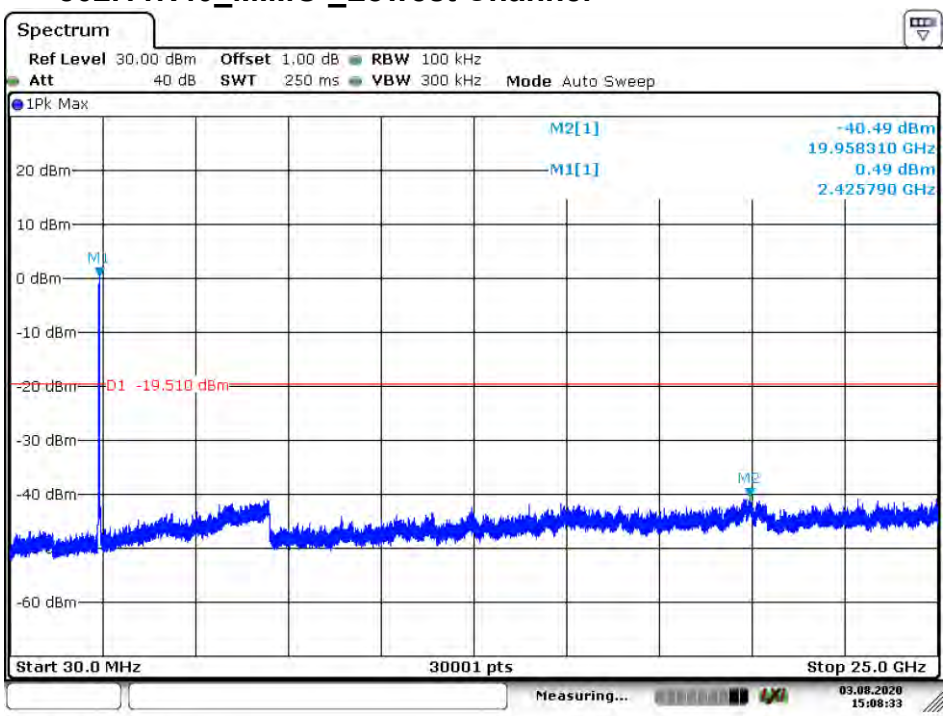
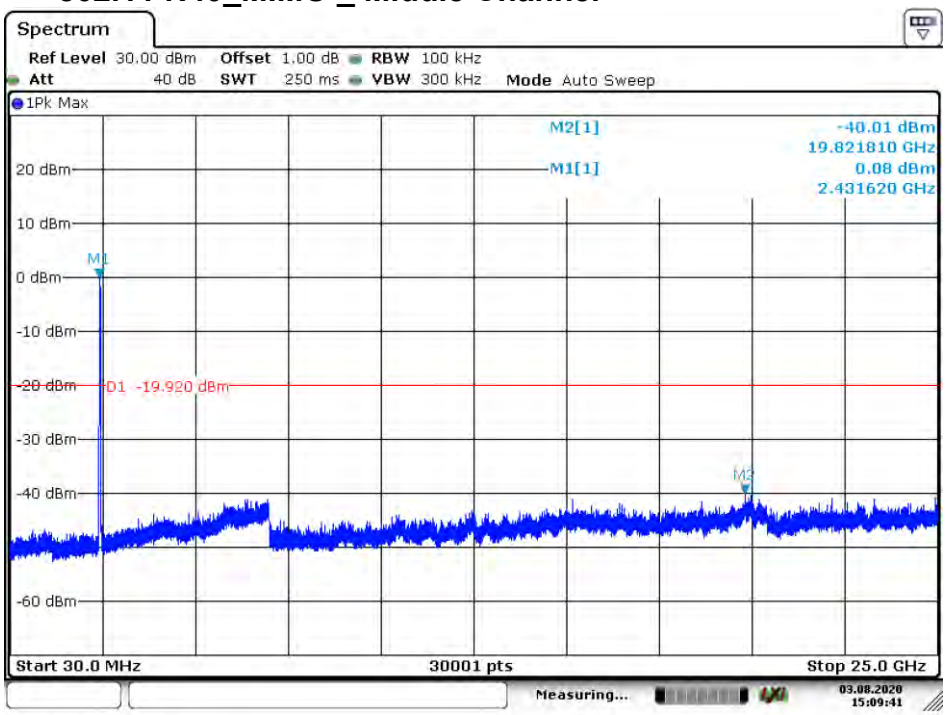
4.8.1.1.10 802.11N40_MIMO _Lowest Channel



Date: 3.AUG.2020 15:08:33

4.8.1.1.11 802.11 N40_MIMO _ Middle Channel



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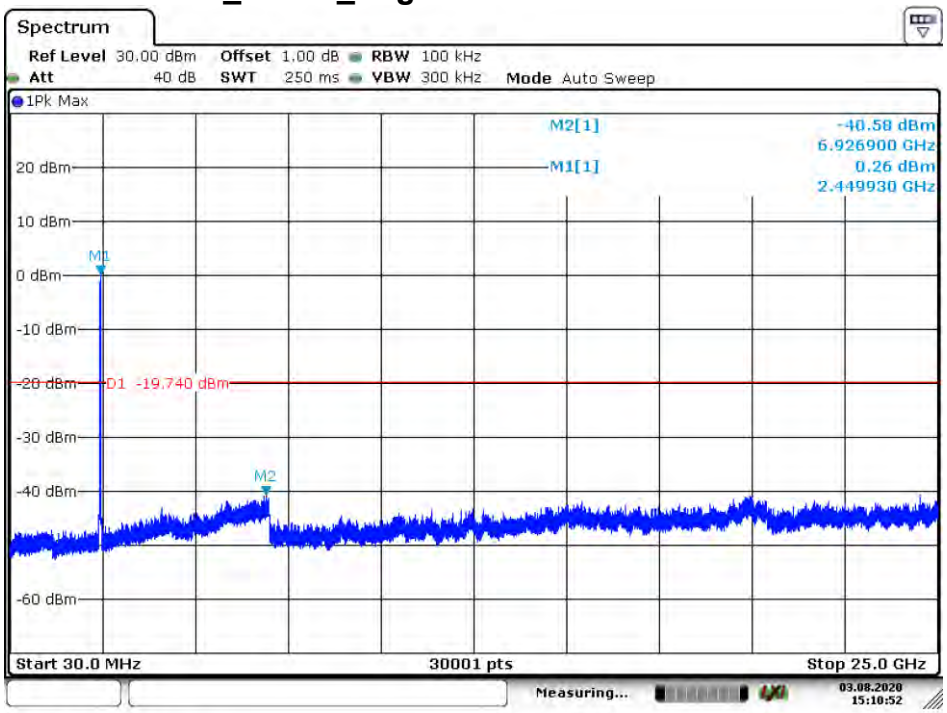
4.8.1.1.12 802.11 N40_MIMO _ Highest Channel



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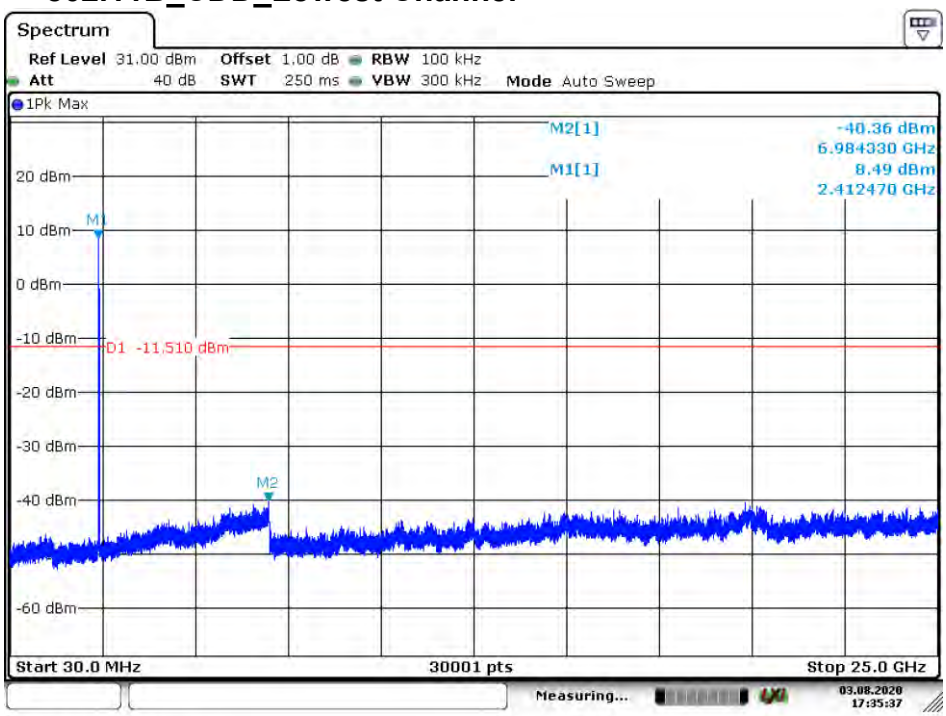
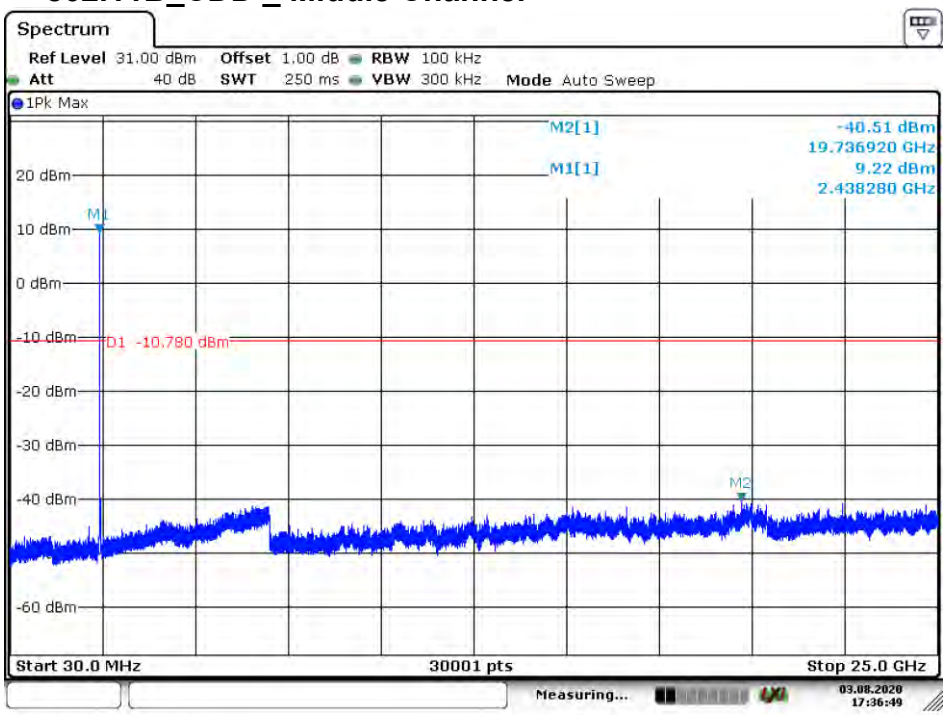
4.8.1.2 ANT2

4.8.1.2.1 802.11B_CDD_Lowest Channel



Date: 3.AUG.2020 17:35:37

4.8.1.2.2 802.11B_CDD _ Middle Channel



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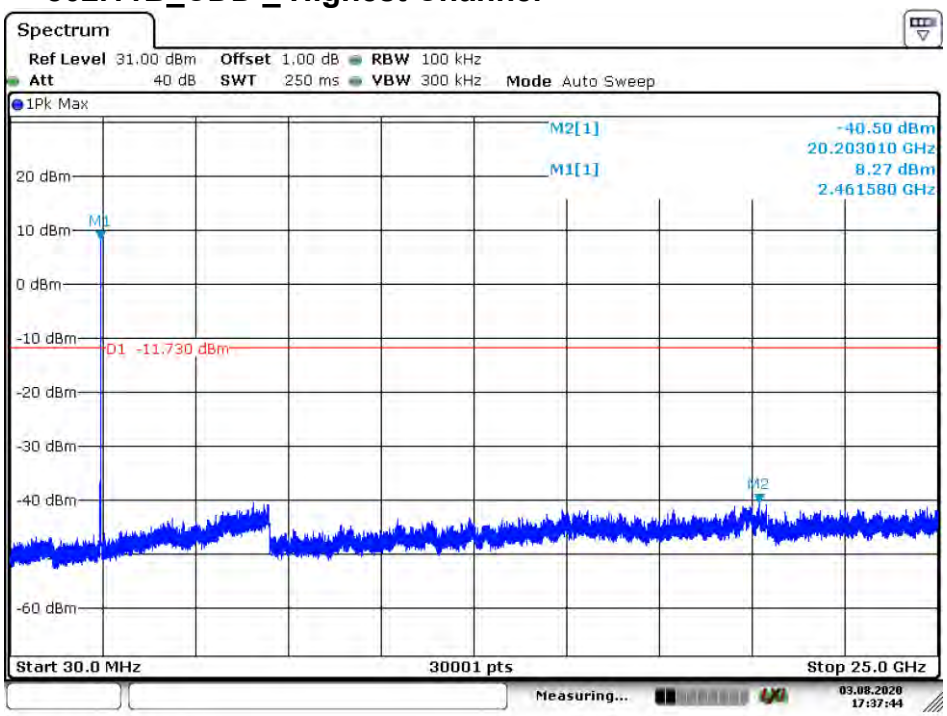
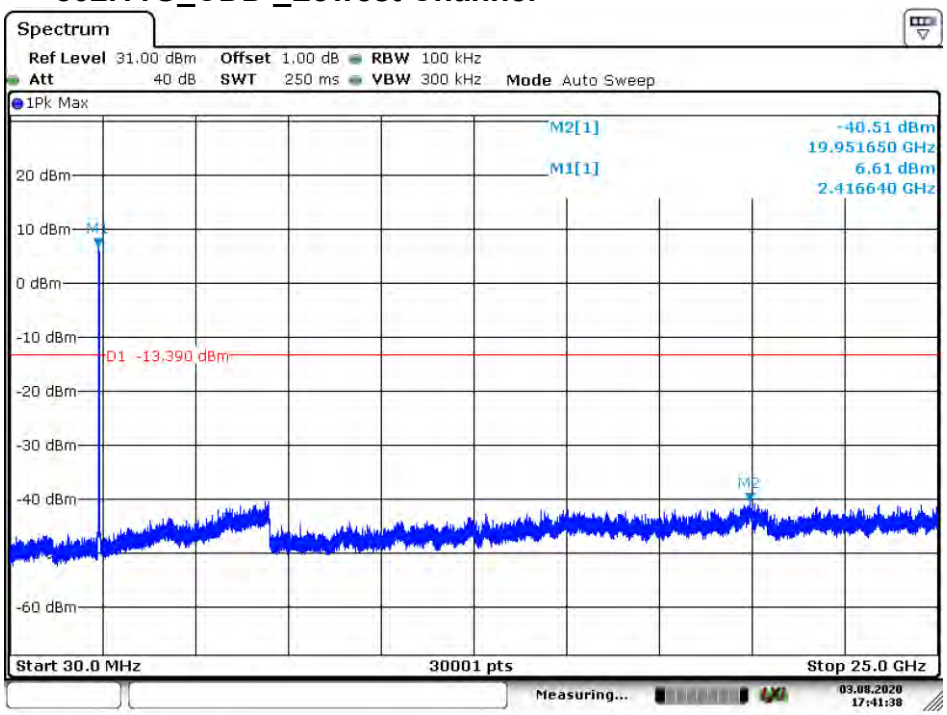
4.8.1.2.3 802.11B_CDD _ Highest Channel



Date: 3.AUG.2020 17:37:45

4.8.1.2.4 802.11G_CDD _Lowest Channel



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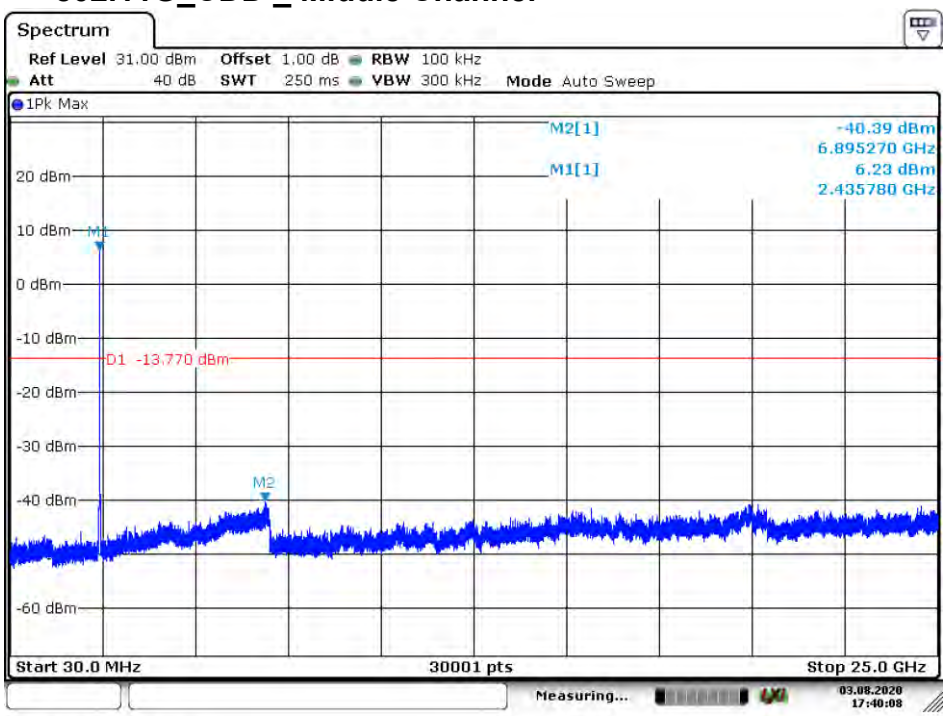
4.8.1.2.5 802.11G_CDD _ Middle Channel



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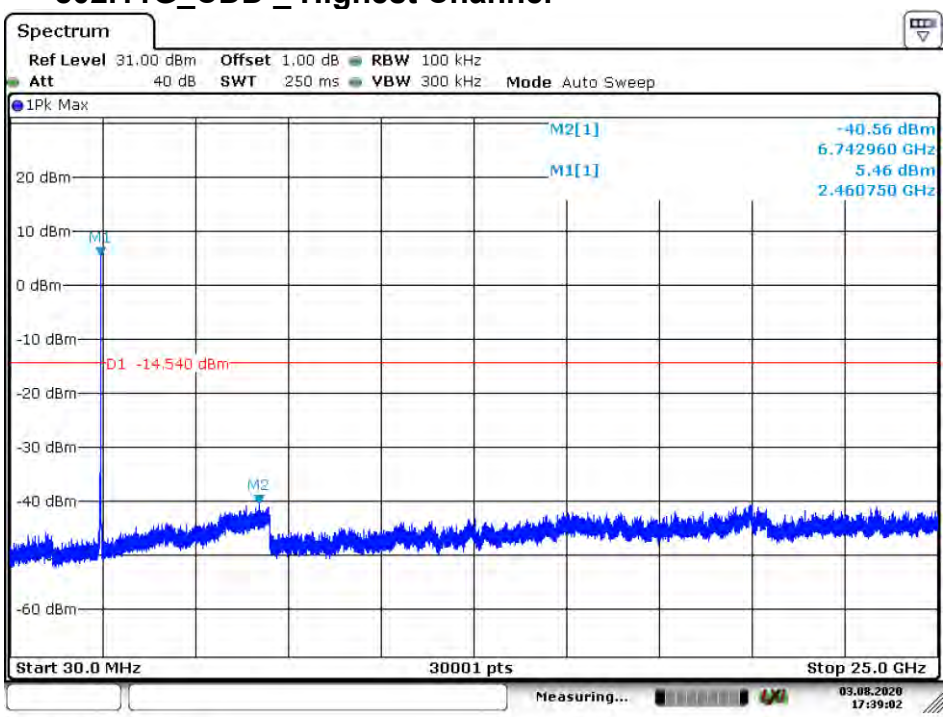
4.8.1.2.6 802.11G_CDD _ Highest Channel



Date: 3.AUG.2020 17:39:03

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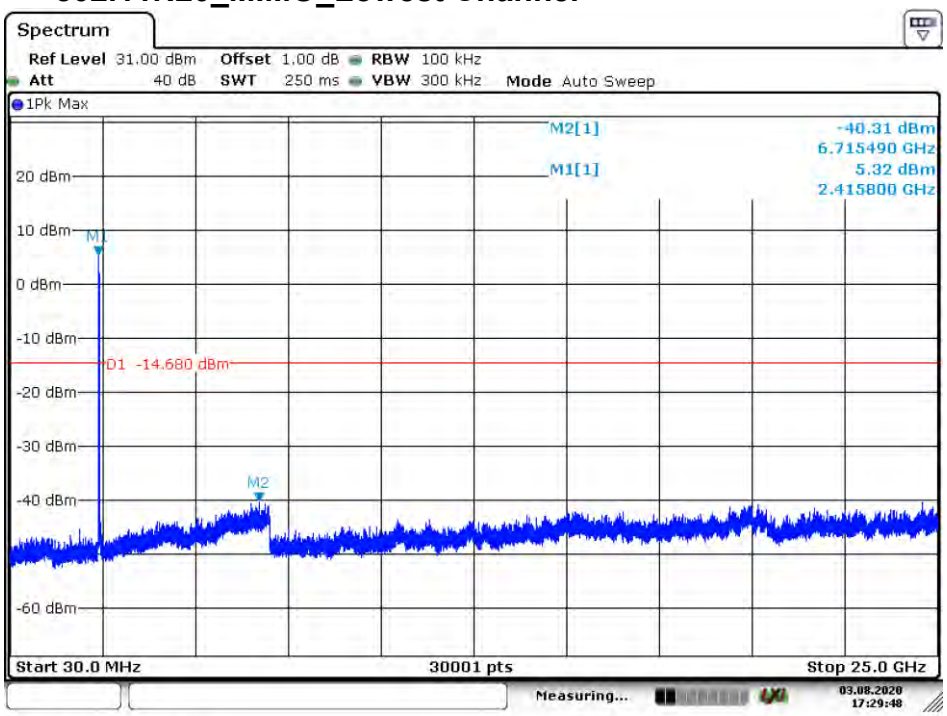
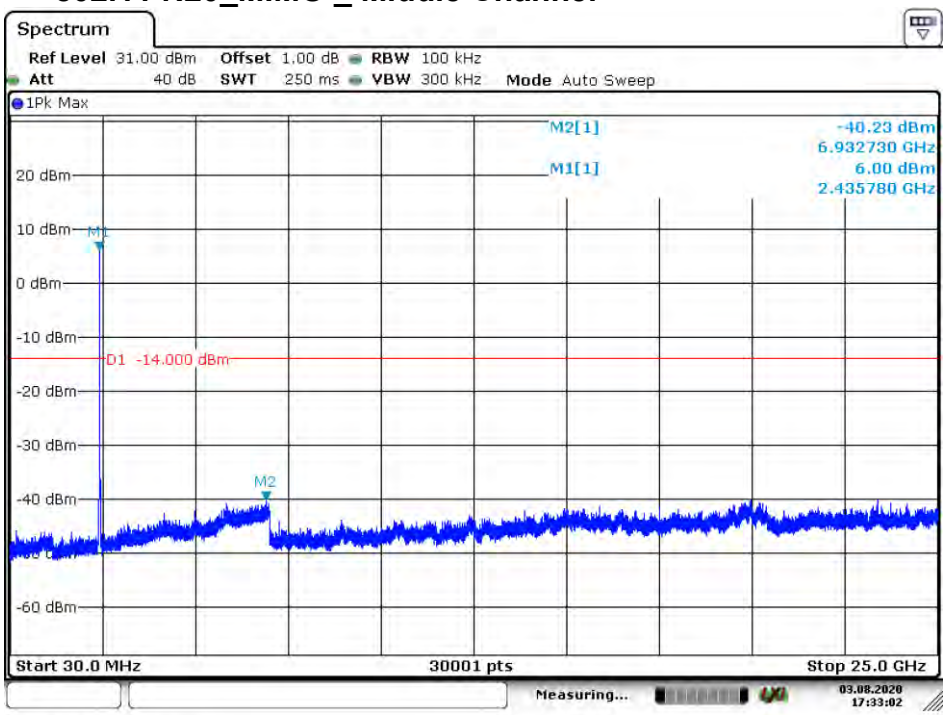
4.8.1.2.7 802.11N20_MIMO_Lowest Channel



Date: 3.AUG.2020 17:29:48

4.8.1.2.8 802.11 N20_MIMO _ Middle Channel



Date: 3.AUG.2020 17:33:03

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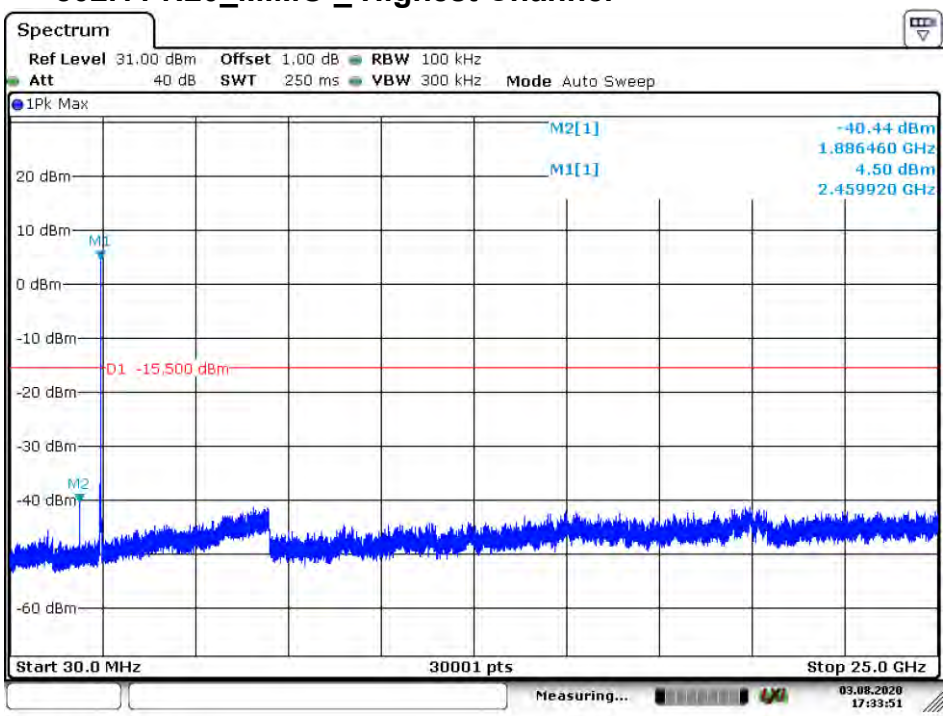
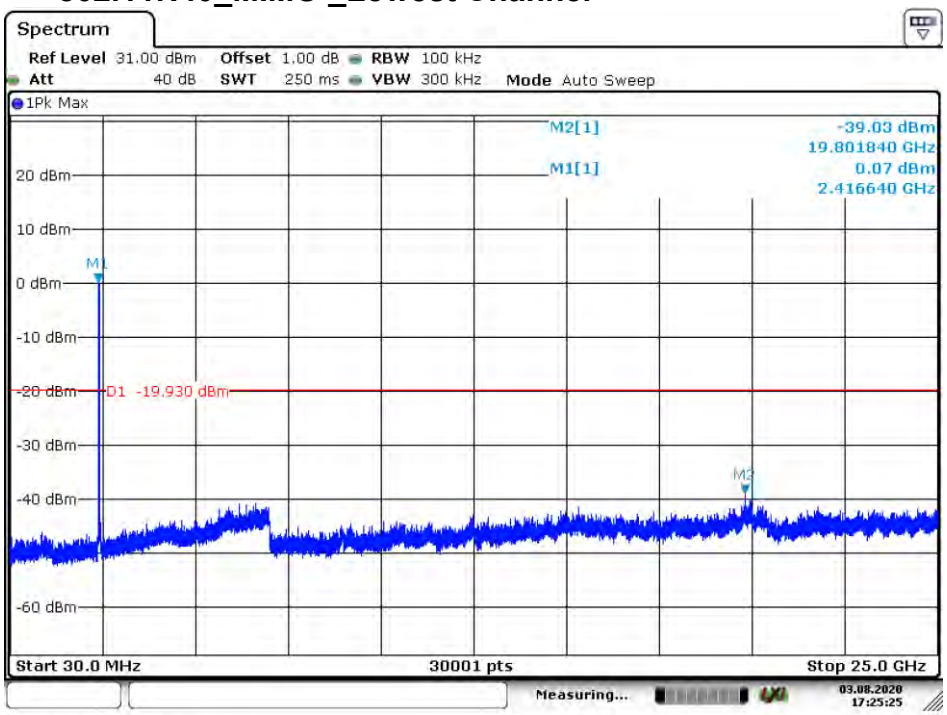
4.8.1.2.9 802.11 N20_MIMO _ Highest Channel



Date: 3.AUG.2020 17:33:51

4.8.1.2.10 802.11N40_MIMO _Lowest Channel



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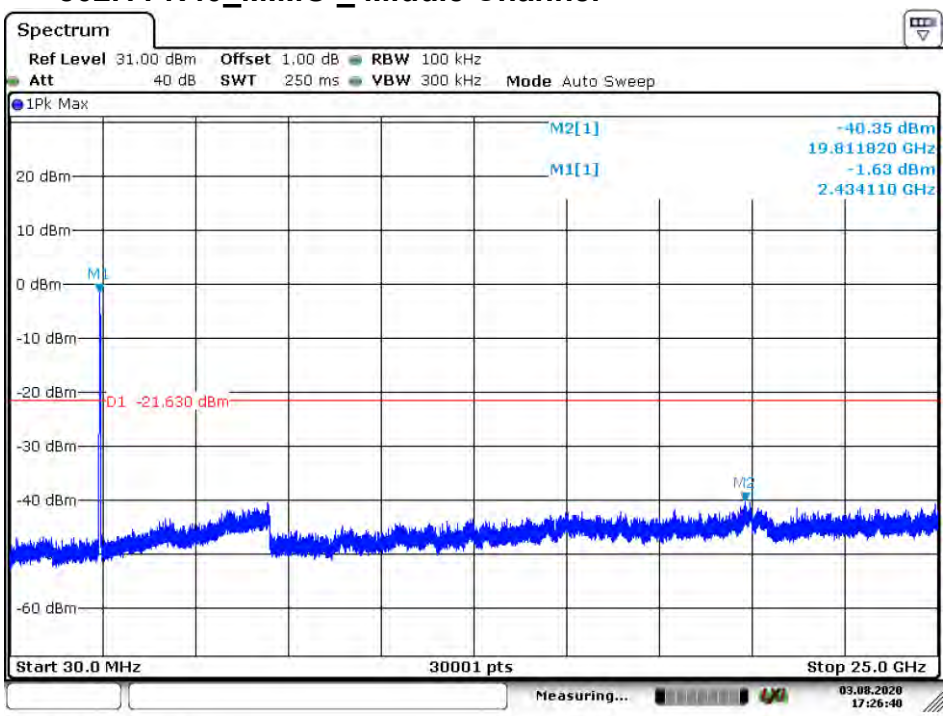
4.8.1.2.11 802.11 N40_MIMO _ Middle Channel



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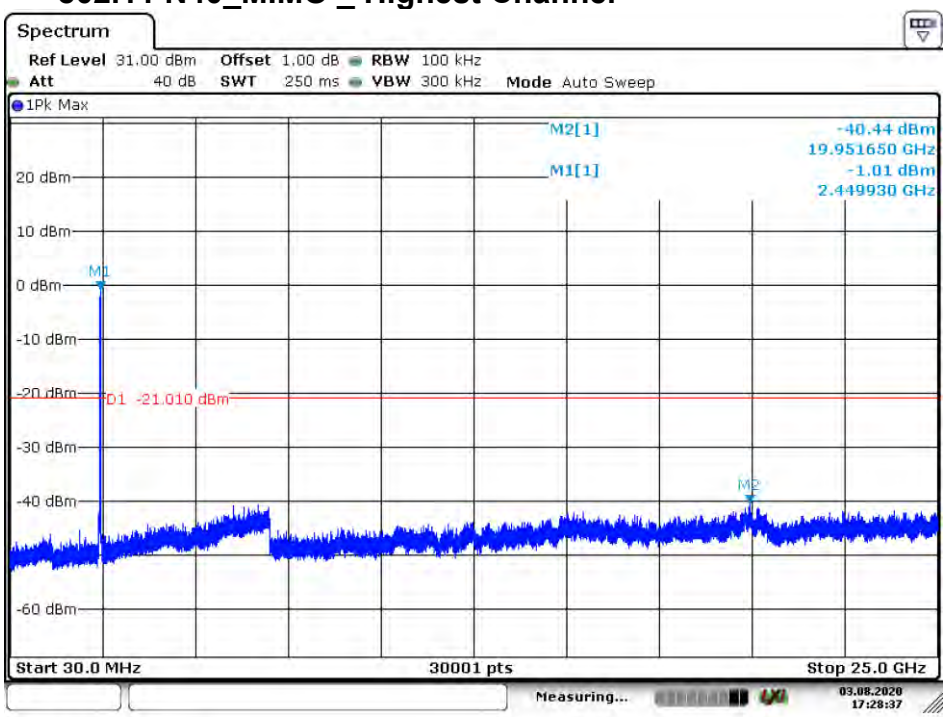
4.8.1.2.12 802.11 N40_MIMO _ Highest Channel



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