FCC TEST REPORT

Application No:	ZR/2020/20029
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.:	M2002J9G
Trade Mark:	MI
FCC ID:	2AFZZJ9G
Standards:	47 CFR FCC Part 2, Subpart J 47 CFR FCC Part 15, Subpart C 47 CFR FCC Part 15, Subpart E
Test Method	KDB 789033 D02 General UNII Test Procedures New Rules v02 FCC KDB 558074 D01 DTS Meas Guidance v0502 KDB 662911 D01 Multiple Transmitter Output v02r01 KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02 KDB 905462 D03 Client Without DFS New Rules v01r02 ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices
Date of Receipt:	2020/3/3
Date of Test:	2020/3/4 to 2020/4/19
Date of Issue:	2020/4/19
Test Result:	**PASS ***

. * 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**
00		2020/4/19		Original

Authorized for issue by:				
Tested By		Mike Hu **(Mike Hu) /Project Engineer**		2020/4/19 **Date**
Checked By		David Chen **(David Chen) /Reviewer**		2020/4/19 **Date**

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Contents

1 VERSION **2**

2 TEST SUMMARY **4**

2.1 CLIENT INFORMATION 6
2.2 TEST LOCATION 6
2.3 TEST FACILITY 6
2.4 GENERAL DESCRIPTION OF EUT 7
2.5 TEST ENVIRONMENT AND MODE 9

3 TEST RESULTS AND MEASUREMENT DATA **10**

3.1 ANTENNA REQUIREMENT 10
3.2 CONDUCTED EMISSIONS 10
3.3 DUTY CYCLE 14
3.3.1 Test Results *14*
3.3.1 Test Plots *15*
3.4 CONDUCTED OUTPUT POWER 33
3.5 26DB EMISSION BANDWIDTH 37
3.5.1 Plots for 26dB Emission Bandwidth *40*
3.6 6DB EMISSION BANDWIDTH 97
3.6.1 Test Plots For 6dB Emission Bandwidth *98*
3.6.2 Test Plots For 6dB Emission Bandwidth *99*
3.7 99% OCCUPIED BANDWIDTH 123
3.7.1 Test Results For 99% Occupied Bandwidth *124*
3.7.2 Test Plots For 99% Occupied Bandwidth *127*
3.8 POWER SPECTRAL DENSITY 197
3.8.1 Test Results For Power Density *198*
3.8.2 Test plots For Power Density *201*
3.9 RADIATED SPURIOUS EMISSIONS 281
3.9.1 Radiated emission below 1GHz *283*
3.9.2 Transmitter emission above 1GHz *285*
3.10 RESTRICTED BANDS AROUND FUNDAMENTAL FREQUENCY 403
3.10.1 Test plots *405*
3.11 FREQUENCIES STABILITY 495
3.11.1 Frequency Error vs. Voltage: *495*
3.11.2 Frequency Error vs. Temperature: *495*
3.12 DYNAMIC FREQUENCY SELECTION 496
3.12.1 DFS Overview *496*
3.12.2 DFS Detection Thresholds *497*
3.12.3 Response Requirements *497*
3.12.4 Test plots *498*
3.12.5 Test Data: *499*

4 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, K=2) **501**

5 EQUIPMENT LIST **502**

6 PHOTOGRAPHS - EUT TEST SETUP DETAILS **503**

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2 Test Summary

Test Item	Band	FCC Rule	Requirements	Test Result	Verdict
Emission Bandwidth	5150-5250	15.403(i) 15.407(a)(1)	No limit.	Clause 4.4 Clause 4.5	Pass
	5250-5350	15.403(i) 15.407(a)(2)			
	5470-5725	15.403(i) 15.407(a)(2)			
	5725-5825	15.403(i) 15.407(e)	≥ 500 kHz.		
Occupied Bandwidth	5150-5250	KDB 789033 D02§ D	No limit.		Pass
	5250-5350				
	5470-5725				
	5725-5825				
Duty Cycle	5150-5825	--	No limit.		Pass
Maximum Conducted Output Power	5150-5250	15.407(a)(1) 15.407(a)(4)	FCC < 250mW (avg during transmission)	Clause 4.3	
	5250-5350	15.407(a)(2) 15.407(a)(4)	<MIN{250mW,11dBm+10*lg(EBW)} (avg during transmission)		
	5470-5725	15.407(a)(2) 15.407(a)(4)	<MIN{250mW,11dBm+10*lg(EBW)} (avg during transmission)		
	5725-5825	15.407(a)(3)	< 1W (avg during transmission)		
maximum Power Spectral Density	5150-5250	15.407(a)(1) 15.407(a)(4)	<11dBm/MHz (avg during transmission)	Clause 4.6	
	5250-5350	15.407(a)(2) 15.407(a)(4)	<11dBm/MHz (avg during transmission)		
	5470-5725	15.407(a)(2) 15.407(a)(4)	<11dBm/MHz (avg during transmission)		
	5725-5825	15.407(a)(3) 15.407(a)(4)	<30dBm/500KHz (avg during transmission)		
Unwanted Emissions that fall Outside of the Restricted Bands(Radiated)	5150-5250	15.407(b)(1) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.15-5.35 GHz). F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).	Clause 4.7	Pass
	5250-5350	15.407(b)(2) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.25-5.35 GHz). F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).		

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Test Item	Band	FCC Rule	Requirements	Test Result	Verdict
	5470-5750	15.407(b)(3) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.47-5.725 GHz). F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).		
	5725-5825	15.407(b)(4) 15.407(b)(6) 15.407(b)(7) 15.209	F<1GHz: §15.209/§7.2.5 limit (QP) F≥1GHz &out-restricted:(QP) a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges; b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges; c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges. F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).		
Unwanted Emissions in the Restricted Bands (Radiated)	5150-5250 5250-5350 5470-5725 5725-5825	15.209	---	Clause 4.8	Pass
AC Power Line Conducted Emissions	5150-5250 5250-5350 5470-5725 5725-5825	15.207	---	Clause 4.2	Pass
Frequency Stability	5150-5250 5250-5350 5470-5600 5650-5725 5725-5825	15.209	---	Clause 4.9	Pass
Dynamic Frequency Selection	5250-5350 5470-5725	47 CFR Part 15, Subpart E 15.407	Channel Move Time:10 Seconds Transmission Time: milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. Non-occupancy period: Minimum 30 minutes	Clause 4.10	Pass

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General Information

2.1 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

2.2 Test Location

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
Telephone:	+86 (0) 755 2601 2053
Fax:	+86 (0) 755 2671 0594
E-mail:	ee.shenzhen@sgs.com

2.3 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 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 3816.01)

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

• VCCI

The 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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2.4 General Description of EUT

EUT Description:	Mobile Phone
Model No.:	M2002J9G
Trade Mark:	MI
Hardware Version:	P2.1
Software Version:	MIUI 11
IEEE 802.11 WLAN Mode Supported	☒ 802.11a (20 MHz channel bandwidth) ; ☒ 802.11n (20 MHz channel bandwidth); ☒ 802.11n (40 MHz channel bandwidth); ☒ 802.11ac (20 MHz channel bandwidth); ☒ 802.11ac (40 MHz channel bandwidth); ☒ 802.11ac (80 MHz channel bandwidth);
Operation Frequency:	IEEE 802.11n(HT20/40)/ ac(HT20/40/80/): 5150MHz to 5250MHz IEEE 802.11n(HT20/40)/ ac(HT20/40/80/160): 5250MHz to 5350MHz IEEE 802.11n(HT20/40)/ ac(HT20/40/80/160): 5470MHz to 5725MHz IEEE 802.11n(HT20/40)/ ac(HT20/40/80): 5725MHz to 5825MHz
Type of Modulation:	OFDM
DFS mode:	☐Master ☐ Slave with radar detection ☒Slave without radar detection
Sample Type:	☒ Portable Device, ☐Module
Antenna Type:	☐ External, ☒ Integrated
Antenna Ports	☒ Ant 1, ☒ Ant 2, ☐ Ant 3
Smart System	☒ SISO (for 802.11a/n/ac), ☒ MIMO (for 802.11a/n/ac), ☐ Diversity (for 802.11a) : Tx & Rx
Antenna Gain:	Ant1:-0.51dBi; Ant2: -1.0dBi
Power Supply	☐ AC/DC Adapter;☒ Battery; ☐ PoE:; ☐ Other:

Remark:

In FCC 15.31, for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table, and the selected channel to perform the test as below:

Frequency Range of Operation Operating Frequency Range (in each Band)	Number of Measurement Frequencies Required	Location of Measurement Frequency in Band of Operation
1 MHz or less	1	centre
1 MHz to 10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near centre

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For UNII Band I:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5180
	The Middle channel	5200
	The Highest channel	5240
IEEE 802.11n/ac 40MHz	The Lowest channel	5190
	The Highest channel	5230
IEEE 802.11ac 80MHz	The Middle channel	5210

For UNII Band II-A:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5260
	The Middle channel	5300
	The Highest channel	5320
IEEE 802.11n/ac 40MHz	The Lowest channel	5270
	The Highest channel	5310
IEEE 802.11ac 80MHz	The Middle channel	5290

For UNII Band II-C:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5500
	The Middle channel	5580
	The Highest channel	5700
IEEE 802.11n/ac 40MHz	The Lowest channel	5510
	The Middle channel	5500
	The Highest channel	5670
IEEE 802.11ac 80MHz	The Middle channel	5530

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For UNII Band III:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5745
	The Middle channel	5785
	The Highest channel	5805
IEEE 802.11n/ac 40MHz	The Lowest channel	5755
	The Highest channel	5795
IEEE 802.11ac 80MHz	The Middle channel	5775

2.5 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	55 % RH
Atmospheric Pressure:	101.32 KPa
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

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3 Test results and Measurement Data

3.1 Antenna Requirement

Test Requirement:	47 CFR Part 15 Section 15.203
The antenna is integrated antenna and no consideration of replacement. The best case gain of the antenna is Ant1:-0.51dBi; Ant2: -1.0dBi.	

3.2 Conducted Emissions

Test Requirement:	47 CFR Part 15 Section 15.407(b)		
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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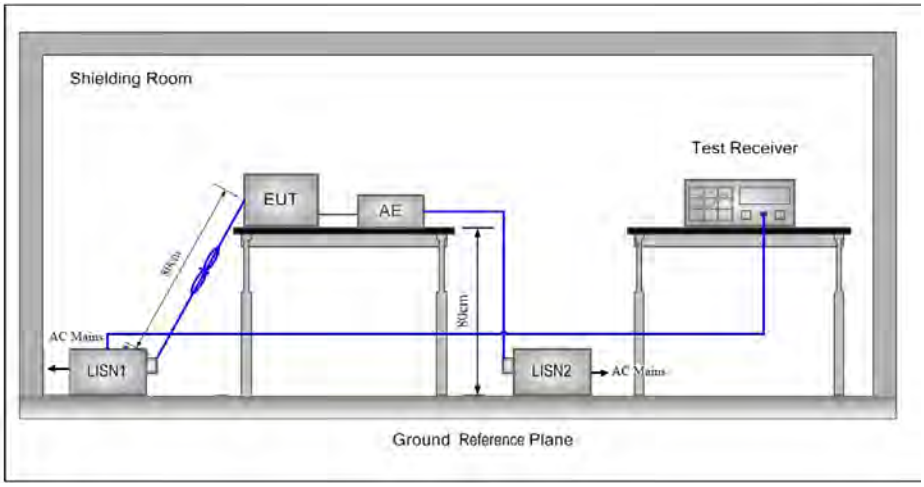
Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Through Pre-scan, find the 6Mbps of rate of 802.11a at lowest channel is the worst case. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

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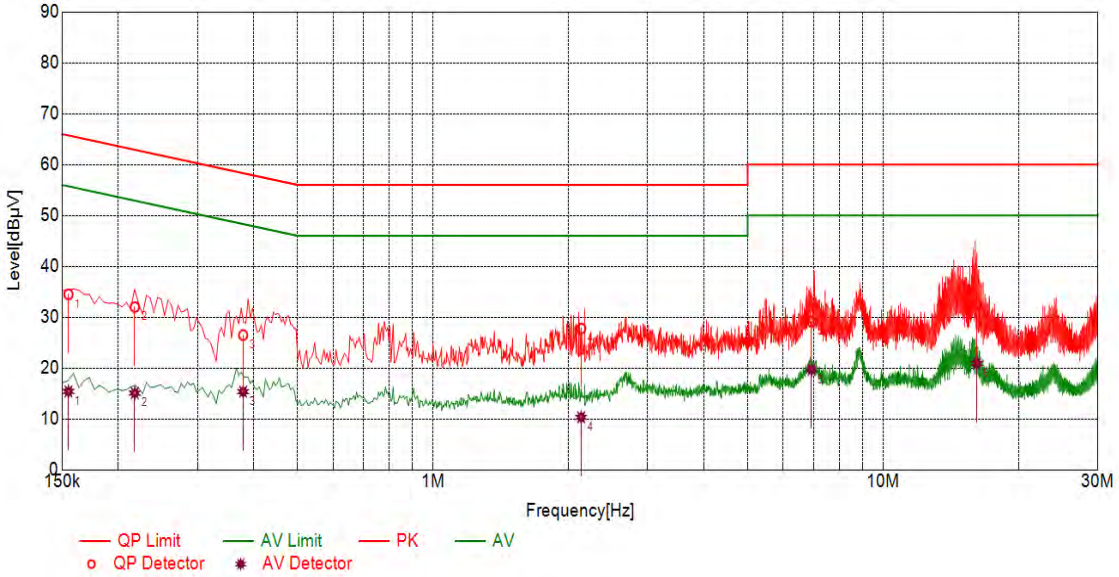
Live Line:



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	0.1550	10.10	34.48	65.73	31.25	15.41	55.73	40.32	L
2	0.2176	10.10	31.99	62.91	30.92	15.08	52.91	37.83	L
3	0.3788	10.10	26.49	58.31	31.82	15.35	48.31	32.96	L
4	2.1346	10.10	27.78	56.00	28.22	10.32	46.00	35.68	L
5	6.9336	10.10	29.11	60.00	30.89	19.65	50.00	30.35	L
6	16.1575	10.11	32.38	60.00	27.62	20.92	50.00	29.08	L

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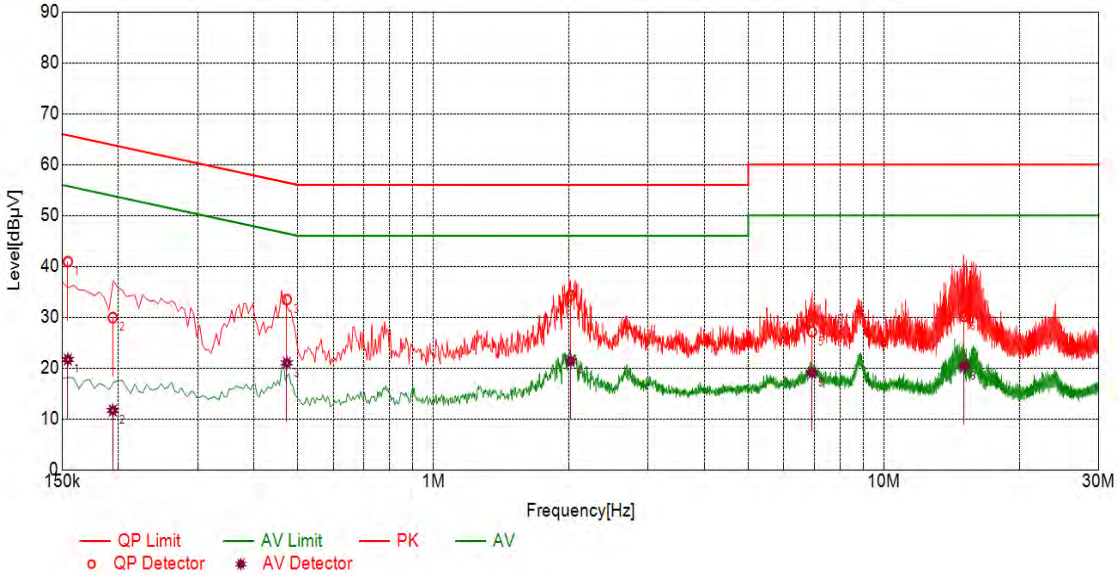
Neutral Line:



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	0.1545	10.10	40.91	65.75	24.84	21.69	55.75	34.06	N
2	0.1943	10.10	29.93	63.85	33.92	11.67	53.85	42.18	N
3	0.4731	10.10	33.47	56.46	22.99	21.02	46.46	25.44	N
4	2.0184	10.10	34.27	56.00	21.73	21.41	46.00	24.59	N
5	6.9289	10.10	27.16	60.00	32.84	19.07	50.00	30.93	N
6	15.0773	10.11	30.16	60.00	29.84	20.43	50.00	29.57	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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3.3 Duty Cycle

3.3.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]	
		Ant1	Ant2
11A	Ant 1: CH149, CH157, CH161	98.34	---
11N20	Ant 1: CH149, CH157, CH161	97.65	---
11N40	Ant 1: CH151, CH159	95.60	---
11AC20	Ant 1: CH149, CH157, CH161	98.08	---
11AC40	Ant 1: CH151, CH159	96.21	---
11AC80	Ant 1: CH155	92.49	---
11A_CDD	Ant 1: CH149, CH157, CH161	98.69	98.34
11N20_MIMO	Ant 1: CH149, CH157, CH161	98.44	98.23
11N40_MIMO	Ant 1: CH151, CH159	96.33	96.48
11AC20_MIMO	Ant 1: CH149, CH157, CH161	96.21	96.62
11AC40_MIMO	Ant 1: CH151, CH159	93.77	93.01
11AC80_MIMO	Ant 1: CH155	87.56	87.62

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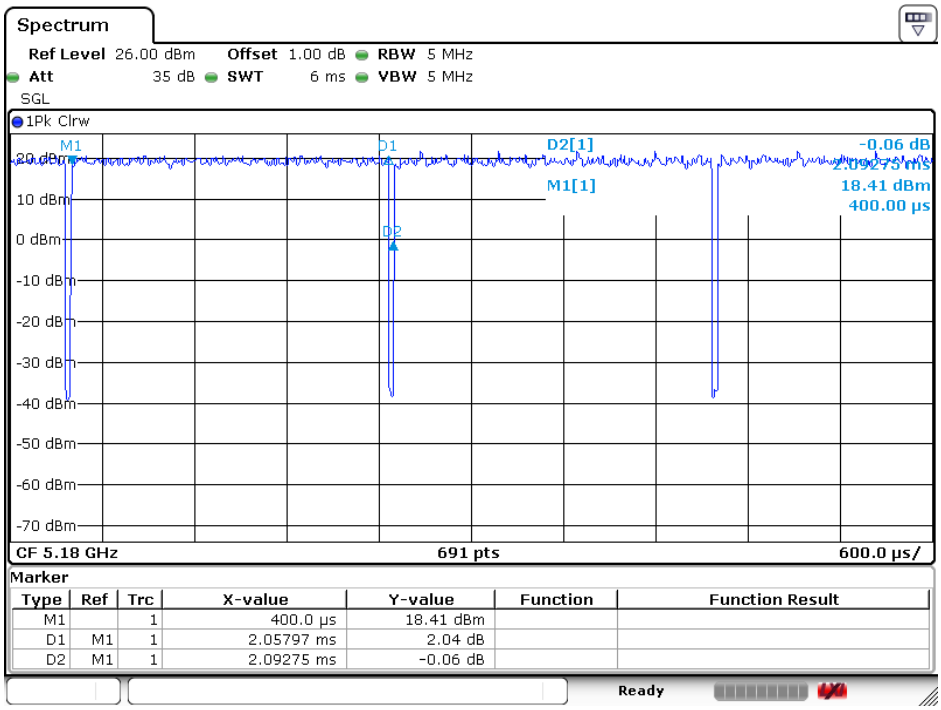
3.3.1 Test Plots

3.3.1.1 ANT1

3.3.1.1.1 11A



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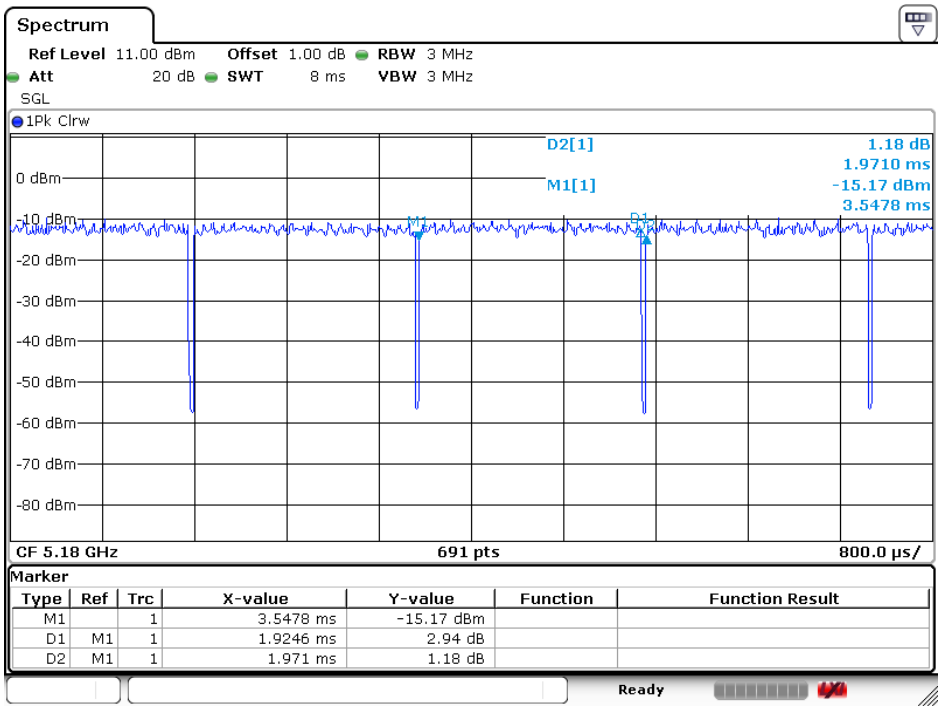
3.3.1.1.2 11N20



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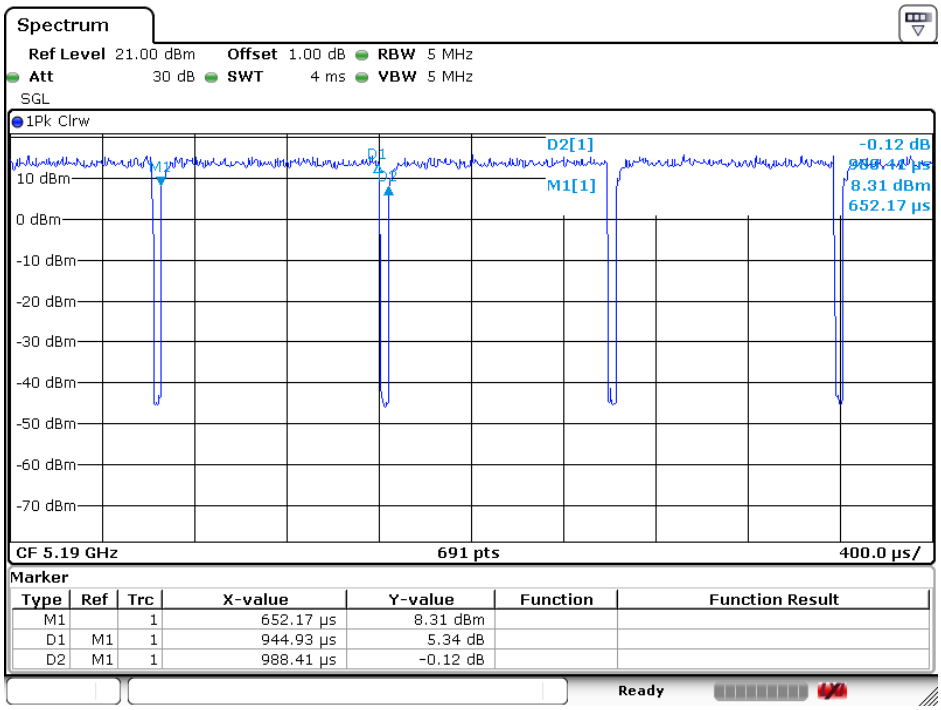
3.3.1.1.3 11N40



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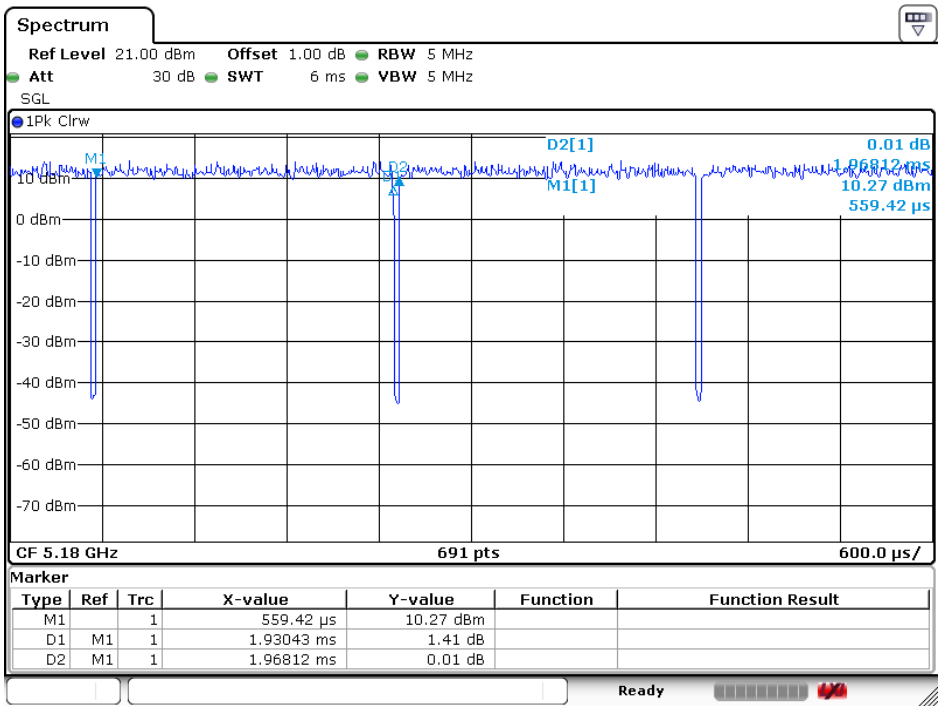
3.3.1.1.4 11AC20



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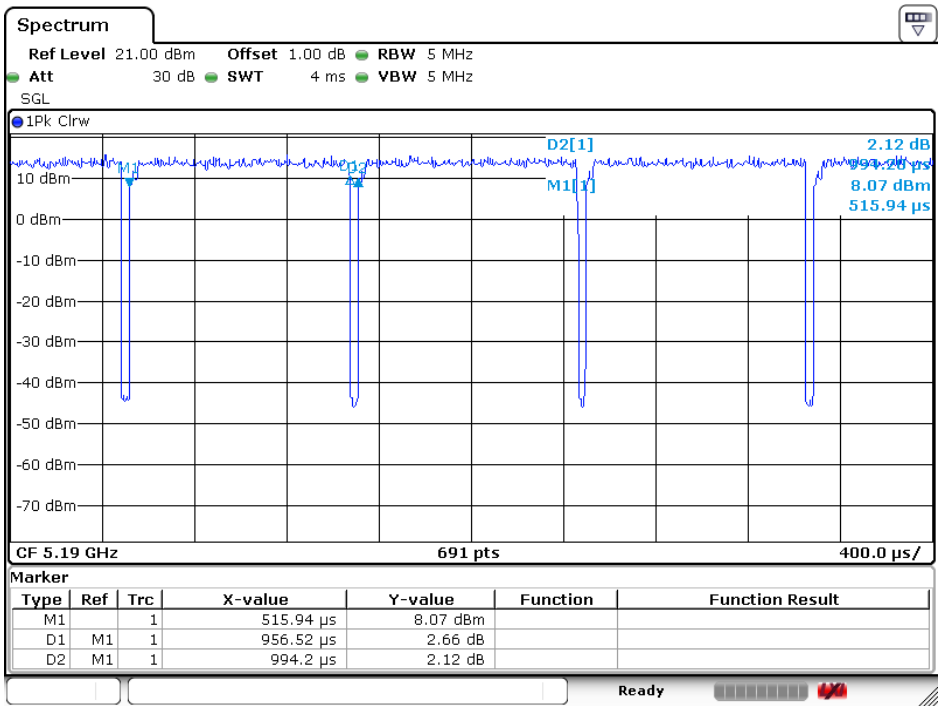
3.3.1.1.5 11AC40



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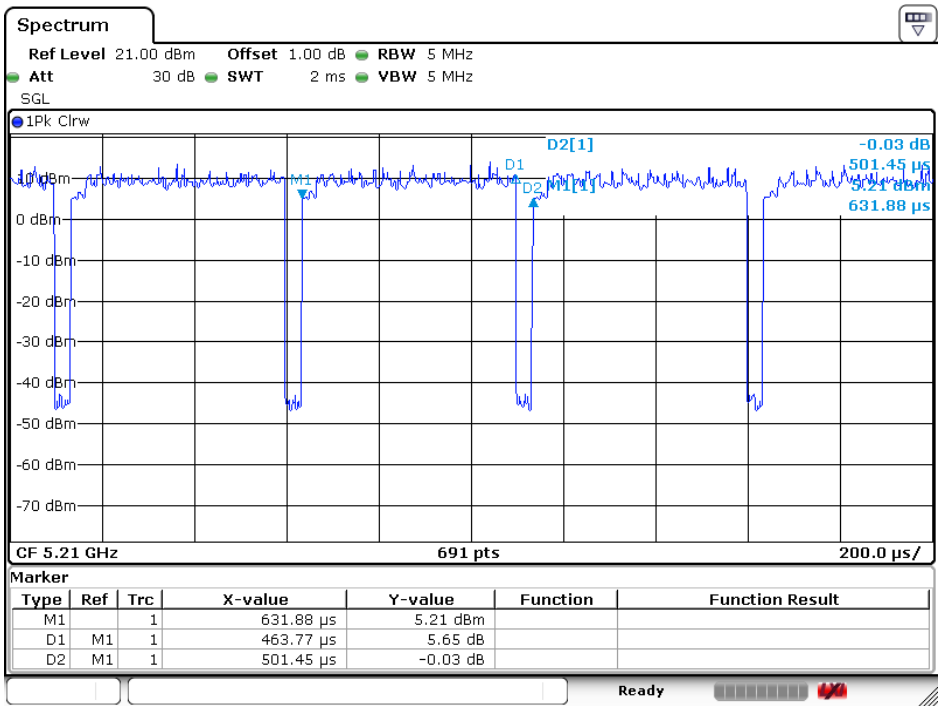
3.3.1.1.6 11AC80



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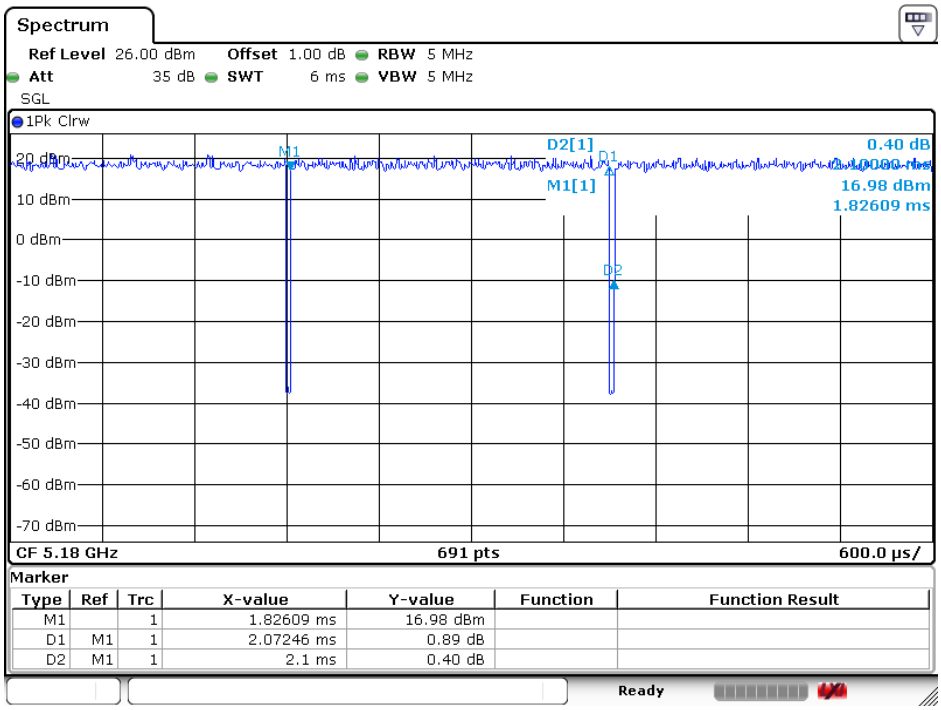
3.3.1.1.7 11A _CDD



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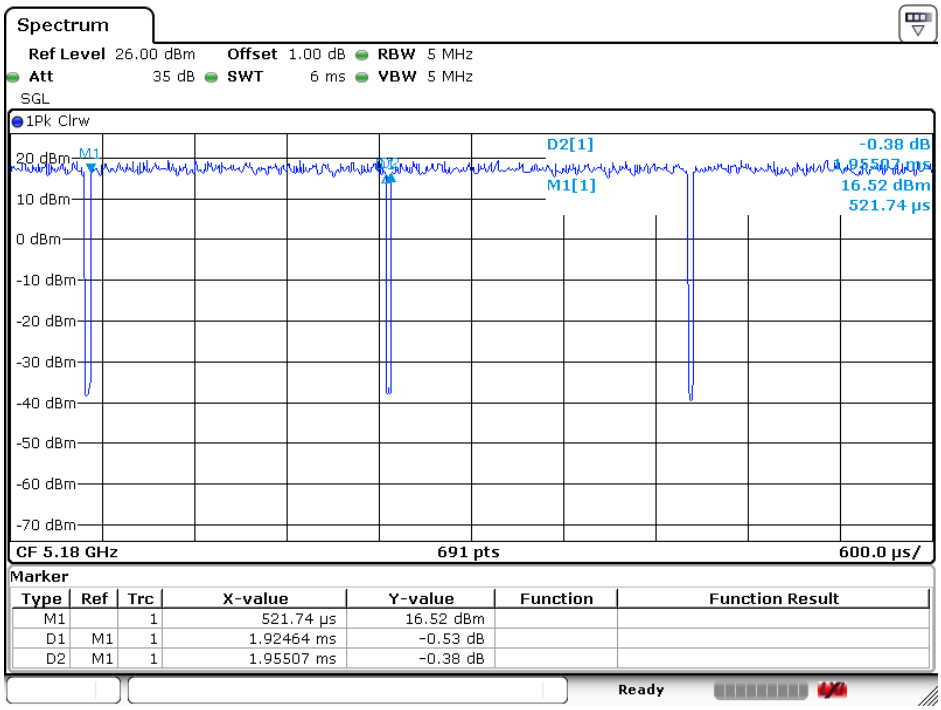
3.3.1.1.8 11N20_MIMO



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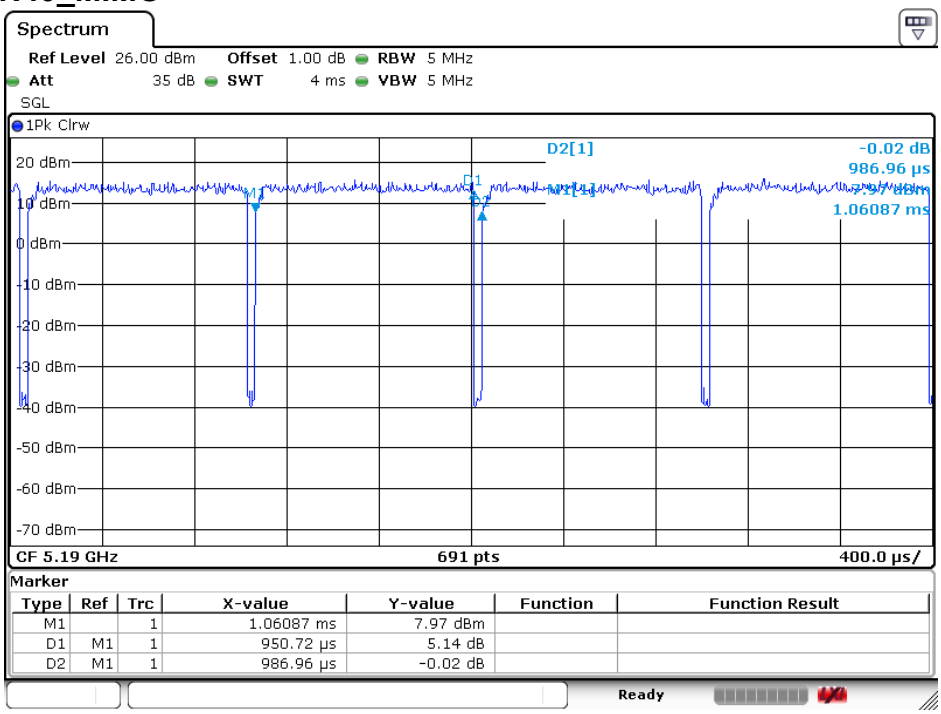
3.3.1.1.9 11N40_MIMO



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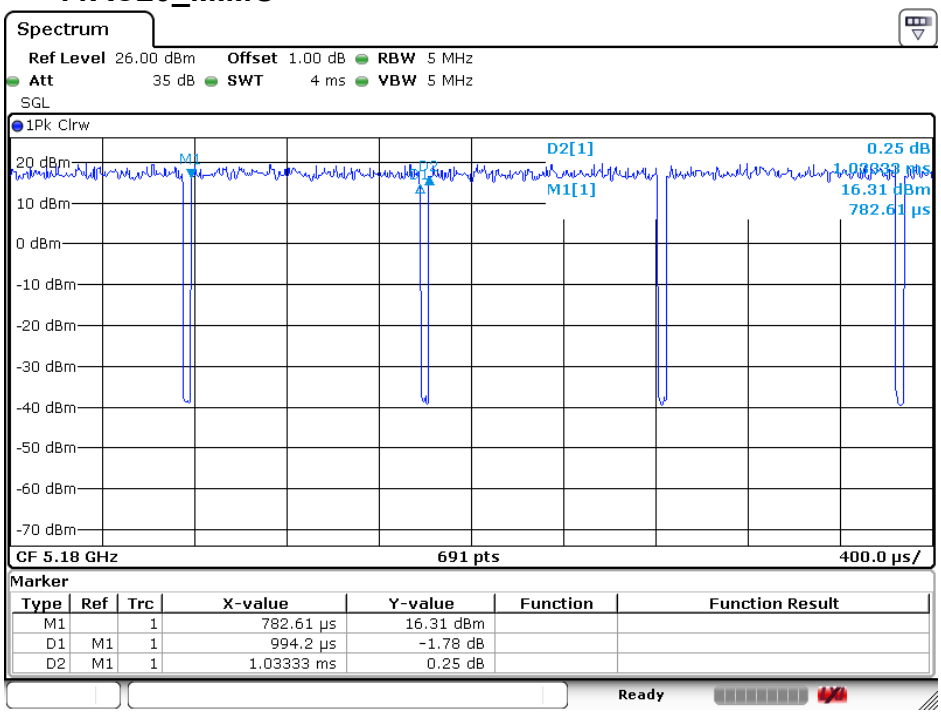
3.3.1.1.10 11AC20_MIMO



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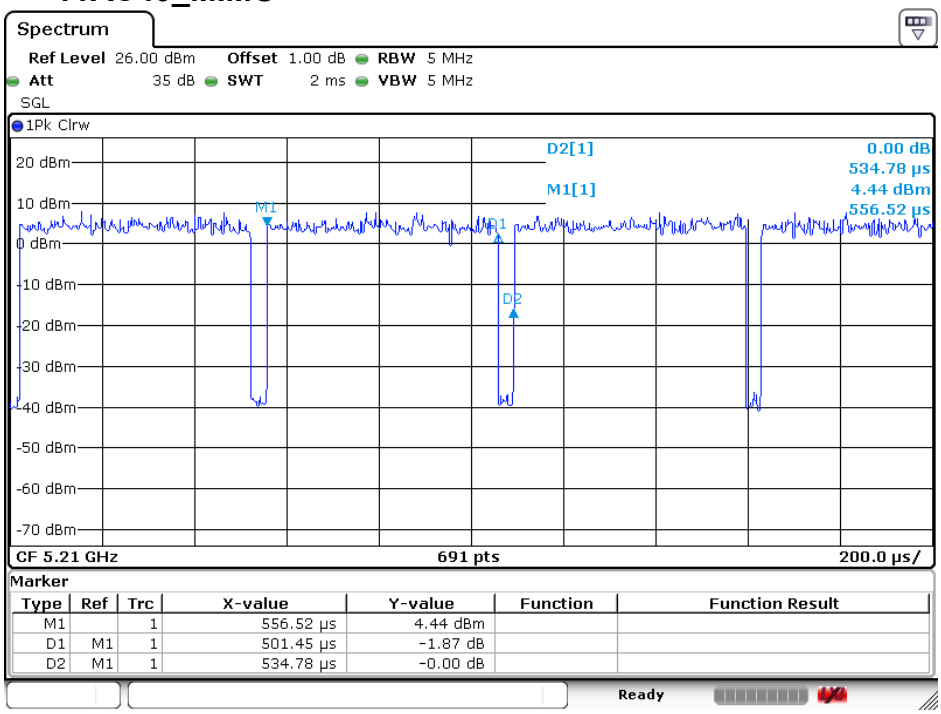
3.3.1.1.11 11AC40_MIMO



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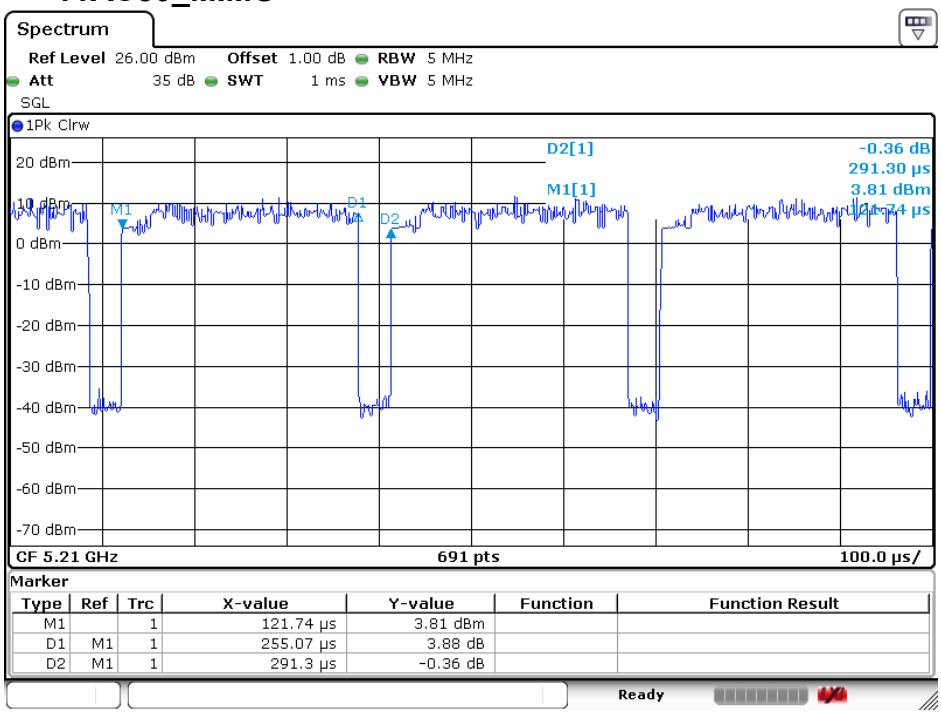
3.3.1.1.12 11AC80_MIMO



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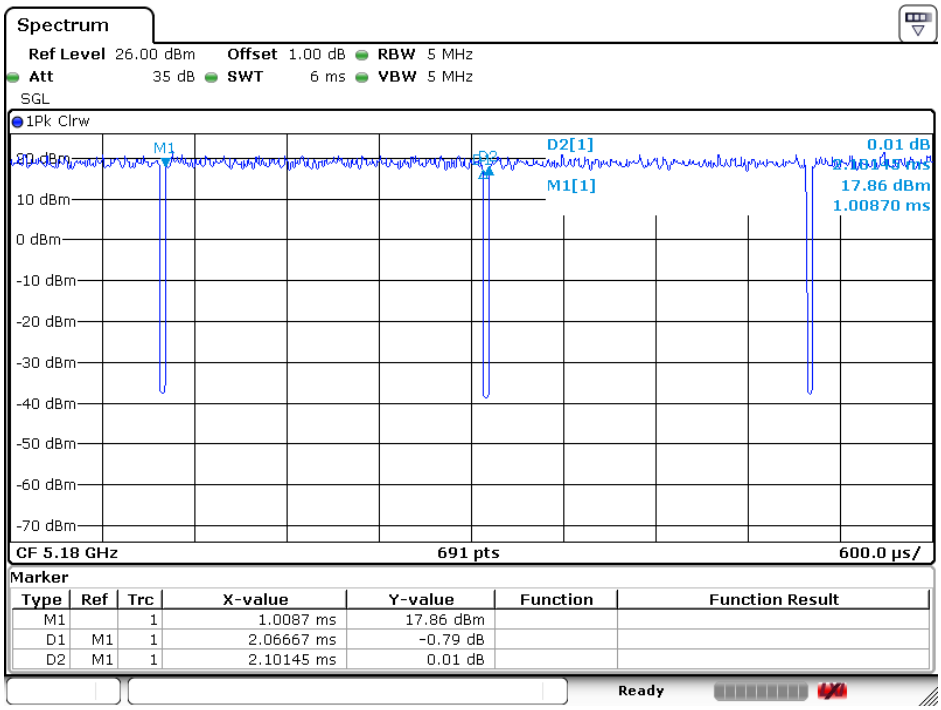
3.3.1.2 ANT2

3.3.1.2.1 11A _CDD



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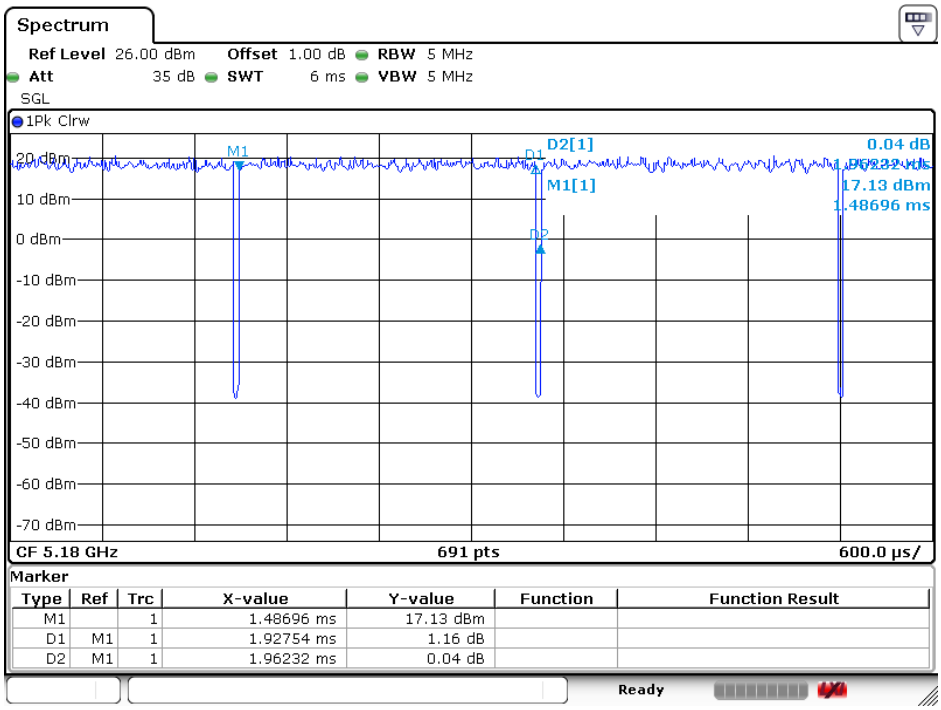
3.3.1.2.2 11N20_MIMO



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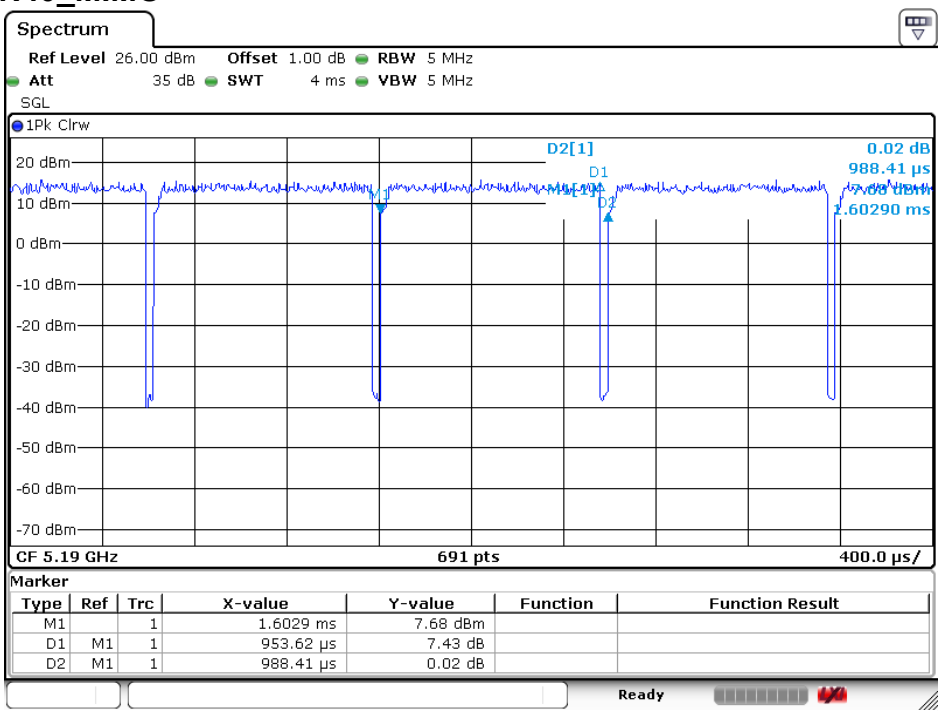
3.3.1.2.3 11N40_MIMO



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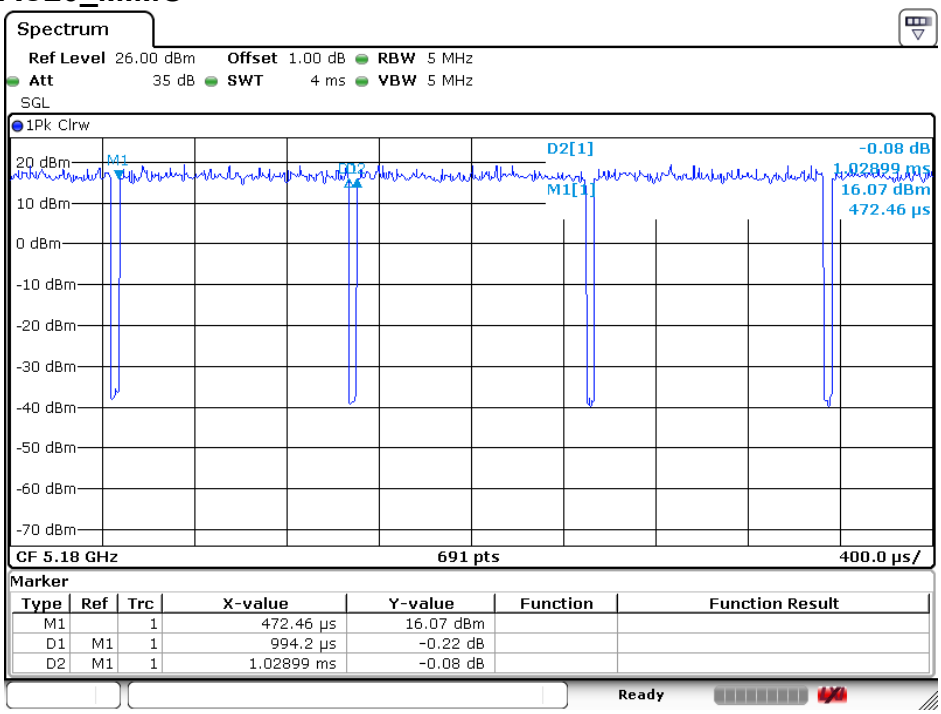
3.3.1.2.4 11AC20_MIMO



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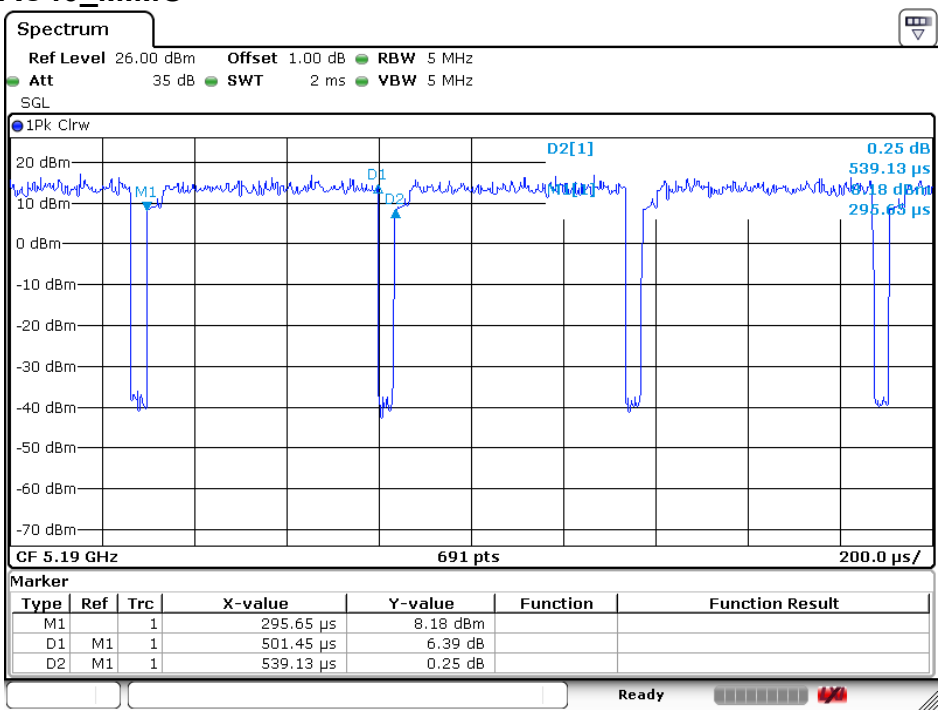
3.3.1.2.5 11AC40_MIMO



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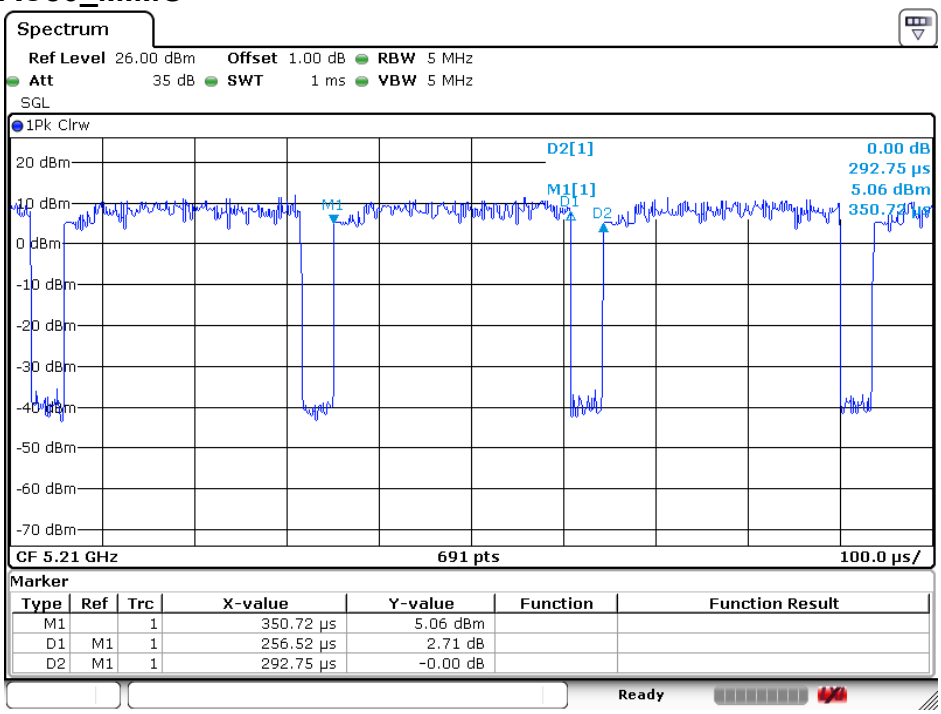
3.3.1.2.6 11AC80_MIMO



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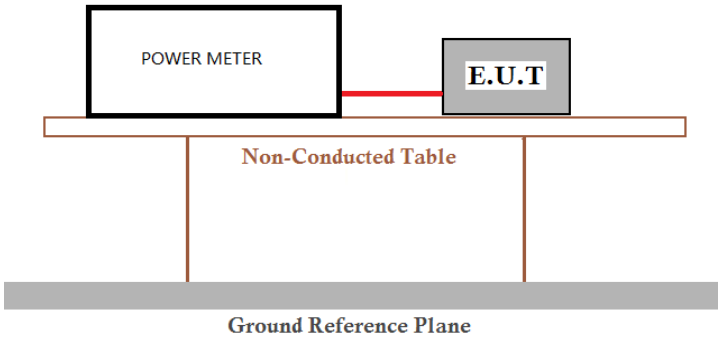
3.4 Conducted Output Power

Test Requirement:	47 CFR Part 15 Section 15.407(a)
Test Method:	ANSI C63.10: 2013
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 that 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(HT20); MCS0 of rate is the worst case of 802.11ac(HT40); MCS0 of rate is the worst case of 802.11ac(HT80) Only the worst case is recorded in the report.
Limit:	Frequency Band / Limit
	5150-5250MHz / Not exceed 250mW(24dBm)
	5250-5350MHz / The lesser of 250mW(24dBm) or 11+ 10logB
	5470-5725MHz / The lesser of 250mW(24dBm) or 11+ 10logB
	5725-5825MHz / Not exceed 1W(30dBm)
	*Where B is the 26dB emission bandwidth in MHz
Test Results:	Pass

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Test Mode	Test Channel	Frequency [MHz]	Meas. Level (Cond.) [dBm]			Verdict
			ANT 1	ANT 2	SUM	
11A20	36	5180	17.23	---	---	PASS
	40	5200	17.48	---	---	PASS
	48	5240	17.56	---	---	PASS
	52	5260	17.58	---	---	PASS
	60	5300	17.52	---	---	PASS
	64	5320	17.37	---	---	PASS
	100	5500	17.43	---	---	PASS
	140	5700	17.25	---	---	PASS
	149	5745	17.21	---	---	PASS
	157	5785	17.38	---	---	PASS
	161	5805	17.20	---	---	PASS
11A20 CDD	36	5180	16.65	16.98	19.83	PASS
	40	5200	16.34	16.77	19.57	PASS
	48	5240	16.65	16.77	19.72	PASS
	52	5260	16.88	17.05	19.98	PASS
	60	5300	16.65	16.92	19.80	PASS
	64	5320	16.55	16.88	19.73	PASS
	100	5500	16.66	16.99	19.84	PASS
	140	5700	16.26	16.76	19.53	PASS
	149	5745	17.05	17.18	20.13	PASS
	157	5785	17.30	17.45	20.39	PASS
	161	5805	16.83	17.09	19.97	PASS
11N20	36	5180	16.01	---	---	PASS
	40	5200	15.21	---	---	PASS
	48	5240	15.06	---	---	PASS
	52	5260	15.11	---	---	PASS
	60	5300	15.26	---	---	PASS
	64	5320	15.09	---	---	PASS
	100	5500	15.01	---	---	PASS
	140	5700	15.03	---	---	PASS
	149	5745	15.89	---	---	PASS
	157	5785	15.93	---	---	PASS
	161	5805	16.01	---	---	PASS
11N20 MIMO	36	5180	15.32	15.84	18.60	PASS
	40	5200	15.42	15.59	18.52	PASS
	48	5240	15.36	15.86	18.63	PASS
	52	5260	15.59	16.09	18.86	PASS
	60	5300	15.58	15.98	18.79	PASS
	64	5320	15.32	15.99	18.68	PASS
	100	5500	15.78	15.77	18.79	PASS
	140	5700	15.59	15.51	18.56	PASS

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	149	5745	15.41	15.43	18.43	PASS
	157	5785	15.62	15.52	18.58	PASS
	161	5805	15.28	15.36	18.33	PASS
11N40	38	5190	16.05	---	---	PASS
	46	5230	15.78	---	---	PASS
	54	5270	15.89	---	---	PASS
	62	5310	15.84	---	---	PASS
	102	5510	15.64	---	---	PASS
	134	5670	15.98	---	---	PASS
	151	5755	15.88	---	---	PASS
	159	5795	15.85	---	---	PASS
11N40 MIMO	38	5190	15.64	15.58	18.62	PASS
	46	5230	15.52	15.58	18.56	PASS
	54	5270	15.46	15.46	18.47	PASS
	62	5310	15.45	15.32	18.40	PASS
	102	5510	15.36	15.02	18.20	PASS
	134	5670	15.47	15.21	18.35	PASS
	151	5755	15.30	15.26	18.29	PASS
	159	5795	15.21	15.21	18.22	PASS
11AC20	36	5180	16.99	---	---	PASS
	40	5200	17.02	---	---	PASS
	48	5240	16.85	---	---	PASS
	52	5260	16.95	---	---	PASS
	60	5300	16.89	---	---	PASS
	64	5320	17.01	---	---	PASS
	100	5500	17.02	---	---	PASS
	140	5700	16.98	---	---	PASS
	149	5745	16.92	---	---	PASS
	157	5785	16.59	---	---	PASS
	161	5805	16.99	---	---	PASS
11AC20 MIMO	36	5180	17.01	16.67	19.85	PASS
	40	5200	16.95	16.62	19.80	PASS
	48	5240	16.85	16.82	19.85	PASS
	52	5260	17.01	16.75	19.89	PASS
	60	5300	16.79	16.56	19.69	PASS
	64	5320	16.82	16.65	19.75	PASS
	100	5500	16.91	16.85	19.89	PASS
	140	5700	16.82	16.74	19.79	PASS
	149	5745	16.35	16.52	19.45	PASS
	157	5785	16.52	16.11	19.33	PASS
	161	5805	16.41	16.52	19.48	PASS
11AC40	38	5190	16.21	---	---	PASS
	46	5230	16.01	---	---	PASS

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	54	5270	16.11	---	---	PASS
	62	5310	16.01	---	---	PASS
	102	5510	16.21	---	---	PASS
	134	5670	16.21	---	---	PASS
	151	5755	16.01	---	---	PASS
	159	5795	16.11	---	---	PASS
11AC40 MIMO	38	5190	15.61	15.33	18.48	PASS
	46	5230	15.56	15.72	18.65	PASS
	54	5270	15.52	15.61	18.58	PASS
	62	5310	15.57	15.52	18.56	PASS
	102	5510	15.99	15.85	18.93	PASS
	134	5670	15.84	15.48	18.67	PASS
	151	5755	15.76	15.62	18.70	PASS
	159	5795	15.85	15.71	18.79	PASS
11AC80	42	5210	14.98	---	---	PASS
	58	5290	14.96	---	---	PASS
	106	5530	14.93	---	---	PASS
	155	5775	14.89	---	---	PASS
11AC80 MIMO	42	5210	14.21	14.62	17.43	PASS
	58	5290	14.09	14.52	17.32	PASS
	106	5530	14.21	14.52	17.38	PASS
	155	5775	14.09	14.72	17.43	PASS

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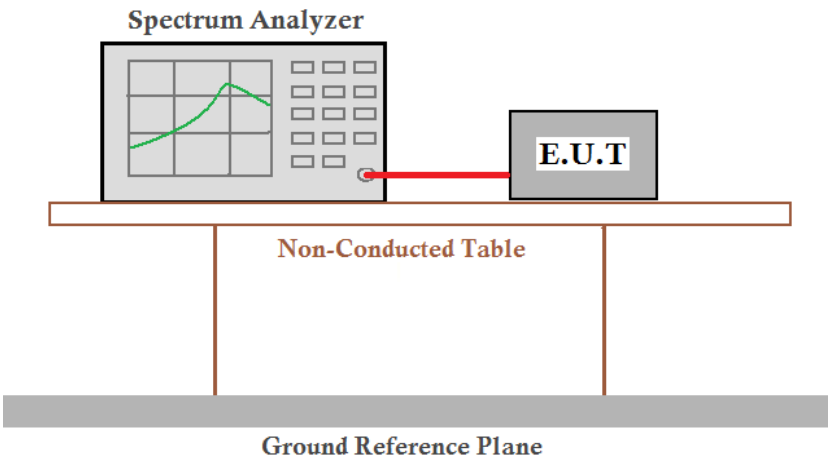
3.5 26dB Emission Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(a)
Test Method:	ANSI C63.10: 2013
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 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(HT20); MCS0 of rate is the worst case of 802.11ac(HT40); MCS0 of rate is the worst case of 802.11ac(HT80). Only the worst case is recorded in the report.
Limit:	No restriction limits
Test Results:	Pass

Test Mode	Test Channel	Frequency [MHz]	26dB Emission Bandwidth [MHz]		Verdict
			ANT 1	ANT 2	
11A20	36	5180	22.89	---	PASS
	44	5200	22.41	---	PASS
	48	5240	22.41	---	PASS
	52	5260	23.01	---	PASS
	60	5300	22.77	---	PASS
	64	5320	22.98	---	PASS
	100	5500	22.86	---	PASS
	140	5700	26.07	---	PASS
11A20 CDD	36	5180	22.23	21.87	PASS
	44	5200	22.26	21.90	PASS

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	48	5240	22.47	21.90	PASS
	52	5260	22.53	21.87	PASS
	60	5300	22.17	22.20	PASS
	64	5320	22.32	21.99	PASS
	100	5500	22.20	22.20	PASS
	140	5700	22.11	29.97	PASS
11N20	36	5180	23.64	---	PASS
	44	5200	23.76	---	PASS
	48	5240	23.34	---	PASS
	52	5260	23.49	---	PASS
	60	5300	23.79	---	PASS
	64	5320	23.70	---	PASS
	100	5500	23.70	---	PASS
	140	5700	24.09	---	PASS
11N20 MIMO	36	5180	23.55	22.98	PASS
	44	5200	24.06	22.92	PASS
	48	5240	23.64	23.13	PASS
	52	5260	23.17	23.13	PASS
	60	5300	23.49	23.25	PASS
	64	5320	23.49	23.19	PASS
	100	5500	23.94	23.07	PASS
	140	5700	22.77	26.43	PASS
11N40	38	5190	41.64	---	PASS
	46	5230	41.76	---	PASS
	54	5270	41.58	---	PASS
	62	5310	41.52	---	PASS
	102	5510	41.34	---	PASS
	134	5670	41.46	---	PASS
11N40 MIMO	38	5190	41.52	41.82	PASS
	46	5230	41.28	41.28	PASS
	54	5270	41.34	41.34	PASS
	62	5310	41.34	41.28	PASS
	102	5510	41.46	41.76	PASS
	134	5670	41.34	41.94	PASS
11AC20	36	5180	23.52	---	PASS
	44	5200	24.27	---	PASS
	48	5240	23.70	---	PASS
	52	5260	24.27	---	PASS
	60	5300	24.18	---	PASS
	64	5320	23.73	---	PASS
	100	5500	24.18	---	PASS
	140	5700	23.91	---	PASS
11AC20 MIMO	36	5180	24.48	23.01	PASS
	44	5200	24.72	24.57	PASS
	48	5240	23.46	23.61	PASS

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	52	5260	24.84	23.25	PASS
	60	5300	24.42	23.67	PASS
	64	5320	26.37	23.43	PASS
	100	5500	24.72	23.16	PASS
	140	5700	24.69	25.83	PASS
11AC40	38	5190	41.64	---	PASS
	46	5230	41.52	---	PASS
	54	5270	41.64	---	PASS
	62	5310	41.70	---	PASS
	102	5510	41.82	---	PASS
	134	5670	41.76	---	PASS
11AC40 MIMO	38	5190	41.64	41.10	PASS
	46	5230	41.58	41.04	PASS
	54	5270	41.52	41.22	PASS
	62	5310	41.40	41.22	PASS
	102	5510	41.46	41.40	PASS
	134	5670	41.34	42.30	PASS
11AC80	42	5210	84.32	---	PASS
	58	5290	84.32	---	PASS
	106	5530	84.00	---	PASS
11AC80 MIMO	42	5210	83.84	83.52	PASS
	58	5290	84.32	83.68	PASS
	106	5530	83.84	83.04	PASS

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3.5.1 Plots for 26dB Emission Bandwidth

3.5.1.1 11A20_36 ANT 1

Date: 13.MAR.2020 08:54:37

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3.5.1.2 11A20_48 ANT 1

Date: 13.MAR.2020 08:57:46

3.5.1.3 11A20_52 ANT 1

Date: 13.MAR.2020 08:59:09

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3.5.1.4 11A20_64 ANT 1

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3.5.1.5 11A20_100 ANT 1

Date: 13.MAR.2020 09:02:47

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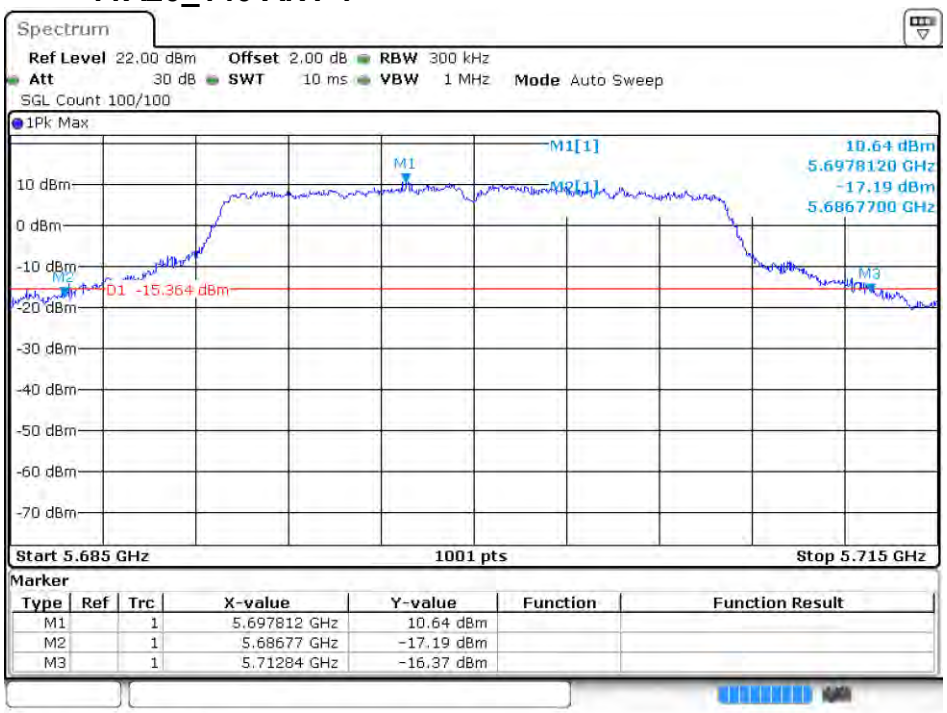
3.5.1.6 11A20_140 ANT 1



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3.5.1.7 11A20_CDD_36 ANT 1

Date: 12.MAR.2020 11:56:13

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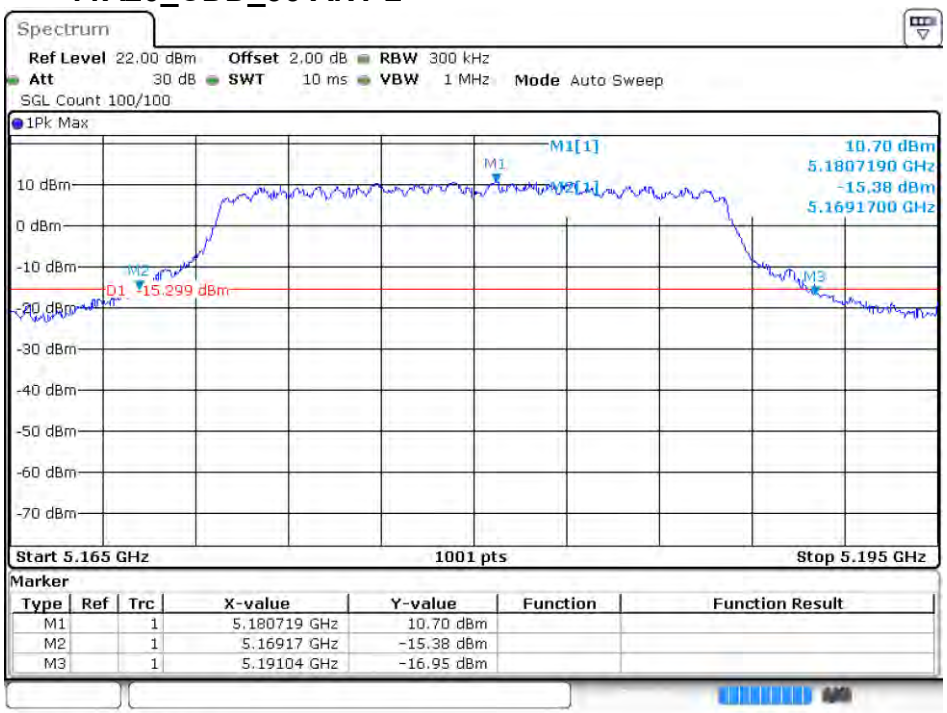
3.5.1.8 11A20_CDD_36 ANT 2



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3.5.1.9 11A20_CDD_44 ANT 1

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3.5.1.10 11A20_CDD_44 ANT 2

Date: 13.MAR.2020 07:13:32

3.5.1.11 11A20_CDD_48 ANT 1

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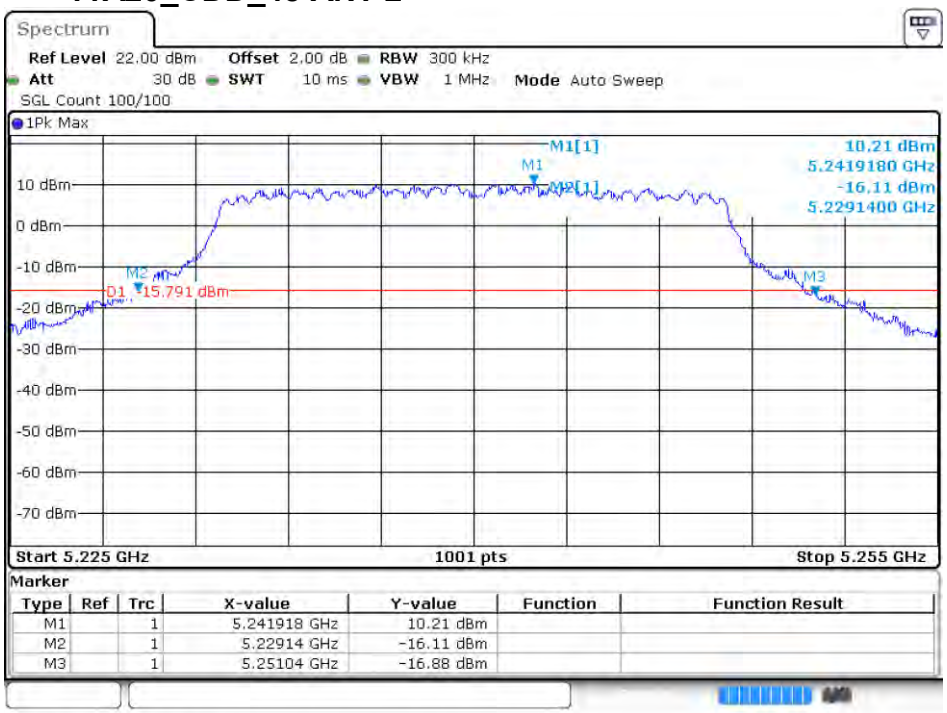
3.5.1.12 11A20_CDD_48 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.241918 GHz	10.21 dBm		
M2		1	5.22914 GHz	-16.11 dBm		
M3		1	5.25104 GHz	-16.88 dBm		

Date: 13.MAR.2020 07:14:49

3.5.1.13 11A20_CDD_52 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.257722 GHz	10.76 dBm		
M2		1	5.24878 GHz	-16.40 dBm		
M3		1	5.27131 GHz	-17.09 dBm		

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3.5.1.14 11A20_CDD_52 ANT 2

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3.5.1.15 11A20_CDD_60 ANT 1

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3.5.1.16 11A20_CDD_60 ANT 2

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3.5.1.17 11A20_CDD_64 ANT 1

Date: 12.MAR.2020 12:04:46

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3.5.1.18 11A20_CDD_64 ANT 2

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3.5.1.19 11A20_CDD_100 ANT 1

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3.5.1.20 11A20_CDD_100 ANT 2

Date: 13.MAR.2020 07:21:03

3.5.1.21 11A20_CDD_140 ANT 1

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3.5.1.22 11A20_CDD_140 ANT 2

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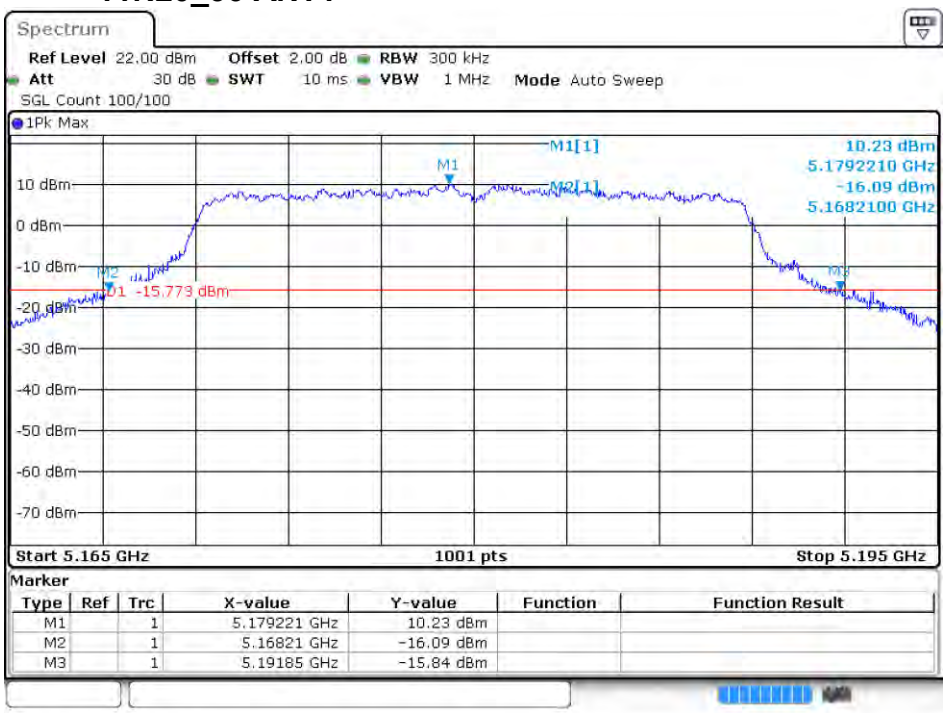
3.5.1.23 11N20_36 ANT1



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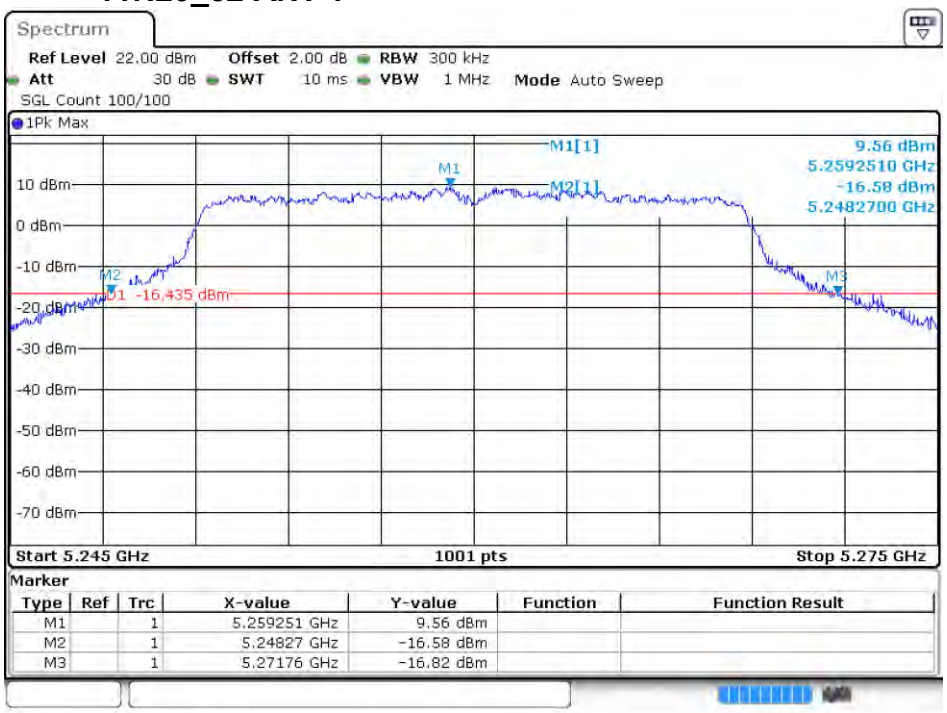
3.5.1.24 11N20_48 ANT 1

Date: 13.MAR.2020 09:11:35

3.5.1.25 11N20_52 ANT 1



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3.5.1.26 11N20_64 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.319341 GHz	8.87 dBm		
M2		1	5.30815 GHz	-17.96 dBm		
M3		1	5.33185 GHz	-17.71 dBm		

Date: 13.MAR.2020 09:15:06

3.5.1.27 11N20_100 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.499221 GHz	9.69 dBm		
M2		1	5.48812 GHz	-18.18 dBm		
M3		1	5.51182 GHz	-17.45 dBm		

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3.5.1.28 11N20_140 ANT 1

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3.5.1.29 11N20MIMO_36 ANT 1

Date: 12.MAR.2020 12:18:33

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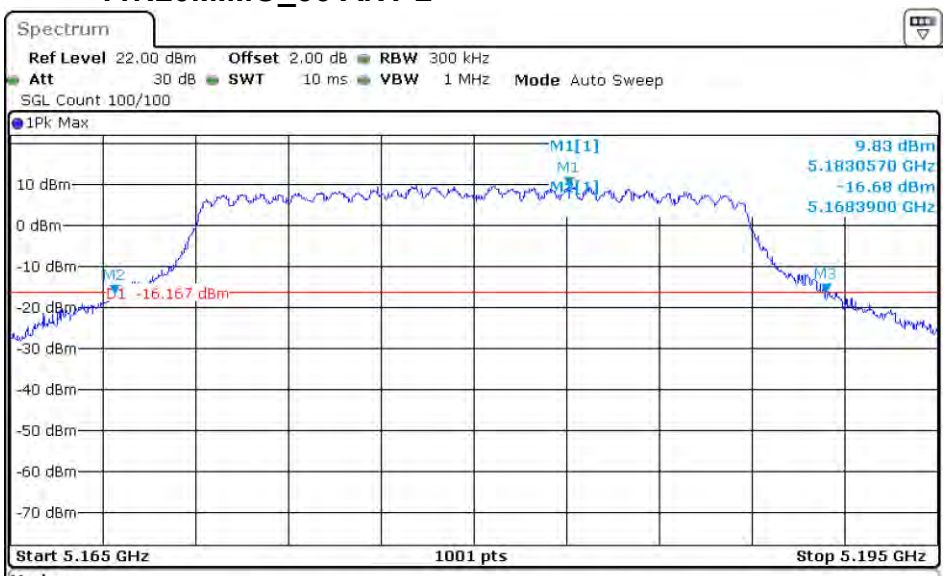
3.5.1.30 11N20MIMO_36 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.183057 GHz	9.83 dBm		
M2		1	5.16839 GHz	-16.68 dBm		
M3		1	5.19137 GHz	-16.25 dBm		

Date: 13.MAR.2020 07:28:14

3.5.1.31 11N20MIMO_40 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.199311 GHz	9.32 dBm		
M2		1	5.18761 GHz	-19.38 dBm		
M3		1	5.21167 GHz	-16.99 dBm		

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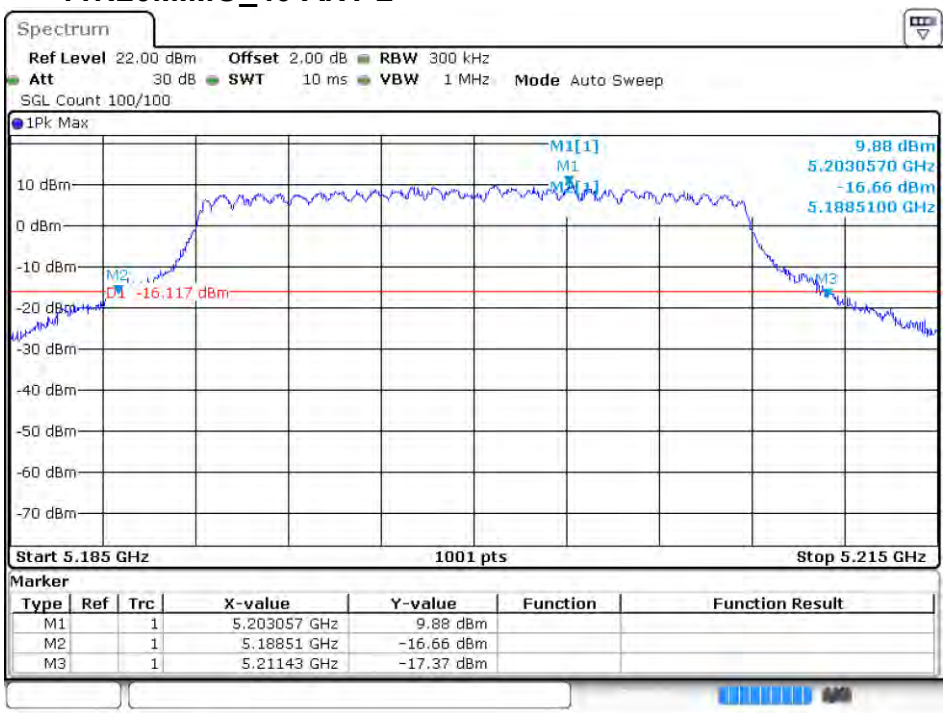
3.5.1.32 11N20MIMO_40 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.203057 GHz	9.88 dBm		
M2		1	5.18851 GHz	-16.66 dBm		
M3		1	5.21143 GHz	-17.37 dBm		

Date: 13.MAR.2020 07:29:20

3.5.1.33 11N20MIMO_48 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.239221 GHz	9.49 dBm		
M2		1	5.22815 GHz	-17.34 dBm		
M3		1	5.25179 GHz	-17.12 dBm		

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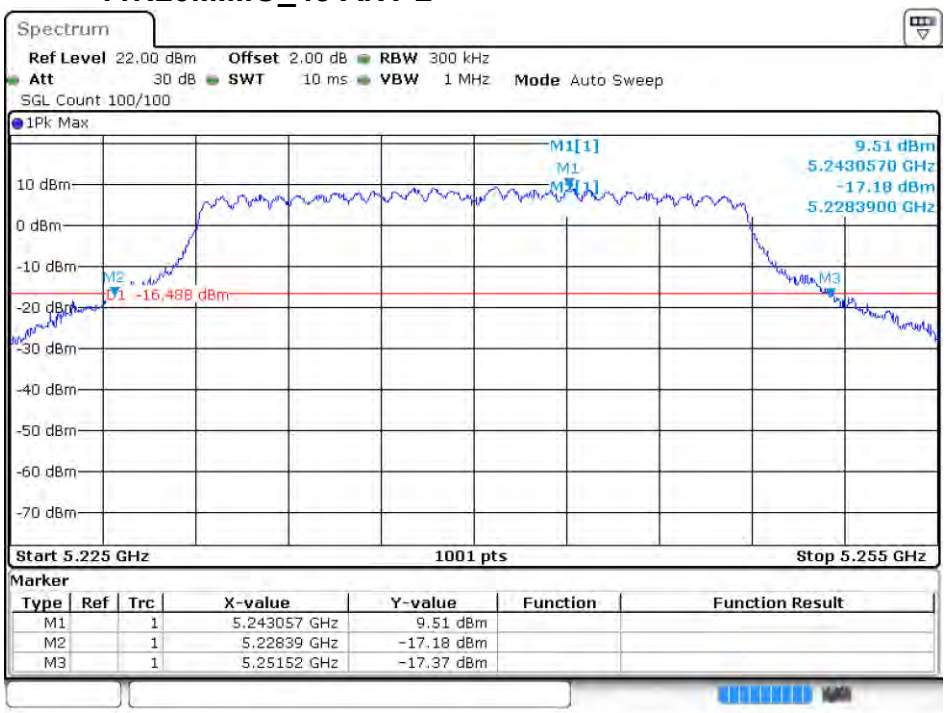
3.5.1.34 11N20MIMO_48 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.243057 GHz	9.51 dBm		
M2		1	5.22839 GHz	-17.18 dBm		
M3		1	5.25152 GHz	-17.37 dBm		

Date: 13.MAR.2020 07:30:25

3.5.1.35 11N20MIMO_52 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.259221 GHz	9.34 dBm		
M2		1	5.24812 GHz	-17.10 dBm		
M3		1	5.27179 GHz	-17.18 dBm		

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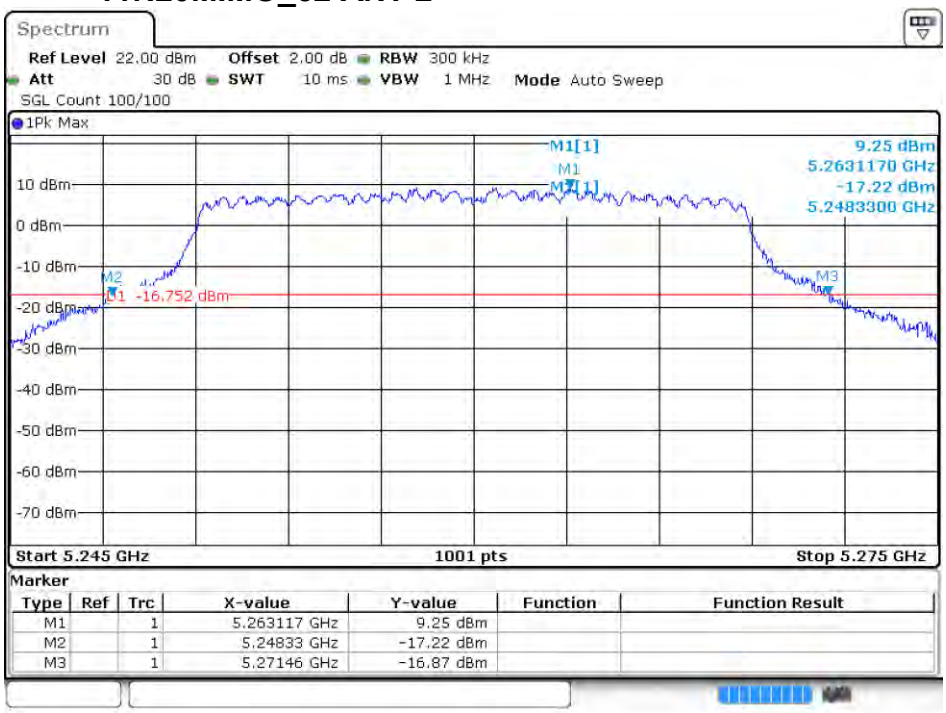
3.5.1.36 11N20MIMO_52 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.263117 GHz	9.25 dBm		
M2		1	5.24833 GHz	-17.22 dBm		
M3		1	5.27146 GHz	-16.87 dBm		

Date: 13.MAR.2020 07:31:30

3.5.1.37 11N20MIMO_60 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.299251 GHz	9.23 dBm		
M2		1	5.2883 GHz	-18.33 dBm		
M3		1	5.31179 GHz	-18.05 dBm		

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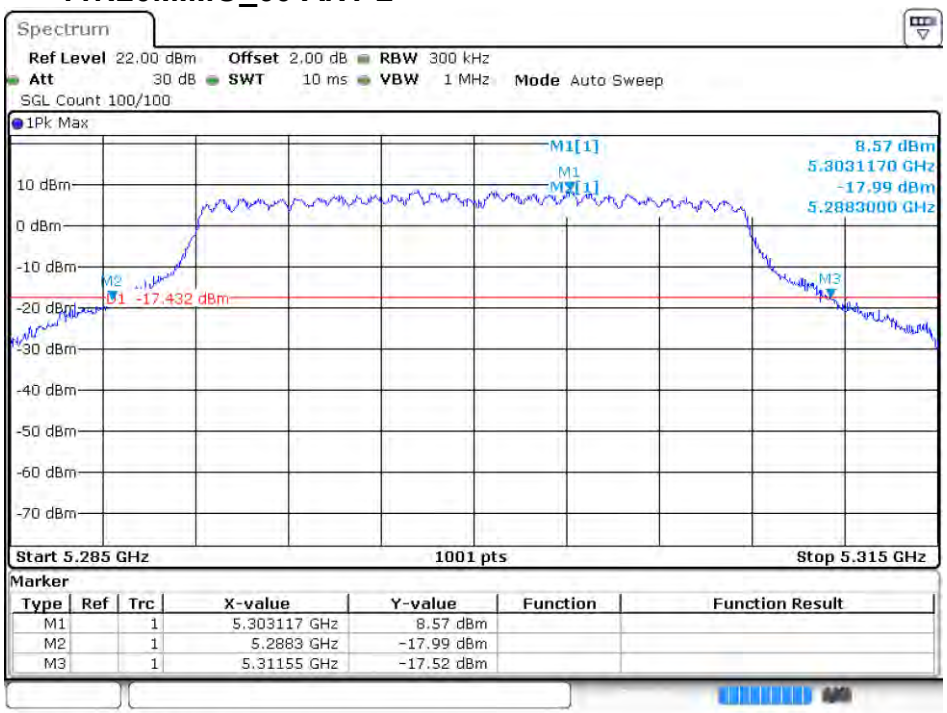
3.5.1.38 11N20MIMO_60 ANT 2



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3.5.1.39 11N20MIMO_64 ANT 1

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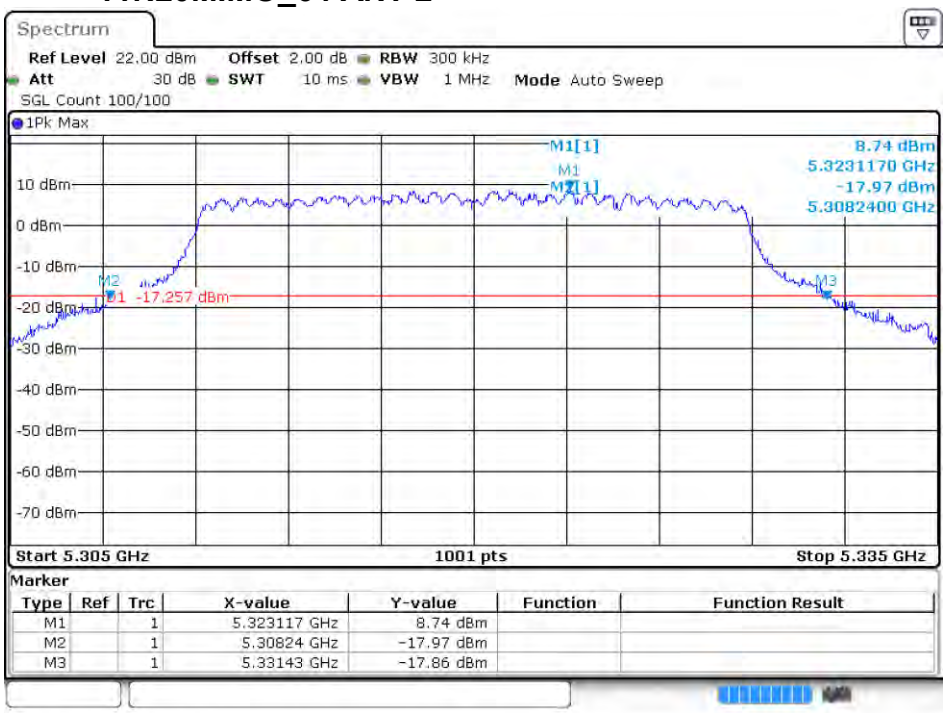
3.5.1.40 11N20MIMO_64 ANT 2



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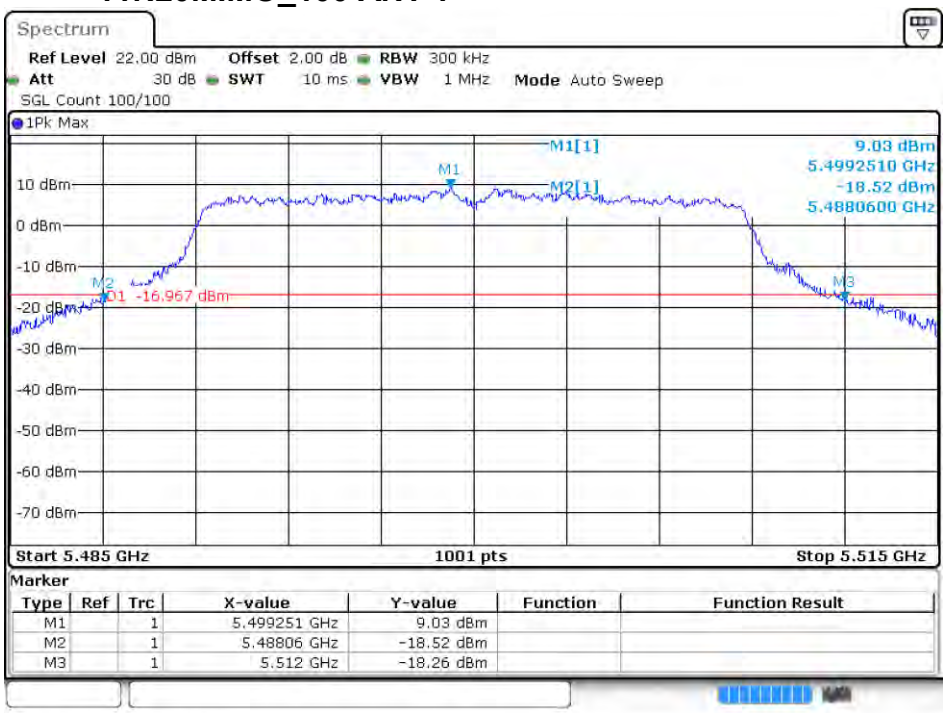
3.5.1.41 11N20MIMO_100 ANT 1



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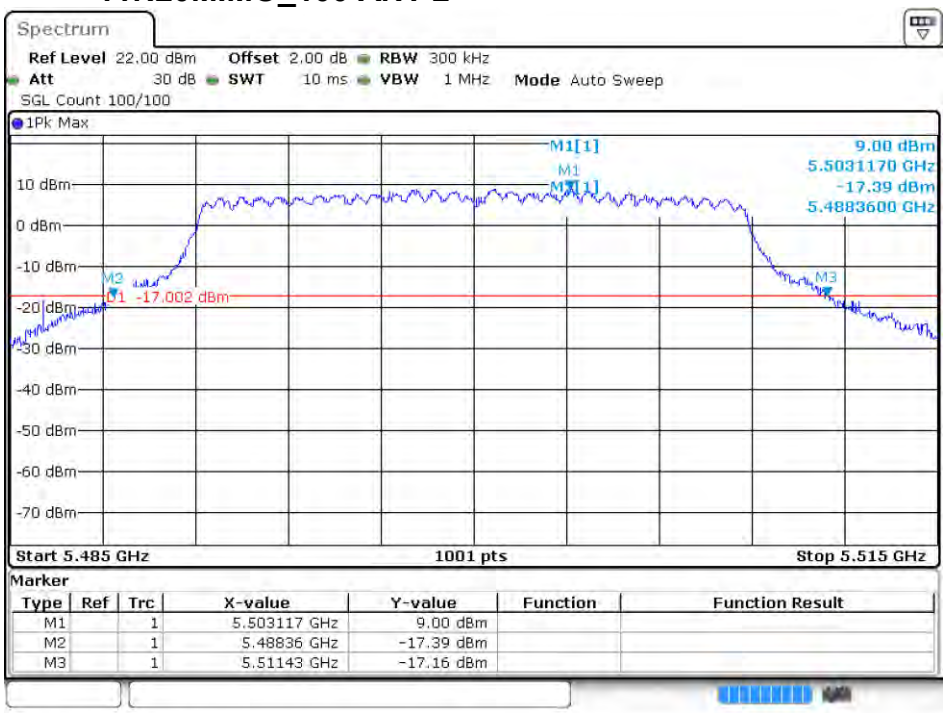
3.5.1.42 11N20MIMO_100 ANT 2



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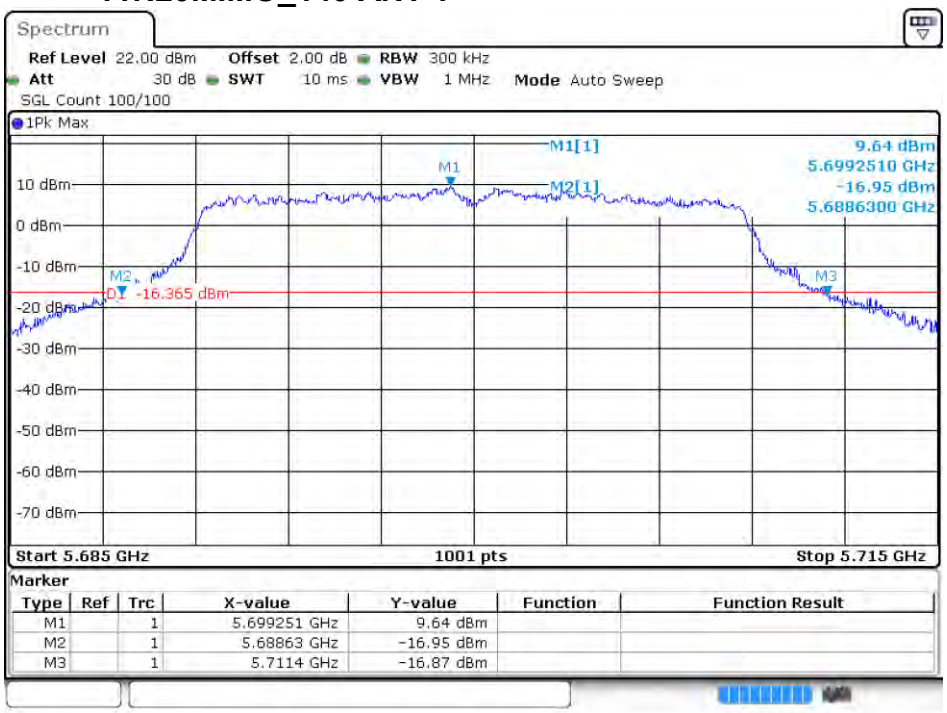
3.5.1.43 11N20MIMO_140 ANT 1



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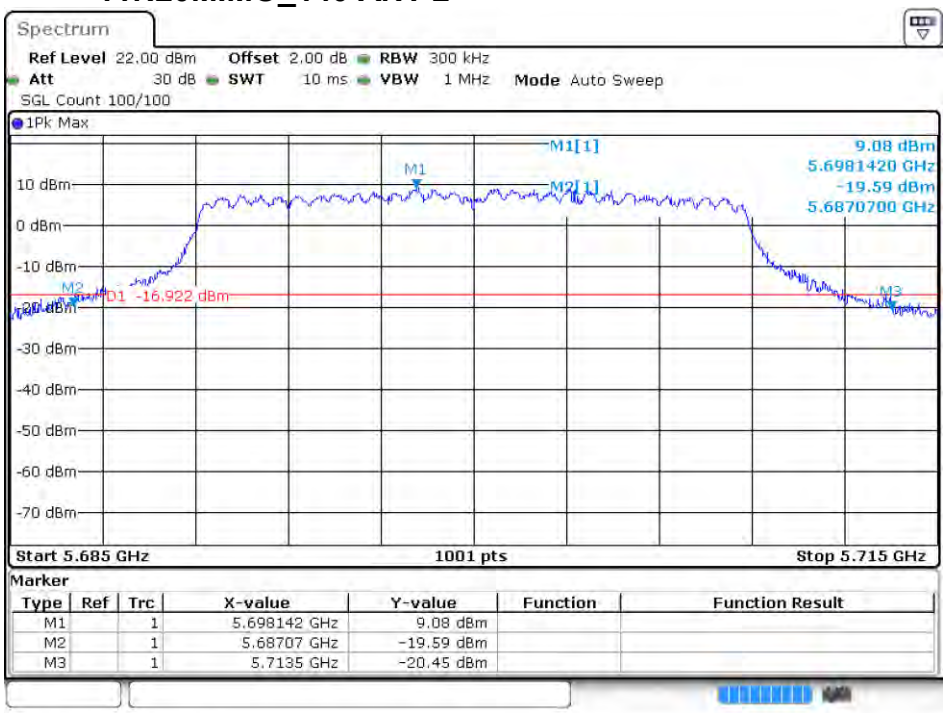
3.5.1.44 11N20MIMO_140 ANT 2



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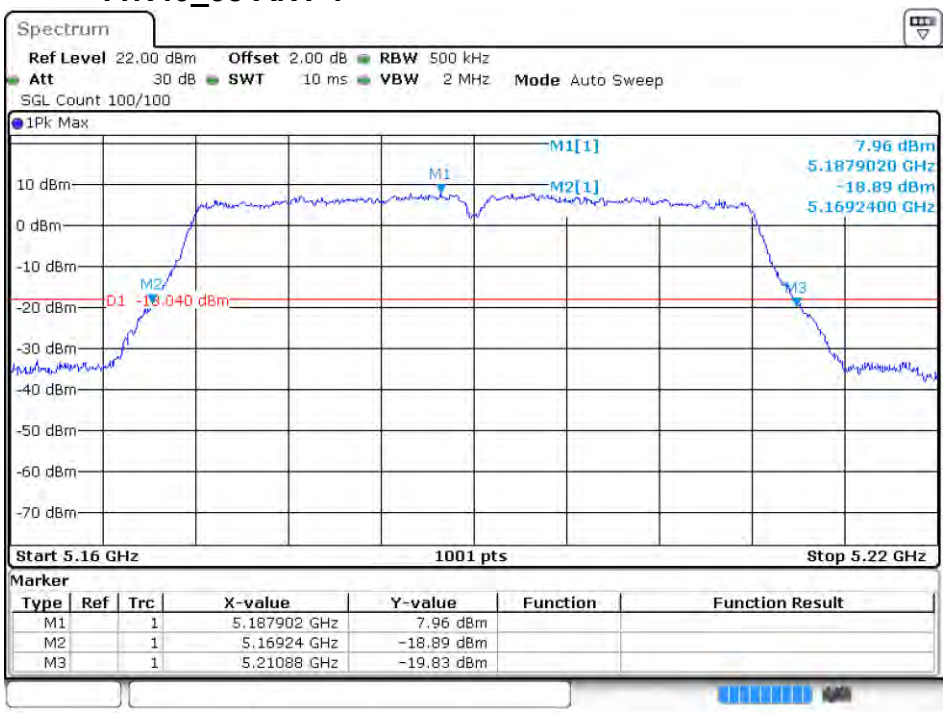
3.5.1.45 11N40_38 ANT 1



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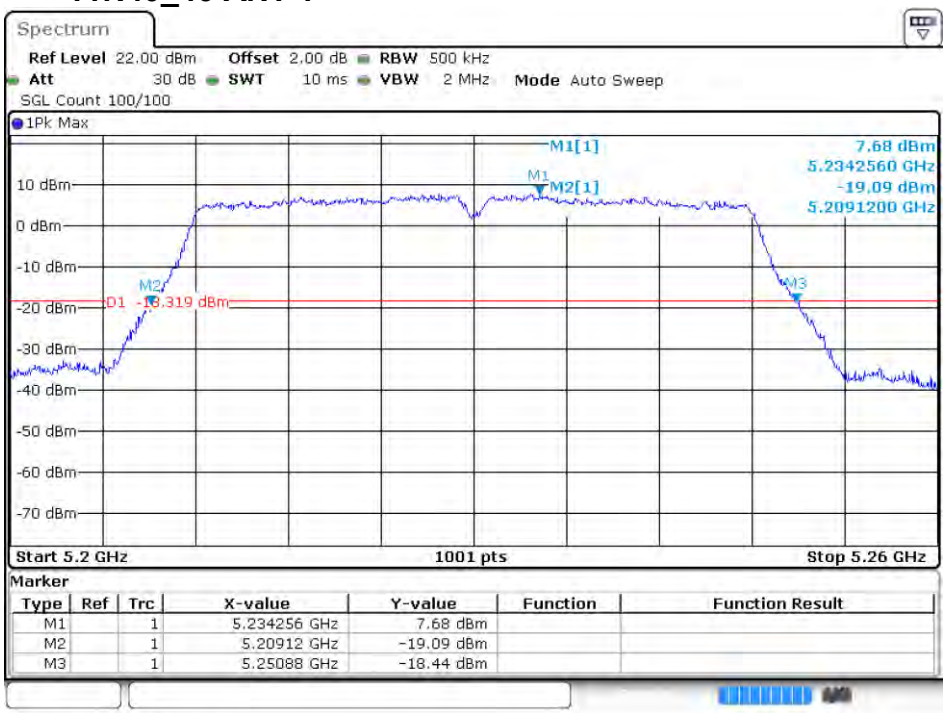
3.5.1.46 11N40_46 ANT 1



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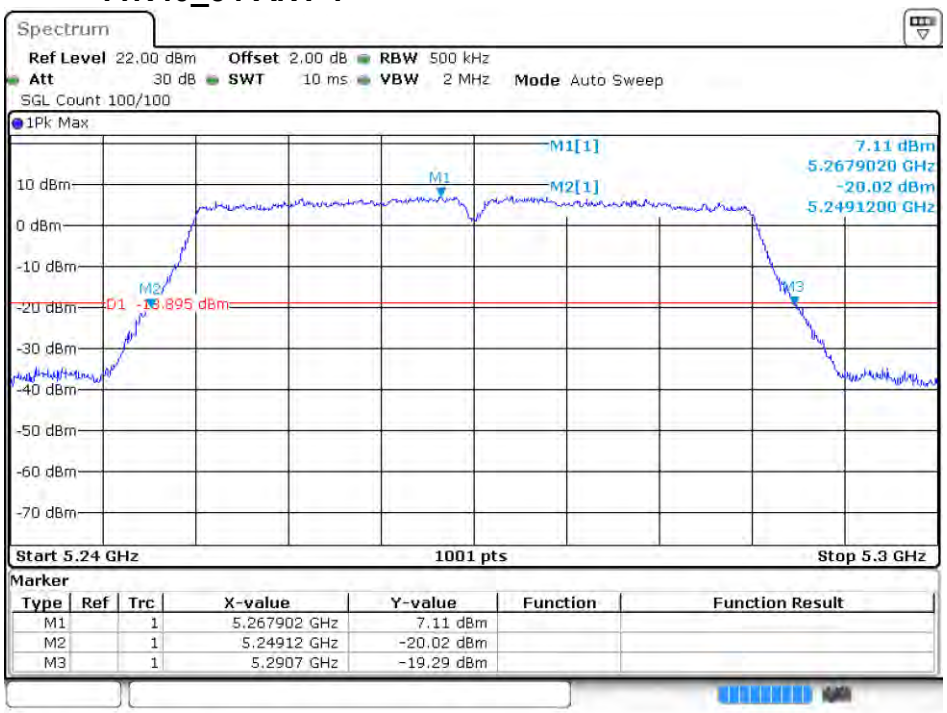
3.5.1.47 11N40_54 ANT 1



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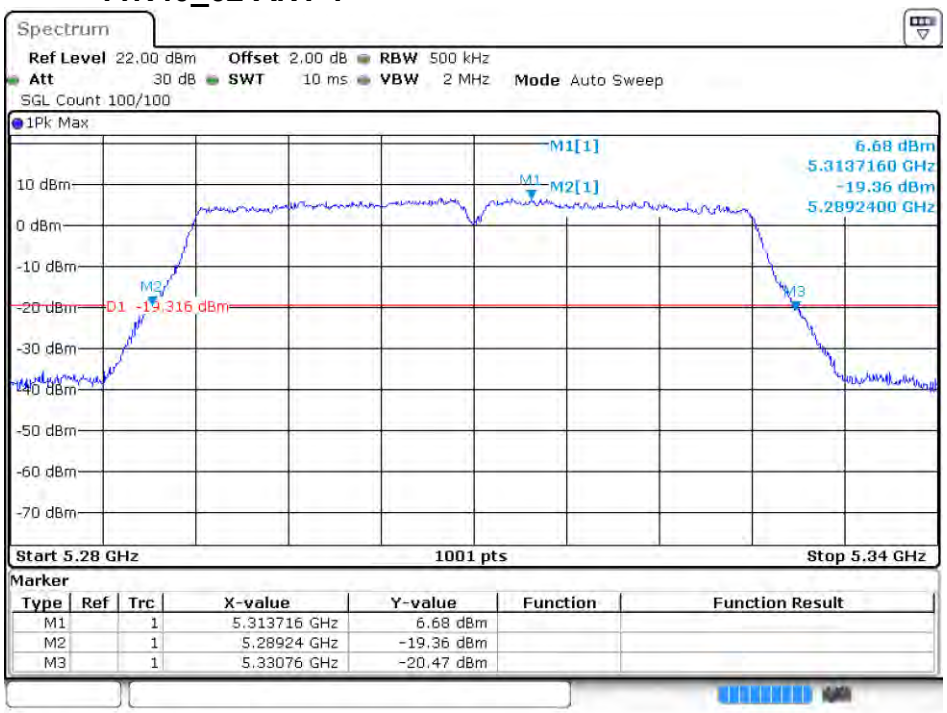
3.5.1.48 11N40_62 ANT 1



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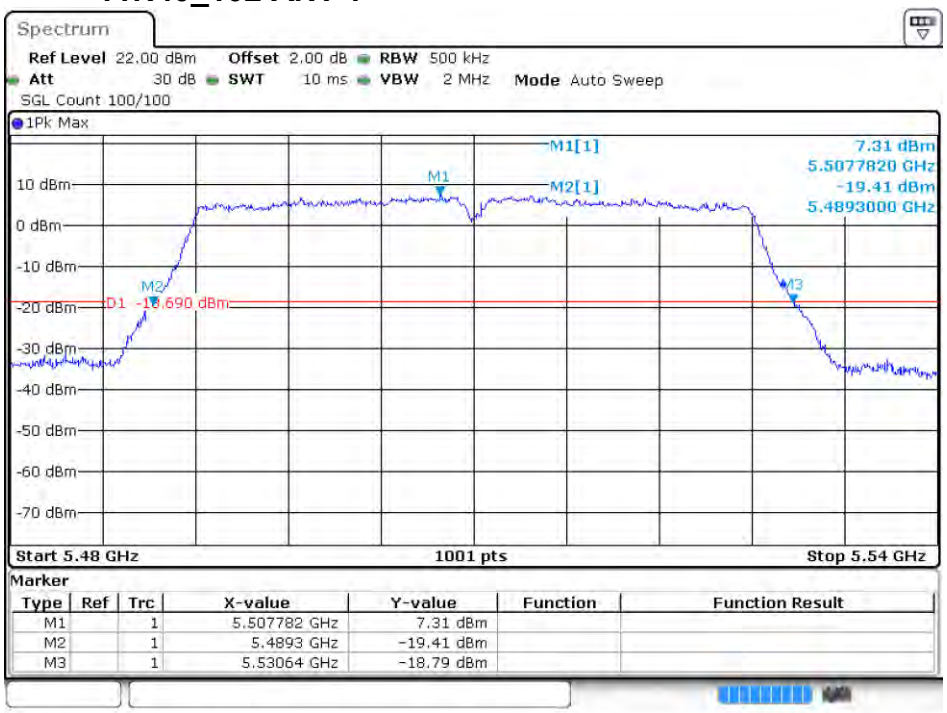
3.5.1.49 11N40_102 ANT 1



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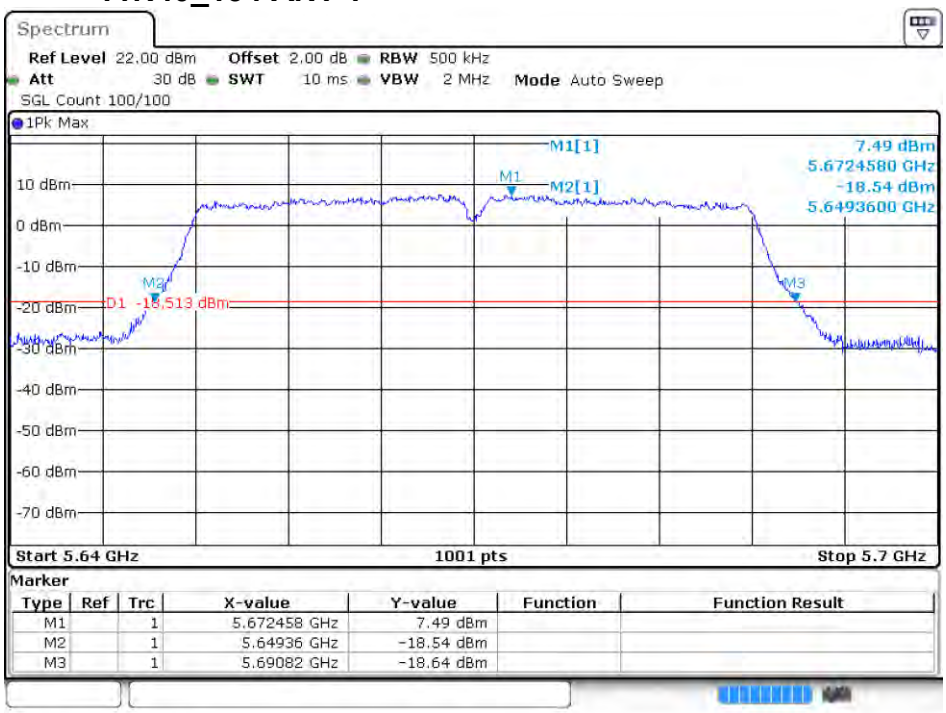
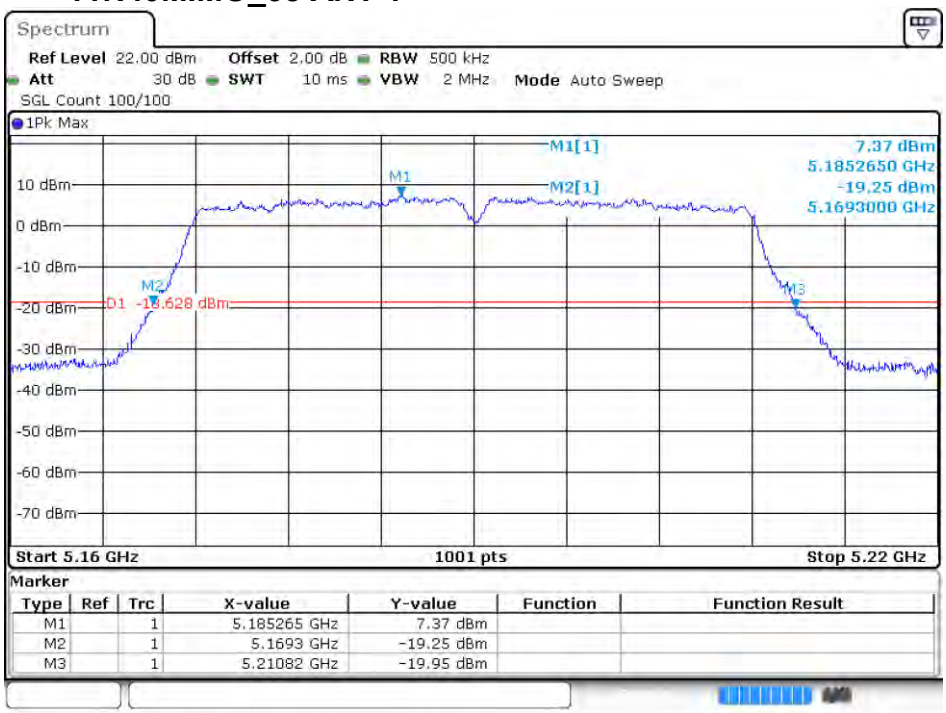
3.5.1.50 11N40_134 ANT 1



Date: 13.MAR.2020 10:13:57

3.5.1.51 11N40MIMO_38 ANT 1



Date: 12.MAR.2020 12:48:18

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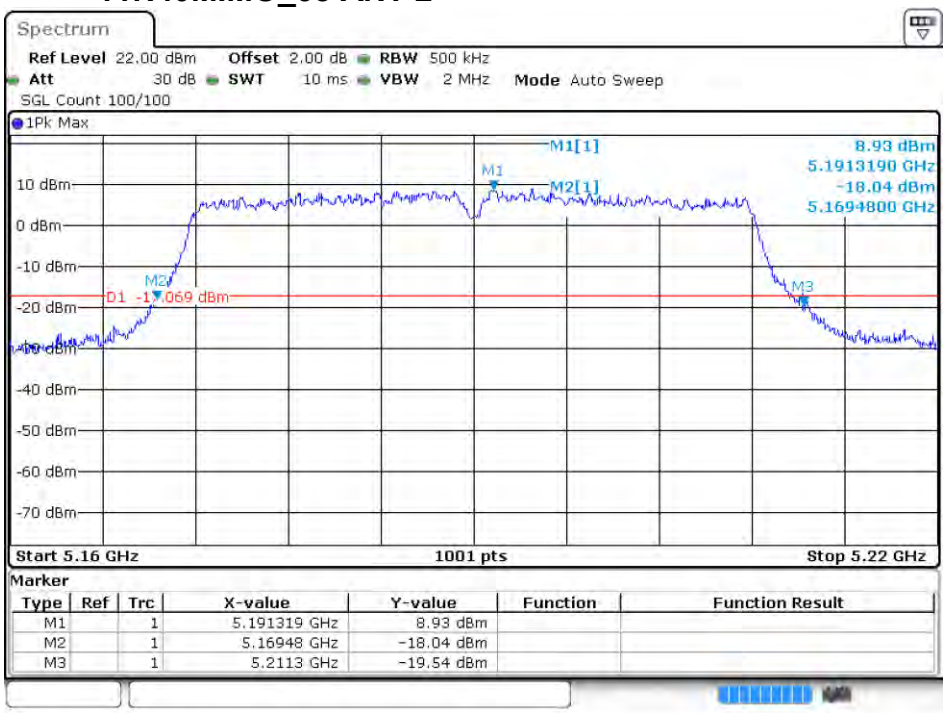
3.5.1.52 11N40MIMO_38 ANT 2



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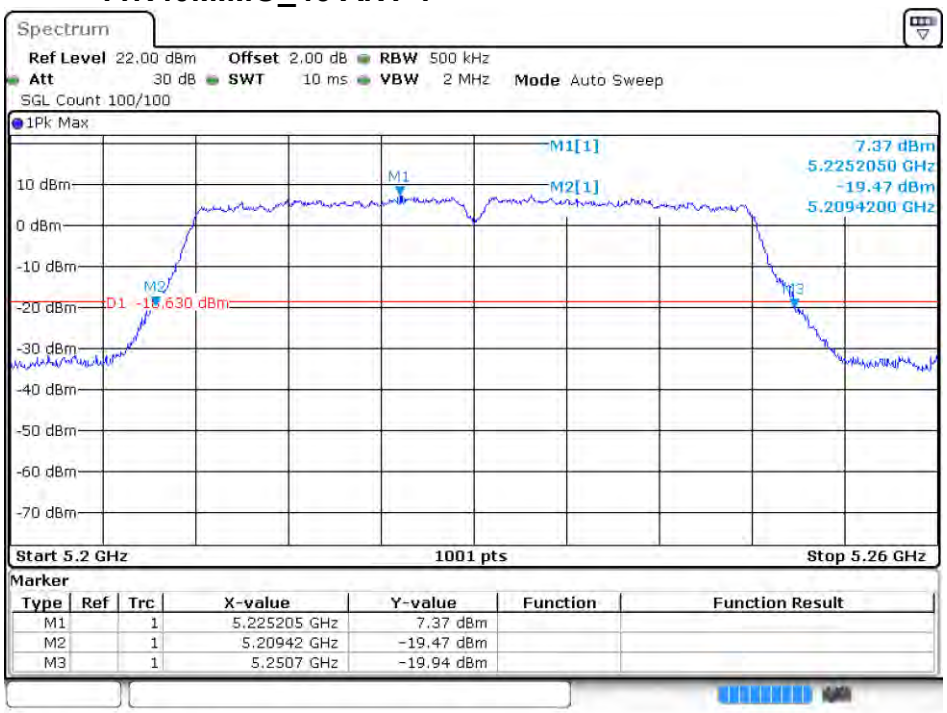
3.5.1.53 11N40MIMO_46 ANT 1



Date: 12.MAR.2020 12:50:14

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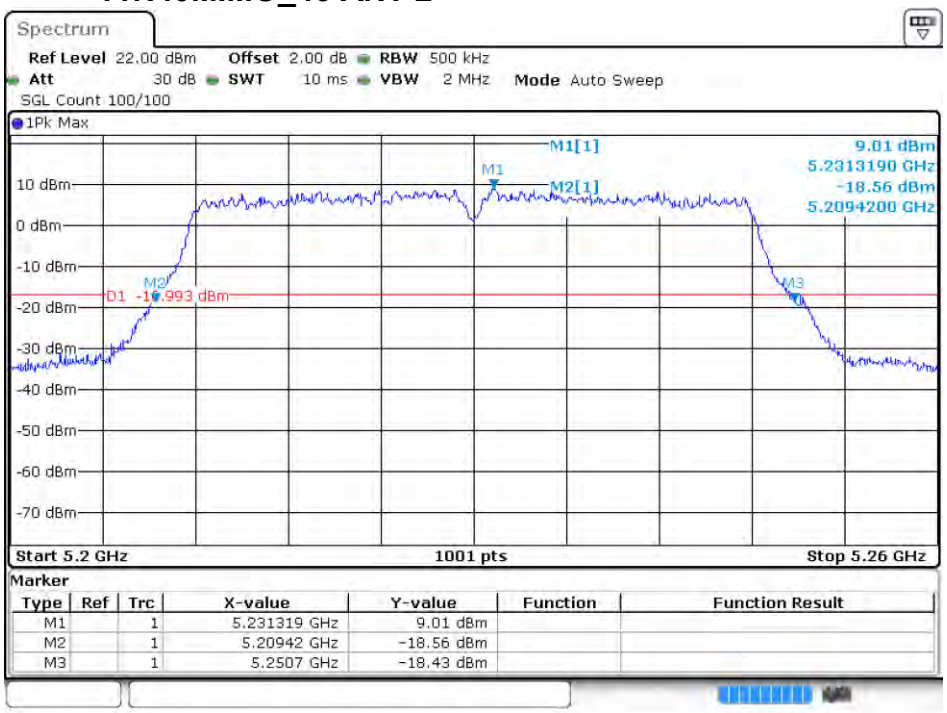
3.5.1.54 11N40MIMO_46 ANT 2



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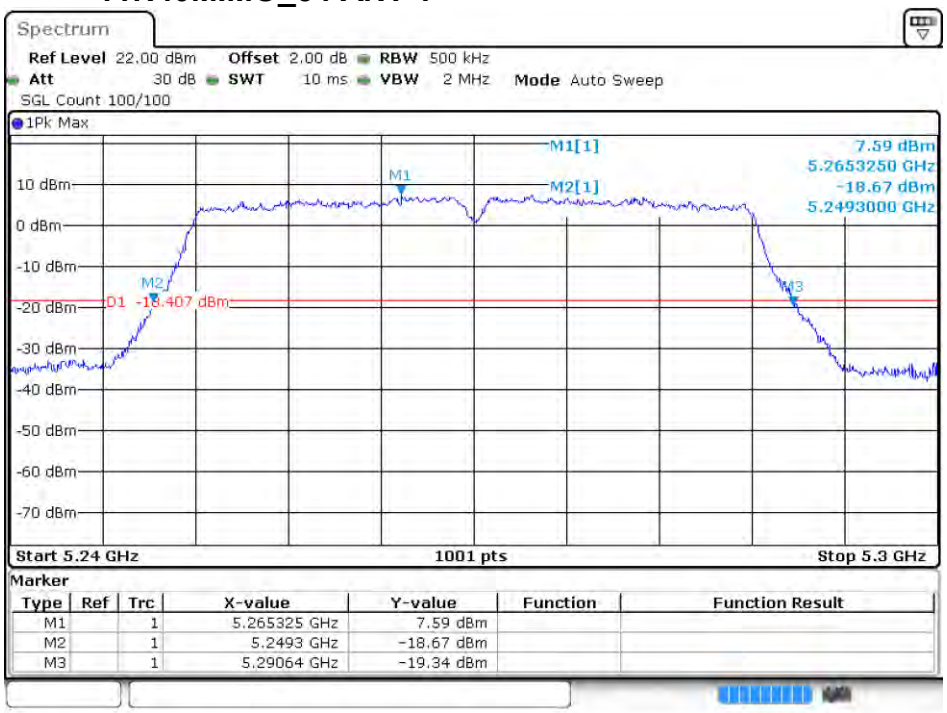
3.5.1.55 11N40MIMO_54 ANT 1



Date: 12.MAR.2020 12:52:04

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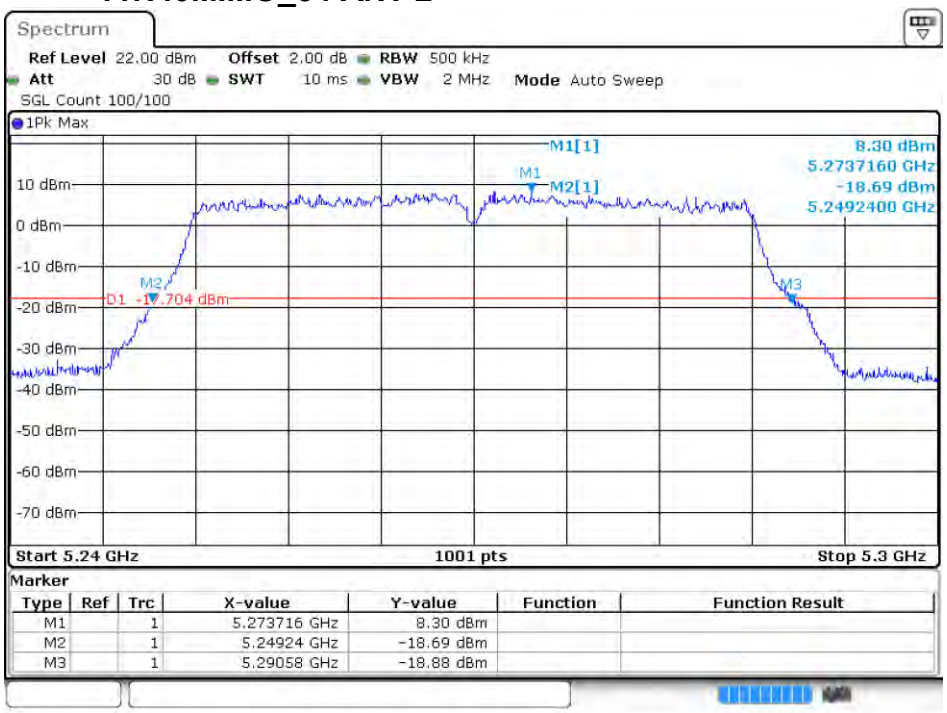
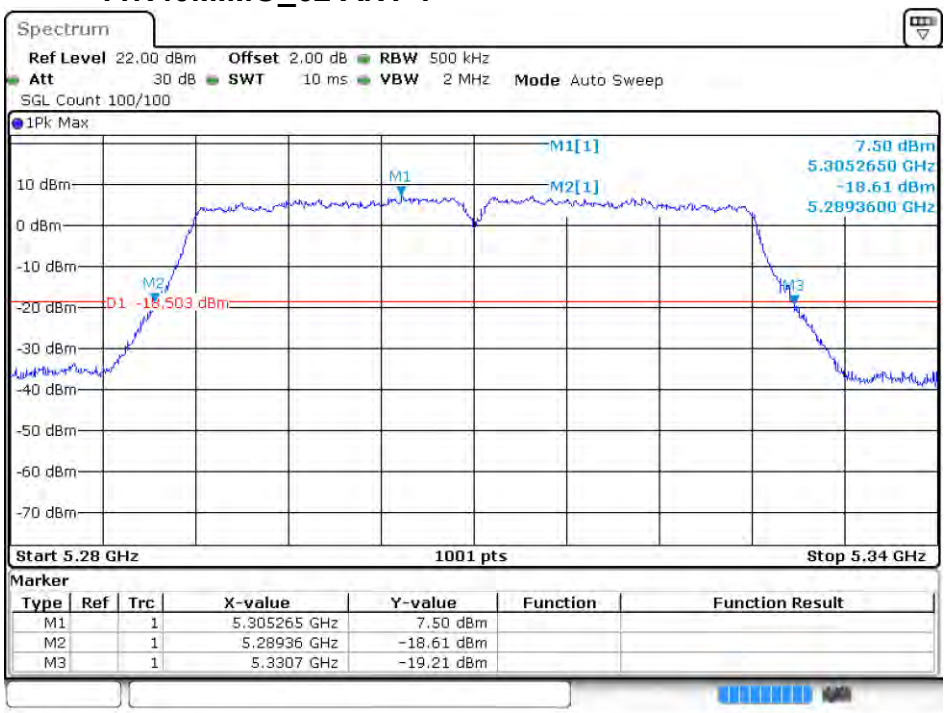
3.5.1.56 11N40MIMO_54 ANT 2



Date: 13.MAR.2020 07:44:53

3.5.1.57 11N40MIMO_62 ANT 1



Date: 12.MAR.2020 12:53:28

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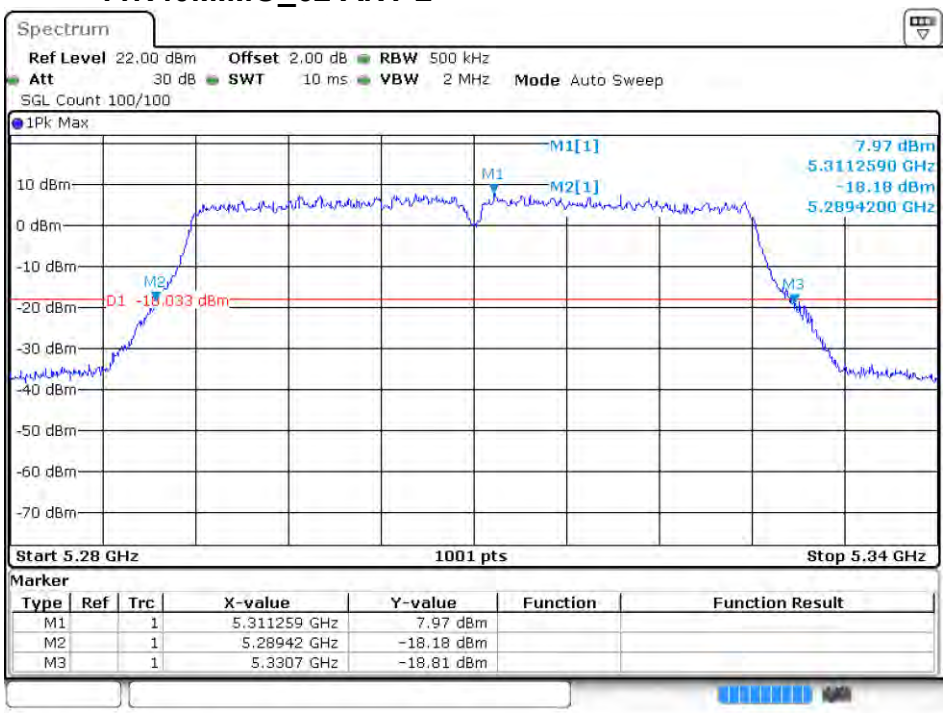
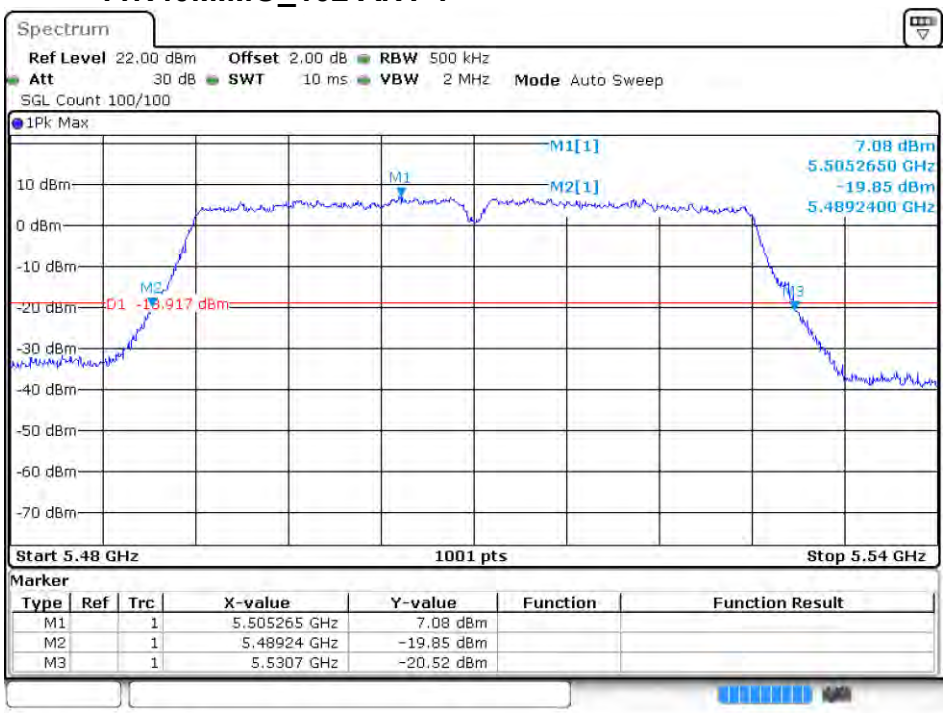
3.5.1.58 11N40MIMO_62 ANT 2



Date: 13.MAR.2020 07:45:58

3.5.1.59 11N40MIMO_102 ANT 1



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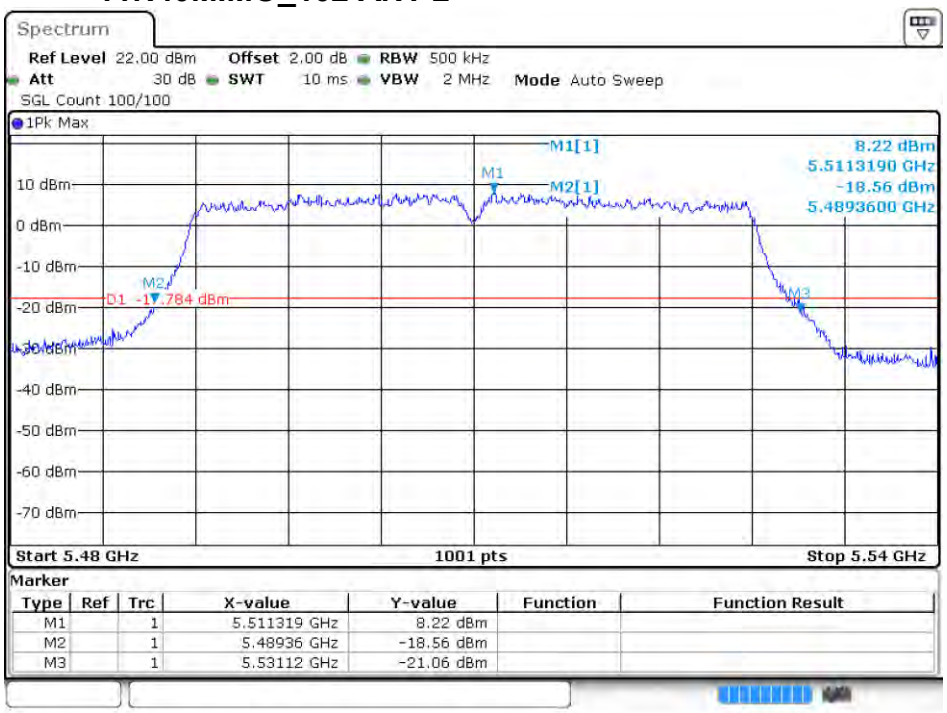
3.5.1.60 11N40MIMO_102 ANT 2



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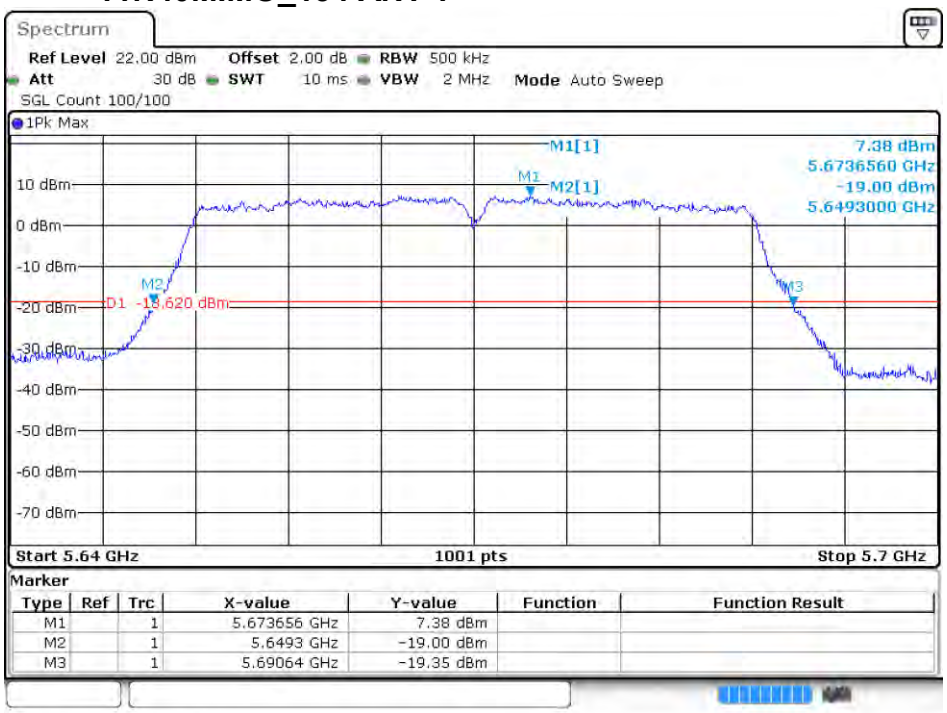
3.5.1.61 11N40MIMO_134 ANT 1



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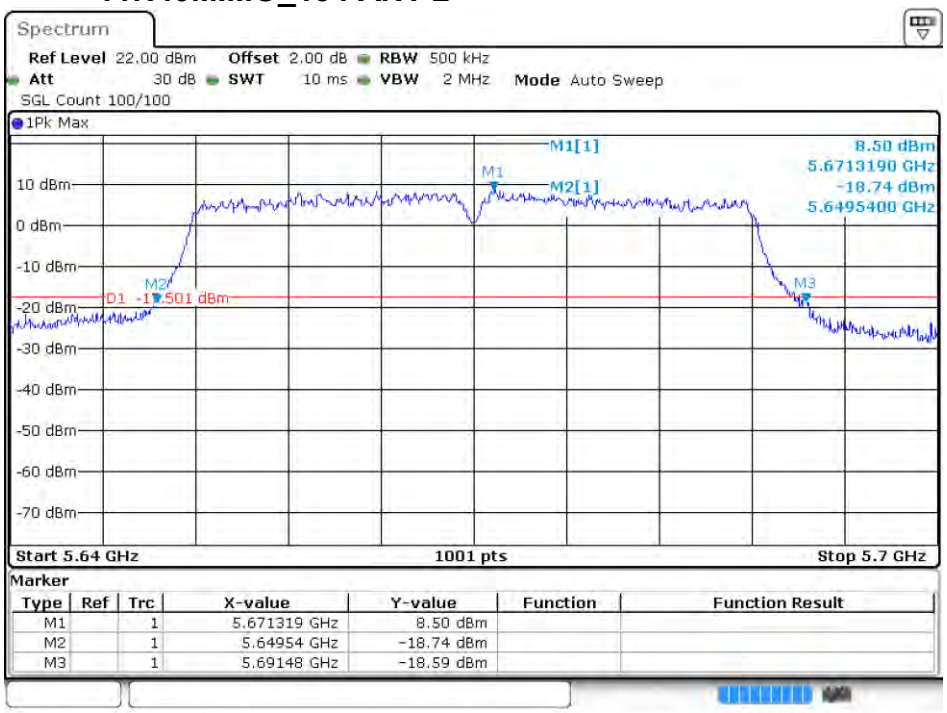
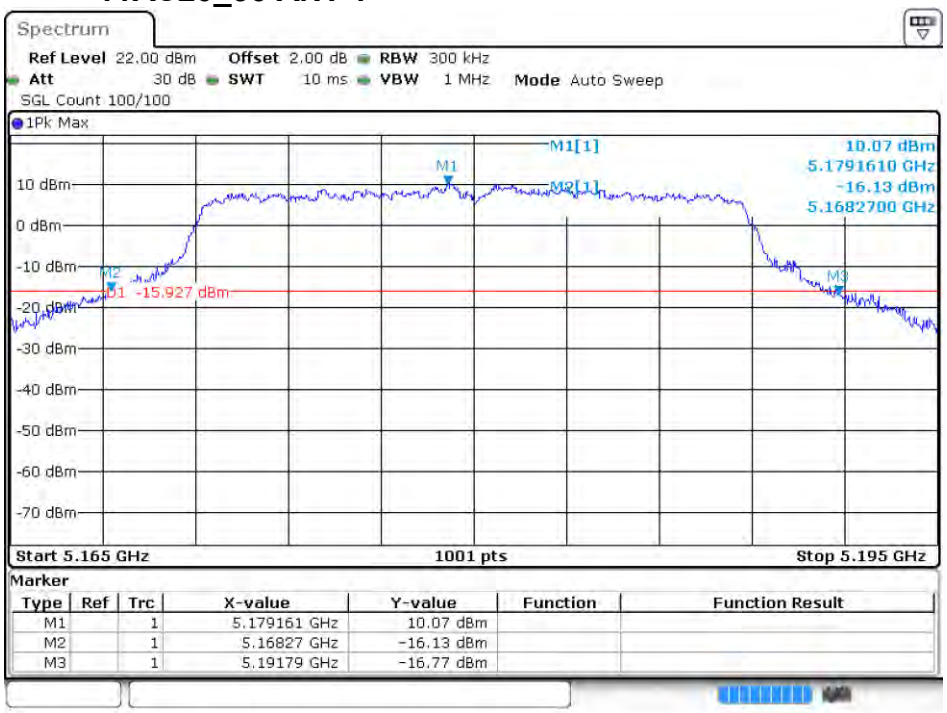
3.5.1.62 11N40MIMO_134 ANT 2



Date: 13.MAR.2020 07:48:56

3.5.1.63 11AC20_36 ANT 1



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3.5.1.64 11AC20_40 ANT 1

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3.5.1.65 11AC20_48 ANT 1

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3.5.1.66 11AC20_52 ANT 1

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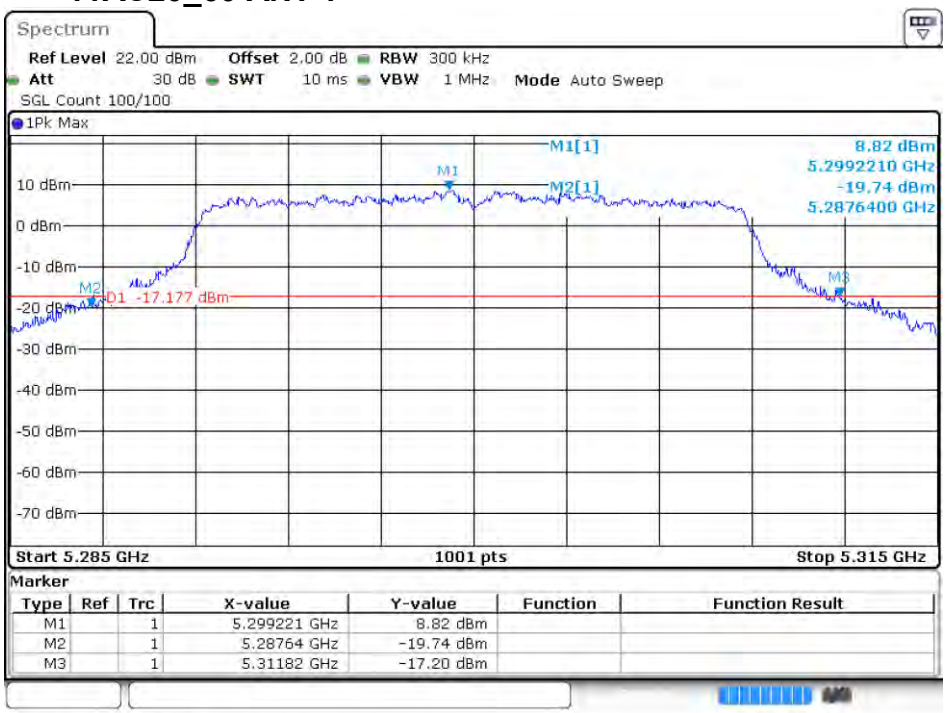
3.5.1.67 11AC20_60 ANT 1



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3.5.1.68 11AC20_64 ANT 1

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3.5.1.69 11AC20_100 ANT 1

Date: 13.MAR.2020 10:27:27

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3.5.1.70 11AC20_140 ANT 1

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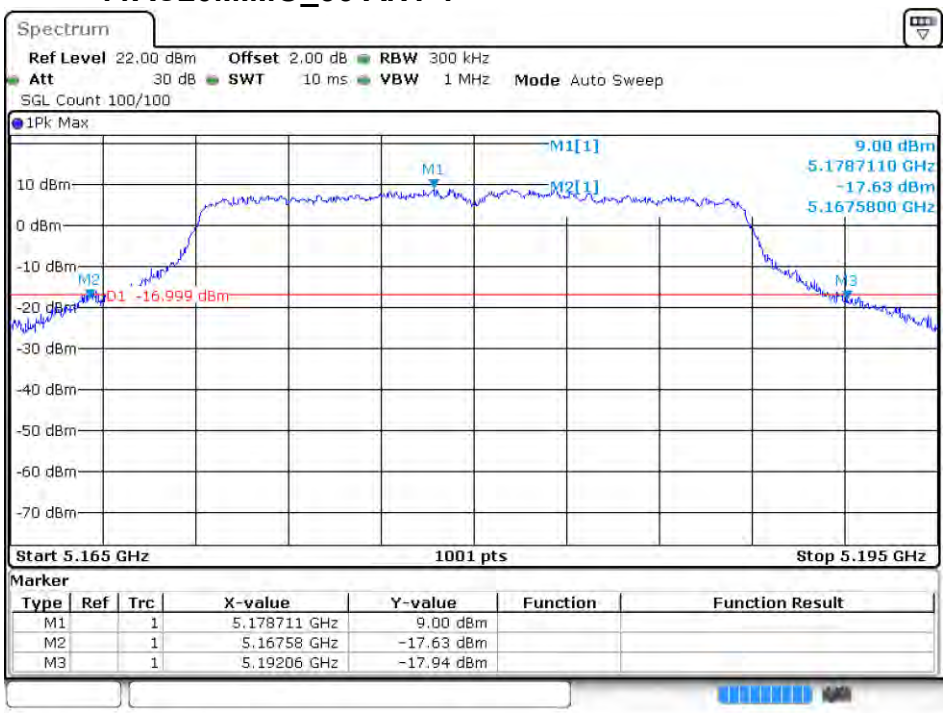
3.5.1.71 11AC20MIMO_36 ANT 1



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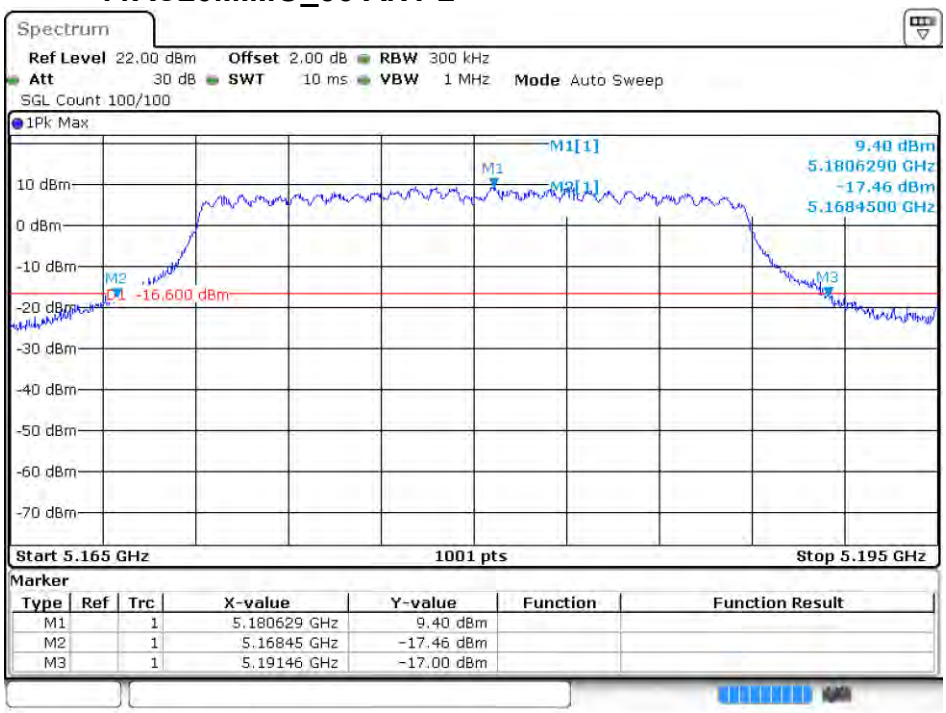

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3.5.1.73 11AC20MIMO_40 ANT

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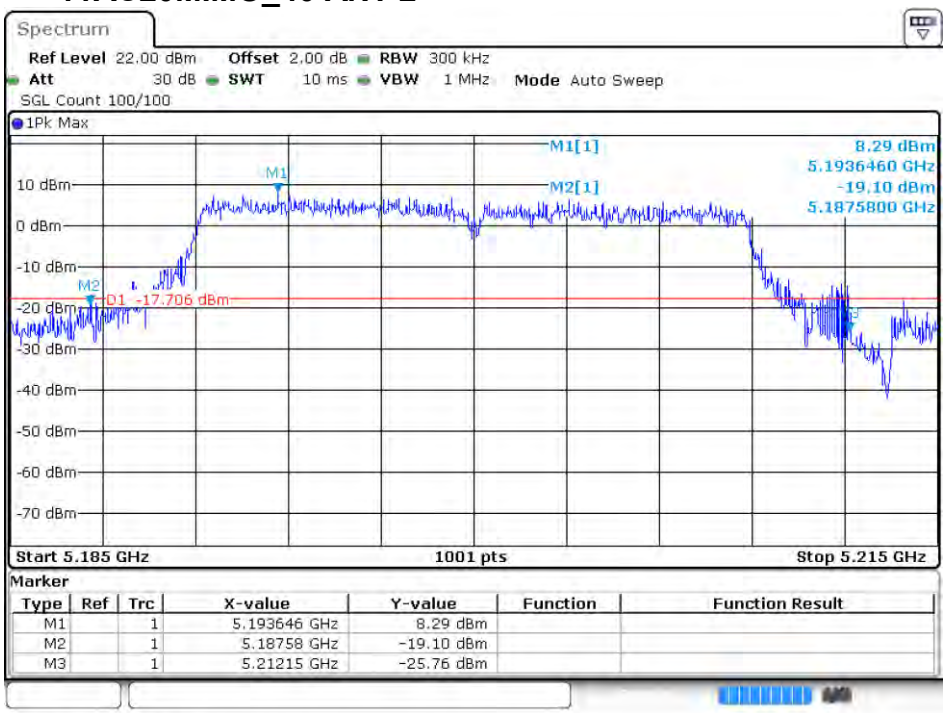
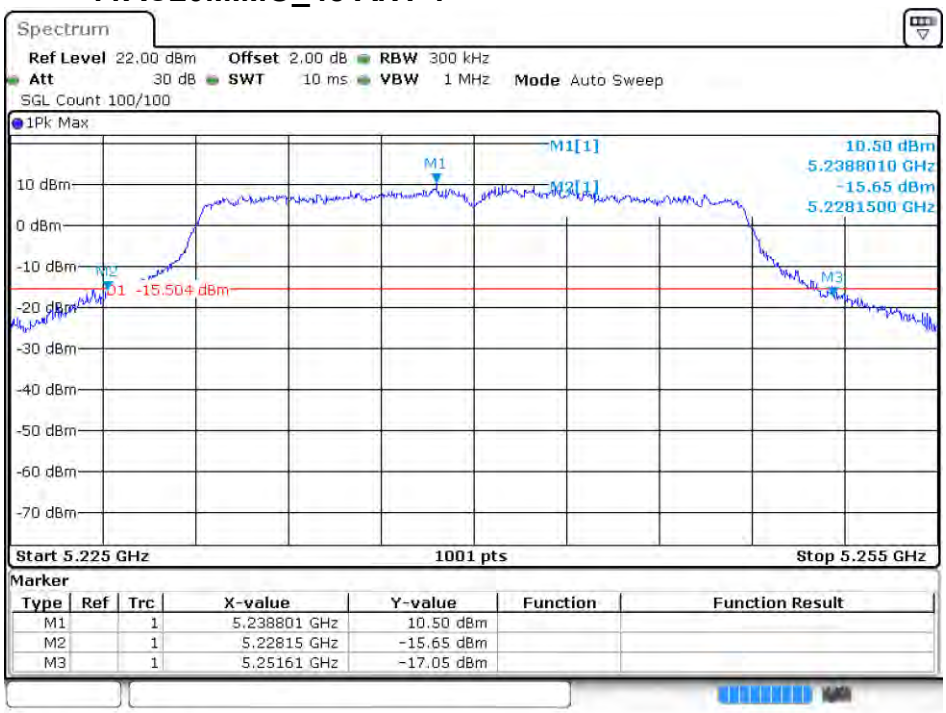
3.5.1.74 11AC20MIMO_40 ANT 2



Date: 13.MAR.2020 07:56:53

3.5.1.75 11AC20MIMO_48 ANT 1



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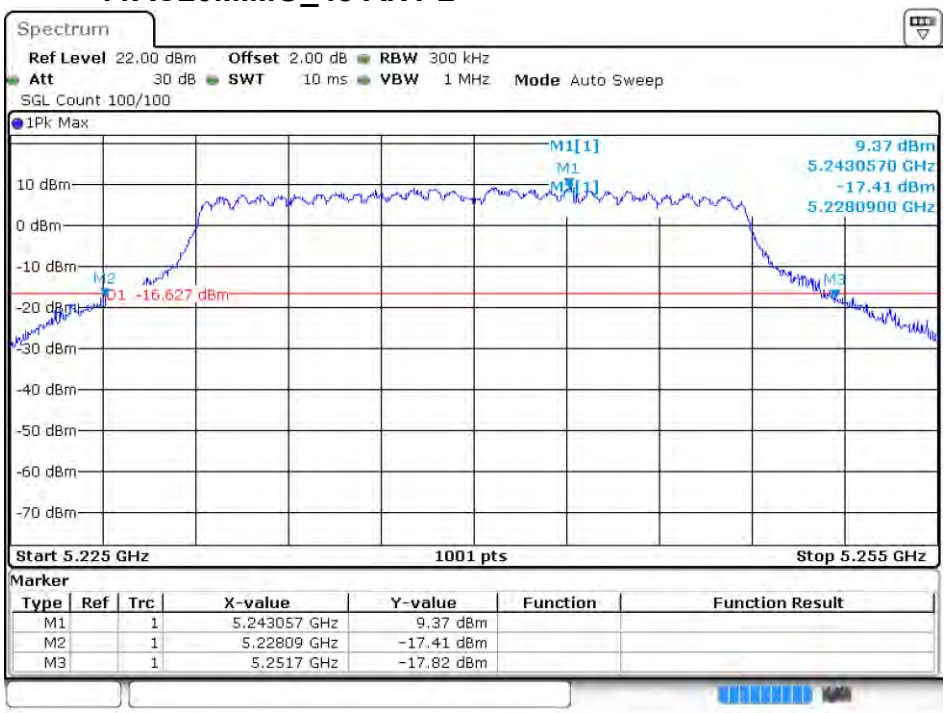
3.5.1.76 11AC20MIMO_48 ANT 2

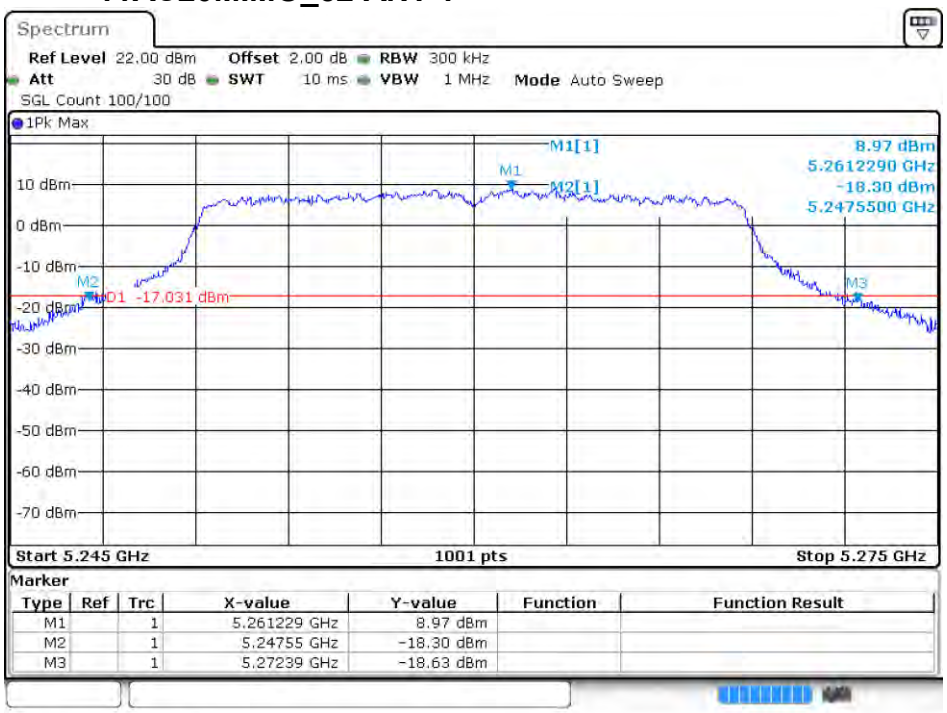


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.243057 GHz	9.37 dBm		
M2		1	5.22809 GHz	-17.41 dBm		
M3		1	5.2517 GHz	-17.82 dBm		

Date: 13.MAR.2020 07:58:00

3.5.1.77 11AC20MIMO_52 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.261229 GHz	8.97 dBm		
M2		1	5.24755 GHz	-18.30 dBm		
M3		1	5.27239 GHz	-18.63 dBm		

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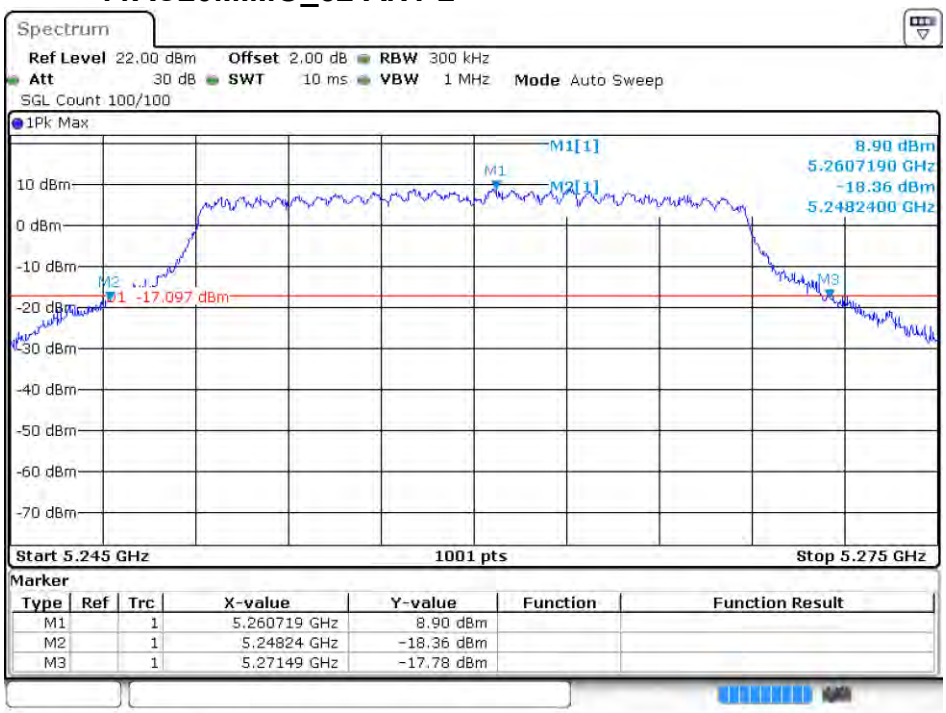
3.5.1.78 11AC20MIMO_52 ANT 2



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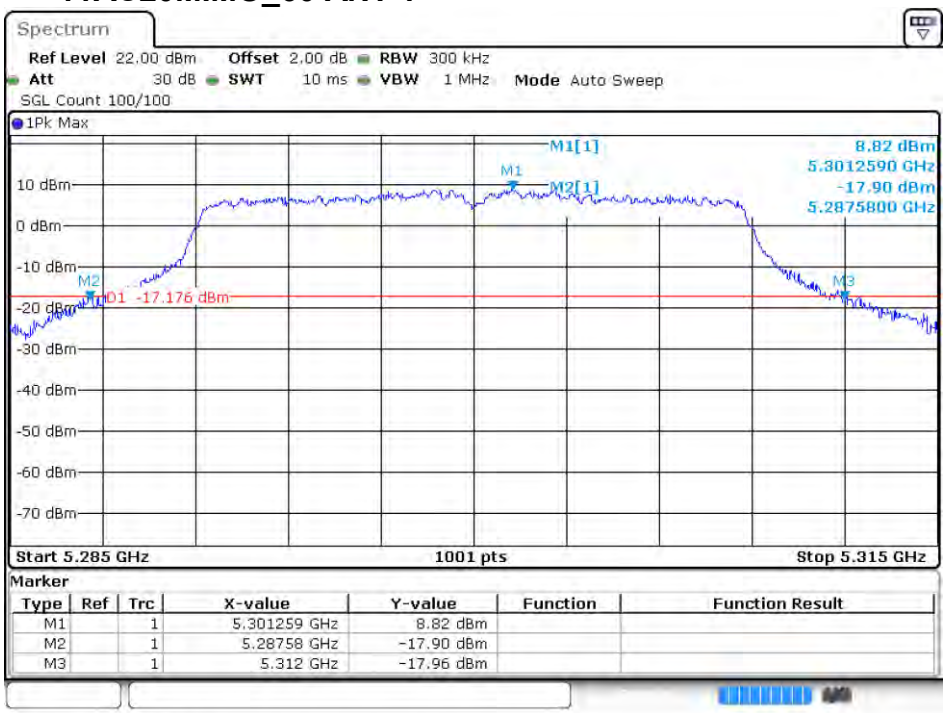
3.5.1.79 11AC20MIMO_60 ANT 1



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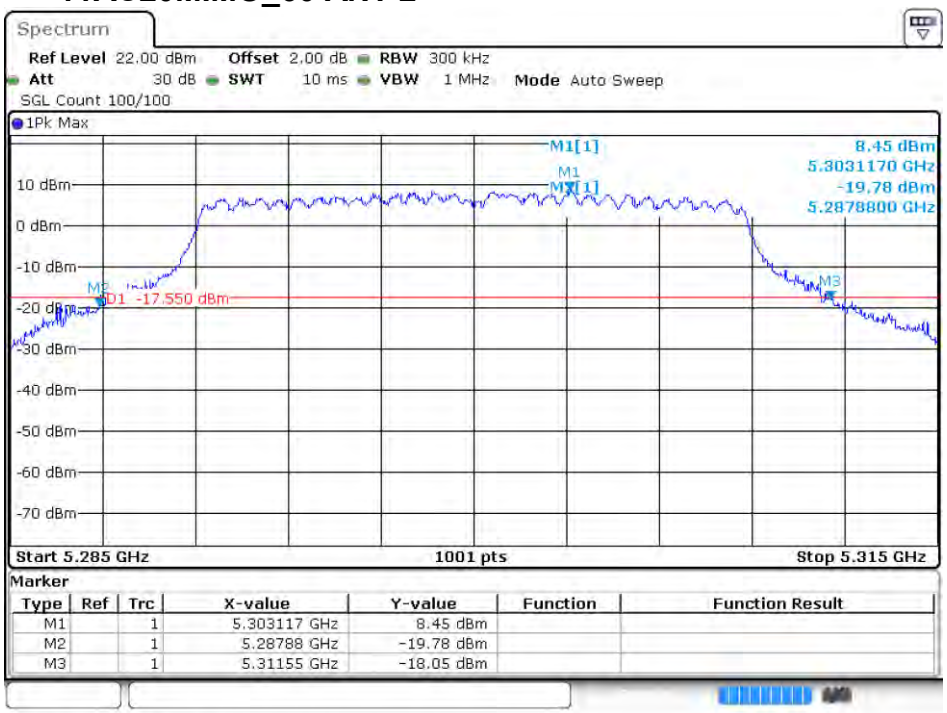
3.5.1.80 11AC20MIMO_60 ANT 2



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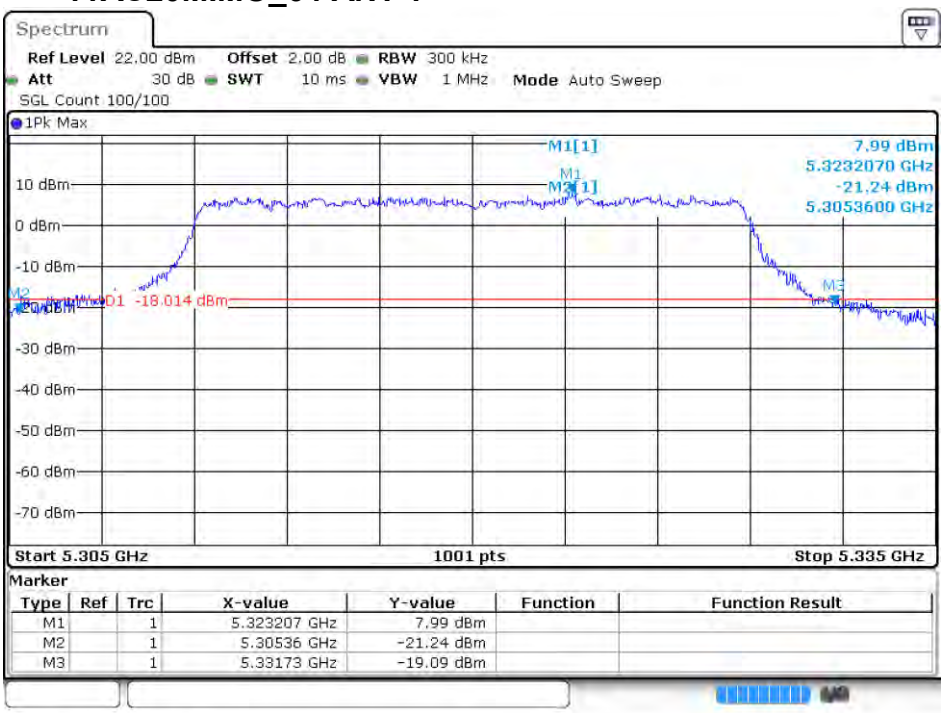
3.5.1.81 11AC20MIMO_64 ANT 1



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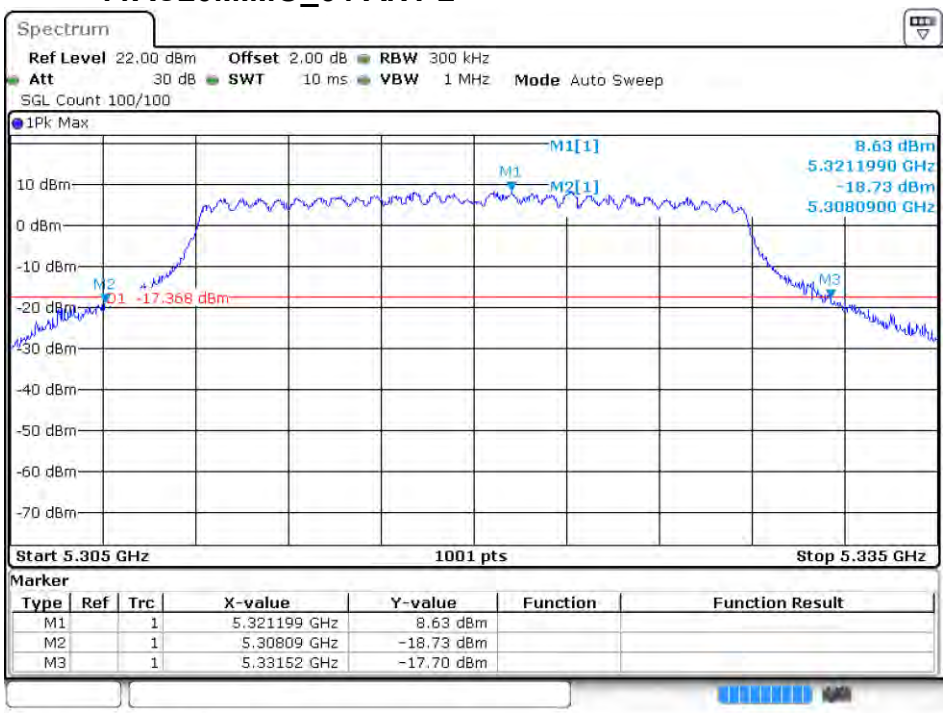
3.5.1.82 11AC20MIMO_64 ANT 2



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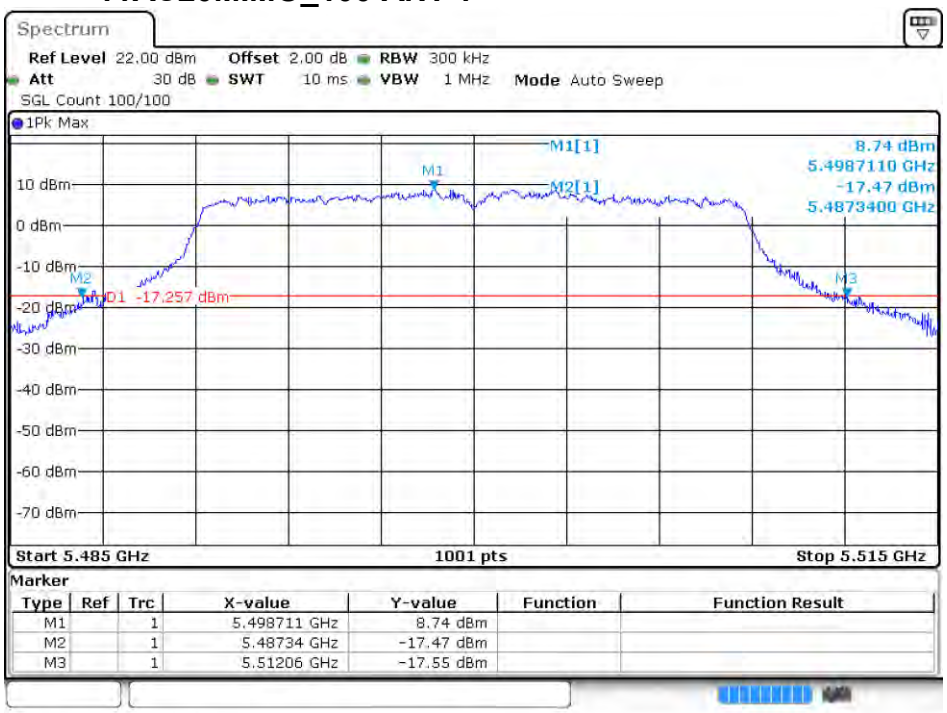
3.5.1.83 11AC20MIMO_100 ANT 1



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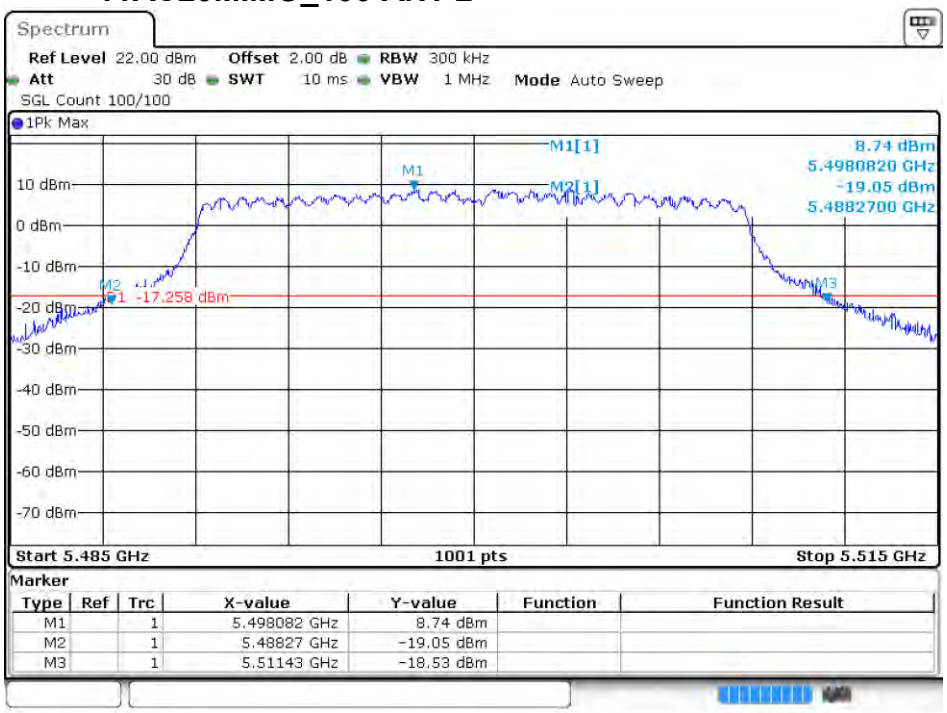

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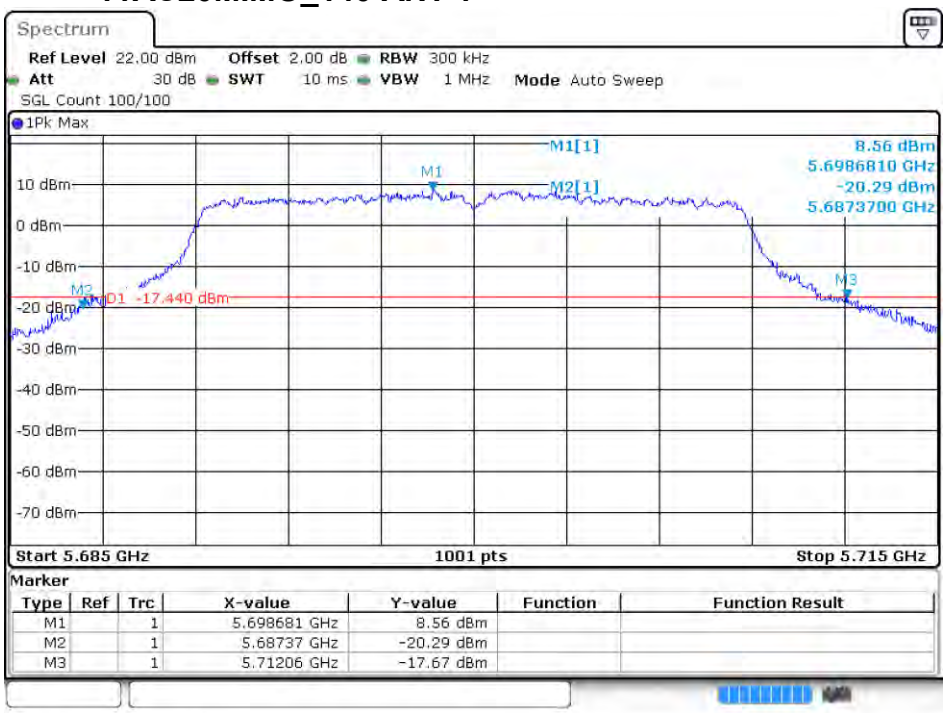
3.5.1.85 11AC20MIMO_140 ANT 1



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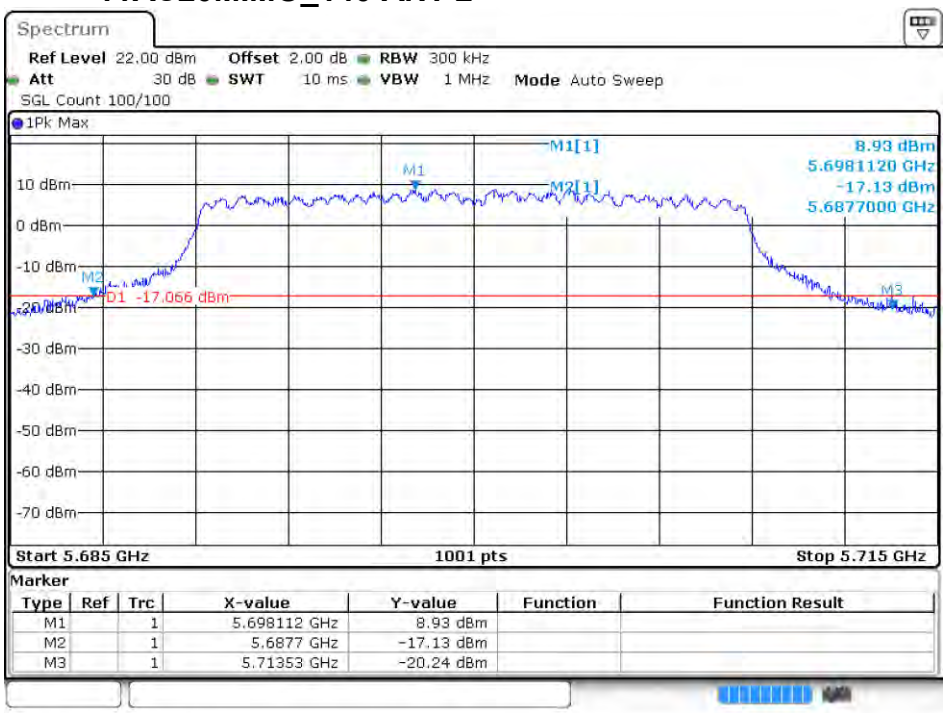
3.5.1.86 11AC20MIMO_140 ANT 2



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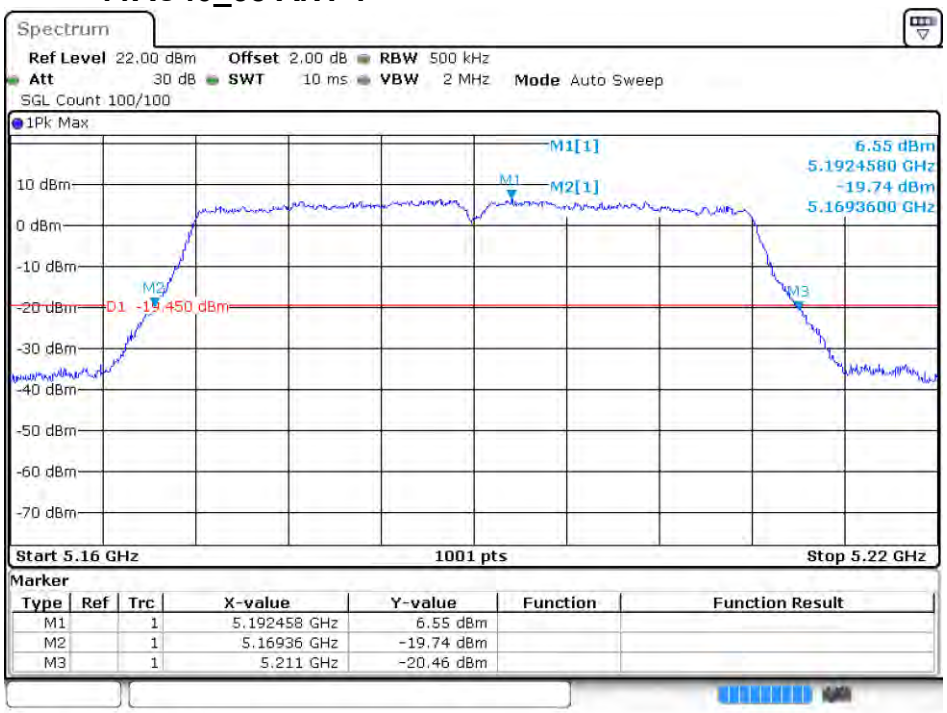
3.5.1.87 11AC40_38 ANT 1



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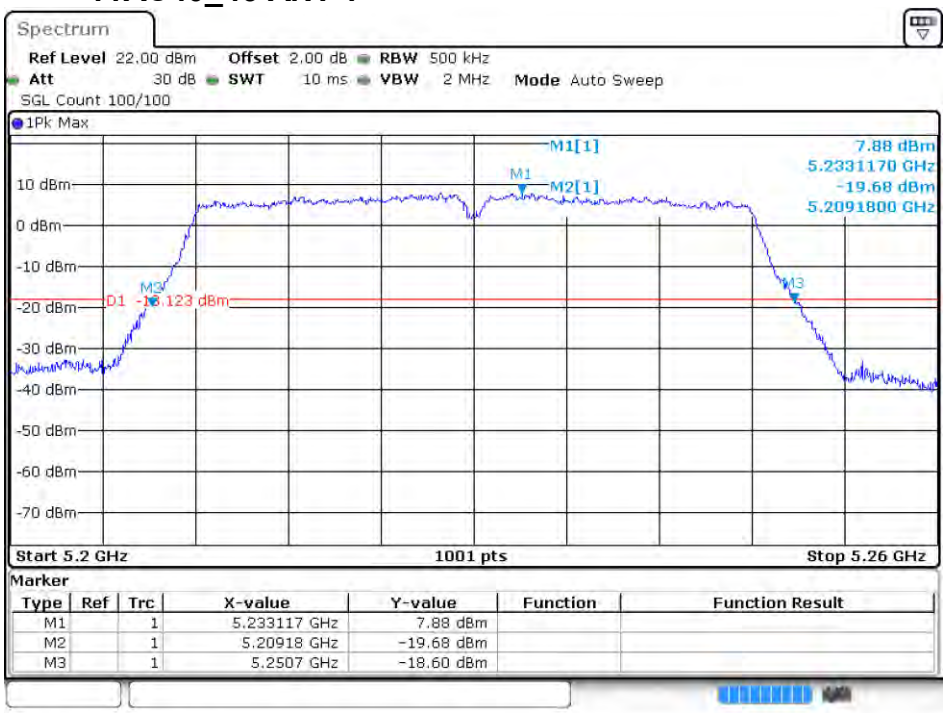

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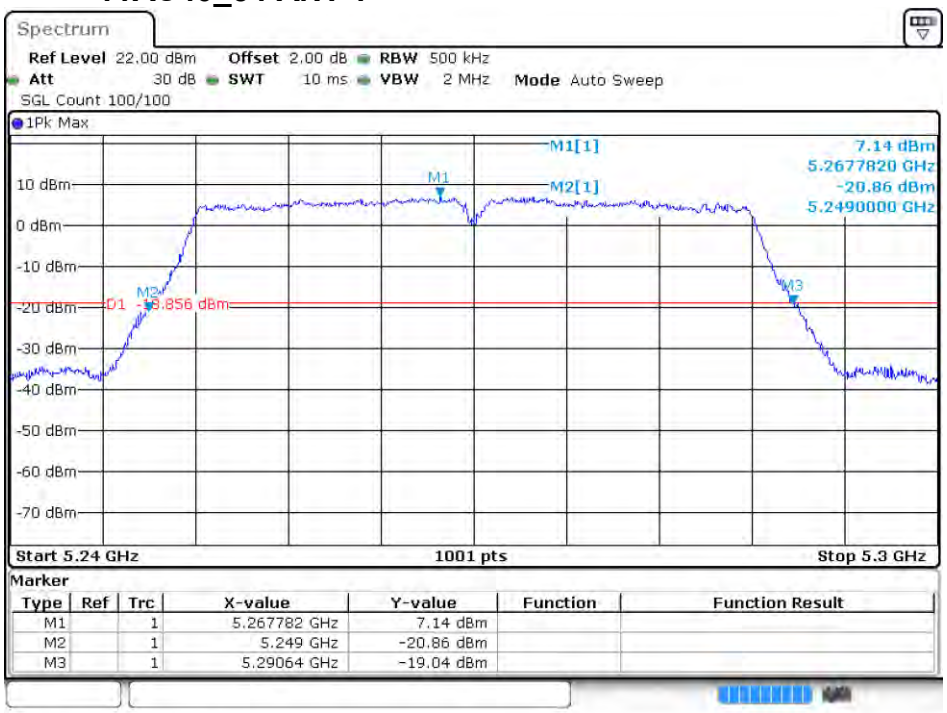
3.5.1.89 11AC40_54 ANT 1



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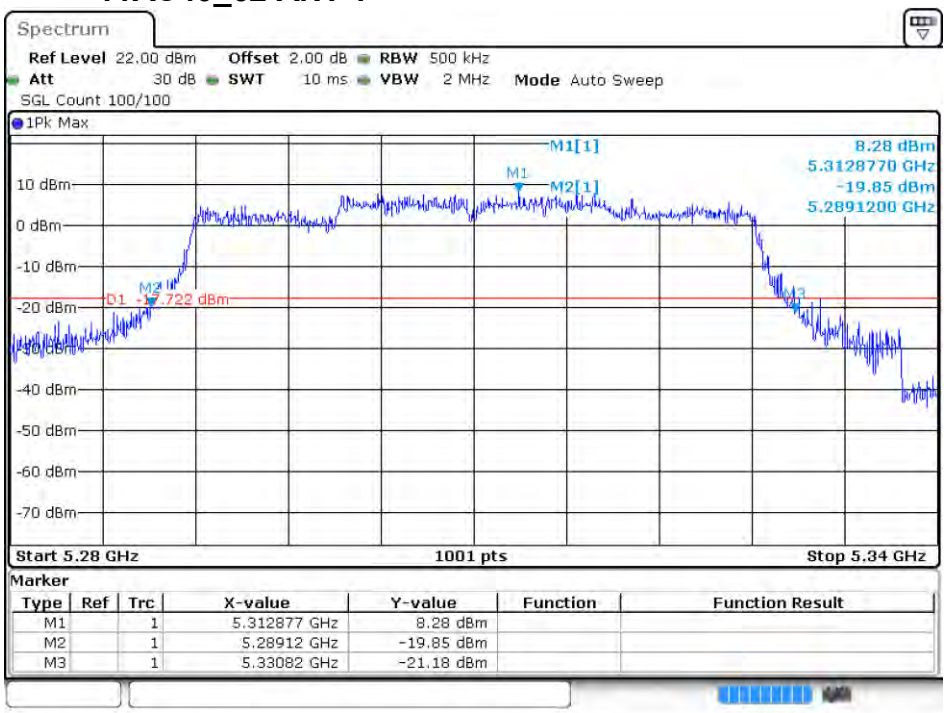
3.5.1.90 11AC40_62 ANT 1



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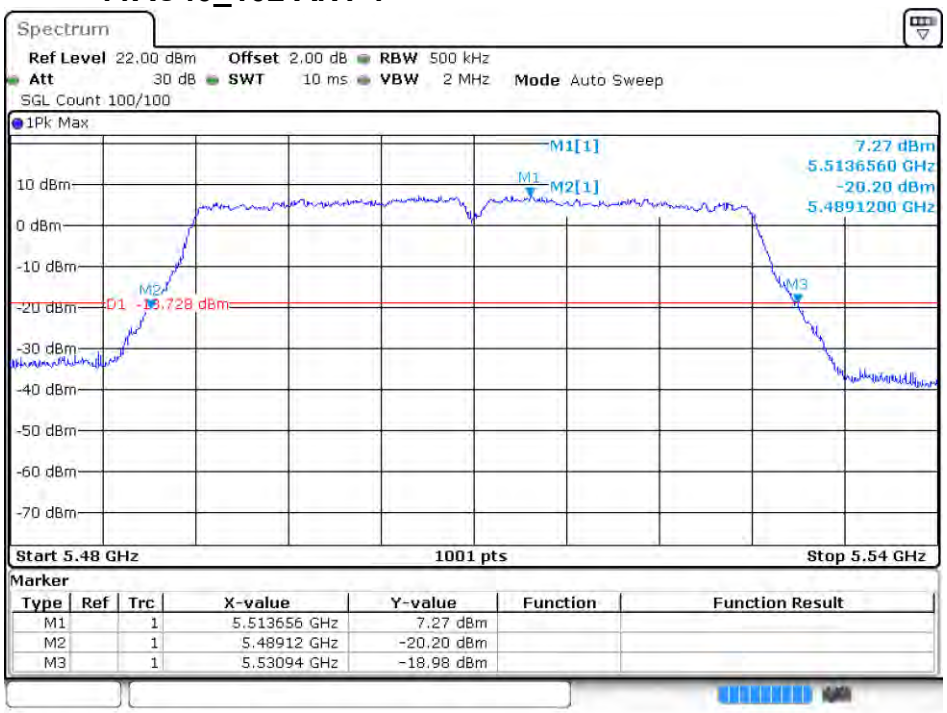
3.5.1.91 11AC40_102 ANT 1



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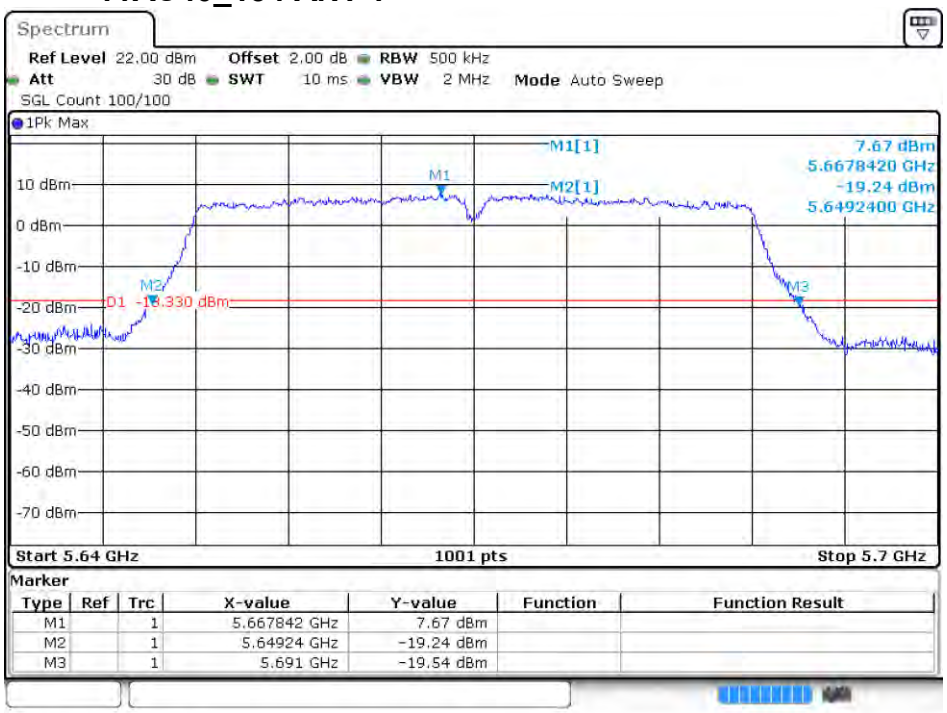

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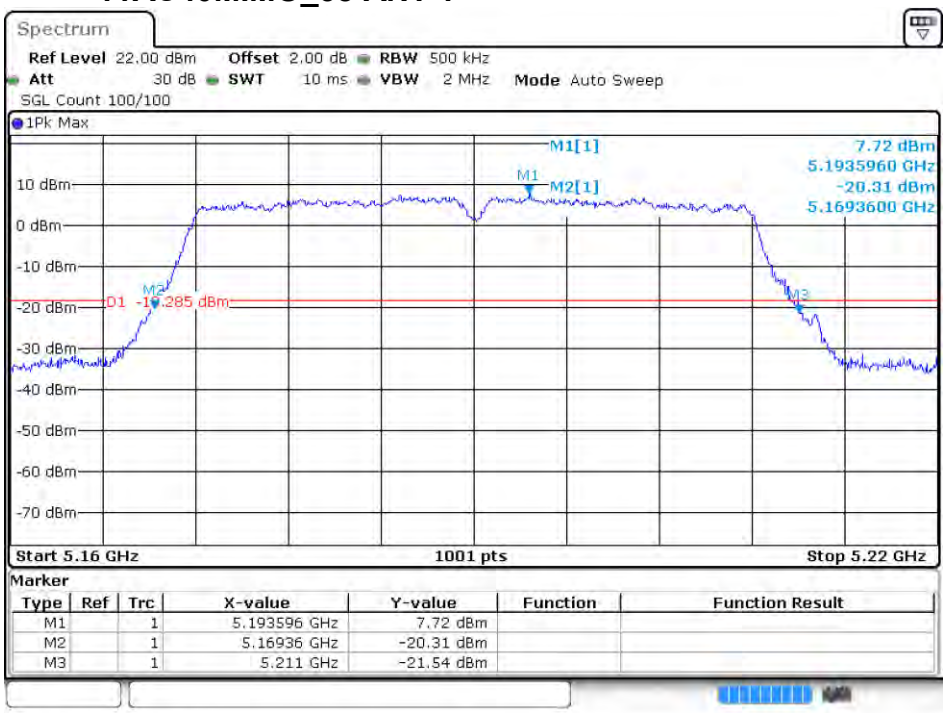

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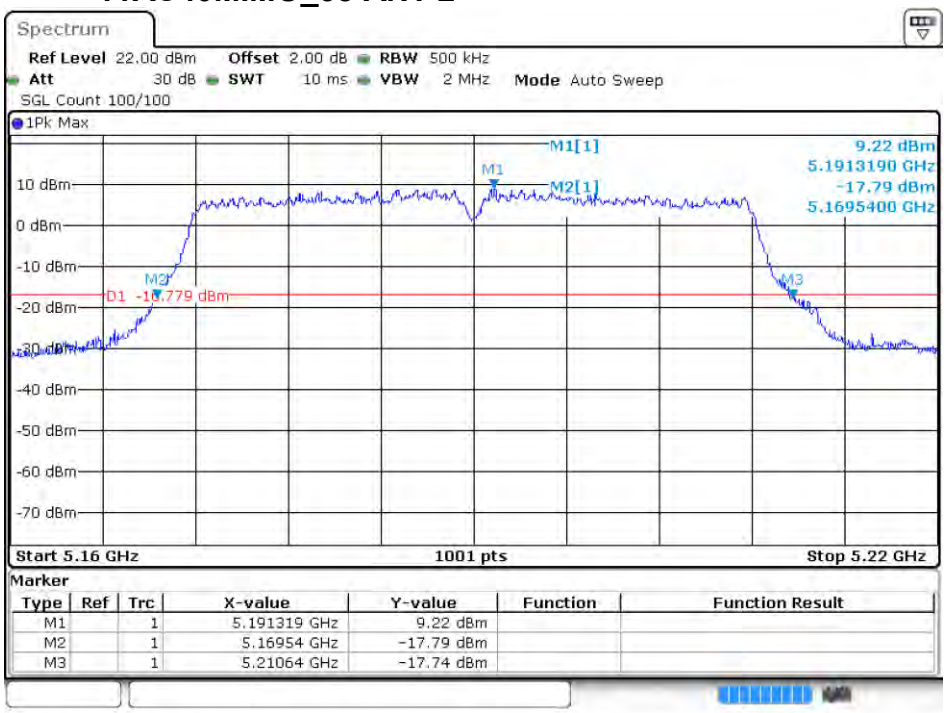
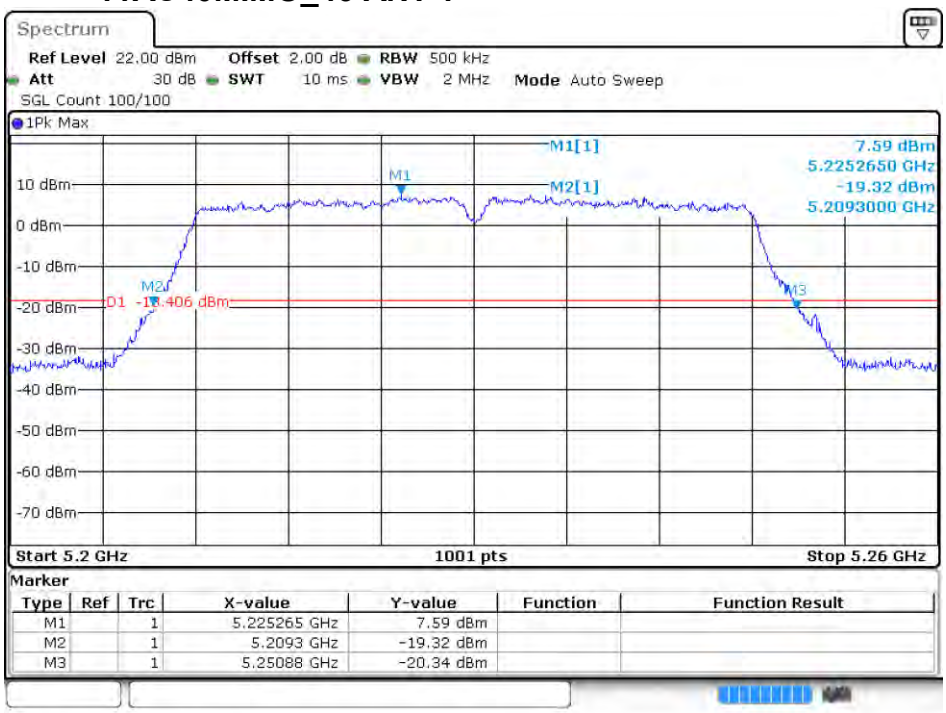
3.5.1.94 11AC40MIMO_38 ANT 2



Date: 13.MAR.2020 08:11:43

3.5.1.95 11AC40MIMO_46 ANT 1



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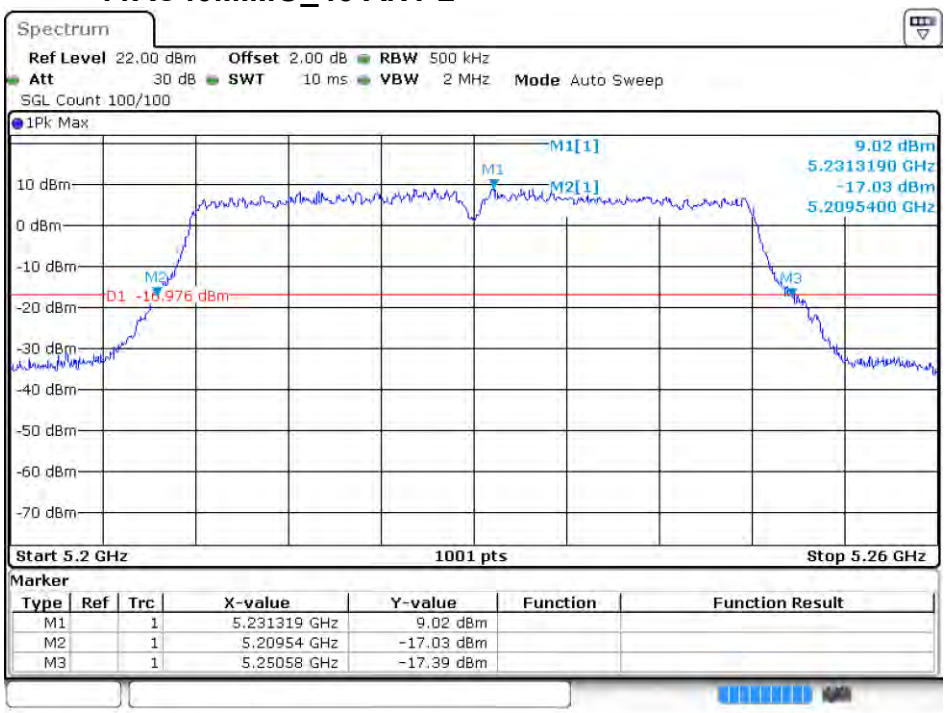
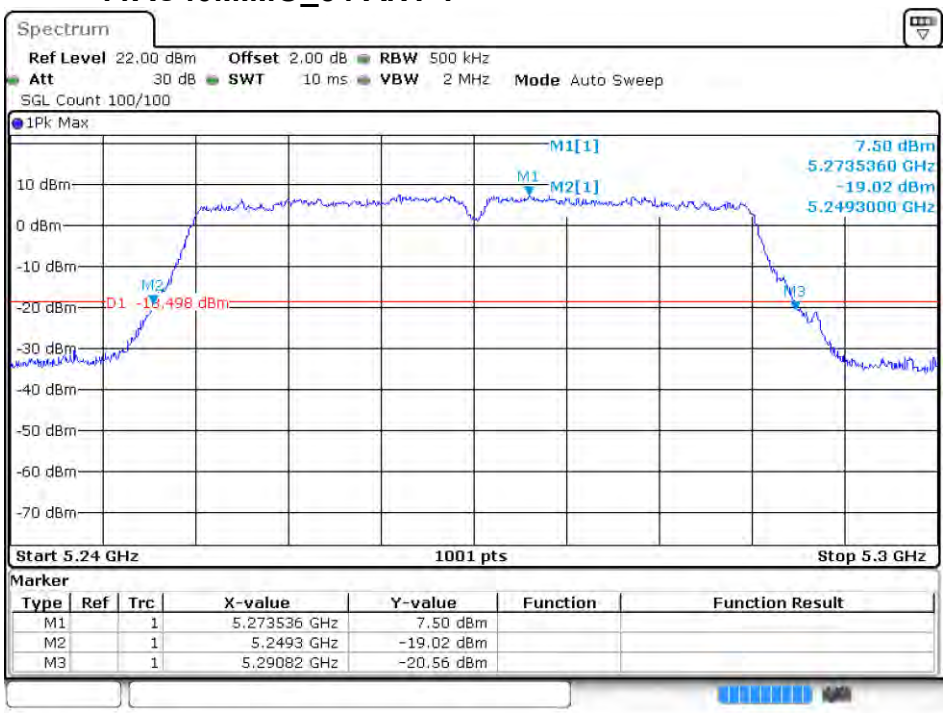
3.5.1.96 11AC40MIMO_46 ANT 2



Date: 13.MAR.2020 08:13:26

3.5.1.97 11AC40MIMO_54 ANT 1



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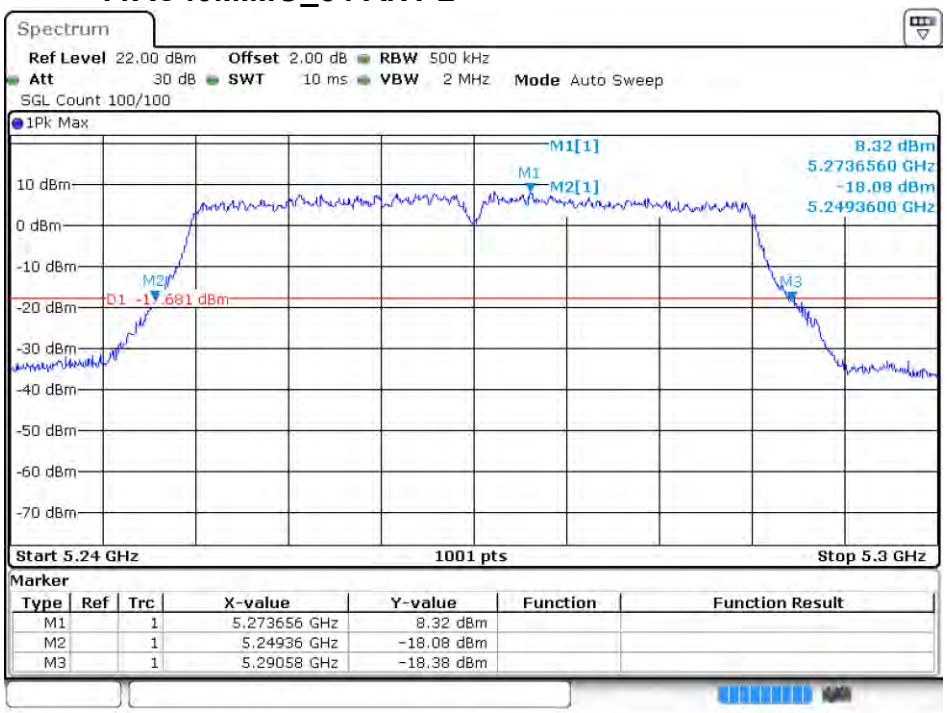
3.5.1.98 11AC40MIMO_54 ANT 2



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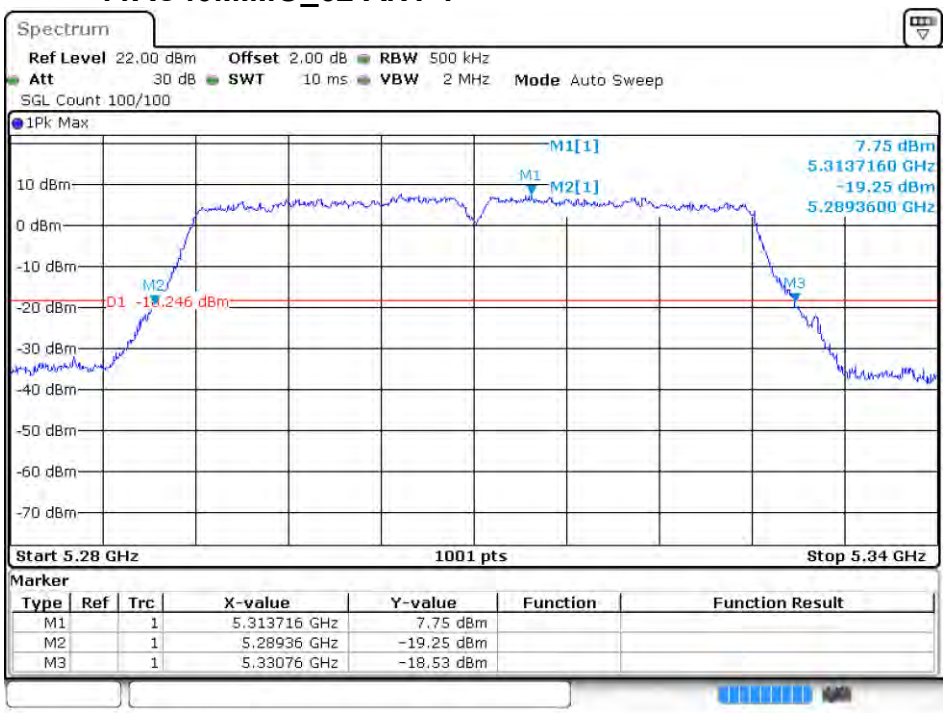
3.5.1.99 11AC40MIMO_62 ANT 1



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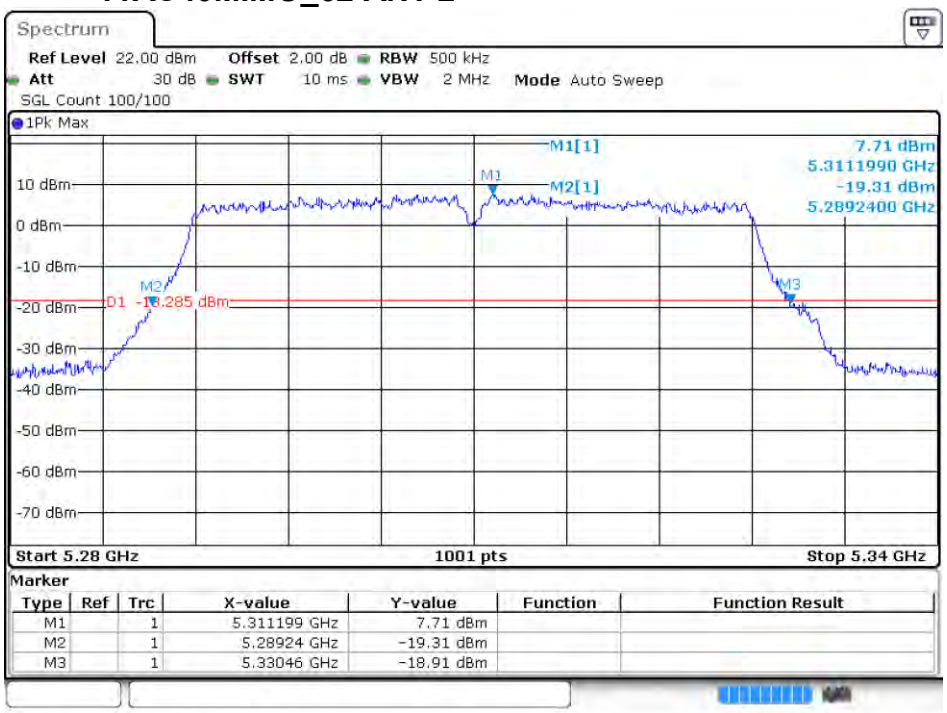
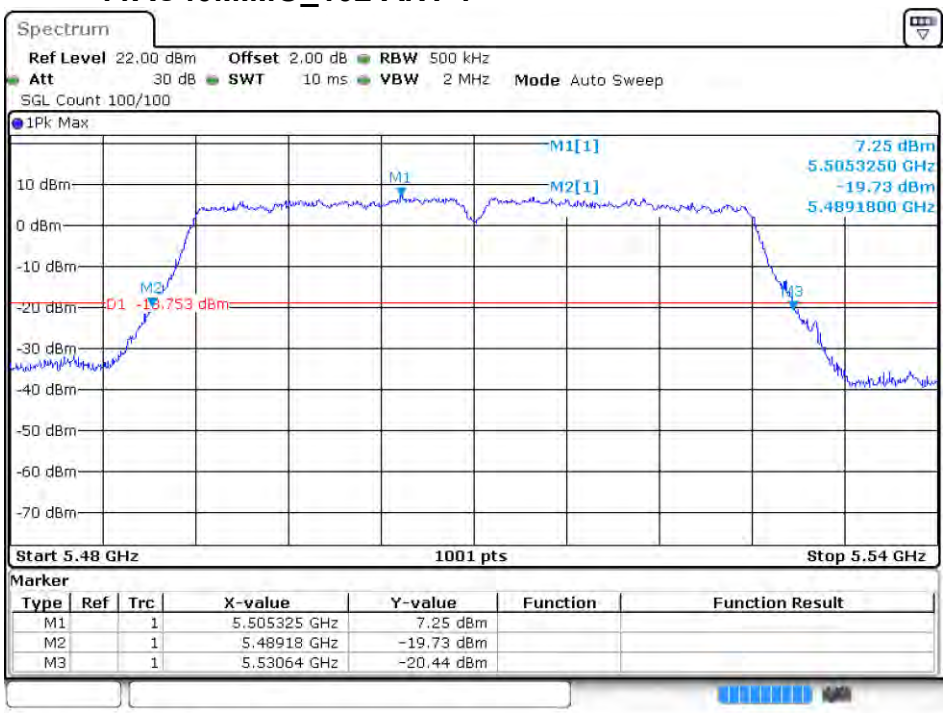
3.5.1.100 11AC40MIMO_62 ANT 2



Date: 13.MAR.2020 08:16:13

3.5.1.101 11AC40MIMO_102 ANT 1



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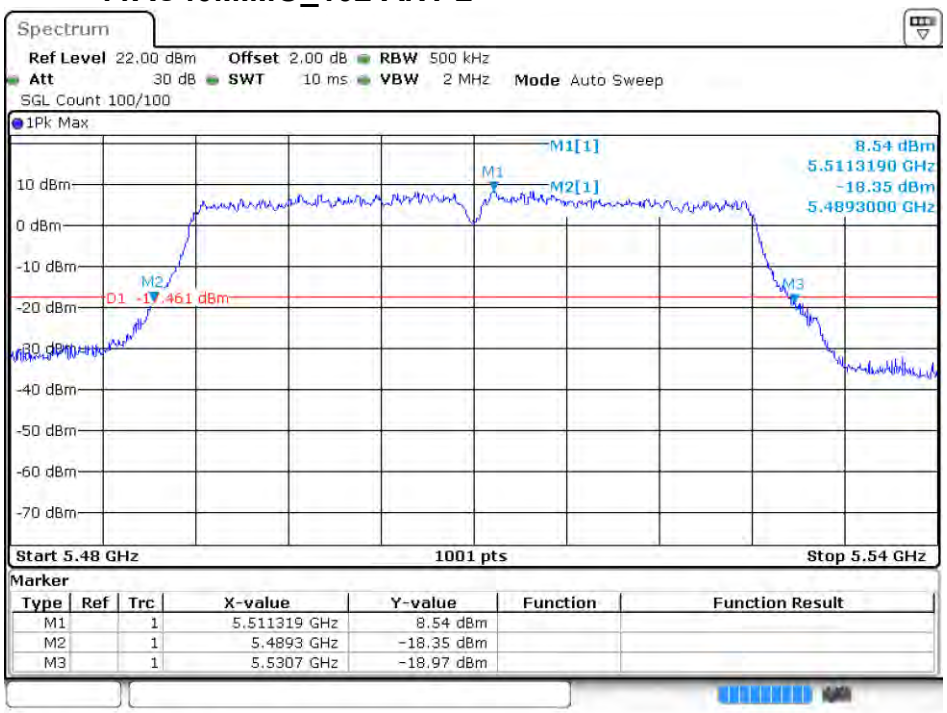
3.5.1.102 11AC40MIMO_102 ANT 2



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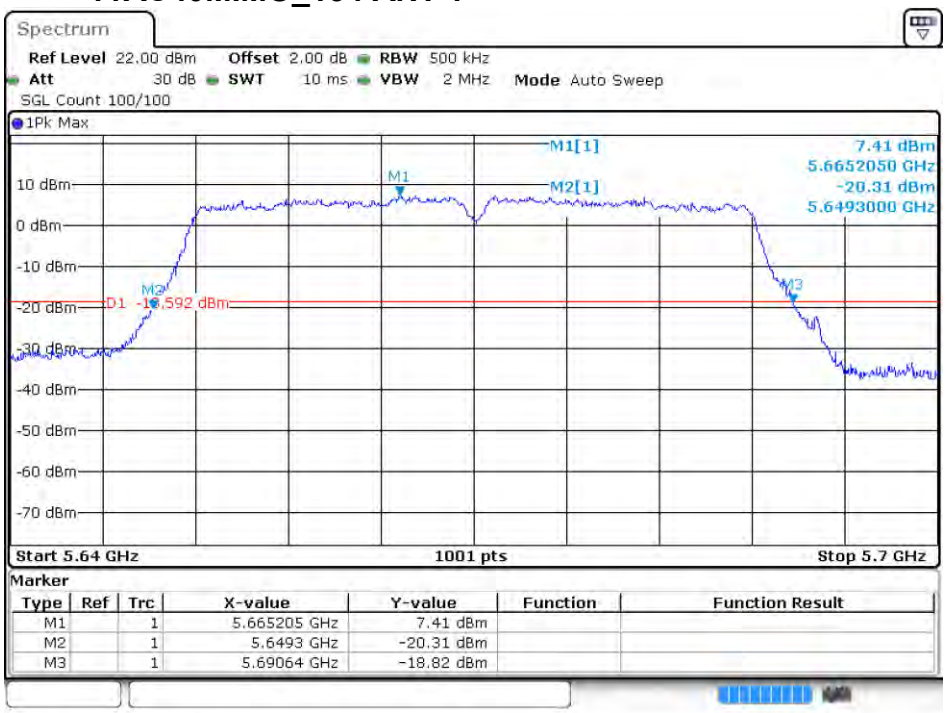
3.5.1.103 11AC40MIMO_134 ANT 1



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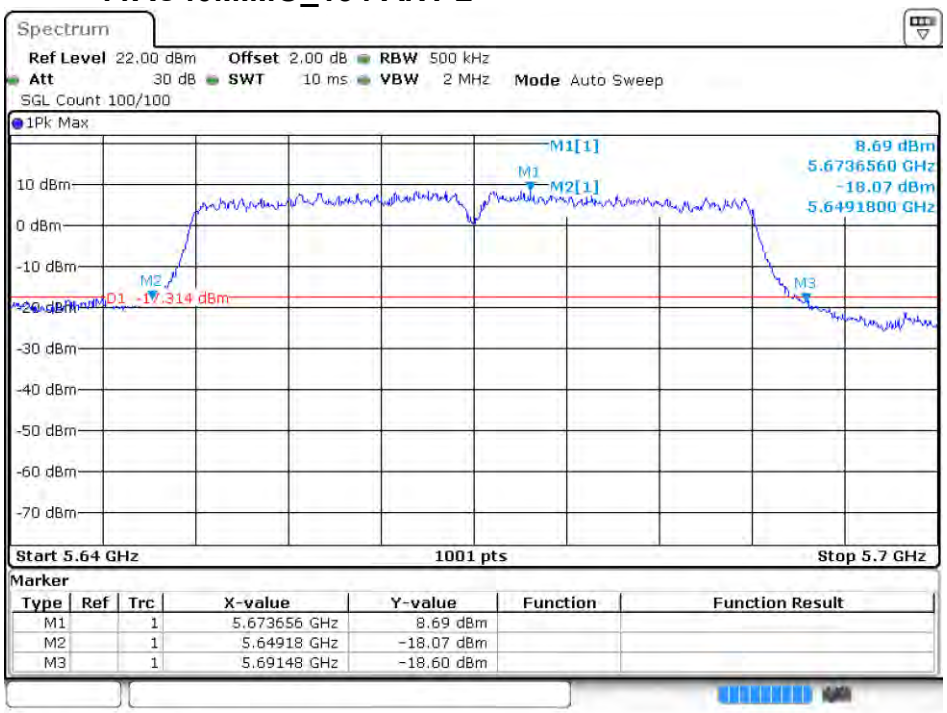
3.5.1.104 11AC40MIMO_134 ANT 2



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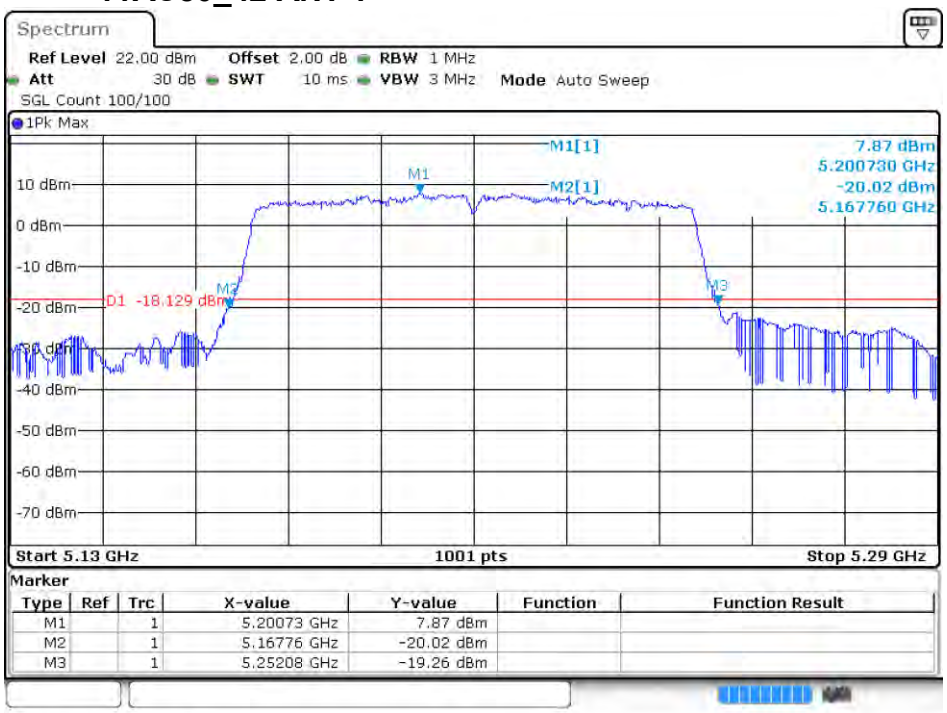
3.5.1.105 11AC80_42 ANT 1



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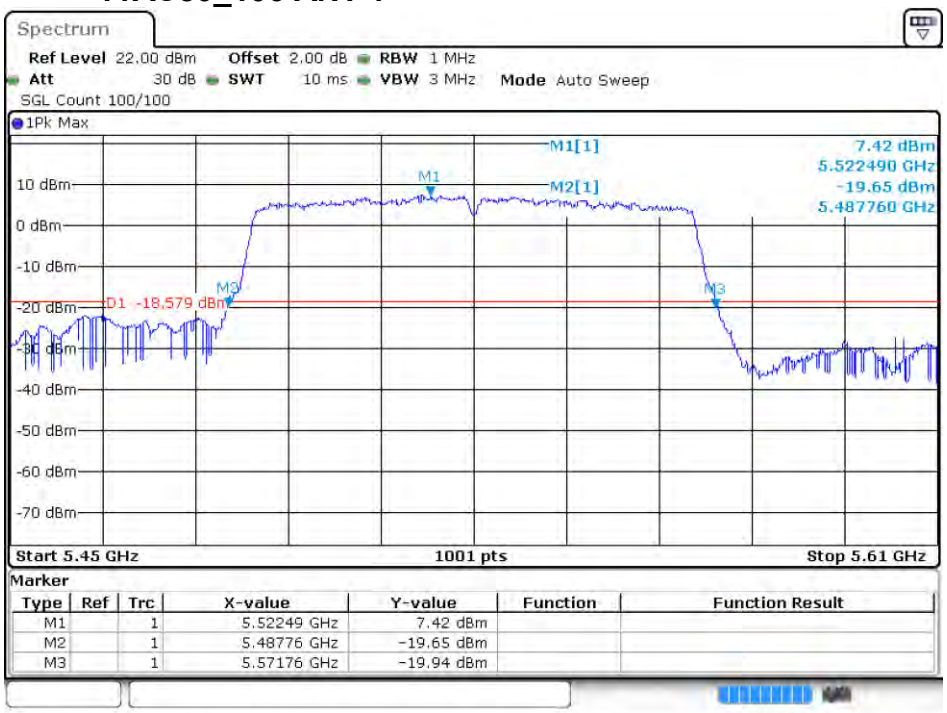
3.5.1.106 11AC80_58 ANT 1

Date: 13.MAR.2020 11:10:27

3.5.1.107 11AC80_106 ANT 1



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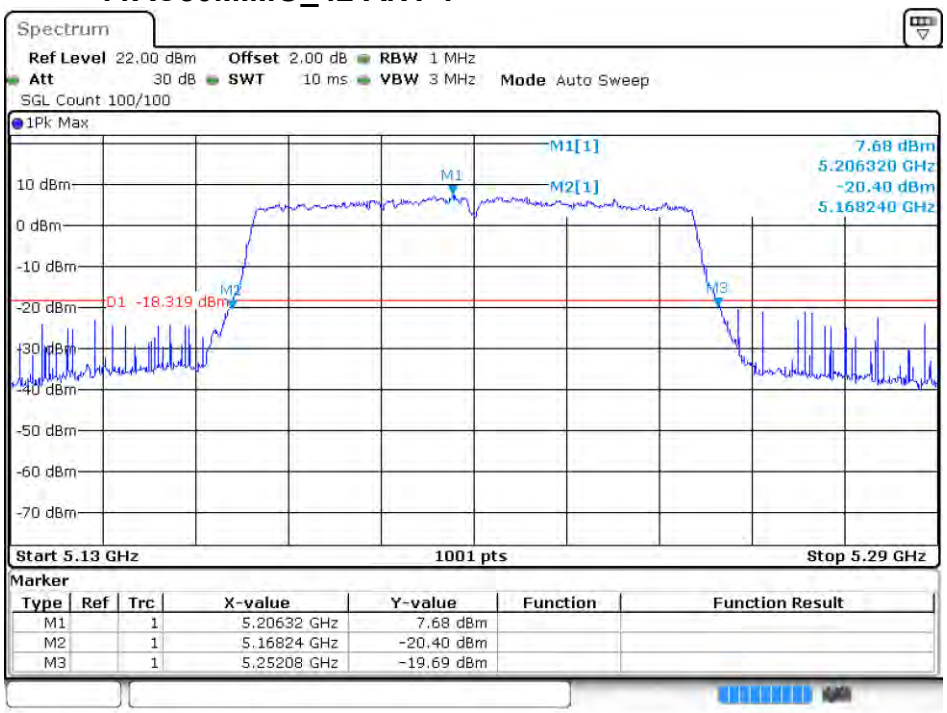
3.5.1.108 11AC80MIMO_42 ANT 1



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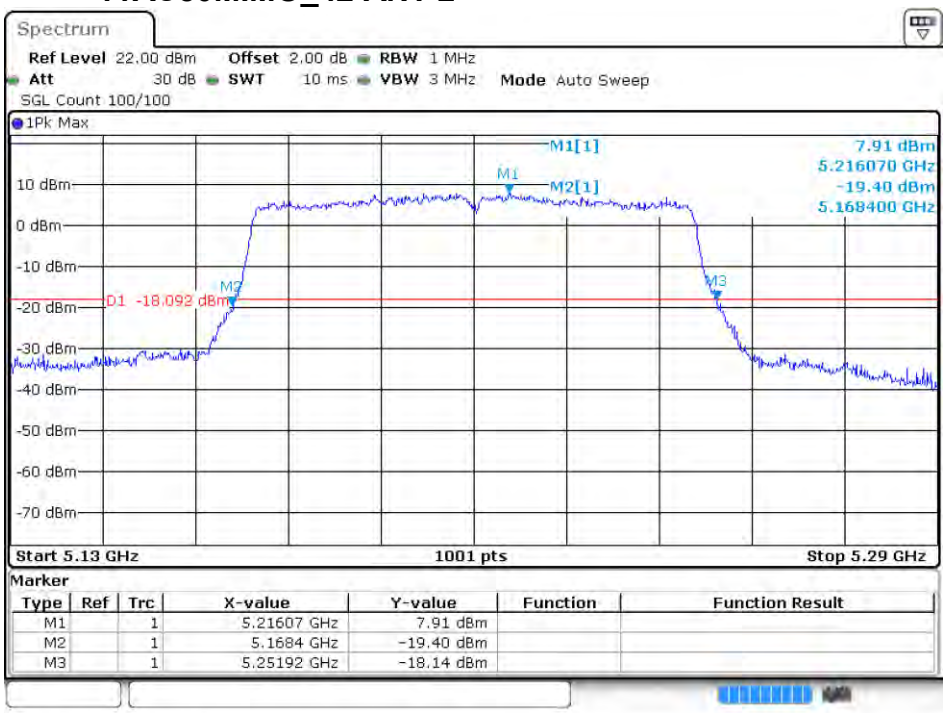
3.5.1.109 11AC80MIMO_42 ANT 2



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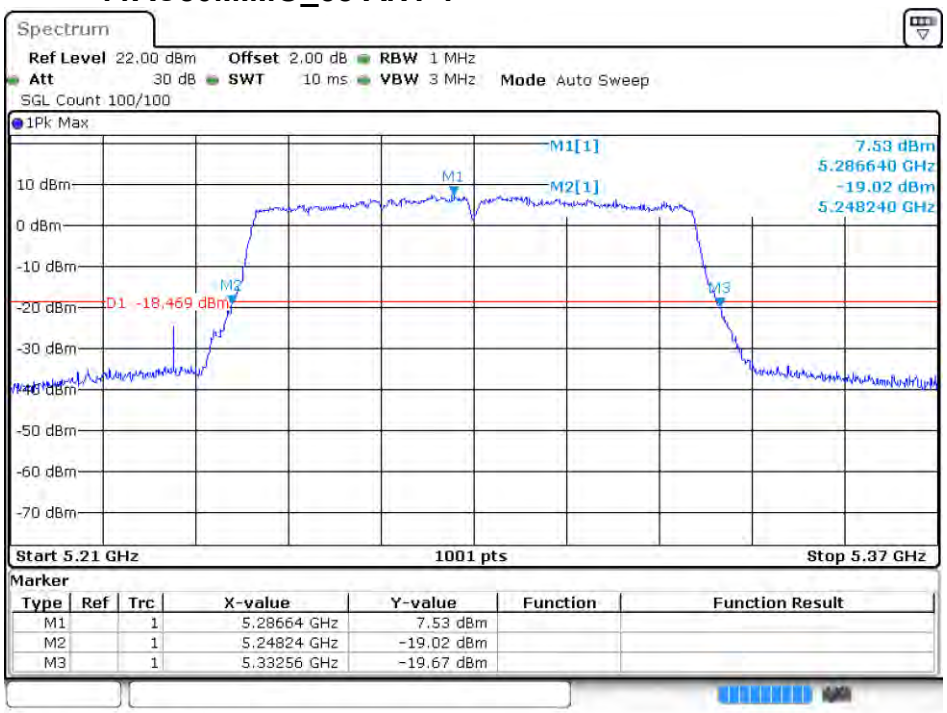
3.5.1.110 11AC80MIMO_58 ANT 1



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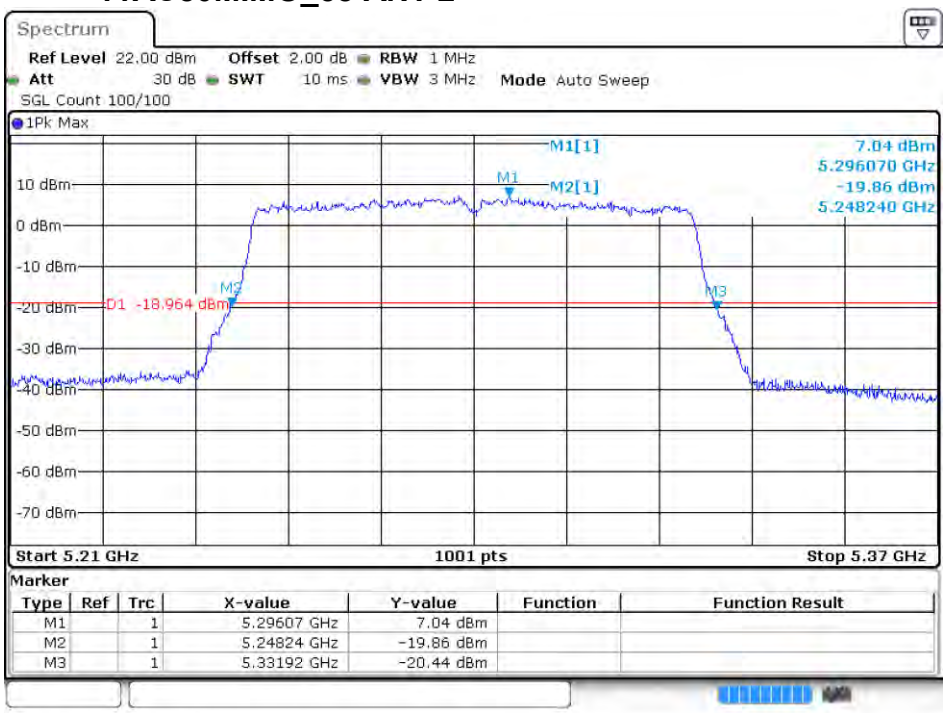
3.5.1.111 11AC80MIMO_58 ANT 2



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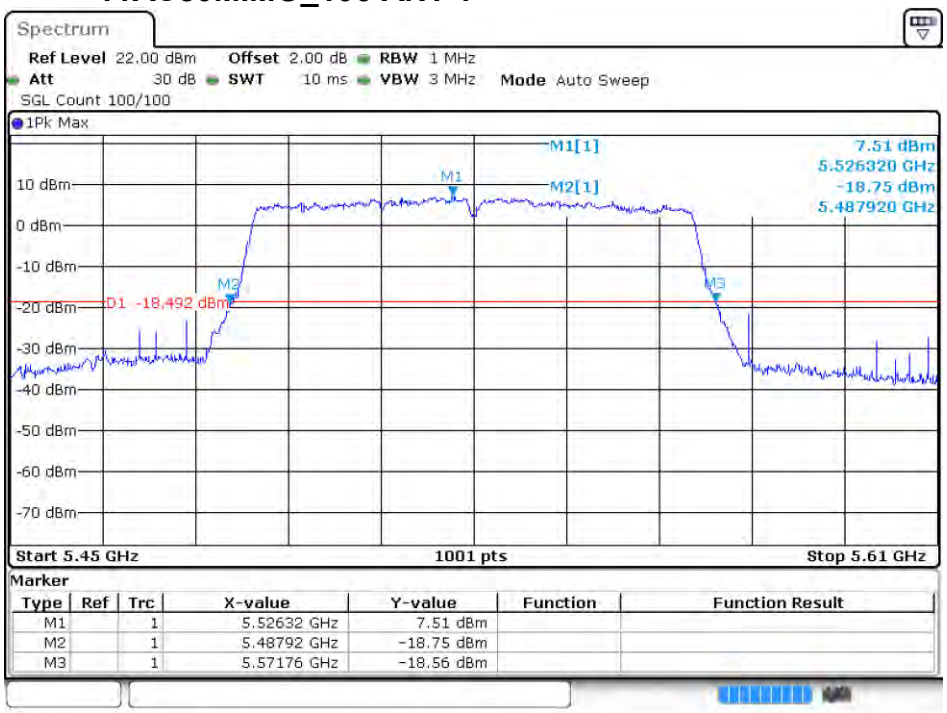
3.5.1.112 11AC80MIMO_106 ANT 1

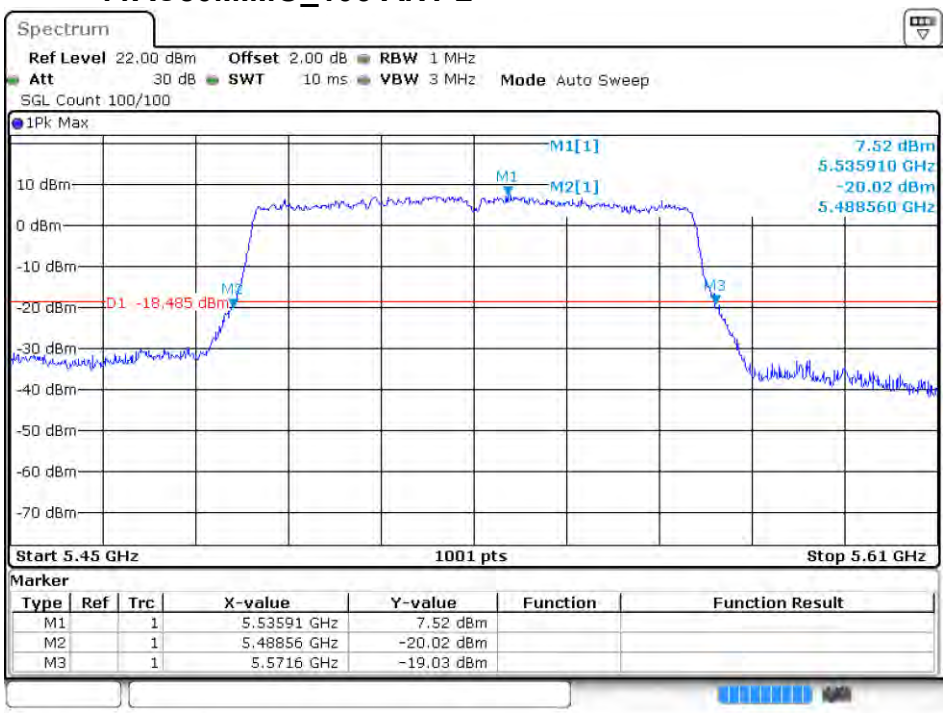


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.52632 GHz	7.51 dBm		
M2		1	5.48792 GHz	-18.75 dBm		
M3		1	5.57176 GHz	-18.56 dBm		

Date: 12.MAR.2020 13:38:02

3.5.1.113 11AC80MIMO_106 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.53591 GHz	7.52 dBm		
M2		1	5.48856 GHz	-20.02 dBm		
M3		1	5.5716 GHz	-19.03 dBm		

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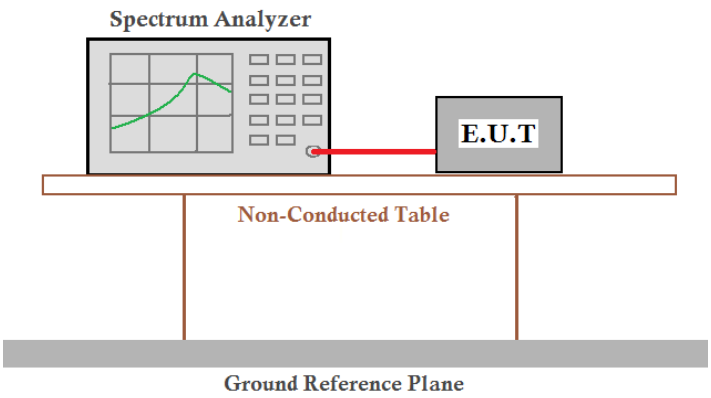
3.6 6dB Emission Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(e)	
Test Method:	ANSI C63.10: 2013	
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 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20); MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(HT20); MCS0 of rate is the worst case of 802.11ac(HT40); MCS0 of rate is the worst case of 802.11ac(HT80). Only the worst case is recorded in the report.	
Limit:	Frequency Band	Limit
	5725-5825MHz	At lease 500kHz
Test Results:	Pass	

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