FCC TEST REPORT

Application No:	ZR/2019/C0026
Applicant:	GUANGDONG OPPO MOBILE TELECOMMUNICATIONS CORP.,LTD.
Address of Applicant	NO. 18 HaiBin Road, WuSha village, Chang An Town, DongGuan City，Guangdong,China
Manufacturer:	GUANGDONG OPPO MOBILE TELECOMMUNICATIONS CORP.,LTD.
Address of Manufacturer:	NO. 18 HaiBin Road, WuSha village, Chang An Town, DongGuan City，Guangdong,China
EUT Description:	MOBILE PHONE
Model No.:	CPH2009
Trade Mark:	OPPO
FCC ID:	R9C-CPH2009
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 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:	2019/12/23
Date of Test:	2019/12/23 to 2020/2/29
Date of Issue:	2021/4/22
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		2020/2/29		Original
01		2021/4/22	James Qin	1.Add test site Information 2.Modify data conversion error of antenna height 3.Update equipment list

*This report supersedes our previous report ZR/2019/C002605, issued on 2020/2/29, which is hereby deemed null and void.

Authorized for issue by:		
Prepared By		James Qin **(James Qin) / Engineer**
Checked By		David Chen **(David Chen) / Reviewer**

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2 Test Summary

Test Item	Band	FCC Rule	Requirements	Result	Test Lab*
Emission Bandwidth	5150-5250	15.403(i) 15.407(a)(1)	No limit.	Pass	A
	5250-5350	15.403(i) 15.407(a)(2)			
	5470-5725	15.403(i) 15.407(a)(2)			
	5725-5850	15.403(i) 15.407(e)	≥ 500 kHz.		
Occupied Bandwidth	5150-5250	KDB 789033 D02§ D	No limit.	Pass	A
	5250-5350				
	5470-5725				
	5725-5850				
Duty Cycle	5150-5850	--	No limit.	Pass	A
Maximum Conducted Output Power	5150-5250	15.407(a)(1) 15.407(a)(4)	FCC < 250mW (avg during transmission)		A
	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)		
	5725-5850	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)		A
	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)		
	5725-5850	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).	Pass	B
	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).		
	5470-5750	15.407(b)(3) 15.407(b)(6) 15.407(b)(7)	F<1GHz: §15.209/§7.2.5 limit (QP).		

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Test Item	Band	FCC Rule	Requirements	Result	Test Lab*
		15.209	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).		
	5725-5850	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).		
Band Edge (Radiated)	5150-5250 5250-5350 5470-5725 5725-5850	15.209	---	Pass	B
AC Power Line Conducted Emissions	5150-5250 5250-5350 5470-5725 5725-5850	15.207	---	Pass	B
Frequency Stability	5150-5250 5250-5350 5470-5600 5650-5725 5725-5850	15.209	---	Pass	A
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	Pass	A

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All test were performed by Lab A and B.
Parts of test items above were subcontracted to Lab B.
Lab A: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Lab B: SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD

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3 General Information

3.1 Client Information

Applicant:	GUANGDONG OPPO MOBILE TELECOMMUNICATIONS CORP.,LTD.
Address of Applicant:	NO. 18 HaiBin Road, WuSha village, Chang An Town, DongGuan City，Guangdong,China
Manufacturer:	GUANGDONG OPPO MOBILE TELECOMMUNICATIONS CORP.,LTD.
Address of Manufacturer:	NO. 18 HaiBin Road, WuSha village, Chang An Town, DongGuan City，Guangdong,China

3.2 Test Location

Lab A:

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

Lab B:

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

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3.3 Test Facility

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

Lab A:

• A2LA (Certificate No. 3816.01)

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

• VCCI

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

• FCC –Designation Number: CN1178

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

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

• Innovation, Science and Economic Development Canada

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

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

A2LA (Certificate No. 4854.01)

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

Designation Number: CN1271.

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3.4 General Description of EUT

EUT Description:	MOBILE PHONE
Model No.:	CPH2009
Trade Mark:	OPPO
Hardware Version:	11
Software Version:	ColorOS V7
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): 5250MHz to 5350MHz IEEE 802.11n(HT20/40)/ ac(HT20/40/80): 5470MHz to 5725MHz IEEE 802.11n(HT20/40)/ ac(HT20/40/80): 5725MHz to 5850MHz
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:	-3.5dBi (Ant1); -3.5dBi (Ant2);
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	5280
	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 Lowest channel	5500
	The Highest channel	5580

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	5825

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IEEE 802.11n/ac 40MHz	The Lowest channel	5755
	The Highest channel	5795
IEEE 802.11ac 80MHz	The Middle channel	5775

3.5 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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4 Test results and Measurement Data

4.1 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 -3.5dBi (Ant1); -3.5dBi (Ant2).	

4.2 AC Power Line 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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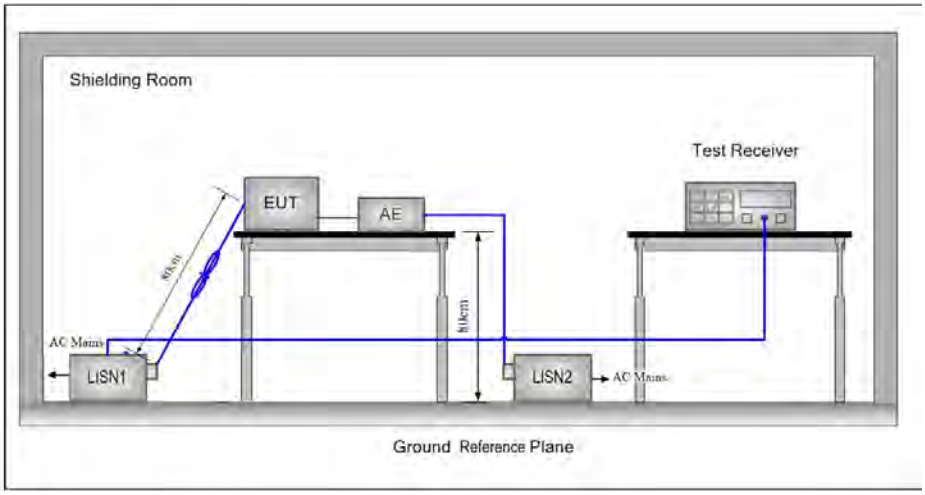
Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Through Pre-scan, find the 6Mbps of rate of 802.11a at lowest channel is the worst case. Only the worst case is recorded in the report.
Instruments Used:	Refer 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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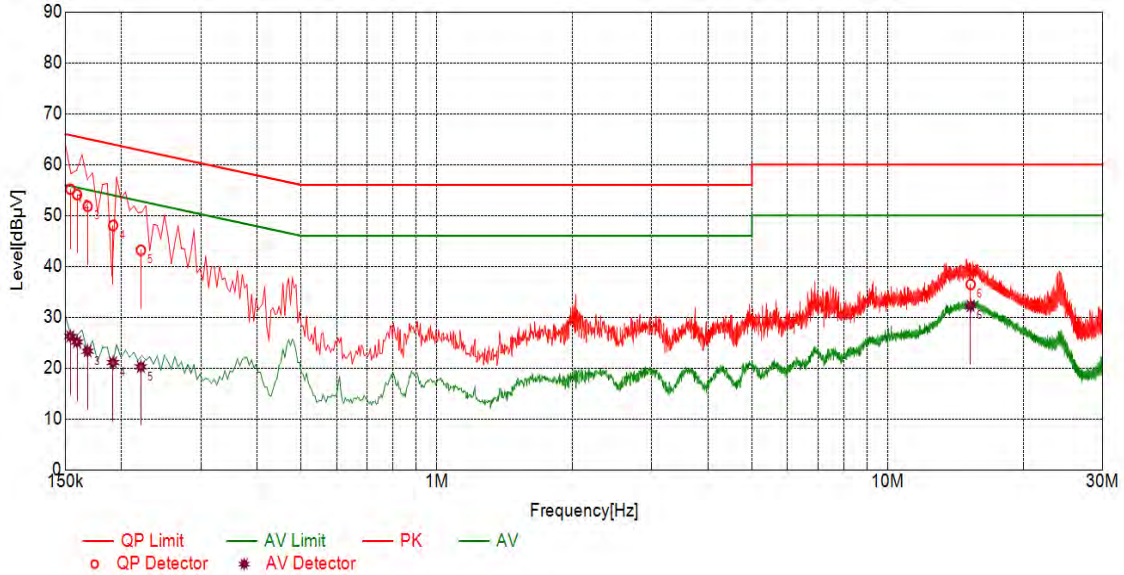
Live Line:



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	0.1540	10.10	55.15	65.78	10.63	26.24	55.78	29.54	L
2	0.1594	10.10	54.08	65.49	11.41	25.13	55.49	30.36	L
3	0.1682	10.10	51.80	65.05	13.25	23.31	55.05	31.74	L
4	0.1916	10.10	48.05	63.97	15.92	21.10	53.97	32.87	L
5	0.2208	10.10	43.16	62.79	19.63	20.25	52.79	32.54	L
6	15.2827	10.11	36.46	60.00	23.54	32.22	50.00	17.78	L

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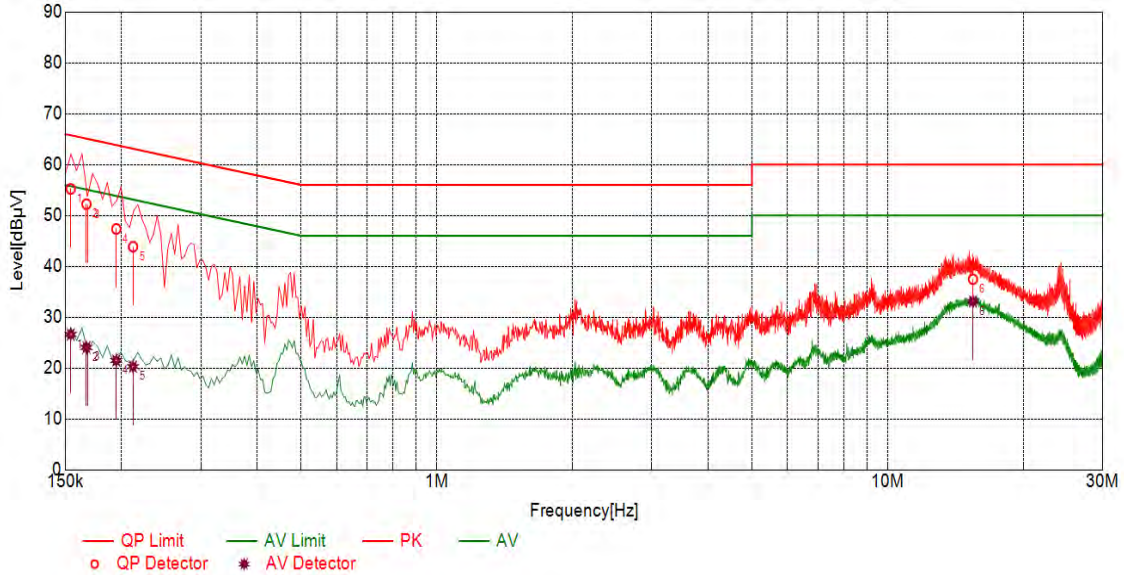
Neutral Line:



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	0.1543	10.10	55.22	65.76	10.54	26.60	55.76	29.16	N
2	0.1672	10.10	52.22	65.10	12.88	24.06	55.10	31.04	N
3	0.1682	10.10	52.13	65.05	12.92	24.22	55.05	30.83	N
4	0.1947	10.10	47.35	63.83	16.48	21.48	53.83	32.35	N
5	0.2121	10.10	43.86	63.12	19.26	20.28	53.12	32.84	N
6	15.4607	10.11	37.48	60.00	22.52	33.09	50.00	16.91	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

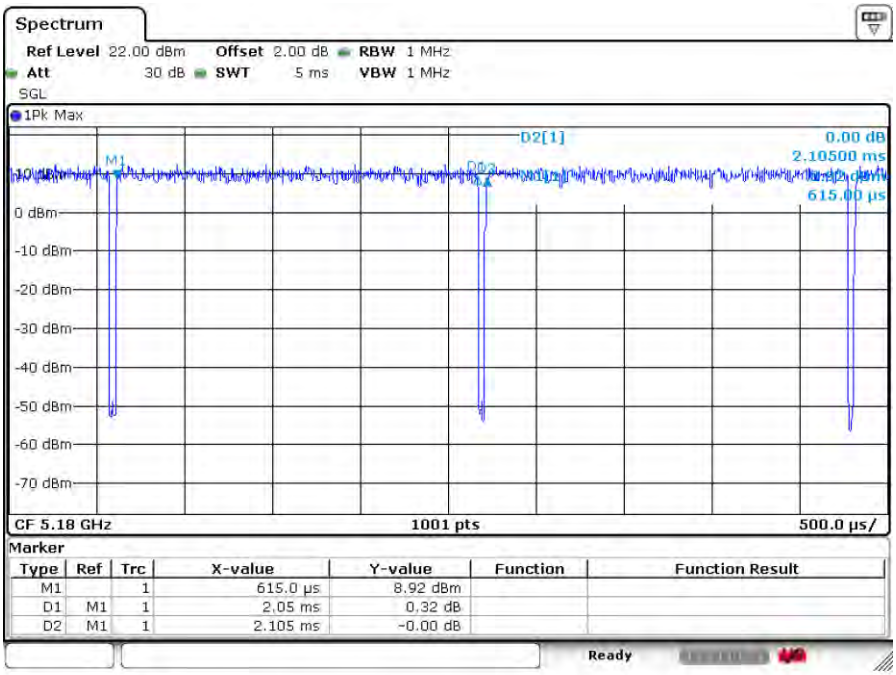
4.3.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]	
		Ant1	Ant2
11A	Ant 1: CH36; Ant 2: CH36	97.39	97.62
11A CCD	Ant 1: CH36; Ant 2: CH36	97.66	97.33
11N20	Ant 1: CH36; Ant 2: CH36	97.46	97.80
11N40	Ant 1: CH38; Ant 2: CH38	93.10	92.61
11N20 MIMO	Ant 1: CH36; Ant 2: CH36	94.93	95.22
11N40 MIMO	Ant 1: CH38; Ant 2: CH38	86.87	86.49
11AC20	Ant 1: CH36; Ant 2: CH36	97.46	97.56
11AC40	Ant 1: CH38; Ant 2: CH38	92.80	92.63
11AC80	Ant 1: CH42; Ant 2: CH42	85.86	85.46
11AC20 MIMO	Ant 1: CH36; Ant 2: CH36	95.54	96.21
11AC40 MIMO	Ant 1: CH38; Ant 2: CH38	87.29	86.75
11AC80 MIMO	Ant 1: CH42; Ant 2: CH42	85.86	87.71

4.3.1 Test Plots

4.3.1.1 ANT1

4.3.1.1.1 11A



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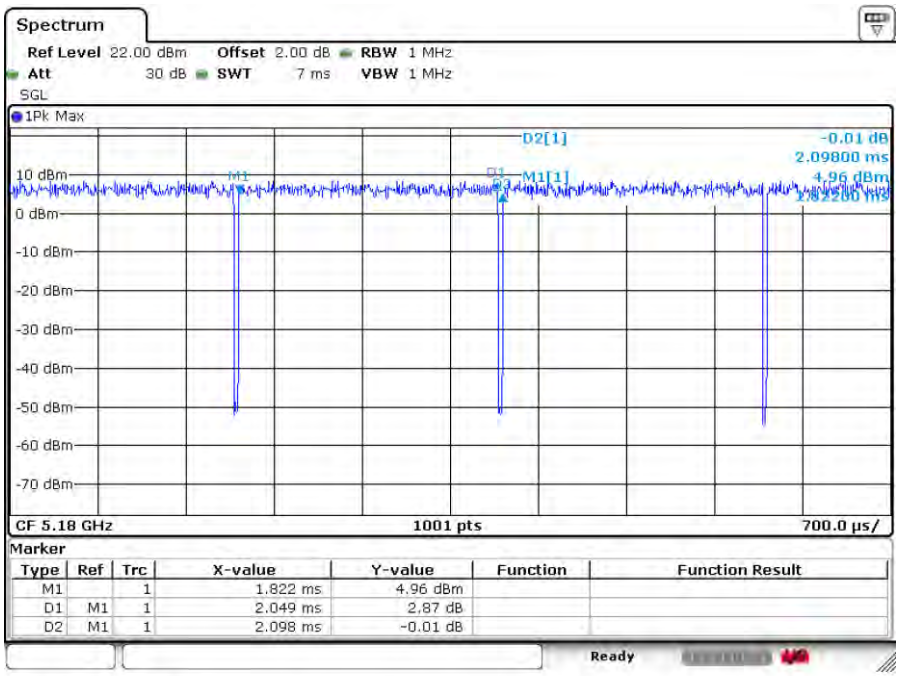
4.3.1.1.2 11A MIMO



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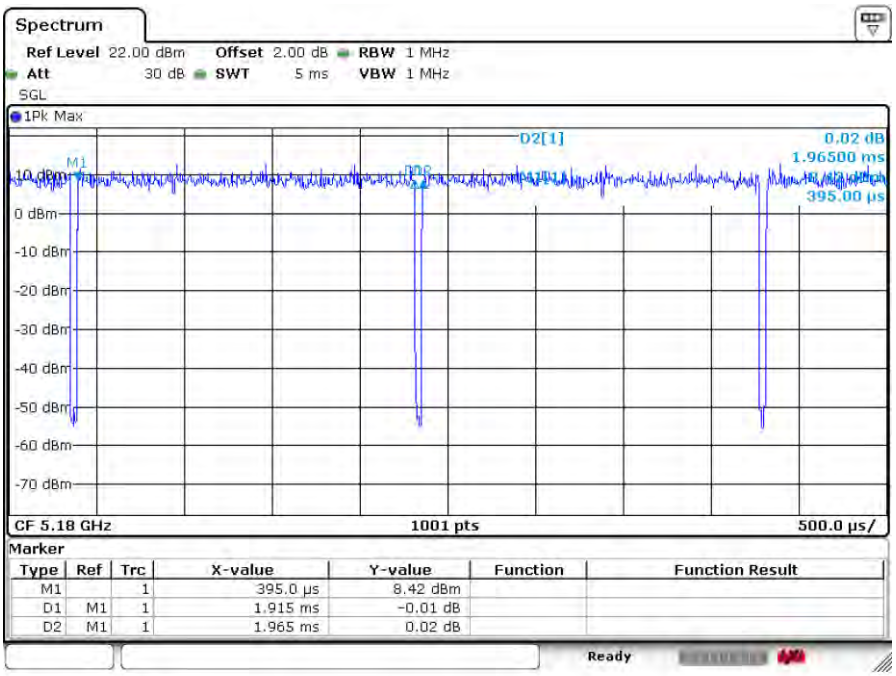
4.3.1.1.3 11N20



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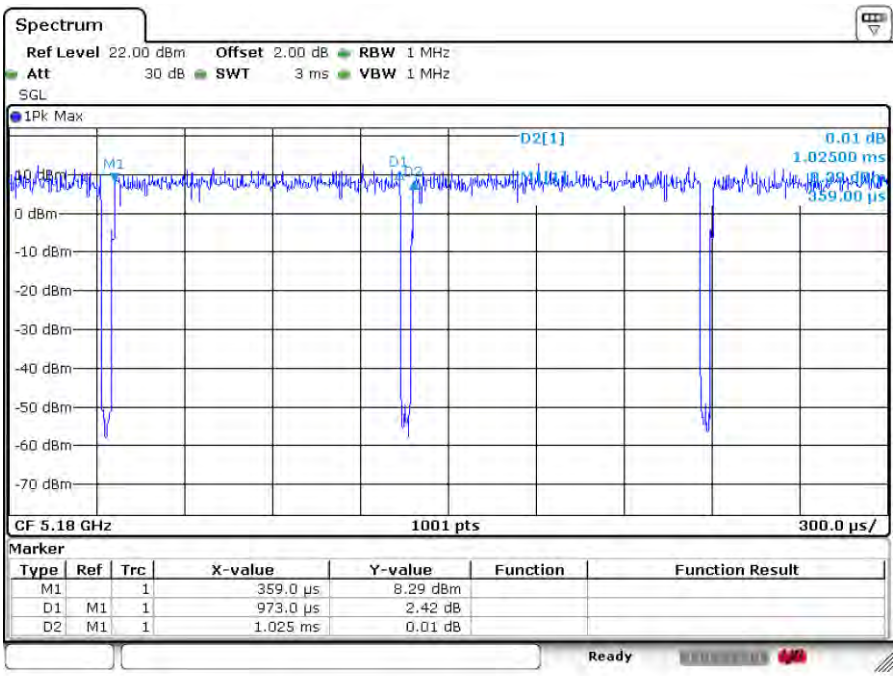
4.3.1.1.4 11N20 MIMO



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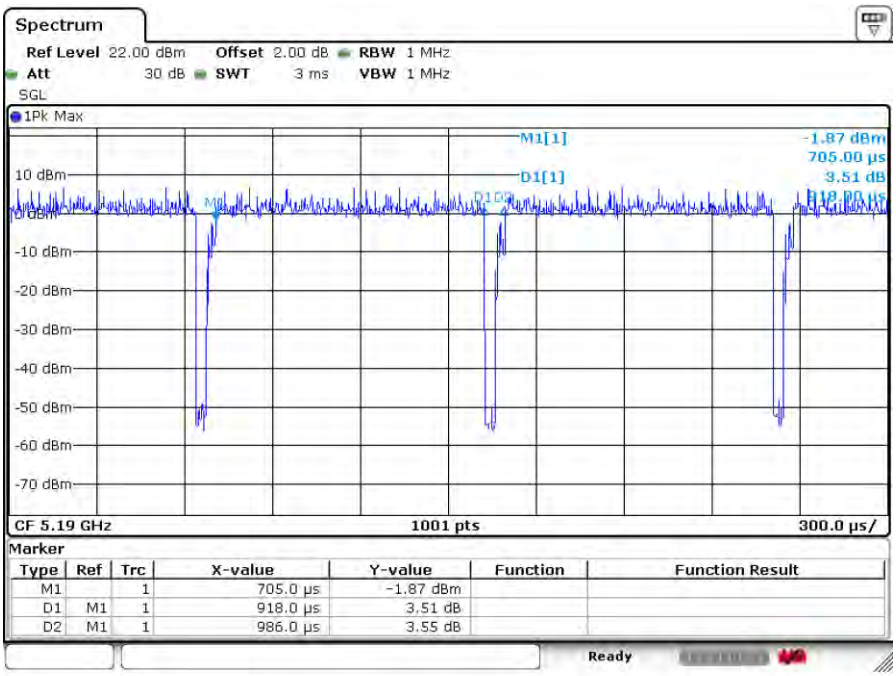
4.3.1.1.5 11N40



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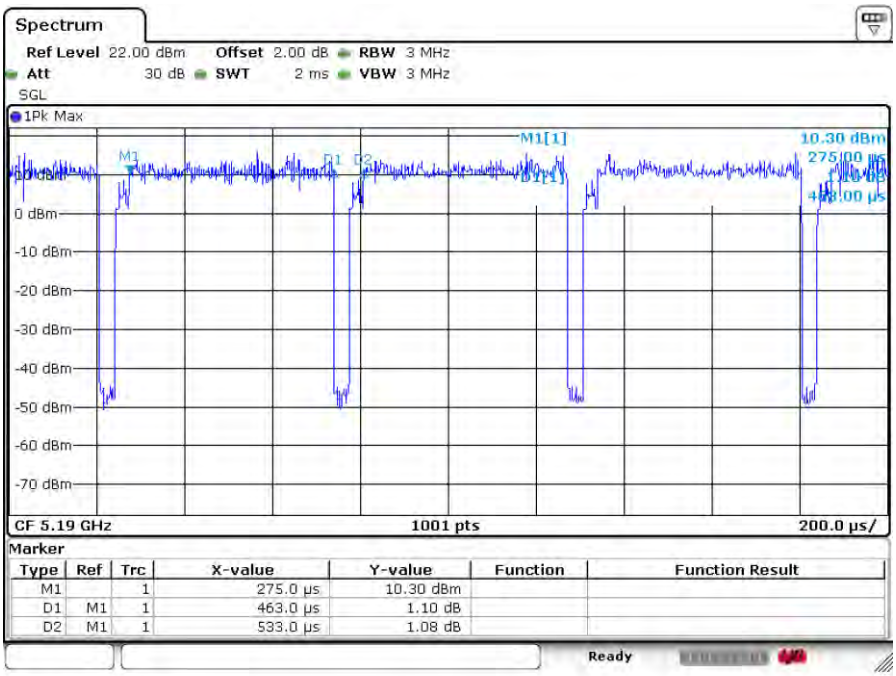
4.3.1.1.6 11N40 MIMO



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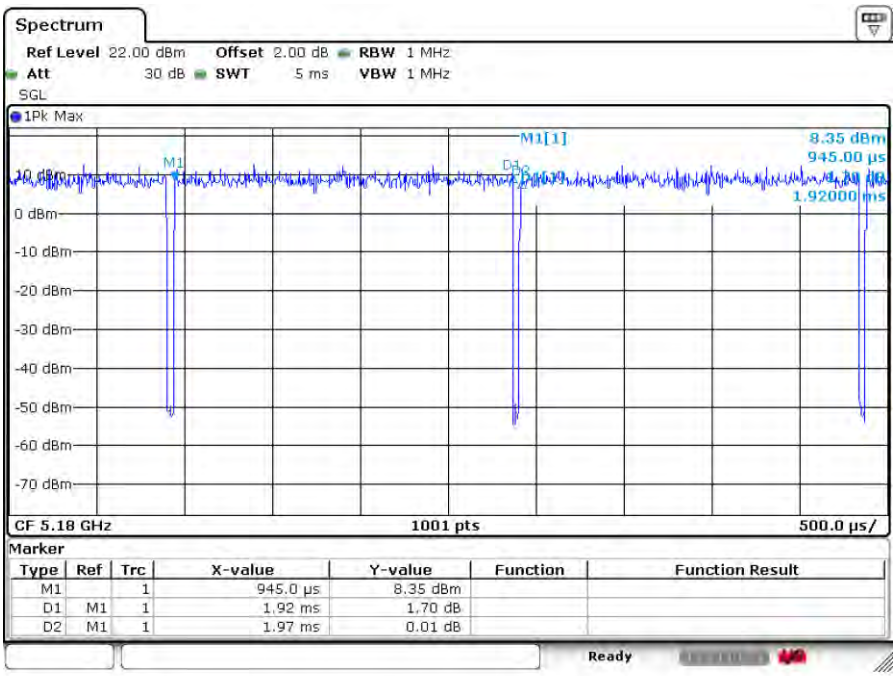
4.3.1.1.7 11AC20



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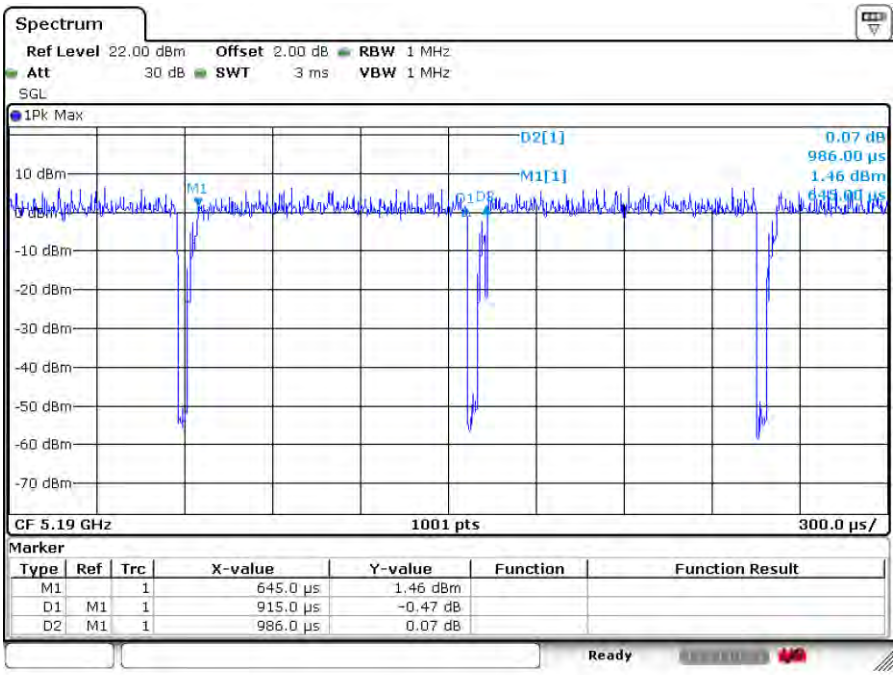
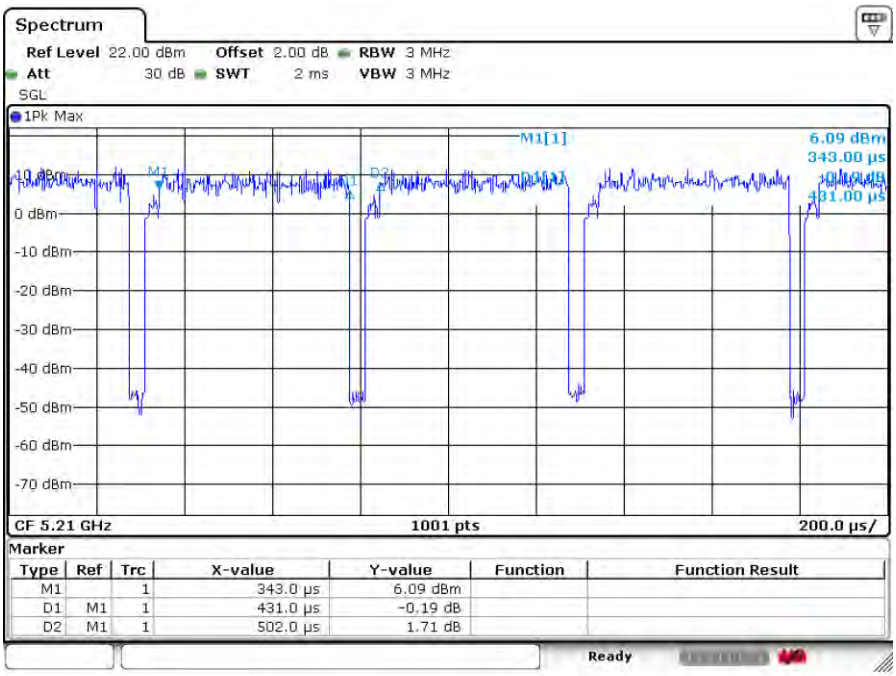
4.3.1.1.8 11AC40



Date: 1.JAN.2020 01:51:00

4.3.1.1.9 11AC80



Date: 1.JAN.2020 01:52:08

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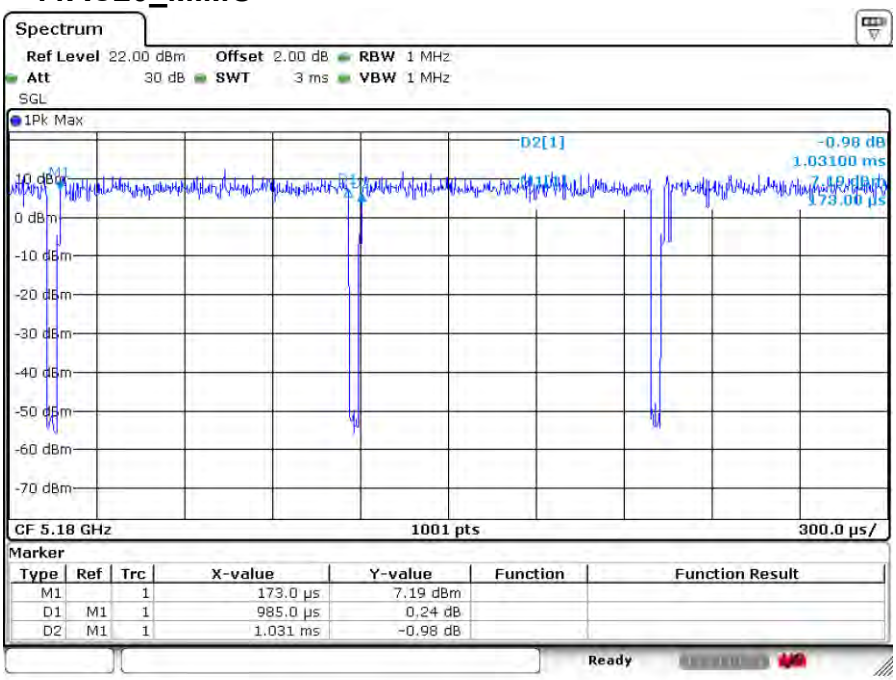
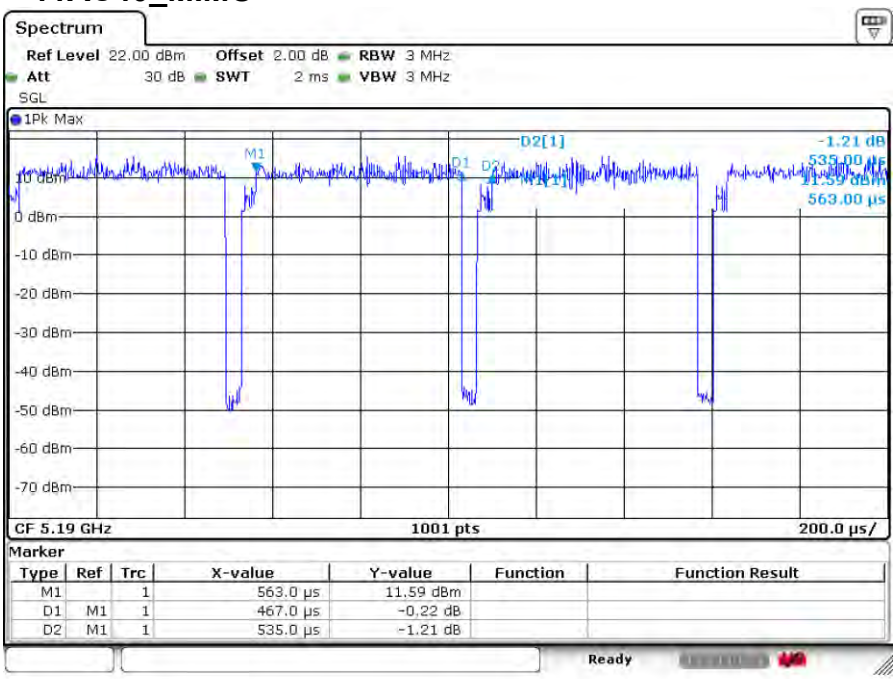
4.3.1.1.10 11AC20_MIMO



Date: 1.JAN.2020 02:25:37

4.3.1.1.11 11AC40_MIMO



Date: 1.JAN.2020 02:22:57

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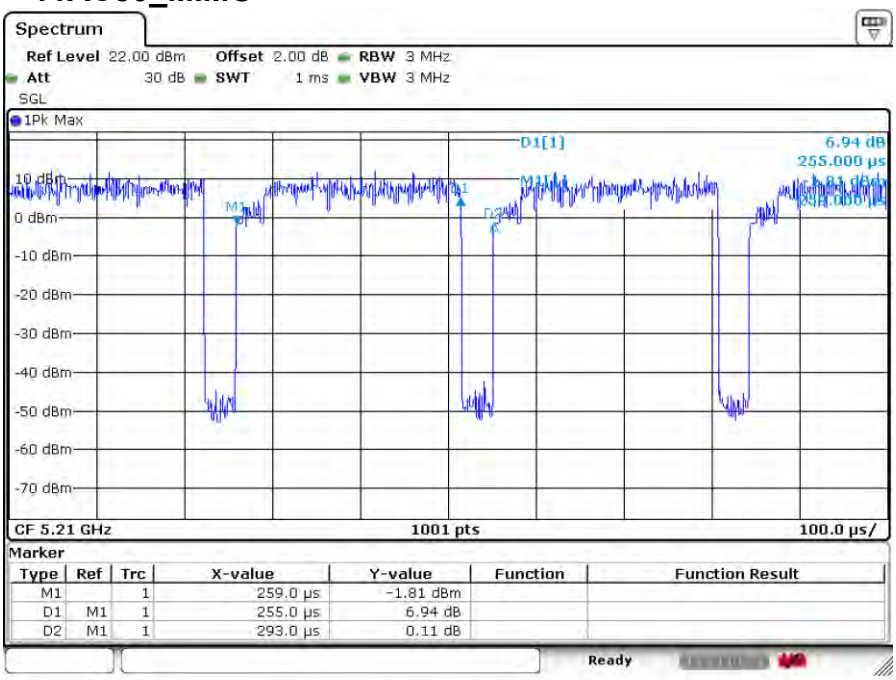
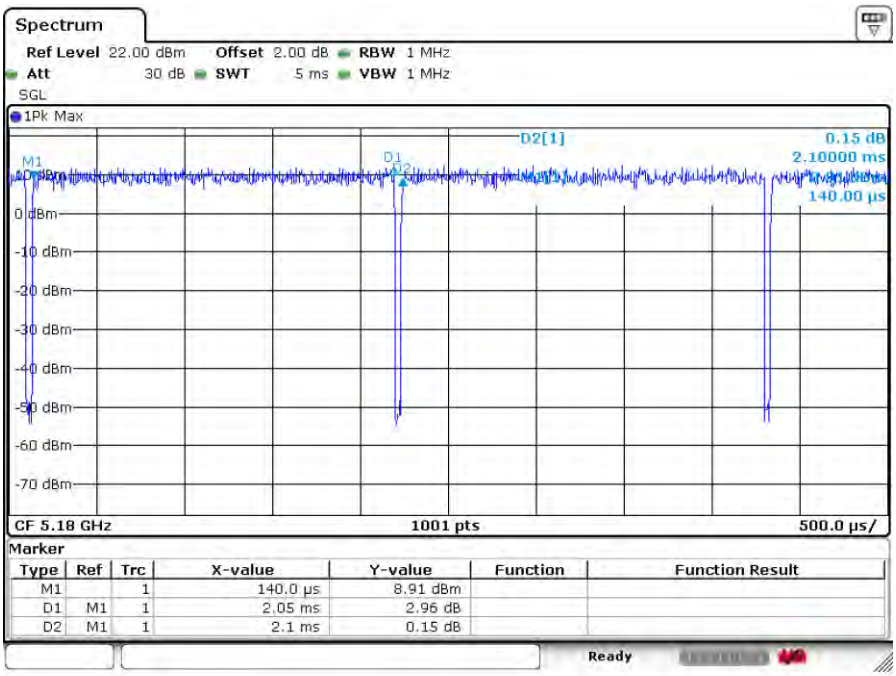
4.3.1.1.12 11AC80_MIMO



Date: 1.JAN.2020 02:22:00

4.3.1.2 ANT2

4.3.1.2.1 11A



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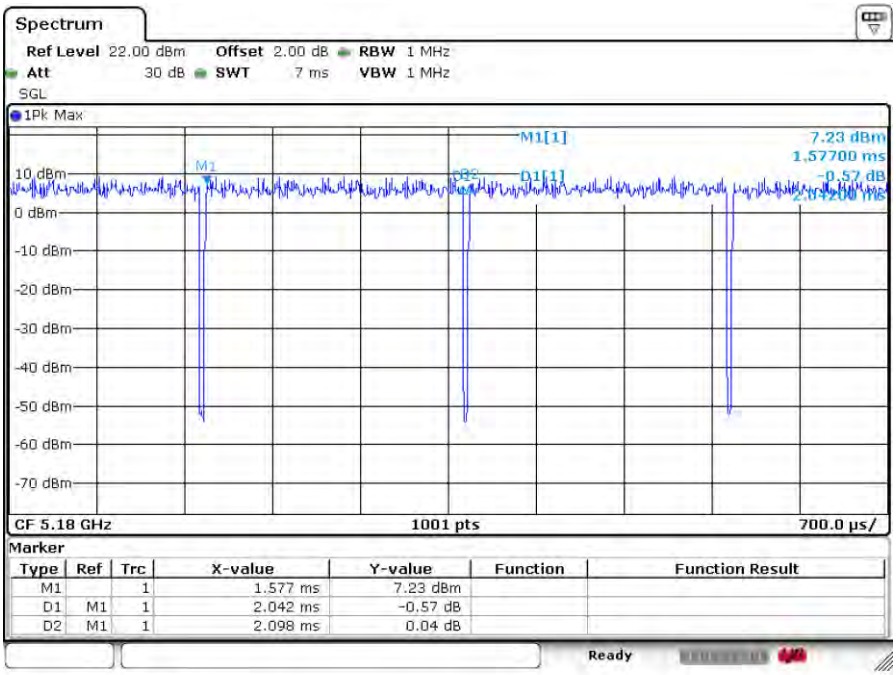
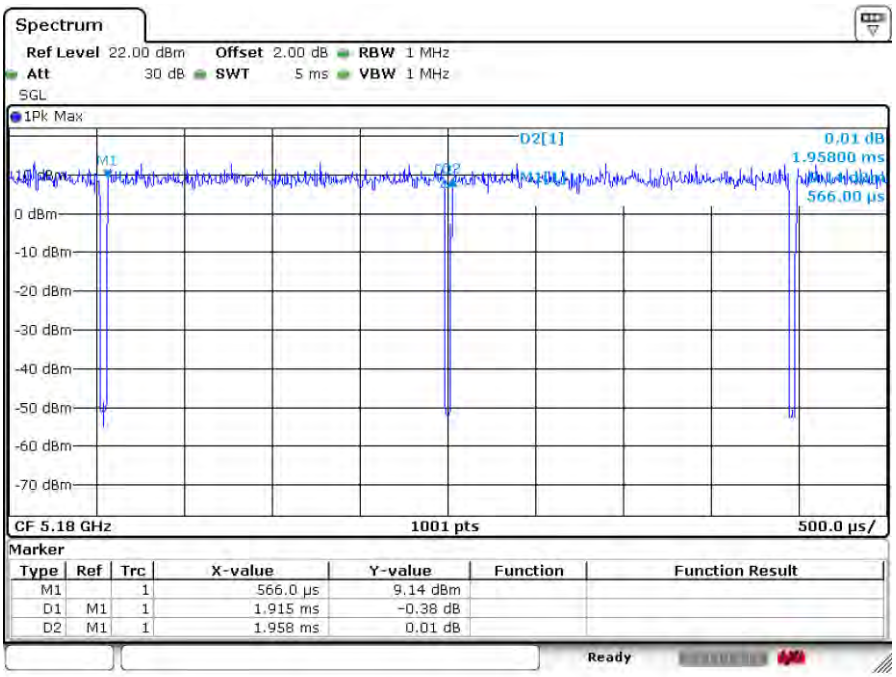
4.3.1.2.2 11A MIMO



Date: 15.JAN.2020 10:40:39

4.3.1.2.3 11N20



Date: 1.JAN.2020 02:04:07

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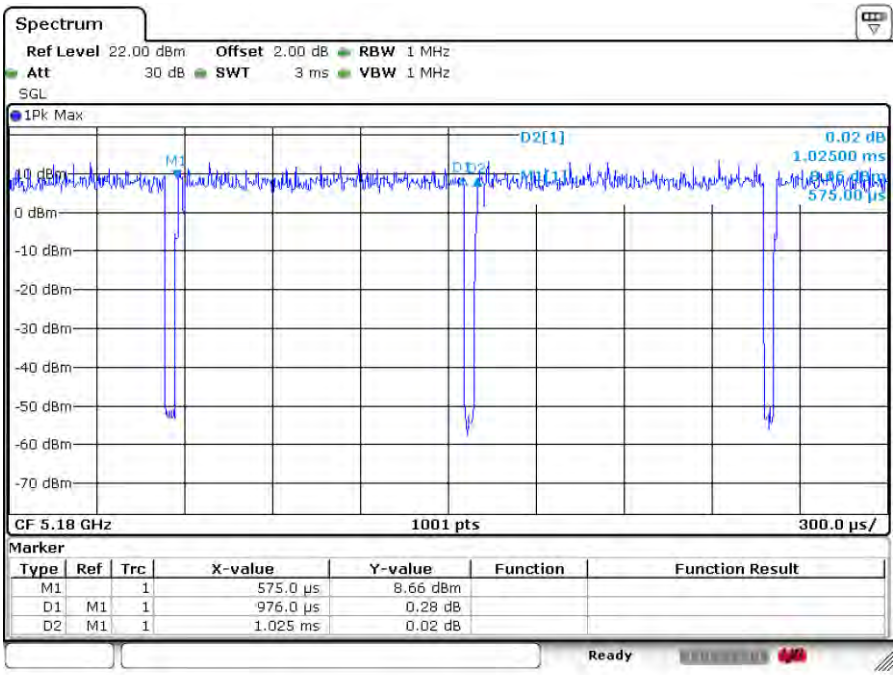
4.3.1.2.4 11N20 MIMO



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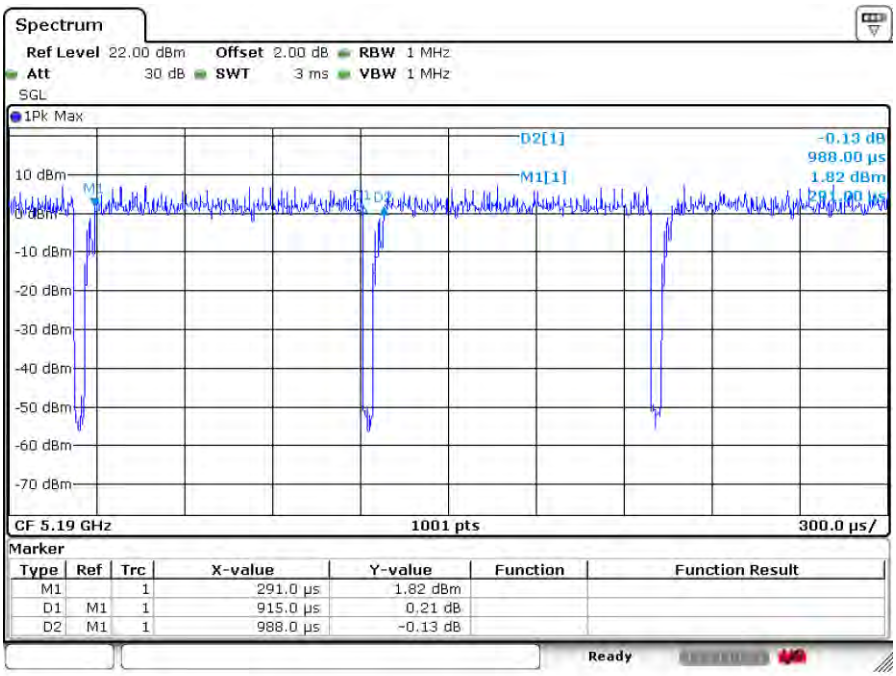
4.3.1.2.5 11N40



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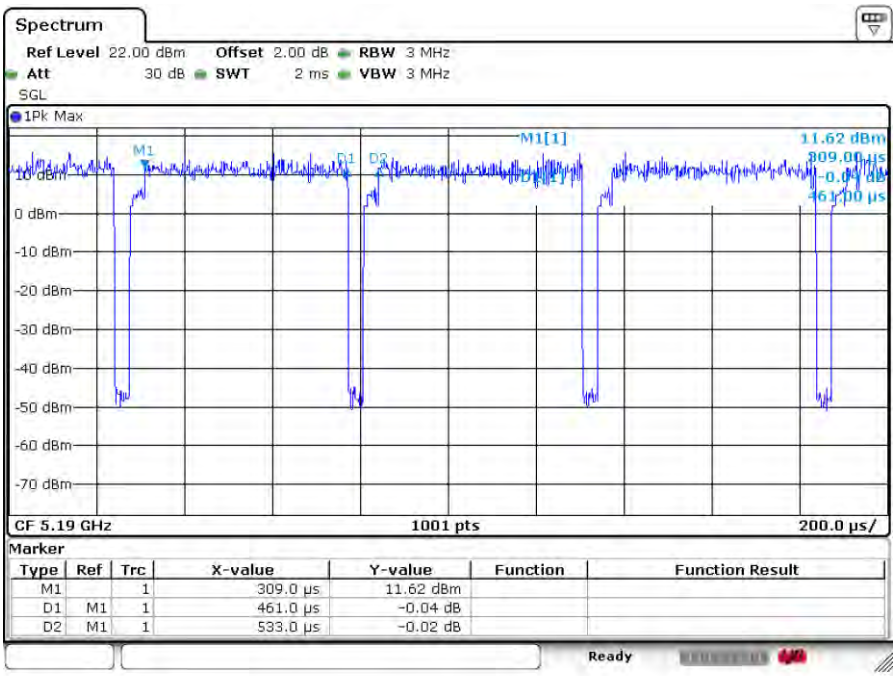
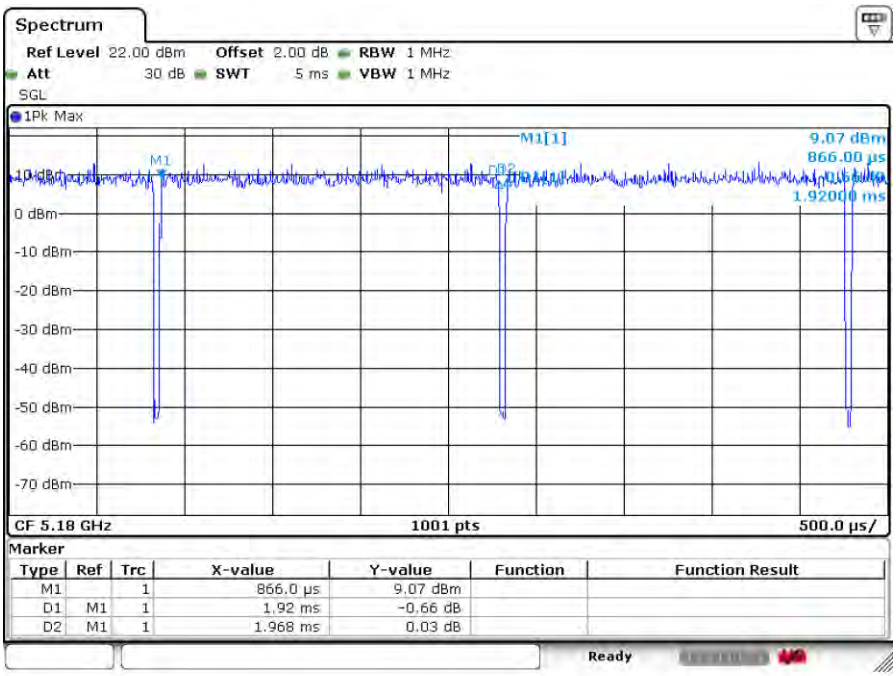
4.3.1.2.6 11N40 MIMO



Date: 1.JAN.2020 02:13:42

4.3.1.2.7 11AC20



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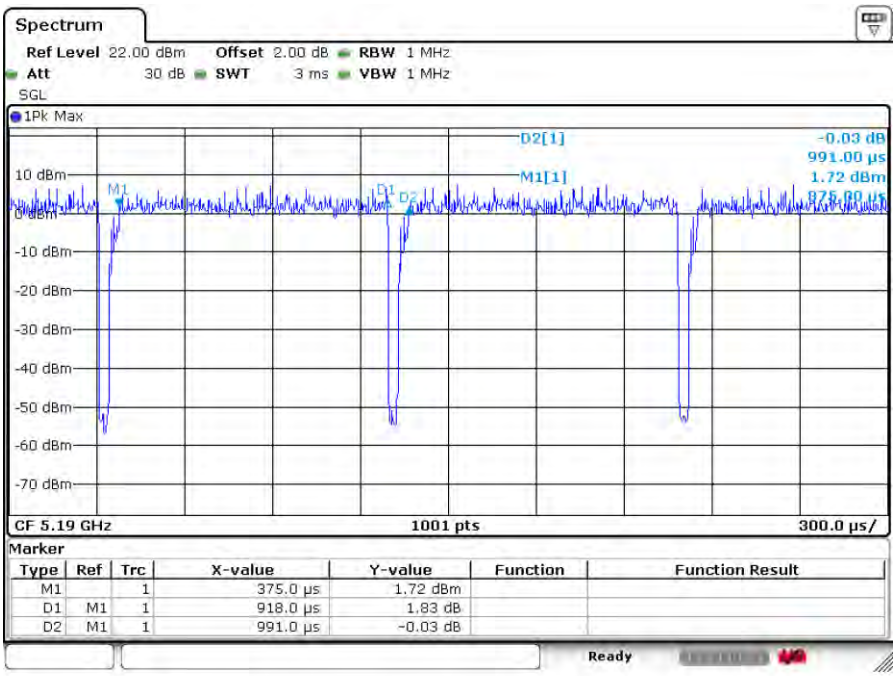
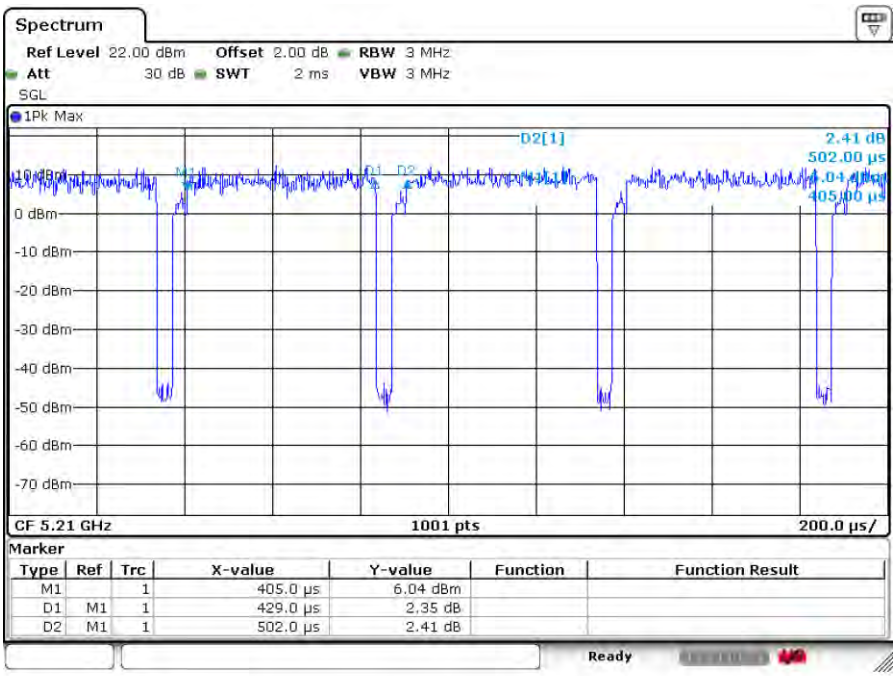
4.3.1.2.8 11AC40



Date: 1.JAN.2020 02:00:38

4.3.1.2.9 11AC80



Date: 1.JAN.2020 01:59:38

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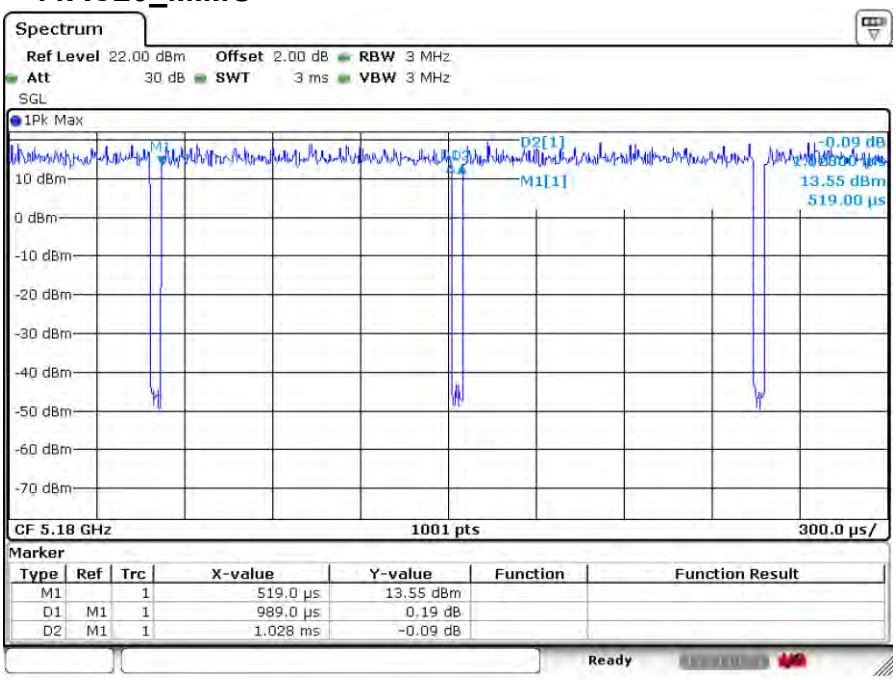
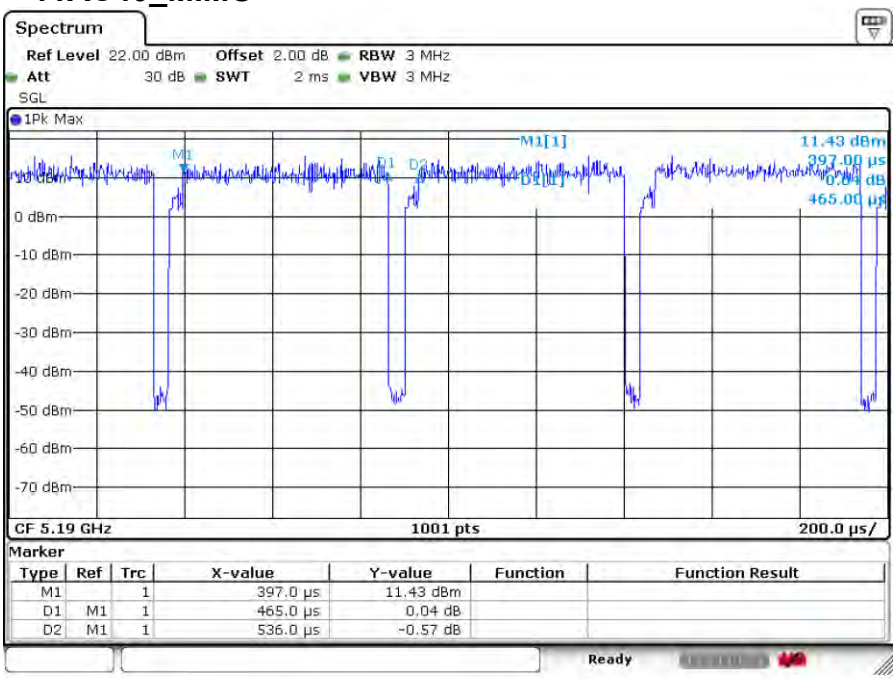
4.3.1.2.10 11AC20_MIMO



Date: 1.JAN.2020 02:14:42

4.3.1.2.11 11AC40_MIMO



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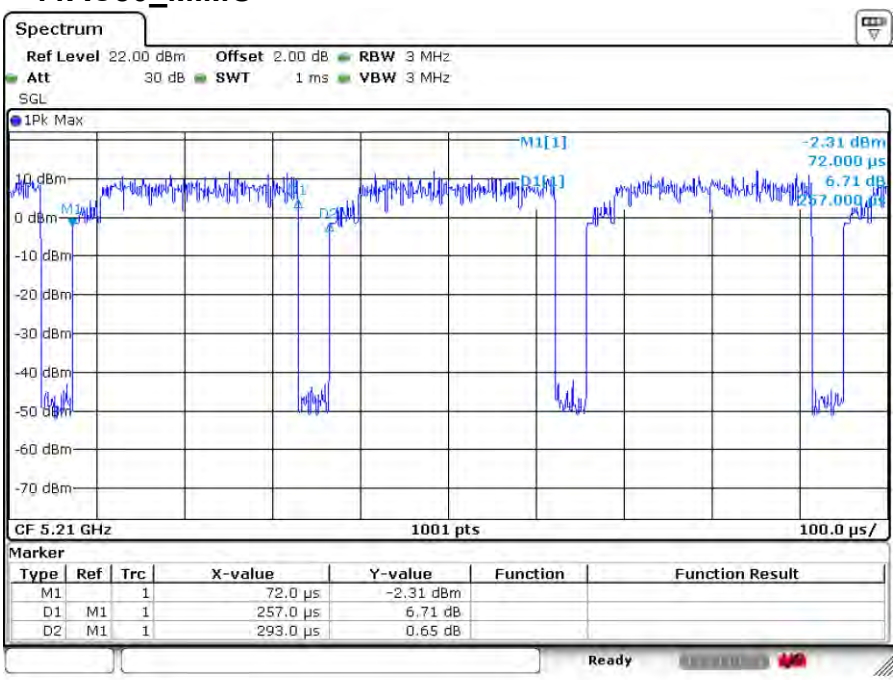
4.3.1.2.12 11AC80_MIMO



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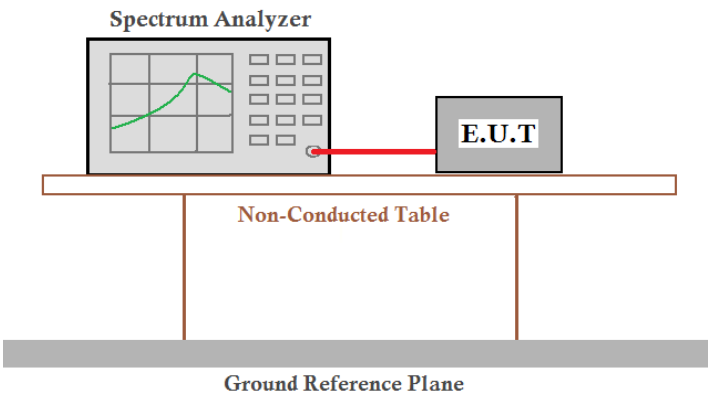
4.4 Conducted Output Power

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
	5725-5850MHz	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	
11A20	36	5180	18.00	18.06	PASS
	48	5240	18.05	18.43	PASS
	52	5260	18.15	18.54	PASS
	64	5320	18.21	18.45	PASS
	100	5500	18.13	18.77	PASS
	140	5700	18.16	18.89	PASS
	149	5745	11.93	13.45	PASS
	165	5825	12.12	13.42	PASS
11A20 CDD	36	5180	20.12		PASS
	48	5240	20.32		PASS
	52	5260	20.41		PASS
	64	5320	20.37		PASS
	100	5500	20.53		PASS
	140	5700	20.60		PASS
	149	5745	15.77		PASS
	165	5825	15.83		PASS
11N20	36	5180	17.48	17.52	PASS
	48	5240	17.51	17.83	PASS
	52	5260	17.45	17.91	PASS
	64	5320	17.52	17.93	PASS
	100	5500	17.43	18.18	PASS
	140	5700	17.51	18.27	PASS
	149	5745	11.77	13.46	PASS
	165	5825	11.97	13.45	PASS
11N20 MIMO	36	5180	19.55		PASS
	48	5240	19.72		PASS
	52	5260	19.78		PASS
	64	5320	19.79		PASS
	100	5500	19.90		PASS
	140	5700	20.00		PASS
	149	5745	15.71		PASS
	165	5825	15.78		PASS
11N40	38	5190	14.85	15.01	PASS
	46	5230	17.94	18.19	PASS
	54	5270	17.95	18.31	PASS
	62	5310	13.82	14.36	PASS
	102	5510	12.39	12.99	PASS
	134	5670	17.95	18.63	PASS
	151	5755	11.54	13.15	PASS
	159	5795	11.52	13.24	PASS
11N40 MIMO	38	5190	18.04		PASS
	46	5230	20.18		PASS
	54	5270	20.24		PASS

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	62	5310	17.20		PASS
	102	5510	15.74		PASS
	134	5670	20.37		PASS
	151	5755	15.43		PASS
	159	5795	15.48		PASS
11AC20	36	5180	16.99	17.05	PASS
	48	5240	17.01	17.44	PASS
	52	5260	17.03	17.54	PASS
	64	5320	17.08	17.53	PASS
	100	5500	16.94	17.76	PASS
	140	5700	17.03	17.98	PASS
	149	5745	11.79	13.45	PASS
	165	5825	12.01	13.43	PASS
11AC20 MIMO	36	5180	19.08		PASS
	48	5240	19.28		PASS
	52	5260	19.34		PASS
	64	5320	19.38		PASS
	100	5500	19.46		PASS
	140	5700	19.58		PASS
	149	5745	15.71		PASS
	165	5825	15.79		PASS
11AC40	38	5190	15.02	15.02	PASS
	46	5230	17.43	17.81	PASS
	54	5270	17.45	17.93	PASS
	62	5310	14.06	14.29	PASS
	102	5510	12.43	13.11	PASS
	134	5670	17.63	18.19	PASS
	151	5755	11.82	13.44	PASS
	159	5795	11.91	13.48	PASS
11AC40 MIMO	38	5190	18.07		PASS
	46	5230	19.73		PASS
	54	5270	19.77		PASS
	62	5310	17.31		PASS
	102	5510	15.85		PASS
	134	5670	19.98		PASS
	151	5755	15.72		PASS
	159	5795	15.77		PASS
11AC80	42	5210	13.33	13.22	PASS
	58	5290	12.69	13.12	PASS
	106	5530	12.03	12.93	PASS
	155	5775	11.96	13.47	PASS
11AC80 MIMO	42	5210	16.35		PASS
	58	5290	17.85		PASS
	106	5530	15.50		PASS
	155	5775	15.79		PASS

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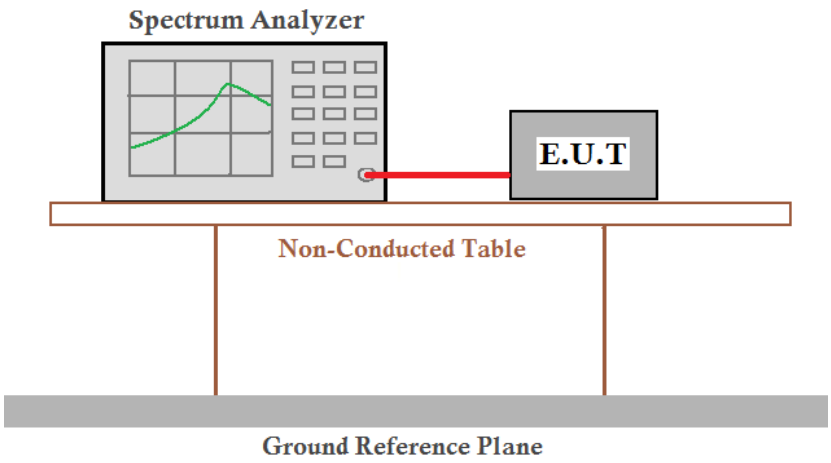
4.5 26dB Emission Bandwidth

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

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Test Mode	Test Channel	Frequency [MHz]	26dB Emission Bandwidth [MHz]		Verdict
			ANT 1	ANT 2	
11A20	36	5180	23.79	26.19	PASS
	48	5240	24.66	28.56	PASS
	52	5260	24.27	28.38	PASS
	64	5320	24.60	28.35	PASS
	100	5500	24.18	25.32	PASS
	140	5700	25.98	26.64	PASS
11A20 CDD	36	5180	24.75	24.78	PASS
	48	5240	24.75	24.48	PASS
	52	5260	24.18	24.39	PASS
	64	5320	24.39	25.41	PASS
	100	5500	24.69	26.76	PASS
	140	5700	24.48	24.39	PASS
11N20	36	5180	24.24	24.96	PASS
	48	5240	24.06	26.01	PASS
	52	5260	24.33	28.23	PASS
	64	5320	24.12	28.26	PASS
	100	5500	25.53	28.86	PASS
	140	5700	23.88	23.70	PASS
11N20 MIMO	36	5180	25.26	27.00	PASS
	48	5240	25.53	26.94	PASS
	52	5260	25.29	27.03	PASS
	64	5320	25.38	27.15	PASS
	100	5500	26.67	27.90	PASS
	140	5700	25.02	23.82	PASS
11N40	38	5190	41.34	41.52	PASS
	46	5230	42.06	57.96	PASS
	54	5270	41.88	58.20	PASS
	62	5310	41.82	41.94	PASS
	102	5510	41.70	41.70	PASS
	134	5670	49.74	59.88	PASS
11N40 MIMO	38	5190	41.34	41.34	PASS
	46	5230	41.58	48.96	PASS
	54	5270	41.28	56.70	PASS
	62	5310	40.98	41.52	PASS
	102	5510	41.28	41.40	PASS
	134	5670	41.76	49.62	PASS
11AC20	36	5180	23.97	25.89	PASS
	48	5240	24.24	28.47	PASS
	52	5260	23.82	28.11	PASS
	64	5320	24.15	28.56	PASS
	100	5500	25.62	28.65	PASS
	140	5700	24.57	24.51	PASS
11AC20	36	5180	25.20	27.24	PASS

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MIMO	48	5240	25.41	27.18	PASS
	52	5260	25.11	27.54	PASS
	64	5320	25.50	26.49	PASS
	100	5500	26.55	27.87	PASS
	140	5700	25.26	26.01	PASS
11AC40	38	5190	41.52	41.58	PASS
	46	5230	41.58	53.10	PASS
	54	5270	41.82	53.10	PASS
	62	5310	41.76	42.18	PASS
	102	5510	41.76	41.64	PASS
	134	5670	42.42	58.20	PASS
11AC40 MIMO	38	5190	41.34	46.92	PASS
	46	5230	41.52	41.64	PASS
	54	5270	41.28	41.76	PASS
	62	5310	41.28	41.46	PASS
	102	5510	41.34	41.22	PASS
	134	5670	41.64	41.88	PASS
11AC80	42	5210	83.36	83.36	PASS
	58	5290	83.84	84.16	PASS
	106	5530	83.52	84.00	PASS
11AC80 MIMO	42	5210	83.04	83.36	PASS
	58	5290	83.52	82.56	PASS
	106	5530	83.52	83.52	PASS

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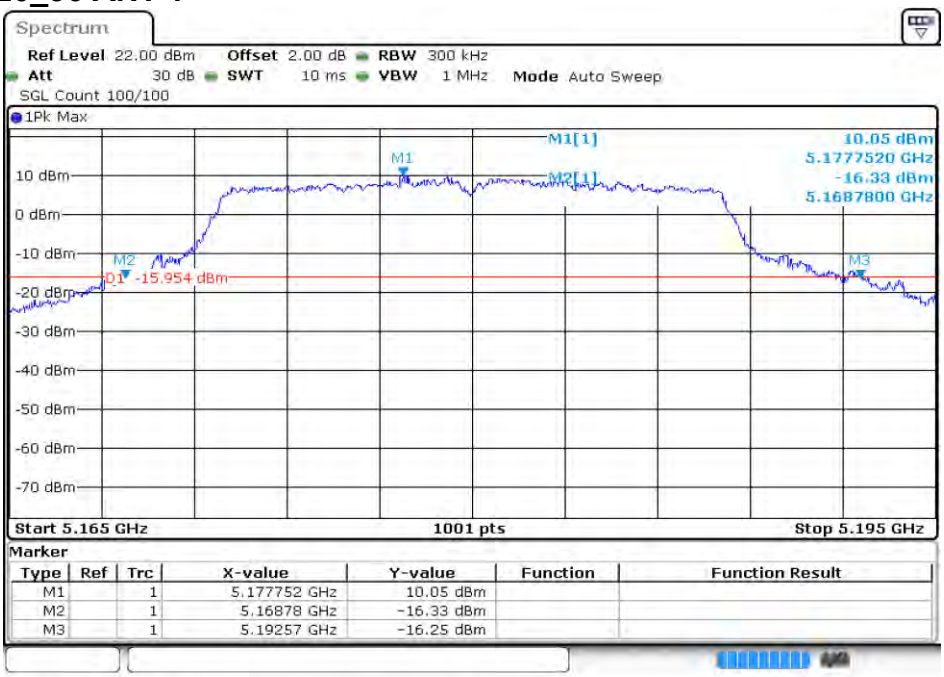
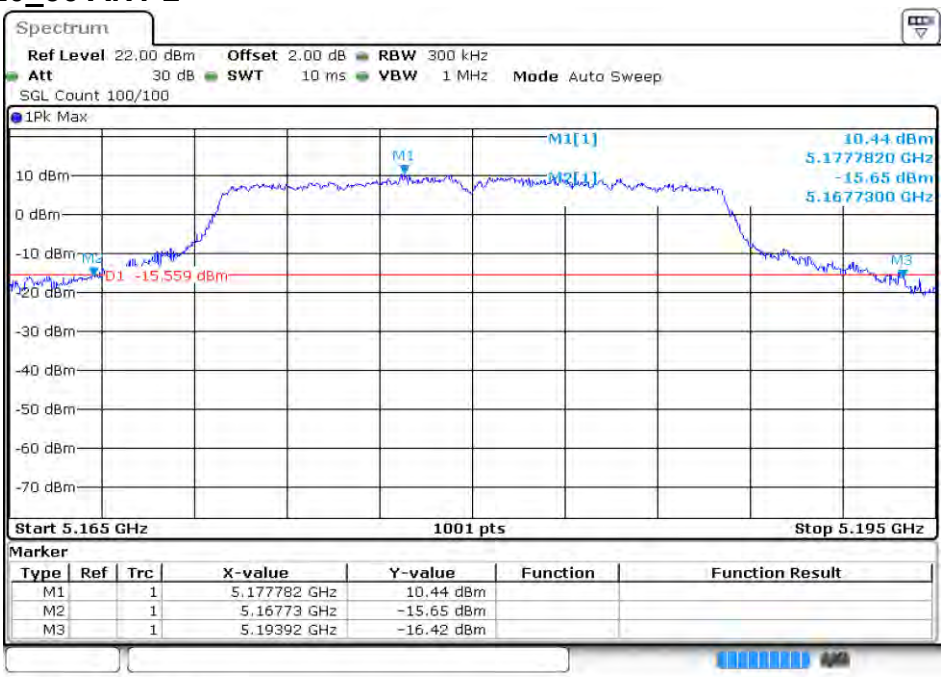
4.5.1 Plots for 26dB Emission Bandwidth

4.5.1.1 11A20_36 ANT 1



4.5.1.2 11A20_36 ANT 2



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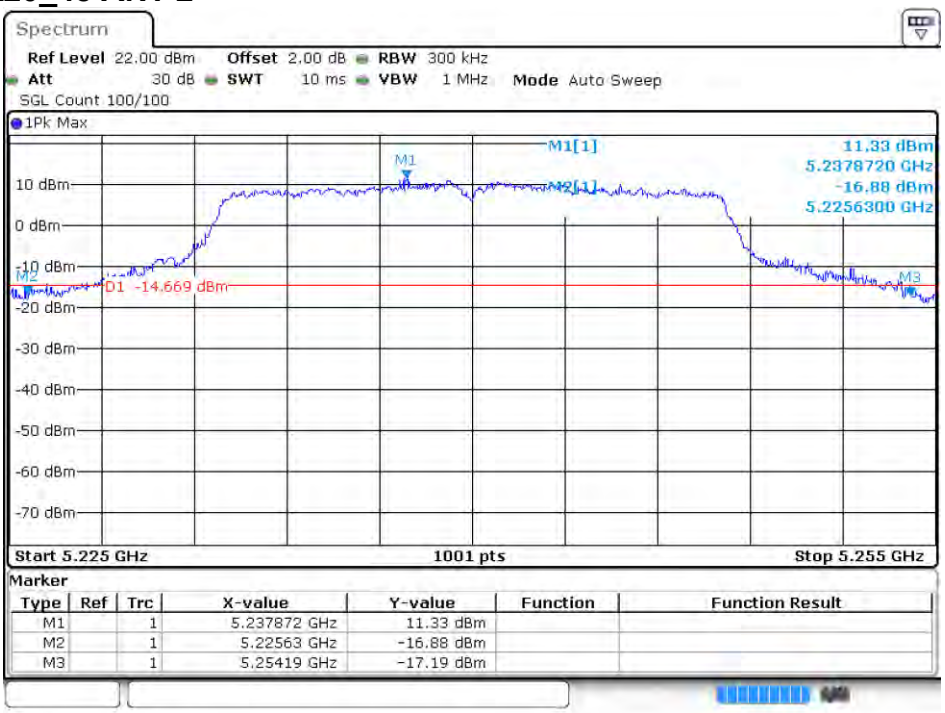
4.5.1.3 11A20_48 ANT 1

Date: 1.JAN.2020 02:46:03

4.5.1.4 11A20_48 ANT 2



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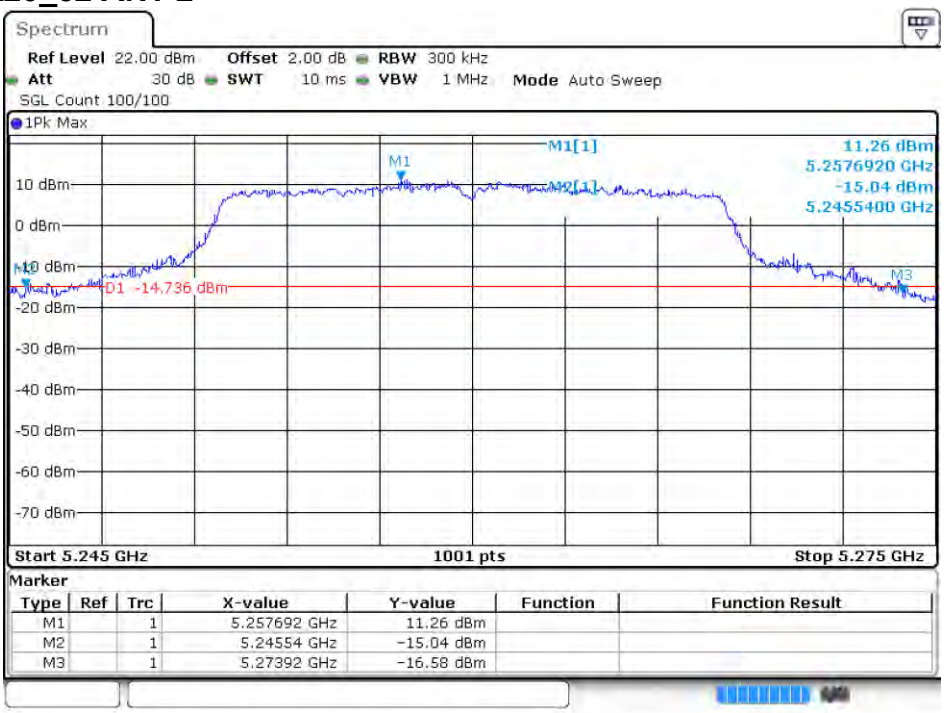
4.5.1.5 11A20_52 ANT 1

Date: 1.JAN.2020 02:47:36

4.5.1.6 11A20_52 ANT 2



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4.5.1.7 11A20_64 ANT 1

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4.5.1.8 11A20_64 ANT 2

Date: 1.JAN.2020 03:15:08

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4.5.1.9 11A20_100 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.497752 GHz	9.30 dBm		
M2		1	5.48821 GHz	-16.72 dBm		
M3		1	5.51239 GHz	-18.13 dBm		

Date: 1.JAN.2020 02:57:59

4.5.1.10 11A20_100 ANT 2

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.497812 GHz	9.84 dBm		
M2		1	5.48755 GHz	-16.55 dBm		
M3		1	5.51287 GHz	-17.06 dBm		

Date: 1.JAN.2020 03:19:08

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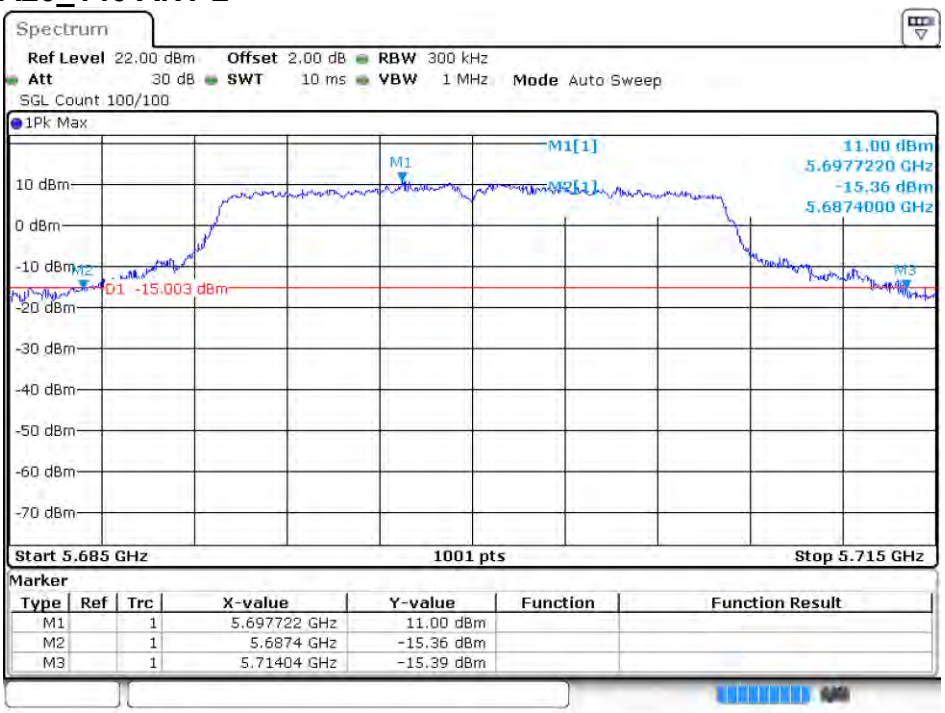
4.5.1.11 11A20_140 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.697782 GHz	10.61 dBm		
M2		1	5.68791 GHz	-16.27 dBm		
M3		1	5.71389 GHz	-15.72 dBm		

Date: 1.JAN.2020 02:59:23

4.5.1.12 11A20_140 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.697722 GHz	11.00 dBm		
M2		1	5.6874 GHz	-15.36 dBm		
M3		1	5.71404 GHz	-15.39 dBm		

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4.5.1.13 11A20 CDD_36 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.177902 GHz	8.82 dBm		
M2		1	5.16815 GHz	-17.47 dBm		
M3		1	5.1929 GHz	-18.92 dBm		

Date: 15.JAN.2020 10:54:10

4.5.1.14 11A20 CDD_36 ANT 2

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.181768 GHz	7.92 dBm		
M2		1	5.16788 GHz	-20.04 dBm		
M3		1	5.19266 GHz	-18.09 dBm		

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4.5.1.15 11A20 CDD_48 ANT 1

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4.5.1.16 11A20 CDD_48 ANT 2

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4.5.1.17 11A20 CDD_52 ANT 1

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4.5.1.18 11A20 CDD_52 ANT 2

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4.5.1.19 11A20 CDD_64 ANT 1

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4.5.1.20 11A20 CDD_64 ANT 2

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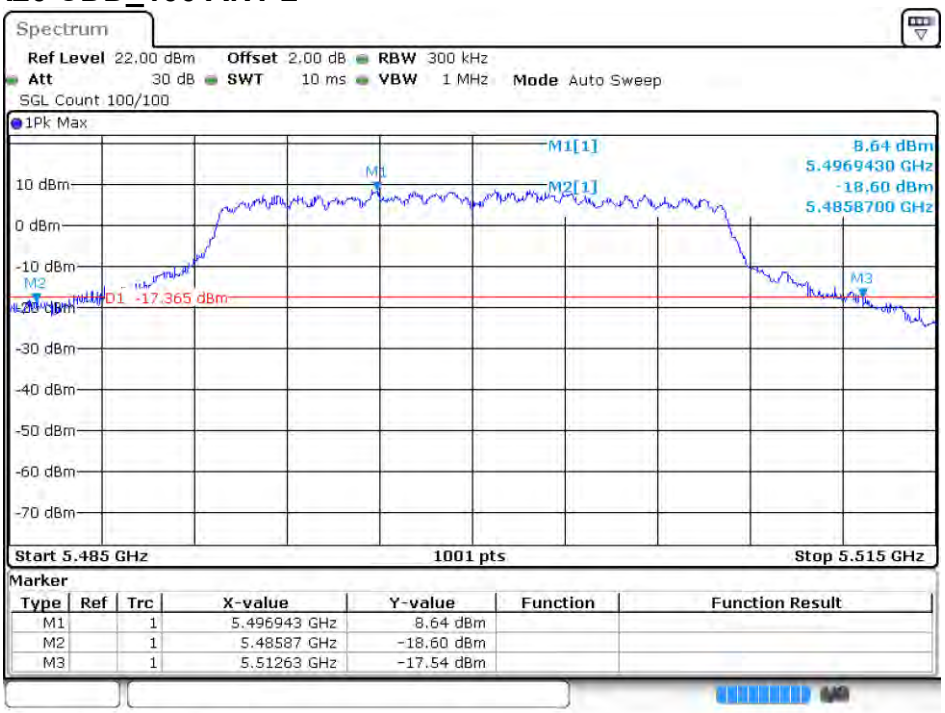
4.5.1.21 11A20 CDD_100 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.497782 GHz	8.40 dBm		
M2		1	5.48794 GHz	-19.08 dBm		
M3		1	5.51263 GHz	-19.10 dBm		

Date: 15.JAN.2020 10:59:10

4.5.1.22 11A20 CDD_100 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.496943 GHz	8.64 dBm		
M2		1	5.48587 GHz	-18.60 dBm		
M3		1	5.51263 GHz	-17.54 dBm		

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4.5.1.23 11A20 CDD_140 ANT 1

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4.5.1.24 11A20 CDD_140 ANT 2

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4.5.1.25 11N20_36 ANT 1

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.179221 GHz	8.86 dBm		
M2		1	5.16806 GHz	-18.29 dBm		
M3		1	5.1923 GHz	-17.98 dBm		

Date: 1.JAN.2020 04:25:01

4.5.1.26 11N20_36 ANT 2

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.177752 GHz	9.95 dBm		
M2		1	5.16794 GHz	-16.44 dBm		
M3		1	5.1929 GHz	-17.08 dBm		

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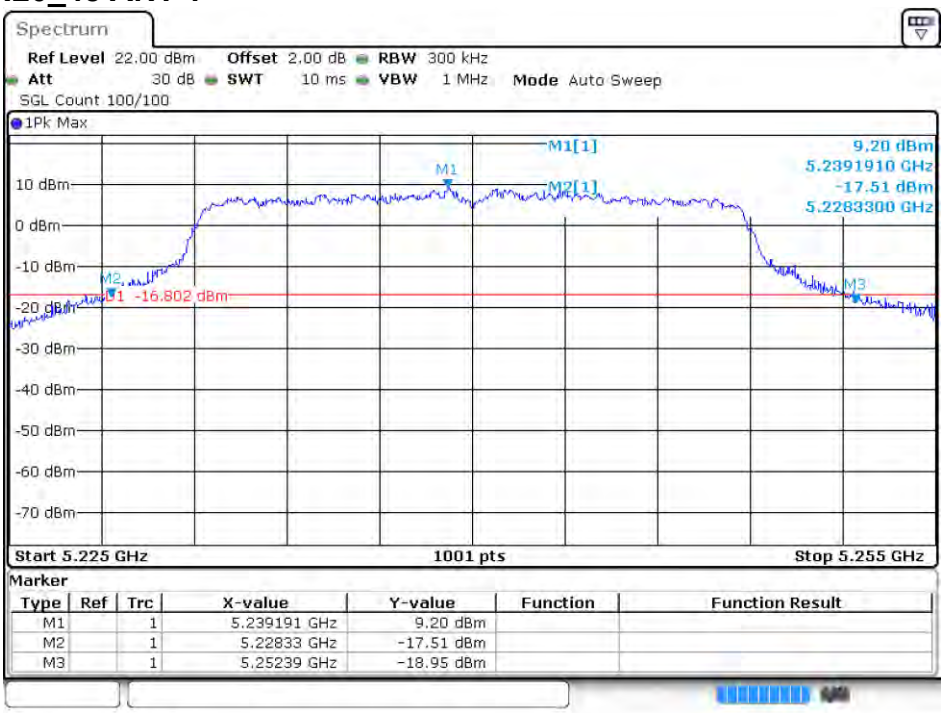
4.5.1.27 11N20_48 ANT 1



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4.5.1.28 11N20_48 ANT 2

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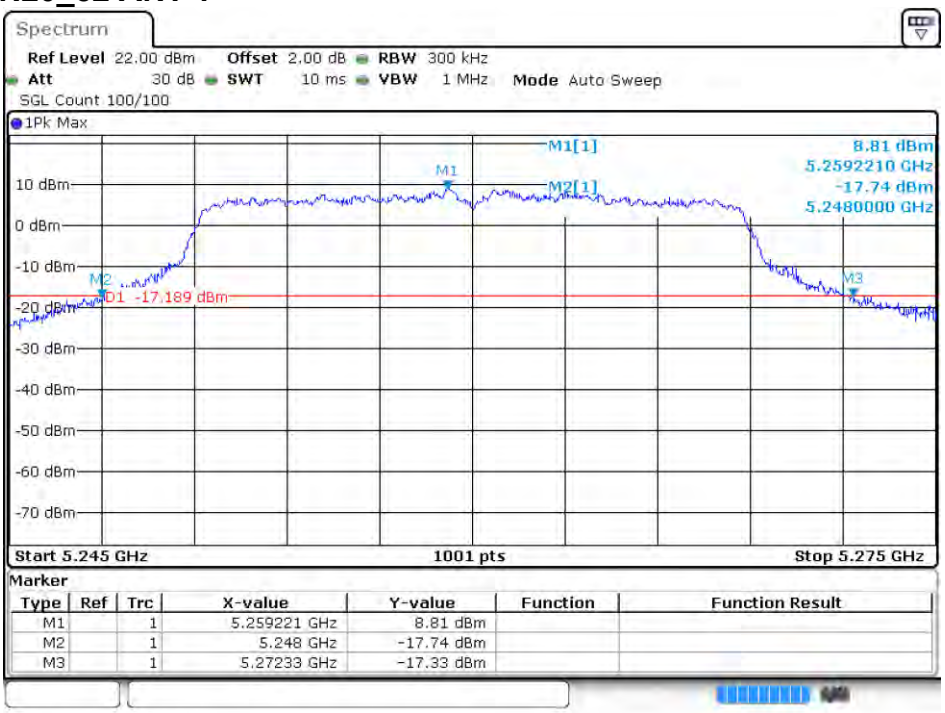

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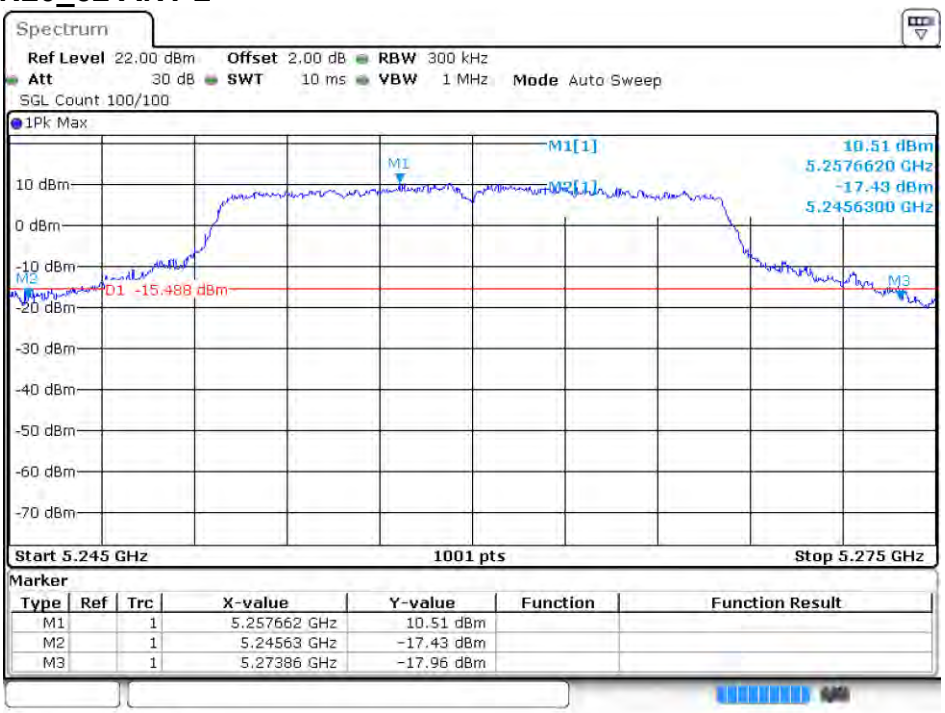
4.5.1.30 11N20_52 ANT 2



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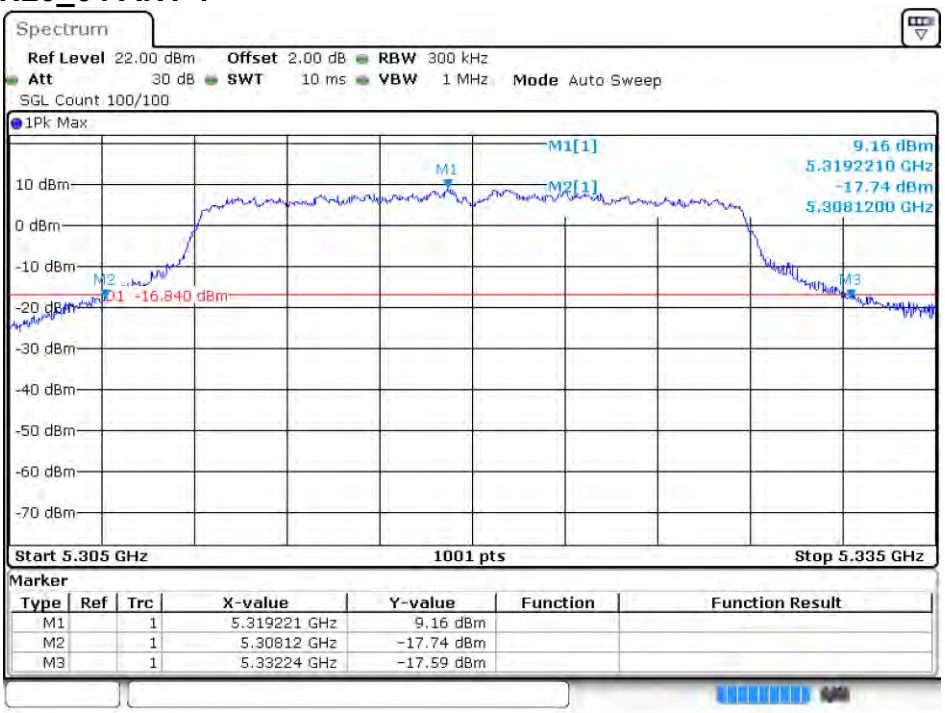
4.5.1.31 11N20_64 ANT 1



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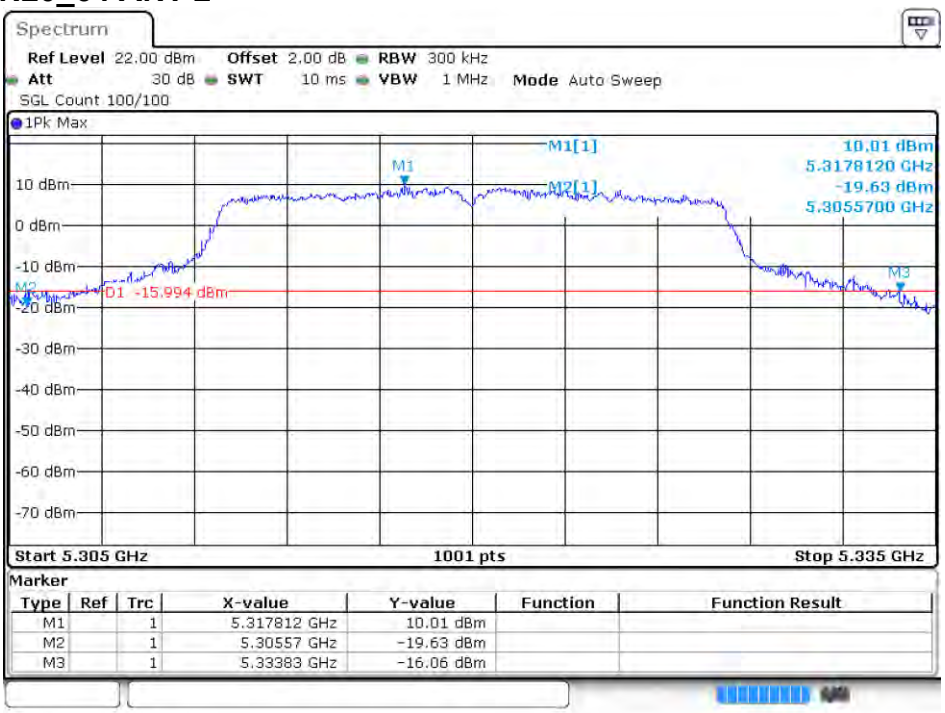
4.5.1.32 11N20_64 ANT 2



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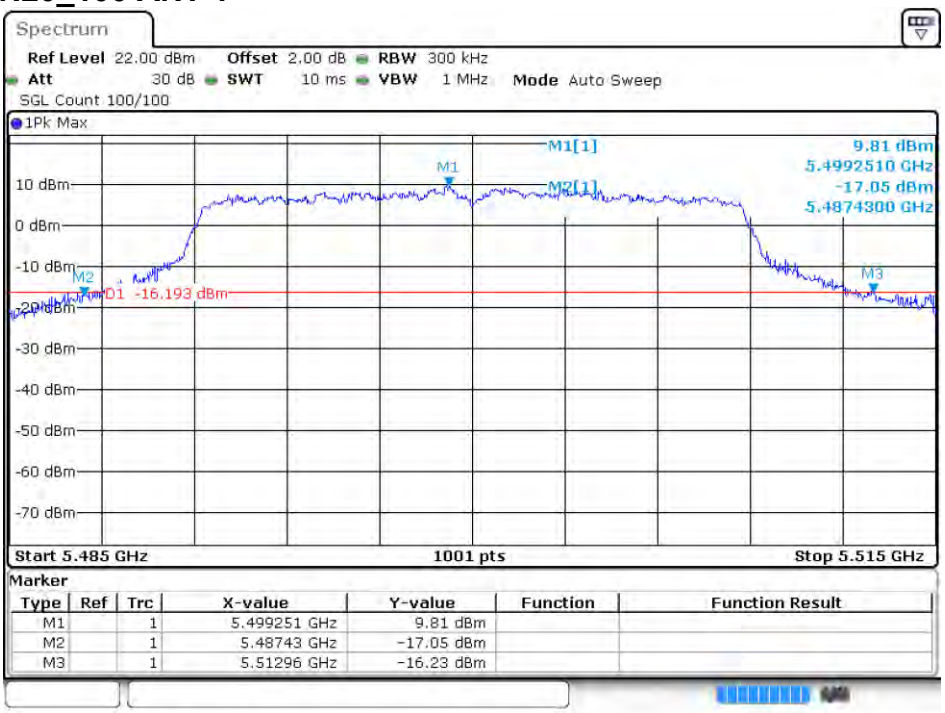
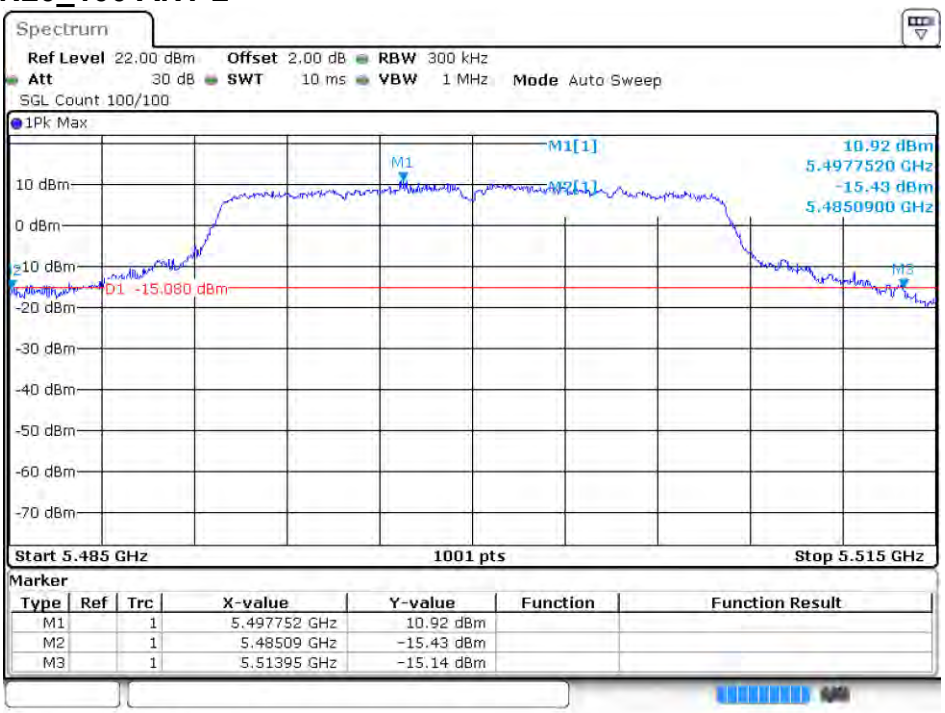
4.5.1.33 11N20_100 ANT 1



Date: 1.JAN.2020 04:31:11

4.5.1.34 11N20_100 ANT 2



Date: 1.JAN.2020 03:39:00

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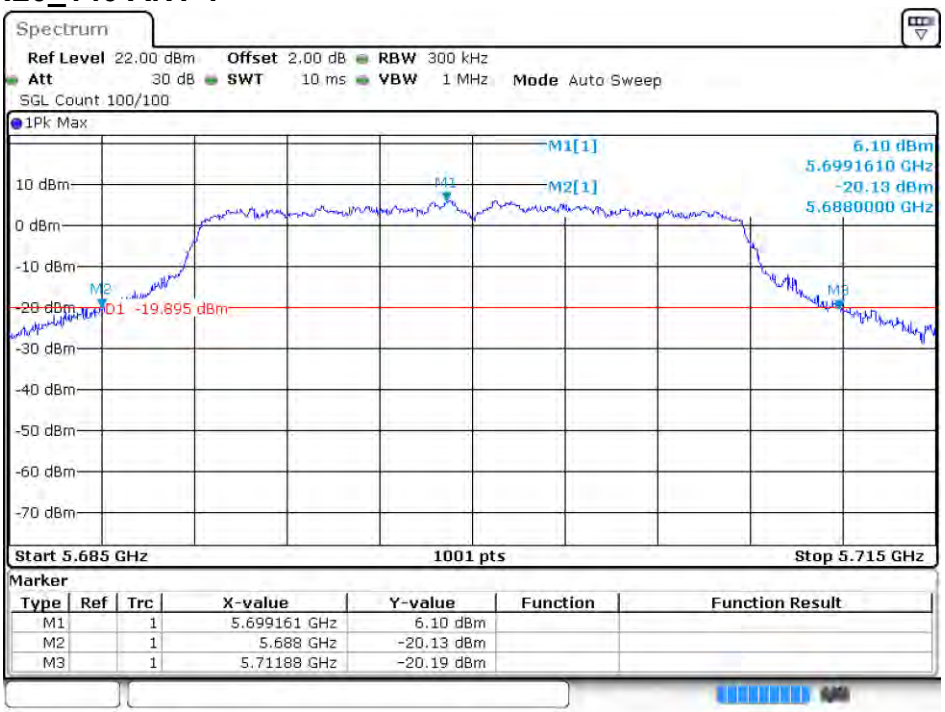
4.5.1.35 11N20_140 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.699161 GHz	6.10 dBm		
M2		1	5.688 GHz	-20.13 dBm		
M3		1	5.71188 GHz	-20.19 dBm		

Date: 1.JAN.2020 04:37:35

4.5.1.36 11N20_140 ANT 2

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.697752 GHz	7.65 dBm		
M2		1	5.68812 GHz	-19.29 dBm		
M3		1	5.71182 GHz	-18.59 dBm		

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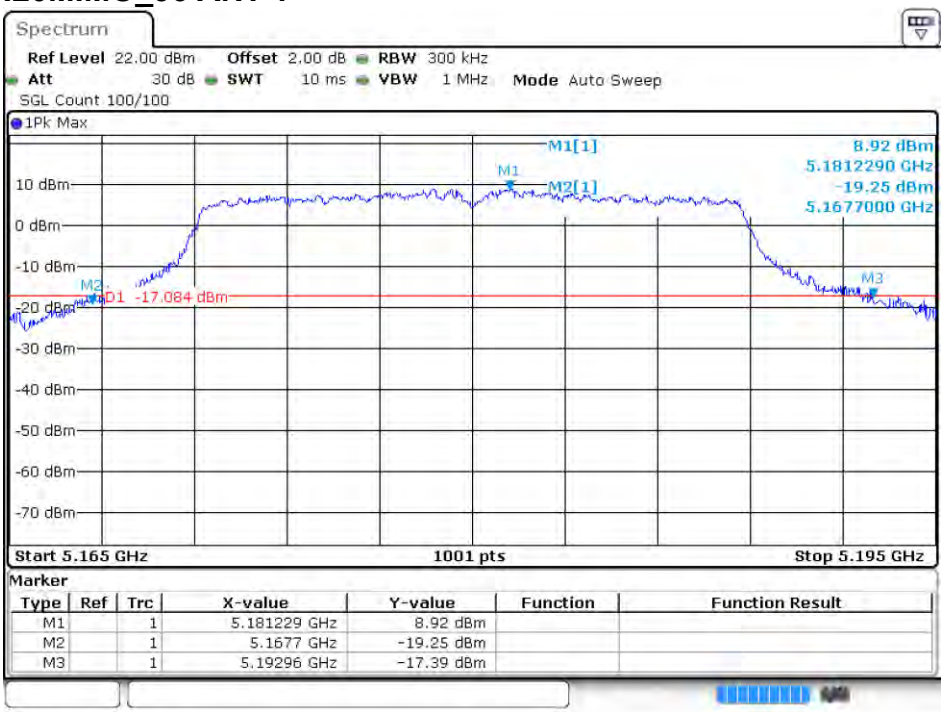
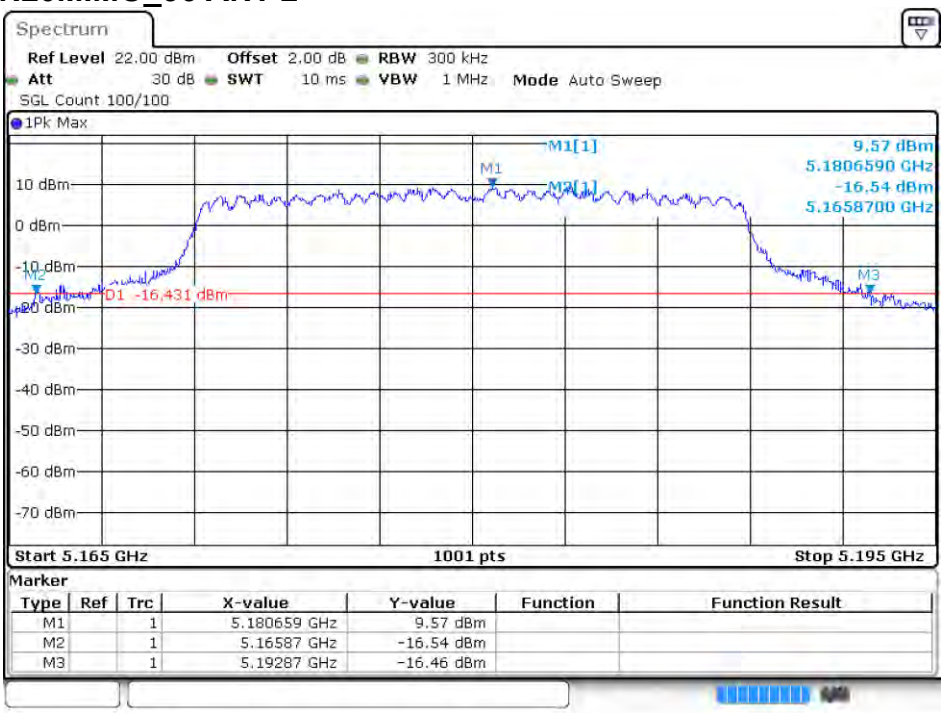
4.5.1.37 11N20MIMO_36 ANT 1



Date: 1.JAN.2020 07:19:18

4.5.1.38 11N20MIMO_36 ANT 2



Date: 1.JAN.2020 08:38:28

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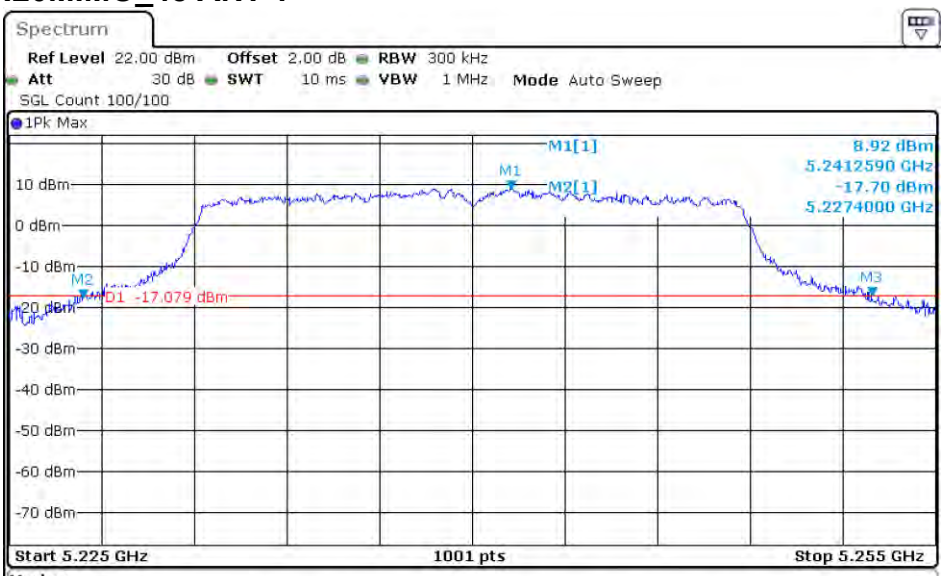
4.5.1.39 11N20MIMO_48 ANT 1

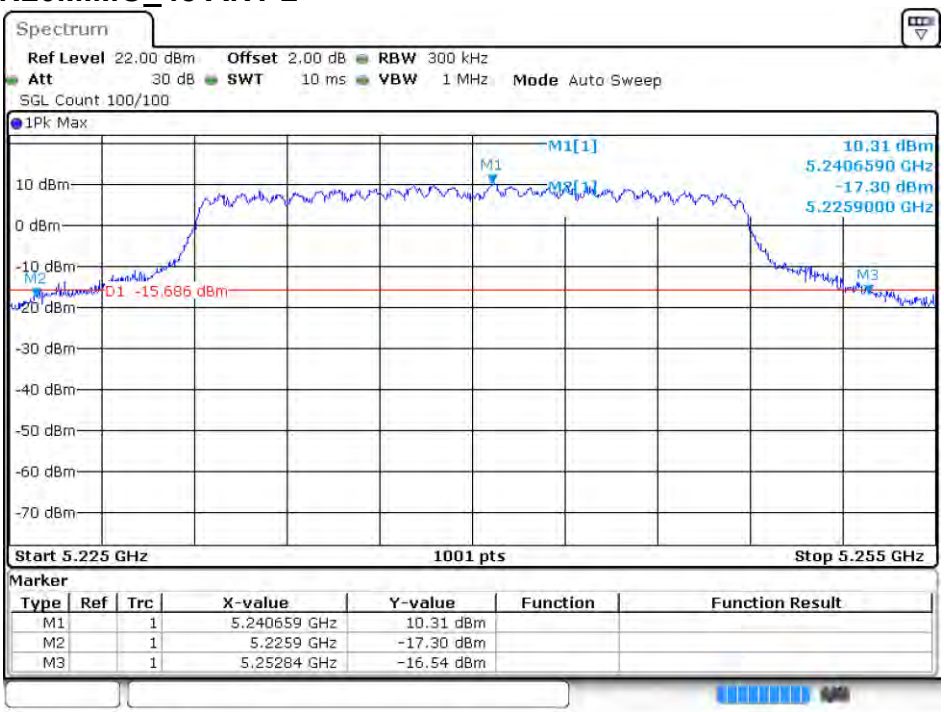


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.241259 GHz	8.92 dBm		
M2		1	5.2274 GHz	-17.70 dBm		
M3		1	5.25293 GHz	-17.17 dBm		

Date: 1.JAN.2020 07:21:08

4.5.1.40 11N20MIMO_48 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.240659 GHz	10.31 dBm		
M2		1	5.2259 GHz	-17.30 dBm		
M3		1	5.25284 GHz	-16.54 dBm		

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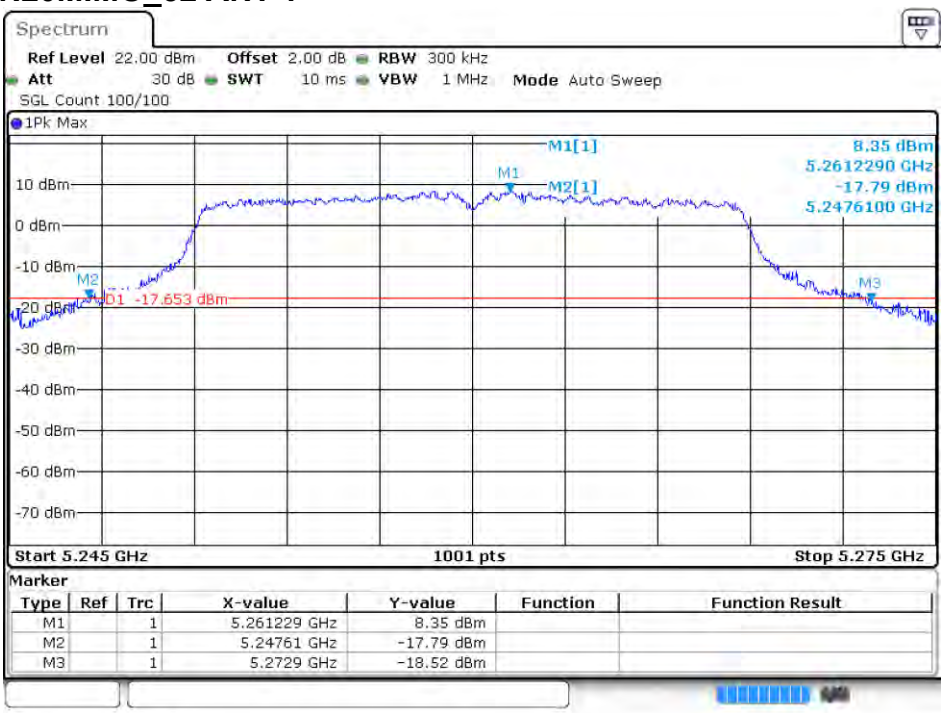
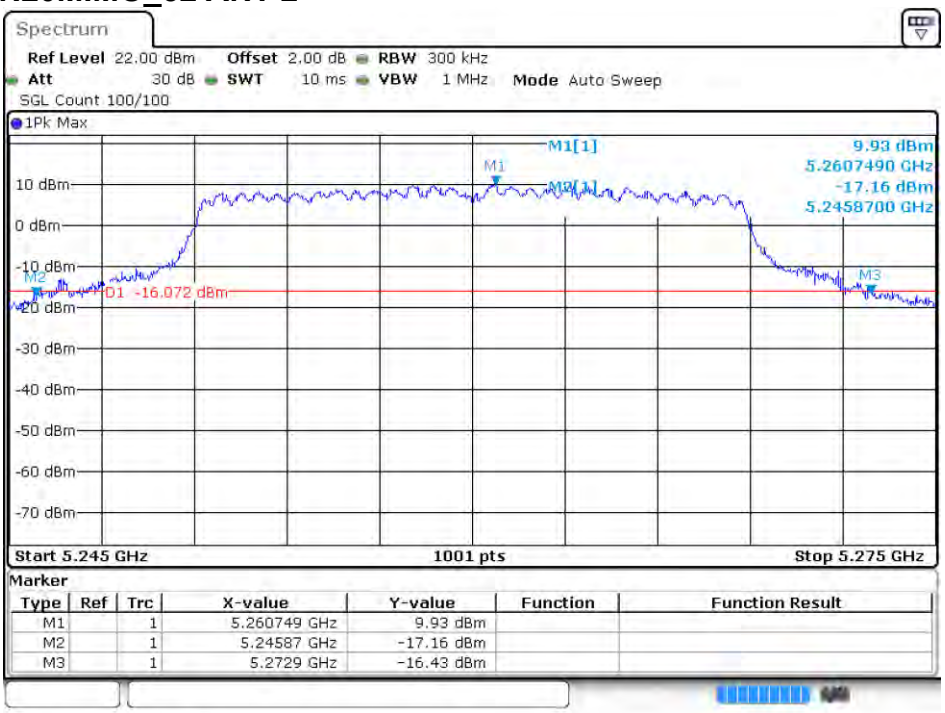
4.5.1.41 11N20MIMO_52 ANT 1



Date: 1.JAN.2020 07:22:28

4.5.1.42 11N20MIMO_52 ANT 2



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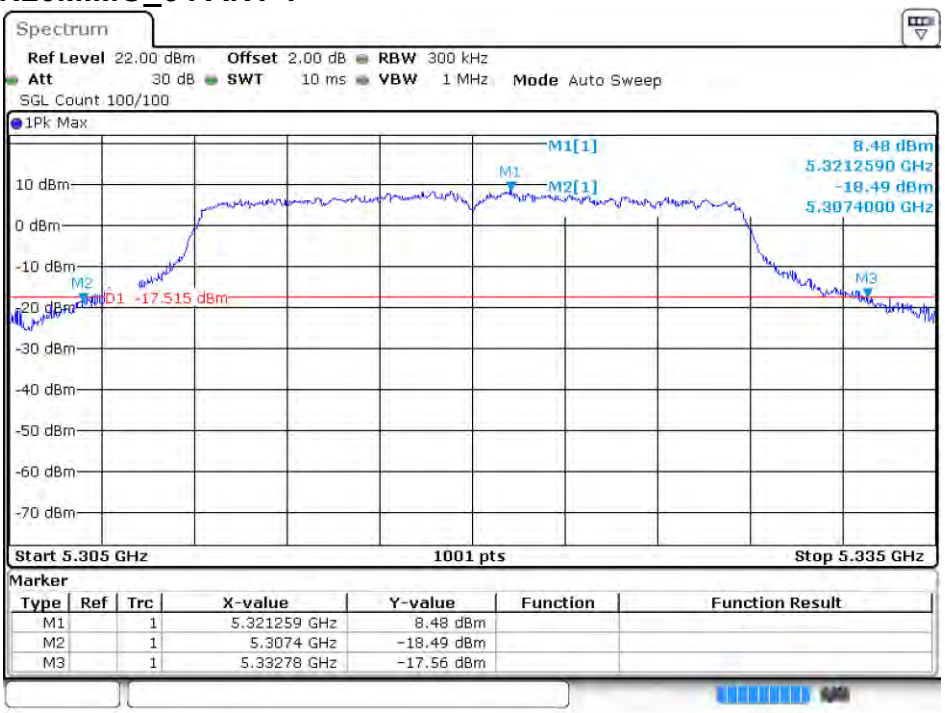
4.5.1.43 11N20MIMO_64 ANT 1



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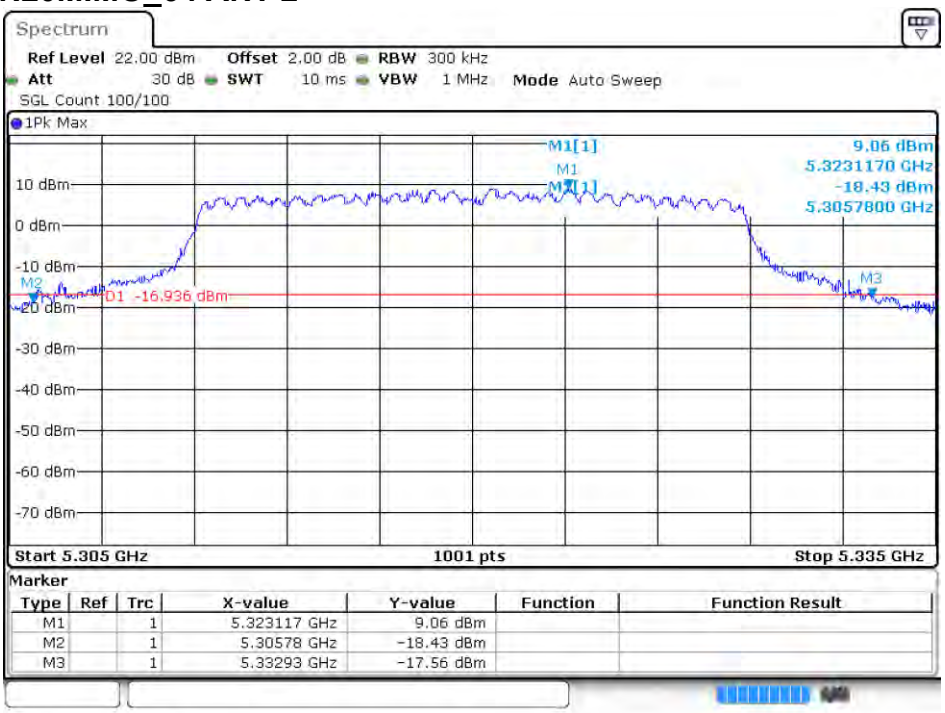
4.5.1.44 11N20MIMO_64 ANT 2



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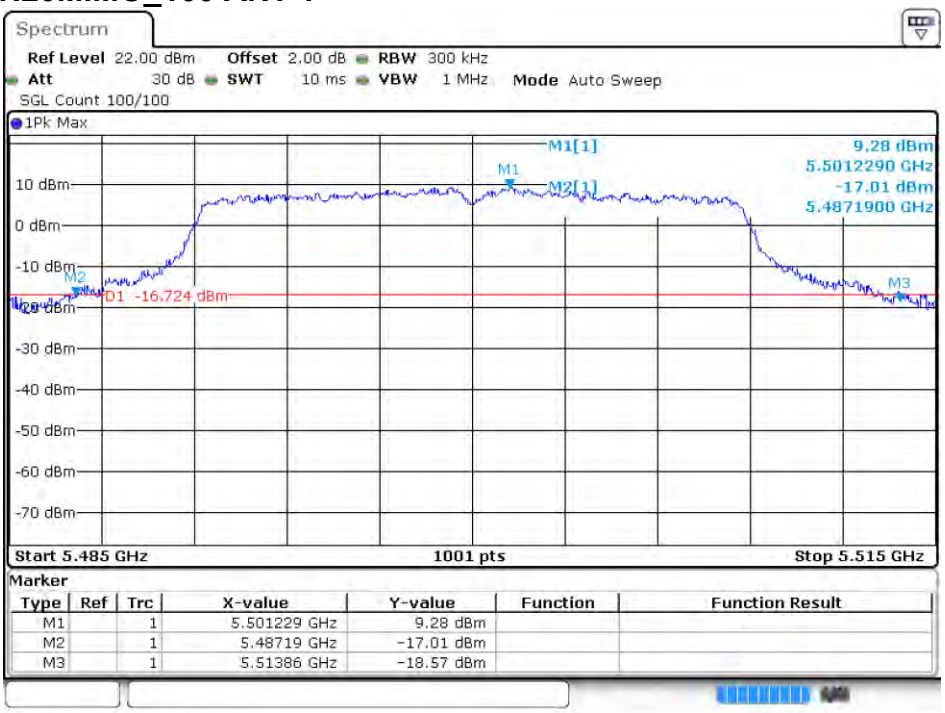
4.5.1.45 11N20MIMO_100 ANT 1



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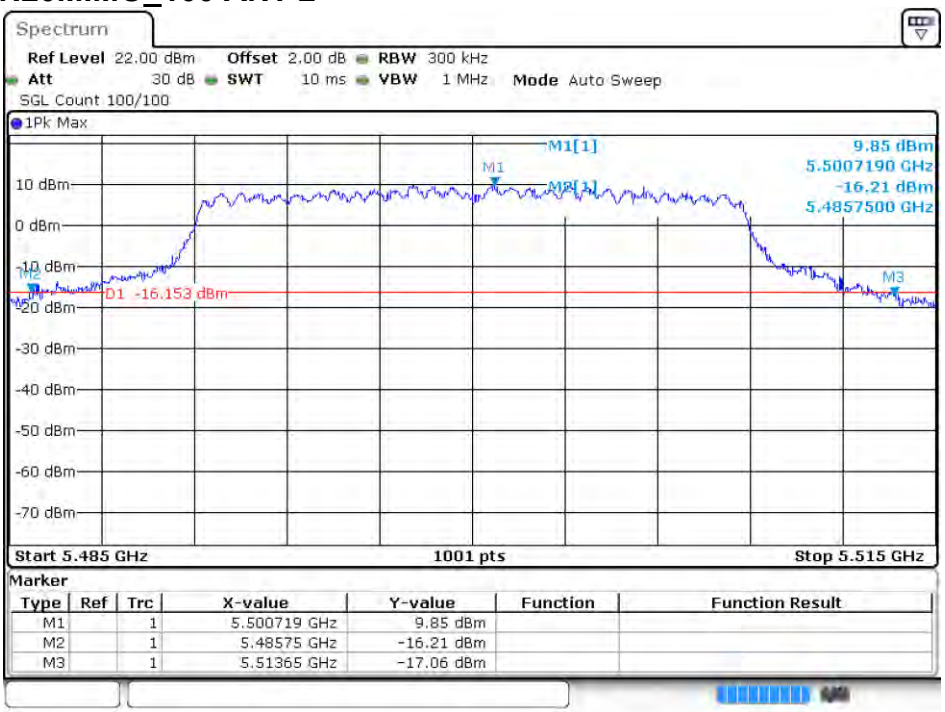
4.5.1.46 11N20MIMO_100 ANT 2



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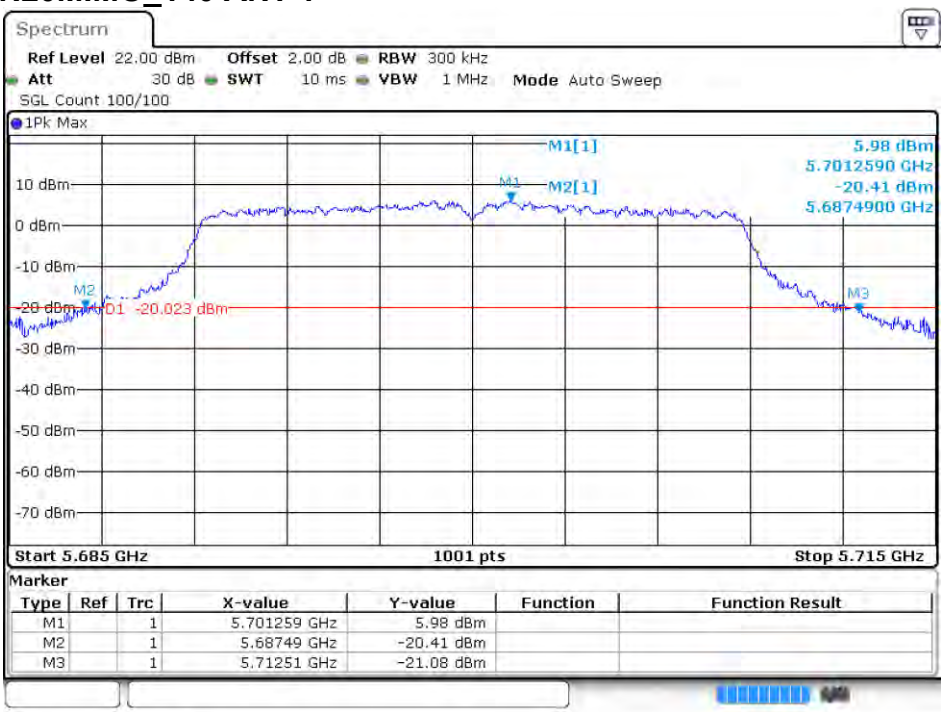
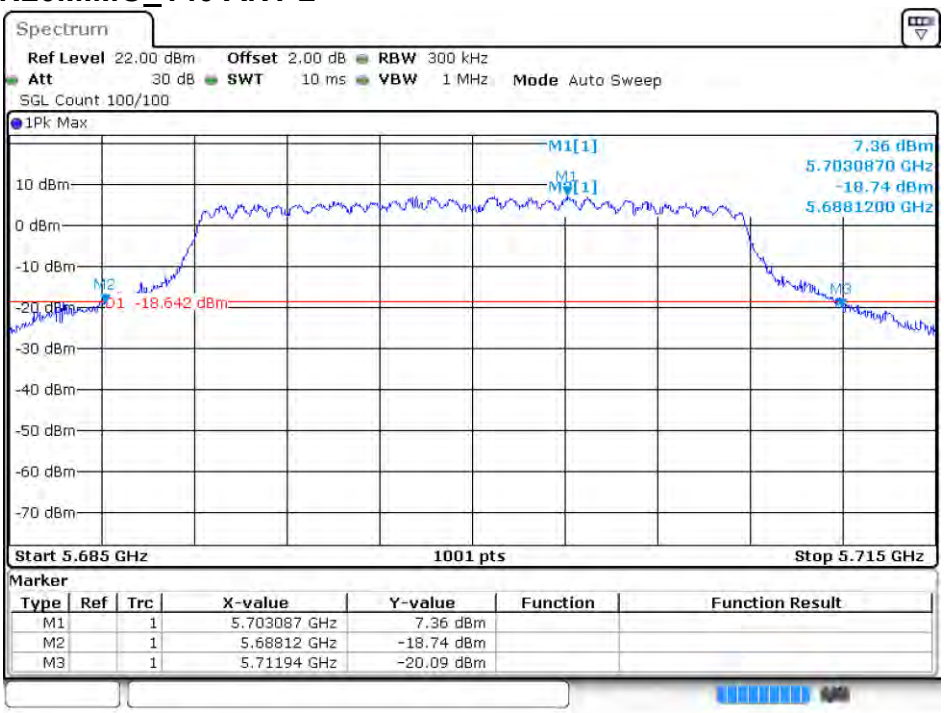
4.5.1.47 11N20MIMO_140 ANT 1



Date: 1.JAN.2020 07:31:41

4.5.1.48 11N20MIMO_140 ANT 2



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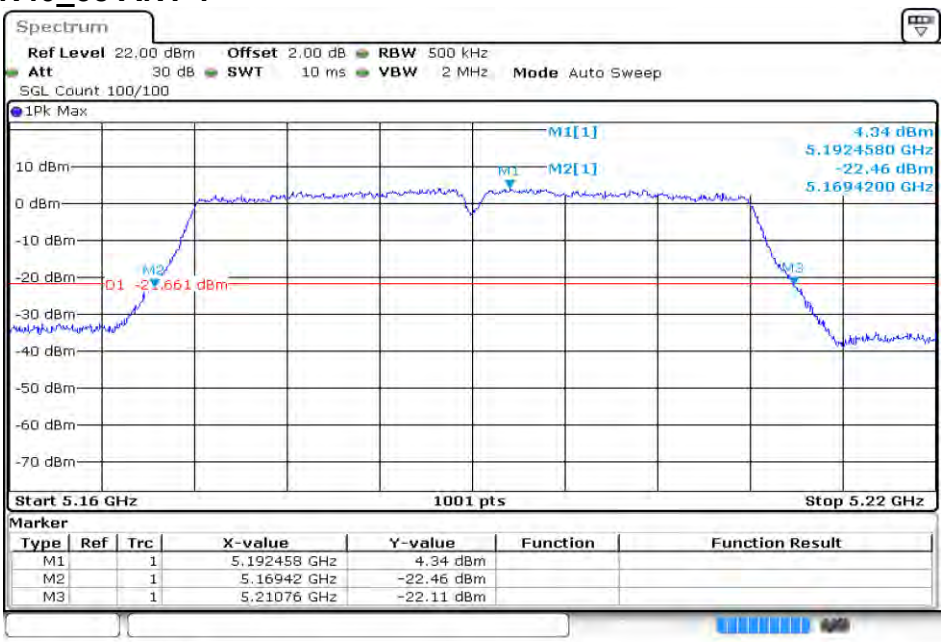
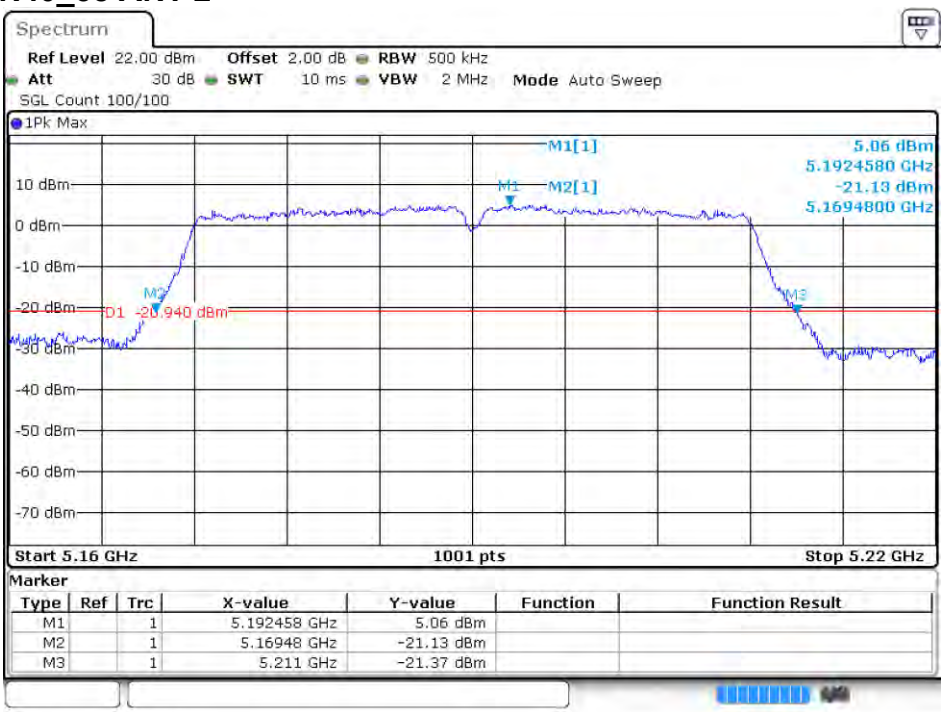
4.5.1.49 11N40_38 ANT 1



Date: 1.JAN.2020 04:59:37

4.5.1.50 11N40_38 ANT 2



Date: 1.JAN.2020 05:59:57

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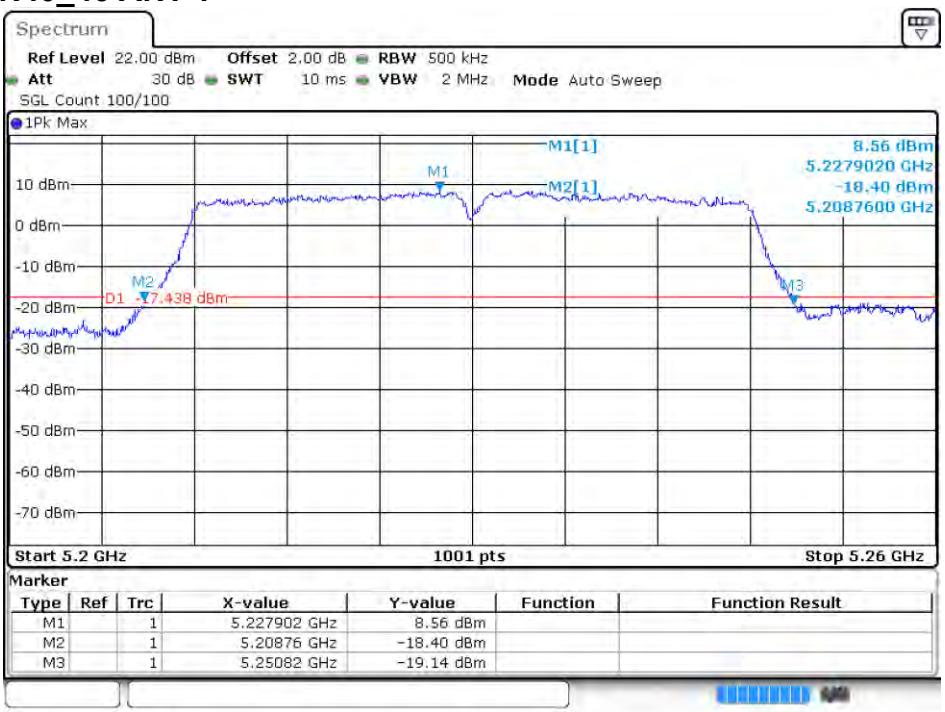
4.5.1.51 11N40_46 ANT 1



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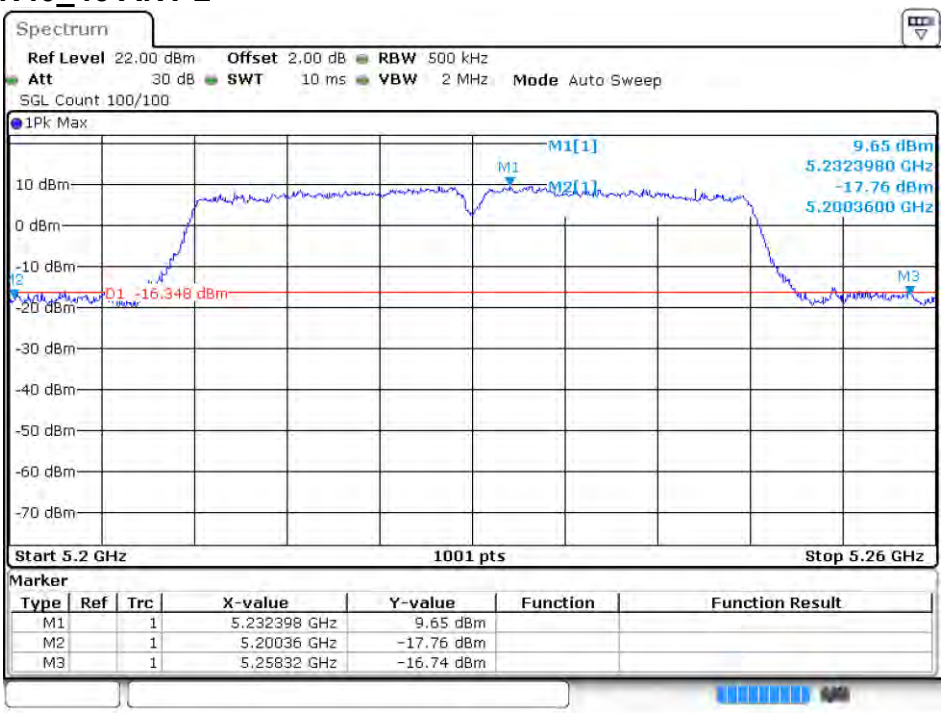
4.5.1.52 11N40_46 ANT 2



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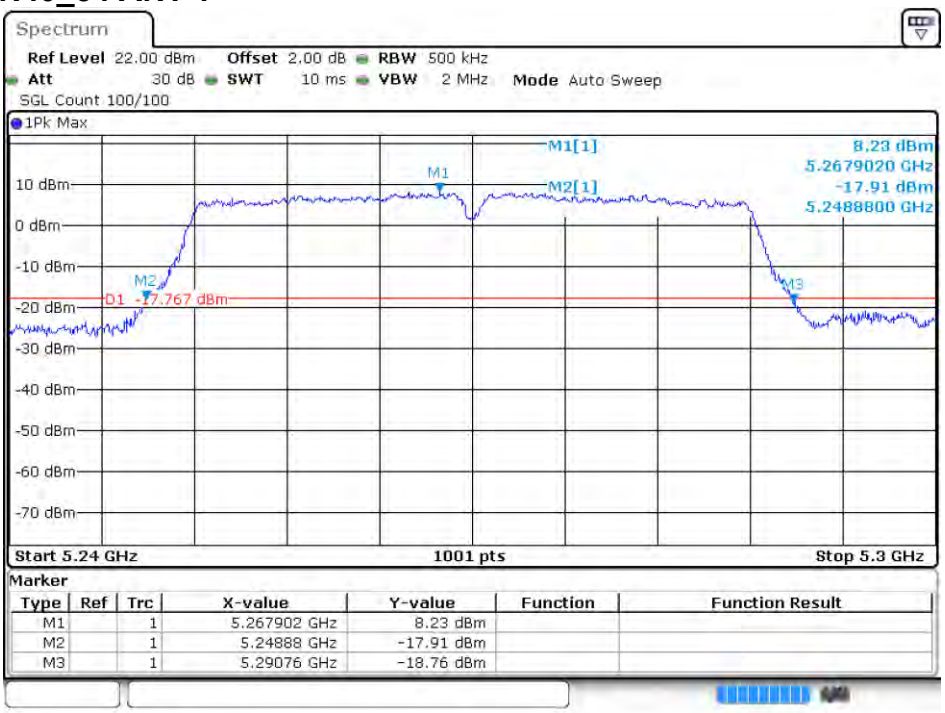
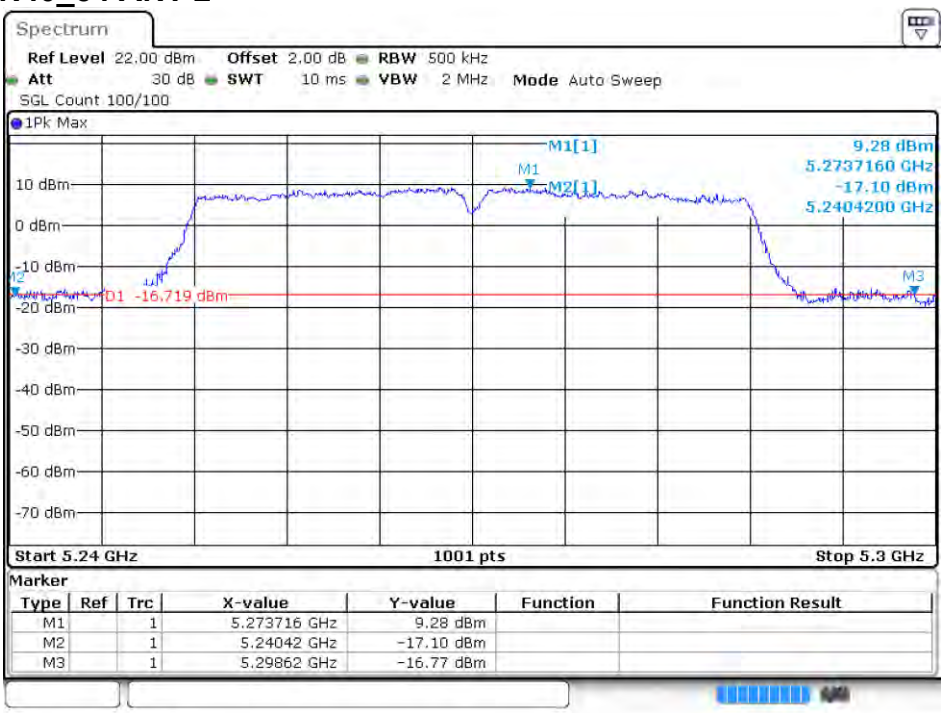
4.5.1.53 11N40_54 ANT 1



Date: 1.JAN.2020 05:02:25

4.5.1.54 11N40_54 ANT 2



Date: 1.JAN.2020 06:02:45

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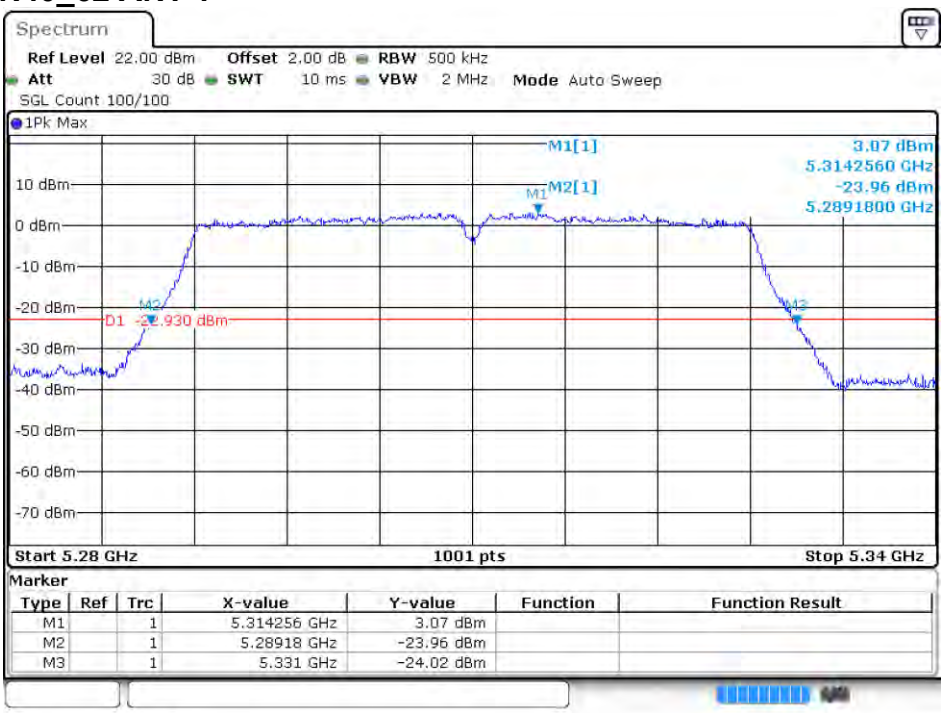
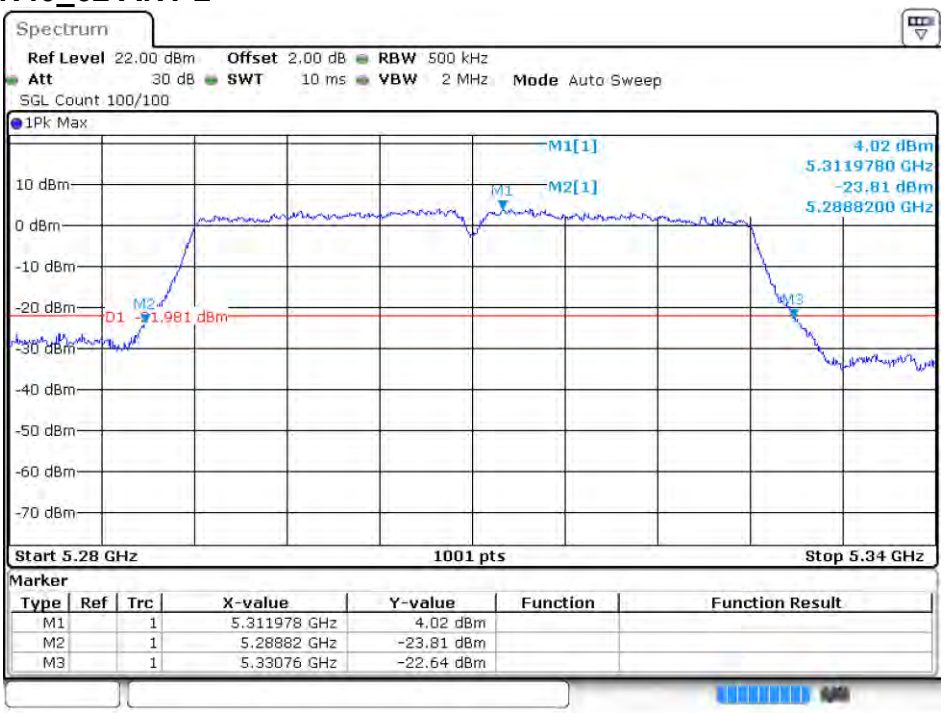
4.5.1.55 11N40_62 ANT 1



Date: 1.JAN.2020 05:03:32

4.5.1.56 11N40_62 ANT 2



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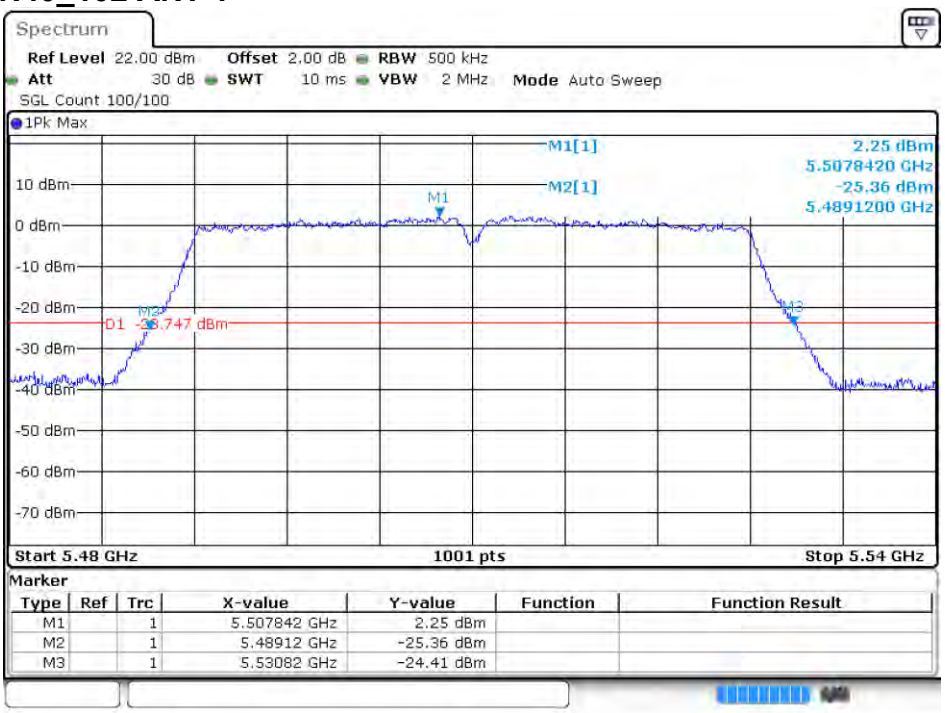
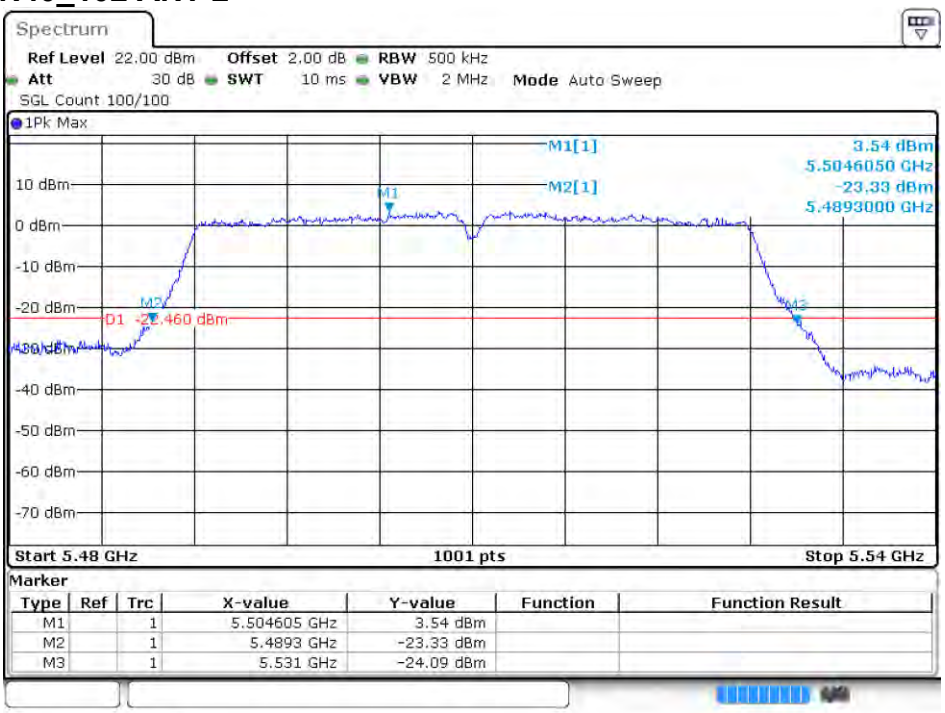
4.5.1.57 11N40_102 ANT 1



Date: 1.JAN.2020 05:07:36

4.5.1.58 11N40_102 ANT 2



Date: 1.JAN.2020 06:07:09

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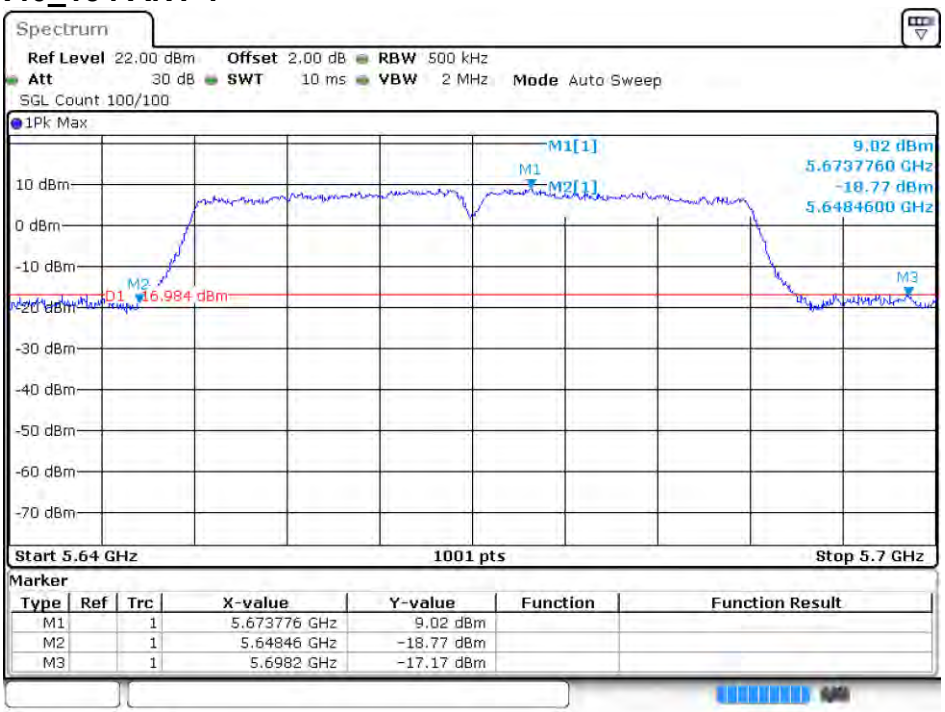
4.5.1.59 11N40_134 ANT 1

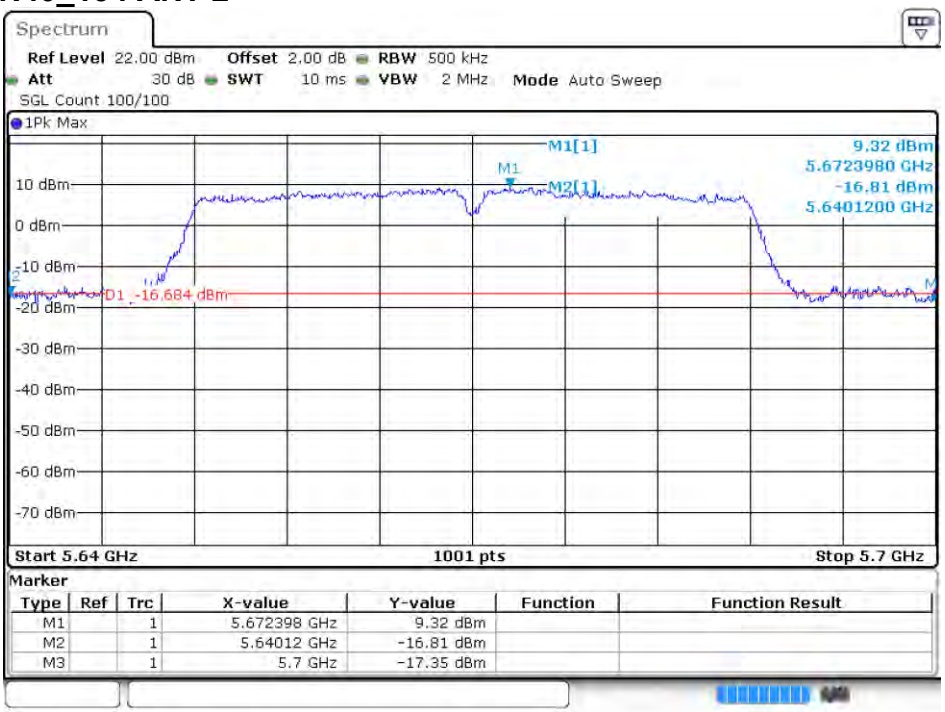


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.673776 GHz	9.02 dBm		
M2		1	5.64846 GHz	-18.77 dBm		
M3		1	5.6982 GHz	-17.17 dBm		

Date: 1.JAN.2020 05:09:36

4.5.1.60 11N40_134 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.672398 GHz	9.32 dBm		
M2		1	5.64012 GHz	-16.81 dBm		
M3		1	5.7 GHz	-17.35 dBm		

Date: 1.JAN.2020 06:08:42

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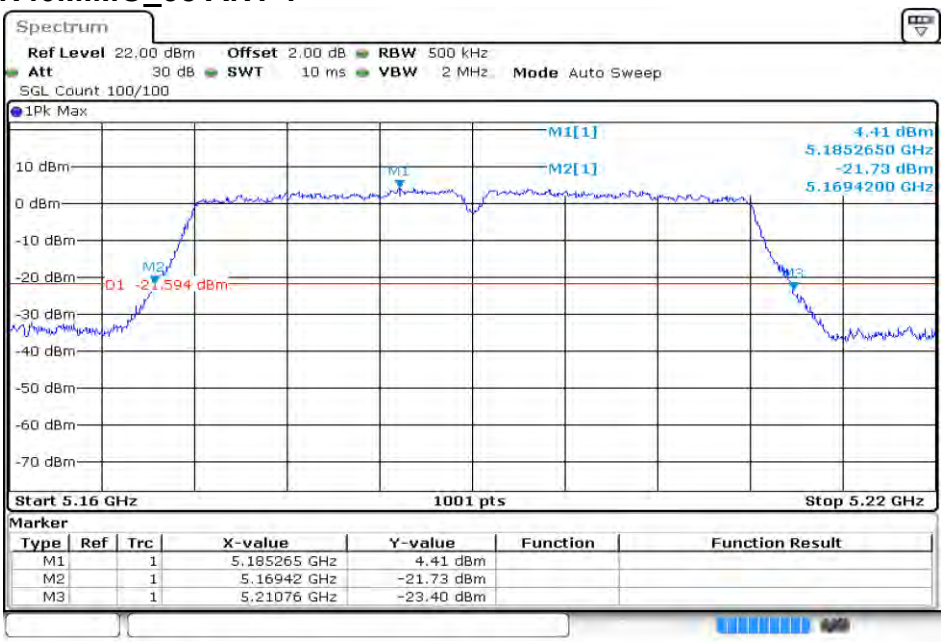
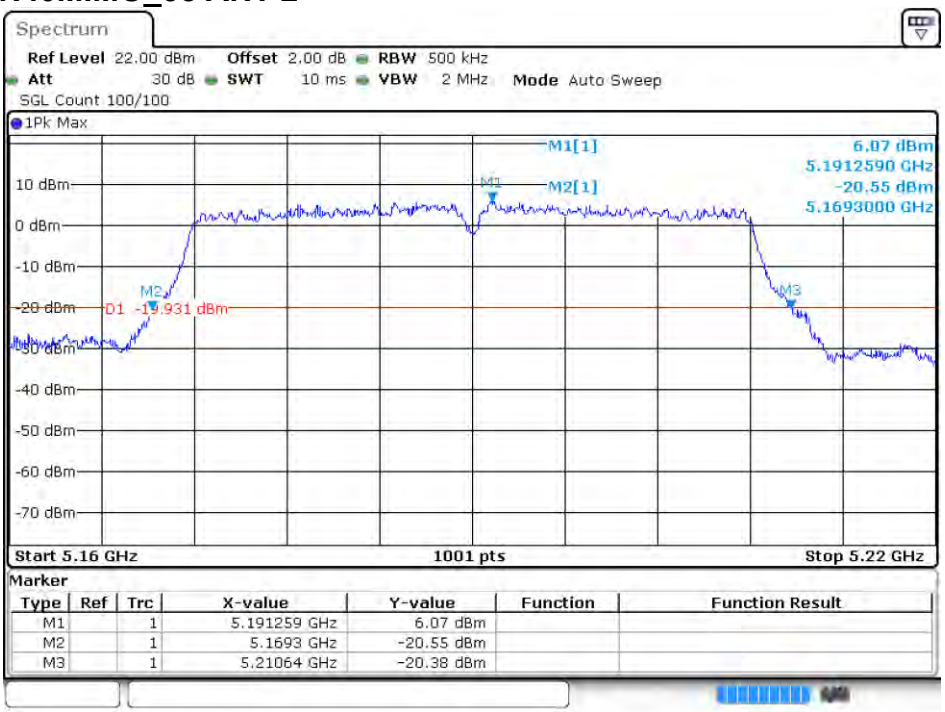
4.5.1.61 11N40MIMO_38 ANT 1



Date: 3.JAN.2020 02:34:52

4.5.1.62 11N40MIMO_38 ANT 2



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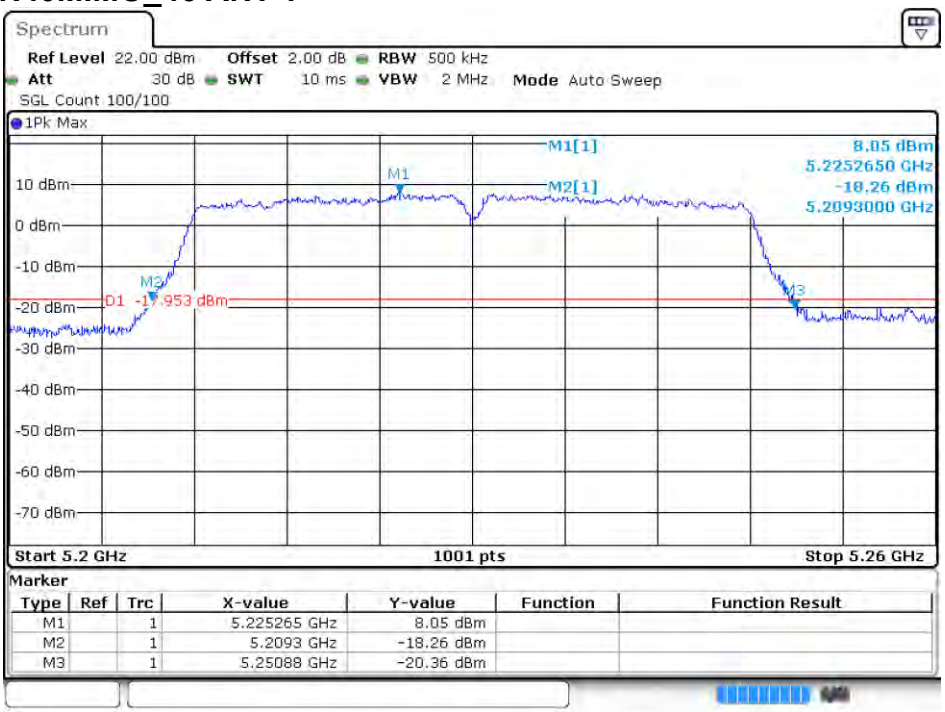
4.5.1.63 11N40MIMO_46 ANT 1

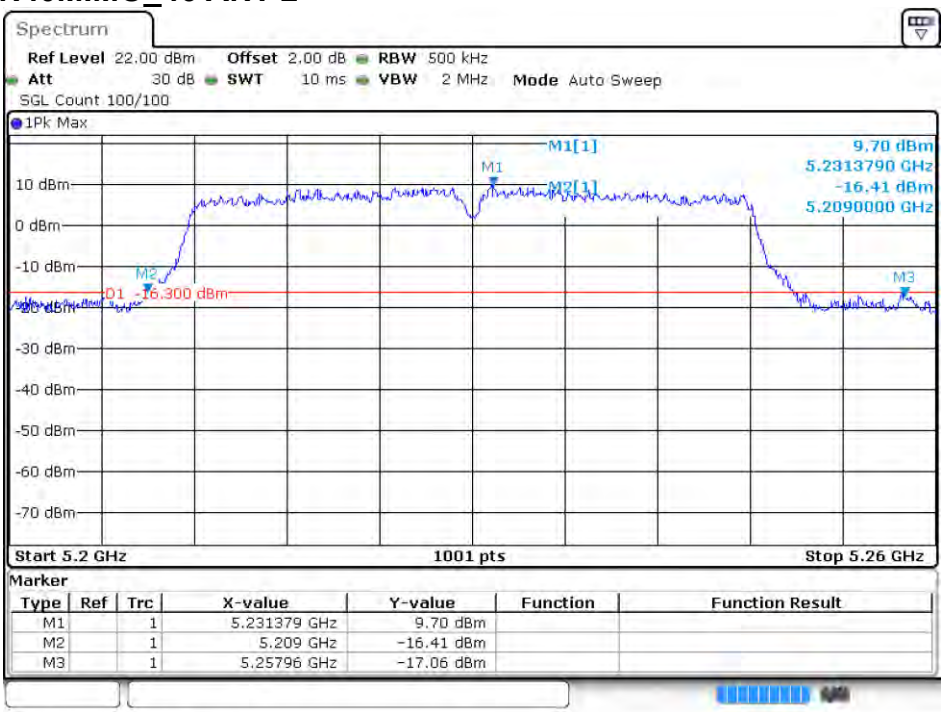


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.225265 GHz	8.05 dBm		
M2		1	5.2093 GHz	-18.26 dBm		
M3		1	5.25088 GHz	-20.36 dBm		

Date: 3.JAN.2020 02:36:00

4.5.1.64 11N40MIMO_46 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.231379 GHz	9.70 dBm		
M2		1	5.209 GHz	-16.41 dBm		
M3		1	5.25796 GHz	-17.06 dBm		

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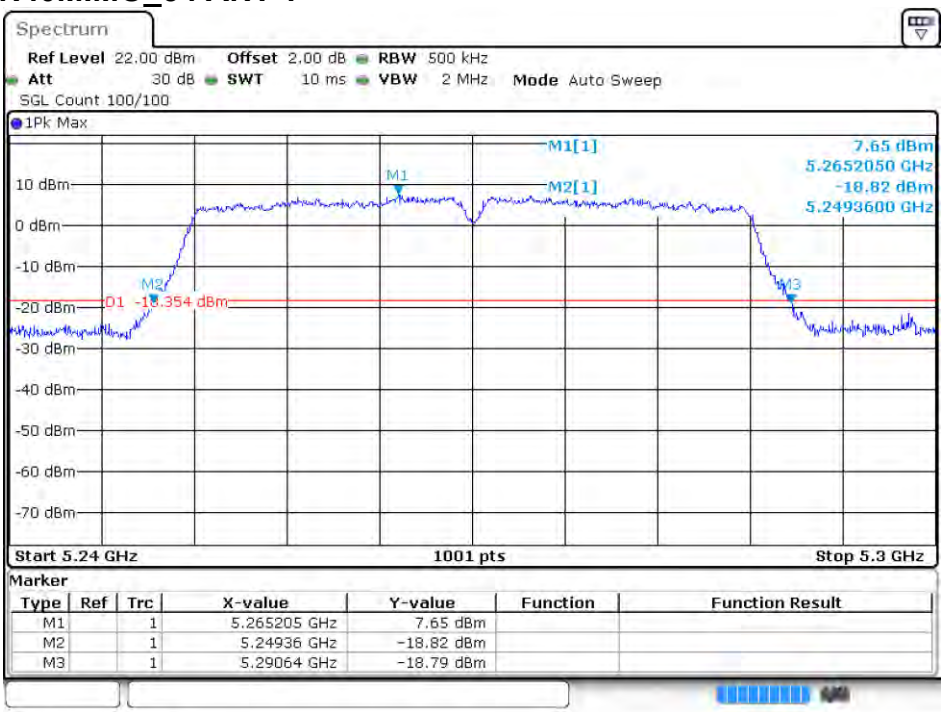
4.5.1.65 11N40MIMO_54 ANT 1

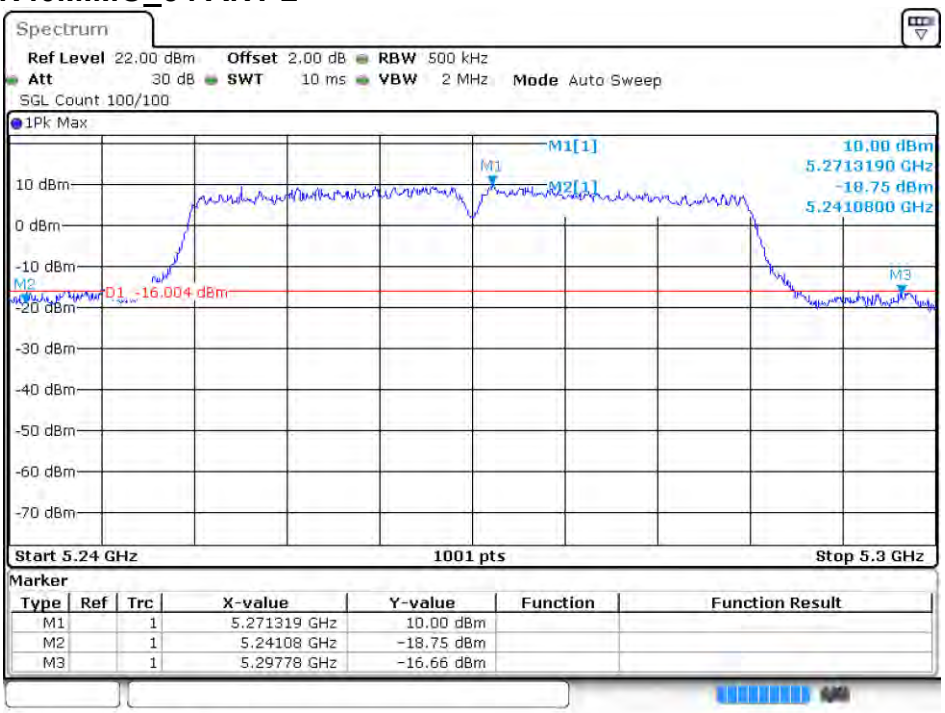


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.265205 GHz	7.65 dBm		
M2		1	5.24936 GHz	-18.82 dBm		
M3		1	5.29064 GHz	-18.79 dBm		

Date: 3.JAN.2020 02:38:16

4.5.1.66 11N40MIMO_54 ANT 2



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.271319 GHz	10.00 dBm		
M2		1	5.24108 GHz	-18.75 dBm		
M3		1	5.29778 GHz	-16.66 dBm		

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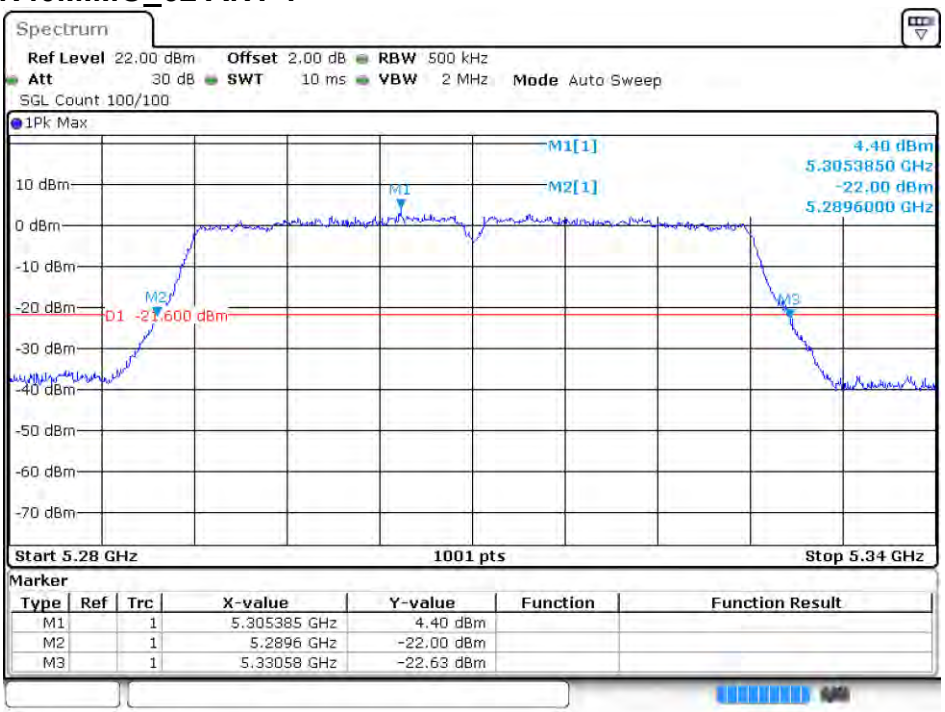
4.5.1.67 11N40MIMO_62 ANT 1



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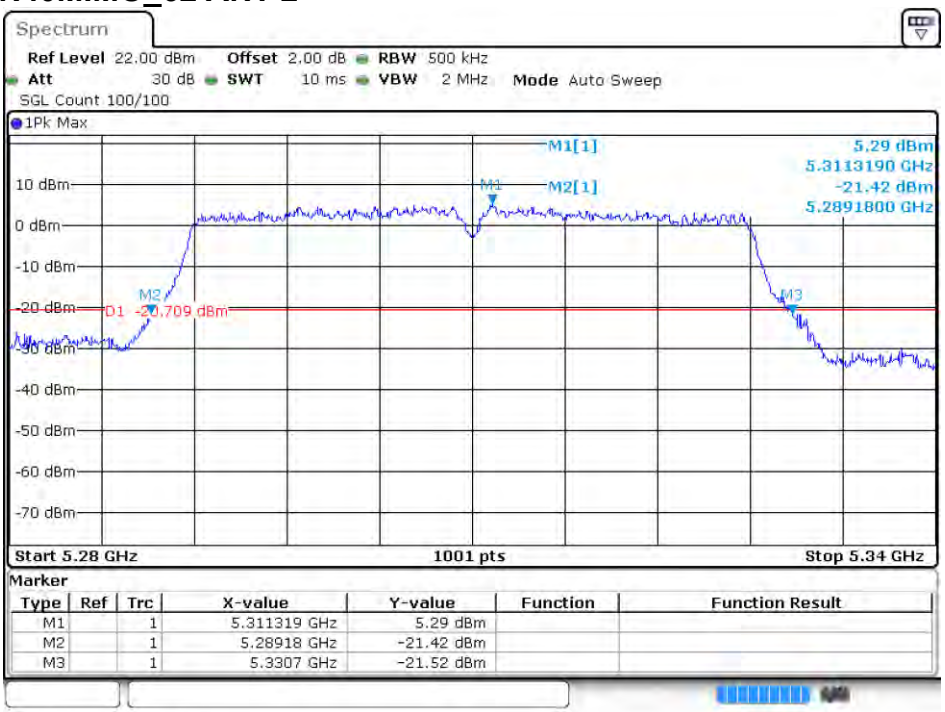
4.5.1.68 11N40MIMO_62 ANT 2



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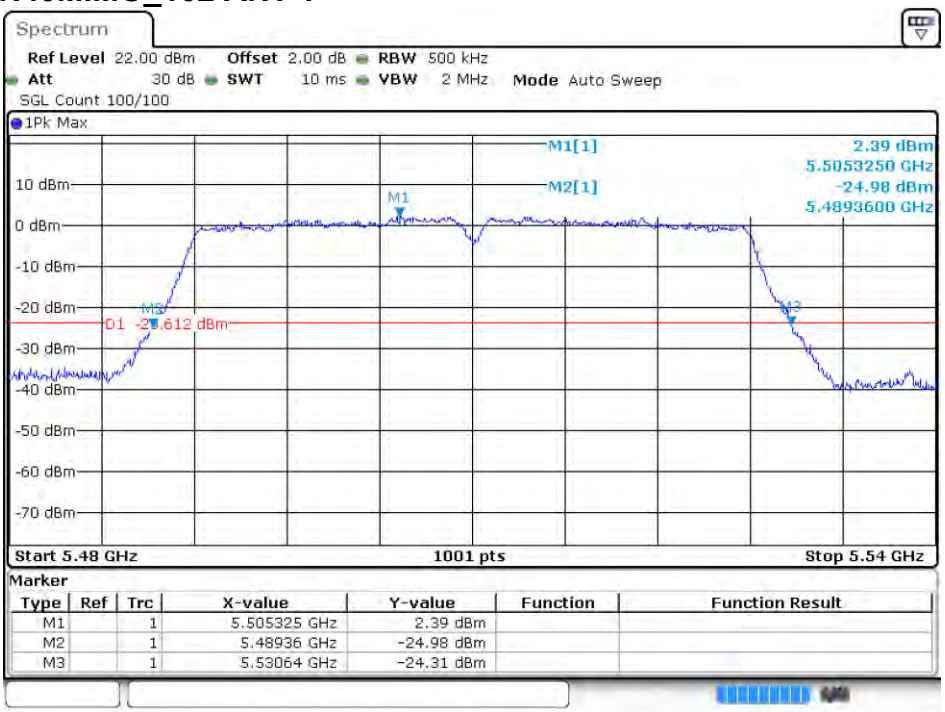
4.5.1.69 11N40MIMO_102 ANT 1



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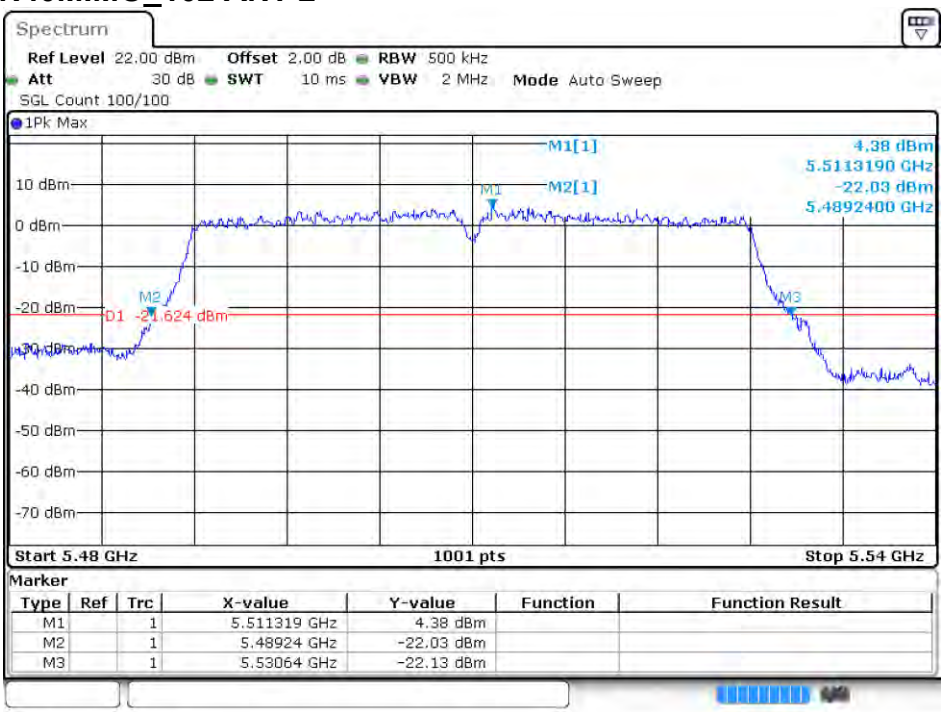
4.5.1.70 11N40MIMO_102 ANT 2



Date: 3.JAN.2020 01:31:04

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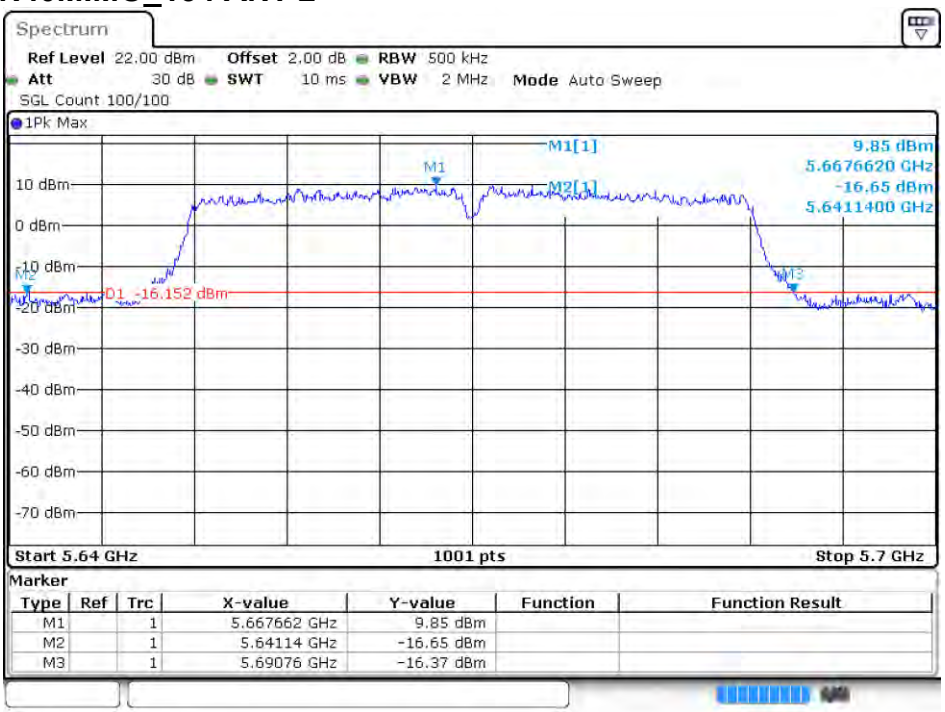
4.5.1.71 11N40MIMO_134 ANT 1

Date: 3.JAN.2020 02:43:06

4.5.1.72 11N40MIMO_134 ANT 2



Date: 3.JAN.2020 01:38:05

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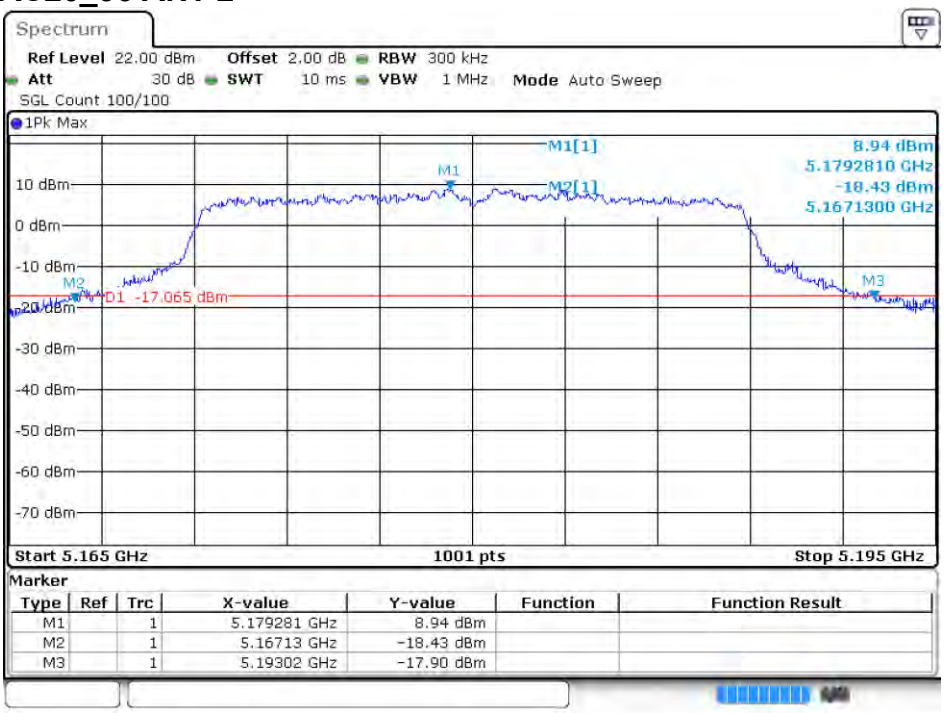
4.5.1.73 11AC20_36 ANT 1

Date: 1.JAN.2020 04:44:59

4.5.1.74 11AC20_36 ANT 2



Date: 1.JAN.2020 04:09:38

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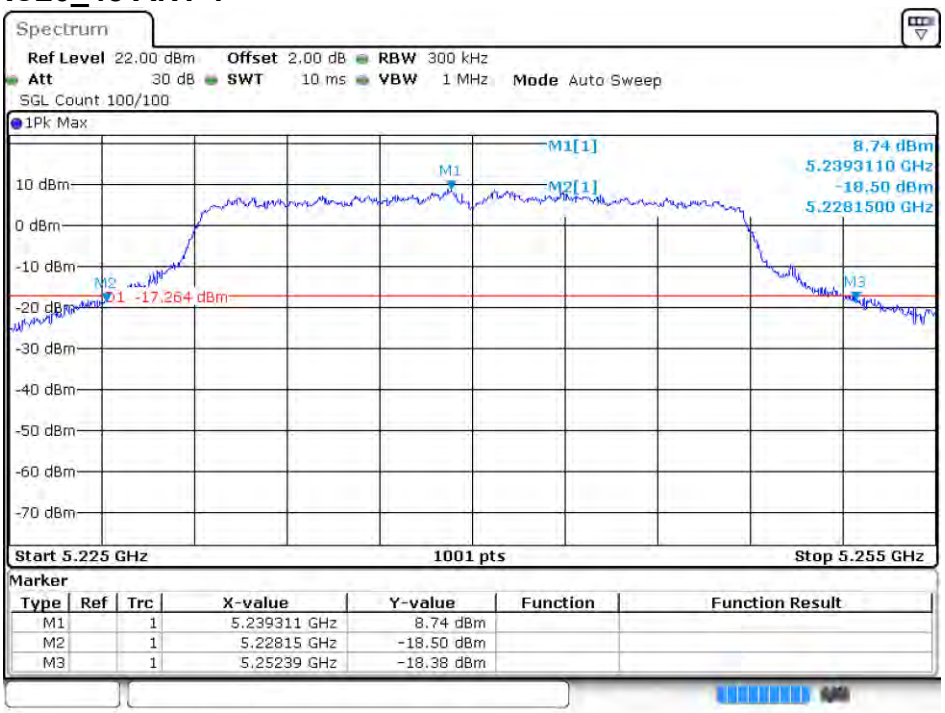
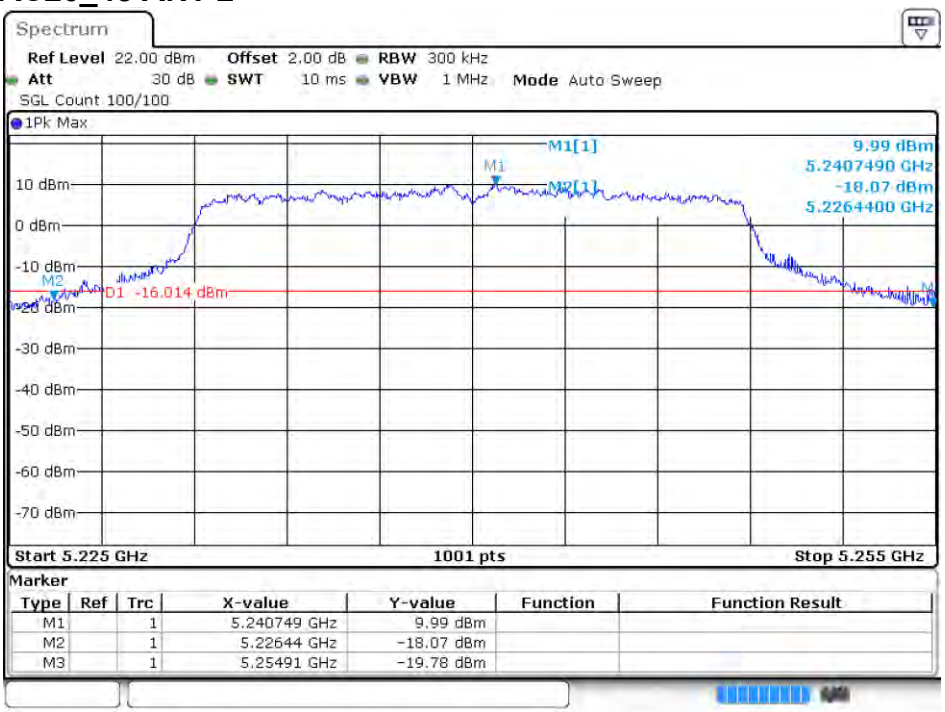
4.5.1.75 11AC20_48 ANT 1



Date: 1.JAN.2020 04:47:14

4.5.1.76 11AC20_48 ANT 2



Date: 1.JAN.2020 04:11:36

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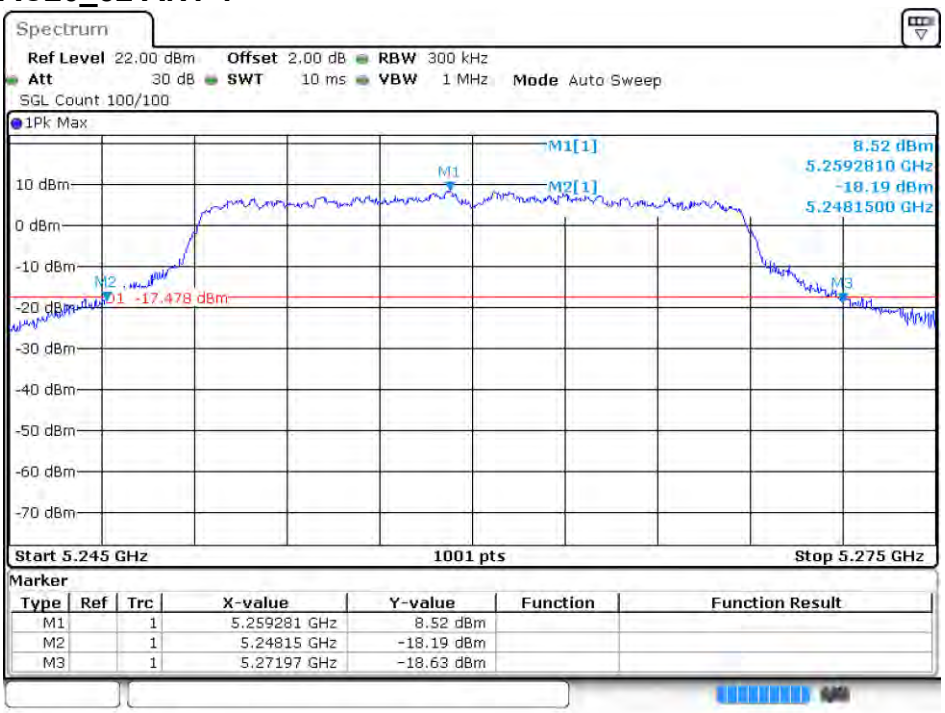
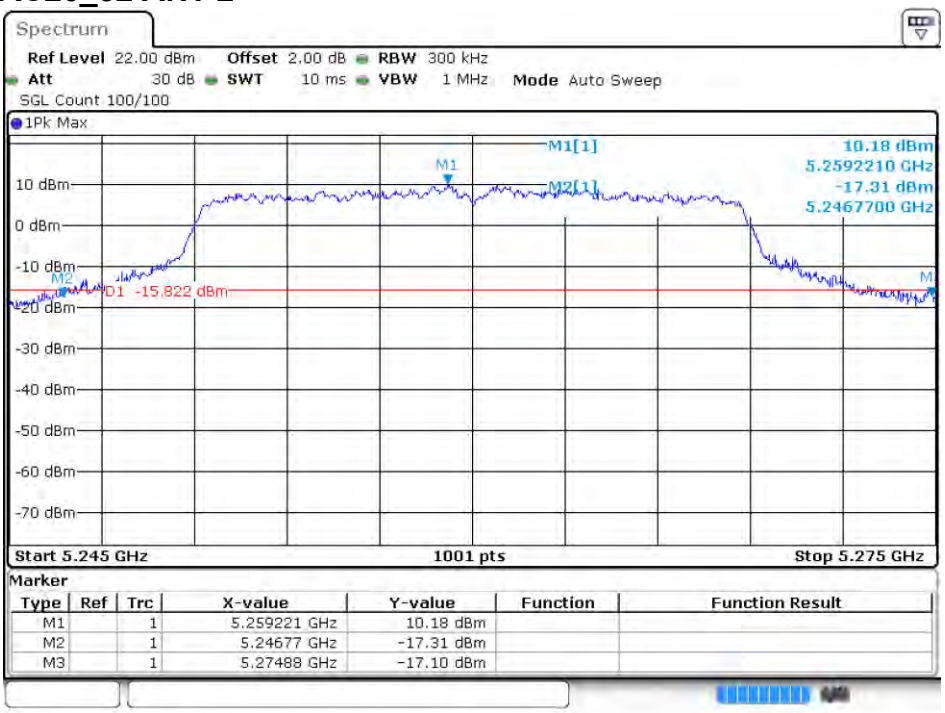
4.5.1.77 11AC20_52 ANT 1



Date: 1.JAN.2020 04:48:28

4.5.1.78 11AC20_52 ANT 2



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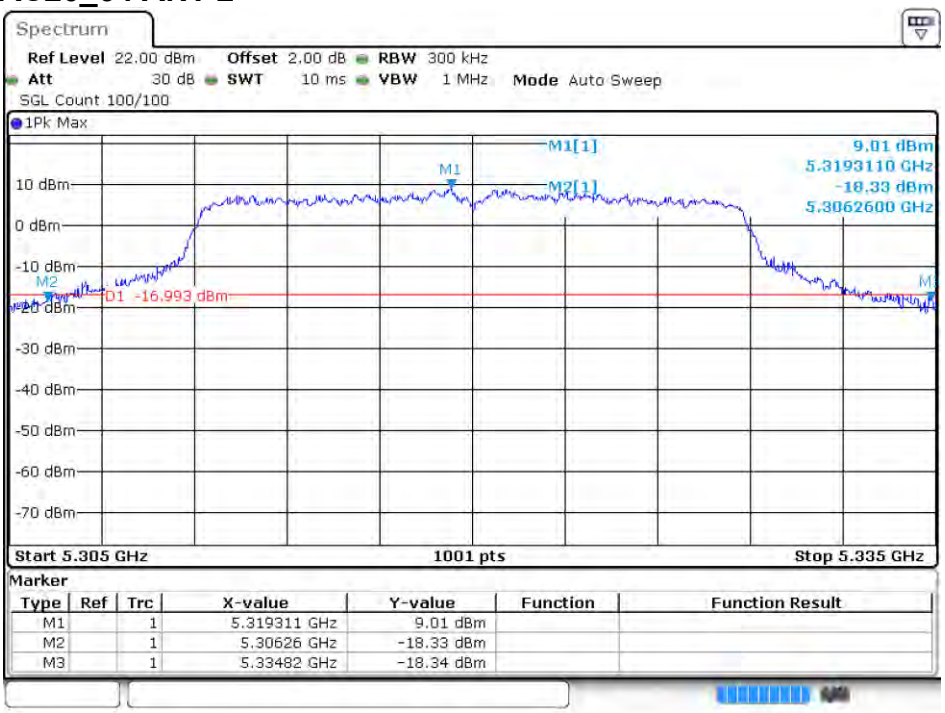
4.5.1.79 11AC20_64 ANT 1

Date: 1.JAN.2020 04:49:56

4.5.1.80 11AC20_64 ANT 2



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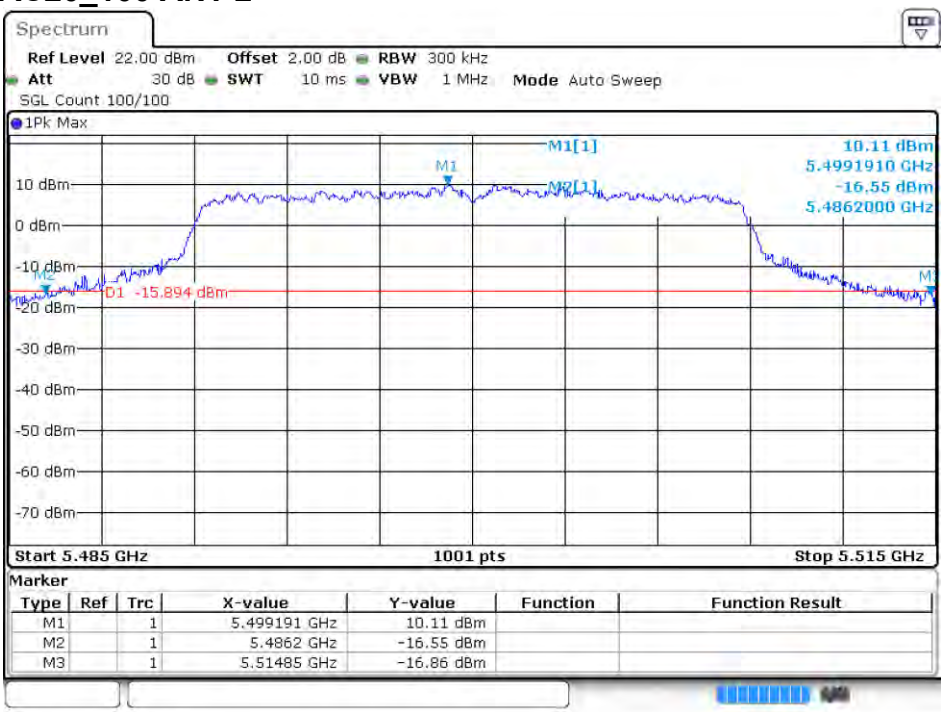
4.5.1.81 11AC20_100 ANT 1

Date: 1.JAN.2020 04:51:04

4.5.1.82 11AC20_100 ANT 2



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4.5.1.83 11AC20_140 ANT 1

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4.5.1.84 11AC20_140 ANT 2

Date: 1.JAN.2020 04:18:26

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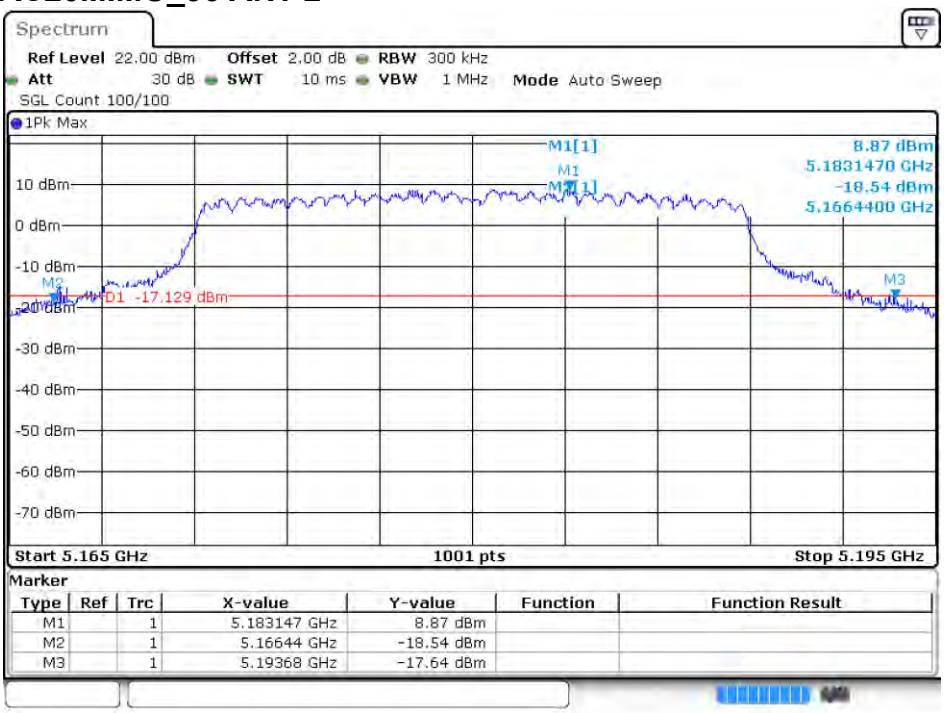
4.5.1.85 11AC20MIMO_36 ANT 1

Date: 1.JAN.2020 07:44:32

4.5.1.86 11AC20MIMO_36 ANT 2



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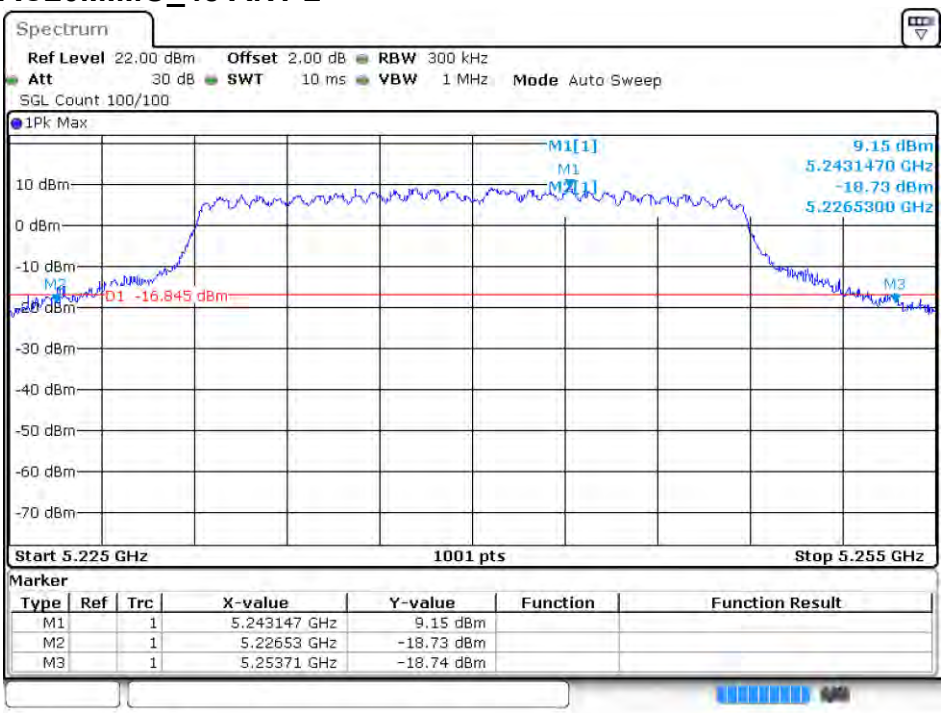
4.5.1.87 11AC20MIMO_48 ANT 1

Date: 1.JAN.2020 07:46:04

4.5.1.88 11AC20MIMO_48 ANT 2



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