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NCC RADIO TEST REPORT

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Product Name	WiFi 模組
Brand Name	Extreme Networks
Model No.	CDRDB
Test Rule Part(s)	NCC LP0002 Section 4.7
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz / 5725 ~ 5850 MHz
Received Date	Oct. 05, 2015
Final Test Date	Jul. 24, 2017
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.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

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**, **NCC LP0002 (Jan. 10, 2018), KDB789033 D02 v02r01, KDB662911 D01 v02r01, 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
TR592302-19AA	Rev. 01	Initial issue of report	Sep. 12, 2017
TR592302-19AB	Rev. 02	Updating the test rule of to “NCC LP0002 (Jan. 10, 2018)” from “NCC LP0002 (Aug. 23, 2016)”.	Mar. 12, 2018

1. VERIFICATION OF COMPLIANCE

Product Name	:	WIFI 模組
Brand Name	:	Extreme Networks
Model No.	:	CDRDB
Applicant	:	香港商極進網路有限公司台灣分公司
Test Rule Part(s)	:	NCC LP0002 Section 4.7

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Oct. 05, 2015 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.

Cliff Chang
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: NCC LP0002 (Jan. 10, 2018)			
Part	Rule Section	Description of Test	Result
4.1	2.3	AC Power Line Conducted Emissions	Complies
4.2	4.7.3	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies
4.3	4.7.5	6dB Spectrum Bandwidth	Complies
4.4	4.7.3	Maximum Conducted Output Power	Complies
4.5	4.7.3	Power Spectral Density	Complies
4.6	4.7.4	Radiated Emissions	Complies
4.7	4.7.4	Band Edge Emissions	Complies
4.8	-	Frequency Stability	Complies
4.9	4.7.8	Antenna Requirements	Complies

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (1TX, 2TX, 3TX / 3RX)
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	5150 ~ 5350MHz / 5470 ~ 5725MHz / 5725 ~ 5850 MHz
Channel Number	25 for 20MHz bandwidth ; 12 for 40MHz bandwidth 6 for 80MHz bandwidth
Channel Band Width (99%)	**For Non-Beamforming Mode** For indoor / outdoor use Chain 1: 5.9dBi / 1TX Band 1: IEEE 802.11a: 18.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.77 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz Band 2: IEEE 802.11a: 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.63 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz Band 3: IEEE 802.11a: 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.77 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz Band 4: IEEE 802.11a: 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.63 MHz

	IEEE 802.11ac MCS0/Nss1 (VHT80): 76.70 MHz Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX Band 1: IEEE 802.11a: 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.63 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz Band 2: IEEE 802.11a: 18.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.63 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz Band 3: IEEE 802.11a: 17.02 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.63 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz Band 4: IEEE 802.11a: 18.67 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.77 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.70 MHz Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX Band 1: IEEE 802.11a: 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz Band 2: IEEE 802.11a: 16.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.19 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz Band 3: IEEE 802.11a: 16.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.89 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.77 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz

	Band 4: IEEE 802.11a: 18.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.67 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.77 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz
Maximum Conducted Output Power	**For Non-Beamforming Mode** For B1 indoor / B2-B4 indoor, outdoor use Chain 1: 5.9dBi / 1TX Band 1: IEEE 802.11a: 19.47 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 18.52 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 18.96 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 14.89 dBm Band 2: IEEE 802.11a: 19.41 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 18.29 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 18.72 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 13.17 dBm Band 3: IEEE 802.11a: 19.42 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 18.46 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 18.96 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 16.40 dBm Band 4: IEEE 802.11a: 19.01 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 18.18 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 18.58 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.68 dBm Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX Band 1: IEEE 802.11a: 21.66 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 21.55 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 20.58 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 14.83 dBm Band 2: IEEE 802.11a: 21.47 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 21.69 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 20.66 dBm

	IEEE 802.11ac MCS0/Nss1 (VHT80): 14.76 dBm Band 3: IEEE 802.11a: 21.38 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 21.41 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.45 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 21.16 dBm Band 4: IEEE 802.11a: 22.11 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 21.86 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.48 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 16.06 dBm Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX Band 1: IEEE 802.11a: 22.79 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 22.60 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 19.75 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 15.61 dBm Band 2: IEEE 802.11a: 19.73 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 19.64 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.91 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 13.63 dBm Band 3: IEEE 802.11a: 19.59 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 19.38 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 22.41 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 18.49 dBm Band 4: IEEE 802.11a: 22.84 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 22.66 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 22.32 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 20.64 dBm For outdoor use Chain 1: 5.9dBi / 1TX Band 1: IEEE 802.11a: 16.86 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 16.88 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 16.84 dBm

	IEEE 802.11ac MCS0/Nss1 (VHT80): 16.81 dBm Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX Band 1: IEEE 802.11a: 16.85 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 16.82 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 16.87 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 15.95 dBm Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX Band 1: IEEE 802.11a: 16.86 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 16.84 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 16.73 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 15.61 dBm **For Beamforming Mode** For B1 indoor / B2-B4 indoor, outdoor use Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 21.55 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 20.58 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 15.95 dBm Band 2: IEEE 802.11ac MCS0/Nss1 (VHT20): 21.29 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 20.66 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 14.83 dBm Band 3: IEEE 802.11ac MCS0/Nss1 (VHT20): 21.10 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.45 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 18.76 dBm Band 4: IEEE 802.11ac MCS0/Nss1 (VHT20): 21.86 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.48 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 21.16 dBm Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 22.60 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 22.34 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 16.30 dBm

	Band 2: IEEE 802.11ac MCS0/Nss1 (VHT20): 19.47 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 19.25 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 13.63 dBm Band 3: IEEE 802.11ac MCS0/Nss1 (VHT20): 19.44 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 19.30 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 18.49 dBm Band 4: IEEE 802.11ac MCS0/Nss1 (VHT20): 22.66 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.78 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 19.38 dBm For outdoor use Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 13.68 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 13.78 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 13.70 dBm Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 12.06 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 12.01 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 12.03 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
TPC Function	☒ With TPC	☐ Without TPC
Weather Band (5600~5650MHz)	☒ With 5600~5650MHz	☐ Without 5600~5650MHz
Beamforming Function	☒ With beamforming	☐ Without beamforming
Operating Mode of UNII-1	☒ Outdoor access point	
	☒ Indoor access point	
	☐ Fixed point-to-point access points	
	☐ Mobile and portable client devices	

Note: The product has beamforming function for 802.11n in 2.4GHz and 802.11n/ac in 5GHz.

Antenna and Band width

Antenna	Single (TX)			Two (TX)			Three (TX)		
Band width Mode	20 MHz	40 MHz	80 MHz	20 MHz	40 MHz	80 MHz	20 MHz	40 MHz	80 MHz
IEEE 802.11a	V	X	X	V	X	X	V	X	X
IEEE 802.11n	V	X	X	V	X	X	V	X	X
IEEE 802.11ac	V	V	V	V	V	V	V	V	V

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	1, 2, 3	MCS 0-7, MCS 0-15, MCS 0-23
802.11n (HT40)	1, 2, 3	MCS 0-7, MCS 0-15, MCS 0-23
802.11ac (VHT20)	1, 2, 3	MCS 0-9/Nss1, MCS 0-9/Nss1-2, MCS 0-9/Nss1-3
802.11ac (VHT40)	1, 2, 3	MCS 0-9/Nss1, MCS 0-9/Nss1-2, MCS 0-9/Nss1-3
802.11ac (VHT80)	1, 2, 3	MCS 0-9/Nss1, MCS 0-9/Nss1-2, MCS 0-9/Nss1-3

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

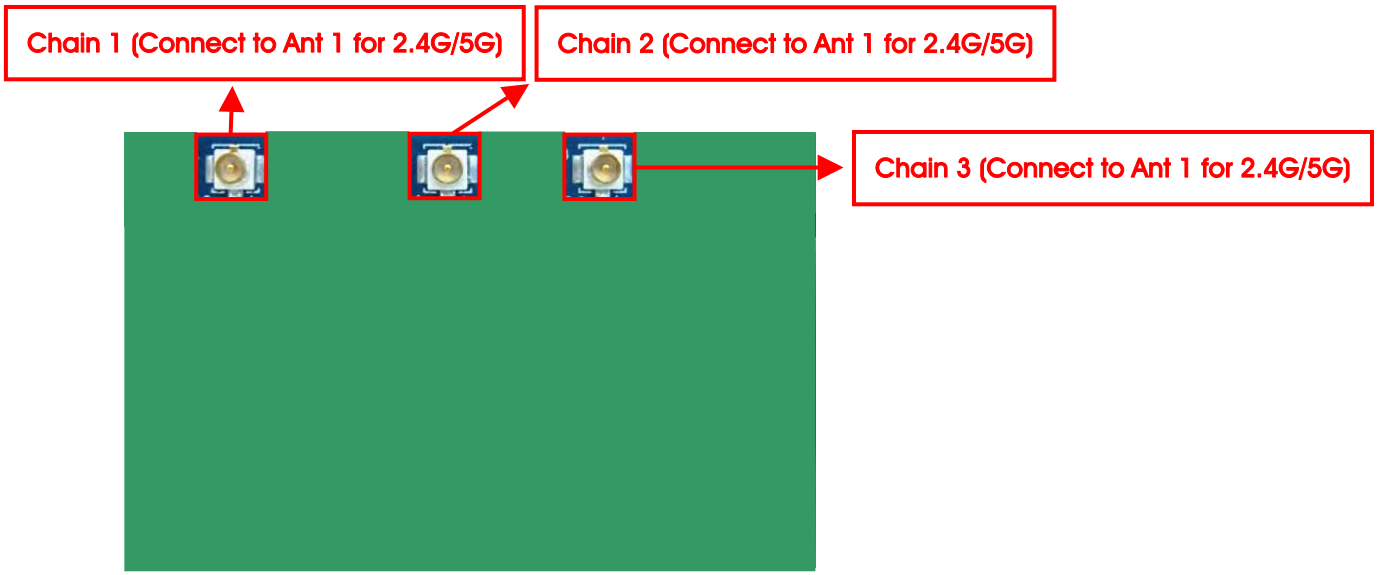
3.3. Table for Filed Antenna

Set	Brand	Model Number	Antenna Type	Connector	Indoor/Outdoor
1	ZEBRA	CEDAR-INT-ANT	Monopole	U.FL	Indoor/Outdoor

Note:

Set	Antenna Gain (dBi)					
	2.4G			5G		
	Chain 1	Chain 2	Chain 3	Chain 1	Chain 2	Chain 3
1	4.1	4.4	4.4	5.9	5.4	5.9

For IEEE 802.11b/g/n & For IEEE 802.11a/n/ac					
Mode	BF	Non BF	Chain 1	Chain 2	Chain 3
For 1TX	-	V	TX/RX	RX	RX
For 2TX-Type 1 (Worst case For IEEE 802.11a/n/ac)	-	V	TX/RX	TX/RX	RX
For 2TX-Type 2 (Worst case For IEEE 802.11b/g/n)	-	V	TX/RX	RX	TX/RX
For 2TX	V	-	TX/RX	TX/RX	RX
For 3TX	V	V	TX/RX	TX/RX	TX/RX
Note: BF = Beamforming ; Non-BF = Non Beamforming					



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 38, 46, 54, 62, 102, 110, 118, 126, 134, 142, 151, 159.

For 80MHz bandwidth systems, use Channel 42, 58, 106, 122, 138, 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz Band 1	36	5180 MHz	44	5220 MHz
	38	5190 MHz	46	5230 MHz
	40	5200 MHz	48	5240 MHz
	42	5210 MHz	-	-
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz Band 3	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 Band 4	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 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	Intentional - CTX		-	-	-
	Unintentional - CRX		-	-	-
Max. Conducted Output Power	For Non-Beamforming Mode				
	11a/BPSK	Band 1-4	6Mbps	36/40/48/52/60/64/100/116/140/144/149/157/165	1 1+2 1+2+3
	11ac VHT20	Band 1-4	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144/149/157/165	1 1+2 1+2+3
	11ac VHT40	Band 1-4	MCS0/Nss1	38/46/54/62/102/110/134/142/151/159	1 1+2 1+2+3
	11ac VHT80	Band 1-4	MCS0/Nss1	42/58/106/122/138/155	1 1+2 1+2+3
	For Beamforming Mode				
	11ac VHT20	Band 1-4	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144/149/157/165	1+2 1+2+3
	11ac VHT40	Band 1-4	MCS0/Nss1	38/46/54/62/102/110/134/142/151/159	1+2 1+2+3
	11ac VHT80	Band 1-4	MCS0/Nss1	42/58/106/122/138/155	1+2 1+2+3

Power Spectral Density	For Non-Beamforming Mode				
	11a/BPSK	Band 1-4	6Mbps	36/40/48/52/60/ 64/100/116/140/ 144/149/157/ 165	1 1+2 1+2+3
	11ac VHT20	Band 1-4	MCS0/Nss1	36/40/48/52/60/ 64/100/116/140/ 144/149/157/ 165	1 1+2 1+2+3
	11ac VHT40	Band 1-4	MCS0/Nss1	38/46/54/62/ 102/110/134/ 142/151/159	1 1+2 1+2+3
	11ac VHT80	Band 1-4	MCS0/Nss1	42/58/106/122/ 138/155	1 1+2 1+2+3
	For Beamforming Mode				
	11ac VHT20	Band 1-4	MCS0/Nss1	36/40/48/52/60/ 64/100/116/140/ 144/149/157/ 165	1+2 1+2+3
	11ac VHT40	Band 1-4	MCS0/Nss1	38/46/54/62/ 102/110/134/ 142/151/159	1+2 1+2+3
	11ac VHT80	Band 1-4	MCS0/Nss1	42/58/106/122/ 138/155	1+2 1+2+3
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	For Non-Beamforming Mode				
	11a/BPSK	Band 1-4	6Mbps	36/40/48/52/60/ 64/100/116/140/ 144/149/157/ 165	1 1+2 1+2+3
	11ac VHT20	Band 1-4	MCS0/Nss1	36/40/48/52/60/ 64/100/116/140/ 144/149/157/ 165	1 1+2 1+2+3
	11ac VHT40	Band 1-4	MCS0/Nss1	38/46/54/62/ 102/110/134/ 142/151/159	1 1+2 1+2+3
	11ac VHT80	Band 1-4	MCS0/Nss1	42/58/106/122/ 138/155	1 1+2 1+2+3

6dB Spectrum Bandwidth Measurement	For Non-Beamforming Mode				
	11a/BPSK	Band 4	6Mbps	144/149/157/165	1 1+2 1+2+3
	11ac VHT20	Band 4	MCS0/Nss1	144/149/157/165	1 1+2 1+2+3
	11ac VHT40	Band 4	MCS0/Nss1	142/151/159	1 1+2 1+2+3
	11ac VHT80	Band 4	MCS0/Nss1	138/155	1 1+2 1+2+3
Radiated Emission Below 1GHz	Intentional - CTX		-	-	-
	Unintentional - CRX		-	-	-
Radiated Emission – Unintentional 1GHz~5th	Unintentional - CRX		-	-	-
Radiated Emissions 1GHz~10th Harmonic	For Non-Beamforming Mode				
	11a/BPSK	Band 1-4	6Mbps	36/40/48/52/60/64/100/116/140/144/149/157/165	1+2+3
	11ac VHT20	Band 1-4	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144/149/157/165	1+2+3
	11ac VHT40	Band 1-4	MCS0/Nss1	38/46/54/62/102/110/134/142/151/159	1+2+3
	11ac VHT80	Band 1-4	MCS0/Nss1	42/58/106/122/138/155	1+2+3

Band Edge Emission	For Non-Beamforming Mode				
	11a/BPSK	Band 1-4	6Mbps	36/40/48/52/60/64/100/116/140/144/149/157/165	1 1+2 1+2+3
	11ac VHT20	Band 1-4	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144/149/157/165	1 1+2 1+2+3
	11ac VHT40	Band 1-4	MCS0/Nss1	38/46/54/62/102/110/134/142/151/159	1 1+2 1+2+3
	11ac VHT80	Band 1-4	MCS0/Nss1	42/58/106/122/138/155	1 1+2 1+2+3
	For Beamforming Mode				
	11ac VHT20	Band 1-4	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144/149/157/165	1+2 1+2+3
	11ac VHT40	Band 1-4	MCS0/Nss1	38/46/54/62/102/110/134/142/151/159	1+2 1+2+3
	11ac VHT80	Band 1-4	MCS0/Nss1	42/58/106/122/138/155	1+2 1+2+3
Frequency Stability	20 MHz	Band 1-4	-	40/60/116/157	1
	40 MHz	Band 1-4	-	38/62/110/151	1
	80 MHz	Band 1-4	-	42/58/106/155	1

Note1: There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802 11n. Beamforming mode and non-beamforming mode has been test and record in this test report.

Note2: 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.

Note3: All the specification of test configurations and test modes were based on customer's request.

Note4:The PoE is for measurement only, would not be marketed.

The PoE information as below:

Power	Brand	Model
PoE	Symbol	APSBIAS-2P3-ATR

The following test modes were performed for all tests:

Conducted Emission test			
Intentional - CTX			
Mode	EUT	2.4GHz	5GHz
1	●	●	-
2	●	-	●
Mode 2 generated the worst test result, so it was recorded in this report.			
Unintentional - CRX			
Mode	EUT	2.4GHz	5GHz
3	●	●	-
4	●	-	●
Mode 3 generated the worst test result, so it was recorded in this report.			

Radiated Emission test							
30MHz~1GHz: Intentional - CTX							
The EUT was performed at Y axis and Z axis position for Radiated emission above 1GHz test, and the worst case was found at Z axis. So the measurement will follow this same test configuration.							
Mode	EUT in Y axis	EUT in Z axis	Set in Y axis	Set in Z axis	2.4GHz	5GHz	Set 1
1	-	●	-	●	●	-	●
2	-	●	-	●	-	●	●
Mode 2 generated the worst test result, so it was recorded in this report.							
30MHz~1GHz: Unintentional - CRX and above 1GHz: Unintentional 1GHz~5th							
Mode	EUT in Y axis	EUT in Z axis	Set in Y axis	Set in Z axis	2.4GHz	5GHz	Set 1
3	-	●	-	●	●	-	●
4	-	●	-	●	-	●	●
Mode 3 generated the worst test result, so it was recorded in this report.							

Radiated Emission above 1GHz: Intentional 1GHz~10th test							
The EUT was performed at Y axis and Z axis position, and the worst case was found at Z axis.							
Mode	EUT in Y axis	EUT in Z axis	Set in Y axis	Set in Z axis	2.4GHz	5GHz	Set 1
1	-	●	-	●	●	-	●

3.6. 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 Reg. 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).

3.7. Table for Supporting Units

For Test Site No: 03CH01-CB (30MHz~1GHz: Intentional and Unintentional and above 1GHz: Unintentional 1GHz~5th test and Intentional 1GHz~10th for non-beamforming mode)

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC
PoE	Symbol	APSBIAS-2P3-ATR	N/A
Fixture	Bplus	P22S-P22F	N/A

For Test Site No: 03CH01-CB (above 1GHz: Intentional 1GHz~10th for beamforming mode)

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC
Notebook	DELL	E4300	DoC
Client Device	Cedar	AP-8532	N/A
PoE	Symbol	APSBIAS-2P3-ATR	N/A
Fixture	Bplus	P22S-P22F	N/A

For Test Site No: CO01-CB (Intentional and Unintentional)

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC
PoE	Symbol	APSBIAS-2P3-ATR	N/A
Fixture	Bplus	P22S-P22F	N/A

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC
PoE	Symbol	APSBIAS-2P3-ATR	N/A
Fixture	Bplus	P22S-P22F	N/A

3.8. 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

For B1 indoor / B2-B4 indoor, outdoor use

Chain 1: 5.9dBi / 1TX

Test Software Version	DoS												
Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	78	77	79	78	78	76	79	79	80	79	71	79	79
802.11ac MCS0/Nss1 VHT20	72	74	74	73	73	73	75	75	69	77	69	76	75

Mode	NCB: 40MHz									
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz	5755 MHz	5795 MHz
	60	76	75	57	56	72	78	77	62	77

Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5690 MHz	5775 MHz
	56	49	51	71	71	56

Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX

Test Software Version	Mtool 2.0.0.7												
Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	77	75	76	74	74	75	65	73	73	77	70	79	78
802.11ac MCS0/Nss1 VHT20	75	75	75	73	73	74	66	74	66	75	67	78	76

Mode	NCB: 40MHz									
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz	5755 MHz	5795 MHz
	55	70	72	52	54	72	73	73	59	75

Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5690 MHz	5775 MHz
	51	46	46	70	66	53

Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX

Test Software Version	Mtool 2.0.0.7												
Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	75	74	74	61	61	61	59	59	57	66	62	76	75
802.11ac MCS0/Nss1 VHT20	74	74	73	61	61	61	61	58	59	67	58	75	66

Mode	NCB: 40MHz									
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz	5755 MHz	5795 MHz
	48	60	69	43	46	60	70	70	46	71

Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5690 MHz	5775 MHz
	41	35	36	62	59	42

For outdoor use

Chain 1: 5.9dBi / 1TX

Test Software Version	DoS		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5180 MHz	5200 MHz	5240 MHz
802.11a	68	68	67
802.11ac MCS0/Nss1 VHT20	68	68	68
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	
	68	67	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5210 MHz		
	68		

Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX

Test Software Version	DoS		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5180 MHz	5200 MHz	5240 MHz
802.11a	55	55	55
802.11ac MCS0/Nss1 VHT20	55	55	55
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	
	55	55	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5210 MHz		
	51		

Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX

Test Software Version	DoS		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5180 MHz	5200 MHz	5240 MHz
802.11a	50	50	50
802.11ac MCS0/Nss1 VHT20	50	50	50
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	
	48	48	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5210 MHz		
	41		

For Beamforming Mode

For B1 indoor / B2-B4 indoor, outdoor use

Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX

Test Software Version	DoS												
Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz	5745 MHz	5785 MHz	5825 MHz
802.11ac MCS0/Nss1 VHT20	75	75	75	73	73	73	66	72	66	75	65	78	73

Mode	NCB: 40MHz									
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz	5755 MHz	5795 MHz
	55	70	72	52	54	72	73	73	59	75

Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5690 MHz	5775 MHz
	51	46	46	70	66	53

Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX

Test Software Version	DoS												
Mode	Test Frequency (MHz)												
	NCB: 20MHz												
	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz	5745 MHz	5785 MHz	5825 MHz
802.11ac MCS0/Nss1 VHT20	74	74	73	61	61	60	61	56	59	66	58	75	66

Mode	NCB: 40MHz									
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz	5755 MHz	5795 MHz
	48	70	58	42	42	58	58	67	46	70

Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5690 MHz	5775 MHz
	44	35	40	57	59	42

For outdoor use

Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX

Test Software Version	DoS		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5180 MHz	5200 MHz	5240 MHz
802.11ac MCS0/Nss1 VHT20	43	43	43
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	
	42	42	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5210 MHz		
	40		

Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX

Test Software Version	DoS		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5180 MHz	5200 MHz	5240 MHz
802.11ac MCS0/Nss1 VHT20	31	30	30
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	
	29	29	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5210 MHz		
	26		

3.9. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting/receiving 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 XP 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 DOS.
3. Executed "Lantest.exe " to link with the remote workstation to receive and transmit packet by Client Device and transmit duty cycle no less 98%

3.10. Duty Cycle

For non-beamforming mode:

Chain 1: 5.9dBi / 1TX

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.070	2.090	99.04	0.04	0.01
802.11ac MCS0/Nss1 VHT20	1.932	1.956	98.77	0.05	0.01
802.11ac MCS0/Nss1 VHT40	0.960	0.978	98.16	0.08	0.01
802.11ac MCS0/Nss1 VHT80	0.464	0.486	95.47	0.20	2.16

Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.050	2.090	98.09	0.08	0.01
802.11ac MCS0/Nss1 VHT20	1.930	1.950	98.97	0.04	0.01
802.11ac MCS0/Nss1 VHT40	0.920	0.960	95.83	0.18	1.09
802.11ac MCS0/Nss1 VHT80	0.426	0.480	88.75	0.52	2.35

Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.070	2.090	99.04	0.04	0.01
802.11ac MCS0/Nss1 VHT20	1.932	1.956	98.77	0.05	0.01
802.11ac MCS0/Nss1 VHT40	0.920	0.960	95.83	0.18	1.09
802.11ac MCS0/Nss1 VHT80	0.426	0.480	88.75	0.52	2.35

For beamforming mode:

Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	3.780	4.140	91.30	0.40	0.26
802.11ac MCS0/Nss1 VHT40	4.580	4.900	93.47	0.29	0.22
802.11ac MCS0/Nss1 VHT80	5.080	5.420	93.73	0.28	0.20

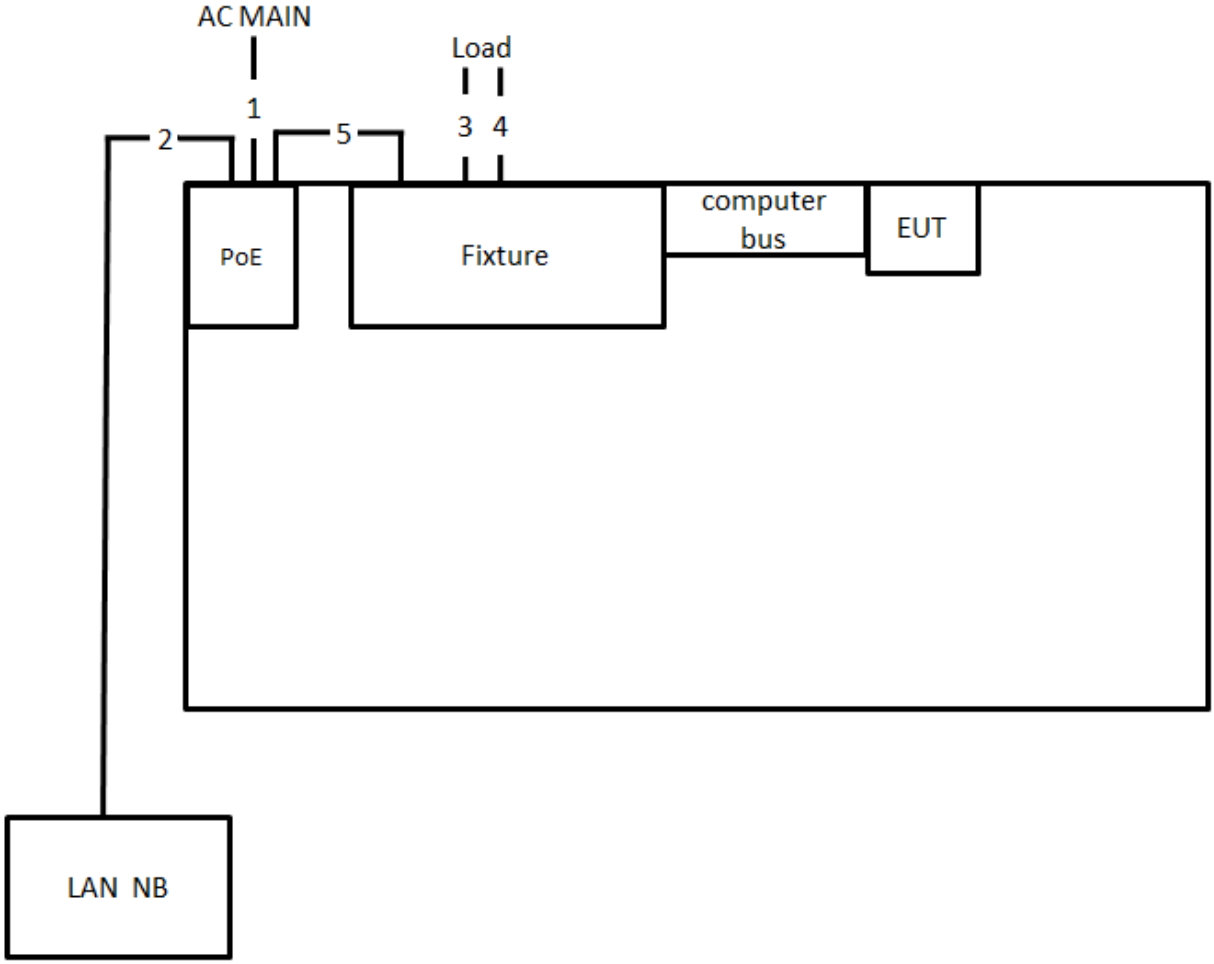
Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	3.780	4.140	91.30	0.40	0.26
802.11ac MCS0/Nss1 VHT40	4.580	4.900	93.47	0.29	0.22
802.11ac MCS0/Nss1 VHT80	5.080	5.420	93.73	0.28	0.20

3.11.Test Configurations

3.11.1. AC Power Line Conduction Emissions Test Configuration

Test Configuration: Intentional – CTX and Unintentional – CRX

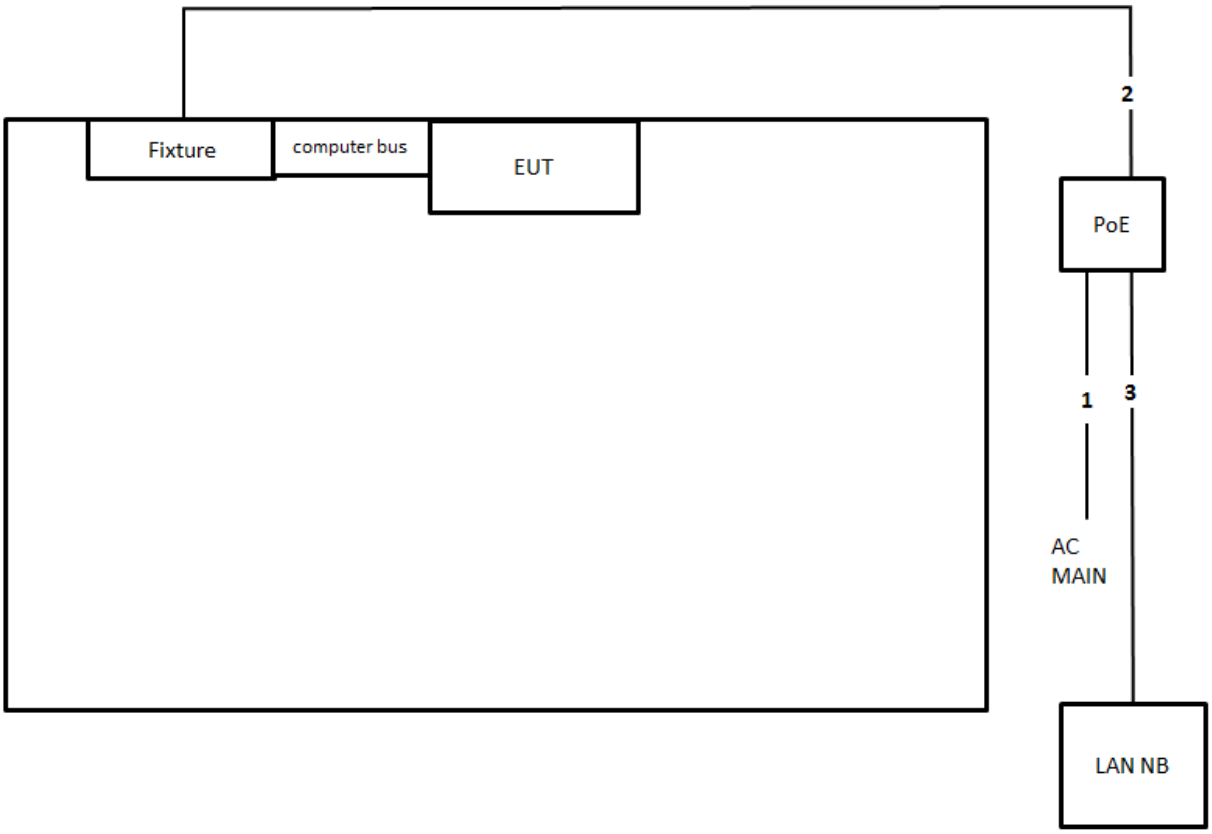


Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1.5m
4	Console cable	No	1.5m
5	RJ-45 cable	No	1.5m

3.11.2. Radiation Emissions Test Configuration

Test Configuration:

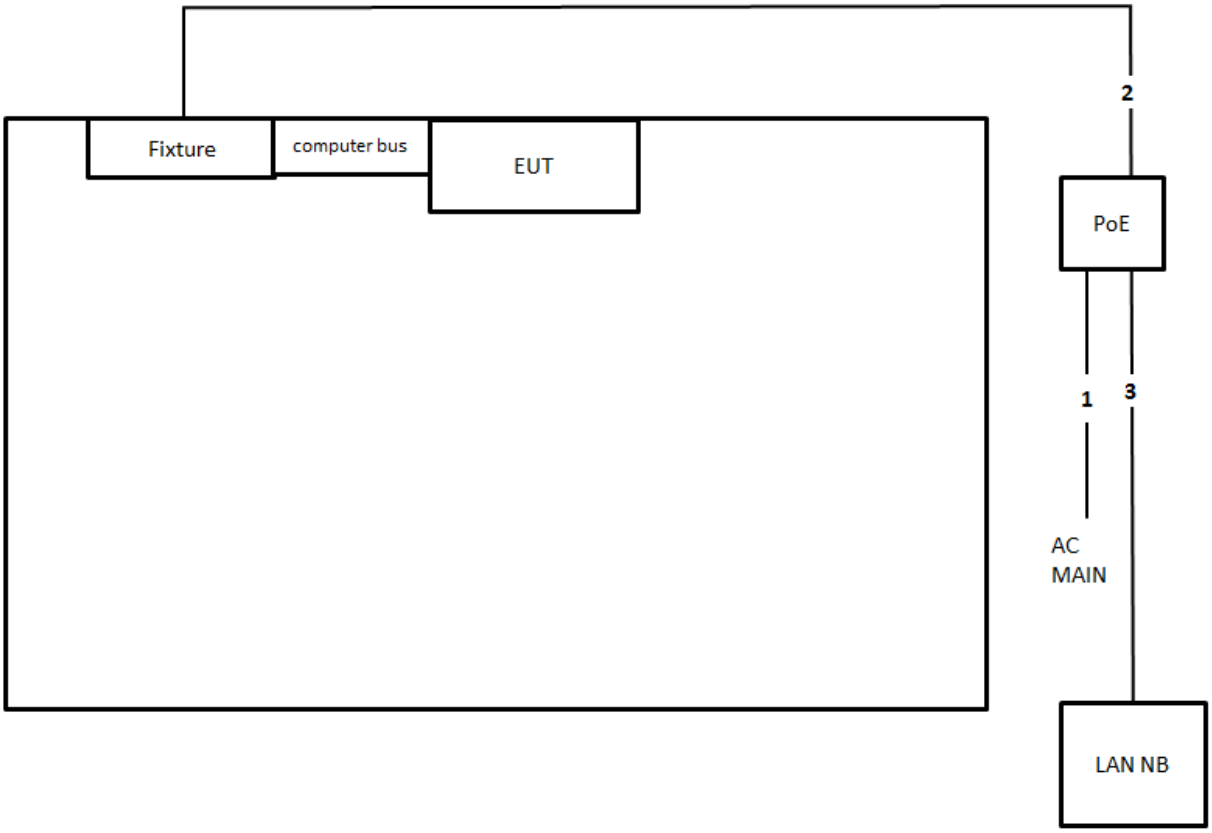
30MHz~1GHz: Intentional - CTX



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1.5m

Test Configuration:

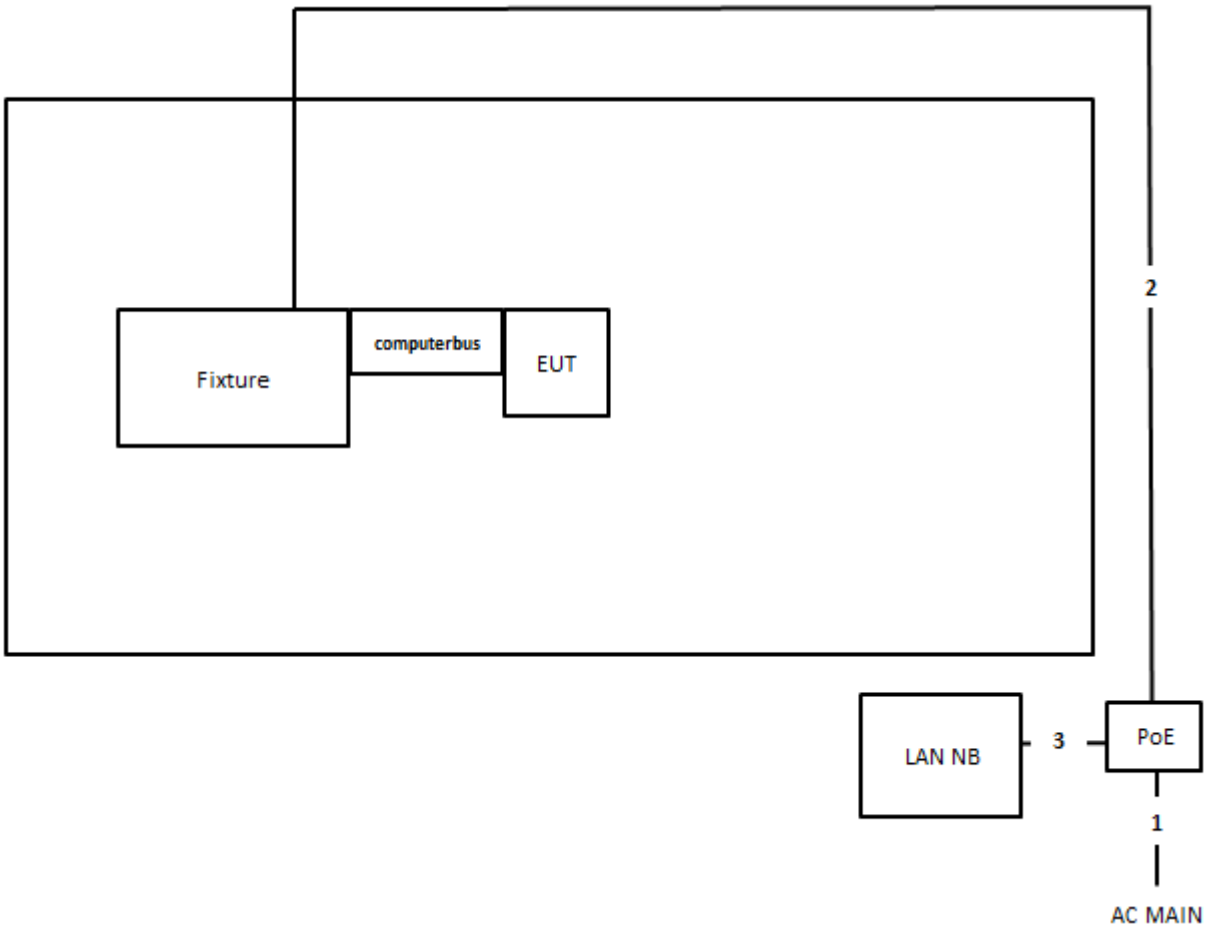
30MHz~1GHz: Unintentional – CRX and Unintentional 1GHz~5th



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1.5m

Test Configuration:

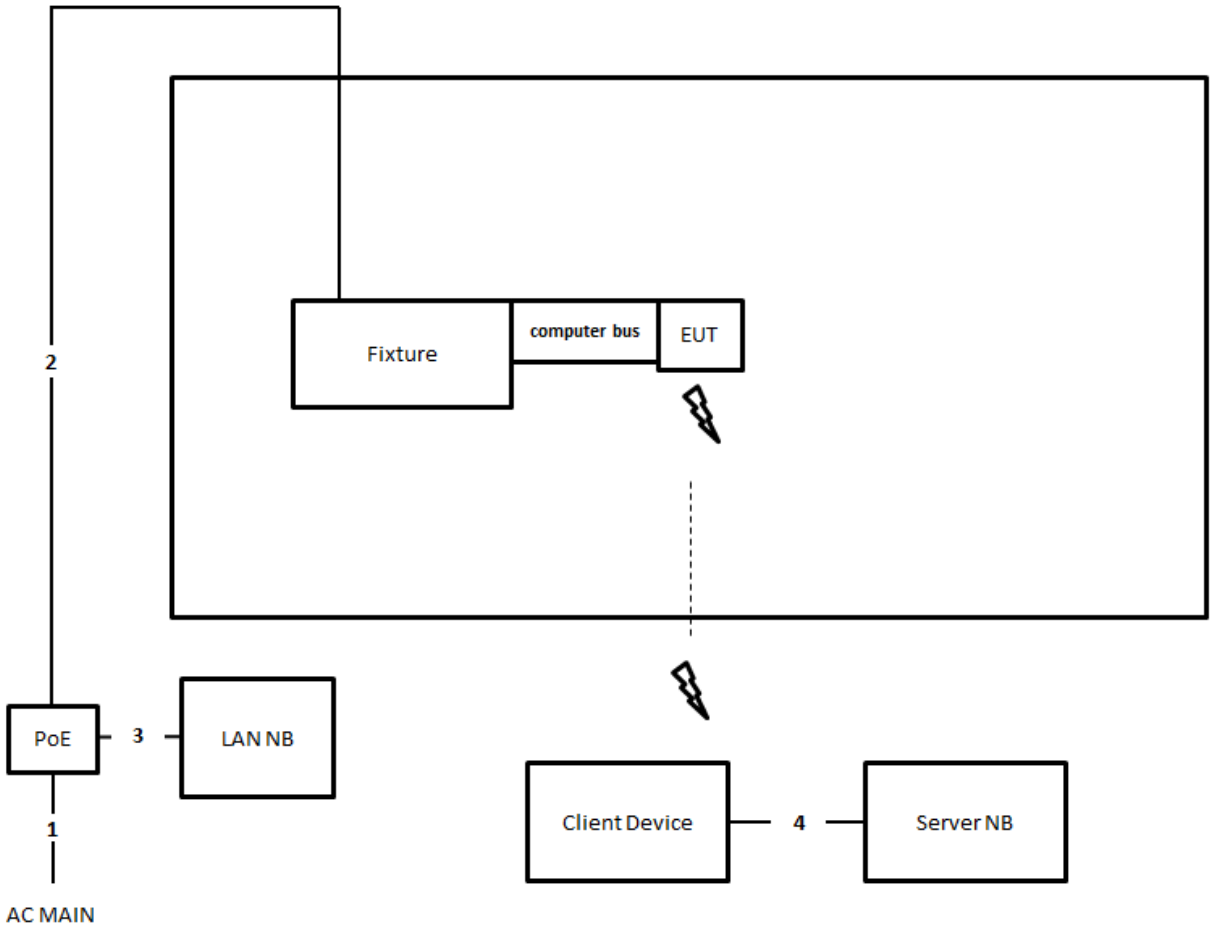
above 1GHz: Intentional 1GHz~10th for Non-beamforming mode



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1m

Test Configuration:

above 1GHz: Intentional 1GHz~10th for beamforming mode



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1m
4	RJ-45 cable	No	10m

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

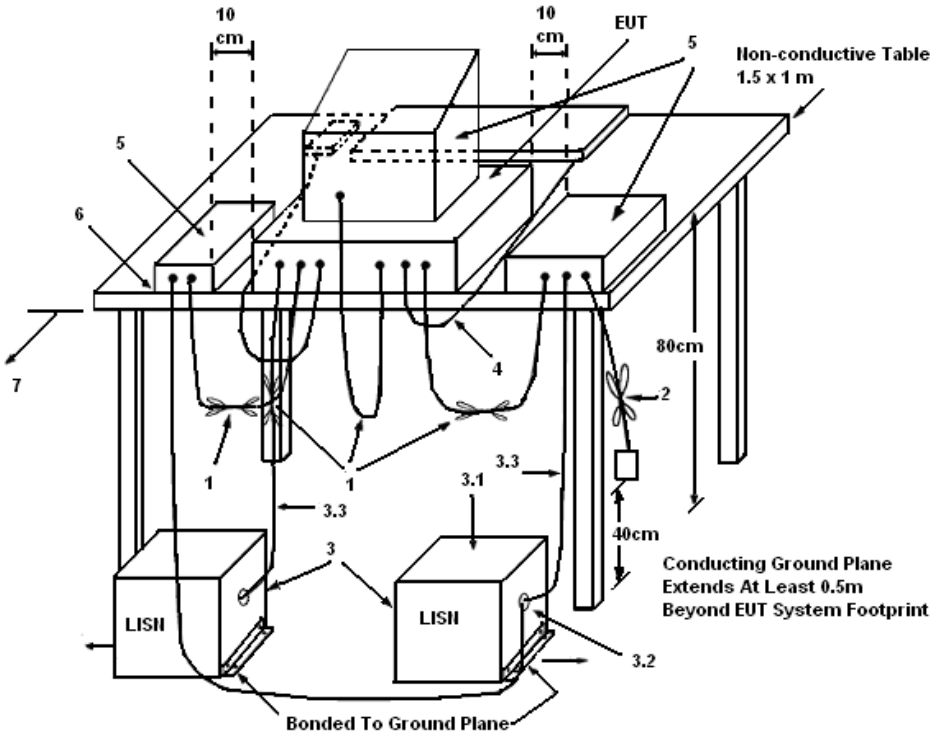
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

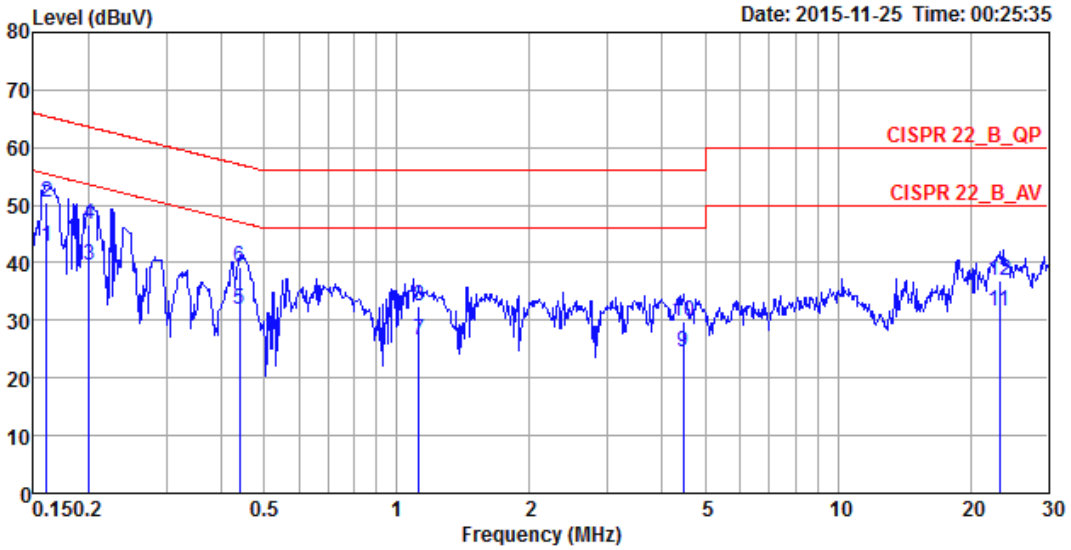
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

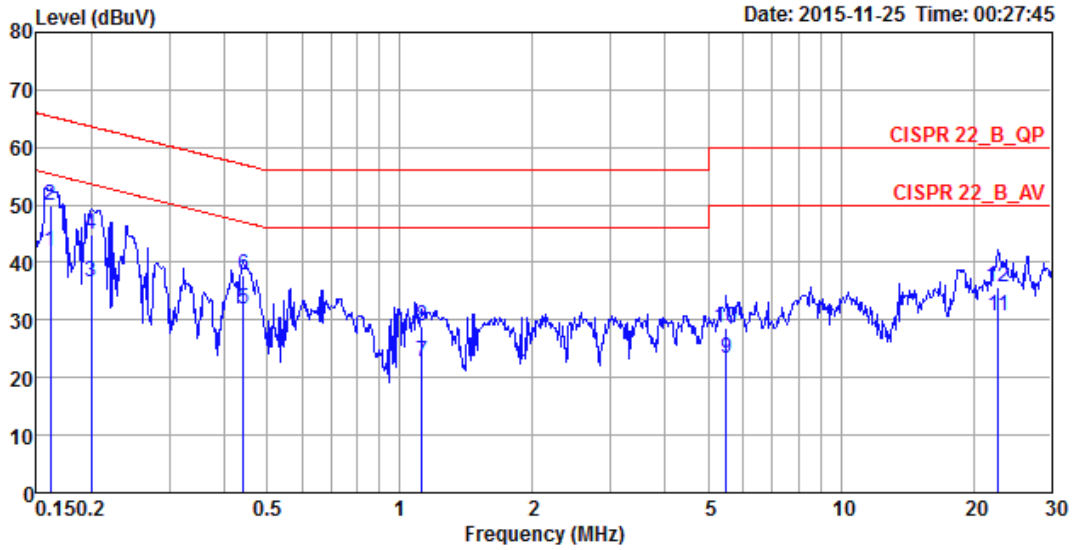
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	25℃	Humidity	59%
Test Engineer	Da Deng	Phase	Line
Configuration	Intentional - CTX	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1607	42.67	-12.76	55.43	32.72	9.93	0.02	LINE	Average
2	0.1607	50.60	-14.83	65.43	40.65	9.93	0.02	LINE	QP
3	0.2007	39.54	-14.04	53.58	29.59	9.93	0.02	LINE	Average
4	0.2007	46.73	-16.85	63.58	36.78	9.93	0.02	LINE	QP
5	0.4397	31.78	-15.29	47.07	21.81	9.93	0.04	LINE	Average
6	0.4397	39.36	-17.71	57.07	29.39	9.93	0.04	LINE	QP
7	1.1233	26.47	-19.53	46.00	16.46	9.96	0.05	LINE	Average
8	1.1233	32.61	-23.39	56.00	22.60	9.96	0.05	LINE	QP
9	4.4540	24.60	-21.40	46.00	14.48	10.04	0.08	LINE	Average
10	4.4540	29.82	-26.18	56.00	19.70	10.04	0.08	LINE	QP
11	23.2633	31.56	-18.44	50.00	20.76	10.53	0.27	LINE	Average
12	23.2633	36.93	-23.07	60.00	26.13	10.53	0.27	LINE	QP

Temperature	25°C	Humidity	59%
Test Engineer	Da Deng	Phase	Neutral
Configuration	Intentional - CTX	Test Mode	Mode 2

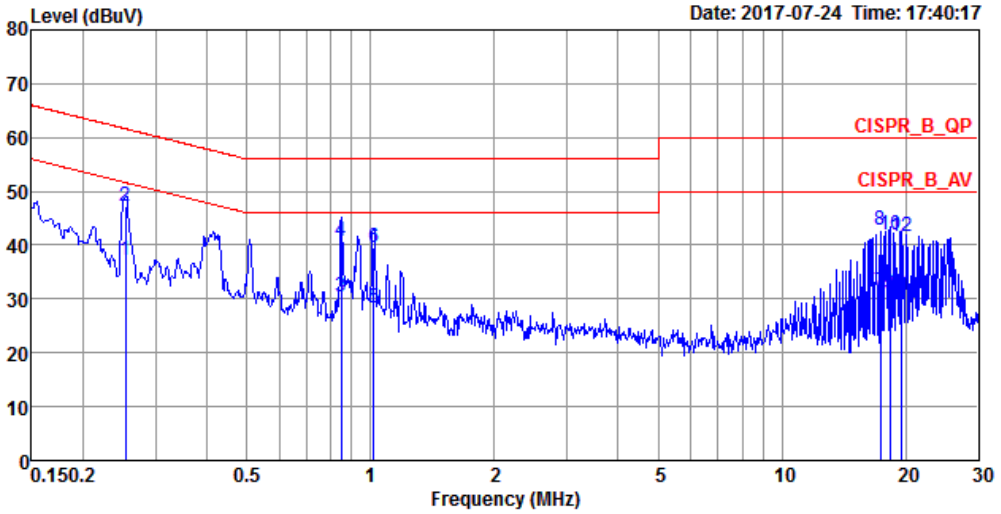


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1616	42.06	-13.32	55.38	32.26	9.78	0.02	NEUTRAL	Average
2	0.1616	49.81	-15.57	65.38	40.01	9.78	0.02	NEUTRAL	QP
3	0.1997	36.60	-17.02	53.62	26.79	9.79	0.02	NEUTRAL	Average
4	0.1997	45.01	-18.61	63.62	35.20	9.79	0.02	NEUTRAL	QP
5	0.4421	31.74	-15.28	47.02	21.91	9.79	0.04	NEUTRAL	Average
6	0.4421	37.78	-19.24	57.02	27.95	9.79	0.04	NEUTRAL	QP
7	1.1233	22.74	-23.26	46.00	12.88	9.81	0.05	NEUTRAL	Average
8	1.1233	28.87	-27.13	56.00	19.01	9.81	0.05	NEUTRAL	QP
9	5.5054	23.35	-26.65	50.00	13.32	9.92	0.11	NEUTRAL	Average
10	5.5054	28.55	-31.45	60.00	18.52	9.92	0.11	NEUTRAL	QP
11	22.7755	30.62	-19.38	50.00	20.12	10.23	0.27	NEUTRAL	Average
12	22.7755	35.84	-24.16	60.00	25.34	10.23	0.27	NEUTRAL	QP

Note:

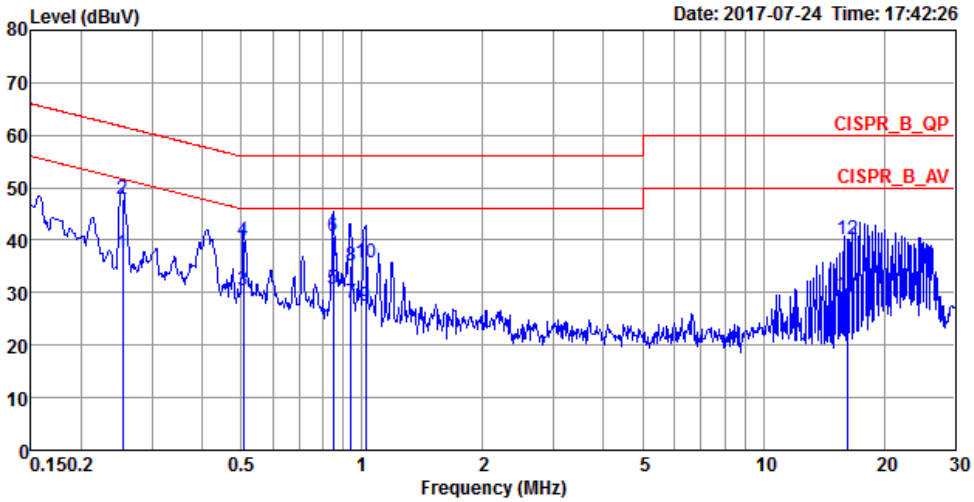
Level = Read Level + LISN Factor + Cable Loss.

Temperature	22°C	Humidity	55%
Test Engineer	Howard Liu	Phase	Line
Configuration	Unintentional – CRX	Test Mode	Mode 3



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.2535	37.09	-14.55	51.64	27.08	9.92	0.09	Average	LINE
2	0.2535	47.11	-14.53	61.64	37.10	9.92	0.09	QP	LINE
3	0.8483	30.51	-15.49	46.00	20.39	9.96	0.16	Average	LINE
4	0.8483	40.64	-15.36	56.00	30.52	9.96	0.16	QP	LINE
5	1.0157	28.22	-17.78	46.00	18.07	9.96	0.19	Average	LINE
6	1.0157	39.61	-16.39	56.00	29.46	9.96	0.19	QP	LINE
7	17.3638	31.40	-18.60	50.00	20.92	10.28	0.20	Average	LINE
8	17.3638	42.73	-17.27	60.00	32.25	10.28	0.20	QP	LINE
9	18.3142	31.00	-19.00	50.00	20.50	10.30	0.20	Average	LINE
10	18.3142	41.99	-18.01	60.00	31.49	10.30	0.20	QP	LINE
11	19.5048	30.71	-19.29	50.00	20.18	10.33	0.20	Average	LINE
12	19.5048	41.54	-18.46	60.00	31.01	10.33	0.20	QP	LINE

Temperature	22°C	Humidity	55%
Test Engineer	Howard Liu	Phase	Neutral
Configuration	Unintentional – CRX	Test Mode	Mode 3



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.2535	37.61	-14.03	51.64	27.44	10.08	0.09	Average	NEUTRAL
2	0.2535	47.96	-13.68	61.64	37.79	10.08	0.09	QP	NEUTRAL
3	0.5074	30.43	-15.57	46.00	20.15	10.22	0.06	Average	NEUTRAL
4	0.5074	39.97	-16.03	56.00	29.69	10.22	0.06	QP	NEUTRAL
5	0.8483	30.81	-15.19	46.00	20.55	10.10	0.16	Average	NEUTRAL
6	0.8483	40.84	-15.16	56.00	30.58	10.10	0.16	QP	NEUTRAL
7	0.9381	28.08	-17.92	46.00	17.83	10.07	0.18	Average	NEUTRAL
8	0.9381	35.16	-20.84	56.00	24.91	10.07	0.18	QP	NEUTRAL
9	1.0211	27.45	-18.55	46.00	17.21	10.05	0.19	Average	NEUTRAL
10	1.0211	35.70	-20.30	56.00	25.46	10.05	0.19	QP	NEUTRAL
11	16.1748	29.59	-20.41	50.00	19.11	10.29	0.19	Average	NEUTRAL
12	16.1748	40.13	-19.87	60.00	29.65	10.29	0.19	QP	NEUTRAL

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	≥ 3 x 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

For Non-Beamforming Mode

Temperature	24℃	Humidity	65%
Test Engineer	Roki Liu	Configurations	Chain 1: 5.9dBi / 1TX

For indoor / outdoor use

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	35.39	18.67
	5200 MHz	35.30	18.58
	5240 MHz	35.57	18.76
	5260 MHz	36.43	18.76
	5300 MHz	38.61	18.84
	5320 MHz	36.00	18.76
	5500 MHz	36.35	18.76
	5580 MHz	38.61	18.84
	5700 MHz	35.04	18.67
	5745 MHz	21.83	17.28
	5785 MHz	40.00	18.67
	5825 MHz	35.83	18.84
802.11ac MCS0/Nss1 VHT20	5180 MHz	31.91	18.67
	5200 MHz	30.52	18.76
	5240 MHz	26.96	18.67
	5260 MHz	31.83	18.76
	5300 MHz	26.87	18.76
	5320 MHz	33.83	18.76
	5500 MHz	26.00	18.67
	5580 MHz	29.74	18.76
	5700 MHz	22.00	18.23
	5745 MHz	21.91	18.32
	5785 MHz	35.39	18.84
	5825 MHz	35.13	18.76

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT40	5190 MHz	41.16	36.90
	5230 MHz	93.62	37.77
	5270 MHz	87.10	37.63
	5310 MHz	41.45	36.90
	5510 MHz	41.30	36.90
	5550 MHz	86.09	37.63
	5670 MHz	93.04	37.77
	5755 MHz	41.16	37.05
	5795 MHz	88.12	37.63
802.11ac MCS0/Nss1 VHT80	5210 MHz	82.32	76.12
	5290 MHz	82.32	76.41
	5530 MHz	82.03	75.83
	5610 MHz	150.15	76.70
	5775 MHz	82.32	76.12

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	39.65	19.88	5700.78	5710.10	24.22	15.43	14.90	4.99
802.11ac MCS0/Nss1 VHT20	5720 MHz	31.30	18.15	5703.57	5710.88	21.43	9.87	14.12	4.03
802.11ac MCS0/Nss1 VHT40	5710 MHz	48.70	36.76	5687.39	5691.62	37.61	11.09	33.38	3.38
802.11ac MCS0/Nss1 VHT80	5690 MHz	81.45	75.83	5649.42	5652.08	75.58	5.87	72.92	2.92

Temperature	24℃	Humidity	65%
Test Engineer	Roki Liu	Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	37.48	18.84
	5200 MHz	36.00	18.67
	5240 MHz	36.26	18.84
	5260 MHz	36.00	18.67
	5300 MHz	35.30	18.76
	5320 MHz	36.09	18.76
	5500 MHz	21.22	16.76
	5580 MHz	26.87	17.02
	5700 MHz	21.56	17.02
	5745 MHz	21.13	16.58
	5785 MHz	32.17	18.67
	5825 MHz	32.52	18.67
802.11ac MCS0/Nss1 VHT20	5180 MHz	37.48	18.84
	5200 MHz	37.74	18.76
	5240 MHz	37.83	18.67
	5260 MHz	37.30	18.67
	5300 MHz	37.83	18.67
	5320 MHz	40.17	18.84
	5500 MHz	21.74	17.89
	5580 MHz	40.52	18.84
	5700 MHz	21.48	17.89
	5745 MHz	21.48	17.80
	5785 MHz	35.83	18.67
	5825 MHz	37.13	18.84

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT40	5190 MHz	40.58	37.05
	5230 MHz	84.78	37.63
	5270 MHz	80.29	37.63
	5310 MHz	41.01	36.90
	5510 MHz	40.87	36.90
	5550 MHz	87.25	37.48
	5670 MHz	88.12	37.63
	5755 MHz	40.87	37.05
	5795 MHz	87.54	37.77
802.11ac MCS0/Nss1 VHT80	5210 MHz	82.32	76.41
	5290 MHz	82.03	76.41
	5530 MHz	81.74	76.12
	5610 MHz	117.68	76.70
	5775 MHz	82.32	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)
802.11a	5720 MHz	28.52	16.85	5705.83	5711.58	19.17	9.35	13.42	3.42
802.11ac MCS0/Nss1 VHT20	5720 MHz	23.57	17.63	5709.39	5711.06	15.61	7.96	13.94	3.68
802.11ac MCS0/Nss1 VHT40	5710 MHz	40.73	37.19	5689.71	5691.12	35.29	5.44	33.88	3.31
802.11ac MCS0/Nss1 VHT80	5690 MHz	81.16	76.12	5649.13	5652.08	75.87	5.29	72.92	3.21

Temperature	24℃	Humidity	65%
Test Engineer	Roki Liu	Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	33.13	18.84
	5200 MHz	32.17	18.67
	5240 MHz	32.00	18.76
	5260 MHz	20.87	16.58
	5300 MHz	21.13	16.76
	5320 MHz	21.04	16.76
	5500 MHz	21.04	16.76
	5580 MHz	21.13	16.58
	5700 MHz	20.96	16.50
	5745 MHz	20.96	16.58
	5785 MHz	37.22	18.84
	5825 MHz	36.17	18.76
802.11ac MCS0/Nss1 VHT20	5180 MHz	38.52	18.76
	5200 MHz	35.74	18.84
	5240 MHz	35.57	18.84
	5260 MHz	21.22	18.06
	5300 MHz	21.30	18.06
	5320 MHz	21.57	17.97
	5500 MHz	21.39	17.97
	5580 MHz	21.22	17.80
	5700 MHz	21.30	17.89
	5745 MHz	21.39	17.89
	5785 MHz	35.48	18.67
	5825 MHz	21.39	17.89

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT40	5190 MHz	40.58	36.90
	5230 MHz	40.73	36.90
	5270 MHz	64.64	37.19
	5310 MHz	40.73	36.90
	5510 MHz	40.87	36.76
	5550 MHz	40.58	36.76
	5670 MHz	89.28	37.77
	5755 MHz	40.87	36.61
	5795 MHz	85.65	37.77
802.11ac MCS0/Nss1 VHT80	5210 MHz	81.45	76.41
	5290 MHz	81.16	75.83
	5530 MHz	81.45	76.12
	5610 MHz	81.45	76.12
	5775 MHz	81.74	76.12

Straddle Channel

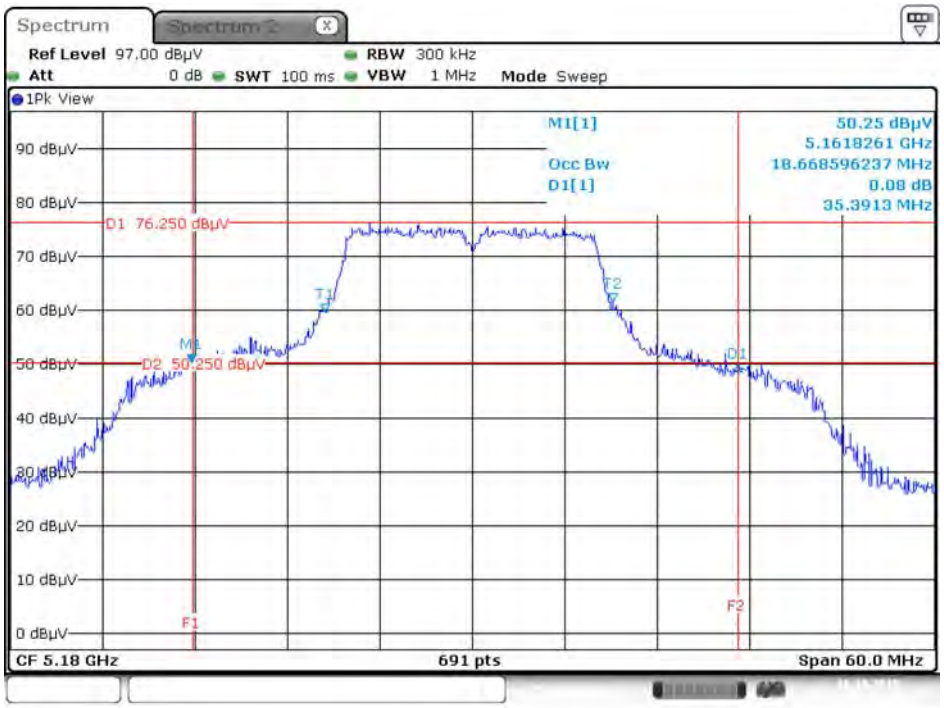
Mode	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII 2C 26dB BW (MHz)	UNII 3 26dB BW (MHz)	UNII 2C 99% BW (MHz)	UNII 3 99% BW (MHz)
802.11a	5720 MHz	21.48	17.28	5709.22	5711.40	15.78	5.70	13.60	3.68
802.11ac MCS0/Nss1 VHT20	5720 MHz	21.57	18.06	5709.22	5711.06	15.78	5.78	13.94	4.12
802.11ac MCS0/Nss1 VHT40	5710 MHz	40.44	37.19	5689.86	5691.62	35.15	5.29	33.38	3.81
802.11ac MCS0/Nss1 VHT80	5690 MHz	80.29	76.41	5650.00	5651.80	75.00	5.29	73.20	3.21

For Non-Beamforming Mode

For indoor / outdoor use

Chain 1: 5.9dBi / 1TX

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5180 MHz



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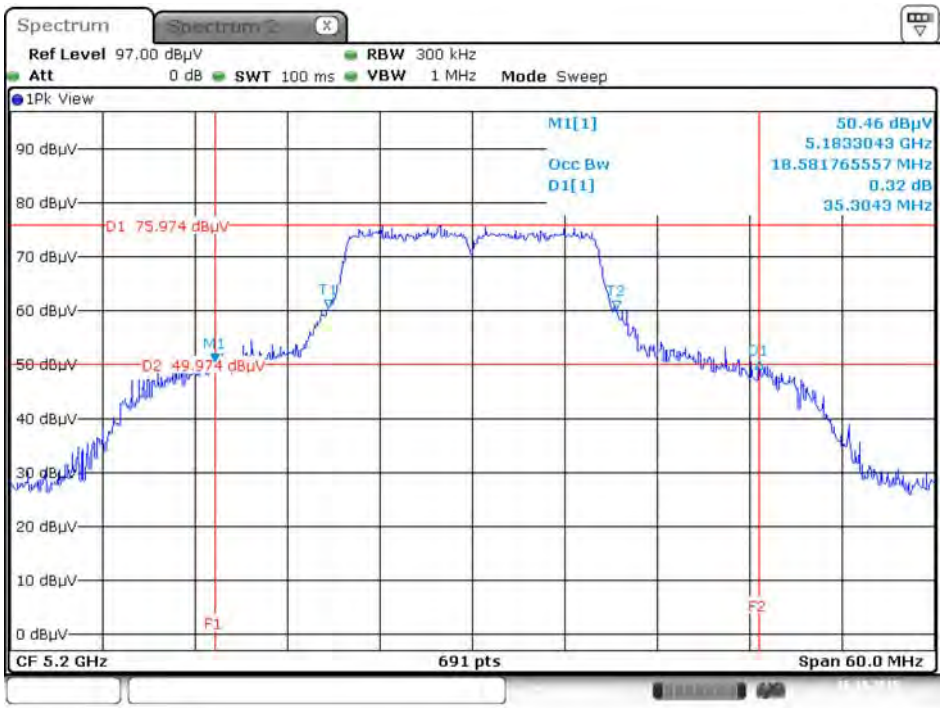
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5200 MHz



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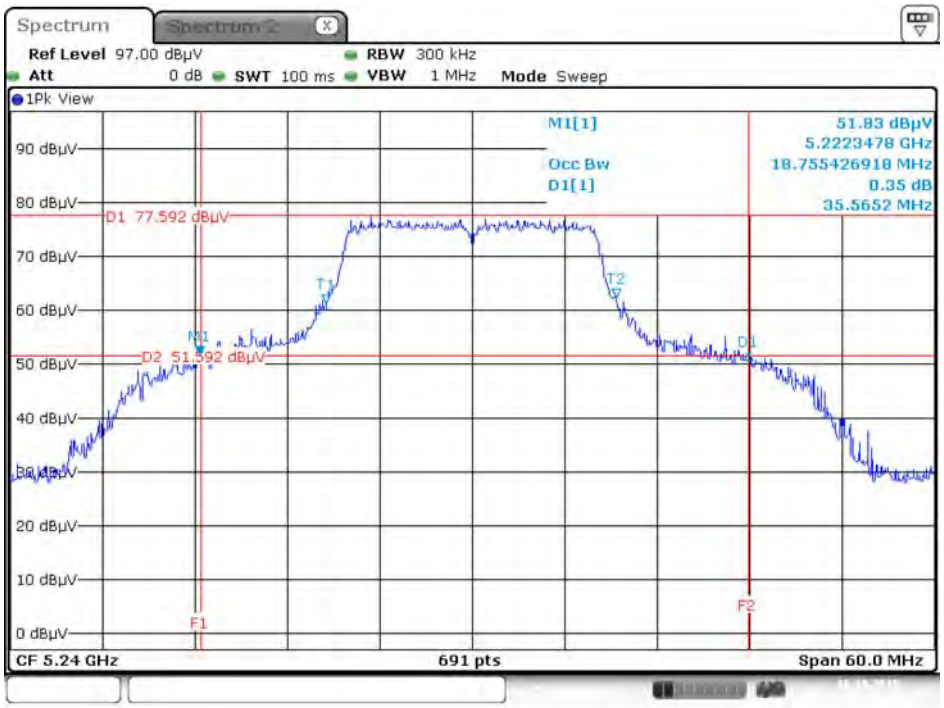
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5240 MHz



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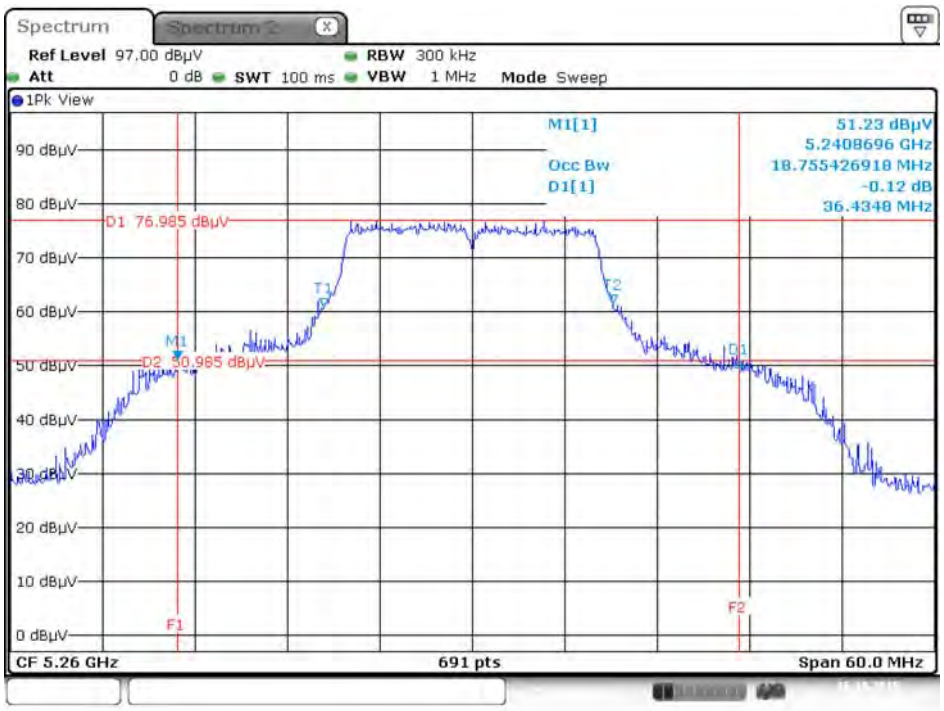
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5260 MHz



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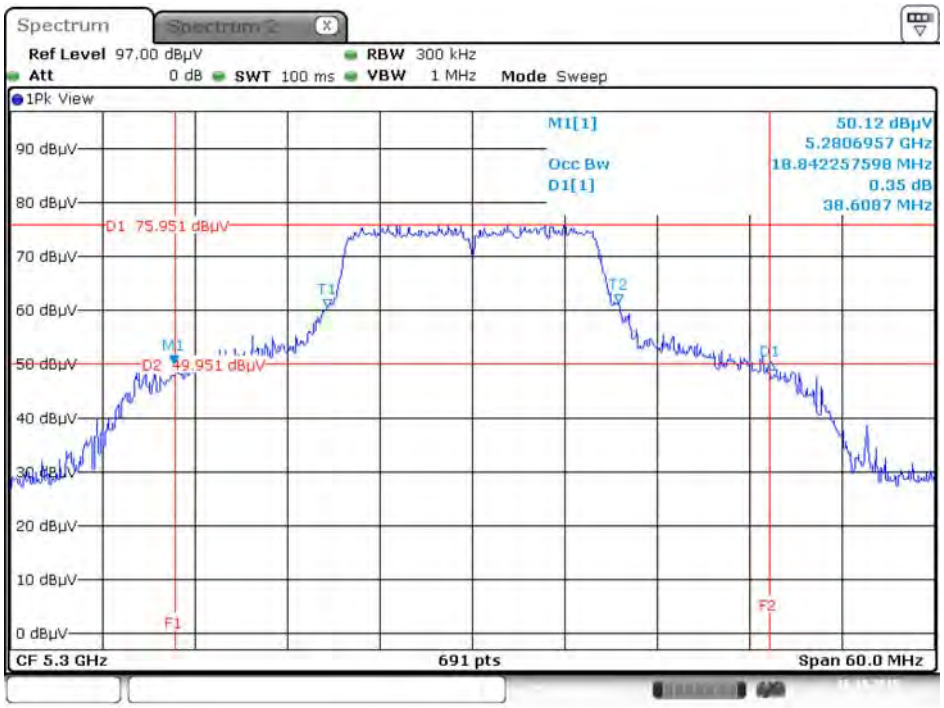
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5300 MHz



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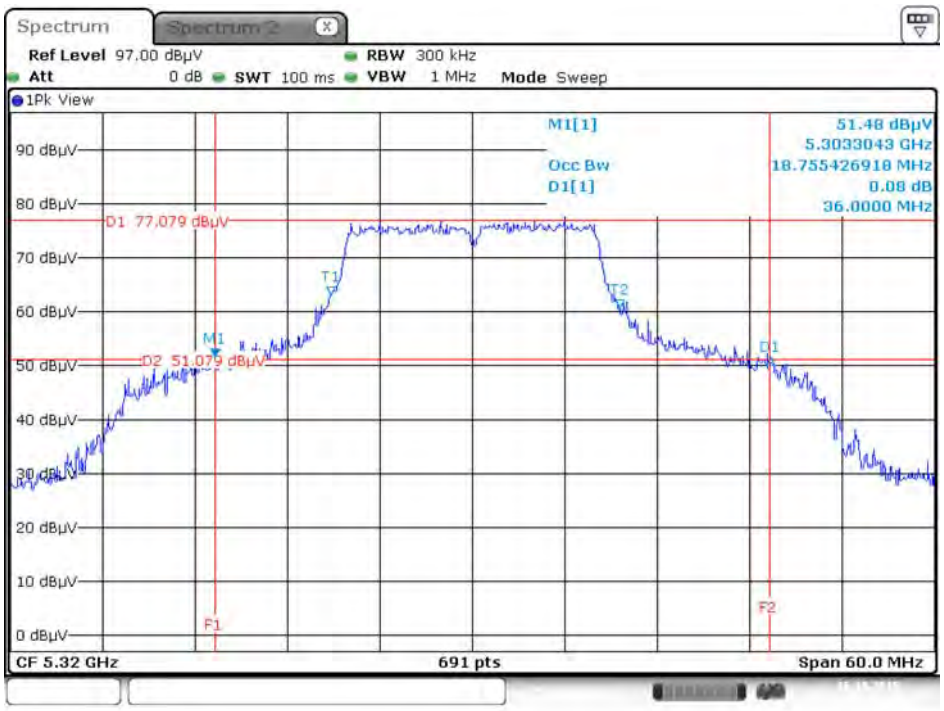
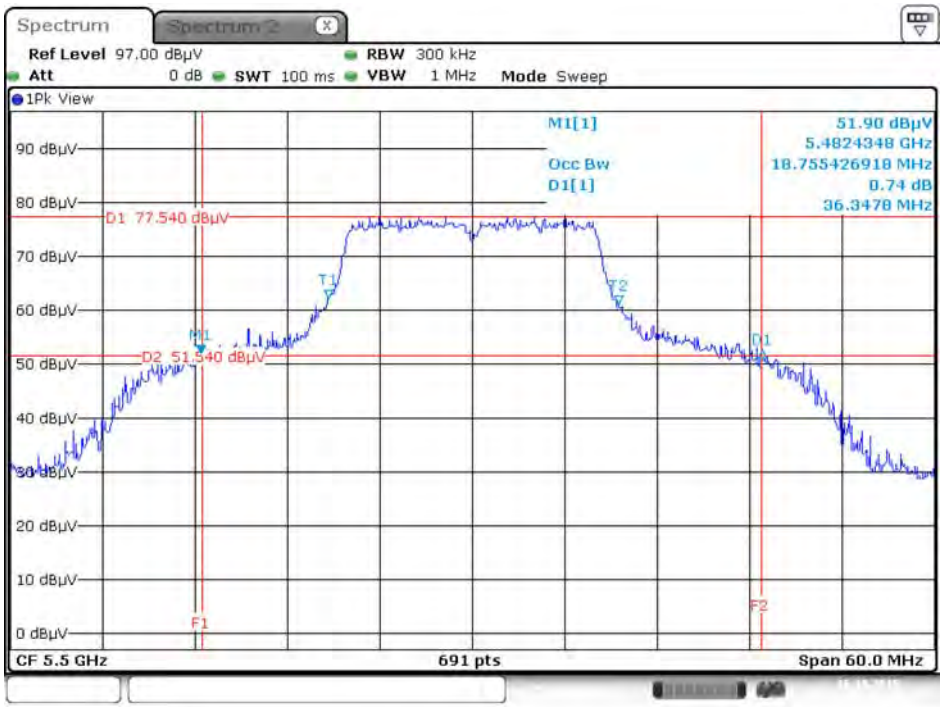
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5320 MHz



Date: 16.OCT.2015 20:49:53

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



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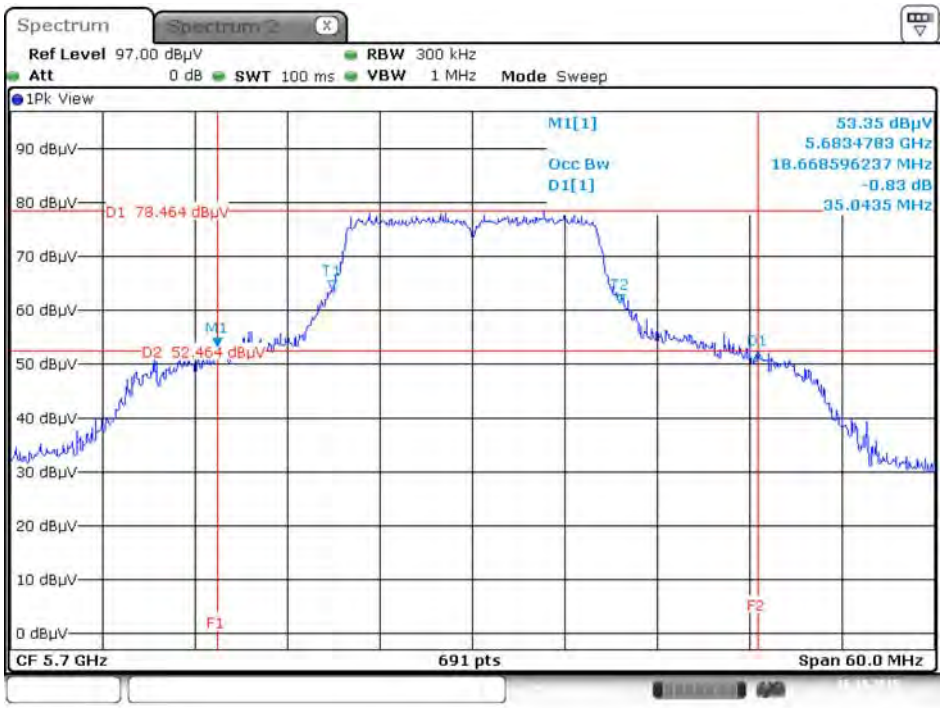
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5580 MHz

Date: 16.OCT.2015 20:52:10

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



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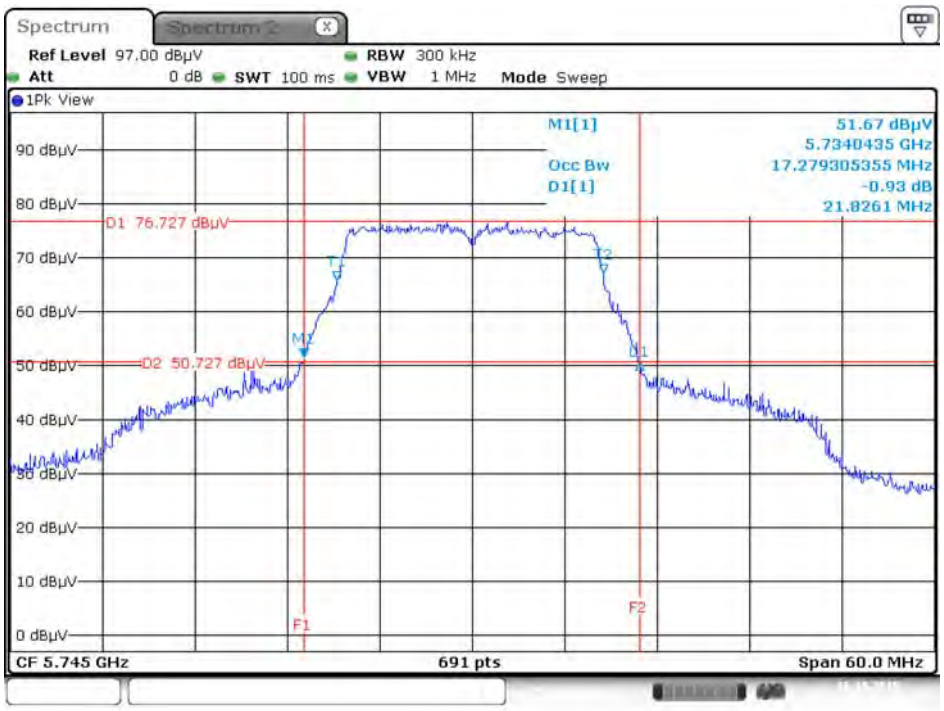
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5745 MHz



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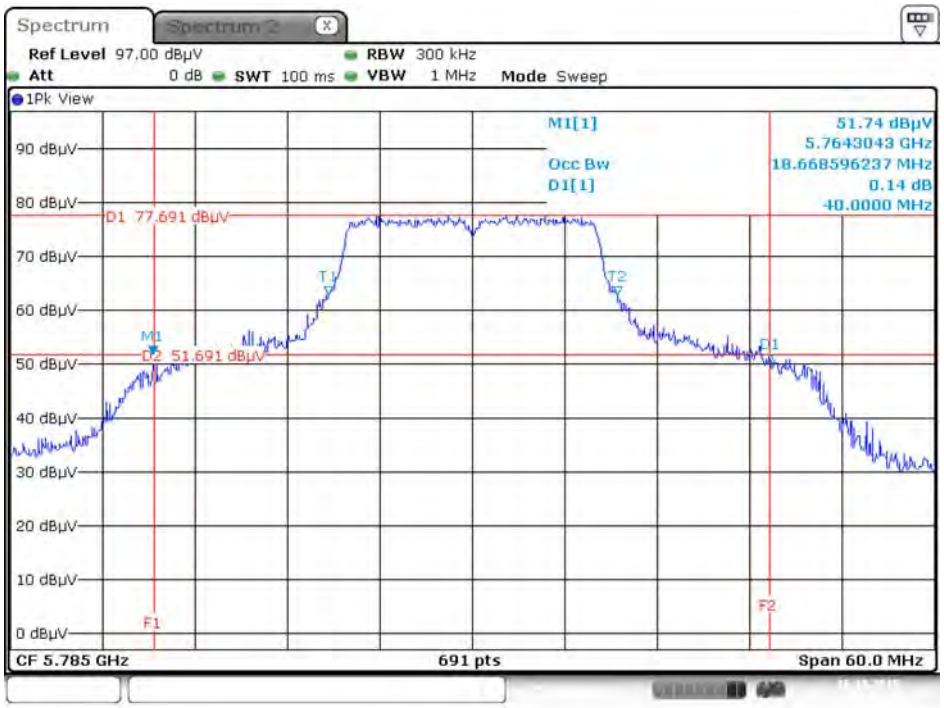
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5785 MHz



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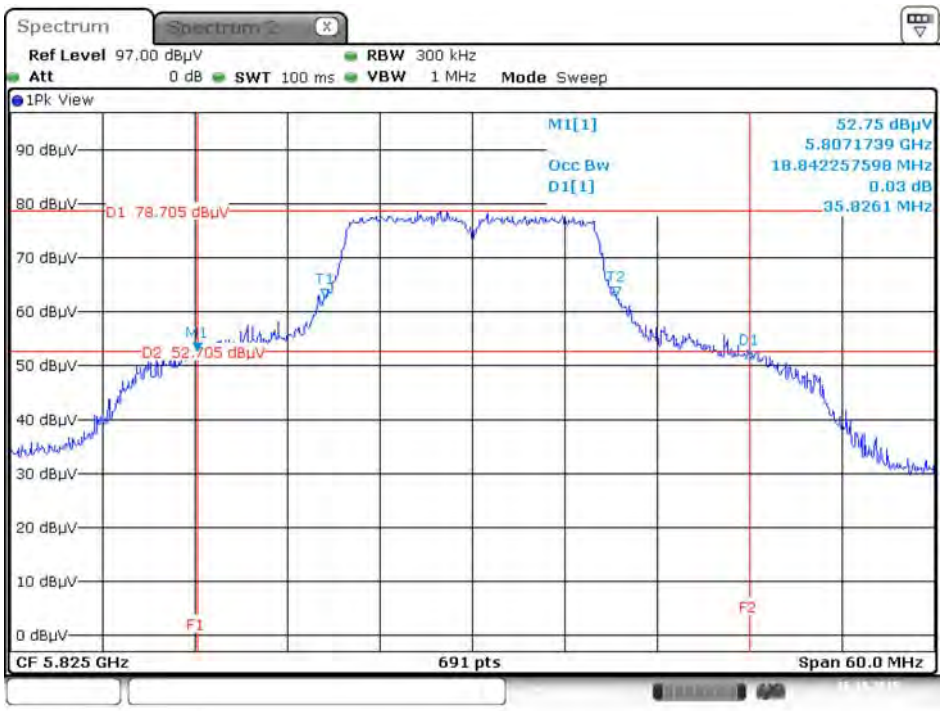
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5825 MHz



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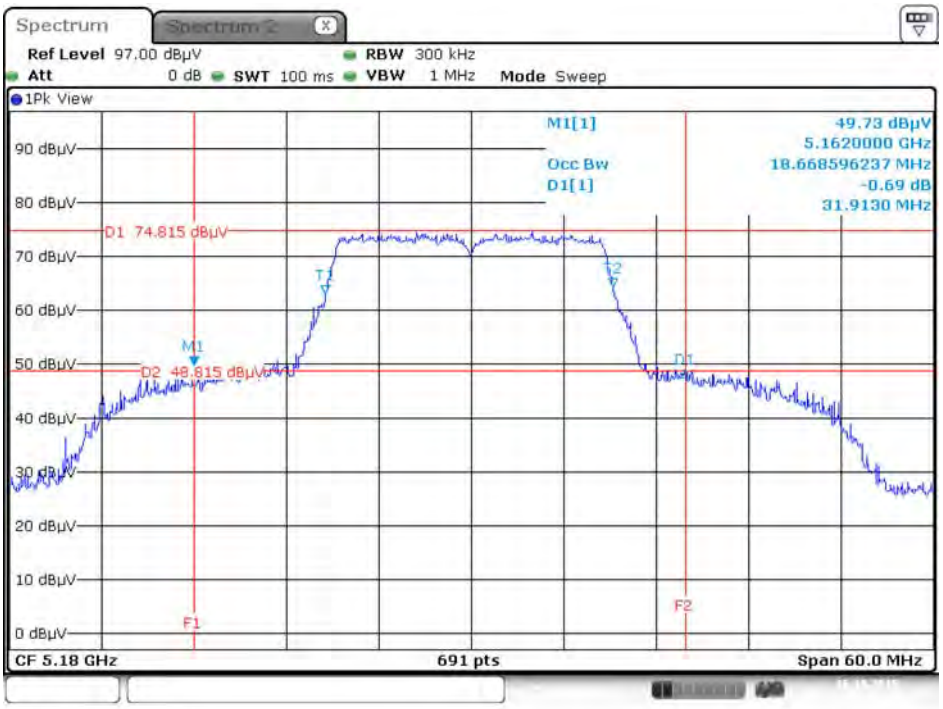
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5180 MHz



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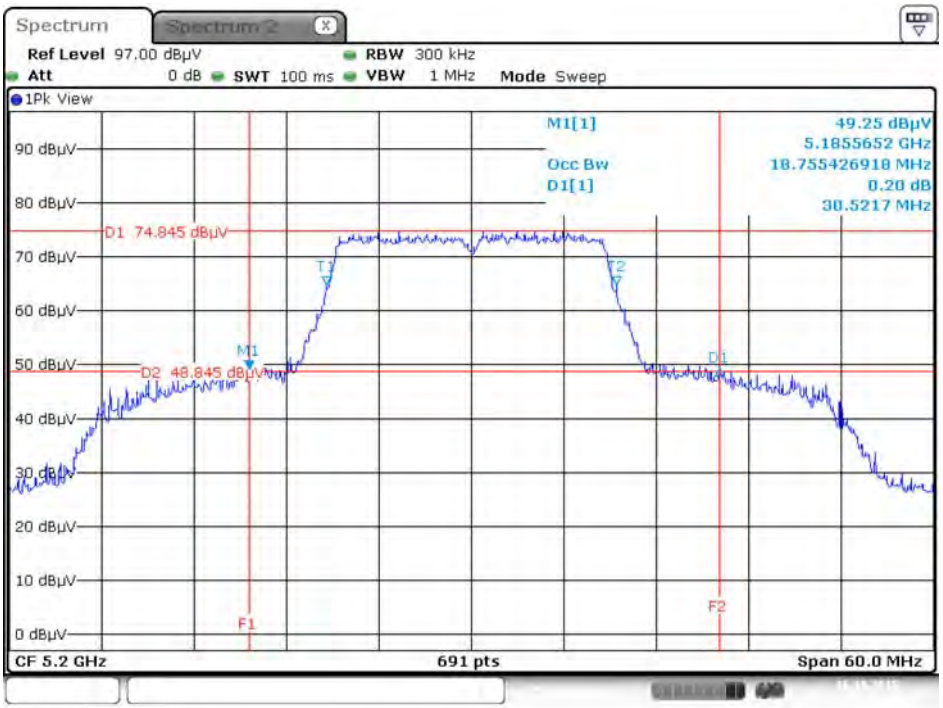
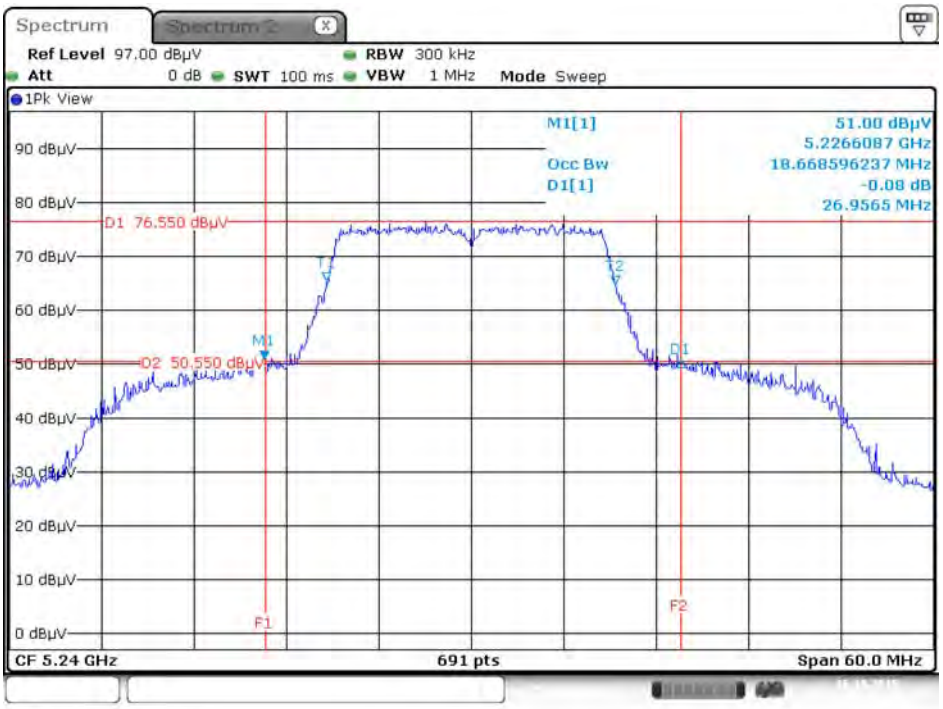
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5200 MHz



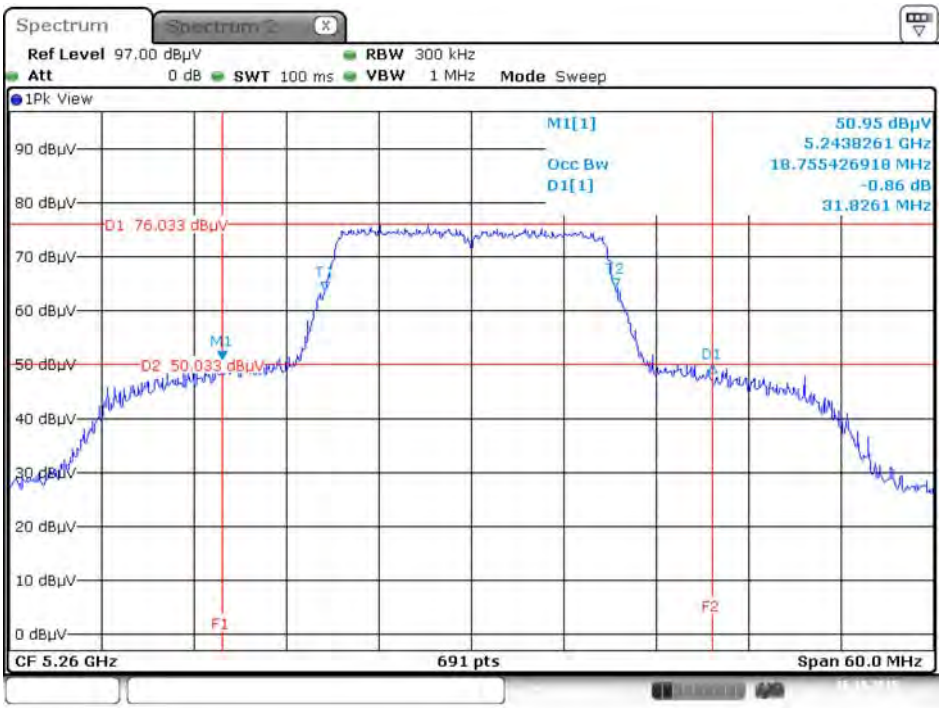
Date: 16.OCT.2015 21:01:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5240 MHz



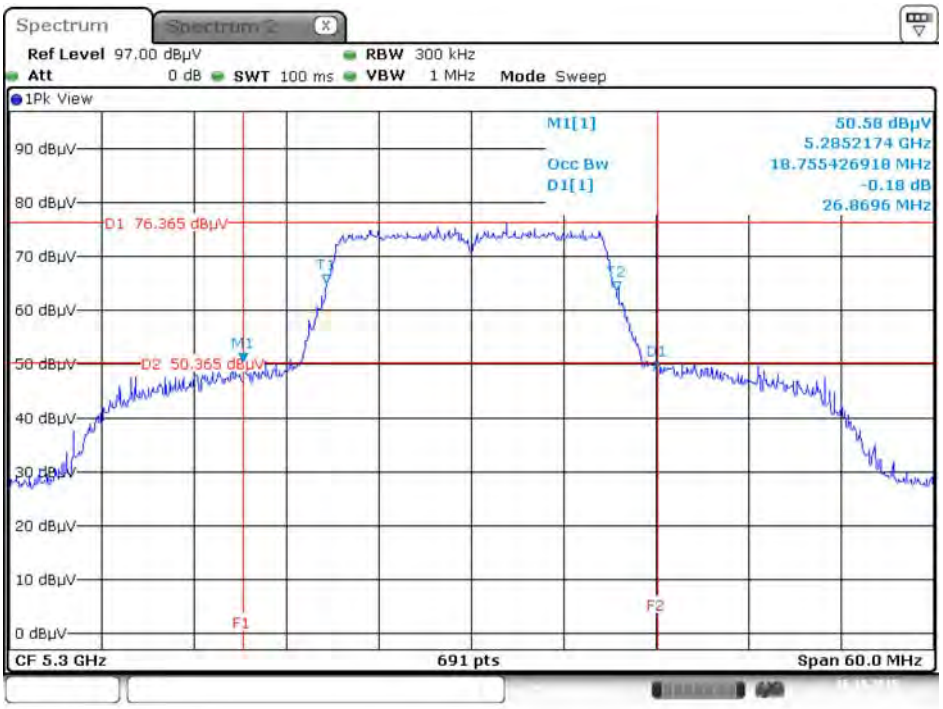
Date: 16.OCT.2015 21:02:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5260 MHz



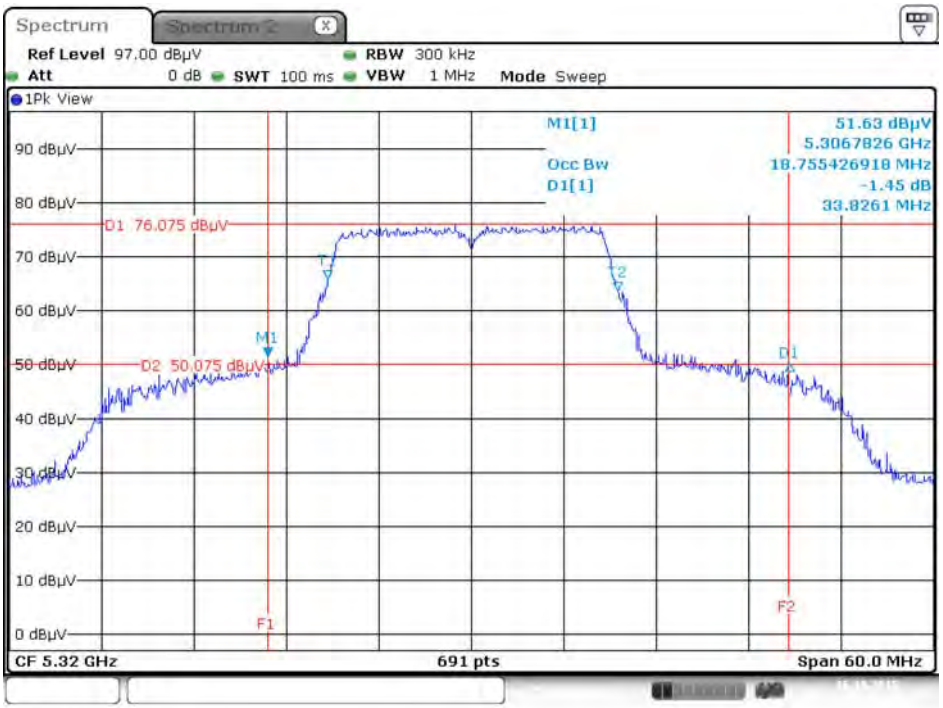
Date: 16.OCT.2015 21:04:18

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5300 MHz



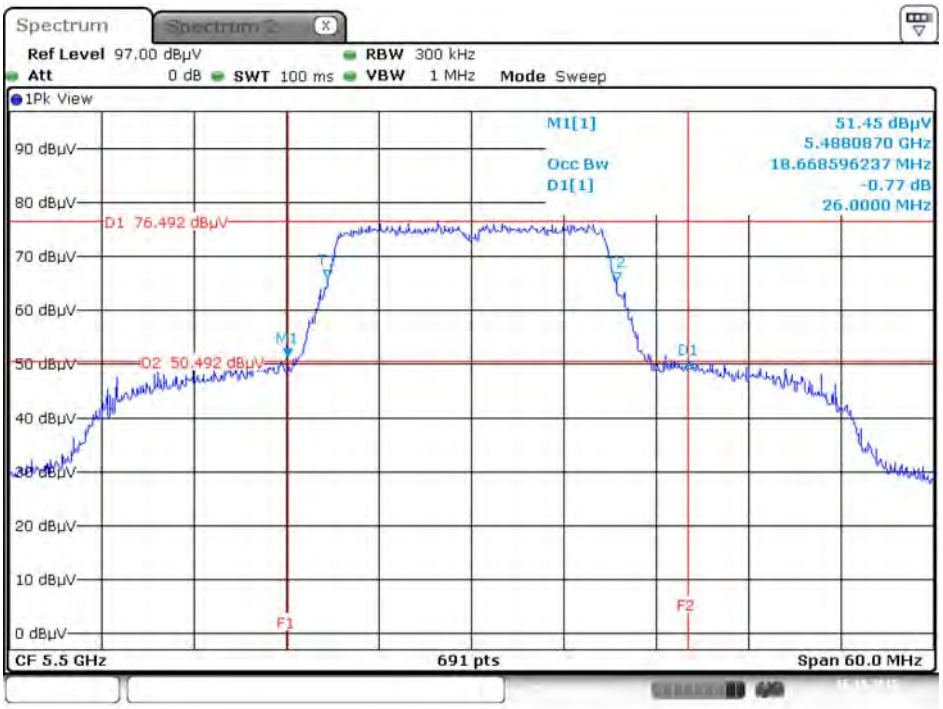
Date: 16.OCT.2015 21:07:43

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5320 MHz



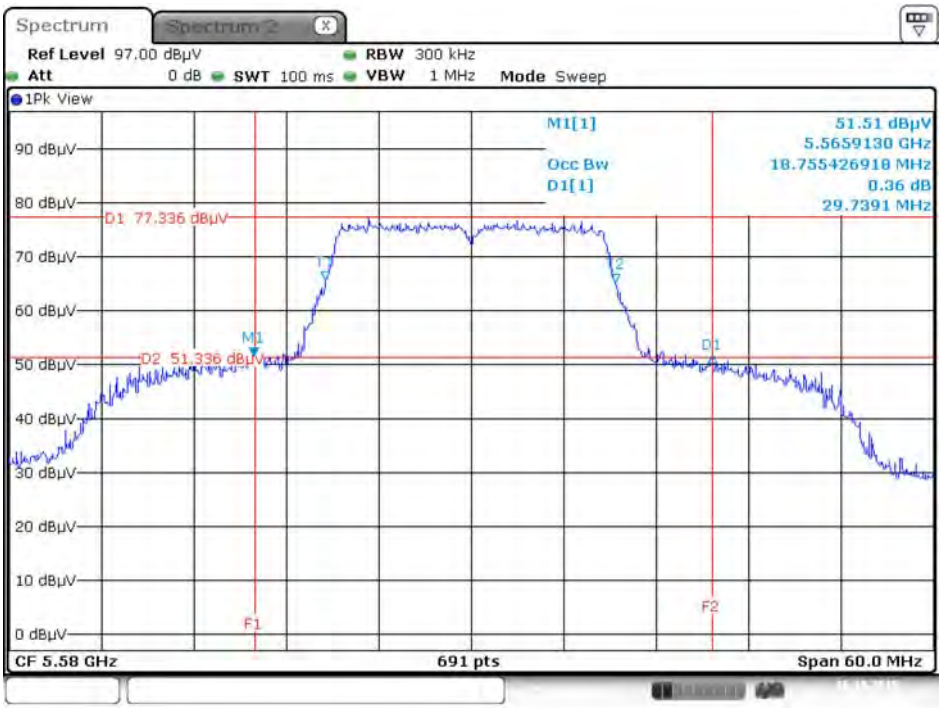
Date: 16.OCT.2015 21:11:44

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



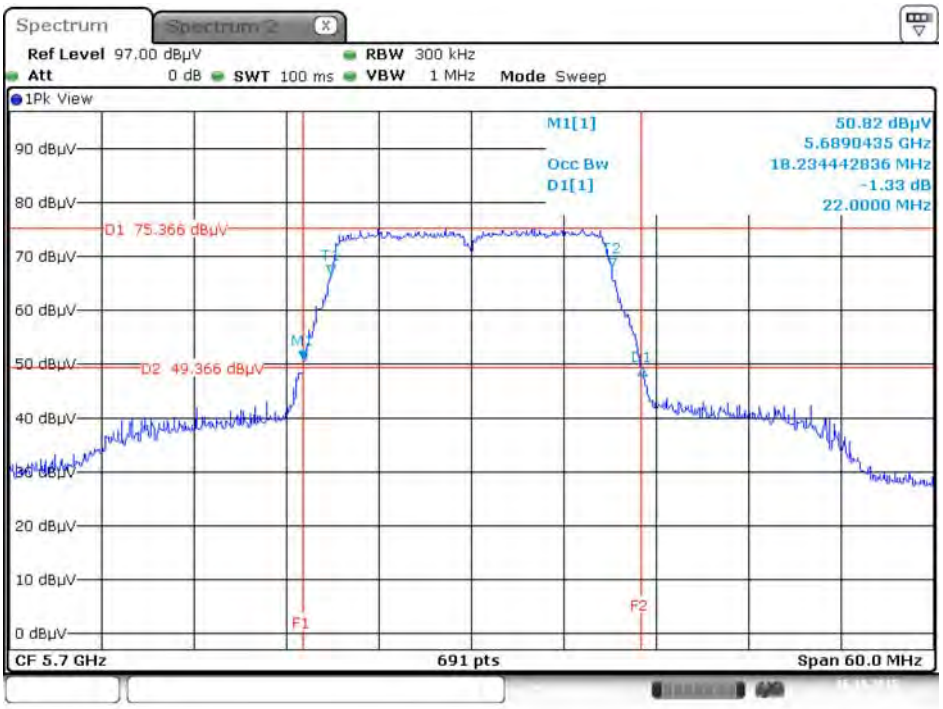
Date: 16.OCT.2015 21:12:57

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



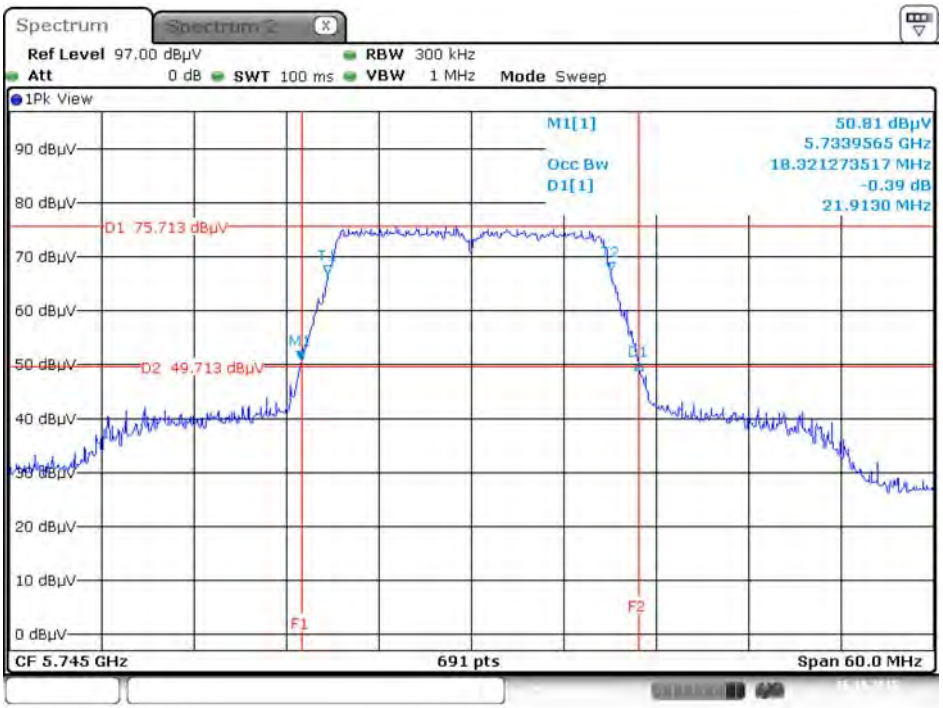
Date: 16.OCT.2015 21:14:09

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



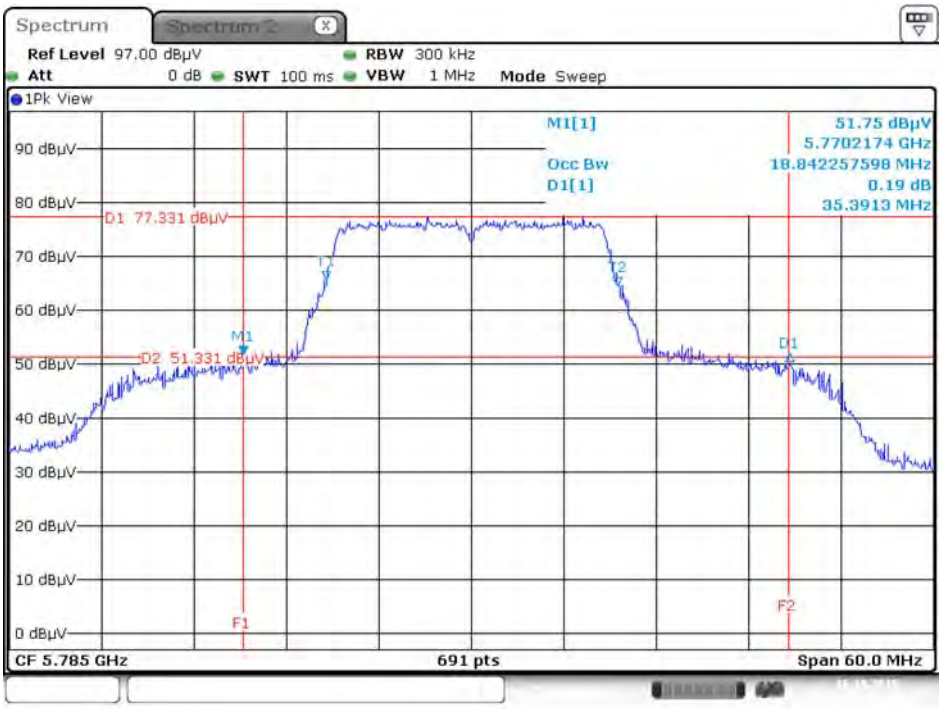
Date: 16.OCT.2015 21:15:11

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



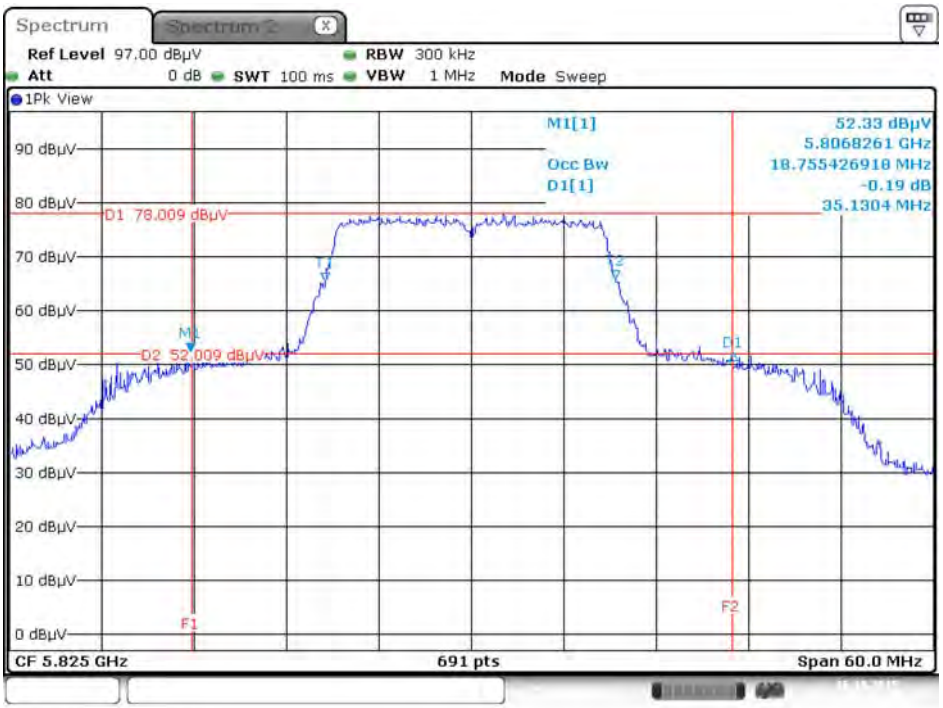
Date: 16.OCT.2015 21:15:48

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



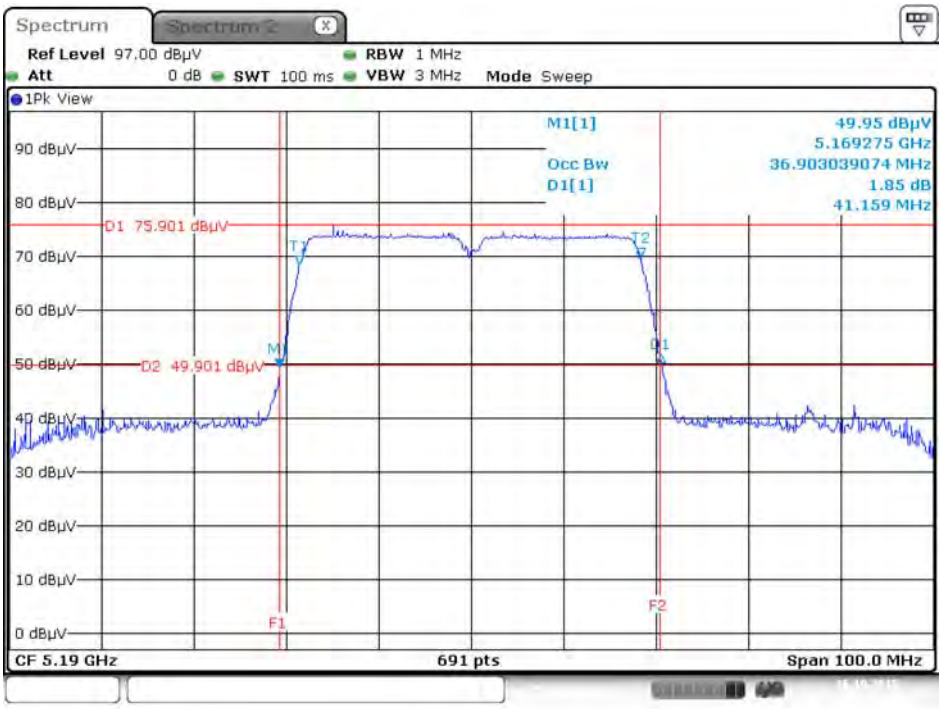
Date: 16.OCT.2015 21:17:44

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



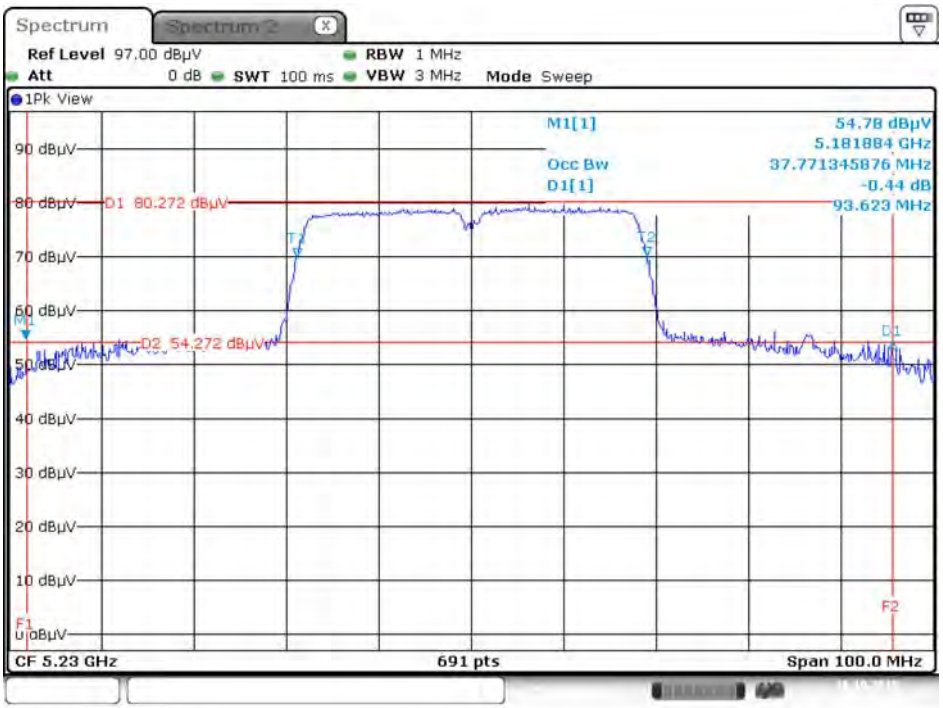
Date: 16.OCT.2015 21:19:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5190 MHz



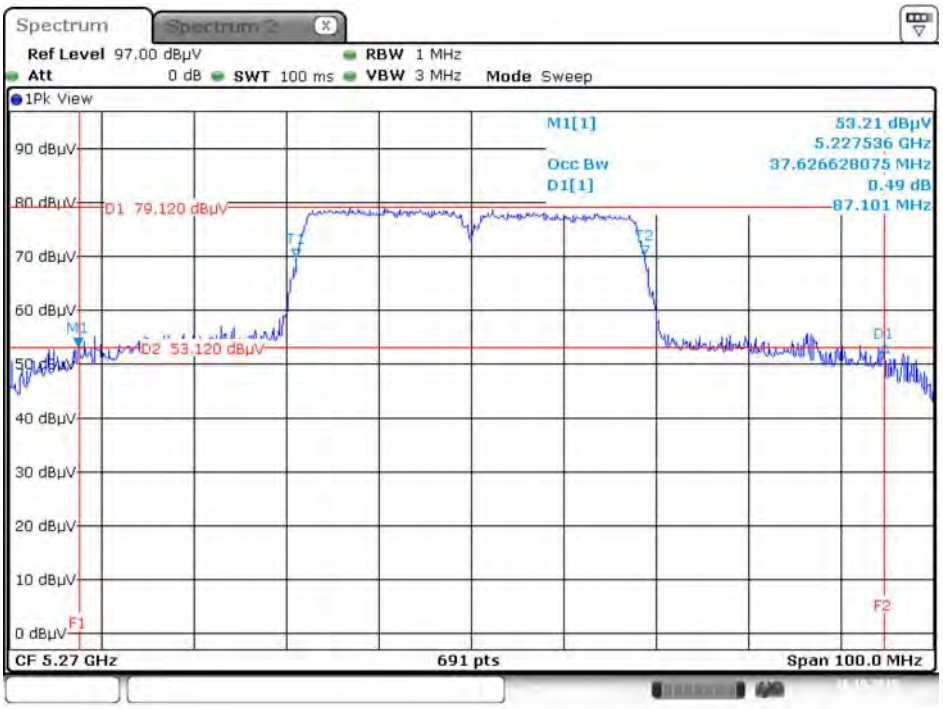
Date: 16.OCT.2015 21:20:43

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5230 MHz



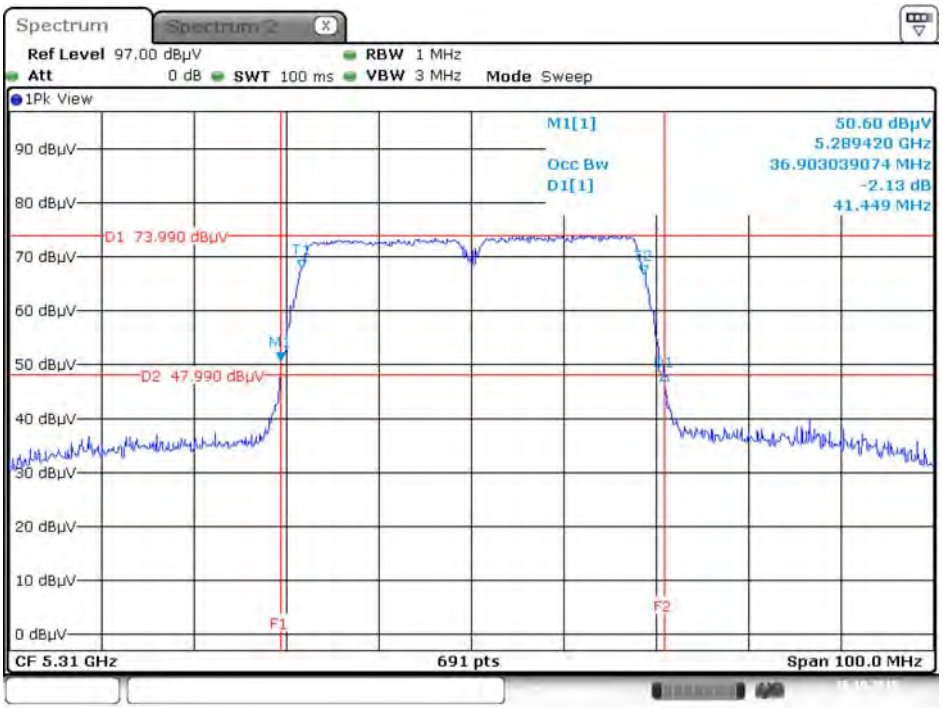
Date: 16.OCT.2015 21:23:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5270 MHz



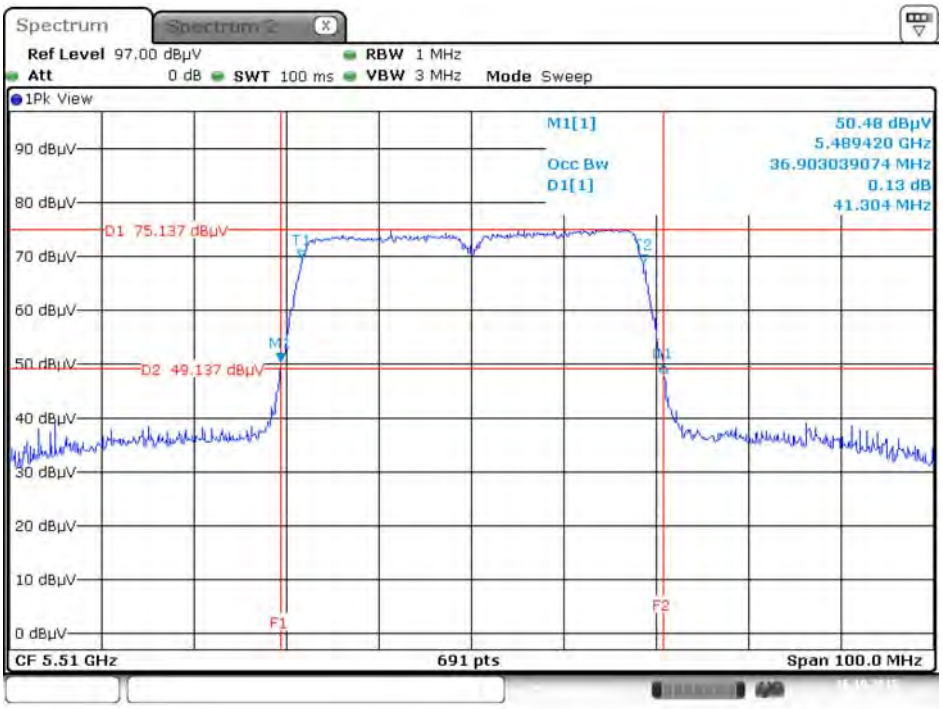
Date: 16.OCT.2015 21:26:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5310 MHz



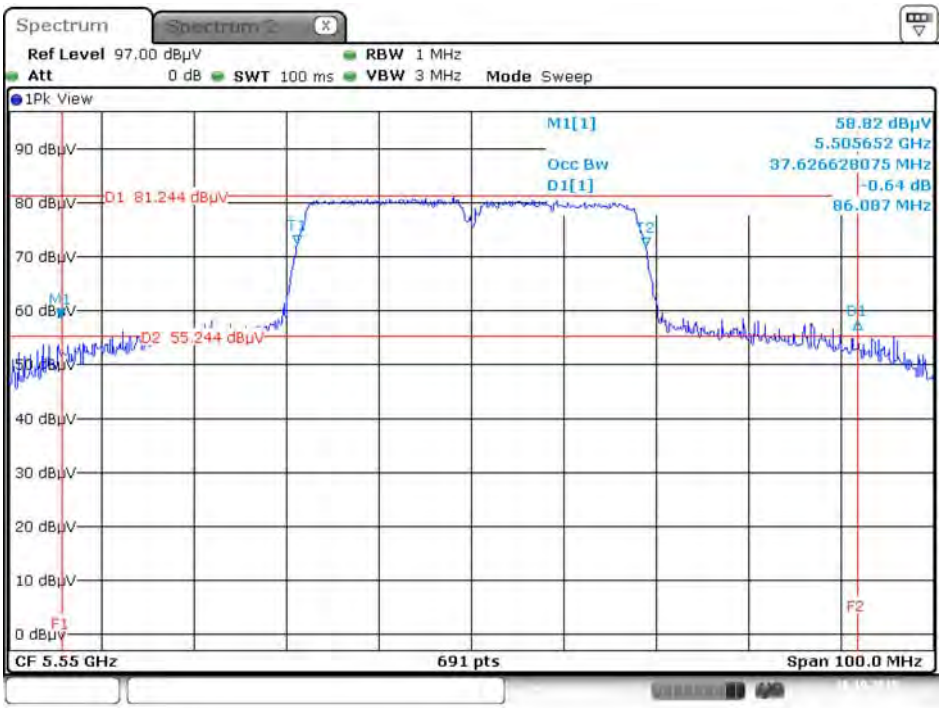
Date: 16.OCT.2015 21:27:23

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



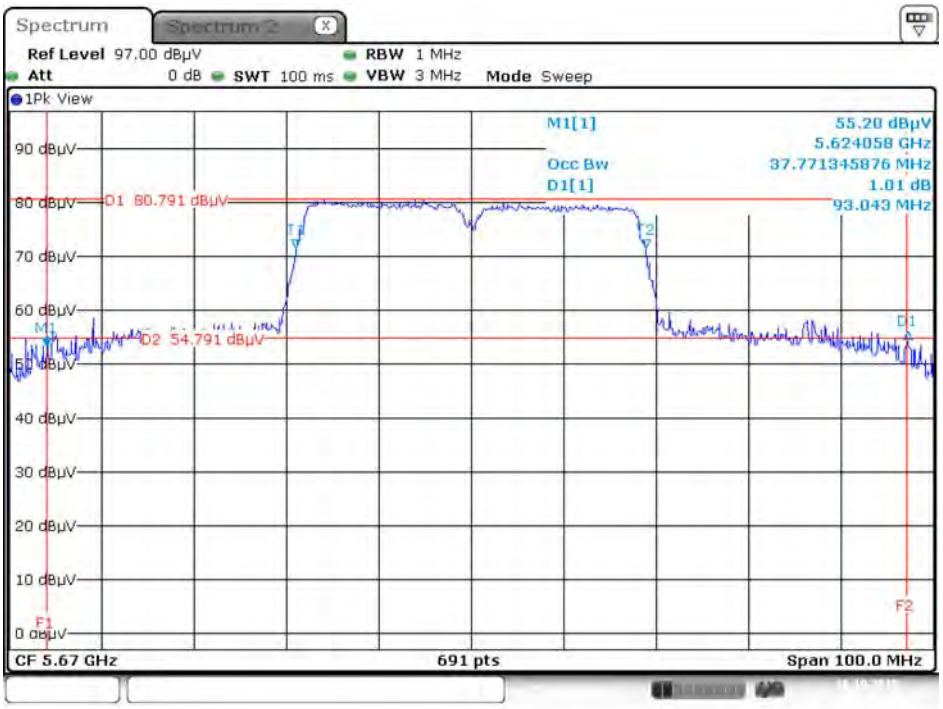
Date: 16.OCT.2015 21:27:52

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



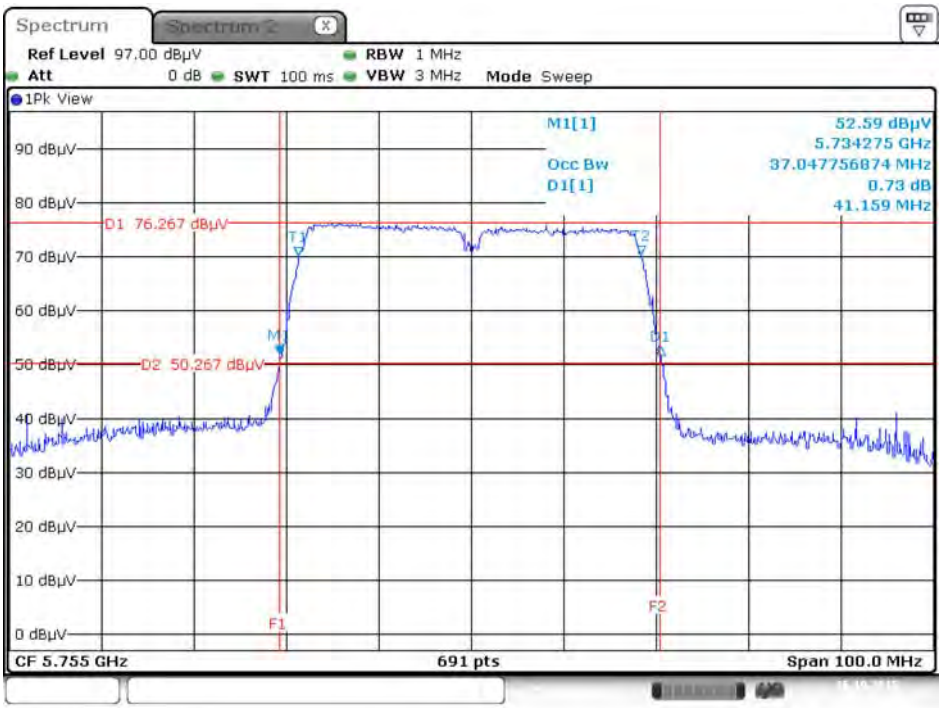
Date: 16.OCT.2015 21:29:24

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



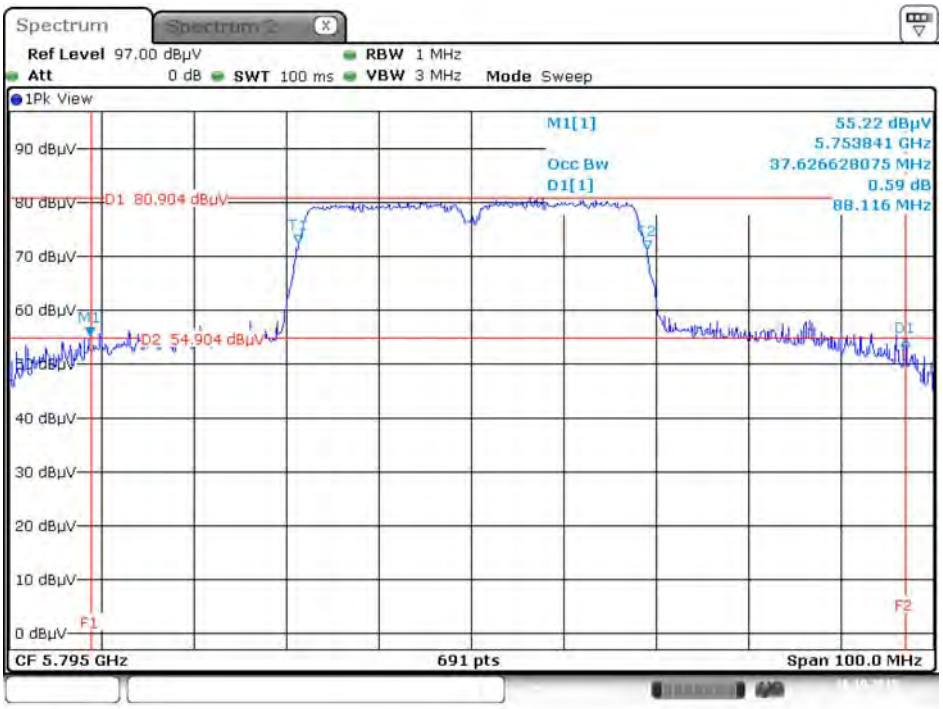
Date: 16.OCT.2015 21:30:30

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



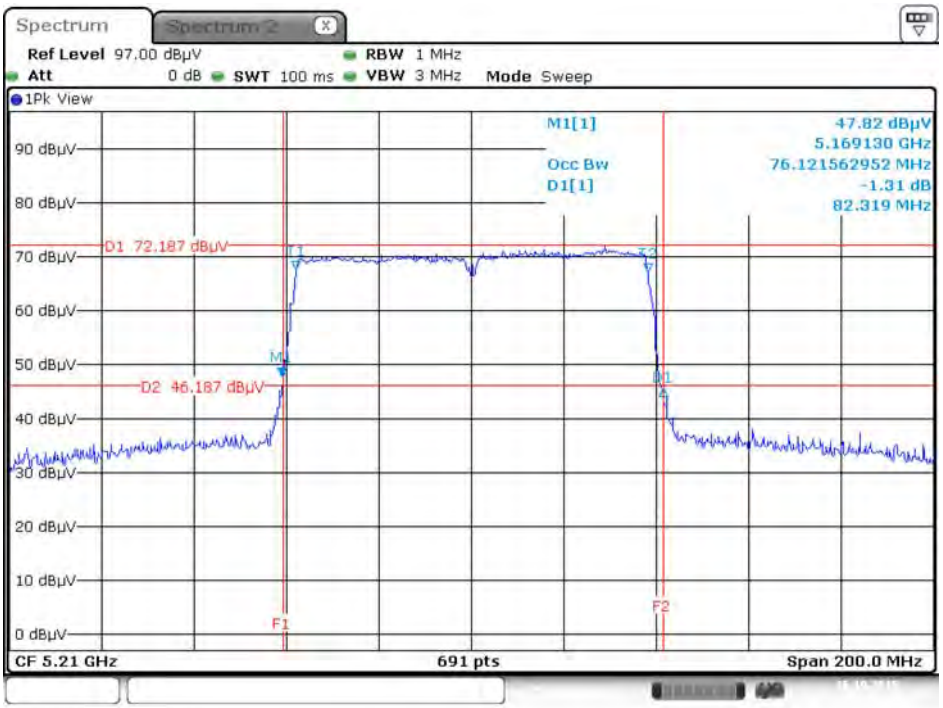
Date: 16.OCT.2015 21:31:27

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



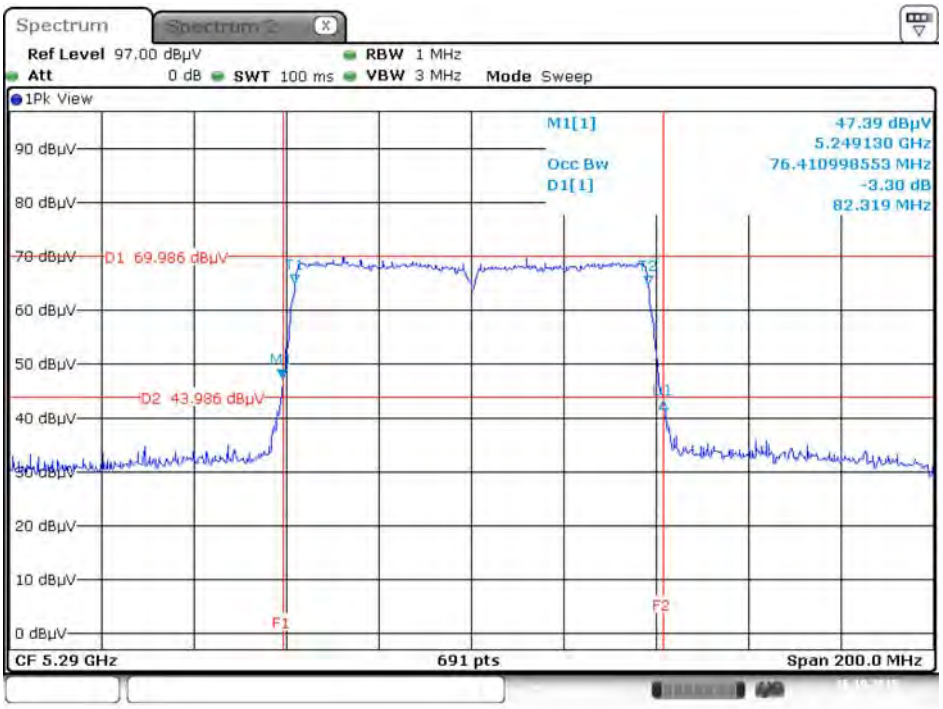
Date: 16.OCT.2015 21:32:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5210 MHz



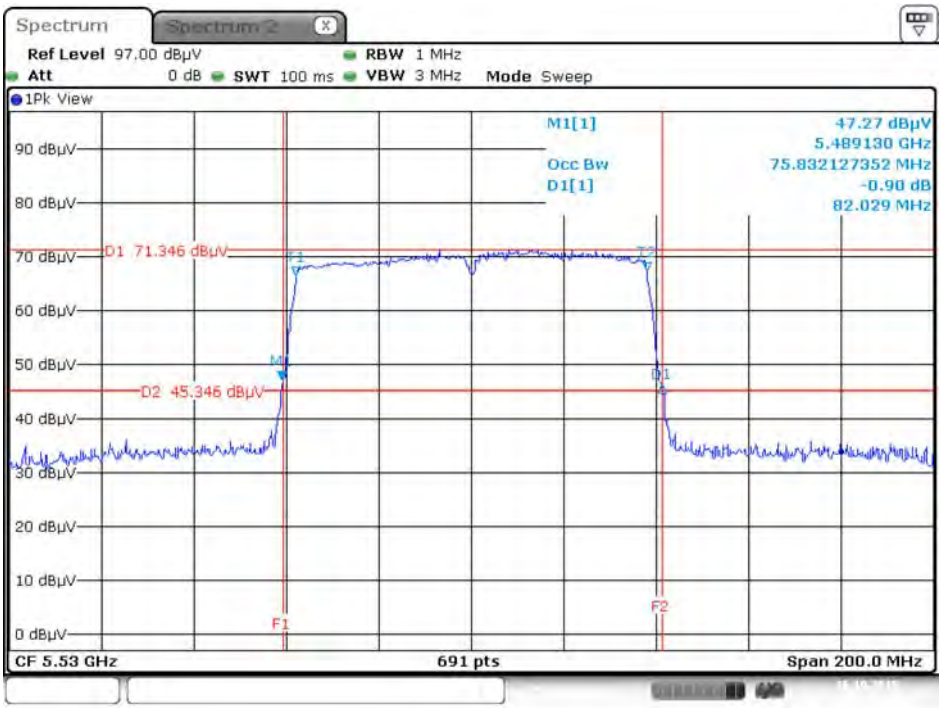
Date: 16.OCT.2015 21:34:55

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5290 MHz



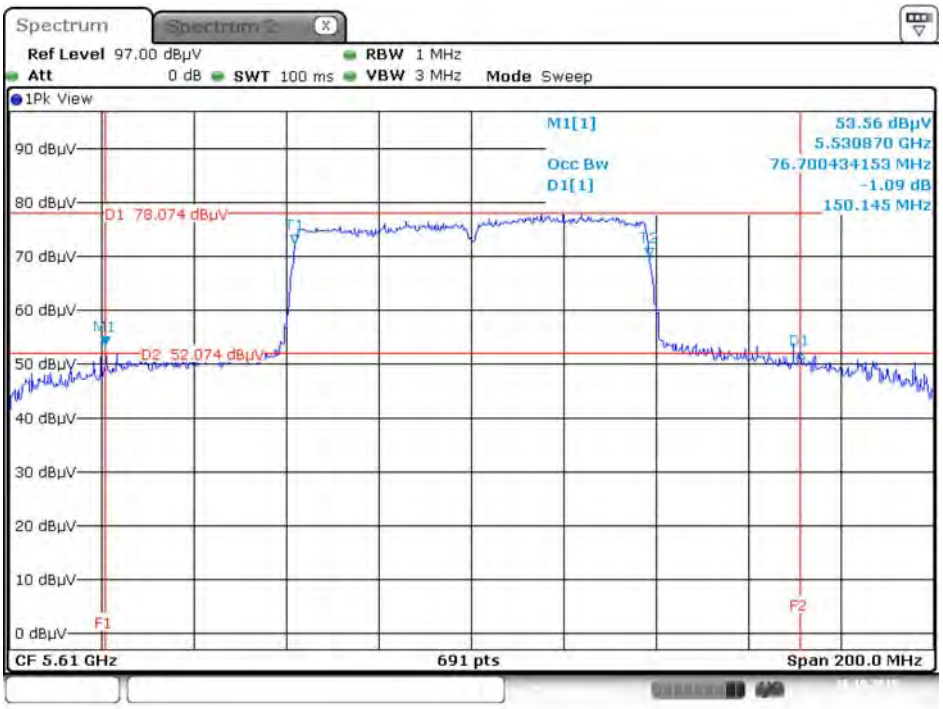
Date: 16.OCT.2015 21:35:36

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



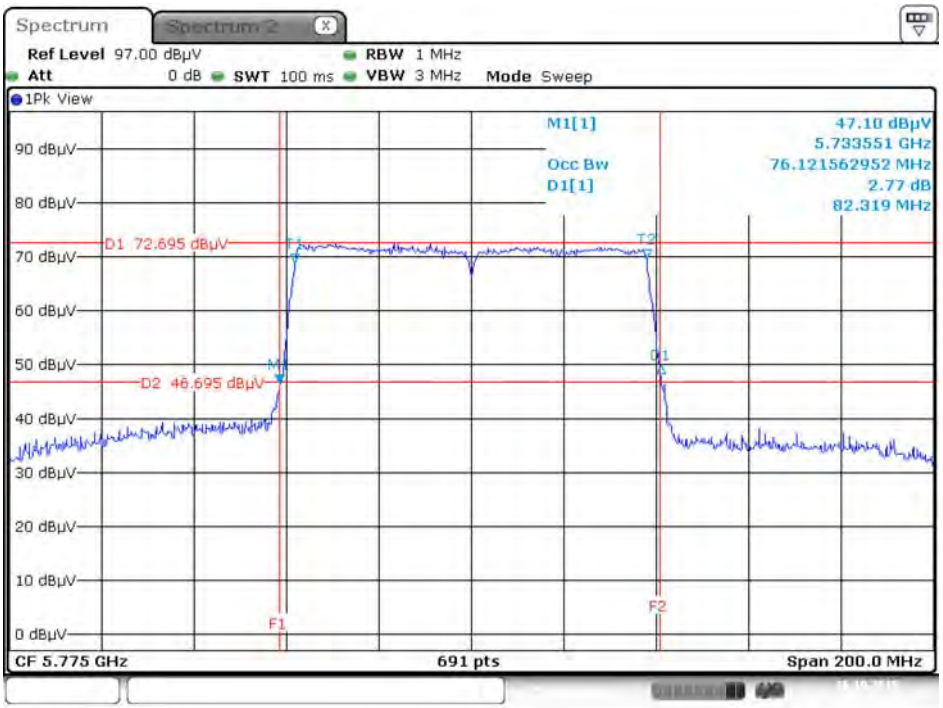
Date: 16.OCT.2015 21:36:16

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



Date: 16.OCT.2015 21:37:48

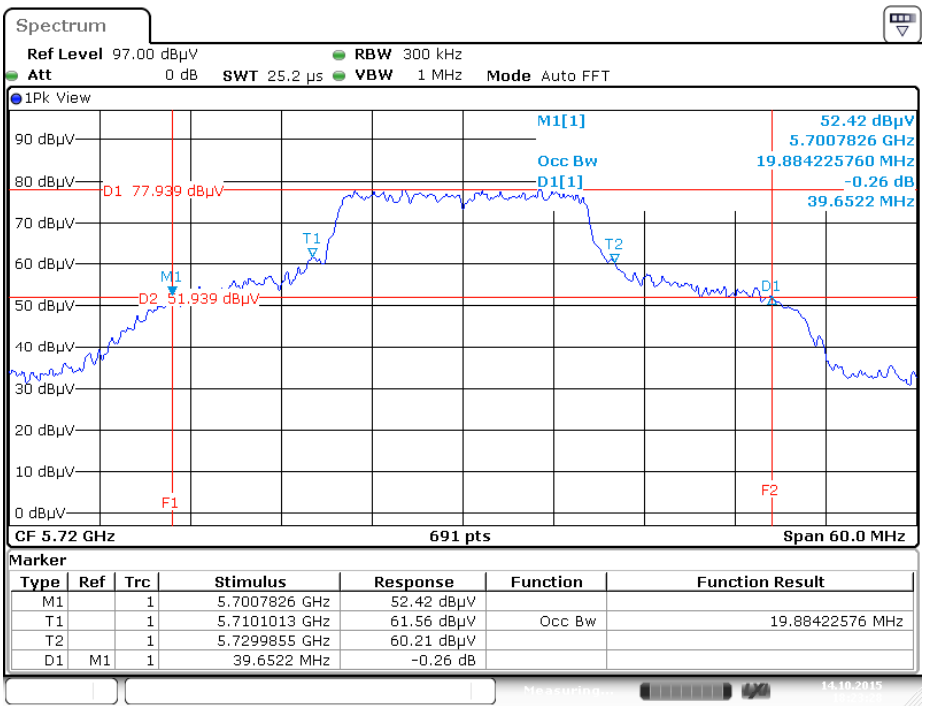
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



Date: 16.OCT.2015 21:38:51

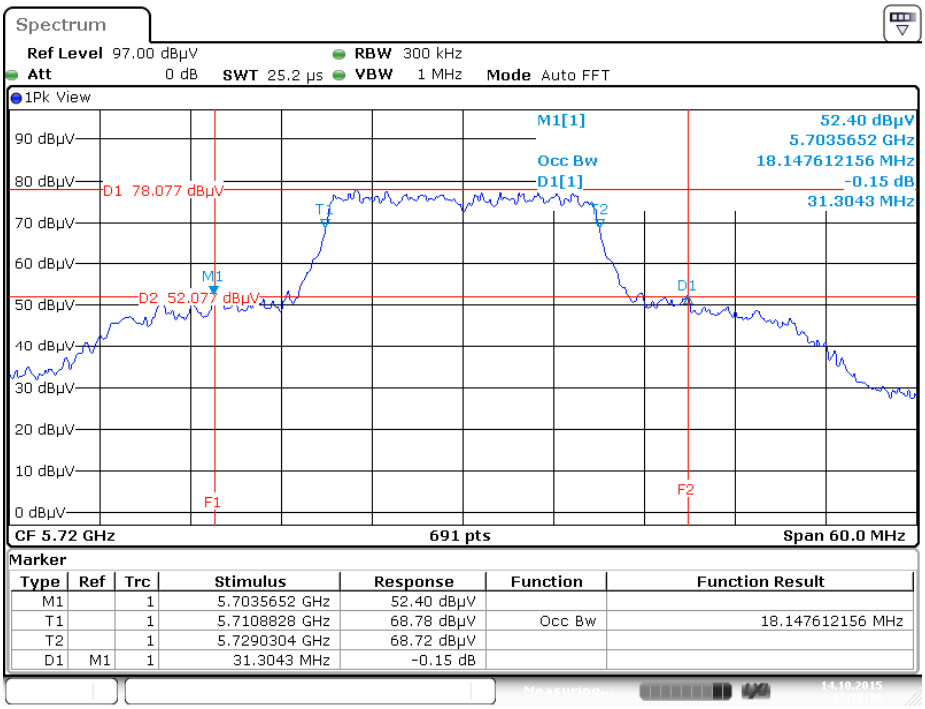
Straddle Channel

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



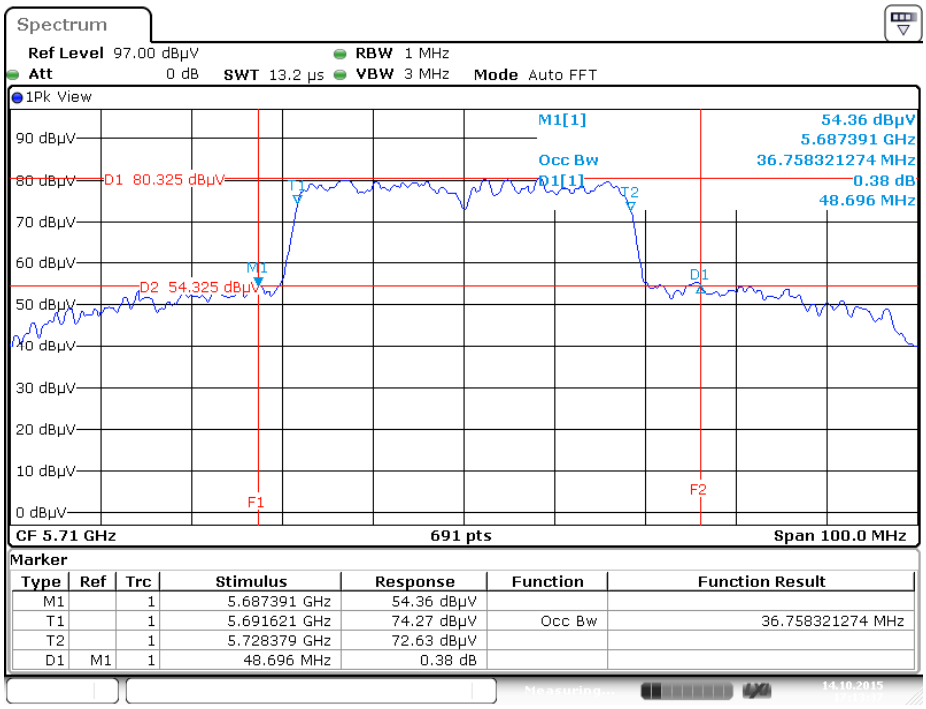
Date: 14.OCT.2015 18:23:28

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



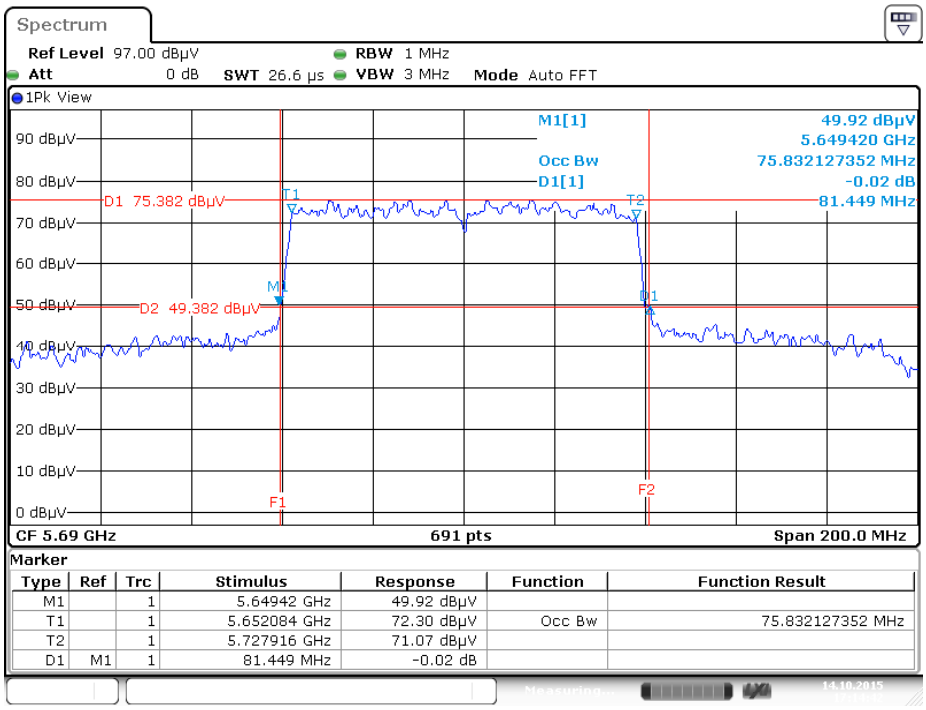
Date: 14.OCT.2015 17:12:36

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



Date: 14.OCT.2015 17:13:38

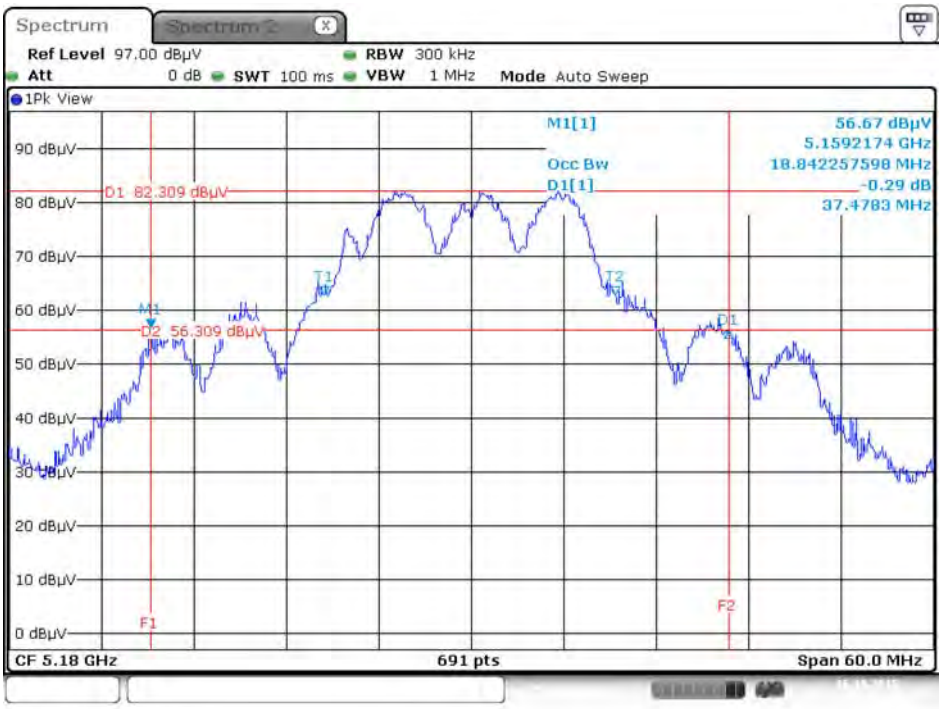
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5690 MHz



Date: 14.OCT.2015 17:14:43

Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5180 MHz

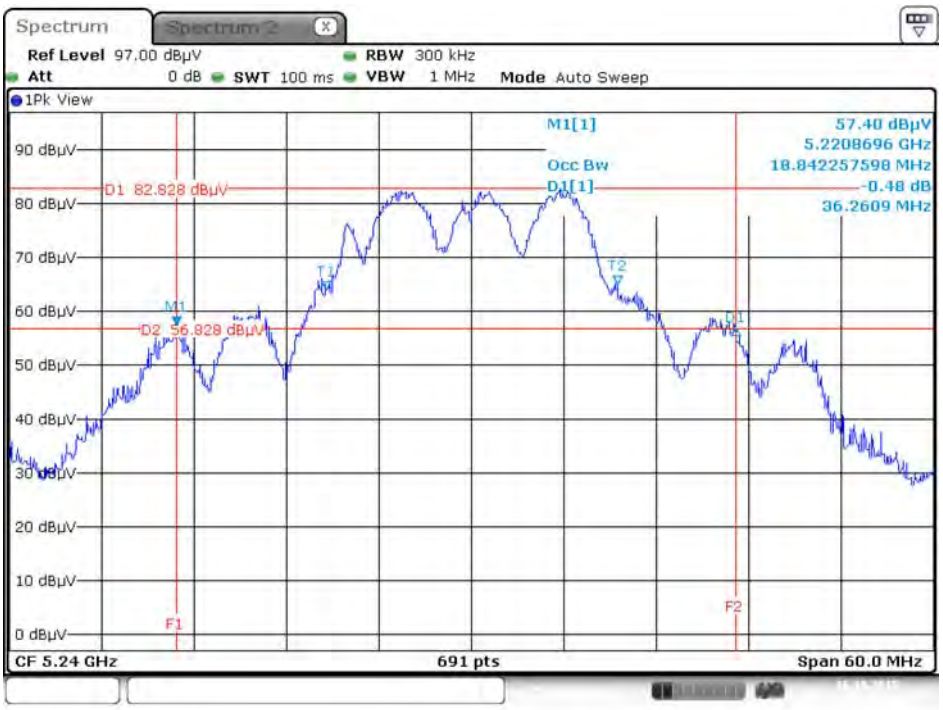


Date: 16.OCT.2015 22:30:29

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5200 MHz

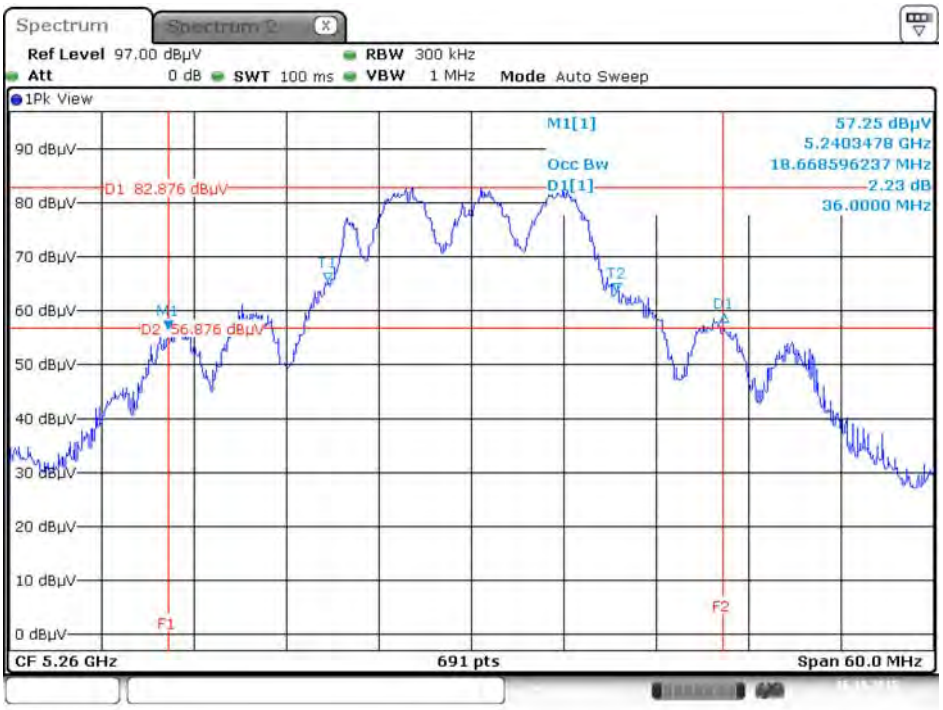
Date: 16.OCT.2015 22:32:10

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5240 MHz



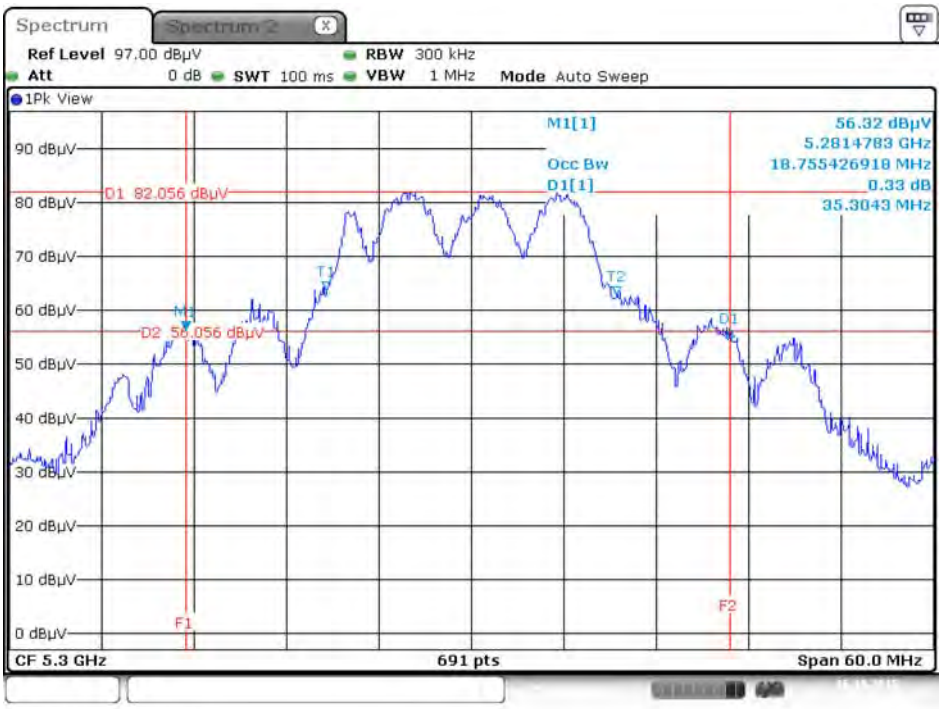
Date: 16.OCT.2015 22:33:02

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5260 MHz



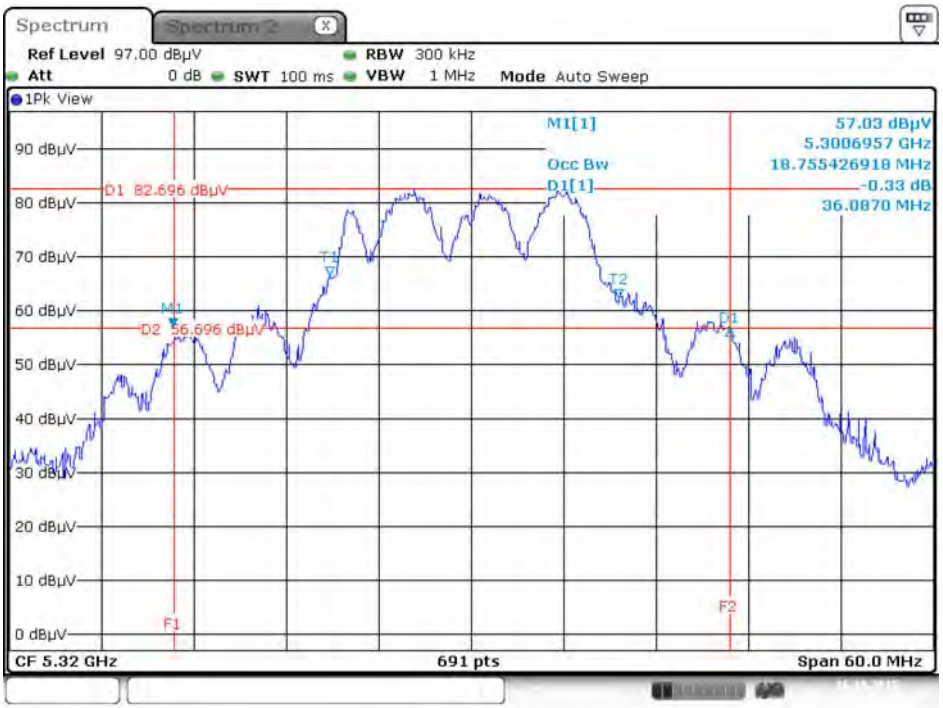
Date: 16.OCT.2015 22:34:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5300 MHz



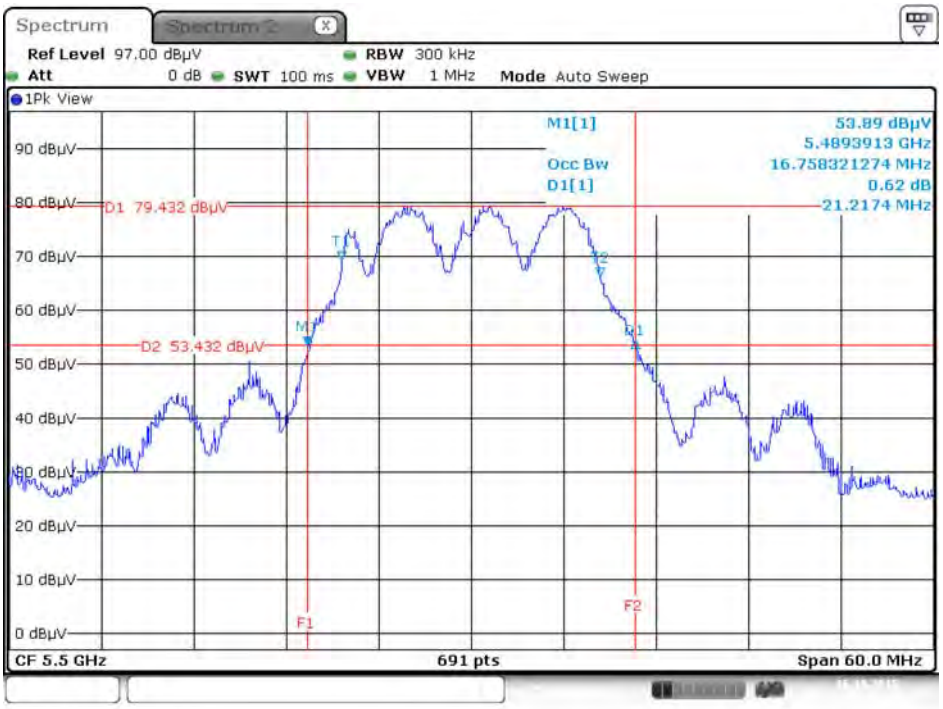
Date: 16.OCT.2015 22:35:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5320 MHz



Date: 16.OCT.2015 22:36:24

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

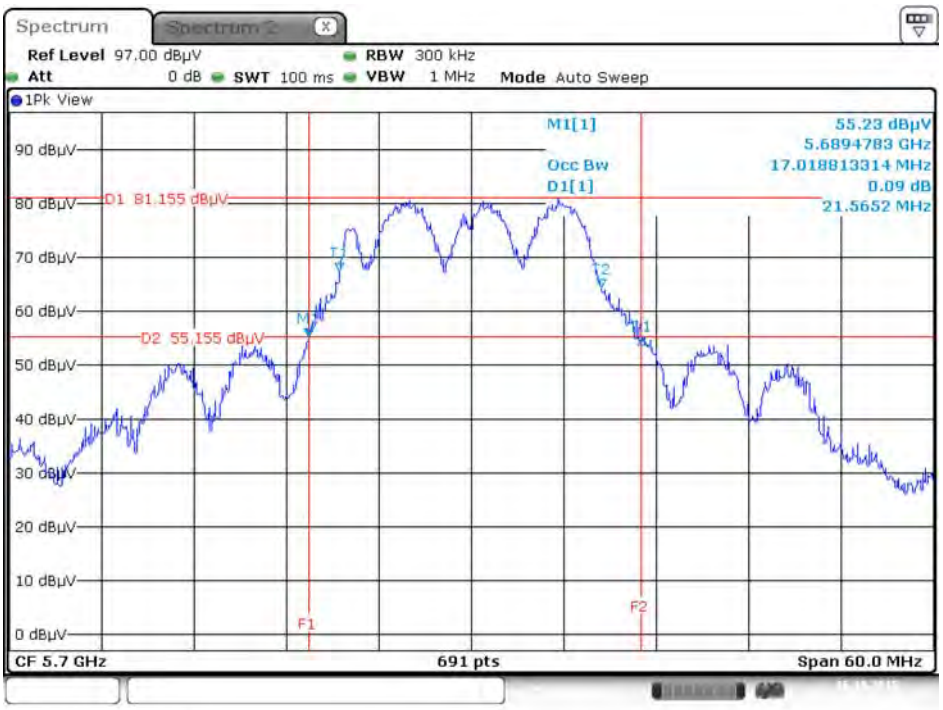


Date: 16.OCT.2015 22:37:49

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

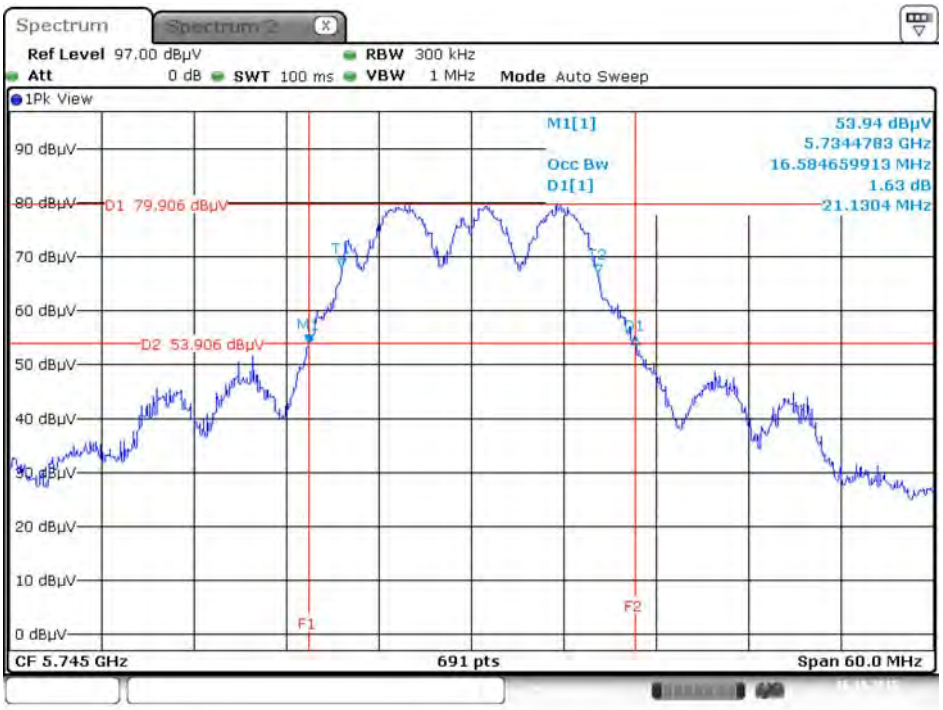
Date: 16.OCT.2015 22:38:25

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



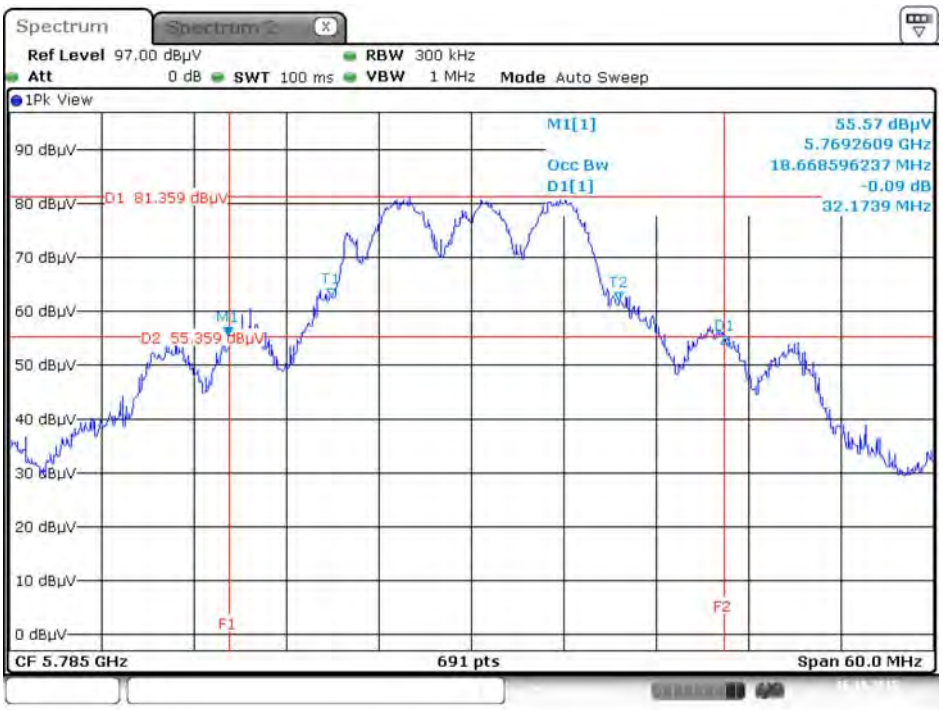
Date: 16.OCT.2015 22:39:04

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



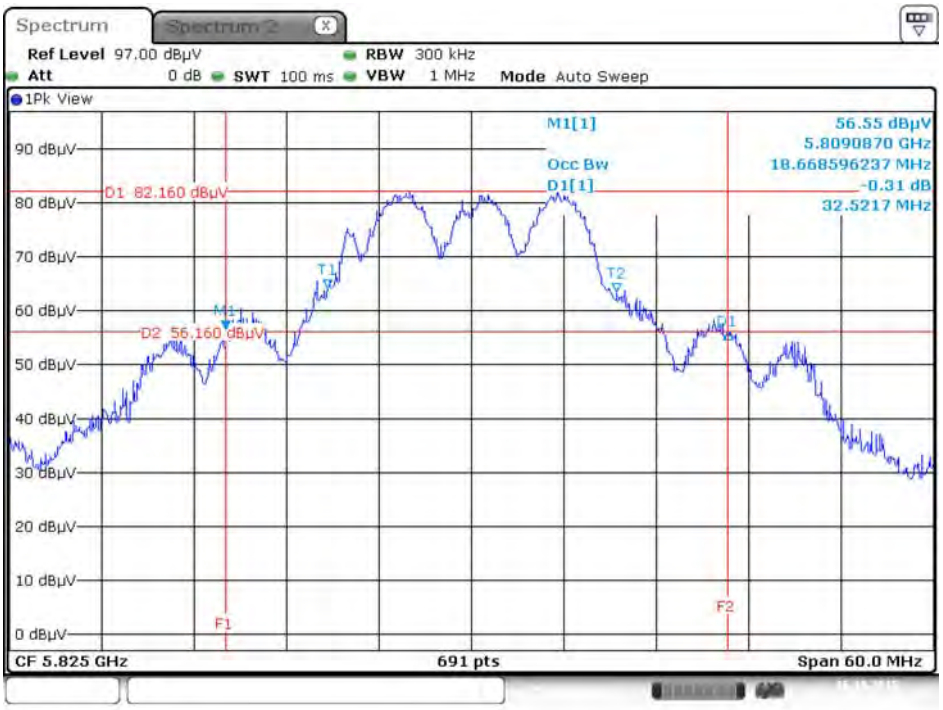
Date: 16.OCT.2015 22:39:42

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



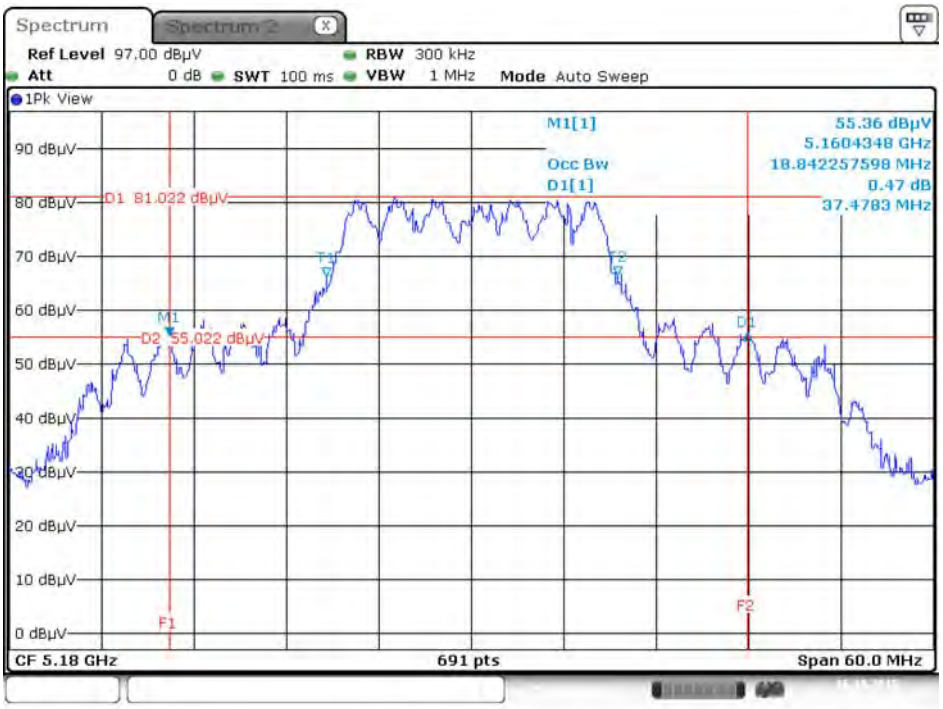
Date: 16.OCT.2015 22:40:09

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



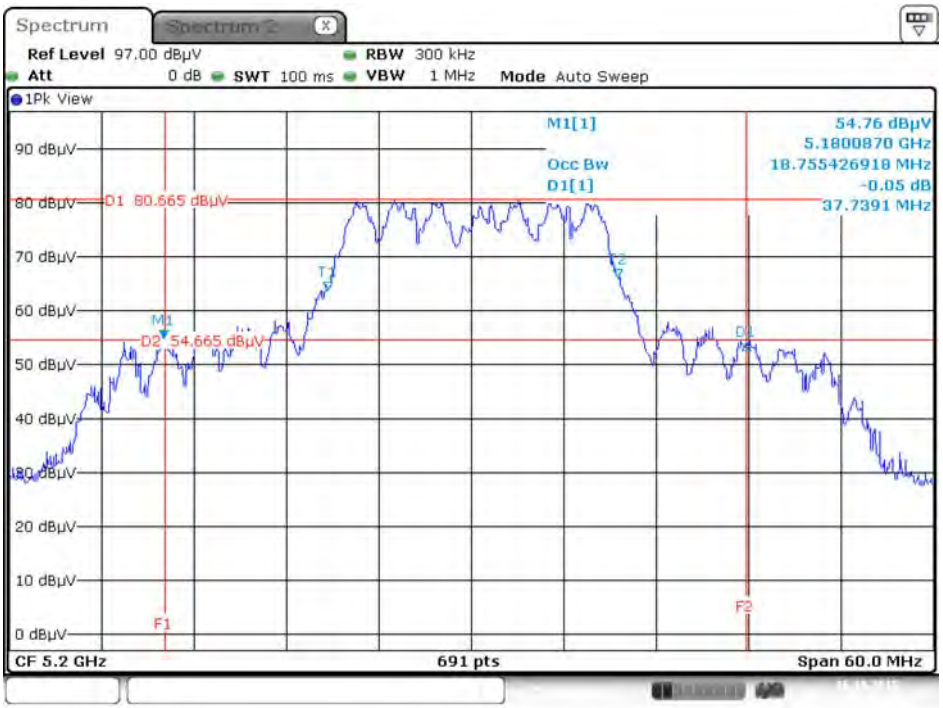
Date: 16.OCT.2015 22:40:53

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5180 MHz



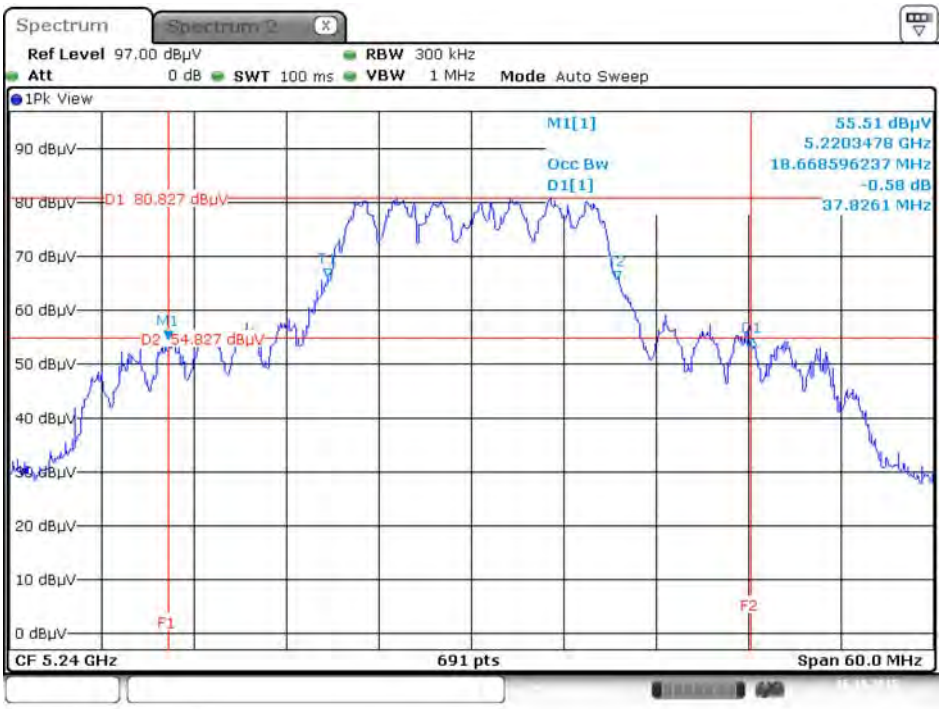
Date: 16.OCT.2015 22:42:50

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5200 MHz



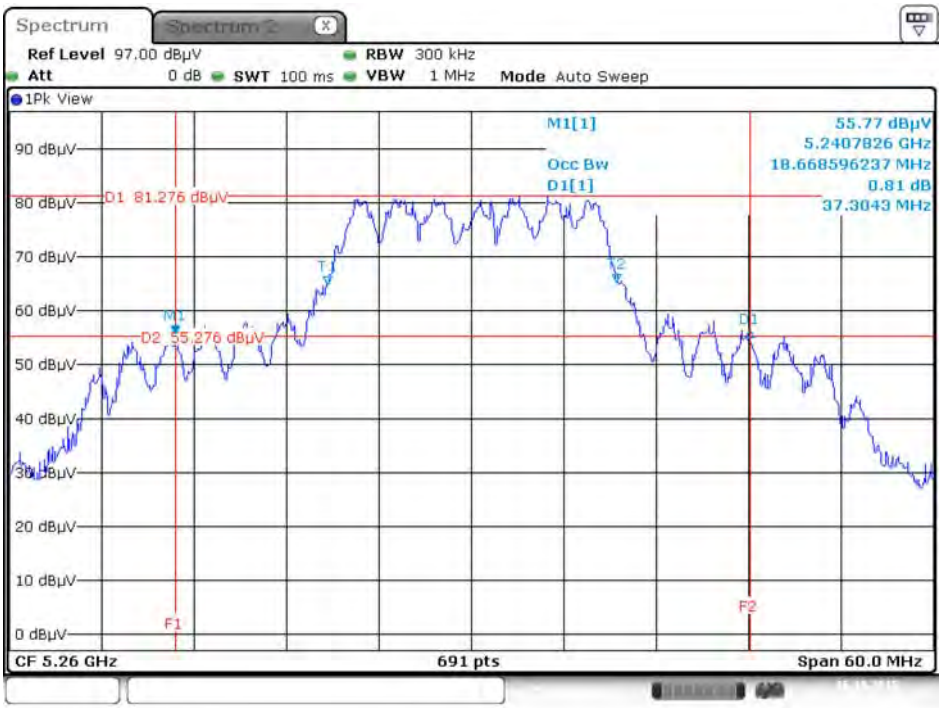
Date: 16.OCT.2015 22:43:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5240 MHz



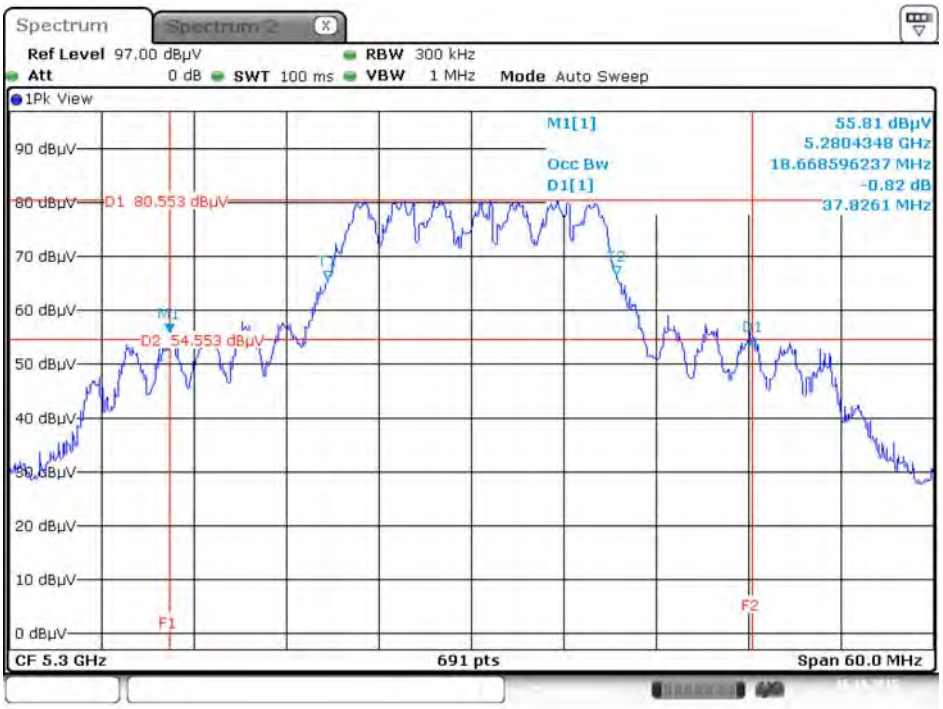
Date: 16.OCT.2015 22:44:42

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5260 MHz



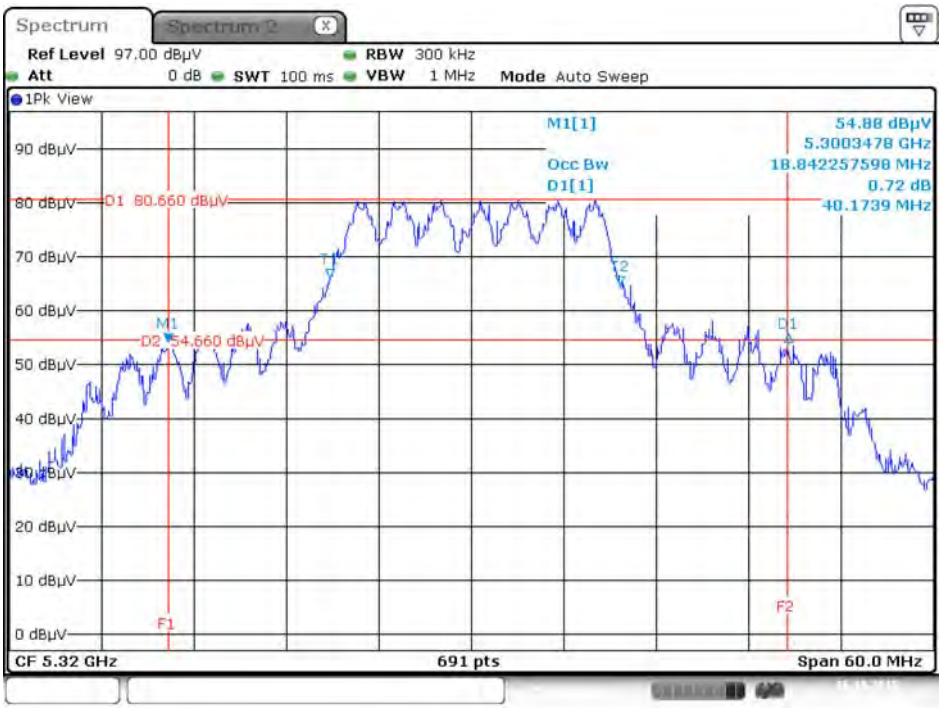
Date: 16.OCT.2015 22:45:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5300 MHz



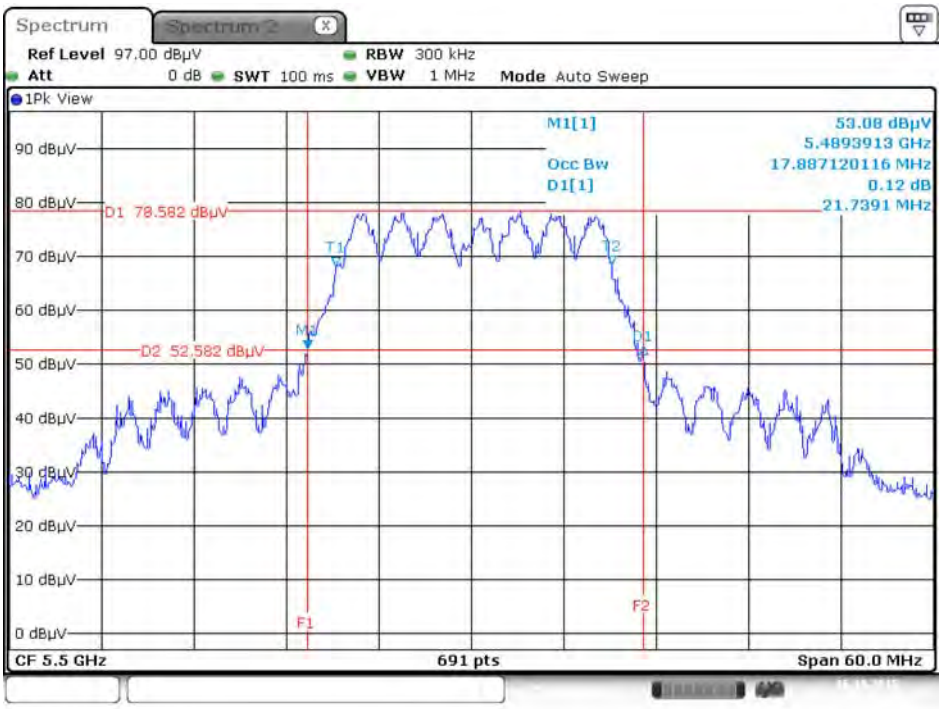
Date: 16.OCT.2015 22:46:41

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5320 MHz



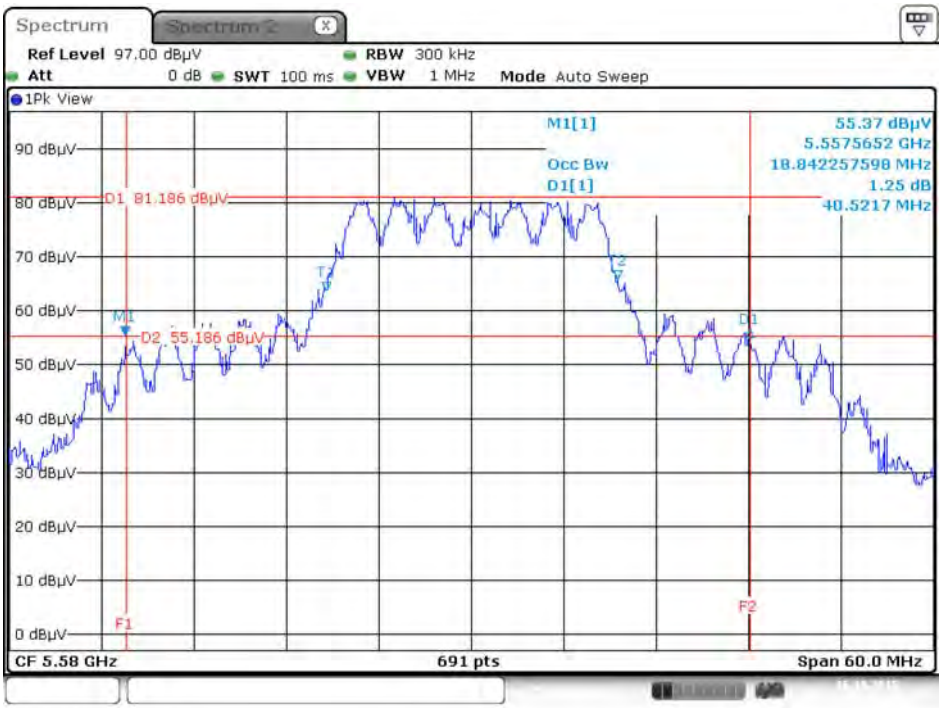
Date: 16.OCT.2015 22:48:30

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



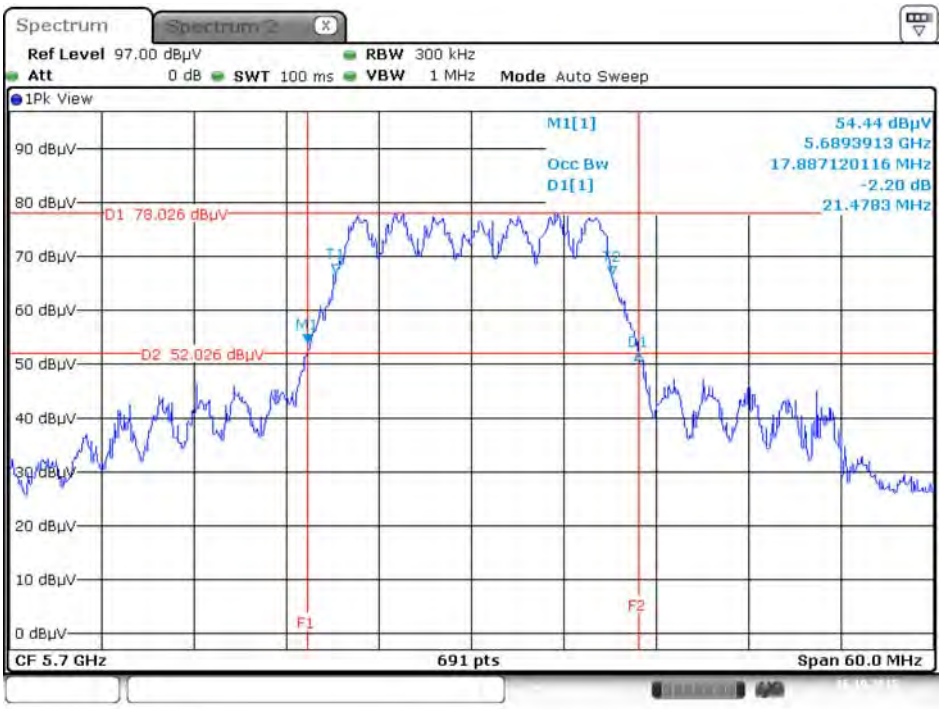
Date: 16.OCT.2015 22:49:09

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



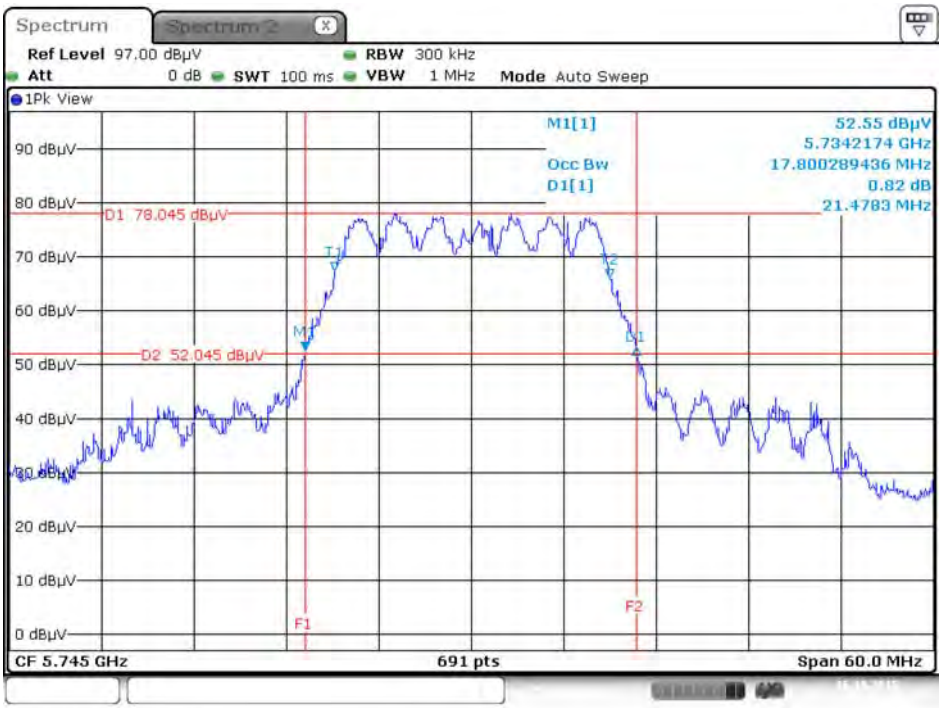
Date: 16.OCT.2015 22:49:48

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



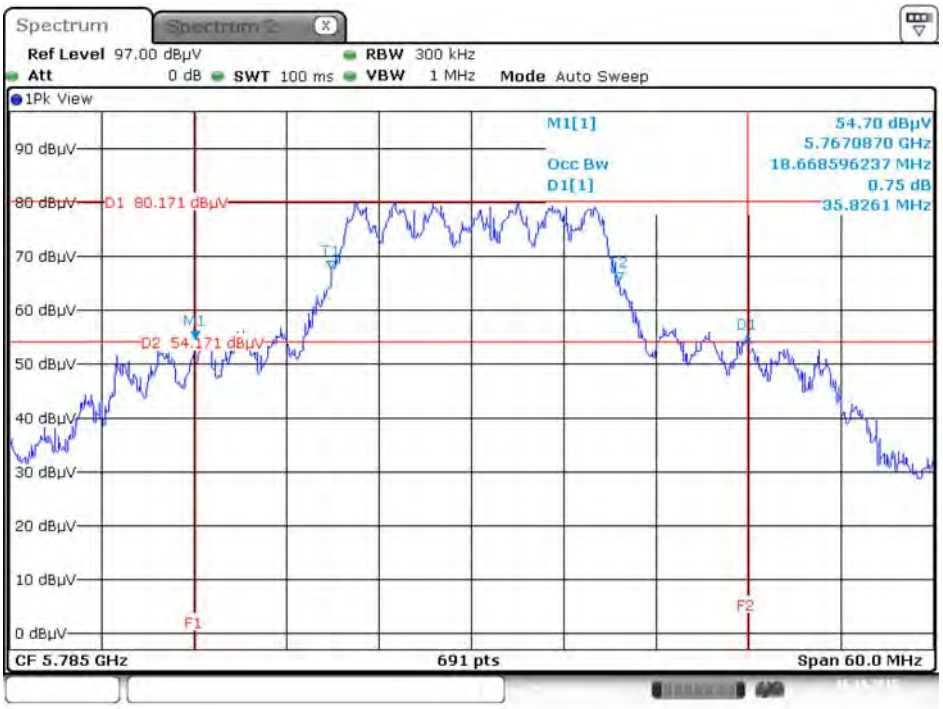
Date: 16.OCT.2015 22:50:37

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



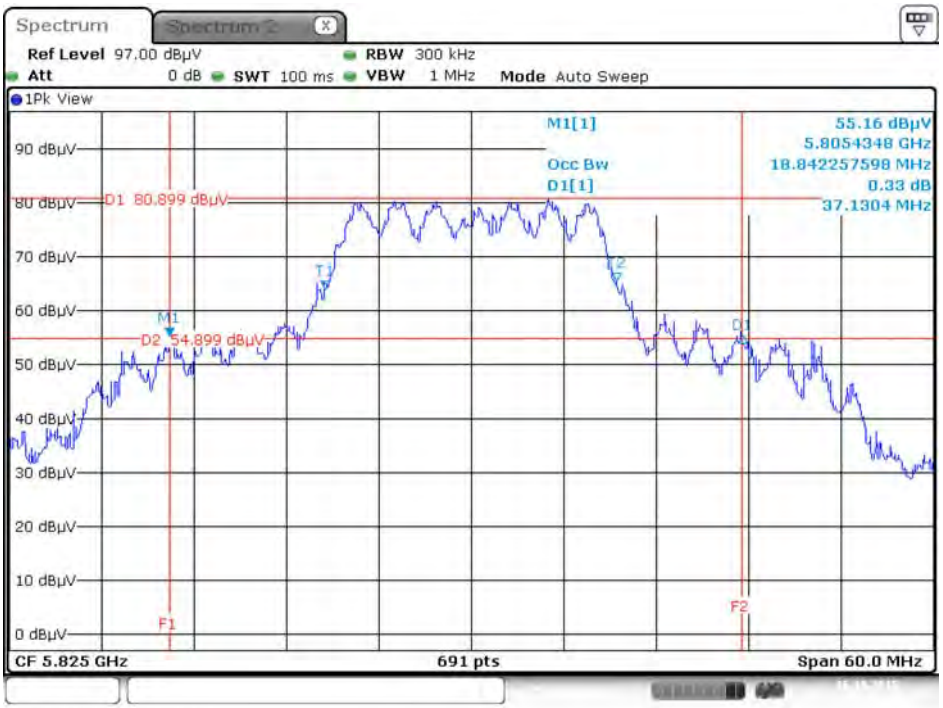
Date: 16.OCT.2015 22:51:10

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



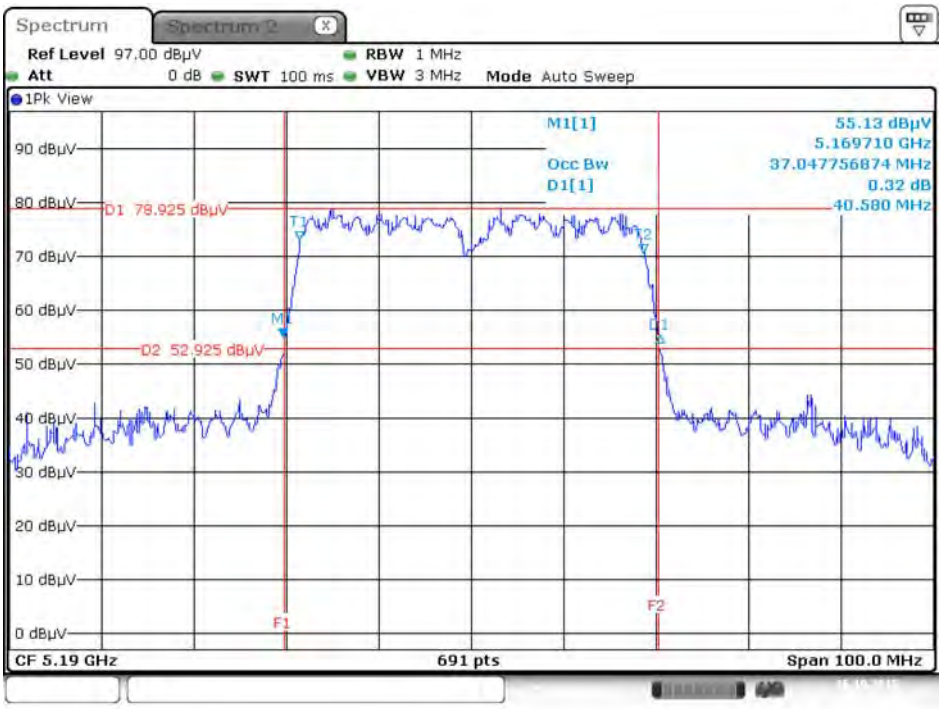
Date: 16.OCT.2015 22:52:39

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



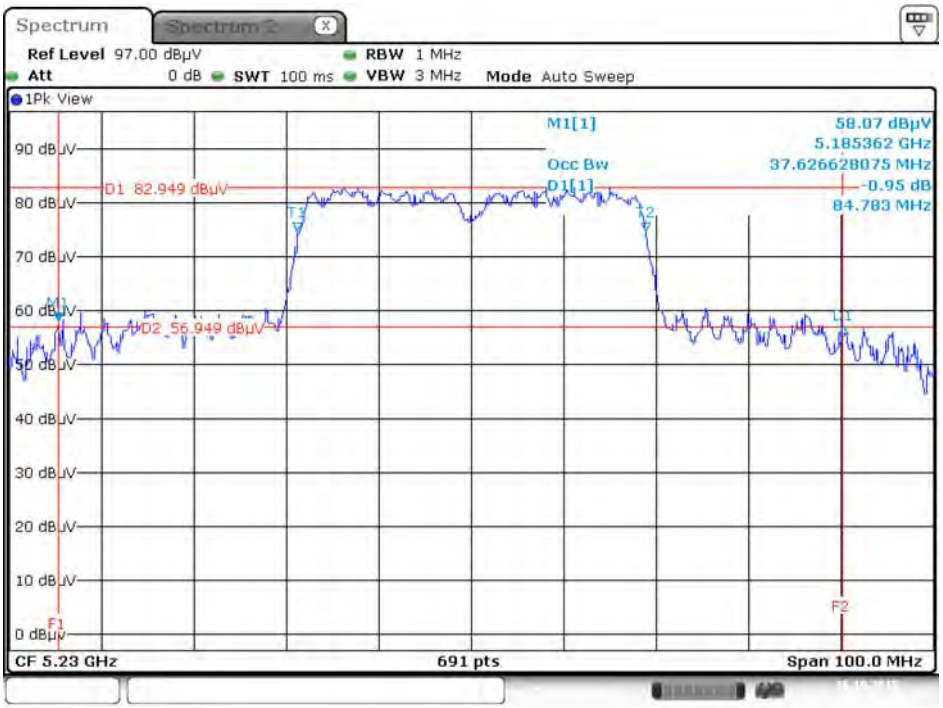
Date: 16.OCT.2015 22:53:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5190 MHz



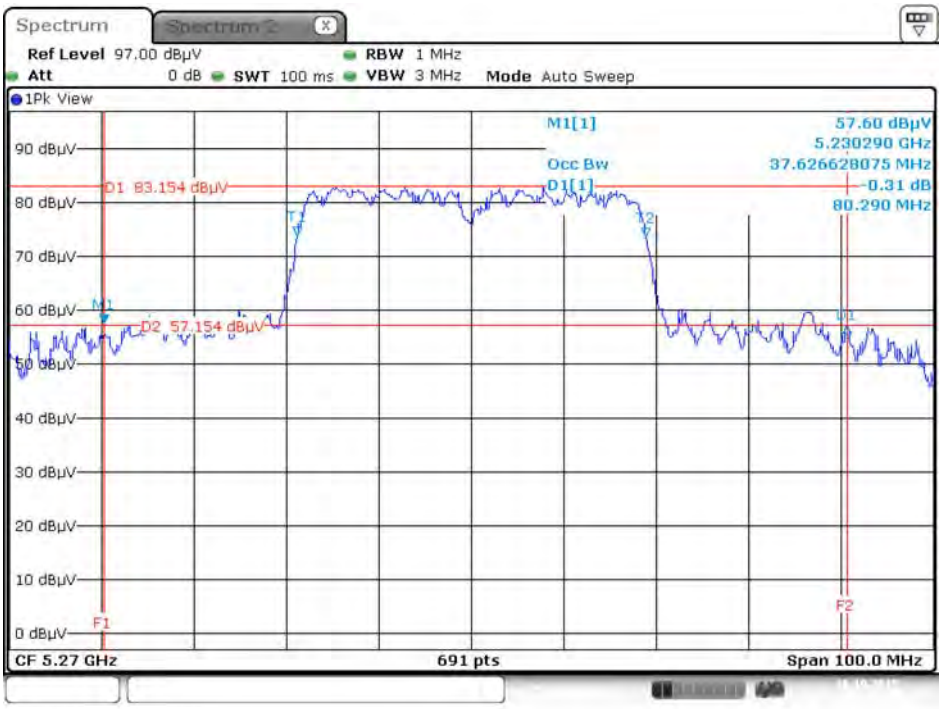
Date: 16.OCT.2015 22:53:43

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5230 MHz



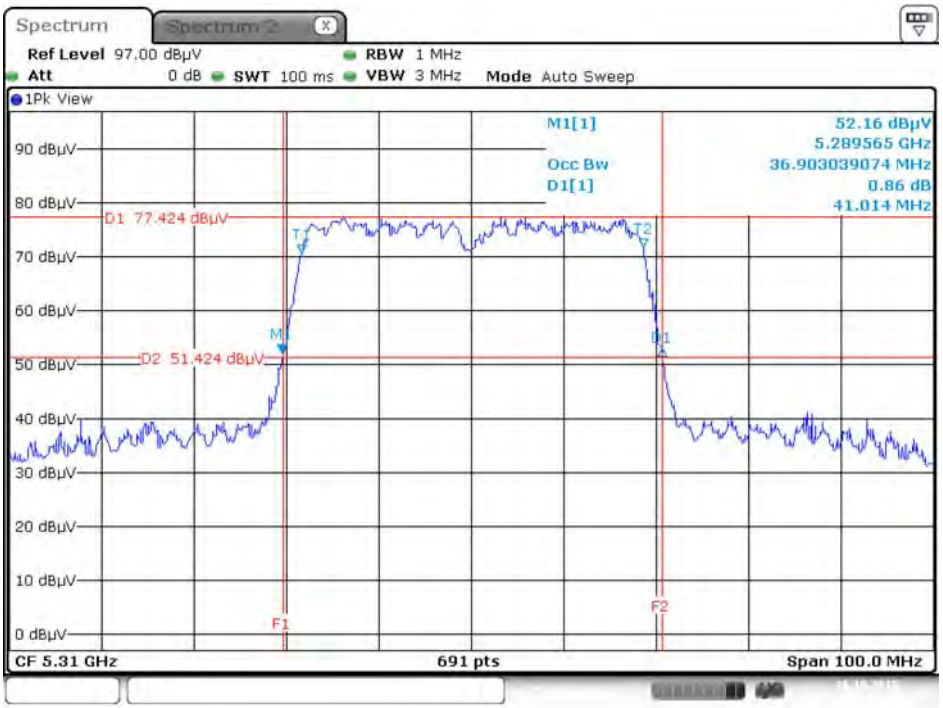
Date: 16.OCT.2015 22:56:02

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5270 MHz



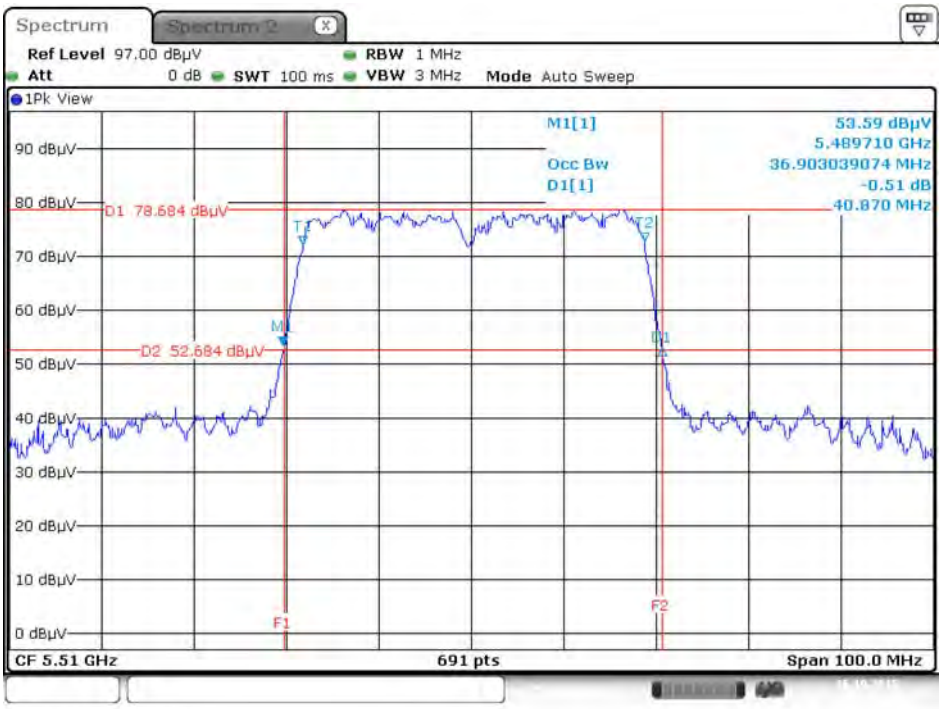
Date: 16.OCT.2015 22:57:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5310 MHz



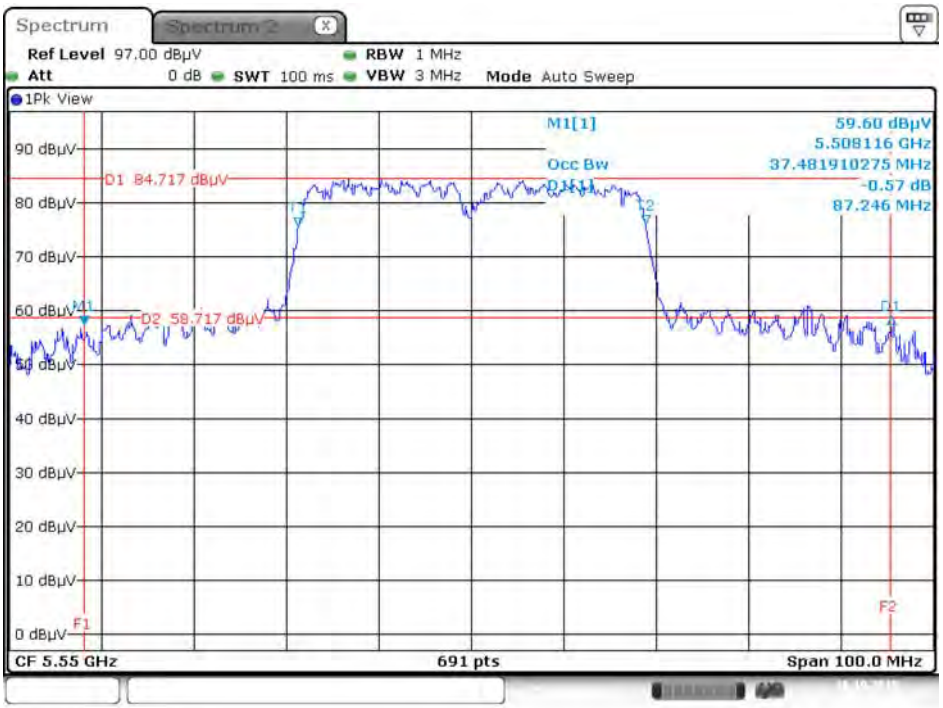
Date: 16.OCT.2015 22:58:03

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



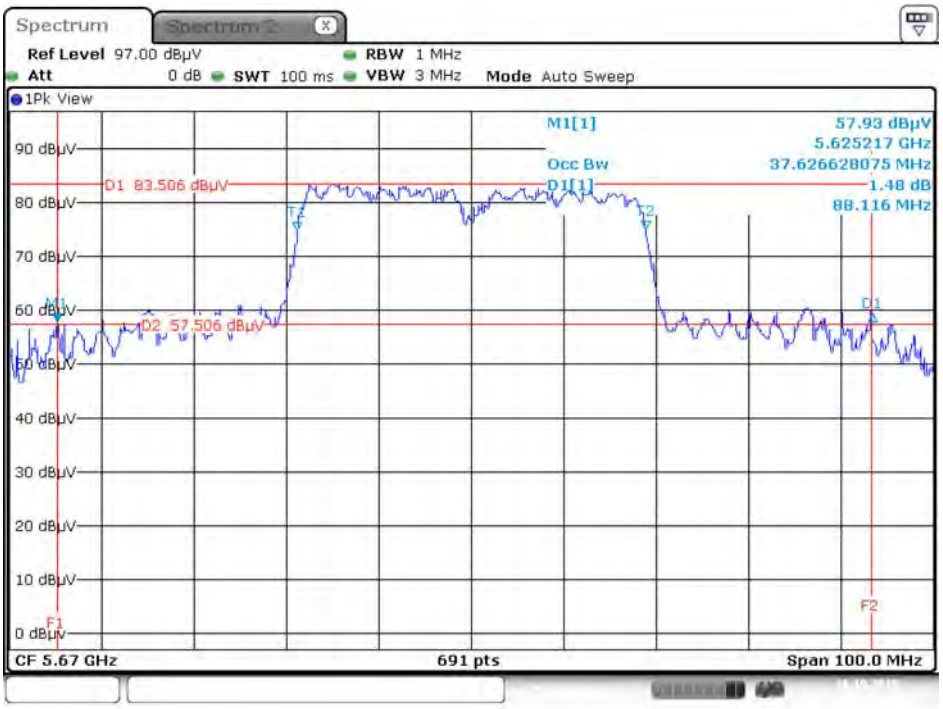
Date: 16.OCT.2015 22:58:39

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



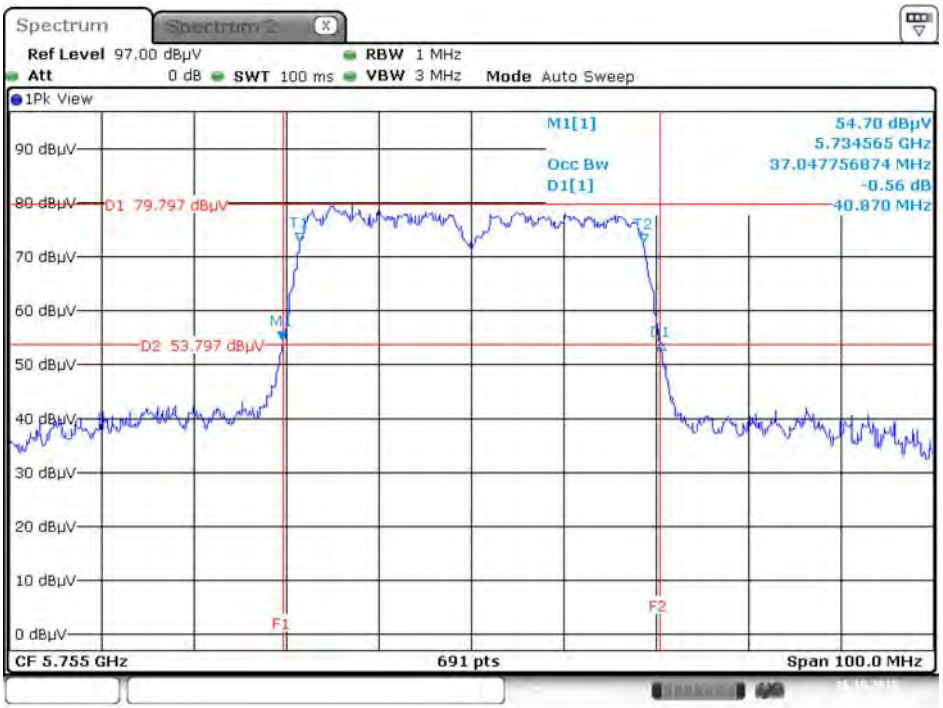
Date: 16.OCT.2015 22:59:20

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



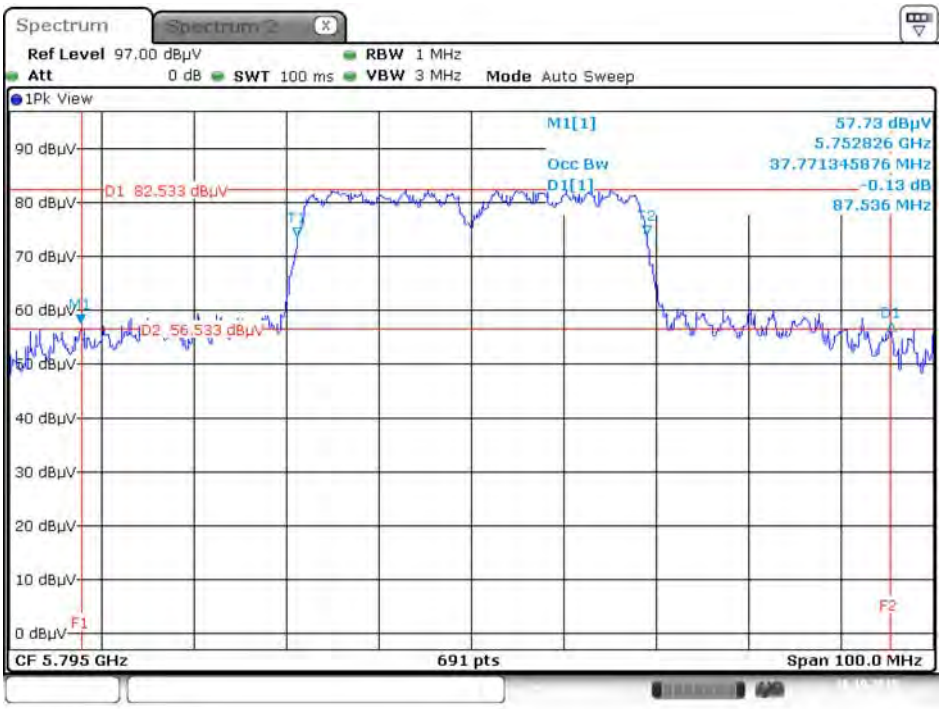
Date: 16.OCT.2015 23:00:34

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



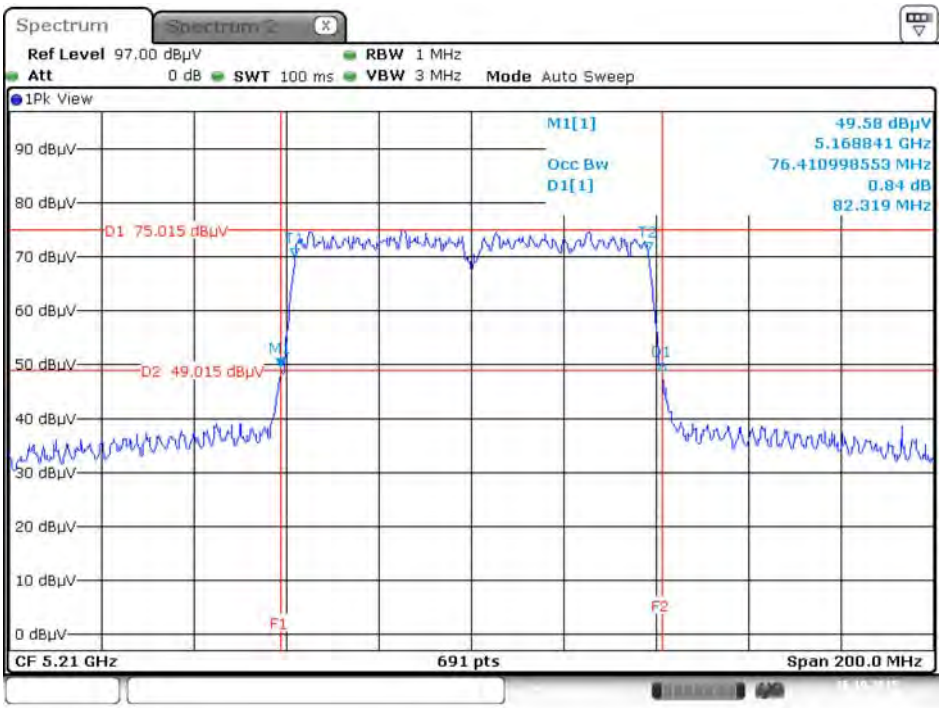
Date: 16.OCT.2015 23:01:36

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



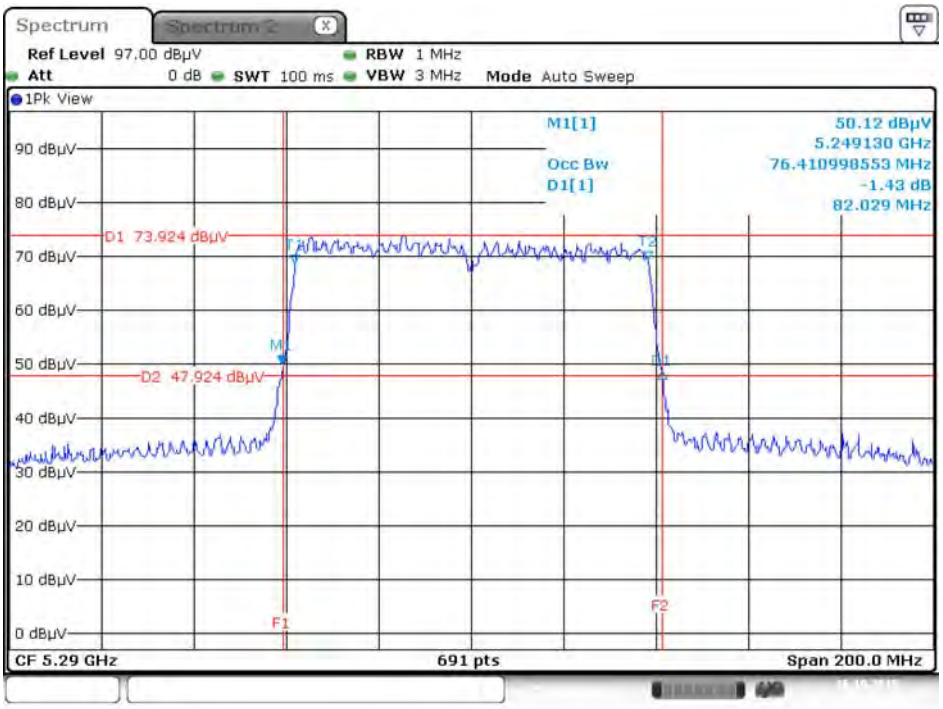
Date: 16.OCT.2015 23:02:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5210 MHz



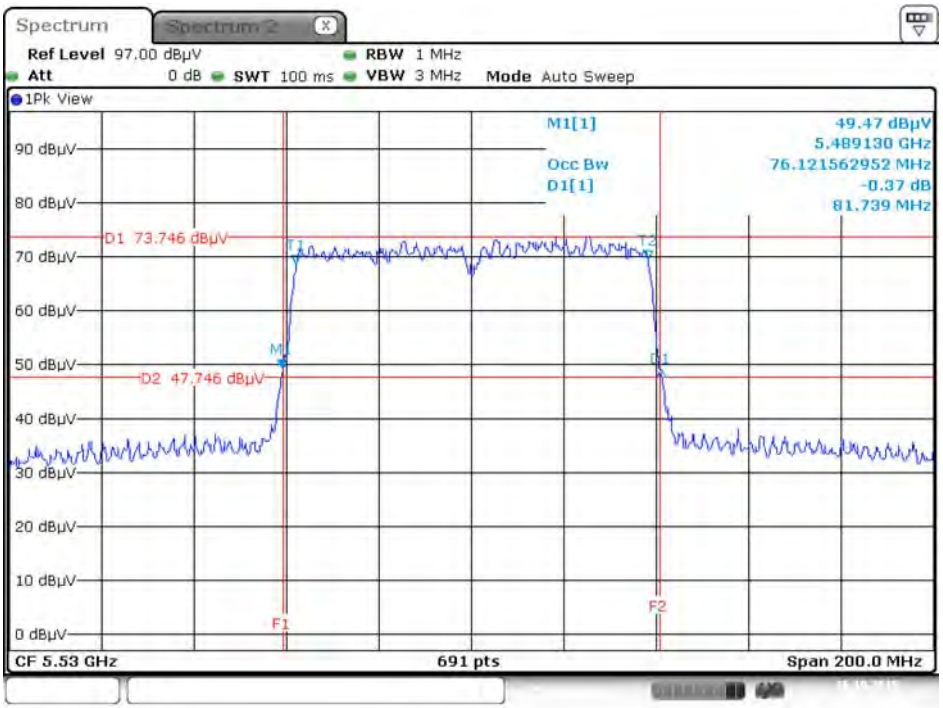
Date: 16.OCT.2015 23:02:55

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5290 MHz



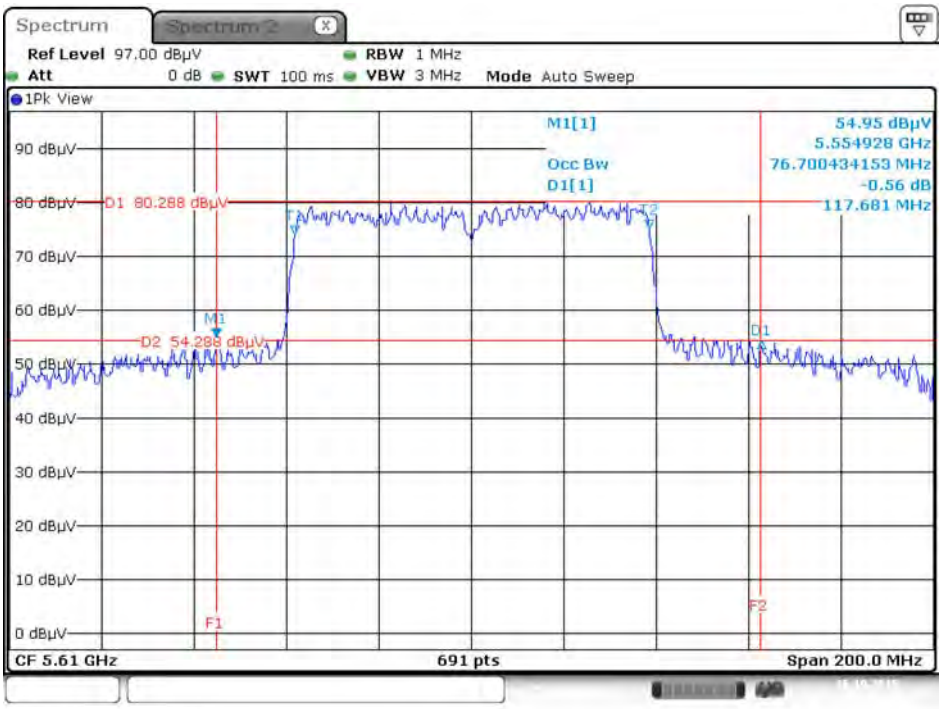
Date: 16.OCT.2015 23:03:42

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



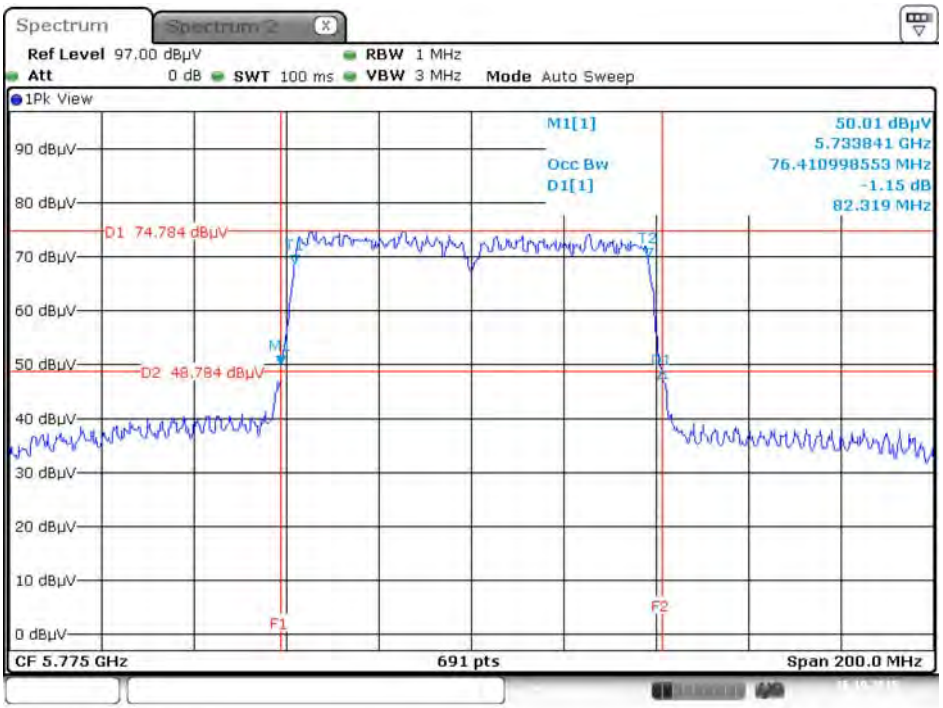
Date: 16.OCT.2015 23:04:29

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



Date: 16.OCT.2015 23:05:10

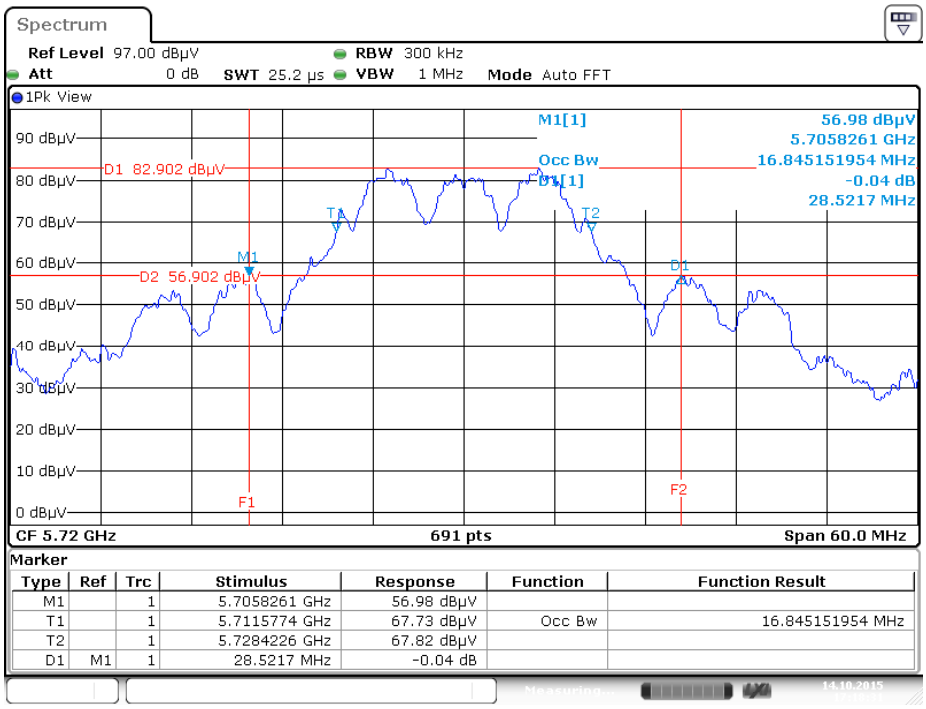
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5775 MHz



Date: 16.OCT.2015 23:05:45

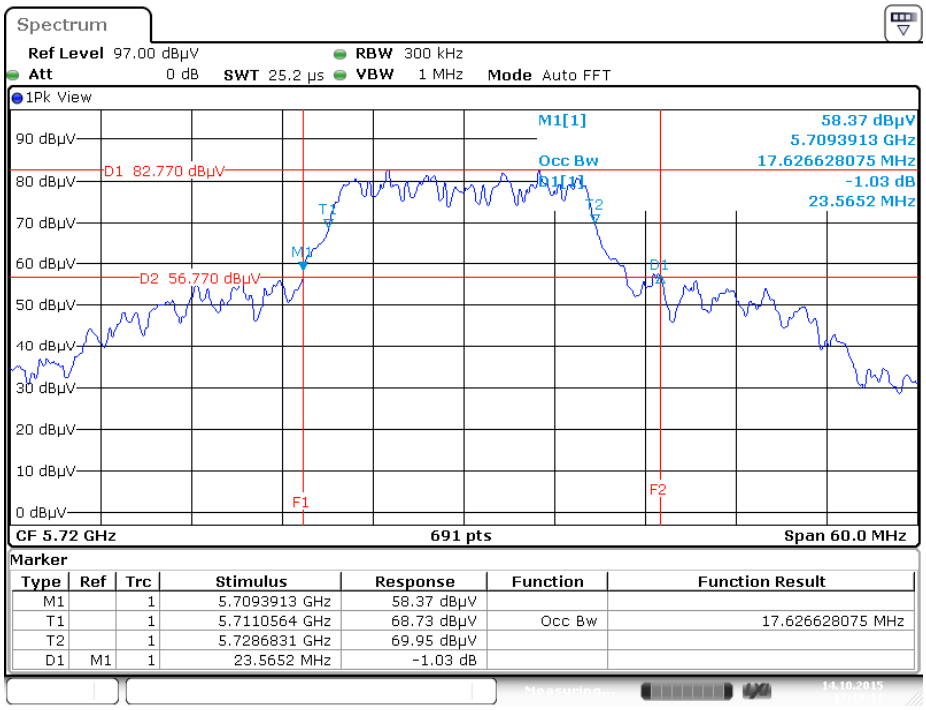
Straddle Channel

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



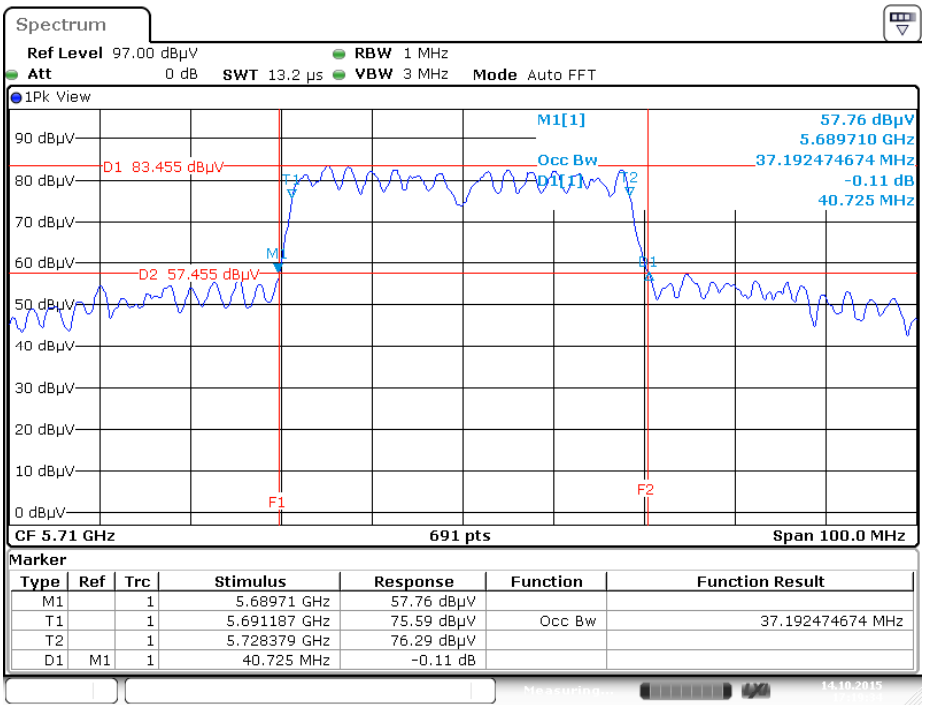
Date: 14.OCT.2015 17:18:31

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



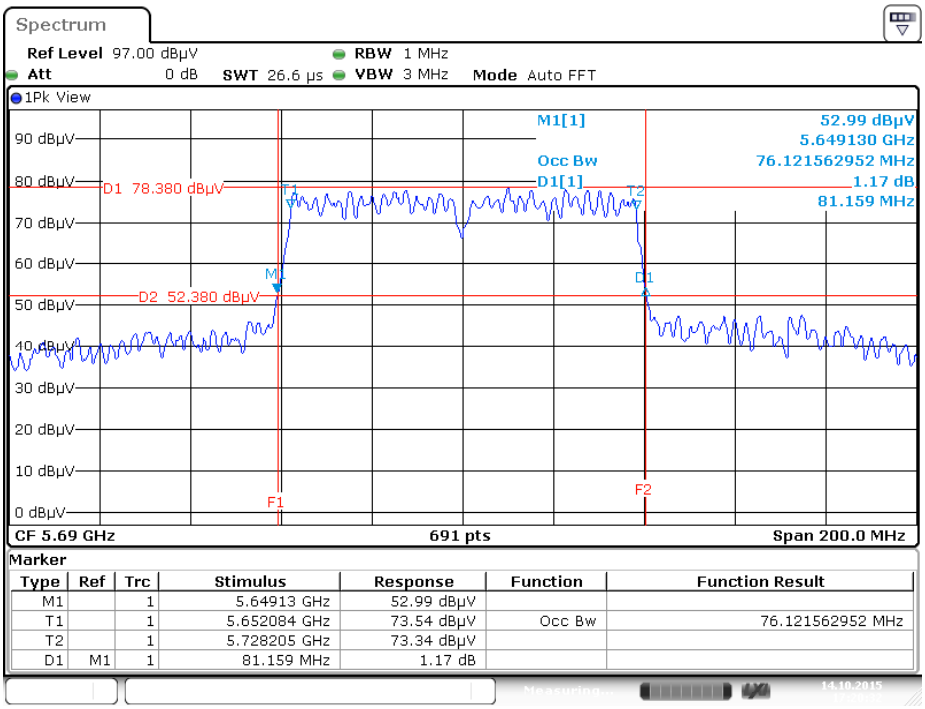
Date: 14.OCT.2015 17:19:11

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



Date: 14.OCT.2015 17:19:34

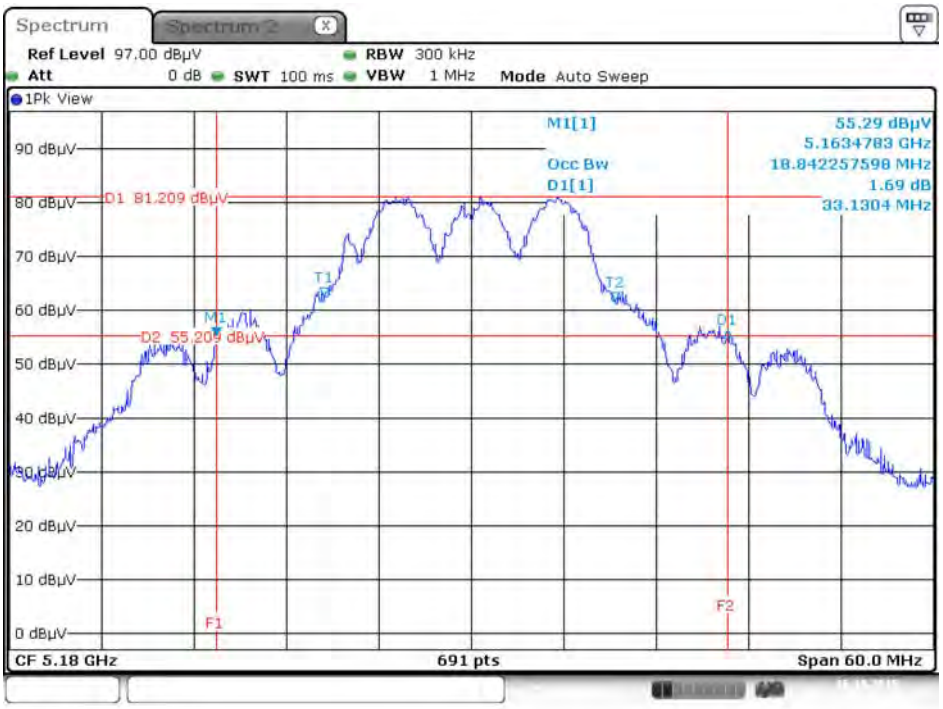
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5690 MHz



Date: 14.OCT.2015 17:20:32

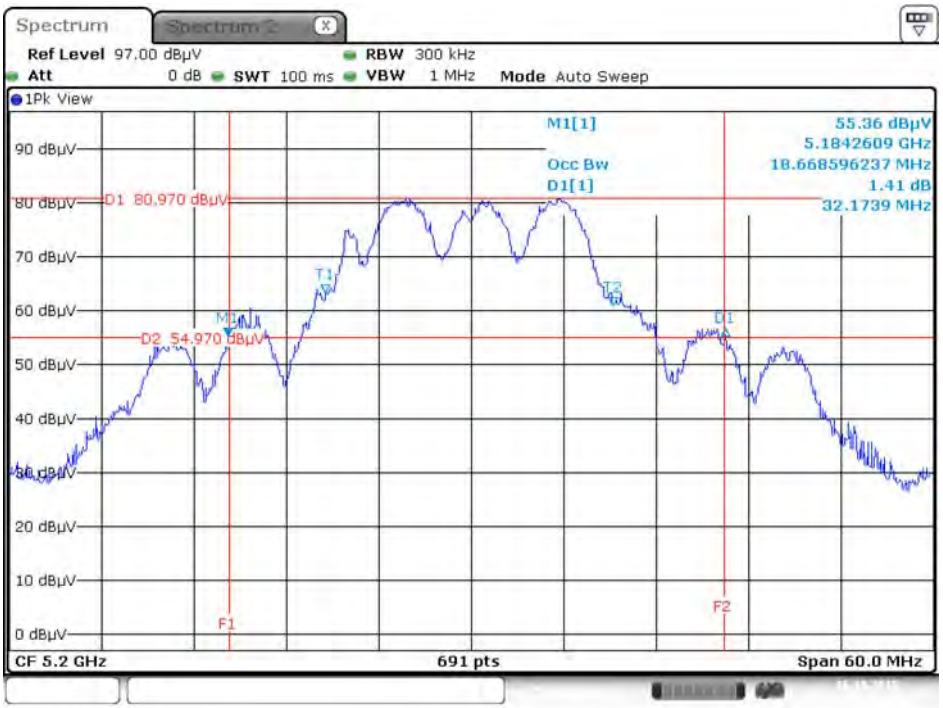
Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5180 MHz



Date: 16.OCT.2015 23:24:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5200 MHz

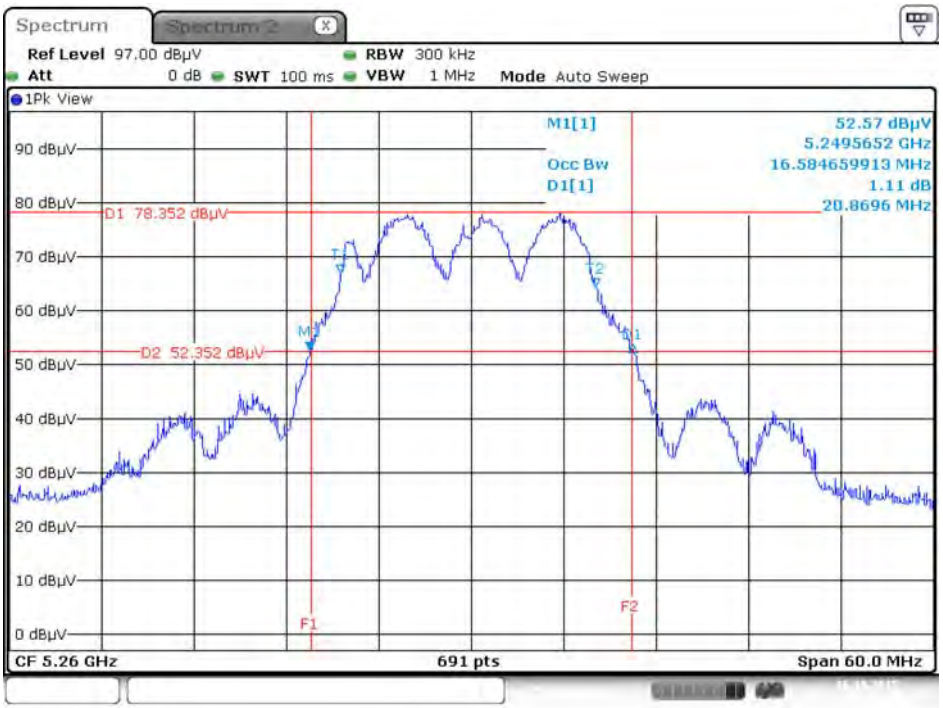


Date: 16.OCT.2015 23:25:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5240 MHz

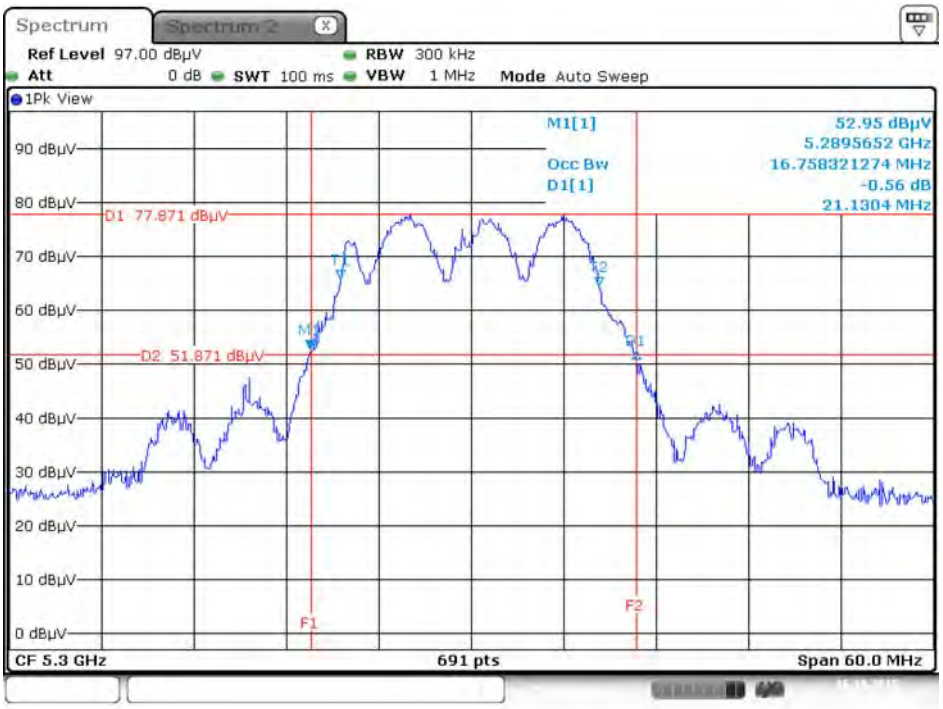
Date: 16.OCT.2015 23:26:18

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5260 MHz



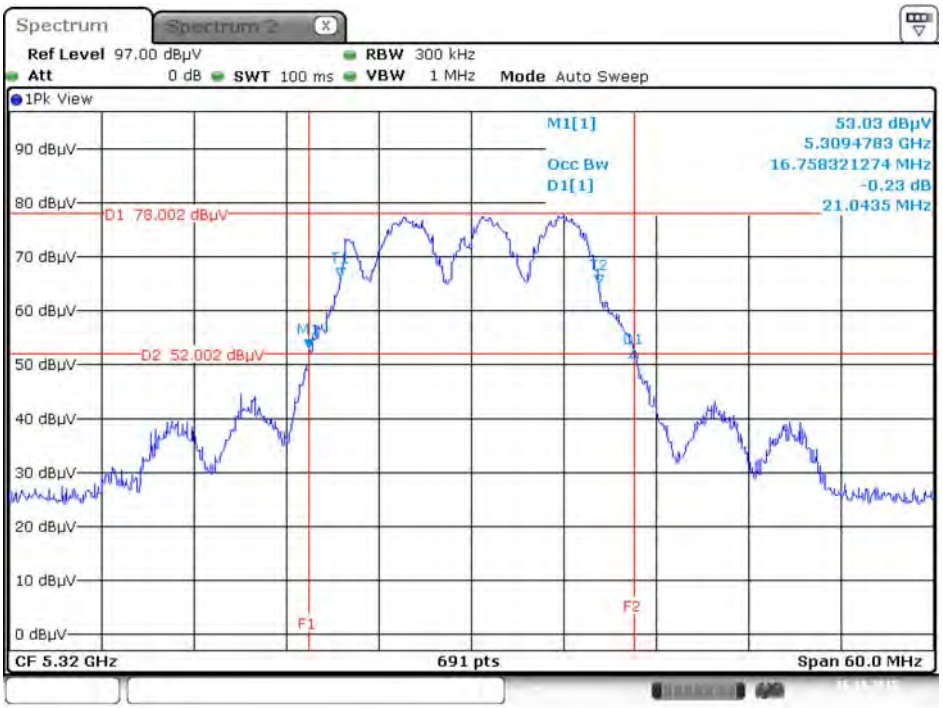
Date: 16.OCT.2015 23:26:55

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5300 MHz



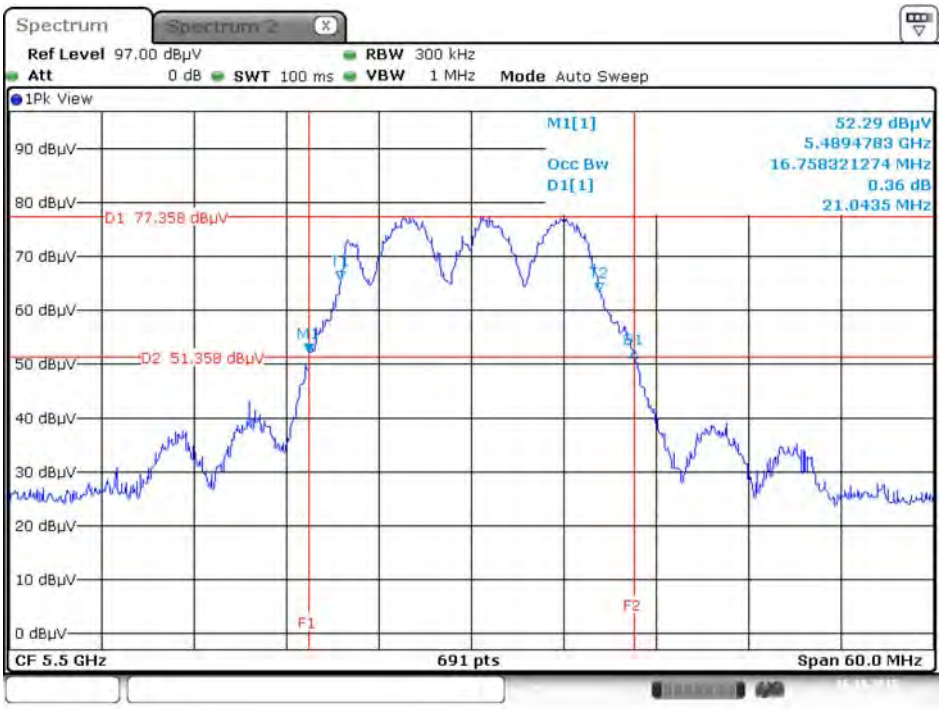
Date: 16.OCT.2015 23:27:25

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5320 MHz



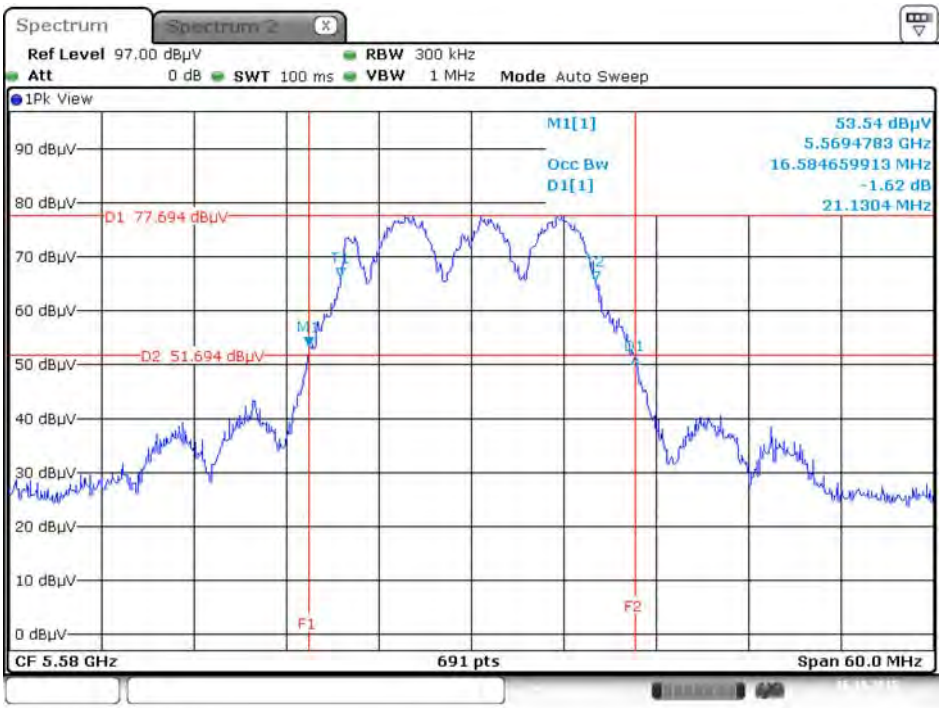
Date: 16.OCT.2015 23:28:14

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



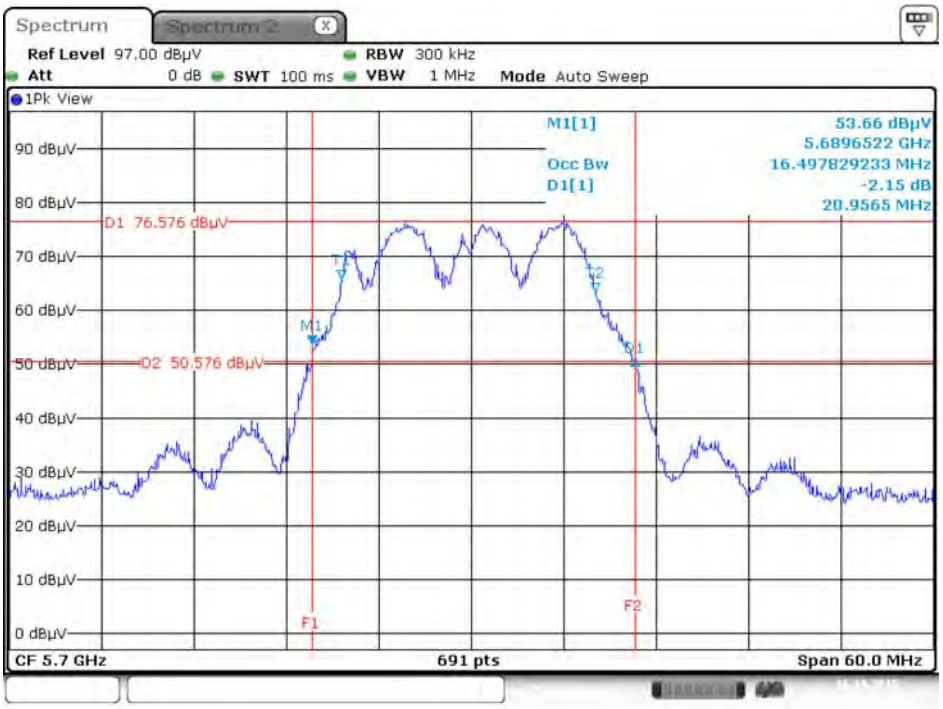
Date: 16.OCT.2015 23:29:17

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



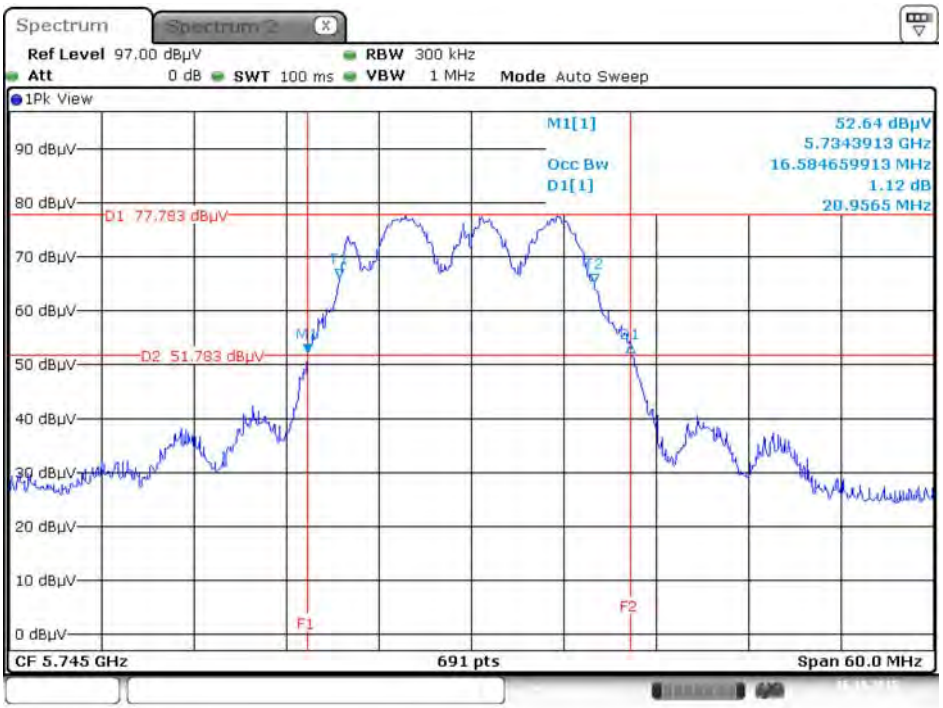
Date: 16.OCT.2015 23:29:56

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



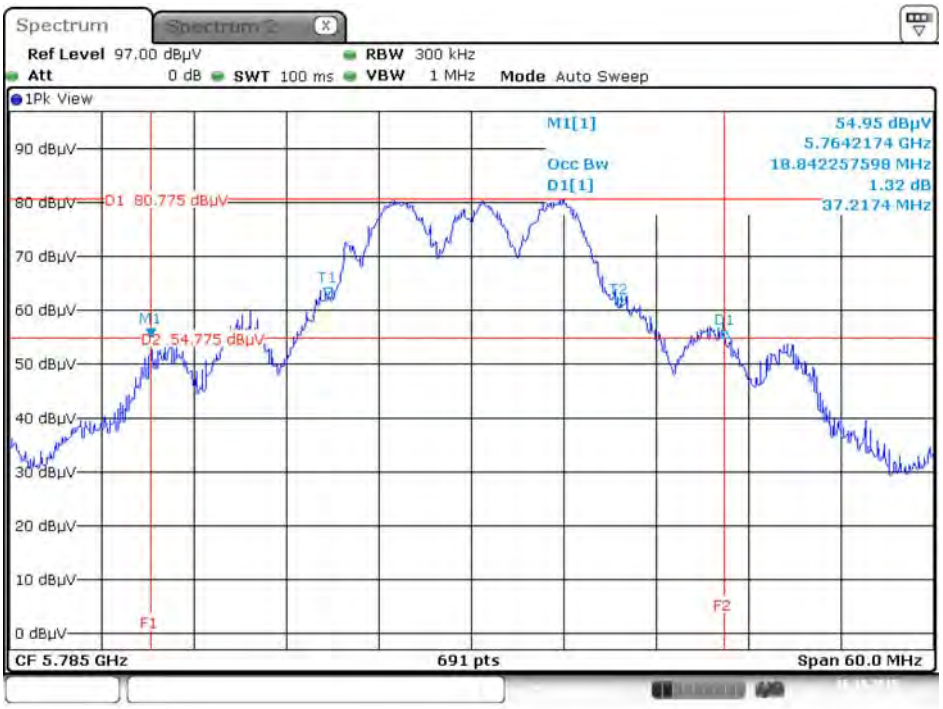
Date: 16.OCT.2015 23:31:06

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



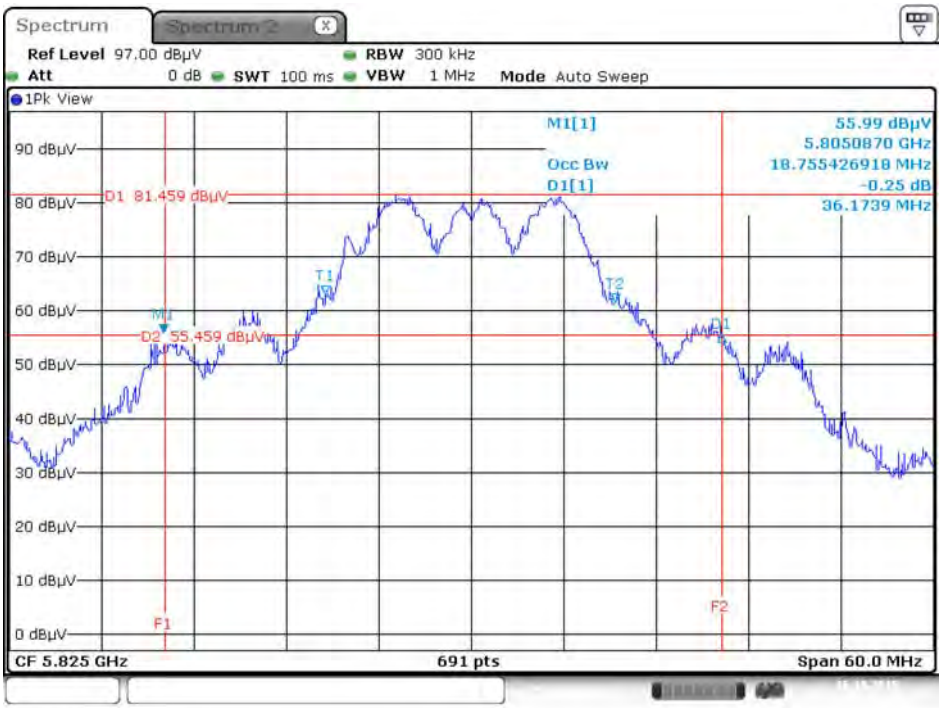
Date: 16.OCT.2015 23:33:19

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



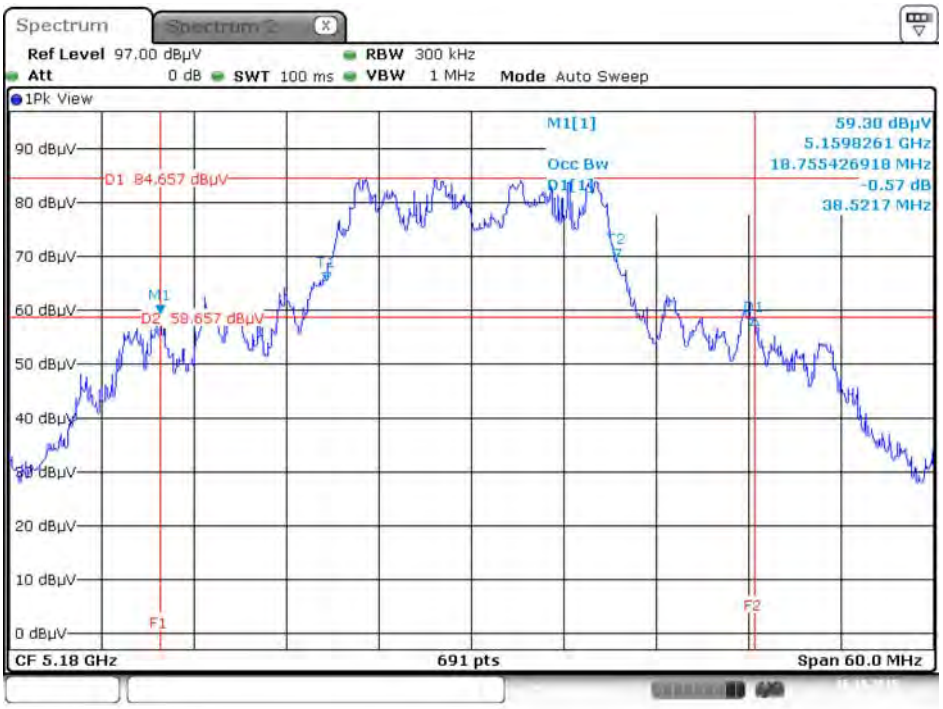
Date: 16.OCT.2015 23:34:56

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



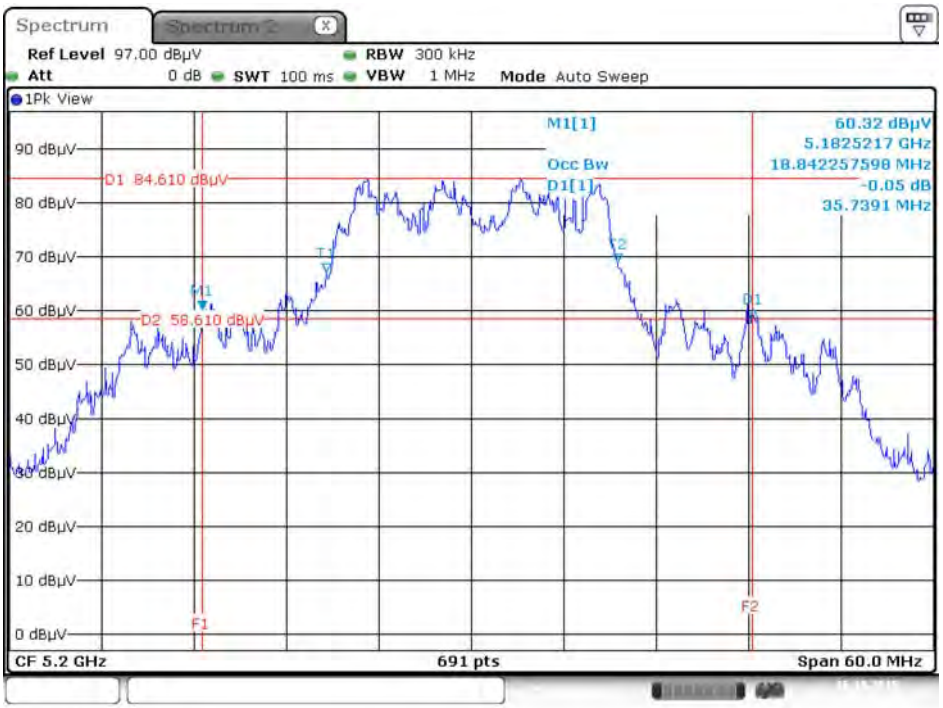
Date: 16.OCT.2015 23:38:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5180 MHz



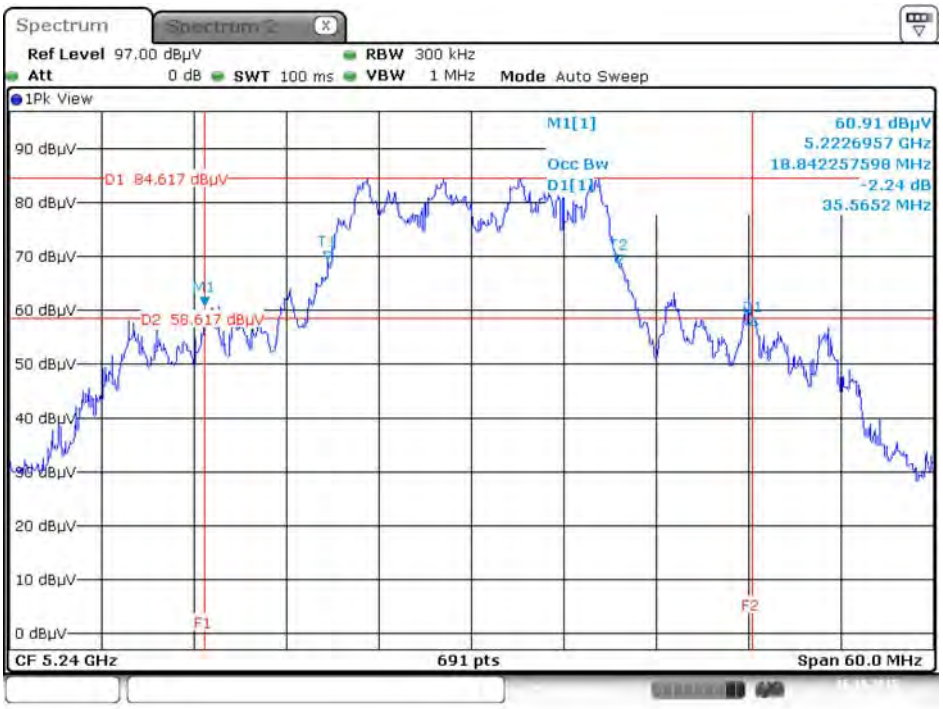
Date: 16.OCT.2015 23:41:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5200 MHz



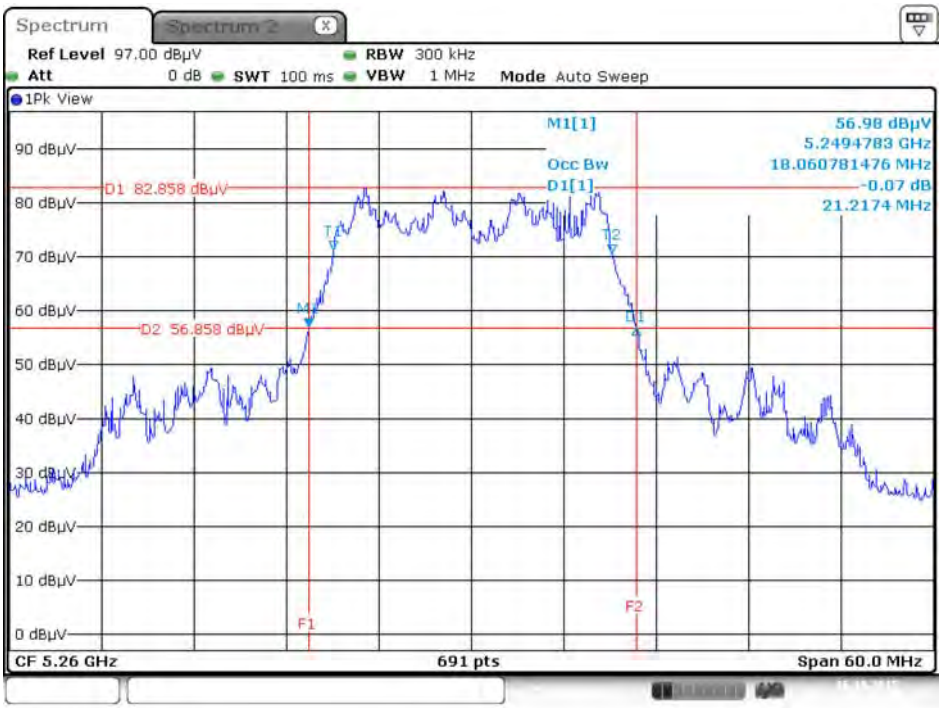
Date: 16.OCT.2015 23:43:39

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



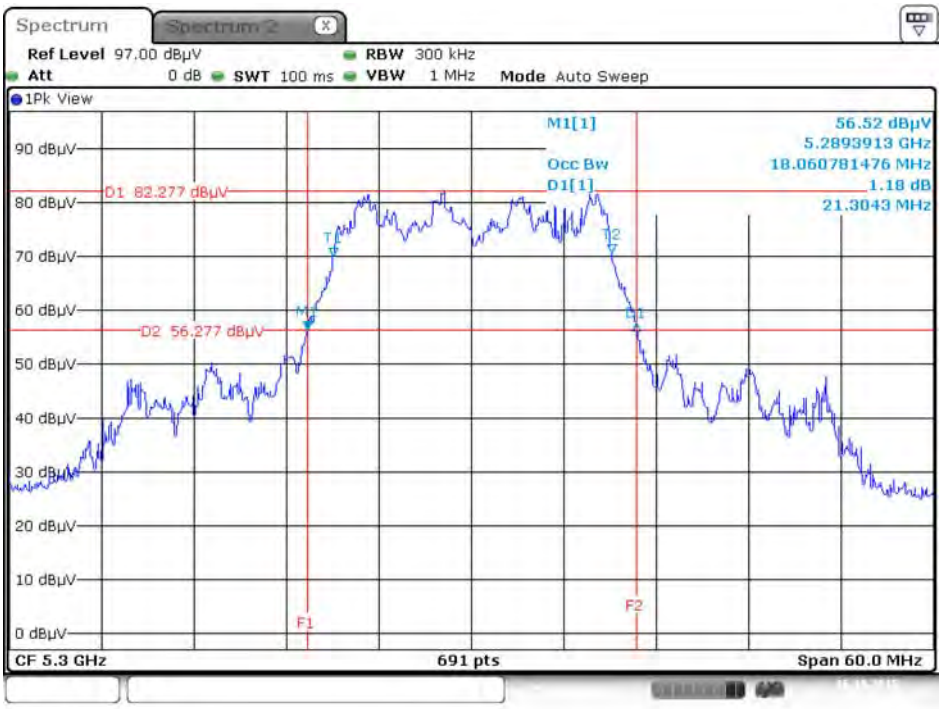
Date: 16.OCT.2015 23:44:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5260 MHz



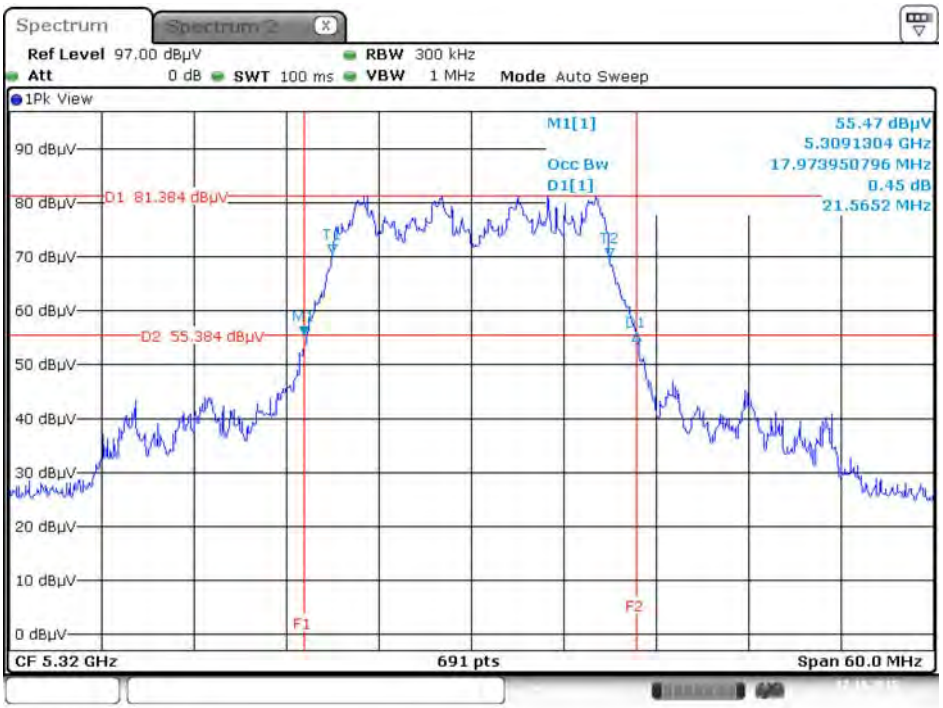
Date: 16.OCT.2015 23:47:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5300 MHz



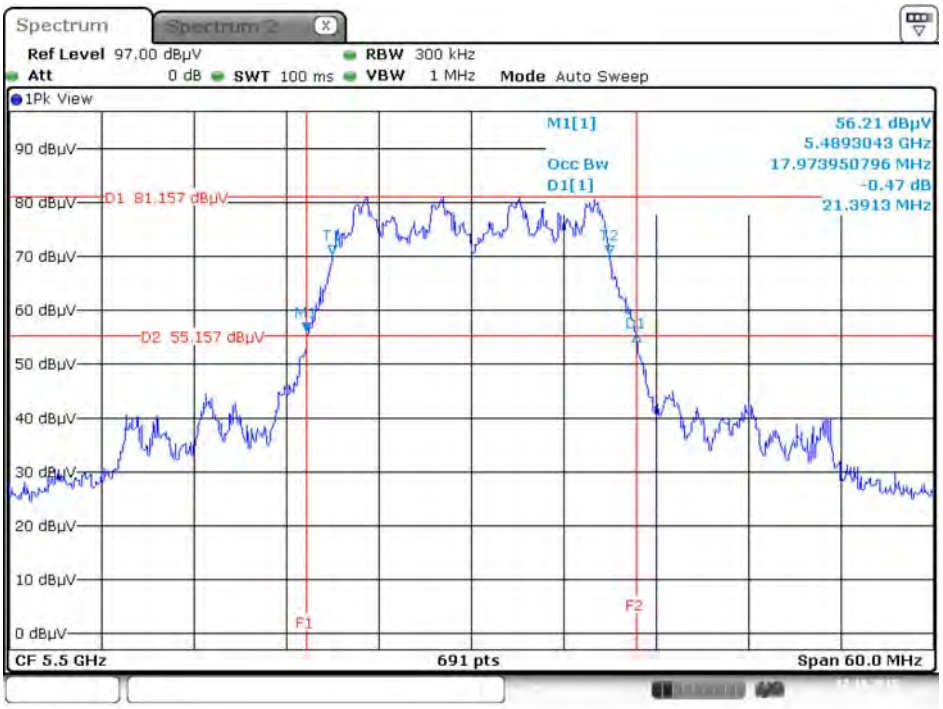
Date: 16.OCT.2015 23:48:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5320 MHz



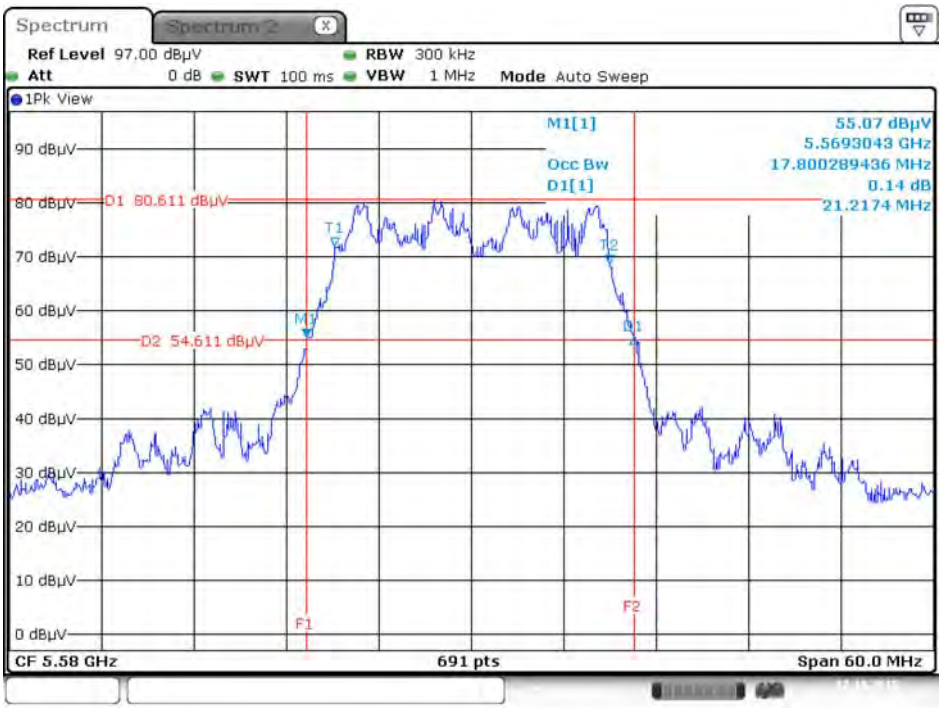
Date: 17.OCT.2015 00:09:13

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



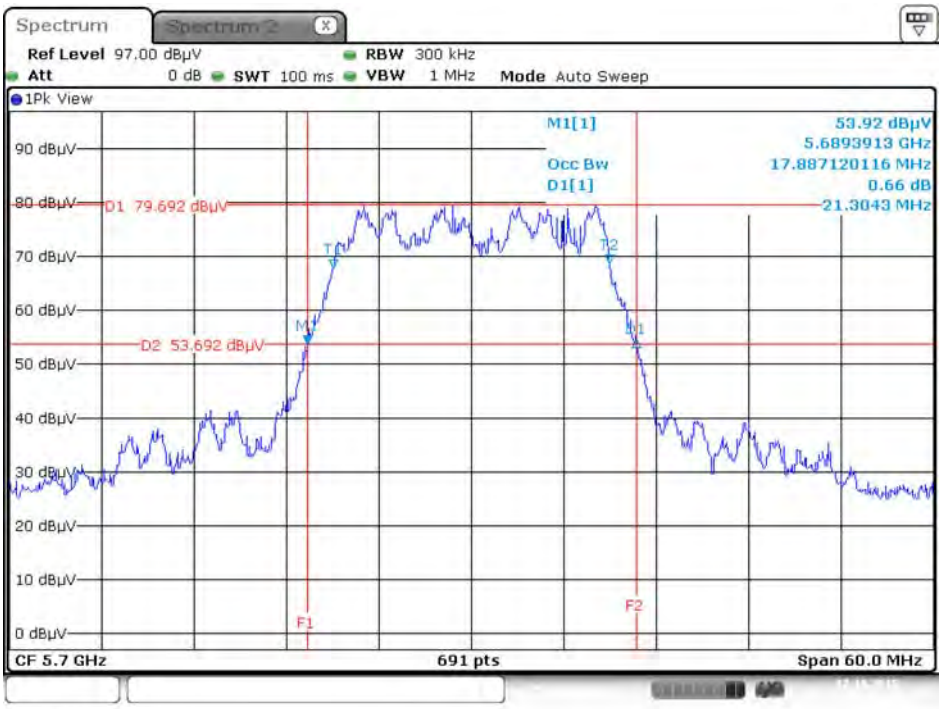
Date: 17.OCT.2015 00:09:38

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



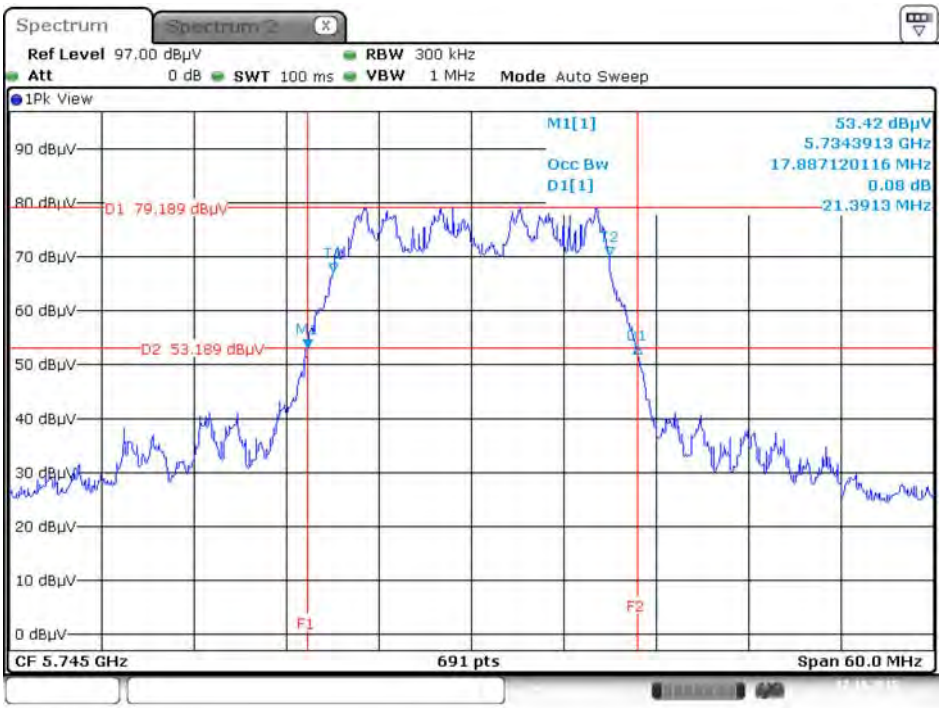
Date: 17.OCT.2015 00:10:04

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



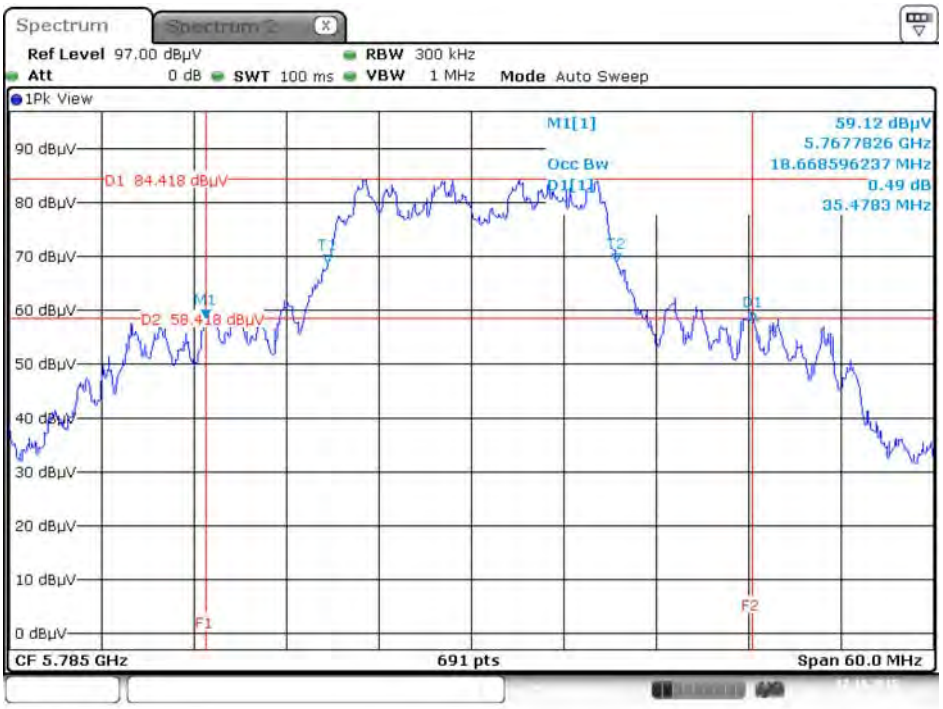
Date: 17.OCT.2015 00:10:28

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



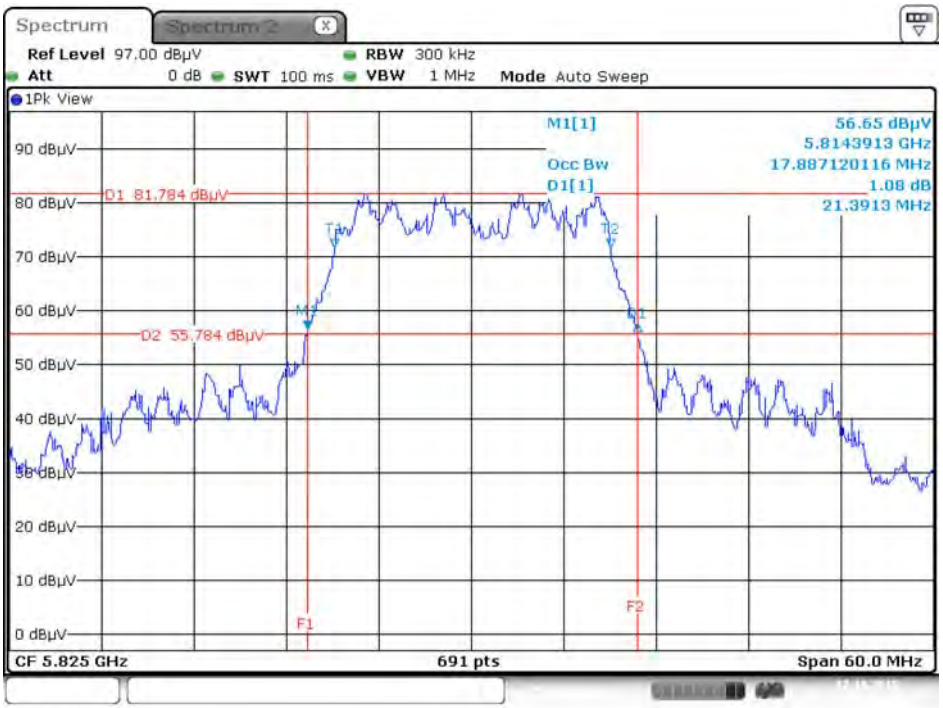
Date: 17.OCT.2015 00:10:52

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



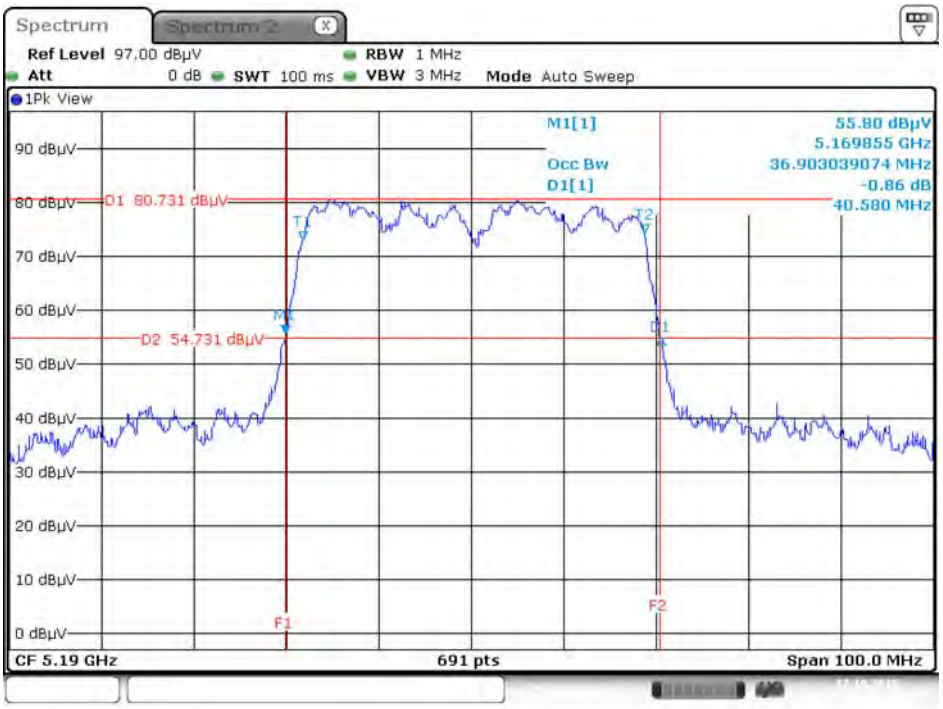
Date: 17.OCT.2015 00:11:45

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



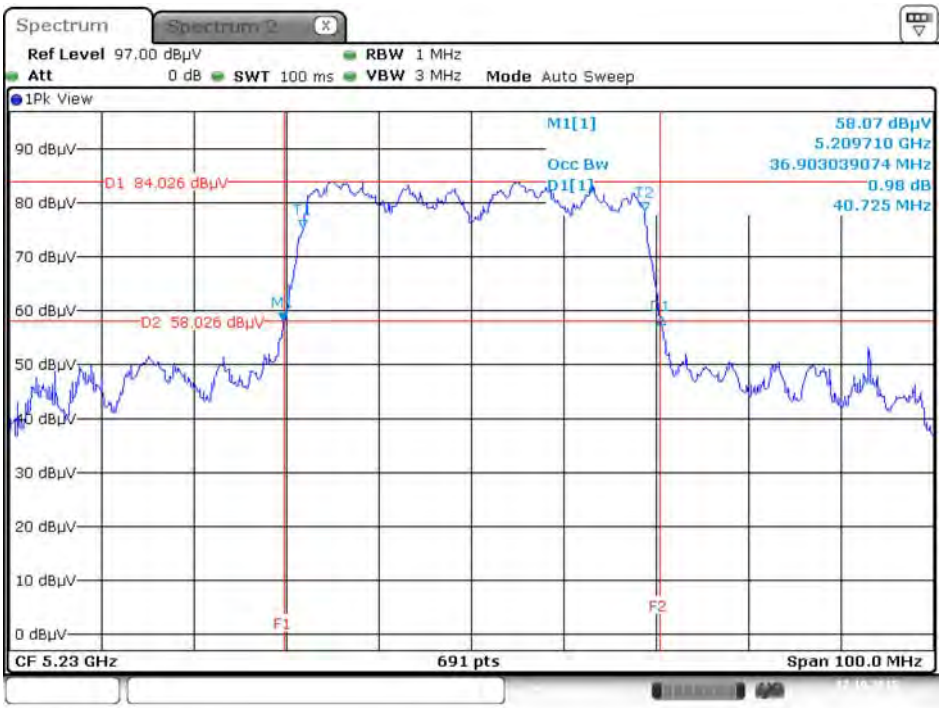
Date: 17.OCT.2015 00:12:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5190 MHz



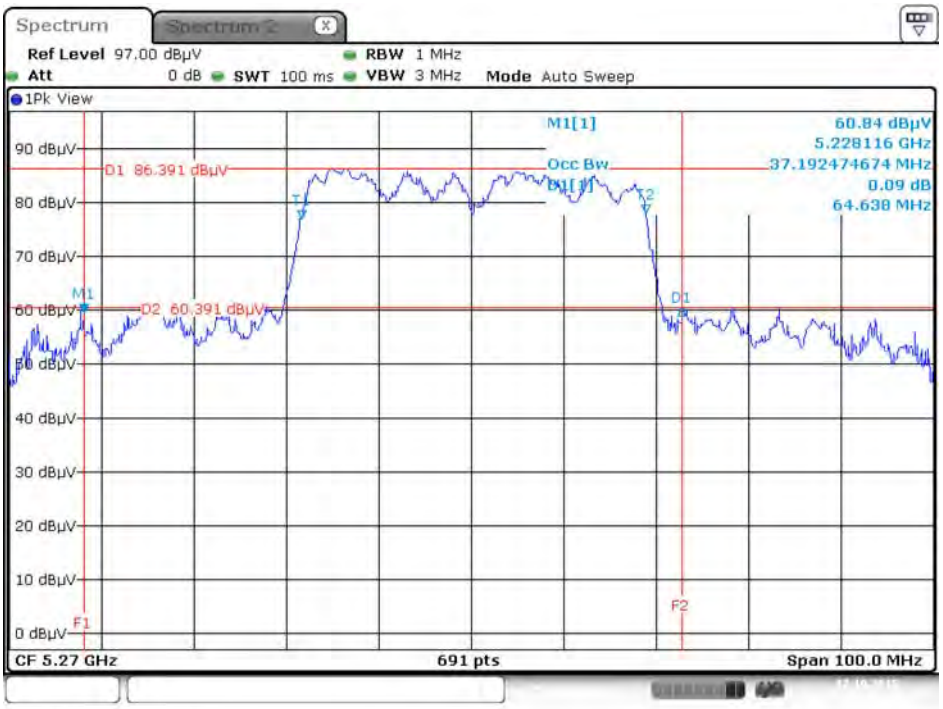
Date: 17.OCT.2015 00:13:40

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



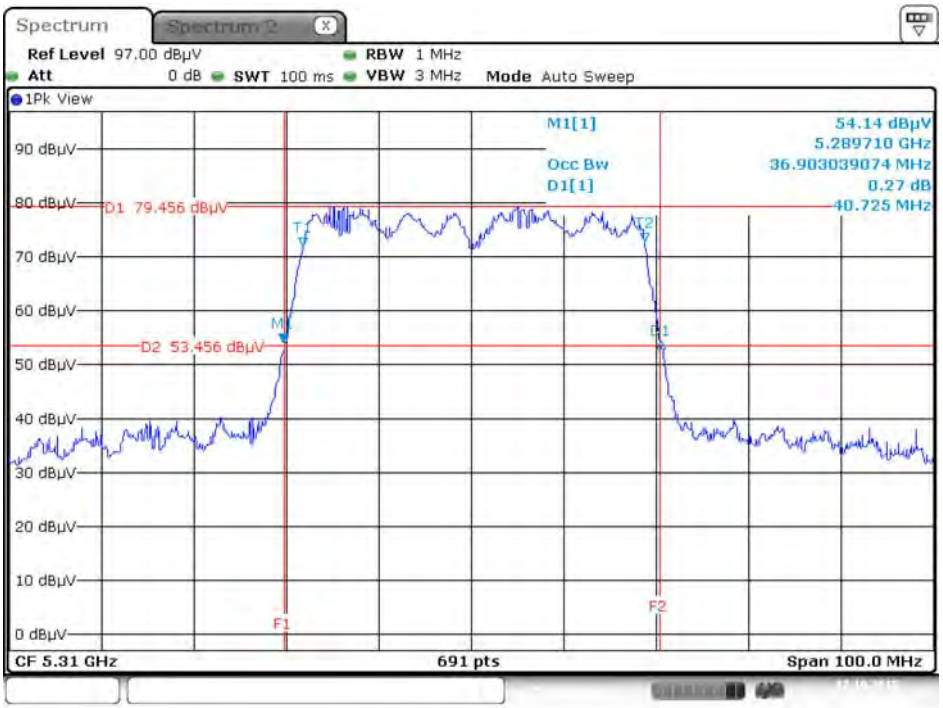
Date: 17.OCT.2015 00:14:09

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5270 MHz



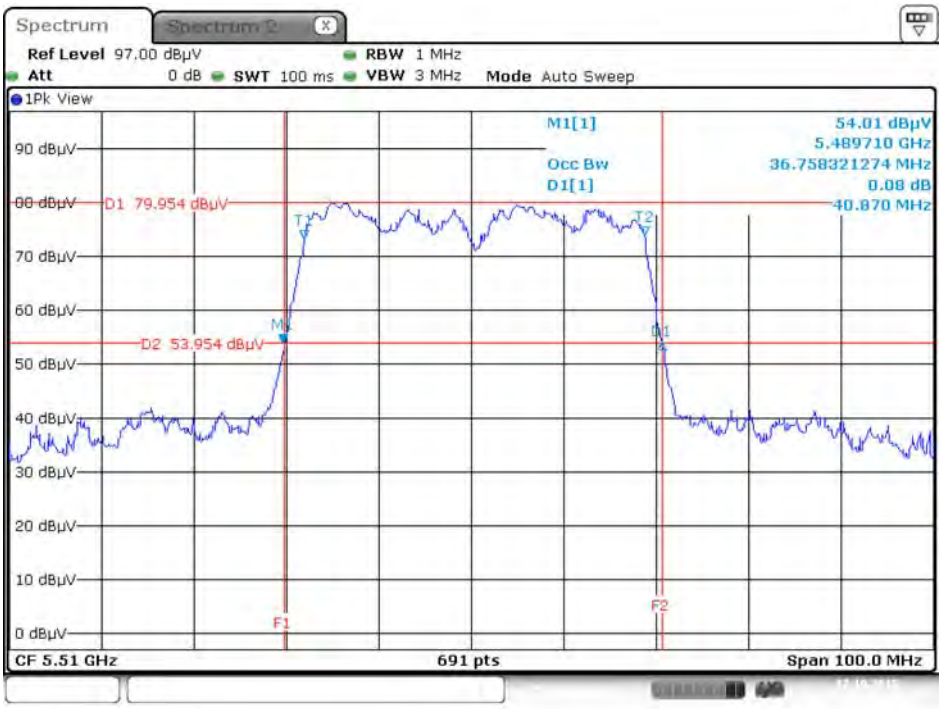
Date: 17.OCT.2015 00:14:43

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5310 MHz



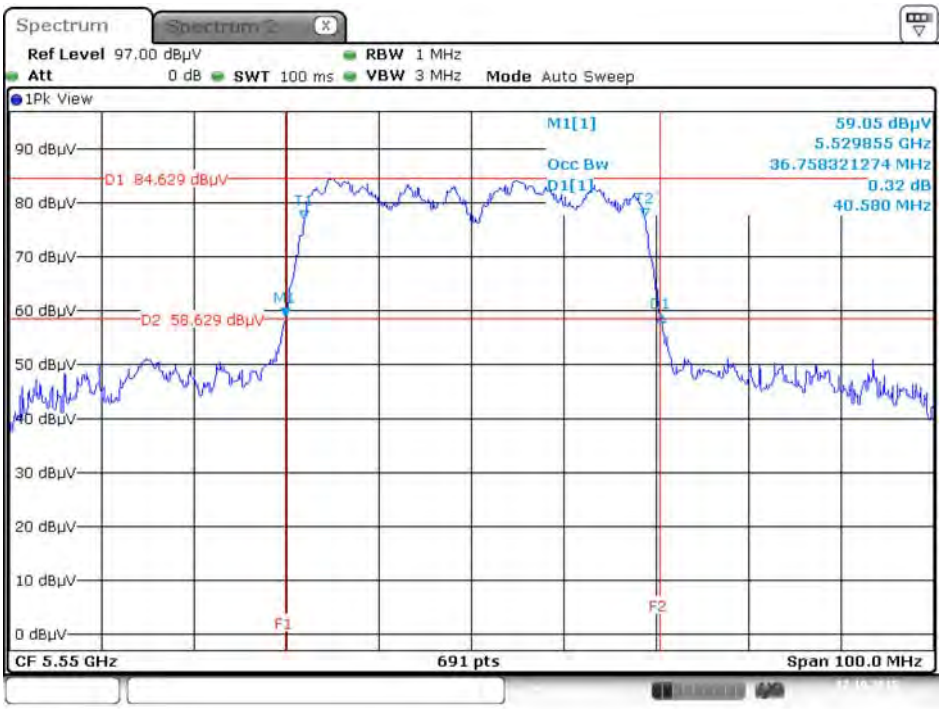
Date: 17.OCT.2015 00:15:13

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



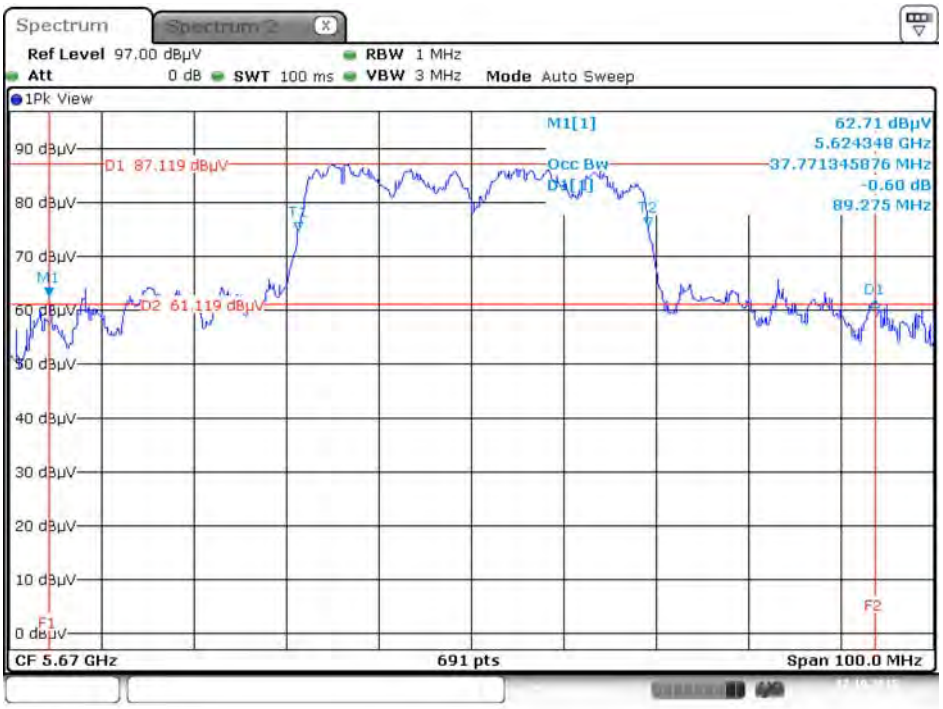
Date: 17.OCT.2015 00:15:40

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



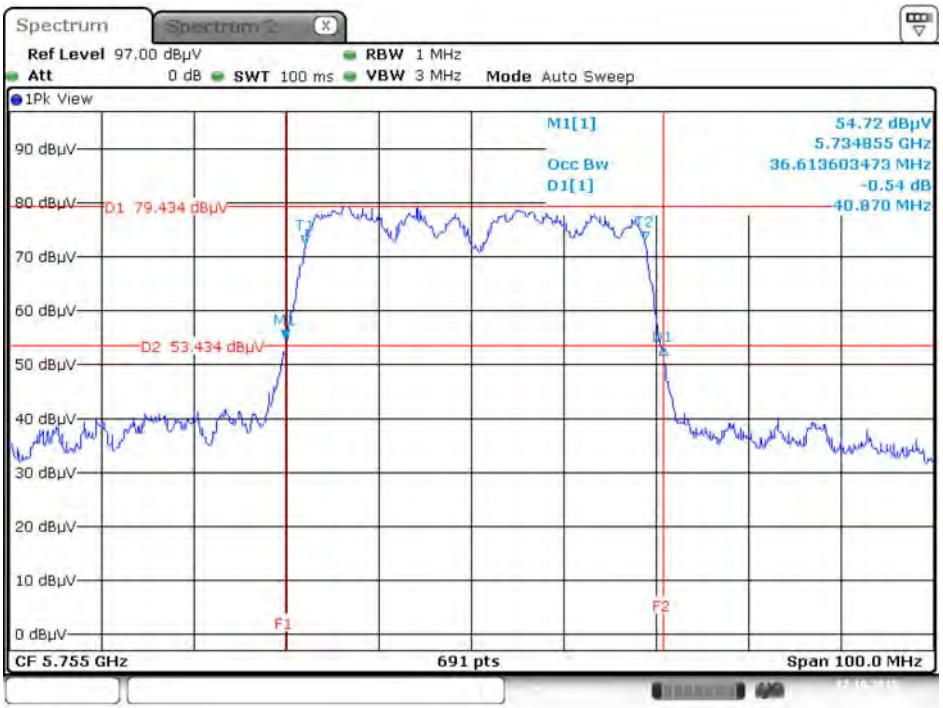
Date: 17.OCT.2015 00:16:08

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



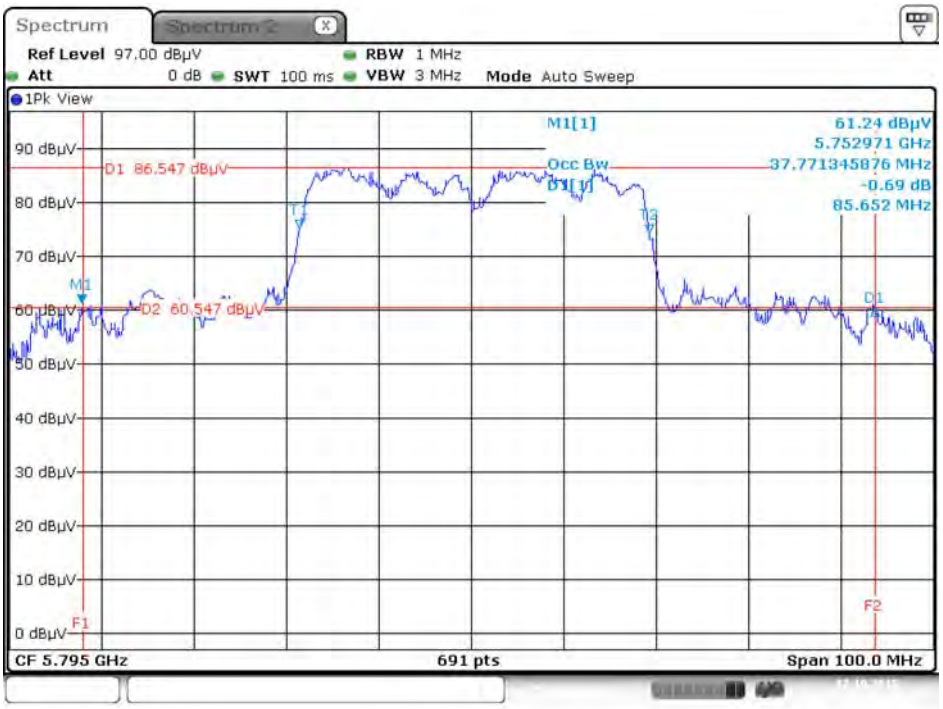
Date: 17.OCT.2015 00:16:57

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



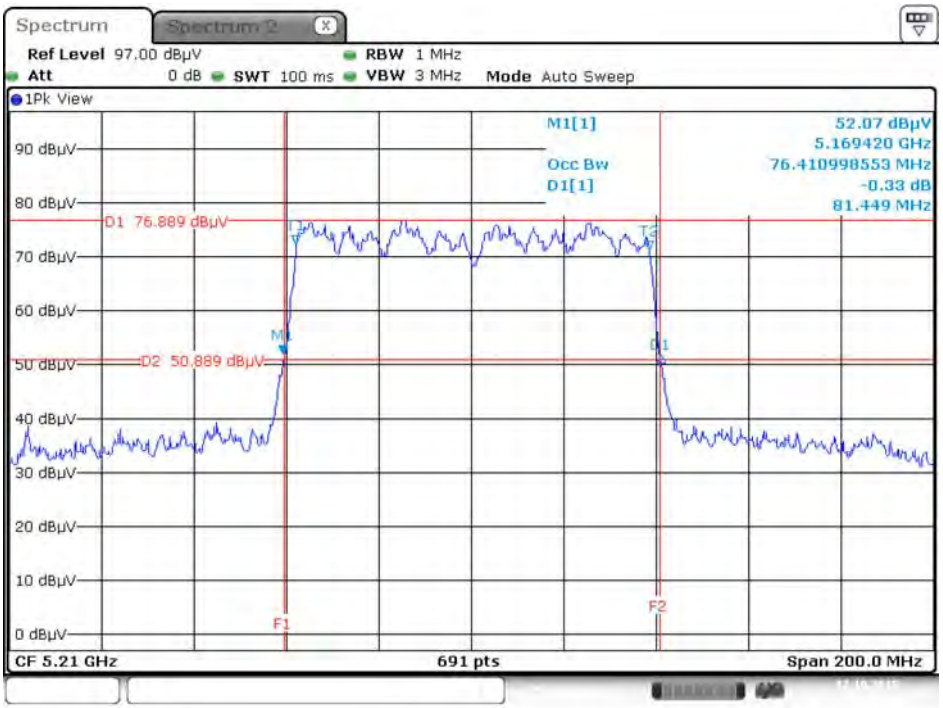
Date: 17.OCT.2015 00:17:30

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



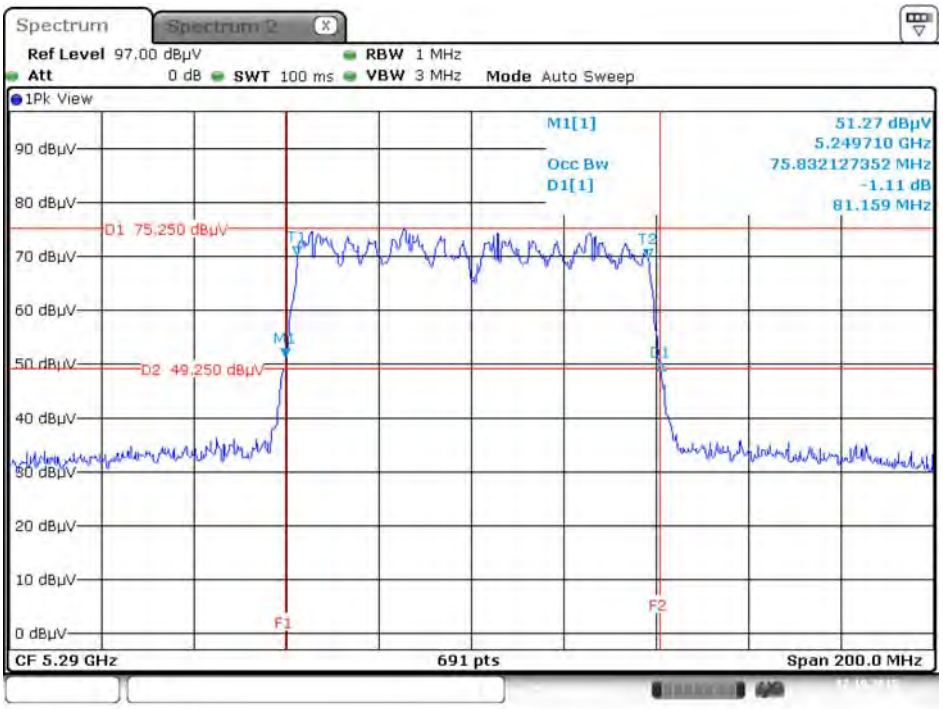
Date: 17.OCT.2015 00:18:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 / 5210 MHz



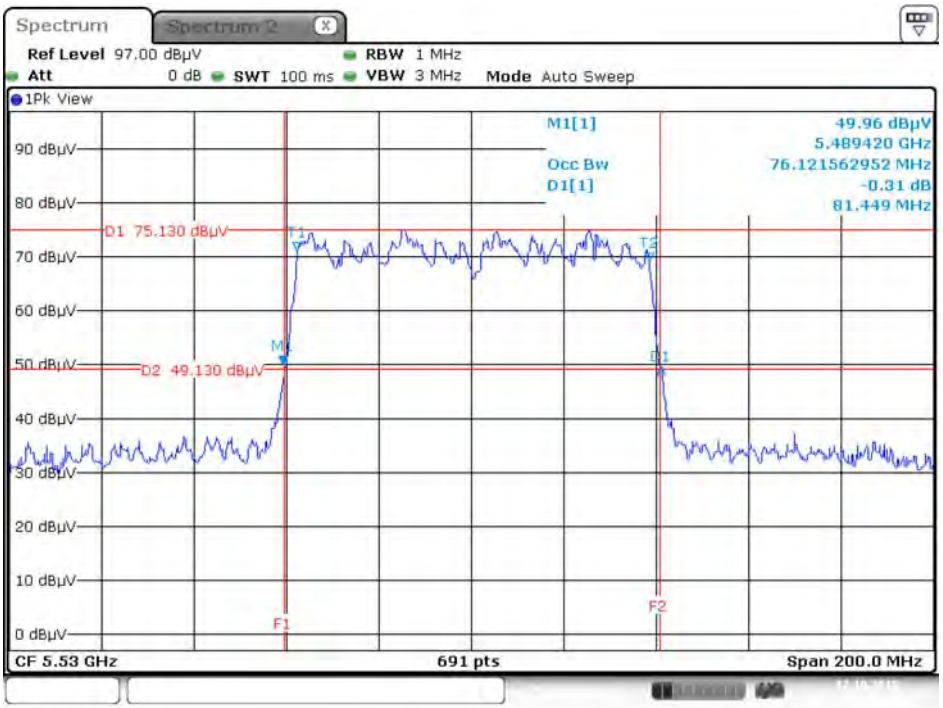
Date: 17.OCT.2015 00:19:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 / 5290 MHz



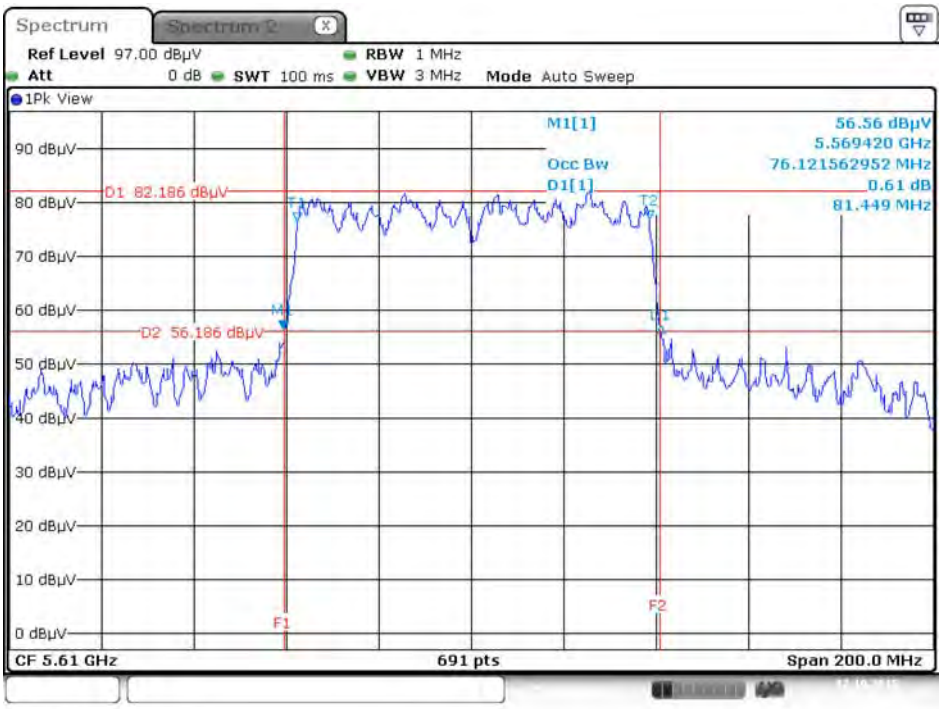
Date: 17.OCT.2015 00:19:25

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



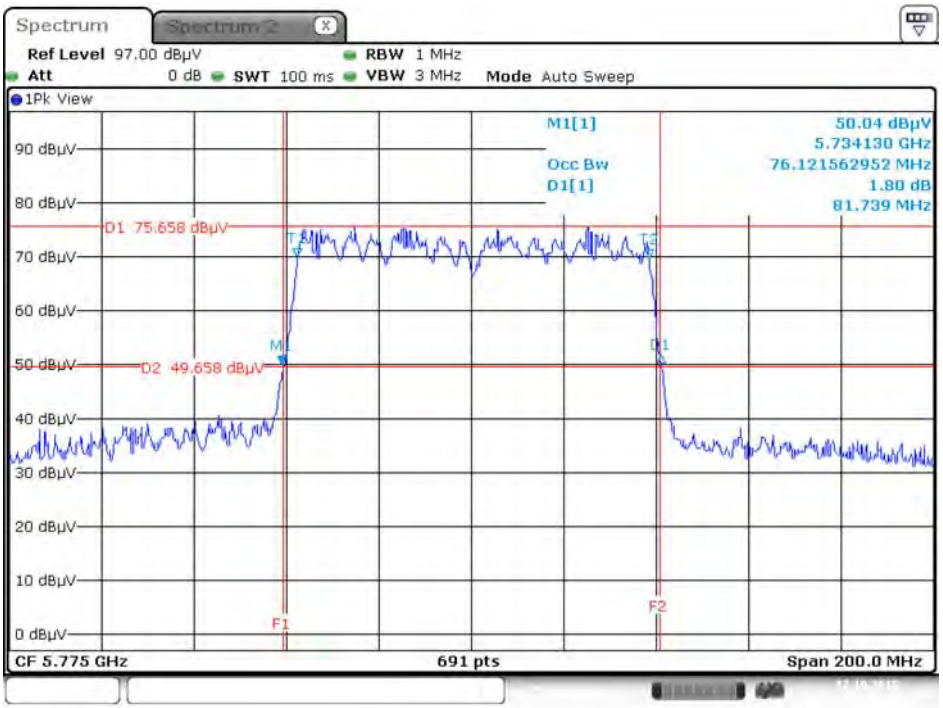
Date: 17.OCT.2015 00:19:53

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



Date: 17.OCT.2015 00:20:17

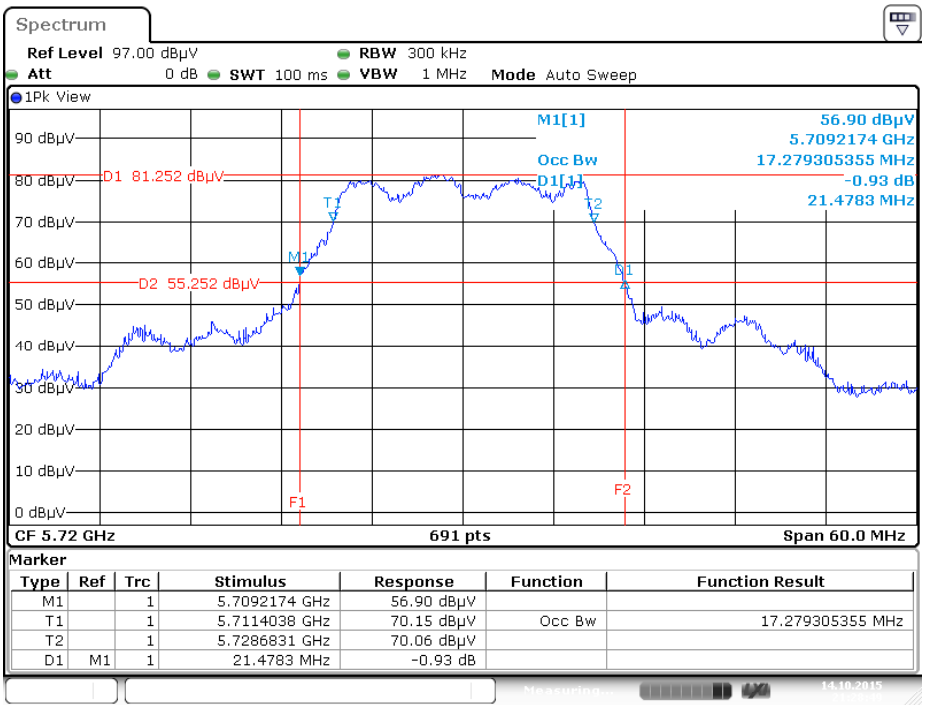
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 / 5775 MHz



Date: 17.OCT.2015 00:20:41

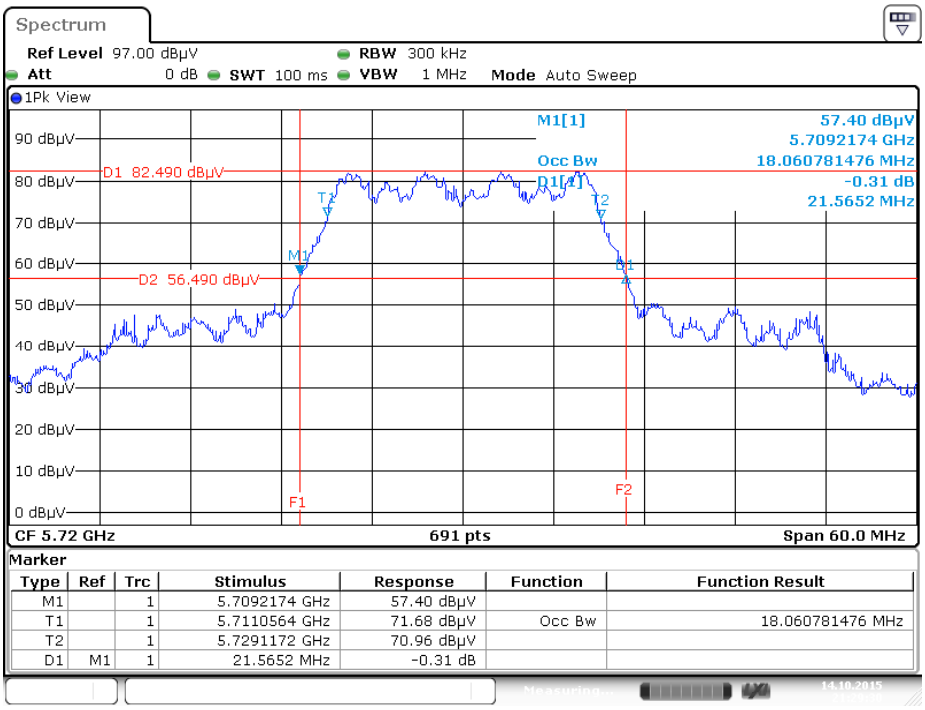
Straddle Channel

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



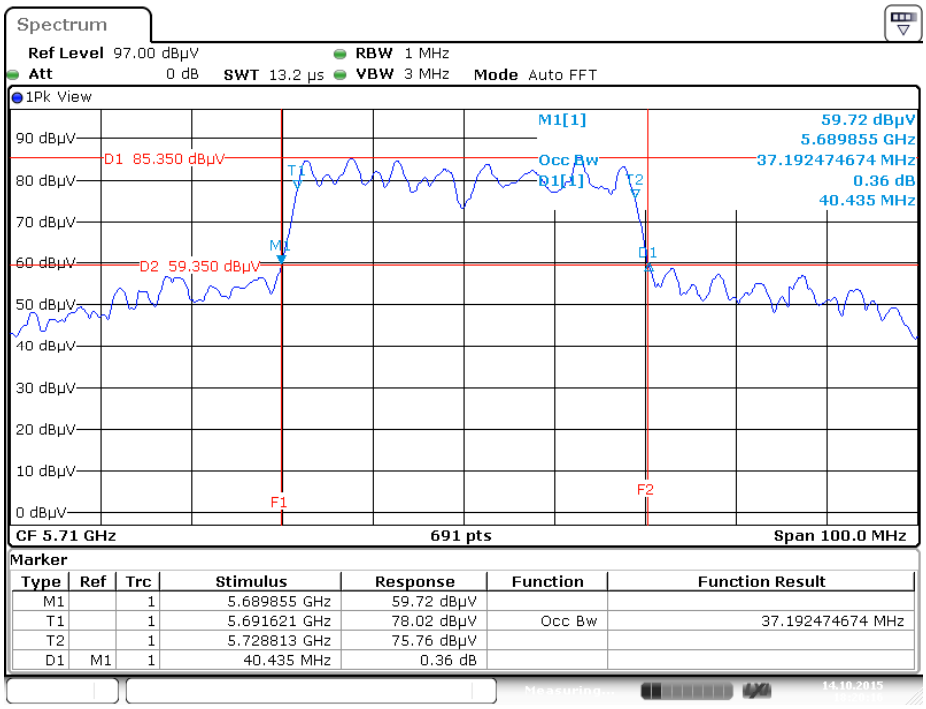
Date: 14.OCT.2015 21:28:50

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



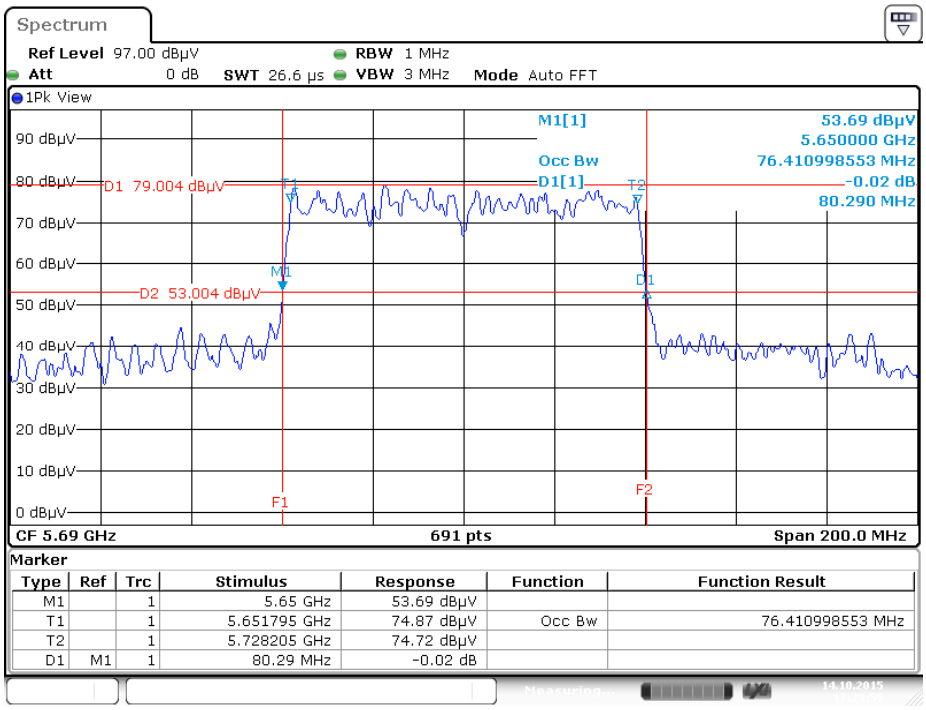
Date: 14.OCT.2015 21:29:30

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



Date: 14.OCT.2015 18:20:17

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



Date: 14.OCT.2015 17:24:00

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	≥ 3 x 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 v02r01 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

For Non-Beamforming Mode

Temperature	24℃	Humidity	65%
Test Engineer	Roki Liu	Configurations	Chain 1: 5.9dBi / 1TX

For indoor / outdoor use

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	16.35	500	Complies
	5785 MHz	16.35	500	Complies
	5825 MHz	16.29	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.62	500	Complies
	5785 MHz	17.57	500	Complies
	5825 MHz	17.57	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	36.29	500	Complies
	5795 MHz	36.29	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	76.23	500	Complies

Straddle Channel

Mode	Frequency	6dB BW (MHz)	6dB BW F2 (MHz)	UNII 3 BW (MHz)	Min. Limit (kHz)	Test Result
802.11a	5720 MHz	16.29	5711.83	3.12	500.00	Complies
802.11ac MCS0/Nss1 VHT20	5720 MHz	17.57	5711.19	3.75	500.00	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz	36.41	5691.80	3.20	500.00	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz	76.23	5651.74	2.97	500.00	Complies

Temperature	24℃	Humidity	65%
Test Engineer	Roki Liu	Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	12.58	500	Complies
	5785 MHz	13.16	500	Complies
	5825 MHz	12.58	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.06	500	Complies
	5785 MHz	16.06	500	Complies
	5825 MHz	15.48	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.83	500	Complies
	5795 MHz	36.06	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.65	500	Complies

Straddle Channel

Mode	Frequency	6dB BW (MHz)	6dB BW F2 (MHz)	UNII 3 BW (MHz)	Min. Limit (kHz)	Test Result
802.11a	5720 MHz	14.78	5711.88	1.67	500.00	Complies
802.11ac MCS0/Nss1 VHT20	5720 MHz	15.71	5712.46	3.17	500.00	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz	35.59	5692.38	2.97	500.00	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz	75.36	5652.32	2.68	500.00	Complies

Temperature	24℃	Humidity	65%
Test Engineer	Roki Liu	Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	15.01	500	Complies
	5785 MHz	10.67	500	Complies
	5825 MHz	15.07	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.06	500	Complies
	5785 MHz	16.12	500	Complies
	5825 MHz	15.54	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.83	500	Complies
	5795 MHz	35.71	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.36	500	Complies

Straddle Channel

Mode	Frequency	6dB BW (MHz)	6dB BW F2 (MHz)	UNII 3 BW (MHz)	Min. Limit (kHz)	Test Result
802.11a	5720 MHz	11.30	5716.17	2.48	500.00	Complies
802.11ac MCS0/Nss1 VHT20	5720 MHz	15.71	5712.46	3.17	500.00	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz	35.48	5692.73	3.20	500.00	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz	75.36	5652.90	3.26	500.00	Complies

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

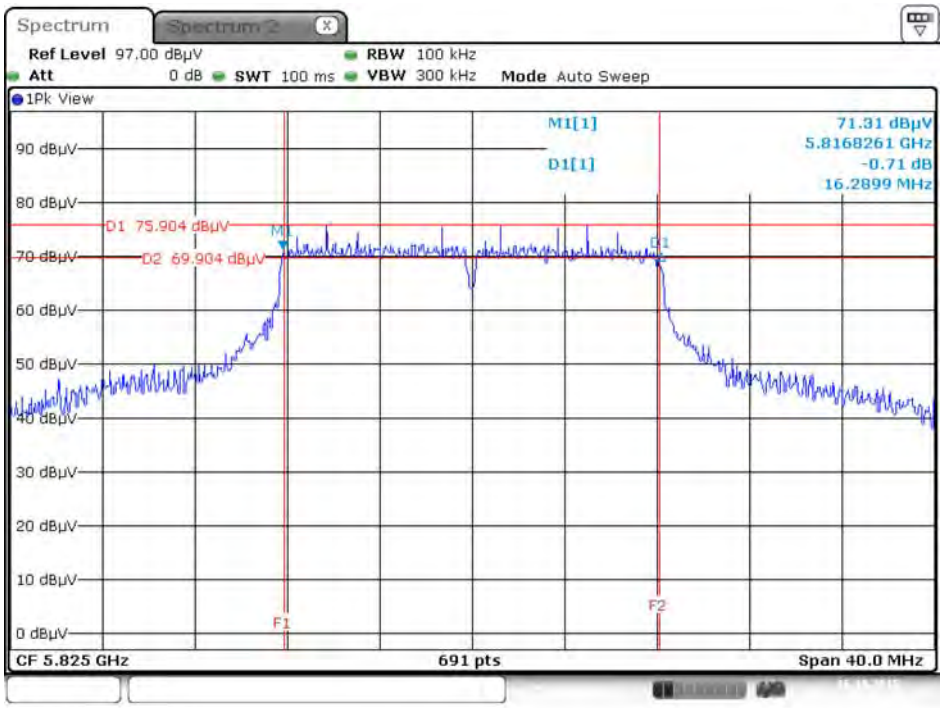
For plots, only the channel with worse result was shown.

For Non-Beamforming Mode

For indoor / outdoor use

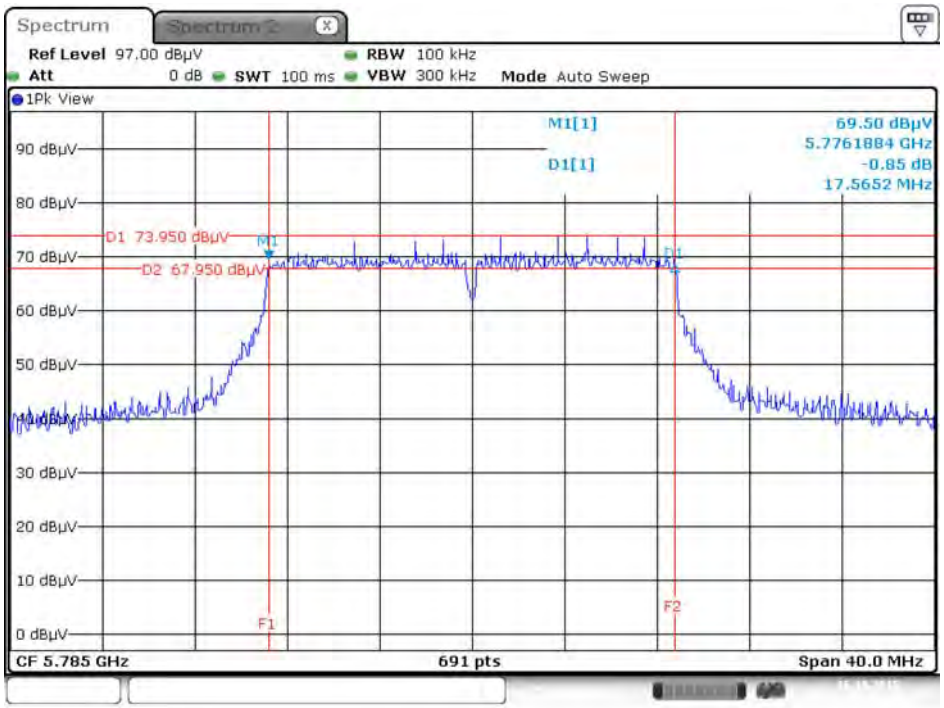
Chain 1: 5.9dBi / 1TX

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5825 MHz



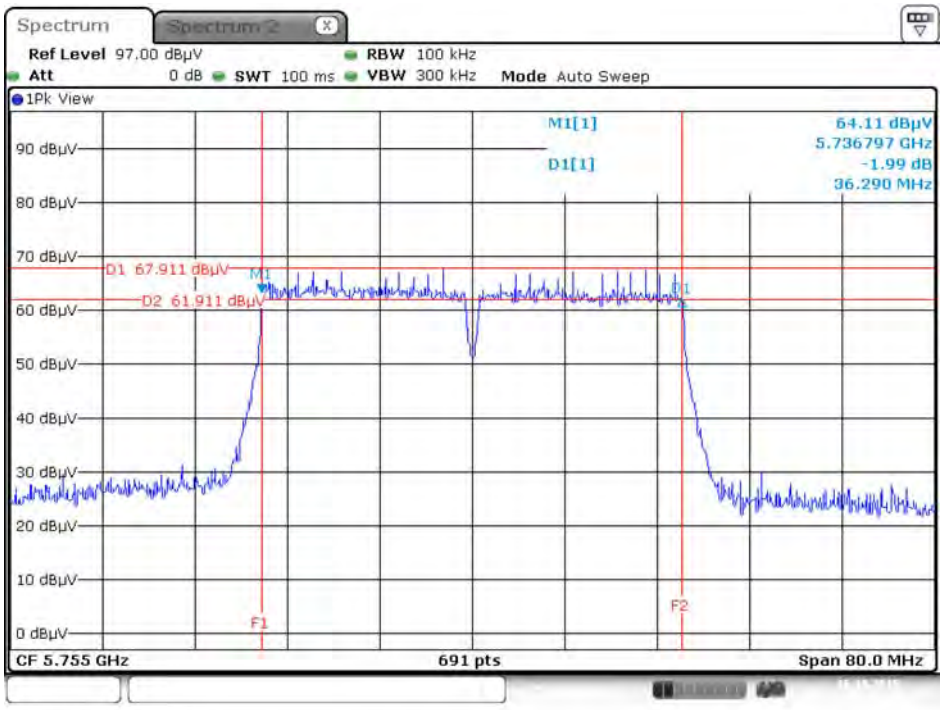
Date: 16.OCT.2015 21:51:31

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



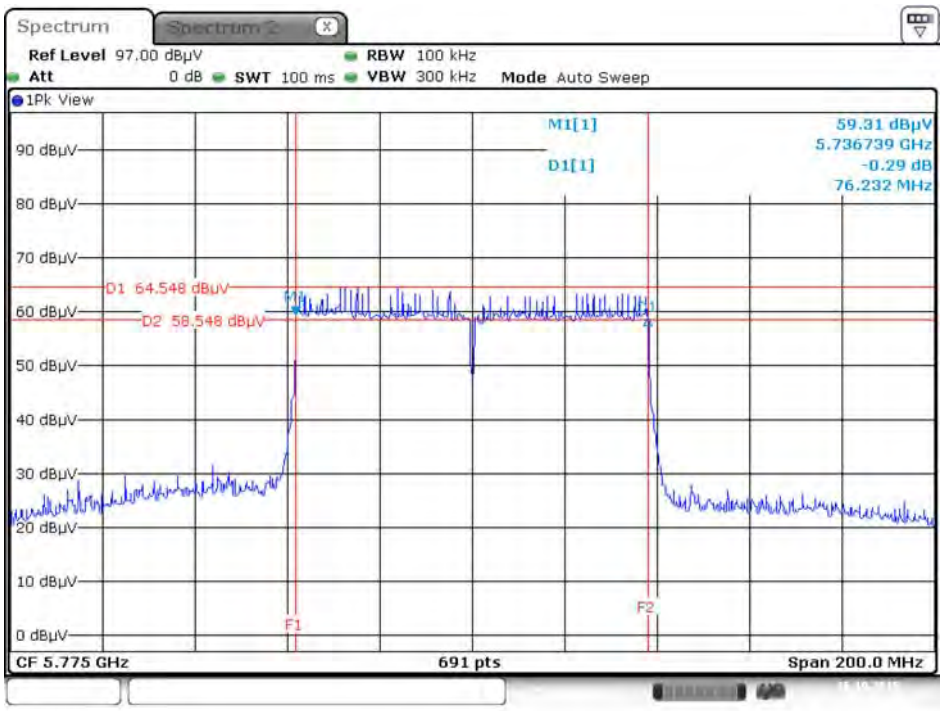
Date: 16.OCT.2015 21:55:52

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5755MHz



Date: 16.OCT.2015 21:58:28

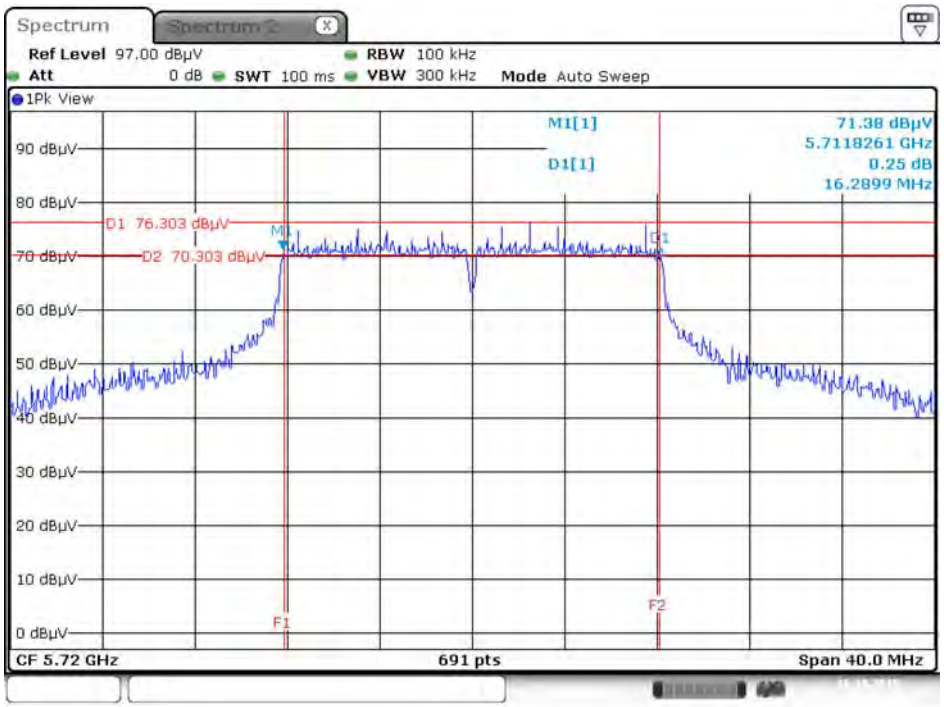
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



Date: 16.OCT.2015 22:02:14

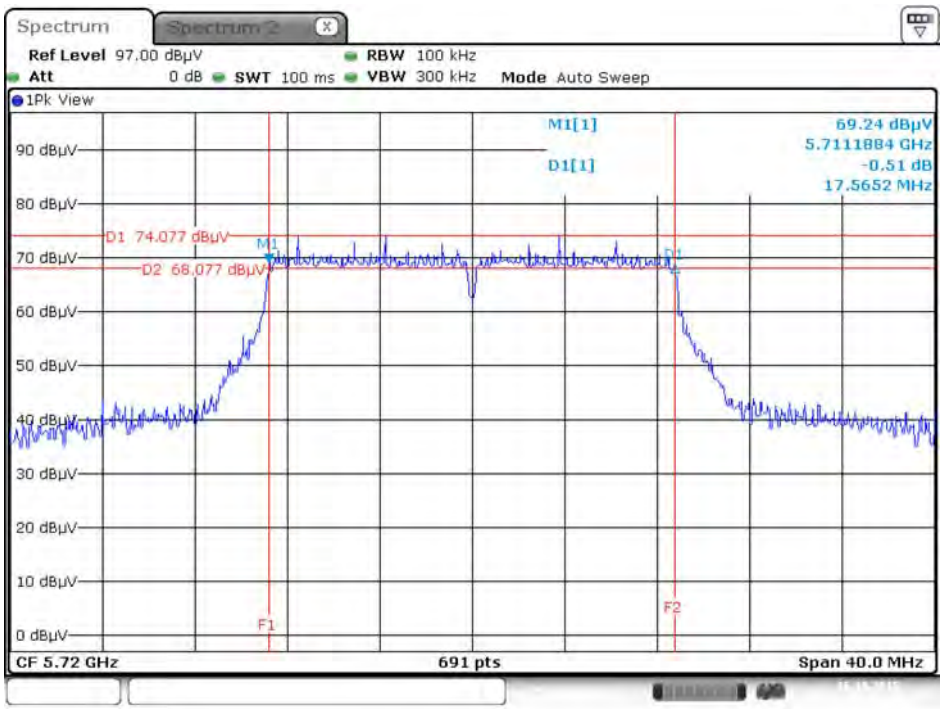
Straddle Channel

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5720 MHz



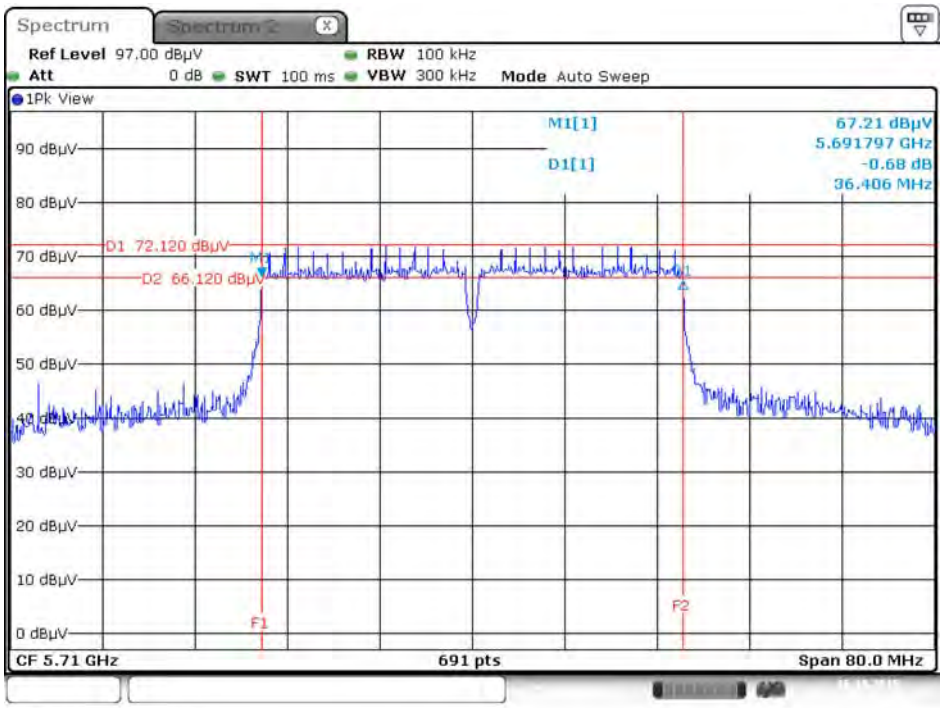
Date: 16.OCT.2015 21:52:33

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



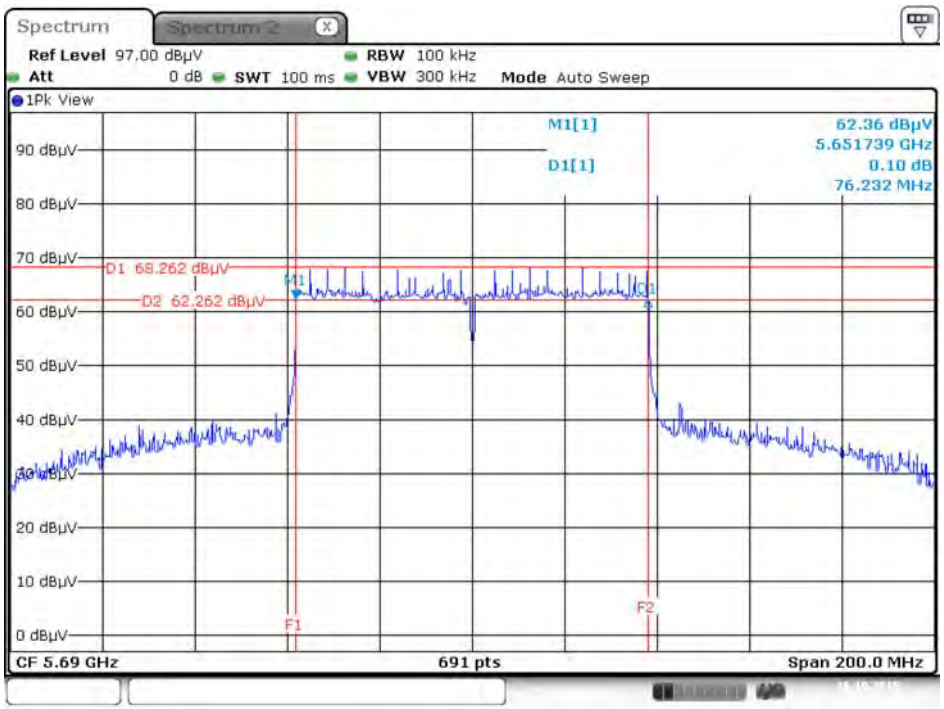
Date: 16.OCT.2015 21:54:33

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



Date: 16.OCT.2015 21:57:41

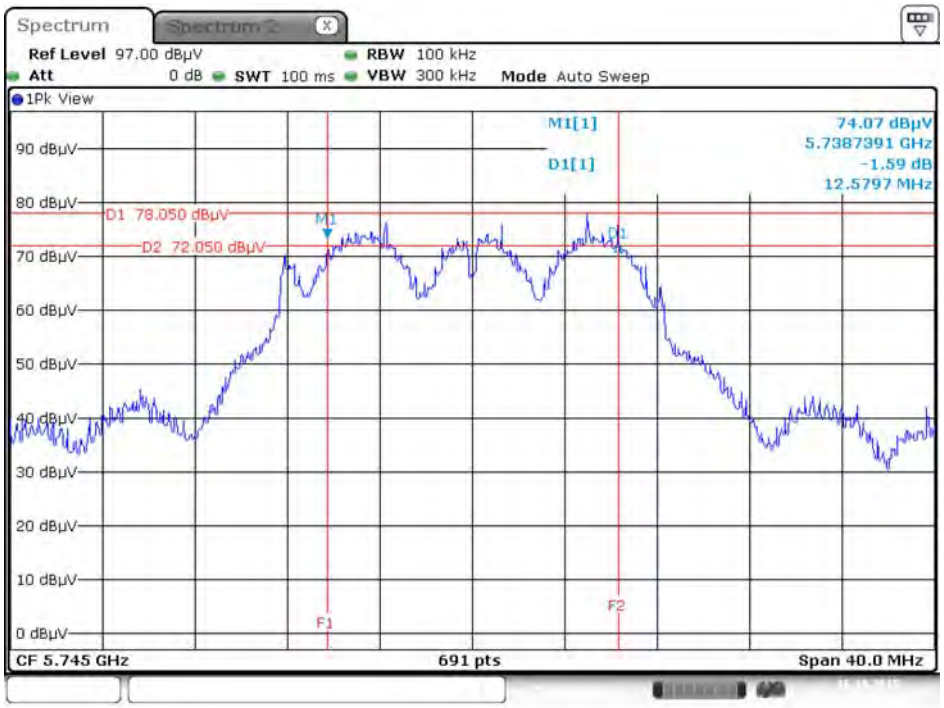
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5690 MHz



Date: 16.OCT.2015 22:01:06

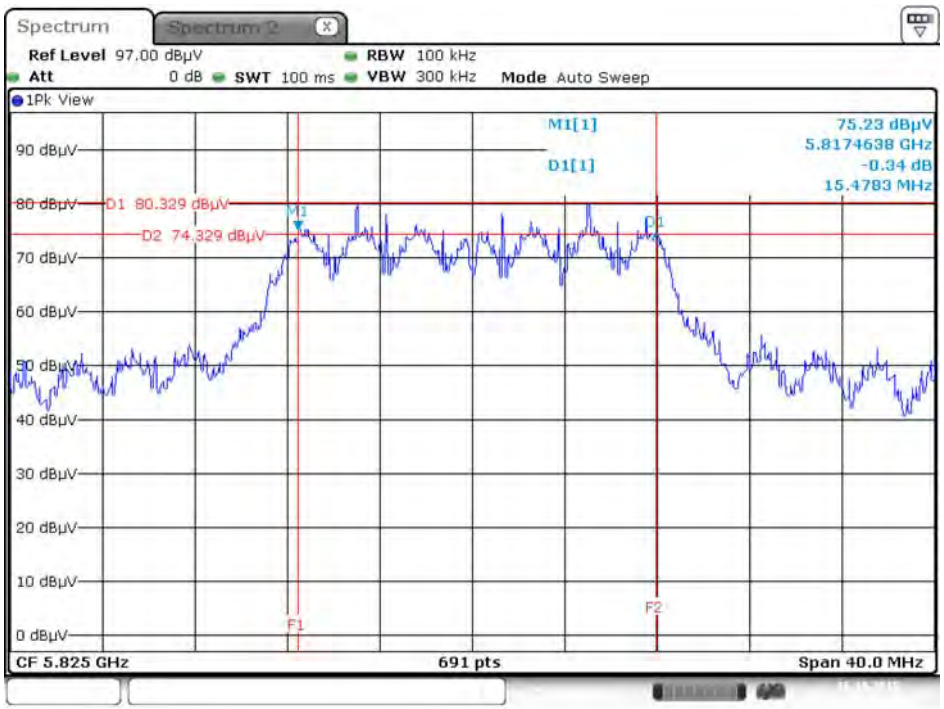
Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5745 MHz



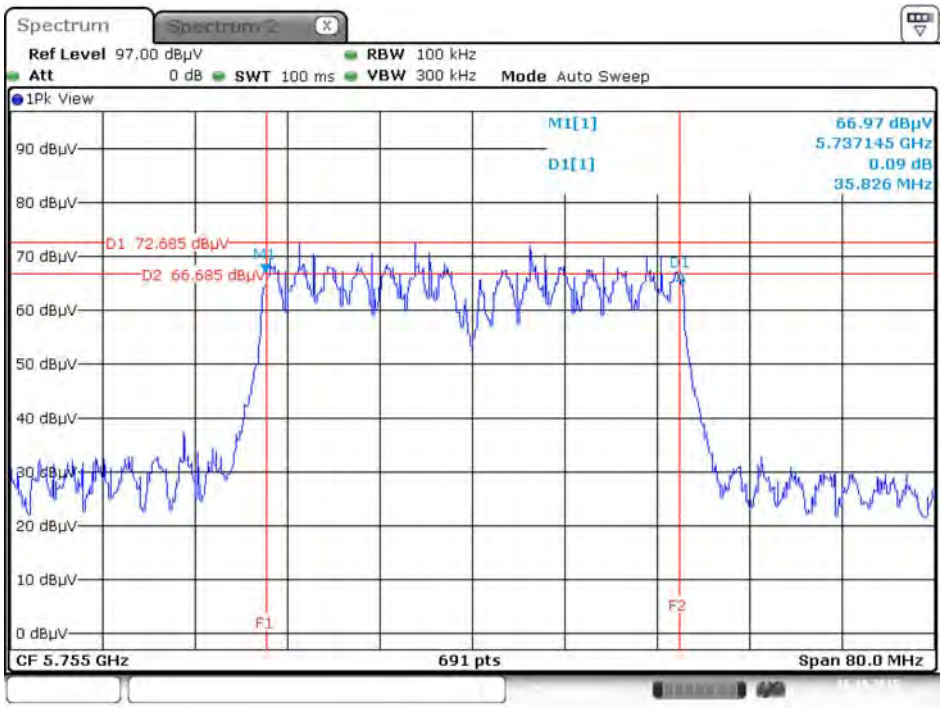
Date: 16.OCT.2015 23:07:03

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



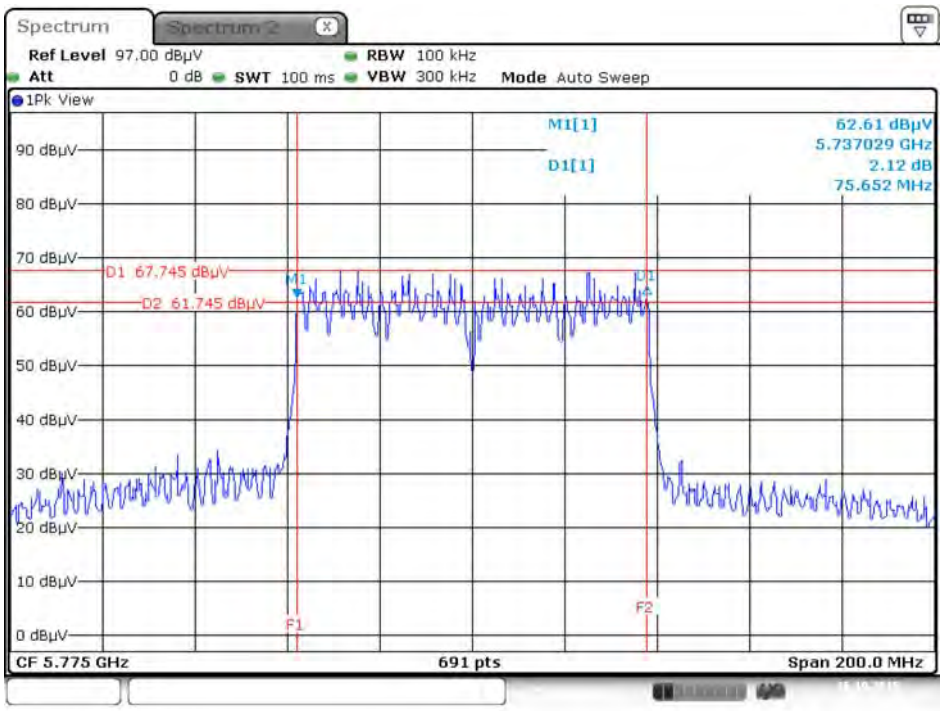
Date: 16.OCT.2015 23:13:22

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5755MHz



Date: 16.OCT.2015 23:16:04

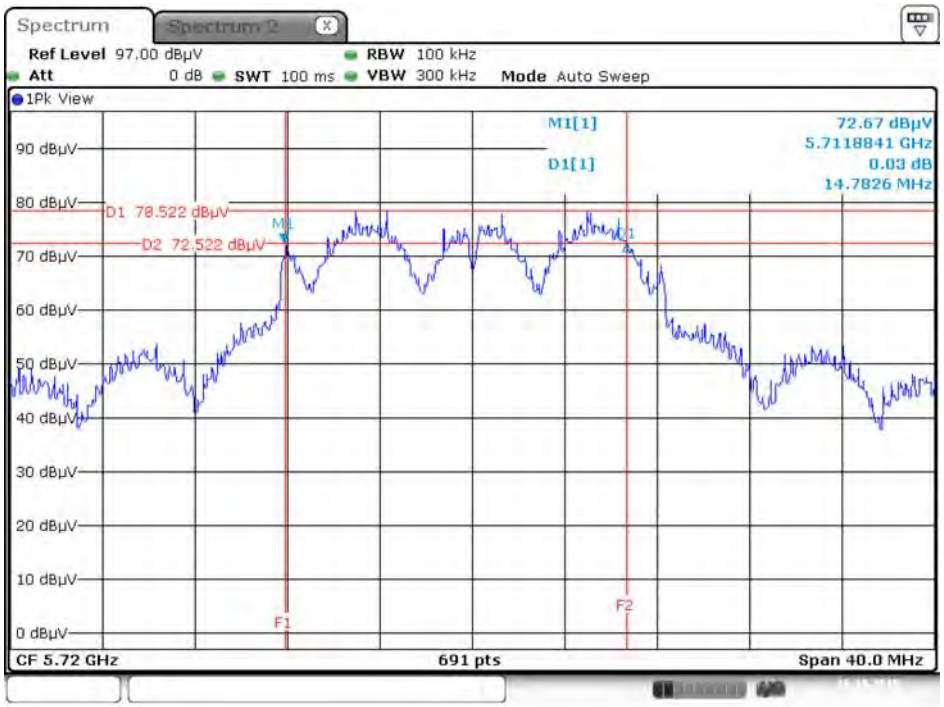
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5775 MHz



Date: 16.OCT.2015 23:20:18

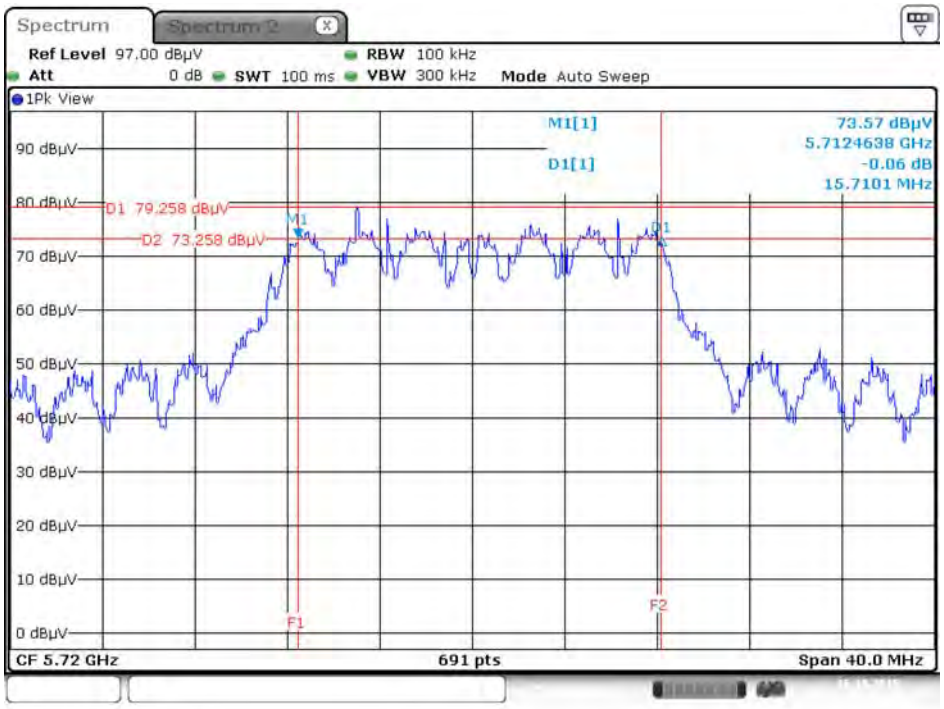
Straddle Channel

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



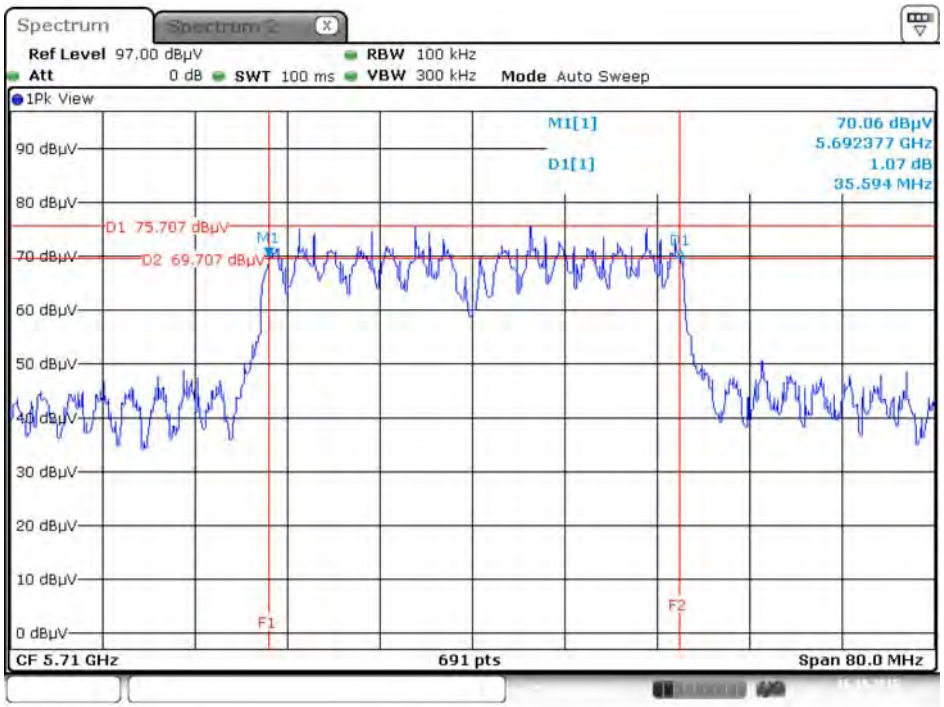
Date: 16.OCT.2015 23:09:35

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



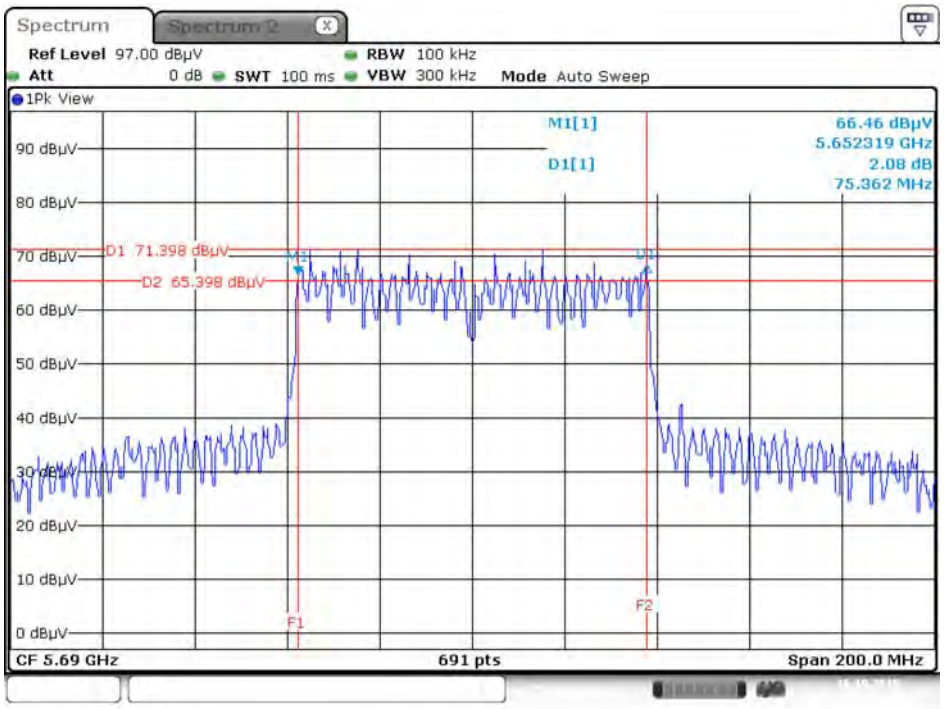
Date: 16.OCT.2015 23:10:37

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



Date: 16.OCT.2015 23:14:55

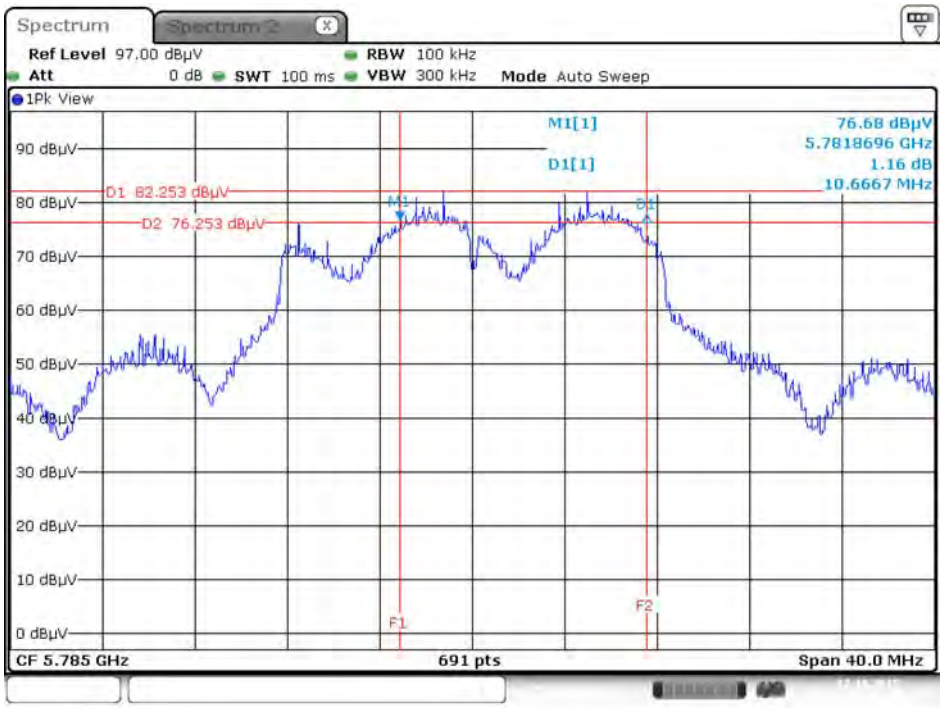
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5690 MHz



Date: 16.OCT.2015 23:18:50

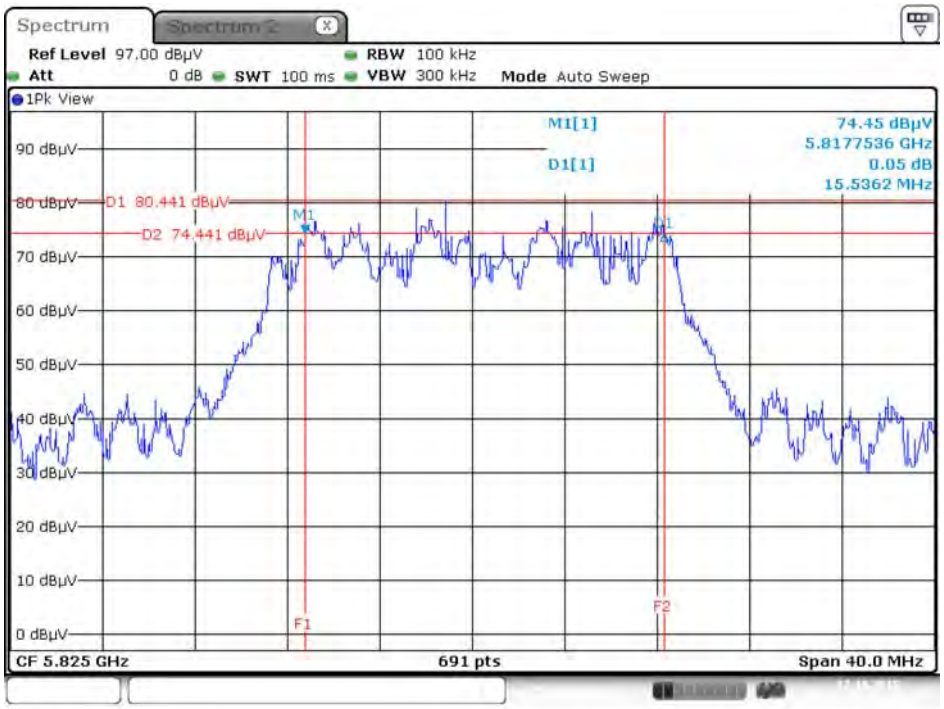
Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX

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



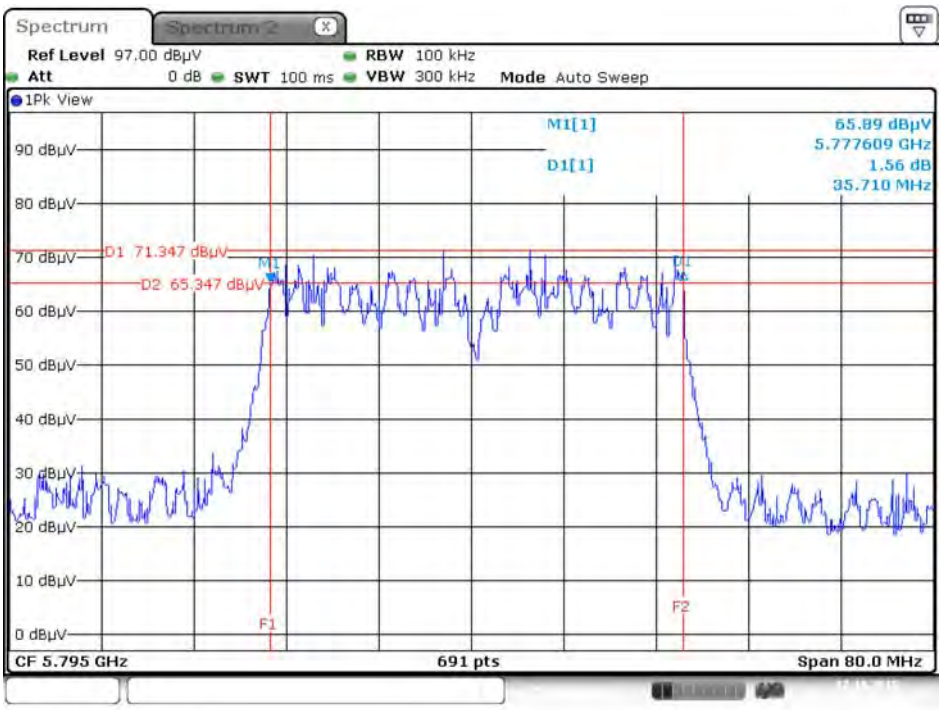
Date: 17.OCT.2015 00:43:05

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



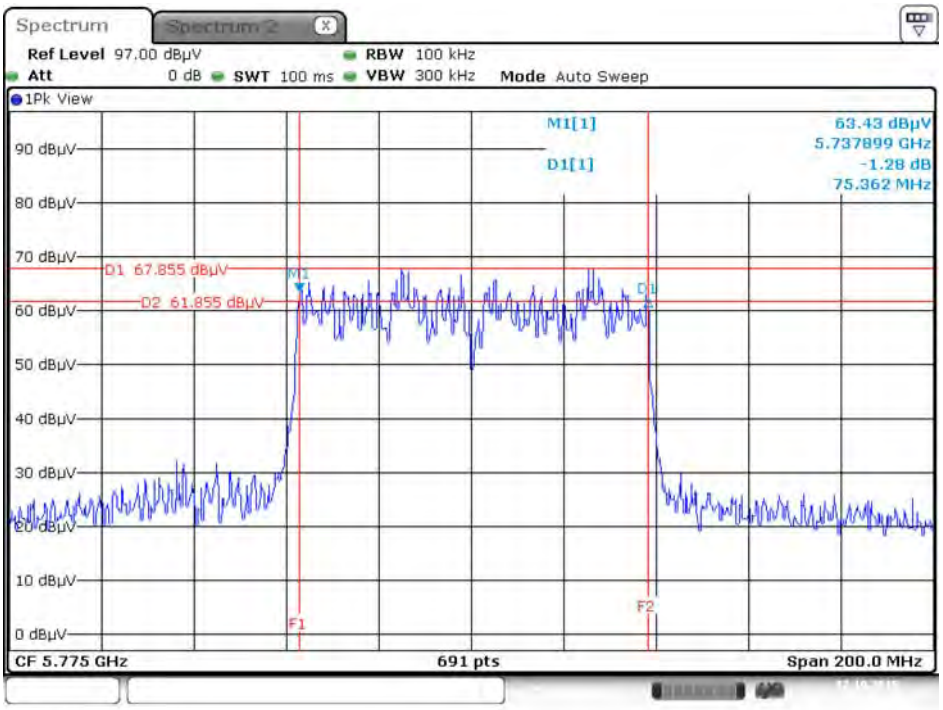
Date: 17.OCT.2015 00:44:52

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



Date: 17.OCT.2015 00:45:47

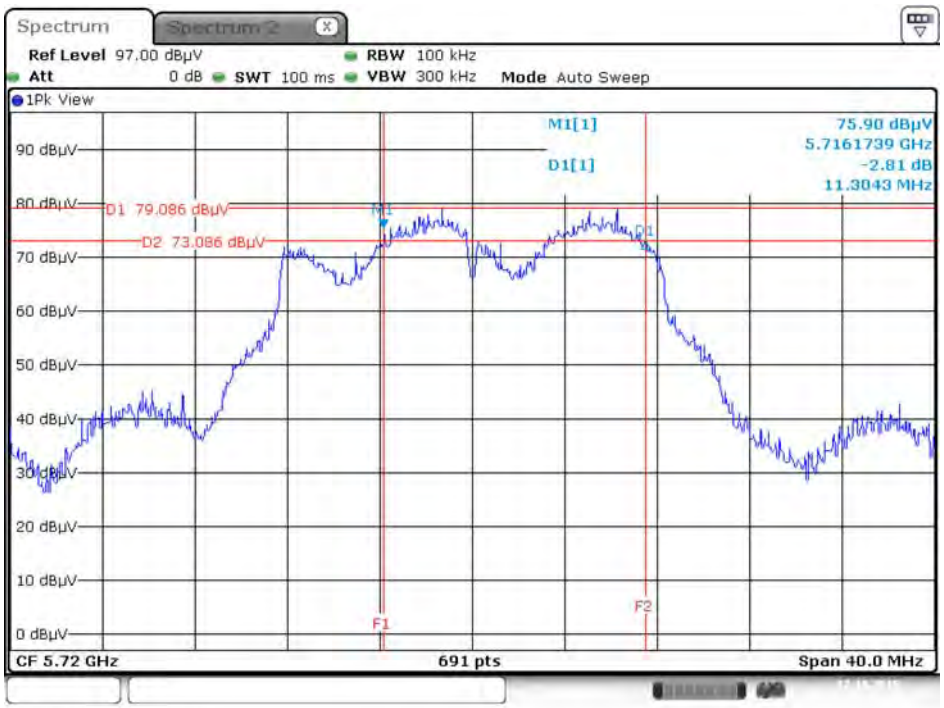
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 / 5775 MHz



Date: 17.OCT.2015 00:46:29

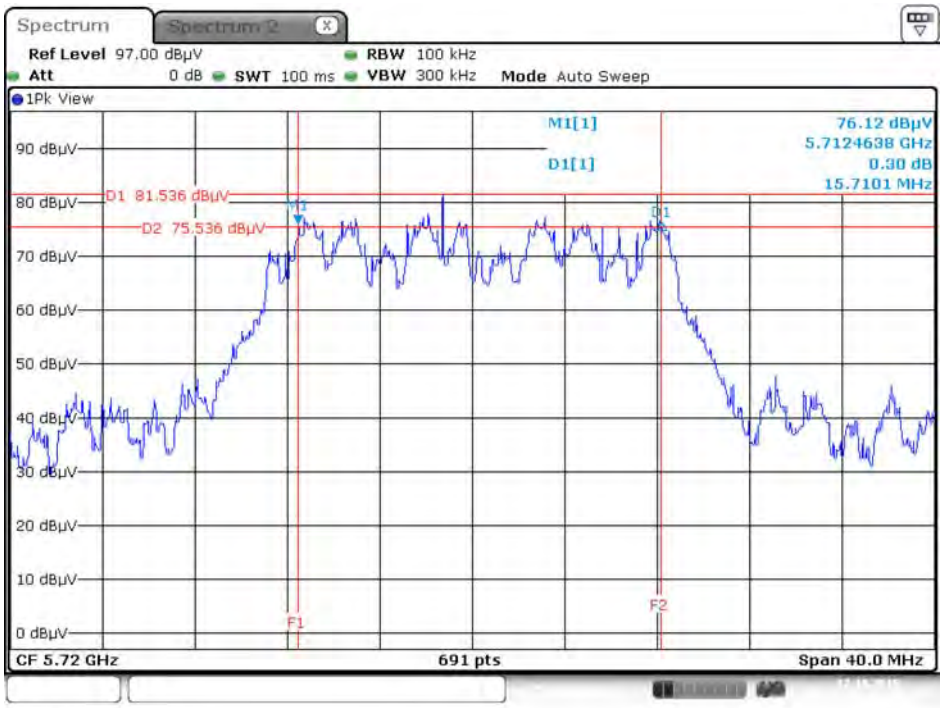
Straddle Channel

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



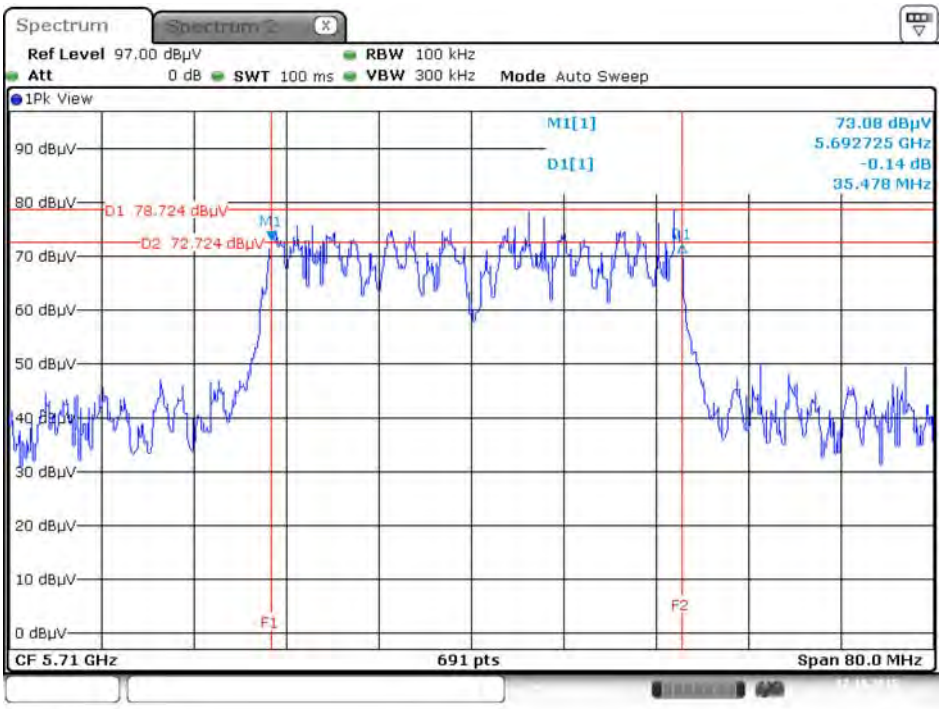
Date: 17.OCT.2015 00:32:26

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



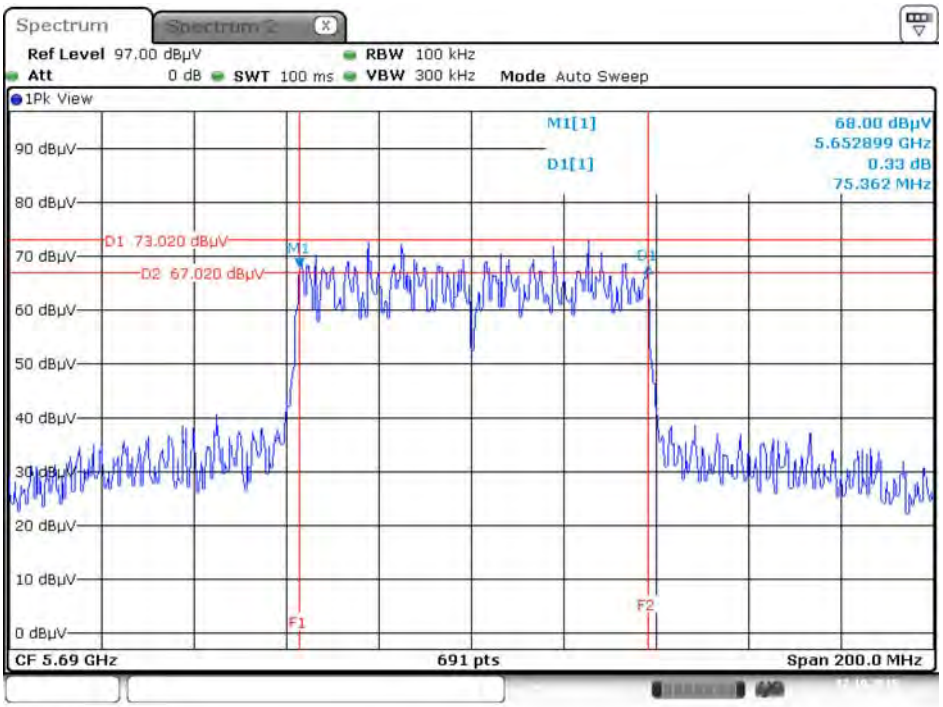
Date: 17.OCT.2015 00:32:59

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



Date: 17.OCT.2015 00:33:38

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



Date: 17.OCT.2015 00:36:03

4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

Frequency Band			Limit
☒	5.15~5.25 GHz		
	Operating Mode		
	☒	Outdoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
	☒	Indoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. 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.
	☐	Fixed point-to-point access points	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.
	☐	Mobile and portable client devices	The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. 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.

☒	5.25-5.35 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.
☒	5.470-5.725 GHz	
☒	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:

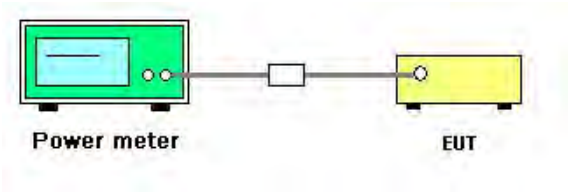
1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v02r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power 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:

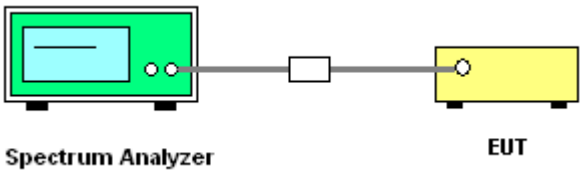
1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with FCC Public Notice DA 02-2138, August 30, 2002.

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

For Non-Beamforming Mode

Temperature	24°C	Humidity	65%
Test Engineer	Roki Liu	Test Date	Oct. 14, 2015
Configurations	Chain 1: 5.9dBi / 1TX		

For B1 indoor / B2-B4 indoor, outdoor use

Mode	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1		
802.11a	5180 MHz	19.22	30.00	Complies
	5200 MHz	19.24	30.00	Complies
	5240 MHz	19.47	30.00	Complies
	5260 MHz	19.35	24.00	Complies
	5300 MHz	19.41	24.00	Complies
	5320 MHz	19.14	24.00	Complies
	5500 MHz	19.42	24.00	Complies
	5580 MHz	19.39	24.00	Complies
	5700 MHz	19.22	24.00	Complies
	5745 MHz	17.22	30.00	Complies
	5785 MHz	19.01	30.00	Complies
	5825 MHz	18.94	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	18.03	30.00	Complies
	5200 MHz	18.52	30.00	Complies
	5240 MHz	18.47	30.00	Complies
	5260 MHz	18.28	24.00	Complies
	5300 MHz	18.26	24.00	Complies
	5320 MHz	18.29	24.00	Complies
	5500 MHz	18.46	24.00	Complies
	5580 MHz	18.22	24.00	Complies
	5700 MHz	16.53	24.00	Complies
	5745 MHz	16.43	30.00	Complies
	5785 MHz	18.18	30.00	Complies
	5825 MHz	18.02	30.00	Complies

Mode	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1		
802.11ac MCS0/Nss1 VHT40	5190 MHz	15.05	30.00	Complies
	5230 MHz	18.96	30.00	Complies
	5270 MHz	18.72	24.00	Complies
	5310 MHz	14.85	24.00	Complies
	5510 MHz	14.29	24.00	Complies
	5550 MHz	18.57	24.00	Complies
	5670 MHz	18.96	24.00	Complies
	5755 MHz	14.87	30.00	Complies
	5795 MHz	18.58	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	14.89	30.00	Complies
	5290 MHz	13.17	24.00	Complies
	5530 MHz	12.84	24.00	Complies
	5610 MHz	17.68	24.00	Complies
	5775 MHz	14.02	30.00	Complies

Straddle Channel

Mode	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1		
802.11a	5720 MHz (UNII 2C)	17.40	24.00	Complies
	5720 MHz (UNII 3)	11.32	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5720 MHz (UNII 2C)	16.88	24.00	Complies
	5720 MHz (UNII 3)	11.34	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz (UNII 2C)	17.73	24.00	Complies
	5710 MHz (UNII 3)	7.61	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz (UNII 2C)	16.40	24.00	Complies
	5690 MHz (UNII 3)	2.60	30.00	Complies

Temperature	24°C	Humidity	65%
Test Engineer	Roki Liu	Test Date	Oct. 14, 2015
Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX		

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11a	5180 MHz	18.76	18.54	21.66	30.00	Complies
	5200 MHz	18.71	18.08	21.42	30.00	Complies
	5240 MHz	18.26	18.36	21.32	30.00	Complies
	5260 MHz	18.49	18.18	21.35	24.00	Complies
	5300 MHz	18.33	18.12	21.24	24.00	Complies
	5320 MHz	18.63	18.28	21.47	24.00	Complies
	5500 MHz	16.25	16.93	19.61	24.00	Complies
	5580 MHz	18.17	18.56	21.38	24.00	Complies
	5700 MHz	17.96	18.66	21.33	24.00	Complies
	5745 MHz	17.53	16.95	20.26	30.00	Complies
	5785 MHz	19.11	19.09	22.11	30.00	Complies
	5825 MHz	19.09	18.55	21.84	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	18.53	18.19	21.37	30.00	Complies
	5200 MHz	18.74	18.34	21.55	30.00	Complies
	5240 MHz	18.76	18.26	21.53	30.00	Complies
	5260 MHz	18.43	18.24	21.35	24.00	Complies
	5300 MHz	18.41	18.37	21.40	24.00	Complies
	5320 MHz	18.79	18.56	21.69	24.00	Complies
	5500 MHz	17.07	17.06	20.08	24.00	Complies
	5580 MHz	18.26	18.53	21.41	24.00	Complies
	5700 MHz	16.45	17.16	19.83	24.00	Complies
	5745 MHz	16.54	16.35	19.46	30.00	Complies
	5785 MHz	19.16	18.51	21.86	30.00	Complies
	5825 MHz	18.81	18.29	21.57	30.00	Complies

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11ac MCS0/Nss1 VHT40	5190 MHz	13.76	13.62	16.70	30.00	Complies
	5230 MHz	17.36	17.77	20.58	30.00	Complies
	5270 MHz	17.42	17.86	20.66	24.00	Complies
	5310 MHz	12.95	12.35	15.67	24.00	Complies
	5510 MHz	13.88	13.71	16.81	24.00	Complies
	5550 MHz	18.42	18.21	21.33	24.00	Complies
	5670 MHz	17.86	18.95	21.45	24.00	Complies
	5755 MHz	14.66	14.65	17.67	30.00	Complies
	5795 MHz	18.47	18.46	21.48	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	13.34	12.49	15.95	30.00	Complies
	5290 MHz	12.26	11.32	14.83	24.00	Complies
	5530 MHz	11.74	11.75	14.76	24.00	Complies
	5610 MHz	17.84	18.44	21.16	24.00	Complies
	5775 MHz	12.99	13.11	16.06	30.00	Complies

Straddle Channel

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11a	5720 MHz (UNII 2C)	16.33	16.70	19.53	23.83	Complies
	5720 MHz (UNII 3)	10.15	10.53	13.35	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5720 MHz (UNII 2C)	15.89	16.48	19.21	22.93	Complies
	5720 MHz (UNII 3)	10.25	10.87	13.58	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz (UNII 2C)	16.40	17.16	19.81	24.00	Complies
	5710 MHz (UNII 3)	5.99	6.92	9.49	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz (UNII 2C)	15.41	16.07	18.76	24.00	Complies
	5690 MHz (UNII 3)	1.22	2.33	4.82	30.00	Complies

(UNII 2C)

11a

Note: 5720 MHz limit=11+10log(19.17)=23.83dBm<24dBm, so limit=23.83dBm.

11ac VHT20

Note: 5720 MHz limit=11+10log(15.61)=22.93dBm<24dBm, so limit=22.93dBm.

Temperature	24°C	Humidity	65%
Test Engineer	Roki Liu	Test Date	Oct. 14, 2015
Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX		

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11a	5180 MHz	18.51	18.02	17.48	22.79	30.00	Complies
	5200 MHz	18.39	17.93	17.26	22.66	30.00	Complies
	5240 MHz	18.12	17.81	17.07	22.46	30.00	Complies
	5260 MHz	14.81	14.83	14.77	19.57	24.00	Complies
	5300 MHz	14.95	14.91	15.01	19.73	24.00	Complies
	5320 MHz	14.85	14.85	14.75	19.59	24.00	Complies
	5500 MHz	14.52	15.05	14.75	19.55	24.00	Complies
	5580 MHz	14.98	15.12	14.31	19.59	24.00	Complies
	5700 MHz	14.18	14.77	13.82	19.05	24.00	Complies
	5745 MHz	15.22	14.92	14.74	19.74	30.00	Complies
	5785 MHz	18.19	17.86	18.15	22.84	30.00	Complies
	5825 MHz	17.97	17.74	18.35	22.80	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	18.18	17.59	17.03	22.40	30.00	Complies
	5200 MHz	18.08	18.02	17.34	22.60	30.00	Complies
	5240 MHz	18.01	17.42	16.97	22.26	30.00	Complies
	5260 MHz	14.81	15.11	14.66	19.64	24.00	Complies
	5300 MHz	14.57	15.04	14.36	19.44	24.00	Complies
	5320 MHz	14.66	14.91	14.43	19.44	24.00	Complies
	5500 MHz	14.49	14.71	14.53	19.35	24.00	Complies
	5580 MHz	14.34	15.07	14.37	19.38	24.00	Complies
	5700 MHz	14.55	14.95	14.04	19.30	24.00	Complies
	5745 MHz	14.12	13.59	13.77	18.60	30.00	Complies
	5785 MHz	18.02	17.71	17.94	22.66	30.00	Complies
	5825 MHz	16.02	16.01	15.94	20.76	30.00	Complies

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11ac MCS0/Nss1 VHT40	5190 MHz	12.14	12.05	11.52	16.68	30.00	Complies
	5230 MHz	15.15	15.12	14.65	19.75	30.00	Complies
	5270 MHz	16.92	16.88	17.58	21.91	24.00	Complies
	5310 MHz	10.45	10.01	10.83	15.21	24.00	Complies
	5510 MHz	11.52	11.42	11.02	16.10	24.00	Complies
	5550 MHz	15.09	15.32	15.31	20.01	24.00	Complies
	5670 MHz	17.46	17.82	17.62	22.41	24.00	Complies
	5755 MHz	11.02	10.92	10.82	15.69	30.00	Complies
	5795 MHz	17.12	17.56	17.93	22.32	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	11.03	10.45	11.02	15.61	30.00	Complies
	5290 MHz	9.38	8.36	8.78	13.63	24.00	Complies
	5530 MHz	9.02	9.23	8.79	13.79	24.00	Complies
	5610 MHz	15.39	16.22	15.95	20.64	24.00	Complies
	5775 MHz	10.38	10.16	9.92	14.93	30.00	Complies

Straddle Channel

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11a	5720 MHz (UNII 2C)	13.44	13.34	13.34	18.14	22.98	Complies
	5720 MHz (UNII 3)	7.42	7.30	7.22	12.09	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5720 MHz (UNII 2C)	13.55	13.50	13.48	18.28	22.98	Complies
	5720 MHz (UNII 3)	8.08	7.91	7.92	12.74	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz (UNII 2C)	15.46	15.96	15.77	20.51	24.00	Complies
	5710 MHz (UNII 3)	5.04	5.75	5.49	10.21	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz (UNII 2C)	13.22	14.32	13.55	18.49	24.00	Complies
	5690 MHz (UNII 3)	-0.87	0.51	-0.41	4.55	30.00	Complies

(UNII 2C)

11a

Note: 5720 MHz limit=11+10log(15.78)=22.98dBm<24dBm, so limit=22.98dBm.

11ac VHT20

Note: 5720 MHz limit=11+10log(15.78)=22.98dBm<24dBm, so limit=22.98dBm.

Temperature	24°C	Humidity	65%
Test Engineer	Roki Liu	Test Date	Jan. 18, 2016
Configurations	Chain 1: 5.9dBi / 1TX		

For outdoor use

Mode	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1		
802.11a	5180 MHz	16.84	30.00	Complies
	5200 MHz	16.86	30.00	Complies
	5240 MHz	16.71	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	16.81	30.00	Complies
	5200 MHz	16.73	30.00	Complies
	5240 MHz	16.88	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	16.84	30.00	Complies
	5230 MHz	16.82	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	16.81	30.00	Complies

Temperature	24°C	Humidity	65%
Test Engineer	Roki Liu	Test Date	Jan. 18, 2016
Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX		

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11a	5180 MHz	13.78	13.89	16.85	30.00	Complies
	5200 MHz	13.72	13.81	16.78	30.00	Complies
	5240 MHz	13.92	13.72	16.83	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	13.59	13.64	16.63	30.00	Complies
	5200 MHz	13.79	13.82	16.82	30.00	Complies
	5240 MHz	13.65	13.53	16.60	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	13.76	13.62	16.70	30.00	Complies
	5230 MHz	13.56	14.14	16.87	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	13.34	12.49	15.95	30.00	Complies

Temperature	24°C	Humidity	65%
Test Engineer	Roki Liu	Test Date	Jan. 18, 2016
Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX		

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11a	5180 MHz	12.36	11.94	11.64	16.76	30.00	Complies
	5200 MHz	12.27	12.14	11.85	16.86	30.00	Complies
	5240 MHz	12.54	12.08	11.58	16.86	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	12.15	12.13	11.72	16.78	30.00	Complies
	5200 MHz	12.19	12.08	11.94	16.84	30.00	Complies
	5240 MHz	12.29	12.06	11.77	16.82	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	12.14	12.05	11.52	16.68	30.00	Complies
	5230 MHz	11.78	12.06	12.03	16.73	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	11.03	10.45	11.02	15.61	30.00	Complies

For Beamforming Mode

Temperature	24°C	Humidity	65%
Test Engineer	Roki Liu	Test Date	Oct. 23, 2015
Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX		

For B1 indoor / B2-B4 indoor, outdoor use

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	18.53	18.19	21.37	27.34	Complies
	5200 MHz	18.74	18.34	21.55	27.34	Complies
	5240 MHz	18.76	18.26	21.53	27.34	Complies
	5260 MHz	17.99	17.91	20.96	21.34	Complies
	5300 MHz	17.95	17.89	20.93	21.34	Complies
	5320 MHz	18.30	18.26	21.29	21.34	Complies
	5500 MHz	17.07	17.06	20.08	21.34	Complies
	5580 MHz	17.91	18.27	21.10	21.34	Complies
	5700 MHz	16.45	17.16	19.83	21.34	Complies
	5745 MHz	15.94	15.52	18.75	27.34	Complies
	5785 MHz	19.16	18.51	21.86	27.34	Complies
	5825 MHz	18.09	17.71	20.91	27.34	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	13.76	13.62	16.70	27.34	Complies
	5230 MHz	17.36	17.77	20.58	27.34	Complies
	5270 MHz	17.42	17.86	20.66	21.34	Complies
	5310 MHz	12.95	12.35	15.67	21.34	Complies
	5510 MHz	13.88	13.71	16.81	21.34	Complies
	5550 MHz	18.42	18.21	21.33	21.34	Complies
	5670 MHz	17.86	18.65	21.28	21.34	Complies
	5755 MHz	14.66	14.65	17.67	27.34	Complies
	5795 MHz	18.47	18.46	21.48	27.34	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	13.34	12.49	15.95	27.34	Complies
	5290 MHz	12.26	11.32	14.83	21.34	Complies
	5530 MHz	11.74	11.75	14.76	21.34	Complies
	5610 MHz	17.84	18.44	21.16	21.34	Complies
	5775 MHz	12.99	13.11	16.06	27.34	Complies

Note1: $Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.66dBi >6dBi, so the B1 B4 limit 30-(8.66-6)=27.34dBm.

Note2: $Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.66dBi >6dBi, so the B2 B3 limit 24-(8.66-6)=21.34dBm.

Straddle Channel

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11ac MCS0/Nss1 VHT20	5720 MHz (UNII 2C)	15.89	16.48	19.21	20.27	Complies
	5720 MHz (UNII 3)	10.25	10.87	13.58	27.34	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz (UNII 2C)	16.40	17.16	19.81	21.34	Complies
	5710 MHz (UNII 3)	5.99	6.92	9.49	27.34	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz (UNII 2C)	15.41	16.07	18.76	21.34	Complies
	5690 MHz (UNII 3)	1.22	2.33	4.82	27.34	Complies

(UNII 2C)

Note1: 5720 MHz limit=11+10log(15.61)=22.93dBm<24dBm, so limit=22.93-(8.66-6)=20.27dBm.

Note2: $Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.66dBi >6dBi, so the limit 24-(8.66-6)=21.34dBm.

(UNII 3)

Note1: $Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.66dBi >6dBi, so the limit 30-(8.66-6)=27.34dBm.

Temperature	24°C	Humidity	65%
Test Engineer	Roki Liu	Test Date	Oct. 23, 2015
Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX		

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	18.18	17.59	17.03	22.40	25.49	Complies
	5200 MHz	18.08	18.02	17.34	22.60	25.49	Complies
	5240 MHz	18.01	17.42	16.97	22.26	25.49	Complies
	5260 MHz	14.51	14.83	14.71	19.46	19.49	Complies
	5300 MHz	14.65	14.81	14.64	19.47	19.49	Complies
	5320 MHz	14.83	14.69	14.51	19.45	19.49	Complies
	5500 MHz	14.49	14.94	14.55	19.44	19.49	Complies
	5580 MHz	13.81	14.53	13.94	18.88	19.49	Complies
	5700 MHz	14.55	14.95	14.04	19.30	19.49	Complies
	5745 MHz	14.12	13.59	13.77	18.60	25.49	Complies
	5785 MHz	18.02	17.71	17.94	22.66	25.49	Complies
	5825 MHz	16.02	16.01	15.94	20.76	25.49	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	12.14	12.05	11.52	16.68	25.49	Complies
	5230 MHz	17.57	17.95	17.15	22.34	25.49	Complies
	5270 MHz	14.77	14.02	14.62	19.25	19.49	Complies
	5310 MHz	10.25	10.01	10.46	15.02	19.49	Complies
	5510 MHz	11.12	10.87	10.76	15.69	19.49	Complies
	5550 MHz	14.62	14.68	14.29	19.30	19.49	Complies
	5670 MHz	14.03	14.84	14.24	19.15	19.49	Complies
	5755 MHz	11.02	10.92	10.82	15.69	25.49	Complies
	5795 MHz	16.92	16.33	17.68	21.78	25.49	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	11.69	11.14	11.72	16.30	25.49	Complies
	5290 MHz	9.38	8.36	8.78	13.63	19.49	Complies
	5530 MHz	10.05	10.08	9.67	14.71	19.49	Complies
	5610 MHz	14.03	15.17	14.55	19.38	19.49	Complies
	5775 MHz	10.38	10.16	9.92	14.93	25.49	Complies

Note1: $$Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$ =10.51dBi >6dBi, so the B1 B4 limit 30-(10.51-6)=25.49dBm.

Note2: $$Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$ =10.51dBi >6dBi, so the B2 B3 limit 24-(10.51-6)=19.49dBm.

Straddle Channel

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11ac MCS0/Nss1 VHT20	5720 MHz (UNII 2C)	13.56	13.16	13.40	18.15	18.47	Complies
	5720 MHz (UNII 3)	8.09	7.57	7.83	12.61	25.49	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz (UNII 2C)	14.60	14.03	13.89	18.96	19.49	Complies
	5710 MHz (UNII 3)	4.32	3.73	3.44	8.62	25.49	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz (UNII 2C)	13.22	14.32	13.55	18.49	19.49	Complies
	5690 MHz (UNII 3)	-0.87	0.51	-0.41	4.55	25.49	Complies

(UNII 2C)

Note1: 5720 MHz limit=11+10log(15.78)=22.98dBm<24dBm, so limit=22.98-(10.51-6)=18.47dBm.

Note2: $$Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$ =10.51dBi >6dBi, so the limit 24-(10.51-6)=19.49dBm.

(UNII 3)

Note1: $$Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$ =10.51dBi >6dBi, so the limit 30-(10.51-6)=25.49dBm.

Temperature	24°C	Humidity	65%
Test Engineer	Roki Liu	Test Date	Jan. 18, 2016
Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi / 2TX		

For outdoor use

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	10.53	10.75	13.65	28.89	Complies
	5200 MHz	10.35	10.82	13.60	28.89	Complies
	5240 MHz	10.77	10.57	13.68	28.89	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	10.67	10.82	13.76	28.89	Complies
	5230 MHz	10.82	10.72	13.78	28.89	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	10.85	10.52	13.70	28.89	Complies

Note: $Directional Gain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.11dBi >6dBi, so the limit 30-(7.11-6)=28.89dBm.

Temperature	24°C	Humidity	65%
Test Engineer	Roki Liu	Test Date	Jan. 18, 2016
Configurations	Chain 1: 5.9dBi, Chain 2: 5.4dBi, Chain 3: 5.9dBi / 3TX		

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	7.52	7.37	6.95	12.06	27.13	Complies
	5200 MHz	7.48	7.39	6.78	12.00	27.13	Complies
	5240 MHz	7.38	7.19	6.53	11.82	27.13	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	6.95	7.51	7.24	12.01	27.13	Complies
	5230 MHz	7.04	7.21	6.95	11.84	27.13	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	7.12	7.36	7.28	12.03	27.13	Complies

Note: $Directional Gain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.87dBi >6dBi, so the limit 30-(8.87-6)=27.13dBm.

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

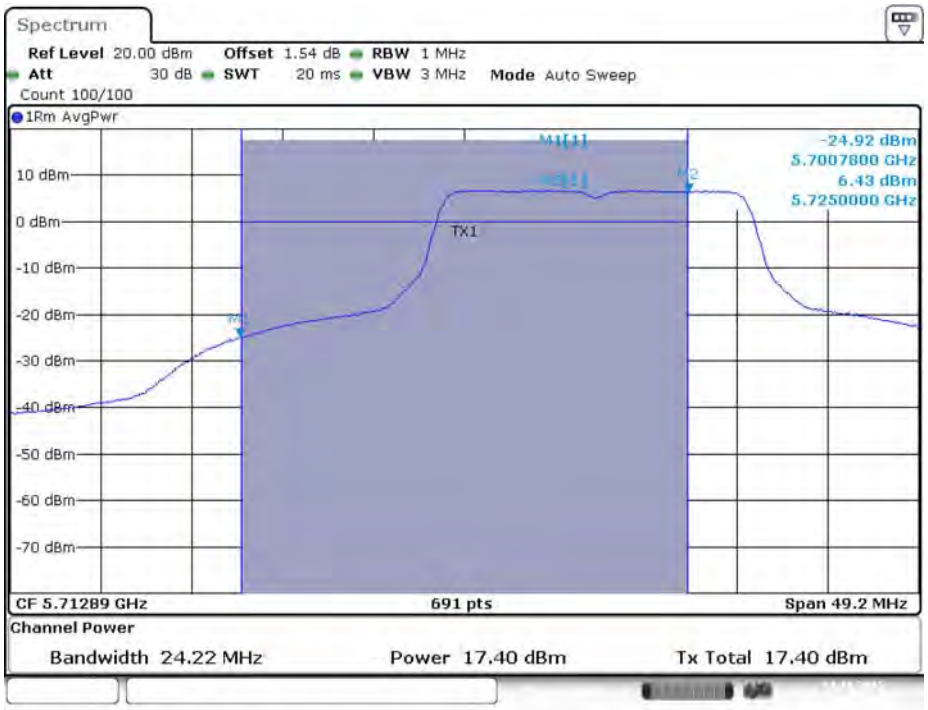
For plots, only the channel with worse result was shown.

For Non-Beamforming Mode / Straddle Channel

For B1 indoor / B2-B4 indoor, outdoor use

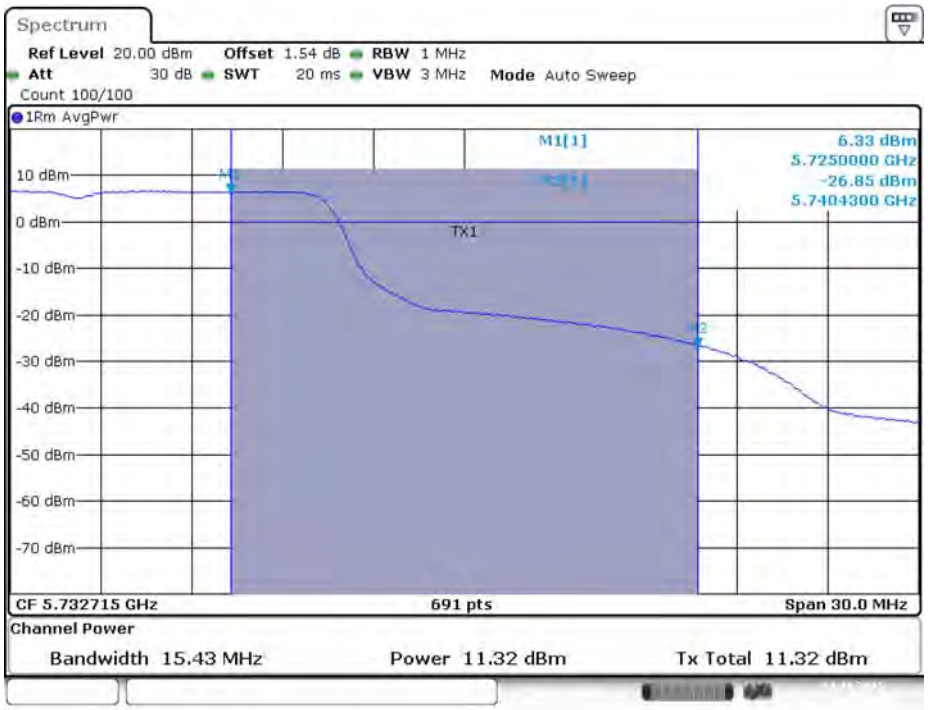
Chain 1: 5.9dBi / 1TX

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



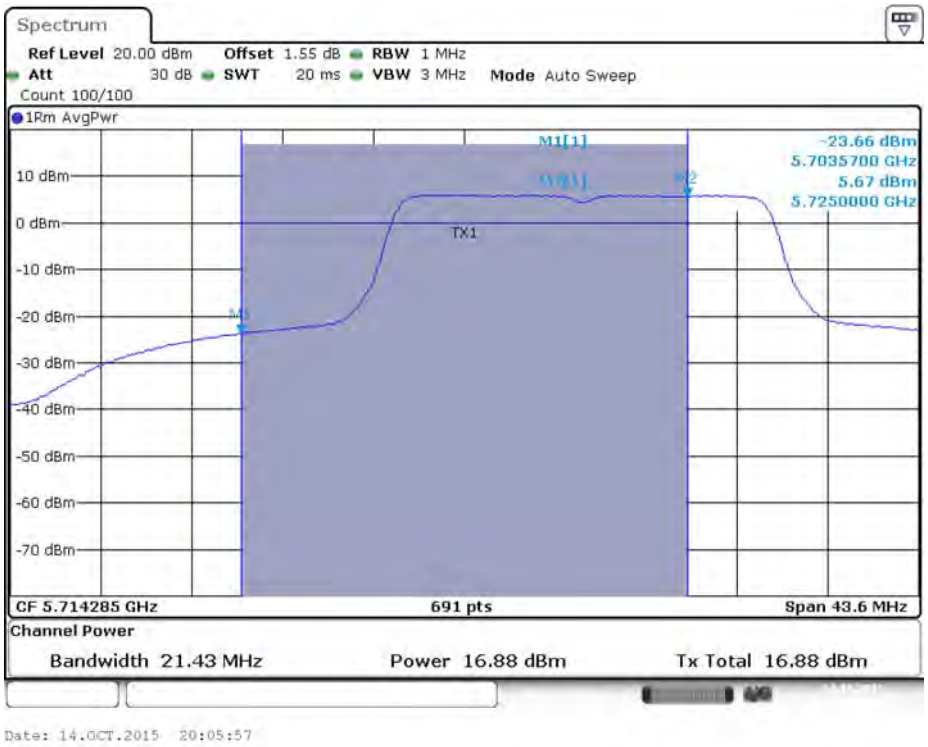
Date: 14.OCT.2015 19:57:47

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

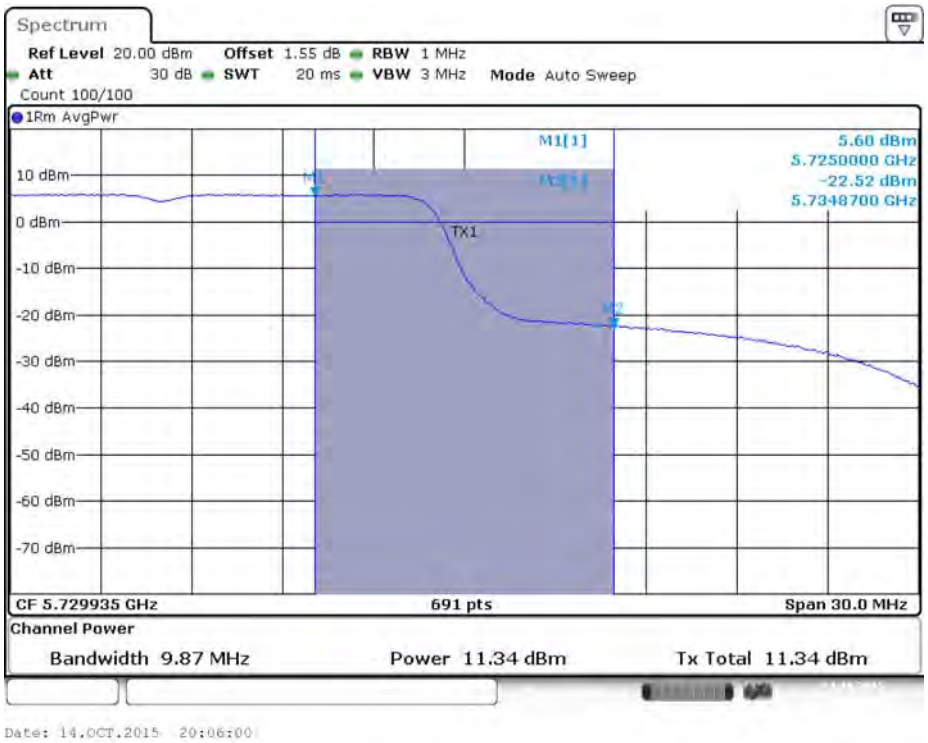


Date: 14.OCT.2015 19:57:50

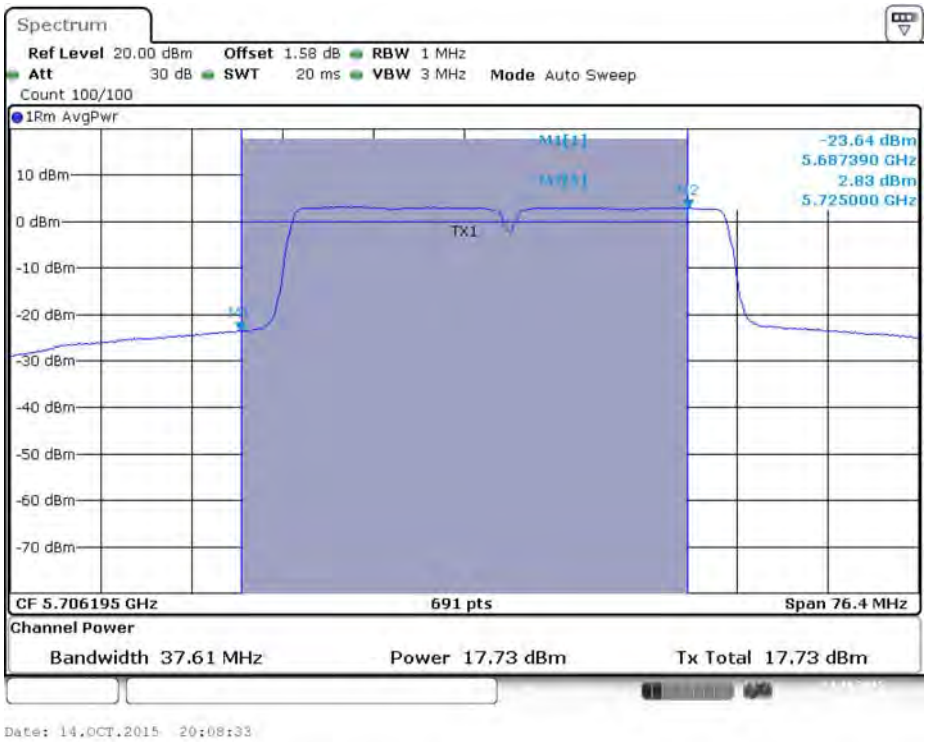
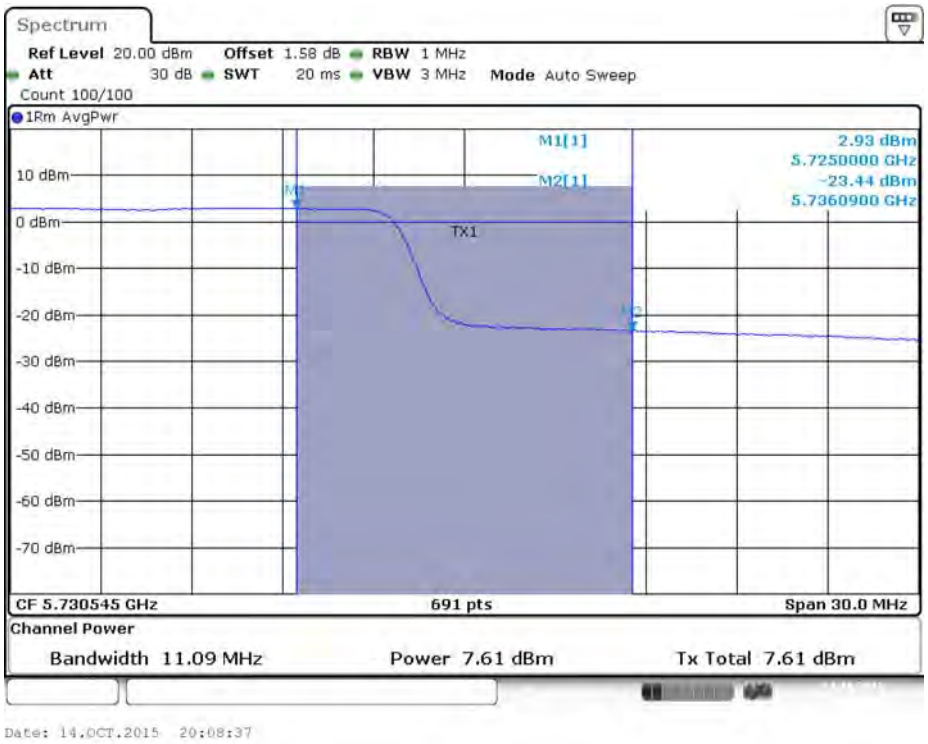
Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5720 MHz (UNII 2C)



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



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



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