FCC TEST REPORT

Application No:	ZR/2020/40013
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.:	M2004J19AG
Trade Mark:	Redmi
FCC ID:	ZAFZZJ19AG
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:	2020/4/9
Date of Test:	2020/4/10 to 2020/4/28
Date of Issue:	2021/4/28
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**
01		2020/4/28		Original
02		2021/4/28	Sherlock Fang	1.Add test site Information 2. Modify data conversion error of antenna height 3.Update equipment list

*This report supersedes our previous report ZR/2020/4001305, issued on 2020-4-28, which is hereby deemed null and void.

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

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2 Test Summary

Test Item	Band	FCC Rule	Requirements	Test Result	Verdict	Test Lab*
Emission Bandwidth	5150-5250	15.403(i) 15.407(a)(1)	No limit.	Clause 4.5 Clause 4.6	Pass	A
	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	A
	5250-5350					
	5470-5725					
	5725-5825					
Duty Cycle	5150-5825	--	No limit.	Clause 4.3	Pass	A
Maximum Conducted Output Power	5150-5250	15.407(a)(1) 15.407(a)(4)	FCC < 250mW (avg during transmission)	Clause 4.4		
	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 4.8		
	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)			

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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 4.10	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) 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 4.9	Pass	B
AC Power Line Conducted Emissions	5150-5250 5250-5350 5470-5725 5725-5825	15.207	---	Clause 4.2	Pass	B

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Frequency Stability	5150-5250 5250-5350 5470-5600 5650-5725 5725-5825	15.209	---	Clause 4.11	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	Clause 4.12	Pass	A

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

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3 General Information

3.1 Client Information

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

3.2 Test Location

Lab A:

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

Lab B:

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

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3.3 Test Facility

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

Lab A:

• A2LA (Certificate No. 3816.01)

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

• VCCI

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

• FCC –Designation Number: CN1178

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

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

• Innovation, Science and Economic Development Canada

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

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

• A2LA (Certificate No. 4854.01)

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

• FCC –Designation Number: CN1271

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3.4 General Description of EUT

EUT Description:	Mobile Phone
Model No.:	M2004J19AG
Trade Mark:	Redmi
Hardware Version:	P2
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 802.11n/ac), ☐ Diversity (for 802.11a) : Tx & Rx
Antenna Gain:	0.55dBi,
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

For UNII Band I:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5180

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

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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 0.55dBi.	

4.2 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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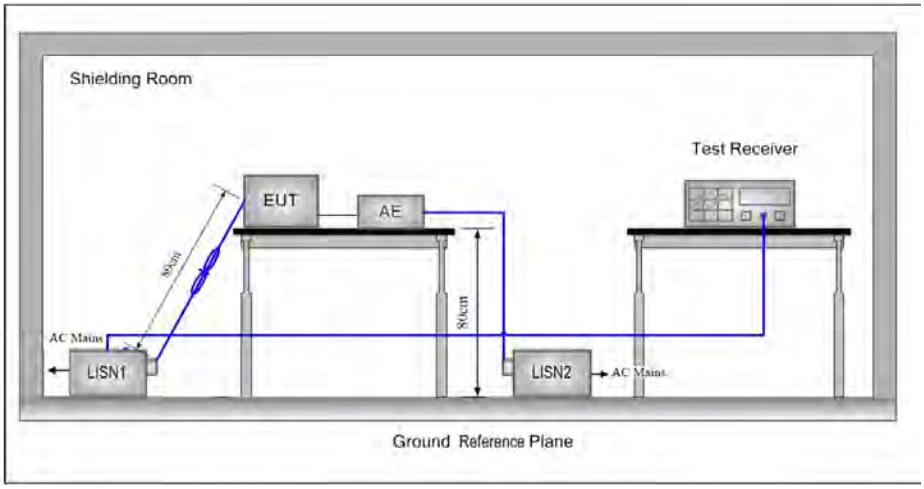
Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Through Pre-scan, find the 6Mbps of rate of 802.11a at lowest channel is the worst case. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

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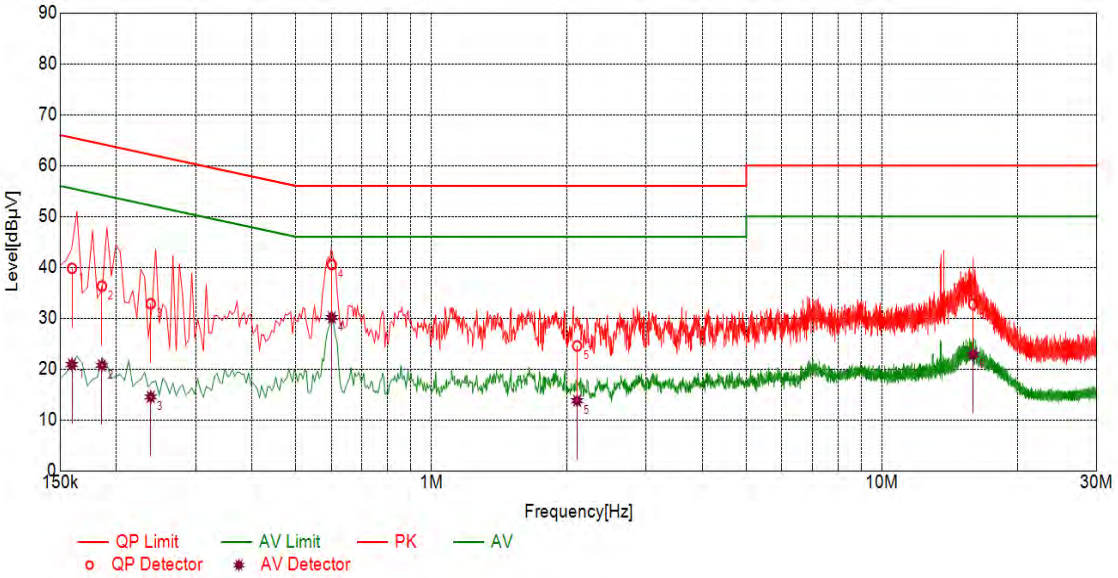
Measurement Data

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

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

Live Line:



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	0.1594	10.10	39.80	65.49	25.69	20.89	55.49	34.60	L
2	0.1857	10.10	36.31	64.22	27.91	20.74	54.22	33.48	L
3	0.2384	10.10	32.84	62.15	29.31	14.52	52.15	37.63	L
4	0.6013	10.10	40.54	56.00	15.46	30.14	46.00	15.86	L
5	2.1068	10.10	24.54	56.00	31.46	13.78	46.00	32.22	L
6	15.9467	10.11	32.75	60.00	27.25	22.84	50.00	27.16	L

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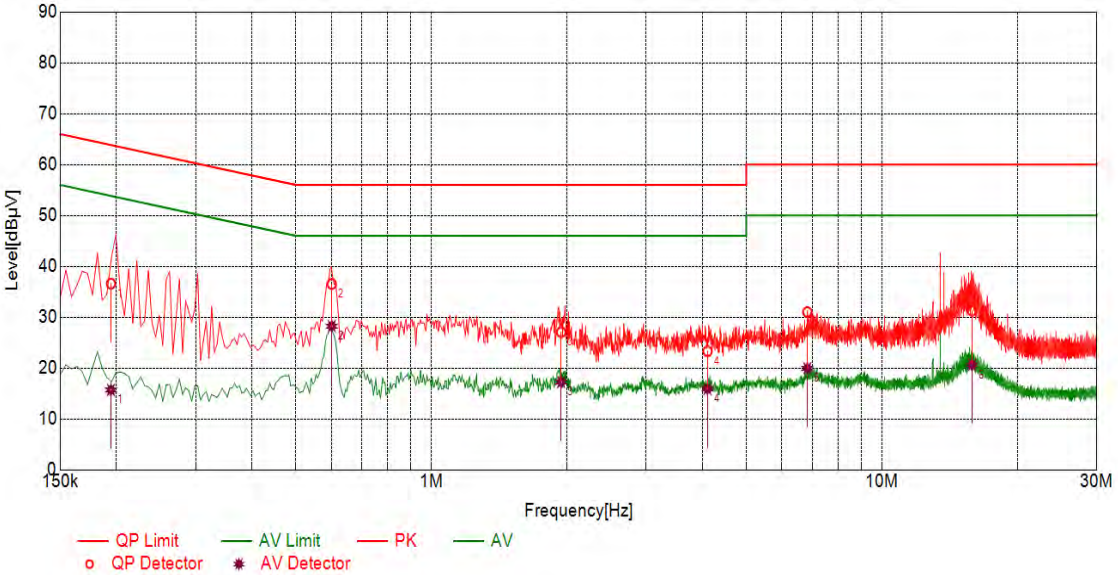
Neutral Line:



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	0.1945	10.10	36.60	63.84	27.24	15.70	53.84	38.14	N
2	0.6012	10.10	36.53	56.00	19.47	28.23	46.00	17.77	N
3	1.9416	10.10	27.05	56.00	28.95	17.26	46.00	28.74	N
4	4.1019	10.10	23.31	56.00	32.69	15.90	46.00	30.10	N
5	6.8322	10.10	31.01	60.00	28.99	19.94	50.00	30.06	N
6	15.8567	10.11	31.26	60.00	28.74	20.63	50.00	29.37	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

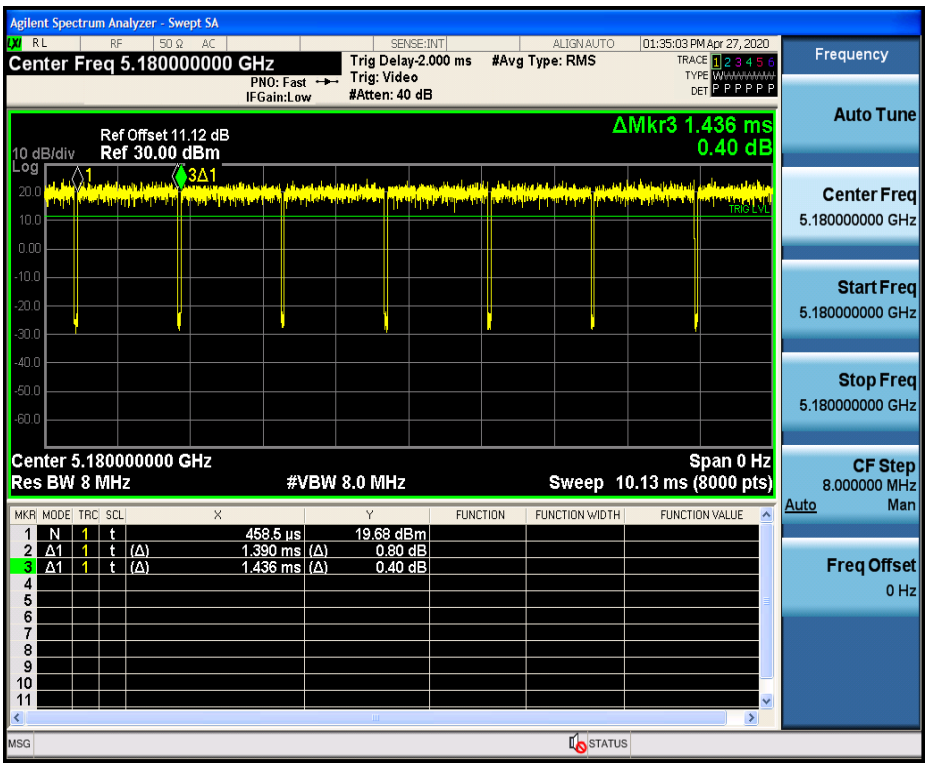
4.3.1 Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
11A	CH36	96.74
11N20	CH36	96.51
11N40	CH38	93.22
11AC20	CH36	96.55
11AC40	CH38	93.26
11AC80	CH42	87.24

4.3.1 Test Plots

4.3.1.1 ANT1

4.3.1.1.1 11A



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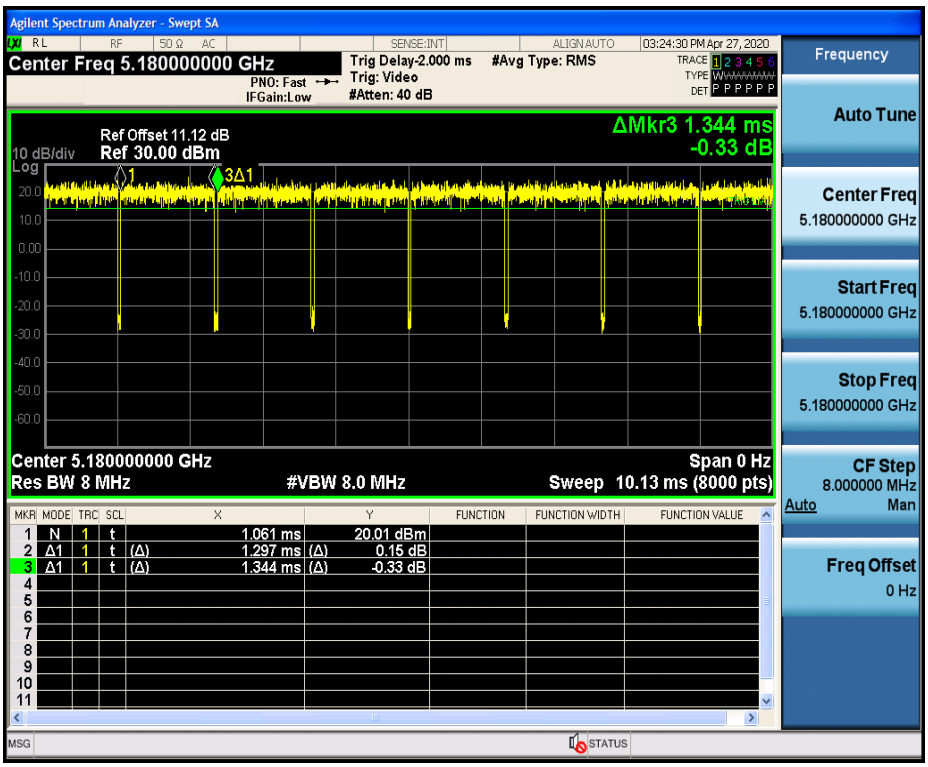
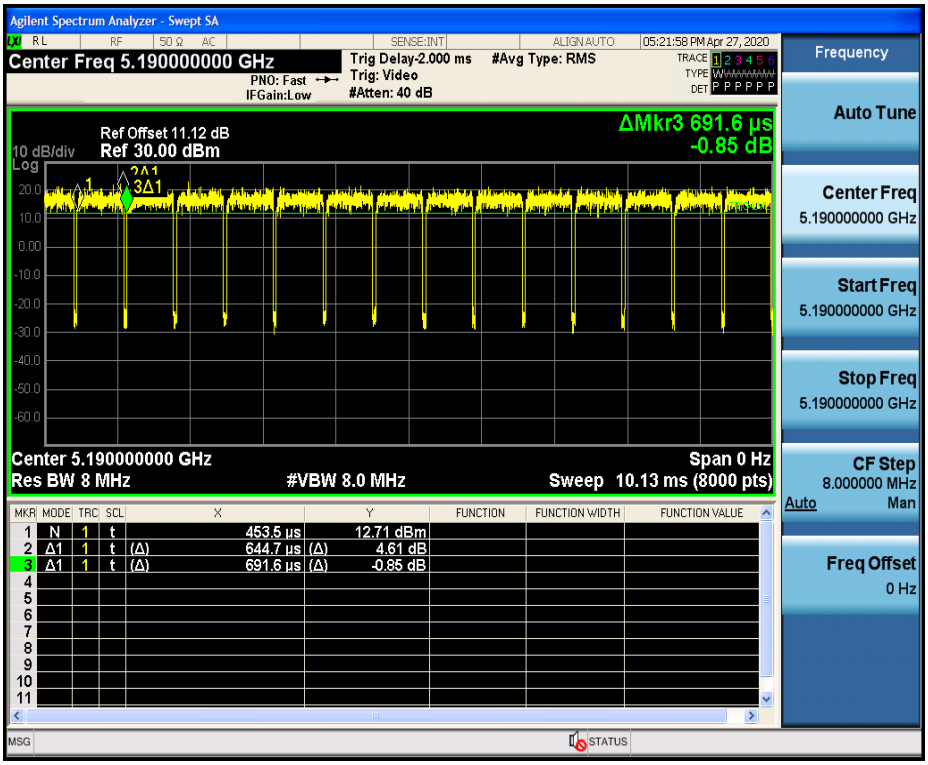
4.3.1.1.2 11N20



4.3.1.1.3 11N40



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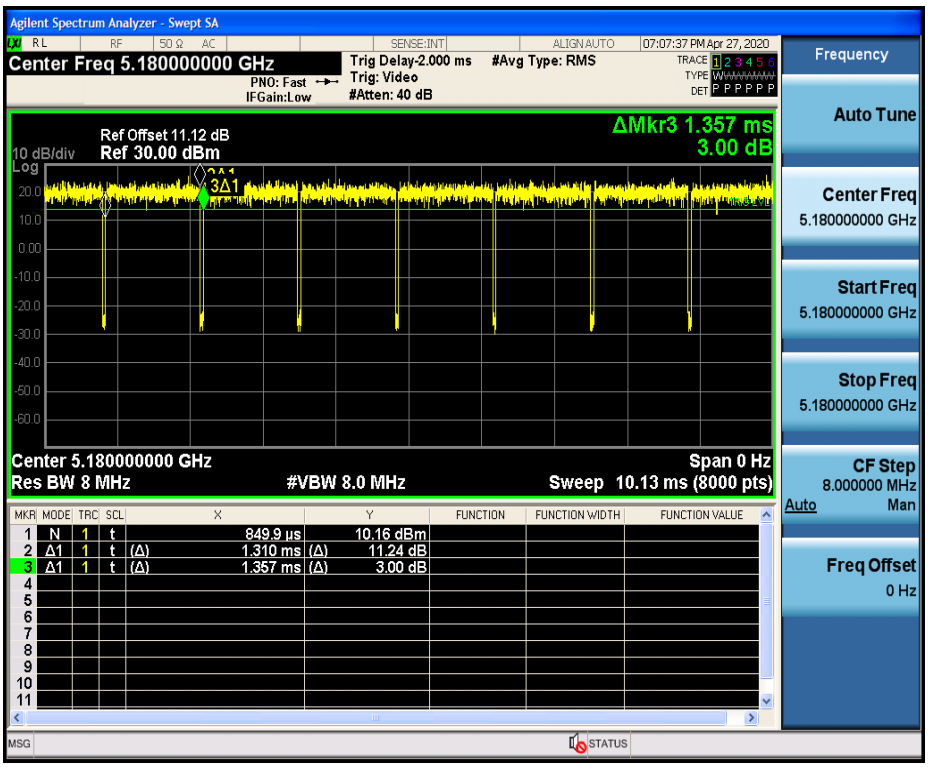
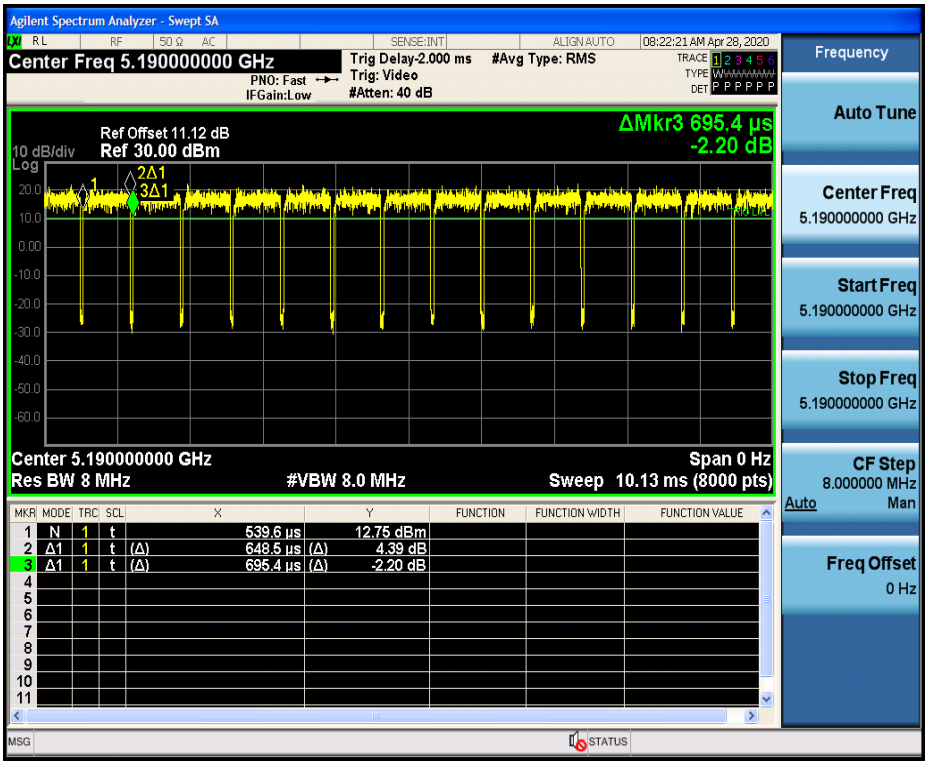
4.3.1.1.4 11AC20



4.3.1.1.5 11AC40



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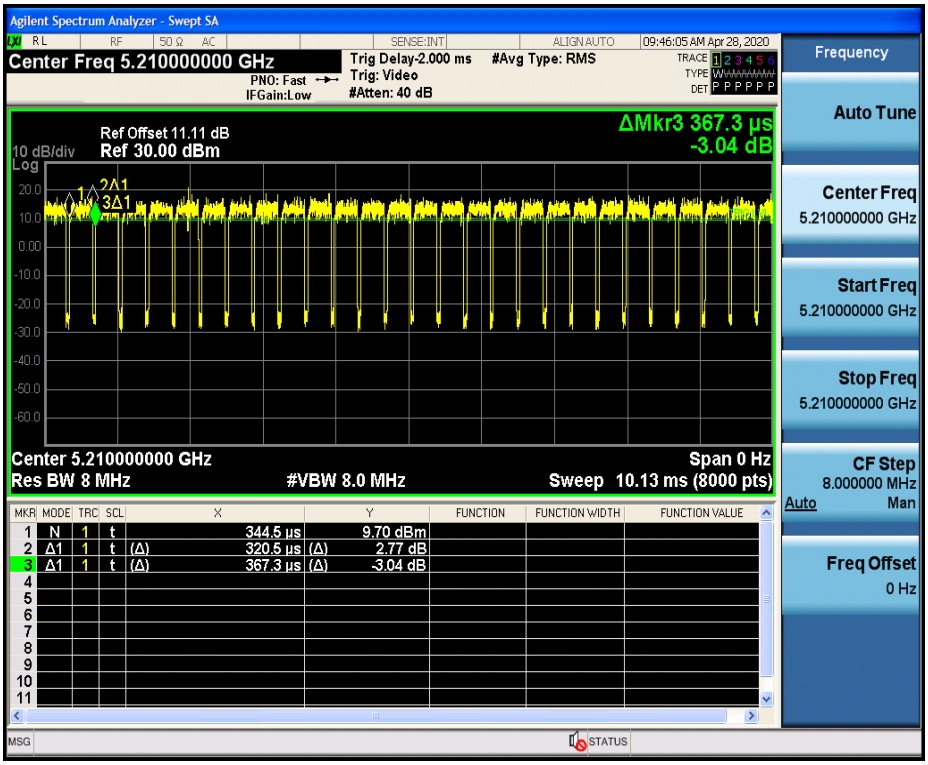
4.3.1.1.6 11AC80



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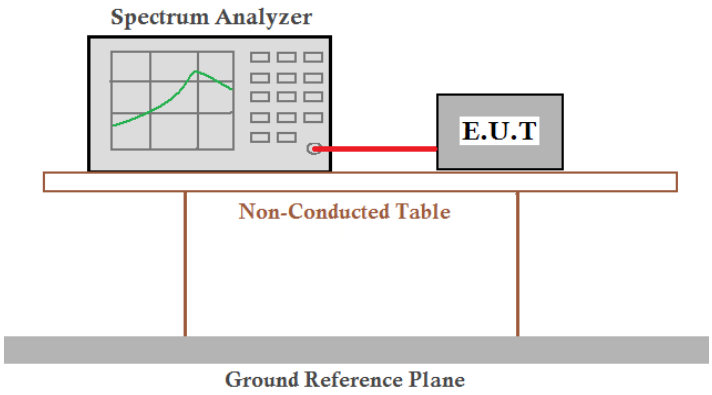
4.4 Conducted Output Power

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
	5725-5825MHz	Not exceed 1W(30dBm)
	*Where B is the 26dB emission bandwidth in MHz	
Test Results:	Pass	

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4.4.1 Test Results for Conducted Output Power

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	5180	17.36	<=23.98	PASS
		5200	18.00	<=23.98	PASS
		5240	17.56	<=23.98	PASS
		5260	17.75	<=23.56	PASS
		5280	17.53	<=23.98	PASS
		5320	18.22	<=23.65	PASS
		5500	17.92	<=23.61	PASS
		5580	17.83	<=23.98	PASS
		5700	17.45	<=23.98	PASS
		5745	17.24	<=30	PASS
		5785	17.32	<=30	PASS
		5805	17.55	<=30	PASS
11N20SISO	Ant1	5180	17.39	<=23.98	PASS
		5200	17.30	<=23.98	PASS
		5240	16.93	<=23.98	PASS
		5260	16.49	<=23.98	PASS
		5280	16.49	<=23.98	PASS
		5320	17.13	<=23.71	PASS
		5500	15.48	<=23.98	PASS
		5580	14.68	<=23.74	PASS
		5700	13.76	<=23.72	PASS
		5745	14.17	<=30	PASS
		5785	14.80	<=30	PASS
		5805	15.04	<=30	PASS
11N40SISO	Ant1	5190	17.05	<=23.98	PASS
		5230	16.92	<=23.98	PASS
		5270	16.66	<=23.98	PASS
		5310	17.15	<=23.98	PASS
		5510	15.10	<=23.98	PASS
		5550	15.49	<=23.98	PASS
		5670	14.39	<=23.98	PASS
		5755	16.81	<=30	PASS
		5795	16.89	<=30	PASS
11AC20SISO	Ant1	5180	17.42	<=23.98	PASS
		5200	17.30	<=23.98	PASS
		5240	17.46	<=23.98	PASS
		5260	17.20	<=23.98	PASS
		5280	17.15	<=23.72	PASS
		5320	17.66	<=23.72	PASS
		5500	17.36	<=23.98	PASS
		5580	17.21	<=23.98	PASS

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		5745	16.75	<=30	PASS
		5785	16.85	<=30	PASS
		5805	17.08	<=30	PASS
11AC40SISO	Ant1	5190	17.31	<=23.98	PASS
		5230	16.92	<=23.98	PASS
		5270	16.82	<=23.98	PASS
		5310	17.49	<=23.98	PASS
		5510	17.11	<=23.98	PASS
		5550	16.92	<=23.98	PASS
		5670	17.02	<=23.98	PASS
		5755	16.29	<=30	PASS
		5795	16.42	<=30	PASS
11AC80SISO	Ant1	5210	17.18	<=23.98	PASS
		5290	16.38	<=23.98	PASS
		5530	16.99	<=23.98	PASS
		5610	16.79	<=23.98	PASS
		5775	16.71	<=30	PASS

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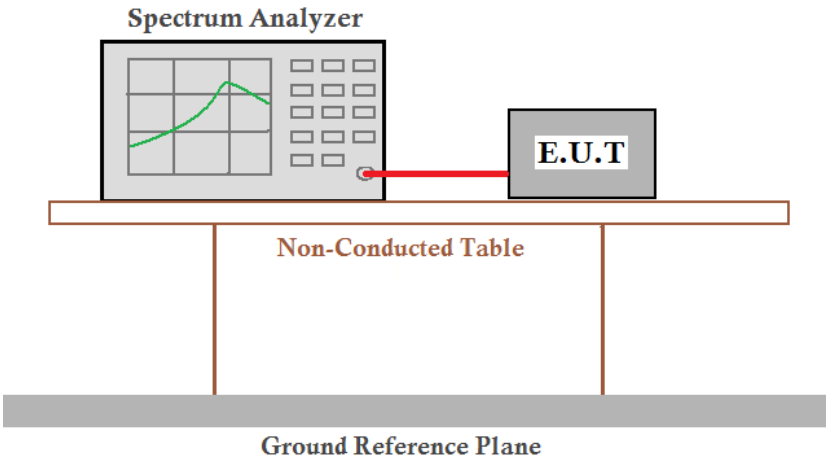
4.5 26dB Emission Bandwidth

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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4.5.1 Test Results for 26dB Emission Bandwidth

Test Mode	Antenna	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	24.560	5168.840	5193.400	---	PASS
		5200	22.120	5189.840	5211.960	---	PASS
		5240	20.560	5230.040	5250.600	---	PASS
		5260	18.040	5250.920	5268.960	---	PASS
		5280	20.840	5270.000	5290.840	---	PASS
		5320	18.400	5310.840	5329.240	---	PASS
		5500	18.240	5490.840	5509.080	---	PASS
		5580	20.000	5570.000	5590.000	---	PASS
		5700	26.000	5688.360	5714.360	---	PASS
		5745	17.920	5736.080	5754.000	---	PASS
		5785	21.400	5775.000	5796.400	---	PASS
		5805	20.640	5794.880	5815.520	---	PASS
11N20SISO	Ant1	5180	24.120	5167.200	5191.320	---	PASS
		5200	24.120	5187.240	5211.360	---	PASS
		5240	23.480	5228.280	5251.760	---	PASS
		5260	20.880	5249.320	5270.200	---	PASS
		5280	20.640	5269.440	5290.080	---	PASS
		5320	18.680	5310.640	5329.320	---	PASS
		5500	21.880	5488.280	5510.160	---	PASS
		5580	18.800	5570.520	5589.320	---	PASS
		5700	18.720	5690.680	5709.400	---	PASS
		5745	19.160	5735.440	5754.600	---	PASS
		5785	20.560	5774.760	5795.320	---	PASS
		5805	20.240	5794.880	5815.120	---	PASS
11N40SISO	Ant1	5190	60.320	5159.520	5219.840	---	PASS
		5230	50.560	5209.280	5259.840	---	PASS
		5270	40.160	5248.640	5288.800	---	PASS
		5310	38.080	5290.880	5328.960	---	PASS
		5510	43.760	5488.880	5532.640	---	PASS
		5550	50.960	5519.360	5570.320	---	PASS
		5670	53.920	5637.520	5691.440	---	PASS
		5755	42.240	5734.200	5776.440	---	PASS
		5795	41.920	5774.360	5816.280	---	PASS
11AC20SISO	Ant1	5180	20.680	5169.760	5190.440	---	PASS
		5200	26.520	5187.840	5214.360	---	PASS
		5240	20.440	5229.760	5250.200	---	PASS
		5260	20.680	5249.840	5270.520	---	PASS
		5280	18.720	5270.600	5289.320	---	PASS
		5320	18.720	5310.640	5329.360	---	PASS
		5500	20.600	5489.840	5510.440	---	PASS
		5580	20.400	5569.880	5590.280	---	PASS
		5745	20.320	5734.880	5755.200	---	PASS
		5785	20.440	5774.720	5795.160	---	PASS
		5805	20.480	5794.720	5815.200	---	PASS
11AC40SISO	Ant1	5190	42.720	5167.600	5210.320	---	PASS
		5230	40.720	5209.760	5250.480	---	PASS
		5270	40.880	5249.440	5290.320	---	PASS

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		5310	37.760	5291.120	5328.880	---	PASS
		5510	40.480	5489.680	5530.160	---	PASS
		5550	40.640	5529.680	5570.320	---	PASS
		5670	38.000	5650.960	5688.960	---	PASS
		5755	38.480	5735.800	5774.280	---	PASS
		5795	40.480	5774.840	5815.320	---	PASS
11AC80SISO	Ant1	5210	88.640	5164.720	5253.360	---	PASS
		5290	86.560	5249.360	5335.920	---	PASS
		5530	88.480	5482.160	5570.640	---	PASS
		5610	84.640	5565.840	5650.480	---	PASS
		5775	78.560	5735.800	5814.360	---	PASS

4.5.1 Test Graphs

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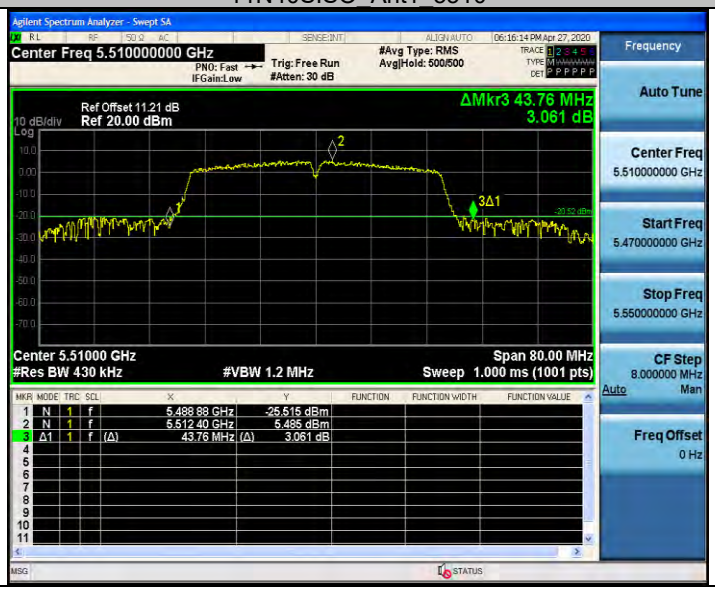

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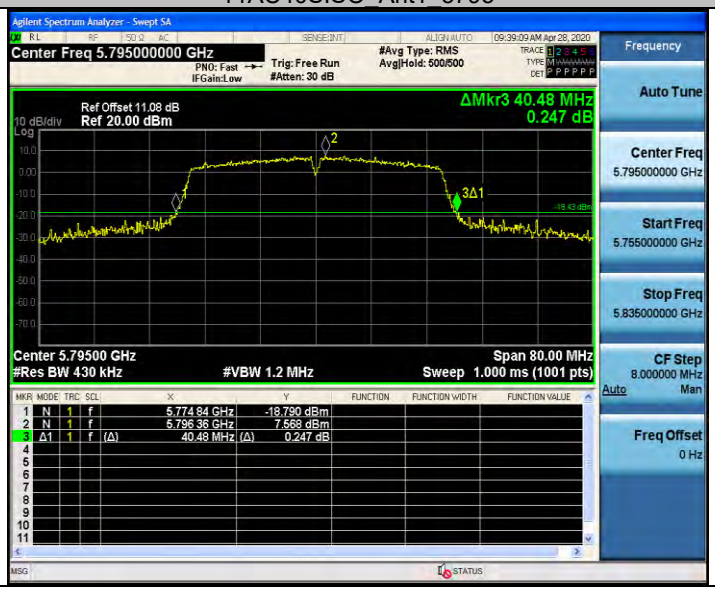

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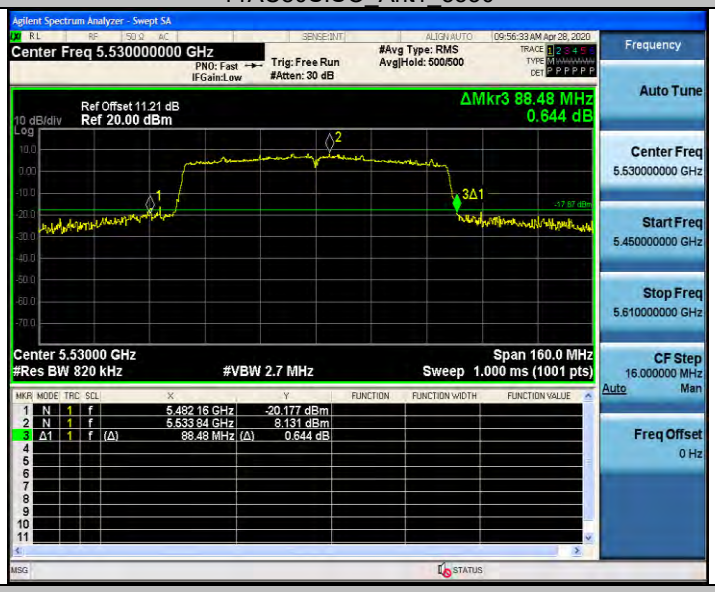

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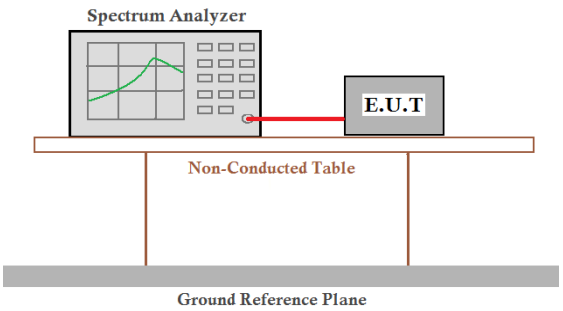
4.6 6dB Emission Bandwidth

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: 5725-5825MHz Limit: At lease 500kHz
Test Results:	Pass

4.6.1 Test Results for 6dB Emission Bandwidth

Test Mode	Test Channel	Frequency [MHz]	ANT	6dB Emission Bandwidth [MHz]	Verdict
11A20	149	5745	ANT 1	15.15	PASS
	161	5805	ANT 1	17.25	PASS
11N20	149	5745	ANT 1	17.64	PASS
	161	5805	ANT 1	17.19	PASS
11N40	151	5755	ANT 1	35.16	PASS
	159	5795	ANT 1	35.82	PASS
11AC20	149	5745	ANT 1	15.15	PASS
	161	5805	ANT 1	17.25	PASS
11AC40	151	5755	ANT 1	36.54	PASS
	159	5795	ANT 1	36.60	PASS
11AC80	155	5775	ANT 1	76.80	PASS

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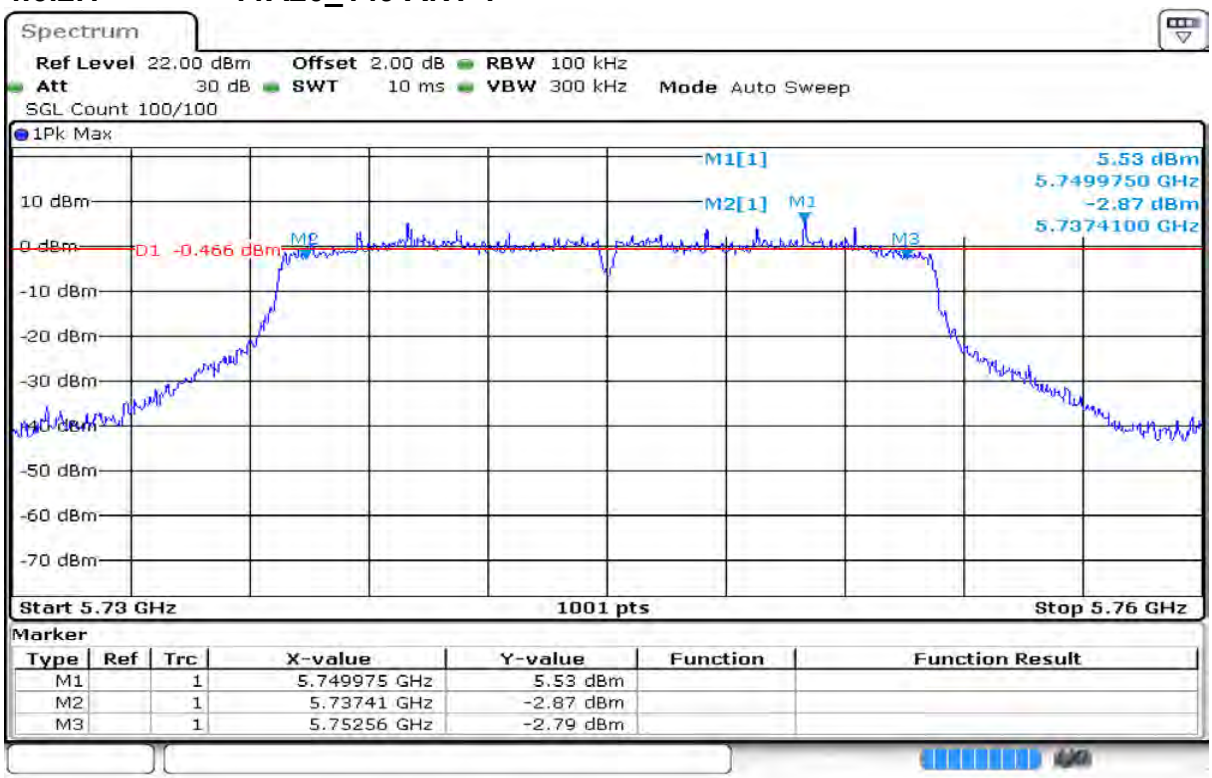
4.6.2 Plots for 6dB Emission Bandwidth

4.6.2.1 11A20_149 ANT 1



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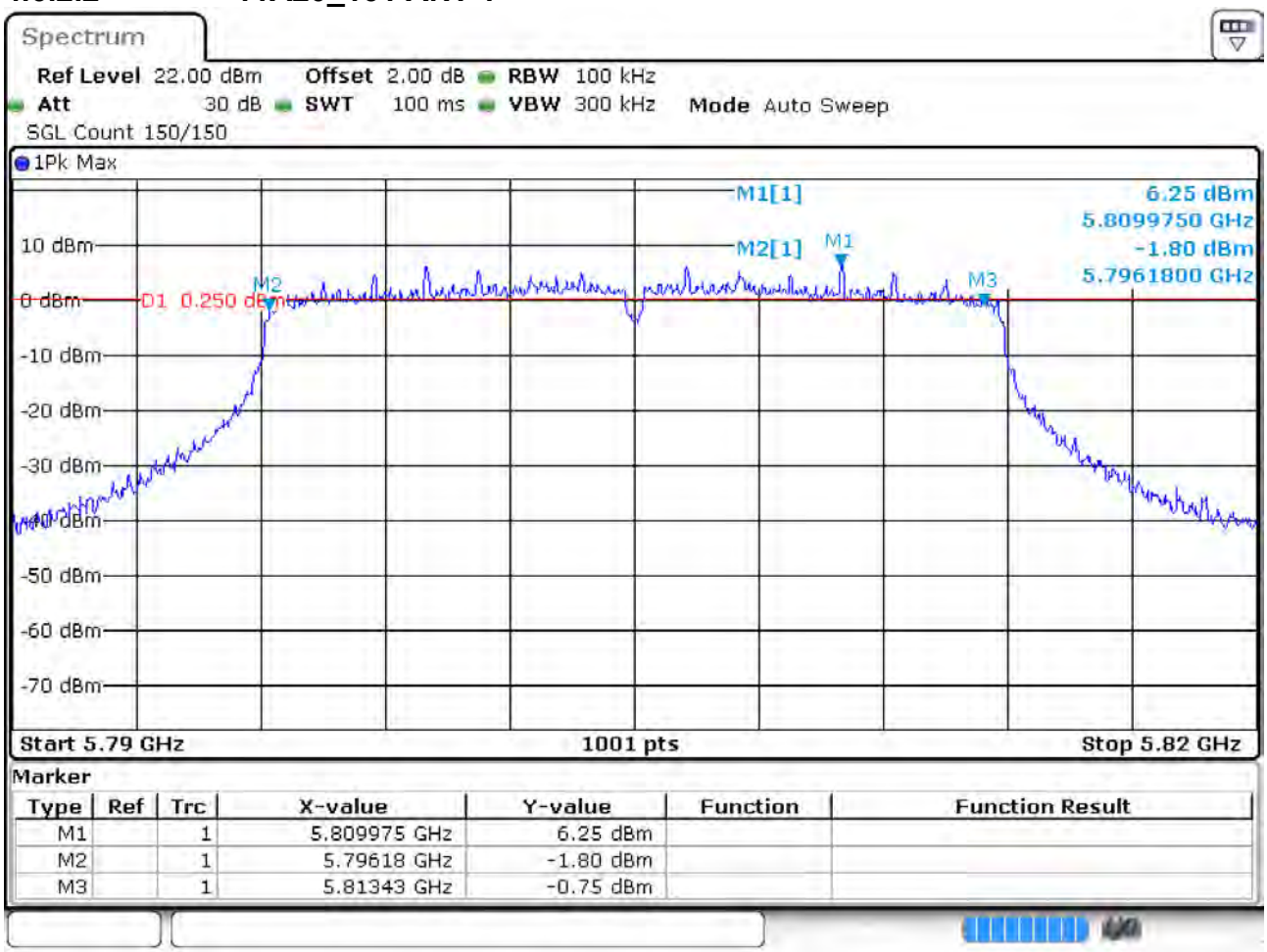
4.6.2.2 11A20_161 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.809975 GHz	6.25 dBm		
M2		1	5.79618 GHz	-1.80 dBm		
M3		1	5.81343 GHz	-0.75 dBm		

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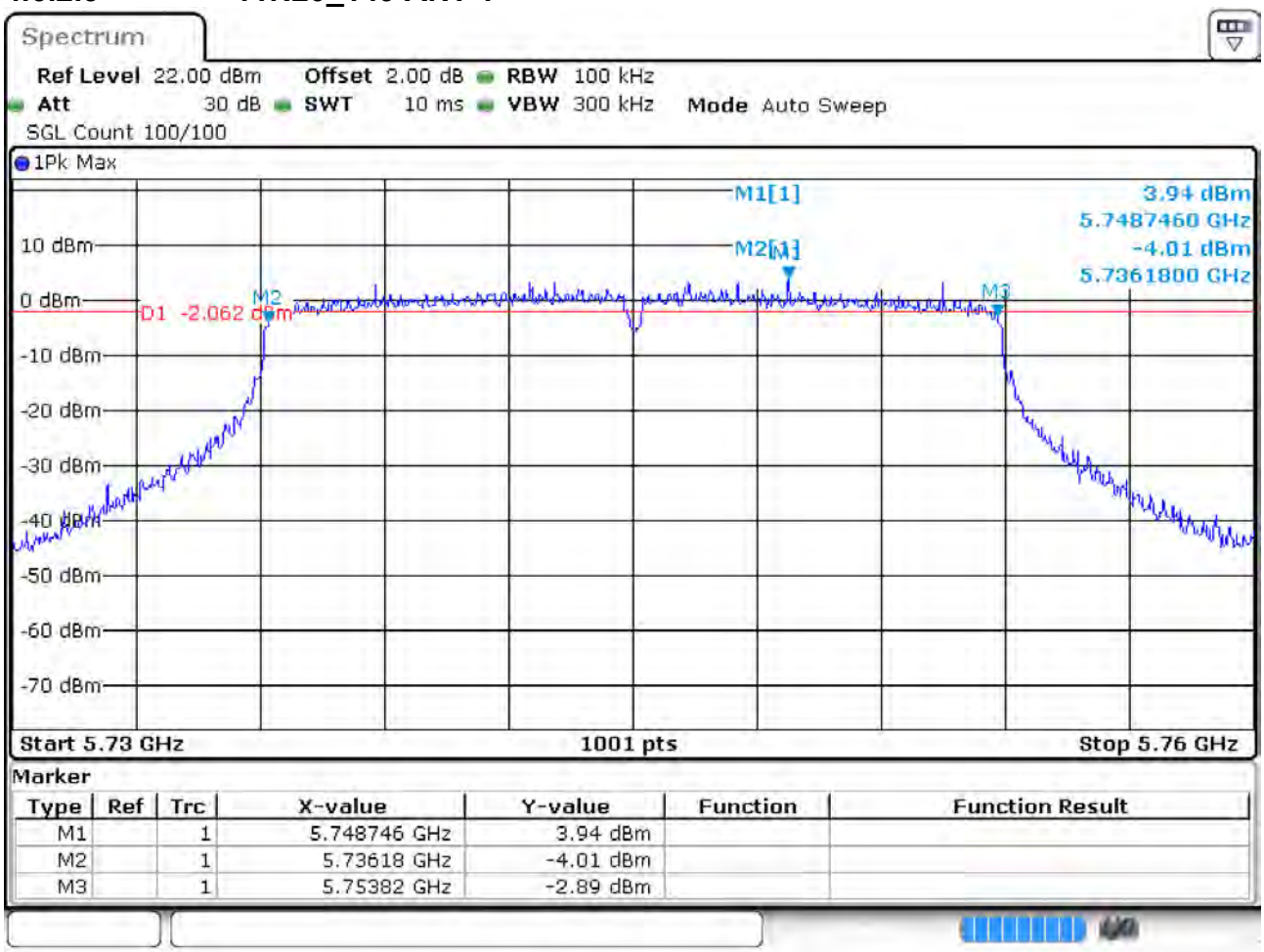
4.6.2.3 11N20_149 ANT 1



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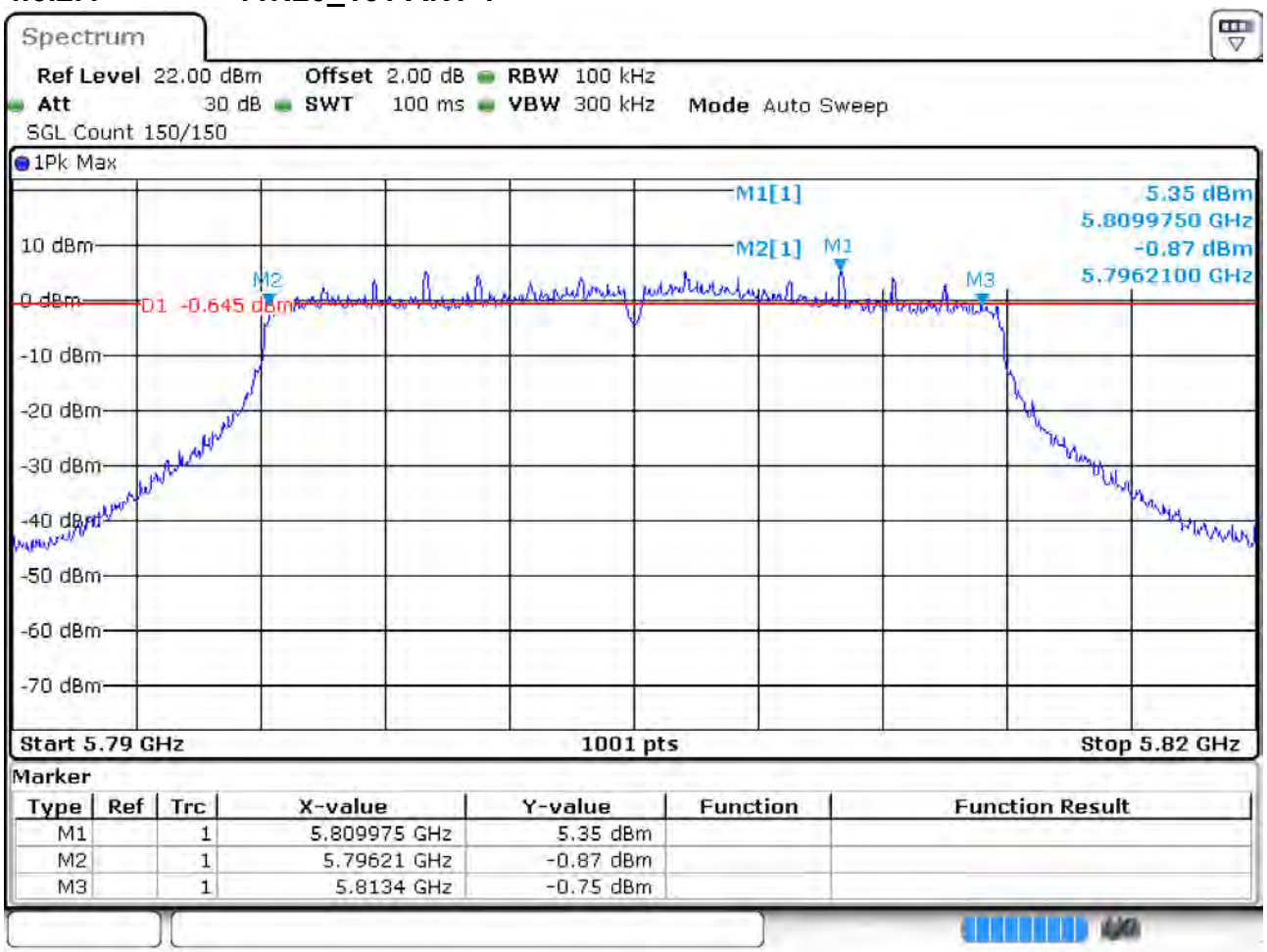
4.6.2.4 11N20_161 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.809975 GHz	5.35 dBm		
M2		1	5.79621 GHz	-0.87 dBm		
M3		1	5.8134 GHz	-0.75 dBm		

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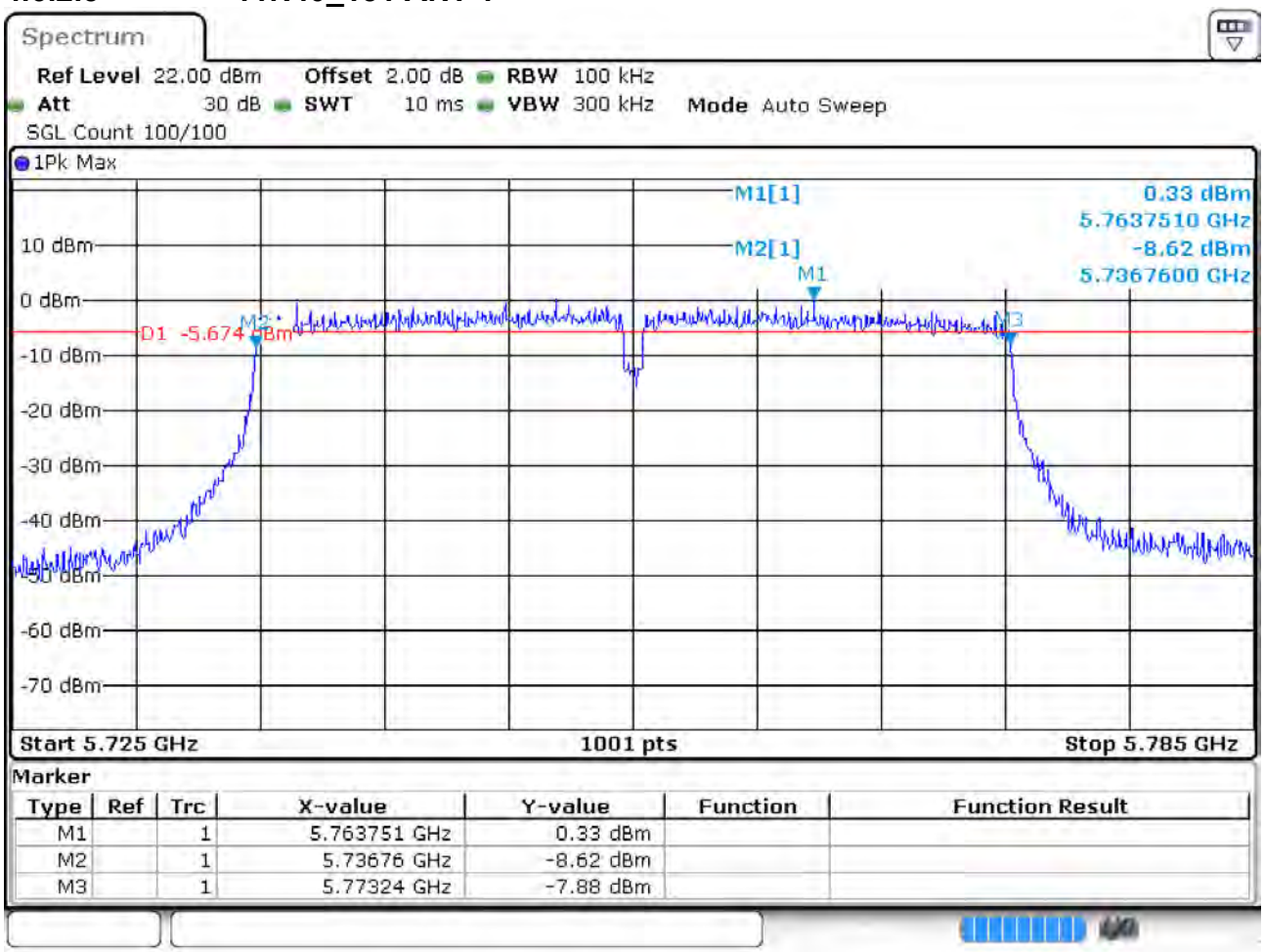
4.6.2.5 11N40_151 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.763751 GHz	0.33 dBm		
M2		1	5.73676 GHz	-8.62 dBm		
M3		1	5.77324 GHz	-7.88 dBm		

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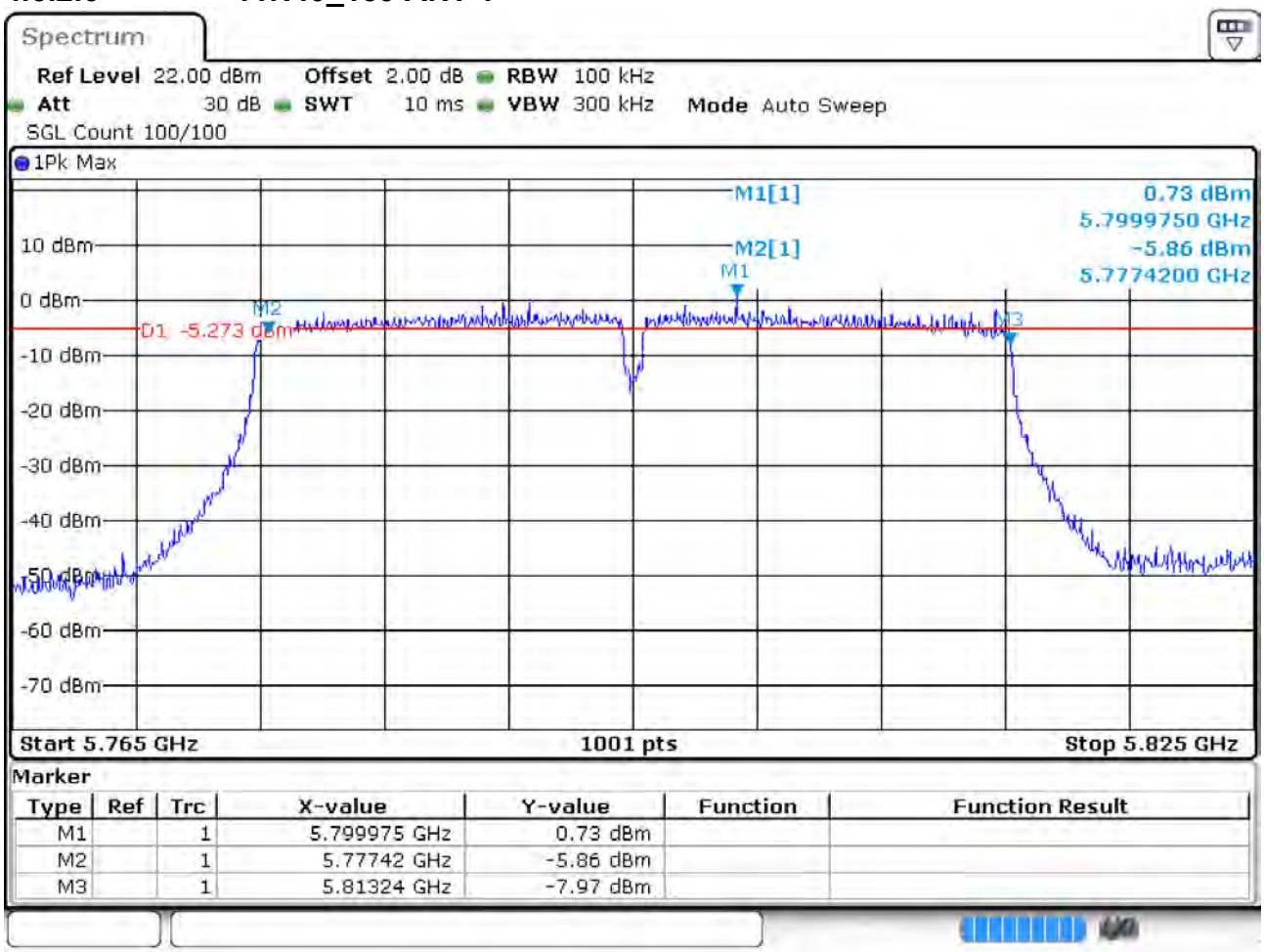
4.6.2.6 11N40_159 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.799975 GHz	0.73 dBm		
M2		1	5.77742 GHz	-5.86 dBm		
M3		1	5.81324 GHz	-7.97 dBm		

Date: 9.APR.2020 05:00:48

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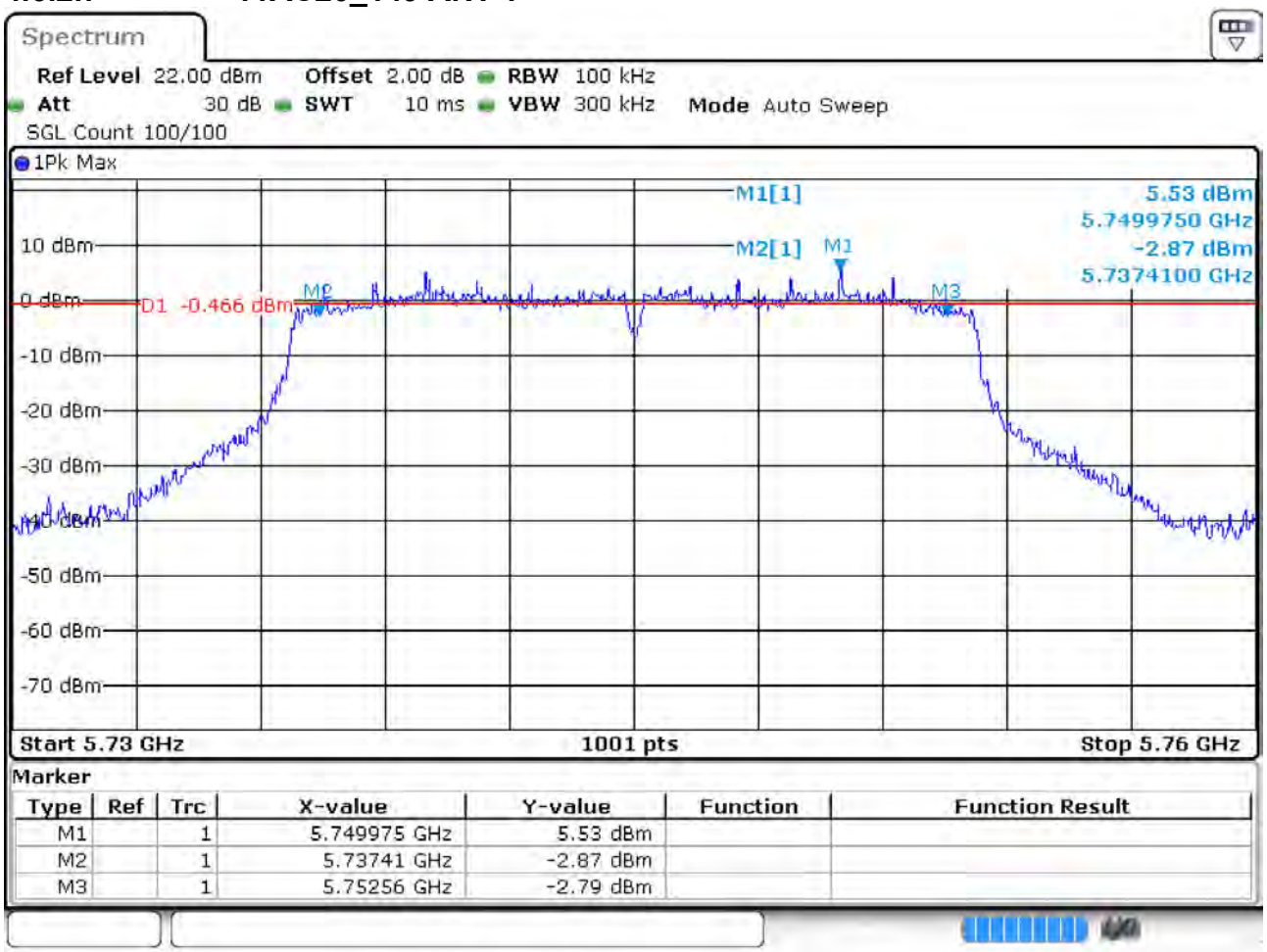
4.6.2.7 11AC20_149 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.749975 GHz	5.53 dBm		
M2		1	5.73741 GHz	-2.87 dBm		
M3		1	5.75256 GHz	-2.79 dBm		

Date: 9.APR.2020 04:13:16

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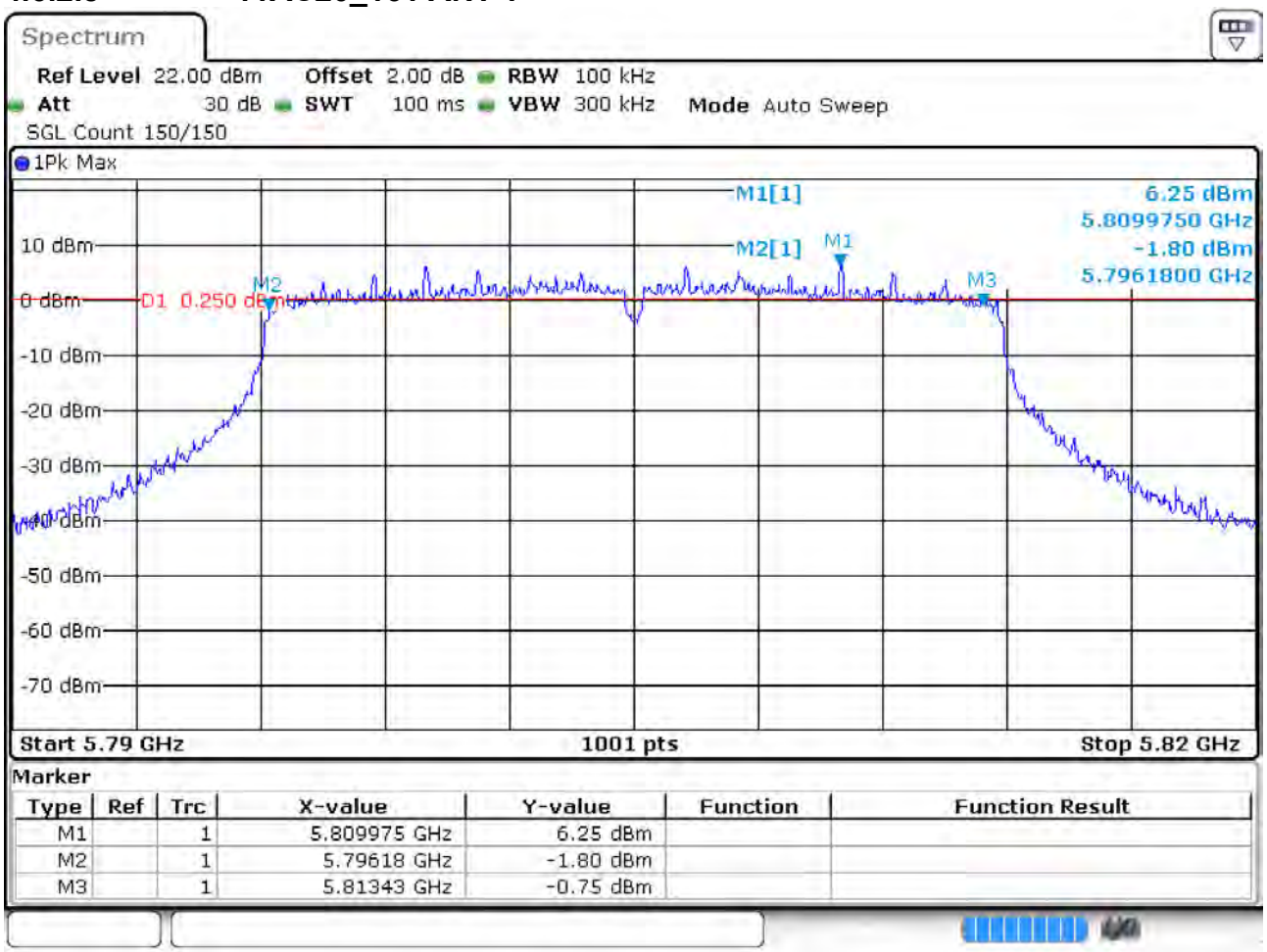
4.6.2.8 11AC20_161 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.809975 GHz	6.25 dBm		
M2		1	5.79618 GHz	-1.80 dBm		
M3		1	5.81343 GHz	-0.75 dBm		

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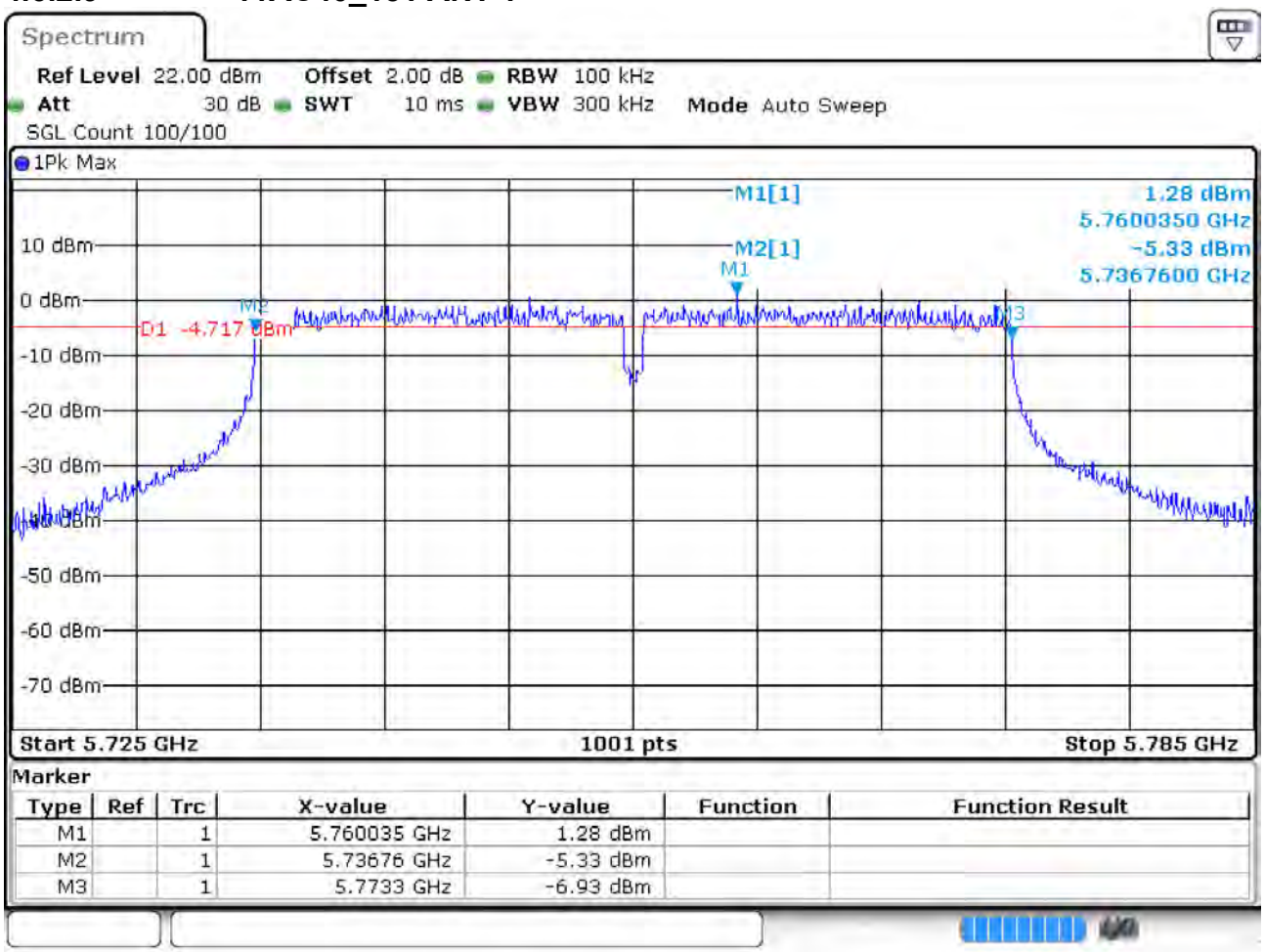
4.6.2.9 11AC40_151 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.760035 GHz	1.28 dBm		
M2		1	5.73676 GHz	-5.33 dBm		
M3		1	5.7733 GHz	-6.93 dBm		

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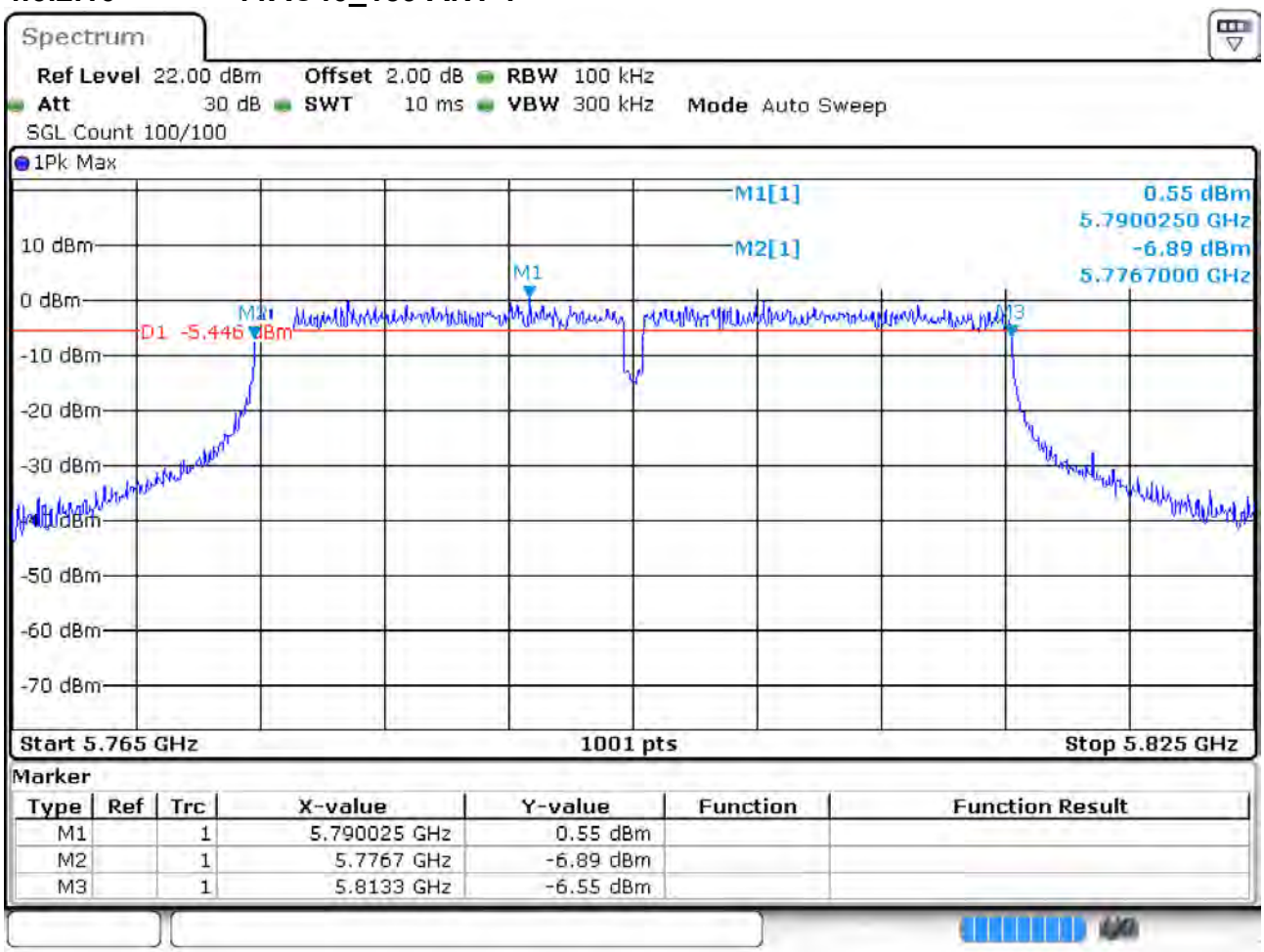
4.6.2.10 11AC40_159 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.790025 GHz	0.55 dBm		
M2		1	5.7767 GHz	-6.89 dBm		
M3		1	5.8133 GHz	-6.55 dBm		

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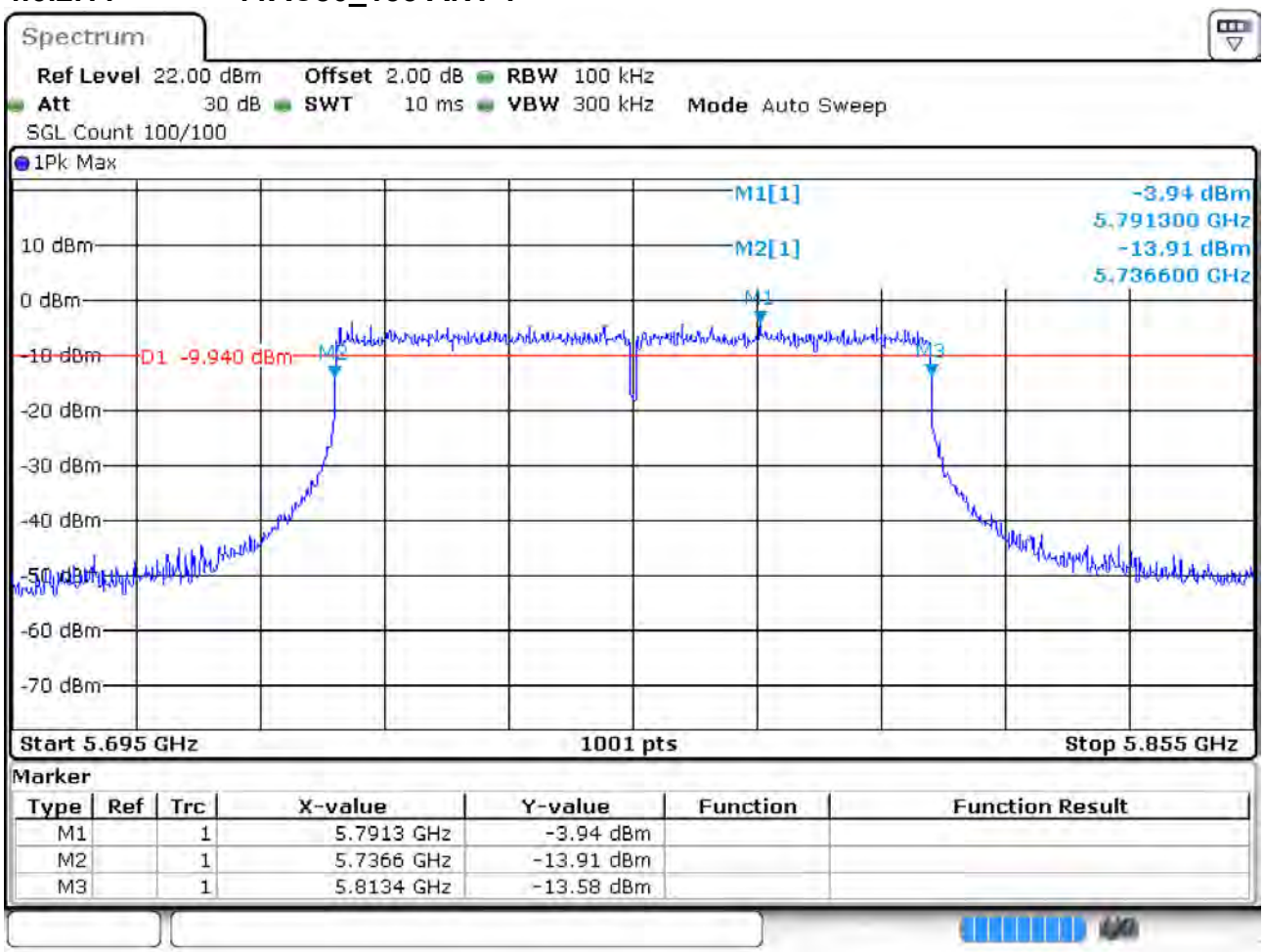
4.6.2.11 11AC80_155 ANT 1



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.7913 GHz	-3.94 dBm		
M2		1	5.7366 GHz	-13.91 dBm		
M3		1	5.8134 GHz	-13.58 dBm		

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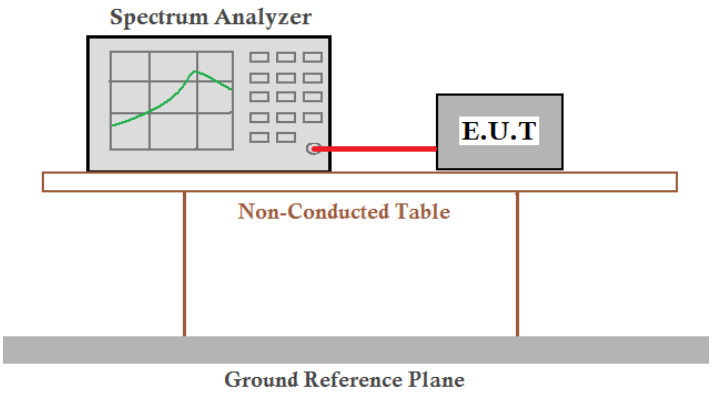
4.7 99% Occupied Bandwidth

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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4.7.1 Test Results for 99% Occupied Bandwidth

Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.213	5171.424	5188.637	---	PASS
		5200	17.123	5191.450	5208.573	---	PASS
		5240	17.078	5231.477	5248.555	---	PASS
		5260	16.822	5251.575	5268.397	---	PASS
		5280	17.046	5271.479	5288.525	---	PASS
		5320	17.081	5311.448	5328.529	---	PASS
		5500	17.032	5491.471	5508.503	---	PASS
		5580	17.052	5571.471	5588.523	---	PASS
		5700	17.022	5691.457	5708.479	---	PASS
		5745	17.005	5736.472	5753.477	---	PASS
		5785	17.035	5776.499	5793.534	---	PASS
		5805	16.926	5796.527	5813.453	---	PASS
11N20SISO	Ant1	5180	18.138	5170.922	5189.060	---	PASS
		5200	18.143	5190.903	5209.046	---	PASS
		5240	17.844	5231.083	5248.927	---	PASS
		5260	17.975	5250.970	5268.945	---	PASS
		5280	18.030	5270.969	5288.999	---	PASS
		5320	17.789	5311.095	5328.884	---	PASS
		5500	17.771	5491.076	5508.847	---	PASS
		5580	17.739	5571.087	5588.826	---	PASS
		5700	17.987	5690.993	5708.980	---	PASS
		5745	18.026	5735.963	5753.989	---	PASS
		5785	18.035	5776.015	5794.050	---	PASS
		5805	17.970	5796.015	5813.985	---	PASS
11N40SISO	Ant1	5190	36.700	5171.689	5208.389	---	PASS
		5230	36.757	5211.683	5248.440	---	PASS
		5270	36.642	5251.702	5288.344	---	PASS
		5310	36.594	5291.761	5328.355	---	PASS
		5510	36.608	5491.623	5528.231	---	PASS
		5550	36.658	5531.603	5568.261	---	PASS
		5670	36.581	5651.672	5688.253	---	PASS
		5755	36.656	5736.693	5773.349	---	PASS
		5795	36.527	5776.750	5813.277	---	PASS
11AC20SISO	Ant1	5180	18.051	5170.979	5189.030	---	PASS
		5200	18.008	5191.007	5209.015	---	PASS
		5240	18.007	5231.012	5249.019	---	PASS
		5260	17.973	5250.993	5268.966	---	PASS
		5280	17.961	5271.025	5288.986	---	PASS
		5320	17.952	5311.028	5328.980	---	PASS
		5500	17.942	5490.999	5508.941	---	PASS
		5580	17.740	5571.155	5588.895	---	PASS
		5700	17.949	5690.986	5708.935	---	PASS
		5745	17.936	5735.993	5753.929	---	PASS
		5785	17.962	5776.022	5793.984	---	PASS
		5805	17.708	5796.127	5813.835	---	PASS
11AC40SISO	Ant1	5190	36.450	5171.791	5208.241	---	PASS
		5230	36.355	5211.877	5248.232	---	PASS

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		5270	35.961	5252.068	5288.029	---	PASS
		5310	36.373	5291.857	5328.230	---	PASS
		5510	36.390	5491.729	5528.119	---	PASS
		5550	36.280	5531.824	5568.104	---	PASS
		5670	36.121	5651.918	5688.039	---	PASS
		5755	36.387	5736.788	5773.175	---	PASS
		5795	36.348	5776.836	5813.184	---	PASS
11AC80SISO	Ant1	5210	75.655	5172.272	5247.927	---	PASS
		5290	74.914	5252.612	5327.526	---	PASS
		5530	75.504	5492.210	5567.714	---	PASS
		5610	74.861	5572.581	5647.442	---	PASS
		5775	75.034	5737.418	5812.452	---	PASS

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4.7.1 Test Graphs

11A_Ant1_5180

11A_Ant1_5200

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11A_Ant1_5240

11A_Ant1_5260

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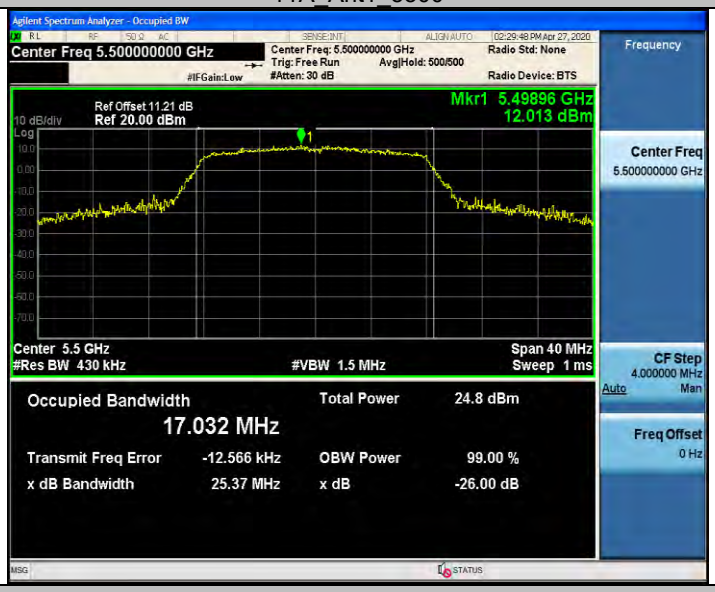

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