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FCC RADIO TEST REPORT

Applicant's company	Ubiquiti Networks, Inc.
Applicant Address	685 Third Avenue, 27th Floor New York, New York 10017 USA
FCC ID	SWX-M445GH
Manufacturer's company	Ubiquiti Networks, Inc.
Manufacturer Address	685 Third Avenue, 27th Floor New York, New York 10017 USA

Product Name	WiFi 5G Module
Brand Name	UBIQUITI
Model No.	4x4-5GH
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5470 ~ 5725MHz / 5725 ~ 5850 MHz
Received Date	Jun. 21, 2016
Final Test Date	Aug. 30, 2016
Submission Type	Original Equipment

Statement

Test result included is for the IEEE 802.11n and IEEE 802.11a/ac of the product.

The test result in this report refers exclusively to the presented test model / sample.

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The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013, 47 CFR FCC Part 15 Subpart E, KDB789033 D02 v01r04, KDB662911 D01 v02r01, KDB644545 D03 v01, ET Docket No. 13-49; FCC 16-24.**

The test equipment used to perform the test is calibrated and traceable to NML/ROC.



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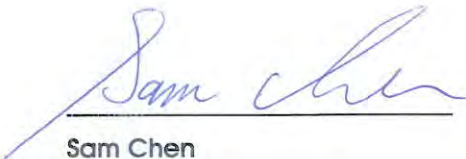
History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR661623-13	Rev. 01	Initial issue of report	Sep. 07, 2017

1. VERIFICATION OF COMPLIANCE

Product Name : WiFi 5G Module
Brand Name : UBIQUITI
Model No. : 4x4-5GH
Applicant : Ubiquiti Networks, Inc.
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jun. 21, 2016 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E			
Part	Rule Section	Description of Test	Result
4.1	15.207	AC Power Line Conducted Emissions	Complies
4.2	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies
4.3	15.407(e)	6dB Spectrum Bandwidth	Complies
4.4	15.407(a)	Maximum Conducted Output Power	Complies
4.5	15.407(a)	Power Spectral Density	Complies
4.6	15.407(b)	Radiated Emissions	Complies
4.7	15.407(b)	Band Edge Emissions	Complies
4.8	15.407(g)	Frequency Stability	Complies
4.9	15.203	Antenna Requirements	Complies

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From host system
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5470 ~ 5725MHz / 5725 ~ 5850 MHz
Channel Number	17 for 20MHz bandwidth ; 8 for 40MHz bandwidth 4 for 80MHz bandwidth
Channel Bandwidth (99%)	<p>For non-beamforming mode</p> <p>U-NII-2C: IEEE 802.11a: 15.28 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 16.24 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.47 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz IEEE 802.11ac MCS0/Nss2 (VHT80+80): 154.99 MHz</p> <p>U-NII-3: IEEE 802.11a: 24.14 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 25.88 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 44.86 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz IEEE 802.11ac MCS0/Nss2 (VHT80+80): 75.54 MHz</p> <p>For beamforming mode</p> <p>U-NII-2C: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.19 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz IEEE 802.11ac MCS0/Nss2 (VHT80+80): 154.56 MHz</p> <p>U-NII-3: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.15 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.05 MHz</p>

	IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz IEEE 802.11ac MCS0/Nss2 (VHT80+80): 76.12 MHz
Maximum Conducted Output Power	<p>For Non-beamforming mode</p> <p>U-NII-2C:</p> <p>IEEE 802.11a: 18.19 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 18.36 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 21.20 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT80): 23.81 dBm</p> <p>IEEE 802.11ac MCS0/Nss2 (VHT80+80): 23.78 dBm</p> <p>U-NII-3:</p> <p>IEEE 802.11a: 29.04 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 28.91 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 28.66 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT80): 23.72 dBm</p> <p>IEEE 802.11ac MCS0/Nss2 (VHT80+80): 19.37 dBm</p> <p>For beamforming mode</p> <p>U-NII-2C:</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 17.36 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 17.36 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT80): 17.89 dBm</p> <p>IEEE 802.11ac MCS0/Nss2 (VHT80+80): 20.87 dBm</p> <p>U-NII-3:</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 23.43 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 23.47 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT80): 23.48 dBm</p> <p>IEEE 802.11ac MCS0/Nss2 (VHT80+80): 18.27 dBm</p>
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Communication Mode	<input checked="" type="checkbox"/> IP Based (Load Based)	<input type="checkbox"/> Frame Based
TPC Function	<input checked="" type="checkbox"/> With TPC	<input type="checkbox"/> Without TPC
Weather Band (5600~5650MHz)	<input checked="" type="checkbox"/> With 5600~5650MHz	<input type="checkbox"/> Without 5600~5650MHz
Beamforming Function	<input checked="" type="checkbox"/> With beamforming	<input type="checkbox"/> Without beamforming

Note: The EUT has beamforming function for 802.11n/ac.

Antenna and Bandwidth

Antenna	Four (TX)		
	20 MHz	40 MHz	80 MHz
IEEE 802.11a	V	X	X
IEEE 802.11n	V	V	X
IEEE 802.11ac	V	V	V

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	4	MCS 0-31
802.11n (HT40)	4	MCS 0-31
802.11ac (VHT20)	4	MCS 0-9/Nss1-4
802.11ac (VHT40)	4	MCS 0-9/Nss1-4
802.11ac (VHT80)	4	MCS 0-9/Nss1-4

Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput).
Then EUT supports HT20 and HT40.

Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20, VHT40 and VHT80.

Note 3: Modulation modes consist of below configuration:
HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	-	-	PIFA Antenna	N/A	6
2	-	-	PIFA Antenna	N/A	6
3	-	-	PIFA Antenna	N/A	6
4	-	-	PIFA Antenna	N/A	6

Note: Ant. 1~Ant. 4 Connect to chain 1~chain 4.

For IEEE 802.11a/n/ac mode (4TX/4RX):

Chain 1, Chain 2, Chain 3 and Chain 4 can be used as transmitting/receiving antenna.

Chain 1, Chain 2, Chain 3 and Chain 4 could transmit/receive simultaneously.

3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 102, 110, 118, 126, 134, 142, 151, 159.

For 80MHz bandwidth systems, use Channel 106, 122, 138, 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5470~5725 MHz U-NII-2C	100	5500 MHz	124	5620 MHz
	102	5510 MHz	126	5630 MHz
	104	5520 MHz	128	5640 MHz
	106	5530 MHz	132	5660 MHz
	108	5540 MHz	134	5670 MHz
	110	5550 MHz	136	5680 MHz
	112	5560 MHz	138	5690 MHz
	116	5580 MHz	140	5700 MHz
	118	5590 MHz	142	5710 MHz
	120	5600 MHz	144	5720 MHz
	122	5610 MHz	-	-
5725~5850 MHz U-NII-3	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 MHz

3.5. Table for 80+80 MHz Mode

Type	Channel No.	Frequency
1	106+138	5530+5690 MHz
2	106+155	5530+5775 MHz
3	122+155	5610+5775 MHz
4	138+155	5690+5775 MHz
5	106+122	5530+5610 MHz
6	122+138	5610+5690 MHz

Note: Non-beamforming mode supports type 1-6, beamforming mode supports type 1-5 only.

3.6. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Chain	
AC Power Conducted Emission	CTX	-	-	-	
Max. Conducted Output Power	For non-beamforming mode				
	11a/BPSK	U-NII-2C U-NII-3	6Mbps	100/116/140/144 /149/157/165	1+2+3+4
	11ac VHT20	U-NII-2C U-NII-3	MCS0/Nss1	100/116/140/144 /149/157/165	1+2+3+4
	11ac VHT40	U-NII-2C U-NII-3	MCS0/Nss1	102/110/134/142 /151/159	1+2+3+4
	11ac VHT80	U-NII-2C U-NII-3	MCS0/Nss1	106/122/138/155	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-2C U-NII-3	MCS0/Nss1	100/116/140/144 /149/157/165	1+2+3+4
	11ac VHT40	U-NII-2C U-NII-3	MCS0/Nss1	102/110/134/142 /151/159	1+2+3+4
	11ac VHT80	U-NII-2C U-NII-3	MCS0/Nss1	106/122/138/155	1+2+3+4

Power Spectral Density	For non-beamforming mode				
	11a/BPSK	U-NII-2C U-NII-3	6Mbps	100/116/140/144 /149/157/165	1+2+3+4
	11ac VHT20	U-NII-2C U-NII-3	MCS0/Nss1	100/116/140/144 /149/157/165	1+2+3+4
	11ac VHT40	U-NII-2C U-NII-3	MCS0/Nss1	102/110/134/142 /151/159	1+2+3+4
	11ac VHT80	U-NII-2C U-NII-3	MCS0/Nss1	106/122/138/155	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-2C U-NII-3	MCS0/Nss1	100/116/140/144 /149/157/165	1+2+3+4
	11ac VHT40	U-NII-2C U-NII-3	MCS0/Nss1	102/110/134/142 /151/159	1+2+3+4
	11ac VHT80	U-NII-2C U-NII-3	MCS0/Nss1	106/122/138/155	1+2+3+4
	26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	For non-beamforming mode			
11a/BPSK		U-NII-2C U-NII-3	6Mbps	100/116/140/144 /149/157/165	1+2+3+4
11ac VHT20		U-NII-2C U-NII-3	MCS0/Nss1	100/116/140/144 /149/157/165	1+2+3+4
11ac VHT40		U-NII-2C U-NII-3	MCS0/Nss1	102/110/134/142 /151/159	1+2+3+4
11ac VHT80		U-NII-2C U-NII-3	MCS0/Nss1	106/122/138/155	1+2+3+4
For beamforming mode					
11ac VHT20		U-NII-2C U-NII-3	MCS0/Nss1	100/116/140/144 /149/157/165	1+2+3+4
11ac VHT40		U-NII-2C U-NII-3	MCS0/Nss1	102/110/134/142 /151/159	1+2+3+4
11ac VHT80		U-NII-2C U-NII-3	MCS0/Nss1	106/122/138/155	1+2+3+4

6dB Spectrum Bandwidth Measurement	For non-beamforming mode					
	11a/BPSK	U-NII-3	6Mbps	144/149/157/165	1+2+3+4	
	11ac VHT20	U-NII-3	MCS0/Nss1	144/149/157/165	1+2+3+4	
	11ac VHT40	U-NII-3	MCS0/Nss1	142/151/159	1+2+3+4	
	11ac VHT80	U-NII-3	MCS0/Nss1	138/155	1+2+3+4	
	For beamforming mode					
	11ac VHT20	U-NII-3	MCS0/Nss1	144/149/157/165	1+2+3+4	
	11ac VHT40	U-NII-3	MCS0/Nss1	142/151/159	1+2+3+4	
	11ac VHT80	U-NII-3	MCS0/Nss1	138/155	1+2+3+4	
	Radiated Emission Below 1GHz	CTX	-	-	-	
Radiated Emission Above 1GHz	For non-beamforming mode					
	11a/BPSK	U-NII-2C U-NII-3	6Mbps	100/116/140/144 /149/157/165	1+2+3+4	
	11ac VHT20	U-NII-2C U-NII-3	MCS0/Nss1	100/116/140/144 /149/157/165	1+2+3+4	
	11ac VHT40	U-NII-2C U-NII-3	MCS0/Nss1	102/110/134/142 /151/159	1+2+3+4	
	11ac VHT80	U-NII-2C U-NII-3	MCS0/Nss1	106/122/138/155	1+2+3+4	
	For beamforming mode					
	11ac VHT20	U-NII-2C U-NII-3	MCS0/Nss1	100/116/140/144 /149/157/165	1+2+3+4	
	11ac VHT40	U-NII-2C U-NII-3	MCS0/Nss1	102/110/134/142 /151/159	1+2+3+4	
	11ac VHT80	U-NII-2C U-NII-3	MCS0/Nss1	106/122/138/155	1+2+3+4	
	Band Edge Emission	For non-beamforming mode				
		11a/BPSK	U-NII-2C U-NII-3	6Mbps	100/116/140/144 /149/157/165	1+2+3+4
		11ac VHT20	U-NII-2C U-NII-3	MCS0/Nss1	100/116/140/144 /149/157/165	1+2+3+4
		11ac VHT40	U-NII-2C U-NII-3	MCS0/Nss1	102/110/134/142 /151/159	1+2+3+4
		11ac VHT80	U-NII-2C U-NII-3	MCS0/Nss1	106/122/138/155	1+2+3+4

	For beamforming mode				
		11ac VHT20	U-NII-2C U-NII-3	MCS0/Nss1	100/116/140/144 /149/157/165
	11ac VHT40	U-NII-2C U-NII-3	MCS0/Nss1	102/110/134/142 /151/159	1+2+3+4
	11ac VHT80	U-NII-2C U-NII-3	MCS0/Nss1	106/122/138/155	1+2+3+4
Frequency Stability	20 MHz	U-NII-2C U-NII-3	-	116/157	1
	40 MHz	U-NII-2C U-NII-3	-	110/151	1
	80 MHz	U-NII-2C U-NII-3	-	106/155	1

Note 1: VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

Note 2: There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802.11n/ac. All test results were recorded in the report.

802.11ac MCS0/Nss2 VHT80+80

Test Items	Mode		Data Rate	Type	Channel	Chain
Max. Conducted Output Power Power Spectral Density 26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement Radiated Emission Above 1GHz Band Edge Emission	11ac VHT80+80	U-NII-2C U-NII-3	MCS0/Nss2	1	106	1+2
					138	3+4
				2	106	1+2
					155	3+4
				3	122	1+2
					155	3+4
				4	138	1+2
					155	3+4
				5	106	1+2
					122	3+4
				6	122	1+2
					138	3+4
6dB Spectrum Bandwidth Measurement	11ac VHT80+80	U-NII-3	MCS0/Nss2	1	106	-
					138	3+4
				2	106	-
					155	3+4
				3	122	-
					155	3+4
				4	138	1+2
					155	3+4
				6	122	1+2
					138	3+4

Note: Non-beamforming mode supports type 1-6 and beamforming mode supports type 1-5 for indoor master.

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. CTX

For Radiated Emission test (Below 1GHz):

Mode 1. CTX at Z-axis

Mode 2. CTX at Y-axis

Mode 2 generated the worst test result, so it was recorded in this report.

For Radiated Emission test (Above 1GHz):

The EUT can be placed in Y-axis and Z-axis. After evaluating, The worst case was found at Z-axis, so it's recorded in this report.

Mode 1. CTX at Z-axis

3.7. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	Site Category	Location	FCC Designation No.	IC File No.	VCCI Reg. No
03CH01-CB	SAC	Hsin Chu	TW0006	IC 4086D	-
CO01-CB	Conduction	Hsin Chu	TW0006	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC).

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB

<For below 1GHz test and above 1GHz test non-beamforming mode>

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC
PoE	UBIQUITI	GP-D480-050G	DoC
Fixture	UBIQUITI	UAP-AC-HD_REV03	N/A

<For above 1GHz test beamforming mode>

Support Unit	Brand	Model	FCC ID
Notebook*2	DELL	E4300	DoC
PoE	UBIQUITI	GP-D480-050G	DoC
RX Device	UBIQUITI	4x4-5GH	SWX-M445GH
Fixture	UBIQUITI	UAP-AC-HD_REV03	N/A

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC
PoE	UBIQUITI	GP-D480-050G	DoC
Fixture	UBIQUITI	UAP-AC-HD_REV03	N/A

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC
PoE	UBIQUITI	GP-D480-050G	DoC
Fixture	UBIQUITI	UAP-AC-HD_REV03	N/A

3.9. Table for Parameters of Test Software Setting

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

For non-beamforming mode

Test Software Version	QCA						
Mode	Test Frequency (MHz)						
	NCB: 20MHz						
	5500 MHz	5580 MHz	5700 MHz	5720 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	10.5	10.5	10.5	10.5	21	21	21
802.11ac MCS0/Nss1 VHT20	11	11	11	11	21	21	21
Mode	NCB: 40MHz						
802.11ac MCS0/Nss1 VHT40	5510 MHz	5550 MHz	5670 MHz	5710 MHz	5755 MHz	5795 MHz	
	12.5	14	13.5	14	20	21	
Mode	NCB: 80MHz						
802.11ac MCS0/Nss1 VHT80	5530 MHz		5610 MHz		5690 MHz		5775 MHz
	11		15.5		17		16.5

802.11ac MCS0/Nss2 VHT80+80

Test Software Version	QCARCT V3.0.197.0			
Mode	NCB: 80MHz+80MHz			
802.11ac MCS0/Nss2 VHT80+80	Type 1	Type 2	Type 3	Type 4
	5530+5690 MHz	5530+5775 MHz	5610+5775 MHz	5690+5775 MHz
	12.5	12.5	14	14.5
	Type 5	Type 6	-	-
	5530+5610 MHz	5610+5690 MHz	-	-
	13	16.5	-	-

For beamforming mode

Test Software Version	QCA v3.0.197.0					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5580 MHz	5700 MHz	5720 MHz	5745 MHz	5785 MHz	5825 MHz
802.11ac MCS0/Nss1 VHT20	16.5	16.5	17	22.5	22.5	22.5
Mode	NCB: 40MHz					
	5510 MHz	5550 MHz	5670 MHz	5710 MHz	5755 MHz	5795 MHz
	16.5	16.5	16.5	17.5	22.5	22.5
802.11ac MCS0/Nss1 VHT40						
Mode	NCB: 80MHz					
	5530 MHz	5610 MHz	5690 MHz	5775 MHz		
	15	16.5	17.5	22		
802.11ac MCS0/Nss1 VHT80						

802.11ac MCS0/Nss2 VHT80+80

Test Software Version	QCA			
Mode	NCB: 80MHz+80MHz			
	Type 1	Type 2	Type 3	Type 4
	5530+5690 MHz	5530+5775 MHz	5610+5775 MHz	5690+5775 MHz
	21	21	21	21
	Type 5	-	-	-
	5530+5610 MHz	-	-	-
	21	-	-	-
802.11ac MCS0/Nss2 VHT80+80				

3.10. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

During the test, the following programs under WIN 7 were executed.

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under Telnet.
3. Executed "Lantest.exe " to link with the remote workstation to receive and transmit packet by RX Deviec and transmit duty cycle no less 98%

3.11. Duty Cycle

For non-beamforming mode:

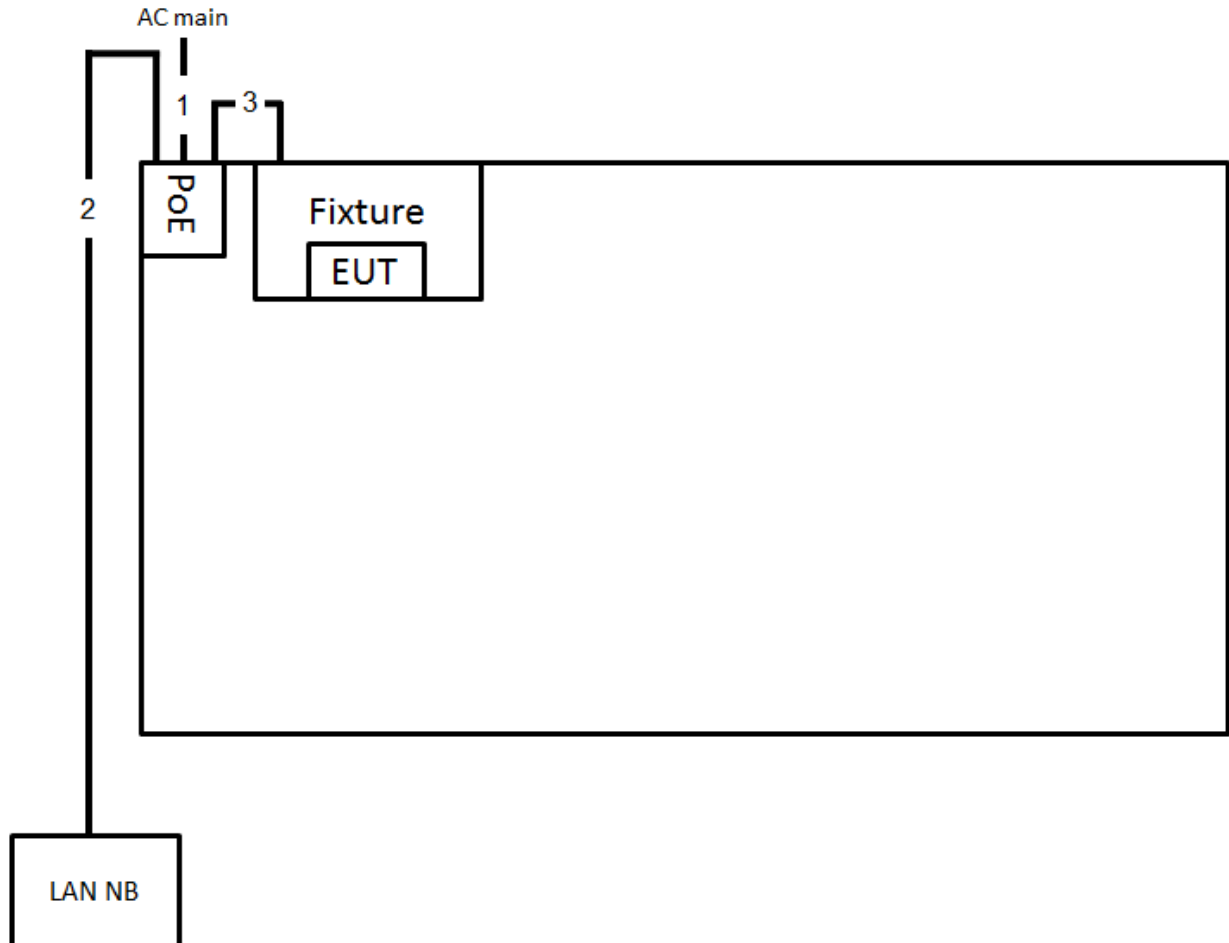
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Min. VBW (kHz)
802.11a	2.020	2.140	94.39	0.25	0.50
802.11ac MCS0/Nss1 VHT20	5.000	5.100	98.04	0.09	0.01
802.11ac MCS0/Nss1 VHT40	2.320	2.540	91.34	0.39	0.43
802.11ac MCS0/Nss1 VHT80	1.136	1.224	92.81	0.32	0.88
802.11ac MCS0/Nss2 VHT80+80	2.210	2.310	95.67	0.19	0.45

For beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Min. VBW (kHz)
802.11ac MCS0/Nss1 VHT20	1.751	1.925	90.96	0.41	0.57
802.11ac MCS0/Nss1 VHT40	1.664	1.854	89.75	0.47	0.60
802.11ac MCS0/Nss1 VHT80	1.915	2.105	90.97	0.41	0.52
802.11ac MCS0/Nss2 VHT80+80	1.764	1.944	90.74	0.42	0.57

3.12. Test Configurations

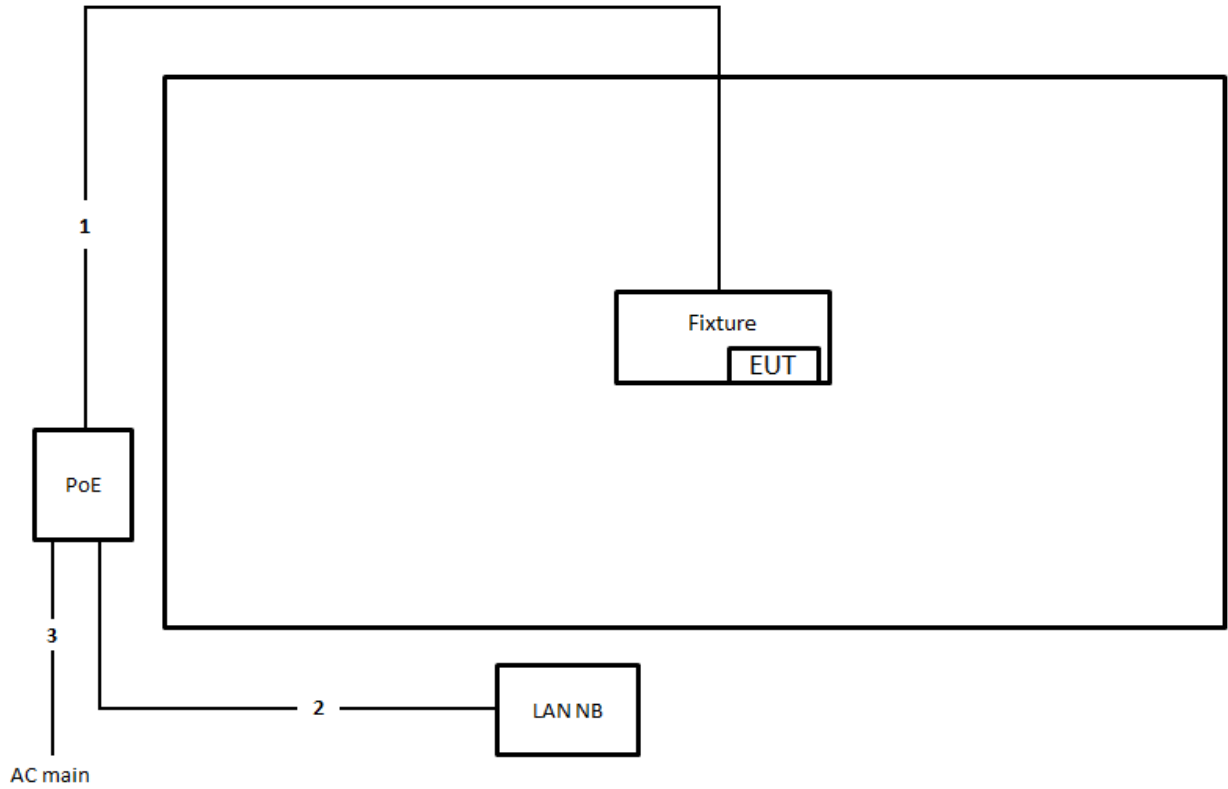
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	0.8m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1m

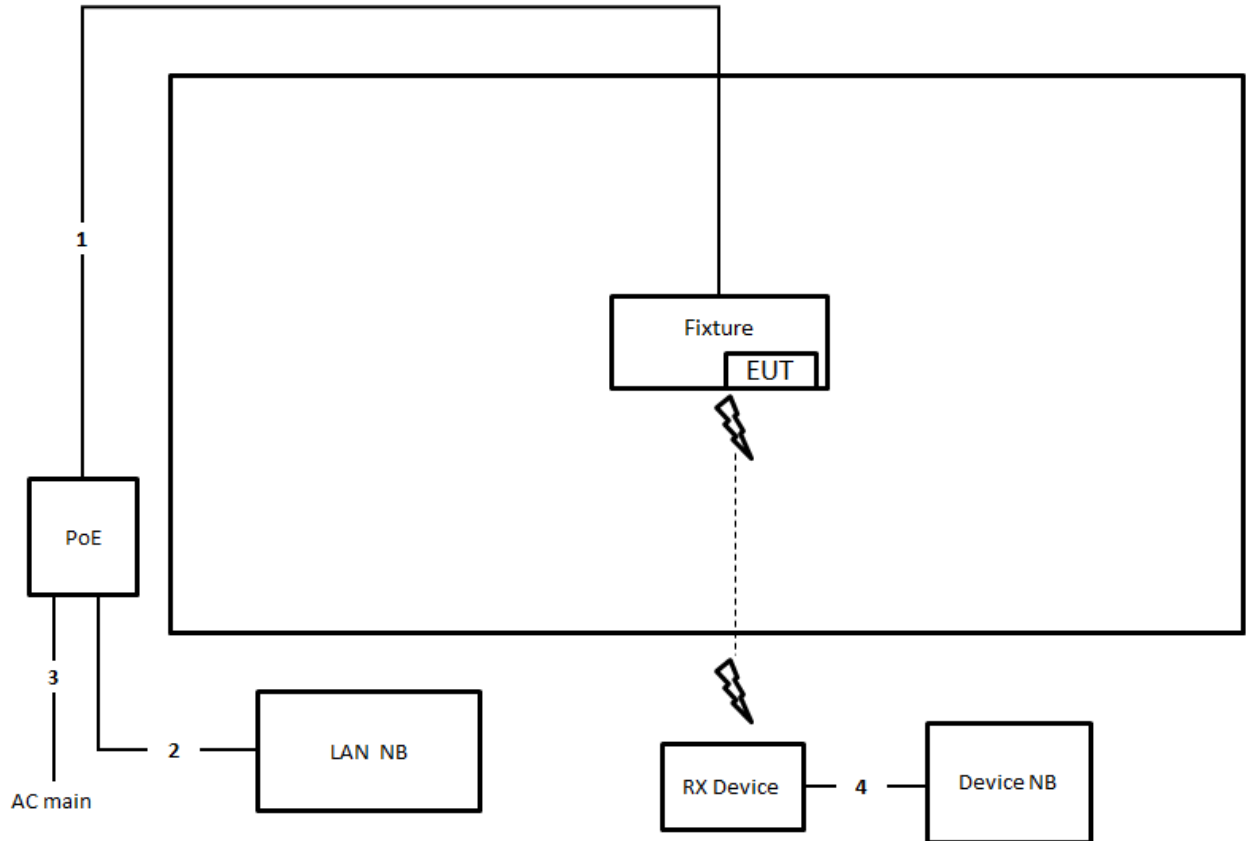
3.12.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz ~1GHz and above 1GHz test non-beamforming mode



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1.5m
3	Power cable	No	0.5m

Test Configuration: above 1GHz beamforming mode



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1.5m
3	Power cable	No	0.5m
4	RJ-45 cable	No	1.5m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product that is designed to connect to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

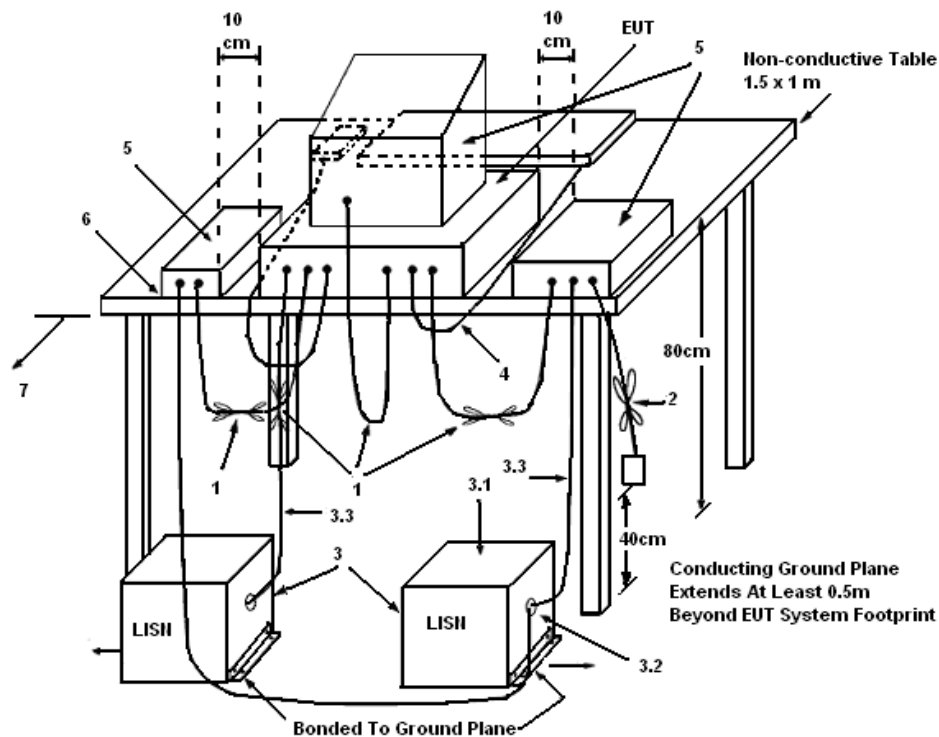
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω . LISN can be placed on top of, or immediately beneath, reference ground plane.
 - (3.1) All other equipment powered from additional LISN(s).
 - (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
 - (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

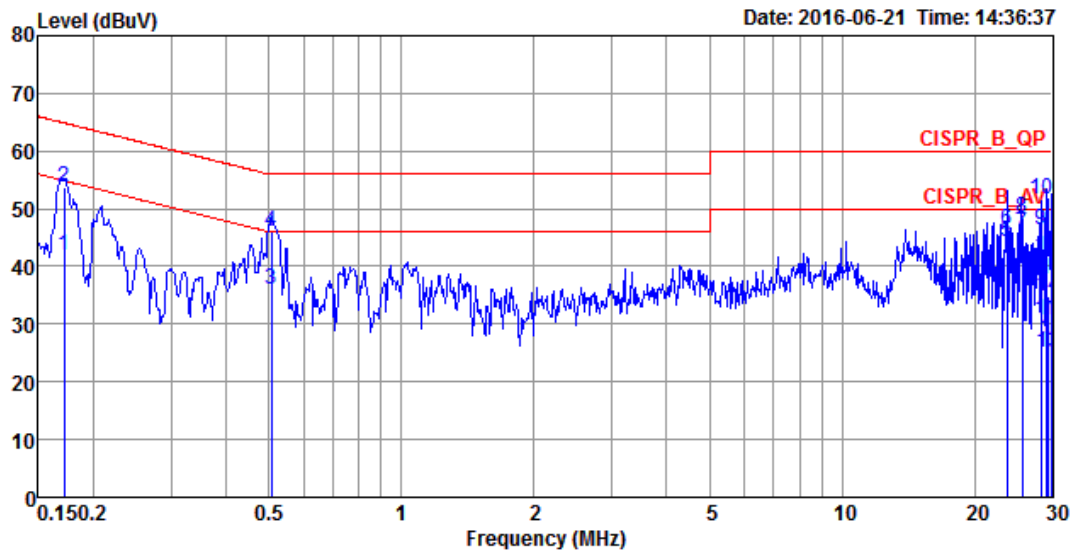
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

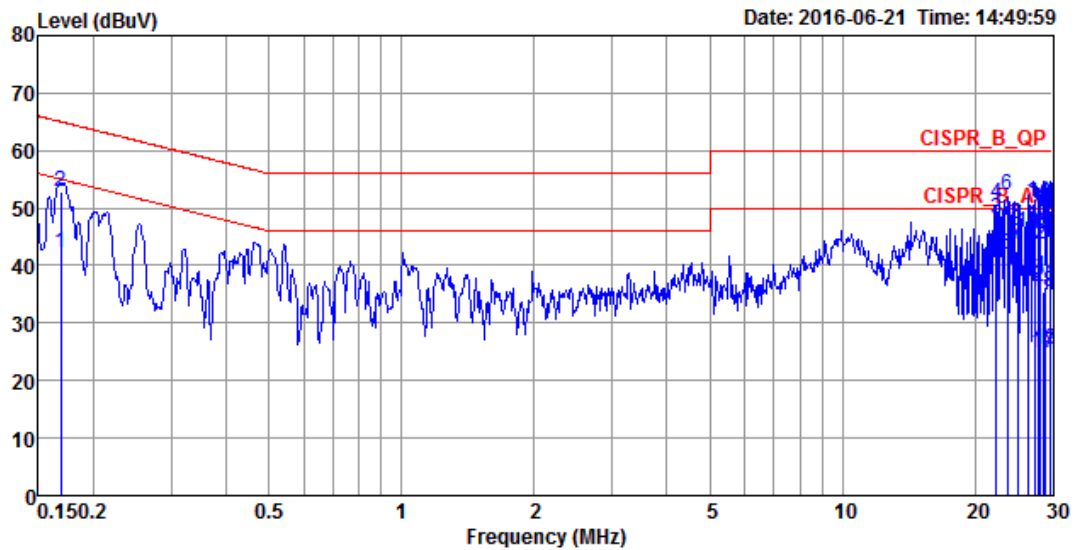
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	22°C	Humidity	52%
Test Engineer	GN Hou	Phase	Line
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISM Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1712	42.06	-12.84	54.90	31.87	10.02	0.17	LINE	Average
2	0.1712	53.62	-11.28	64.90	43.43	10.02	0.17	LINE	QP
3	0.5074	36.16	-9.84	46.00	26.04	9.92	0.20	LINE	Average
4	0.5074	46.01	-9.99	56.00	35.89	9.92	0.20	LINE	QP
5	23.6269	44.25	-5.75	50.00	33.59	10.40	0.26	LINE	Average
6	23.6269	46.25	-13.75	60.00	35.59	10.40	0.26	LINE	QP
7	25.5944	45.88	-4.12	50.00	35.15	10.46	0.27	LINE	Average
8	25.5944	48.50	-11.50	60.00	37.77	10.46	0.27	LINE	QP
9	28.3031	46.35	-3.65	50.00	35.52	10.53	0.30	LINE	Average
10	28.3031	51.71	-8.29	60.00	40.88	10.53	0.30	LINE	QP
11	29.0613	30.59	-19.41	50.00	19.73	10.55	0.31	LINE	Average
12	29.0613	41.49	-18.51	60.00	30.63	10.55	0.31	LINE	QP
13	29.3707	24.99	-25.01	50.00	14.13	10.55	0.31	LINE	Average
14	29.3707	34.95	-25.05	60.00	24.09	10.55	0.31	LINE	QP
15	29.8107	27.56	-22.44	50.00	16.67	10.57	0.32	LINE	Average
16	29.8107	37.89	-22.11	60.00	27.00	10.57	0.32	LINE	QP

Temperature	22°C	Humidity	52%
Test Engineer	GN Hou	Phase	Neutral
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1685	42.13	-12.90	55.03	31.94	10.02	0.17	NEUTRAL	Average
2	0.1685	52.97	-12.06	65.03	42.78	10.02	0.17	NEUTRAL	QP
3	22.3975	48.21	-1.79	50.00	37.59	10.37	0.25	NEUTRAL	Average
4	22.3975	50.85	-9.15	60.00	40.23	10.37	0.25	NEUTRAL	QP
5	23.6361	41.79	-8.21	50.00	31.13	10.40	0.26	NEUTRAL	Average
6	23.6361	52.36	-7.64	60.00	41.70	10.40	0.26	NEUTRAL	QP
7	24.9221	43.76	-6.24	50.00	33.05	10.44	0.27	NEUTRAL	Average
8	24.9221	47.25	-12.75	60.00	36.54	10.44	0.27	NEUTRAL	QP
9	26.4178	38.02	-11.98	50.00	27.26	10.48	0.28	NEUTRAL	Average
10	26.4178	45.65	-14.35	60.00	34.89	10.48	0.28	NEUTRAL	QP
11	27.4160	37.94	-12.06	50.00	27.14	10.50	0.30	NEUTRAL	Average
12	27.4160	43.67	-16.33	60.00	32.87	10.50	0.30	NEUTRAL	QP
13	27.8550	46.88	-3.12	50.00	36.07	10.51	0.30	NEUTRAL	Average
14	27.8550	51.13	-8.87	60.00	40.32	10.51	0.30	NEUTRAL	QP
15	28.1520	45.85	-4.15	50.00	35.03	10.52	0.30	NEUTRAL	Average
16	28.1520	50.77	-9.23	60.00	39.95	10.52	0.30	NEUTRAL	QP
17	28.6030	24.71	-25.29	50.00	13.87	10.53	0.31	NEUTRAL	Average



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
18	28.6030	35.28	-24.72	60.00	24.44	10.53	0.31	NEUTRAL	QP
19	28.9077	25.52	-24.48	50.00	14.67	10.54	0.31	NEUTRAL	Average
20	28.9077	36.39	-23.61	60.00	25.54	10.54	0.31	NEUTRAL	QP
21	29.5399	45.52	-4.48	50.00	34.64	10.56	0.32	NEUTRAL	Average
22	29.5399	49.68	-10.32	60.00	38.80	10.56	0.32	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

26dB Bandwidth	
Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RBW	Approximately 1% of the emission bandwidth
VBW	VBW > RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto
99% Occupied Bandwidth	
Spectrum Parameters	Setting
Span	1.5 times to 5.0 times the OBW
RBW	1 % to 5 % of the OBW
VBW	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold

4.2.3. Test Procedures

For Radiated 26dB Bandwidth and 99% Occupied Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.2.4. Test Setup Layout

For Radiated 26dB Bandwidth and 99% Occupied Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.6.4.

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of 26dB Bandwidth and 99% Occupied Bandwidth

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5500 MHz	17.13	15.02
	5580 MHz	17.48	15.28
	5700 MHz	17.22	14.94
	5745 MHz	26.78	15.63
	5785 MHz	27.22	22.06
	5825 MHz	35.39	24.14
802.11ac MCS0/Nss1 VHT20	5500 MHz	18.26	15.54
	5580 MHz	18.52	16.24
	5700 MHz	18.26	15.63
	5745 MHz	33.65	16.76
	5785 MHz	33.13	21.62
	5825 MHz	34.70	25.88
802.11ac MCS0/Nss1 VHT40	5510 MHz	39.57	36.47
	5550 MHz	39.86	36.32
	5670 MHz	39.28	36.04
	5755 MHz	45.36	36.90
	5795 MHz	83.48	44.86
802.11ac MCS0/Nss1 VHT80	5530 MHz	79.71	76.12
	5610 MHz	78.84	74.67
	5775 MHz	79.42	75.83

Straddle Channel

Mode	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII 2C 26dB BW (MHz)	UNII 3 26dB BW (MHz)	UNII 2C 99% BW (MHz)	UNII 3 99% BW (MHz)
802.11a	5720 MHz	26.70	15.72	5701.74	5711.75	23.26	3.44	13.25	2.47
802.11ac MCSO/Nss1 VHT20	5720 MHz	33.39	16.67	5701.65	5711.32	23.35	10.04	13.68	2.99
802.11ac MCSO/Nss1 VHT40	5710 MHz	80.87	42.55	5671.01	5690.17	53.99	26.88	34.83	7.72
802.11ac MCSO/Nss1 VHT80	5690 MHz	122.90	75.83	5631.16	5651.51	93.84	29.06	73.49	2.34

802.11ac MCSO/Nss2 VHT80+80

Type	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII 1 or UNII 2C 26dB BW (MHz)	UNII 2A or UNII 3 26dB BW (MHz)	UNII 1 or UNII 2C 99% BW (MHz)	UNII 2A or UNII 3 99% BW (MHz)	26dB Total BW (MHz)
1	5530 MHz	80.00	76.41	-						158.26
	5690 MHz	78.26	75.54	5650.87	5652.37	74.13	4.13	72.63	2.92	
2	5530 MHz	78.84	75.83	-						157.97
	5775 MHz	79.13	75.25	-						
3	5610 MHz	79.13	75.83	-						158.26
	5775 MHz	79.13	75.54	-						
4	5690 MHz	80.29	76.12	5650.00	5652.08	75.00	5.29	72.92	3.21	159.13
	5775 MHz	78.84	74.96	-						
5	5530 MHz	159.13	152.39	-						-
	5610 MHz									
6	5610 MHz	158.70	154.99	5570.44	5572.29	154.57	4.13	152.71	2.28	-
	5690 MHz									

For beamforming mode

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5500 MHz	22.87	17.97
	5580 MHz	22.43	18.06
	5700 MHz	21.65	17.97
	5745 MHz	21.39	17.97
	5785 MHz	21.74	17.97
	5825 MHz	25.30	18.15
802.11ac MCS0/Nss1 VHT40	5510 MHz	44.93	36.90
	5550 MHz	45.51	37.19
	5670 MHz	44.64	36.90
	5755 MHz	47.25	37.05
	5795 MHz	47.25	37.05
802.11ac MCS0/Nss1 VHT80	5530 MHz	86.09	76.41
	5610 MHz	85.80	76.41
	5775 MHz	99.13	76.41

Straddle Channel

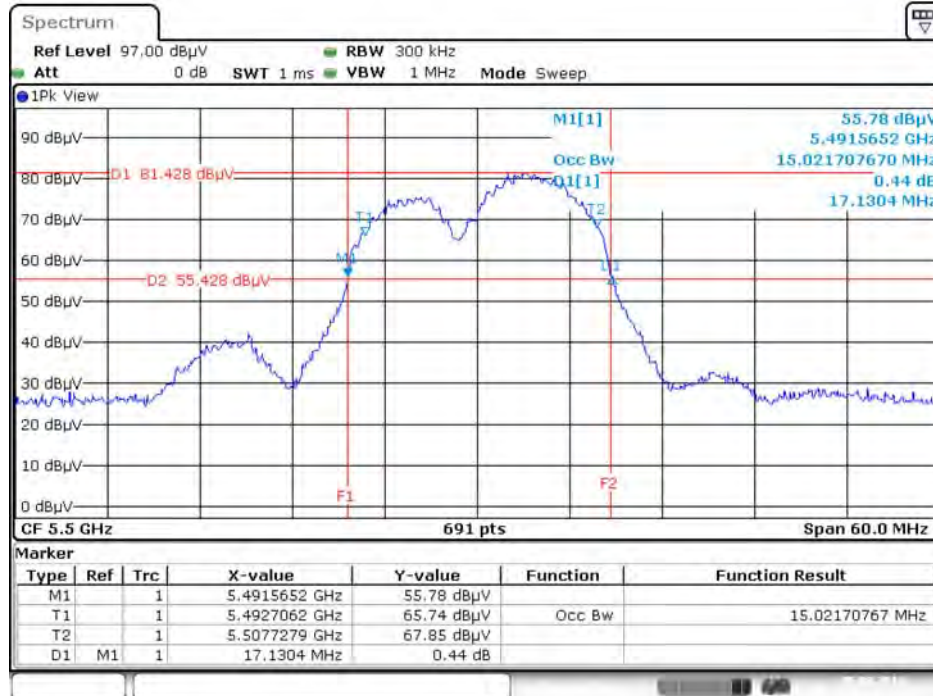
Mode	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII 2C 26dB BW (MHz)	UNII 3 26dB BW (MHz)	UNII 2C 99% BW (MHz)	UNII 3 99% BW (MHz)
802.11ac MCS0/Nss1 VHT20	5720 MHz	20.35	17.71	5709.91	5711.14	15.09	5.26	13.86	3.86
802.11ac MCS0/Nss1 VHT40	5710 MHz	40.29	36.32	5690.15	5691.91	34.85	5.44	33.09	3.23
802.11ac MCS0/Nss1 VHT80	5690 MHz	79.71	75.54	5650.29	5652.37	74.71	5.00	72.63	2.92

802.11ac MCS0/Nss2 VHT80+80

Type	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII 1 or UNII 2C 26dB BW (MHz)	UNII 2A or UNII 3 26dB BW (MHz)	UNII 1 or UNII 2C 99% BW (MHz)	UNII 2A or UNII 3 99% BW (MHz)	26dB Total BW (MHz)
1	5530 MHz	80.29	75.83	-						159.71
	5690 MHz	79.42	75.83	5650.29	5652.08	74.71	4.71	72.92	2.92	
2	5530 MHz	80.29	76.12	-						160.58
	5775 MHz	80.29	75.83							
3	5610 MHz	80.29	76.12	-						160.58
	5775 MHz	80.29	76.12							
4	5690 MHz	79.71	75.83	5650.29	5652.08	74.71	5.00	72.92	2.92	160.00
	5775 MHz	80.29	76.12	-						
5	5530 MHz	159.57	154.56	-						-
	5610 MHz									

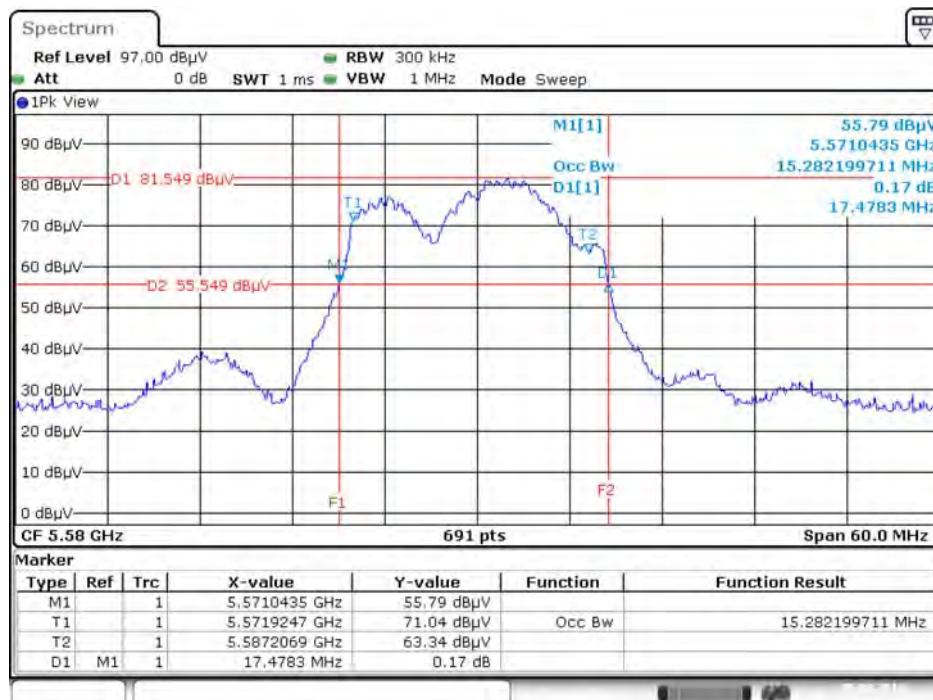
For non-beamforming mode

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5500 MHz



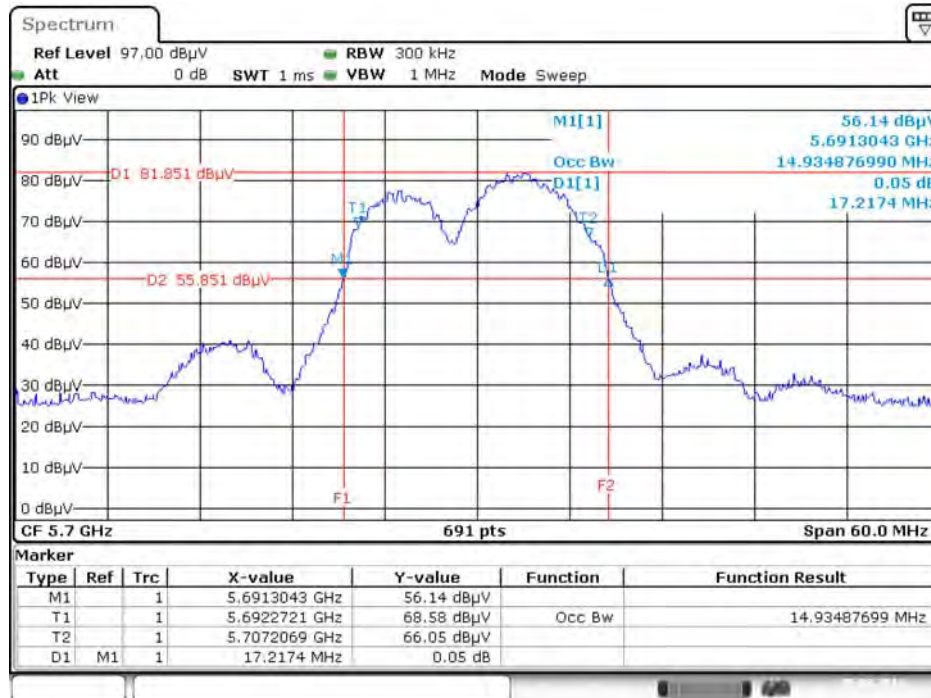
Date: 5.AUG.2016 11:46:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



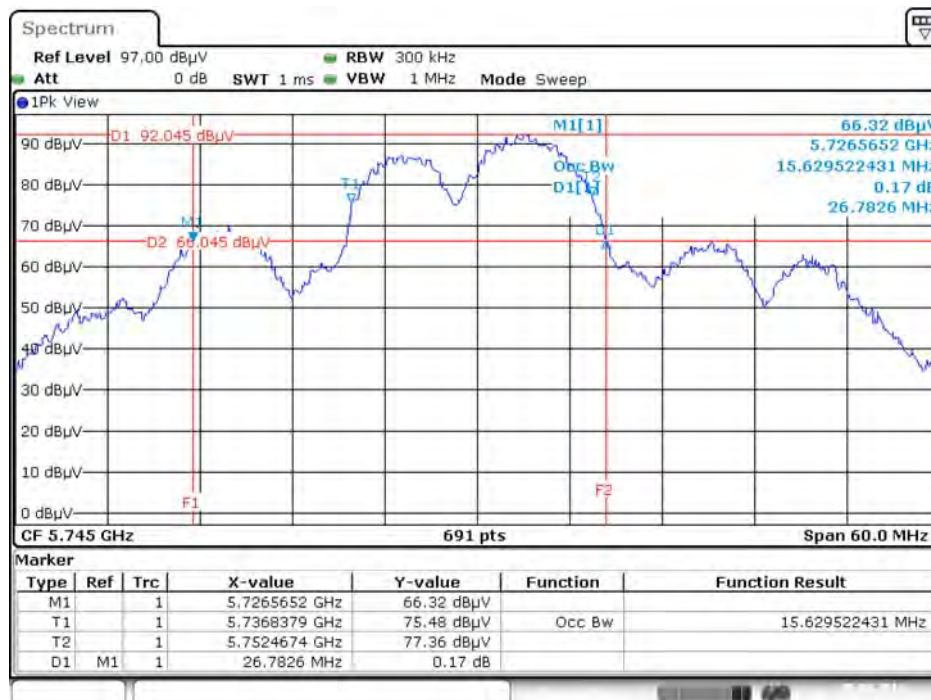
Date: 5.AUG.2016 11:47:13

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



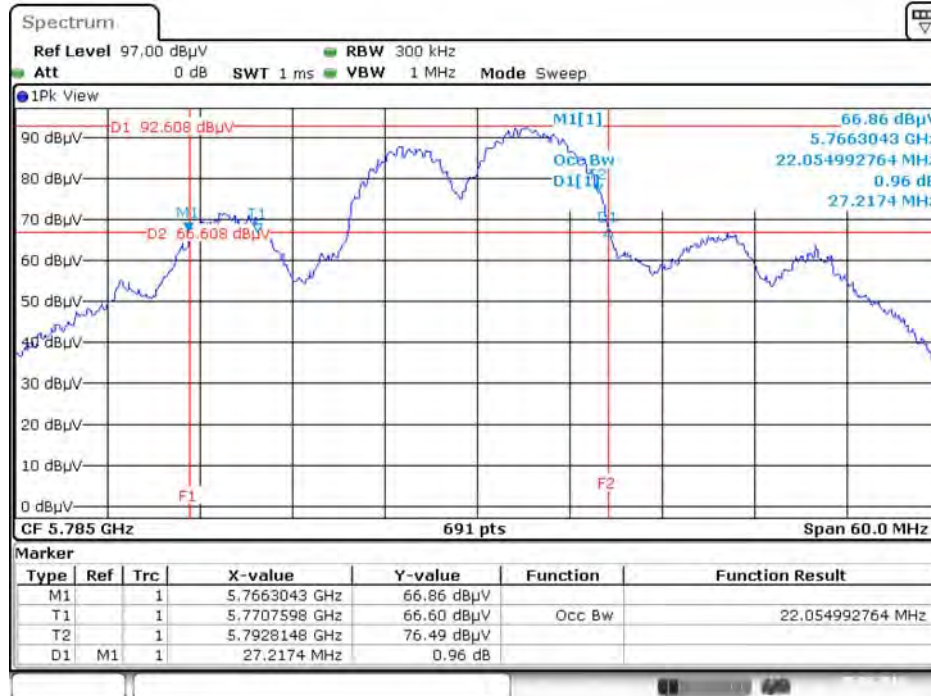
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



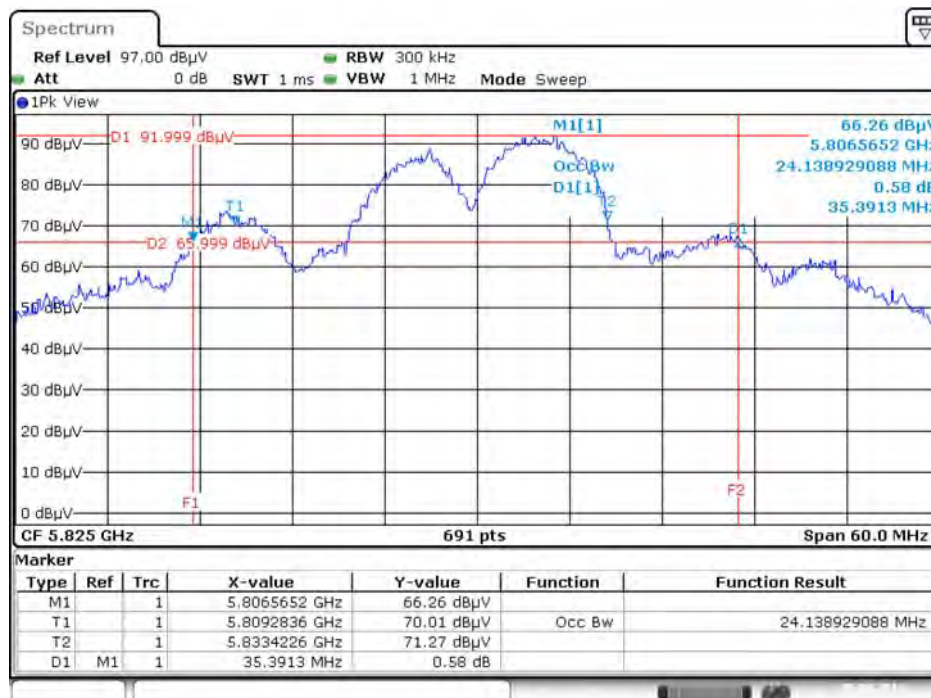
Date: 5.AUG.2016 11:47:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



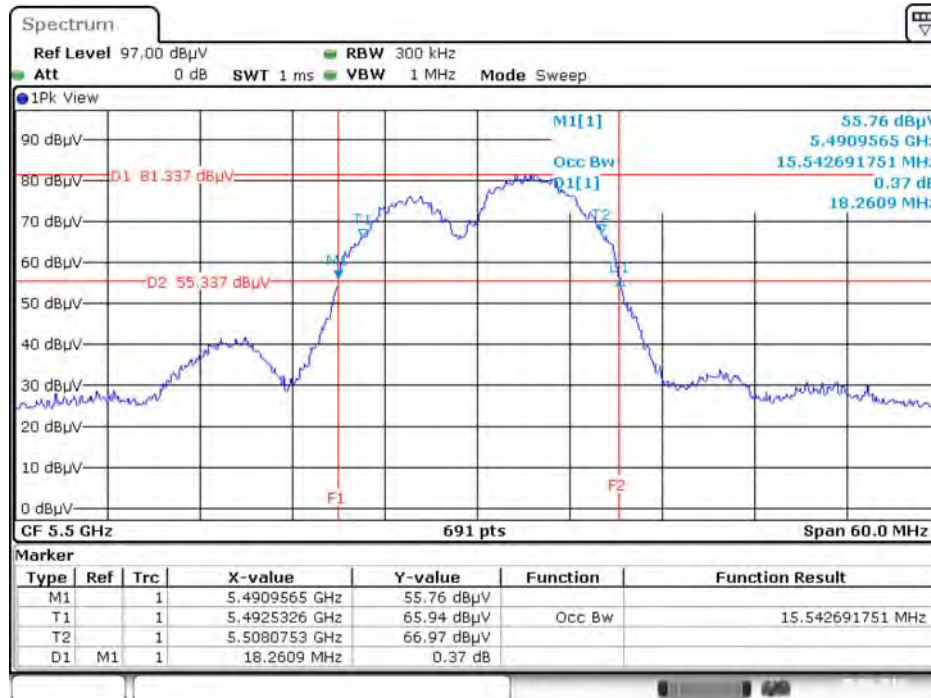
Date: 5.AUG.2016 11:48:24

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



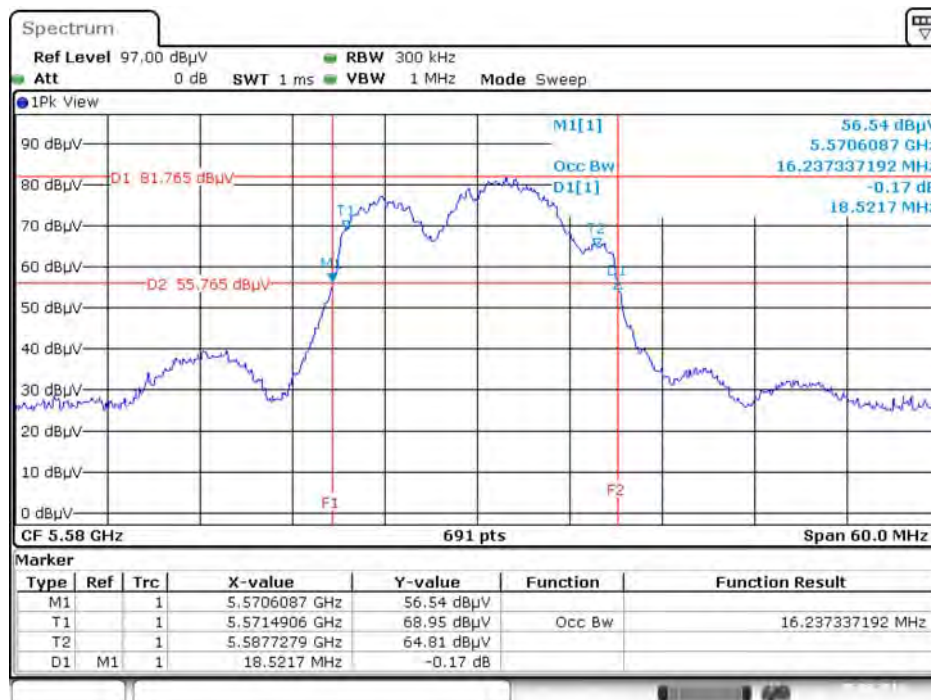
Date: 5.AUG.2016 11:48:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5500 MHz



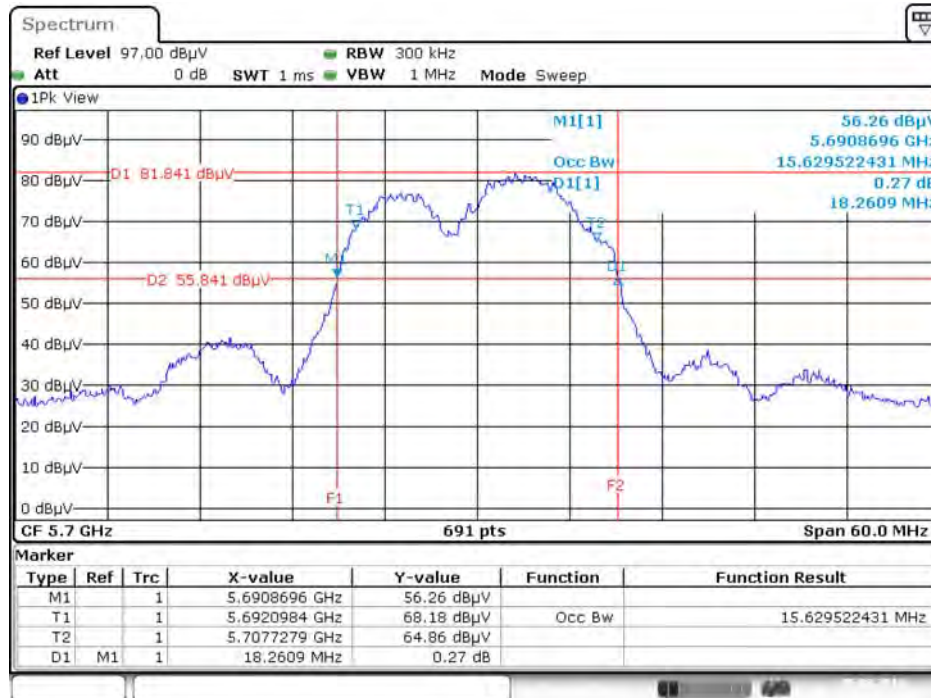
Date: 5.AUG.2016 11:54:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



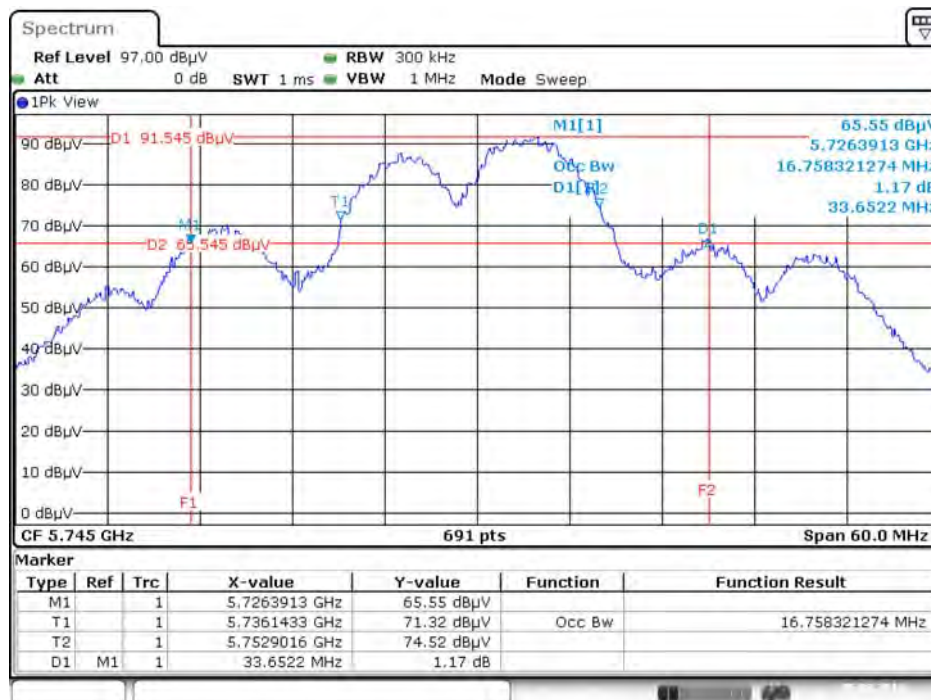
Date: 5.AUG.2016 11:54:37

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



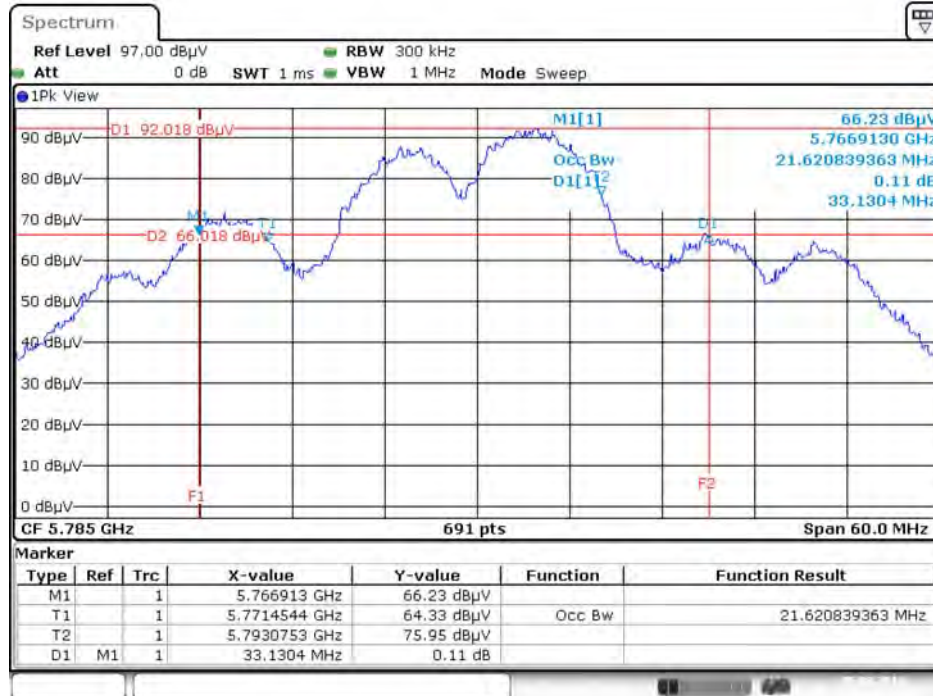
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



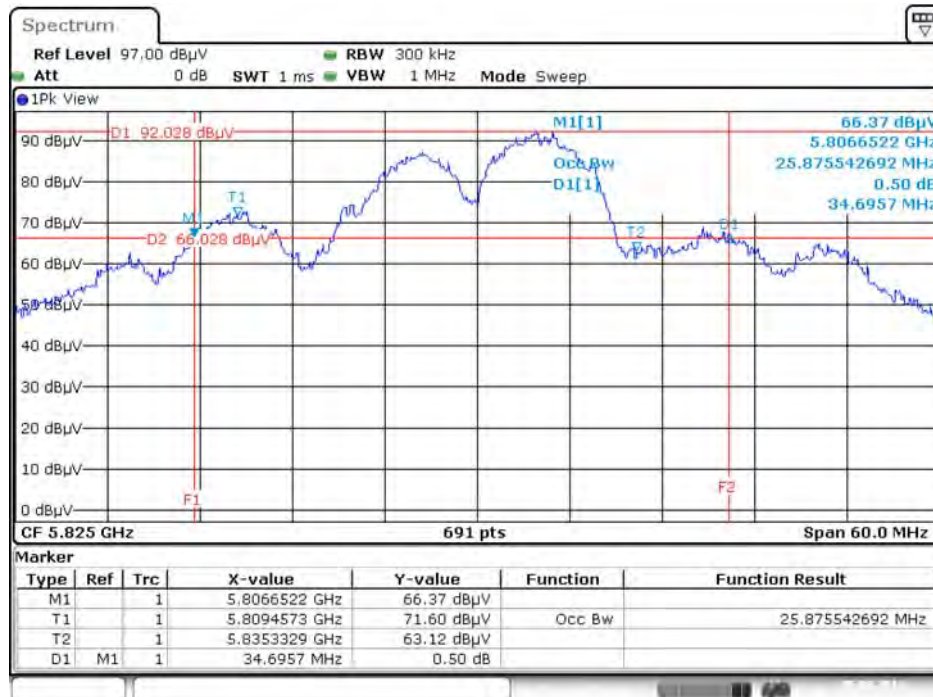
Date: 5.AUG.2016 11:56:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



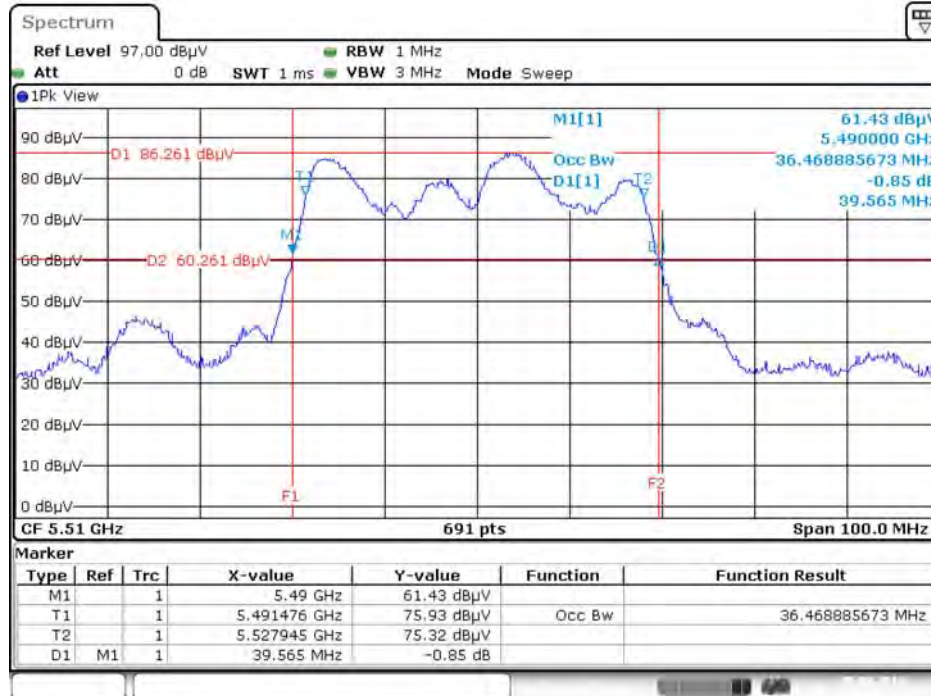
Date: 5.AUG.2016 11:56:29

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



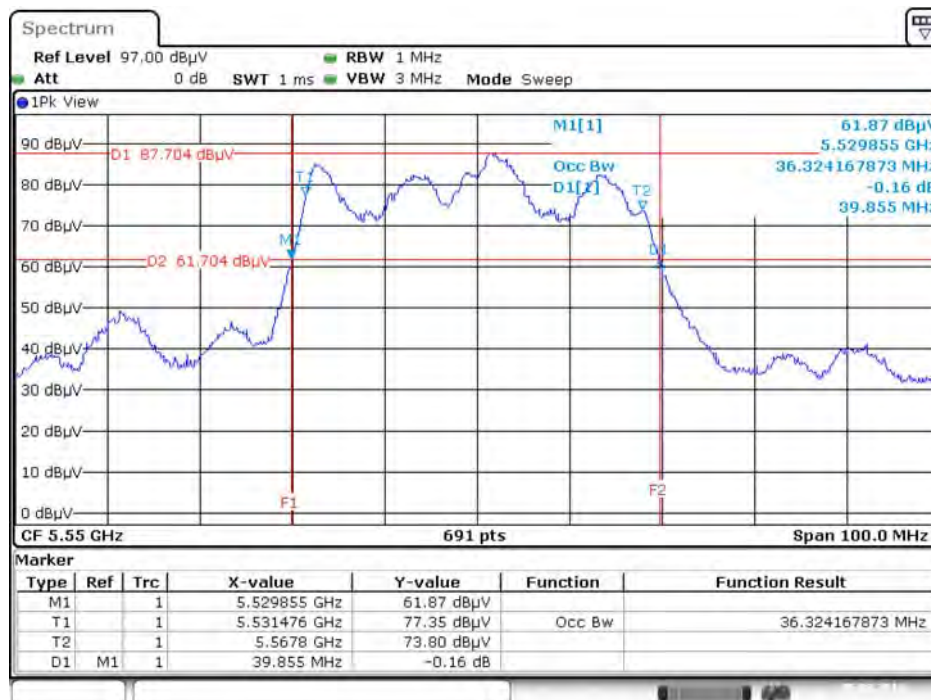
Date: 5.AUG.2016 11:56:48

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5510 MHz



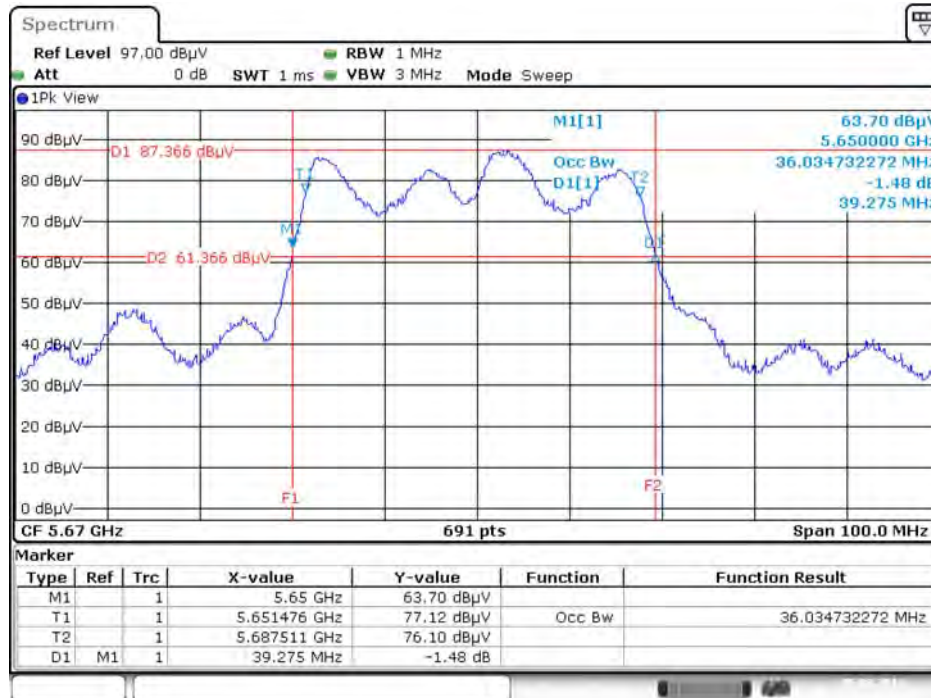
Date: 5.AUG.2016 12:00:37

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5550 MHz



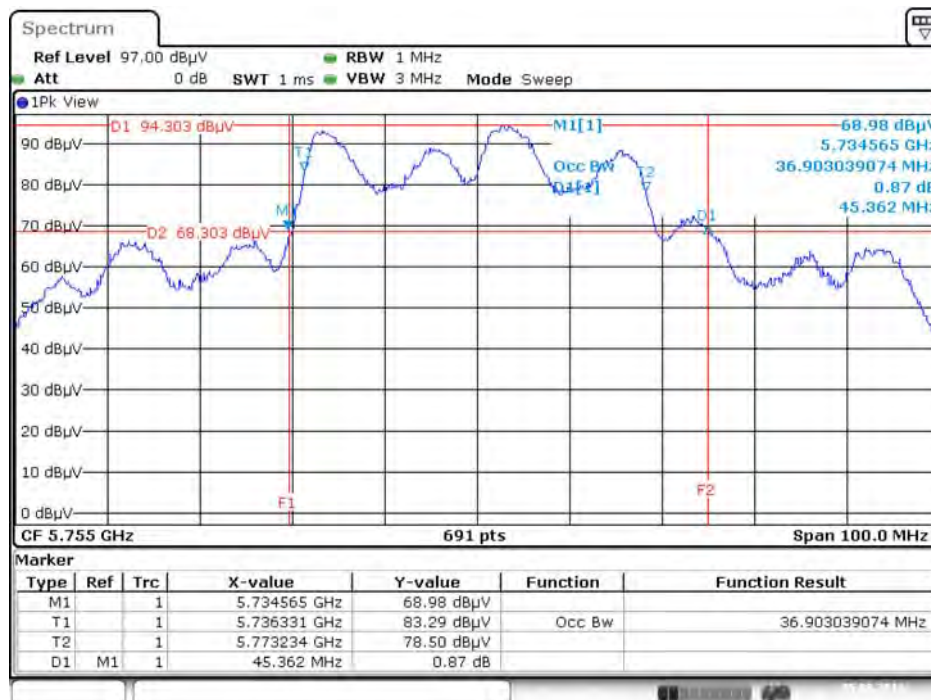
Date: 5.AUG.2016 12:01:00

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



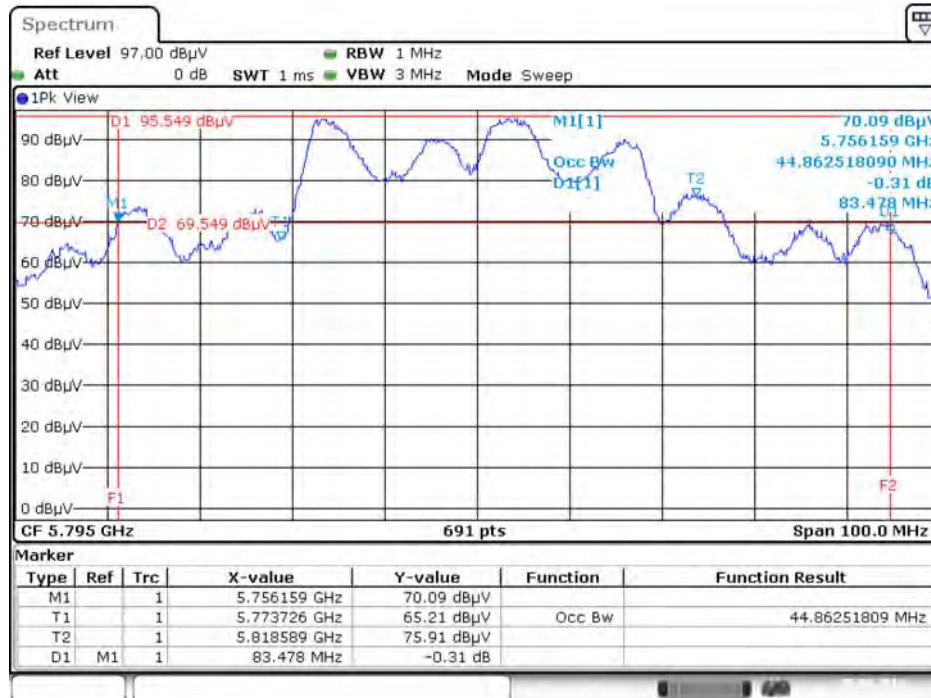
Date: 5.AUG.2016 12:01:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5755 MHz



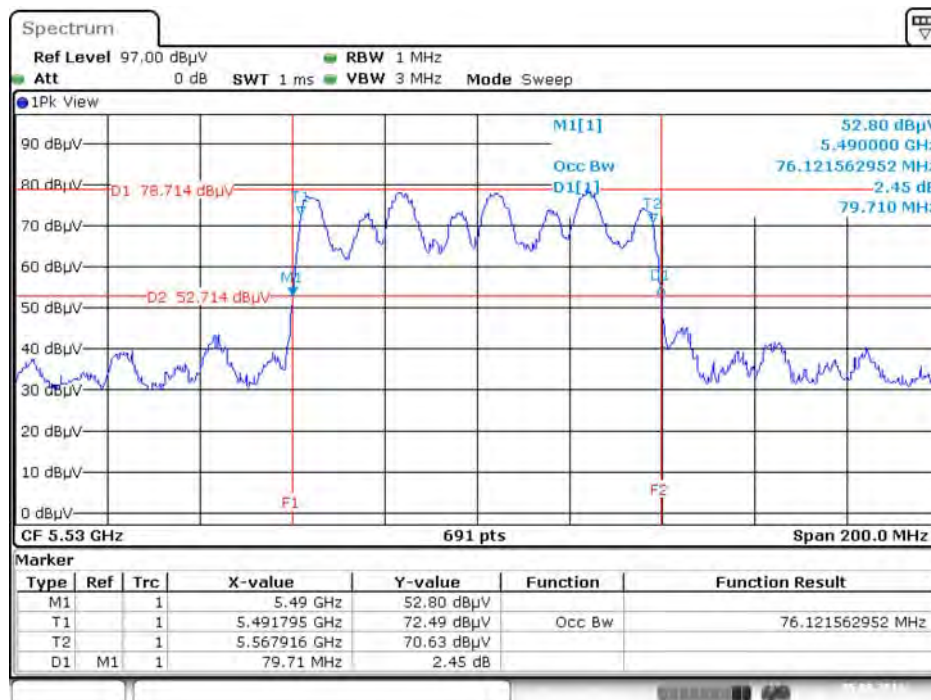
Date: 5.AUG.2016 12:02:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



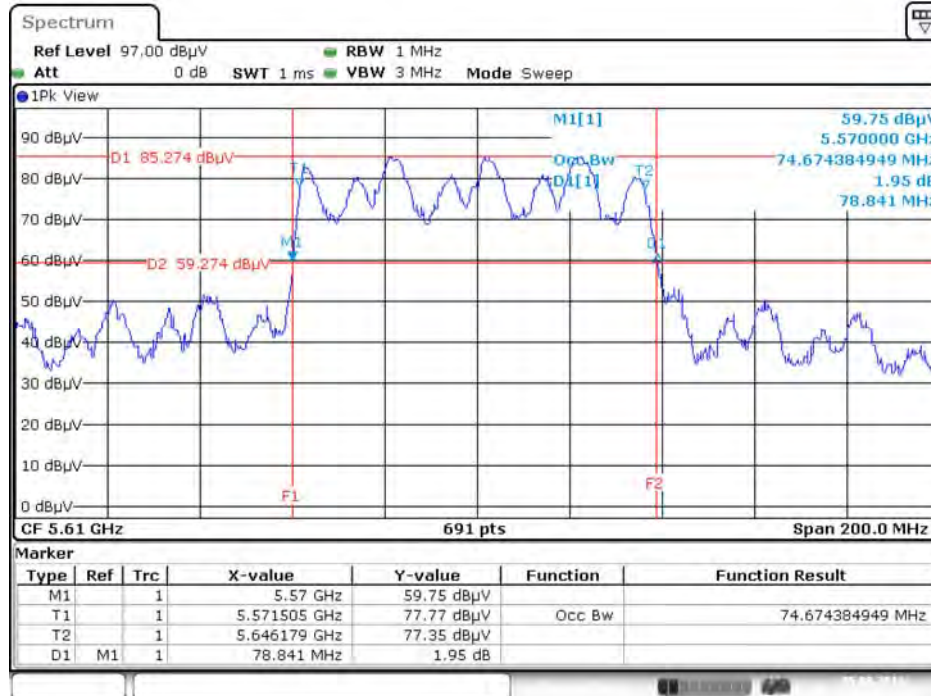
Date: 5.AUG.2016 12:03:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5530 MHz



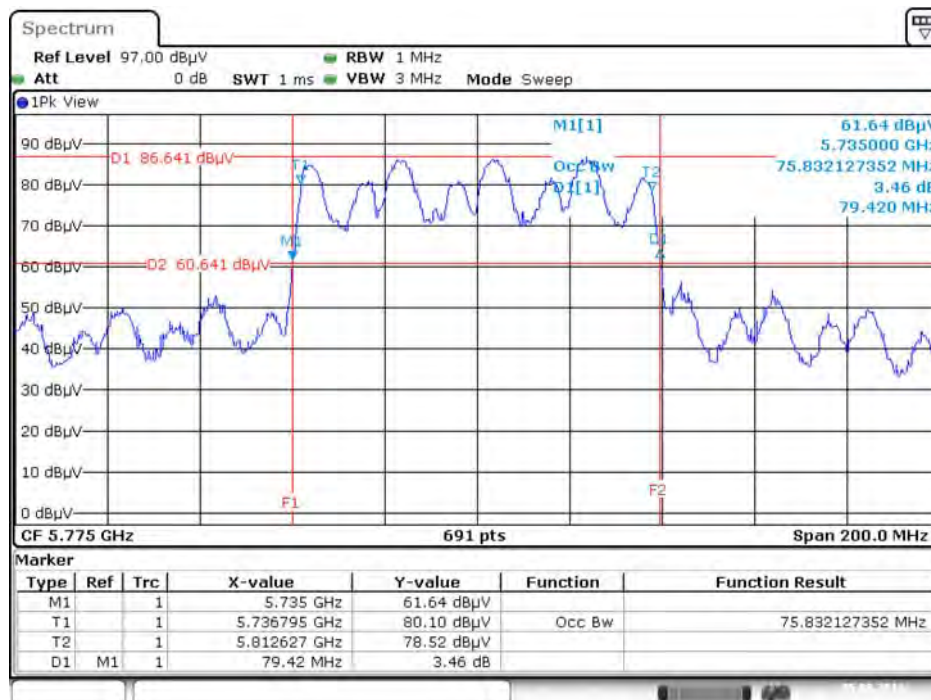
Date: 5.AUG.2016 12:04:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5610 MHz



Date: 5.AUG.2016 12:05:18

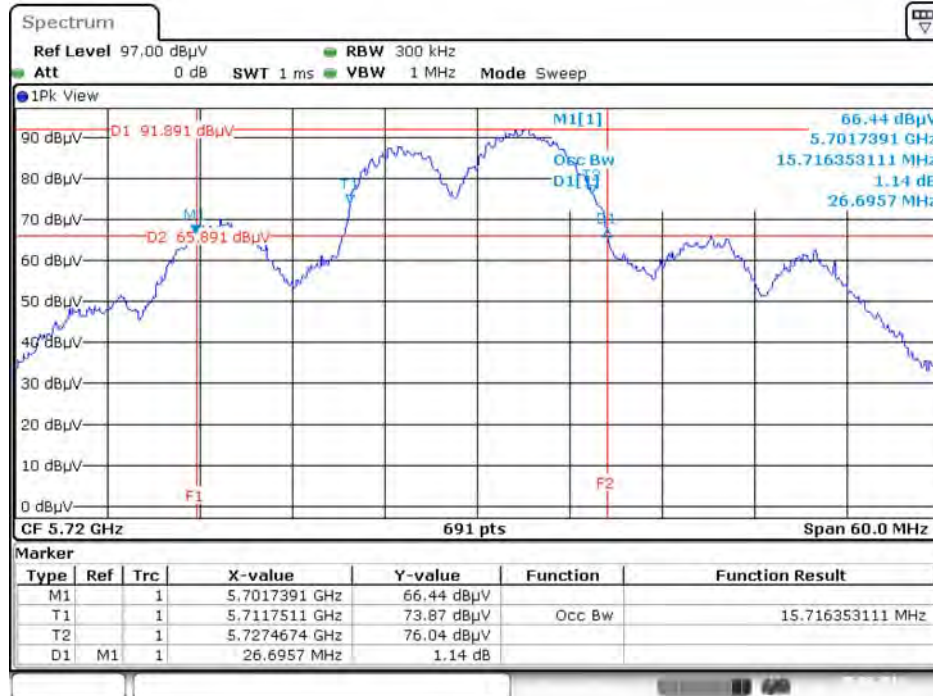
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 5.AUG.2016 12:05:57

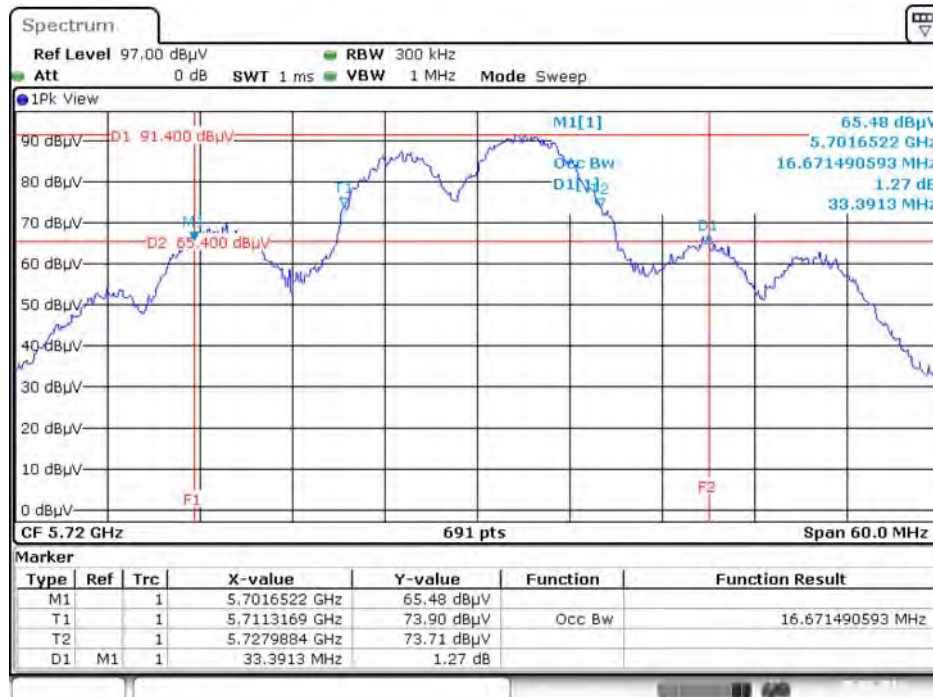
Straddle Channel

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz



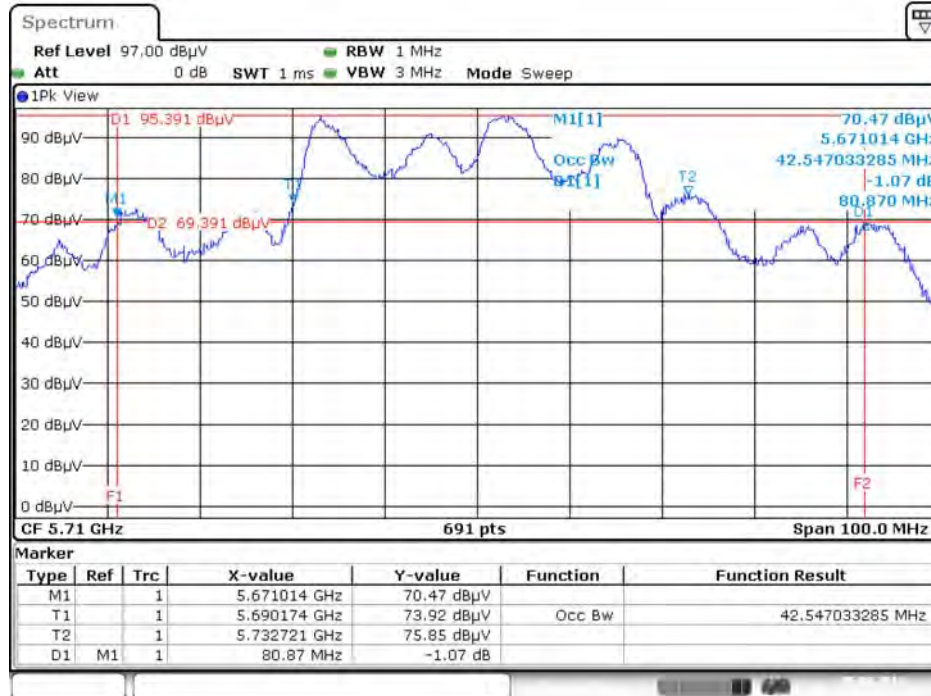
Date: 5.AUG.2016 13:55:22

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz



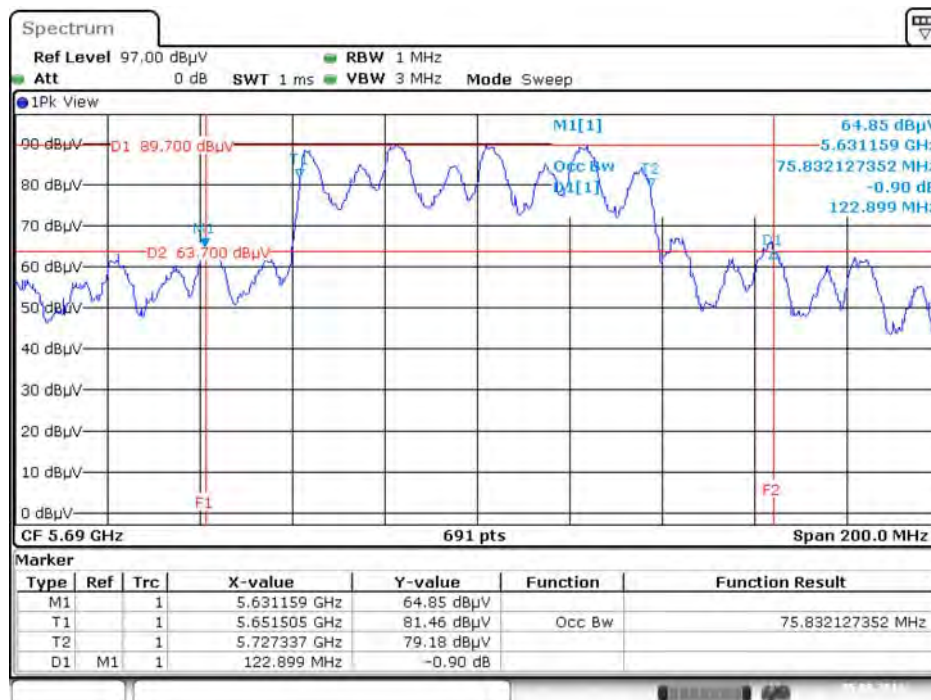
Date: 5.AUG.2016 13:57:36

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5710 MHz



Date: 5.AUG.2016 13:59:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5690 MHz

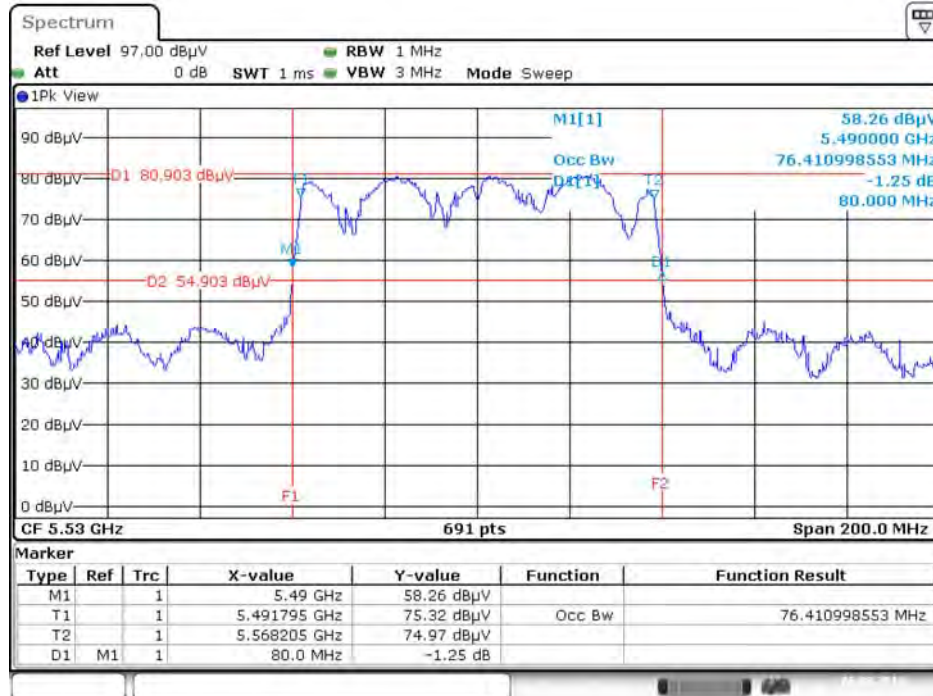


Date: 5.AUG.2016 14:01:19

802.11ac MCS0/Nss2 VHT80+80

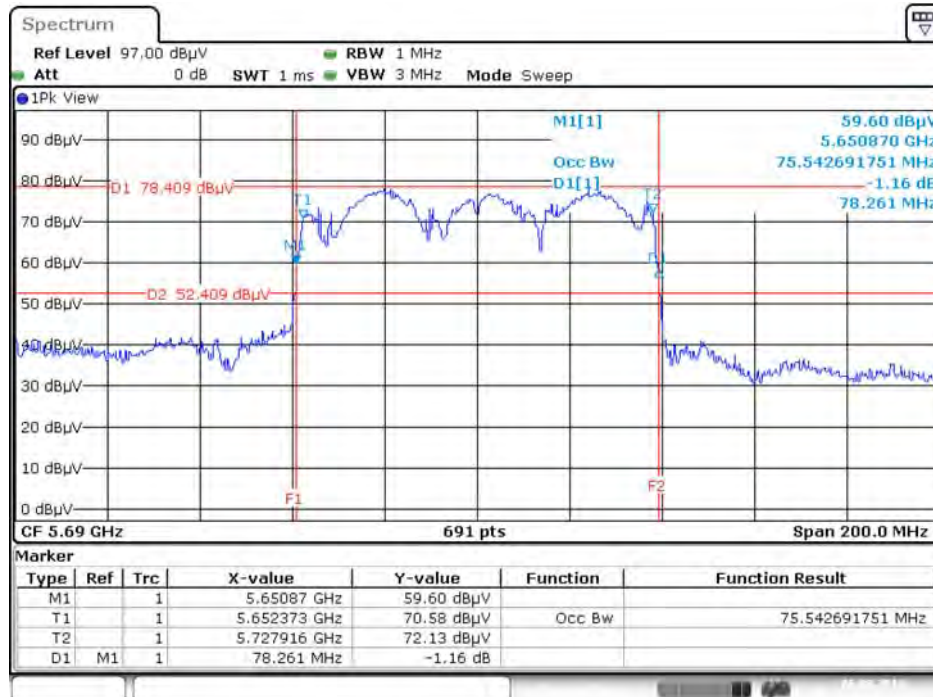
Type 1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 / 5530 MHz



Date: 6.AUG.2016 14:22:14

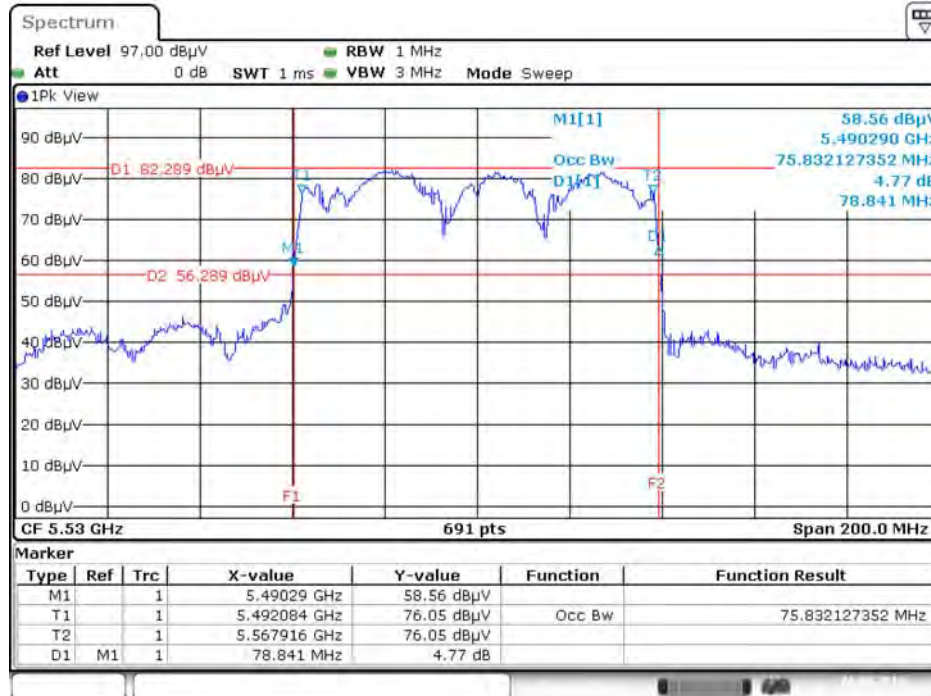
26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 3 + Chain 4 / 5690 MHz



Date: 6.AUG.2016 10:29:22

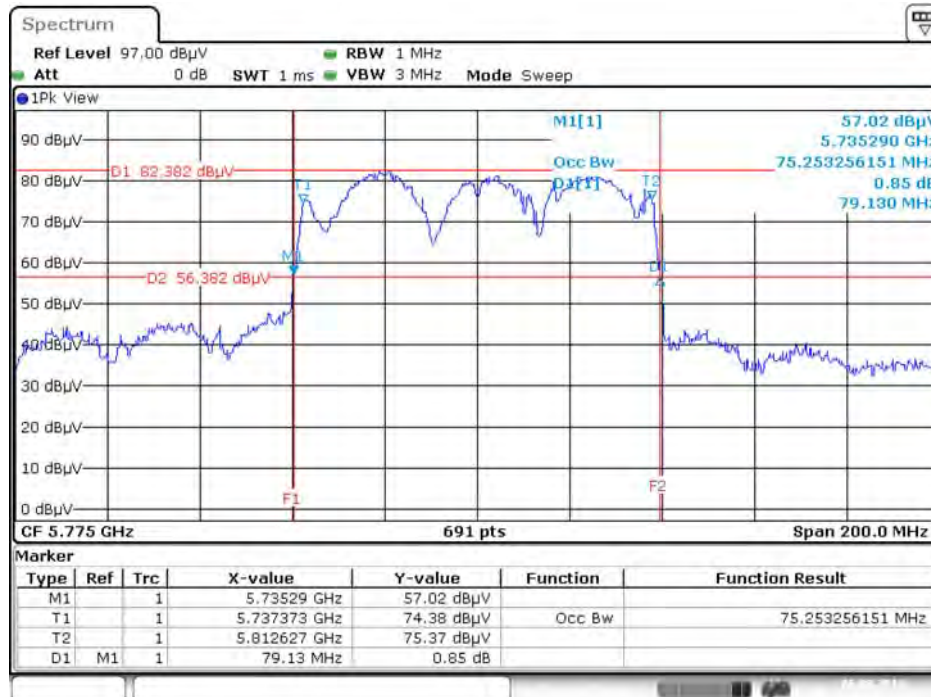
Type 2

26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 / 5530 MHz



Date: 6.AUG.2016 15:12:55

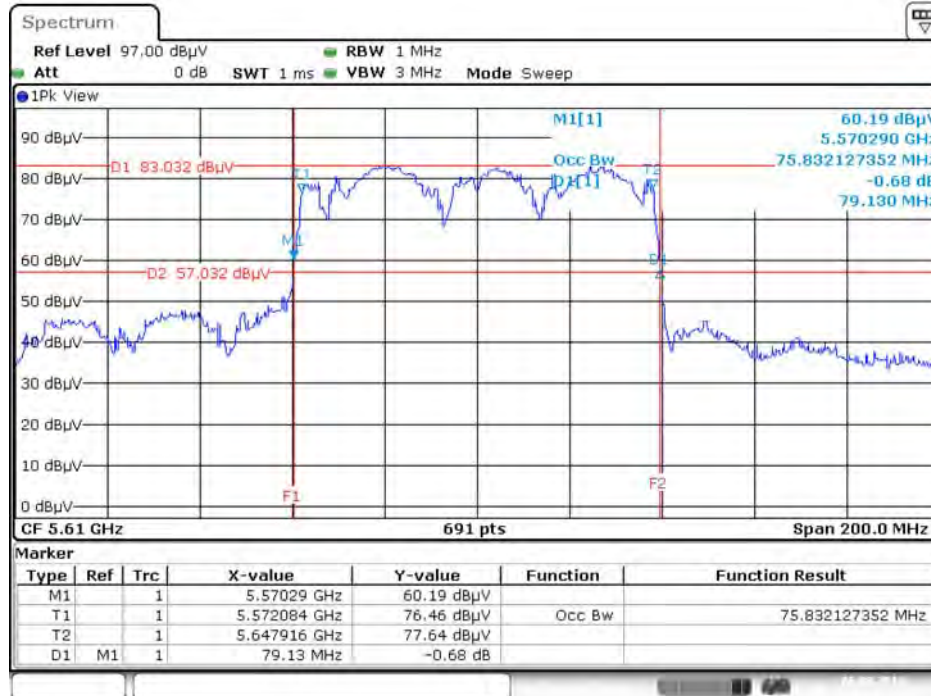
26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 6.AUG.2016 15:17:49

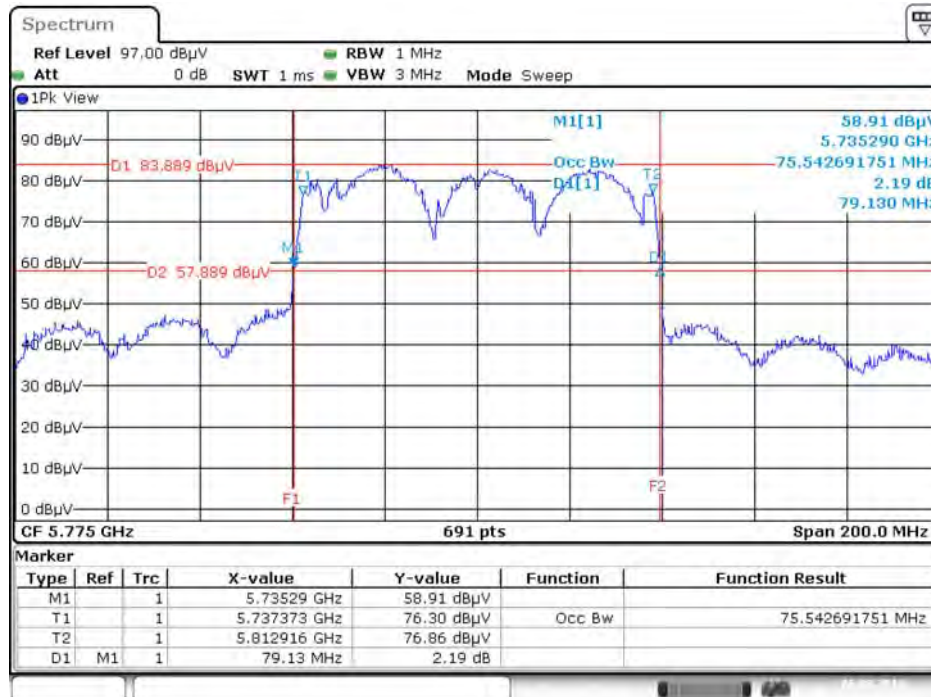
Type 3

26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 / 5610 MHz



Date: 6.AUG.2016 15:15:06

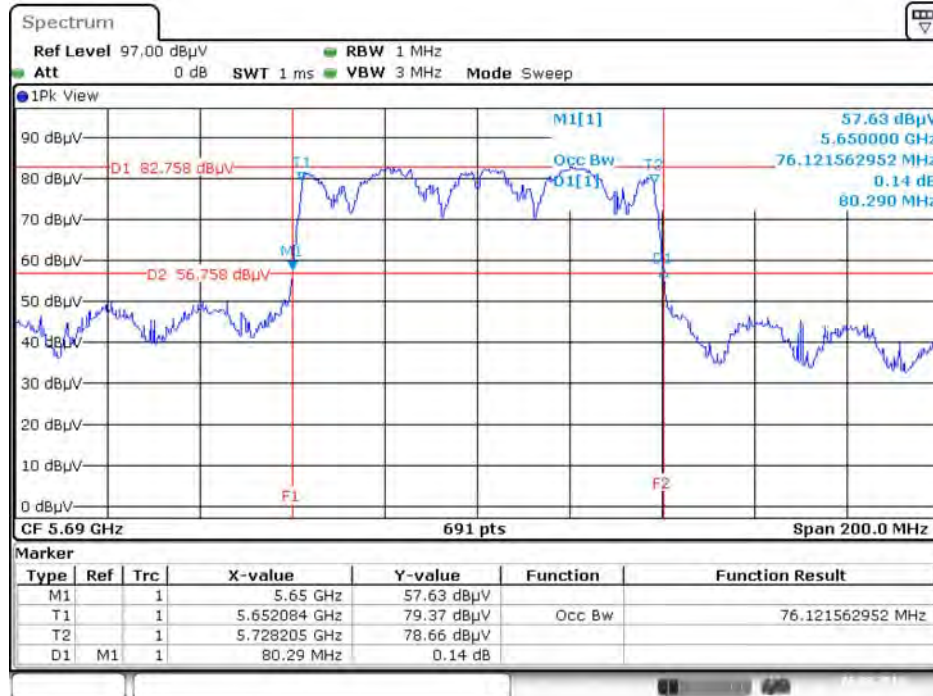
26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 6.AUG.2016 15:18:51

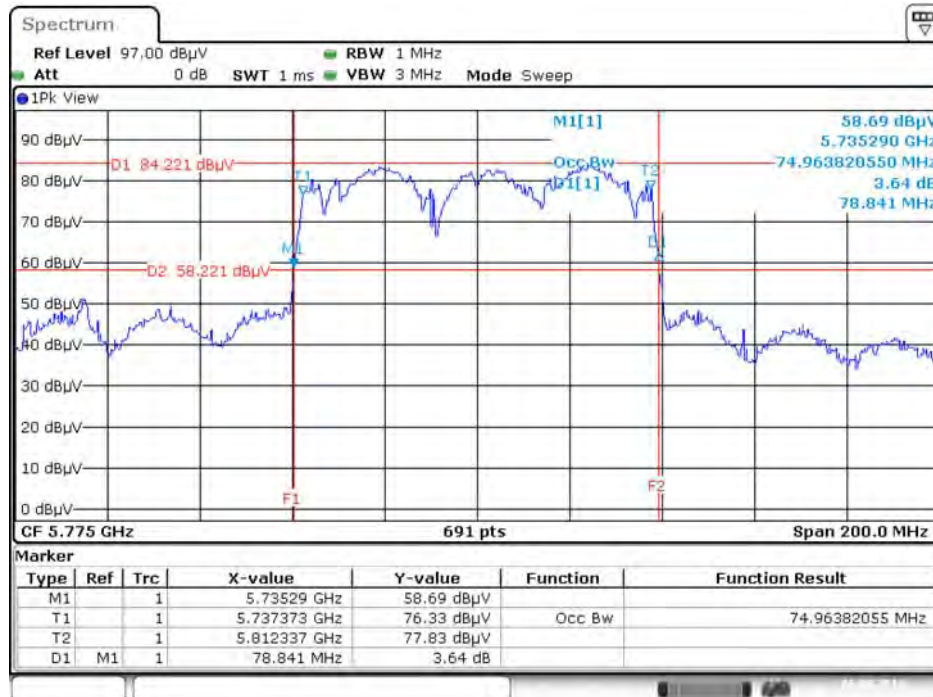
Type 4

26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 / 5690 MHz



Date: 6.AUG.2016 10:56:03

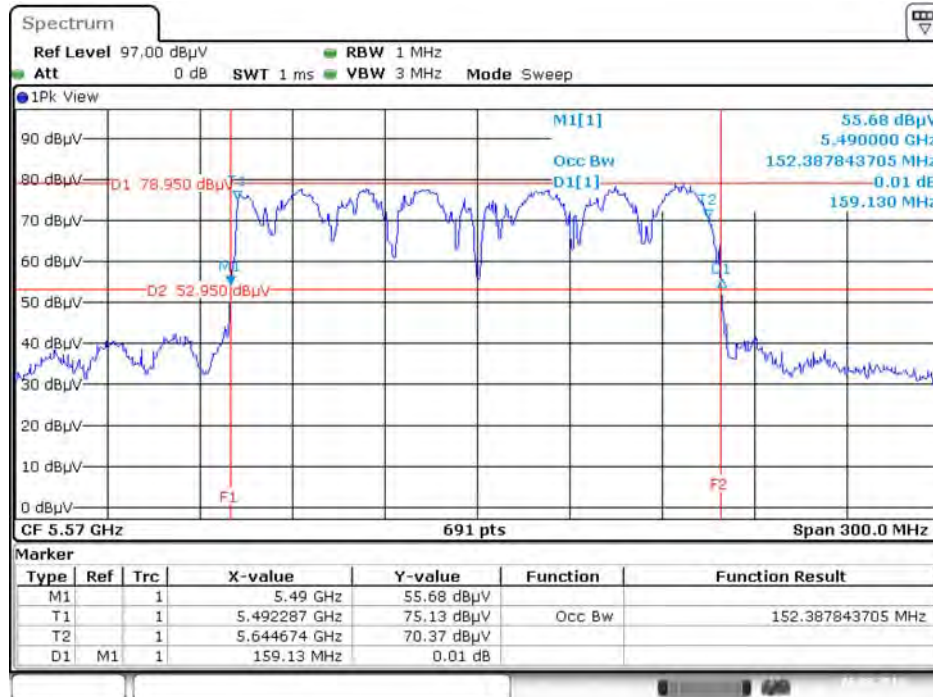
26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 6.AUG.2016 14:18:58

Type 5

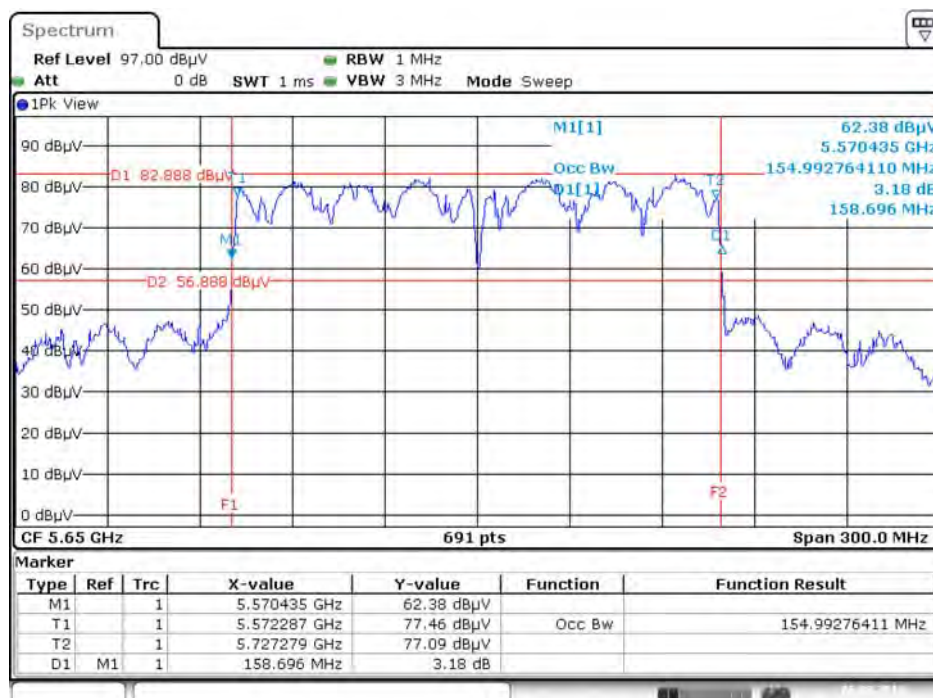
26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5530 MHz+5610 MHz



Date: 6.AUG.2016 14:10:43

Type 6

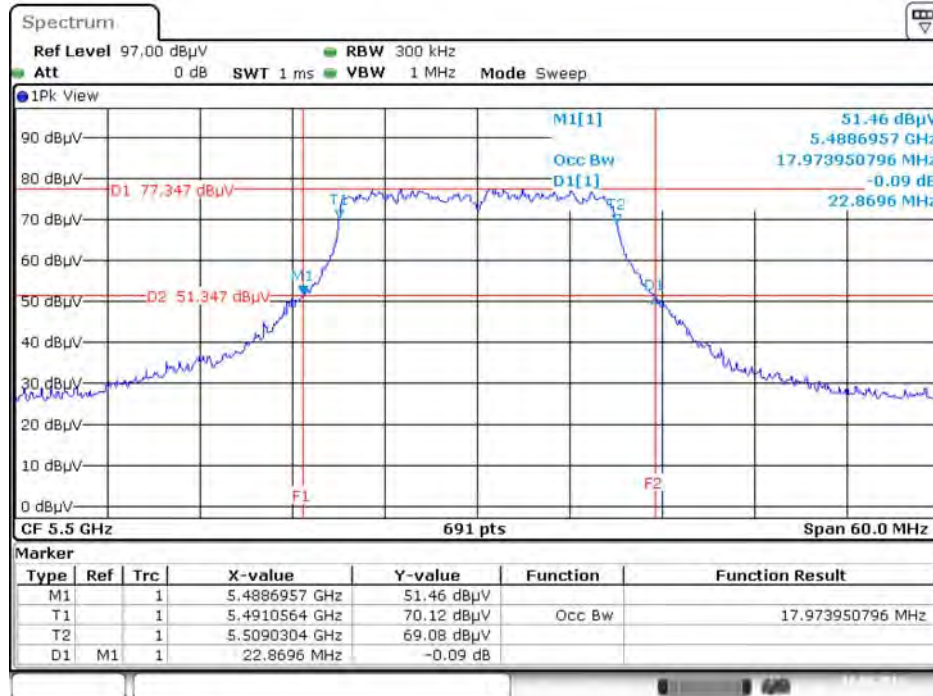
26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5610 MHz+5690 MHz



Date: 6.AUG.2016 14:32:20

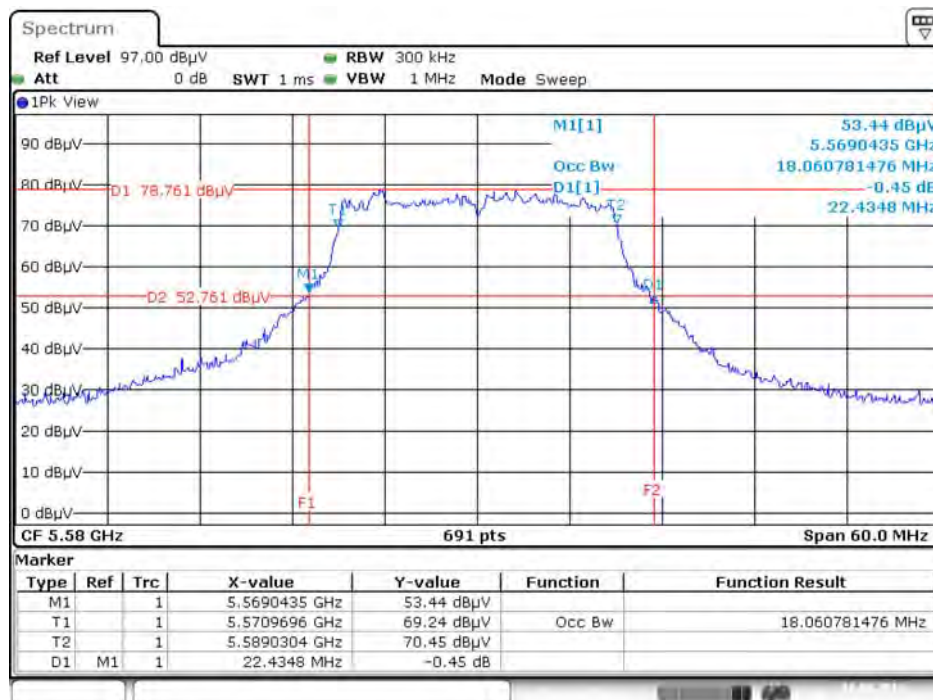
For beamforming mode

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5500 MHz



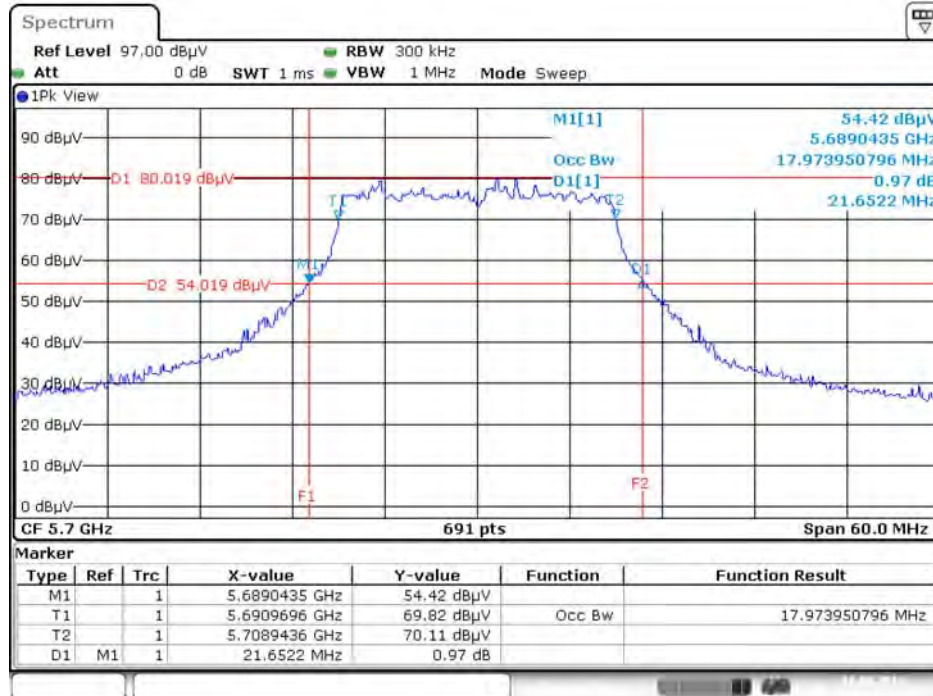
Date: 10.AUG.2016 00:18:30

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



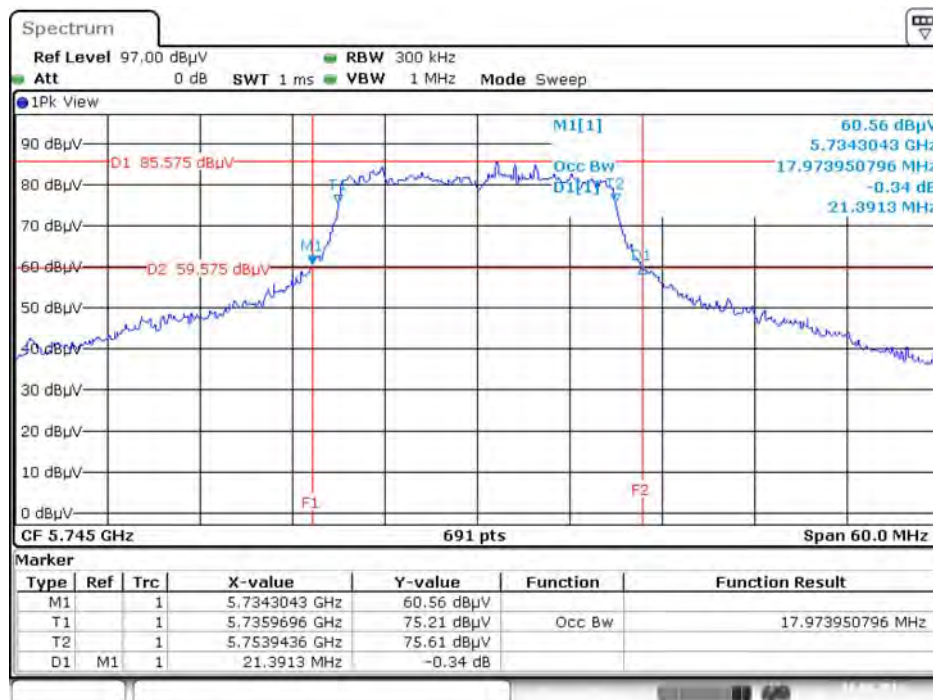
Date: 10.AUG.2016 00:19:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



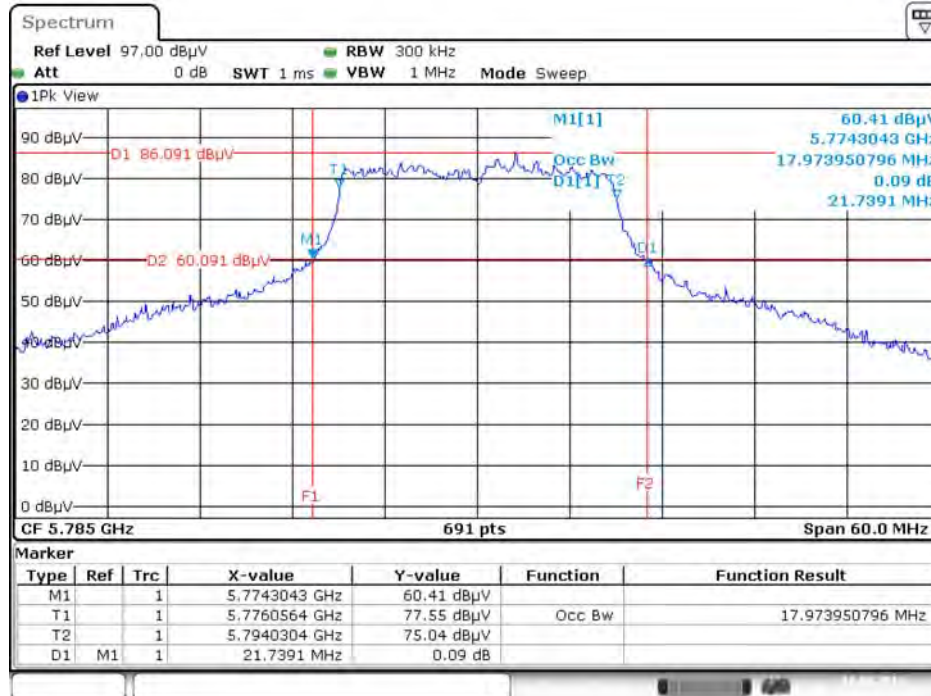
Date: 10.AUG.2016 00:21:40

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



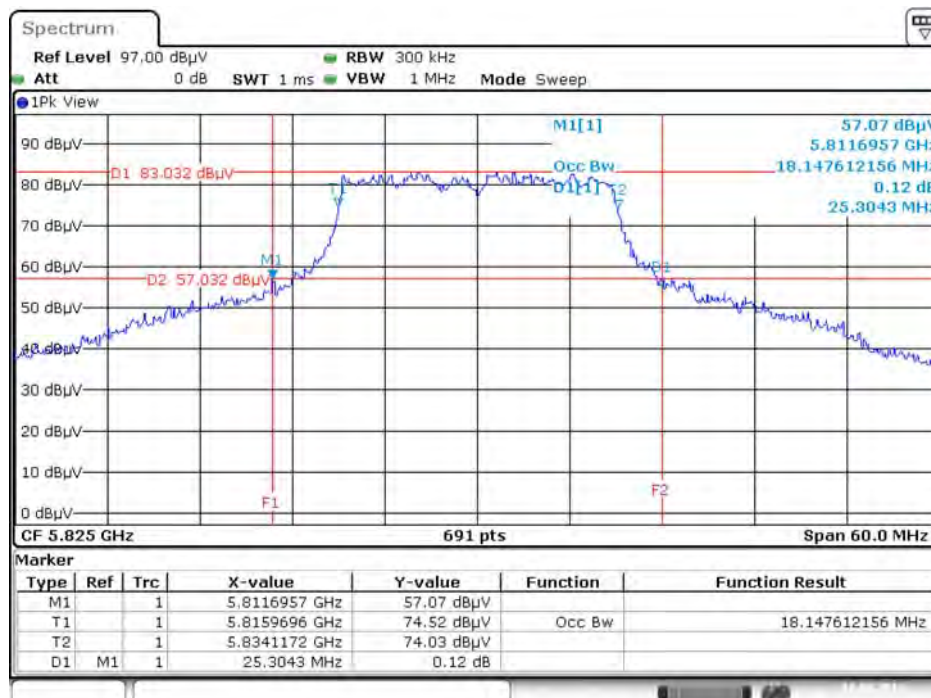
Date: 10.AUG.2016 00:23:07

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



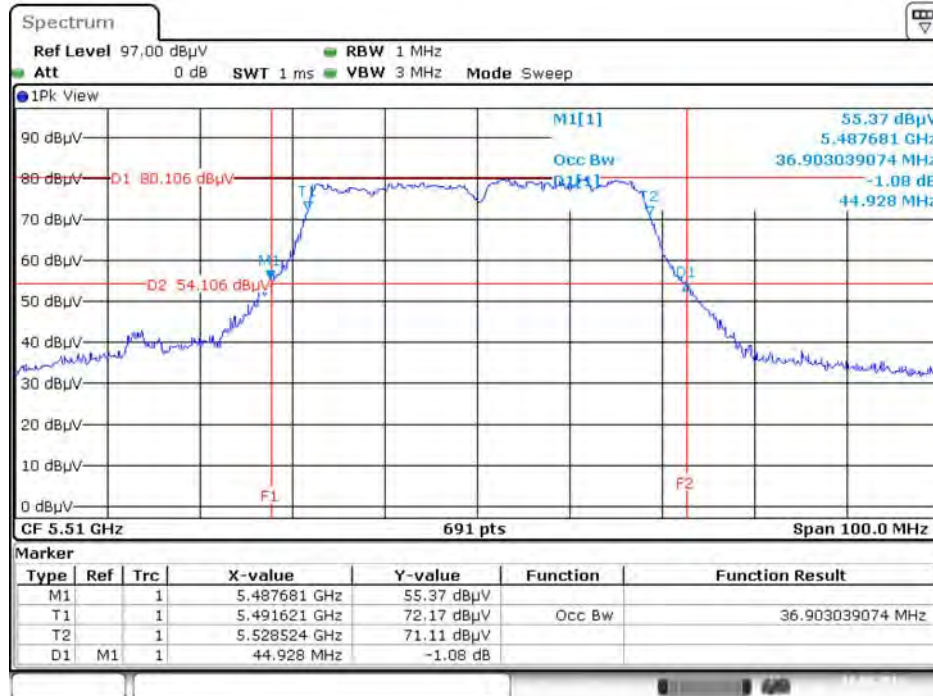
Date: 10.AUG.2016 00:24:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



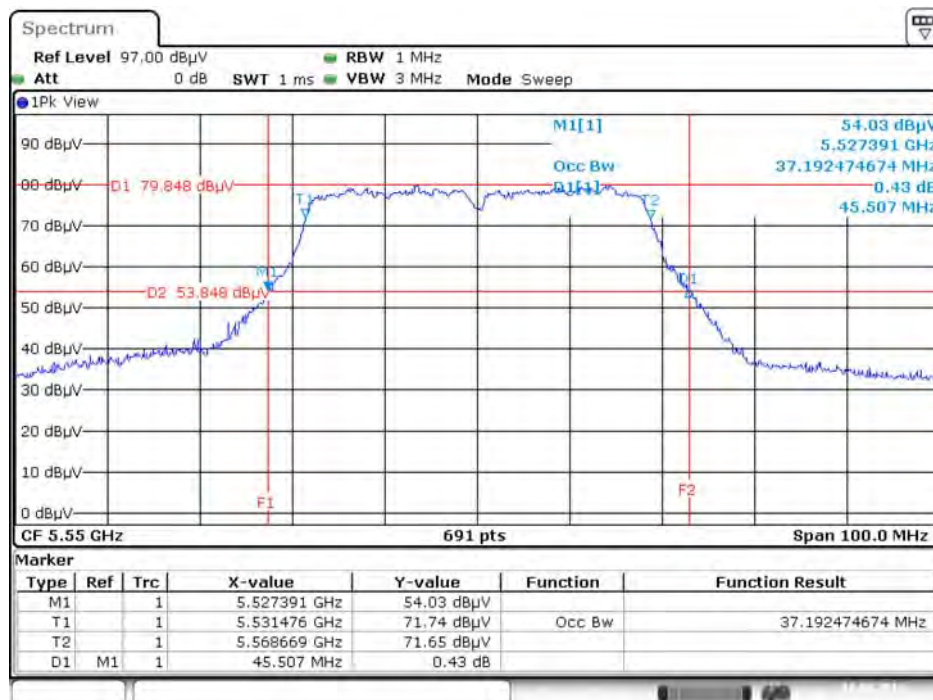
Date: 10.AUG.2016 00:28:53

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5510 MHz



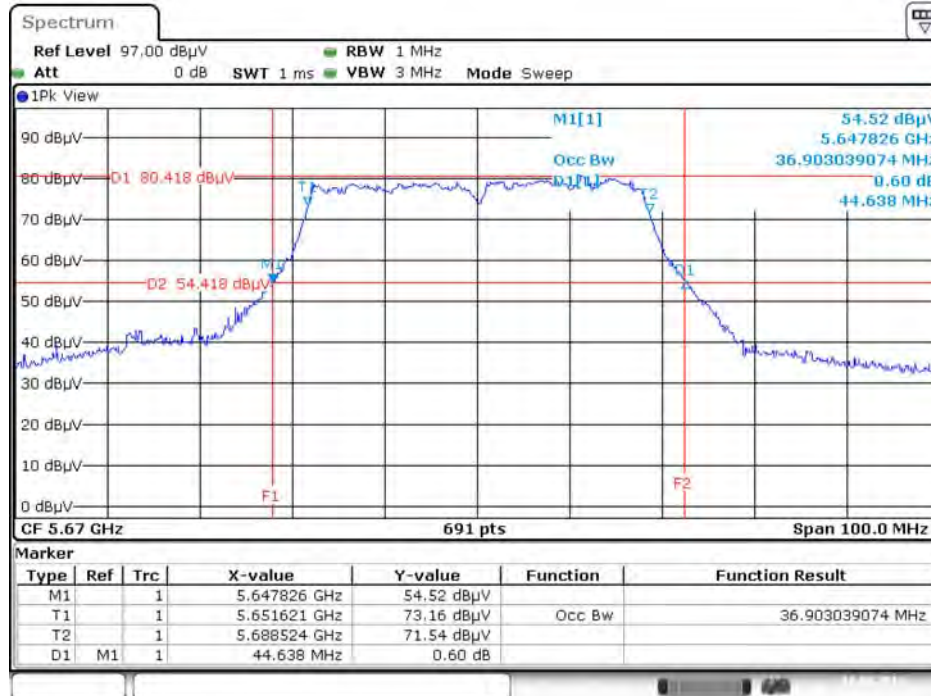
Date: 10.AUG.2016 01:15:48

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5550 MHz



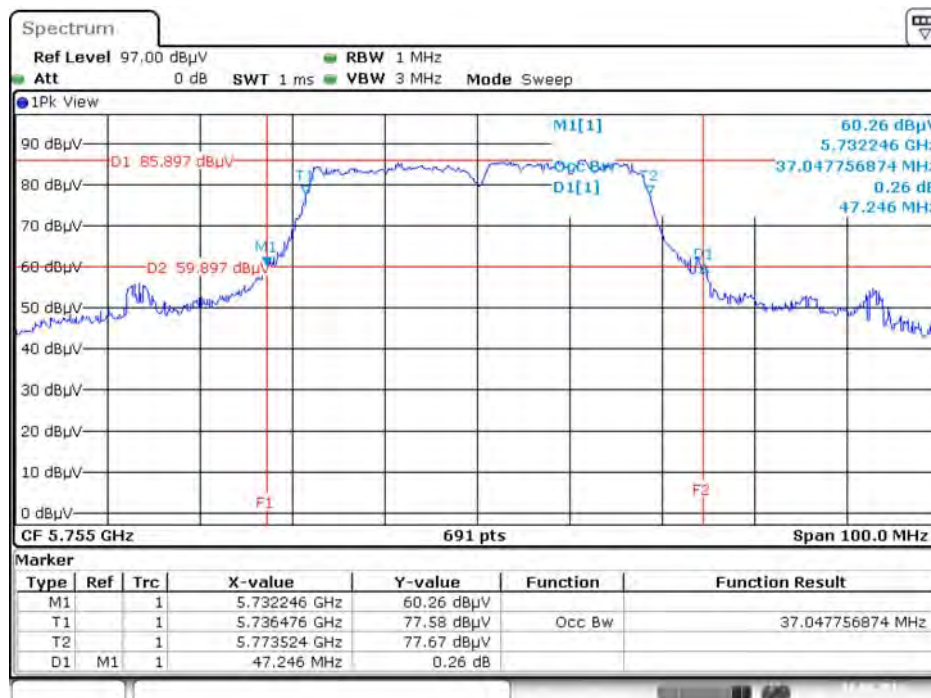
Date: 10.AUG.2016 01:17:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



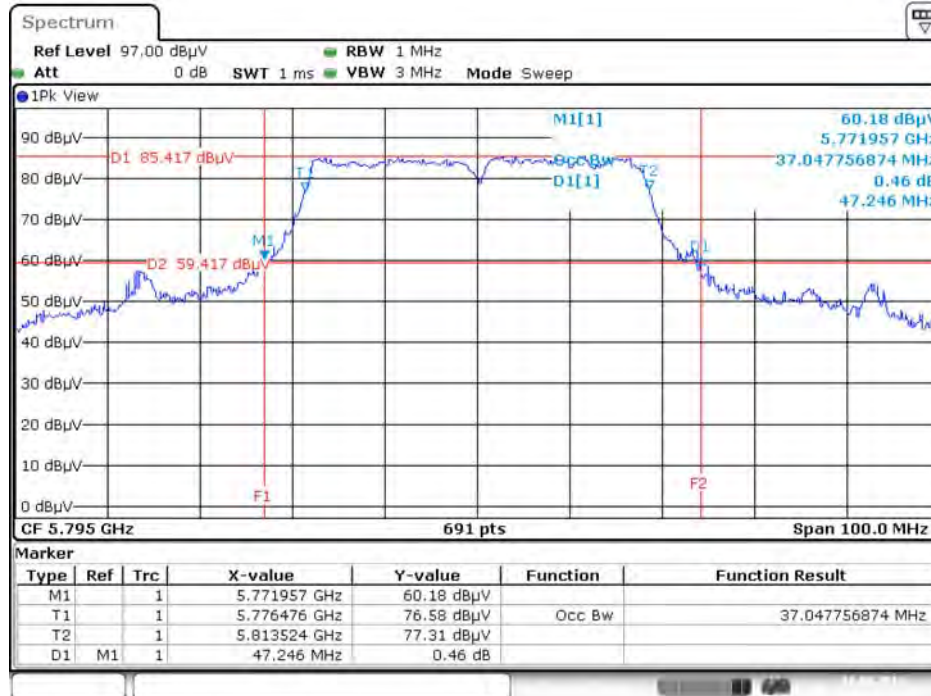
Date: 10.AUG.2016 01:18:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5755 MHz



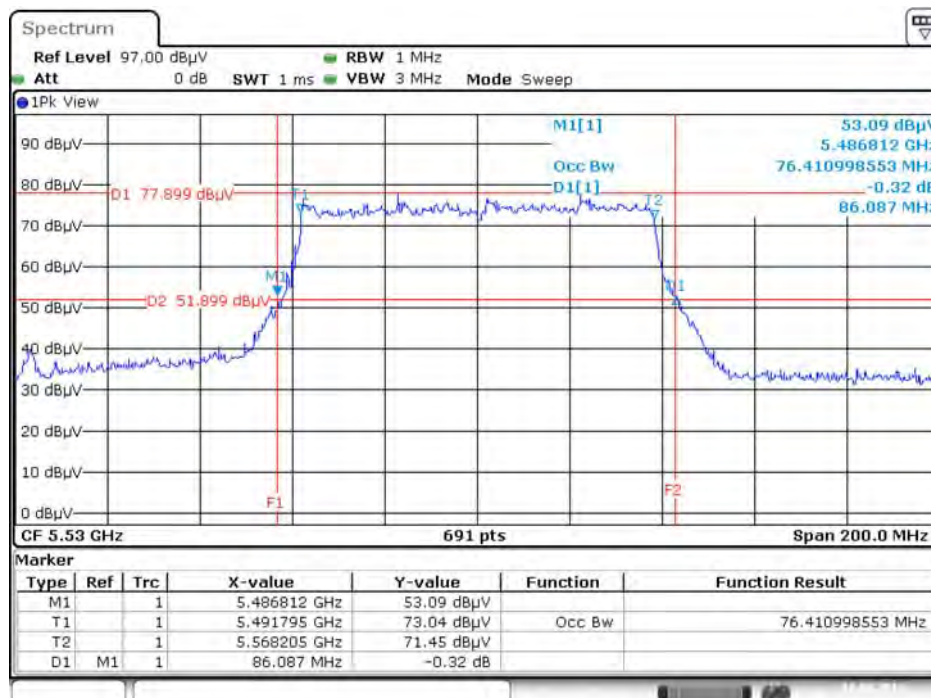
Date: 10.AUG.2016 01:20:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



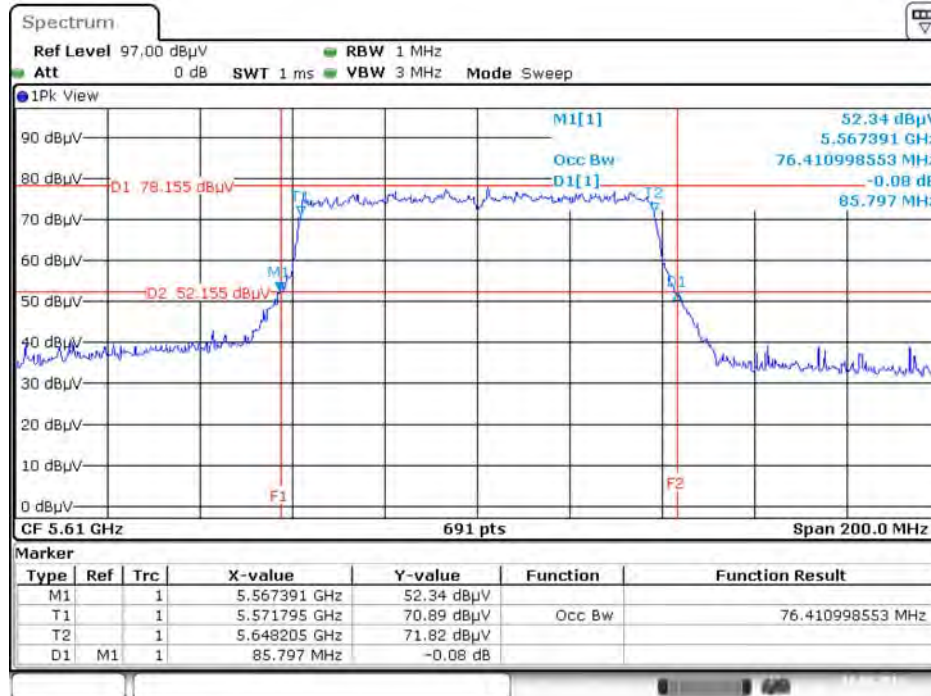
Date: 10.AUG.2016 01:22:25

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5530 MHz



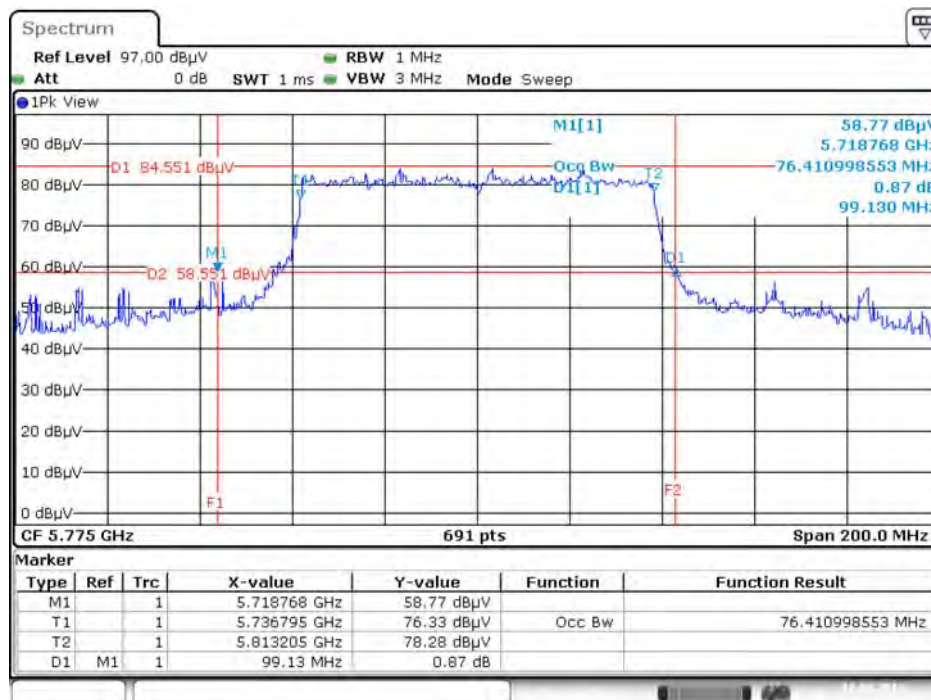
Date: 10.AUG.2016 01:29:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5610 MHz



Date: 10.AUG.2016 01:32:06

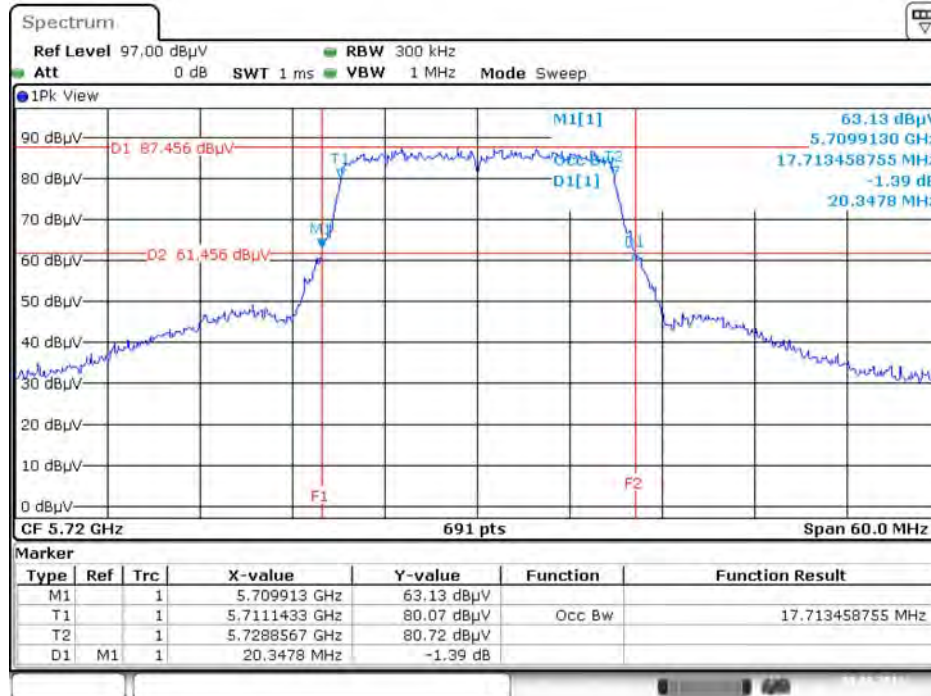
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 10.AUG.2016 01:34:51

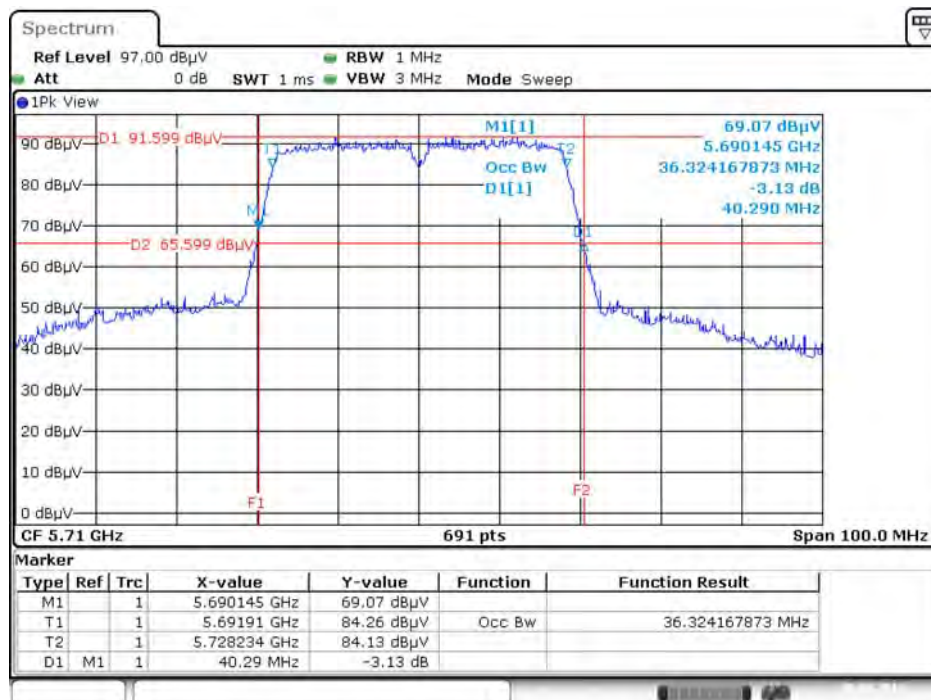
Straddle Channel

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz



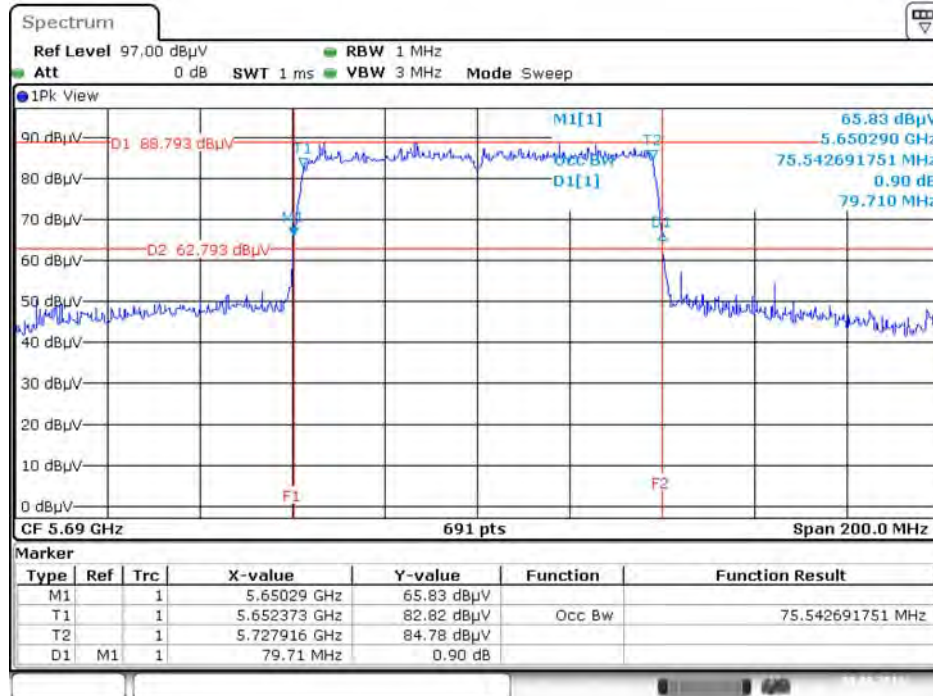
Date: 9.AUG.2016 00:55:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5710 MHz



Date: 9.AUG.2016 01:29:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5690 MHz

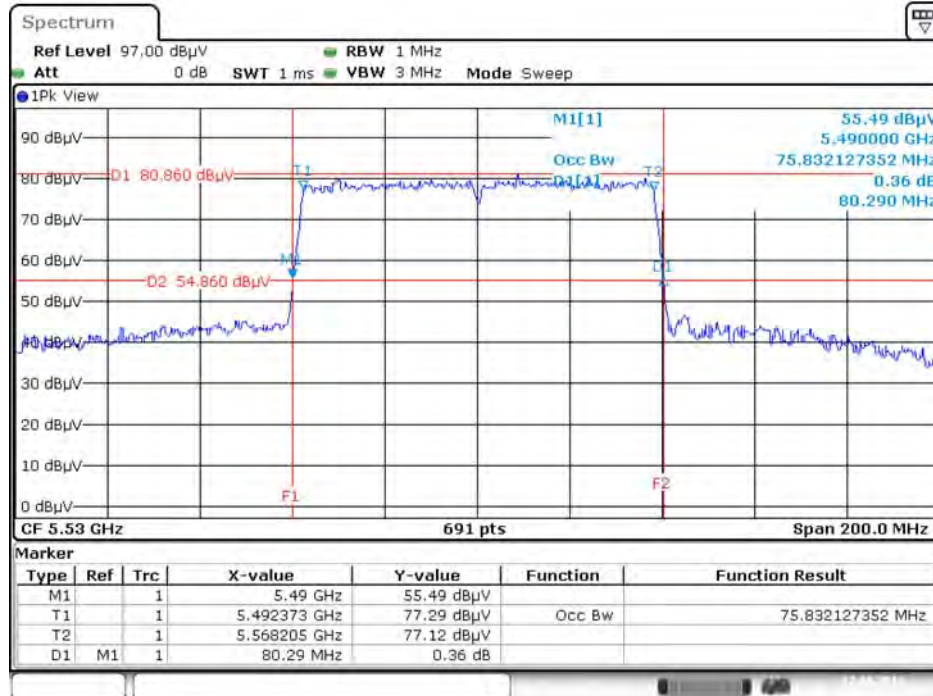


Date: 9.AUG.2016 02:09:34

802.11ac MCS0/Nss2 VHT80+80

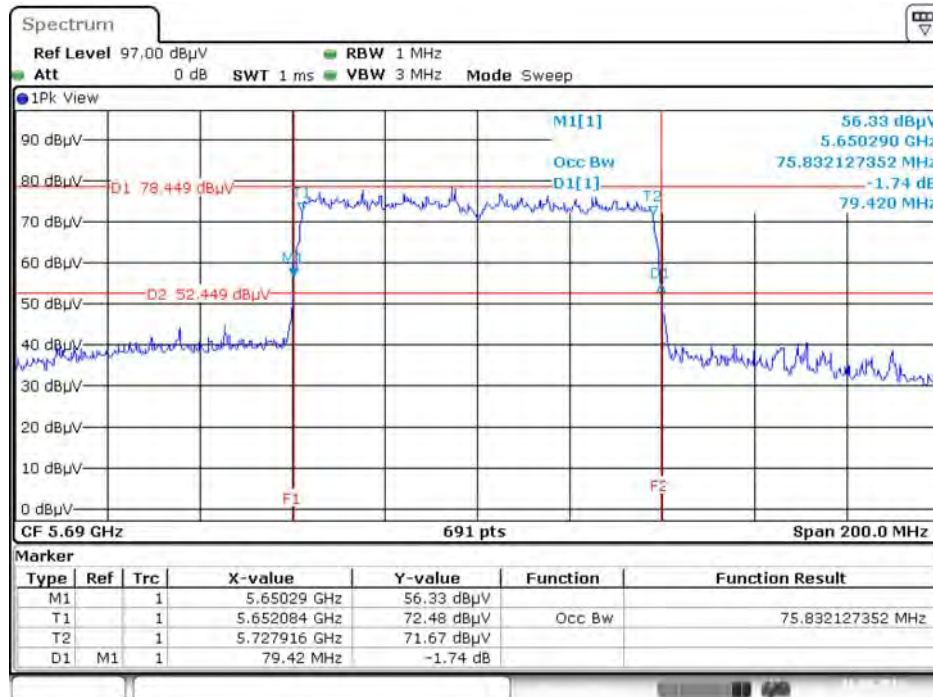
Type 1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 / 5530 MHz



Date: 17.AUG.2016 11:10:56

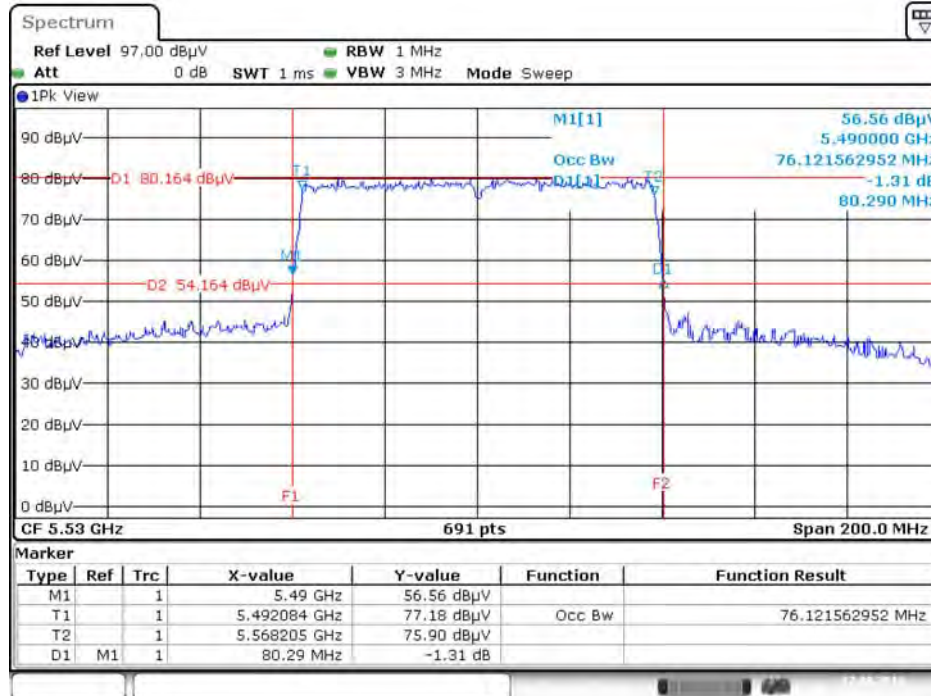
26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 3 + Chain 4 / 5690 MHz



Date: 16.AUG.2016 19:32:09

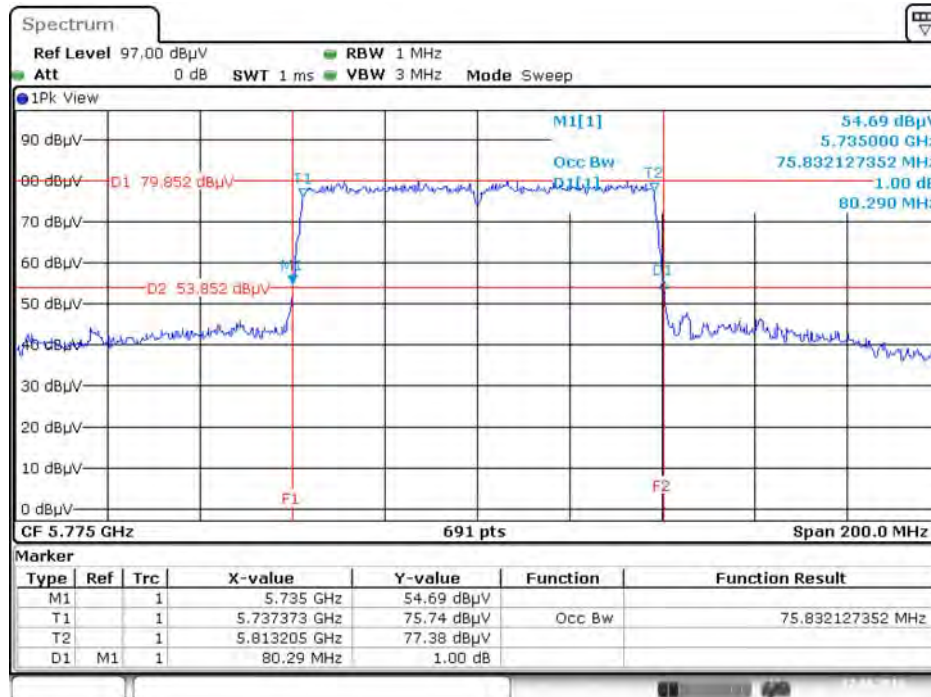
Type 2

26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 / 5530 MHz



Date: 17.AUG.2016 11:12:14

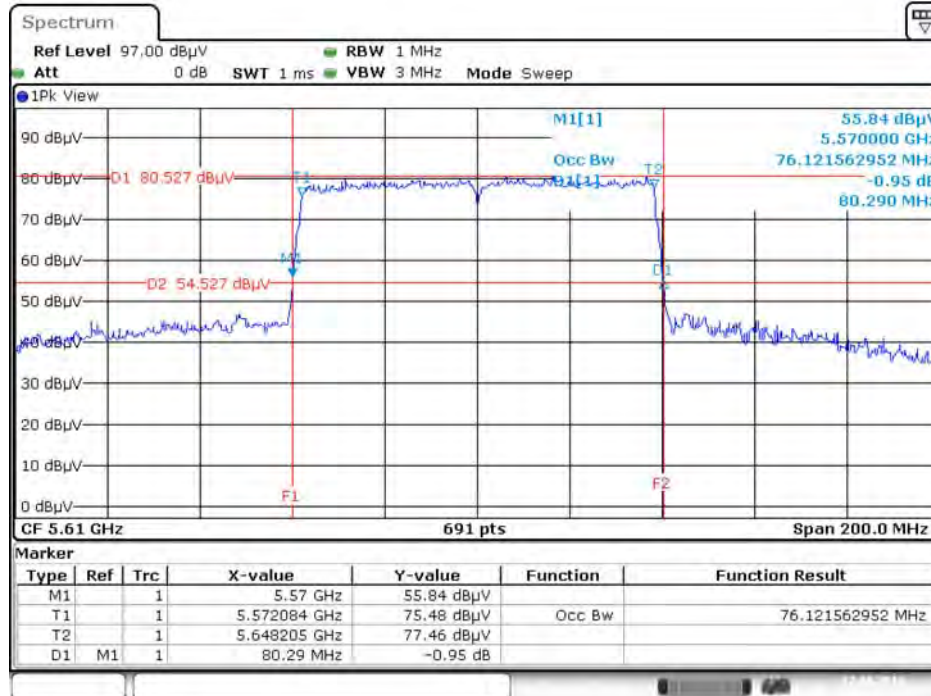
26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 17.AUG.2016 11:15:28

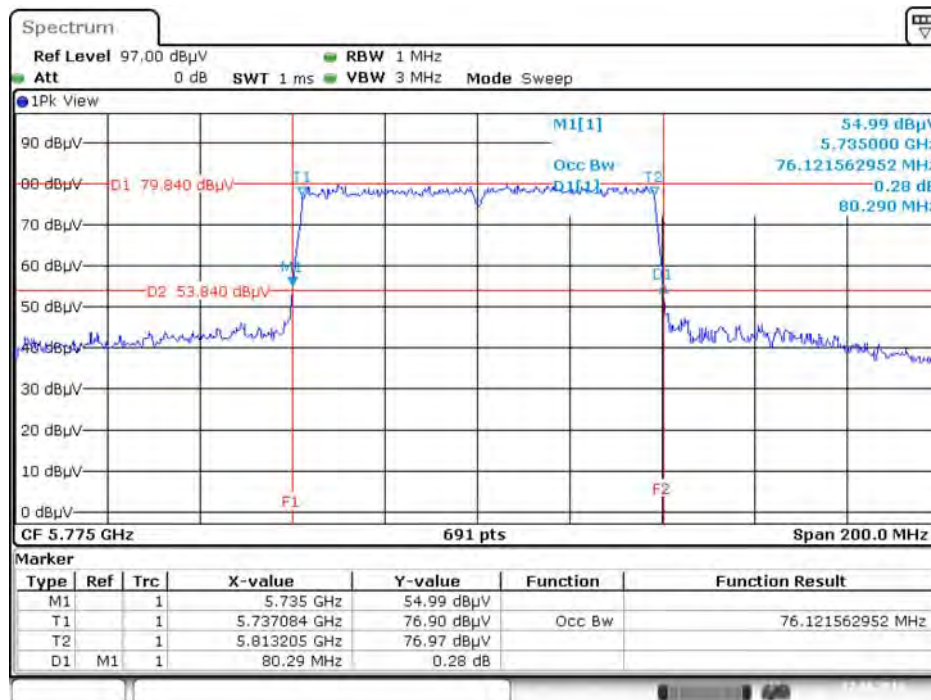
Type 3

26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 / 5610 MHz



Date: 17.AUG.2016 11:13:55

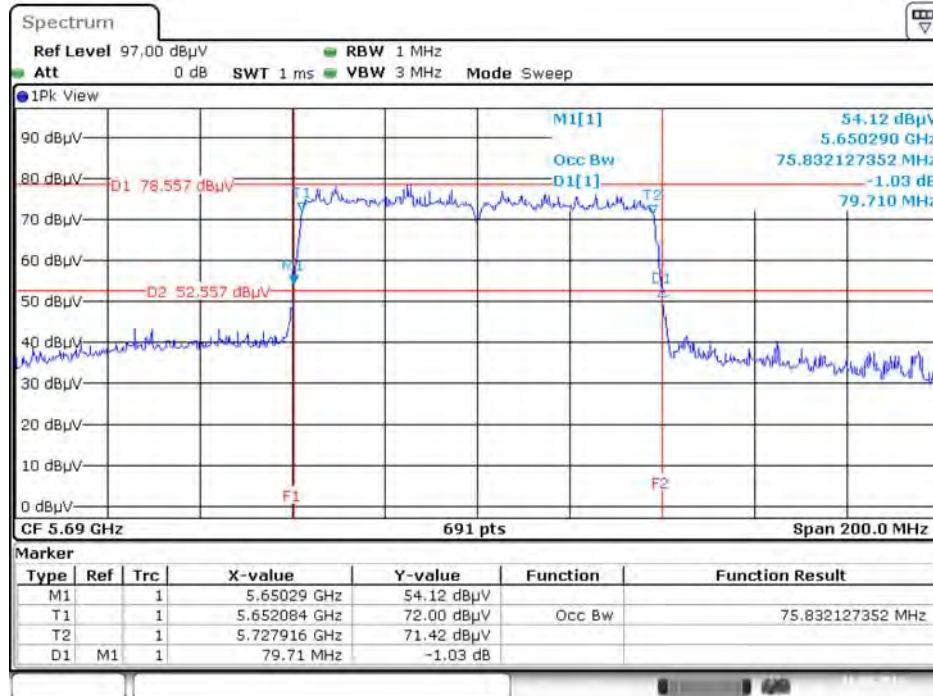
26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 17.AUG.2016 11:15:51

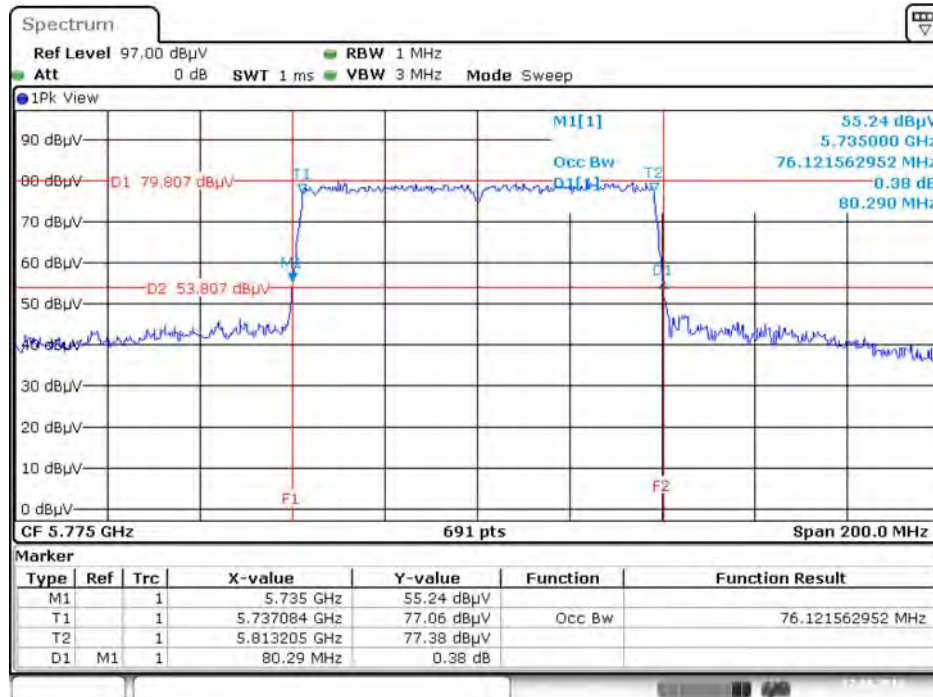
Type 4

26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 / 5690 MHz



Date: 16.AUG.2016 19:33:18

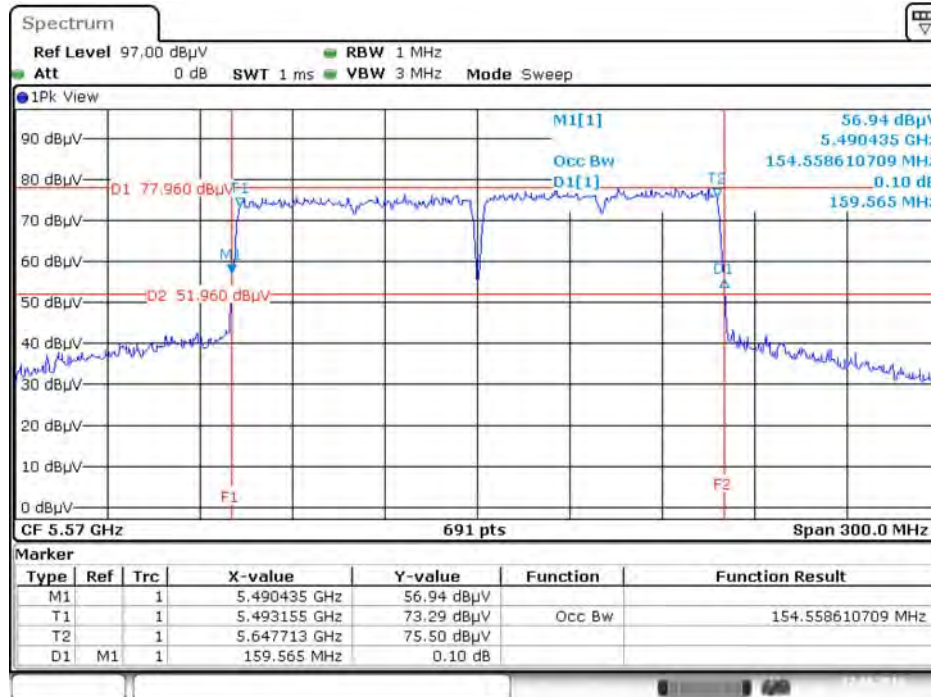
26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 17.AUG.2016 11:16:17

Type 5

26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5530 MHz+5610 MHz



Date: 17.AUG.2016 11:26:44

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

4.3.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

6dB Spectrum Bandwidth	
Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	$\geq 3 \times \text{RBW}$
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 v01r04 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth.
3. Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.6.4.

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	3.88	500	Complies
	5785 MHz	3.77	500	Complies
	5825 MHz	10.73	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	12.00	500	Complies
	5785 MHz	11.71	500	Complies
	5825 MHz	11.77	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	34.55	500	Complies
	5795 MHz	32.81	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.36	500	Complies

Straddle Channel

Mode	Frequency	6dB BW (MHz)	6dB BW M1 (MHz)	UNII 3 BW (MHz)	Min. Limit (kHz)	Test Result
802.11a	5720 MHz	11.94	5713.68	0.62	500	Complies
802.11ac MCS0/Nss1 VHT20	5720 MHz	12.12	5713.68	0.80	500	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz	34.55	5691.80	1.35	500	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz	74.49	5651.74	1.23	500	Complies

802.11ac MCS0/Nss2 VHT80+80

Type	Frequency	6dB BW (MHz)	6dB BW M1 (MHz)	UNII 3 BW (MHz)	Min. Limit (kHz)	Test Result
1	5530 MHz	-				
	5690 MHz	72.75	5654.93	2.68	500	Complies
2	5530 MHz	-				
	5775 MHz	74.20	-		500	Complies
3	5610 MHz	-				
	5775 MHz	73.91	-		500	Complies
4	5690 MHz	74.20	5653.48	2.68	500	Complies
	5775 MHz	73.91	-		500	Complies
6	5610 MHz	151.74	5576.09	2.83	500	Complies
	5690 MHz					Complies

For beamforming mode

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.74	500	Complies
	5785 MHz	17.74	500	Complies
	5825 MHz	17.28	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	33.97	500	Complies
	5795 MHz	32.70	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	74.20	500	Complies

Straddle Channel

Mode	Frequency	6dB BW (MHz)	6dB BW M1 (MHz)	UNII 3 BW (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	5720 MHz	17.74	5711.07	3.81	500	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz	34.44	5691.80	1.23	500	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz	74.20	5652.03	1.23	500	Complies

802.11ac MCS0/Nss2 VHT80+80

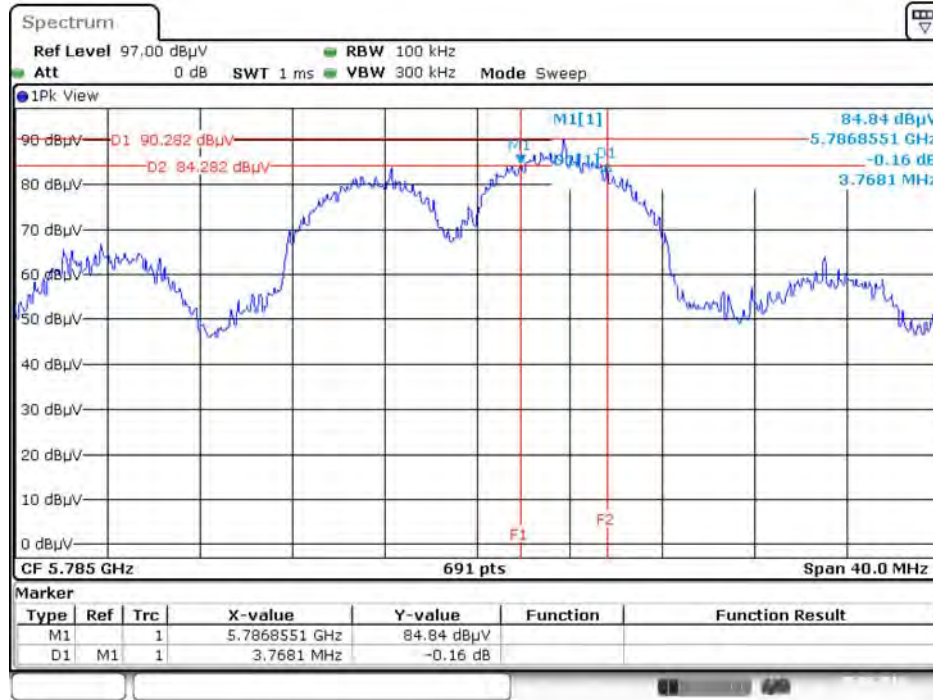
Type	Frequency	6dB BW (MHz)	6dB BW M1 (MHz)	UNII 3 BW (MHz)	Min. Limit (kHz)	Test Result
1	5530 MHz	-				
	5690 MHz	75.65	5652.03	2.68	500	Complies
2	5530 MHz	-				
	5775 MHz	73.91	-		500	Complies
3	5610 MHz	-				
	5775 MHz	73.91	-		500	Complies
4	5690 MHz	75.94	5651.74	2.68	500	Complies
	5775 MHz	75.36	-		500	Complies

Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

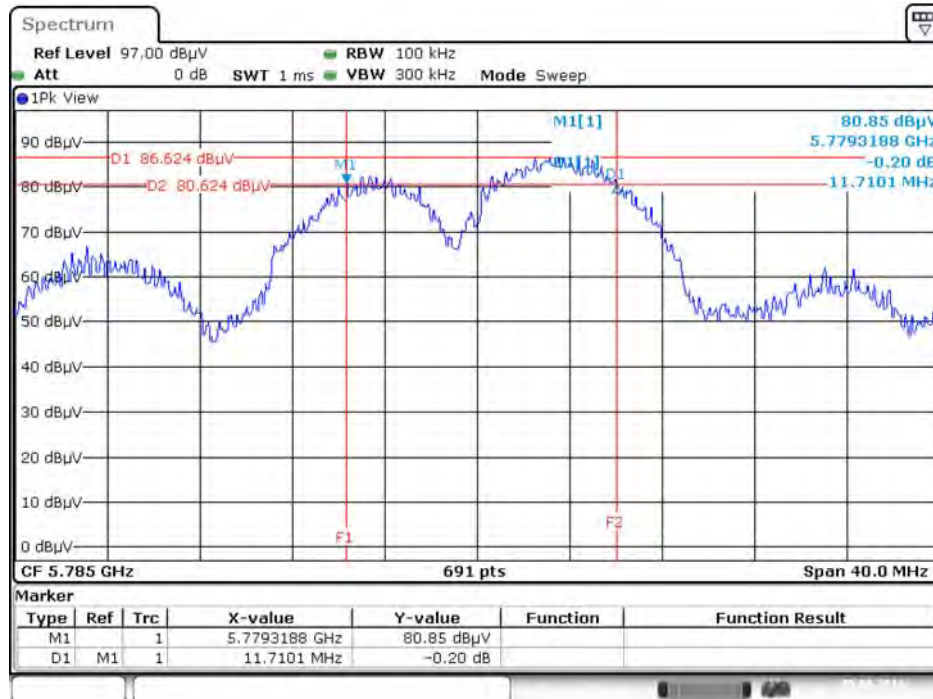
For non-beamforming mode

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



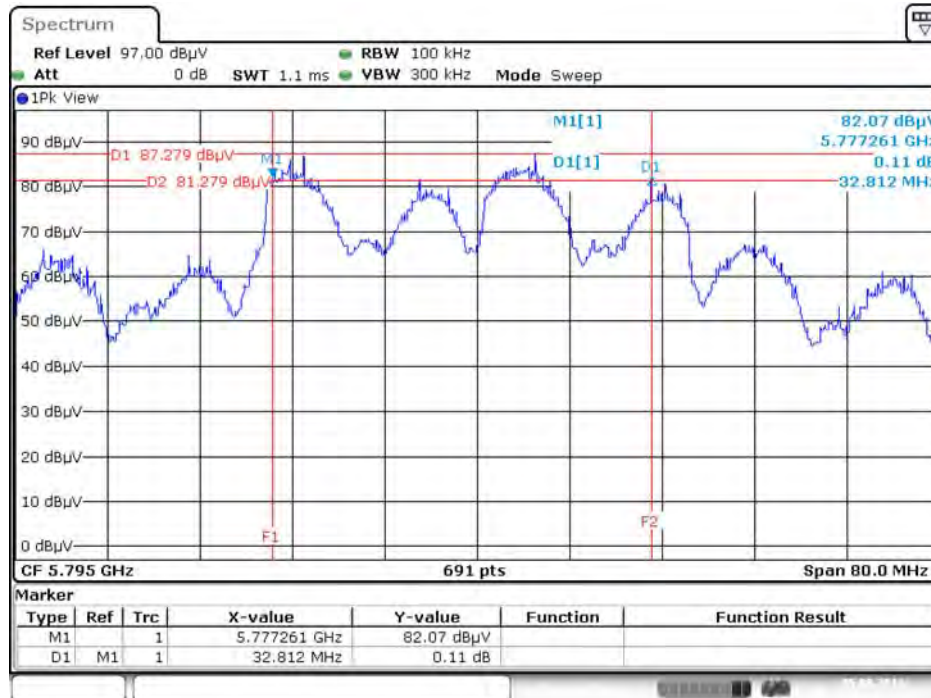
Date: 5.AUG.2016 13:45:08

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz

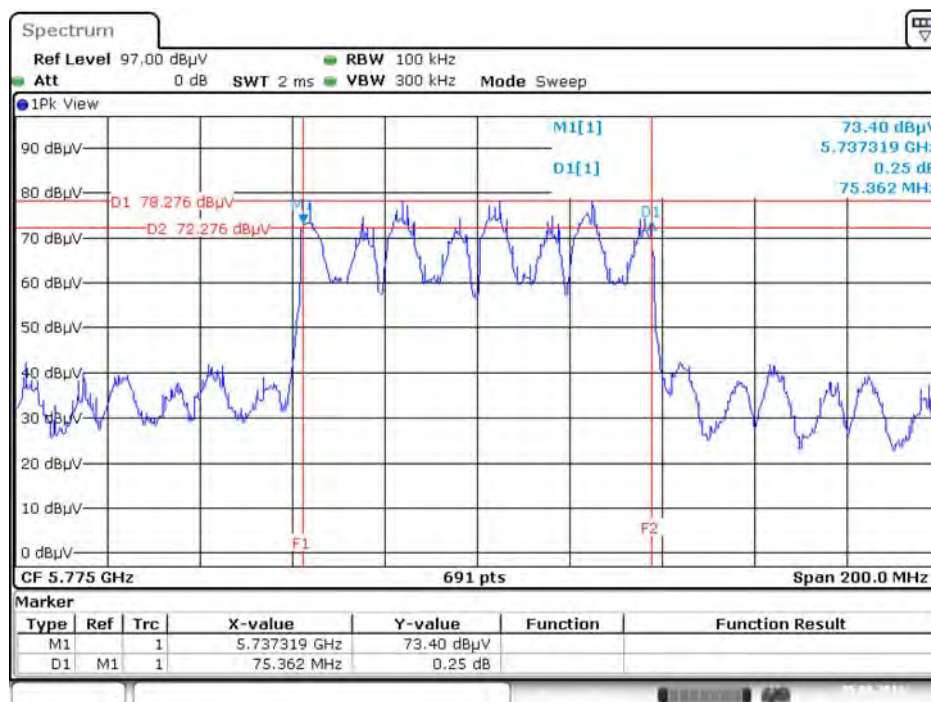


Date: 5.AUG.2016 13:47:09

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz

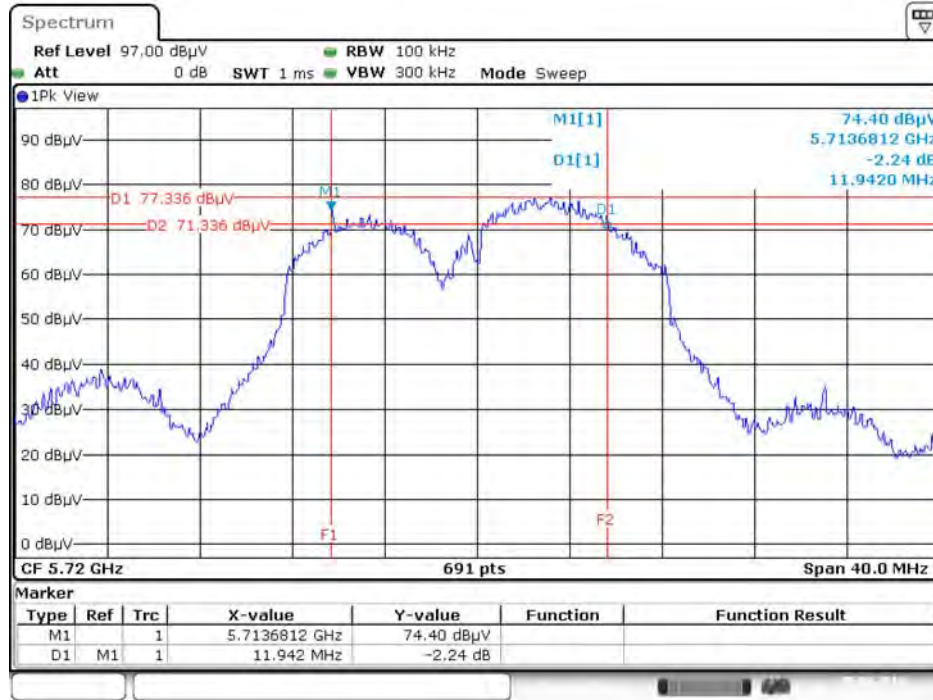


6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



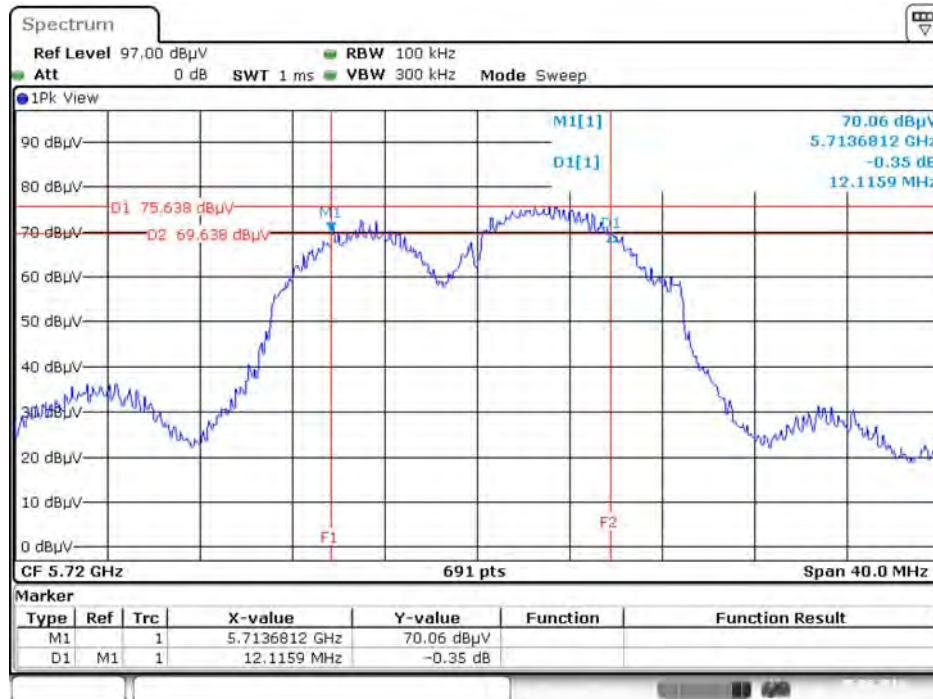
Straddle Channel

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz



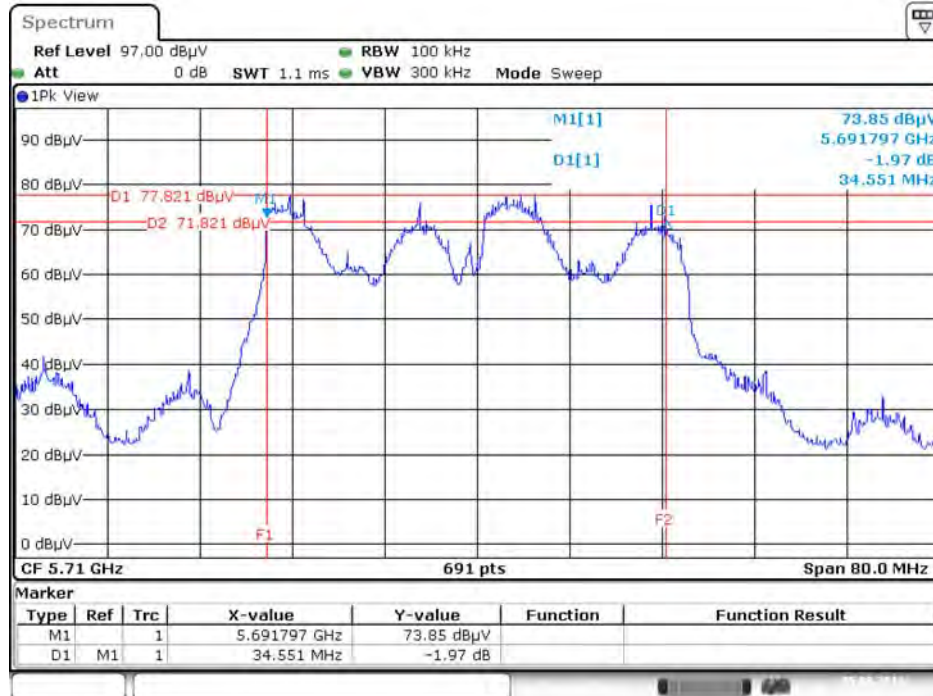
Date: 5.AUG.2016 15:27:57

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz



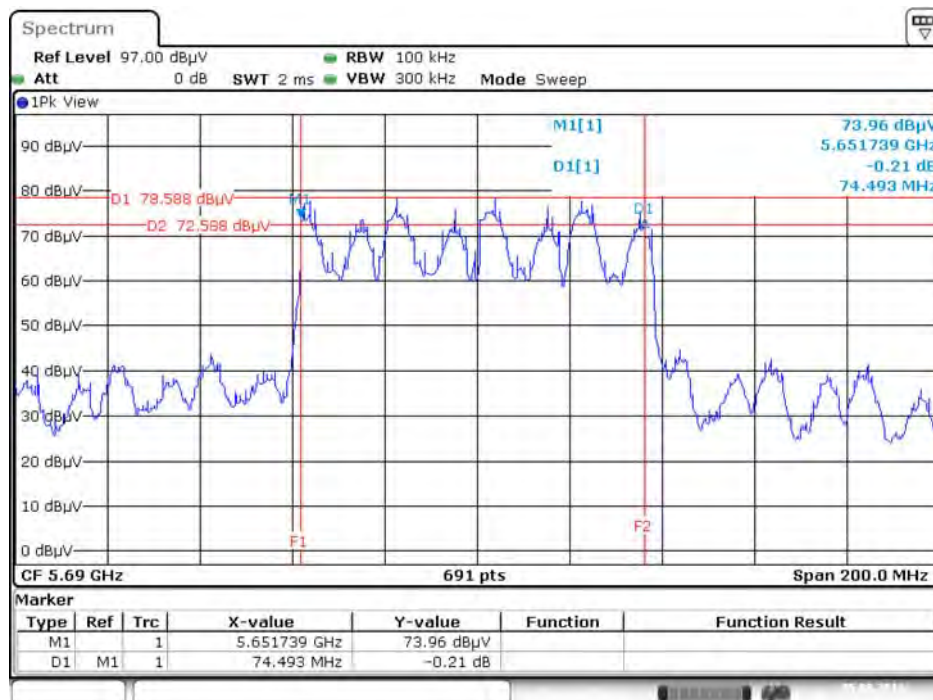
Date: 5.AUG.2016 15:28:41

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5710 MHz



Date: 5.AUG.2016 15:29:19

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5690 MHz

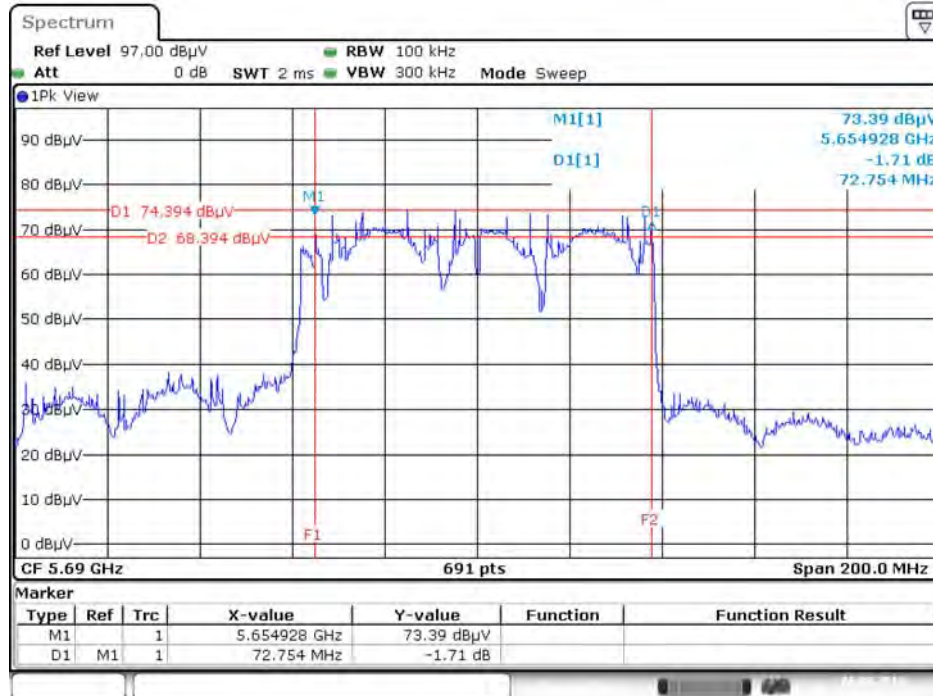


Date: 5.AUG.2016 15:30:55

802.11ac MCS0/Nss2 VHT80+80

Type 1

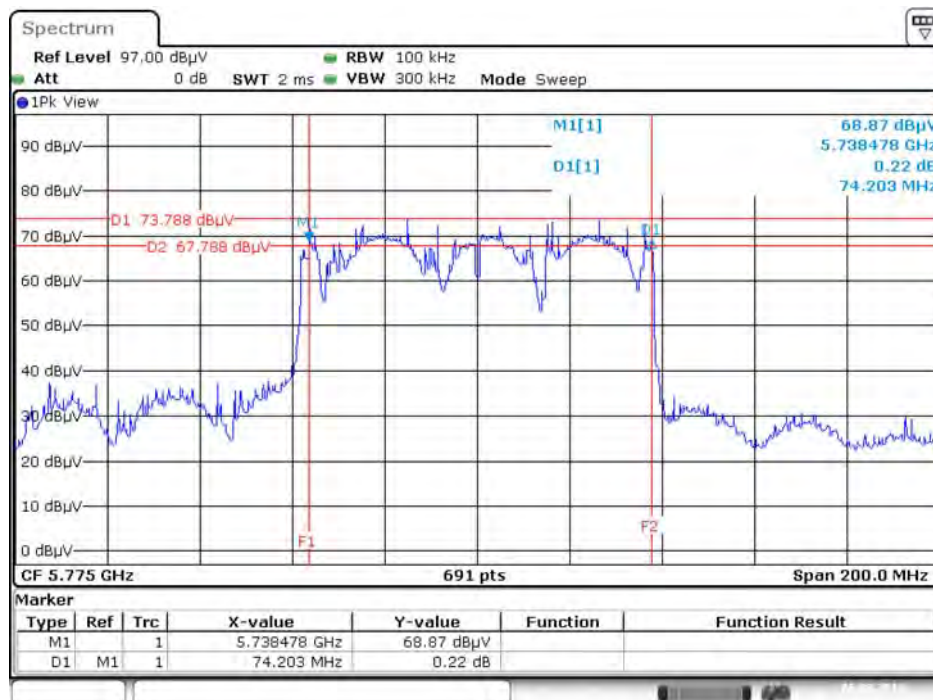
6 dB Bandwidth Plot on Chain 3 + Chain 4 / 5690 MHz



Date: 6.AUG.2016 16:05:53

Type 2

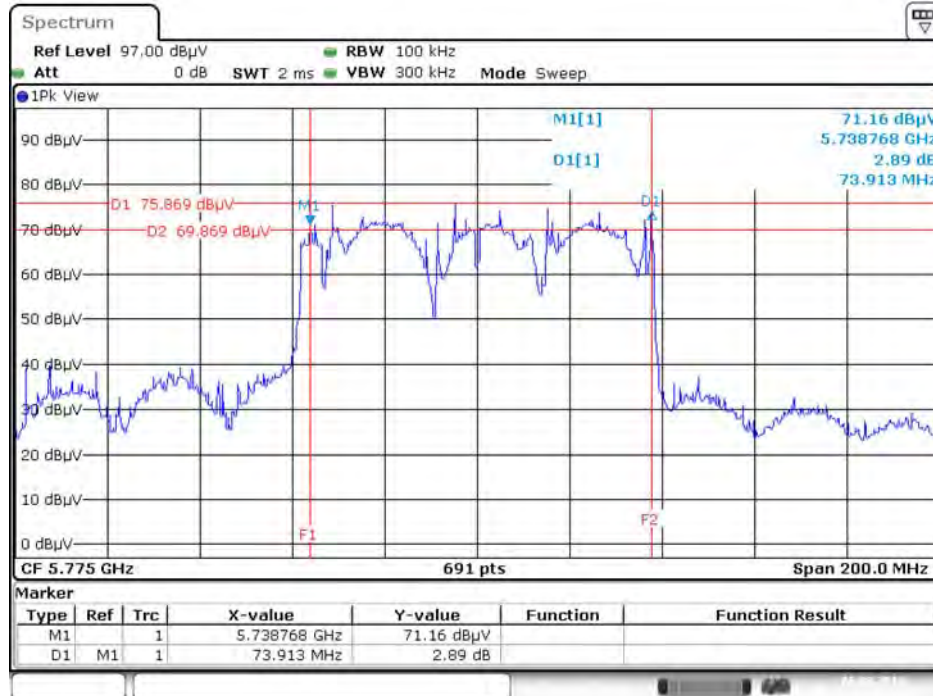
6 dB Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 6.AUG.2016 15:41:09

Type 3

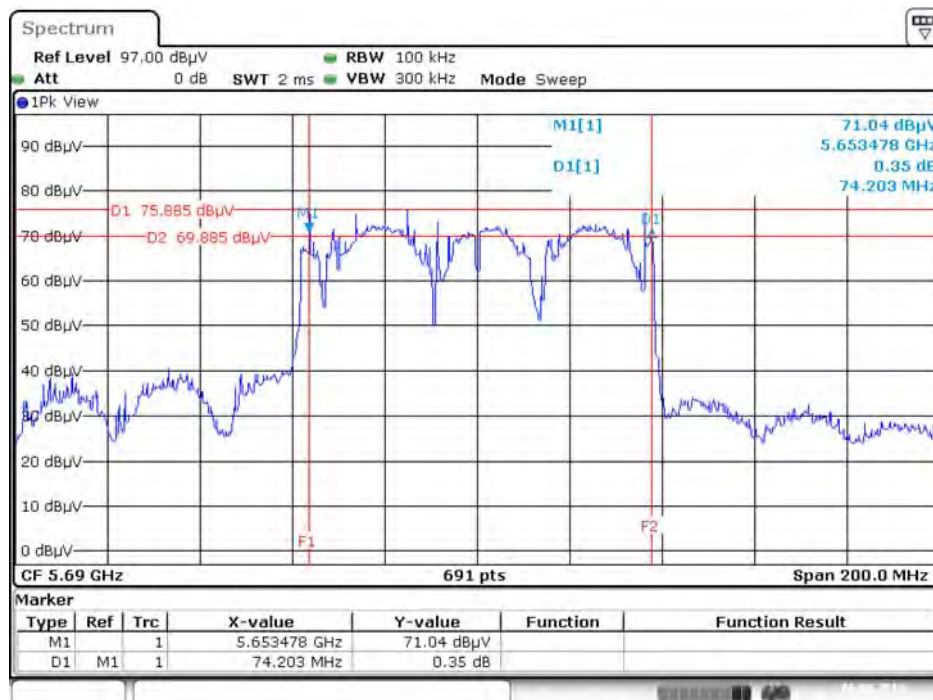
6 dB Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 6.AUG.2016 15:41:46

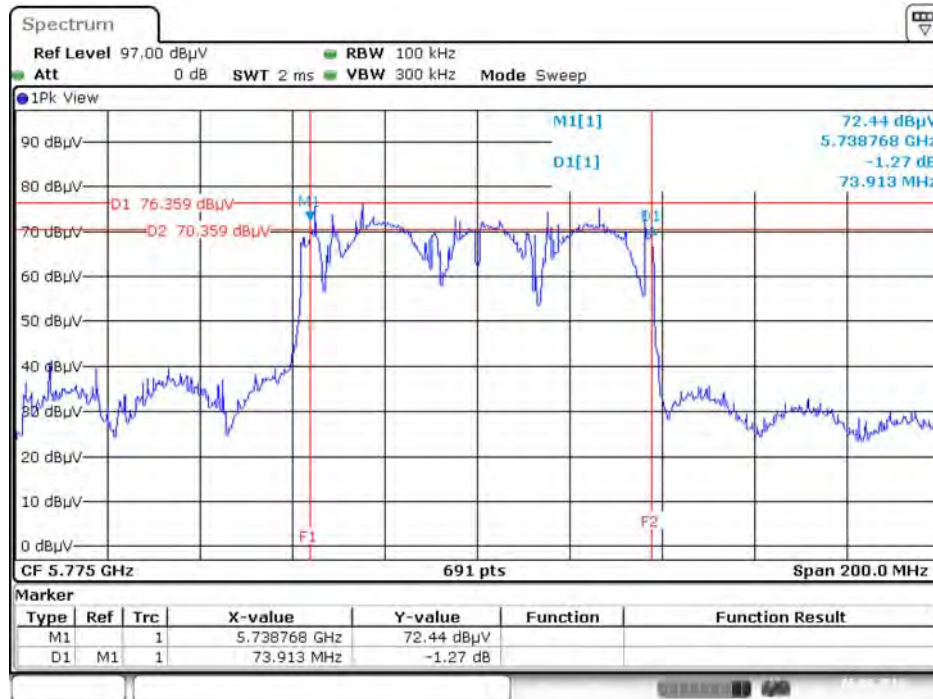
Type 4

6 dB Bandwidth Plot on Chain 1 + Chain 2 / 5690 MHz



Date: 6.AUG.2016 16:06:42

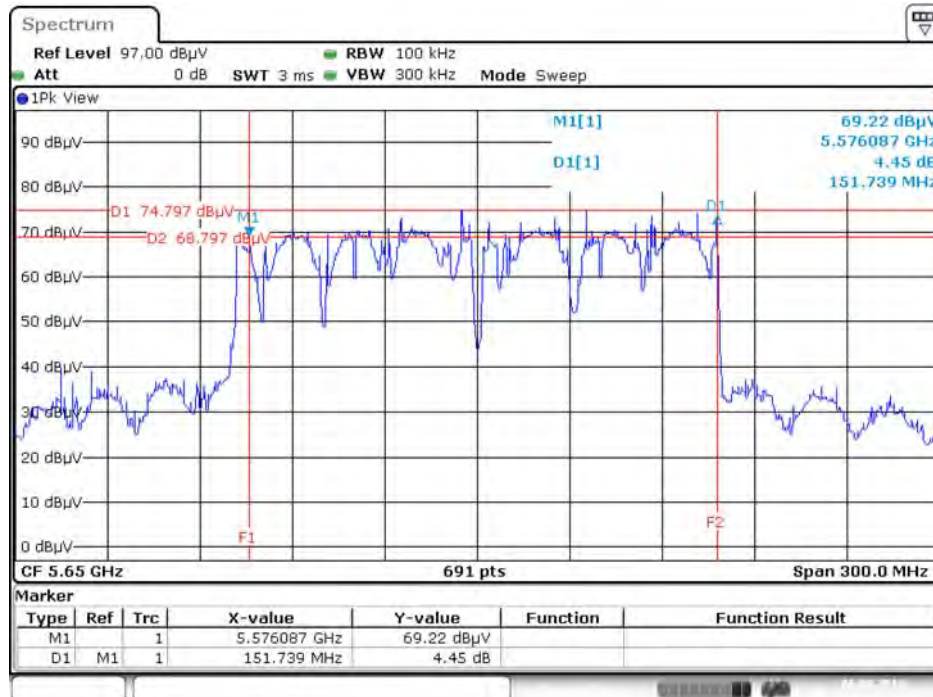
6 dB Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 6.AUG.2016 15:45:35

Type 6

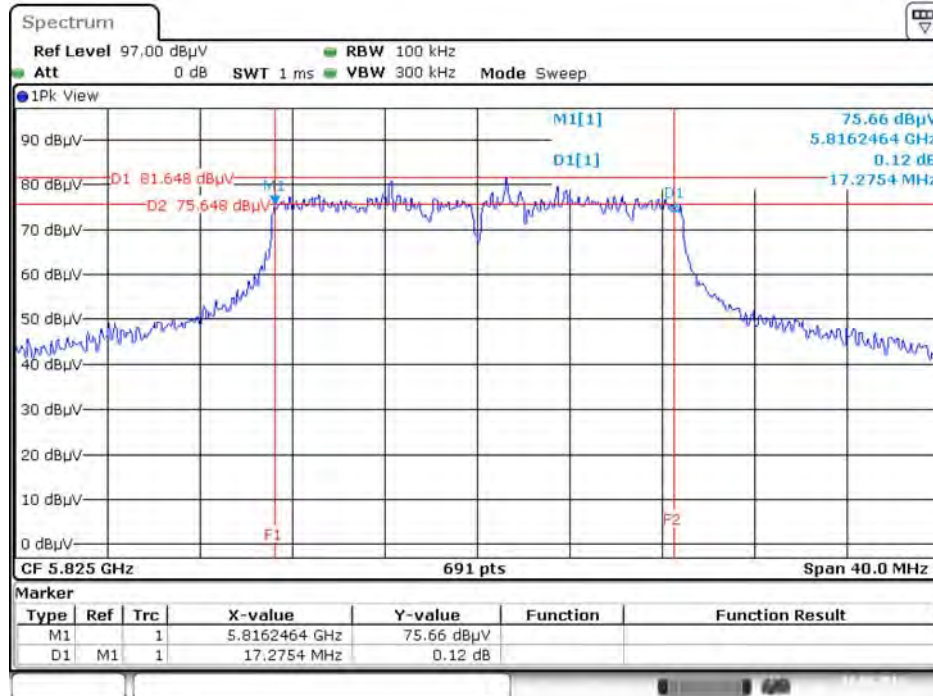
6 dB Bandwidth Plot on Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5610 MHz+5690 MHz



Date: 6.AUG.2016 16:11:24

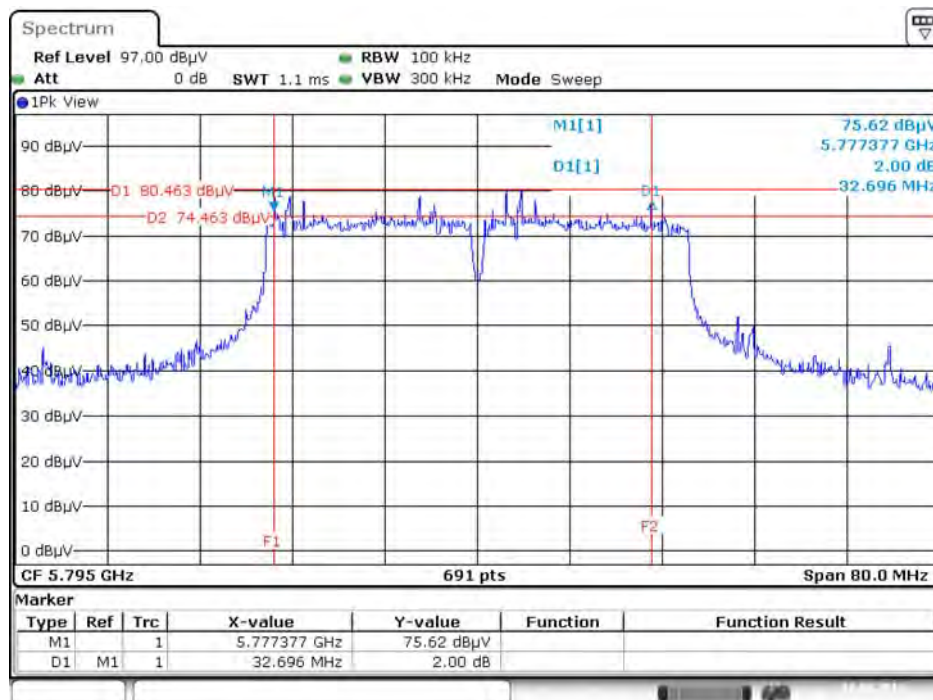
For beamforming mode

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



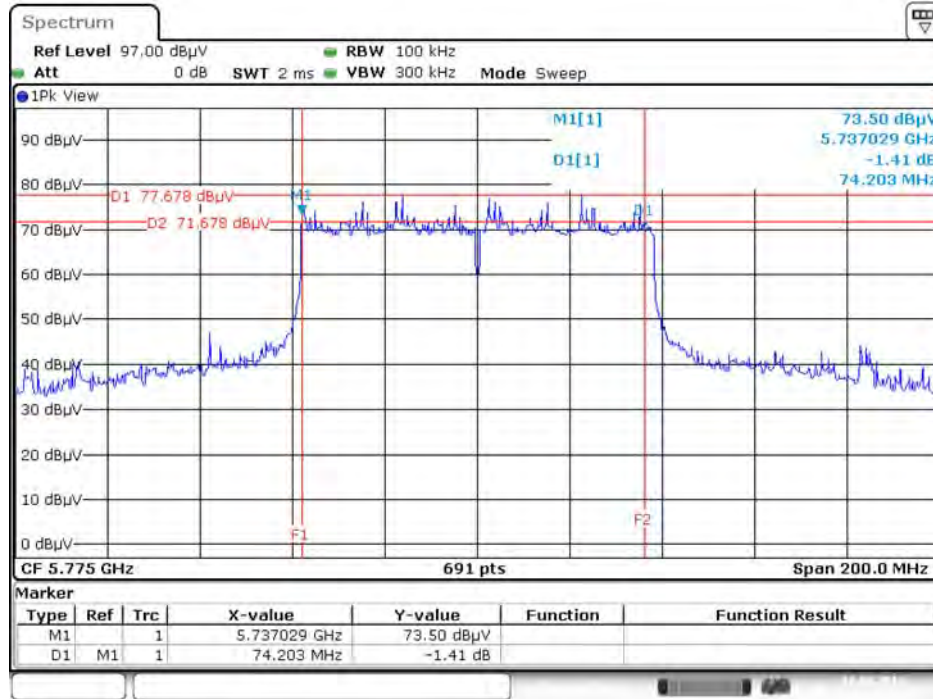
Date: 10.AUG.2016 01:48:45

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



Date: 10.AUG.2016 01:41:23

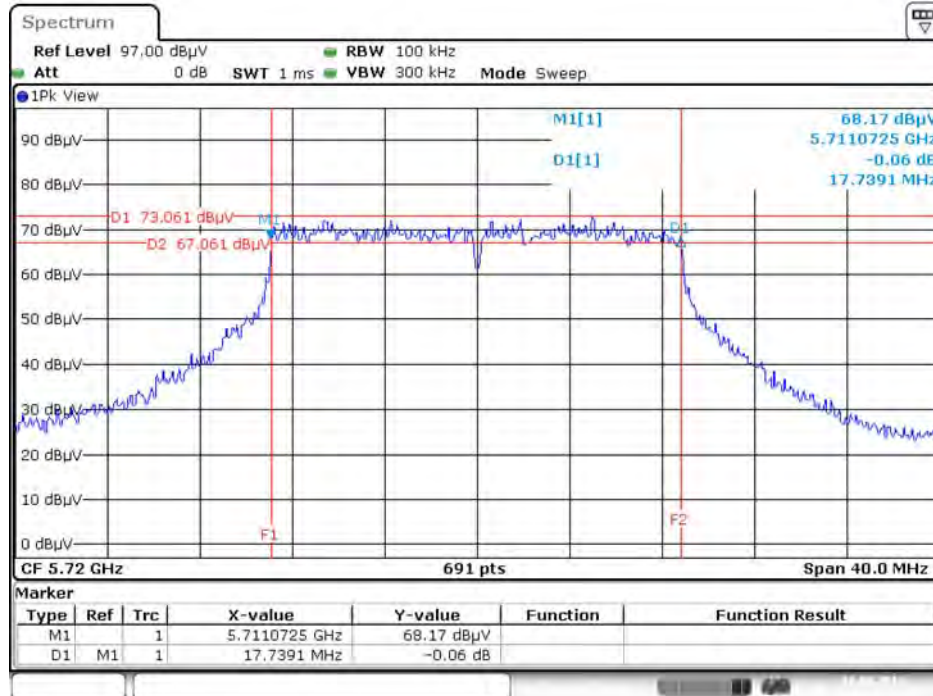
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 10.AUG.2016 01:37:48

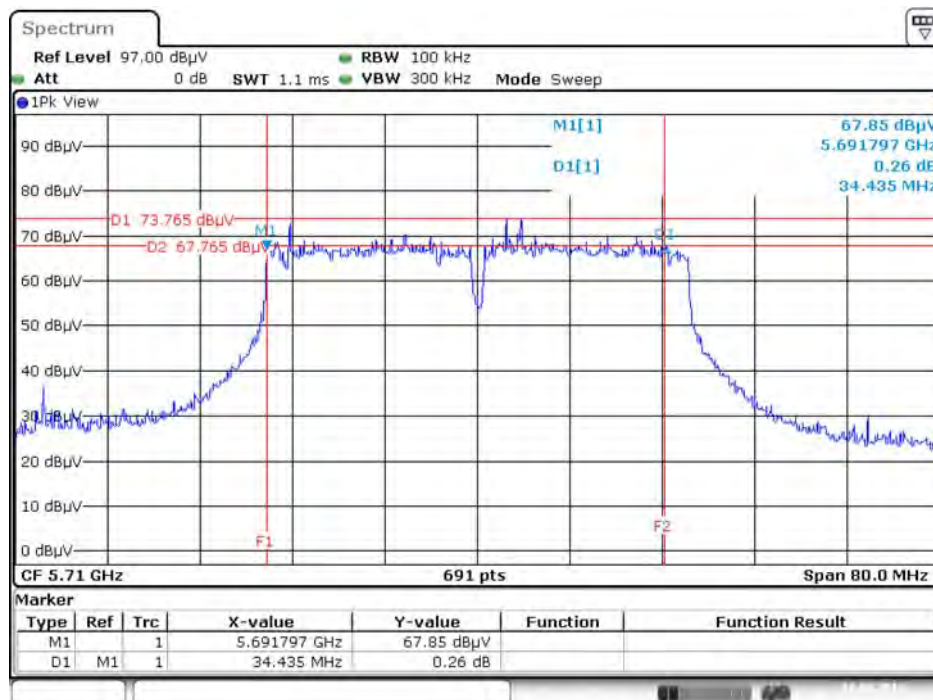
Straddle Channel

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz



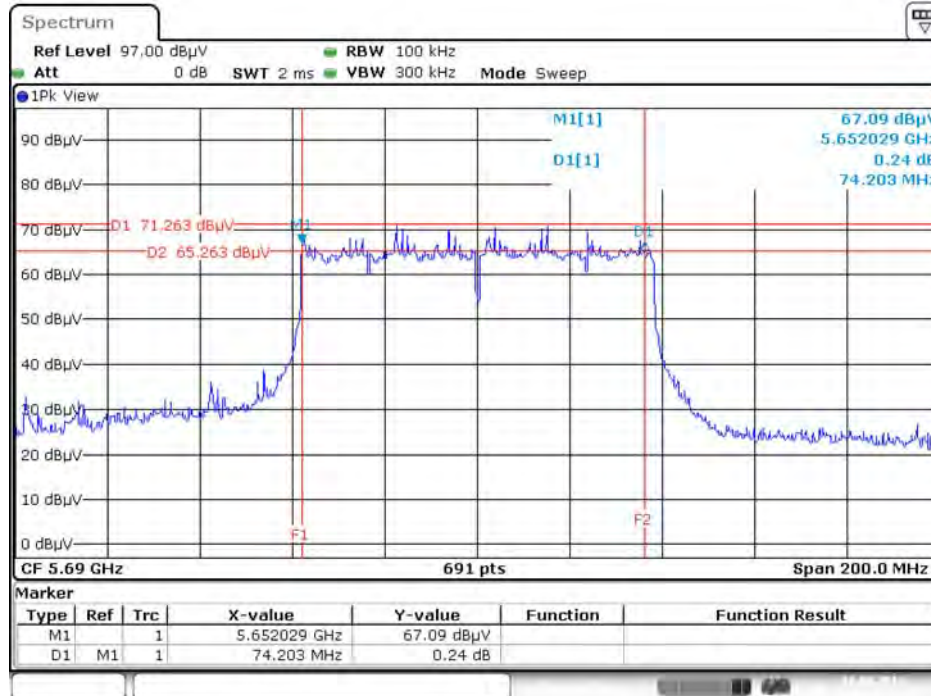
Date: 10.AUG.2016 01:51:30

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5710 MHz



Date: 10.AUG.2016 01:56:32

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5690 MHz

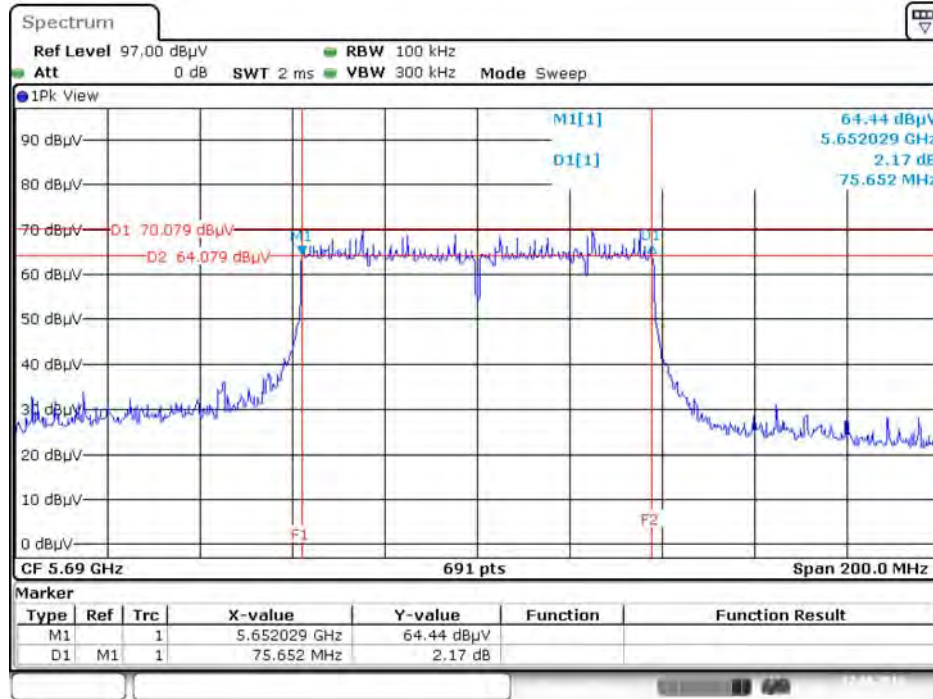


Date: 10.AUG.2016 01:59:30

802.11ac MCS0/Nss2 VHT80+80

Type 1

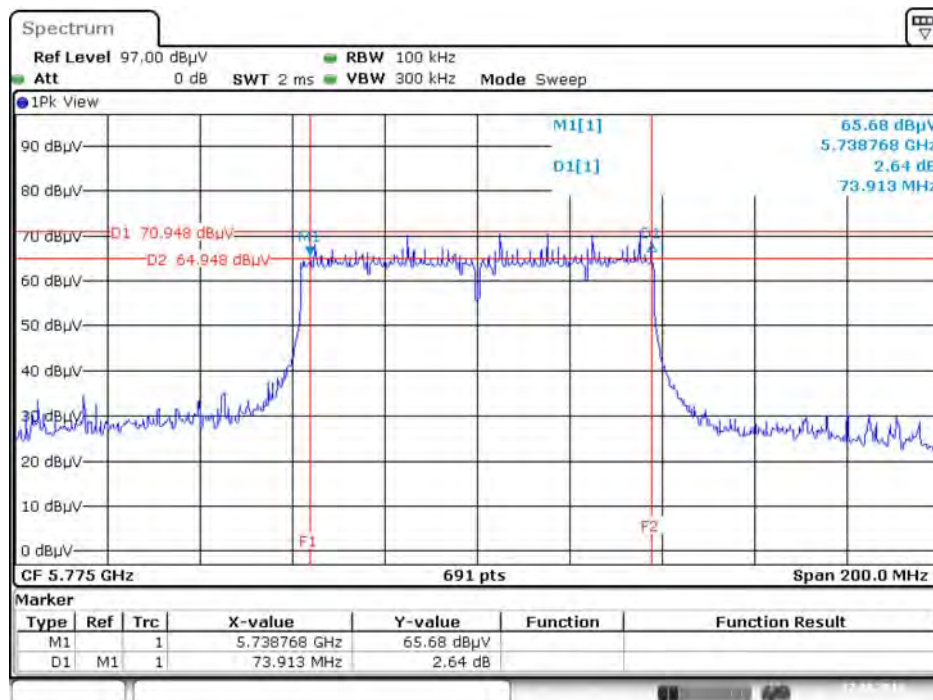
6 dB Bandwidth Plot on Chain 3 + Chain 4 / 5690 MHz



Date: 17.AUG.2016 11:33:09

Type 2

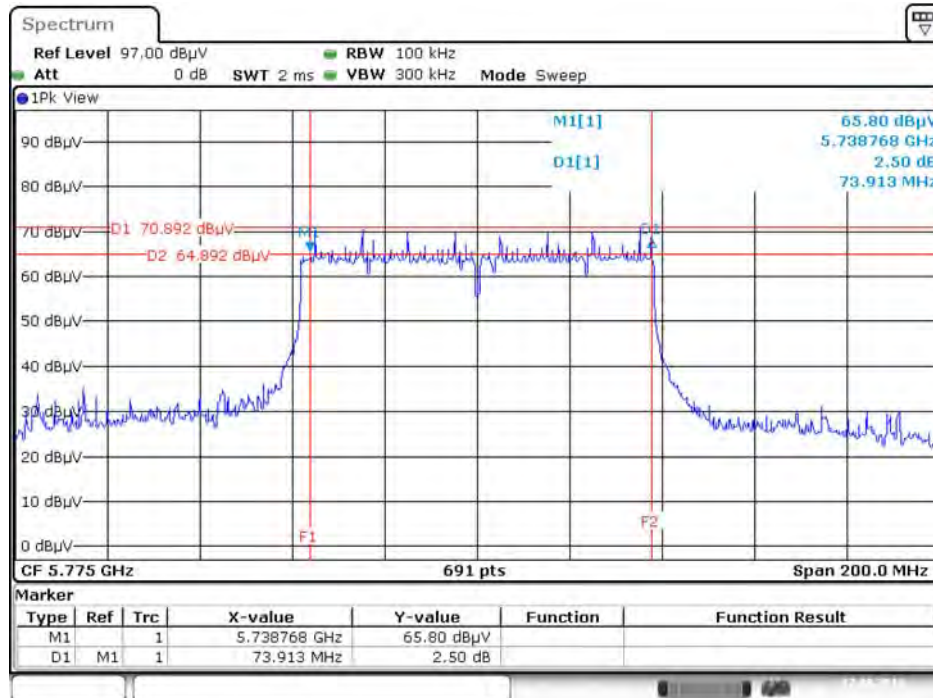
6 dB Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 17.AUG.2016 11:31:19

Type 3

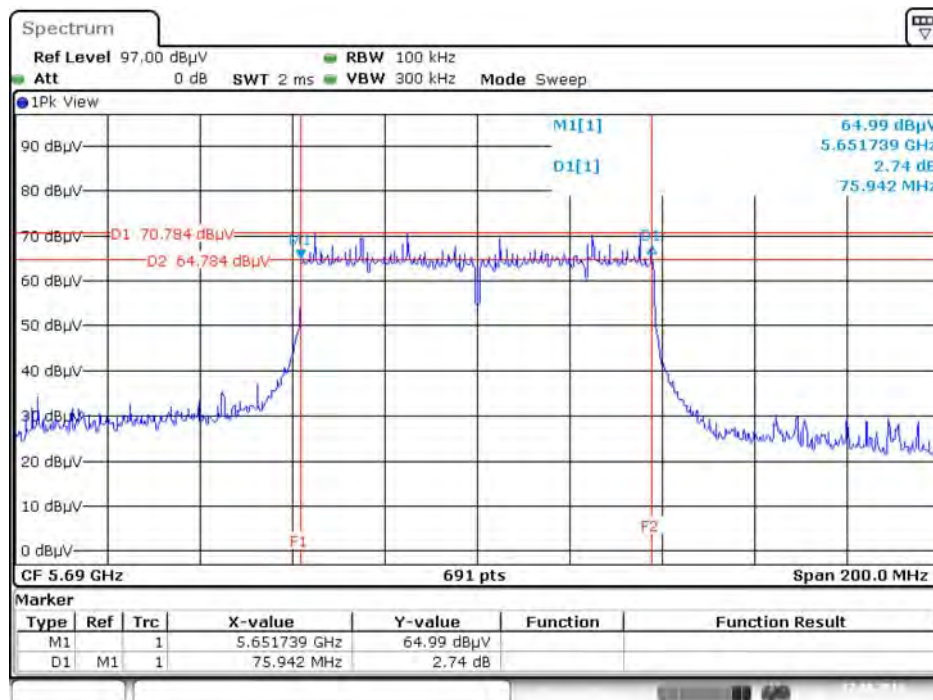
6 dB Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 17.AUG.2016 11:31:33

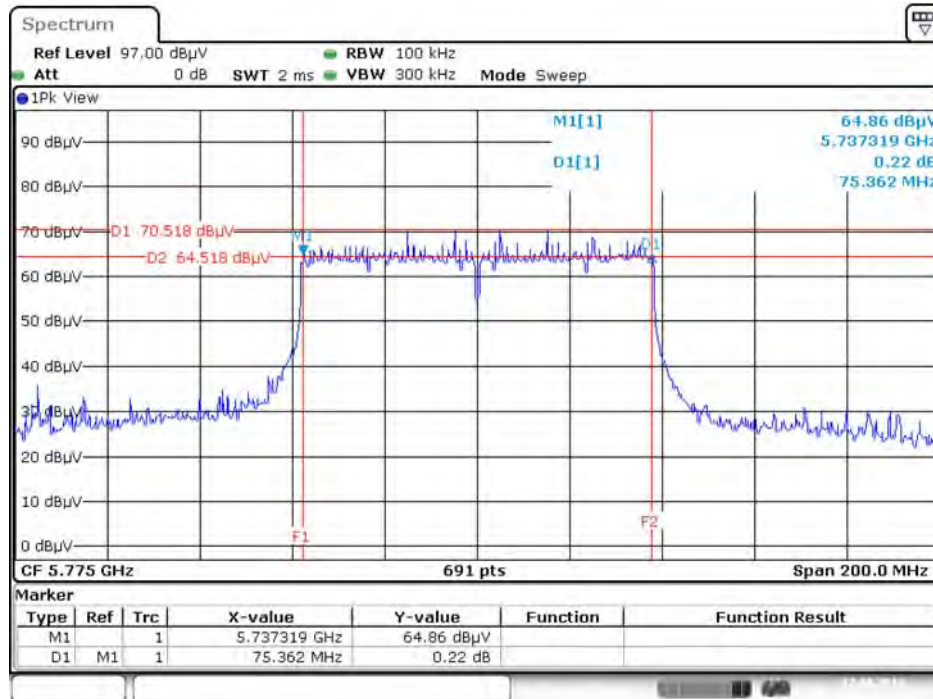
Type 4

6 dB Bandwidth Plot on Chain 1 + Chain 2 / 5690 MHz



Date: 17.AUG.2016 11:32:28

6 dB Bandwidth Plot on Chain 3 + Chain 4 / 5775 MHz



Date: 17.AUG.2016 11:31:58

4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

Frequency Band	Limit
<input checked="" type="checkbox"/> 5.470-5.725 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
<input checked="" type="checkbox"/> 5.725~5.85 GHz	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

4.4.2. Measuring Instruments and Setting

For other channel

Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

For straddle channel

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1000 kHz
VBW	3000 kHz
Detector	RMS
Trace	Average Sweep count 100
Sweep Time	Auto

4.4.3. Test Procedures

For other channel

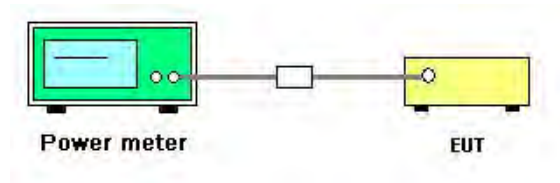
1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01r04 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

For straddle channel

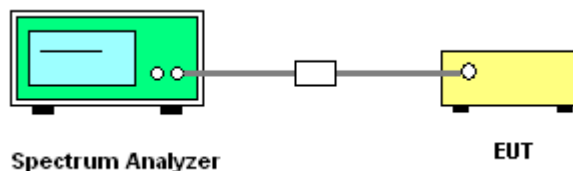
1. The transmitter output (antenna port) was connected to the spectrum analyzer.

4.4.4. Test Setup Layout

For other channel



For straddle channel



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Maximum Conducted Output Power

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11a	5500 MHz	11.78	12.08	12.16	12.61	18.19	23.34	Complies
	5580 MHz	11.69	12.09	11.95	12.59	18.11	23.42	Complies
	5700 MHz	12.05	12.24	11.72	12.53	18.17	23.36	Complies
	5745 MHz	22.56	22.89	23.04	23.54	29.04	30.00	Complies
	5785 MHz	22.07	22.83	23.47	22.43	28.75	30.00	Complies
	5825 MHz	22.34	23.12	23.93	22.45	29.03	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5500 MHz	12.05	12.11	12.57	12.32	18.29	23.62	Complies
	5580 MHz	12.02	12.24	12.64	12.35	18.34	23.68	Complies
	5700 MHz	12.04	12.38	12.75	12.16	18.36	23.62	Complies
	5745 MHz	22.05	22.31	22.97	22.36	28.46	30.00	Complies
	5785 MHz	21.66	22.74	23.18	22.31	28.53	30.00	Complies
	5825 MHz	22.13	22.89	23.93	22.37	28.91	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5510 MHz	13.43	13.67	14.21	13.86	19.82	23.98	Complies
	5550 MHz	14.82	15.05	15.66	15.13	21.20	23.98	Complies
	5670 MHz	14.74	14.85	15.45	14.98	21.03	23.98	Complies
	5755 MHz	20.85	21.33	21.96	21.27	27.39	30.00	Complies
	5795 MHz	21.94	22.75	23.37	22.36	28.66	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5530 MHz	13.25	14.26	14.28	13.58	19.89	23.98	Complies
	5610 MHz	16.22	16.71	16.94	16.45	22.61	23.98	Complies
	5775 MHz	17.17	17.74	18.18	17.65	23.72	30.00	Complies

Note:

For 802.11a:

5500 MHz Power limit=23.98dBm or $11 + 10\log(B)$; $11 + 10\log(17.13) - (6-6) = 23.34\text{dBm} < 23.98\text{dBm}$, so
limit=23.34dBm.

5580 MHz Power limit=23.98dBm or $11 + 10\log(B)$; $11 + 10\log(17.48) - (6-6) = 23.42\text{dBm} < 23.98\text{dBm}$, so
limit=23.42dBm.

5700 MHz Power limit=23.98dBm or $11 + 10\log(B)$; $11 + 10\log(17.22) - (6-6) = 23.36\text{dBm} < 23.98\text{dBm}$, so
limit=23.36dBm.

For 802.11ac VHT20:

5500 MHz Power limit=23.98dBm or $11 + 10\log(B)$; $11 + 10\log(18.26) - (6-6) = 23.62\text{dBm} < 23.98\text{dBm}$, so
limit=23.62dBm.

5580 MHz Power limit=23.98dBm or $11 + 10\log(B)$; $11 + 10\log(18.52) - (6-6) = 23.68\text{dBm} < 23.98\text{dBm}$, so
limit=23.68dBm.

5700 MHz Power limit=23.98dBm or $11 + 10\log(B)$; $11 + 10\log(18.26) - (6-6) = 23.62\text{dBm} < 23.98\text{dBm}$, so
limit=23.62dBm.

Straddle Channel

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11a	5720 MHz (UNII 2C)	10.40	10.78	10.37	11.16	16.71	23.98	Complies
	5720 MHz (UNII 3)	4.10	4.32	4.11	4.76	10.35	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5720 MHz (UNII 2C)	10.63	11.00	10.72	11.64	17.04	23.98	Complies
	5720 MHz (UNII 3)	5.12	5.16	5.03	5.86	11.33	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz (UNII 2C)	14.33	14.57	14.28	15.21	20.63	23.98	Complies
	5710 MHz (UNII 3)	4.18	4.49	4.08	5.04	10.48	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz (UNII 2C)	17.27	17.66	17.64	18.49	23.81	23.98	Complies
	5690 MHz (UNII 3)	4.21	4.68	4.58	5.37	10.75	30.00	Complies

802.11ac MCS0/Nss2 VHT80+80

Type	Frequency	Conducted Power (dBm)						Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total	Band Total		
1	5530 MHz	13.62	13.88	-	-	16.76	19.77	23.98	Complies
	5690 MHz (UNII 2C)	-	-	13.37	14.08	16.75			
	5690 MHz (UNII 3)	-	-	-0.08	0.45	3.20	-	30.00	Complies
2	5530 MHz	13.74	13.86	-	-	16.81	-	23.98	Complies
	5775 MHz	-	-	14.13	14.42	17.29	-	30.00	Complies
3	5610 MHz	14.95	15.53	-	-	18.26	-	23.98	Complies
	5775 MHz	-	-	15.62	16.24	18.95	-	30.00	Complies
4	5690 MHz (UNII 2C)	15.08	15.11	-	-	18.11	-	23.98	Complies
	5690 MHz (UNII 3)	2.19	2.11	-	-	5.16	19.53	30.00	Complies
	5775 MHz	-	-	16.07	16.63	19.37			
5	5530 MHz	14.06	14.32	-	-	17.20	20.52	23.98	Complies
	5610 MHz	-	-	14.49	15.06	17.79			
6	5610 MHz	17.38	18.05	-	-	20.74	23.78	23.98	Complies
	5690 MHz (UNII 2C)	-	-	17.32	18.20	20.79			
	5690 MHz (UNII 3)	-	-	4.03	4.88	7.49	-	30.00	Complies

For beamforming mode

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	5500 MHz	10.75	11.19	11.21	11.63	17.23	17.96	Complies
	5580 MHz	10.83	11.36	11.17	11.91	17.36	17.96	Complies
	5700 MHz	10.95	11.67	10.81	11.47	17.26	17.96	Complies
	5745 MHz	16.71	17.31	17.05	17.64	23.21	23.98	Complies
	5785 MHz	16.85	17.35	17.13	17.95	23.36	23.98	Complies
	5825 MHz	16.81	17.48	17.18	18.07	23.43	23.98	Complies
802.11ac MCS0/Nss1 VHT40	5510 MHz	10.94	11.15	11.23	11.64	17.27	17.96	Complies
	5550 MHz	10.75	11.09	11.24	11.73	17.24	17.96	Complies
	5670 MHz	10.93	11.34	11.27	11.78	17.36	17.96	Complies
	5755 MHz	17.46	16.78	17.55	17.93	23.47	23.98	Complies
	5795 MHz	16.79	17.18	17.63	17.56	23.32	23.98	Complies
802.11ac MCS0/Nss1 VHT80	5530 MHz	11.85	11.92	11.55	12.13	17.89	17.96	Complies
	5610 MHz	10.82	11.43	11.14	11.71	17.31	17.96	Complies
	5775 MHz	17.03	16.88	17.4	18.37	23.48	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi} > 6\text{dBi}$, so B3 limit = $23.98 - (12.02 - 6) = 17.96\text{dBm}$.

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi} > 6\text{dBi}$, so B4 limit = $30 - (12.02 - 6) = 23.98\text{dBm}$.

Straddle Channel

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	5720 MHz (UNII 2C)	10.09	10.81	10.29	10.95	16.57	16.77	Complies
	5720 MHz (UNII 3)	4.58	5.10	4.71	5.41	10.98	23.98	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz (UNII 2C)	10.86	11.53	10.75	11.52	17.20	17.96	Complies
	5710 MHz (UNII 3)	0.75	1.48	0.81	1.43	7.15	23.98	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz (UNII 2C)	10.74	11.08	11.48	11.45	17.22	17.96	Complies
	5690 MHz (UNII 3)	-2.53	-2.14	-1.52	-1.41	4.14	23.98	Complies

Note:

For 802.11ac VHT20:

5720 MHz (UNII 2C): Power limit=23.98dBm or $11 + 10\log(B)$; $11 + 10\log(15.09) - (12.02 - 6) = 16.77\text{dBm} < 23.98\text{dBm}$,
so power limit=16.77dBm.

$$\text{For (UNII 2C): } \textit{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi} > 6\text{dBi}, \text{ so limit} = 23.98 - (12.02 - 6) = 17.96\text{dBm}.$$

$$\text{For (UNII 3): } \textit{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi} > 6\text{dBi}, \text{ so limit} = 30 - (12.02 - 6) = 23.98\text{dBm}.$$

802.11ac MCS0/Nss2 VHT80+80

Type	Frequency	Conducted Power (dBm)						Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total	Band Total		
1	5530 MHz	14.55	14.39	-	-	17.48	20.68	20.97	Complies
	5690 MHz (UNII 2C)	-	-	14.73	14.96	17.86			
	5690 MHz (UNII 3)	-	-	0.81	0.58	3.71	-	26.99	Complies
2	5530 MHz	14.37	14.09	-	-	17.24	-	20.97	Complies
	5775 MHz	-	-	14.93	15.51	18.24	-	26.99	Complies
3	5610 MHz	14.87	14.20	-	-	17.56	-	20.97	Complies
	5775 MHz	-	-	14.81	15.66	18.27	18.40	26.99	Complies
4	5690 MHz (UNII 2C)	14.69	14.94	-	-	17.83	-	20.97	Complies
	5690 MHz (UNII 3)	0.73	0.59	-	-	3.67	18.40	26.99	Complies
	5775 MHz	-	-	14.86	15.59	18.25			
5	5530 MHz	14.77	13.82	-	-	17.33	20.87	20.97	Complies
	5610 MHz	-	-	15.08	15.56	18.34			

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01 \text{ dBi} > 6 \text{ dBi}$, so limit = $23.98 - (9.01 - 6) = 20.97 \text{ dBm}$.

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01 \text{ dBi} > 6 \text{ dBi}$, so limit = $30 - (9.01 - 6) = 26.99 \text{ dBm}$.

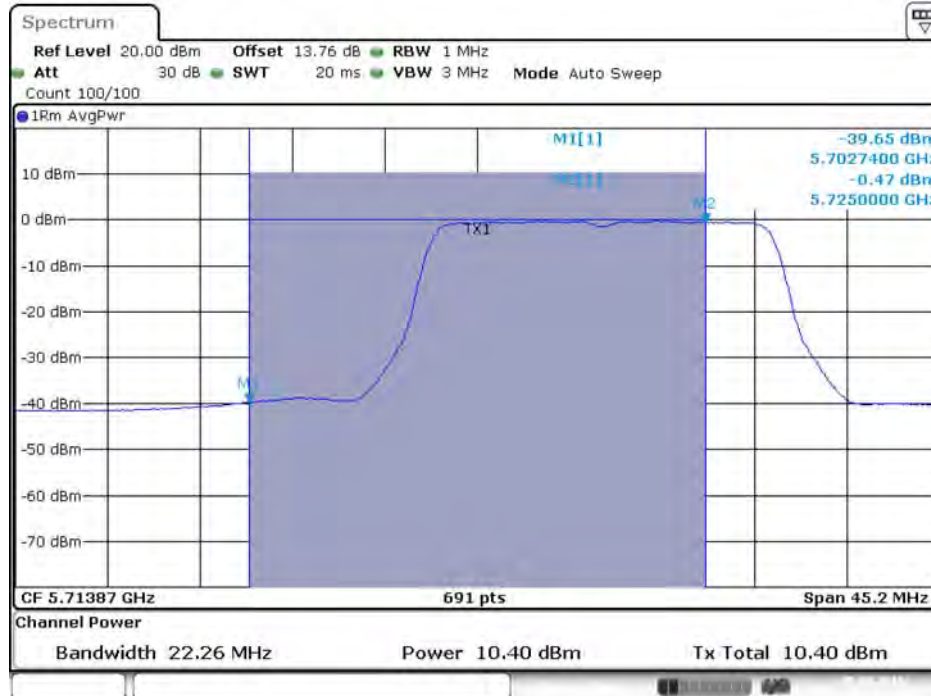
Note: All the test values were listed in the report.

For plots, only the channel with worse result was shown.

For non-beamforming mode

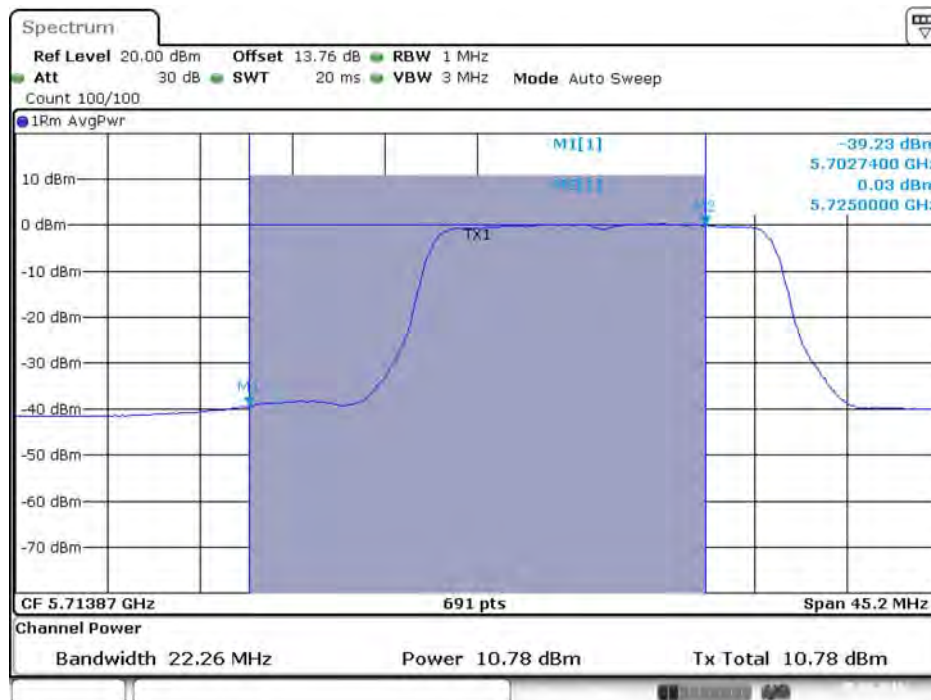
Straddle Channel

Conducted Output Power Plot on Configuration IEEE 802.11a / Chain 1 / 5720 MHz (UNII 2C)



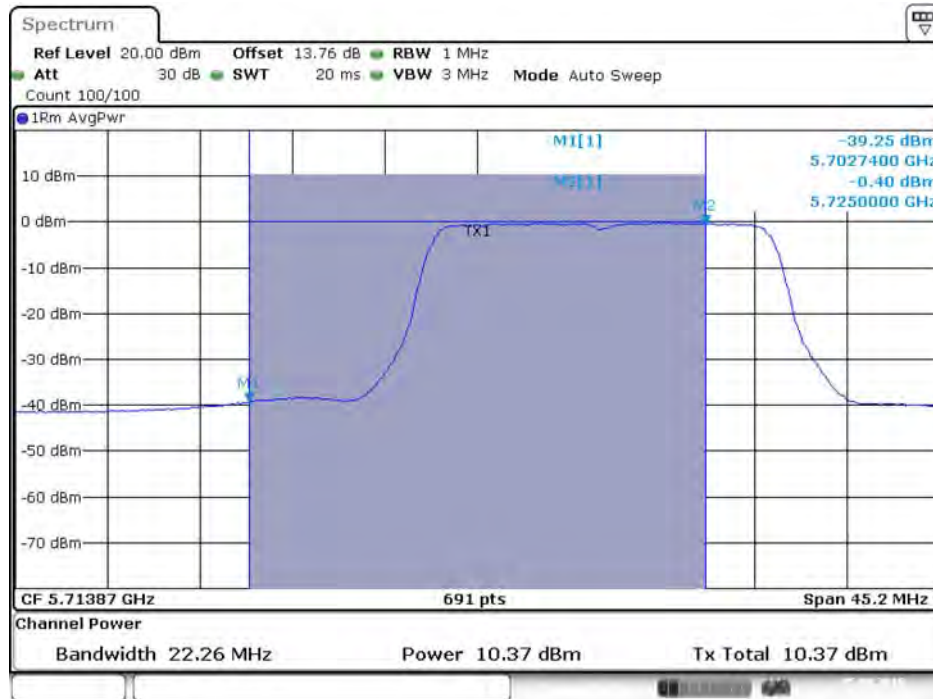
Date: 5.AUG.2016 14:21:33

Conducted Output Power Plot on Configuration IEEE 802.11a / Chain 2 / 5720 MHz (UNII 2C)



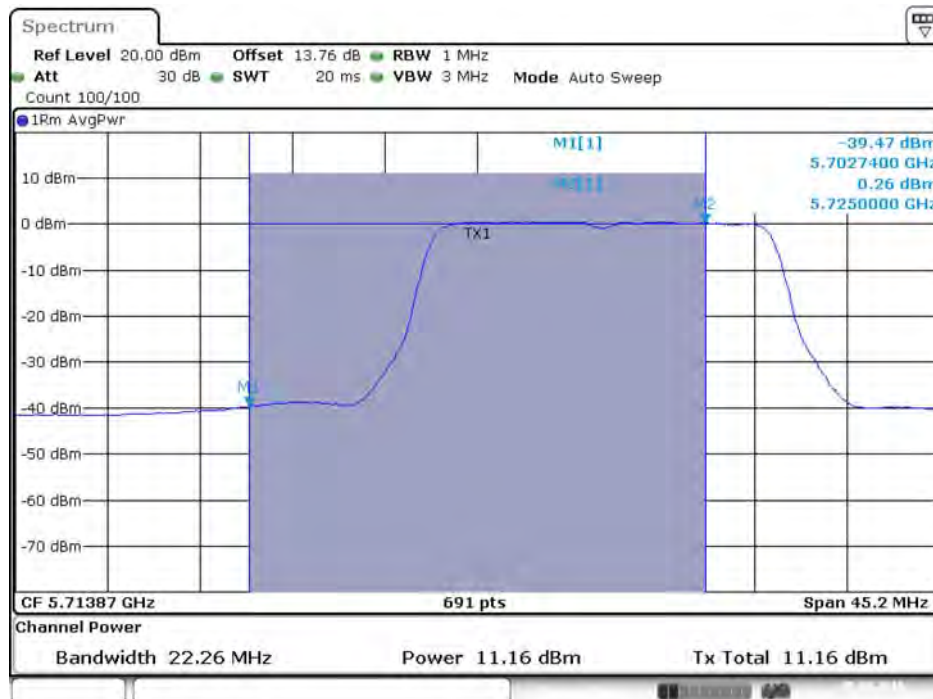
Date: 5.AUG.2016 14:21:40

Conducted Output Power Plot on Configuration IEEE 802.11a / Chain 3 / 5720 MHz (UNII 2C)



Date: 5.AUG.2016 14:21:47

Conducted Output Power Plot on Configuration IEEE 802.11a / Chain 4 / 5720 MHz (UNII 2C)



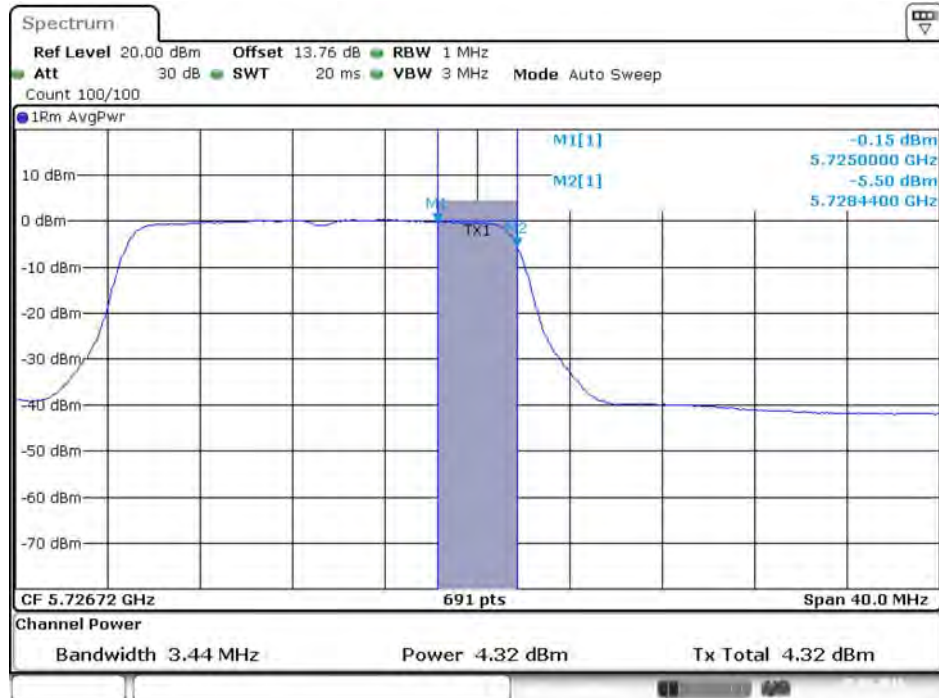
Date: 5.AUG.2016 14:21:54

Conducted Output Power Plot on Configuration IEEE 802.11a / Chain 1 / 5720 MHz (UNII 3)



Date: 5.AUG.2016 14:21:36

Conducted Output Power Plot on Configuration IEEE 802.11a / Chain 2 / 5720 MHz (UNII 3)



Date: 5.AUG.2016 14:21:43

Conducted Output Power Plot on Configuration IEEE 802.11a / Chain 3 / 5720 MHz (UNII 3)



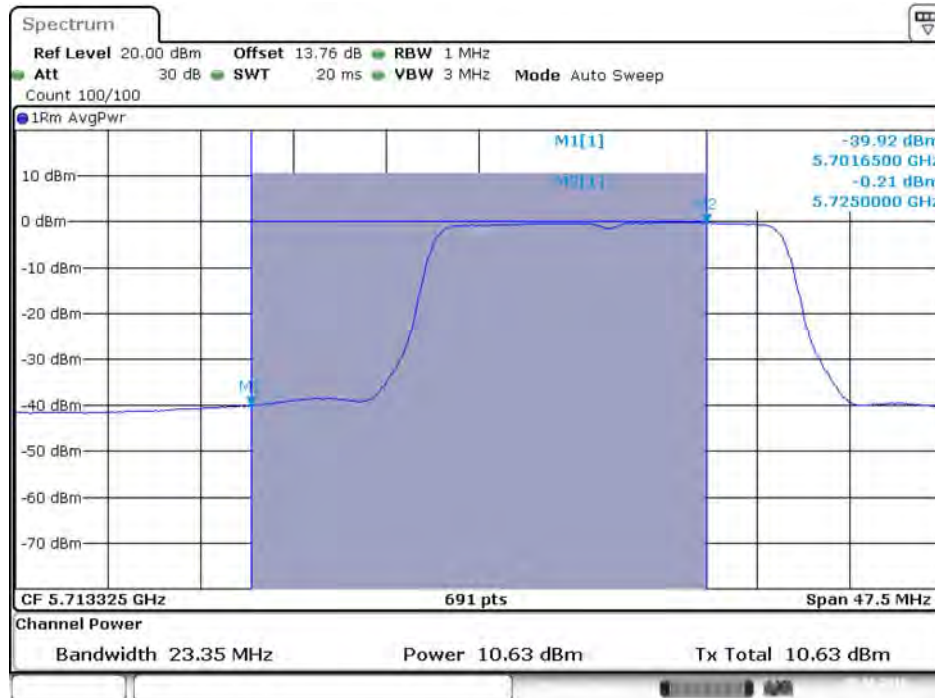
Date: 5.AUG.2016 14:21:50

Conducted Output Power Plot on Configuration IEEE 802.11a / Chain 4 / 5720 MHz (UNII 3)



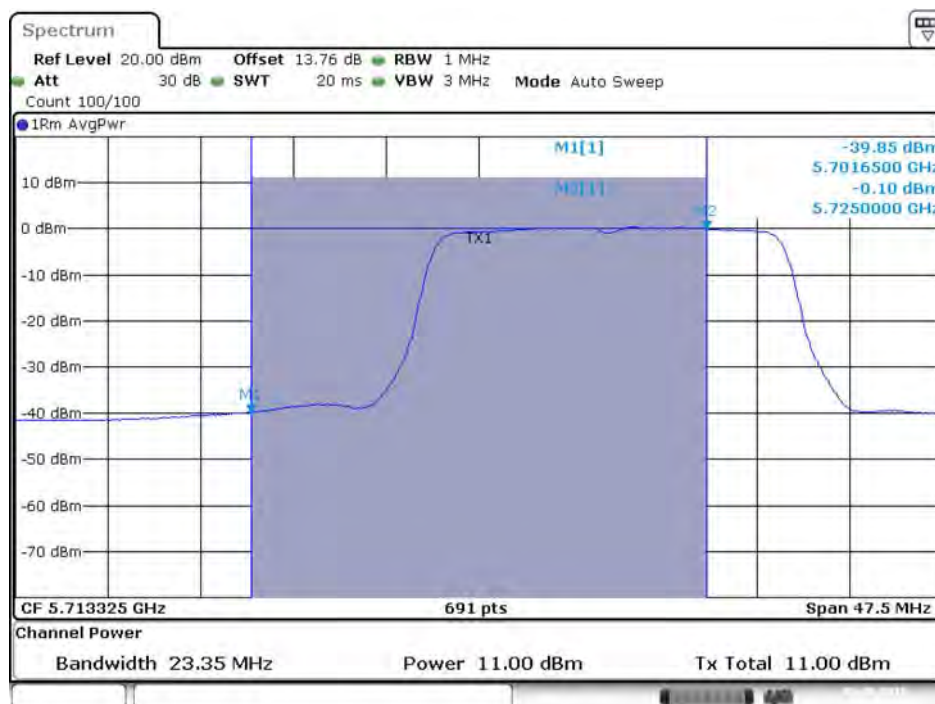
Date: 5.AUG.2016 14:21:57

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5720 MHz (UNII 2C)



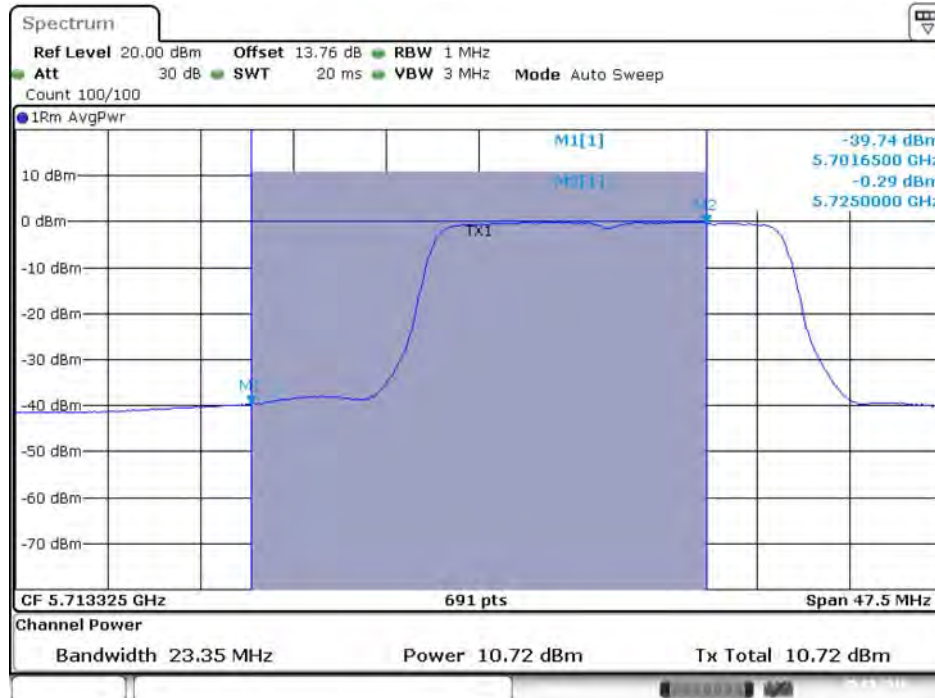
Date: 5.AUG.2016 14:27:37

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5720 MHz (UNII 2C)



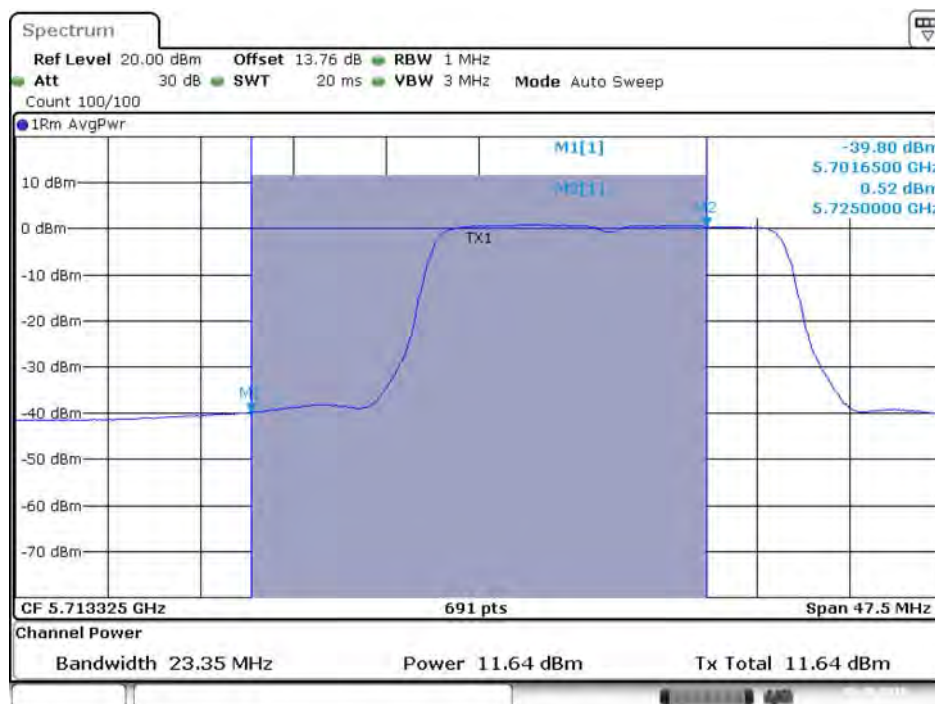
Date: 5.AUG.2016 14:27:45

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5720 MHz (UNII 2C)



Date: 5.AUG.2016 14:27:52

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 / 5720 MHz (UNII 2C)



Date: 5.AUG.2016 14:27:59

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5720 MHz (UNII 3)



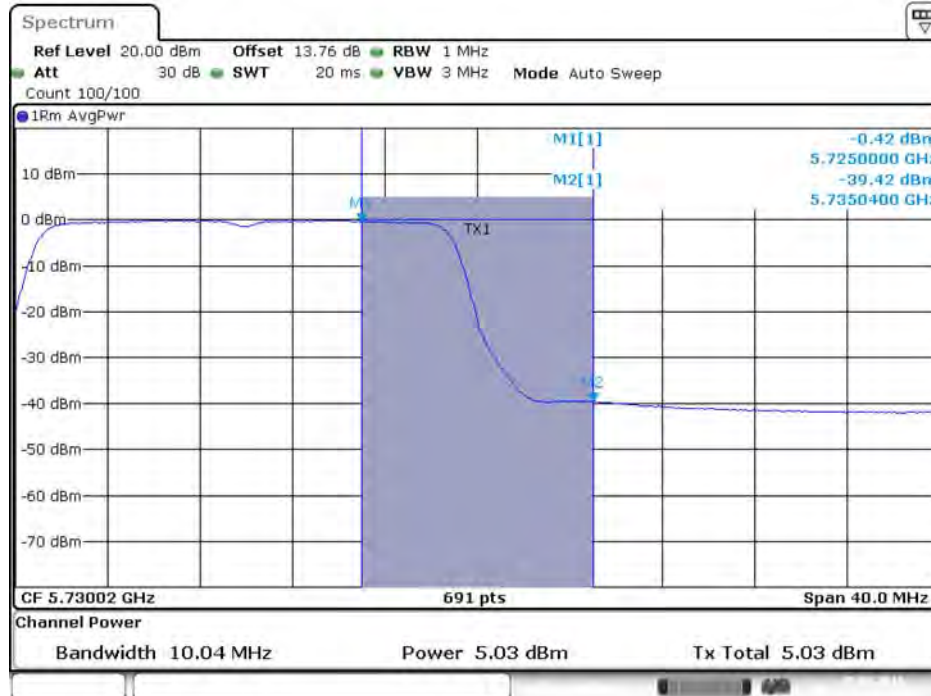
Date: 5.AUG.2016 14:27:41

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5720 MHz (UNII 3)



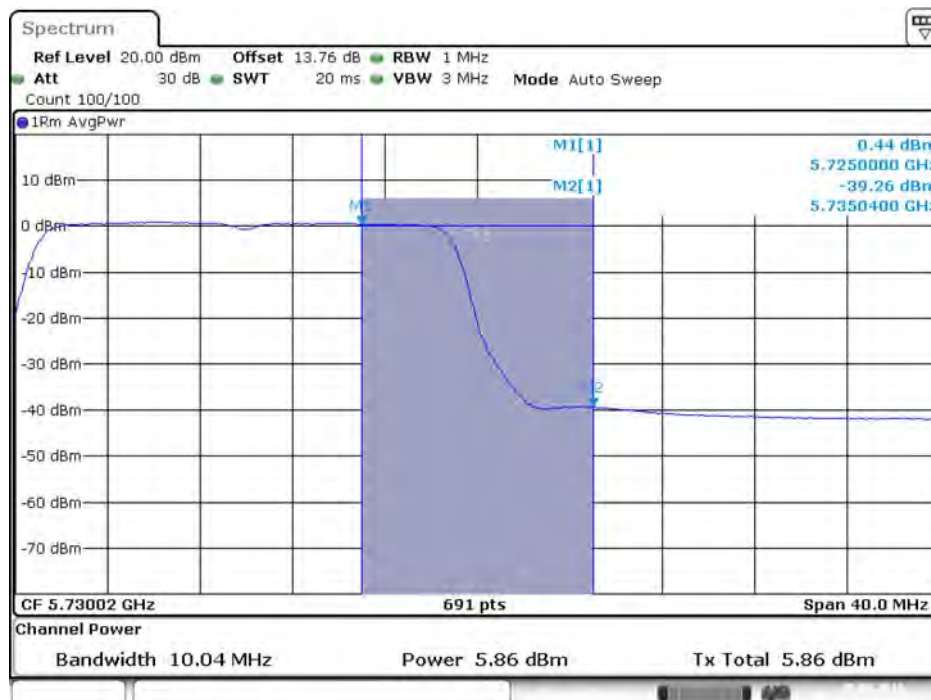
Date: 5.AUG.2016 14:27:48

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5720 MHz (UNII 3)



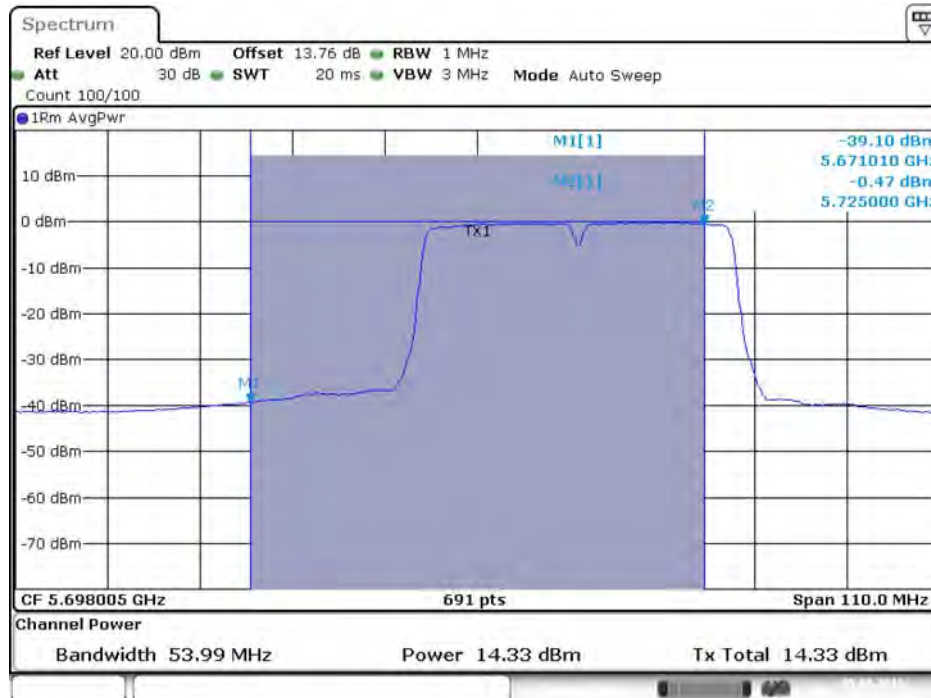
Date: 5.AUG.2016 14:27:55

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 / 5720 MHz (UNII 3)



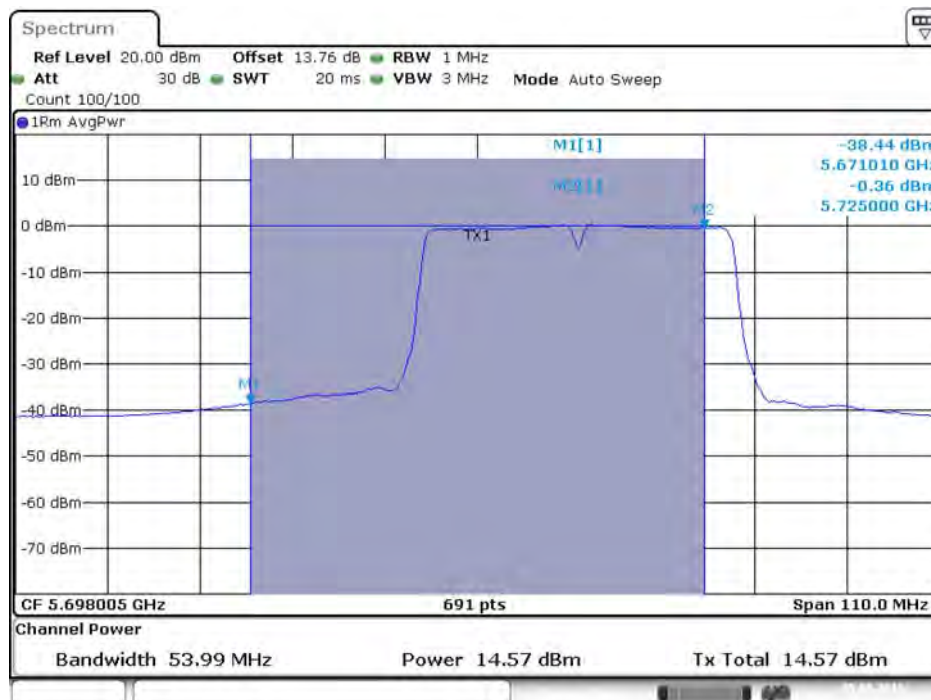
Date: 5.AUG.2016 14:28:02

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5710 MHz (UNII 2C)



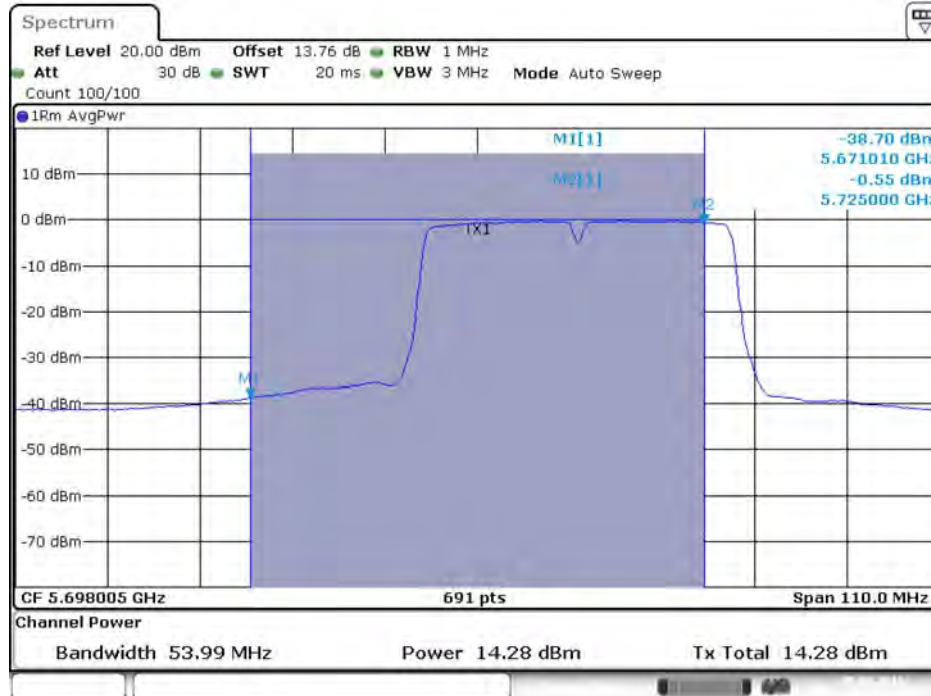
Date: 5.AUG.2016 14:39:10

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5710 MHz (UNII 2C)



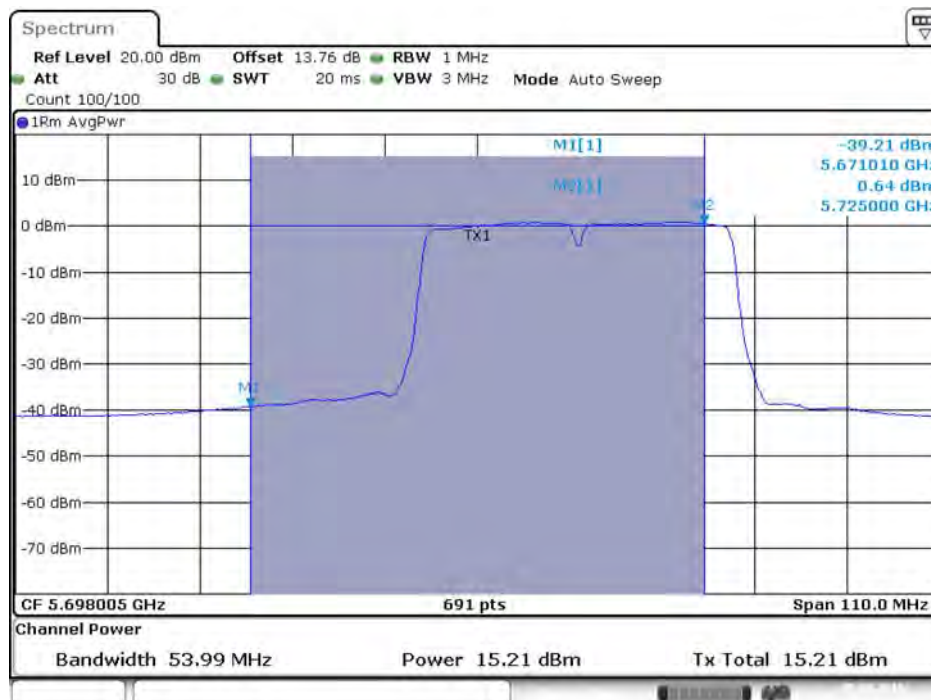
Date: 5.AUG.2016 14:39:17

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5710 MHz (UNII 2C)



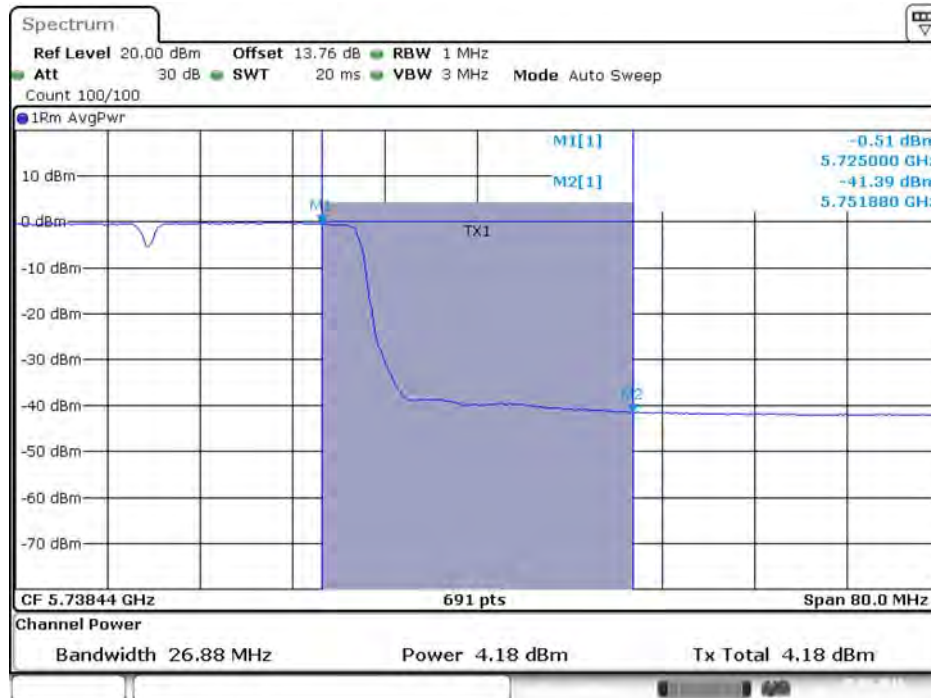
Date: 5.AUG.2016 14:39:24

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 / 5710 MHz (UNII 2C)



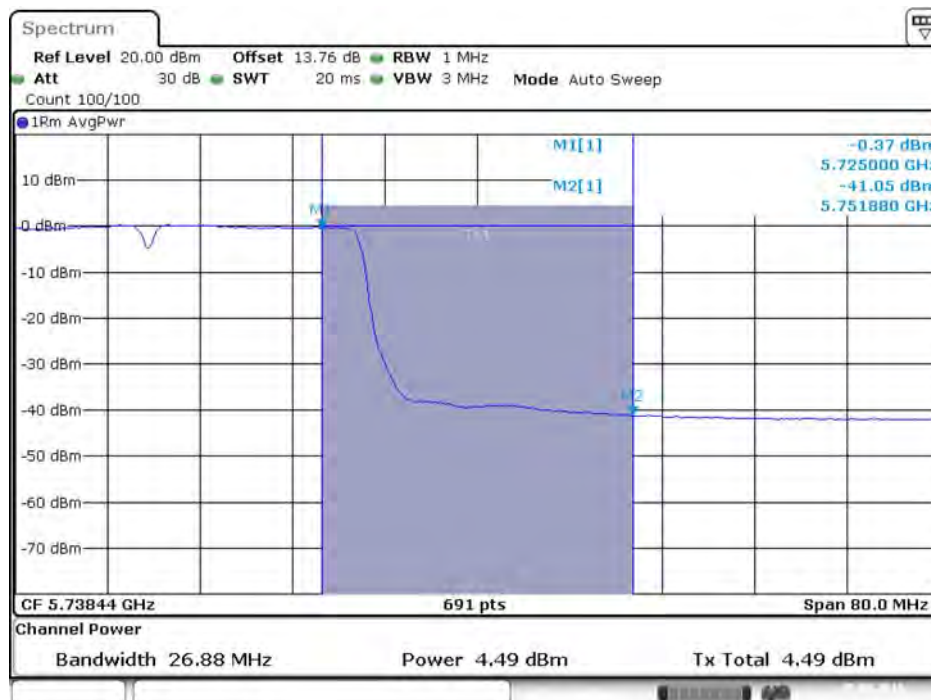
Date: 5.AUG.2016 14:39:31

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5710 MHz (UNII 3)



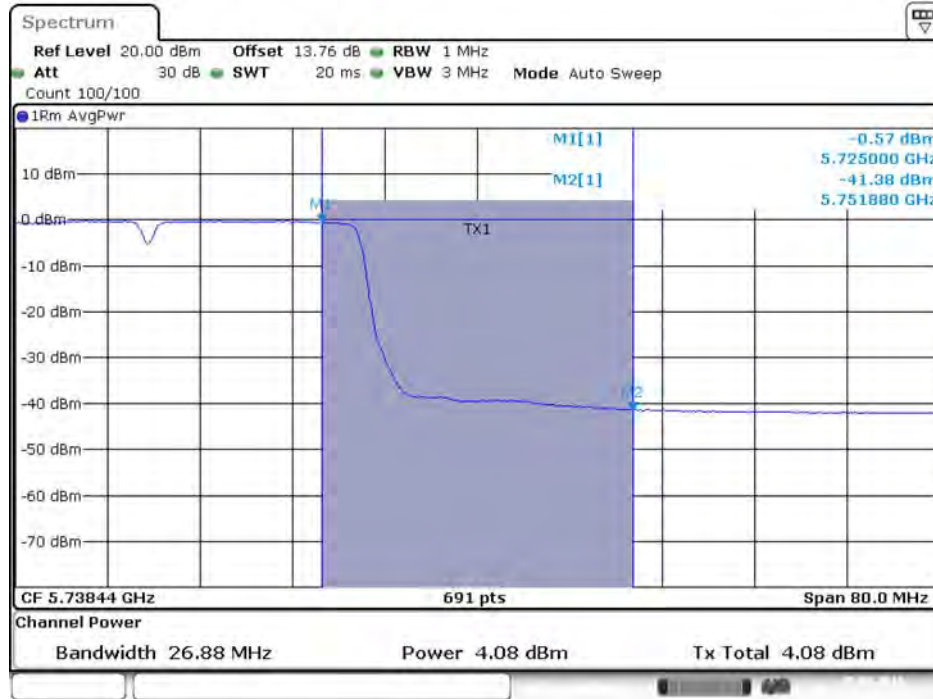
Date: 5.AUG.2016 14:39:13

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5710 MHz (UNII 3)



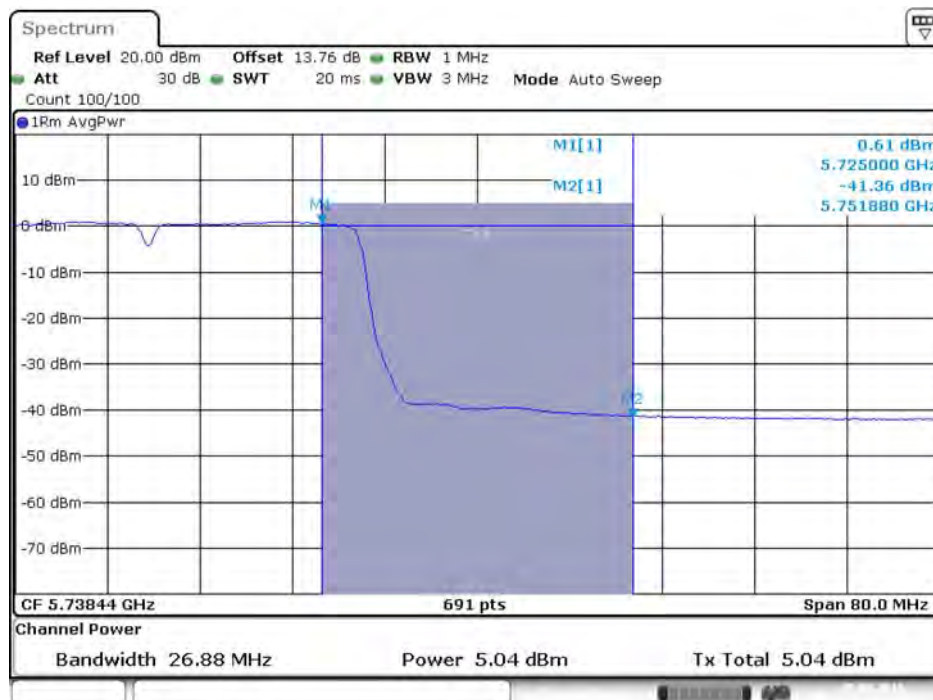
Date: 5.AUG.2016 14:39:20

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5710 MHz (UNII 3)



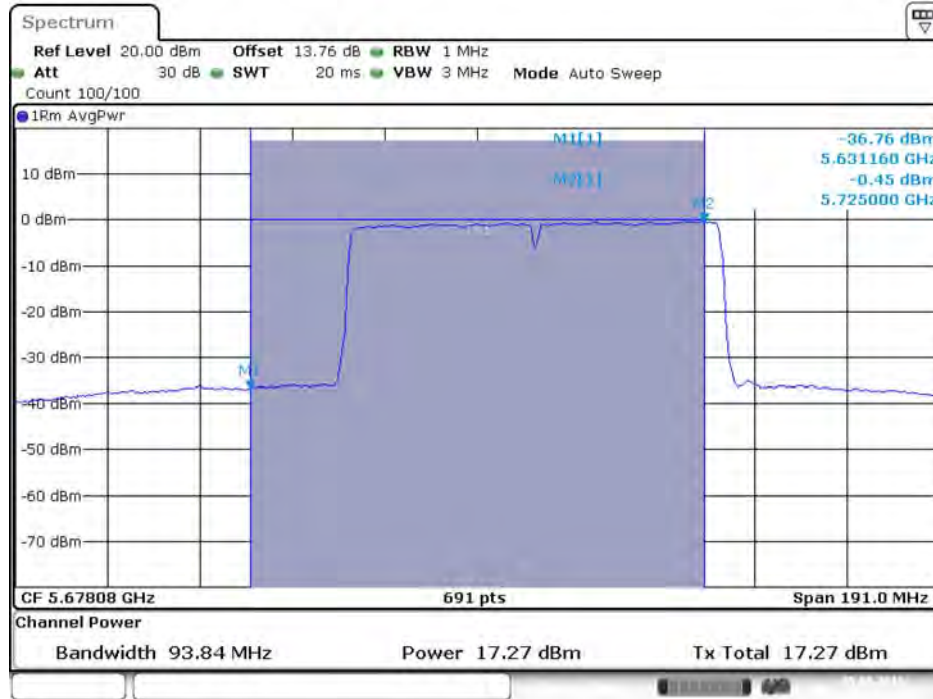
Date: 5.AUG.2016 14:39:27

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 / 5710 MHz (UNII 3)



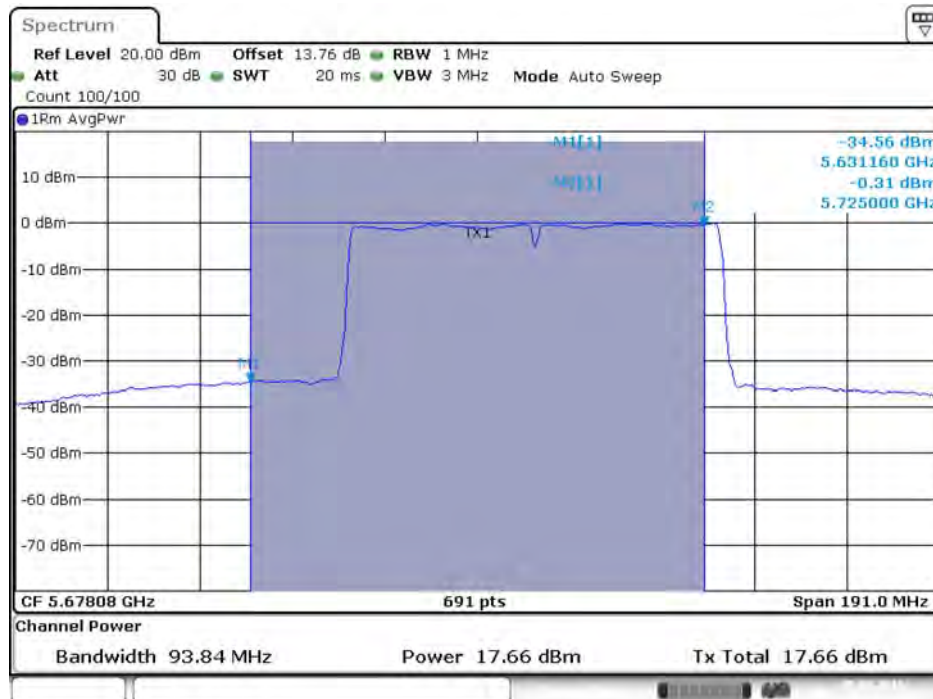
Date: 5.AUG.2016 14:39:34

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5690 MHz (UNII 2C)



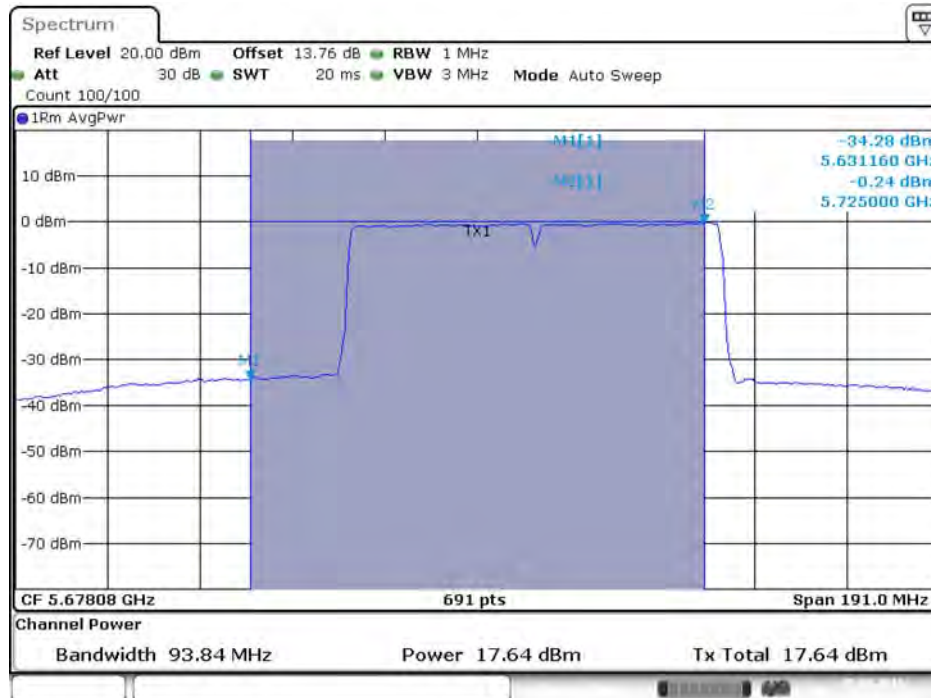
Date: 5.AUG.2016 14:49:31

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5690 MHz (UNII 2C)



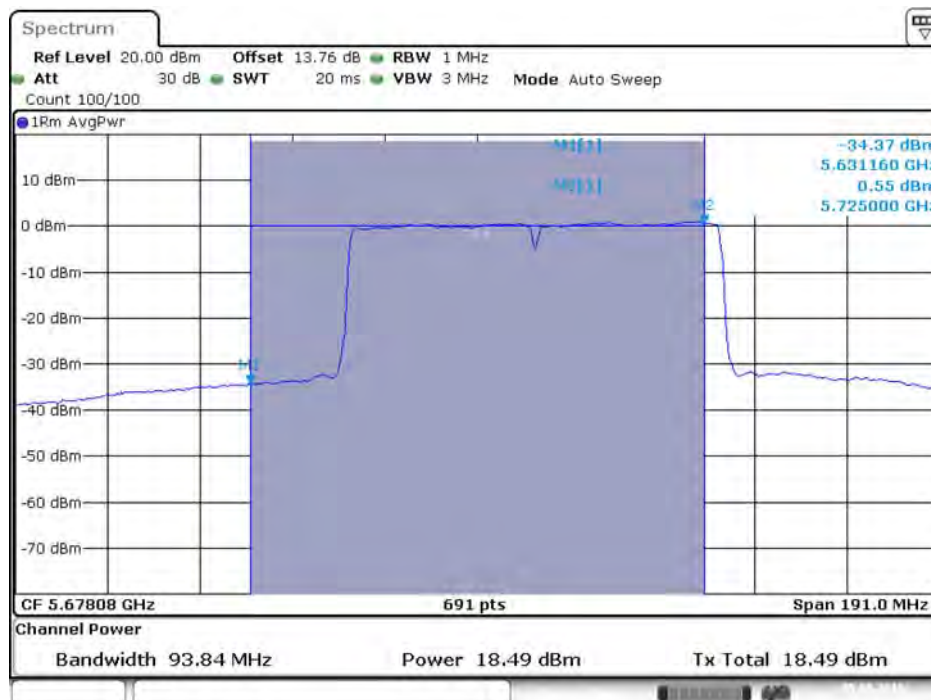
Date: 5.AUG.2016 14:49:38

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 / 5690 MHz (UNII 2C)



Date: 5.AUG.2016 14:49:46

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 / 5690 MHz (UNII 2C)



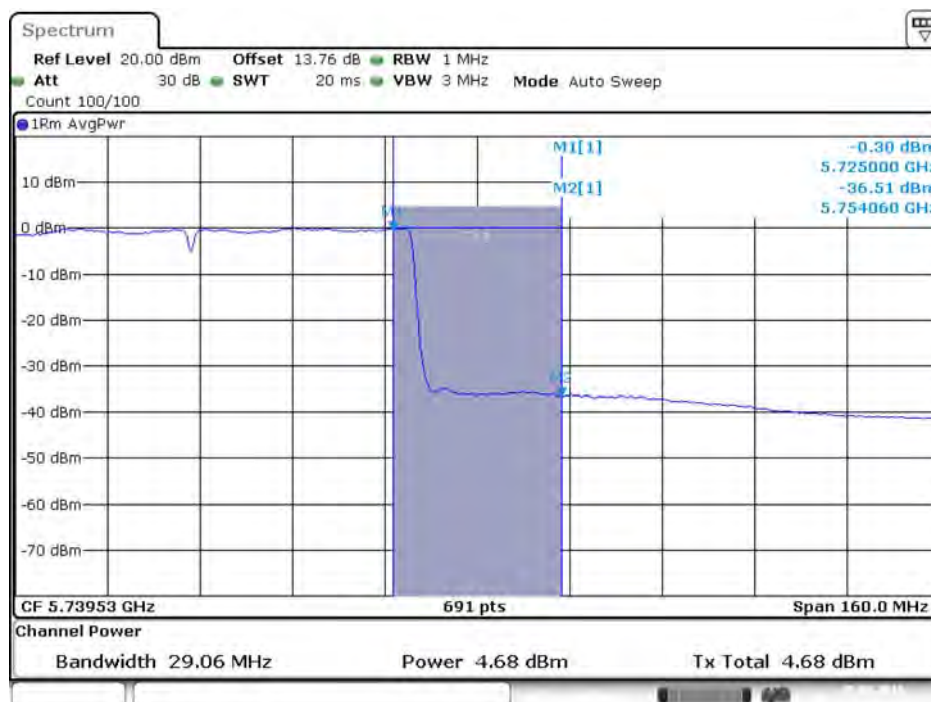
Date: 5.AUG.2016 14:49:53

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5690 MHz (UNII 3)



Date: 5.AUG.2016 14:49:34

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5690 MHz (UNII 3)



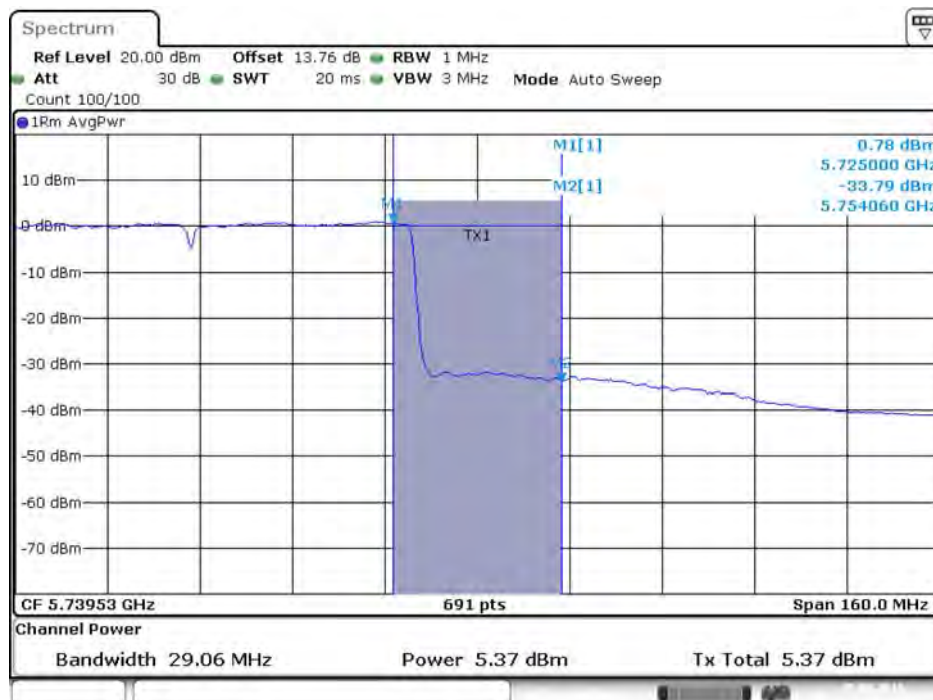
Date: 5.AUG.2016 14:49:42

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 / 5690 MHz (UNII 3)



Date: 5.AUG.2016 14:49:49

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 / 5690 MHz (UNII 3)



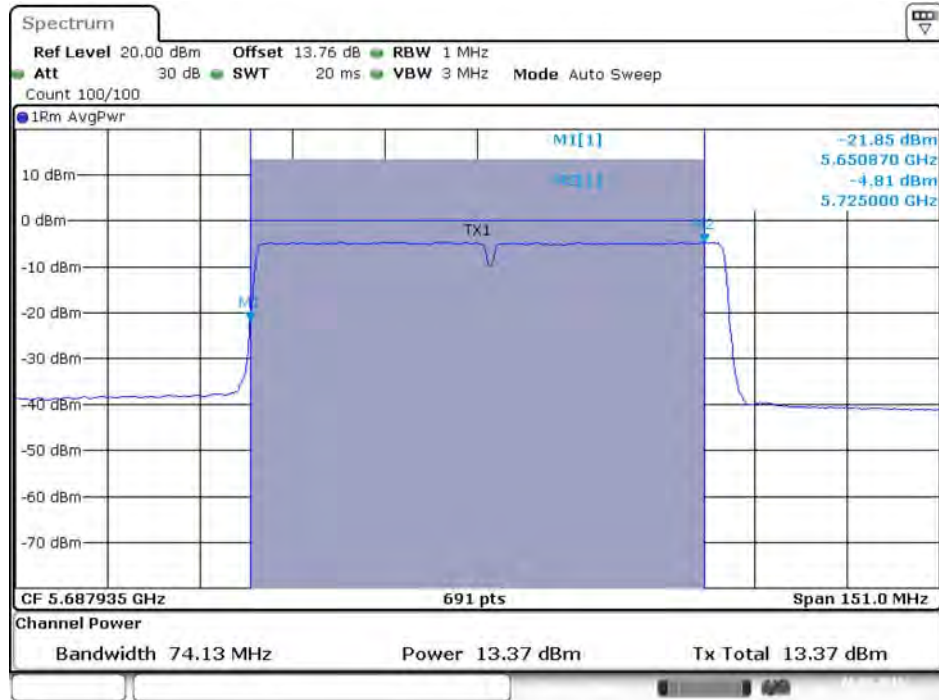
Date: 5.AUG.2016 14:49:56

802.11ac MCS0/Nss2 VHT80+80

Straddle Channel

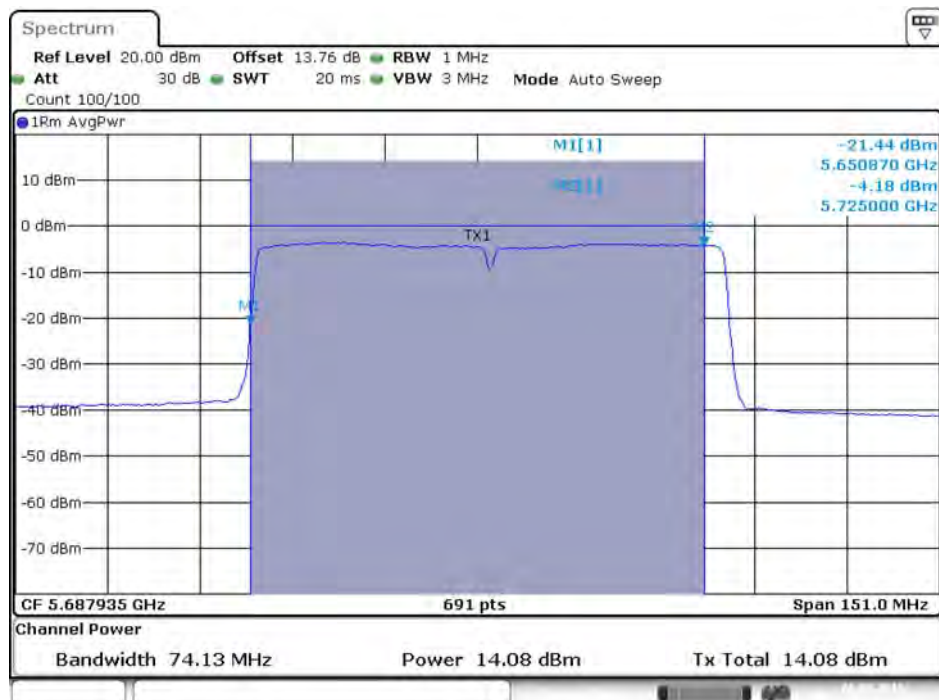
Type 1

Conducted Output Power Plot on Chain 3 / 5690 MHz (UNII 2C)



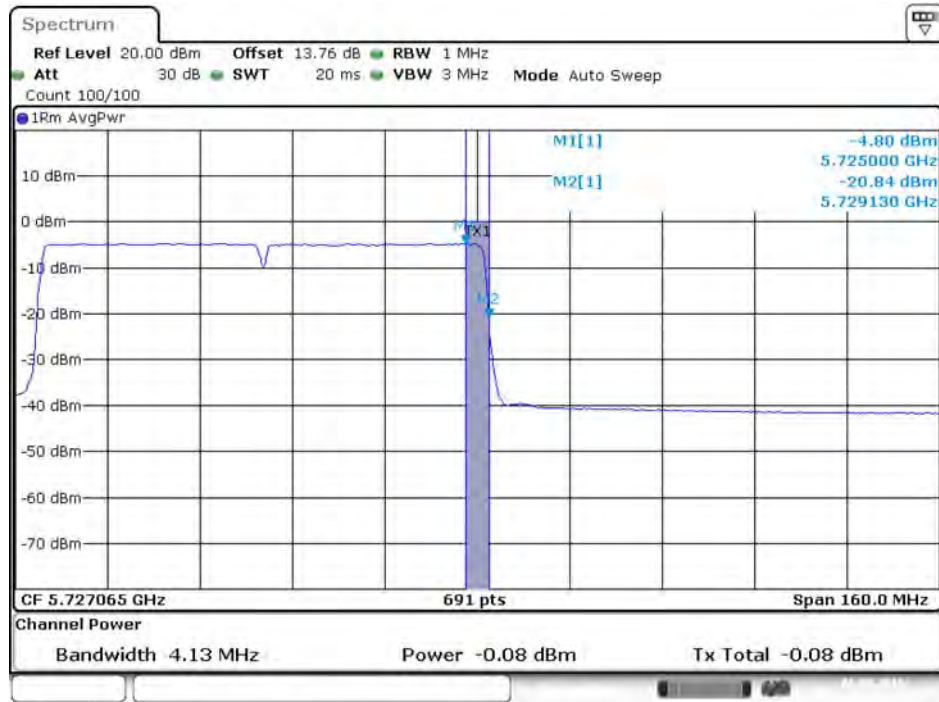
Date: 6.AUG.2016 11:26:25

Conducted Output Power Plot on Chain 4 / 5690 MHz (UNII 2C)



Date: 6.AUG.2016 11:26:32

Conducted Output Power Plot on Chain 3 / 5690 MHz (UNII 3)



Date: 6.AUG.2016 11:26:28

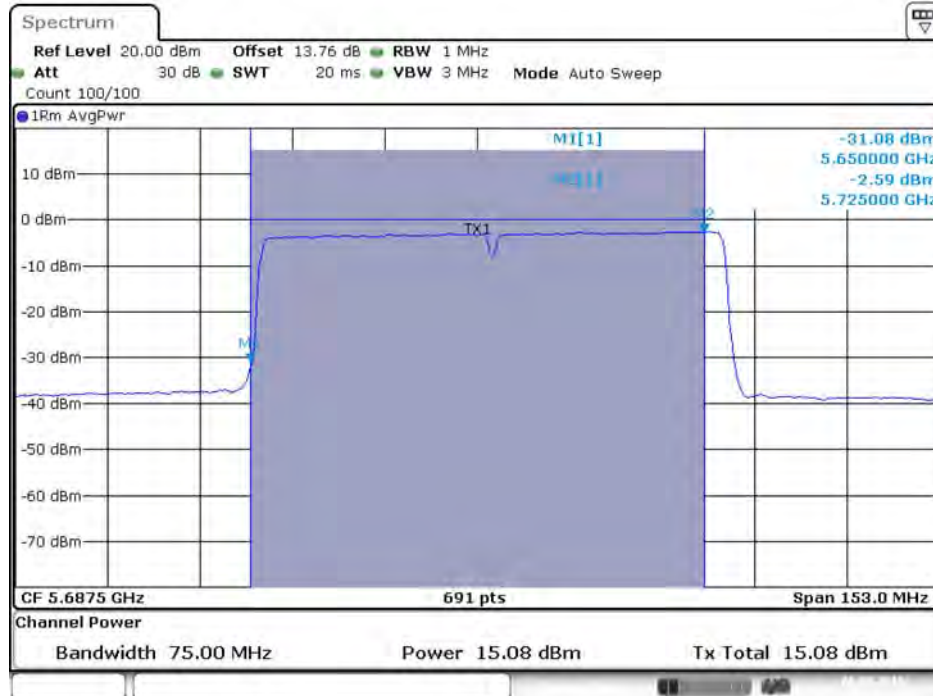
Conducted Output Power Plot on Chain 4 / 5690 MHz (UNII 3)



Date: 6.AUG.2016 11:26:35

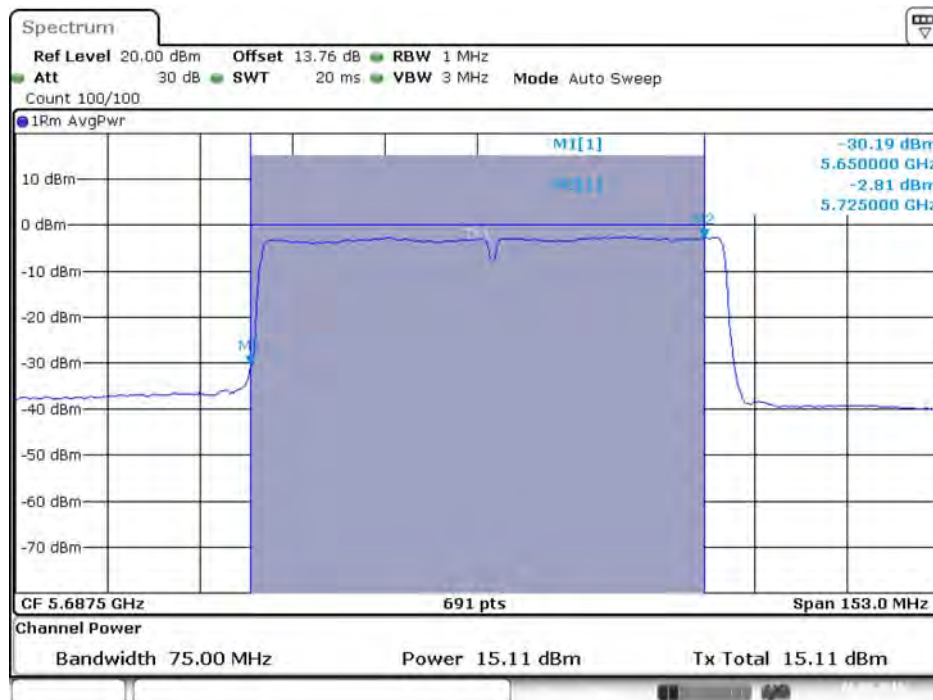
Type 4

Conducted Output Power Plot on Chain 1 / 5690 MHz (UNII 2C)



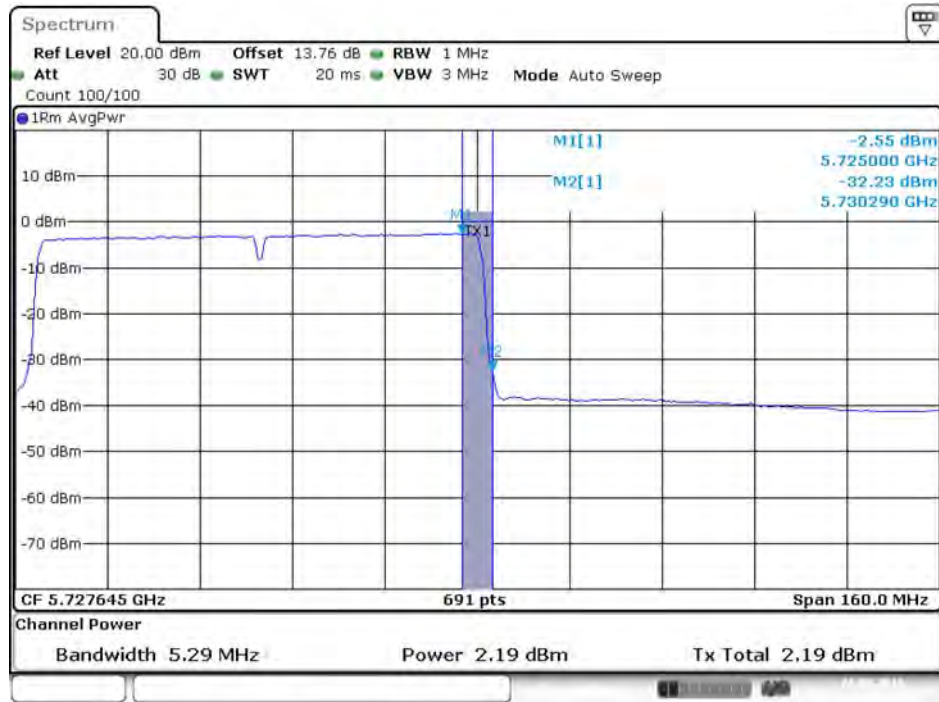
Date: 6.AUG.2016 11:44:52

Conducted Output Power Plot on Chain 2 / 5690 MHz (UNII 2C)



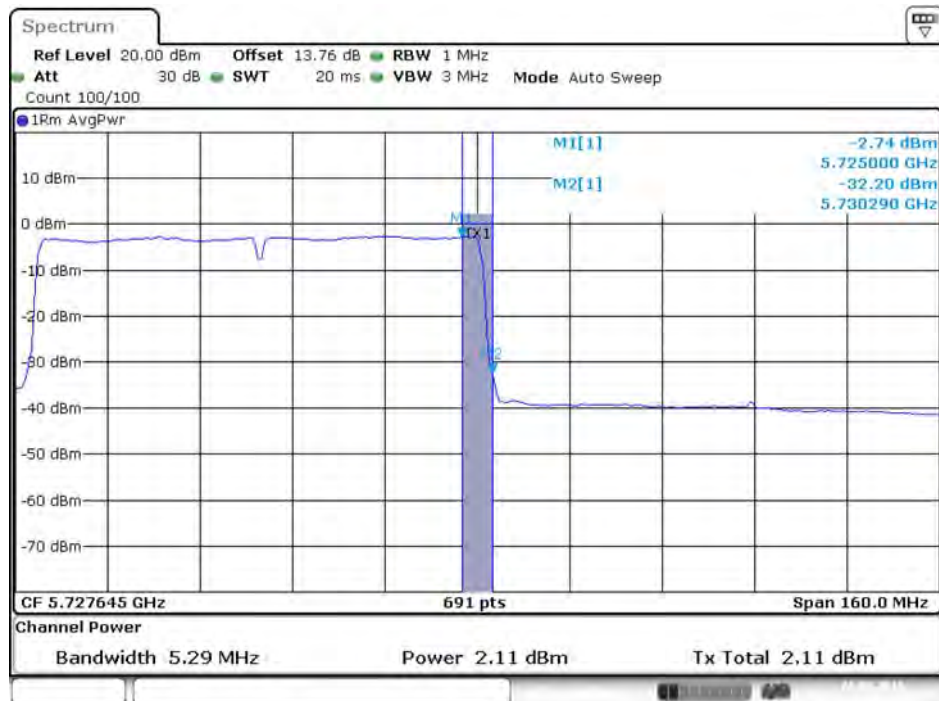
Date: 6.AUG.2016 11:44:59

Conducted Output Power Plot on Chain 1 / 5690 MHz (UNII 3)



Date: 6.AUG.2016 11:44:55

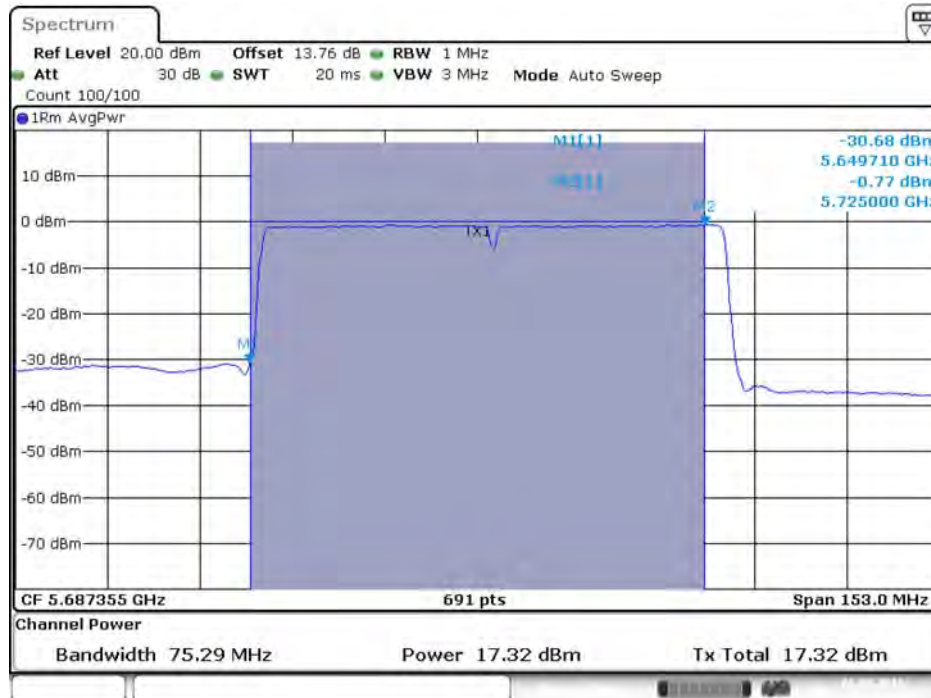
Conducted Output Power Plot on Chain 2 / 5690 MHz (UNII 3)



Date: 6.AUG.2016 11:45:02

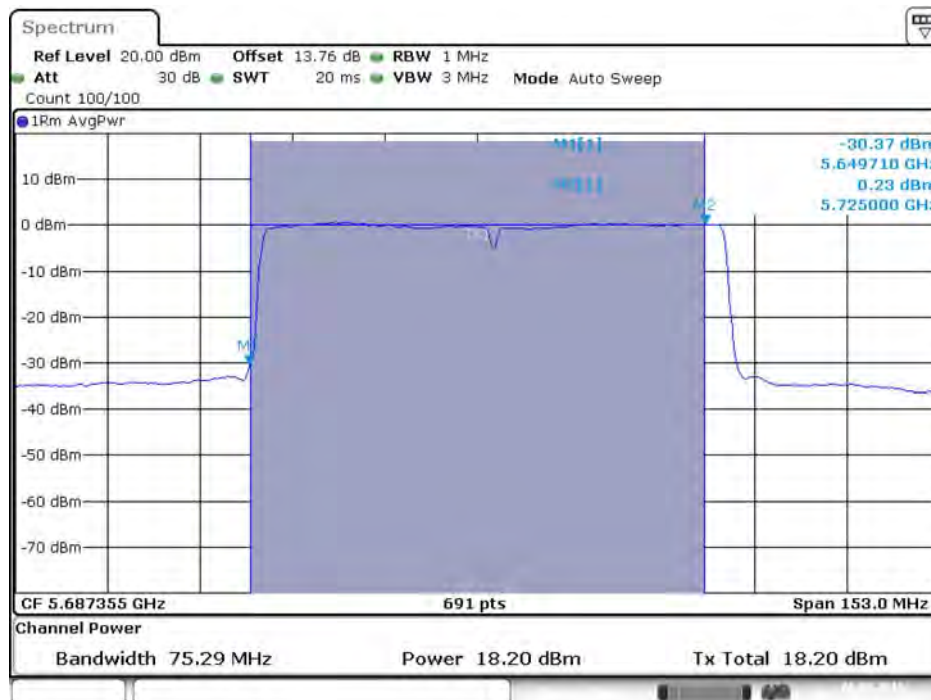
Type 6

Conducted Output Power Plot on Chain 3 / 5690 MHz (UNII 2C)



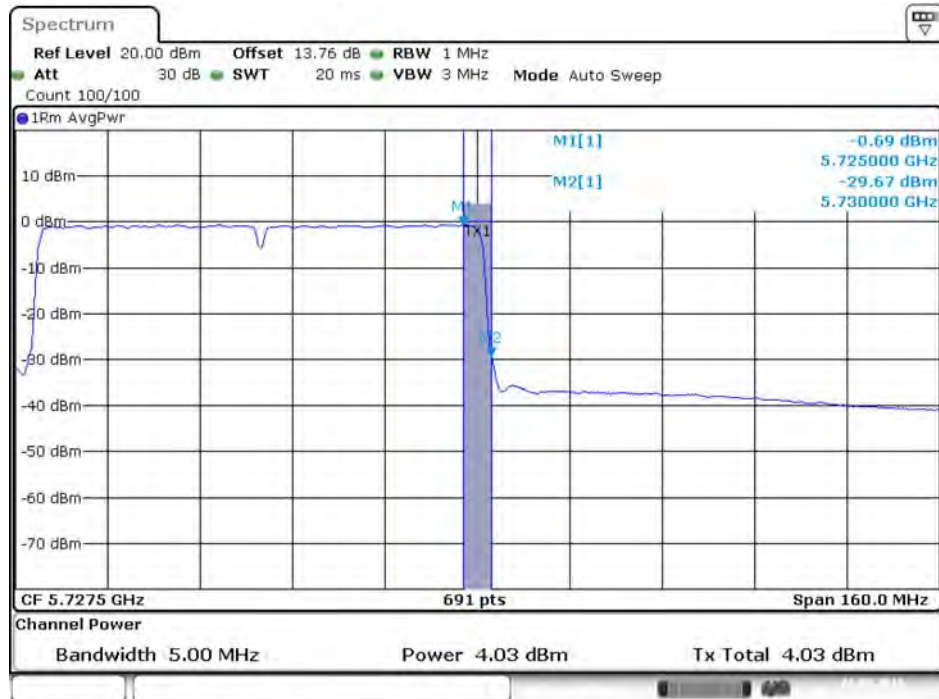
Date: 6.AUG.2016 11:53:17

Conducted Output Power Plot on Chain 4 / 5690 MHz (UNII 2C)



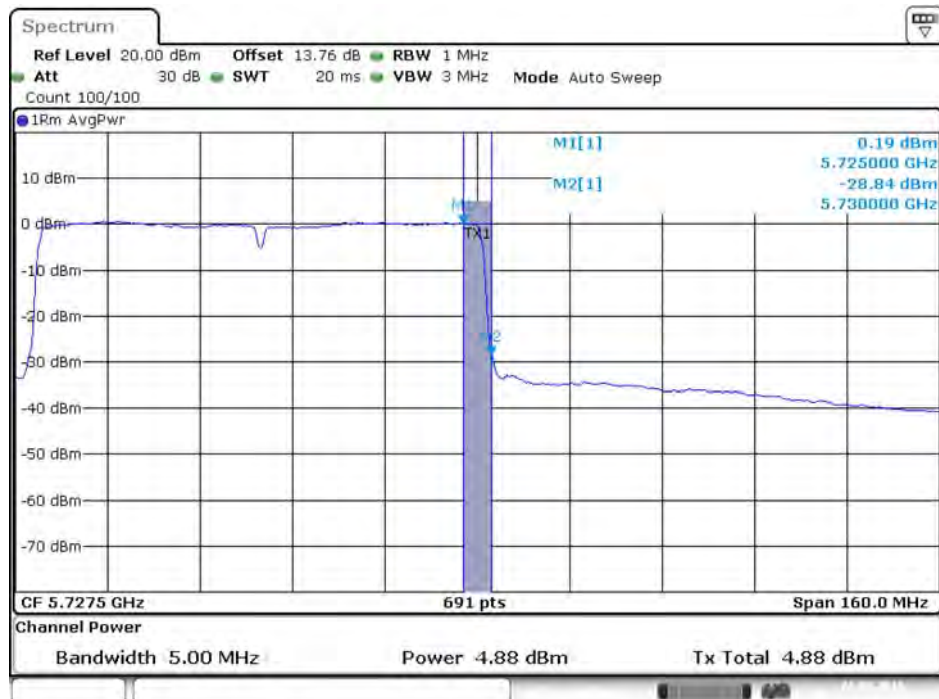
Date: 6.AUG.2016 11:53:24

Conducted Output Power Plot on Chain 3 / 5690 MHz (UNII 3)



Date: 6.AUG.2016 11:53:20

Conducted Output Power Plot on Chain 4 / 5690 MHz (UNII 3)

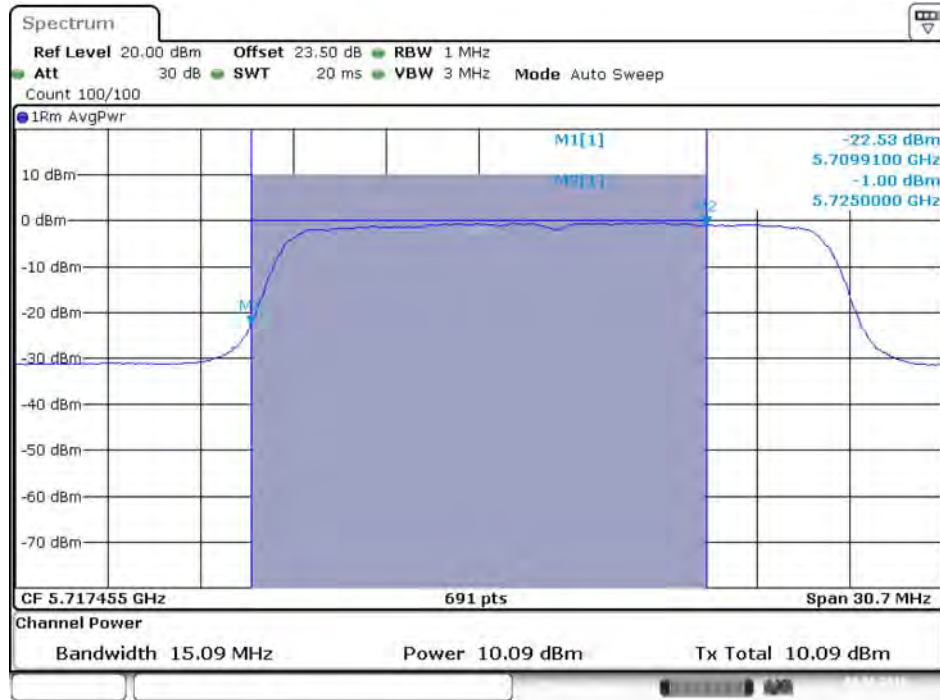


Date: 6.AUG.2016 11:53:27

For beamforming mode

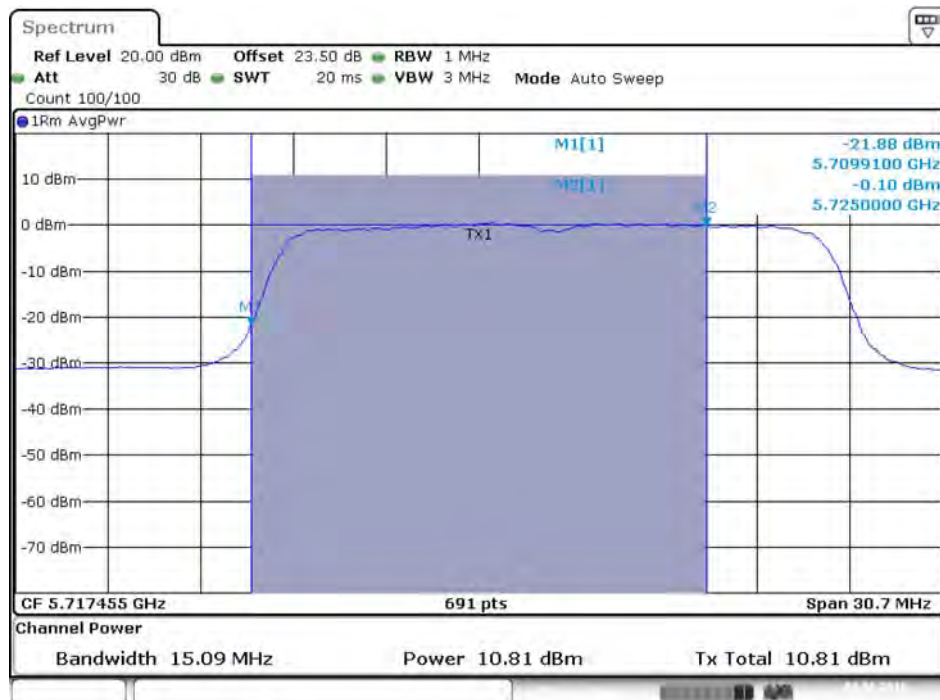
Straddle Channel

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5720 MHz (UNII 2C)



Date: 9.AUG.2016 01:18:35

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5720 MHz (UNII 2C)



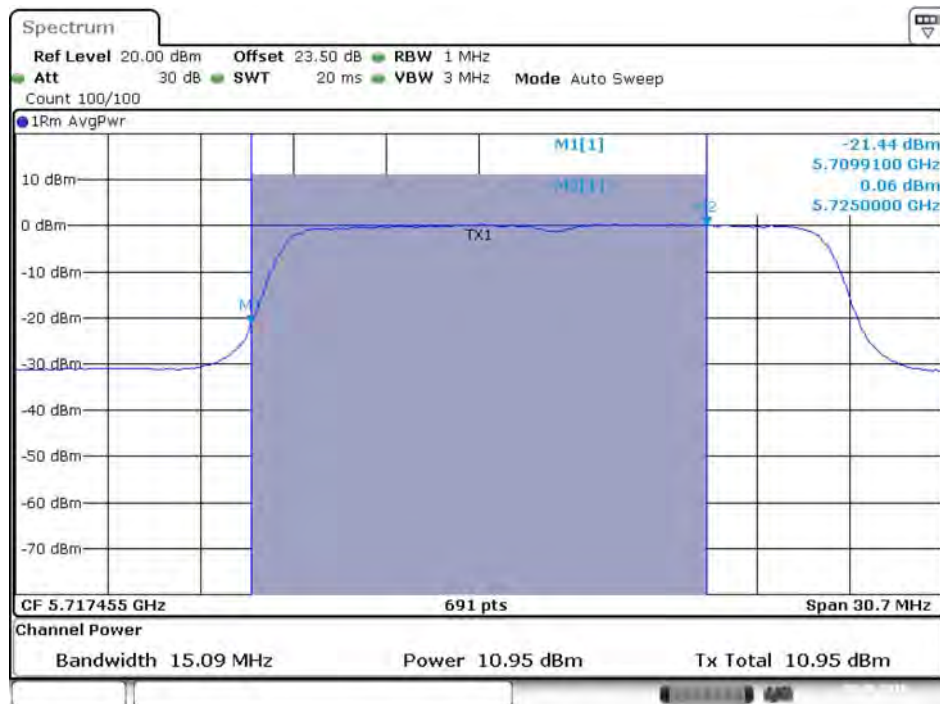
Date: 9.AUG.2016 01:14:50

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5720 MHz (UNII 2C)



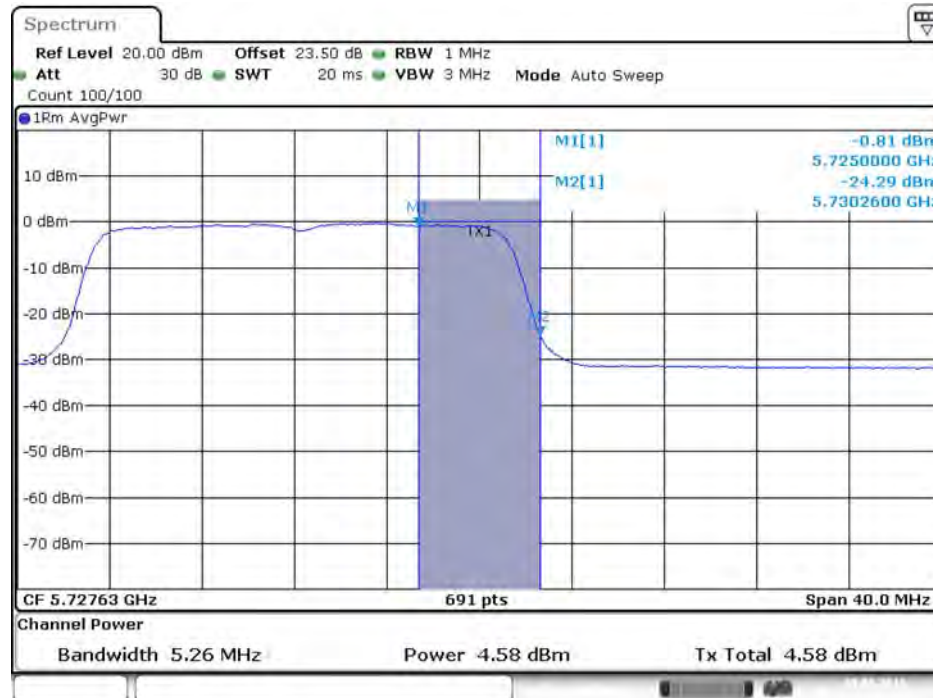
Date: 9.AUG.2016 01:10:35

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 / 5720 MHz (UNII 2C)



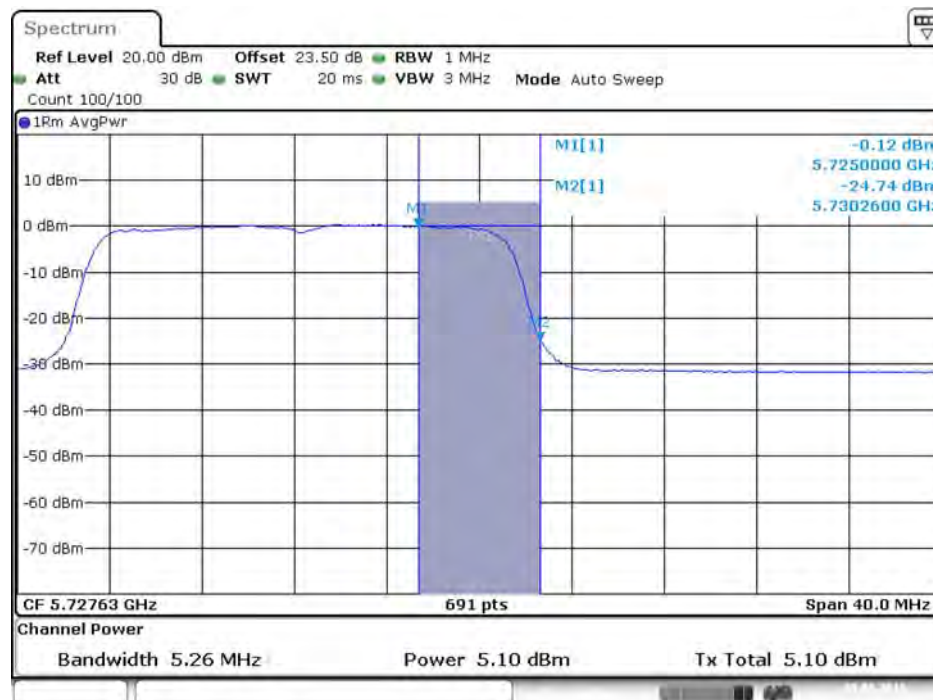
Date: 9.AUG.2016 01:02:35

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5720 MHz (UNII 3)



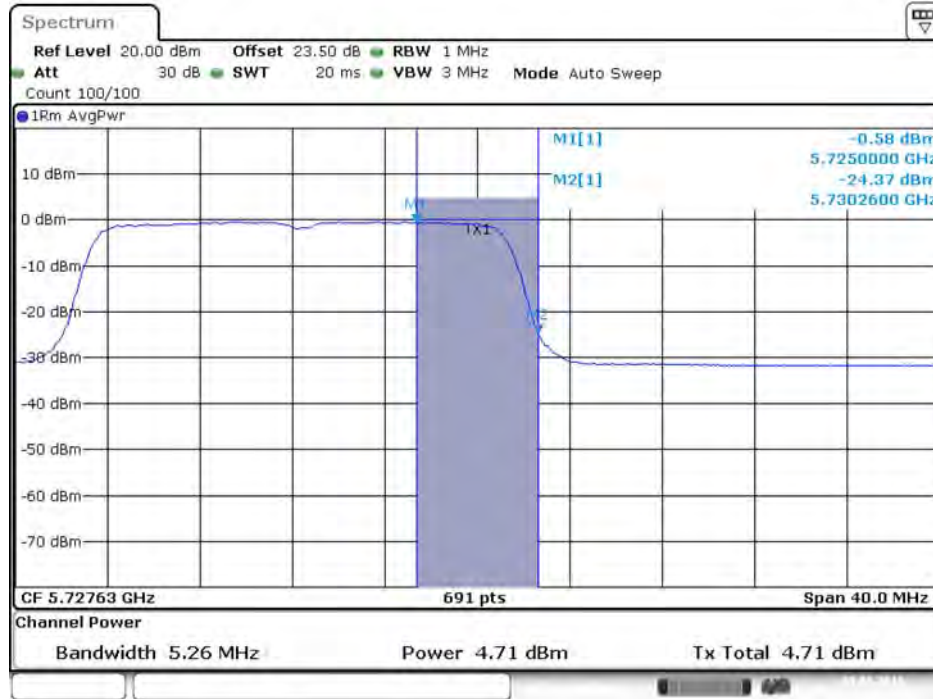
Date: 9.AUG.2016 01:18:39

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5720 MHz (UNII 3)



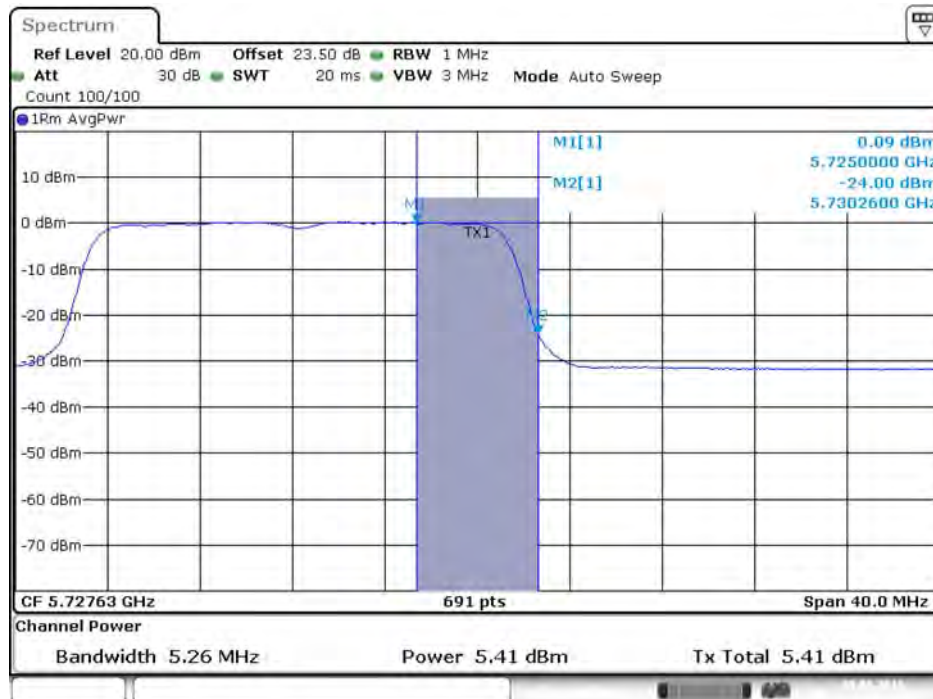
Date: 9.AUG.2016 01:14:53

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5720 MHz (UNII 3)



Date: 9.AUG.2016 01:10:39

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 / 5720 MHz (UNII 3)



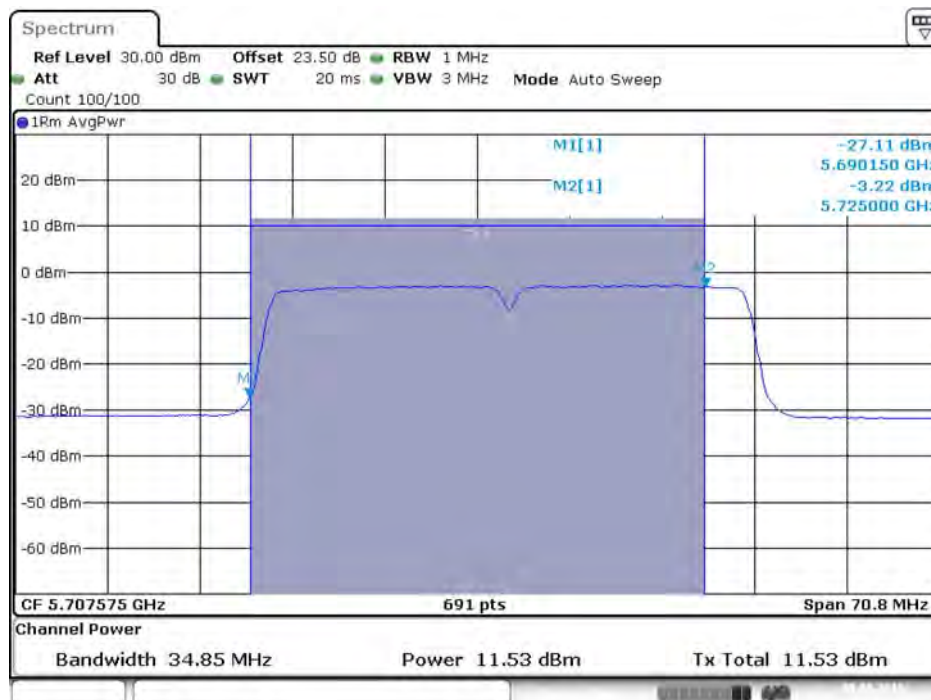
Date: 9.AUG.2016 01:02:39

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5710 MHz (UNII 2C)



Date: 9.AUG.2016 03:10:42

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5710 MHz (UNII 2C)



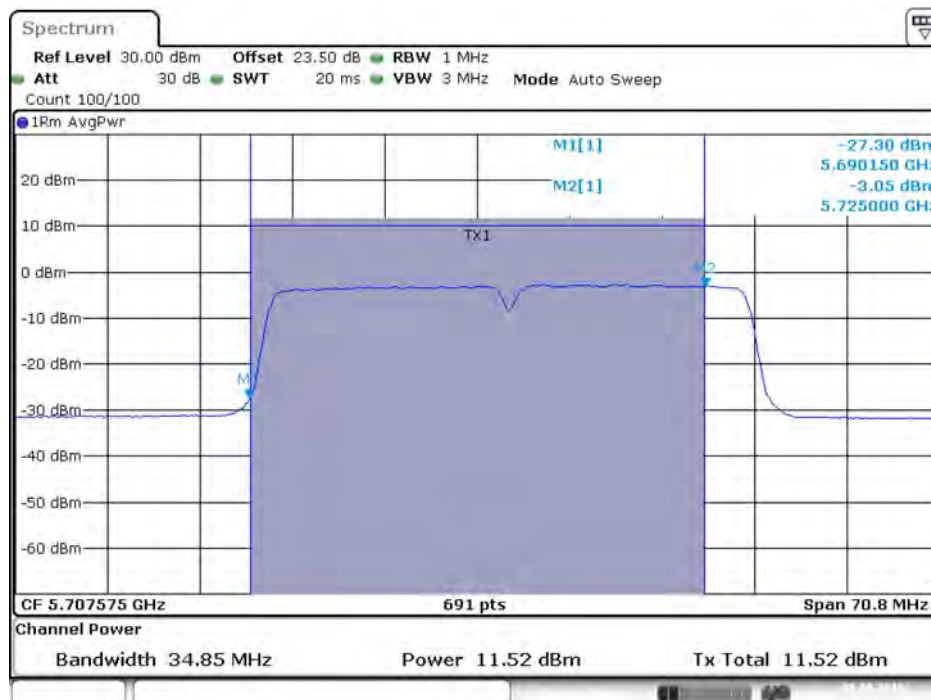
Date: 9.AUG.2016 03:08:17

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5710 MHz (UNII 2C)



Date: 9.AUG.2016 03:05:47

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 / 5710 MHz (UNII 2C)



Date: 9.AUG.2016 02:59:54

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5710 MHz (UNII 3)



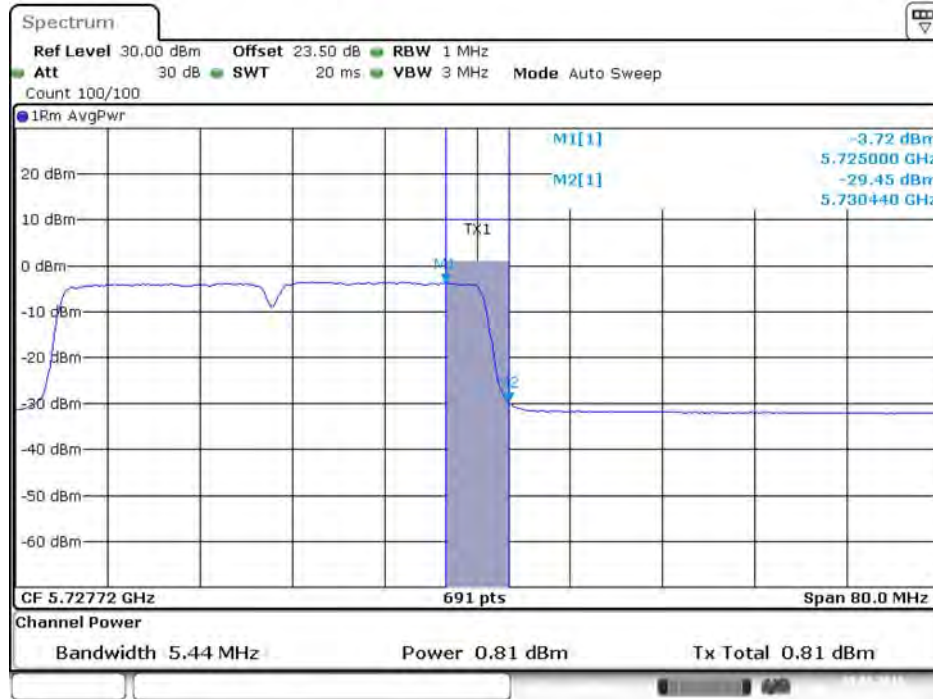
Date: 9.AUG.2016 03:10:46

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5710 MHz (UNII 3)



Date: 9.AUG.2016 03:08:20

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5710 MHz (UNII 3)



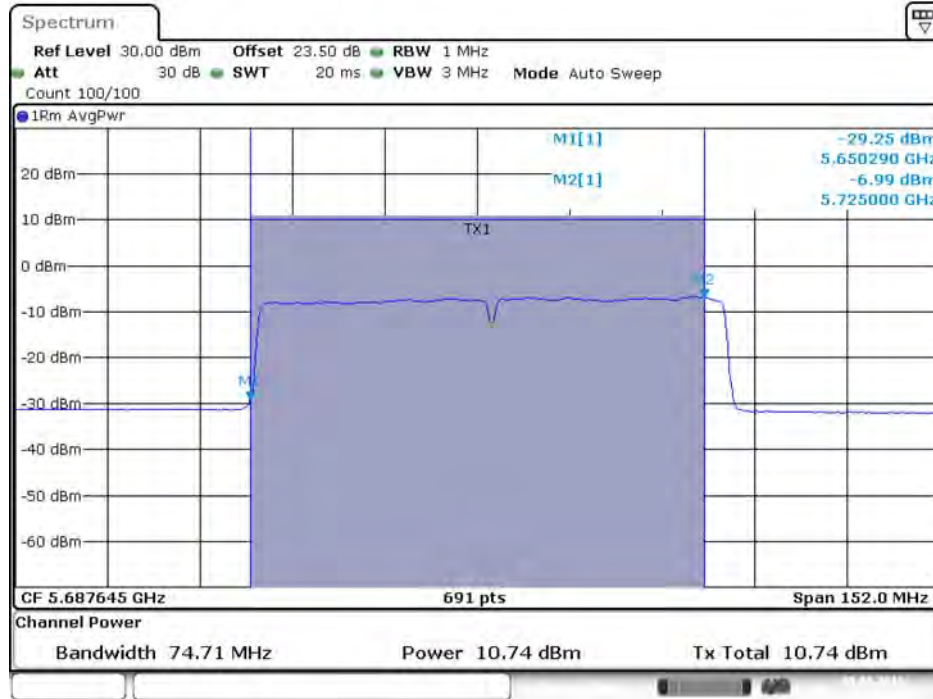
Date: 9.AUG.2016 03:05:51

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 / 5710 MHz (UNII 3)



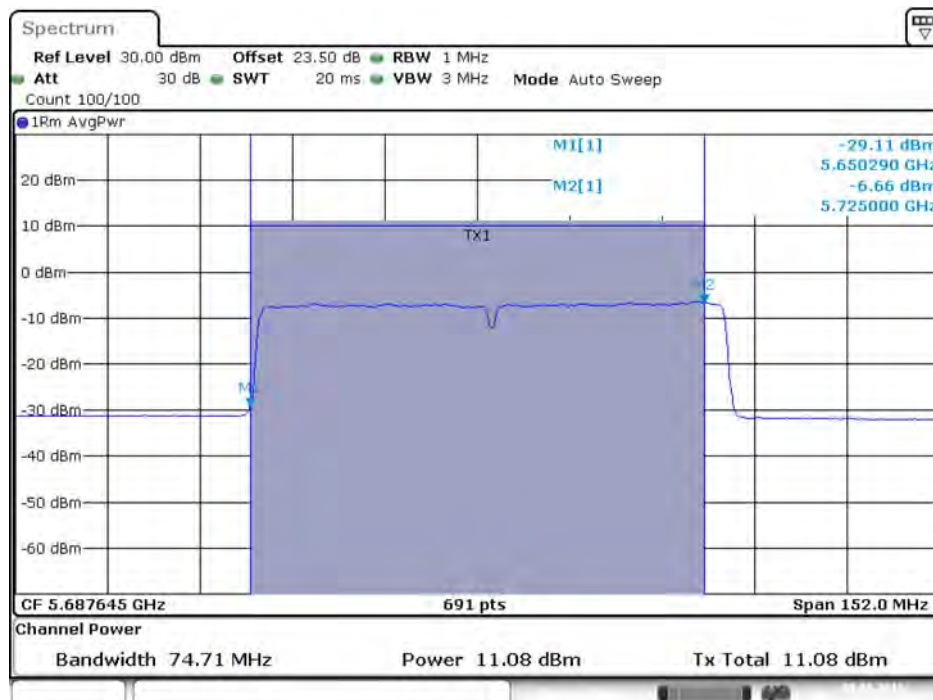
Date: 9.AUG.2016 02:59:58

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5690 MHz (UNII 2C)



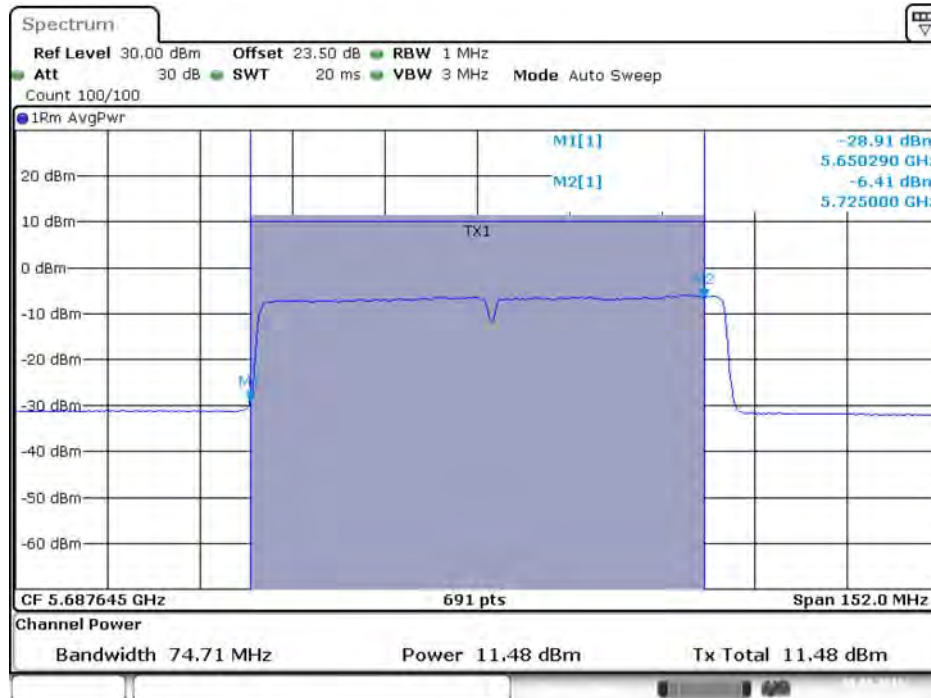
Date: 9.AUG.2016 02:36:05

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5690 MHz (UNII 2C)



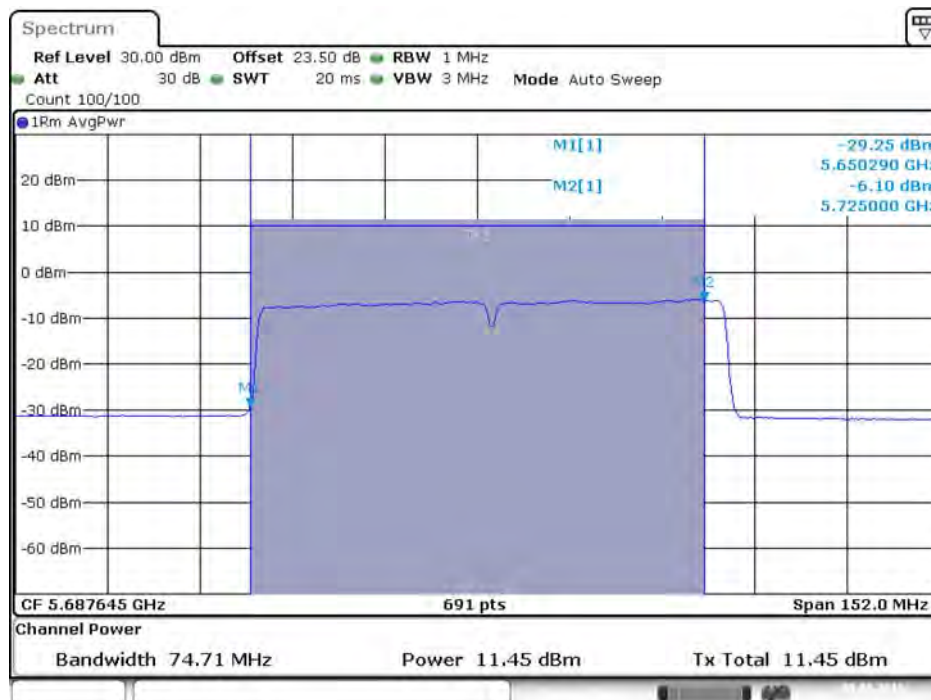
Date: 9.AUG.2016 02:38:20

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 / 5690 MHz (UNII 2C)



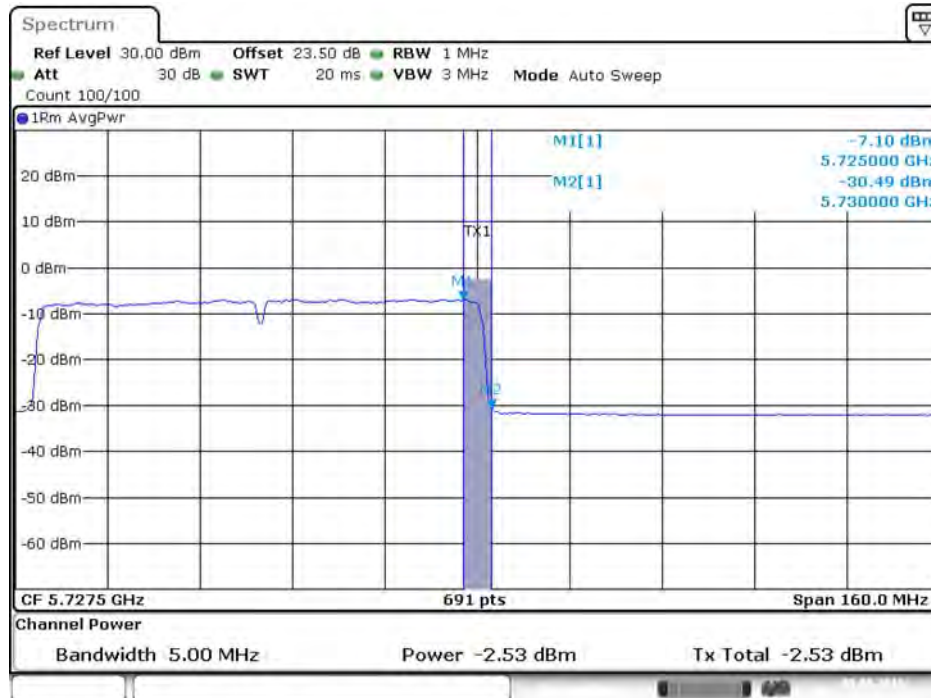
Date: 9.AUG.2016 02:40:07

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 / 5690 MHz (UNII 2C)



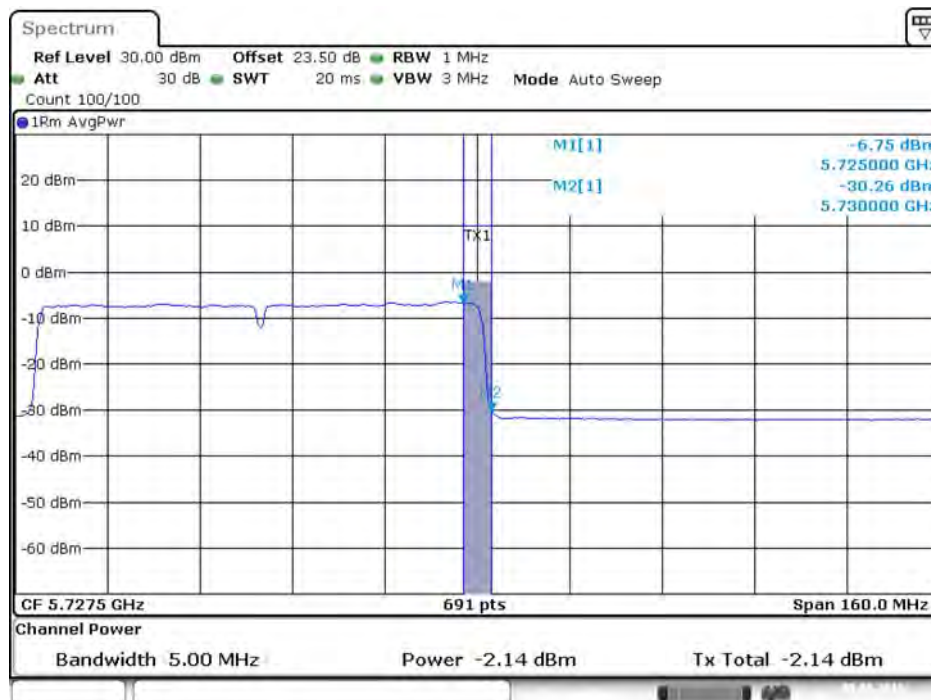
Date: 9.AUG.2016 02:42:22

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5690 MHz (UNII 3)



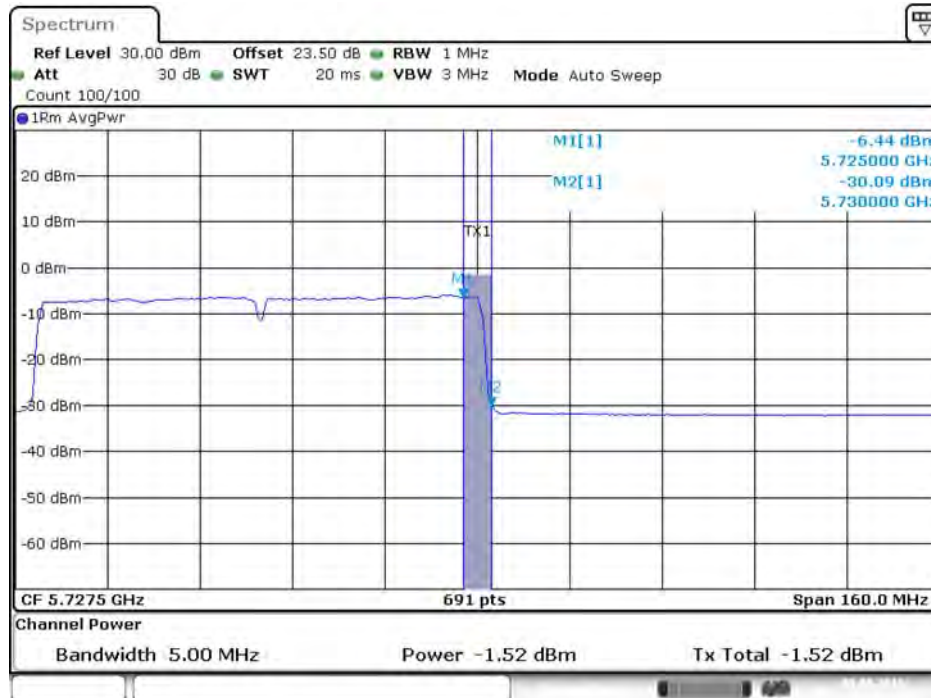
Date: 9.AUG.2016 02:36:08

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5690 MHz (UNII 3)



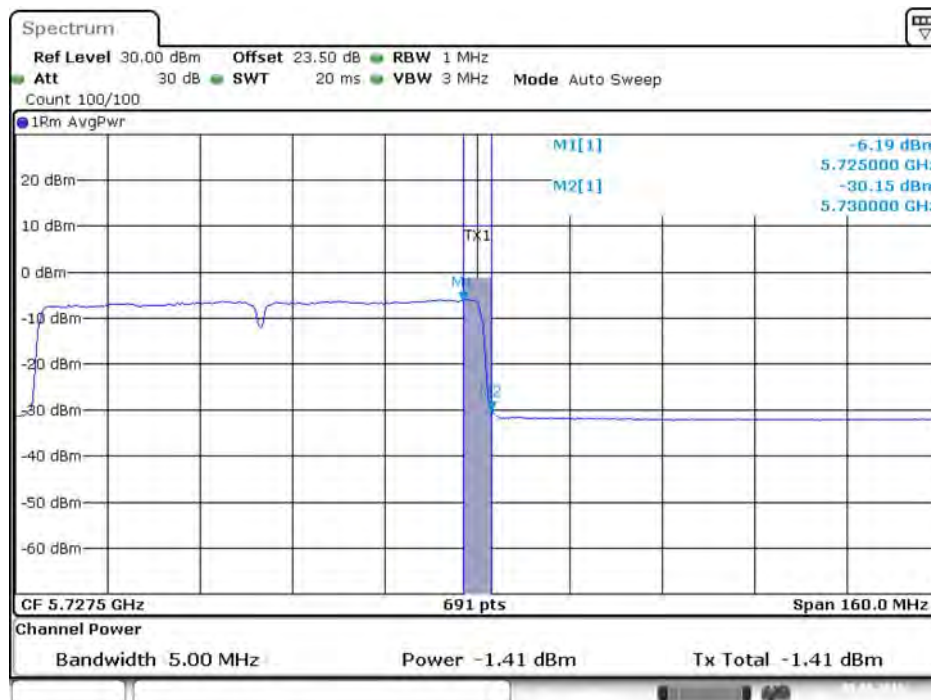
Date: 9.AUG.2016 02:38:23

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 / 5690 MHz (UNII 3)



Date: 9.AUG.2016 02:40:11

Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 / 5690 MHz (UNII 3)



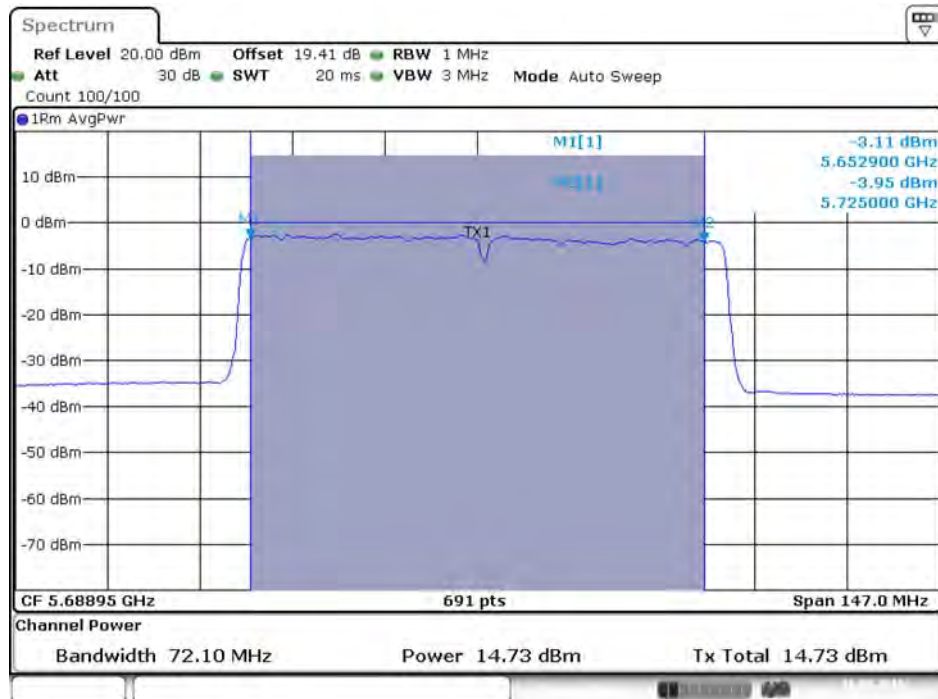
Date: 9.AUG.2016 02:42:26

802.11ac MCS0/Nss2 VHT80+80

Straddle Channel

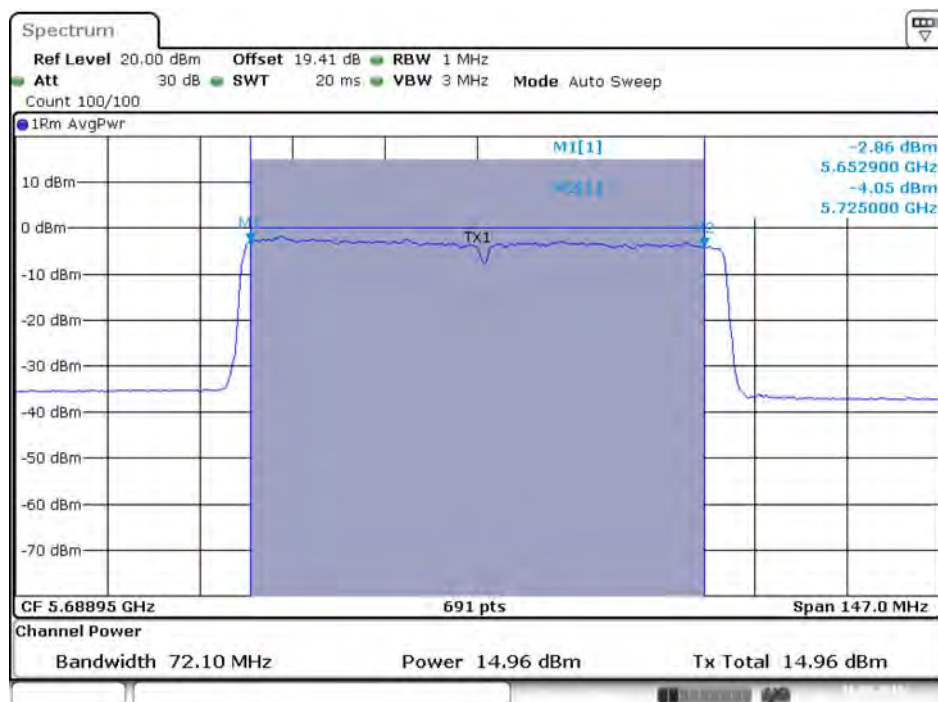
Type 1

Conducted Output Power Plot on Chain 3 / 5690 MHz (UNII 2C)



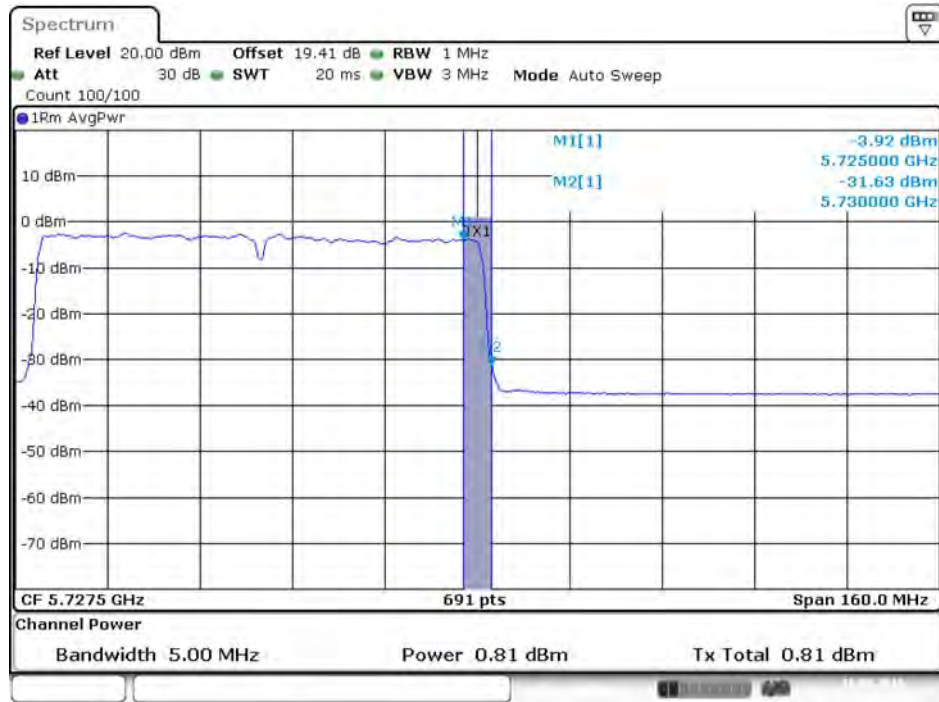
Date: 16.AUG.2016 20:01:30

Conducted Output Power Plot on Chain 4 / 5690 MHz (UNII 2C)



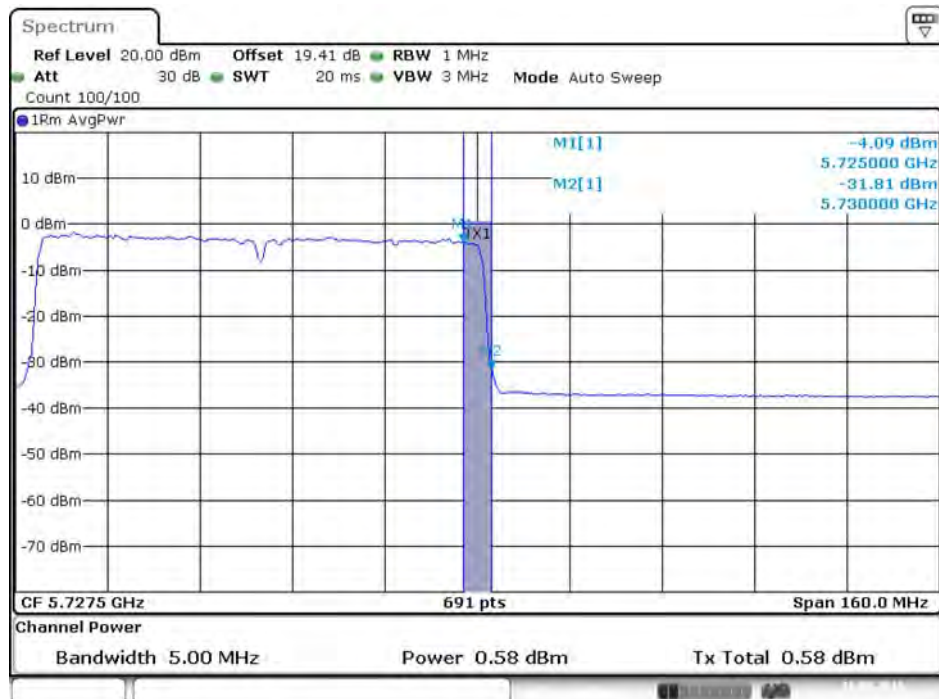
Date: 16.AUG.2016 20:01:37

Conducted Output Power Plot on Chain 3 / 5690 MHz (UNII 3)



Date: 16.AUG.2016 20:01:33

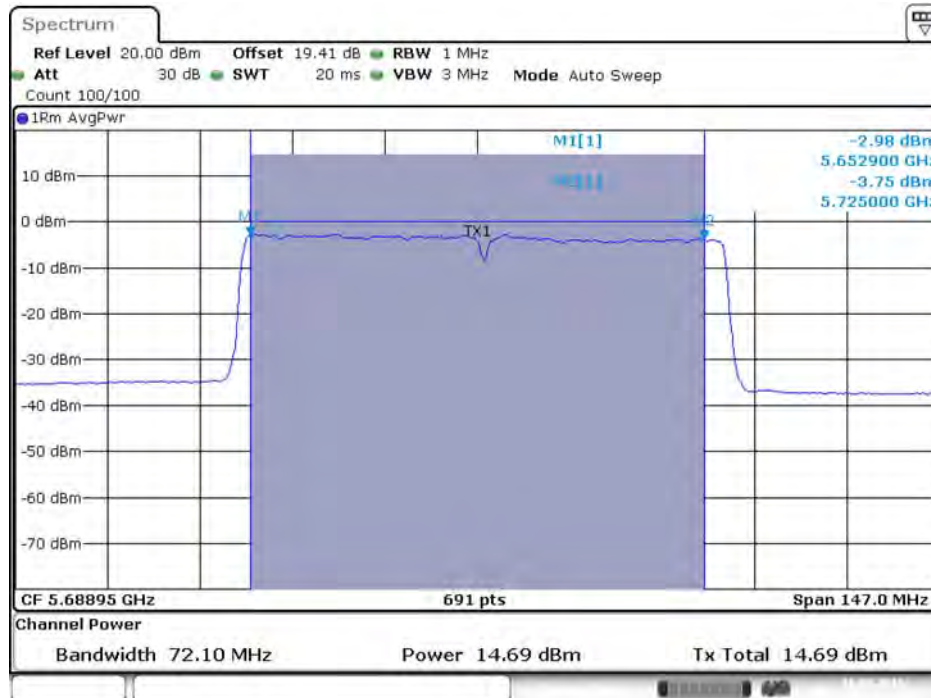
Conducted Output Power Plot on Chain 4 / 5690 MHz (UNII 3)



Date: 16.AUG.2016 20:01:40

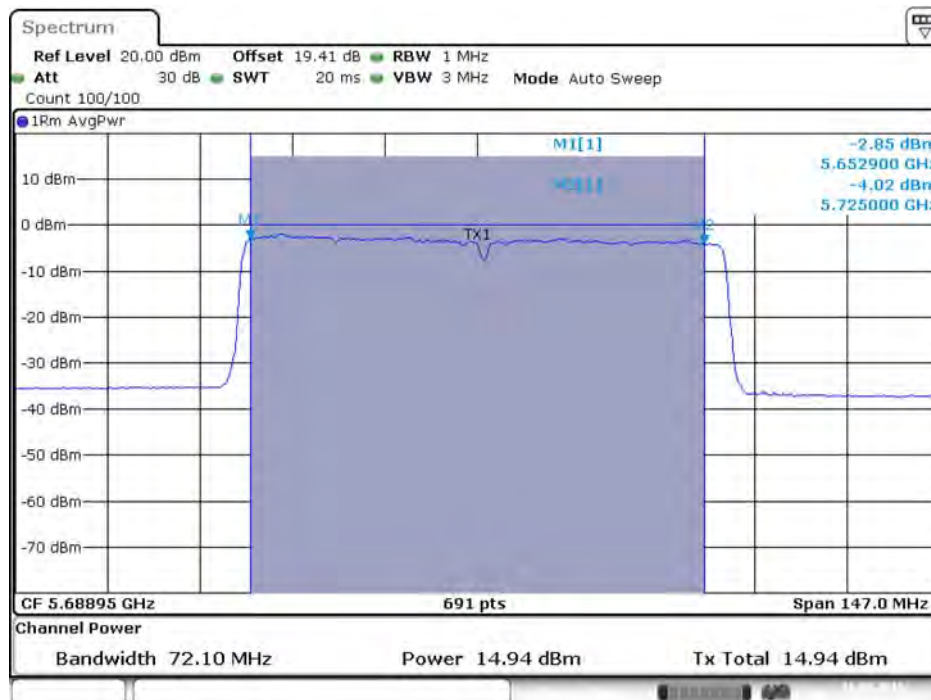
Type 4

Conducted Output Power Plot on Chain 1 / 5690 MHz (UNII 2C)



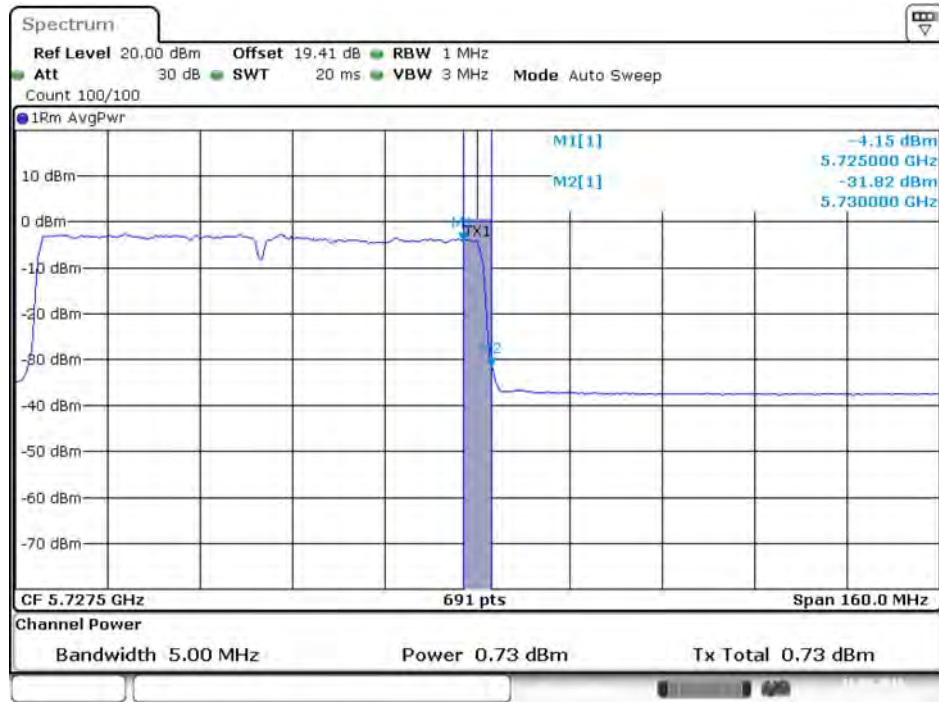
Date: 16.AUG.2016 20:11:40

Conducted Output Power Plot on Chain 2 / 5690 MHz (UNII 2C)



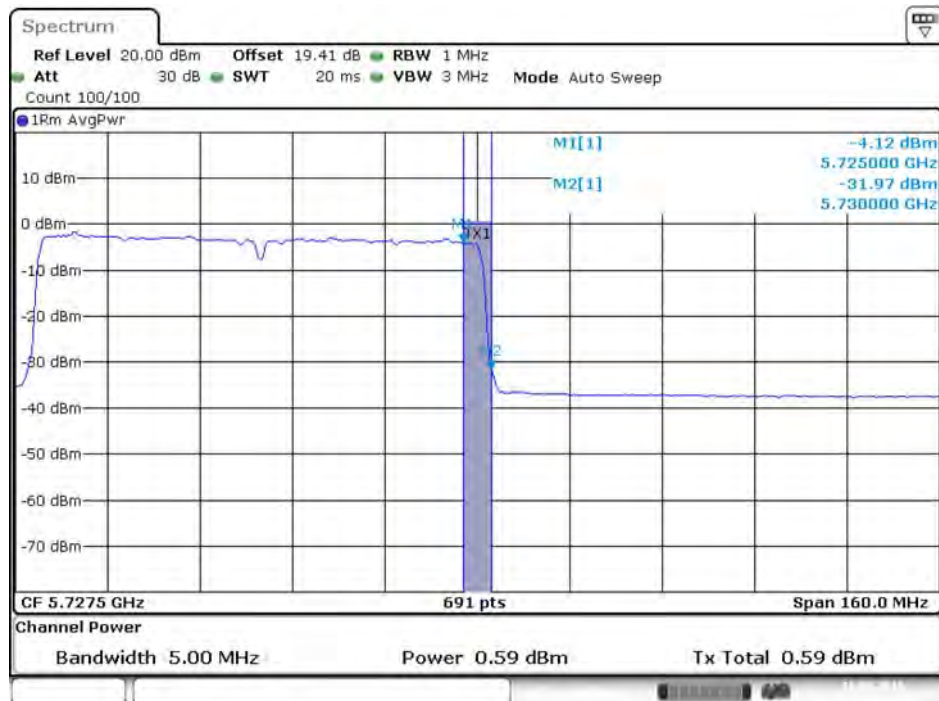
Date: 16.AUG.2016 20:11:47

Conducted Output Power Plot on Chain 1 / 5690 MHz (UNII 3)



Date: 16.AUG.2016 20:11:43

Conducted Output Power Plot on Chain 2 / 5690 MHz (UNII 3)



Date: 16.AUG.2016 20:11:50

4.5. Power Spectral Density Measurement

4.5.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.4.1.

	Frequency Band	Limit
<input checked="" type="checkbox"/>	5.470-5.725 GHz	11 dBm/MHz
<input checked="" type="checkbox"/>	5.725~5.85 GHz	30 dBm/500kHz

4.5.2. Measuring Instruments and Setting

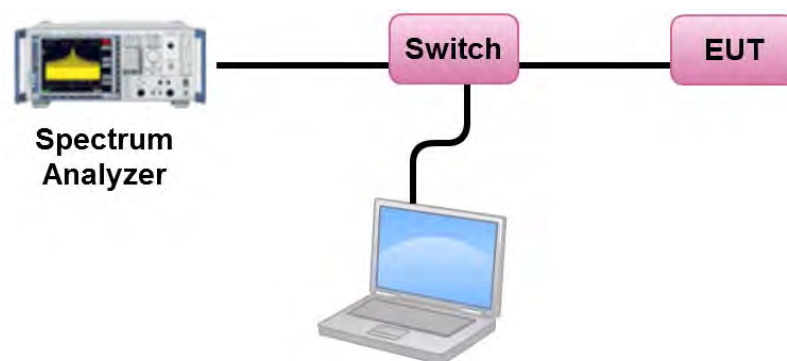
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1000 kHz
VBW	3000 kHz
Detector	RMS
Trace	AVERAGE
Sweep Time	Auto
Trace Average	100 times
Note: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/\text{RBW})$ to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.	

4.5.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01r04 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements and sum the spectra across the outputs.
4. For 5.725~5.85 GHz, the measured result of PSD level must add $10\log(500\text{kHz}/\text{RBW})$ and the final result should ≤ 30 dBm.

4.5.4. Test Setup Layout



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Power Spectral Density

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
100	5500 MHz	4.85	4.98	Complies
116	5580 MHz	4.93	4.98	Complies
140	5700 MHz	4.97	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B3 limit = 11-(12.02-6)=4.98dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	15.87	-3.01	12.86	23.98	Complies
157	5785 MHz	15.61	-3.01	12.60	23.98	Complies
165	5825 MHz	15.74	-3.01	12.73	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = 30-(12.02-6)=23.98dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
100	5500 MHz	4.88	4.98	Complies
116	5580 MHz	4.85	4.98	Complies
140	5700 MHz	4.97	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B3 limit = $11 - (12.02 - 6) = 4.98\text{dBm/MHz}$.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	15.10	-3.01	12.09	23.98	Complies
157	5785 MHz	15.43	-3.01	12.42	23.98	Complies
165	5825 MHz	15.50	-3.01	12.49	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = $30 - (12.02 - 6) = 23.98\text{dBm/500kHz}$.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
102	5510 MHz	3.41	4.98	Complies
110	5550 MHz	4.88	4.98	Complies
134	5670 MHz	4.90	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B3 limit = $11 - (12.02 - 6) = 4.98\text{dBm/MHz}$.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	11.02	-3.01	8.01	23.98	Complies
159	5795 MHz	12.63	-3.01	9.62	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = $30 - (12.02 - 6) = 23.98\text{dBm/500kHz}$.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
106	5530 MHz	-3.41	4.98	Complies
122	5610 MHz	3.39	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B3 limit = $11 - (12.02 - 6) = 4.98\text{dBm/MHz}$.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	4.60	-3.01	1.59	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = $30 - (12.02 - 6) = 23.98\text{dBm/500kHz}$.

Straddle Channel
Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
144	5720 MHz (UNII 2C)	4.68	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 11-(12.02-6)=4.98dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
144	5720 MHz (UNII 3)	4.47	-3.01	1.46	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 30-(12.02-6)=23.98dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
144	5720 MHz (UNII 2C)	4.76	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 11-(12.02-6)=4.98dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
144	5720 MHz (UNII 3)	4.58	-3.01	1.57	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 30-(12.02-6)=23.98dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
142	5710 MHz (UNII 2C)	4.69	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = $11 - (12.02 - 6) = 4.98\text{dBm/MHz}$.

Channel	Frequency	Power Density (dBm/MHz)	$10\log(500\text{kHz}/\text{RBW})$ Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
142	5710 MHz (UNII 3)	4.38	-3.01	1.37	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = $30 - (12.02 - 6) = 23.98\text{dBm}/500\text{kHz}$.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
138	5690 MHz (UNII 2C)	4.61	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 11-(12.02-6)=4.98dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
138	5690 MHz (UNII 3)	4.60	-3.01	1.59	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = 30-(12.02-6)=23.98dBm/500kHz.

802.11ac MCS0/Nss2 VHT80+80

Type	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Max. Limit (dBm/MHz)	Result
1	5530 MHz	-2.33	-			7.99	Complies
	5690 MHz (UNII 2C)	-2.43				7.99	Complies
	5690 MHz (UNII 3)	-2.85	-3.01	-5.86	26.99	-	Complies
2	5530 MHz	-2.46	-			7.99	Complies
	5775 MHz	-1.84	-3.01	-4.85	26.99	-	Complies
3	5610 MHz	-1.03	-			7.99	Complies
	5775 MHz	-0.24	-3.01	-3.25	26.99	-	Complies
4	5690 MHz (UNII 2C)	-1.08	-			7.99	Complies
	5690 MHz (UNII 3)	-0.96	-3.01	-3.97	26.99	-	Complies
	5775 MHz	0.30	-3.01	-2.71	26.99	-	Complies
5	5530 MHz	-2.06	-			7.99	Complies
	5610 MHz	-1.41				7.99	Complies
6	5610 MHz	1.30	-			7.99	Complies
	5690 MHz (UNII 2C)	1.60	-			7.99	Complies
	5690 MHz (UNII 3)	1.40	-3.01	-1.61	26.99	-	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01 \text{ dBi}$, so limit = $11 - (9.01 - 6) = 7.99 \text{ dBm/MHz}$.

For beamforming mode

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
100	5500 MHz	3.91	4.98	Complies
116	5580 MHz	4.00	4.98	Complies
140	5700 MHz	3.94	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B3 limit = $11 - (12.02 - 6) = 4.98\text{dBm/MHz}$.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	9.92	-3.01	6.91	23.98	Complies
157	5785 MHz	10.02	-3.01	7.01	23.98	Complies
165	5825 MHz	10.08	-3.01	7.07	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = $30 - (12.02 - 6) = 23.98\text{dBm/500kHz}$.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
102	5510 MHz	0.92	4.98	Complies
110	5550 MHz	0.89	4.98	Complies
134	5670 MHz	1.05	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B3 limit = $11 - (12.02 - 6) = 4.98\text{dBm/MHz}$.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	7.21	-3.01	4.20	23.98	Complies
159	5795 MHz	7.06	-3.01	4.05	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B4 limit = $30 - (12.02 - 6) = 23.98\text{dBm/500kHz}$.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
106	5530 MHz	-1.72	4.98	Complies
122	5610 MHz	-1.91	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02 \text{dBi}$, so B3 limit = $11 - (12.02 - 6) = 4.98 \text{dBm/MHz}$.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	4.27	-3.01	1.26	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02 \text{dBi}$, so B4 limit = $30 - (12.02 - 6) = 23.98 \text{dBm/500kHz}$.

Straddle Channel
Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
144	5720 MHz (UNII 2C)	4.64	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = $11 - (12.02 - 6) = 4.98\text{dBm/MHz}$.

Channel	Frequency	Power Density (dBm/MHz)	$10\log(500\text{kHz}/\text{RBW})$ Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
144	5720 MHz (UNII 3)	4.39	-3.01	1.38	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = $30 - (12.02 - 6) = 23.98\text{dBm}/500\text{kHz}$.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
142	5710 MHz (UNII 2C)	1.81	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = $11 - (12.02 - 6) = 4.98\text{dBm/MHz}$.

Channel	Frequency	Power Density (dBm/MHz)	$10\log(500\text{kHz}/\text{RBW})$ Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
142	5710 MHz (UNII 3)	1.65	-3.01	-1.36	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = $30 - (12.02 - 6) = 23.98\text{dBm}/500\text{kHz}$.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
138	5690 MHz (UNII 2C)	-1.60	4.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = $11 - (12.02 - 6) = 4.98\text{dBm/MHz}$.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
138	5690 MHz (UNII 3)	-1.66	-3.01	-4.67	23.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so limit = $30 - (12.02 - 6) = 23.98\text{dBm/500kHz}$.

802.11ac MCS0/Nss2 VHT80+80
For indoor use master

Type	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Max. Limit (dBm/MHz)	Result
1	5530 MHz	-1.68	-			7.99	Complies
	5690 MHz (UNII 2C)	-0.91				7.99	Complies
	5690 MHz (UNII 3)	-2.34	-3.01	-5.35	26.99	-	Complies
2	5530 MHz	-1.86	-			7.99	Complies
	5775 MHz	-1.02	-3.01	-4.03	26.99	-	Complies
3	5610 MHz	-1.76	-			7.99	Complies
	5775 MHz	-1.01	-3.01	-4.02	26.99	-	Complies
4	5690 MHz (UNII 2C)	-0.81	-			7.99	Complies
	5690 MHz (UNII 3)	-2.28	-3.01	-5.29	26.99	-	Complies
	5775 MHz	-0.99	-3.01	-4.00	26.99	-	Complies
5	5530 MHz	-2.01	-			7.99	Complies
	5610 MHz	-0.84				7.99	Complies

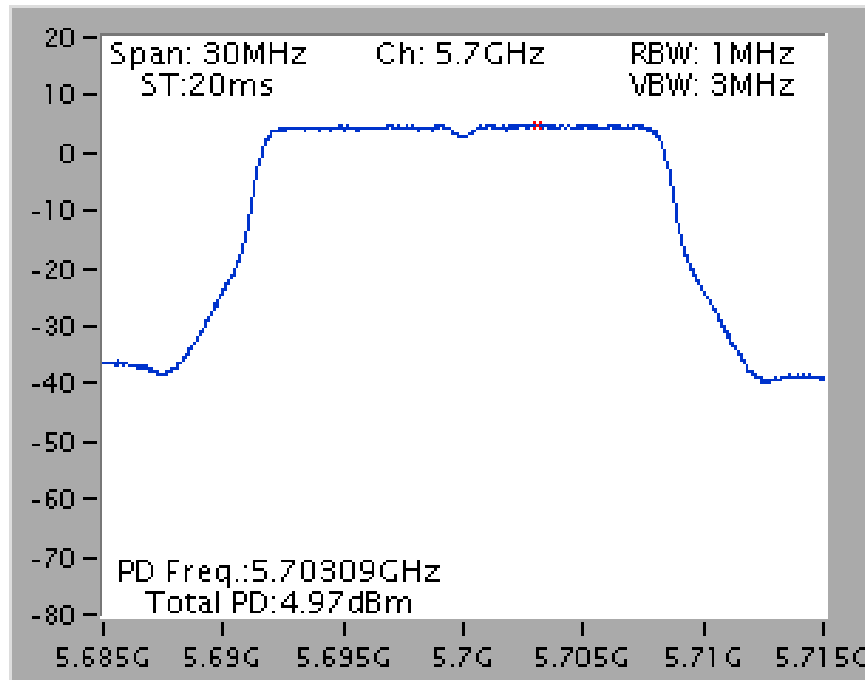
Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 9.01 \text{ dBi}$, so limit = $11 - (9.01 - 6) = 7.99 \text{ dBm/MHz}$.

Note: All the test values were listed in the report.

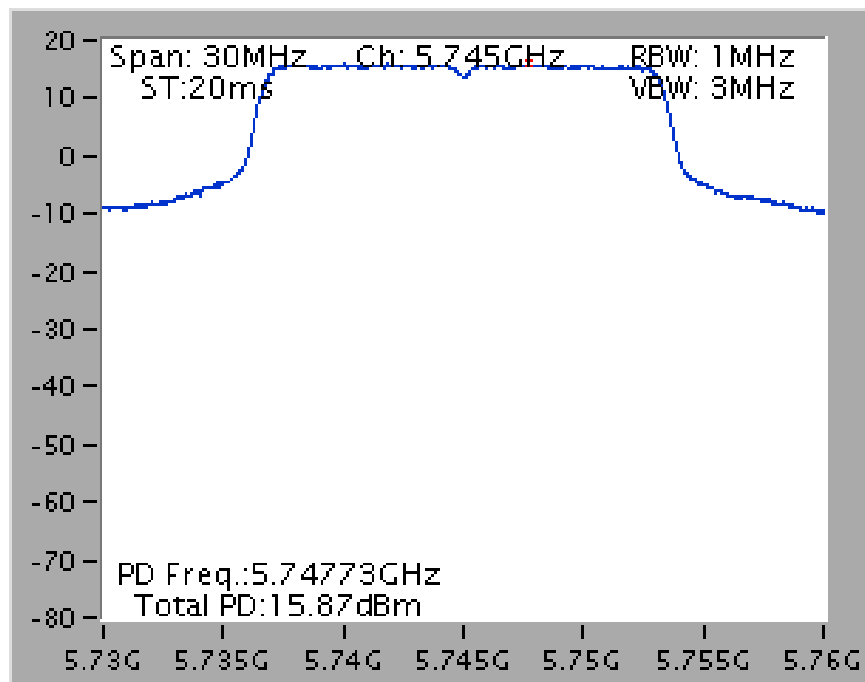
For plots, only the channel with worse result was shown.

For non-beamforming mode

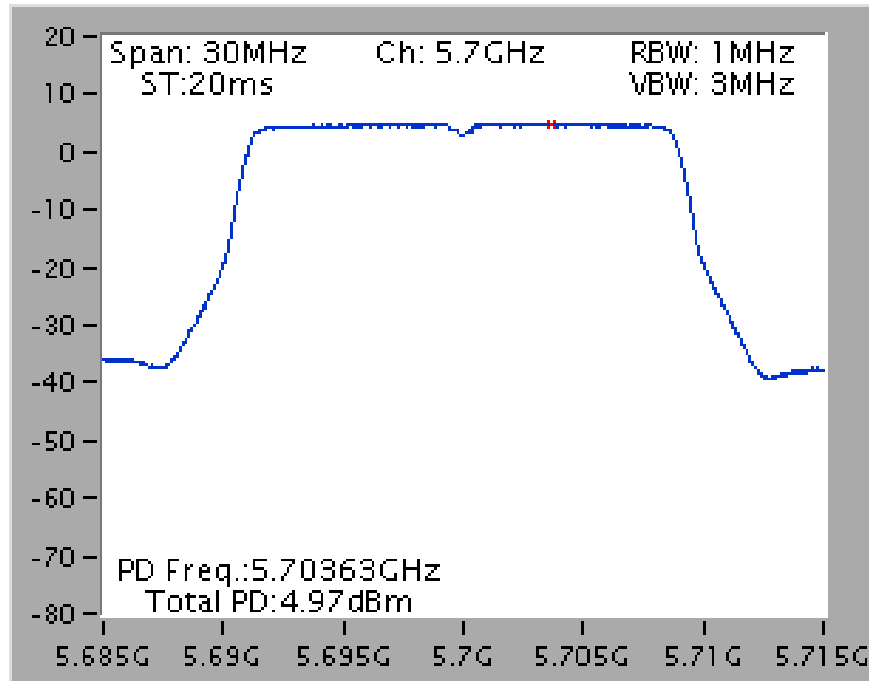
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



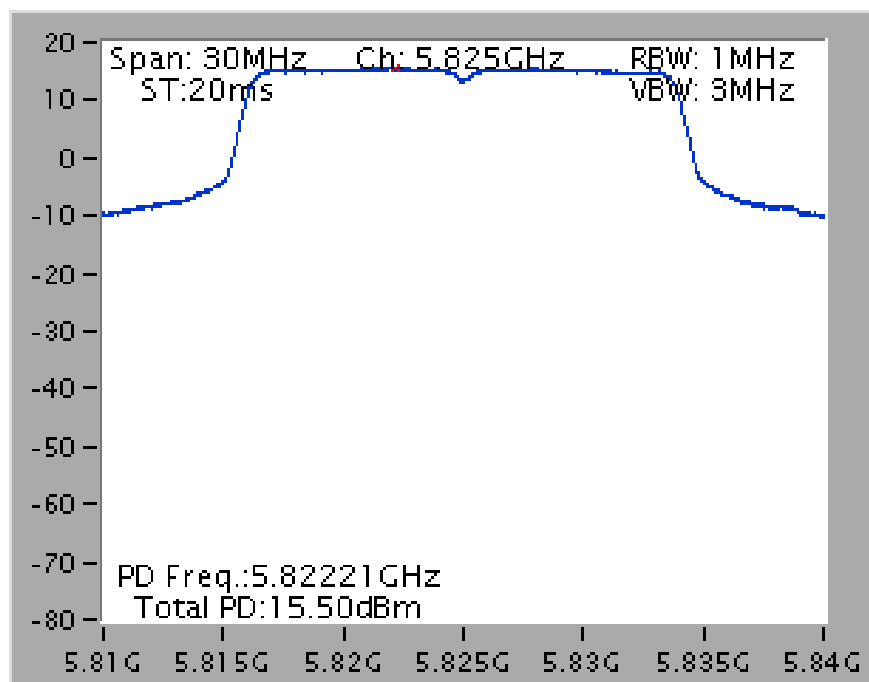
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



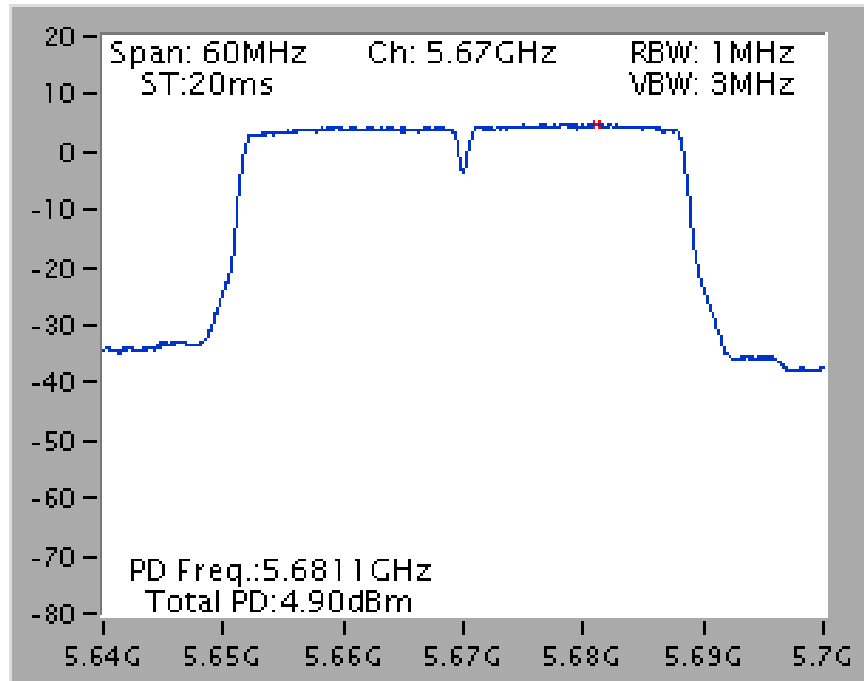
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



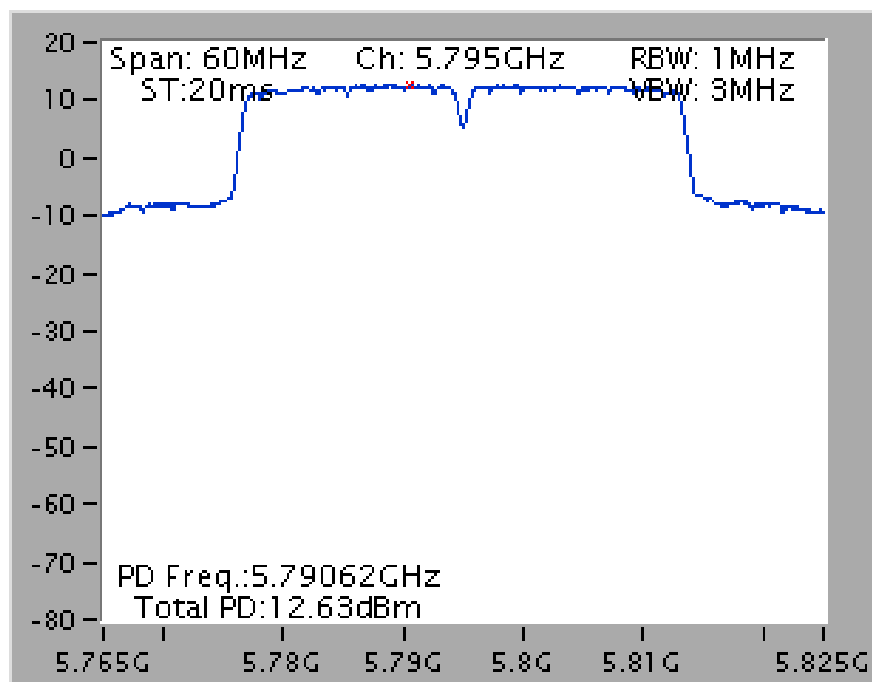
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



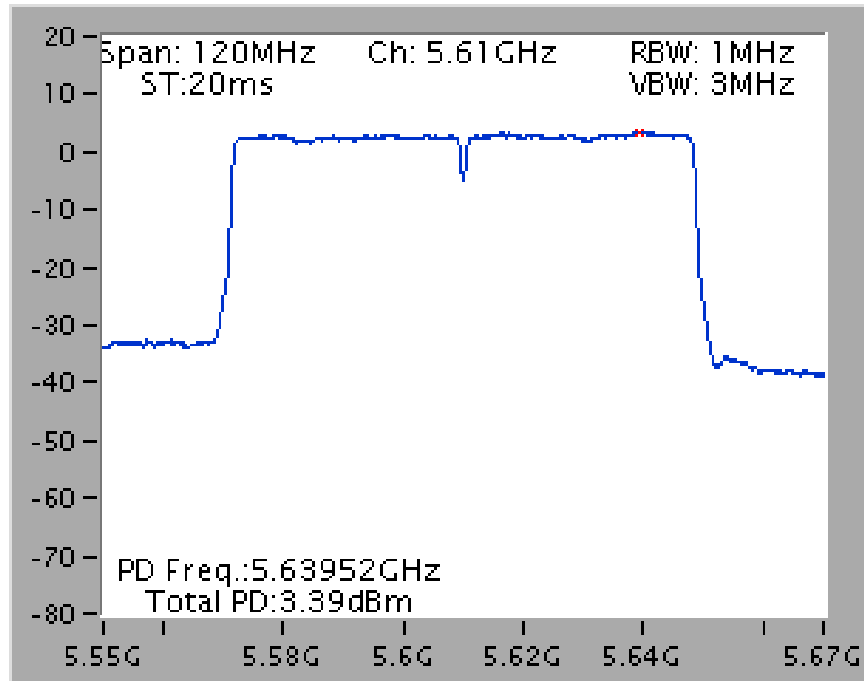
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



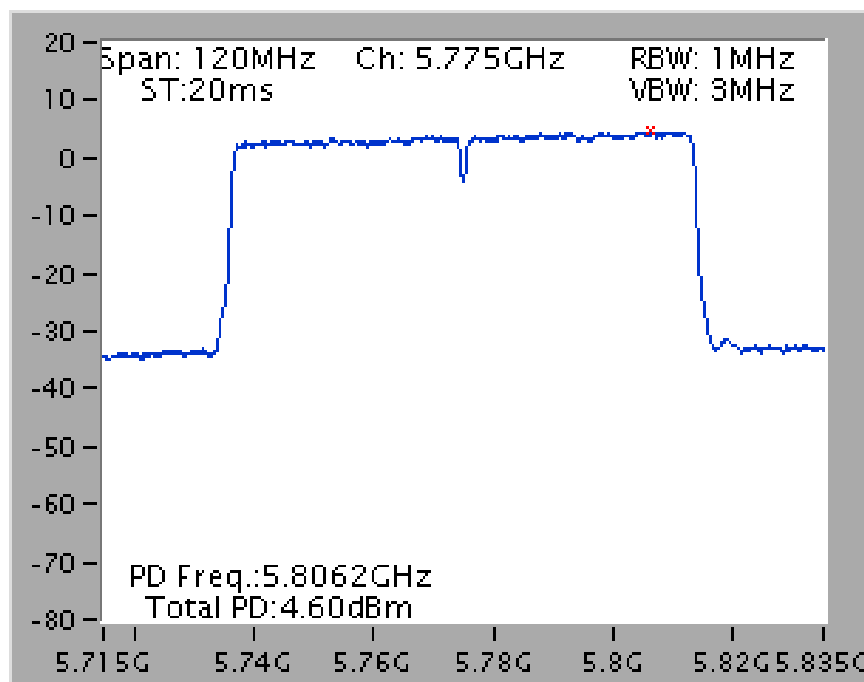
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5610 MHz

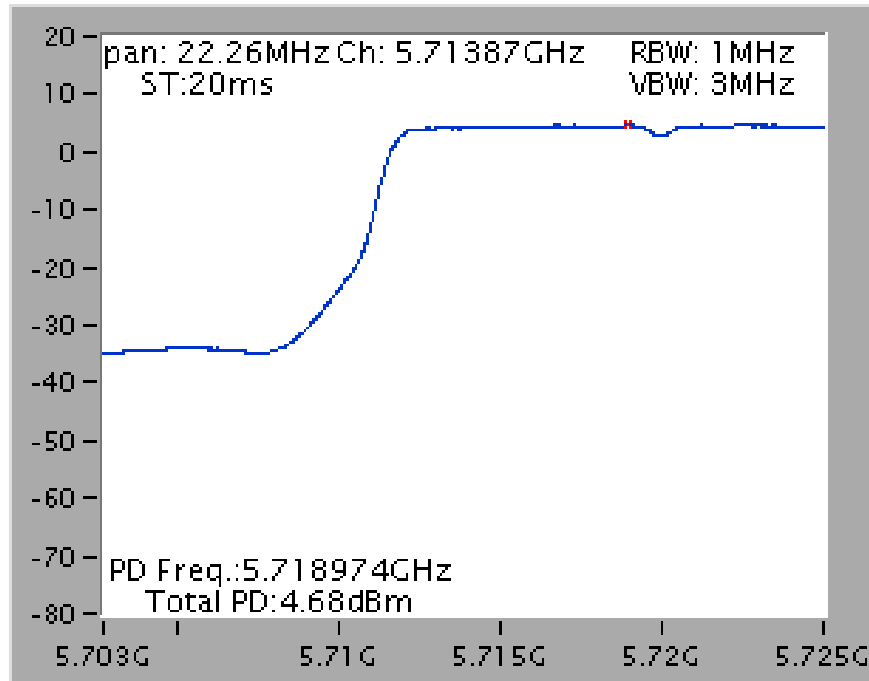


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz

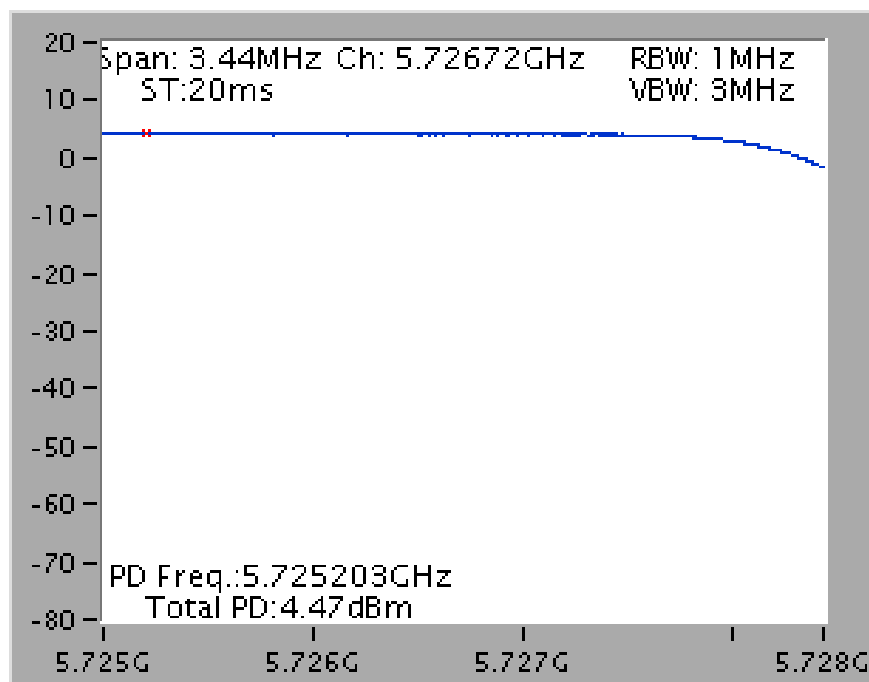


Straddle Channel

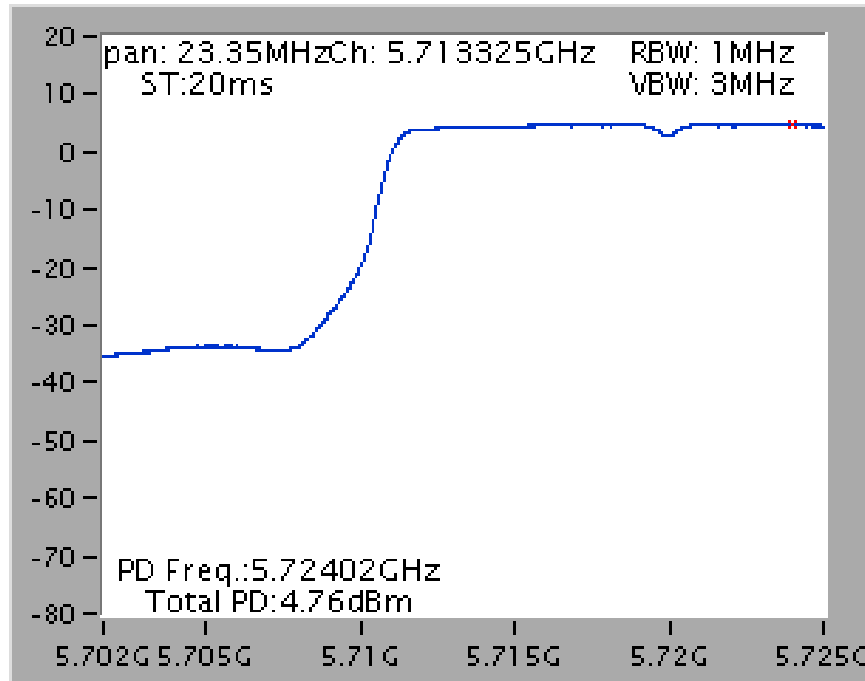
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz
(UNII 2C)



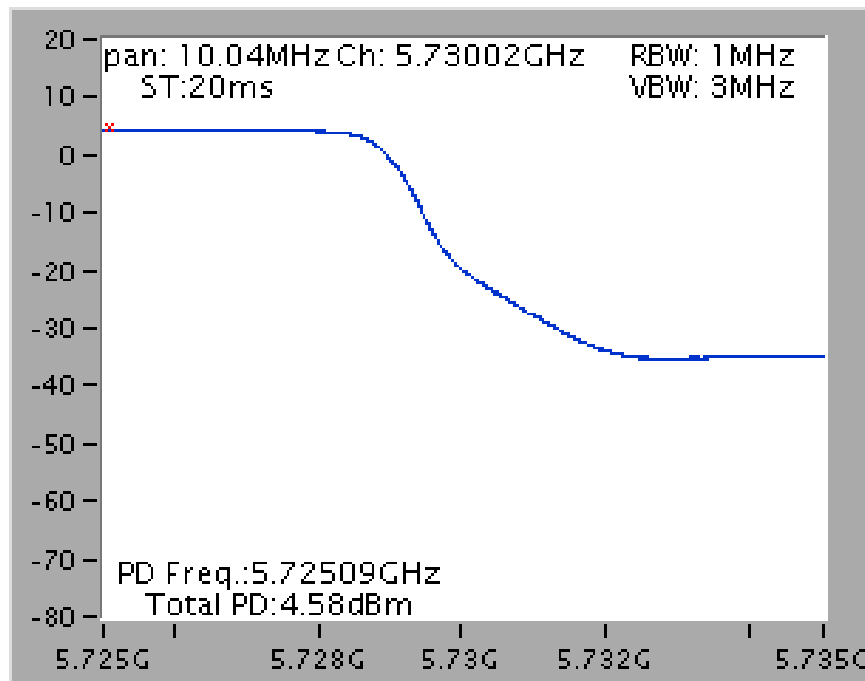
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz
(UNII 3)



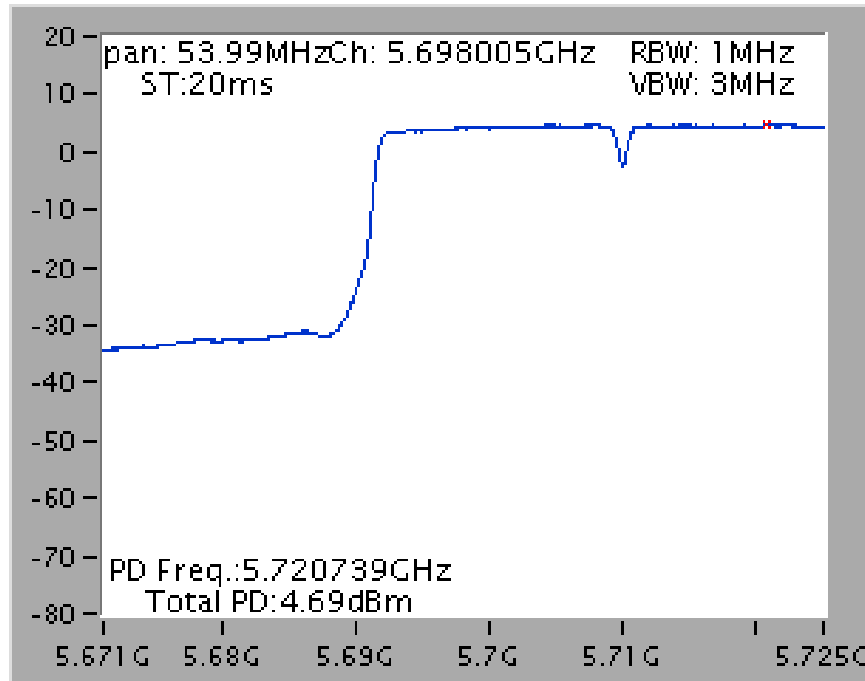
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz (UNII 2C)



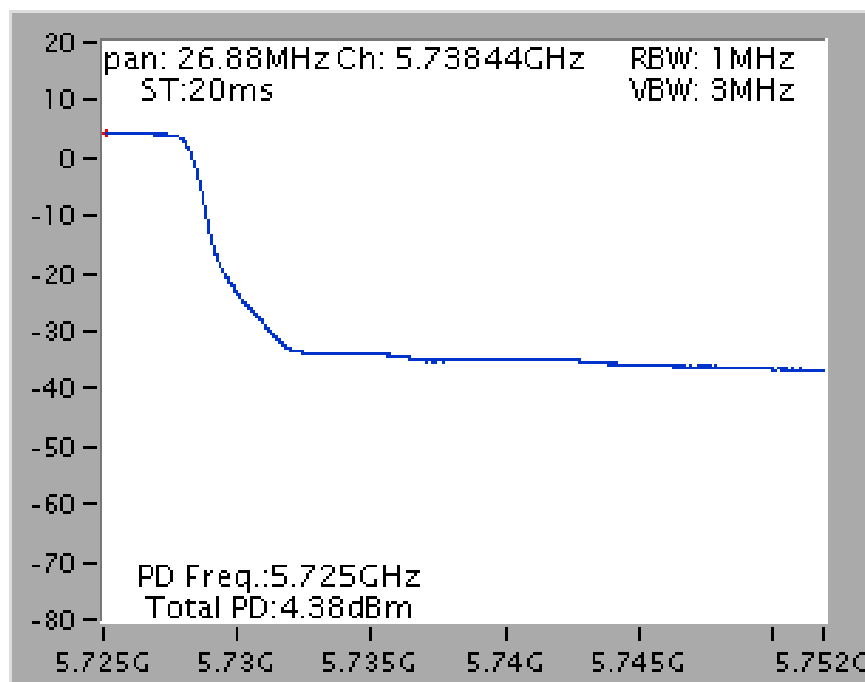
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz (UNII 3)



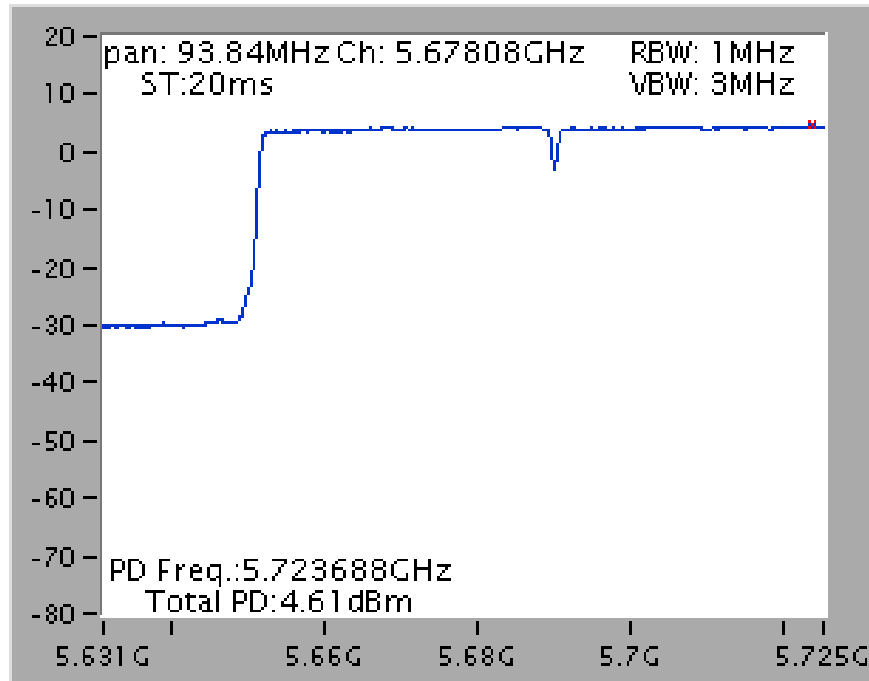
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5710 MHz (UNII 2C)



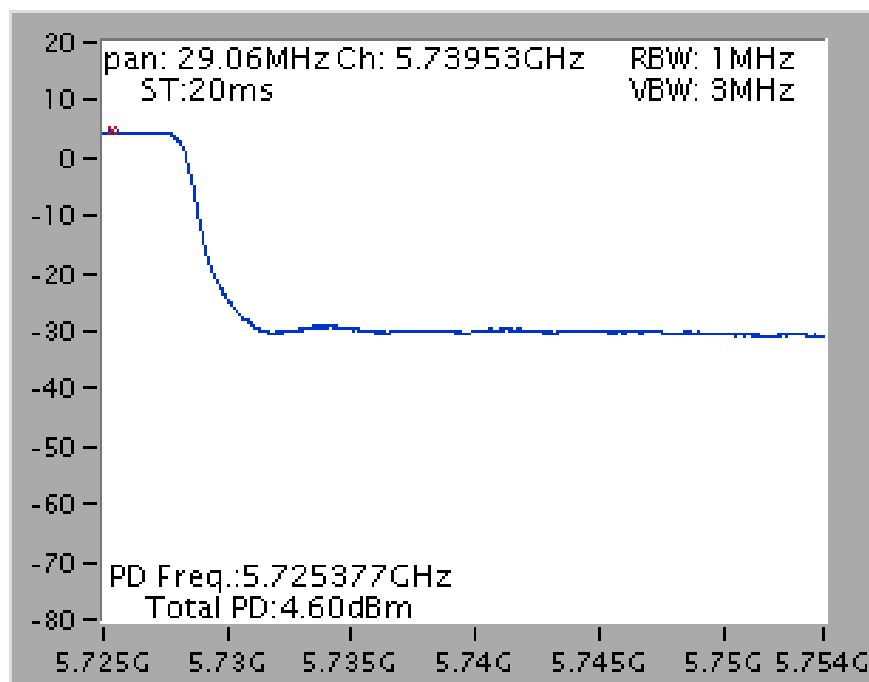
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5710 MHz (UNII 3)



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5690 MHz (UNII 2C)



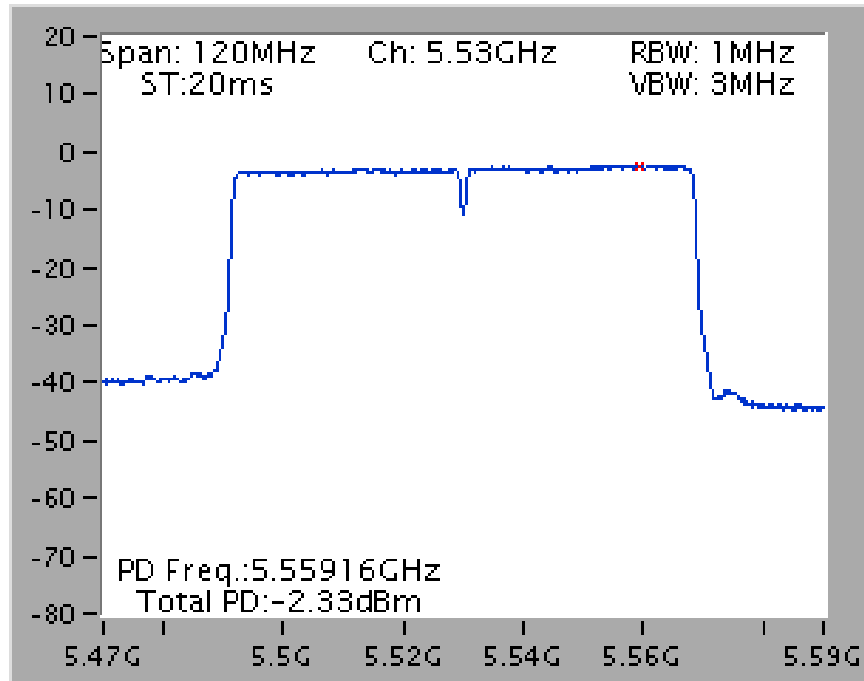
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5690 MHz (UNII 3)



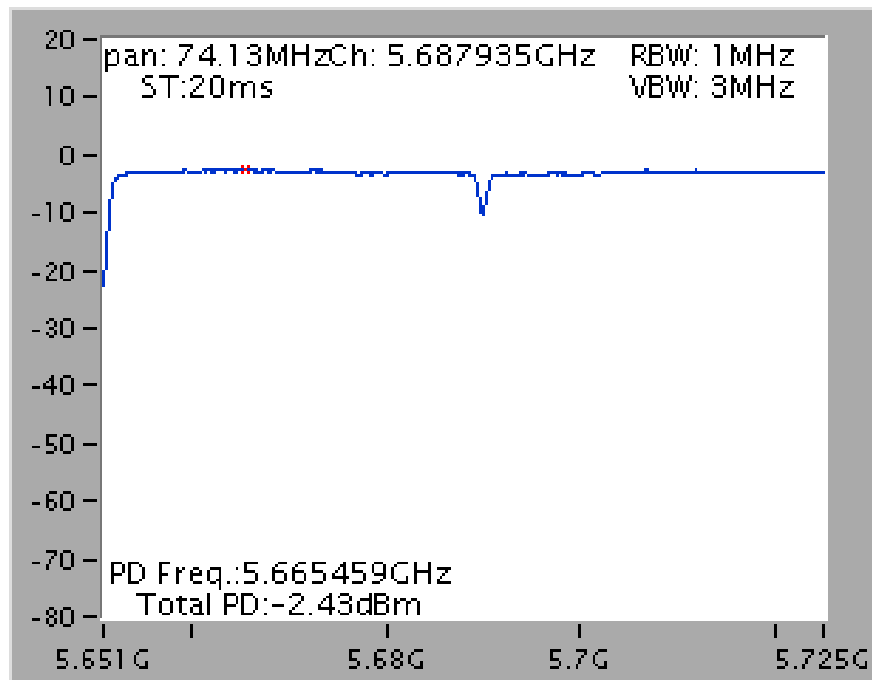
802.11ac MCS0/Nss2 VHT80+80

Type 1

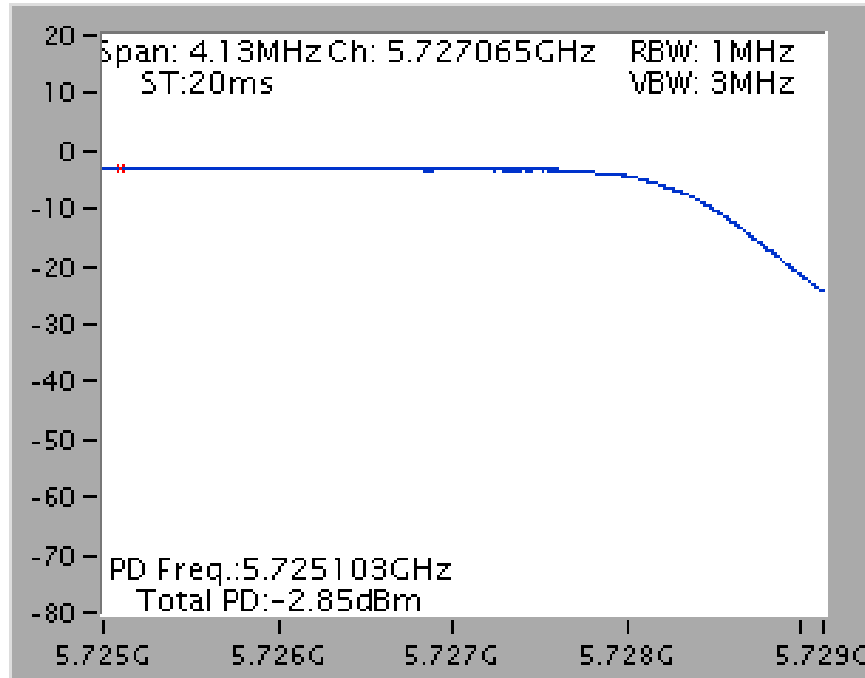
Power Density Plot on Chain 1 + Chain 2 / 5530 MHz



Power Density Plot on Chain 3 + Chain 4 / 5690 MHz (UNII 2C)

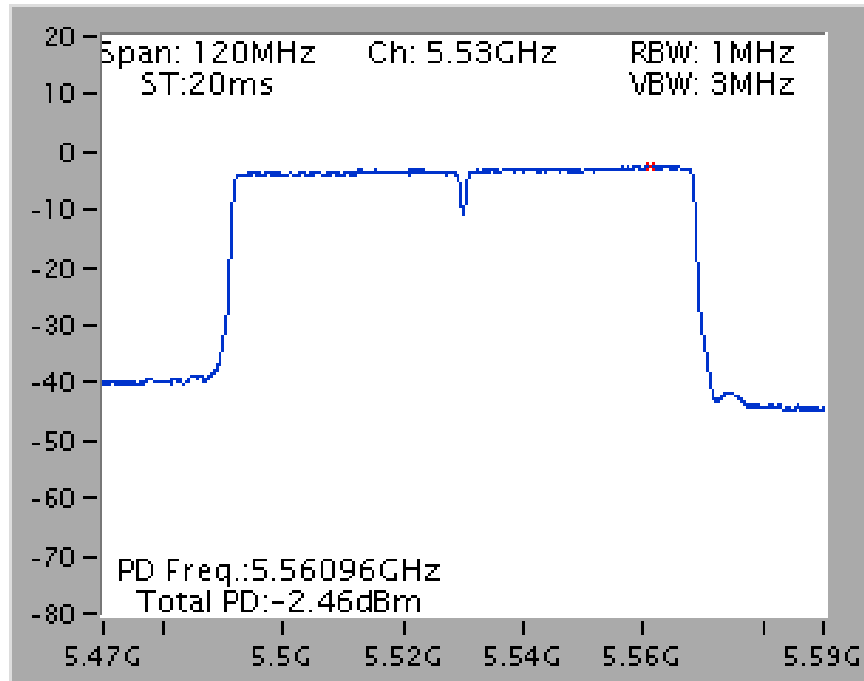


Power Density Plot on Chain 3 + Chain 4 / 5690 MHz (UNII 3)

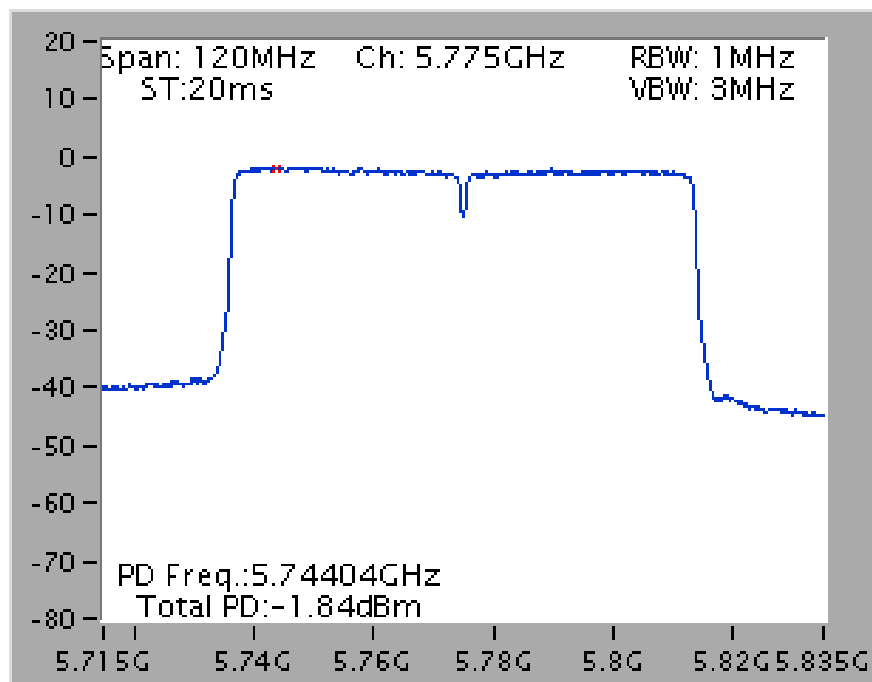


Type 2

Power Density Plot on Chain 1 + Chain 2 / 5530 MHz

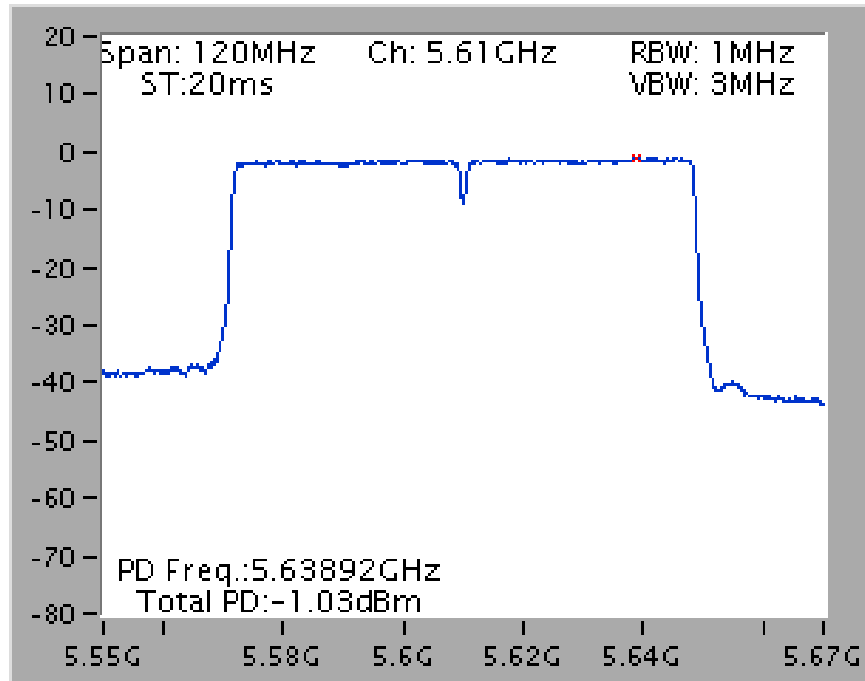


Power Density Plot on Chain 3 + Chain 4 / 5775 MHz

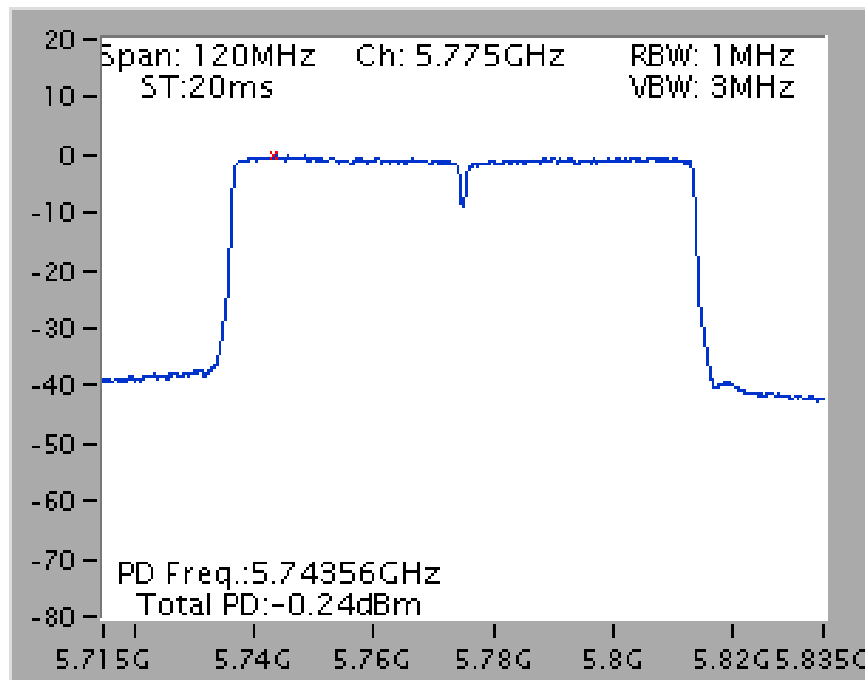


Type 3

Power Density Plot on Chain 1 + Chain 2 / 5610 MHz

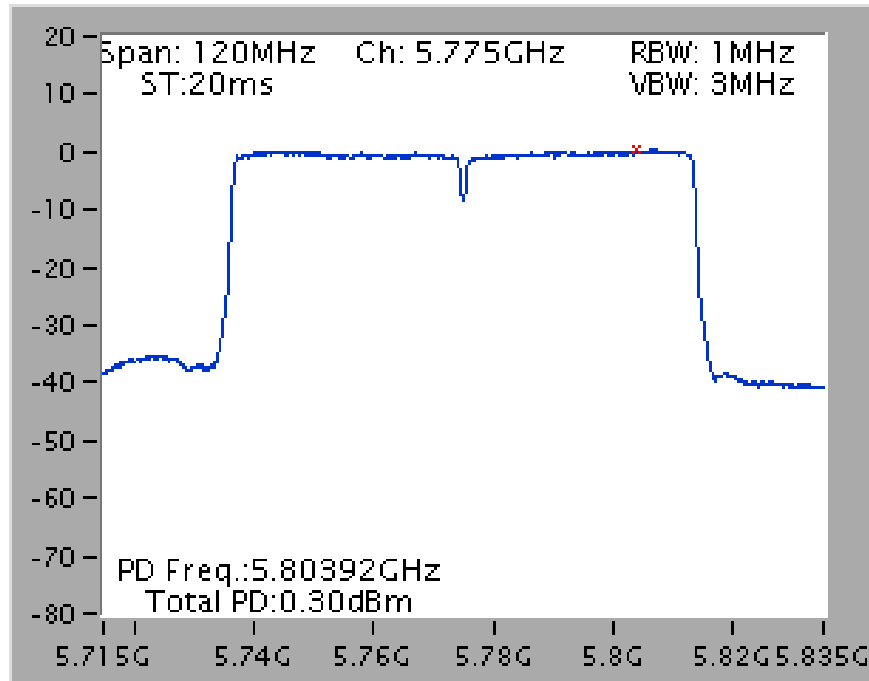


Power Density Plot on Chain 3 + Chain 4 / 5775 MHz

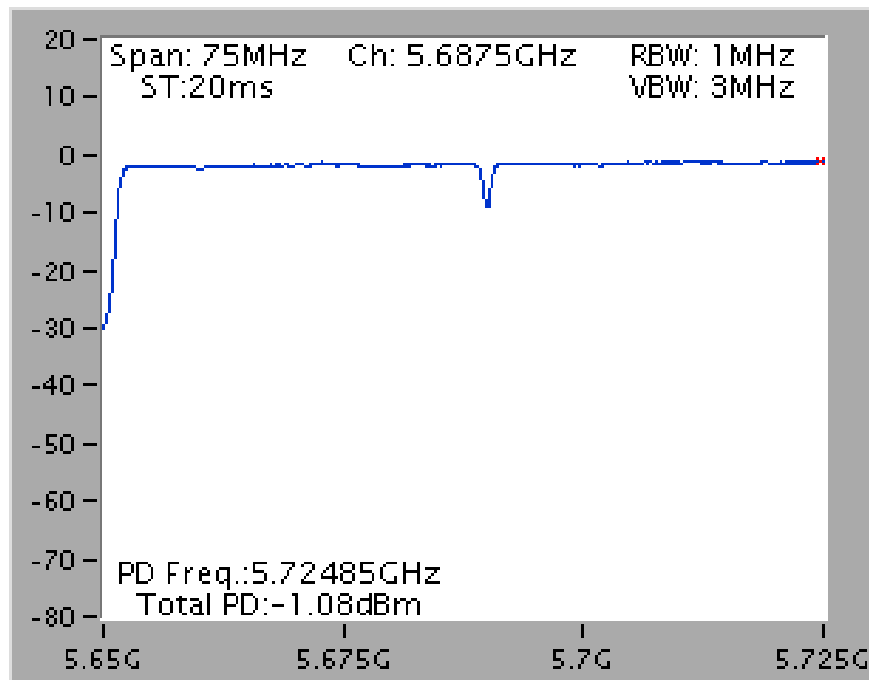


Type 4

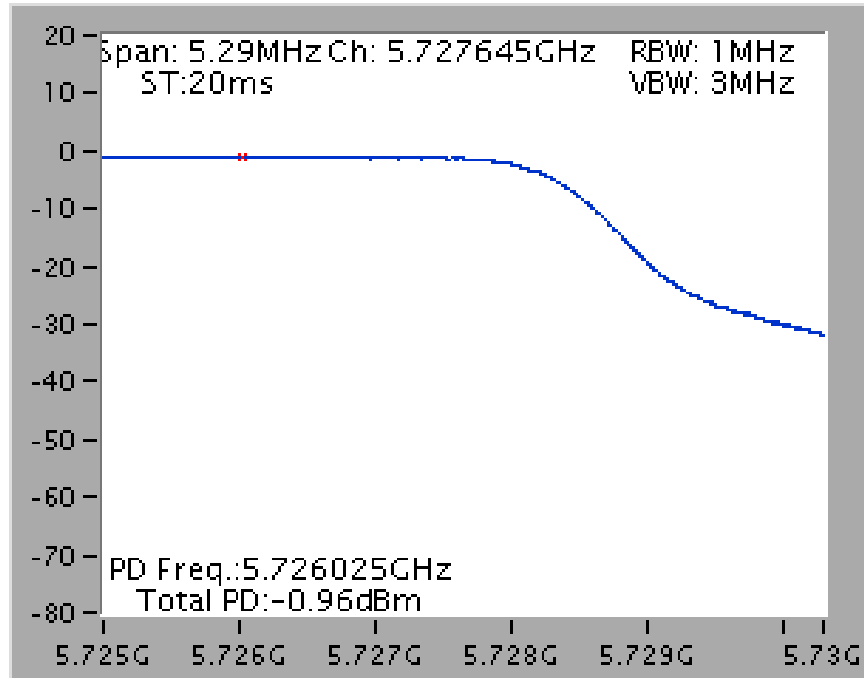
Power Density Plot on Chain 3 + Chain 4 / 5775 MHz



Power Density Plot on Chain 1 + Chain 2 / 5690 MHz (UNII 2C)

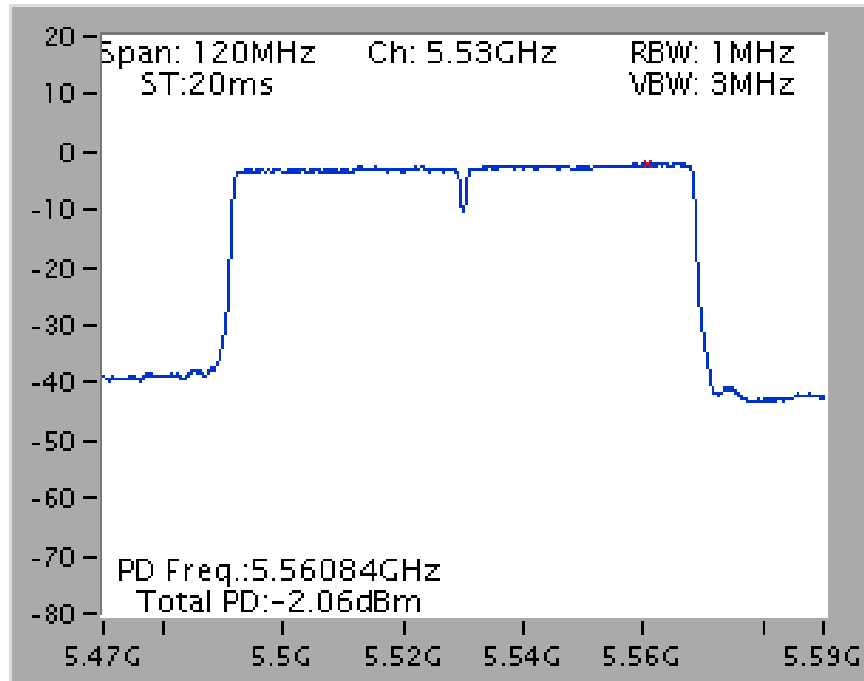


Power Density Plot on Chain 1 + Chain 2 / 5690 MHz (UNII 3)

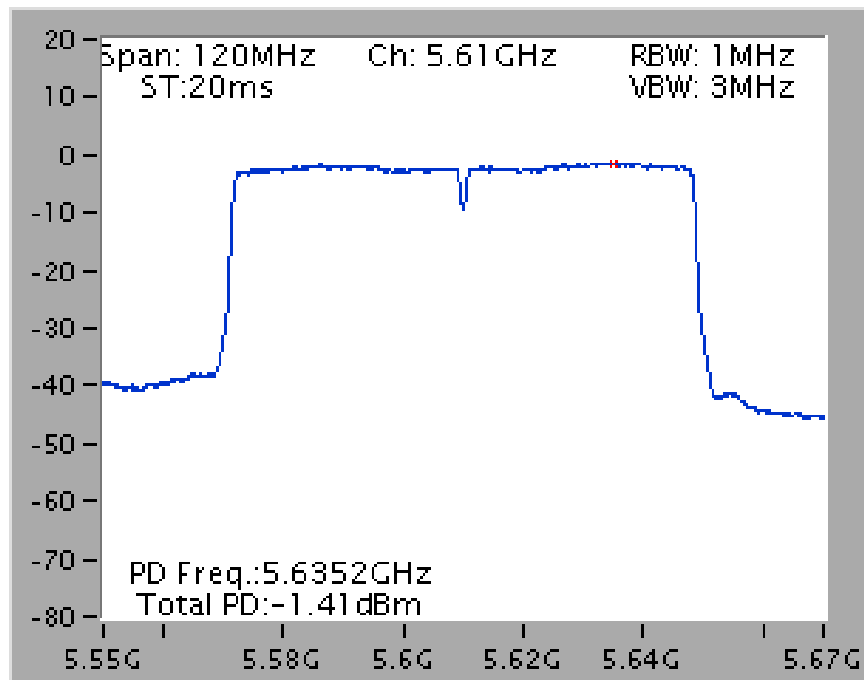


Type 5

Power Density Plot on Chain 1 + Chain 2 / 5530 MHz

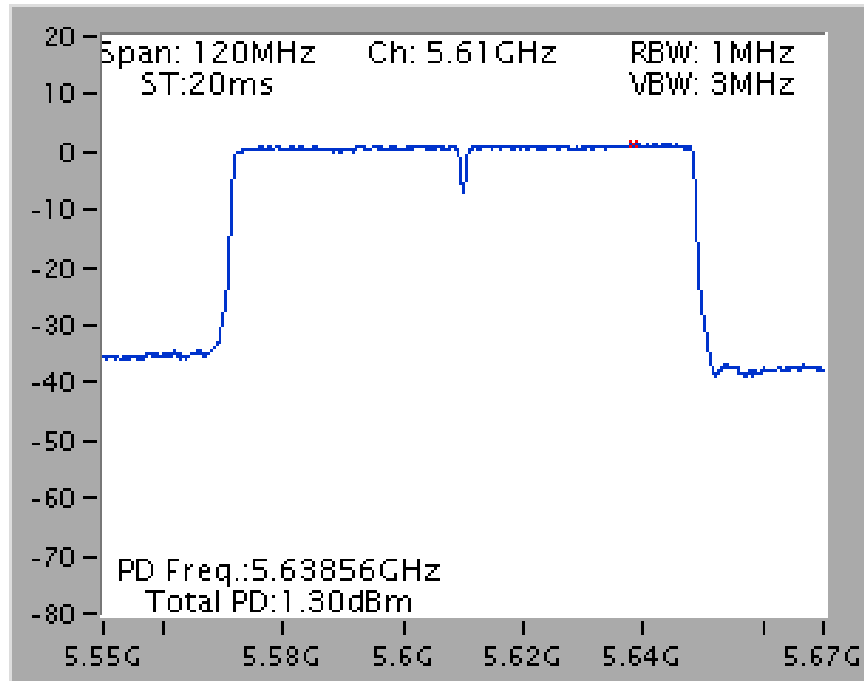


Power Density Plot on Chain 3 + Chain 4 / 5610 MHz

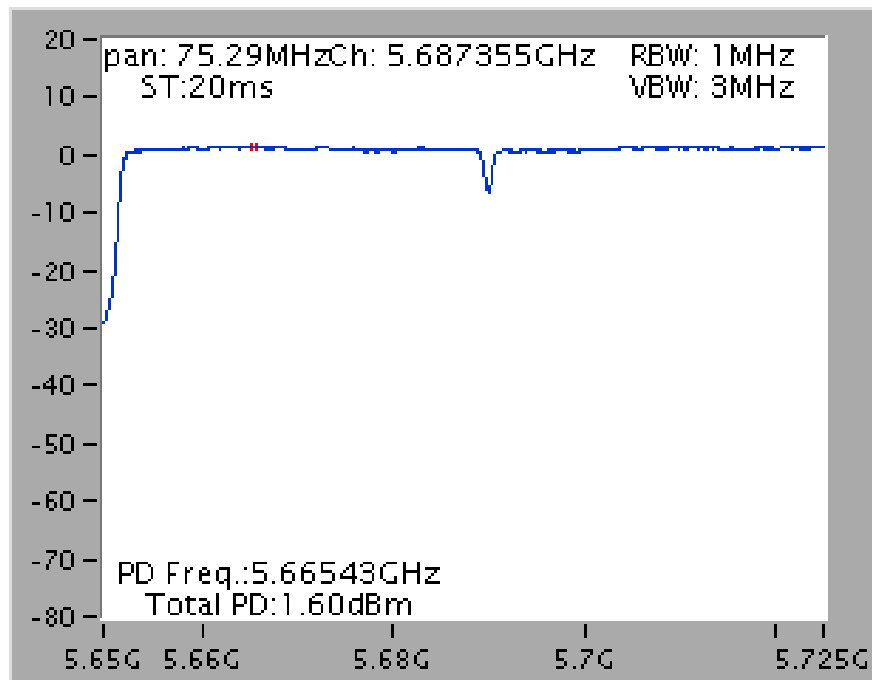


Type 6

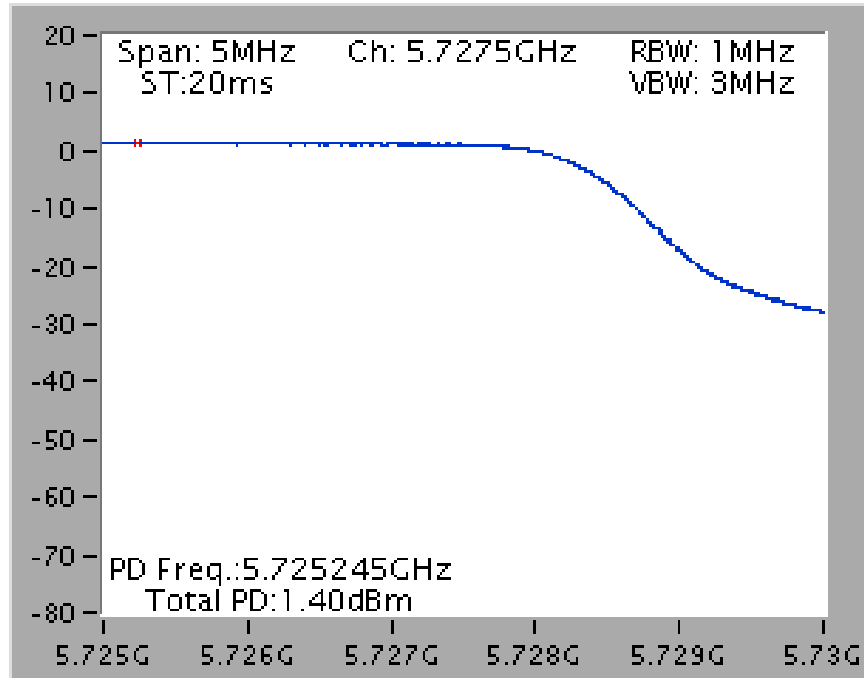
Power Density Plot on Chain 1 + Chain 2 / 5610 MHz



Power Density Plot on Chain 3 + Chain 4 / 5690 MHz (UNII 2C)

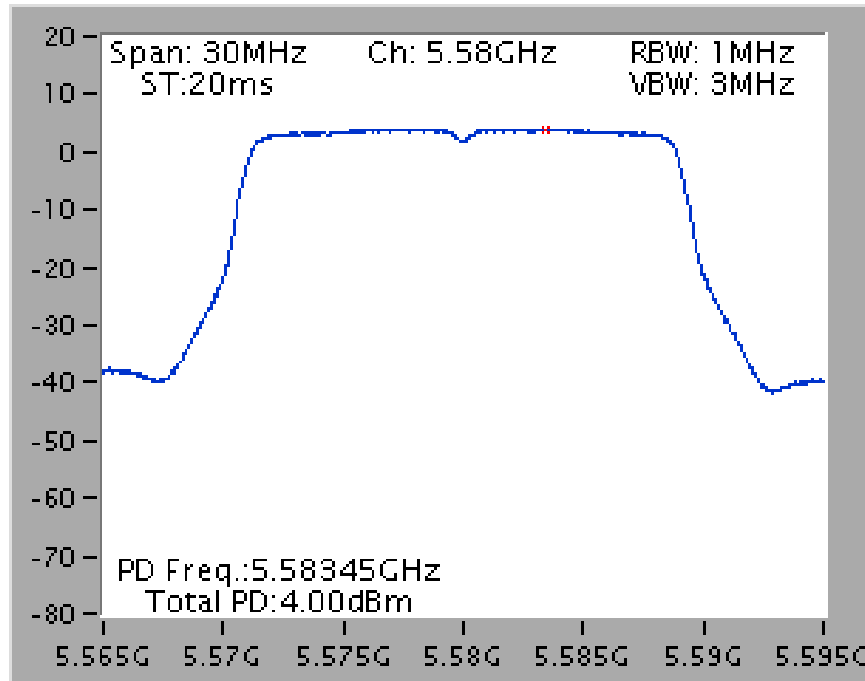


Power Density Plot on Chain 3 + Chain 4 / 5690 MHz (UNII 3)

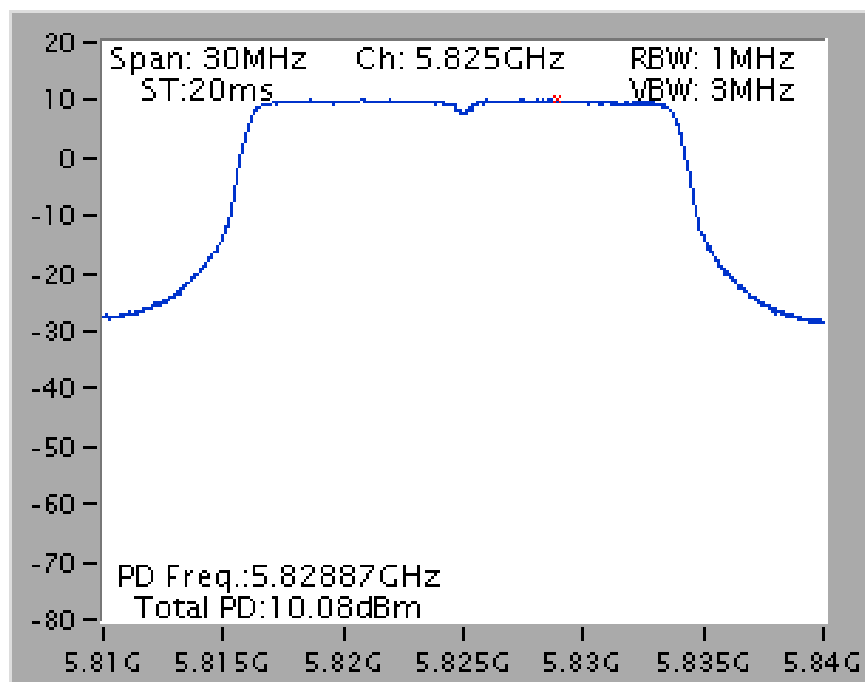


For beamforming mode

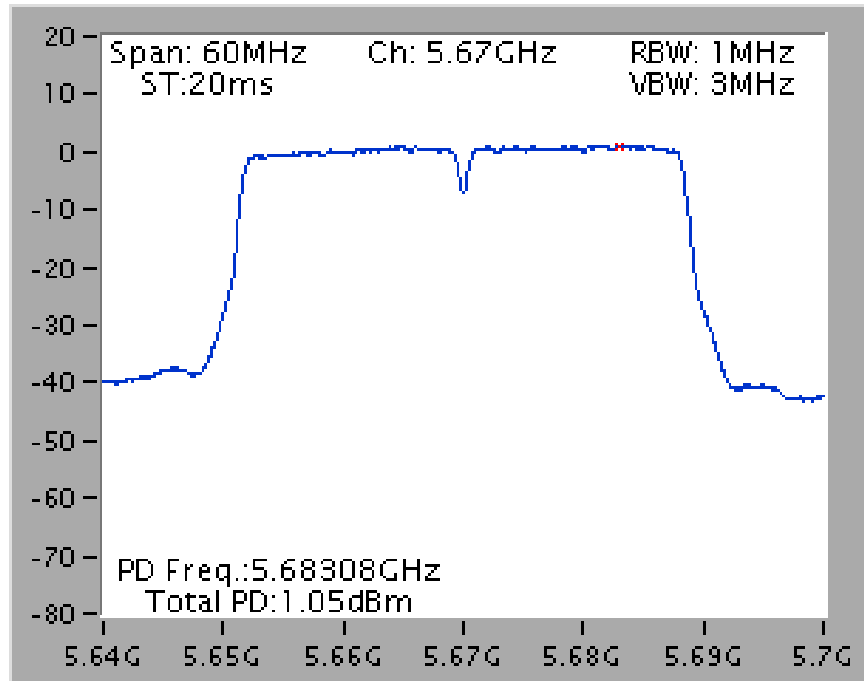
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



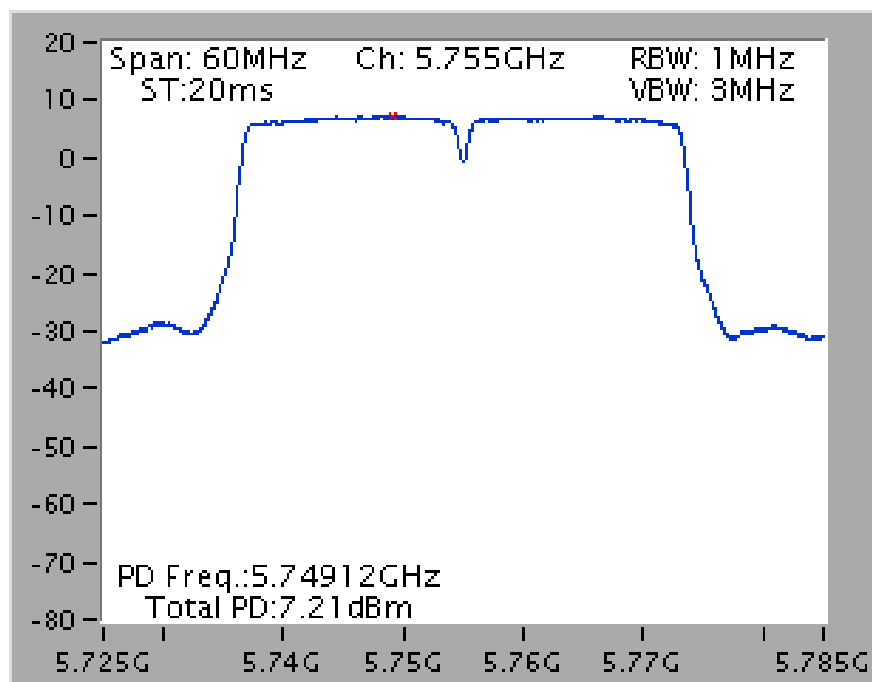
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



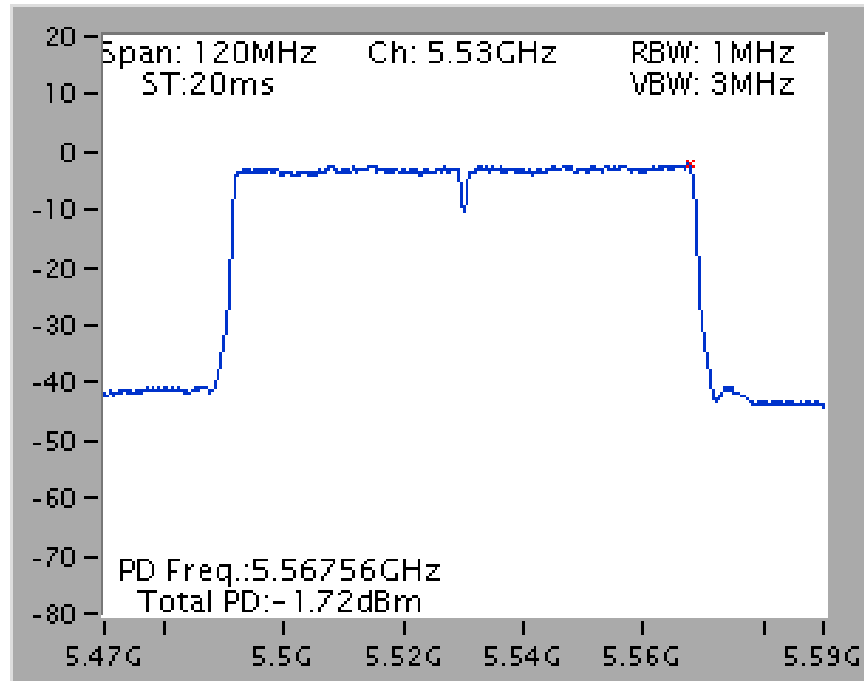
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



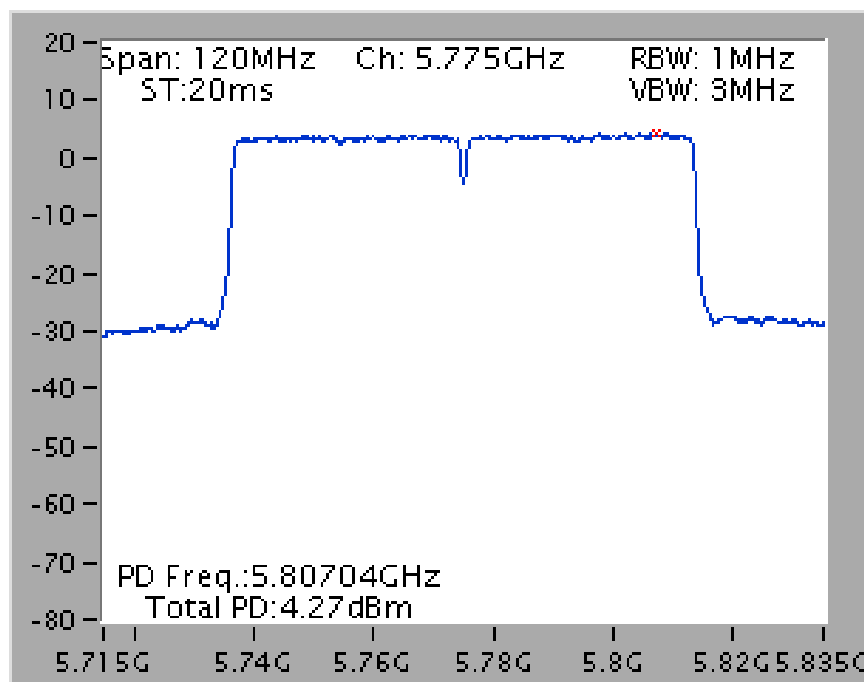
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5755 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5530 MHz

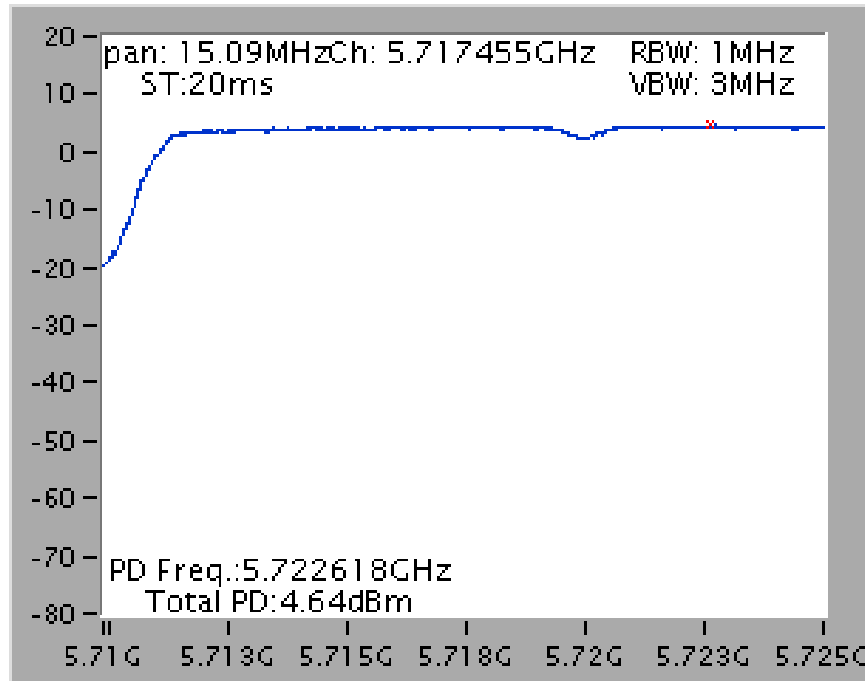


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz

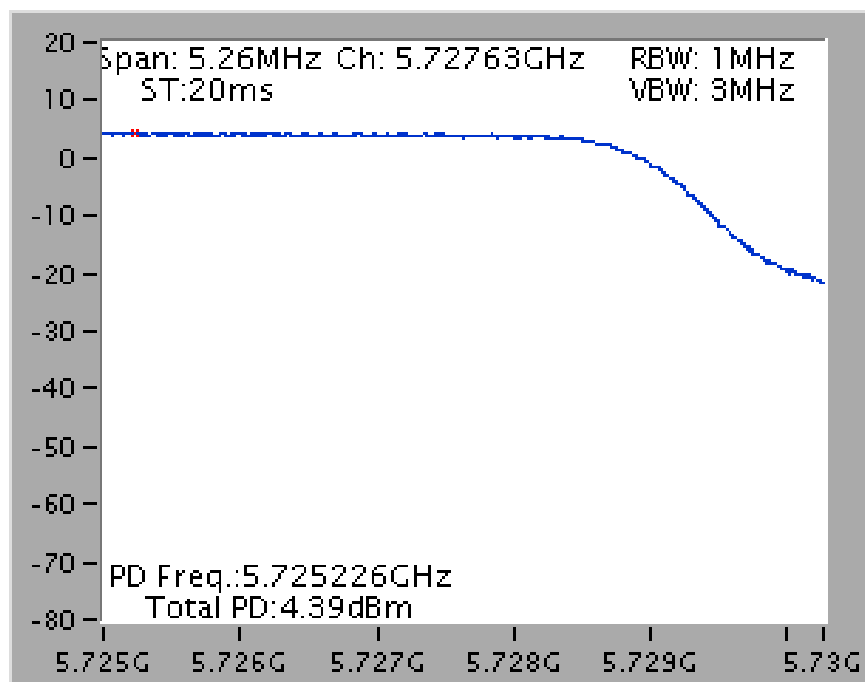


Straddle Channel

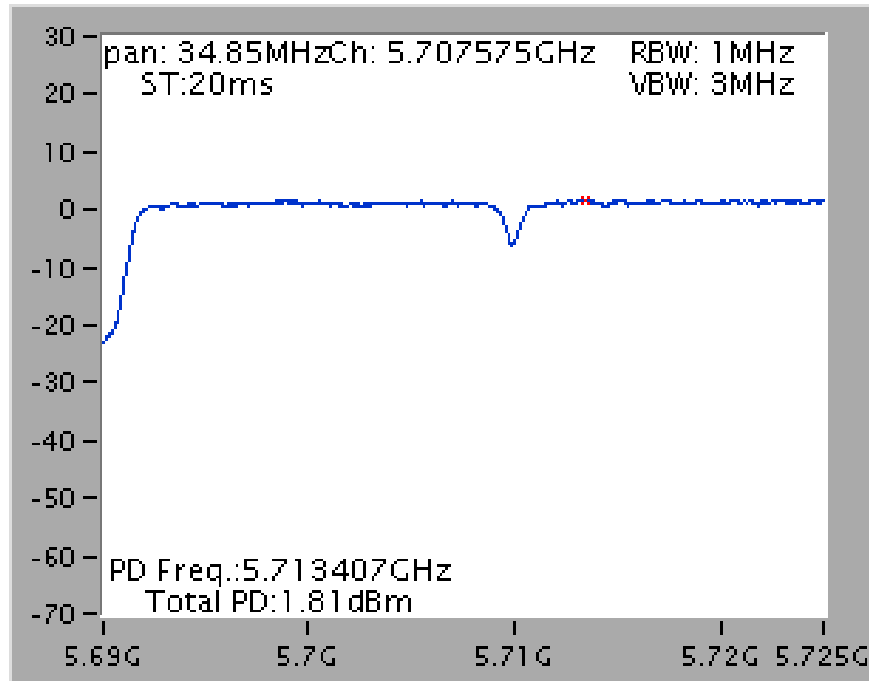
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz (UNII 2C)



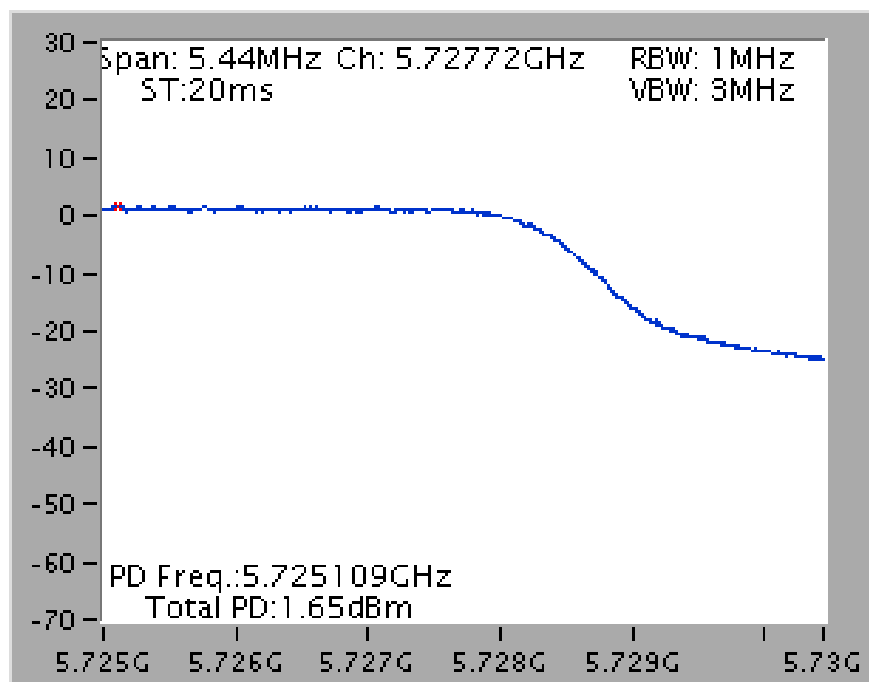
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5720 MHz (UNII 3)



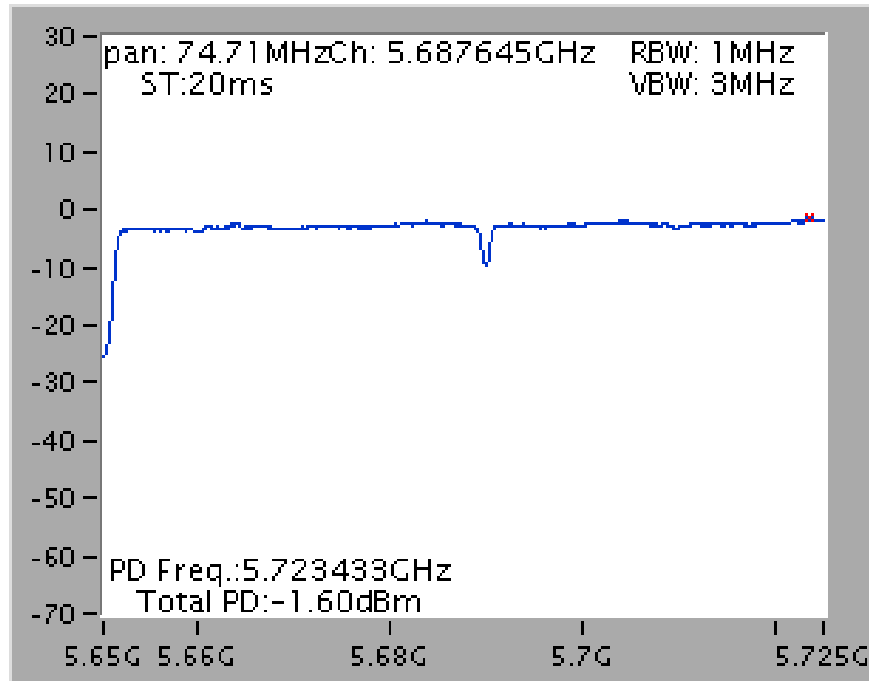
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5710 MHz (UNII 2C)



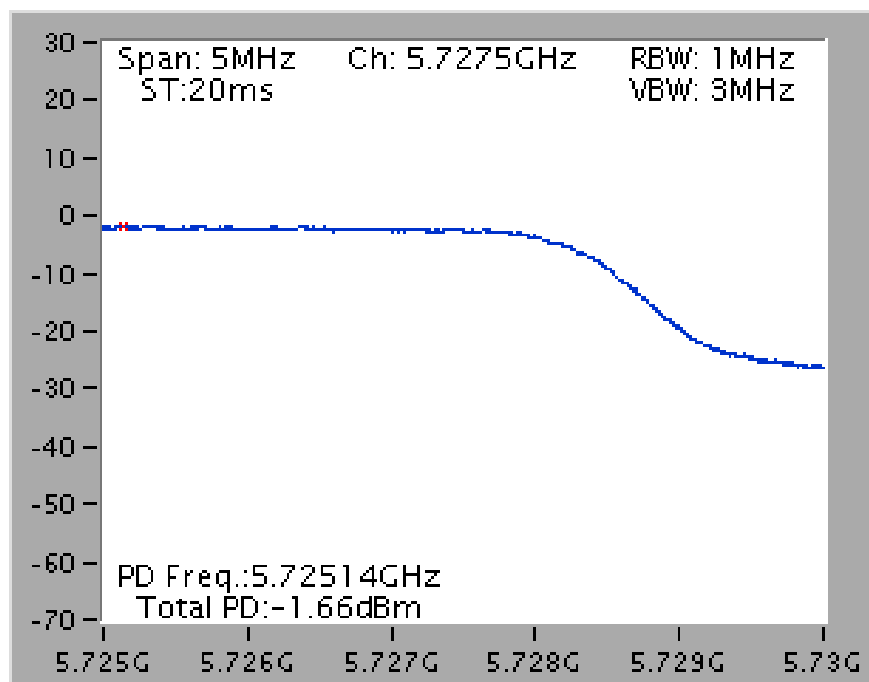
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5710 MHz (UNII 3)



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5690 MHz (UNII 2C)



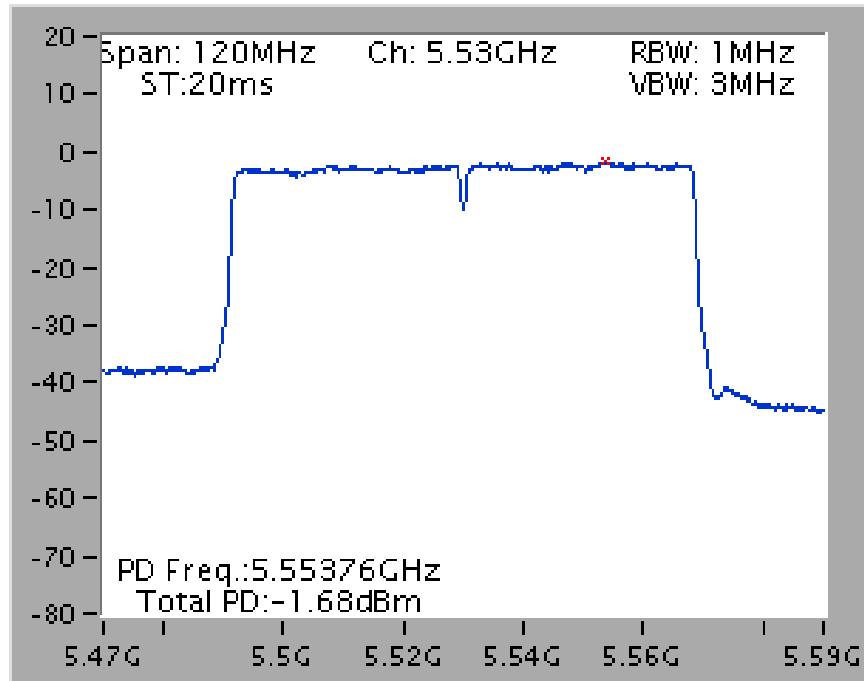
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5690 MHz (UNII 3)



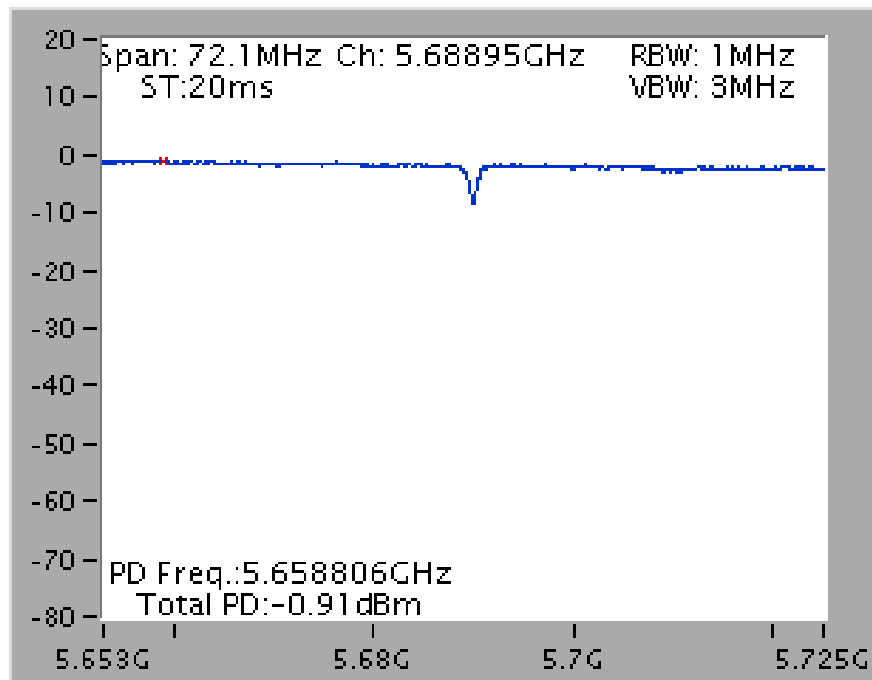
802.11ac MCS0/Nss2 VHT80+80

Type 1

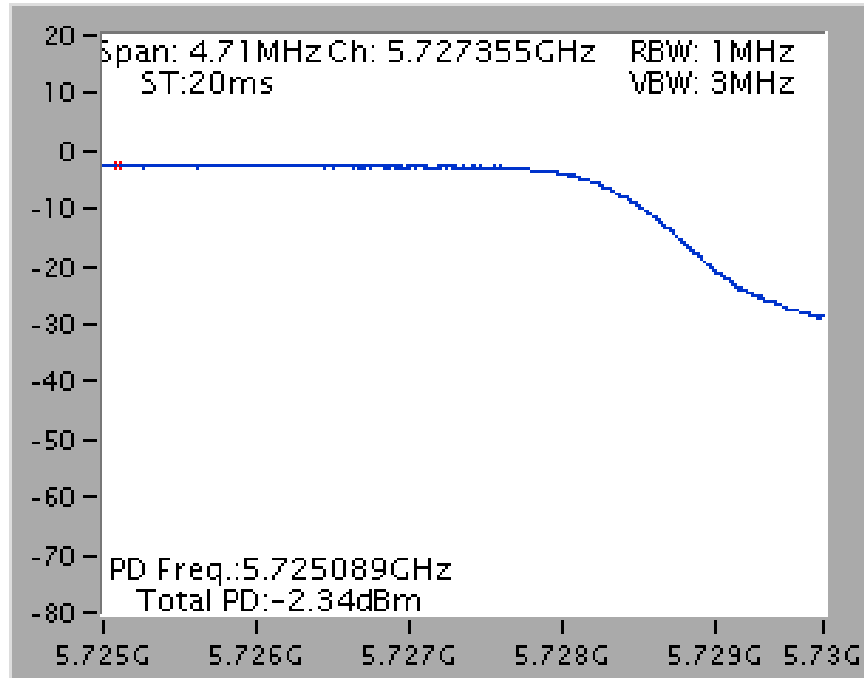
Power Density Plot on Chain 1 + Chain 2 / 5530 MHz



Power Density Plot on Chain 3 + Chain 4 / 5690 MHz (UNII 2C)

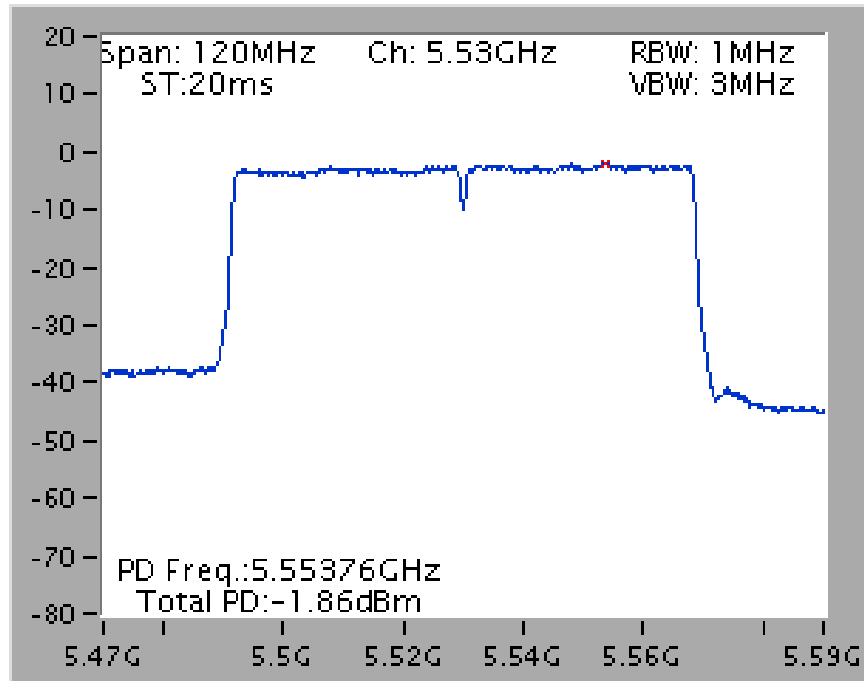


Power Density Plot on Chain 3 + Chain 4 / 5690 MHz (UNII 3)

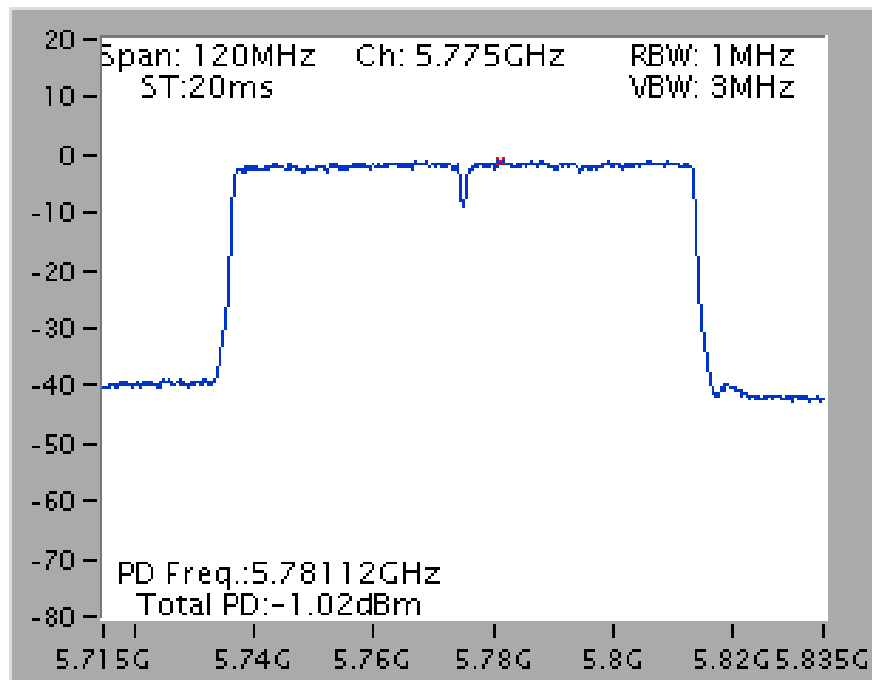


Type 2

Power Density Plot on Chain 1 + Chain 2 / 5530 MHz

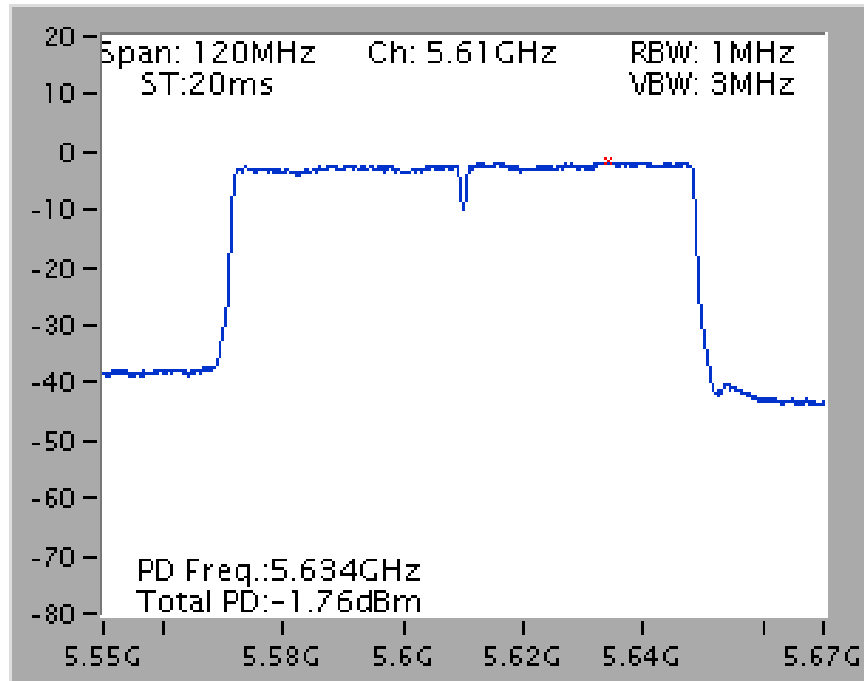


Power Density Plot on Chain 3 + Chain 4 / 5775 MHz

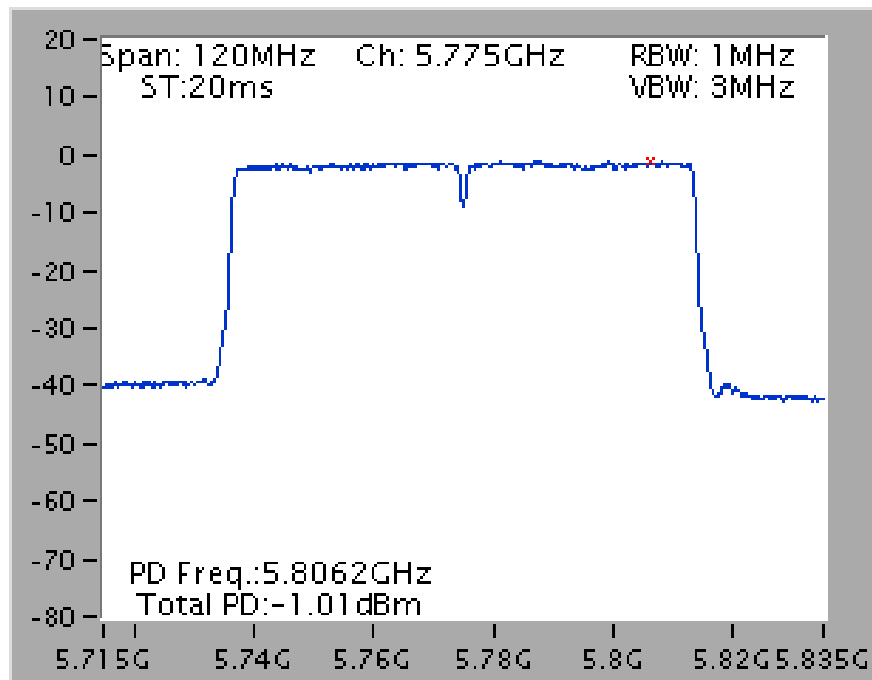


Type 3

Power Density Plot on Chain 1 + Chain 2 / 5610 MHz

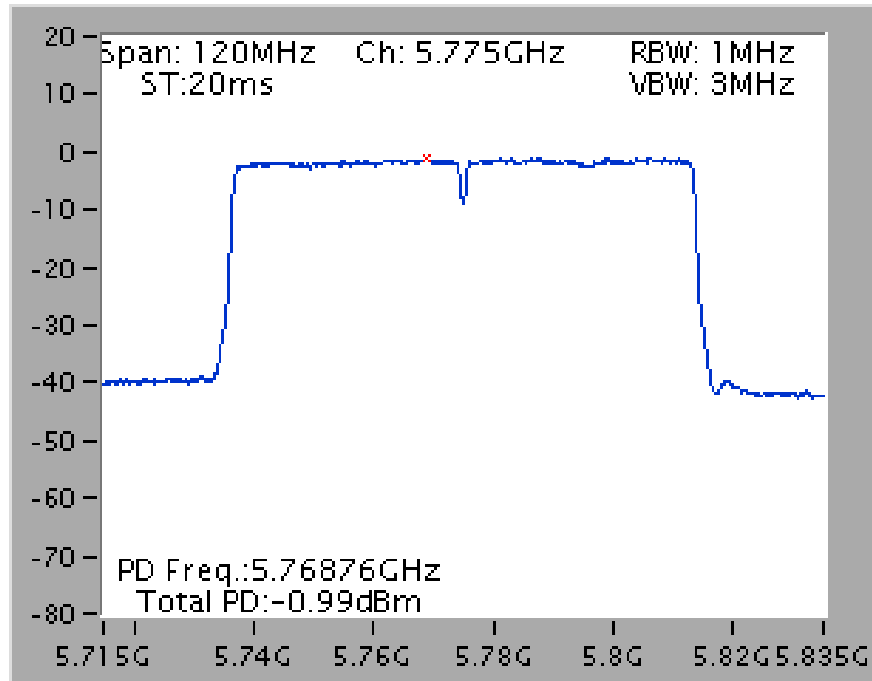


Power Density Plot on Chain 3 + Chain 4 / 5775 MHz

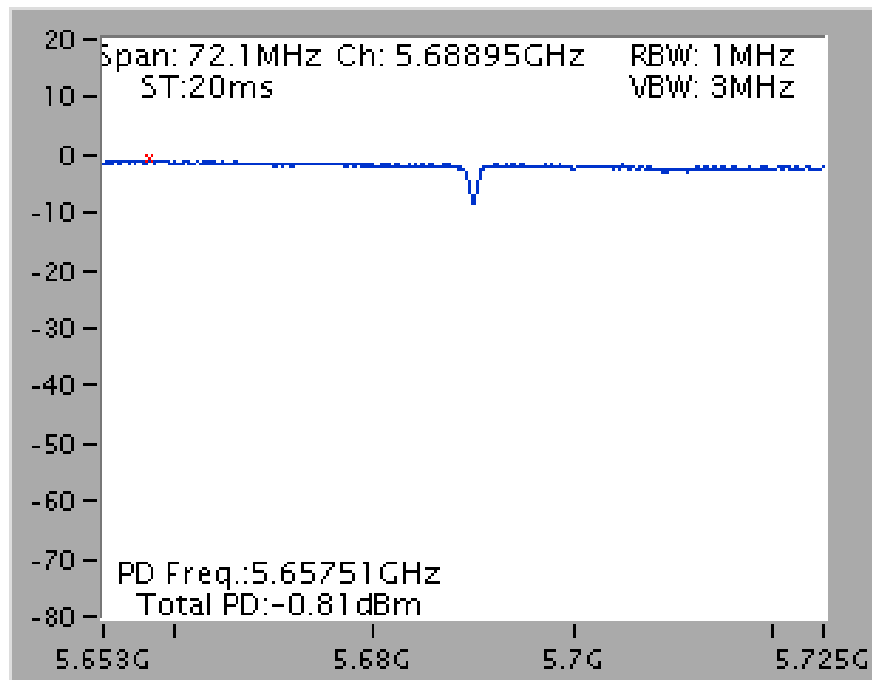


Type 4

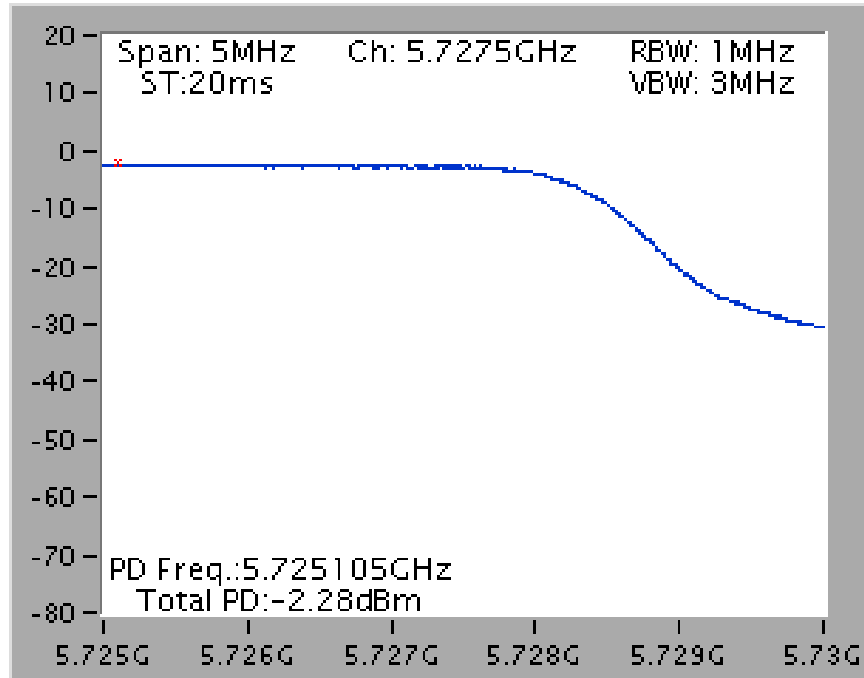
Power Density Plot on Chain 3 + Chain 4 / 5775 MHz



Power Density Plot on Chain 1 + Chain 2 / 5690 MHz (UNII 2C)

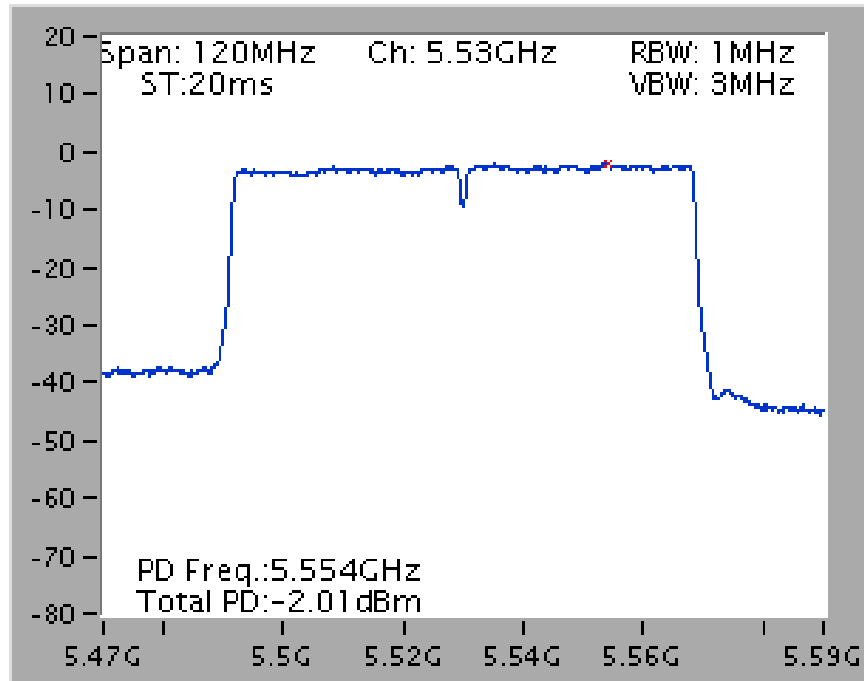


Power Density Plot on Chain 1 + Chain 2 / 5690 MHz (UNII 3)

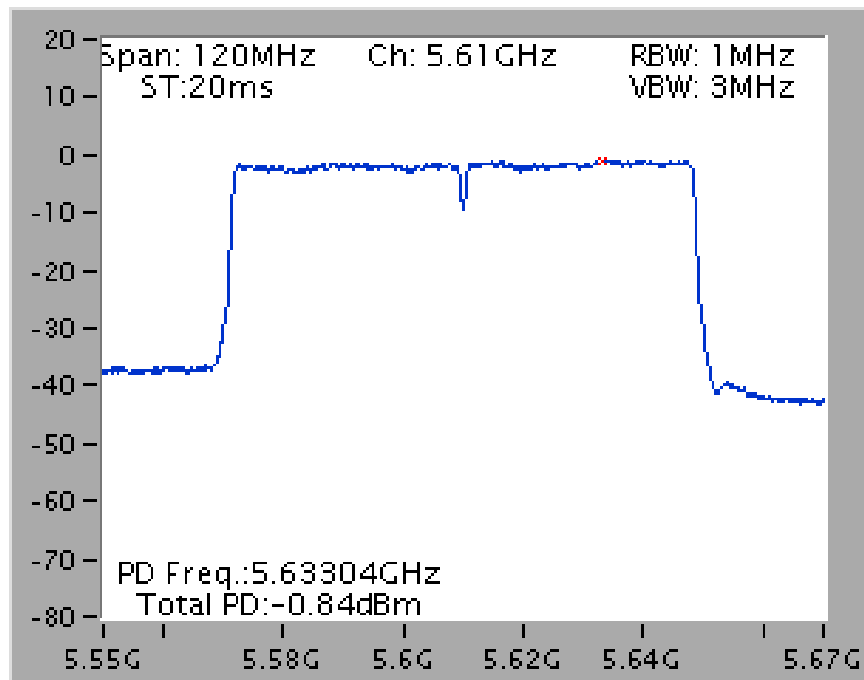


Type 5

Power Density Plot on Chain 1 + Chain 2 / 5530 MHz



Power Density Plot on Chain 3 + Chain 4 / 5610 MHz



4.6. Radiated Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micovolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.6.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RBW / VBW (Emission in restricted band)	1 MHz / 3MHz for Peak, 1 MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1 MHz / 3MHz for peak

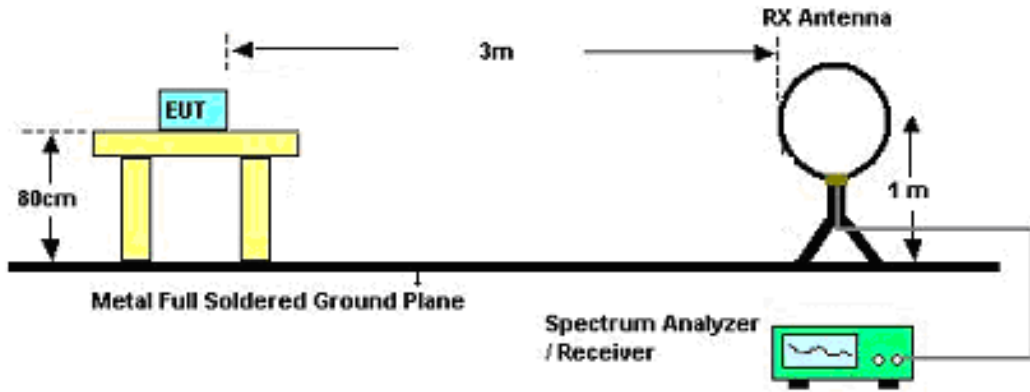
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

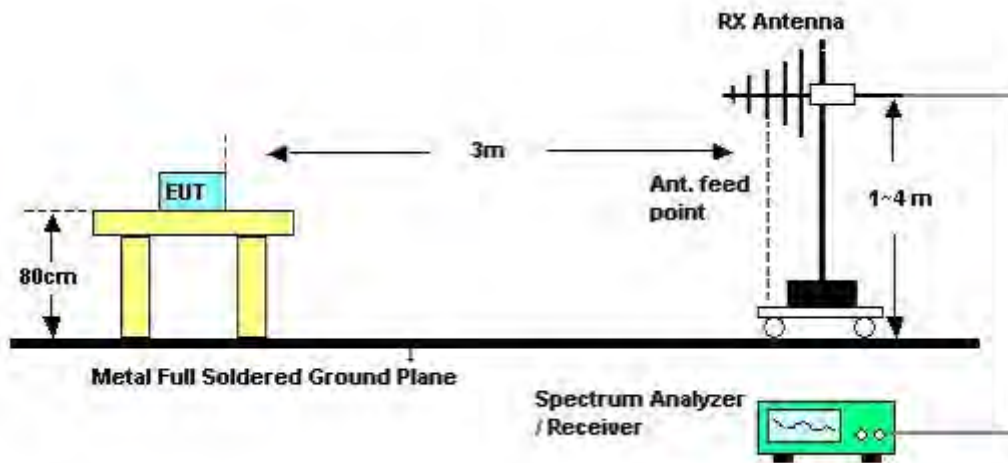
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.6.4. Test Setup Layout

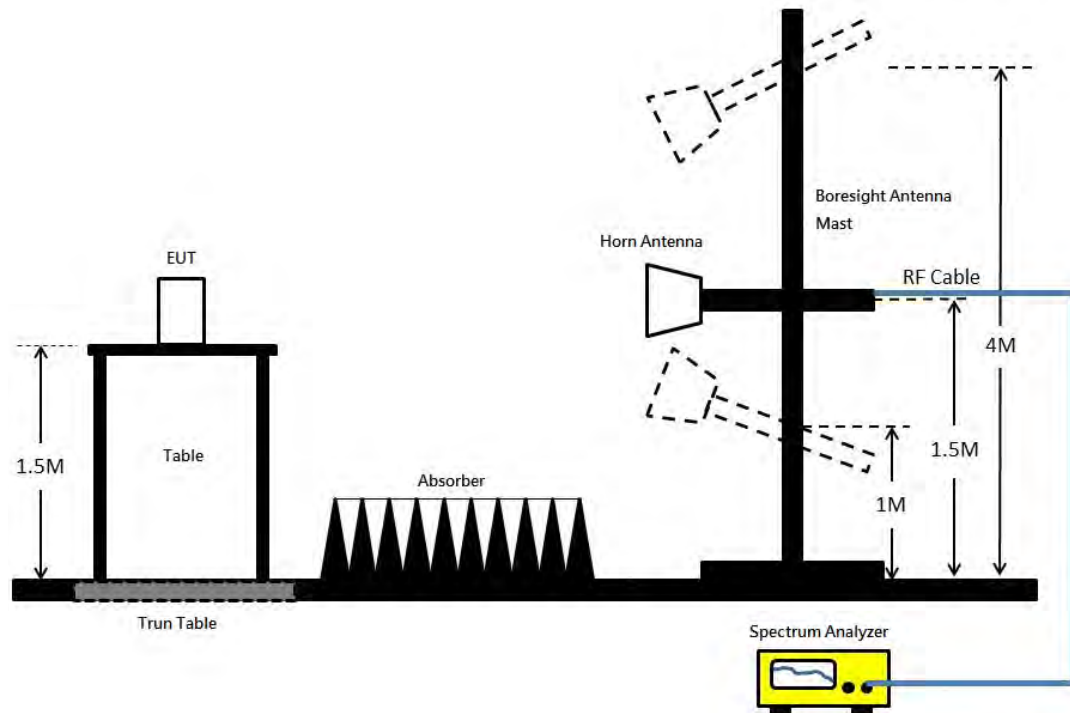
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

4.6.7. Results of Radiated Emissions (9kHz~30MHz)

Temperature	22°C	Humidity	54%
Test Engineer	Nyle Chang & Eason Chen	Configurations	CTX
Test Date	Aug. 16, 2016	Test Mode	Mode 2

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

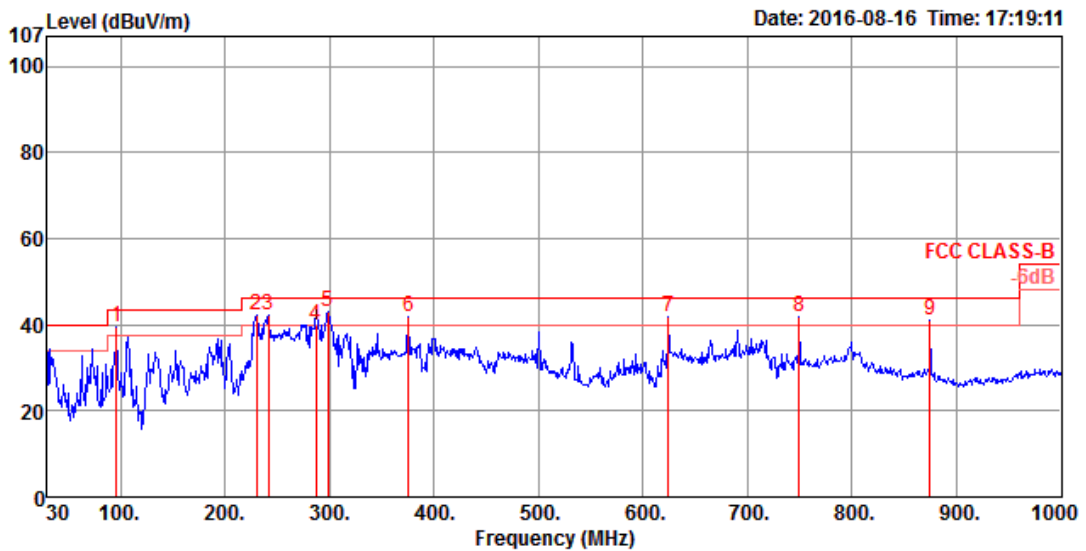
Distance extrapolation factor = $40 \log(\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

4.6.8. Results of Radiated Emissions (30MHz~1GHz)

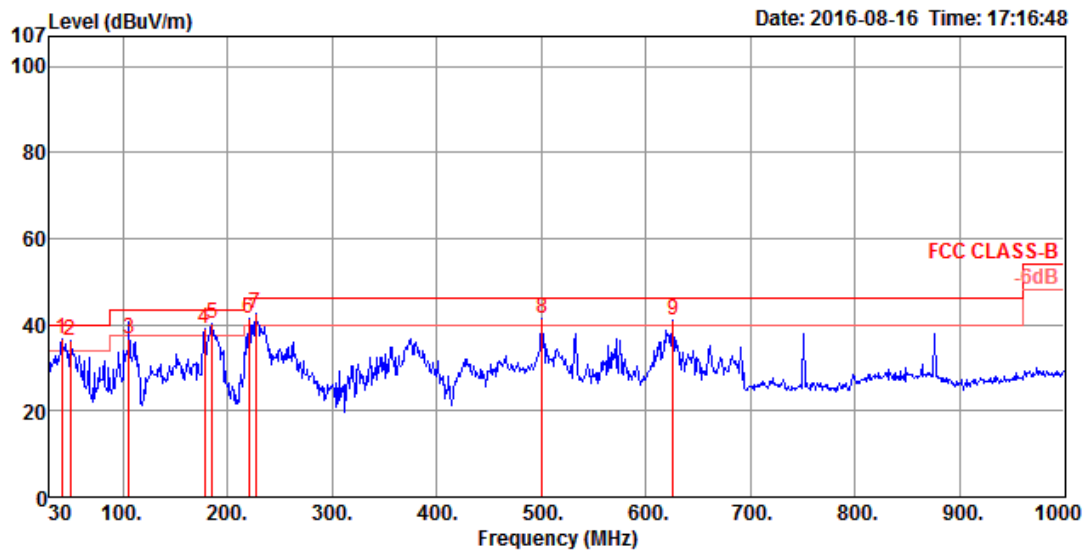
Temperature	22°C	Humidity	54%
Test Engineer	Nyle Chang & Eason Chen	Configurations	CTX
Test Mode	Mode 2		

Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	PoI/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	95.96	39.48	43.50	-4.02	54.16	0.87	16.30	31.85	200	322 Peak	HORIZONTAL
2	229.82	42.40	46.00	-3.60	56.17	1.21	17.00	31.98	125	74 Peak	HORIZONTAL
3	241.46	42.40	46.00	-3.60	55.00	1.23	18.12	31.95	150	235 Peak	HORIZONTAL
4	287.05	39.77	46.00	-6.23	51.10	1.34	19.37	32.04	125	236 QP	HORIZONTAL
5	298.69	42.95	46.00	-3.05	54.03	1.37	19.56	32.01	125	260 Peak	HORIZONTAL
6	375.32	41.75	46.00	-4.25	50.64	1.50	21.73	32.12	100	98 Peak	HORIZONTAL
7	624.61	41.74	46.00	-4.26	47.06	1.97	25.16	32.45	125	125 Peak	HORIZONTAL
8	749.74	41.68	46.00	-4.32	46.07	2.19	26.00	32.58	150	241 Peak	HORIZONTAL
9	874.87	41.08	46.00	-4.92	44.04	2.38	27.15	32.49	100	46 Peak	HORIZONTAL

Vertical



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	41.64	36.86	40.00	-3.14	49.26	0.56	18.71	31.67	100	229 Peak	VERTICAL
2	49.40	36.31	40.00	-3.69	52.37	0.61	15.08	31.75	125	196 Peak	VERTICAL
3	105.66	36.90	43.50	-6.60	50.20	0.87	17.69	31.86	100	295 QP	VERTICAL
4	178.41	39.19	43.50	-4.31	54.53	1.06	15.54	31.94	100	132 Peak	VERTICAL
5	185.20	40.17	43.50	-3.33	55.60	1.08	15.45	31.96	100	147 Peak	VERTICAL
6	220.12	41.51	46.00	-4.49	55.98	1.18	16.30	31.95	200	310 Peak	VERTICAL
7	226.91	42.75	46.00	-3.25	56.74	1.20	16.78	31.97	200	270 Peak	VERTICAL
8	500.45	41.30	46.00	-4.70	48.13	1.76	23.73	32.32	100	144 Peak	VERTICAL
9	625.58	40.99	46.00	-5.01	46.31	1.97	25.16	32.45	100	40 Peak	VERTICAL

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

4.6.9. Results for Radiated Emissions (1GHz~40GHz)

For non-beamforming mode

Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11a CH 100 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11008.90	44.65	54.00	-9.35	29.58	9.86	38.40	33.19	175	177	Average	HORIZONTAL
2	11011.00	56.93	74.00	-17.07	41.86	9.86	38.40	33.19	175	177	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10998.80	44.84	54.00	-9.16	29.77	9.86	38.40	33.19	209	94	Average	VERTICAL
2	11002.10	58.12	74.00	-15.88	43.05	9.86	38.40	33.19	209	94	Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11a CH 116 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11158.40	44.39	54.00	-9.61	28.97	9.94	38.67	33.19	128	267 Average	HORIZONTAL
2	11178.40	56.49	74.00	-17.51	41.07	9.94	38.67	33.19	128	267 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11159.10	45.39	54.00	-8.61	29.97	9.94	38.67	33.19	100	142 Average	VERTICAL
2	11175.00	57.08	74.00	-16.92	41.66	9.94	38.67	33.19	100	142 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11a CH 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11417.90	45.87	54.00	-8.13	29.89	10.07	39.09	33.18	244	172 Average	HORIZONTAL
2	11421.40	58.00	74.00	-16.00	42.02	10.07	39.09	33.18	244	172 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11417.60	45.79	54.00	-8.21	29.81	10.07	39.09	33.18	218	85 Average	VERTICAL
2	11419.90	58.22	74.00	-15.78	42.24	10.07	39.09	33.18	218	85 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11467.50	57.98	74.00	-16.02	41.93	10.08	39.15	33.18	245	120 Peak	HORIZONTAL
2	11492.50	46.03	54.00	-7.97	29.91	10.10	39.20	33.18	245	120 Average	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11491.60	46.44	54.00	-7.56	30.32	10.10	39.20	33.18	256	294 Average	VERTICAL
2	11494.40	58.61	74.00	-15.39	42.49	10.10	39.20	33.18	256	294 Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11546.00	58.01	74.00	-15.99	41.88	10.12	39.20	33.19	239	200 Peak	HORIZONTAL
2	11551.30	45.65	54.00	-8.35	29.52	10.13	39.20	33.20	239	200 Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11548.40	58.12	74.00	-15.88	42.00	10.12	39.20	33.20	262	91 Peak	VERTICAL
2	11572.60	46.02	54.00	-7.98	29.89	10.13	39.20	33.20	262	91 Average	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11644.60	45.43	54.00	-8.57	29.29	10.16	39.20	33.22	148	291	Average	HORIZONTAL
2	11651.68	57.99	74.00	-16.01	41.83	10.18	39.20	33.22	148	291	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11645.52	58.01	74.00	-15.99	41.87	10.16	39.20	33.22	193	102	Peak	VERTICAL
2	11648.68	45.73	54.00	-8.27	29.59	10.16	39.20	33.22	193	102	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10982.60	43.95	54.00	-10.05	28.92	9.84	38.40	33.21	268	50 Average	HORIZONTAL
2	11011.50	56.41	74.00	-17.59	41.34	9.86	38.40	33.19	268	50 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10982.90	44.06	54.00	-9.94	29.03	9.84	38.40	33.21	182	250 Average	VERTICAL
2	10994.10	57.05	74.00	-16.95	42.00	9.84	38.40	33.19	182	250 Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11159.40	56.87	74.00	-17.13	41.45	9.94	38.67	33.19	184	78	Peak	HORIZONTAL
2	11164.20	44.61	54.00	-9.39	29.19	9.94	38.67	33.19	184	78	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11138.00	56.79	74.00	-17.21	41.45	9.92	38.61	33.19	173	325	Peak	VERTICAL
2	11155.20	44.11	54.00	-9.89	28.77	9.92	38.61	33.19	173	325	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11415.20	58.08	74.00	-15.92	42.17	10.05	39.04	33.18	237	65 Peak	HORIZONTAL
2	11418.10	45.46	54.00	-8.54	29.48	10.07	39.09	33.18	237	65 Average	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11406.00	57.98	74.00	-16.02	42.07	10.05	39.04	33.18	295	276 Peak	VERTICAL
2	11422.70	45.44	54.00	-8.56	29.46	10.07	39.09	33.18	295	276 Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11490.00	57.95	74.00	-16.05	41.83	10.10	39.20	33.18	117	128	Peak	HORIZONTAL
2	11497.00	45.52	54.00	-8.48	29.40	10.10	39.20	33.18	117	128	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11474.70	57.94	74.00	-16.06	41.89	10.08	39.15	33.18	220	283	Peak	VERTICAL
2	11495.90	45.70	54.00	-8.30	29.58	10.10	39.20	33.18	220	283	Average	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11561.76	45.21	54.00	-8.79	29.08	10.13	39.20	33.20	159	257 Average	HORIZONTAL
2	11573.20	58.11	74.00	-15.89	41.98	10.13	39.20	33.20	159	257 Peak	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11562.04	46.05	54.00	-7.95	29.92	10.13	39.20	33.20	176	176 Average	VERTICAL
2	11570.36	58.63	74.00	-15.37	42.50	10.13	39.20	33.20	176	176 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11640.40	57.71	74.00	-16.29	41.57	10.16	39.20	33.22	151	323	Peak	HORIZONTAL
2	11651.72	45.15	54.00	-8.85	28.99	10.18	39.20	33.22	151	323	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.88	45.29	54.00	-8.71	29.15	10.16	39.20	33.22	241	149	Average	VERTICAL
2	11659.80	57.76	74.00	-16.24	41.60	10.18	39.20	33.22	241	149	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	
1	11015.88	56.47	74.00	-17.53	41.40	9.86	38.40	33.19	224	106 Peak	HORIZONTAL
2	11021.32	43.71	54.00	-10.29	28.64	9.86	38.40	33.19	224	106 Average	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	
1	11024.20	43.79	54.00	-10.21	28.72	9.86	38.40	33.19	159	324 Average	VERTICAL
2	11026.28	56.83	74.00	-17.17	41.76	9.86	38.40	33.19	159	324 Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Zero Chen & Stim Sung & Steven Liang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 17, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11090.40	44.25	54.00	-9.75	29.04	9.89	38.51	33.19	236	211	Average	HORIZONTAL
2	11103.44	57.04	74.00	-16.96	41.76	9.91	38.56	33.19	236	211	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11092.84	57.13	74.00	-16.87	41.85	9.91	38.56	33.19	230	128	Peak	VERTICAL
2	11094.96	44.92	54.00	-9.08	29.64	9.91	38.56	33.19	230	128	Average	VERTICAL