

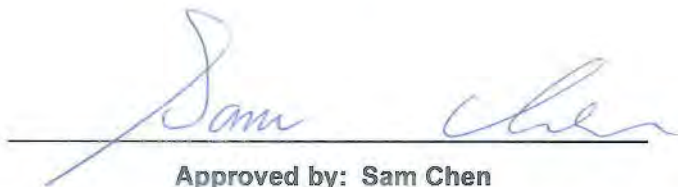
NCC RADIO TEST REPORT

Equipment : 雙頻無線接入點
Brand Name : UBIQUITI
Model Name : UAP-AC-SHD
Applicant : 香港商優比快科技有限公司台灣分公司
臺北市信義區松仁路 107 號 12 樓
Manufacturer : Ubiquiti Networks, Inc.
685 Third Avenue, 27th Floor New York, New York
10017 USA
Standard : NCC LP0002 Section 4.7

The product was received on Jun. 17, 2016, and testing was started from Aug. 05, 2016 and completed on Aug. 06, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures 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 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

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Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2.1	2.3	AC Power Line Conducted Emissions	PASS	-
2.2	4.7.3	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	PASS	-
2.3	4.7.5	6dB Spectrum Bandwidth	PASS	-
2.4	4.7.3	Maximum Conducted Output Power	PASS	-
2.5	4.7.3	Power Spectral Density	PASS	-
2.6	4.7.4	Radiated Emissions	PASS	-
2.7	4.7.4	Band Edge Emissions	PASS	-
2.8	4.7.8	Antenna Requirements	PASS	-
Reference to Sporton Project No.: 661623-07				

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Viola Huang

1. General Information

1.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From PoE
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	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	16 for 20MHz bandwidth;8 for 40MHz bandwidth;4 for 80MHz bandwidth
Channel Bandwidth (99%)	For non-beamforming mode For indoor, outdoor use B2~B3 U-NII-2A: IEEE 802.11a: 15.54 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 16.50 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.18 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 74.39 MHz U-NII-2C: IEEE 802.11a: 15.28 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 16.24 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.47 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz For beamforming mode For indoor, outdoor use B2~B3 U-NII-2A: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.19 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz U-NII-2C: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.19 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz

Maximum Conducted Output Power	For Non-beamforming mode For indoor, outdoor use B2~B3 U-NII-2A: IEEE 802.11a: 18.36 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 18.18 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.18 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 20.69 dBm U-NII-2C: IEEE 802.11a: 18.19 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 18.36 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.20 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 23.81 dBm For beamforming mode For indoor, outdoor use B2~B3 U-NII-2A: IEEE 802.11ac MCS0/Nss1 (VHT20): 17.75 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 17.88 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.47 dBm U-NII-2C: IEEE 802.11ac MCS0/Nss1 (VHT20): 17.36 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 17.36 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.89 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

Note: The above information was declared by manufacturer.

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

Antenna and Bandwidth

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

IEEE 11n/ac Spec.

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

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

Then EUT supports HT20 and HT40.

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

Note 3: Modulation modes consist of below configuration:

HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

1.2. Accessories

Equipment Name	Brand Name	Model Name	P/N	Rating
PoE	UBIQUITI	GP-H480-050G	POE-48-24W-G-WH	Input: 100-240V~50/60Hz, MAX 0.75A(0.75A) Output: 48V, 0.5A(0.5A)
Others				
Equipment Name		Brand Name	Model Name	Remark
Power cable*1		UBIQUITI	CH-1902+CH-1106	Non-shielded, 0.6m
Cradle*1 (plastic)				
Cradle*1 (iron)				

1.3. Table for Filed Antenna

For 2.4GHz WLAN function

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

For 5GHz WLAN function

Ant.	Port	Brand	Model Name	Antenna Type	Connector	TX/RX Gain (dBi)
5	1	-	-	PIFA Antenna	N/A	6
6	2	-	-	PIFA Antenna	N/A	6
7	3	-	-	PIFA Antenna	N/A	6
8	4	-	-	PIFA Antenna	N/A	6

For Bluetooth function

Ant.	Port	Brand	Model Name	Antenna Type	Connector	TX/RX Gain (dBi)
9	1	-	-	PIFA Antenna	N/A	1

For RX function

Ant.	Port	Brand	Model Name	Antenna Type	Connector	RX Gain (dBi)	
						2.4GHz	5GHz
10	1	-	-	PIFA Antenna	N/A	1	2

Note: The above information was declared by manufacturer.

Note: The EUT has ten antennas.

For 2.4GHz WLAN function

IEEE 802.11b/g/n/ac mode (4TX/4RX): The module has four ports.

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

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

For 5GHz WLAN function

IEEE 802.11a/n/ac mode (4TX/4RX): The module has four ports.

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

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

For Bluetooth function: The module has one port only.

Port 1 can be used as transmitting/receiving antenna.

For RX function (scan radio): The module has one port only.

Only Port 1 can be used as receiving antenna.

1.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144.

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

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

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5250~5350 MHz U-NII-2A	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz U-NII-2C	100	5500 MHz	124	5620 MHz
	102	5510 MHz	126	5630 MHz
	104	5520 MHz	128	5640 MHz
	106	5530 MHz	132	5660 MHz
	108	5540 MHz	134	5670 MHz
	110	5550 MHz	136	5680 MHz
	112	5560 MHz	138	5690 MHz
	116	5580 MHz	140	5700 MHz
	118	5590 MHz	142	5710 MHz
	120	5600 MHz	144	5720 MHz
	122	5610 MHz	-	-

1.5. 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	Port
AC Power Conducted Emission	Intentional-CTX		-	-	-
	Unintentional-CRX		-	-	-
Max. Conducted Output Power	For non-beamforming mode				
	11a/BPSK	U-NII-2A U-NII-2C	6Mbps	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT20	U-NII-2A U-NII-2C	MCS0/Nss1	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT40	U-NII-2A U-NII-2C	MCS0/Nss1	54/62/ 102/110/134/142	1+2+3+4
	11ac VHT80	U-NII-2A U-NII-2C	MCS0/Nss1	58/106/122/138	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-2A U-NII-2C	MCS0/Nss1	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT40	U-NII-2A U-NII-2C	MCS0/Nss1	54/62/ 102/110/134/142	1+2+3+4
	11ac VHT80	U-NII-2A U-NII-2C	MCS0/Nss1	58/106/122/138	1+2+3+4

Power Spectral Density	For non-beamforming mode				
	11a/BPSK	U-NII-2A U-NII-2C	6Mbps	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT20	U-NII-2A U-NII-2C	MCS0/Nss1	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT40	U-NII-2A U-NII-2C	MCS0/Nss1	54/62/ 102/110/134/142	1+2+3+4
	11ac VHT80	U-NII-2A U-NII-2C	MCS0/Nss1	58/106/122/138	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-2A U-NII-2C	MCS0/Nss1	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT40	U-NII-2A U-NII-2C	MCS0/Nss1	54/62/ 102/110/134/142	1+2+3+4
	11ac VHT80	U-NII-2A U-NII-2C	MCS0/Nss1	58/106/122/138/	1+2+3+4
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	For non-beamforming mode				
	11a/BPSK	U-NII-2A U-NII-2C	6Mbps	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT20	U-NII-2A U-NII-2C	MCS0/Nss1	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT40	U-NII-2A U-NII-2C	MCS0/Nss1	54/62/ 102/110/134/142	1+2+3+4
	11ac VHT80	U-NII-2A U-NII-2C	MCS0/Nss1	58/106/122/138	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-2A U-NII-2C	MCS0/Nss1	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT40	U-NII-2A U-NII-2C	MCS0/Nss1	54/62/ 102/110/134/142	1+2+3+4
	11ac VHT80	U-NII-2A U-NII-2C	MCS0/Nss1	58/106/122/138/	1+2+3+4

6dB Spectrum Bandwidth Measurement	For non-beamforming mode				
	11a/BPSK	U-NII-3	6Mbps	144	1+2+3+4
	11ac VHT20	U-NII-3	MCS0/Nss1	144	1+2+3+4
	11ac VHT40	U-NII-3	MCS0/Nss1	142	1+2+3+4
	11ac VHT80	U-NII-3	MCS0/Nss1	138	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-3	MCS0/Nss1	144	1+2+3+4
	11ac VHT40	U-NII-3	MCS0/Nss1	142	1+2+3+4
	11ac VHT80	U-NII-3	MCS0/Nss1	138	1+2+3+4
Radiated Emission Below 1GHz	Intentional-CTX		-	-	-
	Unintentional-CRX		-	-	-
Radiated Emission Unintentional 1GHz~5 th Harmonic	Unintentional-CRX		-	-	-
Radiated Emission Intentional 1GHz~10 th Harmonic	For non-beamforming mode				
	11a/BPSK	U-NII-2A U-NII-2C	6Mbps	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT20	U-NII-2A U-NII-2C	MCS0/Nss1	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT40	U-NII-2A U-NII-2C	MCS0/Nss1	54/62/ 102/110/134/142	1+2+3+4
	11ac VHT80	U-NII-2A U-NII-2C	MCS0/Nss1	58/106/122/138/	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-2A U-NII-2C	MCS0/Nss1	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT40	U-NII-2A U-NII-2C	MCS0/Nss1	54/62/ 102/110/134/142	1+2+3+4
	11ac VHT80	U-NII-2A U-NII-2C	MCS0/Nss1	58/106/122/138/	1+2+3+4

Band Edge Emission	For non-beamforming mode				
	11a/BPSK	U-NII-2A U-NII-2C	6Mbps	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT20	U-NII-2A U-NII-2C	MCS0/Nss1	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT40	U-NII-2A U-NII-2C	MCS0/Nss1	54/62/ 102/110/134/142	1+2+3+4
	11ac VHT80	U-NII-2A U-NII-2C	MCS0/Nss1	58/106/122/138	1+2+3+4
	For beamforming mode				
	11ac VHT20	U-NII-2A U-NII-2C	MCS0/Nss1	52/60/64/100/ 116/140/144	1+2+3+4
	11ac VHT40	U-NII-2A U-NII-2C	MCS0/Nss1	54/62/ 102/110/134/142	1+2+3+4
	11ac VHT80	U-NII-2A U-NII-2C	MCS0/Nss1	58/106/122/138	1+2+3+4

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

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

Note 3: The EUT supports P to M and P to P operating mode. After evaluating, the P to M is the worst operating mode. And it was tested and recorded in the report.

The following test modes were performed for all tests:

For Conducted Emission test:

Intentional-CTX

Mode 1. EUT + 2.4GHz

Mode 2. EUT + 5GHz

Mode 3. EUT + Bluetooth

Mode 3 generated the worst test result, so it was recorded in this report.

Unintentional-CRX

Mode 1. EUT + 2.4GHz

Mode 2. EUT + 5GHz

Mode 3. EUT + Bluetooth

Mode 4. EUT + RX (scan radio_2.4GHz) function

Mode 5. EUT + RX (scan radio_5GHz) function

Mode 5 generated the worst test result, so it was recorded in this report.

For Radiated Emission test (Below 1GHz):

For 2.4GHz / 5GHz / RX (scan radio_2.4GHz) function

The EUT was performed at Y axis and Z axis position. The worst case was found at Z axis, thus the measurement will follow this same test configuration.

For Bluetooth / RX (scan radio_5GHz) function

The EUT was performed at Y axis and Z axis position. The worst case was found at Y axis, thus the measurement will follow this same test configuration.

Intentional-CTX

Mode 1. EUT in Z axis + 2.4GHz

Mode 2. EUT in Z axis + 5GHz

Mode 3. EUT in Y axis + Bluetooth

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

Unintentional-CRX

Mode 1. EUT in Z axis + 2.4GHz

Mode 2. EUT in Z axis + 5GHz

Mode 3. EUT in Y axis + Bluetooth

Mode 4. EUT in Z axis + RX (scan radio_2.4GHz) function

Mode 5. EUT in Y axis + RX (scan radio_5GHz) function

Mode 3 generated the worst test result, so it was recorded in this report.

For Radiated Emission test (Unintentional 1GHz~5th Harmonic):

For 2.4GHz / 5GHz / RX (scan radio_2.4GHz) function

The EUT was performed at Y axis and Z axis position. The worst case was found at Z axis, thus the measurement will follow this same test configuration.

For Bluetooth / RX (scan radio_5GHz) function

The EUT was performed at Y axis and Z axis position. The worst case was found at Y axis, thus the measurement will follow this same test configuration.

Mode 1. EUT in Z axis + 2.4GHz

Mode 2. EUT in Z axis + 5GHz

Mode 3. EUT in Y axis + Bluetooth

Mode 4. EUT in Z axis + RX (scan radio_2.4GHz) function

Mode 5. EUT in Y axis + RX (scan radio_5GHz) function

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

For Radiated Emission test (Intentional 1GHz~10th Harmonic):

The EUT was performed at Y axis and Z axis position. The worst case was found at Z axis, thus the measurement will follow this same test configuration.

Mode 1. EUT in Z axis

1.6. Table for Testing Locations

Test Site Location		
For other tests		
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	
For below 1GHz test		
Address:	No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)	
TEL:	886-3-327-3456	
FAX:	886-3-327-0973	
Test Site No.	Site Category	Location
03CH05-CB	SAC	Hsin Chu
CO01-CB	Conduction	Hsin Chu
TH01-CB	OVEN Room	Hsin Chu
03CH03-HY	SAC	Hwa Ya

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

1.7. Table for Supporting Units

For Conduction (Intentional-CTX / Unintentional-CRX)

No.	Equipment	Brand Name	Model Name	FCC ID
A	LAN Notebook	DELL	E6430	N/A

For SAC (Below 1GHz: Intentional-CTX / Unintentional-CRX)

No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E5520	N/A

For SAC (Above 1GHz: Unintentional 1GHz~5th-CRX)

No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A

For SAC (Above 1GHz: Intentional 1GHz~10th-CTX)

For non-beamforming mode

No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A

For beamforming mode

No.	Equipment	Brand Name	Model Name	FCC ID
A	NB*2	DELL	E4300	N/A
B	RX Device	UBIQUITI	UAP-AC-SHD	SWX-UAPACSHD

For OVEN Room:

No.	Equipment	Brand Name	Model Name	FCC ID
A	Notebook	DELL	E4300	N/A
B	Fixture	UBIQUITI	UAP-AC-HD_REV03	N/A

1.8. 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 indoor, outdoor use B2~B3

Test Software Version	QCA						
Mode	Test Frequency (MHz)						
	NCB: 20MHz						
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz
802.11a	10.5	10.5	10.5	10.5	10.5	10.5	10.5
802.11ac MCS0/Nss1 VHT20	10.5	10.5	10.5	11	11	11	11
Mode	NCB: 40MHz						
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz	
	13.5	13.5	12.5	14	13.5	14	
Mode	NCB: 80MHz						
802.11ac MCS0/Nss1 VHT80	5290 MHz		5530 MHz		5610 MHz		5690 MHz
	13		11		15.5		17

For beamforming mode

For indoor, outdoor use B2~B3

Test Software Version	QCA v3.0.197.0						
Mode	Test Frequency (MHz)						
	NCB: 20MHz						
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz
802.11ac MCS0/Nss1 VHT20	16.5	16.5	16.5	16.5	16.5	16.5	17
Mode	NCB: 40MHz						
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz	
	16.5	16.5	16.5	16.5	16.5	17.5	
Mode	NCB: 80MHz						
802.11ac MCS0/Nss1 VHT80	5290 MHz		5530 MHz		5610 MHz		5690 MHz
	16.5		15		16.5		17.5

1.9. 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 7 were executed.

The program was executed as follows:

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

1.10. Duty Cycle

For non-beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Min. VBW (kHz)
802.11a	2.060	2.140	96.26%	0.17	0.49
802.11ac MCS0/Nss1 VHT20	5.000	5.120	97.66%	0.10	0.20
802.11ac MCS0/Nss1 VHT40	2.400	2.500	96.00%	0.18	0.42
802.11ac MCS0/Nss1 VHT80	1.140	1.215	93.83%	0.28	0.88

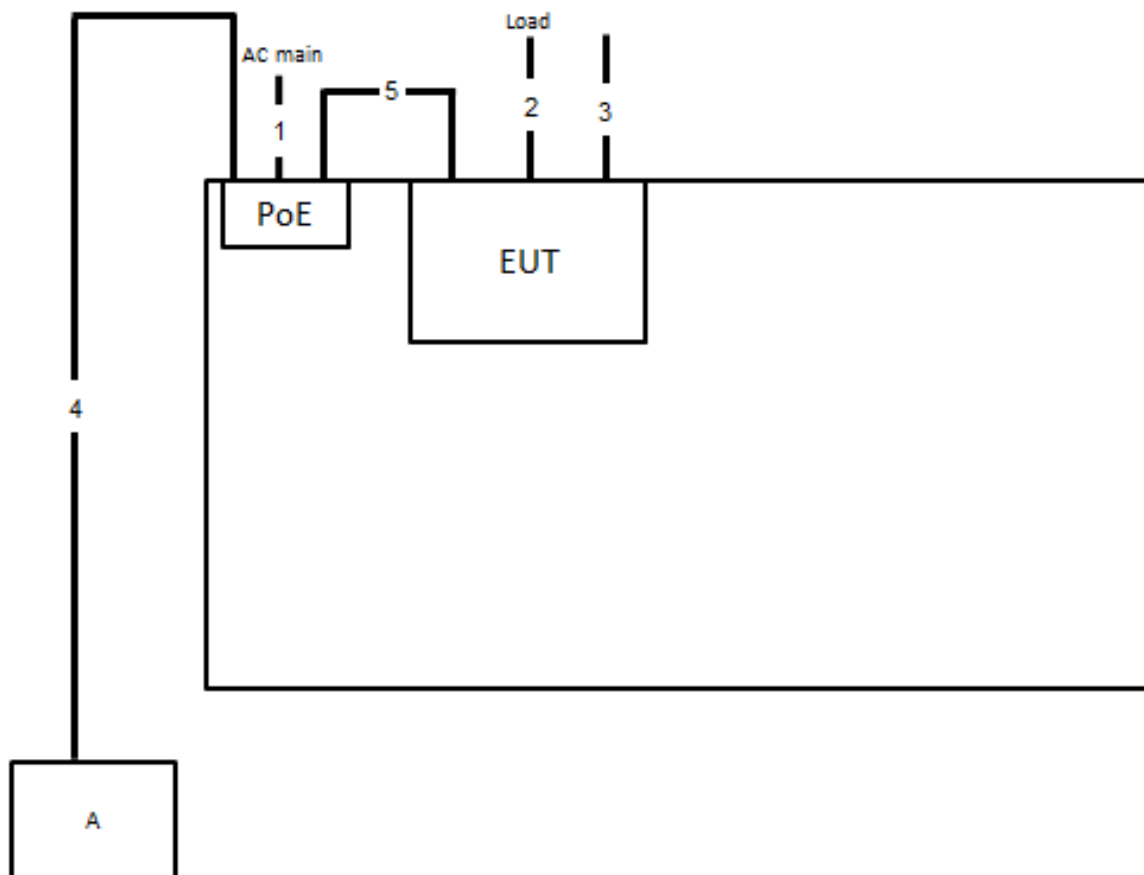
For beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Min. VBW (kHz)
802.11ac MCS0/Nss1 VHT20	1.830	1.933	94.70%	0.24	0.55
802.11ac MCS0/Nss1 VHT40	1.663	1.863	89.26%	0.49	0.60
802.11ac MCS0/Nss1 VHT80	1.947	2.127	91.54%	0.38	0.51

1.11. Test Configurations

1.11.1. AC Power Line Conduction Emissions Test Configuration

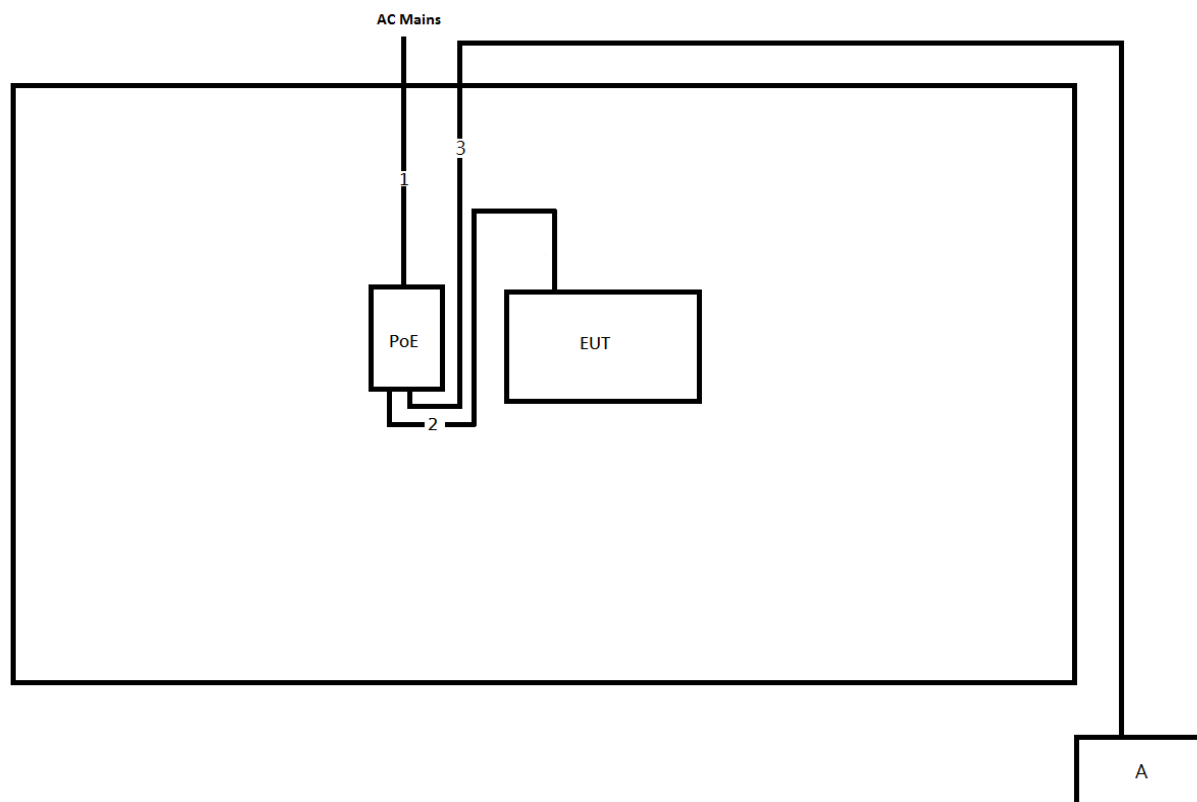
For Intentional-CTX / Unintentional-CRX



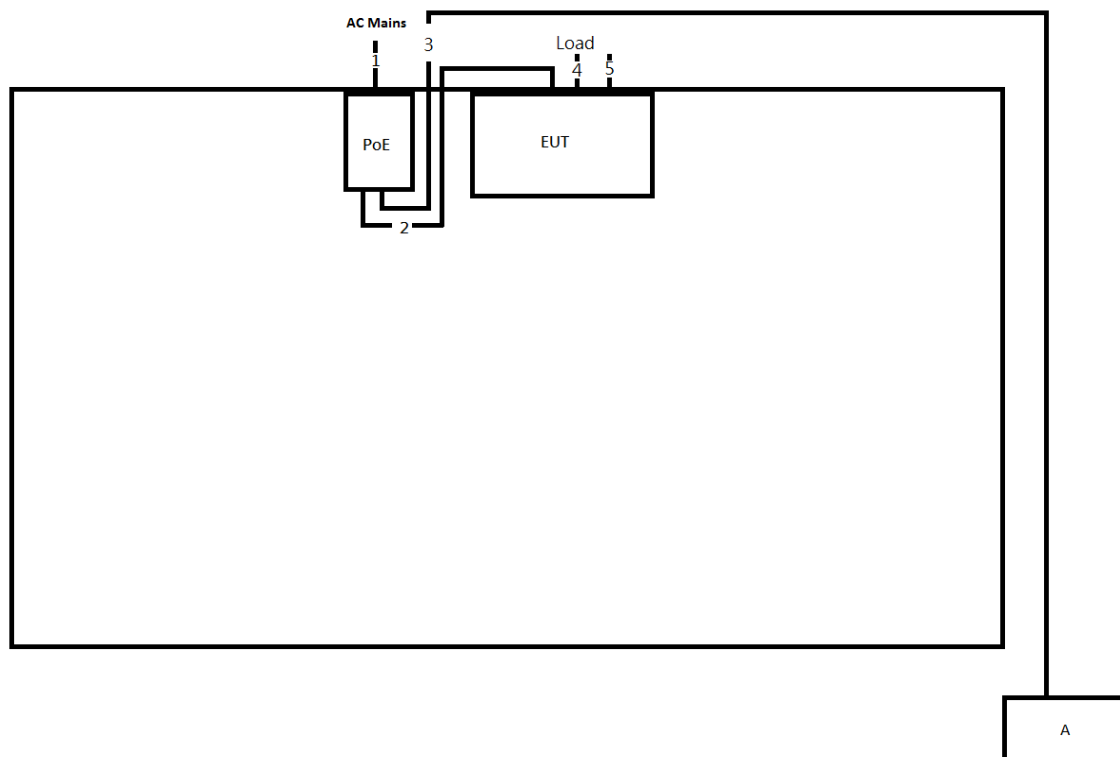
Item	Connection	Shielded	Length	Brand	Model No.
1	Power cable	No	0.6m	-	-
2	RJ-45 cable	No	1.5m	Powersync	CLN5GBR9020
3	USB cable	Yes	2m	BENEVO	BUSB0150AMMB
4	RJ-45 cable	No	10m	-	-
5	RJ-45 cable	No	1.5m	Powersync	CLN5GBR9020

1.11.2. Radiation Emissions Test Configuration

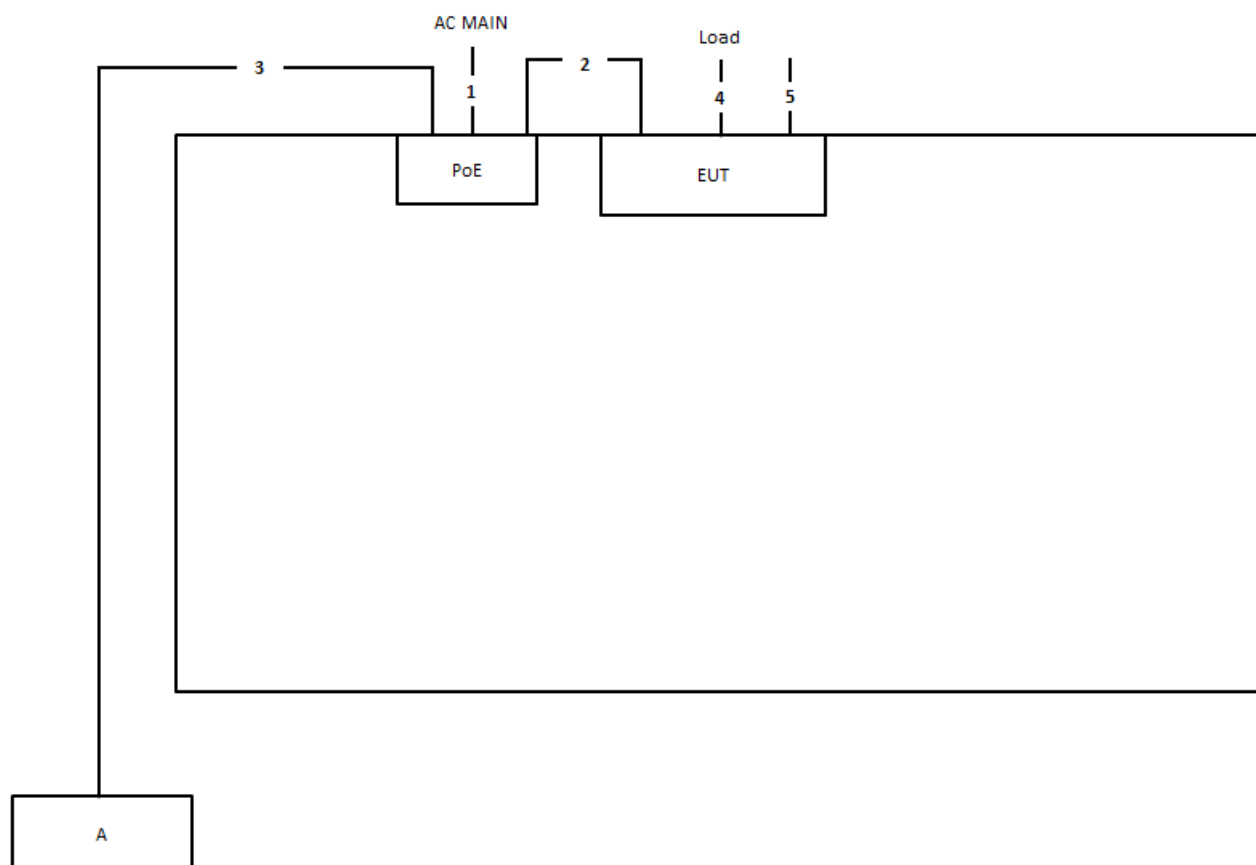
Test Configuration: 30MHz ~1GHz / For Intentional-CTX



Item	Connection	Shielded	Length	Brand	Model No.
1	Power cable	No	0.6m	-	-
2	RJ-45 cable	No	1m	Power Sync	CAT6E-01
3	RJ-45 cable	No	10 m	-	-

For Unintentional-CRX


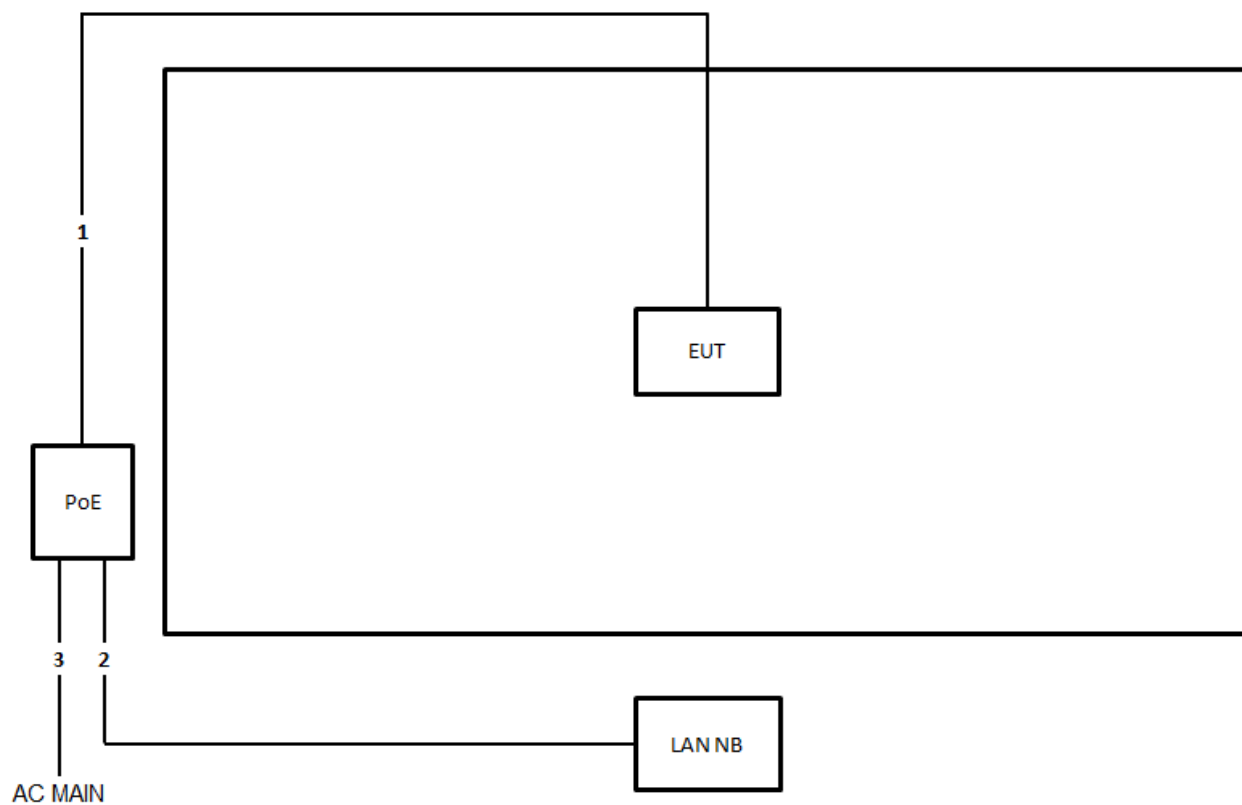
Item	Connection	Shielded	Length	Brand	Model No.
1	Power cable	No	0.6m	-	-
2	RJ-45 cable	No	1m	Power Sync	CAT6E-01
3	RJ-45 cable	No	10m	-	-
4	RJ-45 cable	No	2m	Power Sync	CAT6E-02
5	USB cable	Yes	1.2m	Hawk	04-HTE120RD

Test Configuration: above 1GHz test Unintentional 1GHz~5th-CRX


Item	Connection	Shielded	Length	Brand	Model No.
1	Power cable	No	0.6m	-	-
2	RJ-45 cable	No	1.5m	PowerSync	C65B10FL
3	RJ-45 cable	No	10m	-	-
4	RJ-45 cable	No	1.5m	PowerSync	C65B10FL
5	USB cable	Yes	2m	MYCE II	R.Link II

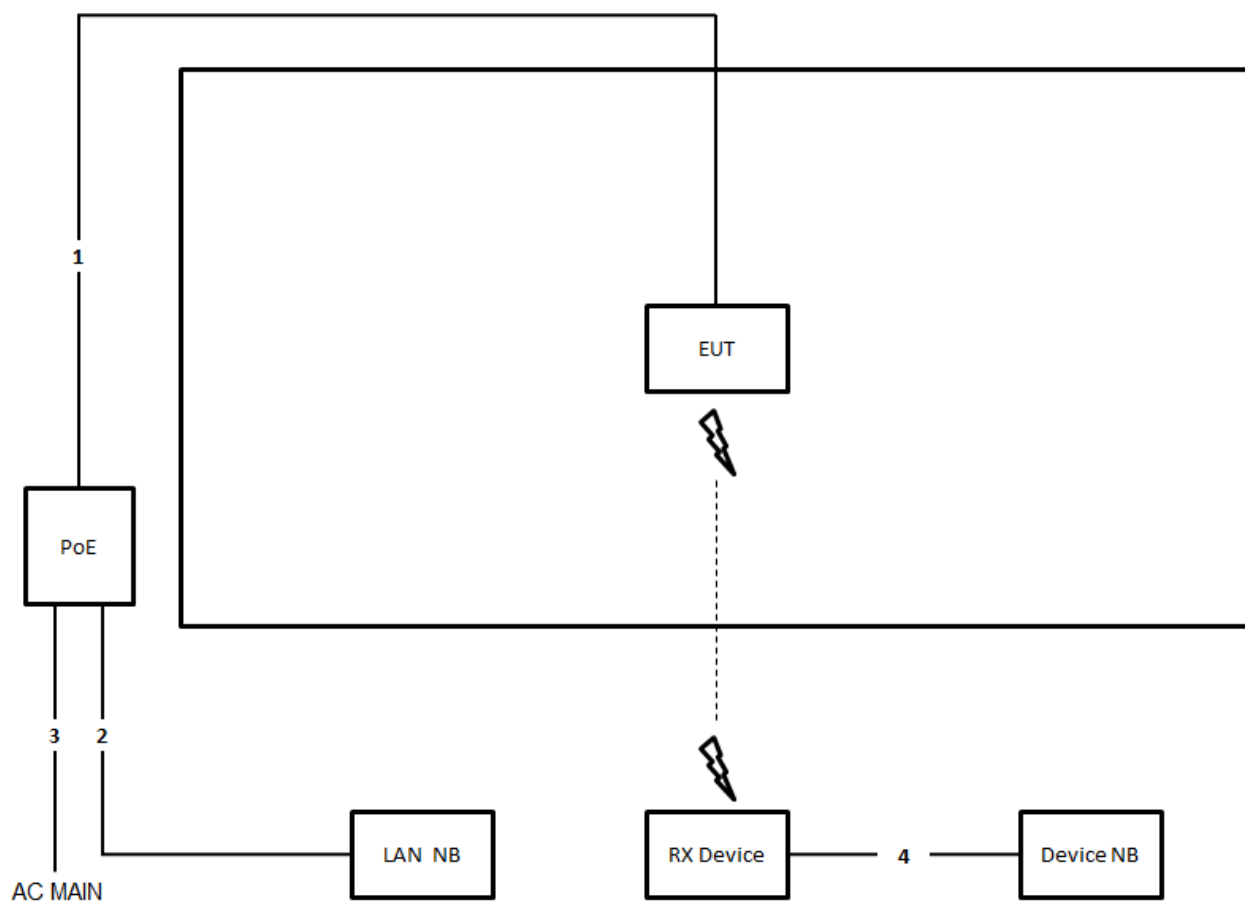
Test Configuration: above 1GHz test Intentional 1GHz~10th-CTX

For non-beamforming mode



Item	Connection	Shielded	Length	Brand	Model No.
1	RJ-45 cable	No	10m	PowerSync	C65B10FL
2	RJ-45 cable	No	1.5m	-	-
3	Power cable	No	0.6m	-	-

For beamforming mode



Item	Connection	Shielded	Length	Brand	Model No.
1	RJ-45 cable	No	10m	PowerSync	C65B10FL
2	RJ-45 cable	No	1.5m	-	-
3	Power cable	No	0.6m	-	-
4	RJ-45 cable	No	1.5m	-	-

2. Test Result

2.1. AC Power Line Conducted Emissions Measurement

2.1.1. 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

2.1.2. Measuring Instruments and Setting

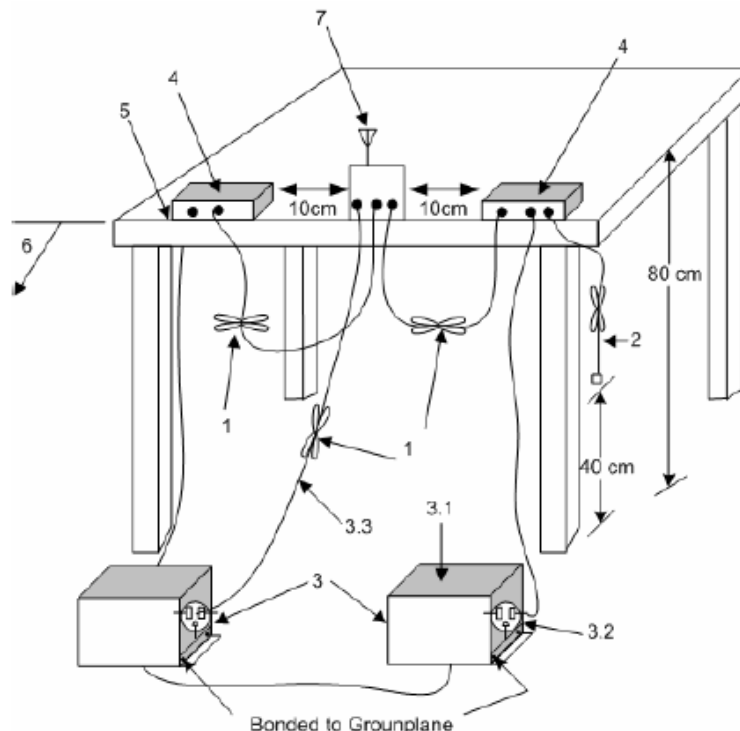
Please refer to section 3 of equipments list in this report. The following table is the setting of the receiver.

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

2.1.3. 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.

2.1.4. Test Setup Layout



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 cm to 40 cm long.

2—The I/O cables that are not connected to an accessory 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 loads. LISN may be placed on top of, or immediately beneath, reference ground plane.

3.1—All other equipment powered from additional LISN(s).

3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.

3.3—LISN at least 80 cm from nearest part of EUT chassis.

4—Non-EUT components of EUT system being tested.

5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.

6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

2.1.5. Test Deviation

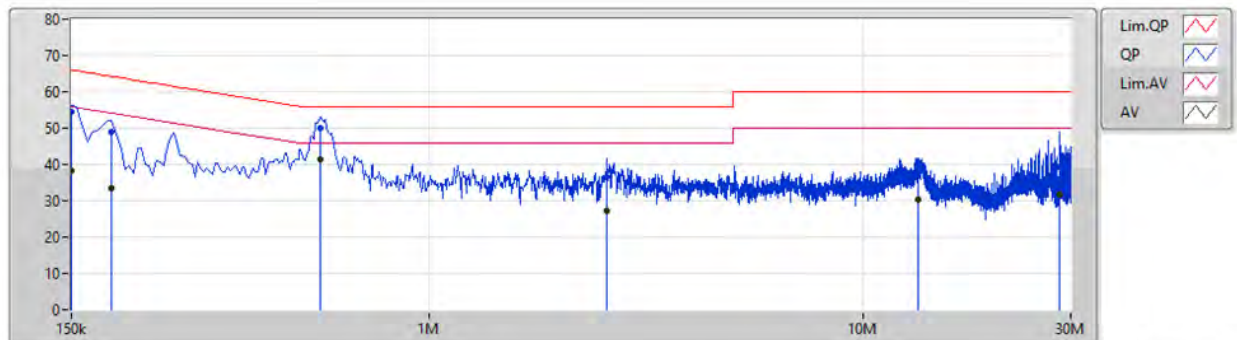
There is no deviation with the original standard.

2.1.6. EUT Operation during Test

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

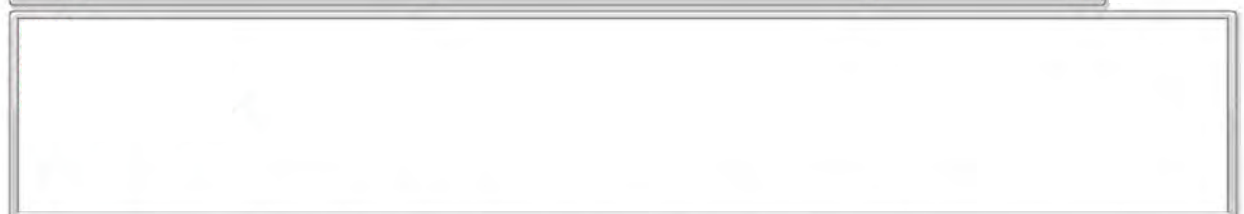
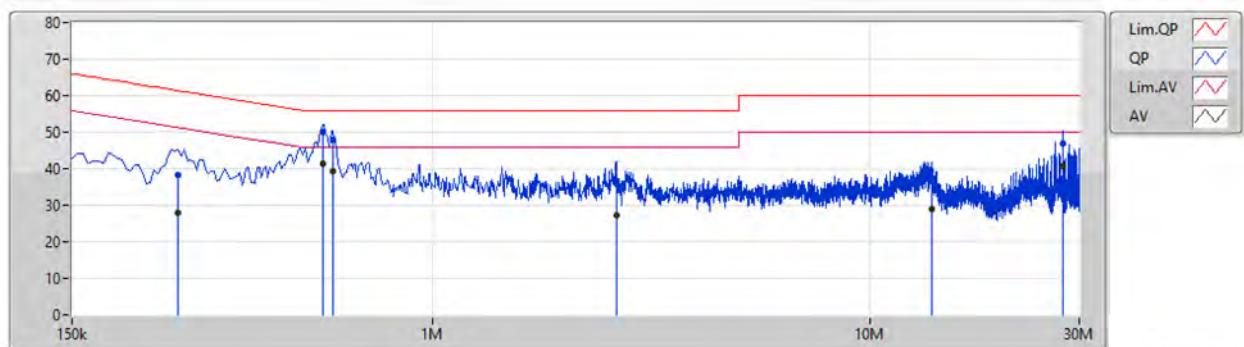
2.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23.9~24.3°C	Humidity	58~59%
Test Engineer	Max Lin	Phase	Line
Configuration	Intentional-CTX	Test Mode	Mode 3
Test date	Jun. 08, 2019		



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)
QP	150k	54.58	66.00	-11.42	9.90	Line	-	44.68	0.05	0.06	9.79
AV	150k	38.39	56.00	-17.61	9.90	Line	-	28.49	0.05	0.06	9.79
QP	186k	48.94	64.20	-15.26	9.91	Line	-	39.03	0.06	0.06	9.79
AV	186k	33.56	54.20	-20.64	9.91	Line	-	23.65	0.06	0.06	9.79
QP	559.5k	50.12	56.00	-5.88	9.94	Line	-	40.18	0.06	0.07	9.81
AV	559.5k	41.30	46.00	-4.70	9.94	Line	"Worst"	31.36	0.06	0.07	9.81
QP	2.567M	36.52	56.00	-19.48	10.06	Line	-	26.46	0.10	0.14	9.82
AV	2.567M	27.33	46.00	-18.67	10.06	Line	-	17.27	0.10	0.14	9.82
QP	13.371M	38.14	60.00	-21.86	10.38	Line	-	27.76	0.24	0.22	9.92
AV	13.371M	30.38	50.00	-19.62	10.38	Line	-	20.00	0.24	0.22	9.92
QP	28.181M	39.37	60.00	-20.63	10.72	Line	-	28.65	0.35	0.33	10.04
AV	28.181M	31.56	50.00	-18.44	10.72	Line	-	20.84	0.35	0.33	10.04

Temperature	23.9~24.3°C	Humidity	58~59%
Test Engineer	Max Lin	Phase	Neutral
Configuration	Intentional-CTX	Test Mode	Mode 3
Test date	Jun. 08, 2019		

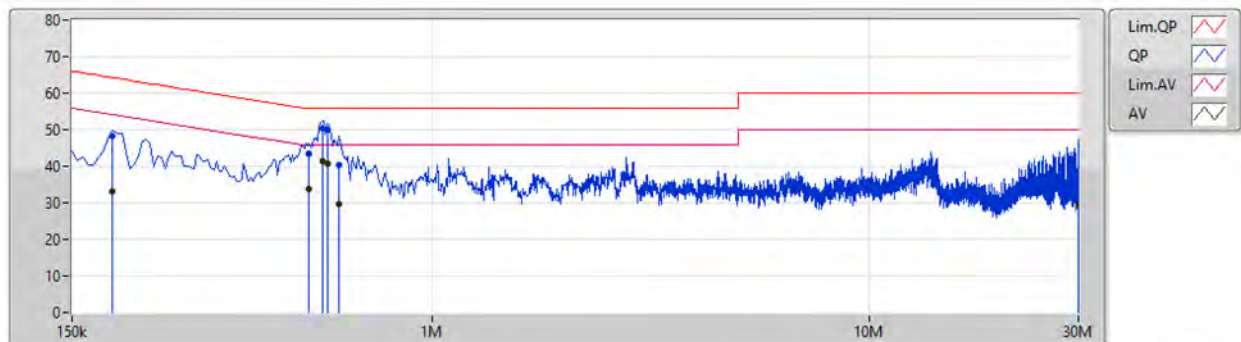


Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	262.5k	38.12	61.35	-23.23	9.90	Neutral	-	28.22	0.04	0.06	9.80			
AV	262.5k	27.78	51.35	-23.57	9.90	Neutral	-	17.88	0.04	0.06	9.80			
QP	559.5k	50.15	56.00	-5.85	9.93	Neutral	-	40.22	0.05	0.07	9.81			
AV	559.5k	41.31	46.00	-4.69	9.93	Neutral	"Worst"	31.38	0.05	0.07	9.81			
QP	591k	48.07	56.00	-7.93	9.93	Neutral	-	38.14	0.05	0.07	9.81			
AV	591k	39.27	46.00	-6.73	9.93	Neutral	-	29.34	0.05	0.07	9.81			
QP	2.625M	36.62	56.00	-19.38	10.04	Neutral	-	26.58	0.08	0.14	9.82			
AV	2.625M	27.09	46.00	-18.91	10.04	Neutral	-	17.05	0.08	0.14	9.82			
QP	13.826M	36.53	60.00	-23.47	10.36	Neutral	-	26.17	0.22	0.22	9.92			
AV	13.826M	28.96	50.00	-21.04	10.36	Neutral	-	18.60	0.22	0.22	9.92			
QP	27.438M	46.94	60.00	-13.06	10.72	Neutral	-	36.22	0.35	0.33	10.04			
AV	27.438M	40.76	50.00	-9.24	10.72	Neutral	-	30.04	0.35	0.33	10.04			

Note:

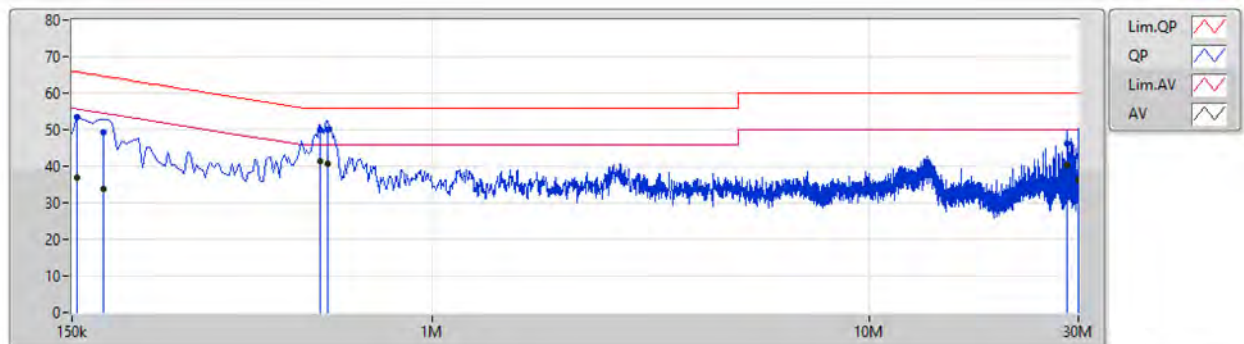
Level = Read Level + LISN Factor + Cable Loss.

Temperature	23.9~24.3°C	Humidity	58~59%
Test Engineer	Max Lin	Phase	Line
Configuration	Unintentional-CRX	Test Mode	Mode 5
Test date	Jun. 08, 2019		



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	186k	48.13	64.20	-16.07	9.91	Line	-	38.22	0.06	0.06	9.79			
AV	186k	33.02	54.20	-21.18	9.91	Line	-	23.11	0.06	0.06	9.79			
QP	523.5k	43.36	56.00	-12.64	9.94	Line	-	33.42	0.06	0.07	9.81			
AV	523.5k	33.78	46.00	-12.22	9.94	Line	-	23.84	0.06	0.07	9.81			
QP	559.5k	50.29	56.00	-5.71	9.94	Line	-	40.35	0.06	0.07	9.81			
AV	559.5k	41.55	46.00	-4.45	9.94	Line	"Worst"	31.61	0.06	0.07	9.81			
QP	577.5k	49.92	56.00	-6.08	9.94	Line	-	39.98	0.06	0.07	9.81			
AV	577.5k	40.70	46.00	-5.30	9.94	Line	-	30.76	0.06	0.07	9.81			
QP	613.5k	40.23	56.00	-15.77	9.94	Line	-	30.29	0.06	0.07	9.81			
AV	613.5k	29.70	46.00	-16.30	9.94	Line	-	19.76	0.06	0.07	9.81			
QP	29.918M	38.53	60.00	-21.47	10.72	Line	-	27.81	0.36	0.31	10.05			
AV	29.918M	29.18	50.00	-20.82	10.72	Line	-	18.46	0.36	0.31	10.05			

Temperature	23.9~24.3°C	Humidity	58~59%
Test Engineer	Max Lin	Phase	Neutral
Configuration	Unintentional-CRX	Test Mode	Mode 5
Test date	Jun. 08, 2019		



Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Factor (dB)	Condition	Comment	Raw (dBuV)	AF (dB)	CL (dB)	AT (dB)			
QP	154.5k	53.41	65.75	-12.34	9.89	Neutral	-	43.52	0.04	0.06	9.79			
AV	154.5k	37.04	55.75	-18.71	9.89	Neutral	-	27.15	0.04	0.06	9.79			
QP	177k	49.47	64.62	-15.15	9.89	Neutral	-	39.58	0.04	0.06	9.79			
AV	177k	33.83	54.62	-20.79	9.89	Neutral	-	23.94	0.04	0.06	9.79			
QP	555k	49.84	56.00	-6.16	9.93	Neutral	-	39.91	0.05	0.07	9.81			
AV	555k	41.25	46.00	-4.75	9.93	Neutral	"Worst"	31.32	0.05	0.07	9.81			
QP	577.5k	49.98	56.00	-6.02	9.93	Neutral	-	40.05	0.05	0.07	9.81			
AV	577.5k	40.86	46.00	-5.14	9.93	Neutral	-	30.93	0.05	0.07	9.81			
QP	28.176M	46.15	60.00	-13.85	10.73	Neutral	-	35.42	0.36	0.33	10.04			
AV	28.176M	40.29	50.00	-9.71	10.73	Neutral	-	29.56	0.36	0.33	10.04			
QP	29.913M	42.85	60.00	-17.15	10.74	Neutral	-	32.11	0.38	0.31	10.05			
AV	29.913M	36.24	50.00	-13.76	10.74	Neutral	-	25.50	0.38	0.31	10.05			

Note:

Level = Read Level + LISN Factor + Cable Loss.

2.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

2.2.1. Limit

No restriction limits.

2.2.2. Measuring Instruments and Setting

Please refer to section 3 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

2.2.3. 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%.

2.2.4. Test Setup Layout

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

This test setup layout is the same as that shown in section 2.6.4.

2.2.5. Test Deviation

There is no deviation with the original standard.

2.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

For indoor, outdoor use B2~B3

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5260 MHz	17.04	15.11
	5300 MHz	17.48	15.54
	5320 MHz	17.48	15.54
	5500 MHz	17.13	15.02
	5580 MHz	17.48	15.28
	5700 MHz	17.22	14.94
802.11ac MCS0/Nss1 VHT20	5260 MHz	18.35	15.89
	5300 MHz	18.44	16.50
	5320 MHz	18.44	16.50
	5500 MHz	18.26	15.54
	5580 MHz	18.52	16.24
	5700 MHz	18.26	15.63
802.11ac MCS0/Nss1 VHT40	5270 MHz	39.42	36.18
	5310 MHz	39.42	35.89
	5510 MHz	39.57	36.47
	5550 MHz	39.86	36.32
	5670 MHz	39.28	36.04
802.11ac MCS0/Nss1 VHT80	5290 MHz	79.13	74.39
	5530 MHz	79.71	76.12
	5610 MHz	78.84	74.67

Straddle Channel

Mode	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII 2C 26dB BW (MHz)	UNII 3 26dB BW (MHz)	UNII 2C 99% BW (MHz)	UNII 3 99% BW (MHz)
802.11a	5720 MHz	26.70	15.72	5701.74	5711.75	23.26	3.44	13.25	2.47
802.11ac MCS0/Nss1 VHT20	5720 MHz	33.39	16.67	5701.65	5711.32	23.35	10.04	13.68	2.99
802.11ac MCS0/Nss1 VHT40	5710 MHz	80.87	42.55	5671.01	5690.17	53.99	26.88	34.83	7.72
802.11ac MCS0/Nss1 VHT80	5690 MHz	122.90	75.83	5631.16	5651.51	93.84	29.06	73.49	2.34

For beamforming mode

For indoor, outdoor use B2~B3

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5260 MHz	23.13	17.89
	5300 MHz	22.17	18.06
	5320 MHz	21.91	17.97
	5500 MHz	22.87	17.97
	5580 MHz	22.43	18.06
	5700 MHz	21.65	17.97
802.11ac MCS0/Nss1 VHT40	5270 MHz	45.07	37.19
	5310 MHz	44.64	37.05
	5510 MHz	44.93	36.90
	5550 MHz	45.51	37.19
	5670 MHz	44.64	36.90
802.11ac MCS0/Nss1 VHT80	5290 MHz	87.54	76.41
	5530 MHz	86.09	76.41
	5610 MHz	85.80	76.41

Straddle Channel

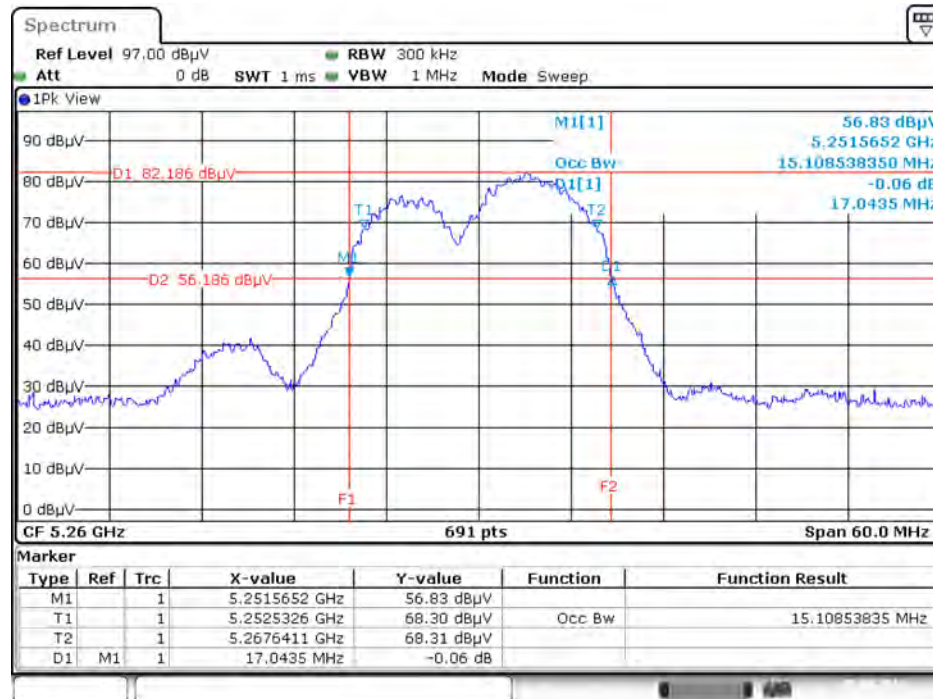
Mode	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII 2C 26dB BW (MHz)	UNII 3 26dB BW (MHz)	UNII 2C 99% BW (MHz)	UNII 3 99% BW (MHz)
802.11ac MCS0/Nss1 VHT20	5720 MHz	20.35	17.71	5709.91	5711.14	15.09	5.26	13.86	3.86
802.11ac MCS0/Nss1 VHT40	5710 MHz	40.29	36.32	5690.15	5691.91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

For non-beamforming mode

For indoor, outdoor use B2~B3

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

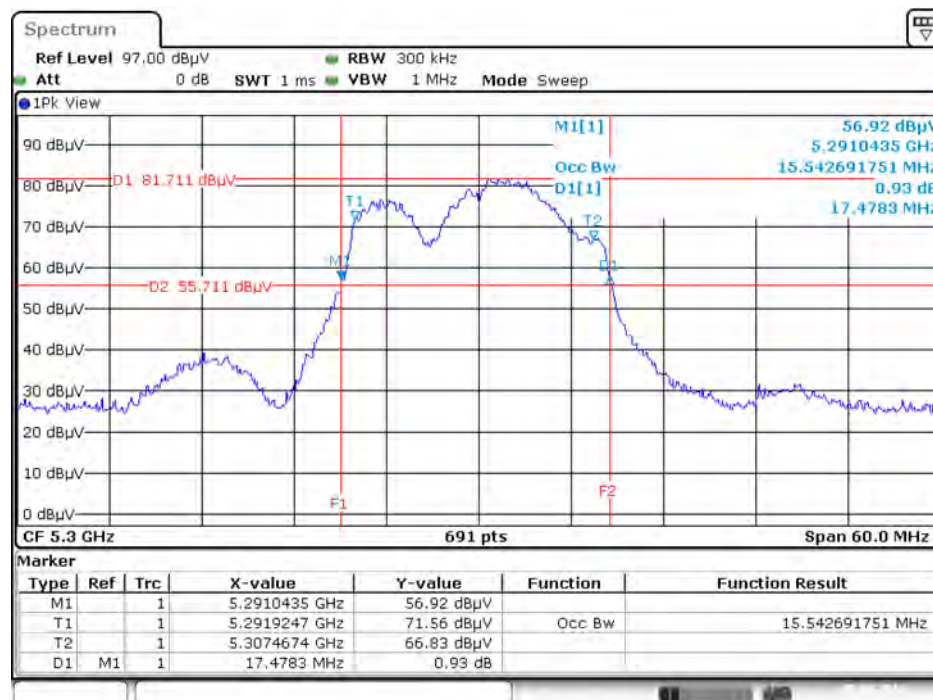
+ Port 3 + Port 4 / 5260 MHz



Date: 5.AUG.2016 11:45:15

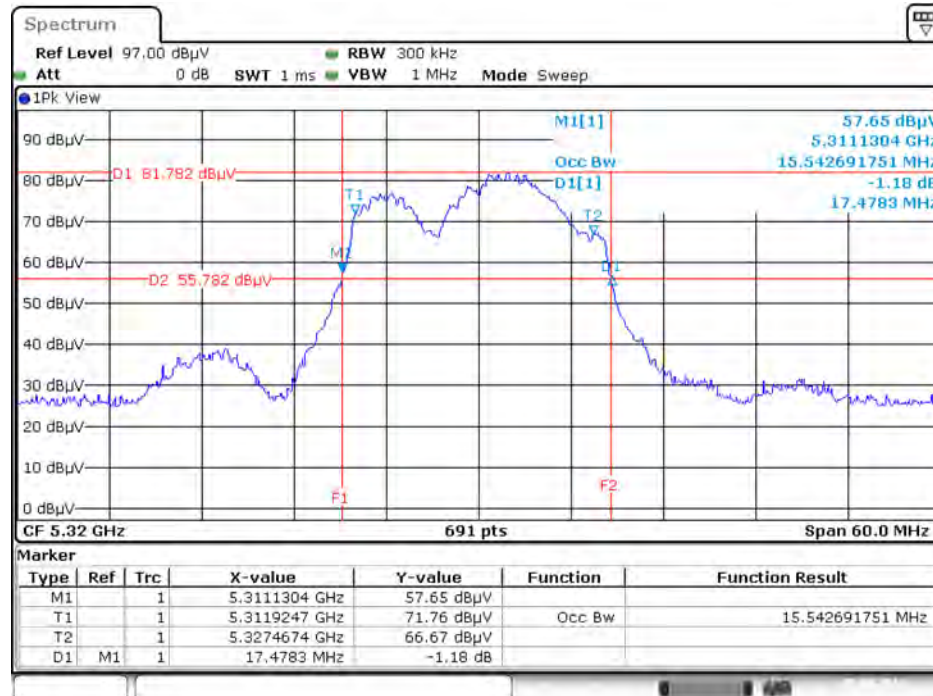
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2

+ Port 3 + Port 4 / 5300 MHz



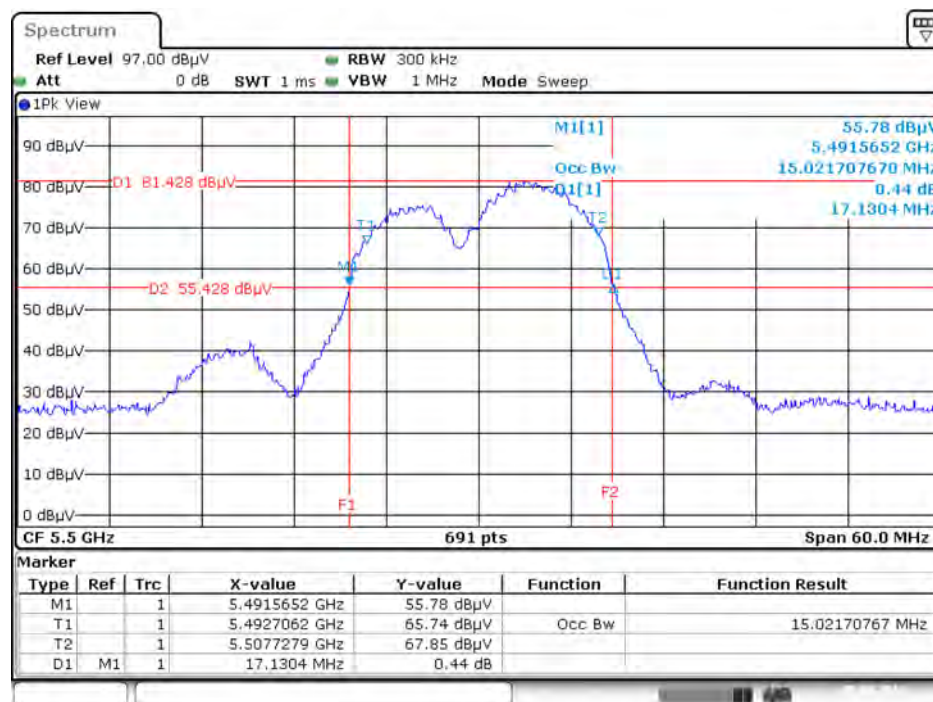
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5320 MHz



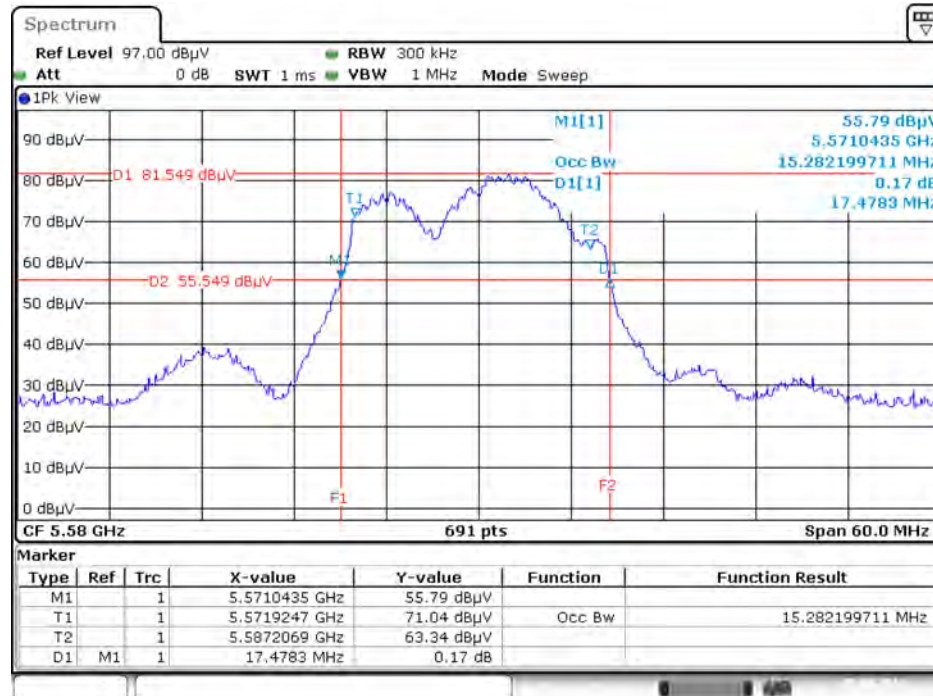
Date: 5.AUG.2016 11:46:19

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



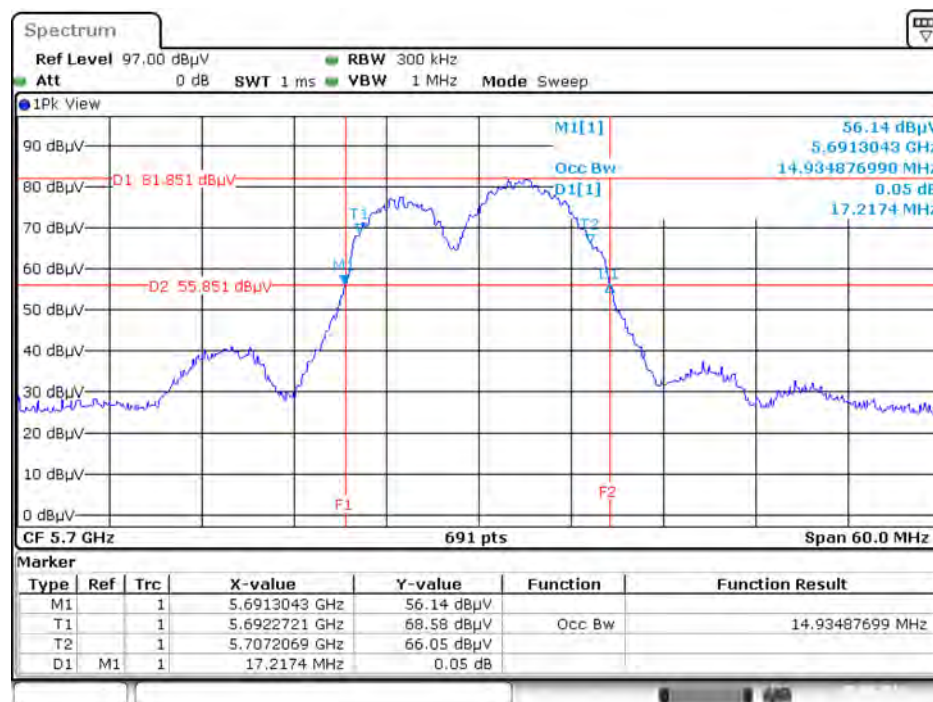
Date: 5.AUG.2016 11:46:44

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



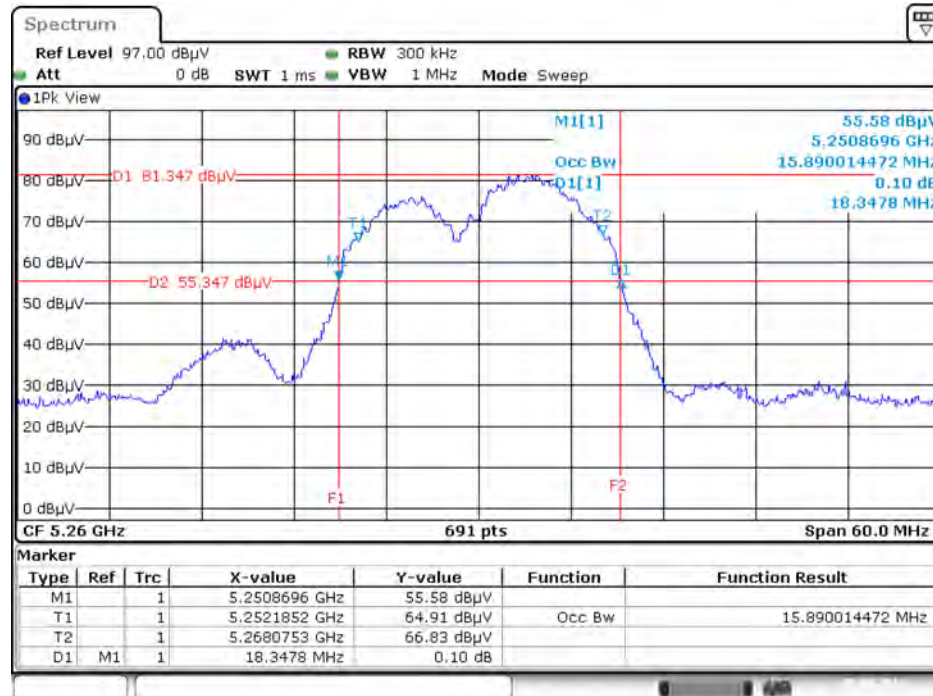
Date: 5.AUG.2016 11:47:13

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



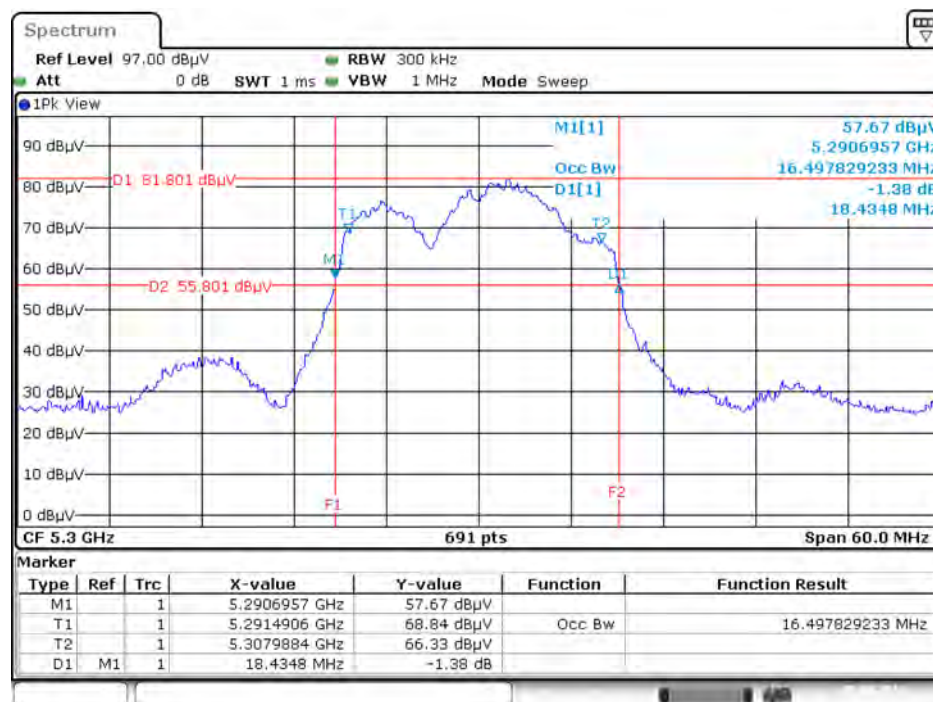
Date: 5.AUG.2016 11:47:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5260 MHz



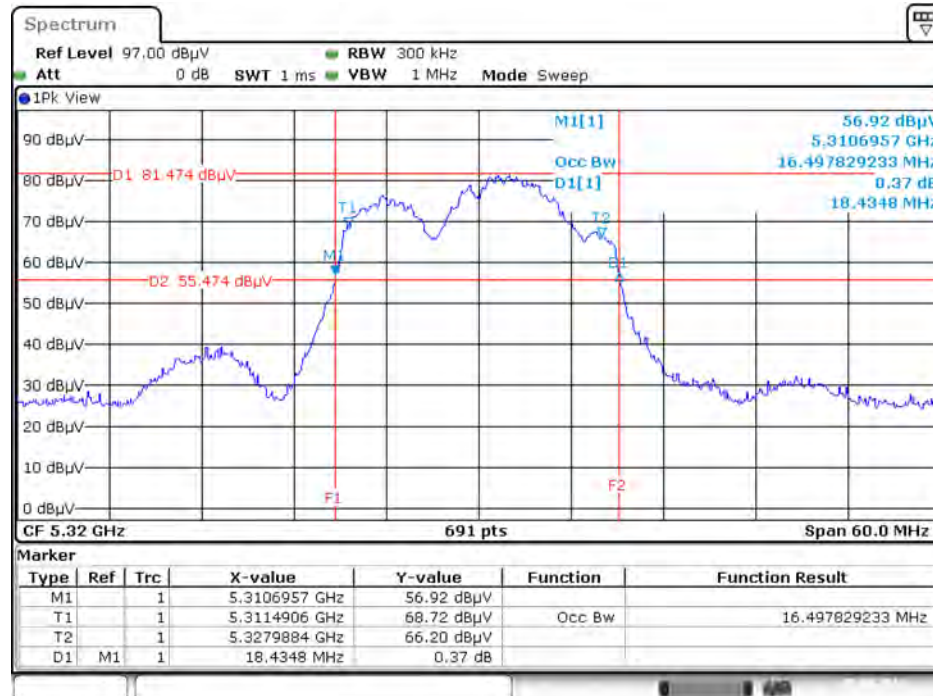
Date: 5.AUG.2016 11:52:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5300 MHz



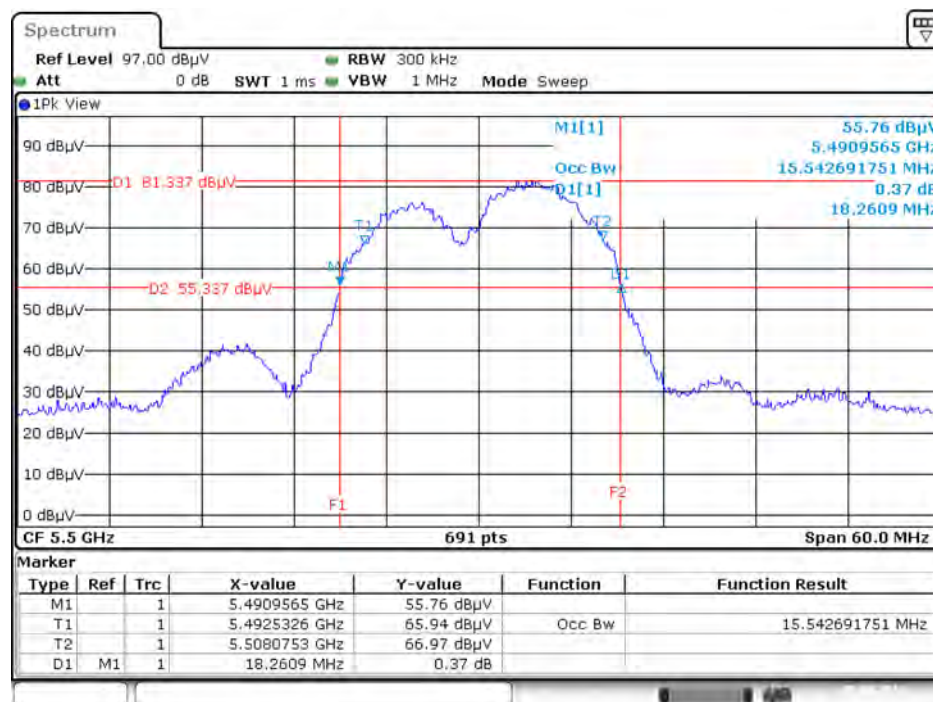
Date: 5.AUG.2016 11:53:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5320 MHz



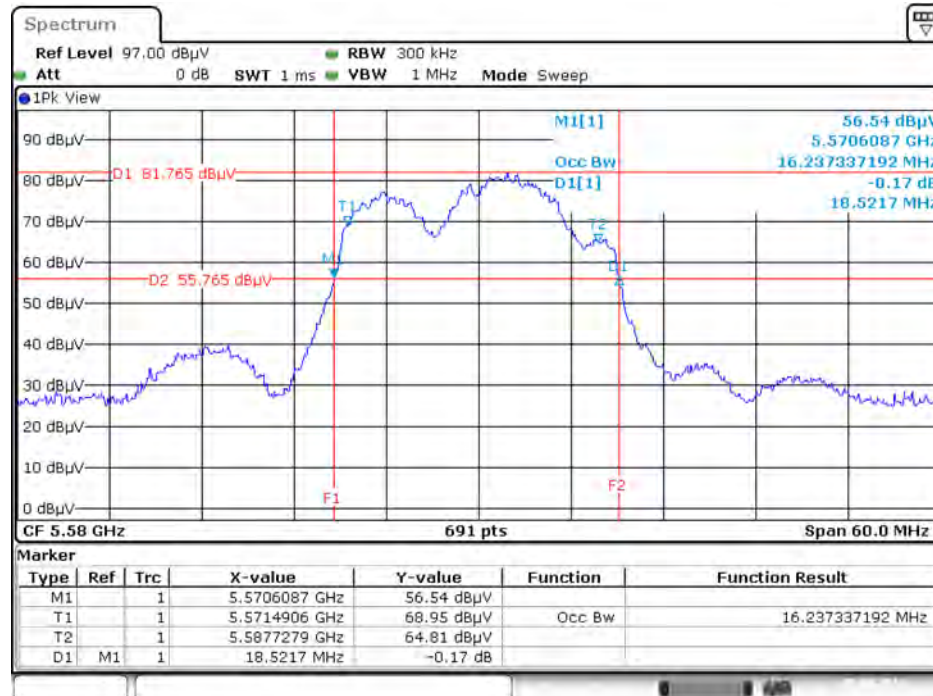
Date: 5.AUG.2016 11:53:41

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



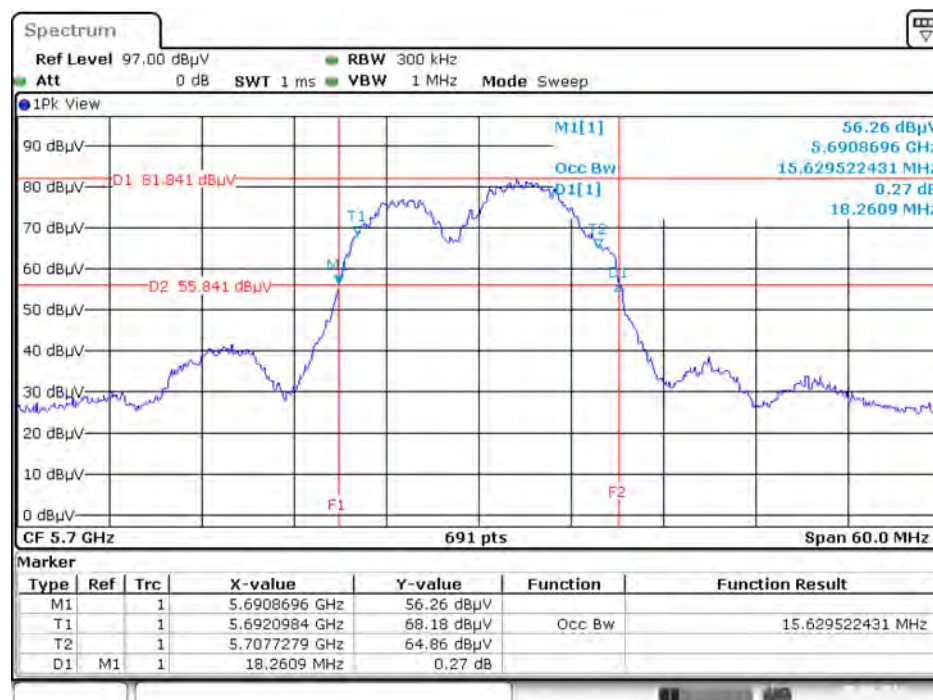
Date: 5.AUG.2016 11:54:06

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



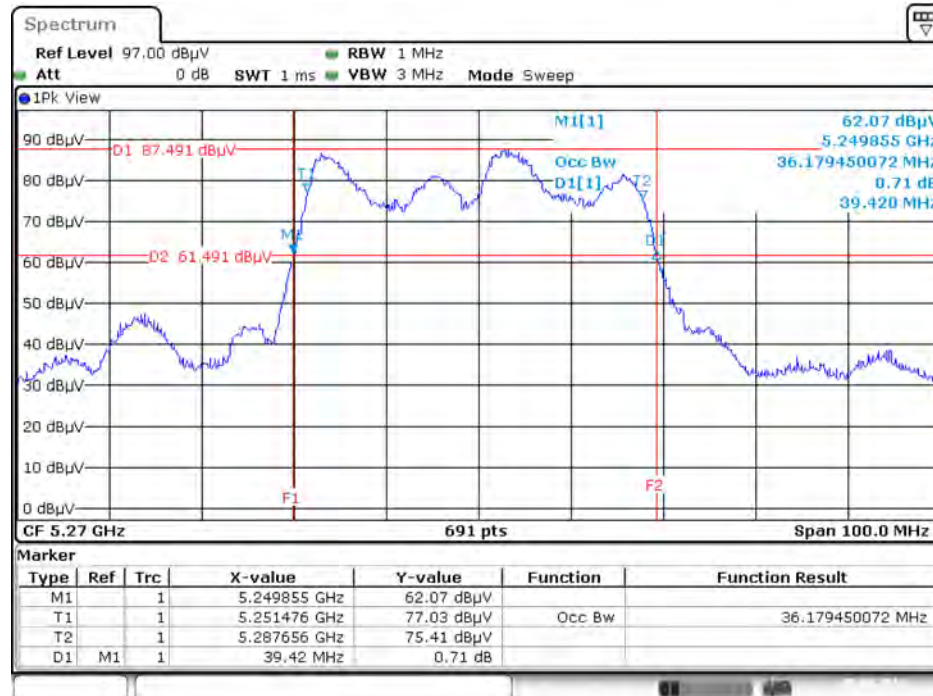
Date: 5.AUG.2016 11:54:37

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



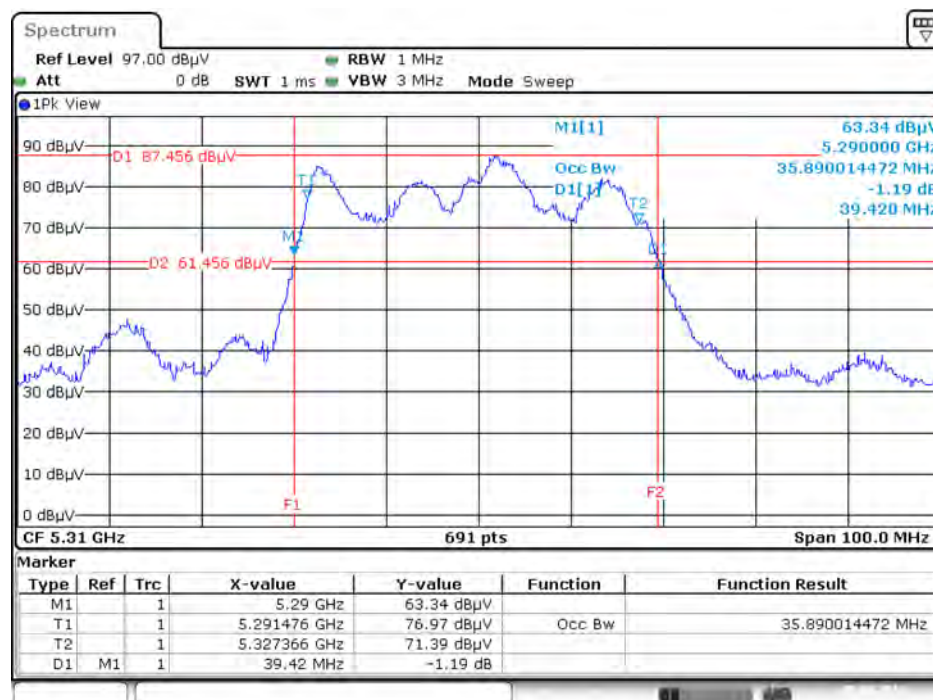
Date: 5.AUG.2016 11:55:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5270 MHz



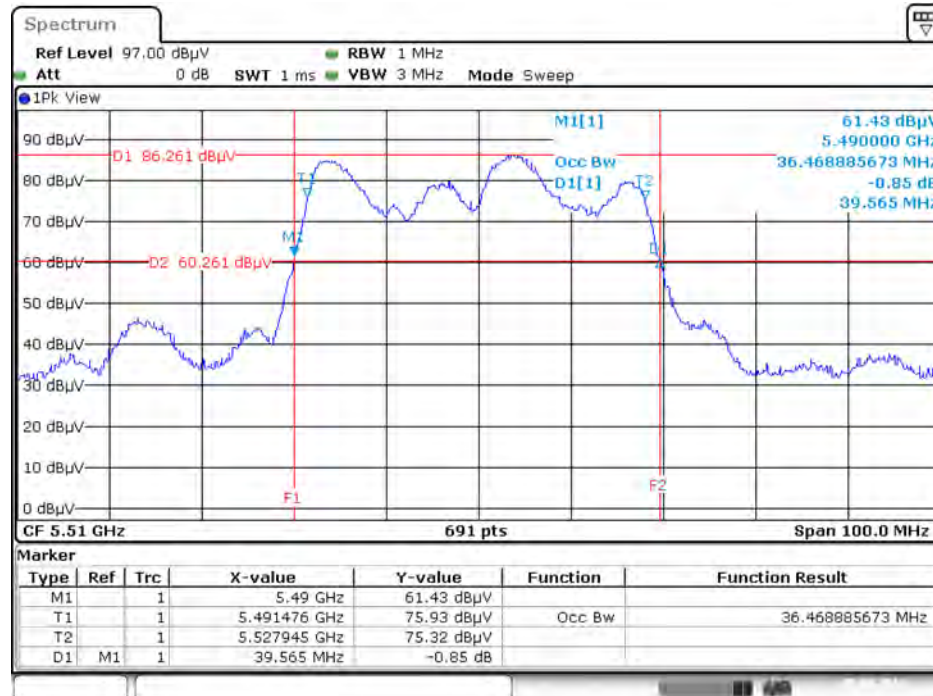
Date: 5.AUG.2016 11:59:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5310 MHz



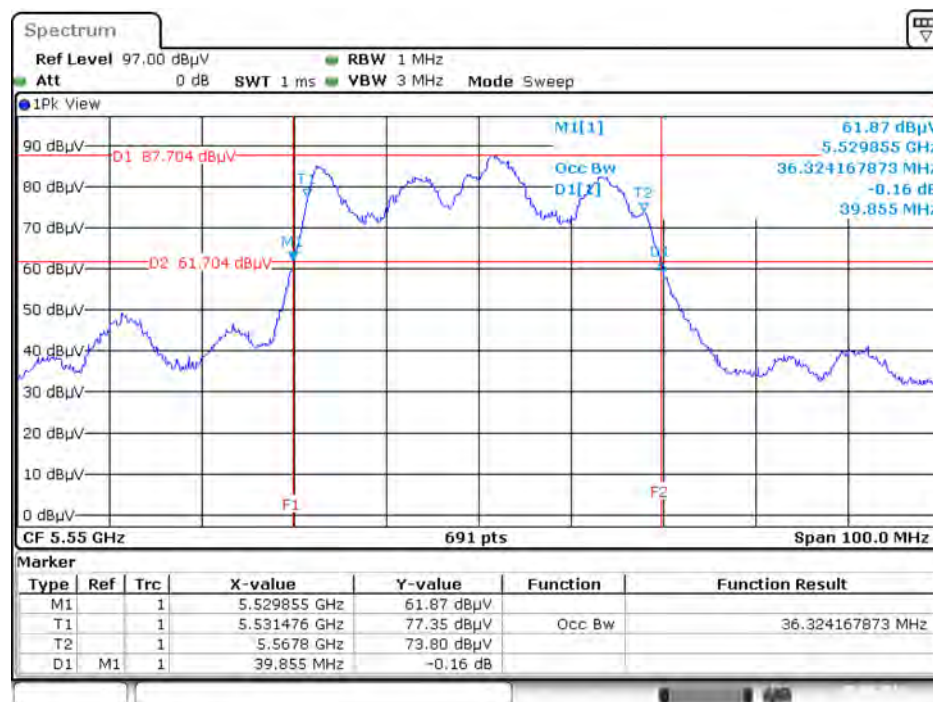
Date: 5.AUG.2016 12:00:05

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



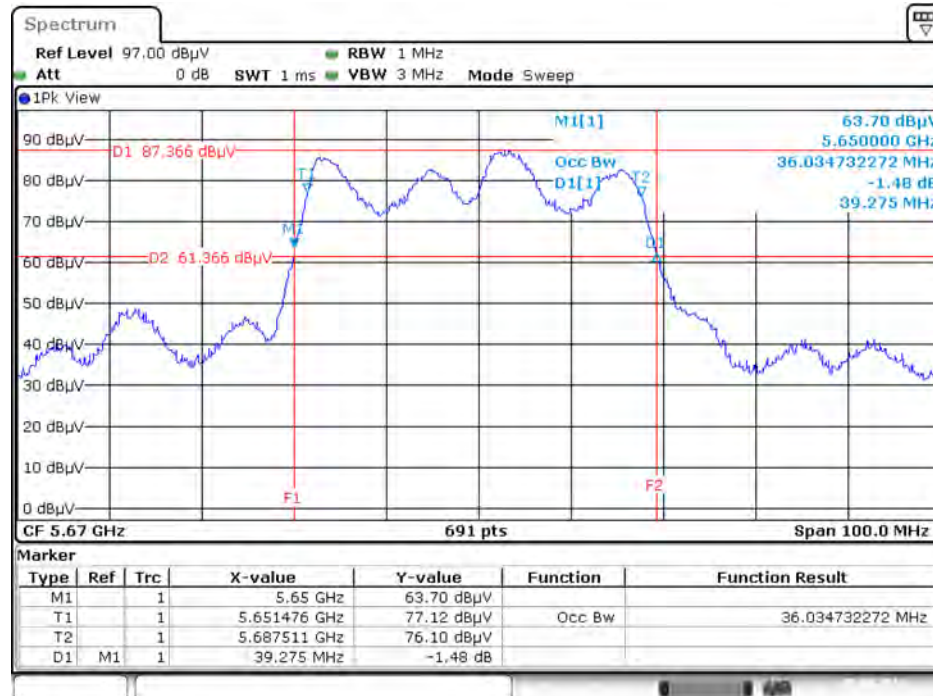
Date: 5.AUG.2016 12:00:37

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



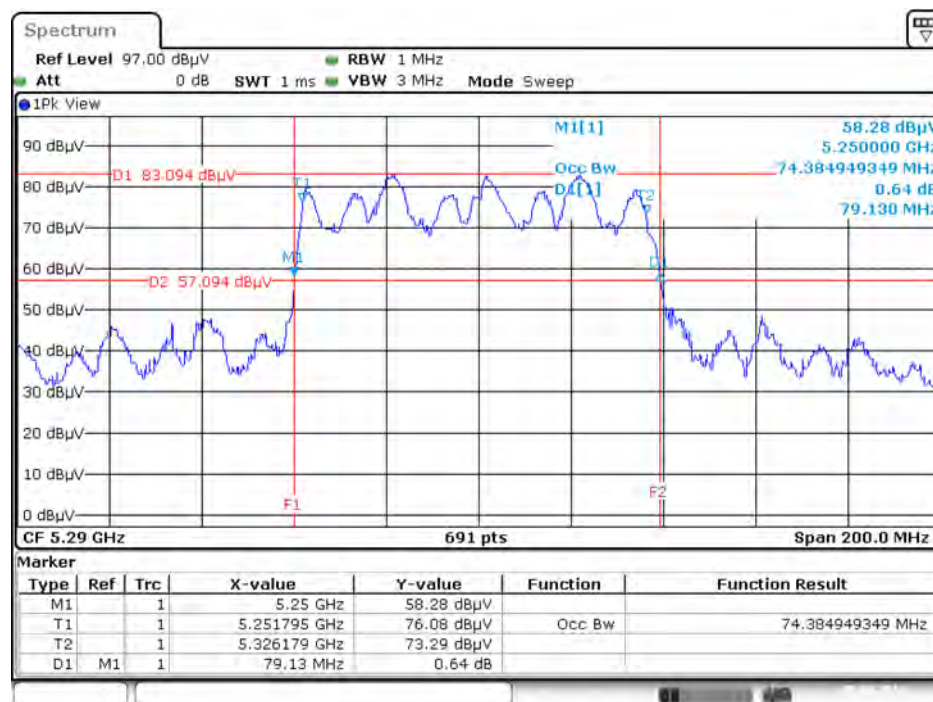
Date: 5.AUG.2016 12:01:00

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



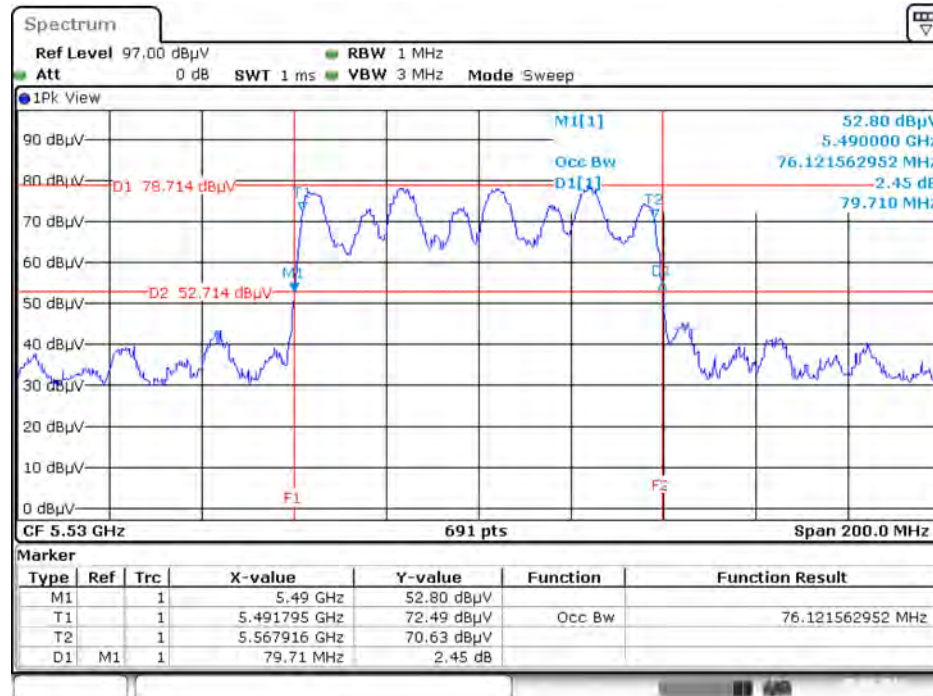
Date: 5.AUG.2016 12:01:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5290 MHz



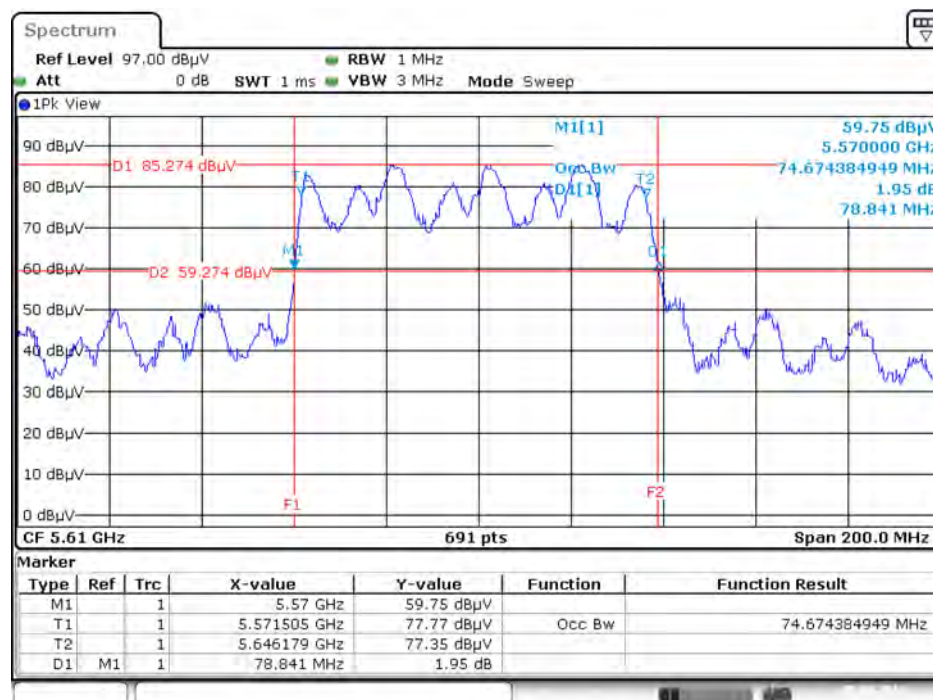
Date: 5.AUG.2016 12:04:24

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



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

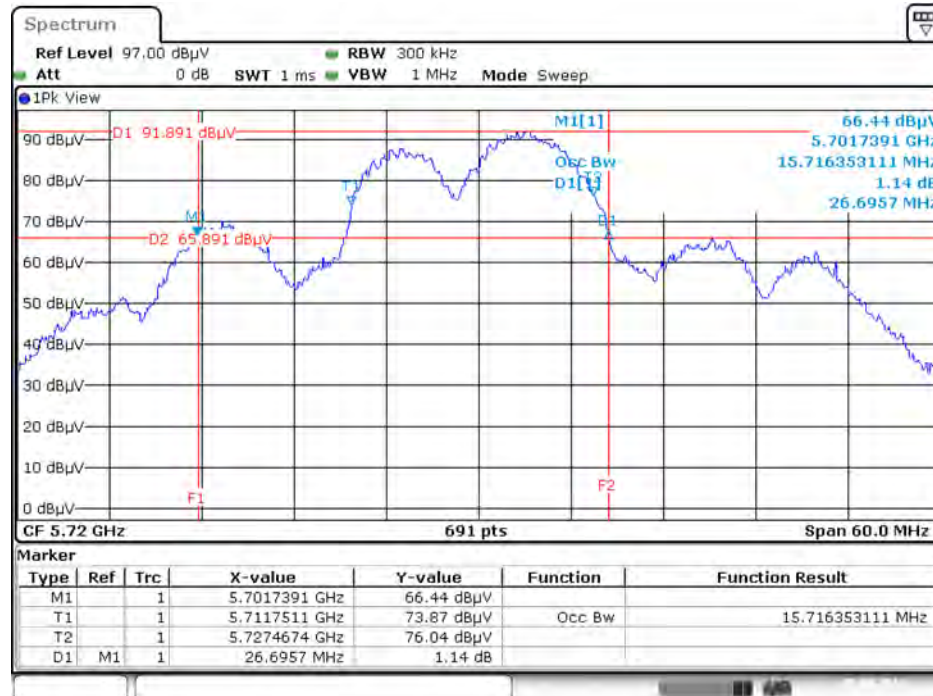
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5610 MHz



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

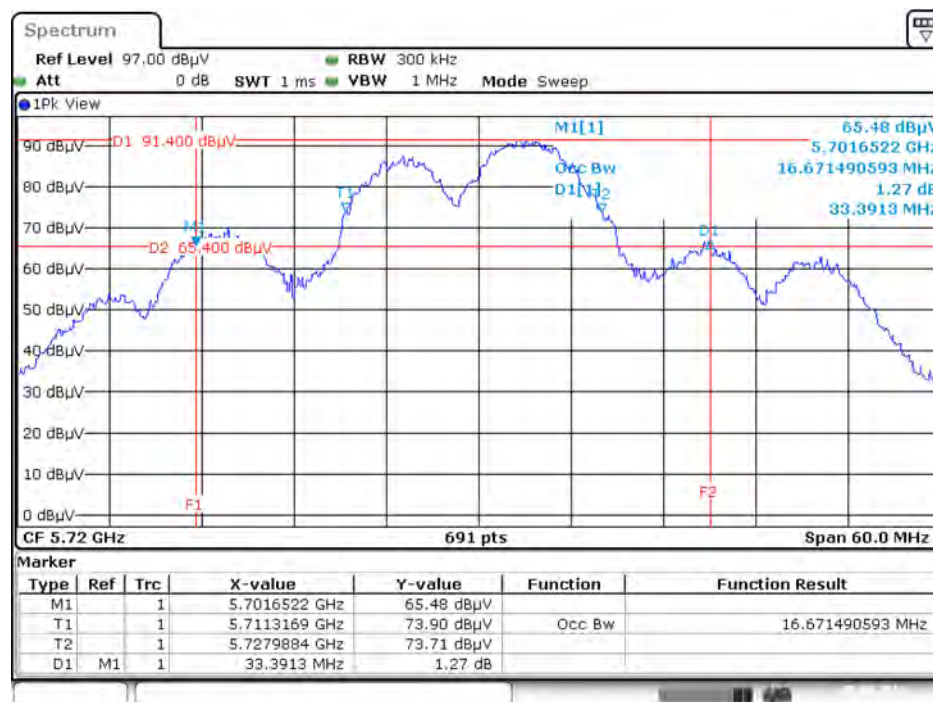
Straddle Channel

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



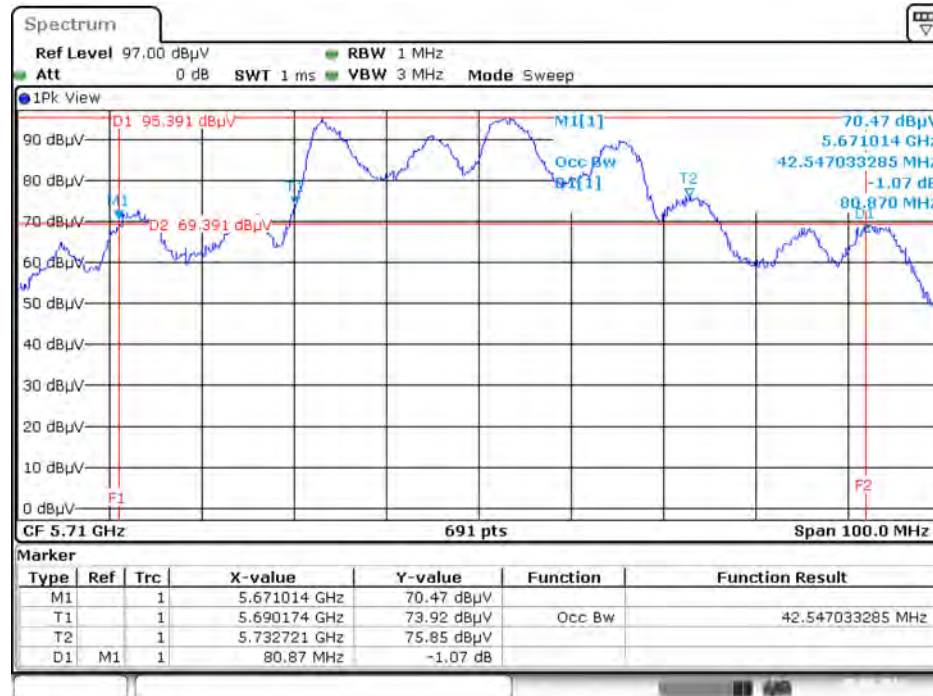
Date: 5.AUG.2016 13:55:22

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



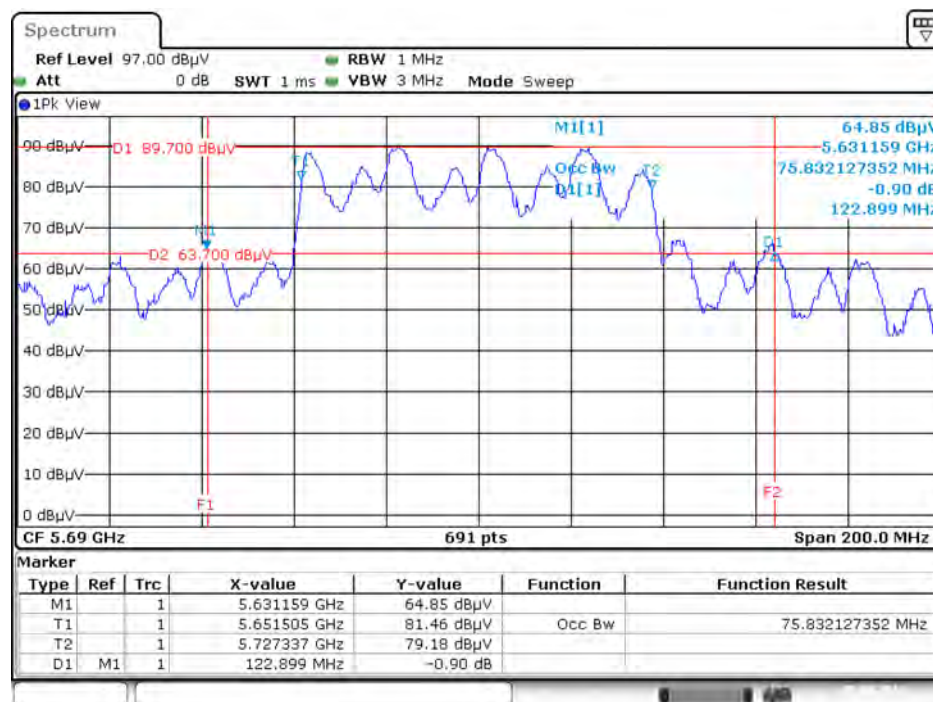
Date: 5.AUG.2016 13:57:36

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



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

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



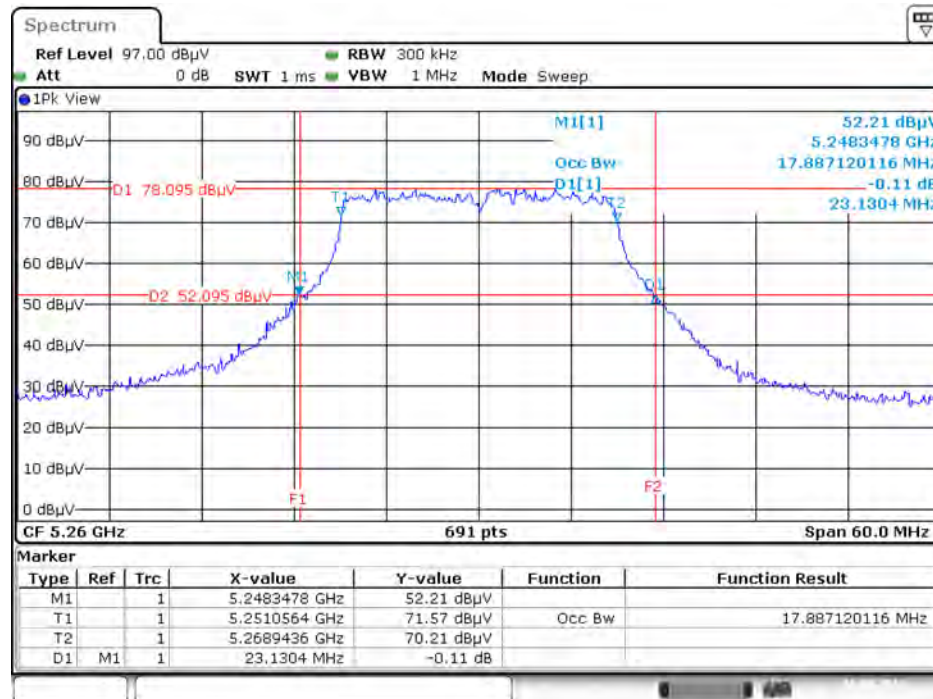
Date: 5.AUG.2016 14:01:19

For beamforming mode

For indoor, outdoor use B2~B3

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1

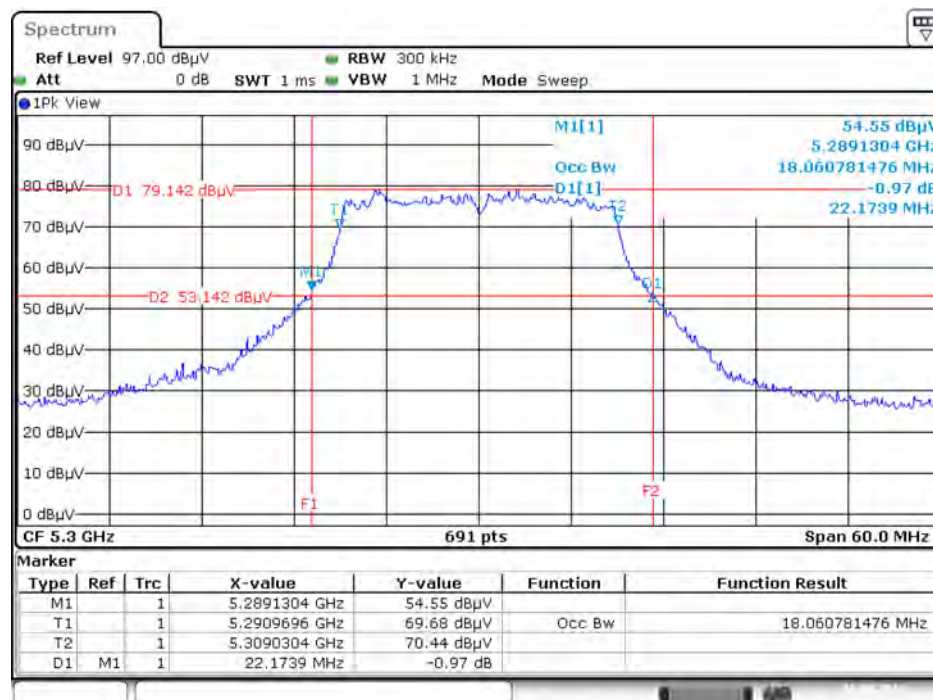
VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5260 MHz



Date: 10.AUG.2016 00:14:14

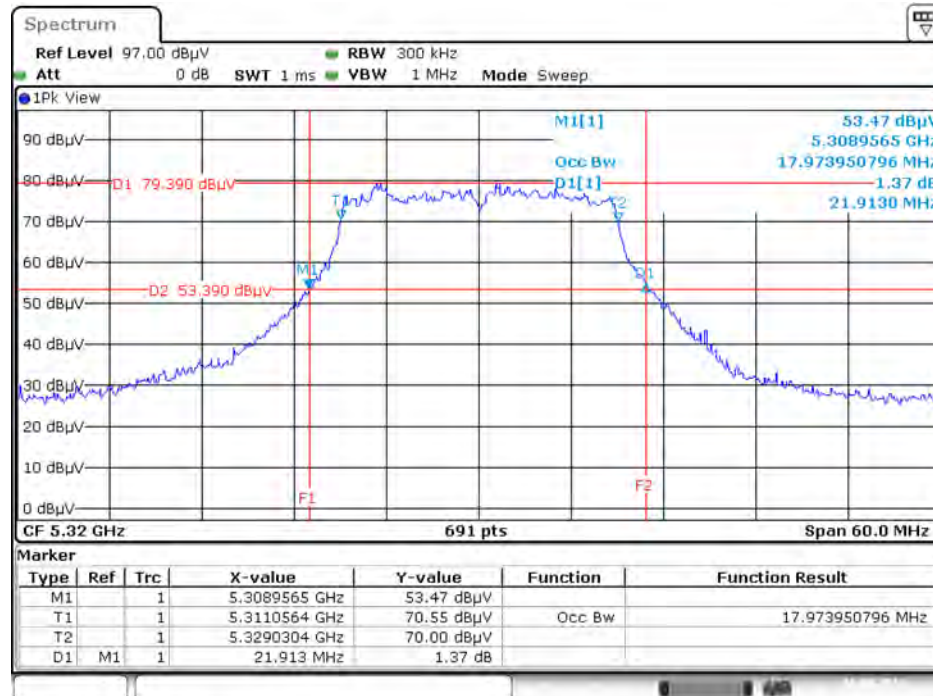
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1

VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5300 MHz



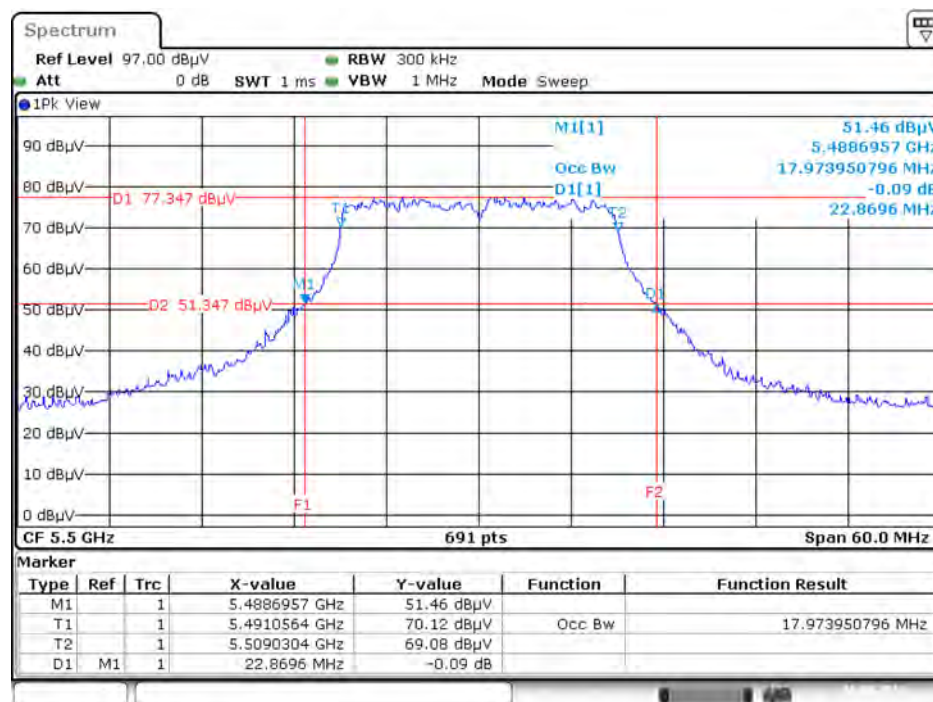
Date: 10.AUG.2016 00:15:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5320 MHz



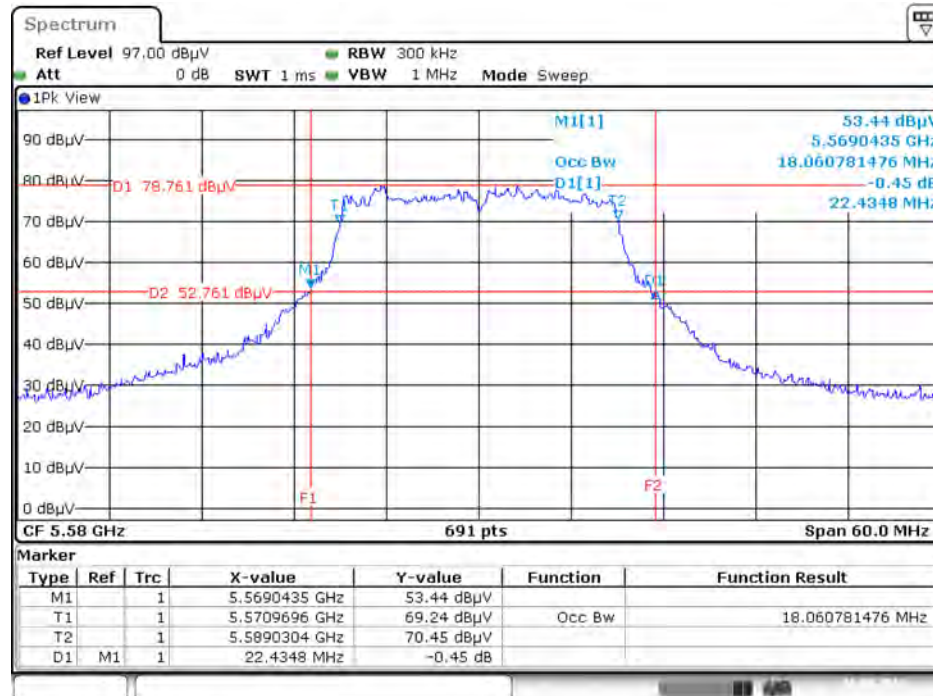
Date: 10.AUG.2016 00:17:00

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



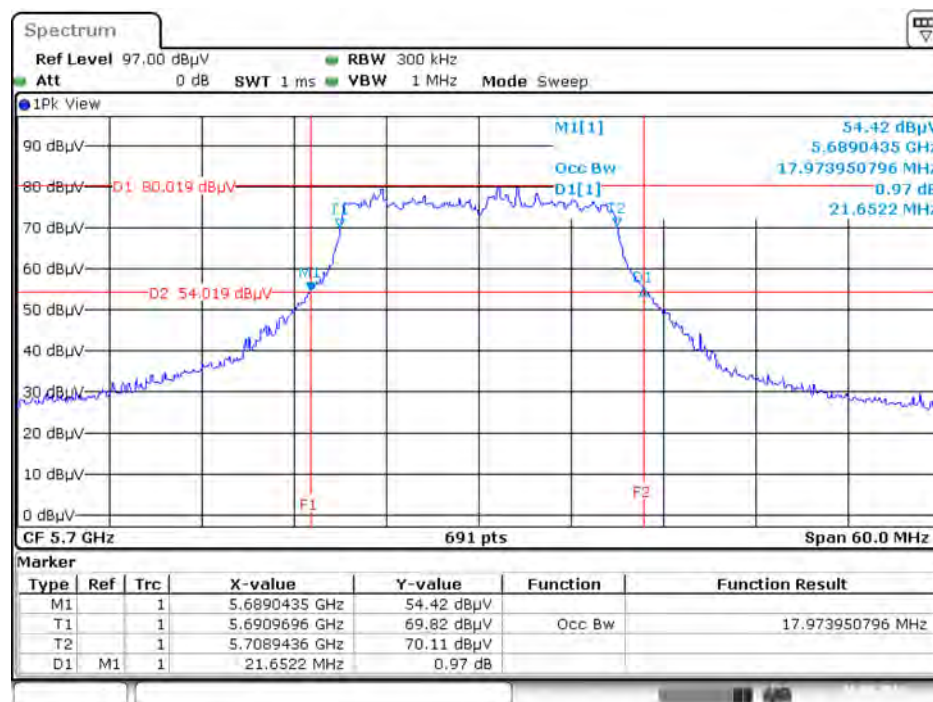
Date: 10.AUG.2016 00:18:30

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



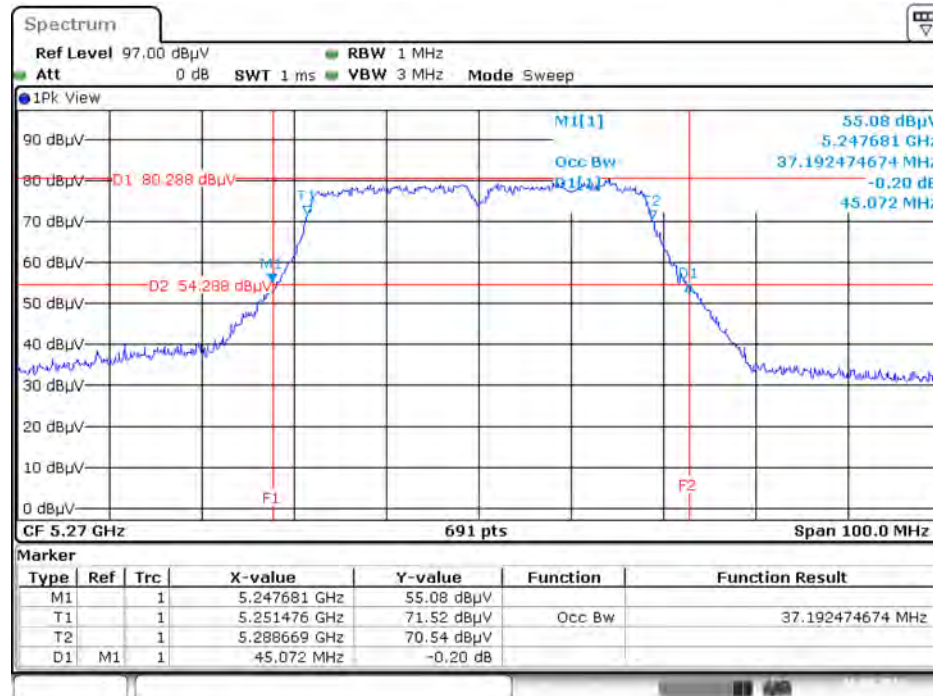
Date: 10.AUG.2016 00:19:45

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

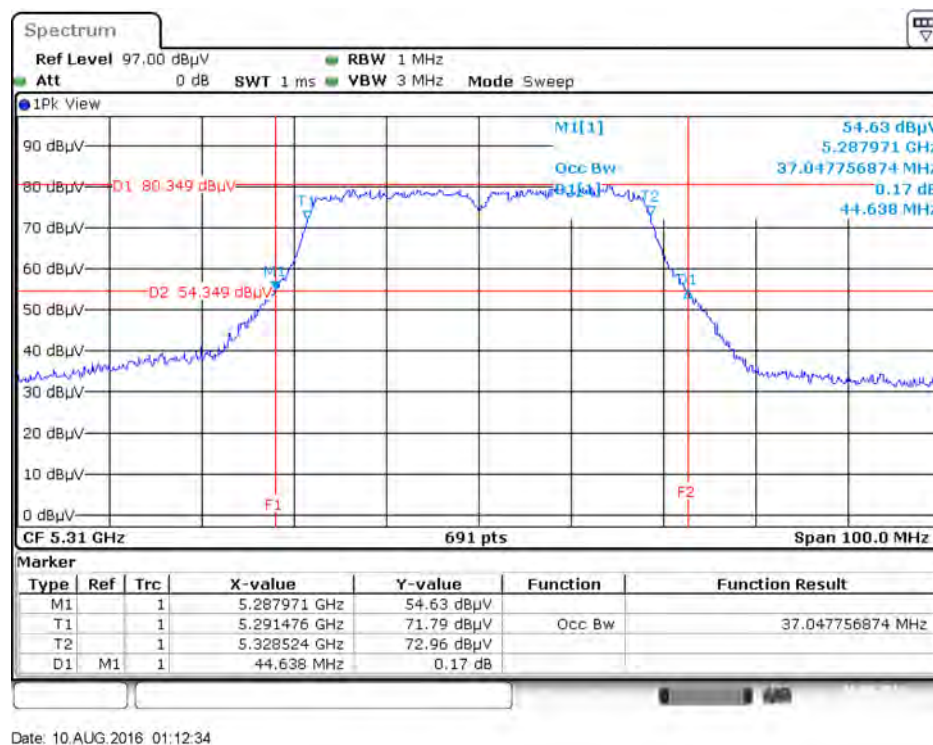


Date: 10.AUG.2016 00:21:40

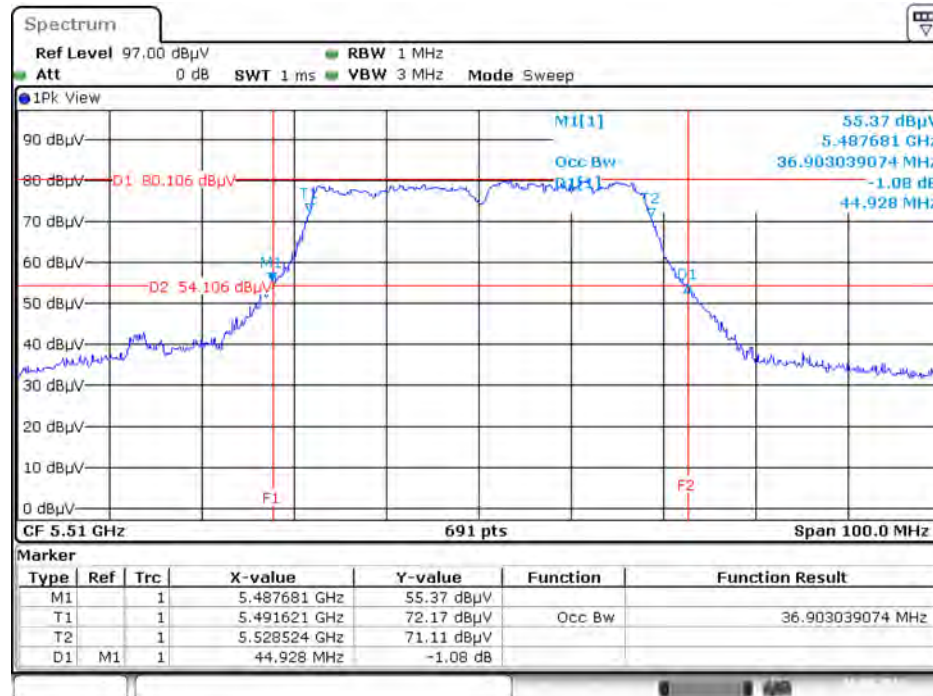
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5270 MHz



26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5310 MHz

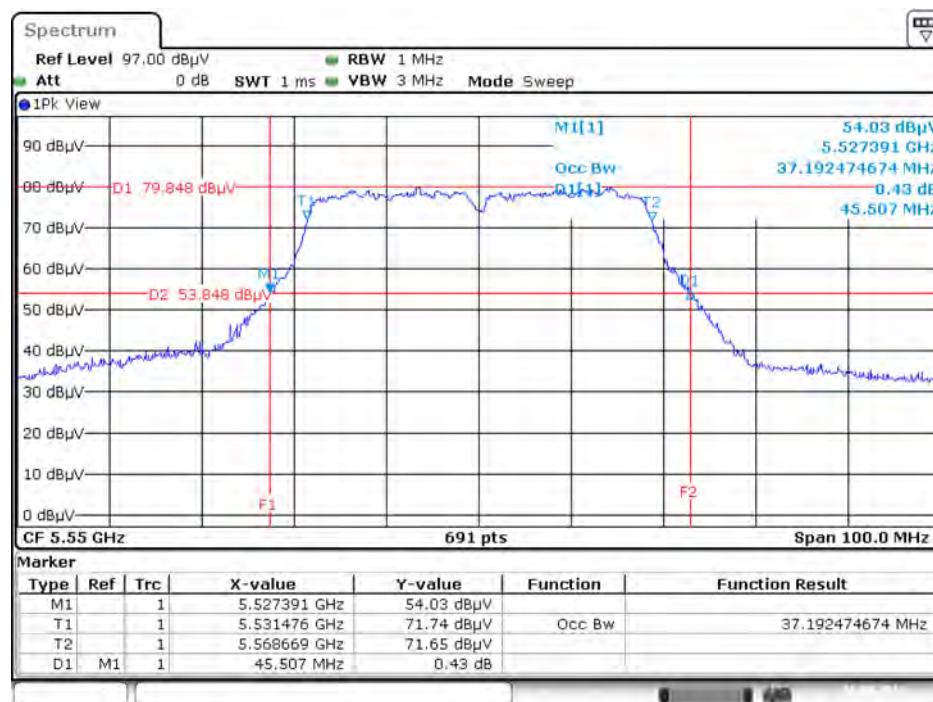


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5510 MHz



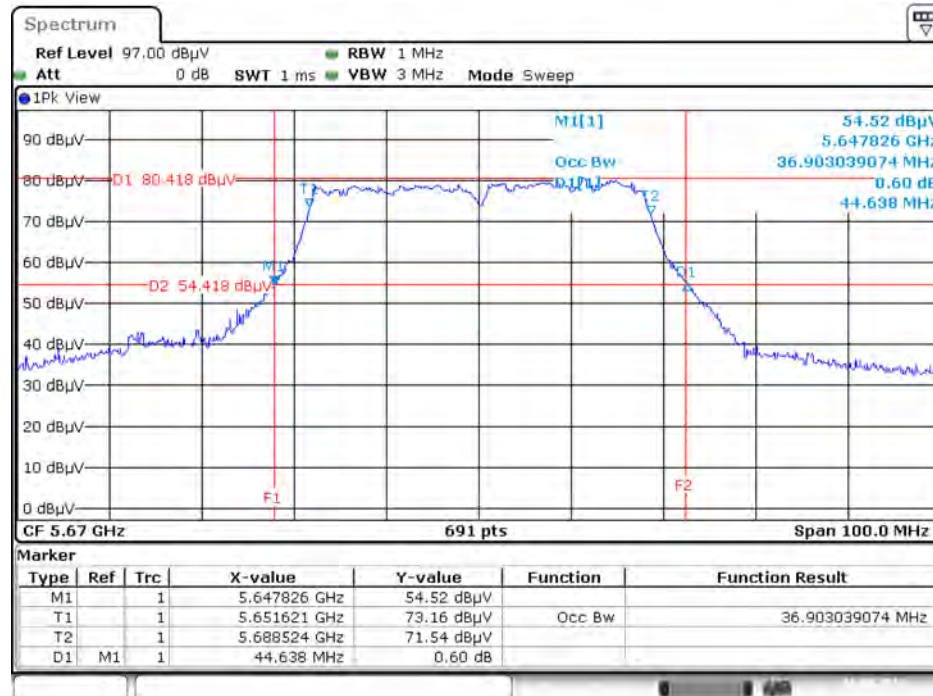
Date: 10.AUG.2016 01:15:48

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



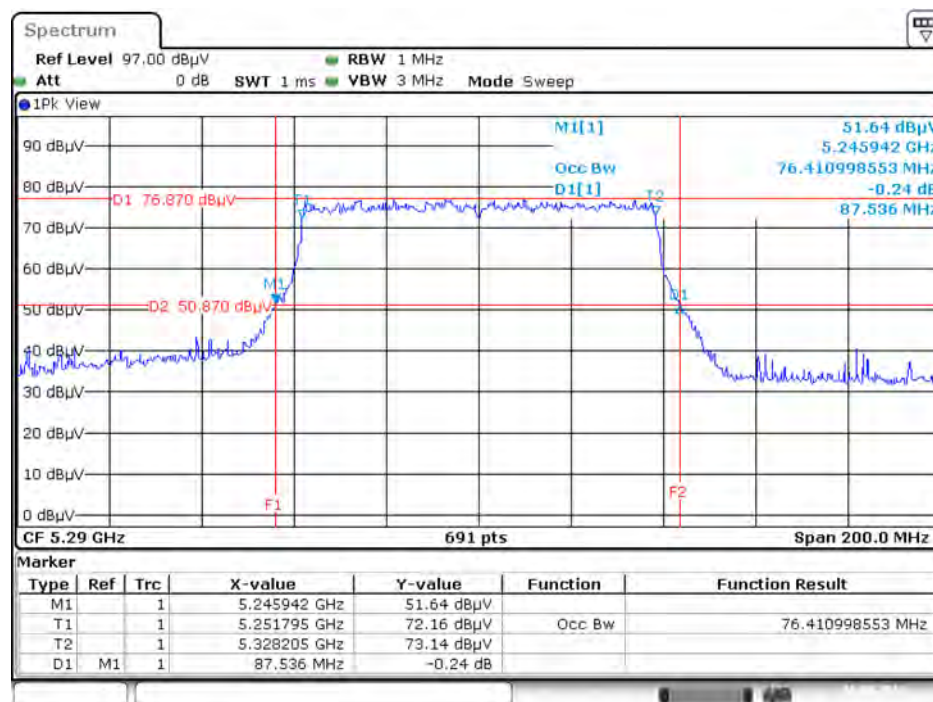
Date: 10.AUG.2016 01:17:19

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



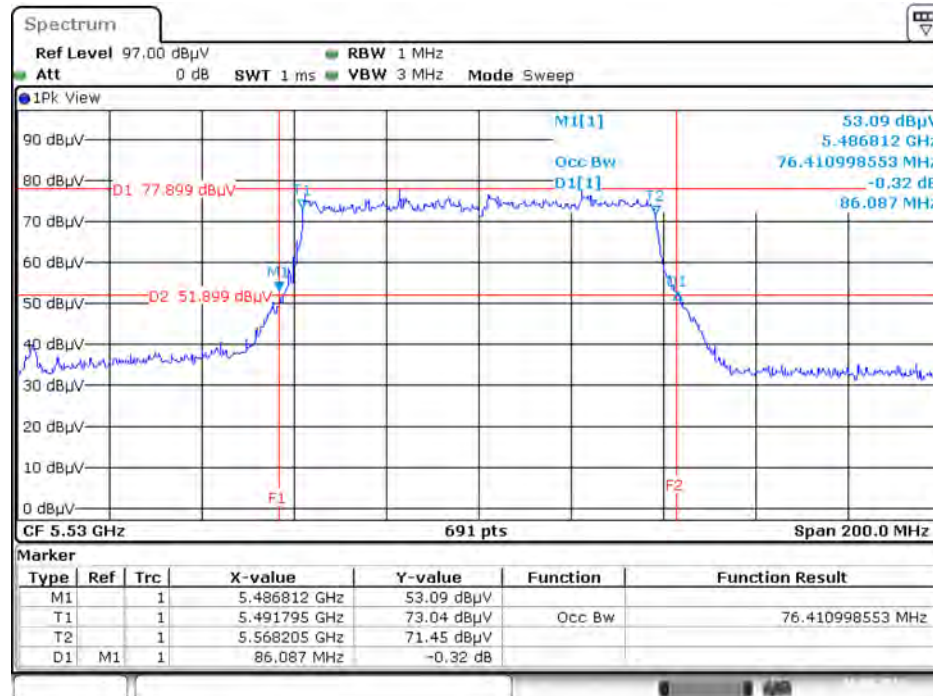
Date: 10.AUG.2016 01:18:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5290 MHz



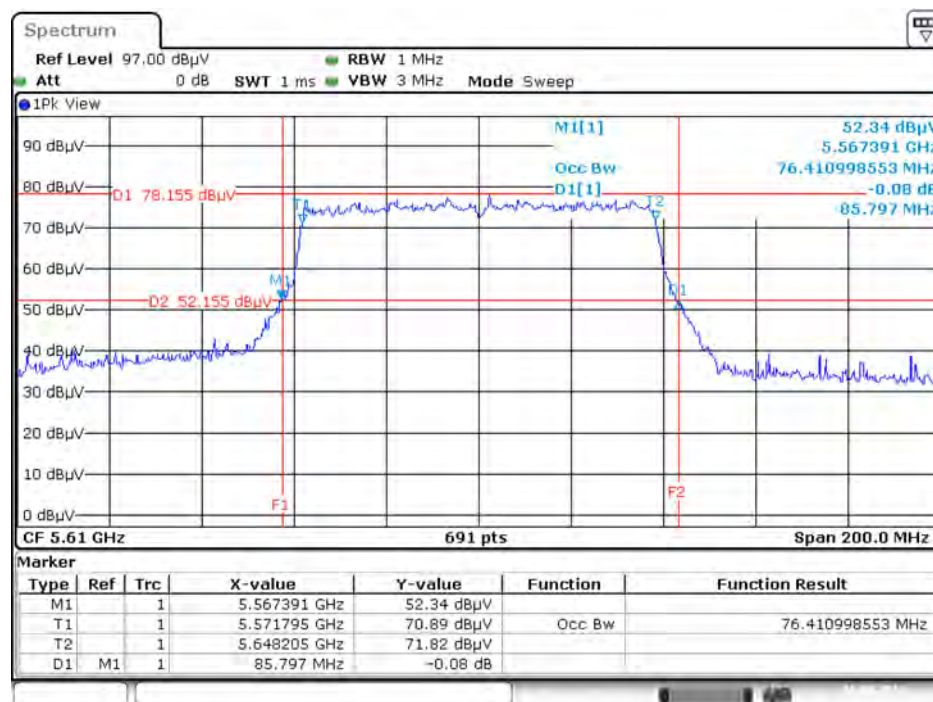
Date: 10.AUG.2016 01:27:19

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



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

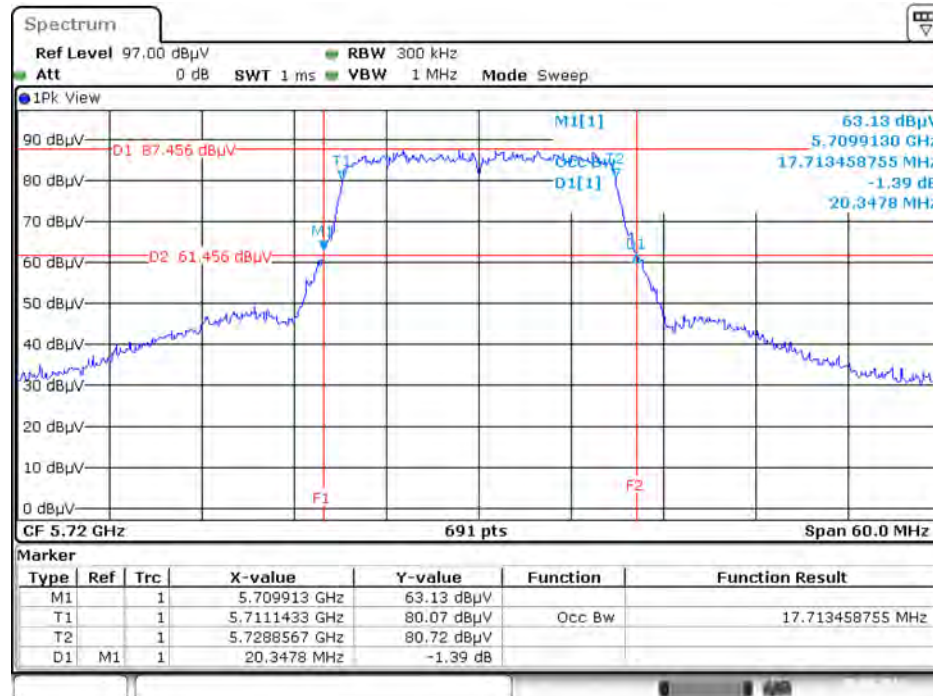
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5610 MHz



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

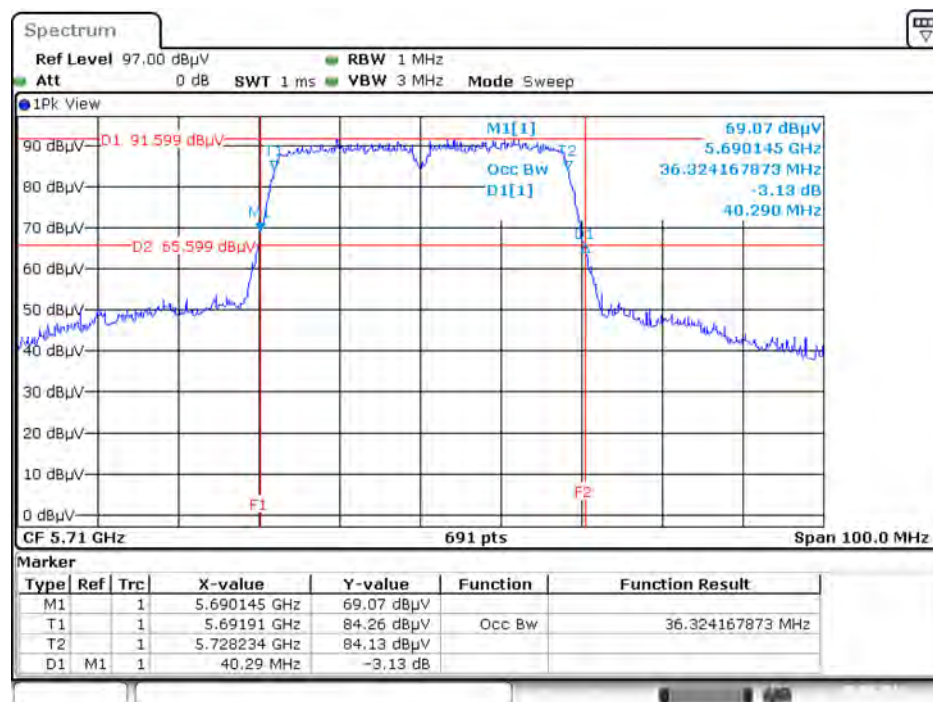
Straddle Channel

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



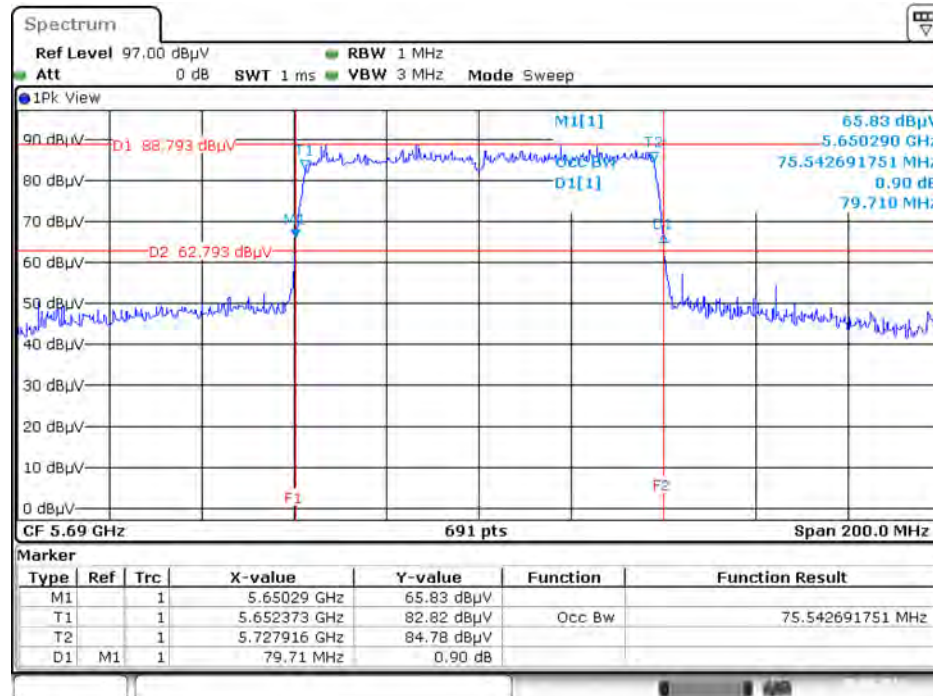
Date: 9 AUG. 2016 00:55:32

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



Date: 9 AUG. 2016 01:29:01

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



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

2.3. 6dB Spectrum Bandwidth Measurement

2.3.1. Limit

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

2.3.2. Measuring Instruments and Setting

Please refer to section 3 of equipments list in this report. The following table is the setting of spectrum analyzer.

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

2.3.3. 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.

2.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

This test setup layout is the same as that shown in section 2.6.4.

2.3.5. Test Deviation

There is no deviation with the original standard.

2.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.3.7. Test Result of 6dB Spectrum Bandwidth

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode / For indoor, outdoor use

Straddle Channel

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

For beamforming mode / For indoor, outdoor use

Straddle Channel

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

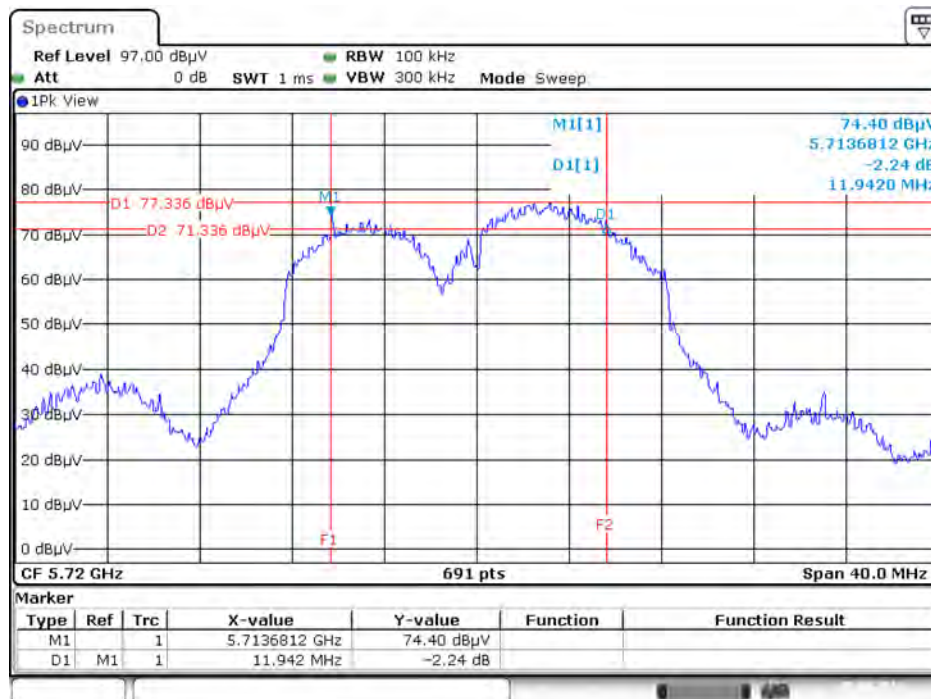
Note: All the test values were listed in the report.

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

For non-beamforming mode / For indoor, outdoor use

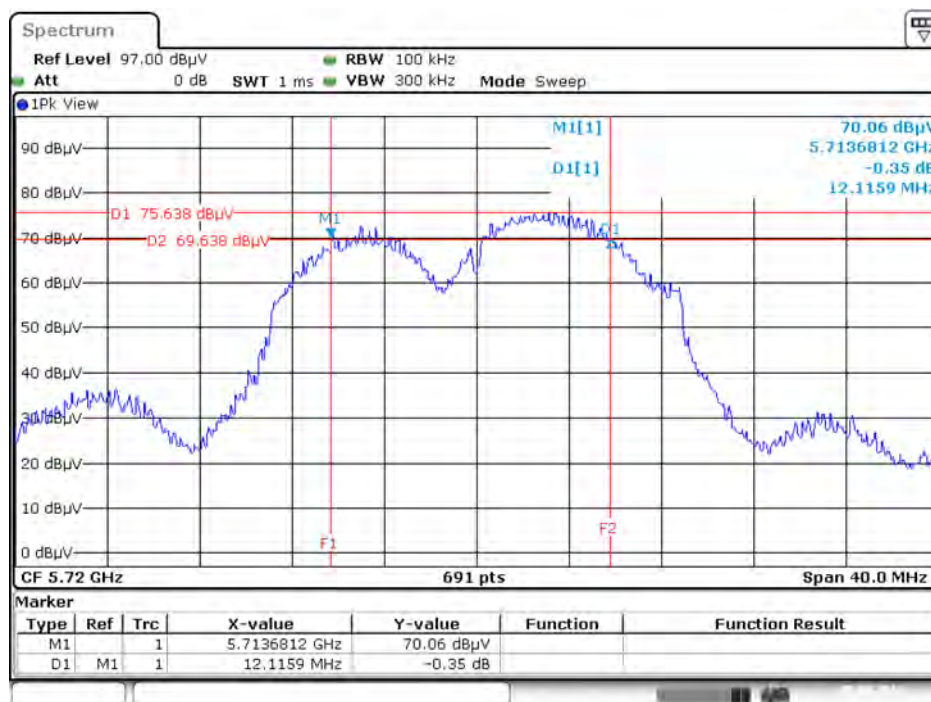
Straddle Channel

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



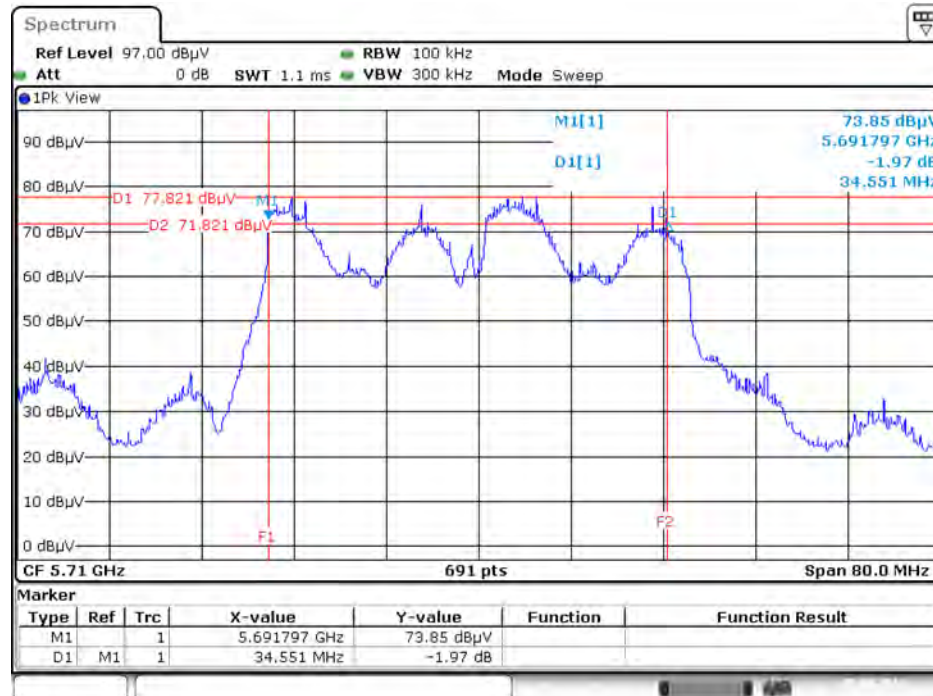
Date: 5.AUG.2016 15:27:57

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



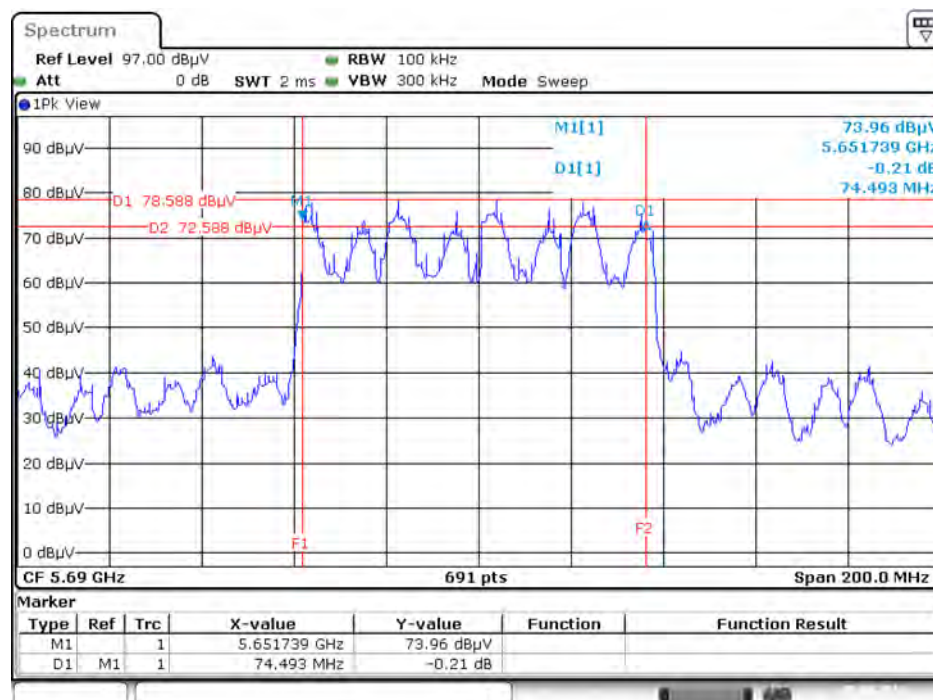
Date: 5.AUG.2016 15:28:41

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



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

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



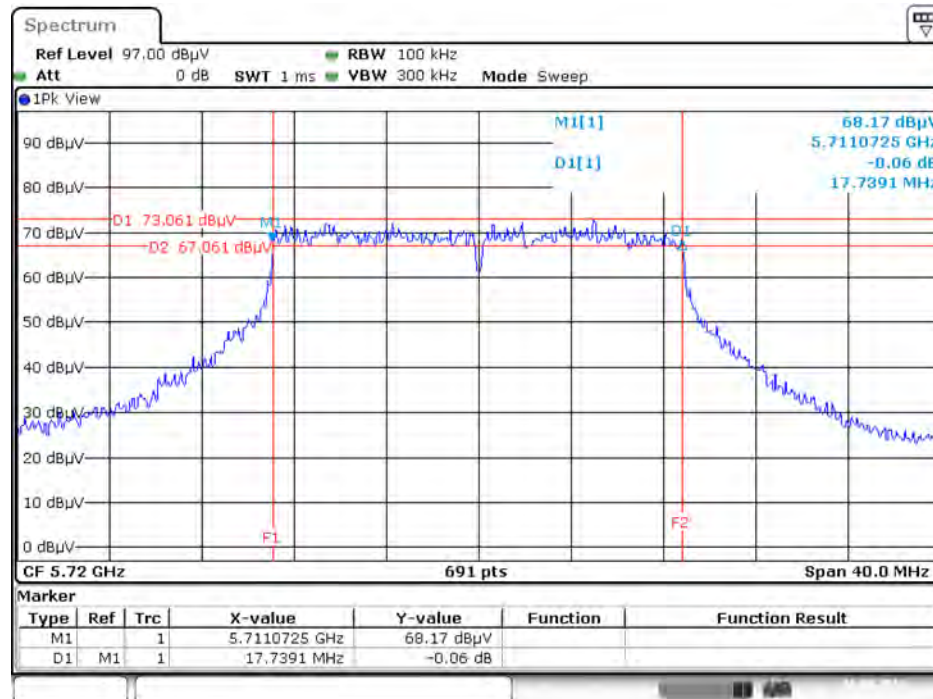
Date: 5.AUG.2016 15:30:55

For beamforming mode / For indoor, outdoor use

Straddle Channel

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

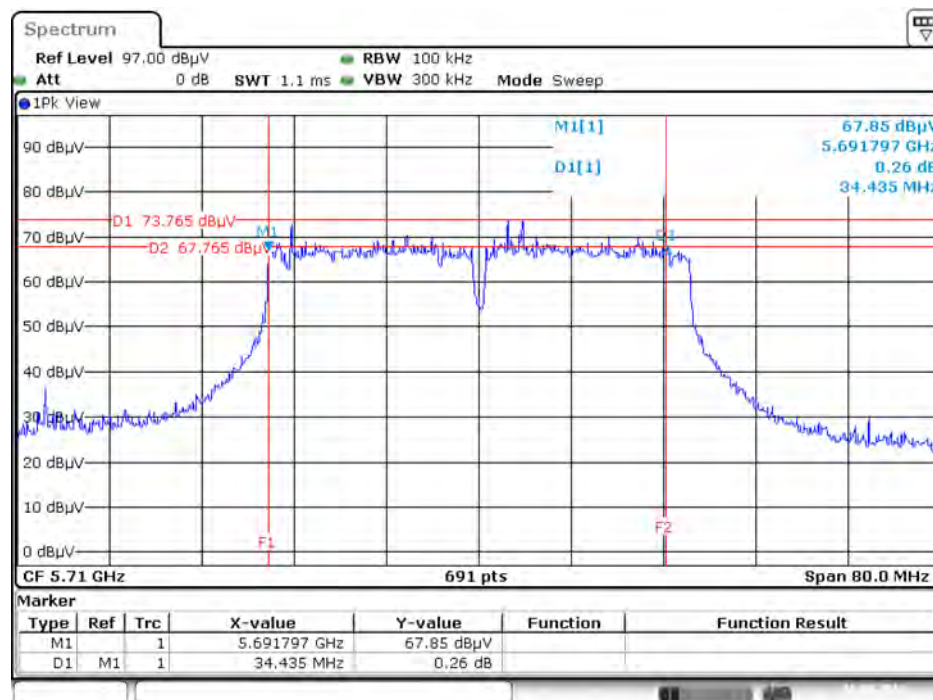
Port 4 / 5720 MHz



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

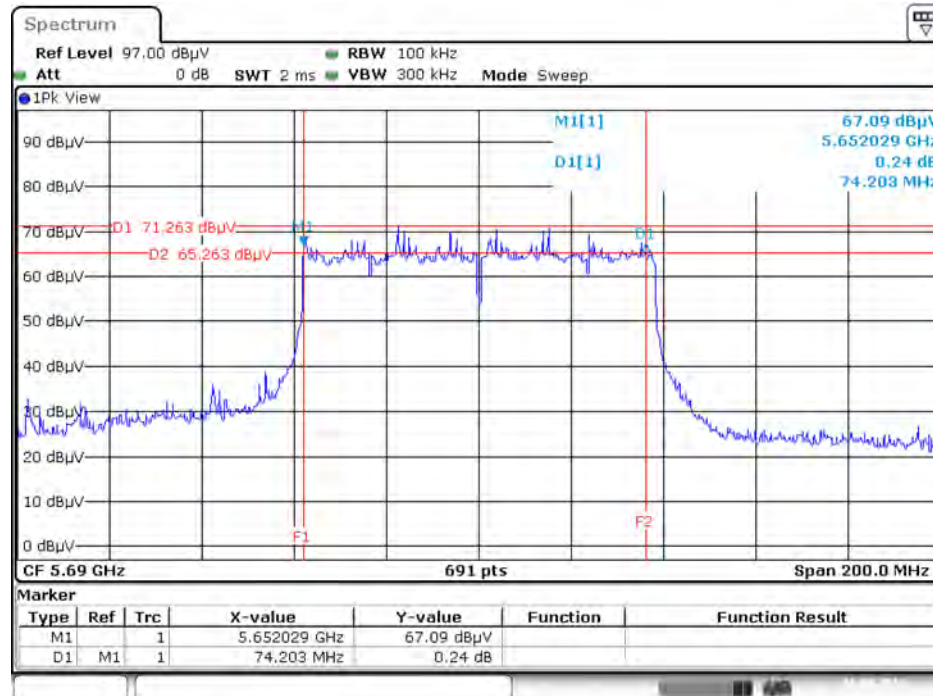
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 +

Port 4 / 5710 MHz



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

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



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

2.4. Maximum Conducted Output Power Measurement

2.4.1. Limit

Frequency Band		Limit
☒	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.

2.4.2. Measuring Instruments and Setting

For other channel

Please refer to section 3 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 3 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

2.4.3. Test Procedures

For other channel

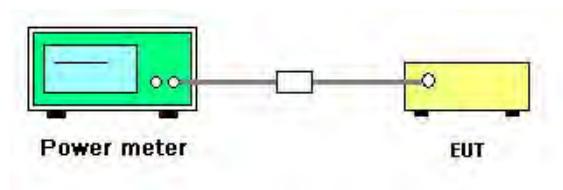
1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v02r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power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

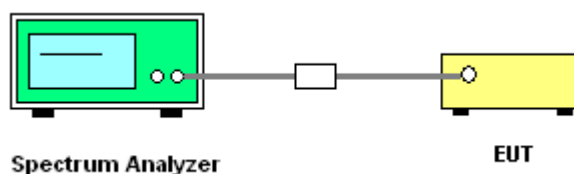
1. The transmitter output (antenna port) was connected to the spectrum analyzer.

2.4.4. Test Setup Layout

For other channel



For straddle channel



2.4.5. Test Deviation

There is no deviation with the original standard.

2.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4.7. Test Result of Maximum Conducted Output Power

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

For indoor, outdoor use B2~B3

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
802.11a	5260 MHz	12.35	12.42	12.24	12.31	18.35	23.32	PASS
	5300 MHz	12.34	12.38	12.28	12.35	18.36	23.42	PASS
	5320 MHz	12.31	12.14	12.27	12.39	18.30	23.42	PASS
	5500 MHz	11.78	12.08	12.16	12.61	18.19	23.34	PASS
	5580 MHz	11.69	12.09	11.95	12.59	18.11	23.42	PASS
	5700 MHz	12.05	12.24	11.72	12.53	18.17	23.36	PASS
802.11ac MCS0/Nss1 VHT20	5260 MHz	12.01	12.22	12.06	12.09	18.12	23.64	PASS
	5300 MHz	12.18	12.25	12.07	12.15	18.18	23.66	PASS
	5320 MHz	11.87	11.93	12.18	12.06	18.03	23.66	PASS
	5500 MHz	12.05	12.11	12.57	12.32	18.29	23.62	PASS
	5580 MHz	12.02	12.24	12.64	12.35	18.34	23.68	PASS
	5700 MHz	12.04	12.38	12.75	12.16	18.36	23.62	PASS
802.11ac MCS0/Nss1 VHT40	5270 MHz	15.13	15.24	15.07	15.19	21.18	23.98	PASS
	5310 MHz	15.29	15.11	15.06	15.15	21.17	23.98	PASS
	5510 MHz	13.43	13.67	14.21	13.86	19.82	23.98	PASS
	5550 MHz	14.82	15.05	15.66	15.13	21.20	23.98	PASS
	5670 MHz	14.74	14.85	15.45	14.98	21.03	23.98	PASS
802.11ac MCS0/Nss1 VHT80	5290 MHz	14.61	14.74	14.59	14.72	20.69	23.98	PASS
	5530 MHz	13.25	14.26	14.28	13.58	19.89	23.98	PASS
	5610 MHz	16.22	16.71	16.94	16.45	22.61	23.98	PASS

Note:

For 802.11a:

5260 MHz Power limit=23.98dBm or $11+10\log(B)$; $11+10\log(17.04)-(6-6)=23.32\text{dBm}<23.98\text{dBm}$, so limit=23.32dBm.

5300 MHz Power limit=23.98dBm or $11+10\log(B)$; $11+10\log(17.48)-(6-6)=23.42\text{dBm}<23.98\text{dBm}$, so limit=23.42dBm.

5320 MHz Power limit=23.98dBm or $11+10\log(B)$; $11+10\log(17.48)-(6-6)=23.42\text{dBm}<23.98\text{dBm}$, so limit=23.42dBm.

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

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

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



For 802.11ac VHT20:

5260 MHz Power limit=23.98dBm or $11+10\log(B)$; $11+10\log(18.35)-(6-6)=23.64\text{dBm}<23.98\text{dBm}$, so limit=23.64dBm.

5300 MHz Power limit=23.98dBm or $11+10\log(B)$; $11+10\log(18.44)-(6-6)=23.66\text{dBm}<23.98\text{dBm}$, so limit=23.66dBm.

5320 MHz Power limit=23.98dBm or $11+10\log(B)$; $11+10\log(18.44)-(6-6)=23.66\text{dBm}<23.98\text{dBm}$, so limit=23.66dBm.

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

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

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

Straddle Channel

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

For beamforming mode

For ndoor, outdoor use B2~B3

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Port 1	Port 2	Port 3	Port 4	Total		
802.11ac MCS0/Nss1 VHT20	5260 MHz	11.58	11.96	11.59	11.65	17.72	17.96	PASS
	5300 MHz	11.83	11.71	11.67	11.72	17.75	17.96	PASS
	5320 MHz	11.43	11.55	11.48	11.77	17.58	17.96	PASS
	5500 MHz	10.75	11.19	11.21	11.63	17.23	17.96	PASS
	5580 MHz	10.83	11.36	11.17	11.91	17.36	17.96	PASS
	5700 MHz	10.95	11.67	10.81	11.47	17.26	17.96	PASS
802.11ac MCS0/Nss1 VHT40	5270 MHz	12.03	11.72	11.55	11.46	17.72	17.96	PASS
	5310 MHz	12.22	11.81	11.76	11.61	17.88	17.96	PASS
	5510 MHz	10.94	11.15	11.23	11.64	17.27	17.96	PASS
	5550 MHz	10.75	11.09	11.24	11.73	17.24	17.96	PASS
	5670 MHz	10.93	11.34	11.27	11.78	17.36	17.96	PASS
802.11ac MCS0/Nss1 VHT80	5290 MHz	11.71	11.53	11.13	11.41	17.47	17.96	PASS
	5530 MHz	11.85	11.92	11.55	12.13	17.89	17.96	PASS
	5610 MHz	10.82	11.43	11.14	11.71	17.31	17.96	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi} > 6\text{dBi}$, so B2 B3 limit = 23.98-(12.02-6)=17.96dBm.

Straddle Channel

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

Note:

For 802.11ac VHT20:

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

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

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

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

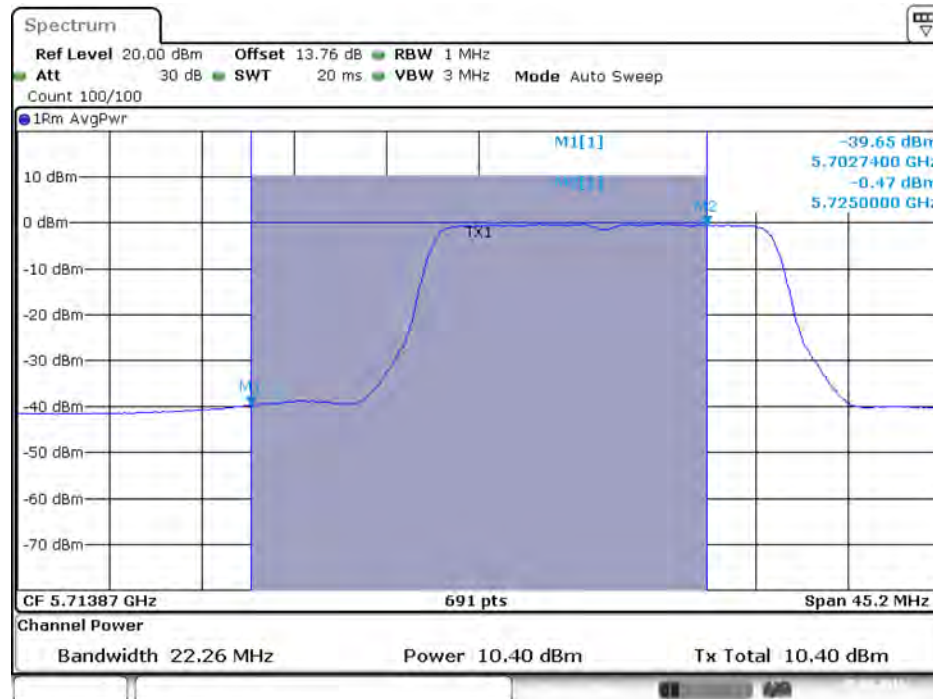
For plots, only the channel with worse result was shown.

For non-beamforming mode

For indoor, outdoor use

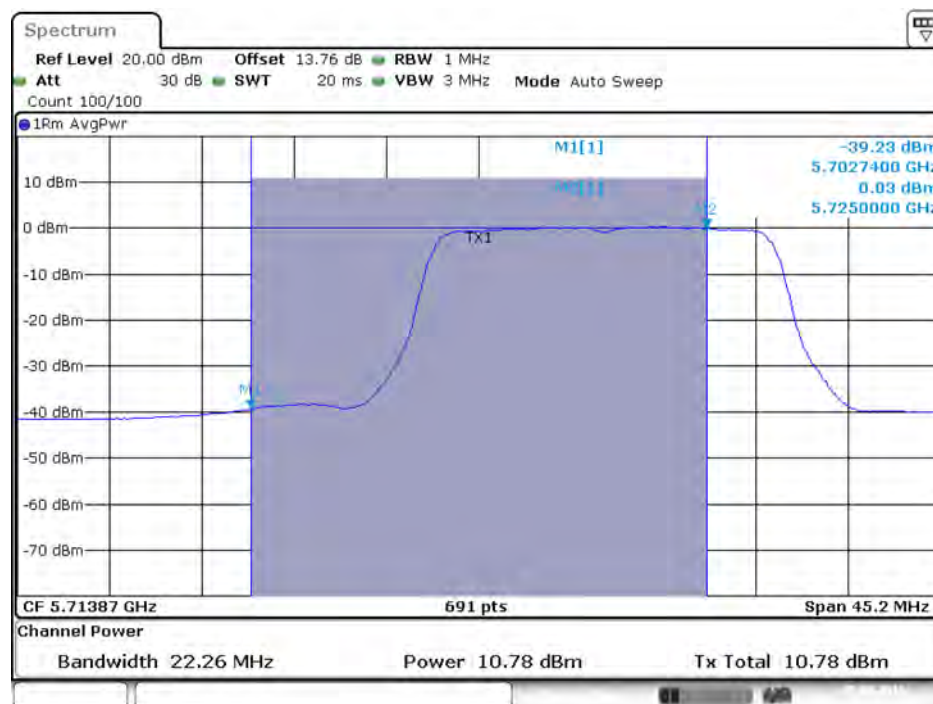
Straddle Channel

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



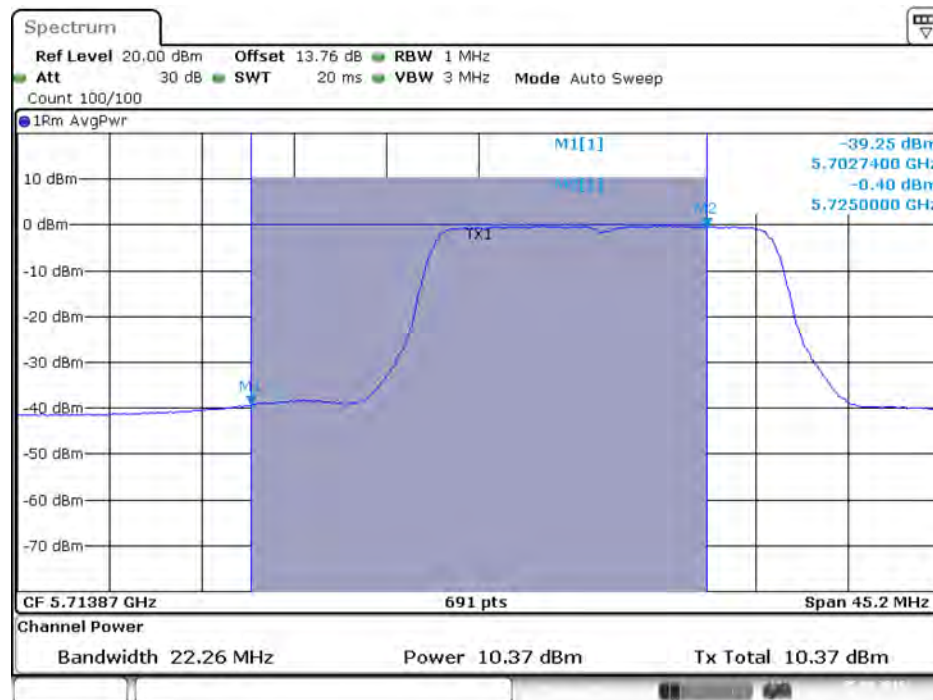
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Conducted Output Power Plot on Configuration IEEE 802.11a / Port 2 / 5720 MHz (UNII 2C)



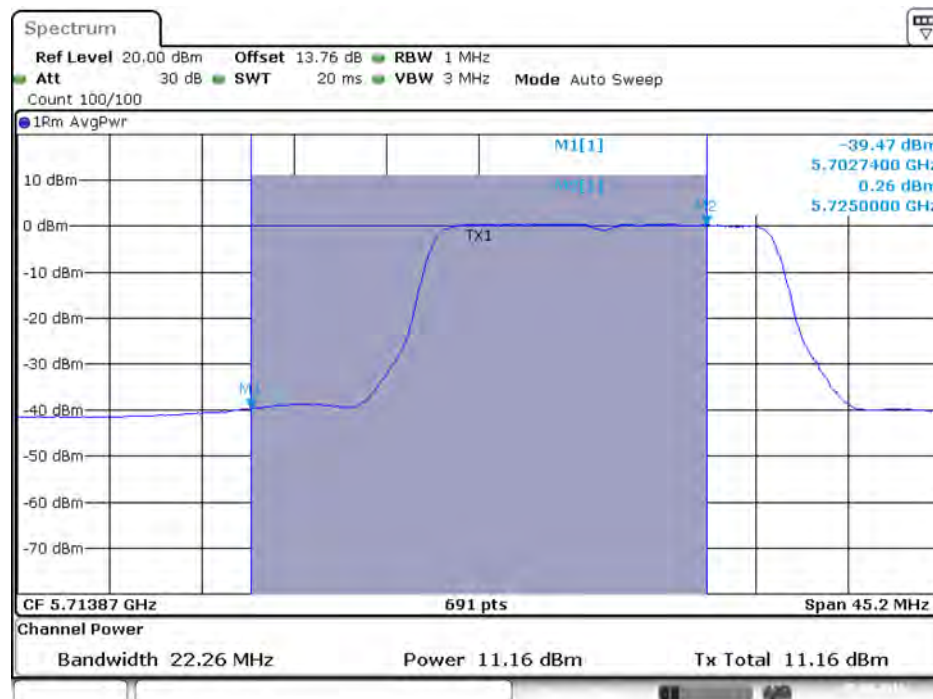
Date: 5.AUG.2016 14:21:40

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



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

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



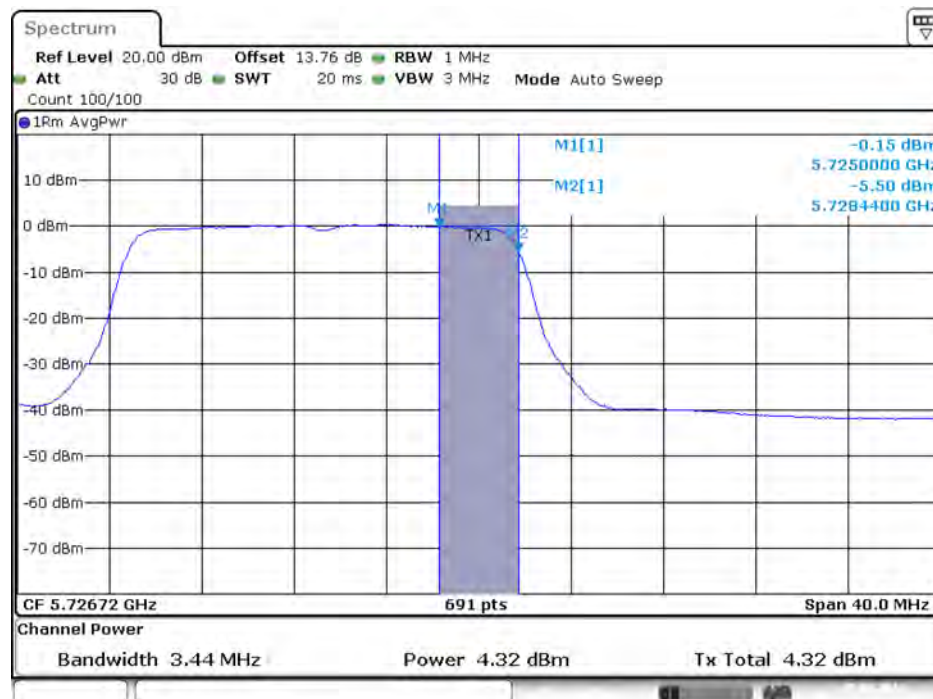
Date: 5.AUG.2016 14:21:54

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



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

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



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

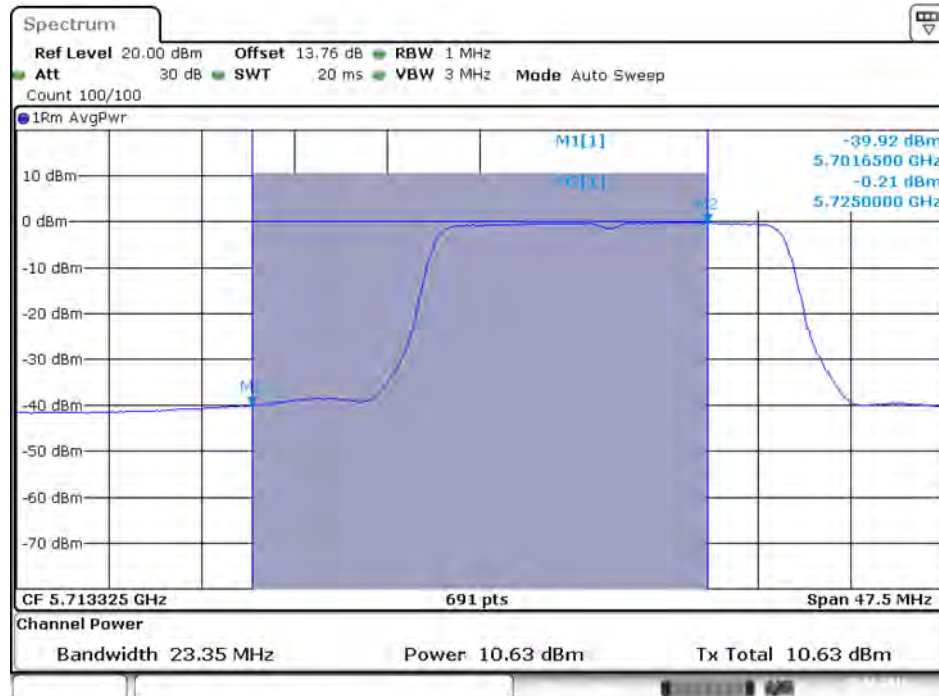
Conducted Output Power Plot on Configuration IEEE 802.11a / Port 3 / 5720 MHz (UNII 3)


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

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

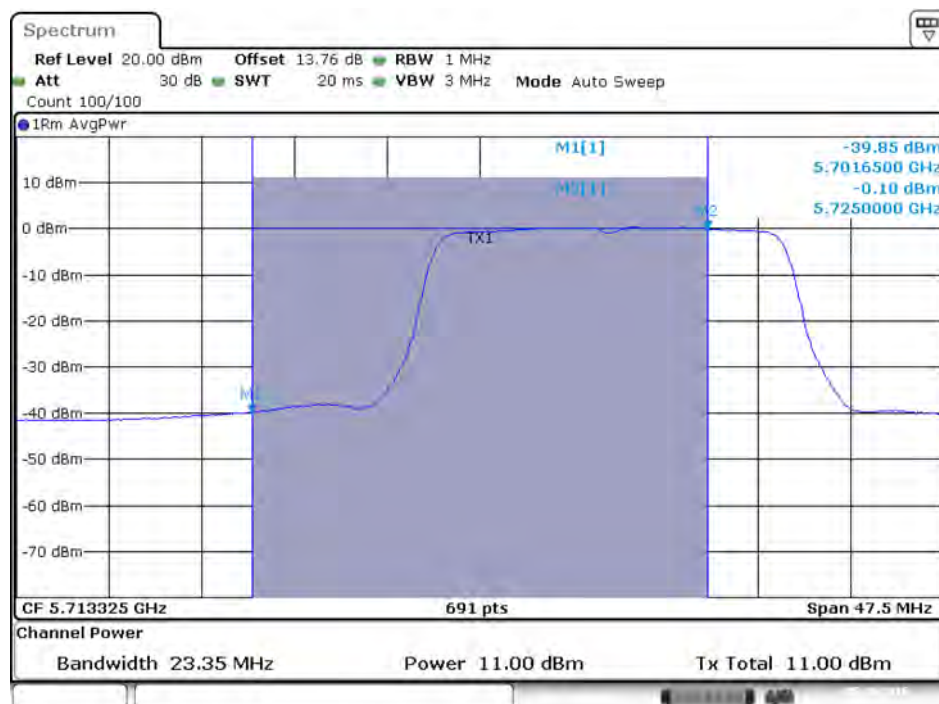

Date: 5.AUG.2016 14:21:57

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



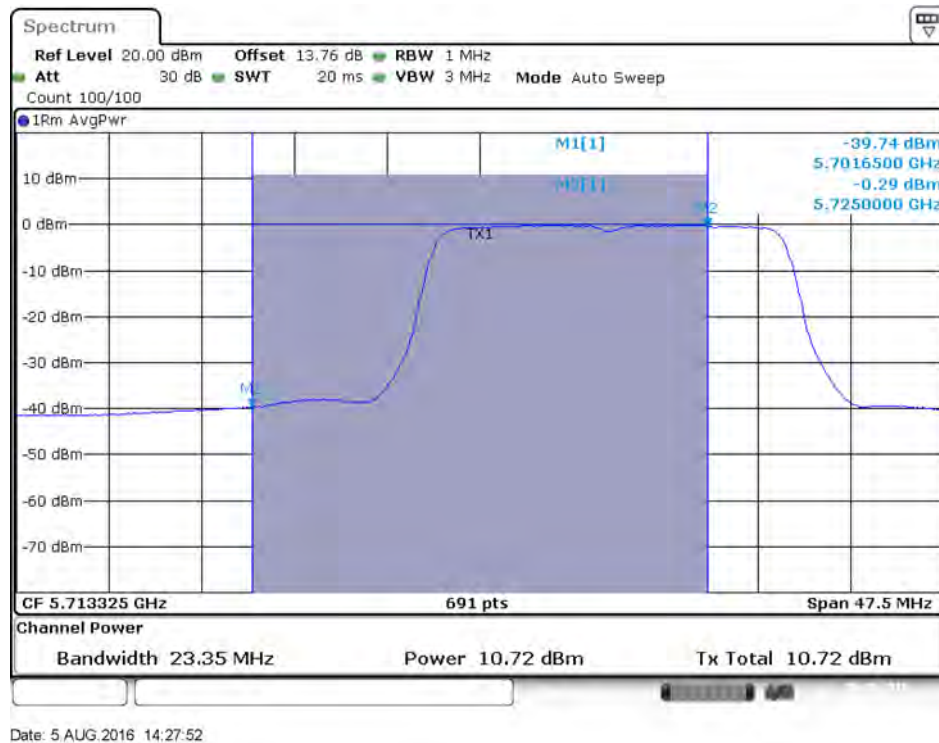
Date: 5.AUG.2016 14:27:37

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

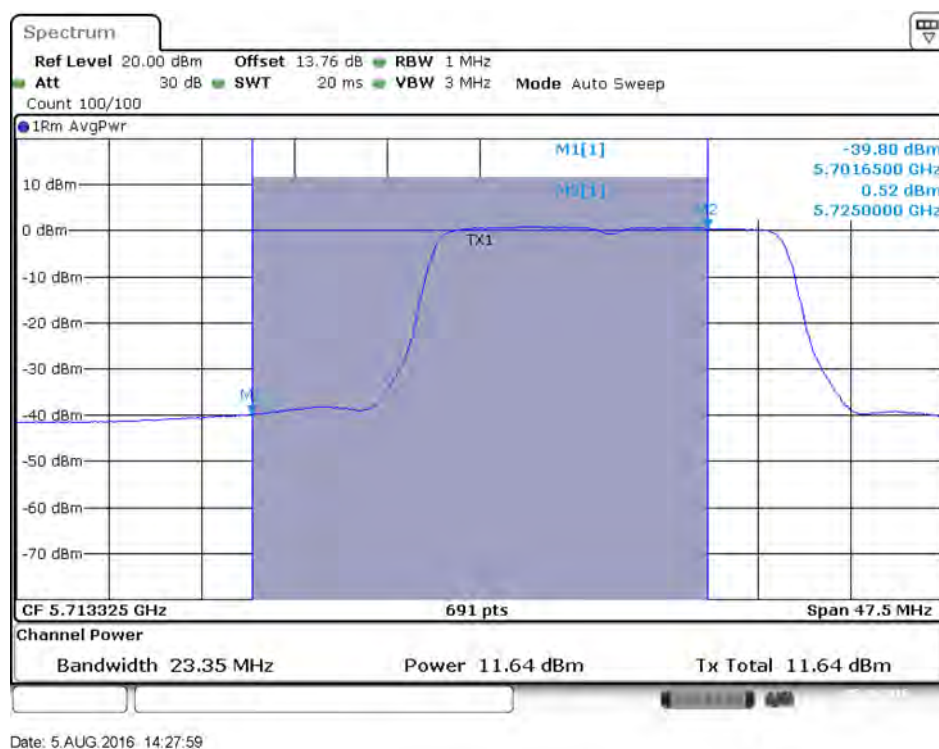


Date: 5.AUG.2016 14:27:45

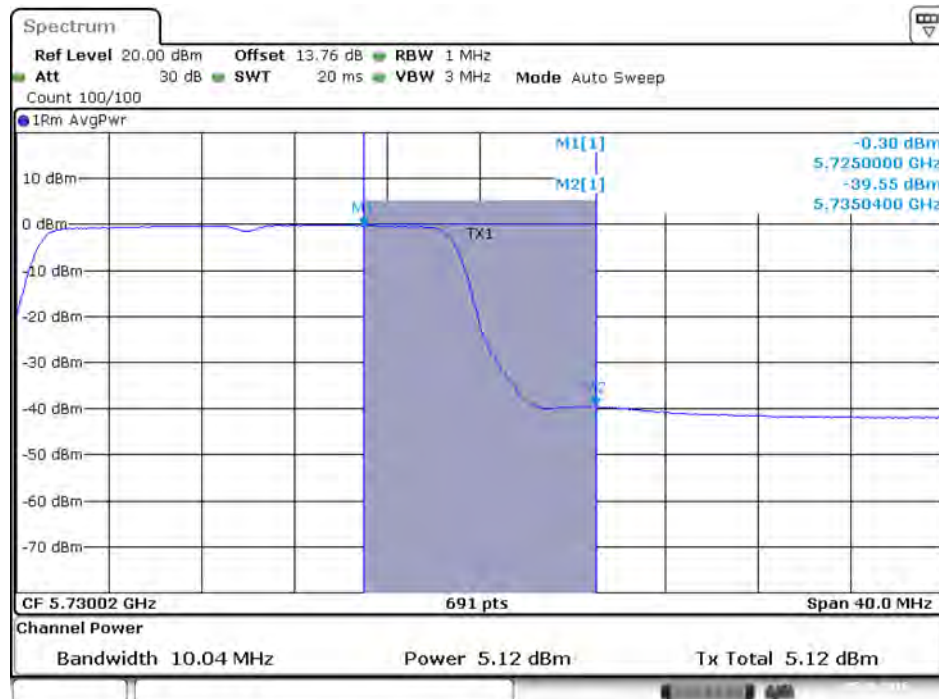
Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 3 / 5720 MHz (UNII 2C)



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

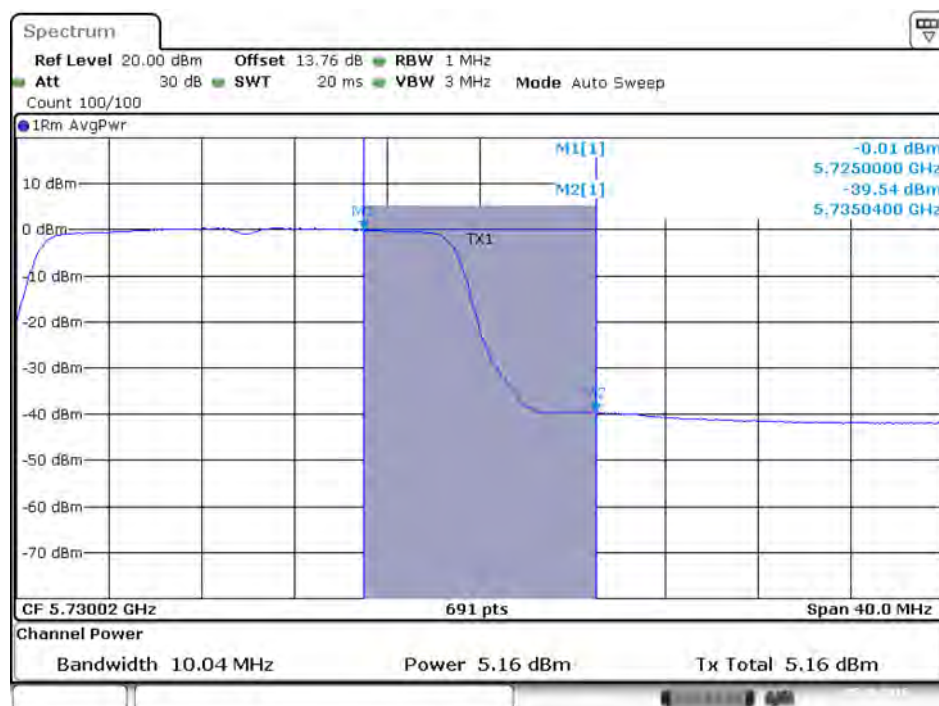


Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 / 5720 MHz (UNII 3)



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

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



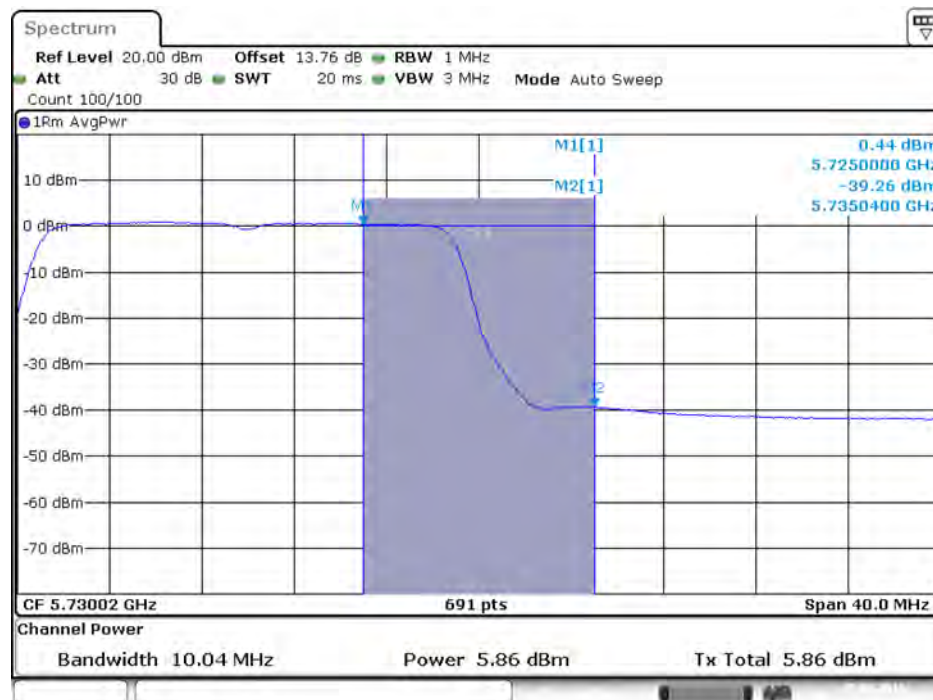
Date: 5.AUG.2016 14:27:48

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



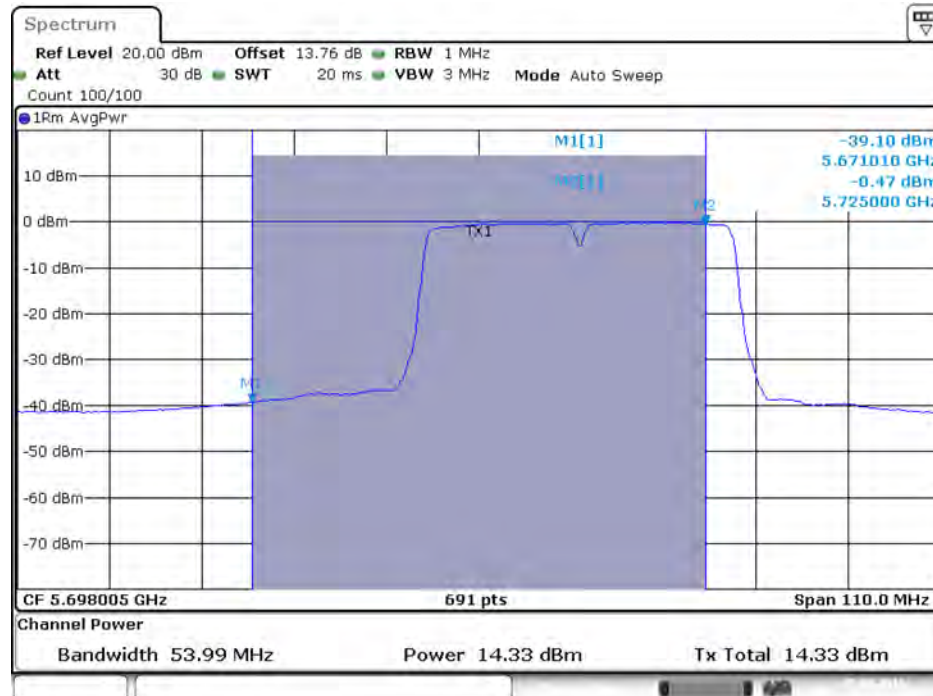
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Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 4 / 5720 MHz (UNII 3)



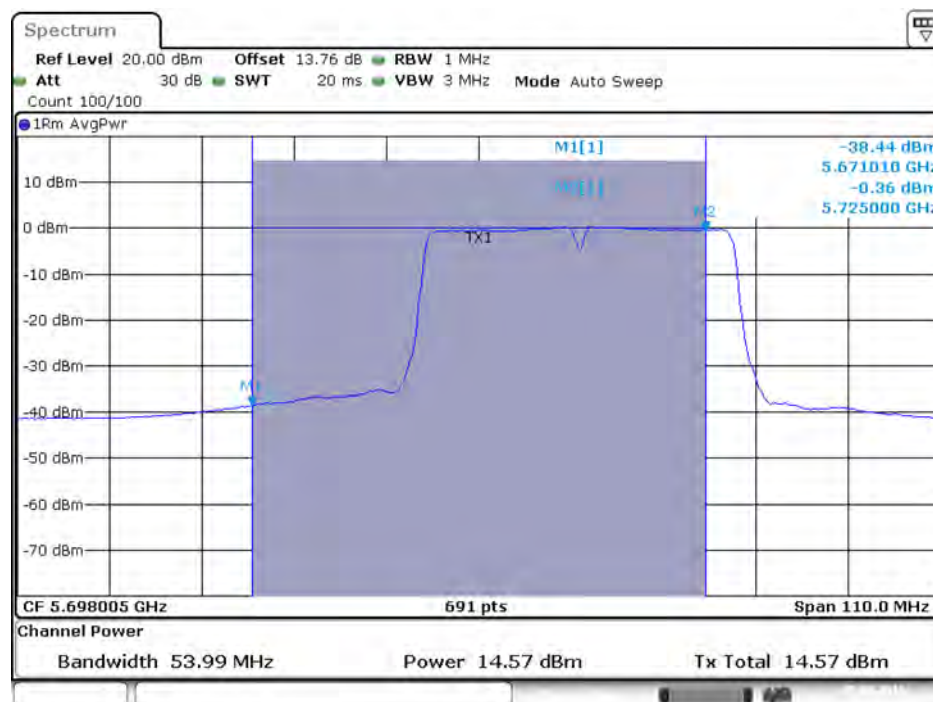
Date: 5.AUG.2016 14:28:02

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



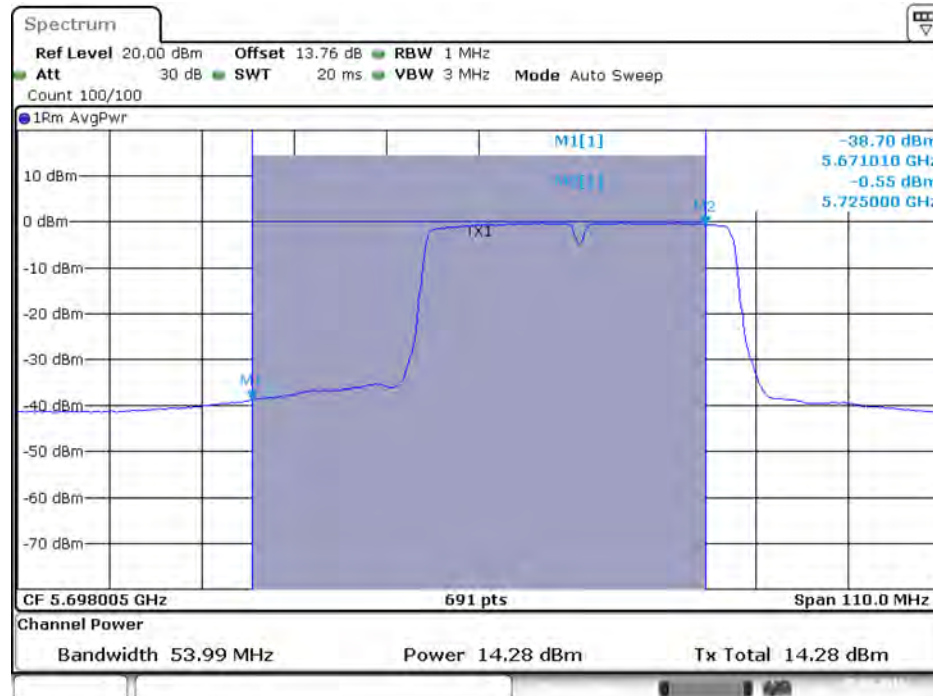
Date: 5.AUG.2016 14:39:10

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



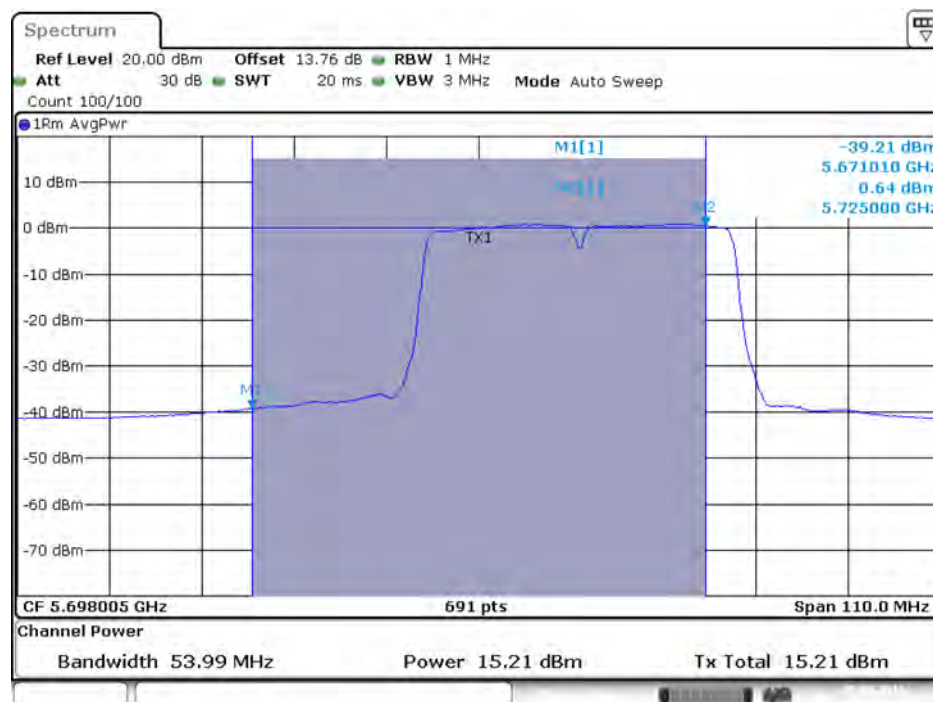
Date: 5.AUG.2016 14:39:17

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



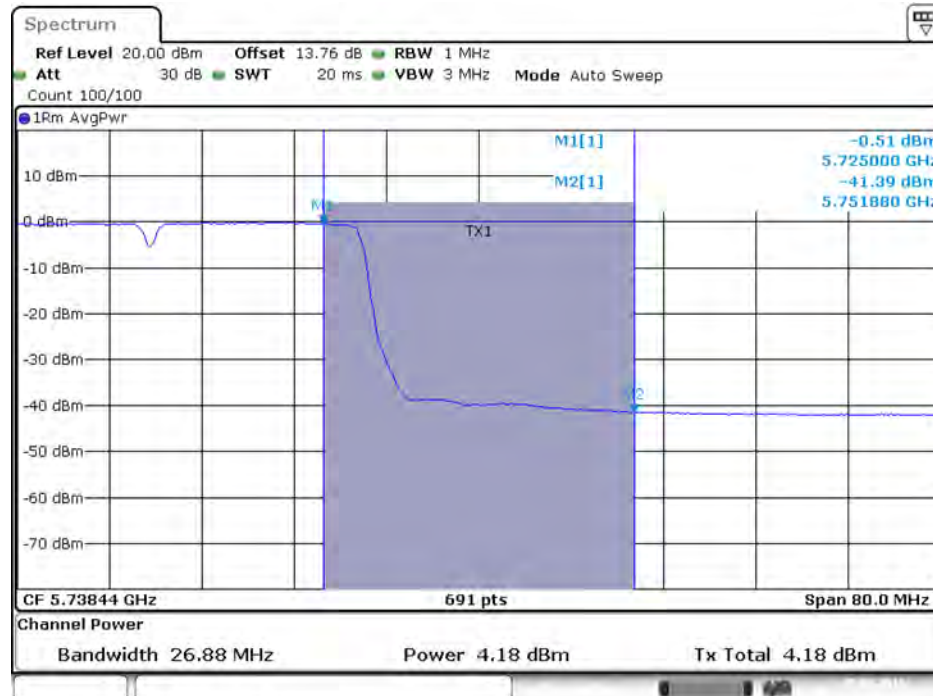
Date: 5.AUG.2016 14:39:24

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



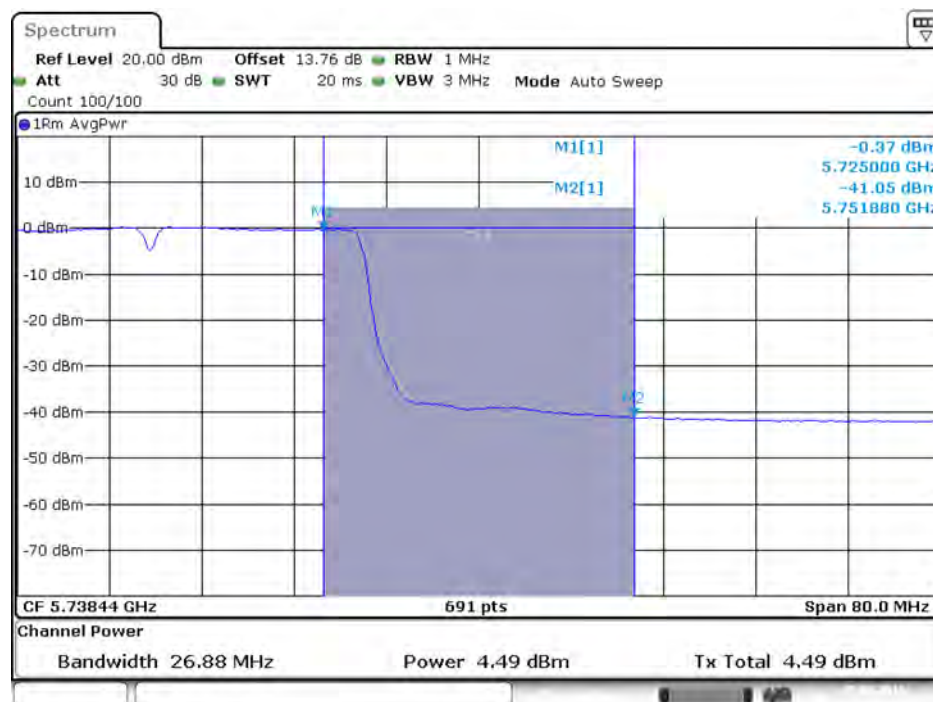
Date: 5.AUG.2016 14:39:31

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



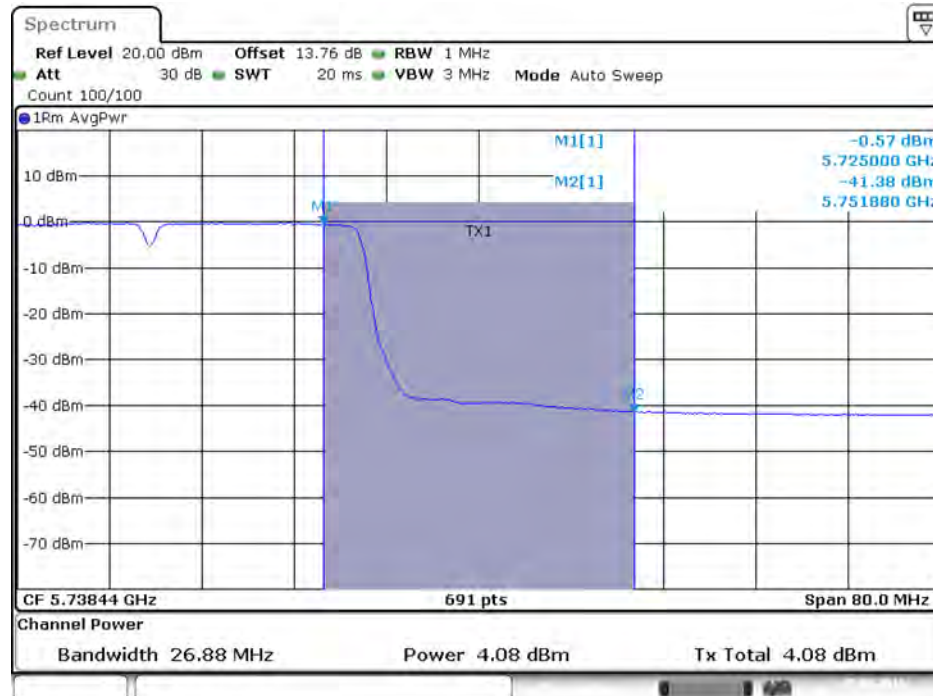
Date: 5.AUG.2016 14:39:13

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



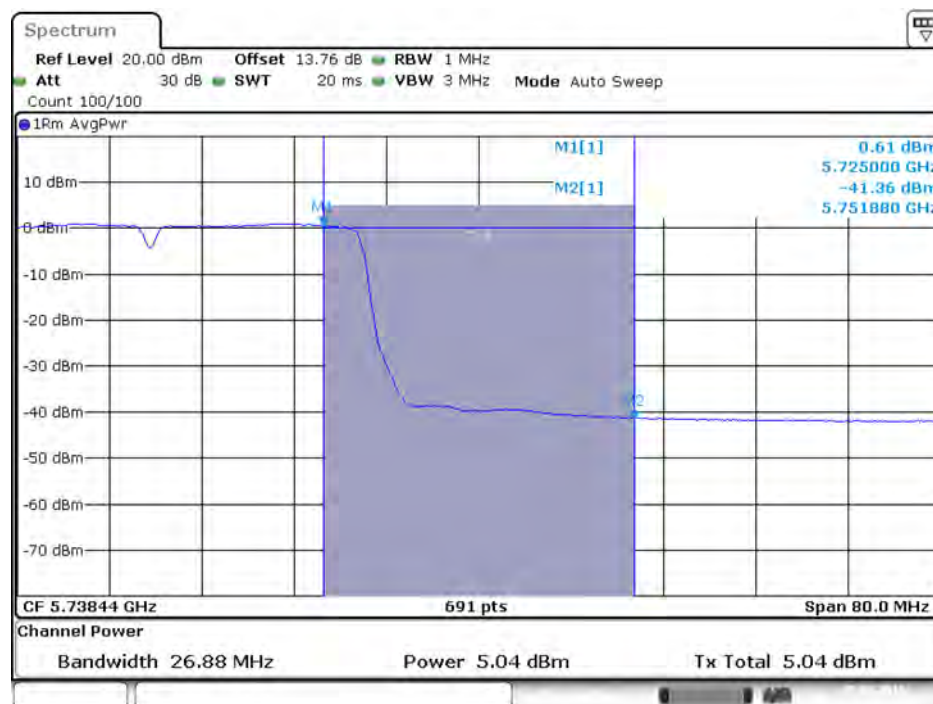
Date: 5.AUG.2016 14:39:20

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



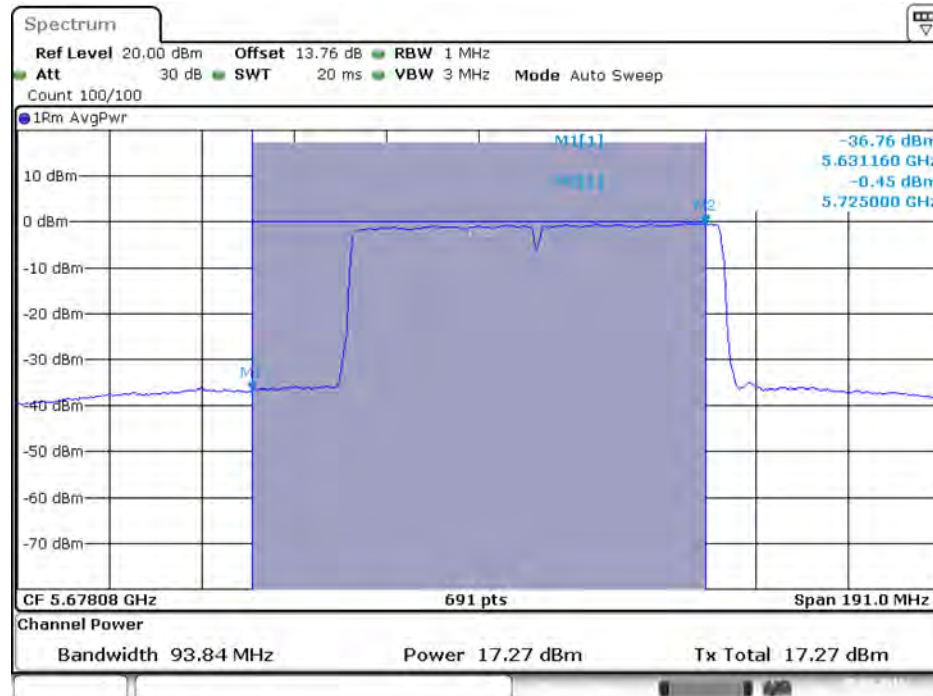
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Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 4 / 5710 MHz (UNII 3)



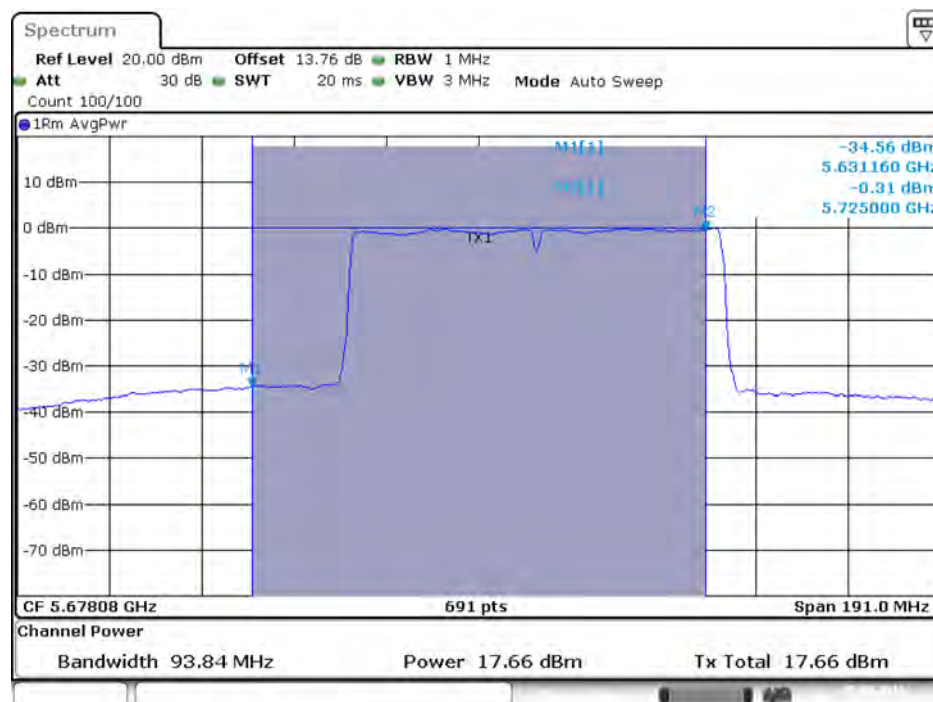
Date: 5.AUG.2016 14:39:34

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



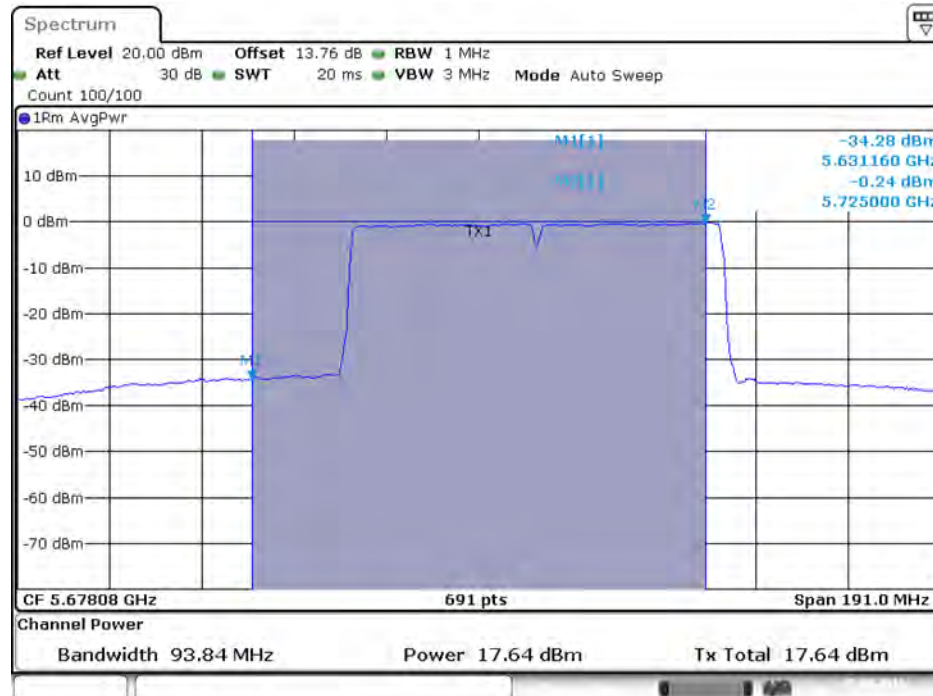
Date: 5.AUG.2016 14:49:31

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



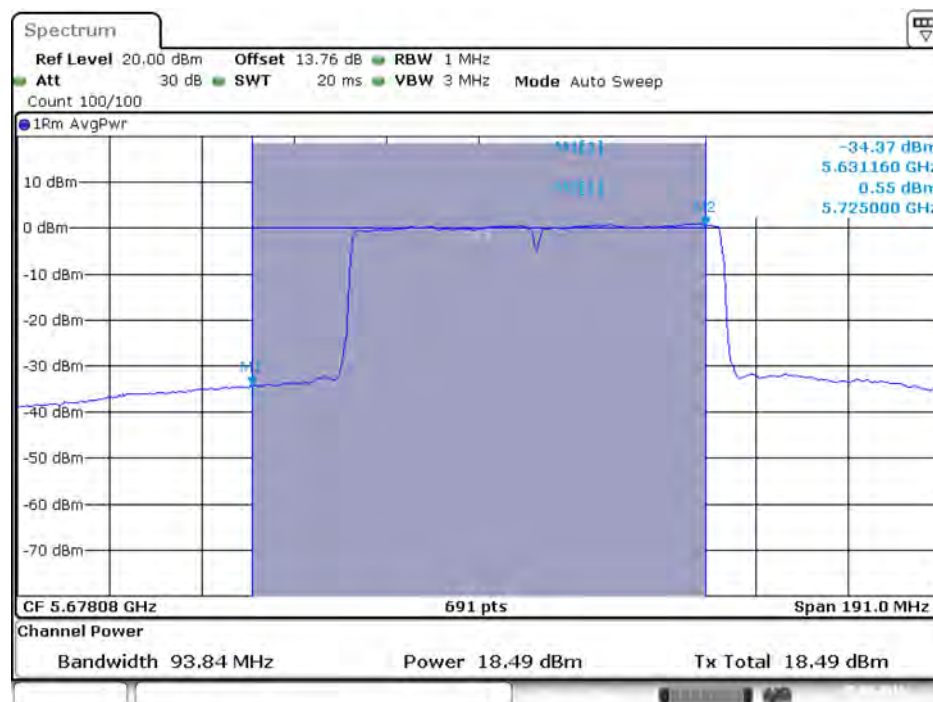
Date: 5.AUG.2016 14:49:38

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



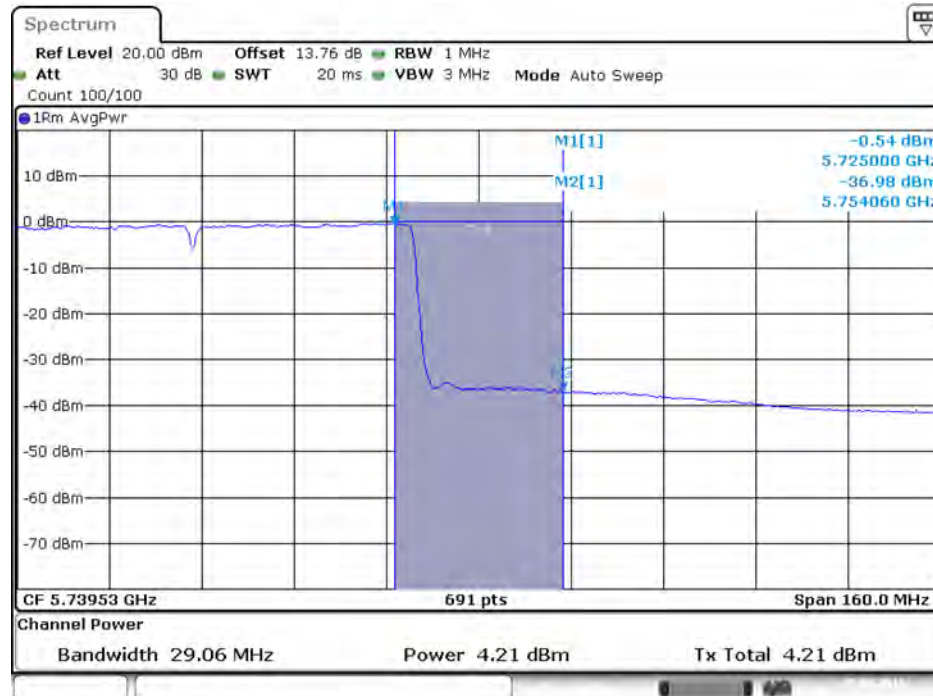
Date: 5.AUG.2016 14:49:46

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



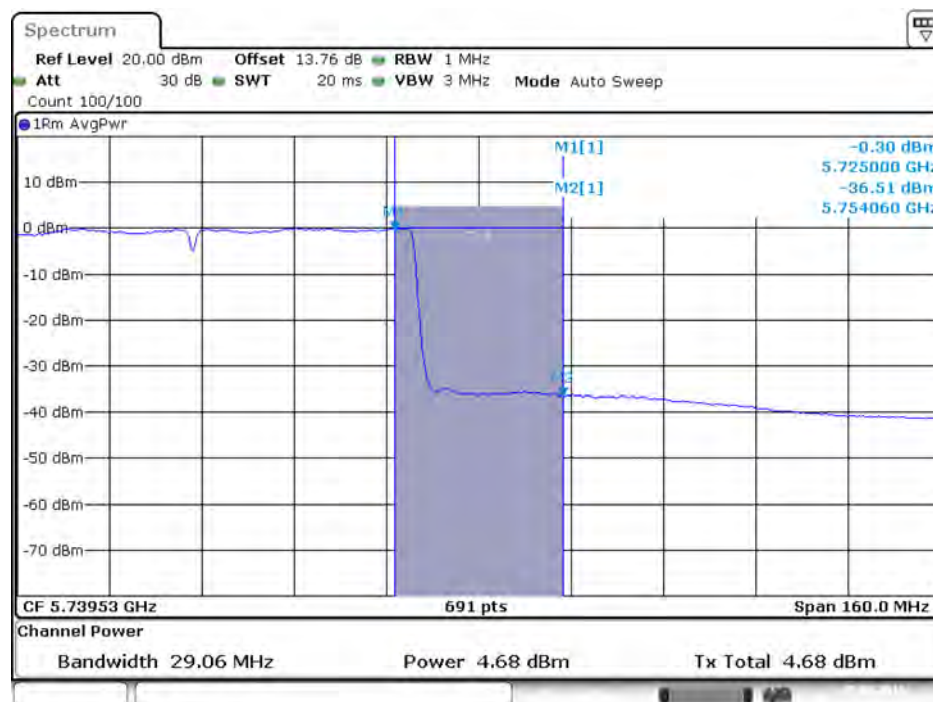
Date: 5.AUG.2016 14:49:53

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



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

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



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

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



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

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



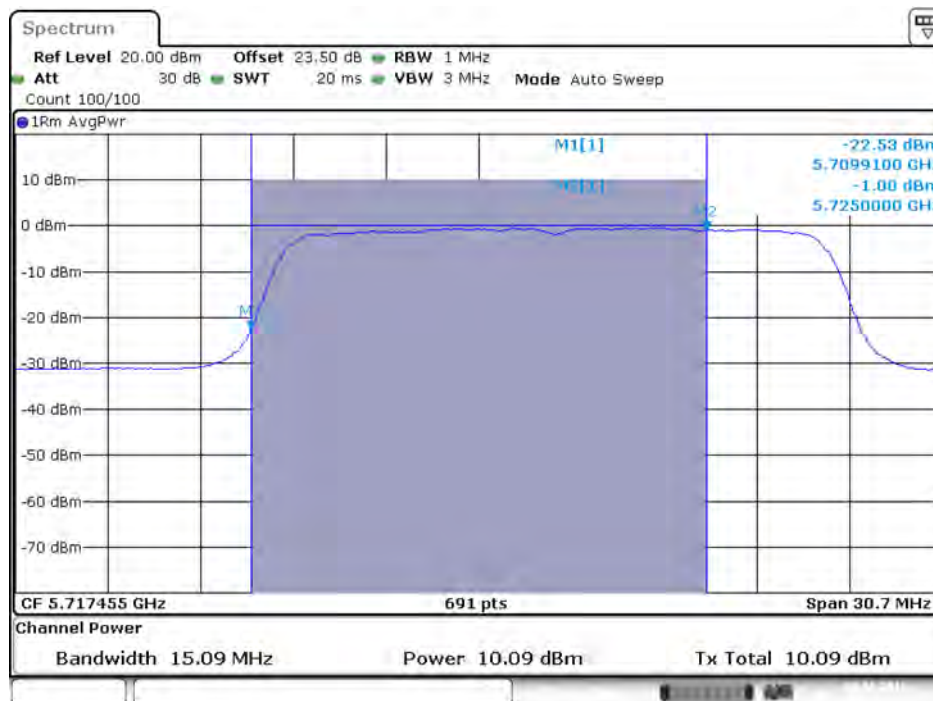
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For beamforming mode

For indoor, outdoor use

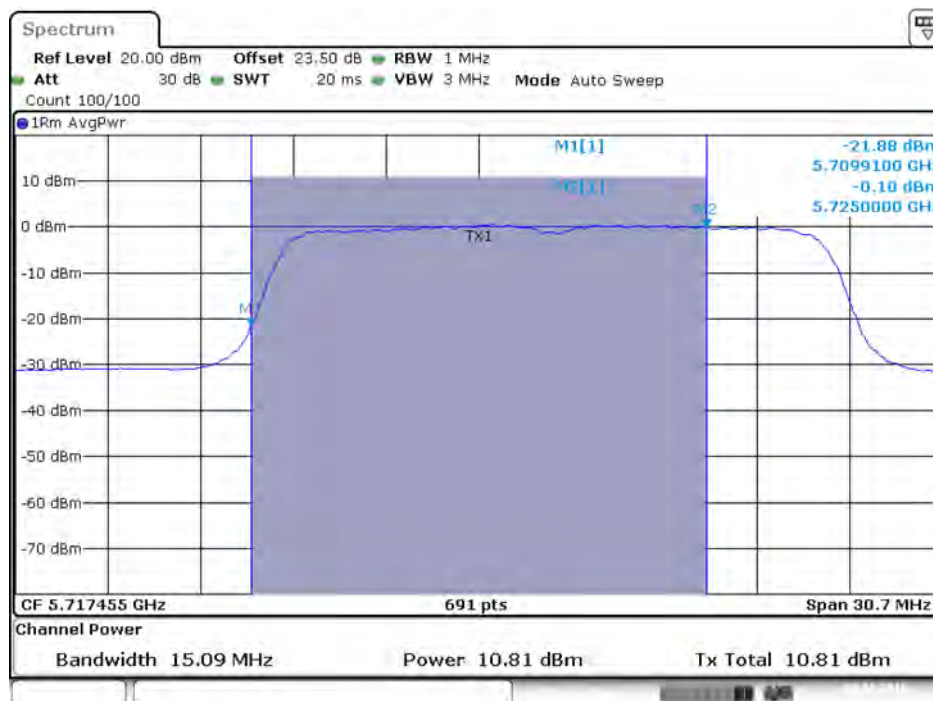
Straddle Channel

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



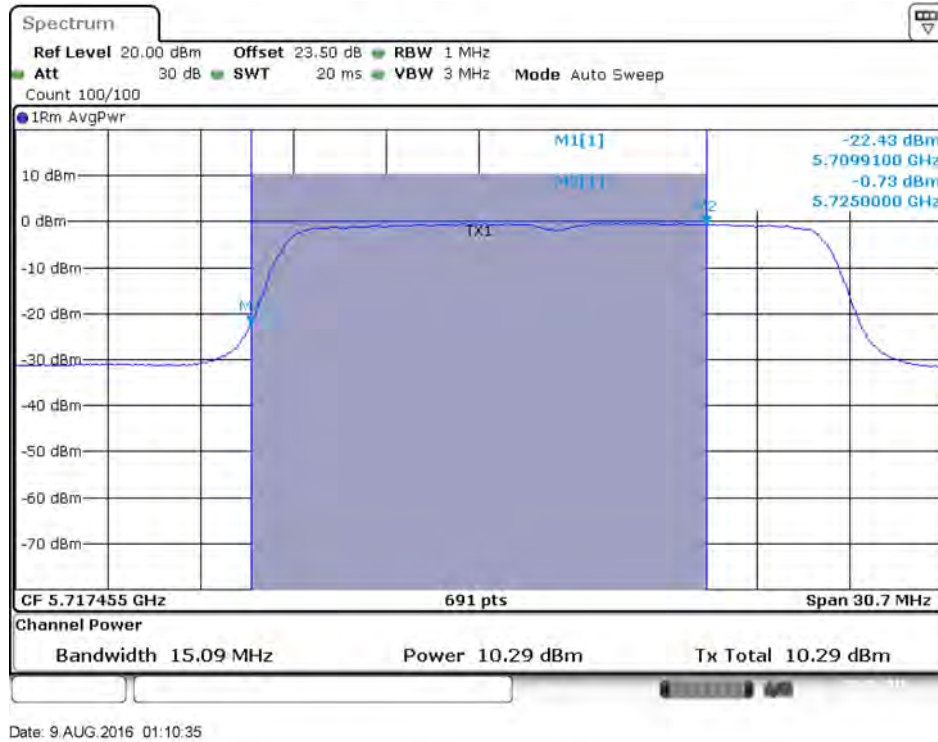
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Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 2 / 5720 MHz (UNII 2C)

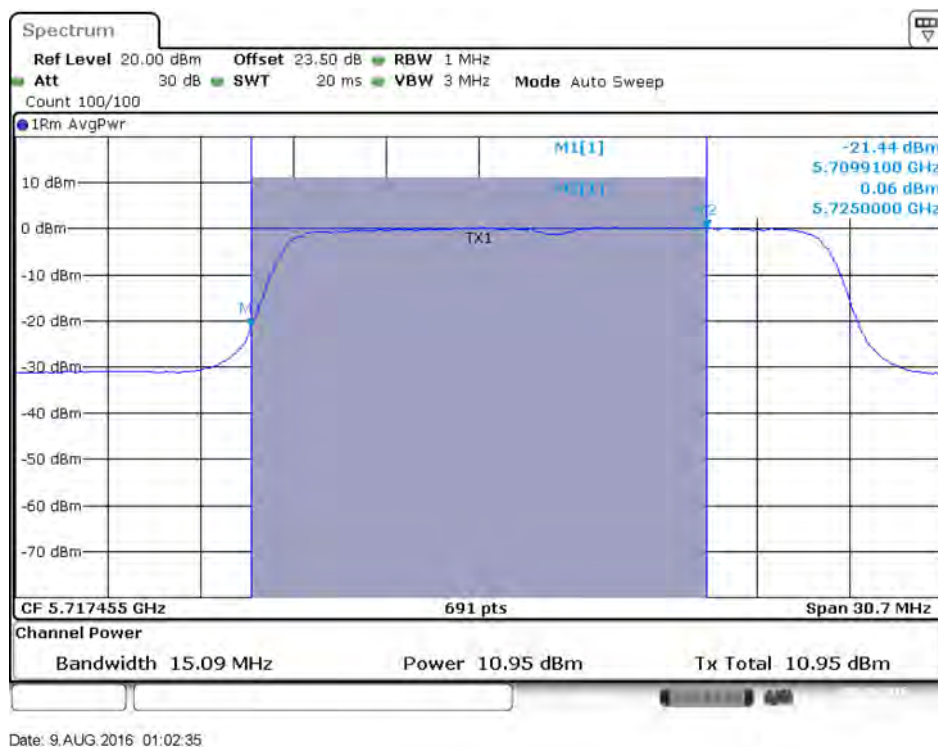


Date: 9.AUG.2016 01:14:50

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



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

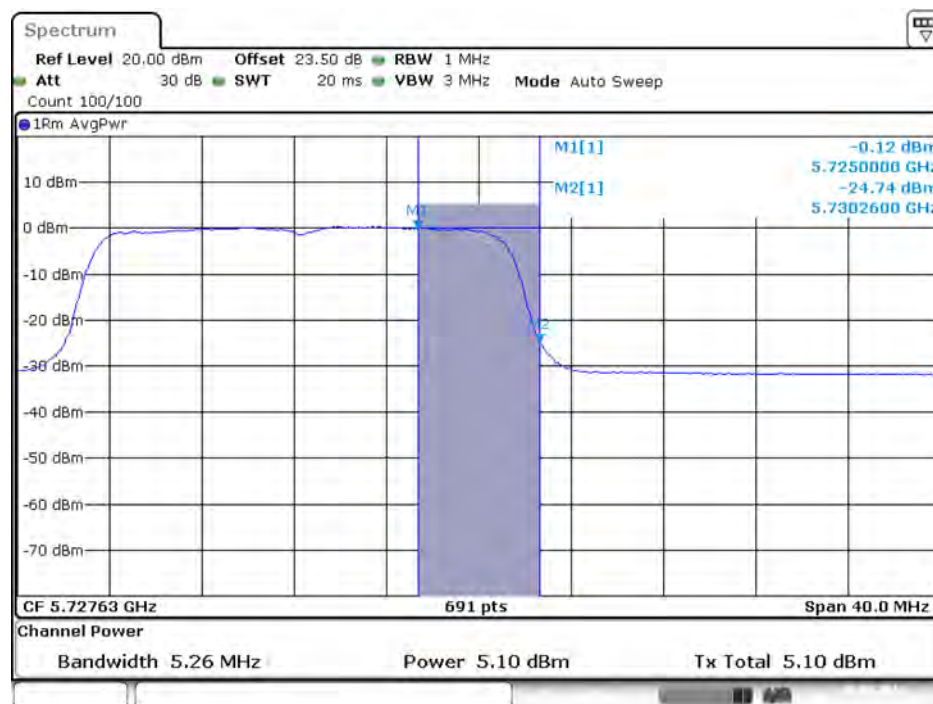


Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 / 5720 MHz (UNII 3)



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

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



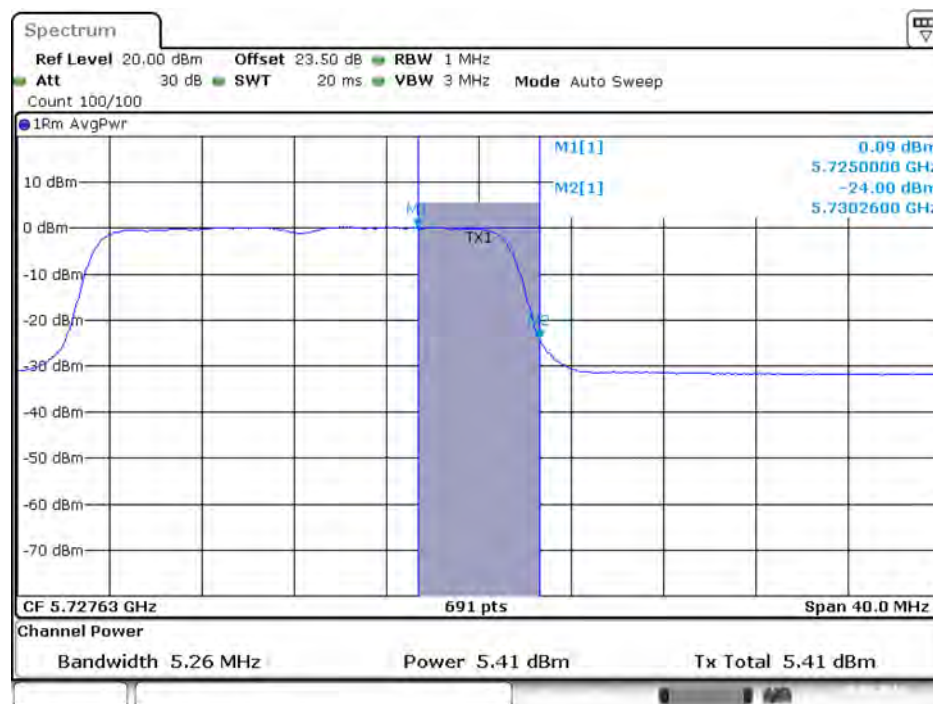
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Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 3 / 5720 MHz (UNII 3)



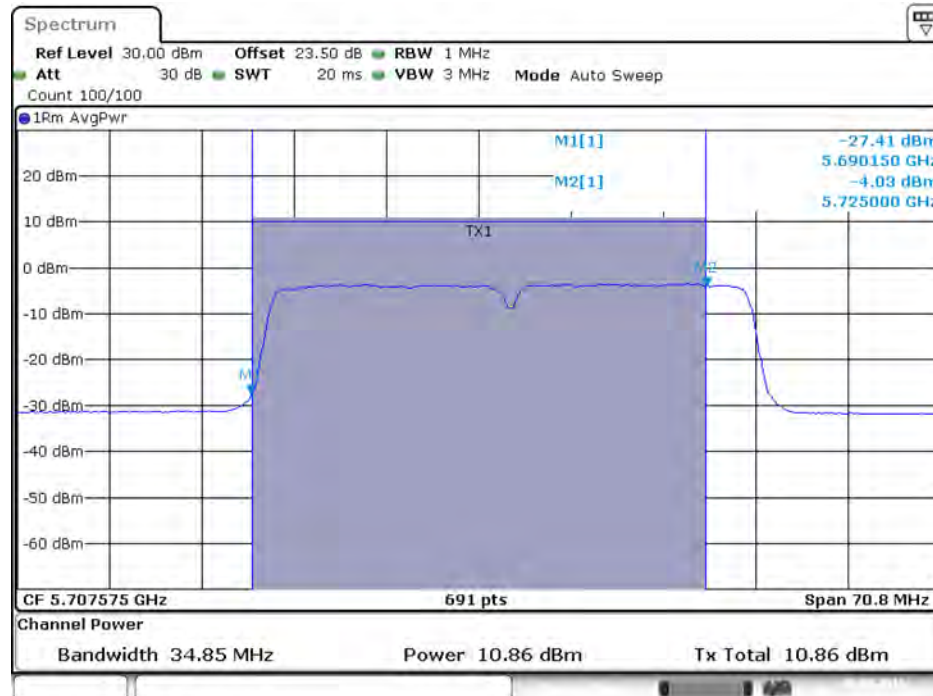
Date: 9.AUG.2016 01:10:39

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



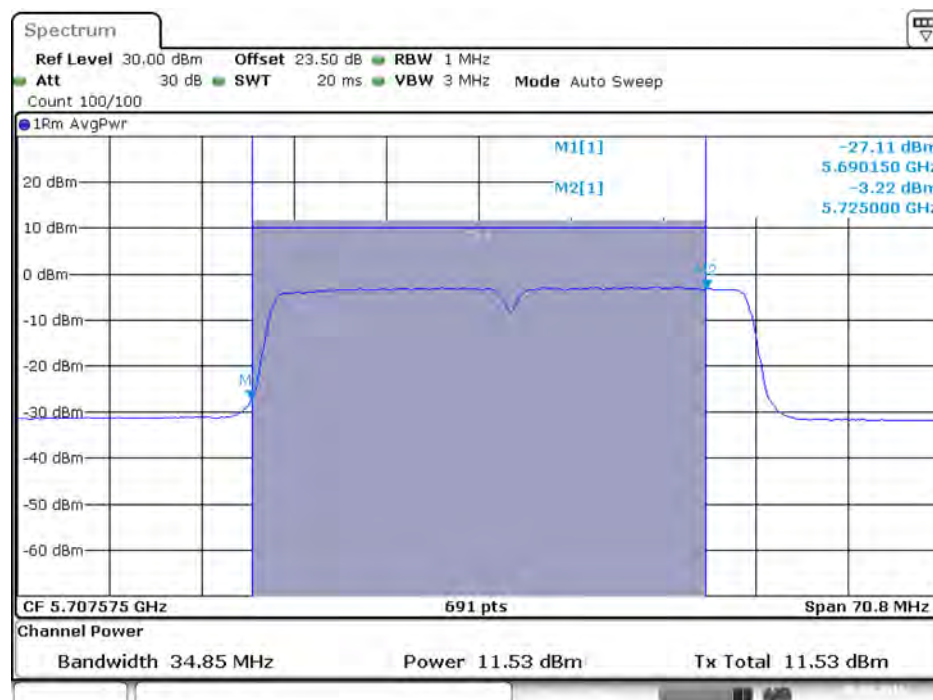
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Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 / 5710 MHz (UNII 2C)



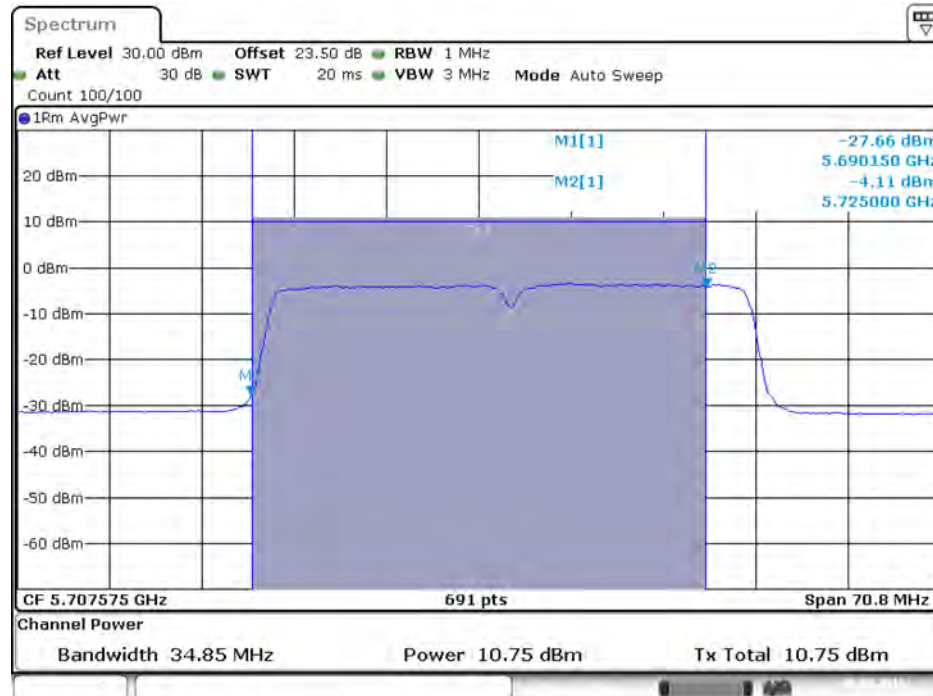
Date: 9.AUG.2016 03:10:42

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



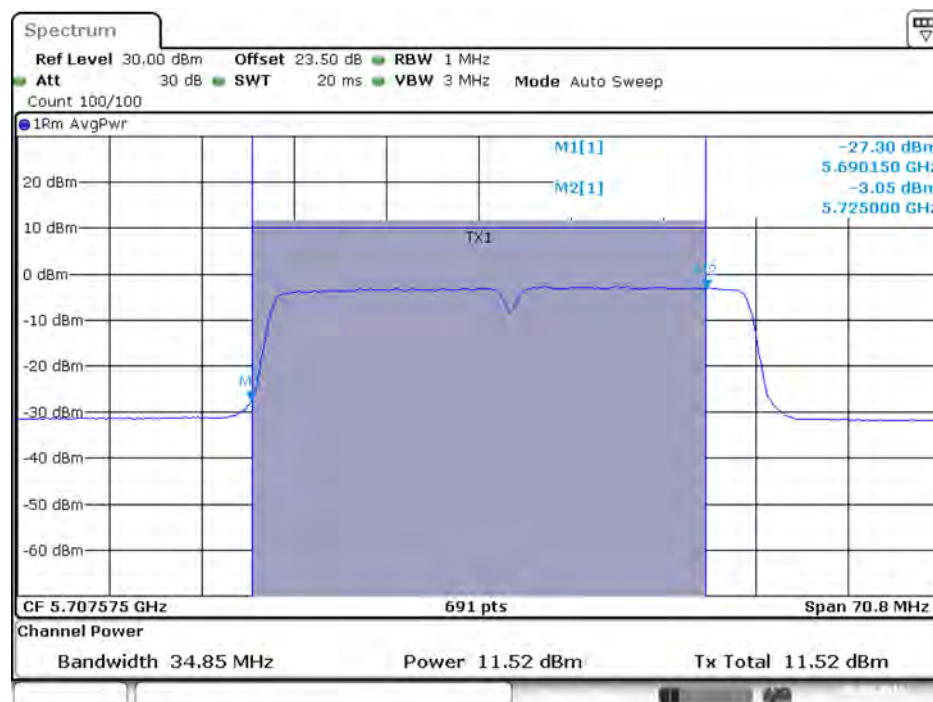
Date: 9.AUG.2016 03:08:17

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



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

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



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

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



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

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



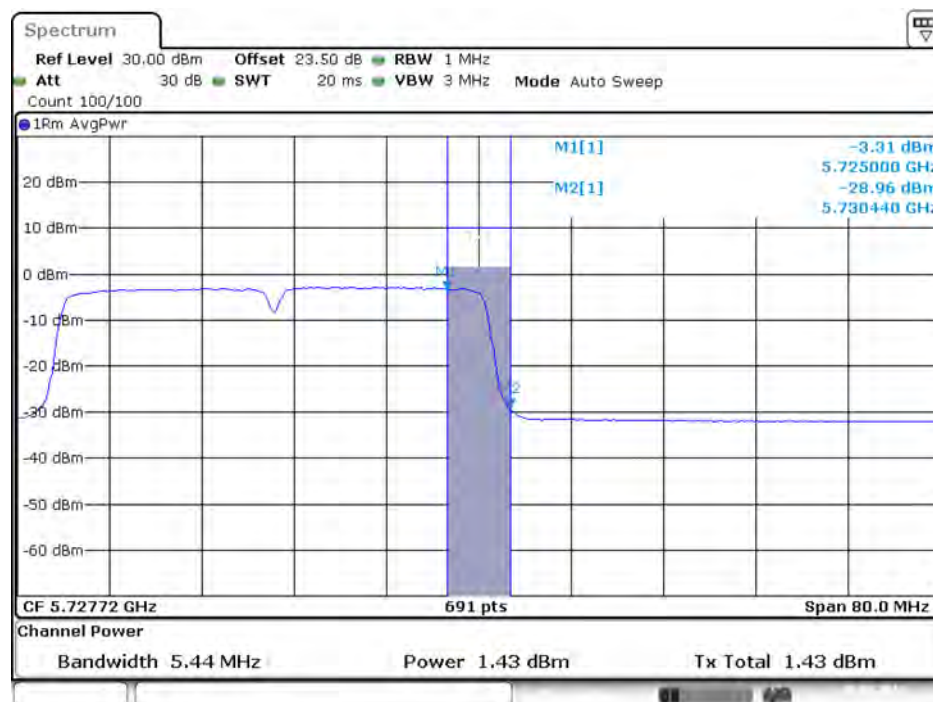
Date: 9.AUG.2016 03:08:20

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



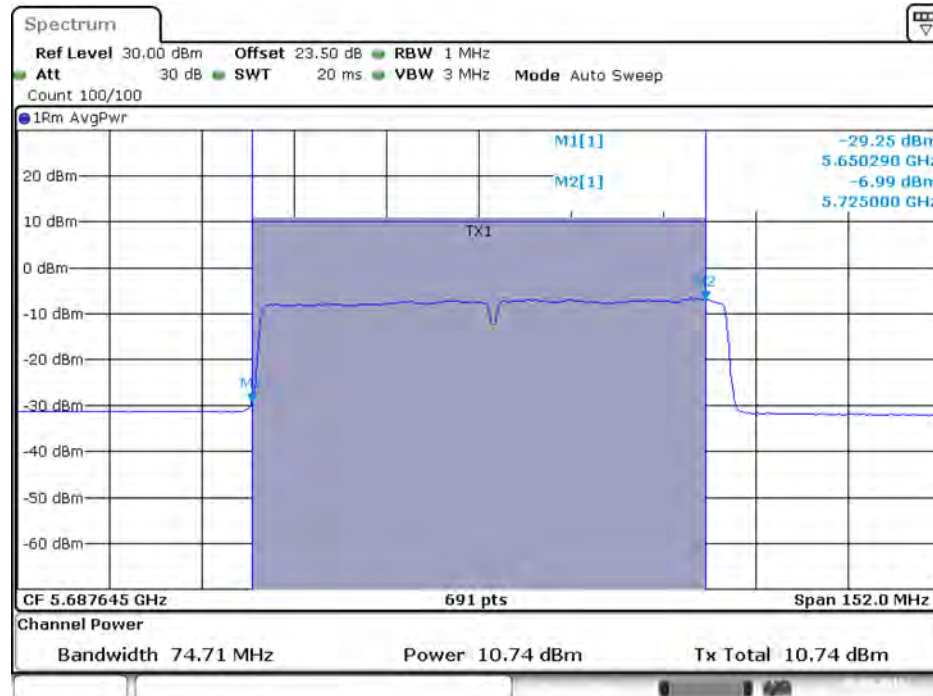
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Conducted Output Power Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 4 / 5710 MHz (UNII 3)



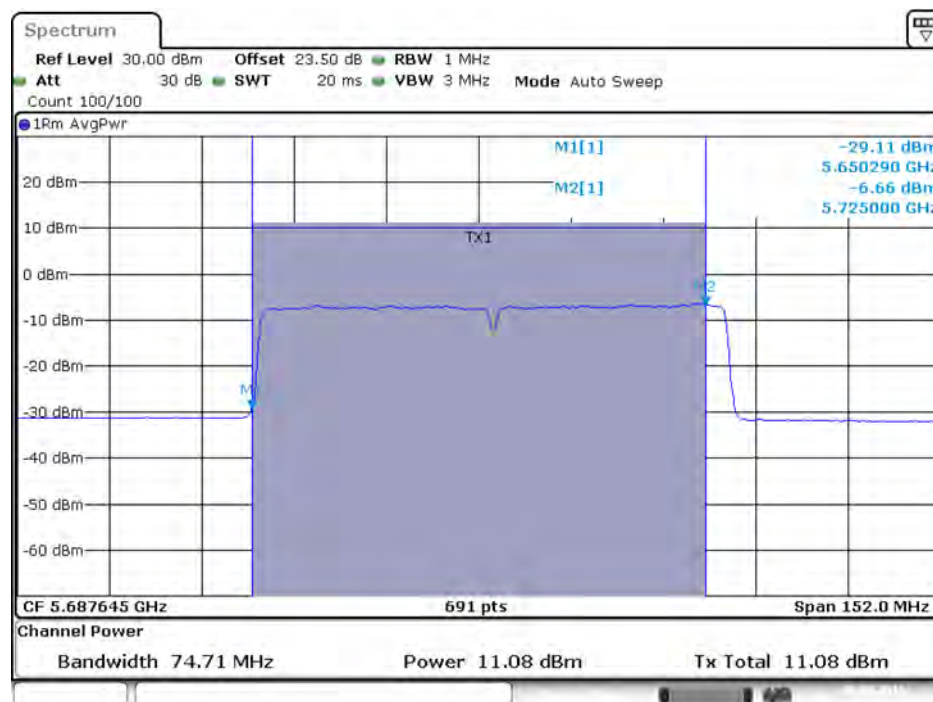
Date: 9.AUG.2016 02:59:58

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



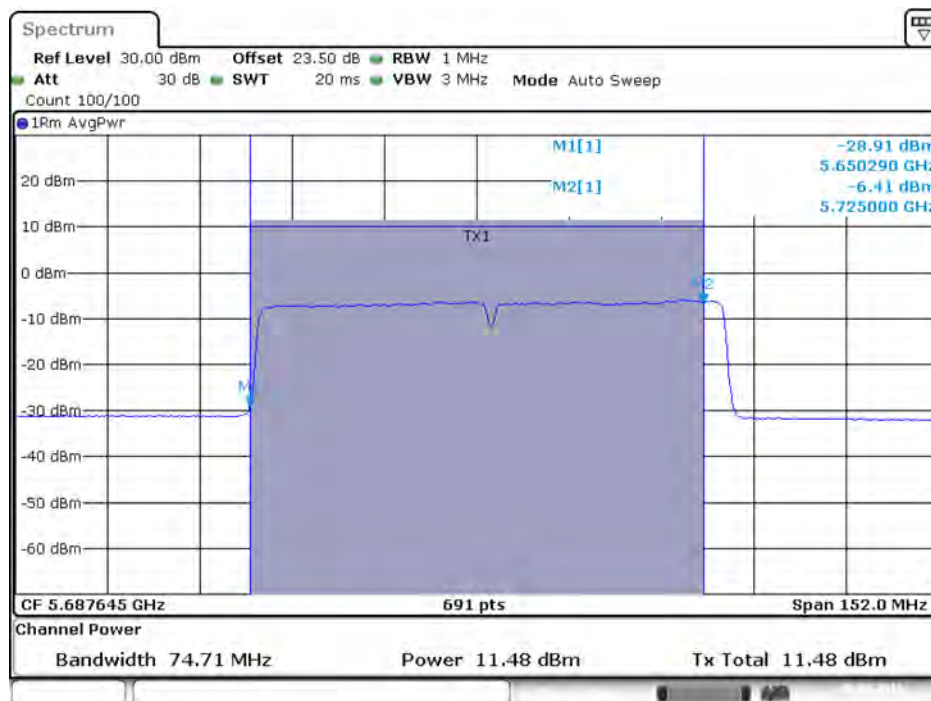
Date: 9.AUG.2016 02:36:05

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



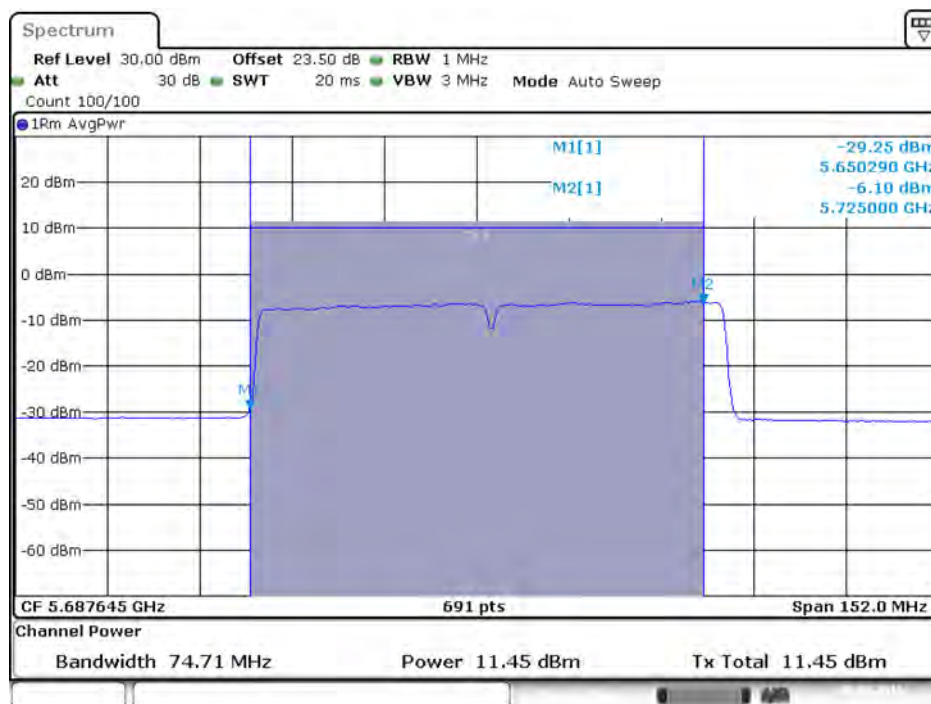
Date: 9.AUG.2016 02:38:20

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



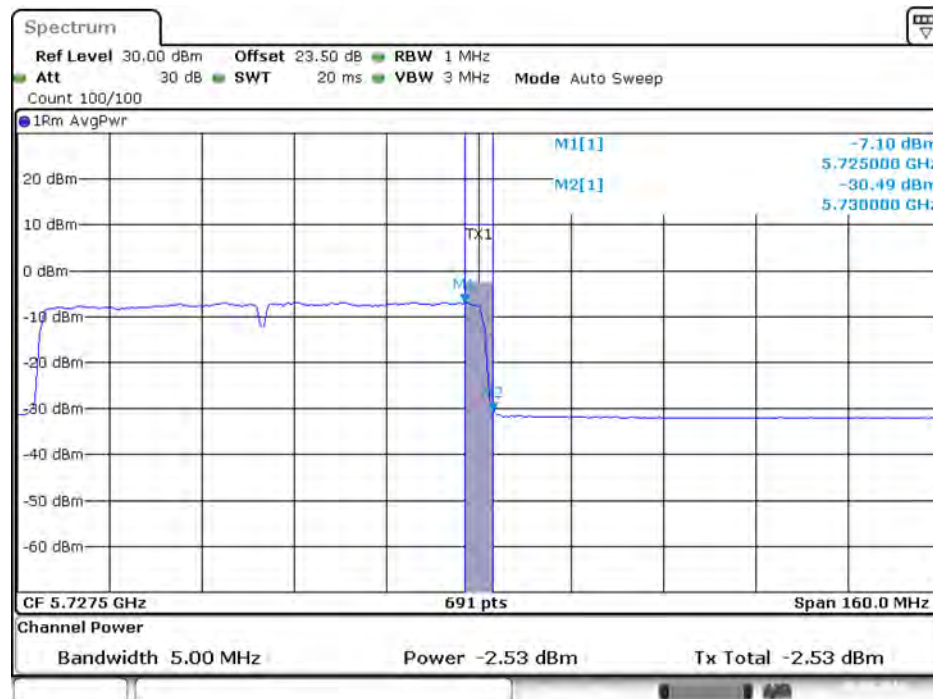
Date: 9.AUG.2016 02:40:07

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



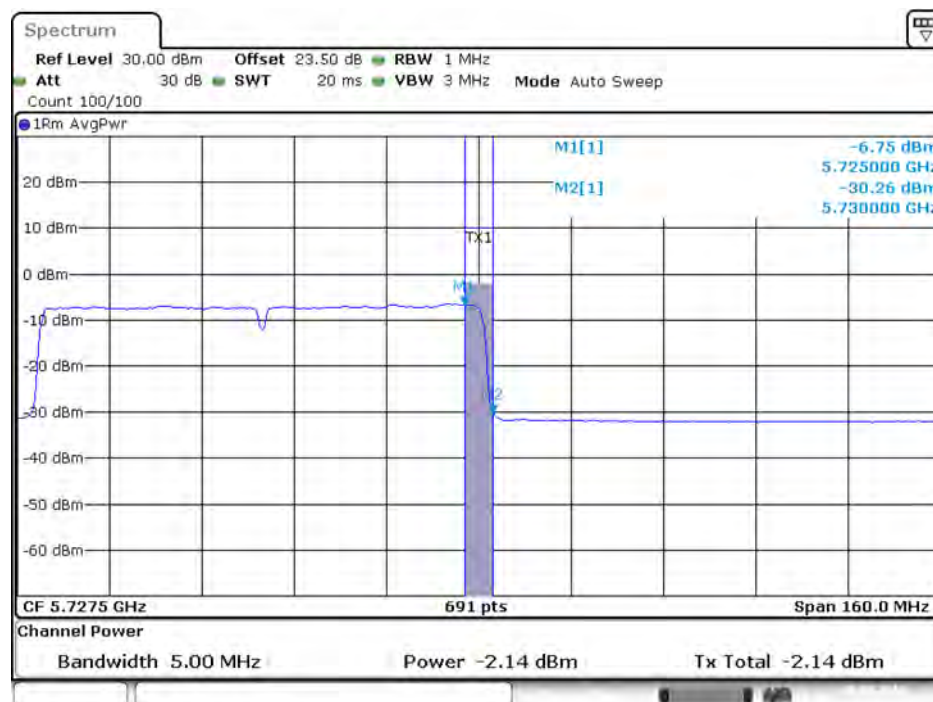
Date: 9.AUG.2016 02:42:22

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



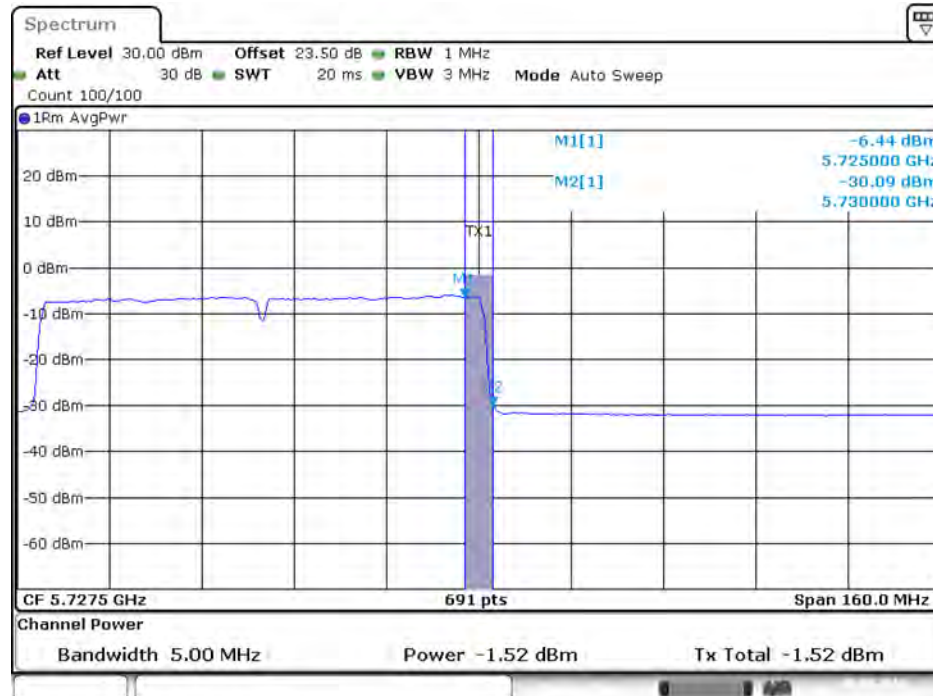
Date: 9.AUG.2016 02:36:08

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



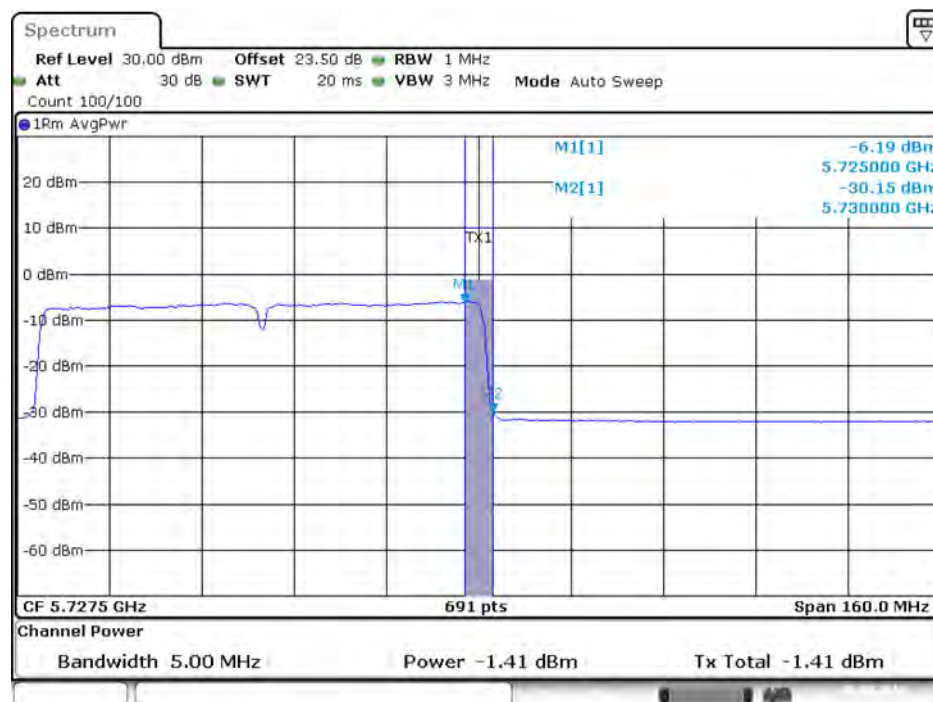
Date: 9.AUG.2016 02:38:23

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



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

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



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

2.5. Power Spectral Density Measurement

2.5.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 2.4.1.

Frequency Band		Limit
☒	5.25-5.35 GHz	11 dBm/MHz
☒	5.470-5.725 GHz	11 dBm/MHz
☒	5.725~5.85 GHz	30 dBm/500kHz

2.5.2. Measuring Instruments and Setting

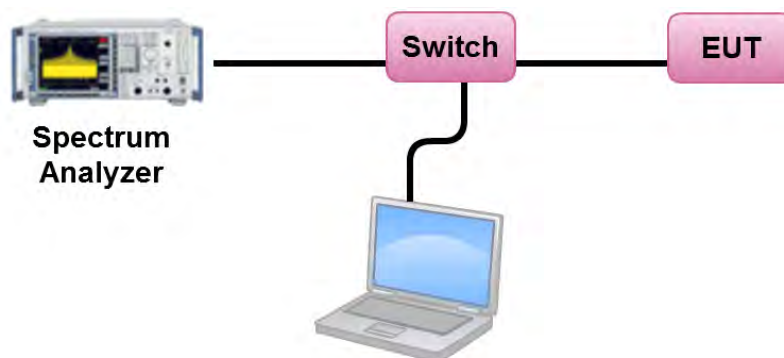
Please refer to section 3 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

2.5.3. Test Procedures

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

2.5.4. Test Setup Layout



2.5.5. Test Deviation

There is no deviation with the original standard.

2.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.5.7. Test Result of Power Spectral Density

Temperature	22°C	Humidity	54%
Test Engineer	Gary Chu		

For non-beamforming mode

For indoor, outdoor use B2~B3

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	4.92	4.98	PASS
60	5300 MHz	4.91	4.98	PASS
64	5320 MHz	4.88	4.98	PASS
100	5500 MHz	4.85	4.98	PASS
116	5580 MHz	4.93	4.98	PASS
140	5700 MHz	4.97	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B2 B3 limit = 11-(12.02-6)=4.98dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	4.76	4.98	PASS
60	5300 MHz	4.82	4.98	PASS
64	5320 MHz	4.81	4.98	PASS
100	5500 MHz	4.88	4.98	PASS
116	5580 MHz	4.85	4.98	PASS
140	5700 MHz	4.97	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B2 B3 limit = 11-(12.02-6)=4.98dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
54	5270 MHz	4.87	4.98	PASS
62	5310 MHz	4.93	4.98	PASS
102	5510 MHz	3.41	4.98	PASS
110	5550 MHz	4.88	4.98	PASS
134	5670 MHz	4.90	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B2 B3 limit = 11-(12.02-6)=4.98dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
58	5290 MHz	1.41	4.98	PASS
106	5530 MHz	-3.41	4.98	PASS
122	5610 MHz	3.39	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B2 B3 limit = 11-(12.02-6)=4.98dBm/MHz.

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

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

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

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

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

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

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

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

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

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

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

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

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

Channel	Frequency	Power Density (dBm/MHz)	10log (500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
142	5710 MHz (UNII 3)	4.38	-3.01	1.37	23.98	PASS

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

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

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

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

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

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

For beamforming mode

For indoor, outdoor use B2~B3

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	4.37	4.98	PASS
60	5300 MHz	4.42	4.98	PASS
64	5320 MHz	4.25	4.98	PASS
100	5500 MHz	3.91	4.98	PASS
116	5580 MHz	4.00	4.98	PASS
140	5700 MHz	3.94	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B2 B3 limit = 11-(12.02-6)=4.98dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
54	5270 MHz	1.43	4.98	PASS
62	5310 MHz	1.57	4.98	PASS
102	5510 MHz	0.92	4.98	PASS
110	5550 MHz	0.89	4.98	PASS
134	5670 MHz	1.05	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B2 B3 limit = 11-(12.02-6)=4.98dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
58	5290 MHz	-1.73	4.98	PASS
106	5530 MHz	-1.72	4.98	PASS
122	5610 MHz	-1.91	4.98	PASS

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 12.02\text{dBi}$, so B2 B3 limit = $11 - (12.02 - 6) = 4.98\text{dBm/MHz}$.

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

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

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

Channel	Frequency	Power Density (dBm/MHz)	10log (500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
144	5720 MHz (UNII 3)	4.39	-3.01	1.38	23.98	PASS

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

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

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

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

Channel	Frequency	Power Density (dBm/MHz)	10log (500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
142	5710 MHz (UNII 3)	1.65	-3.01	-1.36	23.98	PASS

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

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

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

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

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

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

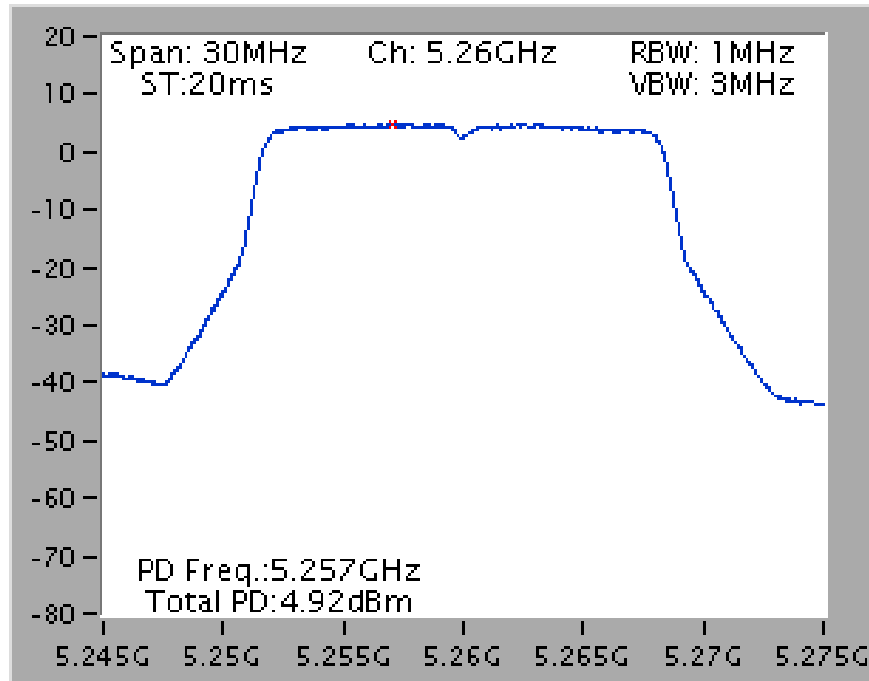
Note: All the test values were listed in the report.

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

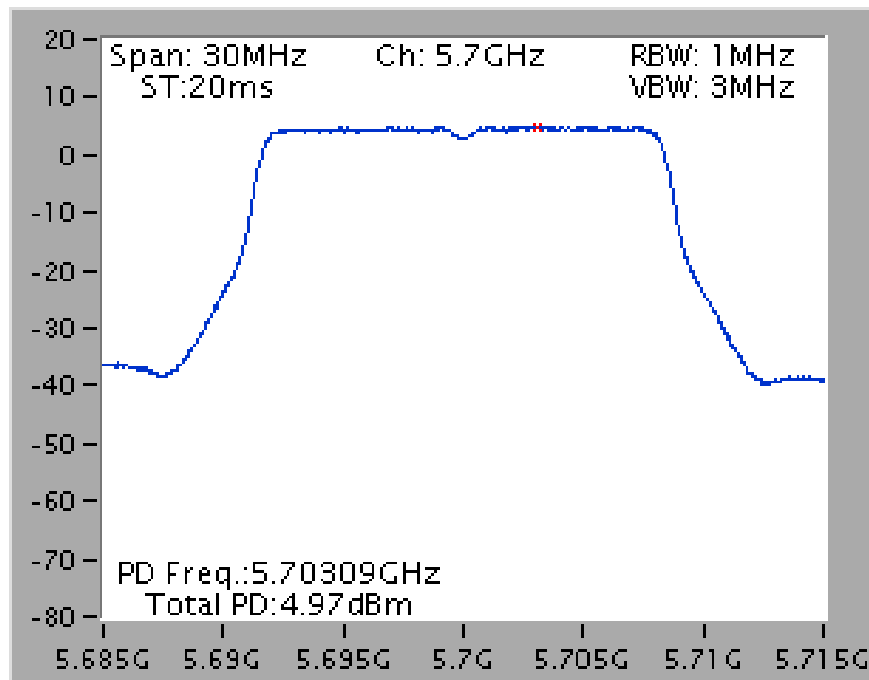
For non-beamforming mode

For indoor, outdoor use B2~B3

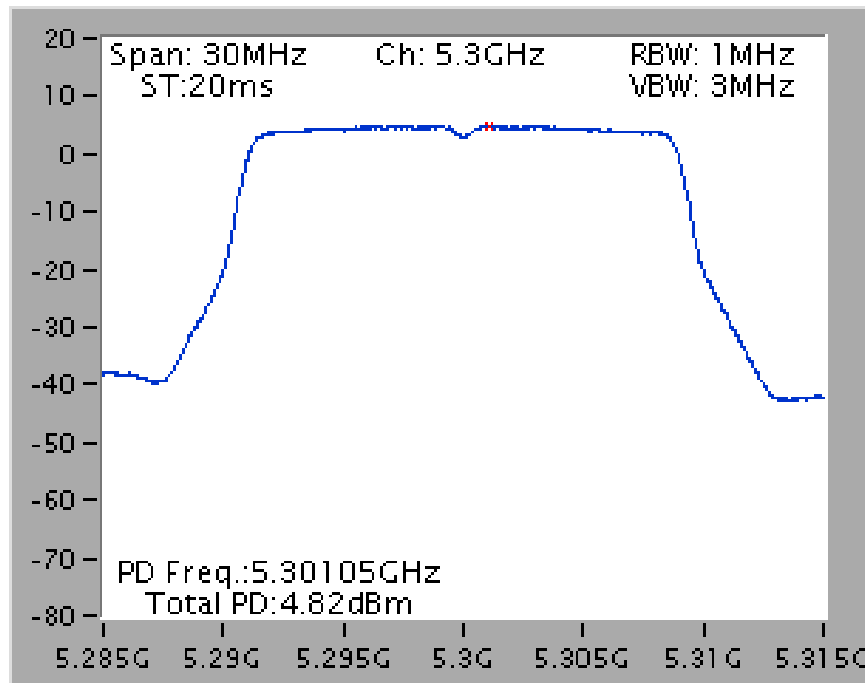
Power Density Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5260 MHz



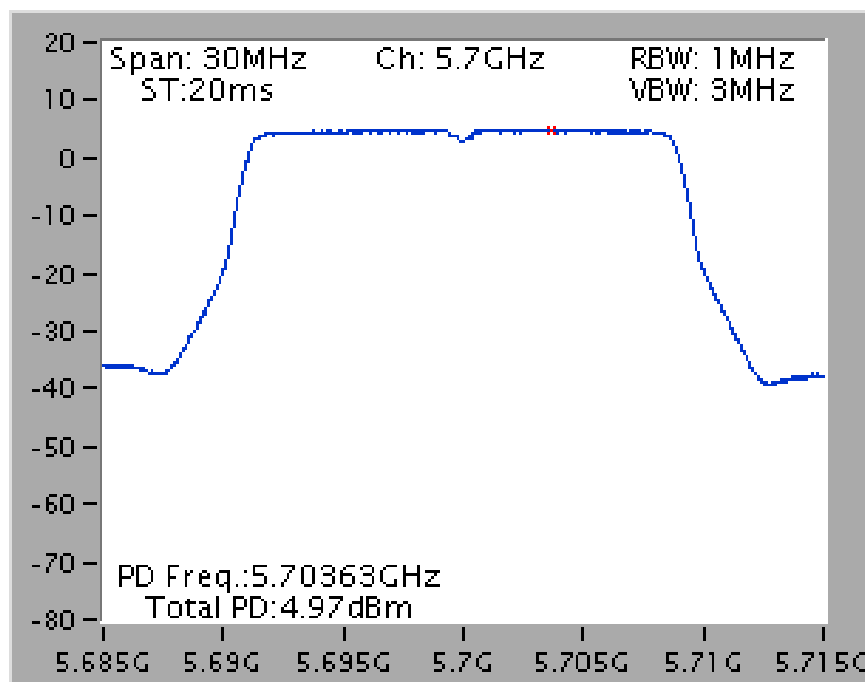
Power Density Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5700 MHz



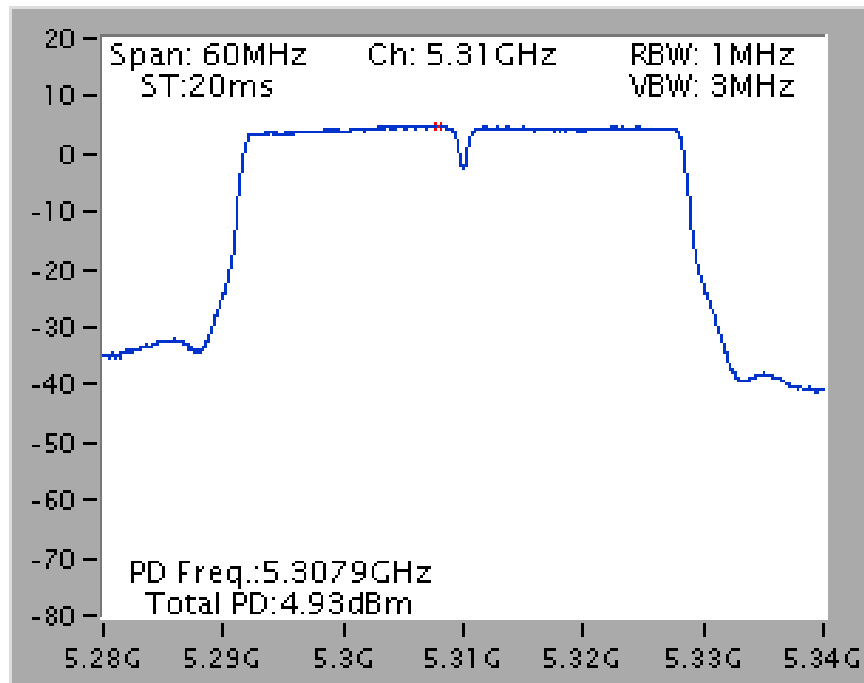
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5300 MHz



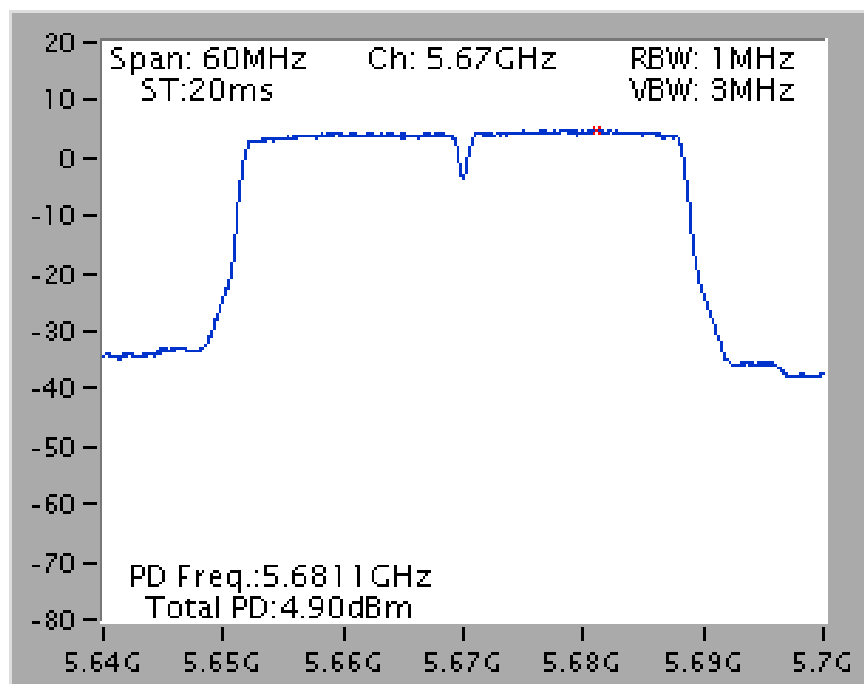
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5700 MHz



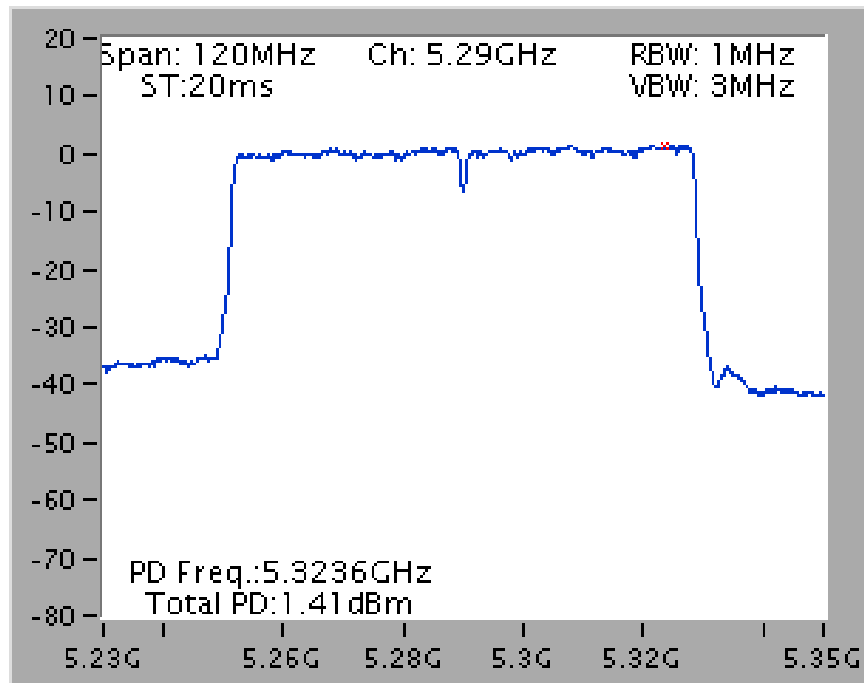
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5310 MHz



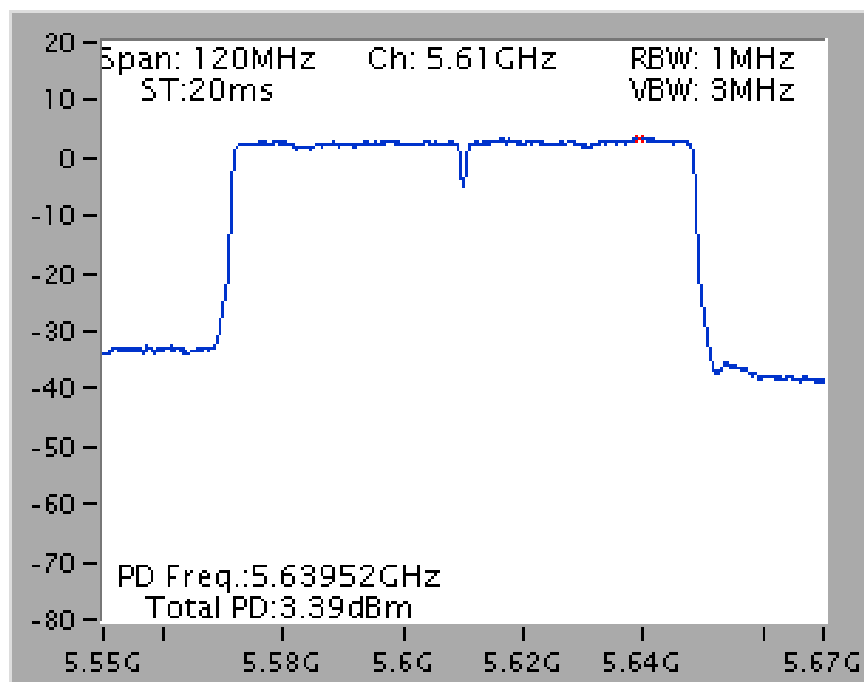
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5670 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5290 MHz

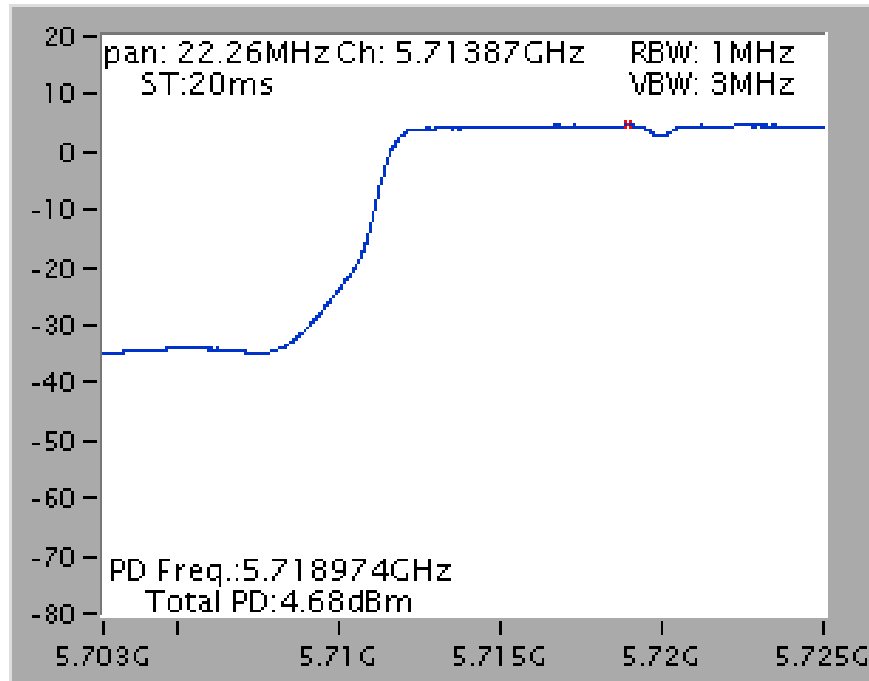


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5610 MHz

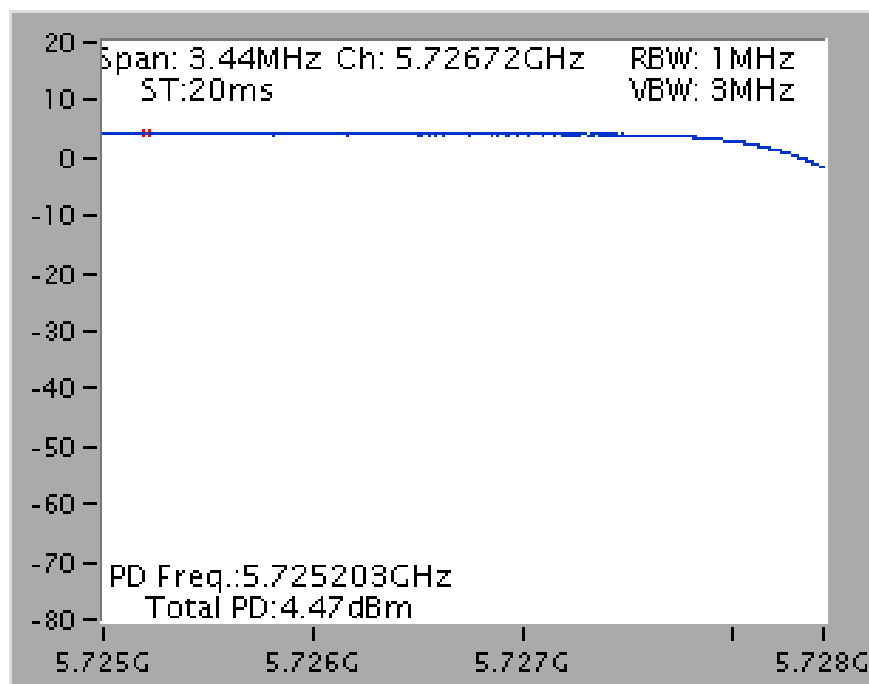


Straddle Channel

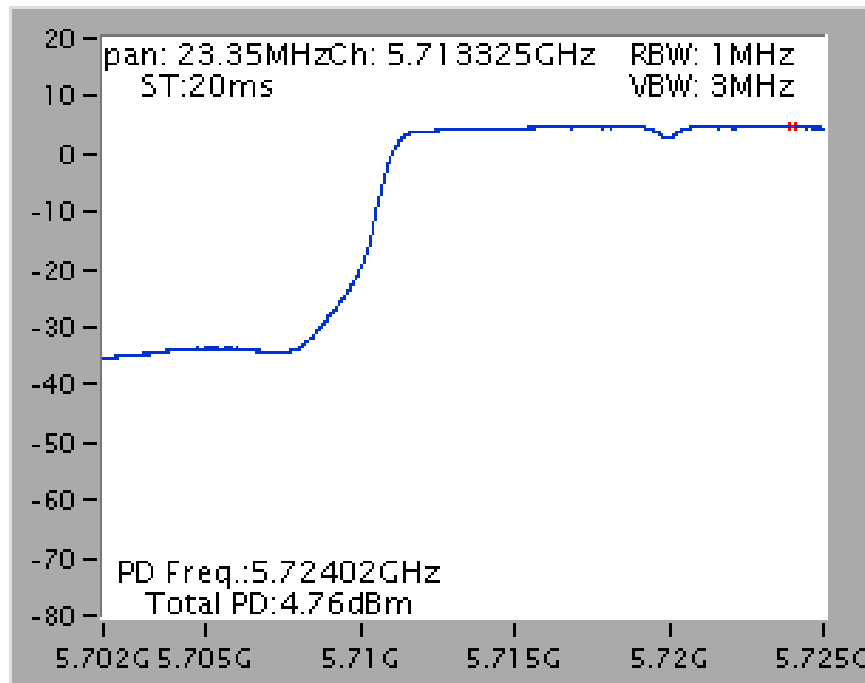
Power Density Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5720 MHz (UNII 2C)



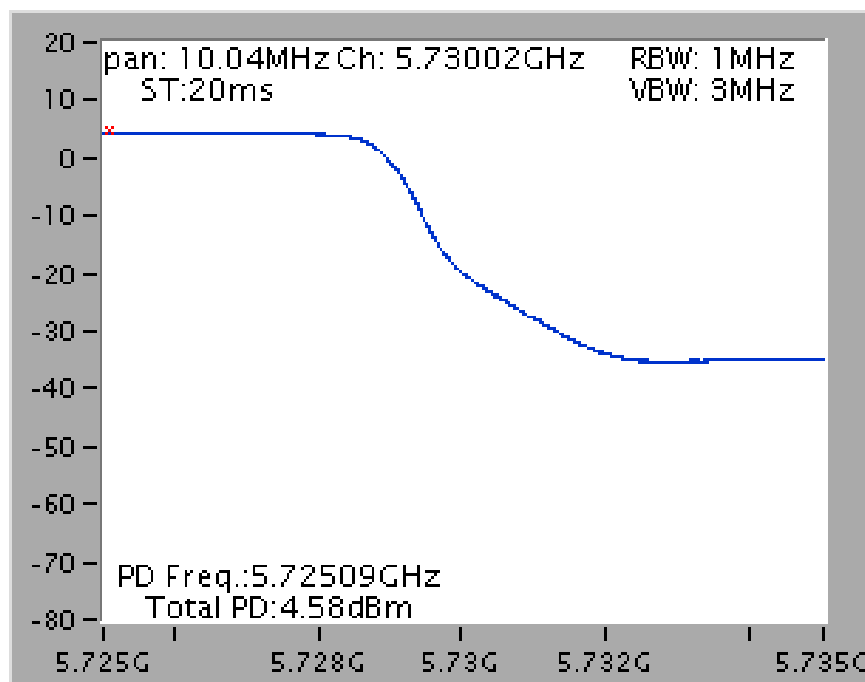
Power Density Plot on Configuration IEEE 802.11a / Port 1 + Port 2 + Port 3 + Port 4 / 5720 MHz (UNII 3)



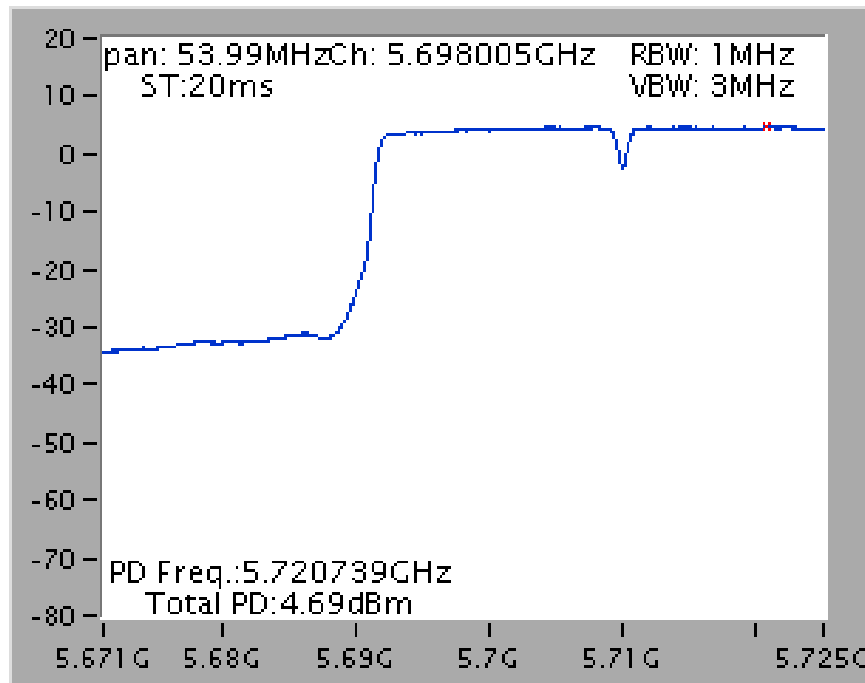
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5720 MHz (UNII 2C)



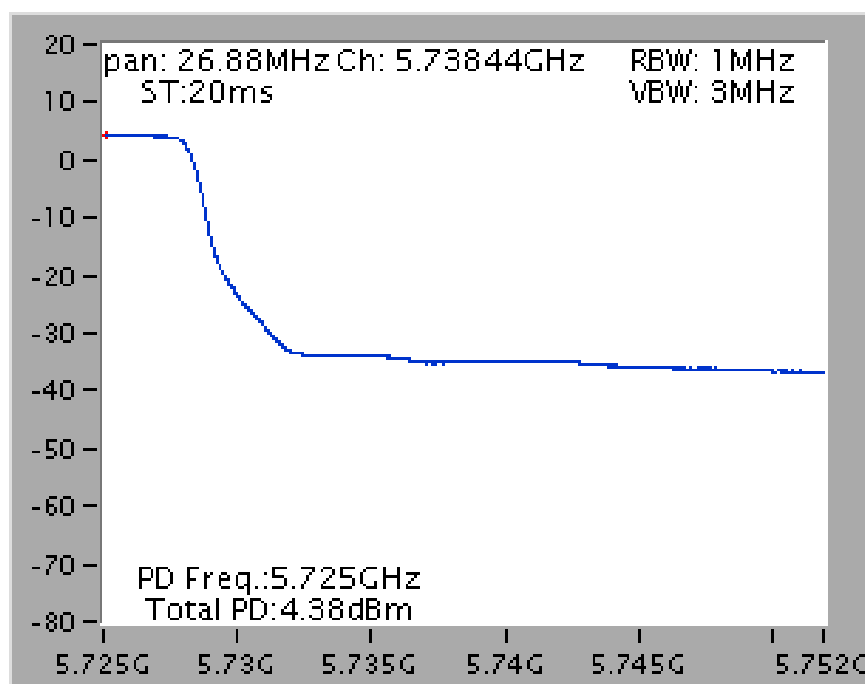
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5720 MHz (UNII 3)



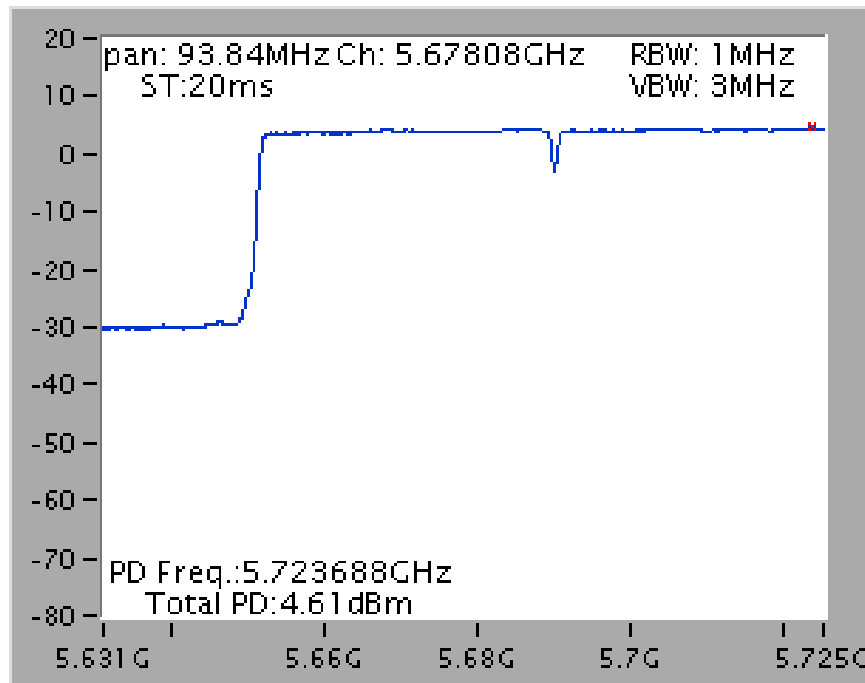
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5710 MHz (UNII 2C)



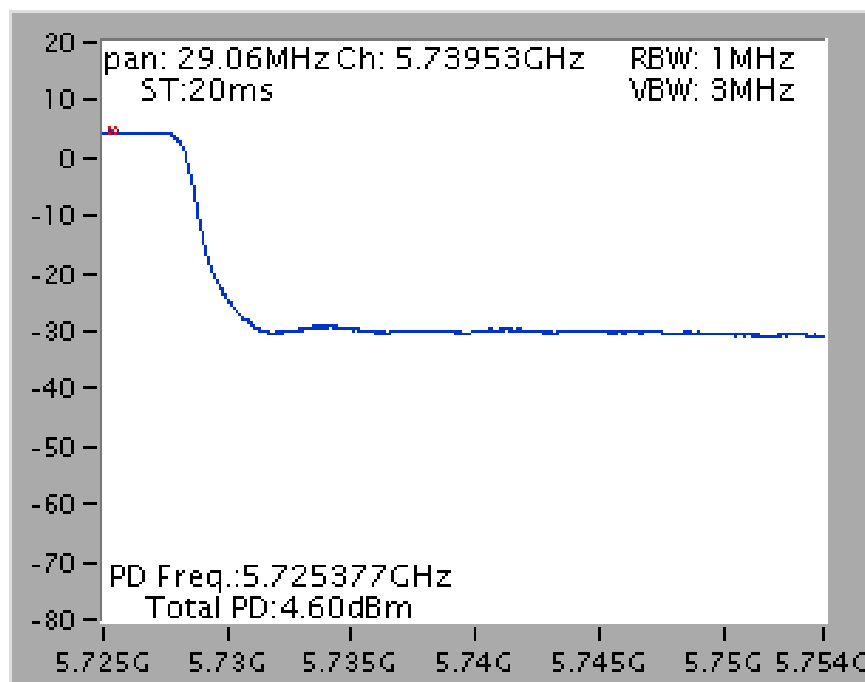
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5710 MHz (UNII 3)



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



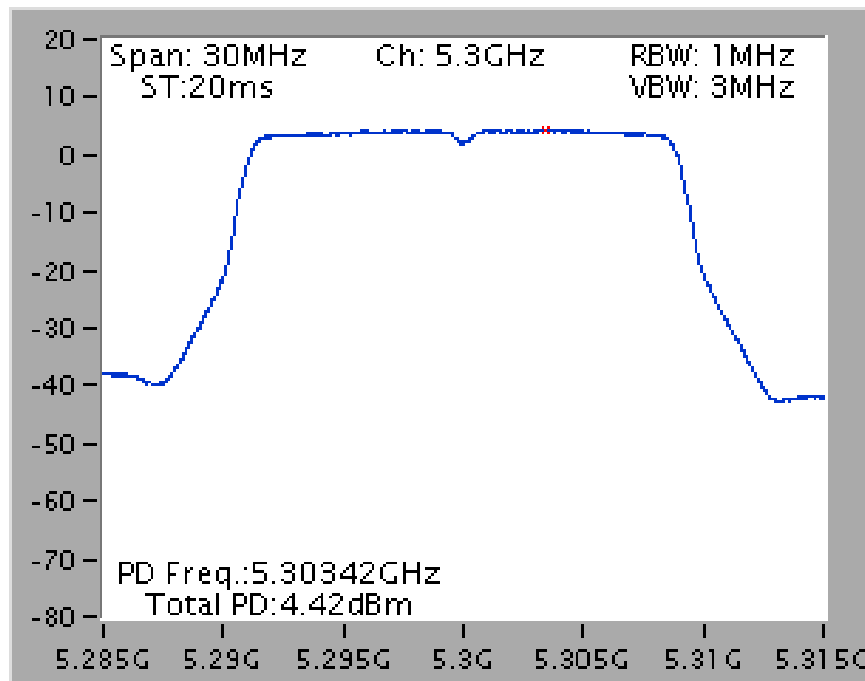
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5690 MHz (UNII 3)



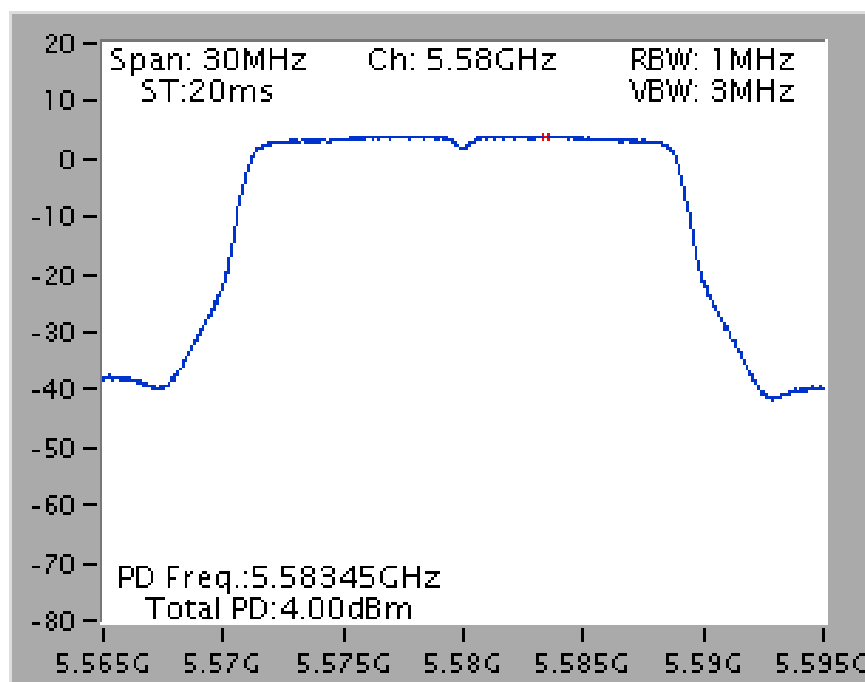
For beamforming mode

For indoor, outdoor use B2~B3

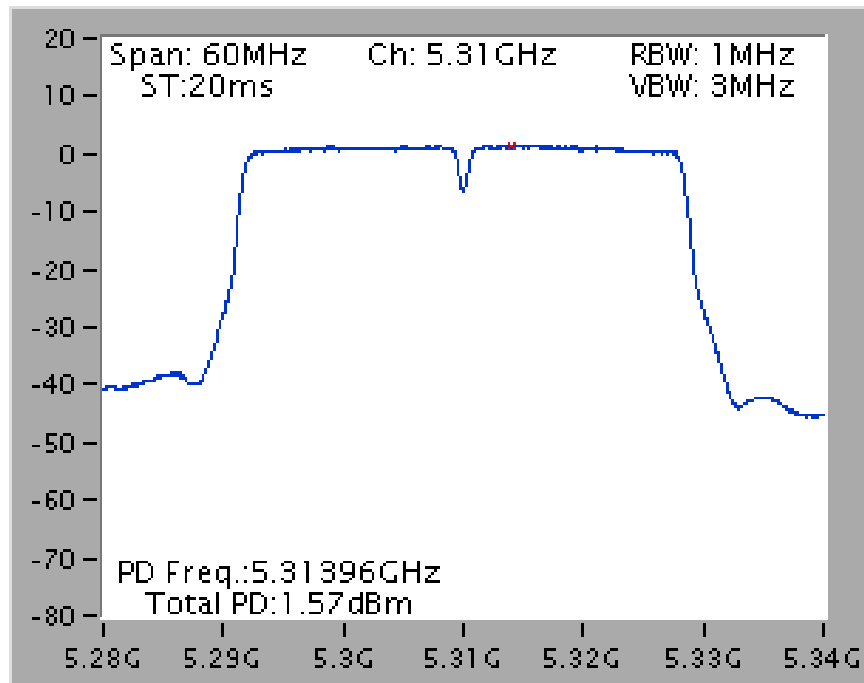
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5300 MHz



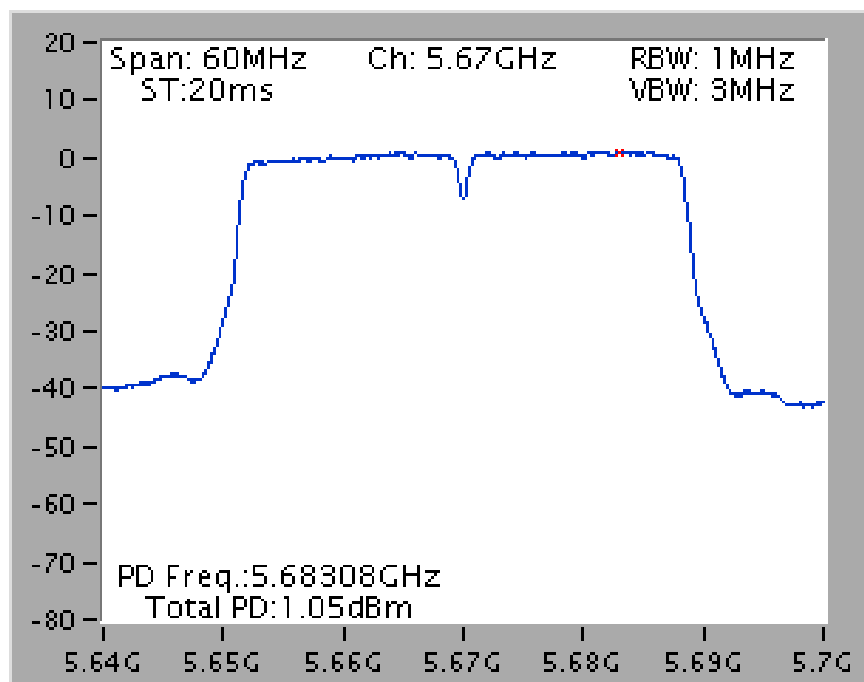
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5580 MHz



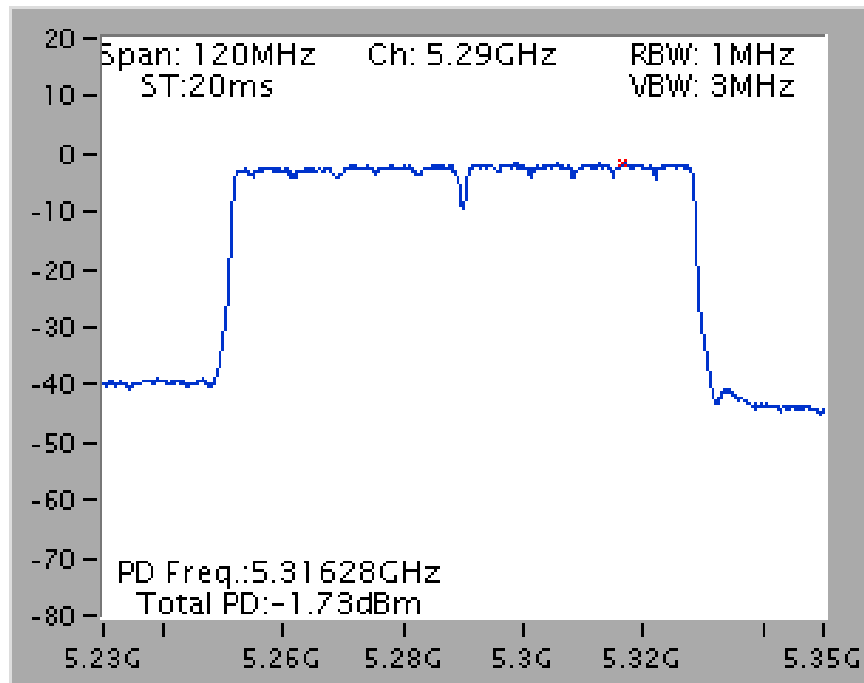
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5310 MHz



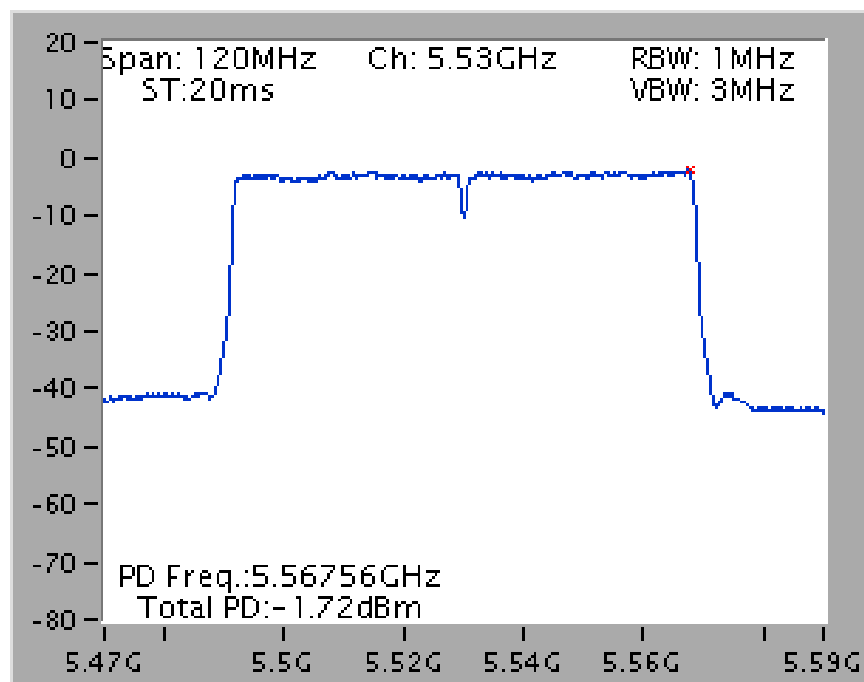
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5670 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5290 MHz

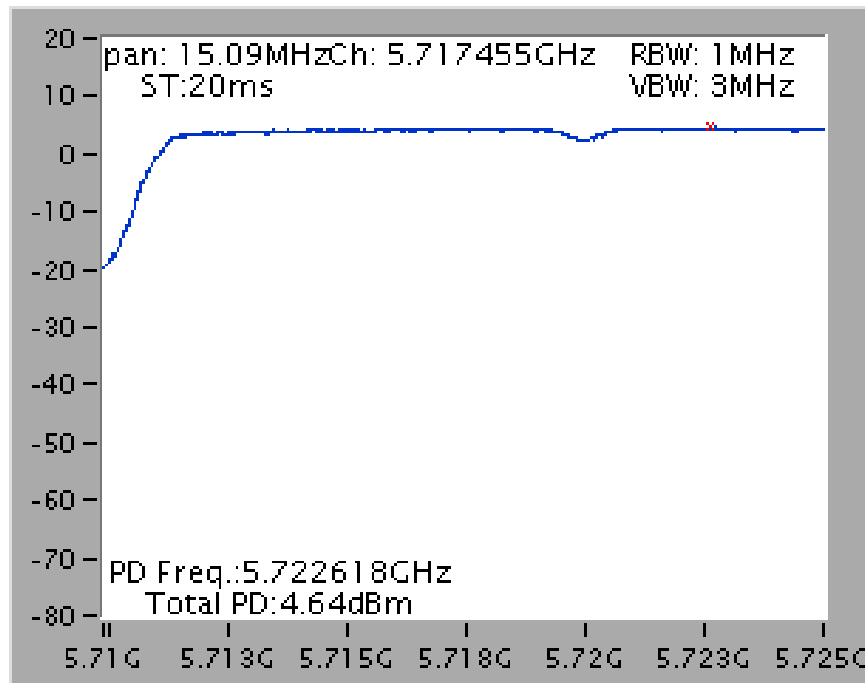


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Port 1 + Port 2 + Port 3 + Port 4 / 5530 MHz

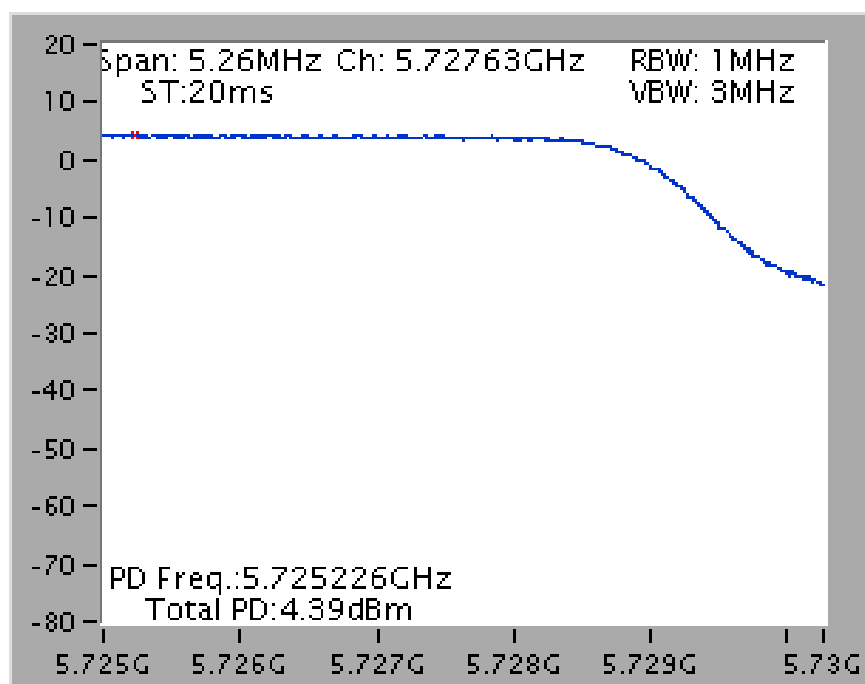


Straddle Channel

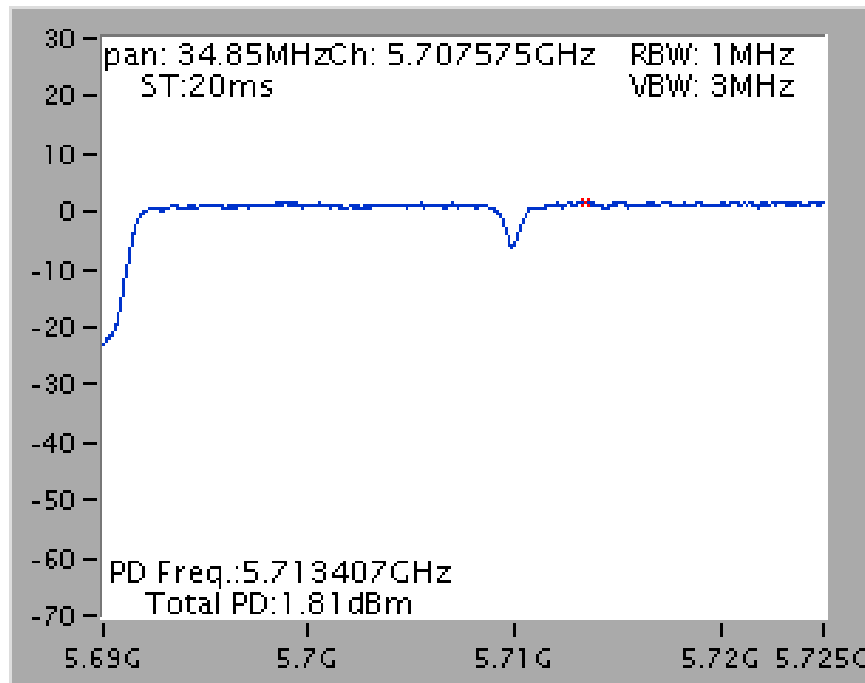
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5720 MHz (UNII 2C)



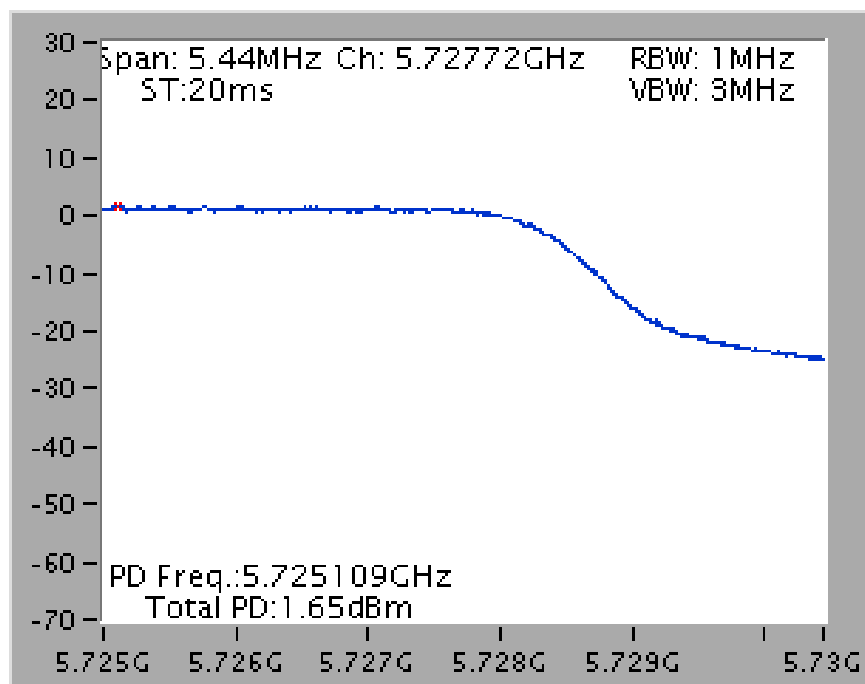
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Port 1 + Port 2 + Port 3 + Port 4 / 5720 MHz (UNII 3)



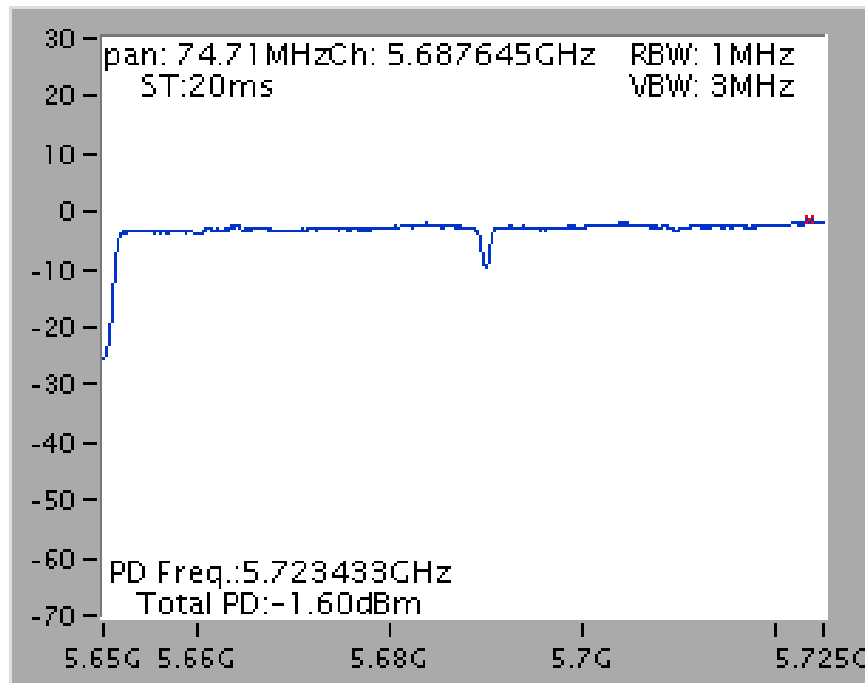
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5710 MHz (UNII 2C)



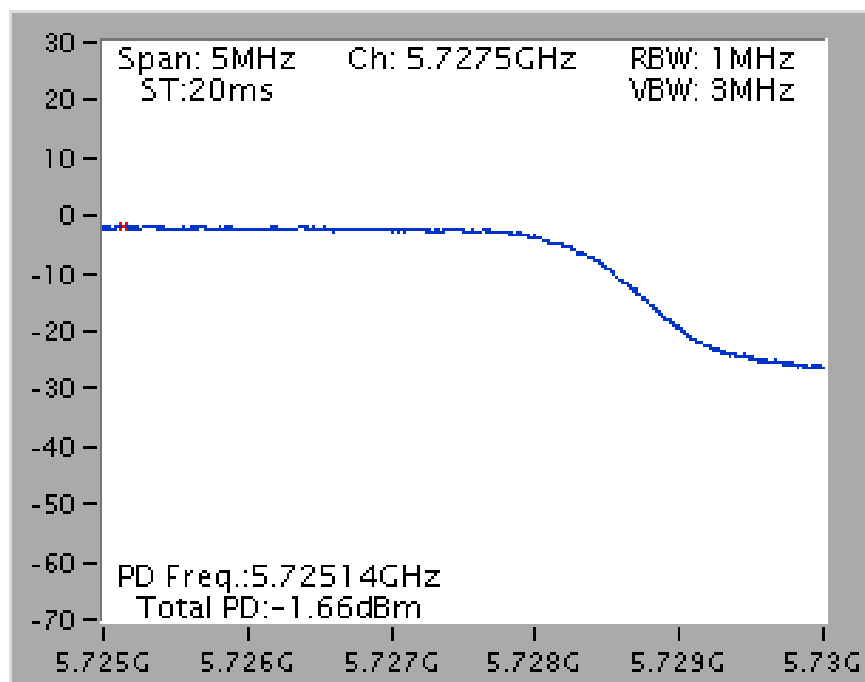
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Port 1 + Port 2 + Port 3 + Port 4 / 5710 MHz (UNII 3)



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



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



2.6. Radiated Emissions Measurement

2.6.1. Limit

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.25-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

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

In addition, In case the emission fall within the restricted band specified on 2.7, then the 2.8 limit in the table below has to be followed.

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

2.6.2. Measuring Instruments and Setting

Please refer to section 3 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

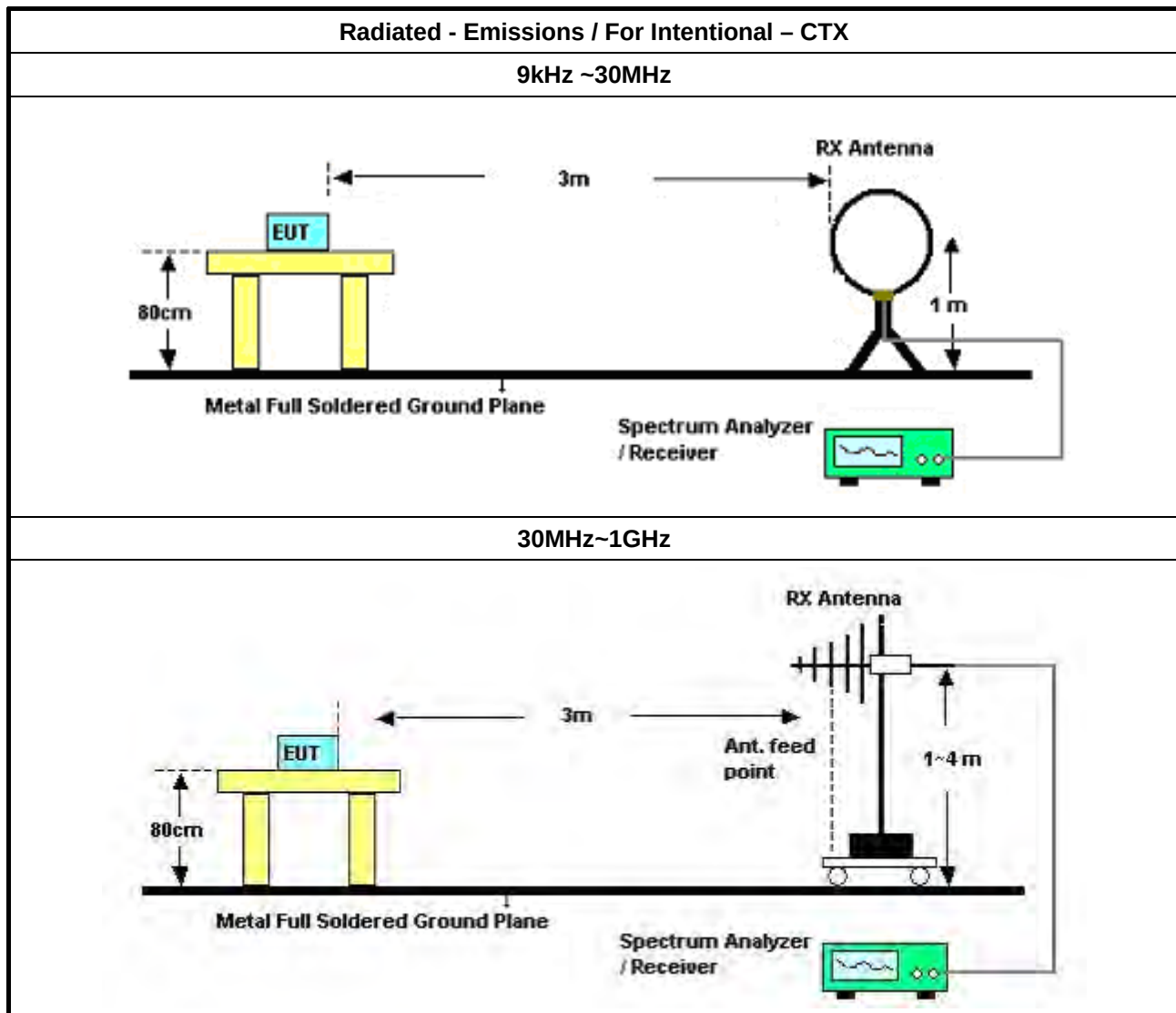
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 3MHz for peak

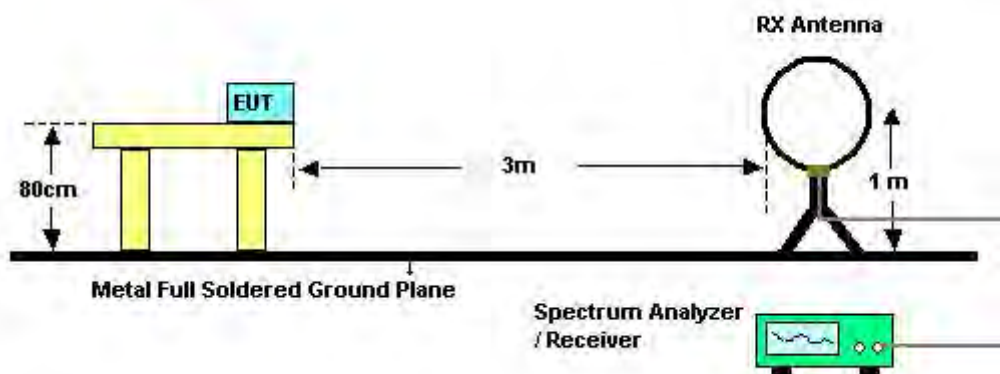
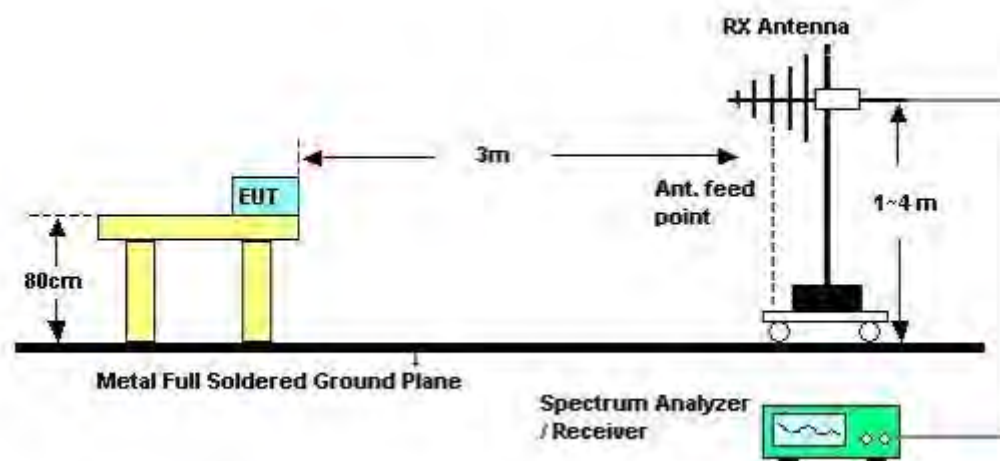
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

2.6.3. Test Procedures

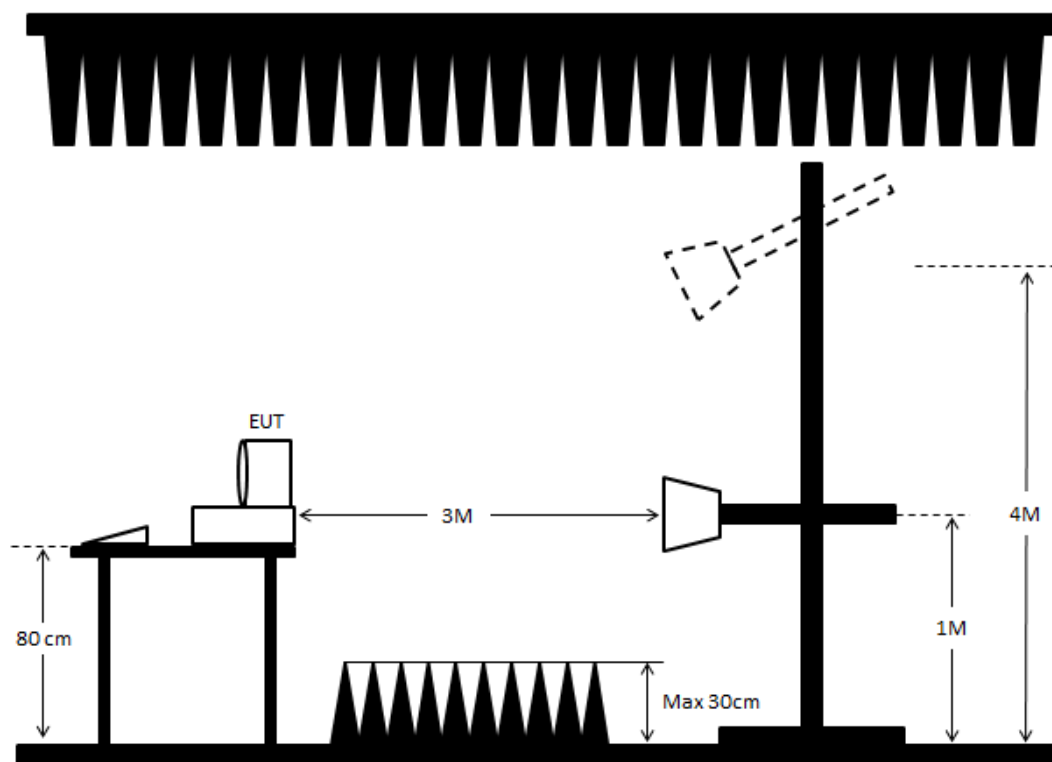
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

2.6.4. Test Setup Layout

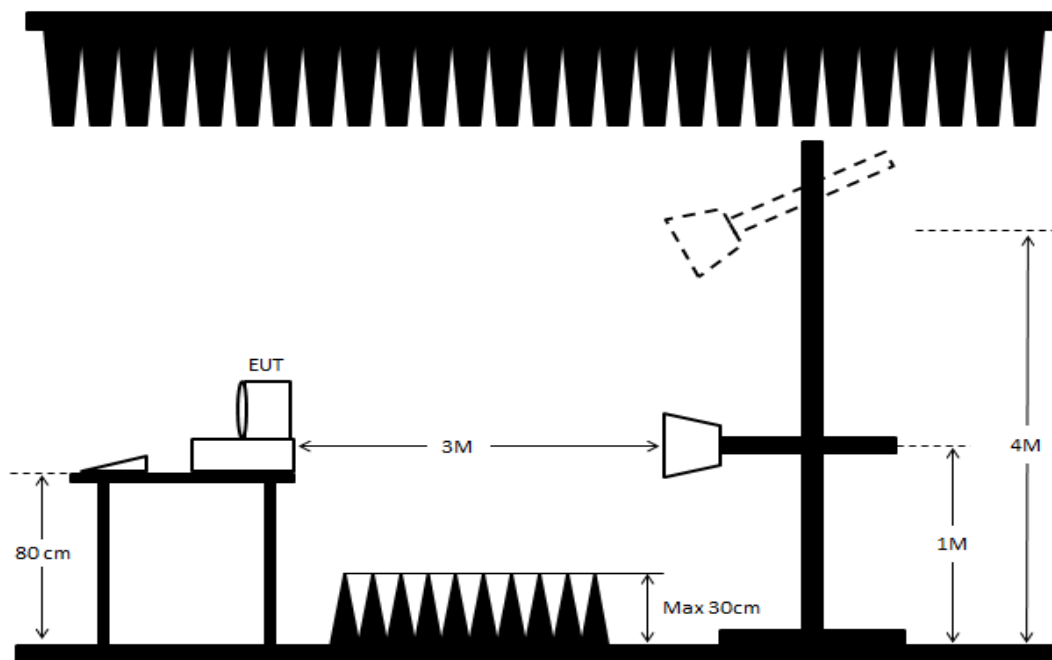


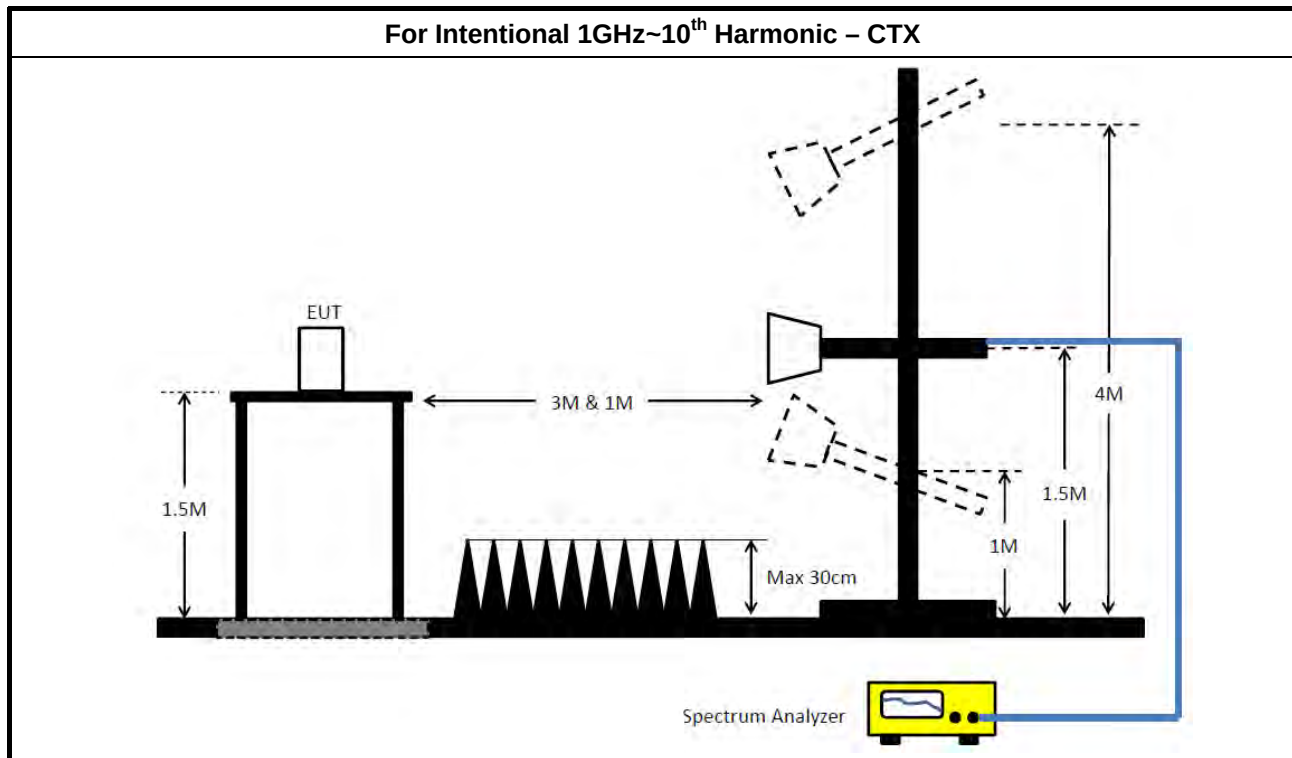
For Unintentional – CRX
9kHz ~30MHz

30MHz~1GHz


For Unintentional 1GHz~5th Harmonic – CRX (1,000~18,000 MHz)



For Unintentional 1GHz~5th Harmonic – CRX (18,000~30,000 MHz)





2.6.5. Test Deviation

There is no deviation with the original standard.

2.6.6. EUT Operation during Test

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	19.9~25.6°C	Humidity	50.2~54.6%
Test Engineer	Justin Pan	Configurations	Intentional-CTX
Test Date	Jul. 29, 2019~Jul. 30, 2019	Test Mode	Mode 2

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

Note:

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

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

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

Temperature	19.9~25.6°C	Humidity	50.2~54.6%
Test Engineer	Justin Pan	Configurations	Unintentional-CRX
Test Date	Jul. 29, 2019~Jul. 30, 2019	Test Mode	Mode 3

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

Note:

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

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

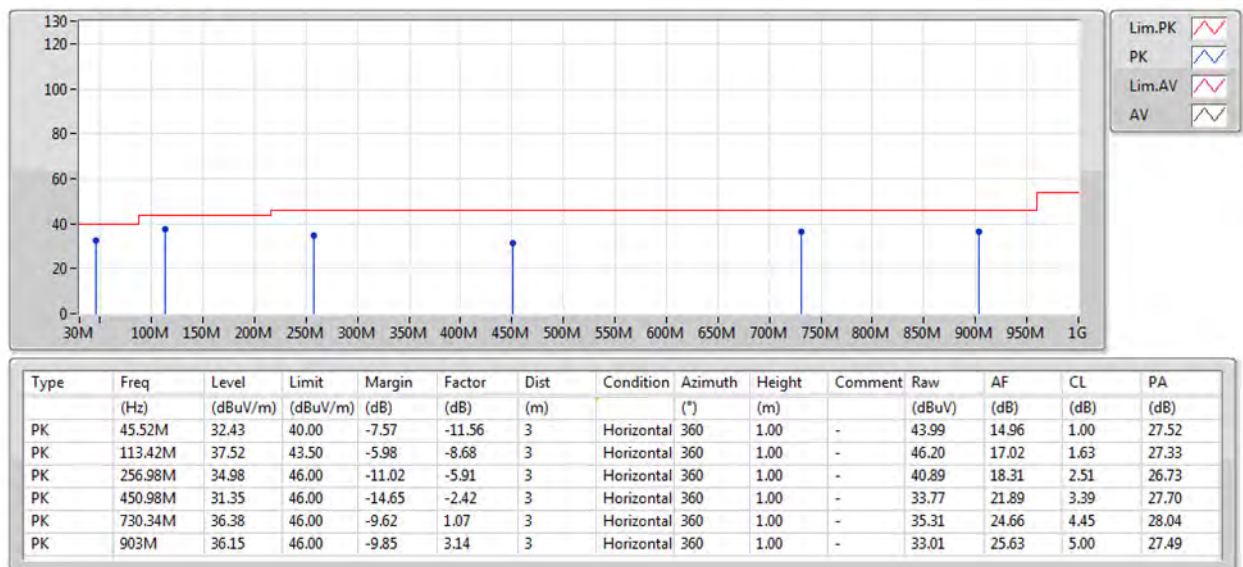
Limit line = specific limits (dBuV) + distance extrapolation factor.

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

Temperature	19.9~25.6°C	Humidity	50.2~54.6%
Test Engineer	Justin Pan	Configurations	Intentional-CTX
Test Mode	Mode 2		

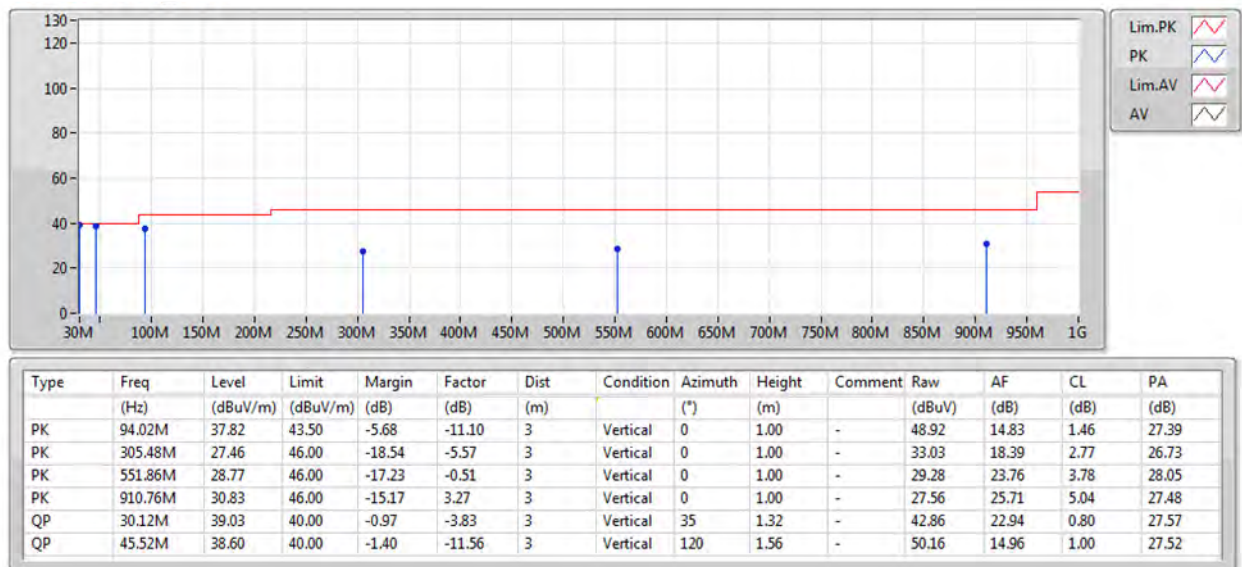
Horizontal

29/07/2019



Vertical

29/07/2019



Note:

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

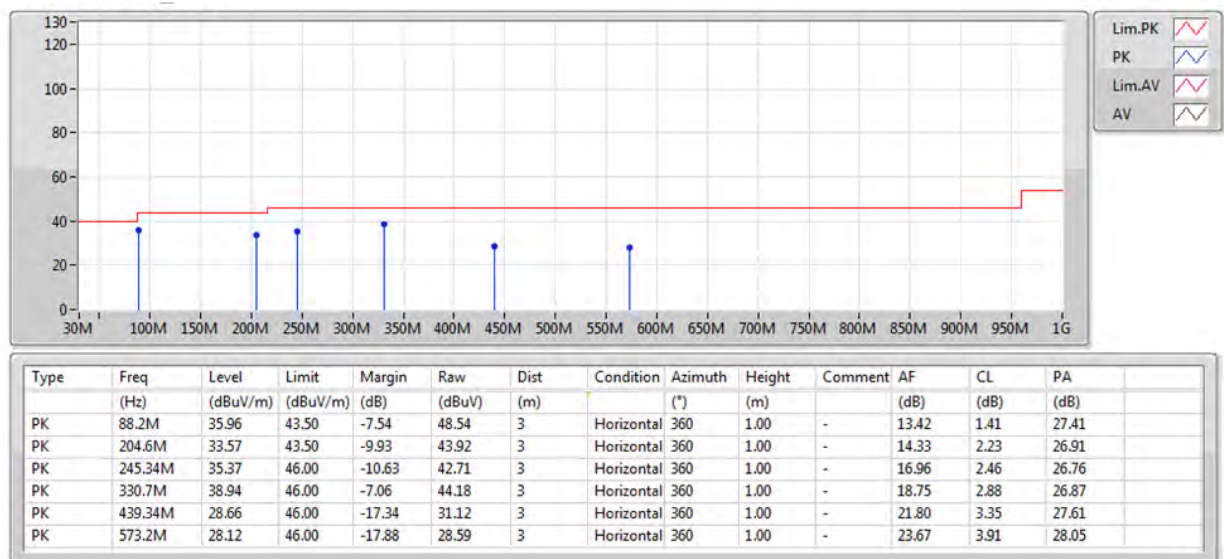
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

Temperature	19.9~25.6°C	Humidity	50.2~54.6%
Test Engineer	Justin Pan	Configurations	Unintentional-CRX
Test Mode	Mode 3		

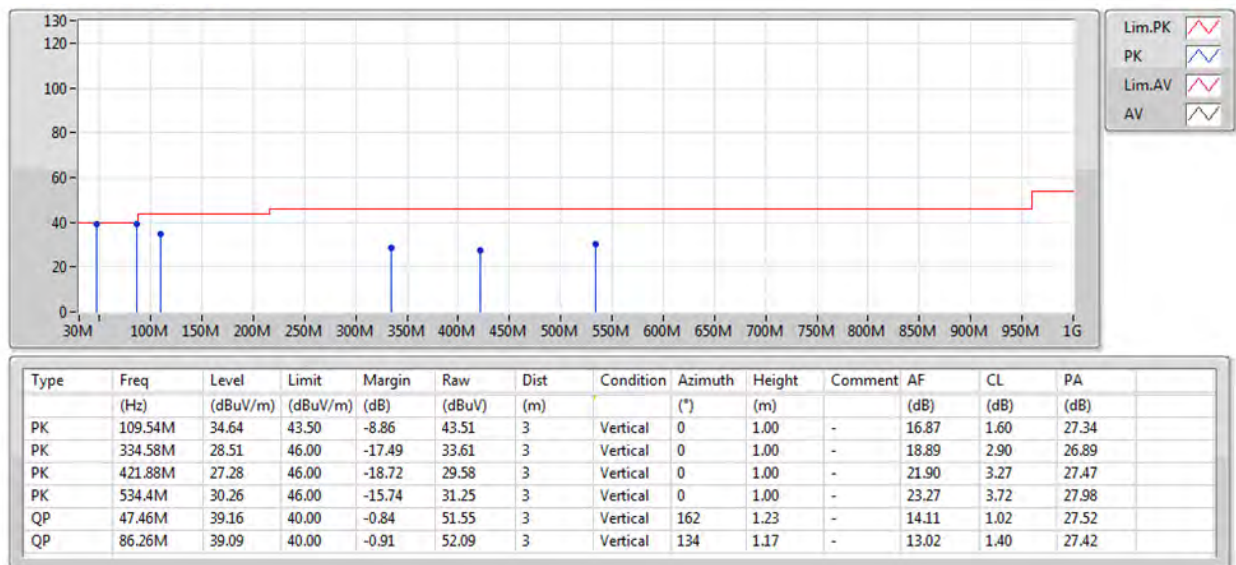
Horizontal

30/07/2019



Vertical

30/07/2019



Note:

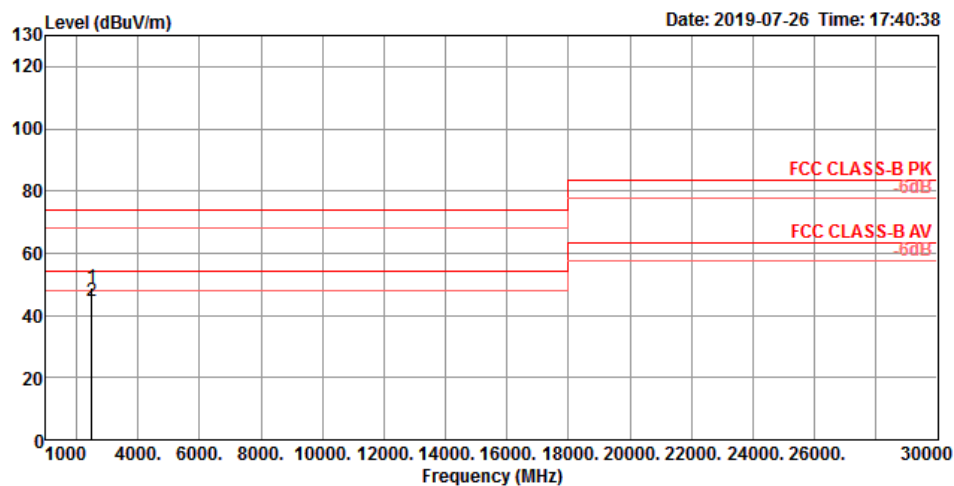
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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

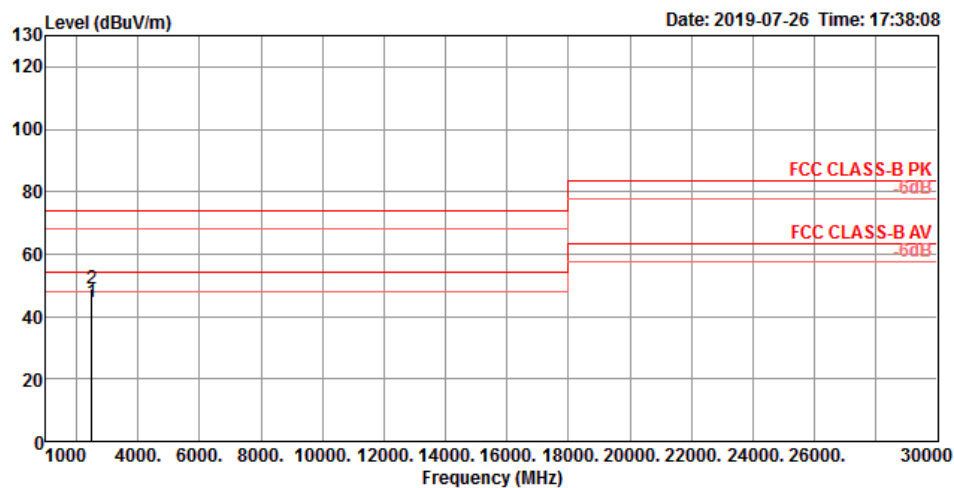
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

2.6.9. Results for Radiated Emissions (Unintentional 1GHz~5th-CRX)

Temperature	26.3~27.2°C	Humidity	61~65%
Test Engineer	Cola Fan	Configurations	Unintentional-CRX
Test Mode	Mode 2		

Horizontal


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	2500.37	48.91	74.00	-25.09	51.32	4.00	30.20	36.61	118	204 Peak	HORIZONTAL
2	2500.43	44.52	54.00	-9.48	46.93	4.00	30.20	36.61	118	204 Average	HORIZONTAL

Vertical


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	2500.45	44.68	54.00	-9.32	47.09	4.00	30.20	36.61	120	205 Average	VERTICAL
2	2500.46	48.79	74.00	-25.21	51.20	4.00	30.20	36.61	120	205 Peak	VERTICAL

Note:

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

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

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

2.6.10. Results for Radiated Emissions (Intentional 1GHz~10th-CTX)

For non-beamforming mode

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 52 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15778.76	57.09	74.00	-16.91	39.94	12.06	37.81	32.72	159	358	Peak	HORIZONTAL
2	15779.02	43.09	54.00	-10.91	25.94	12.06	37.81	32.72	159	358	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15777.96	42.94	54.00	-11.06	25.79	12.06	37.81	32.72	107	282	Average	VERTICAL
2	15784.40	56.09	74.00	-17.91	38.94	12.08	37.79	32.72	107	282	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 60 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10597.54	54.14	74.00	-19.86	38.49	9.94	38.24	32.53	198	235	Peak	HORIZONTAL
2	10600.76	41.10	54.00	-12.90	25.45	9.94	38.24	32.53	198	235	Average	HORIZONTAL
3	15895.00	42.68	54.00	-11.32	25.65	12.12	37.64	32.73	241	151	Average	HORIZONTAL
4	15897.42	56.65	74.00	-17.35	39.62	12.12	37.64	32.73	241	151	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10597.18	41.18	54.00	-12.82	25.53	9.94	38.24	32.53	188	158	Average	VERTICAL
2	10598.50	54.73	74.00	-19.27	39.08	9.94	38.24	32.53	188	158	Peak	VERTICAL
3	15902.84	56.15	74.00	-17.85	39.14	12.12	37.62	32.73	124	266	Peak	VERTICAL
4	15904.32	43.05	54.00	-10.95	26.04	12.12	37.62	32.73	124	266	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 64 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10637.64	54.74	74.00	-19.26	39.07	9.95	38.26	32.54	104	213	Peak	HORIZONTAL
2	10639.44	41.20	54.00	-12.80	25.53	9.95	38.26	32.54	104	213	Average	HORIZONTAL
3	15962.18	42.93	54.00	-11.07	25.97	12.14	37.55	32.73	148	42	Average	HORIZONTAL
4	15963.04	56.11	74.00	-17.89	39.15	12.14	37.55	32.73	148	42	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10636.40	41.26	54.00	-12.74	25.59	9.95	38.26	32.54	191	330	Average	VERTICAL
2	10639.40	54.37	74.00	-19.63	38.70	9.95	38.26	32.54	191	330	Peak	VERTICAL
3	15958.58	42.82	54.00	-11.18	25.86	12.14	37.55	32.73	122	229	Average	VERTICAL
4	15962.46	56.35	74.00	-17.65	39.39	12.14	37.55	32.73	122	229	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 100 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10999.68	54.92	74.00	-19.08	39.09	10.12	38.40	32.69	156	297	Peak	HORIZONTAL
2	11001.94	41.65	54.00	-12.35	25.82	10.12	38.40	32.69	156	297	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10995.38	55.17	74.00	-18.83	39.34	10.11	38.40	32.68	201	159	Peak	VERTICAL
2	10995.40	41.82	54.00	-12.18	25.99	10.11	38.40	32.68	201	159	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 116 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11159.70	41.36	54.00	-12.64	25.35	10.19	38.53	32.71	194	175	Average	HORIZONTAL
2	11160.24	55.18	74.00	-18.82	39.17	10.19	38.53	32.71	194	175	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11158.04	41.42	54.00	-12.58	25.41	10.19	38.53	32.71	236	341	Average	VERTICAL
2	11160.60	55.11	74.00	-18.89	39.10	10.19	38.53	32.71	236	341	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 140 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11395.52	42.26	54.00	-11.74	25.98	10.29	38.72	32.73	103	261	Average	HORIZONTAL
2	11395.66	55.72	74.00	-18.28	39.44	10.29	38.72	32.73	103	261	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11398.00	42.23	54.00	-11.77	25.95	10.29	38.72	32.73	156	92	Average	VERTICAL
2	11401.66	55.58	74.00	-18.42	39.30	10.29	38.72	32.73	156	92	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15777.08	56.58	74.00	-17.42	39.43	12.06	37.81	32.72	267	190	Peak	HORIZONTAL
2	15779.42	43.07	54.00	-10.93	25.92	12.06	37.81	32.72	267	190	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15779.20	56.95	74.00	-17.05	39.80	12.06	37.81	32.72	223	0	Peak	VERTICAL
2	15781.52	43.32	54.00	-10.68	26.19	12.06	37.79	32.72	223	0	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10595.80	54.50	74.00	-19.50	38.86	9.94	38.23	32.53	221	26	Peak	HORIZONTAL
2	10601.70	41.34	54.00	-12.66	25.69	9.94	38.24	32.53	221	26	Average	HORIZONTAL
3	15897.88	43.16	54.00	-10.84	26.13	12.12	37.64	32.73	163	127	Average	HORIZONTAL
4	15900.36	56.75	74.00	-17.25	39.72	12.12	37.64	32.73	163	127	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10596.28	54.16	74.00	-19.84	38.52	9.94	38.23	32.53	191	321	Peak	VERTICAL
2	10598.68	41.20	54.00	-12.80	25.55	9.94	38.24	32.53	191	321	Average	VERTICAL
3	15895.22	42.92	54.00	-11.08	25.89	12.12	37.64	32.73	119	184	Average	VERTICAL
4	15896.04	56.52	74.00	-17.48	39.49	12.12	37.64	32.73	119	184	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10638.06	41.33	54.00	-12.67	25.66	9.95	38.26	32.54	276	160	Average	HORIZONTAL
2	10644.02	54.66	74.00	-19.34	38.99	9.95	38.26	32.54	276	160	Peak	HORIZONTAL
3	15955.10	42.98	54.00	-11.02	26.02	12.14	37.55	32.73	168	314	Average	HORIZONTAL
4	15963.68	56.76	74.00	-17.24	39.80	12.14	37.55	32.73	168	314	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10635.94	41.50	54.00	-12.50	25.83	9.95	38.26	32.54	195	176	Average	VERTICAL
2	10640.78	55.13	74.00	-18.87	39.46	9.95	38.26	32.54	195	176	Peak	VERTICAL
3	15960.30	42.85	54.00	-11.15	25.89	12.14	37.55	32.73	121	65	Average	VERTICAL
4	15960.42	56.18	74.00	-17.82	39.22	12.14	37.55	32.73	121	65	Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10995.08	42.23	54.00	-11.77	26.40	10.11	38.40	32.68	128	206	Average	HORIZONTAL
2	11001.81	54.98	74.00	-19.02	39.15	10.12	38.40	32.69	128	206	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11157.92	41.83	54.00	-12.17	25.82	10.19	38.53	32.71	182	278	Average	VERTICAL
2	11164.68	54.89	74.00	-19.11	38.88	10.19	38.53	32.71	182	278	Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11162.85	54.91	74.00	-19.09	38.90	10.19	38.53	32.71	194	315	Peak	HORIZONTAL
2	11163.24	41.81	54.00	-12.19	25.80	10.19	38.53	32.71	194	315	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11157.92	41.83	54.00	-12.17	25.82	10.19	38.53	32.71	182	278	Average	VERTICAL
2	11164.68	54.89	74.00	-19.11	38.88	10.19	38.53	32.71	182	278	Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11402.24	42.32	54.00	-11.68	26.04	10.29	38.72	32.73	171	282	Average	HORIZONTAL
2	11403.09	56.03	74.00	-17.97	39.75	10.29	38.72	32.73	171	282	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11399.42	42.47	54.00	-11.53	26.19	10.29	38.72	32.73	159	247	Average	VERTICAL
2	11402.92	56.44	74.00	-17.56	40.16	10.29	38.72	32.73	159	247	Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15805.26	42.39	54.00	-11.61	25.26	12.08	37.77	32.72	201	204	Average	HORIZONTAL
2	15810.64	55.80	74.00	-18.20	38.67	12.08	37.77	32.72	201	204	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15816.60	42.44	54.00	-11.56	25.34	12.08	37.74	32.72	196	285	Average	VERTICAL
2	15816.79	55.48	74.00	-18.52	38.38	12.08	37.74	32.72	196	285	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10610.06	40.91	54.00	-13.09	25.26	9.94	38.24	32.53	206	177	Average	HORIZONTAL
2	10617.79	53.76	74.00	-20.24	38.10	9.94	38.25	32.53	206	177	Peak	HORIZONTAL
3	15925.58	42.27	54.00	-11.73	25.26	12.14	37.60	32.73	172	125	Average	HORIZONTAL
4	15933.75	55.21	74.00	-18.79	38.20	12.14	37.60	32.73	172	125	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10612.88	54.11	74.00	-19.89	38.46	9.94	38.24	32.53	173	171	Peak	VERTICAL
2	10627.98	40.99	54.00	-13.01	25.33	9.95	38.25	32.54	173	171	Average	VERTICAL
3	15932.79	42.26	54.00	-11.74	25.25	12.14	37.60	32.73	151	160	Average	VERTICAL
4	15936.35	55.16	74.00	-18.84	38.18	12.14	37.57	32.73	151	160	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11010.19	54.08	74.00	-19.92	38.24	10.12	38.41	32.69	151	283	Peak	HORIZONTAL
2	11028.14	41.15	54.00	-12.85	25.29	10.12	38.43	32.69	151	283	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11013.30	41.40	54.00	-12.60	25.56	10.12	38.41	32.69	176	236	Average	VERTICAL
2	11025.64	54.64	74.00	-19.36	38.78	10.12	38.43	32.69	176	236	Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11096.83	54.01	74.00	-19.99	38.07	10.16	38.48	32.70	211	264	Peak	HORIZONTAL
2	11102.31	41.05	54.00	-12.95	25.11	10.16	38.48	32.70	211	264	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11098.43	54.10	74.00	-19.90	38.16	10.16	38.48	32.70	182	323	Peak	VERTICAL
2	11101.99	41.31	54.00	-12.69	25.37	10.16	38.48	32.70	182	323	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11341.57	41.30	54.00	-12.70	25.09	10.26	38.67	32.72	176	244	Average	HORIZONTAL
2	11344.07	53.69	74.00	-20.31	37.48	10.26	38.67	32.72	176	244	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11331.67	41.50	54.00	-12.50	25.29	10.26	38.67	32.72	192	306	Average	VERTICAL
2	11336.09	54.33	74.00	-19.67	38.12	10.26	38.67	32.72	192	306	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15865.35	42.21	54.00	-11.79	25.14	12.10	37.69	32.72	166	261	Average	HORIZONTAL
2	15874.55	55.22	74.00	-18.78	38.16	12.12	37.67	32.73	166	261	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15875.71	42.35	54.00	-11.65	25.29	12.12	37.67	32.73	189	300	Average	VERTICAL
2	15878.69	56.35	74.00	-17.65	39.29	12.12	37.67	32.73	189	300	Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11062.47	41.09	54.00	-12.91	25.19	10.15	38.45	32.70	156	175	Average	HORIZONTAL
2	11067.92	54.94	74.00	-19.06	39.04	10.15	38.45	32.70	156	175	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11050.00	54.73	74.00	-19.27	38.85	10.13	38.44	32.69	175	209	Peak	VERTICAL
2	11051.76	40.98	54.00	-13.02	25.10	10.13	38.44	32.69	175	209	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 122 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11214.55	41.04	54.00	-12.96	24.98	10.20	38.57	32.71	145	170	Average	HORIZONTAL
2	11224.52	54.93	74.00	-19.07	38.85	10.22	38.57	32.71	145	170	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11223.56	54.23	74.00	-19.77	38.15	10.22	38.57	32.71	137	211	Peak	VERTICAL
2	11223.72	41.15	54.00	-12.85	25.07	10.22	38.57	32.71	137	211	Average	VERTICAL



Straddle Channel

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 144 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 22, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11437.52	42.34	54.00	-11.66	26.02	10.30	38.75	32.73	229	116	Average	HORIZONTAL
2	11440.18	56.10	74.00	-17.90	39.78	10.30	38.75	32.73	229	116	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11437.20	55.78	74.00	-18.22	39.46	10.30	38.75	32.73	154	99	Peak	VERTICAL
2	11443.40	42.53	54.00	-11.47	26.21	10.30	38.75	32.73	154	99	Average	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11436.39	42.30	54.00	-11.70	25.98	10.30	38.75	32.73	187	147	Average	HORIZONTAL
2	11437.29	56.14	74.00	-17.86	39.82	10.30	38.75	32.73	187	147	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11442.34	42.39	54.00	-11.61	26.07	10.30	38.75	32.73	183	194	Average	VERTICAL
2	11443.46	55.60	74.00	-18.40	39.28	10.30	38.75	32.73	183	194	Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 142 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11412.34	54.57	74.00	-19.43	38.29	10.29	38.72	32.73	204	275	Peak	HORIZONTAL
2	11415.64	41.89	54.00	-12.11	25.60	10.29	38.73	32.73	204	275	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11415.16	41.86	54.00	-12.14	25.57	10.29	38.73	32.73	155	310	Average	VERTICAL
2	11424.36	55.42	74.00	-18.58	39.12	10.30	38.73	32.73	155	310	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 138 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 23, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11386.63	55.06	74.00	-18.94	38.79	10.29	38.71	32.73	214	139	Peak	HORIZONTAL
2	11387.47	41.66	54.00	-12.34	25.39	10.29	38.71	32.73	214	139	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11376.73	41.95	54.00	-12.05	25.72	10.27	38.69	32.73	233	99	Average	VERTICAL
2	11385.48	54.84	74.00	-19.16	38.57	10.29	38.71	32.73	233	99	Peak	VERTICAL

Note:

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

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

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

For beamforming mode

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15776.66	57.08	74.00	-16.92	40.00	12.06	37.74	32.72	112	171	Peak	HORIZONTAL
2	15778.42	43.28	54.00	-10.72	26.20	12.06	37.74	32.72	112	171	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15775.56	42.90	54.00	-11.10	25.82	12.06	37.74	32.72	225	57	Average	VERTICAL
2	15781.84	56.24	74.00	-17.76	39.17	12.08	37.71	32.72	225	57	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10605.24	54.51	74.00	-19.49	38.86	9.94	38.24	32.53	176	83	Peak	HORIZONTAL
2	10608.40	41.05	54.00	-12.95	25.40	9.94	38.24	32.53	176	83	Average	HORIZONTAL
3	15900.78	43.10	54.00	-10.90	26.06	12.12	37.65	32.73	226	184	Average	HORIZONTAL
4	15904.36	56.96	74.00	-17.04	39.92	12.12	37.65	32.73	226	184	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10600.98	54.39	74.00	-19.61	38.74	9.94	38.24	32.53	185	30	Peak	VERTICAL
2	10601.56	41.26	54.00	-12.74	25.61	9.94	38.24	32.53	185	30	Average	VERTICAL
3	15902.86	55.99	74.00	-18.01	38.95	12.12	37.65	32.73	146	240	Peak	VERTICAL
4	15904.44	43.01	54.00	-10.99	25.97	12.12	37.65	32.73	146	240	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10637.32	54.89	74.00	-19.11	39.23	9.95	38.25	32.54	236	206	Peak	HORIZONTAL
2	10638.40	41.21	54.00	-12.79	25.55	9.95	38.25	32.54	236	206	Average	HORIZONTAL
3	15955.00	43.17	54.00	-10.83	26.13	12.14	37.63	32.73	194	61	Average	HORIZONTAL
4	15960.04	56.44	74.00	-17.56	39.40	12.14	37.63	32.73	194	61	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10635.90	54.34	74.00	-19.66	38.68	9.95	38.25	32.54	158	320	Peak	VERTICAL
2	10636.44	41.07	54.00	-12.93	25.41	9.95	38.25	32.54	158	320	Average	VERTICAL
3	15959.28	56.18	74.00	-17.82	39.14	12.14	37.63	32.73	110	190	Peak	VERTICAL
4	15963.42	42.97	54.00	-11.03	25.93	12.14	37.63	32.73	110	190	Average	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10995.06	55.77	74.00	-18.23	39.95	10.11	38.39	32.68	160	138	Peak	HORIZONTAL
2	10996.72	41.67	54.00	-12.33	25.84	10.12	38.40	32.69	160	138	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11001.94	55.09	74.00	-18.91	39.26	10.12	38.40	32.69	115	221	Peak	VERTICAL
2	11004.28	41.87	54.00	-12.13	26.04	10.12	38.40	32.69	115	221	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11161.74	54.35	74.00	-19.65	38.27	10.19	38.60	32.71	192	166	Peak	HORIZONTAL
2	11163.42	41.44	54.00	-12.56	25.36	10.19	38.60	32.71	192	166	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11157.68	54.52	74.00	-19.48	38.44	10.19	38.60	32.71	113	256	Peak	VERTICAL
2	11159.60	41.57	54.00	-12.43	25.49	10.19	38.60	32.71	113	256	Average	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11395.60	55.54	74.00	-18.46	39.10	10.29	38.88	32.73	166	179	Peak	HORIZONTAL
2	11404.56	42.34	54.00	-11.66	25.90	10.29	38.88	32.73	166	179	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11397.50	55.40	74.00	-18.60	38.96	10.29	38.88	32.73	126	315	Peak	VERTICAL
2	11401.06	42.47	54.00	-11.53	26.03	10.29	38.88	32.73	126	315	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15812.08	42.94	54.00	-11.06	25.87	12.08	37.71	32.72	118	205	Average	HORIZONTAL
2	15814.58	56.21	74.00	-17.79	39.14	12.08	37.71	32.72	118	205	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15805.50	42.77	54.00	-11.23	25.70	12.08	37.71	32.72	145	340	Average	VERTICAL
2	15808.68	56.22	74.00	-17.78	39.15	12.08	37.71	32.72	145	340	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10617.22	53.81	74.00	-20.19	38.16	9.94	38.24	32.53	160	302	Peak	HORIZONTAL
2	10622.08	41.18	54.00	-12.82	25.52	9.95	38.25	32.54	160	302	Average	HORIZONTAL
3	15925.76	43.17	54.00	-10.83	26.13	12.14	37.63	32.73	124	213	Average	HORIZONTAL
4	15934.80	56.45	74.00	-17.55	39.41	12.14	37.63	32.73	124	213	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	10615.18	41.07	54.00	-12.93	25.42	9.94	38.24	32.53	229	213	Average	VERTICAL
2	10617.60	55.00	74.00	-19.00	39.35	9.94	38.24	32.53	229	213	Peak	VERTICAL
3	15925.34	56.74	74.00	-17.26	39.70	12.14	37.63	32.73	175	66	Peak	VERTICAL
4	15926.40	43.19	54.00	-10.81	26.15	12.14	37.63	32.73	175	66	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11019.24	54.92	74.00	-19.08	39.09	10.12	38.40	32.69	139	269	Peak	HORIZONTAL
2	11024.00	41.76	54.00	-12.24	25.93	10.12	38.40	32.69	139	269	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11017.52	41.66	54.00	-12.34	25.83	10.12	38.40	32.69	196	148	Average	VERTICAL
2	11018.90	54.97	74.00	-19.03	39.14	10.12	38.40	32.69	196	148	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11095.74	54.73	74.00	-19.27	38.75	10.16	38.52	32.70	204	78	Peak	HORIZONTAL
2	11096.12	41.27	54.00	-12.73	25.29	10.16	38.52	32.70	204	78	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11098.02	41.46	54.00	-12.54	25.48	10.16	38.52	32.70	161	349	Average	VERTICAL
2	11102.10	54.58	74.00	-19.42	38.60	10.16	38.52	32.70	161	349	Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11336.88	54.56	74.00	-19.44	38.22	10.26	38.80	32.72	238	303	Peak	HORIZONTAL
2	11344.08	41.68	54.00	-12.32	25.34	10.26	38.80	32.72	238	303	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11335.14	41.59	54.00	-12.41	25.25	10.26	38.80	32.72	245	175	Average	VERTICAL
2	11344.02	54.50	74.00	-19.50	38.16	10.26	38.80	32.72	245	175	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15870.16	42.93	54.00	-11.07	25.87	12.10	37.68	32.72	173	131	Average	HORIZONTAL
2	15870.94	56.06	74.00	-17.94	39.00	12.10	37.68	32.72	173	131	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15866.54	42.81	54.00	-11.19	25.75	12.10	37.68	32.72	105	210	Average	VERTICAL
2	15870.68	56.30	74.00	-17.70	39.24	12.10	37.68	32.72	105	210	Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11058.28	41.73	54.00	-12.27	25.85	10.13	38.44	32.69	160	107	Average	HORIZONTAL
2	11062.18	54.61	74.00	-19.39	38.68	10.15	38.48	32.70	160	107	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11059.20	41.49	54.00	-12.51	25.61	10.13	38.44	32.69	111	229	Average	VERTICAL
2	11061.90	54.88	74.00	-19.12	38.95	10.15	38.48	32.70	111	229	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 122 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11218.06	54.87	74.00	-19.13	38.74	10.20	38.64	32.71	201	228	Peak	HORIZONTAL
2	11225.00	41.40	54.00	-12.60	25.21	10.22	38.68	32.71	201	228	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11218.66	41.50	54.00	-12.50	25.37	10.20	38.64	32.71	126	318	Average	VERTICAL
2	11219.34	54.33	74.00	-19.67	38.20	10.20	38.64	32.71	126	318	Peak	VERTICAL

Straddle Channel

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11437.08	42.37	54.00	-11.63	25.88	10.30	38.92	32.73	108	286	Average	HORIZONTAL
2	11440.00	55.52	74.00	-18.48	39.03	10.30	38.92	32.73	108	286	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11439.34	55.95	74.00	-18.05	39.46	10.30	38.92	32.73	159	86	Peak	VERTICAL
2	11444.08	42.46	54.00	-11.54	25.97	10.30	38.92	32.73	159	86	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 142 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11418.92	55.73	74.00	-18.27	39.24	10.30	38.92	32.73	224	79	Peak	HORIZONTAL
2	11422.68	42.45	54.00	-11.55	25.96	10.30	38.92	32.73	224	79	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11420.66	55.15	74.00	-18.85	38.66	10.30	38.92	32.73	183	180	Peak	VERTICAL
2	11422.22	42.36	54.00	-11.64	25.87	10.30	38.92	32.73	183	180	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 138 / Port 1 + Port 2 + Port 3 + Port 4
Test Date	May 24, 2017		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11379.60	54.99	74.00	-19.01	38.61	10.27	38.84	32.73	214	118	Peak	HORIZONTAL
2	11384.44	42.13	54.00	-11.87	25.75	10.27	38.84	32.73	214	118	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11379.16	42.06	54.00	-11.94	25.68	10.27	38.84	32.73	260	185	Average	VERTICAL
2	11384.22	56.33	74.00	-17.67	39.95	10.27	38.84	32.73	260	185	Peak	VERTICAL

Note:

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

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

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

2.7. Band Edge Emissions Measurement

2.7.1. Limit

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.25-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

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

In addition, In case the emission fall within the restricted band specified on 2.7, then the 2.8 limit in the table below has to be followed.

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

2.7.2. Measuring Instruments and Setting

Please refer to section 3 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 3MHz for Peak

2.7.3. Test Procedures

1. The test procedure is the same as section 2.6.3.

2.7.4. Test Setup Layout

This test setup layout is the same as that shown in section 2.6.4.

2.7.5. Test Deviation

There is no deviation with the original standard.

2.7.6. EUT Operation during Test

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

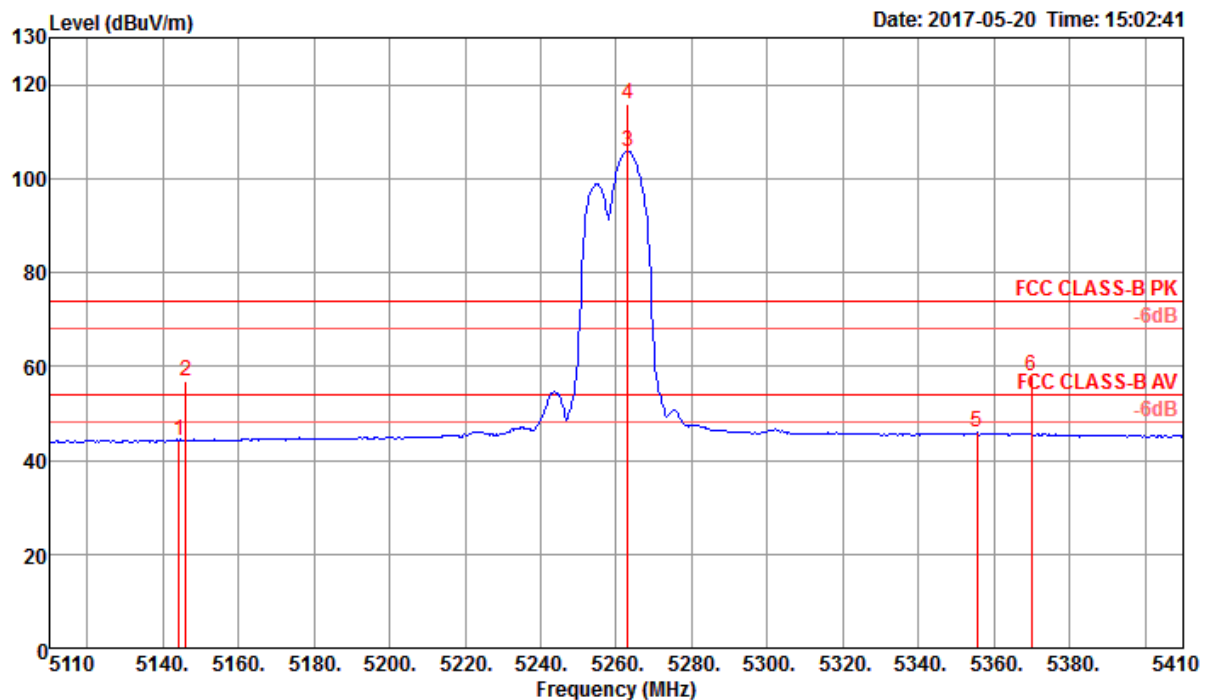
The EUT was programmed to be in beamforming transmitting mode.

2.7.7. Test Result of Band Edge and Fundamental Emissions

For non-beamforming mode

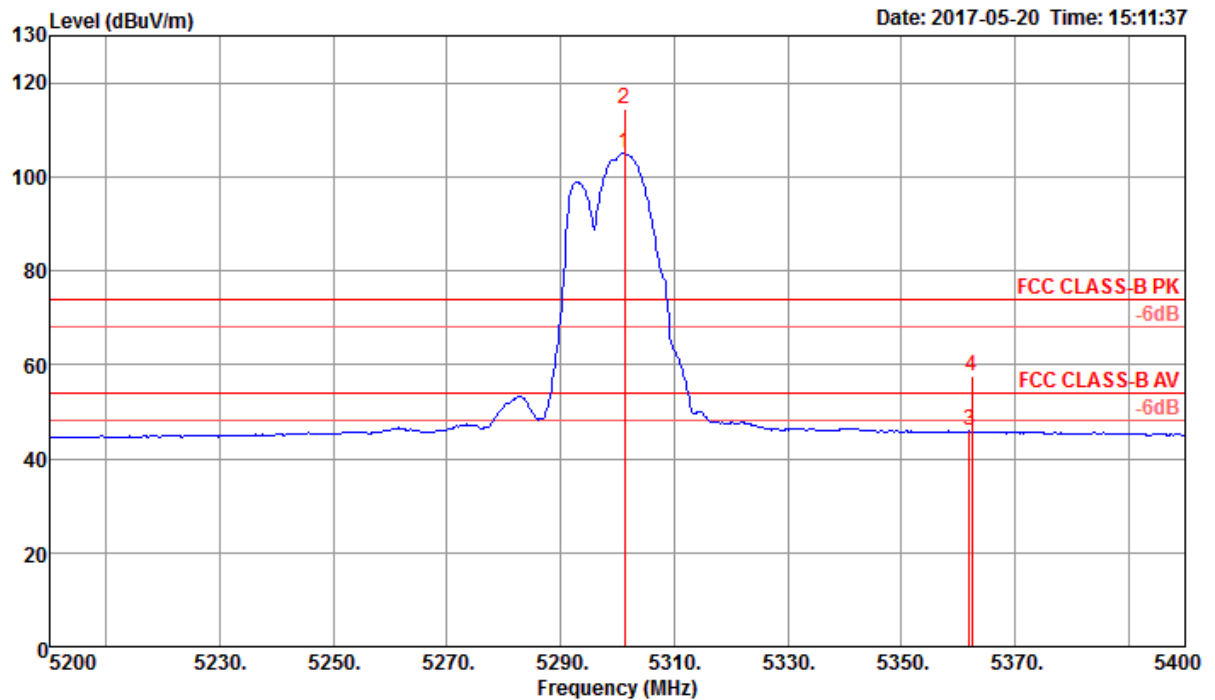
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 52, 60, 64 / Port 1 + Port 2 + Port 3 + Port 4

Channel 52



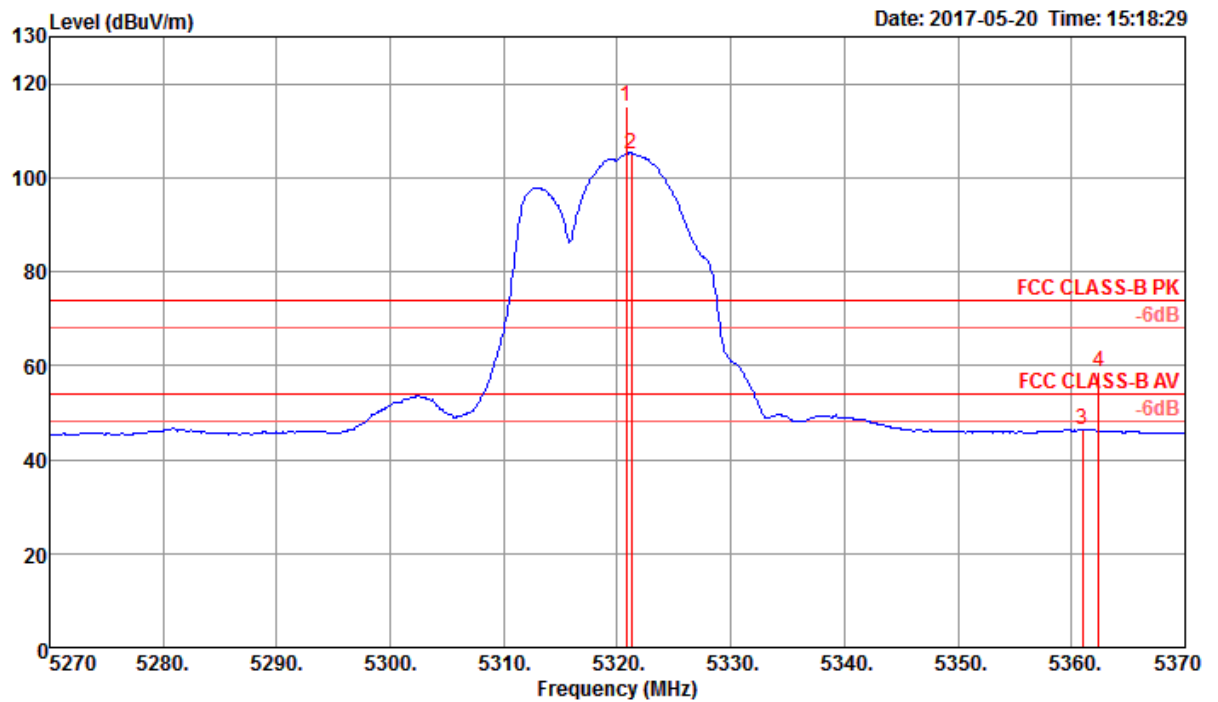
	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5144.20	44.20	54.00	-9.80	39.93	5.47	33.27	34.47	264	277	Average	VERTICAL
2	5146.00	56.72	74.00	-17.28	52.45	5.47	33.27	34.47	264	277	Peak	VERTICAL
3 @	5263.00	105.75			101.22	5.52	33.49	34.48	264	277	Average	VERTICAL
4 @	5263.00	115.86			111.33	5.52	33.49	34.48	264	277	Peak	VERTICAL
5	5355.40	45.86	54.00	-8.14	41.16	5.53	33.65	34.48	264	277	Average	VERTICAL
6	5369.80	58.12	74.00	-15.88	53.38	5.54	33.68	34.48	264	277	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5260 MHz.

Channel 60


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5301.20	105.05			100.46	5.52	33.55	34.48	262	277 Average	VERTICAL
2 @	5301.20	114.58			109.99	5.52	33.55	34.48	262	277 Peak	VERTICAL
3	5362.00	45.81	54.00	-8.19	41.11	5.53	33.65	34.48	262	277 Average	VERTICAL
4	5362.40	57.66	74.00	-16.34	52.96	5.53	33.65	34.48	262	277 Peak	VERTICAL

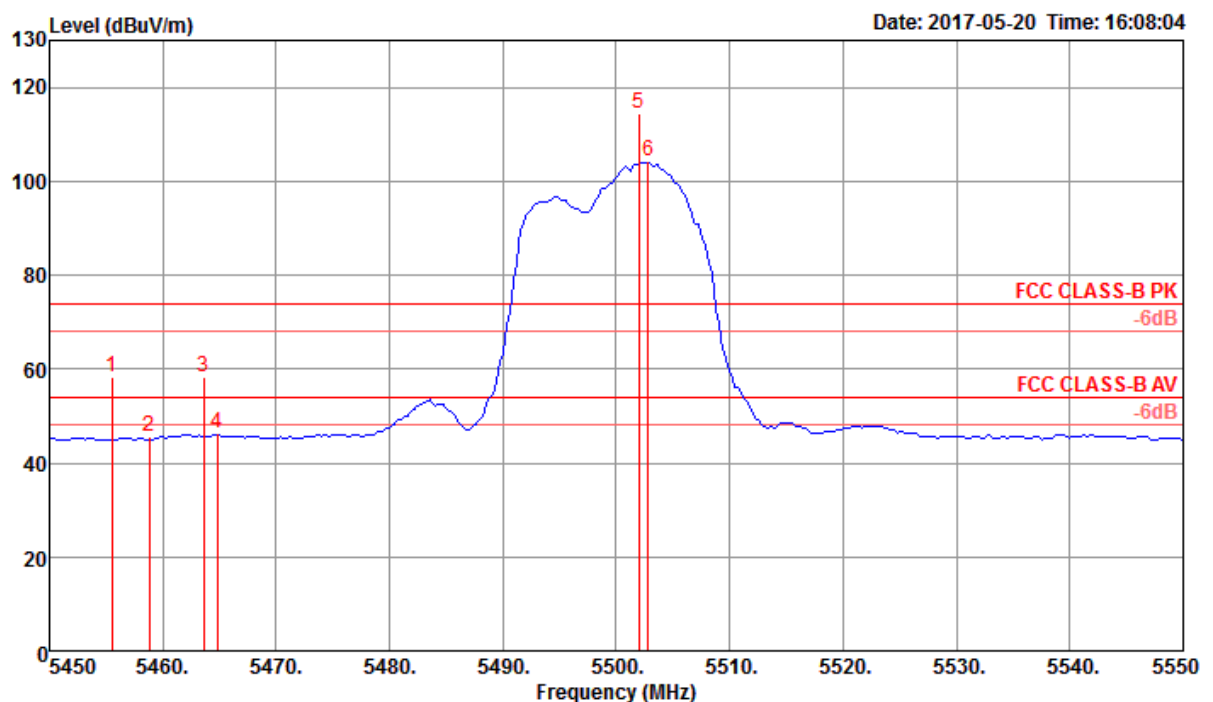
Item 1, 2 are the fundamental frequency at 5300 MHz.

Channel 64


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5320.80	115.19			110.58	5.52	33.57	34.48	249	278	Peak	VERTICAL
2 @	5321.20	105.17			100.56	5.52	33.57	34.48	249	278	Average	VERTICAL
3	5361.00	46.35	54.00	-7.65	41.65	5.53	33.65	34.48	249	278	Average	VERTICAL
4	5362.40	58.71	74.00	-15.29	54.01	5.53	33.65	34.48	249	278	Peak	VERTICAL

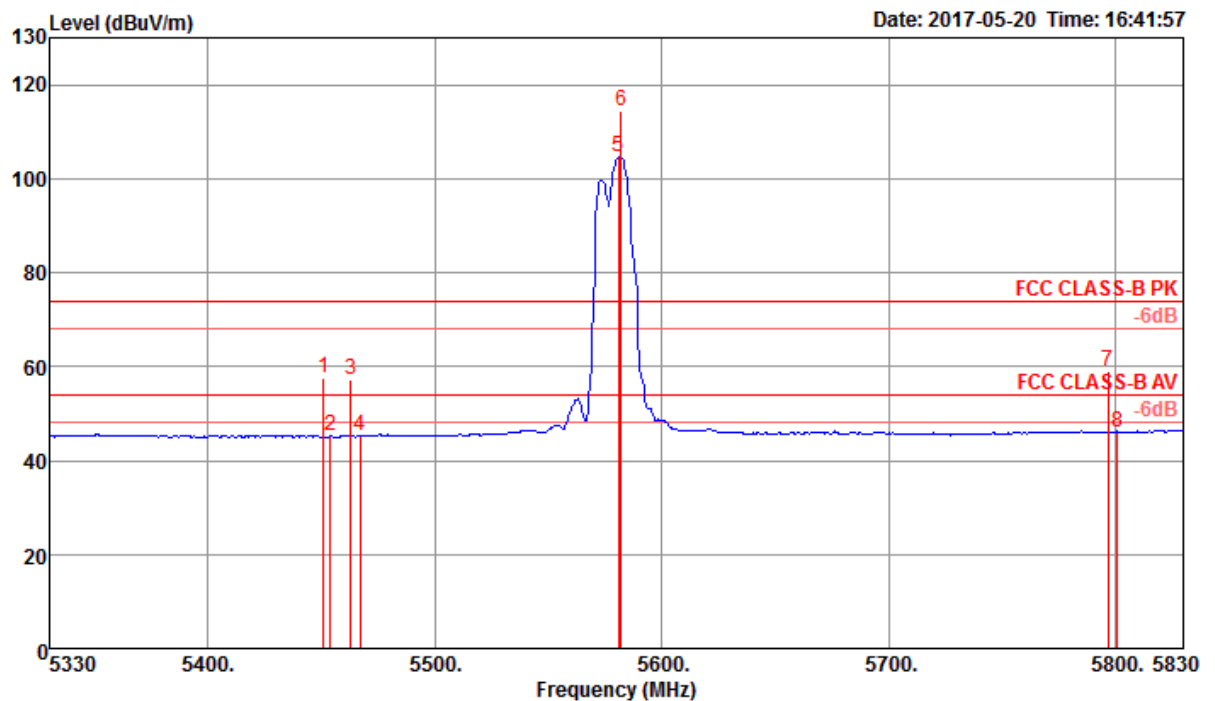
Item 1, 2 are the fundamental frequency at 5320 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 100, 116, 140 / Port 1 + Port 2 + Port 3 + Port 4

Channel 100


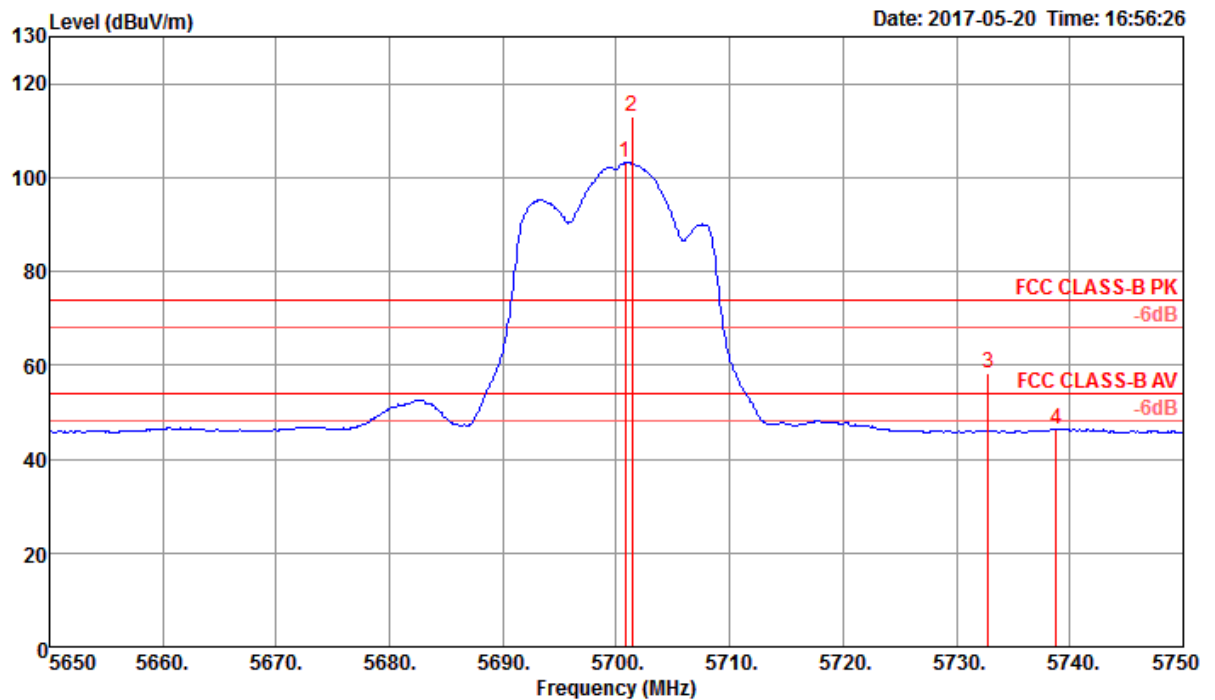
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5455.55	58.33	74.00	-15.67	53.41	5.59	33.82	34.49	264	277 Peak	VERTICAL
2	5458.80	45.72	54.00	-8.28	40.80	5.59	33.82	34.49	264	277 Average	VERTICAL
3	5463.60	58.24	74.00	-15.76	53.28	5.60	33.85	34.49	264	277 Peak	VERTICAL
4	5464.80	46.42	54.00	-7.58	41.46	5.60	33.85	34.49	264	277 Average	VERTICAL
5 @	5502.00	114.55			109.52	5.62	33.90	34.49	264	277 Peak	VERTICAL
6 @	5502.80	104.43			99.40	5.62	33.90	34.49	264	277 Average	VERTICAL

Item 5, 6 are the fundamental frequency at 5500 MHz.

Channel 116


	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5451.00	57.41	74.00	-16.59	52.49	5.59	33.82	34.49	299	279 Peak	VERTICAL
2	5454.00	45.23	54.00	-8.77	40.31	5.59	33.82	34.49	299	279 Average	VERTICAL
3	5463.00	57.26	74.00	-16.74	52.34	5.59	33.82	34.49	299	279 Peak	VERTICAL
4	5467.00	45.19	54.00	-8.81	40.23	5.60	33.85	34.49	299	279 Average	VERTICAL
5 @	5581.00	104.53			99.20	5.68	34.15	34.50	299	279 Average	VERTICAL
6 @	5582.00	114.35			109.02	5.68	34.15	34.50	299	279 Peak	VERTICAL
7	5797.00	58.88	74.00	-15.12	52.92	5.70	34.80	34.54	299	279 Peak	VERTICAL
8	5801.00	46.09	54.00	-7.91	40.13	5.70	34.80	34.54	299	279 Average	VERTICAL

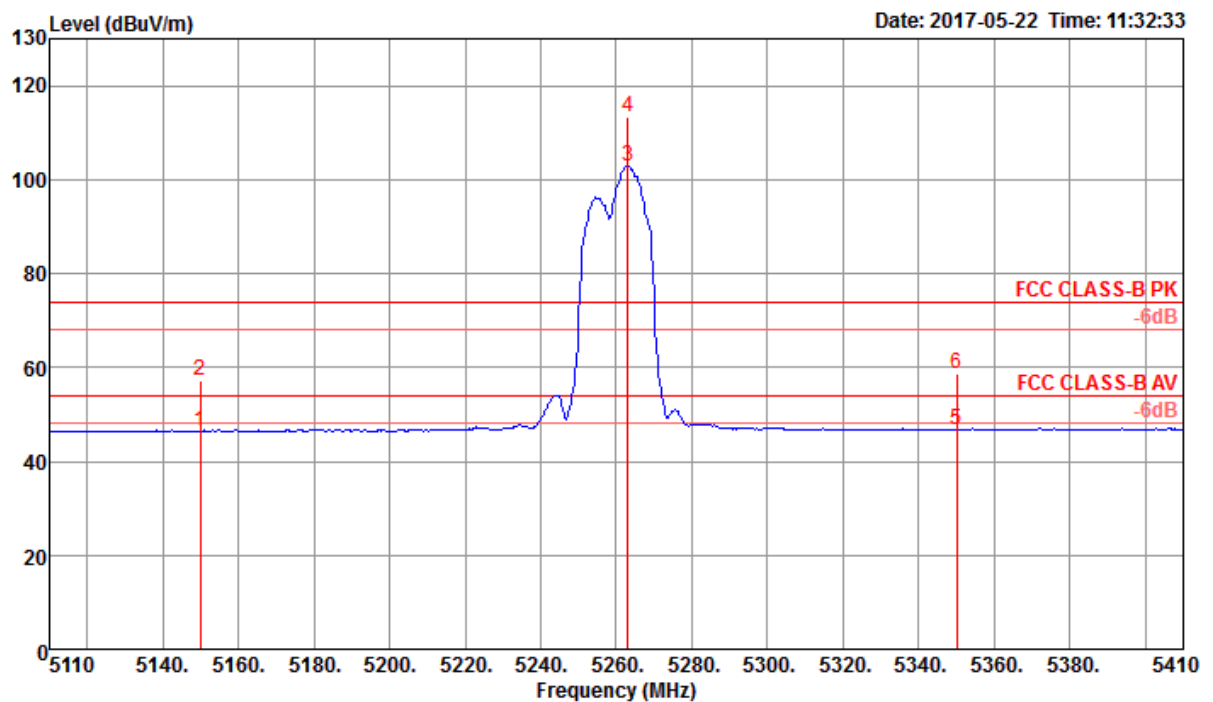
Item 5, 6 are the fundamental frequency at 5580 MHz.

Channel 140


	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5700.80	103.13			97.46	5.69	34.50	34.52	225	276 Average	VERTICAL
2 @	5701.40	113.04			107.37	5.69	34.50	34.52	225	276 Peak	VERTICAL
3	5732.80	58.34	74.00	-15.66	52.57	5.70	34.60	34.53	225	276 Peak	VERTICAL
4	5738.80	46.25	54.00	-7.75	40.43	5.70	34.65	34.53	225	276 Average	VERTICAL

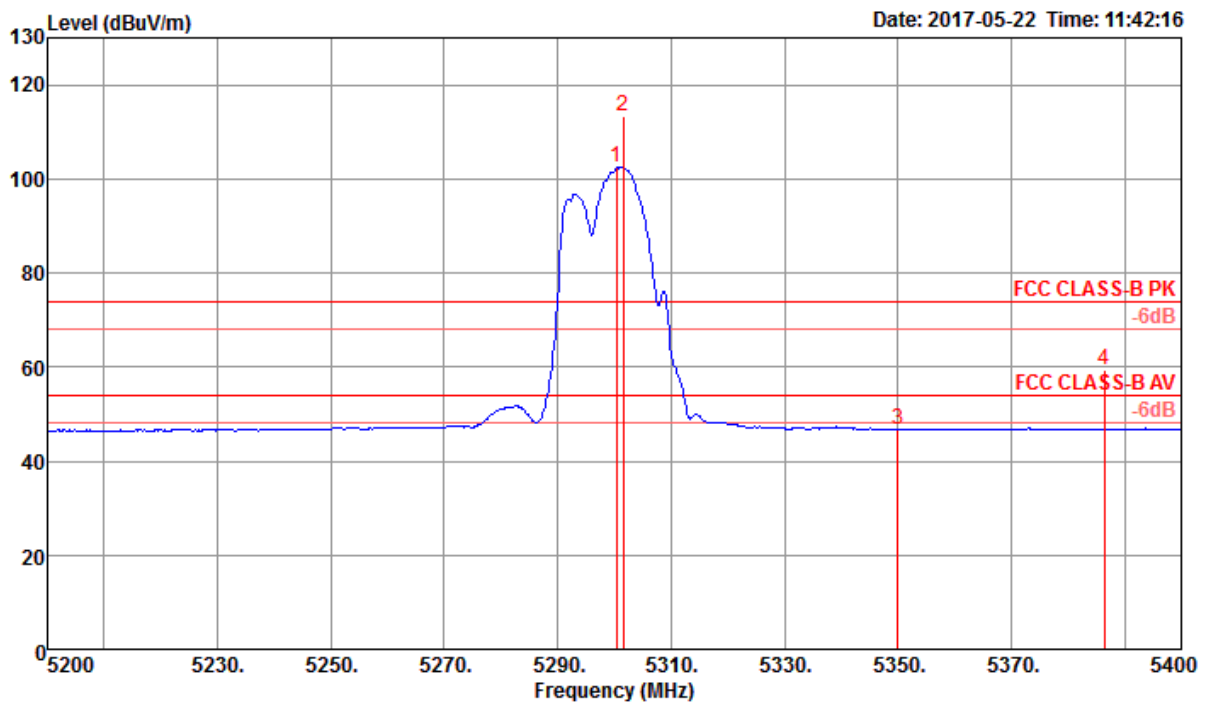
Item 1, 2 are the fundamental frequency at 5700 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Port 1 + Port 2 + Port 3 + Port 4

Channel 52


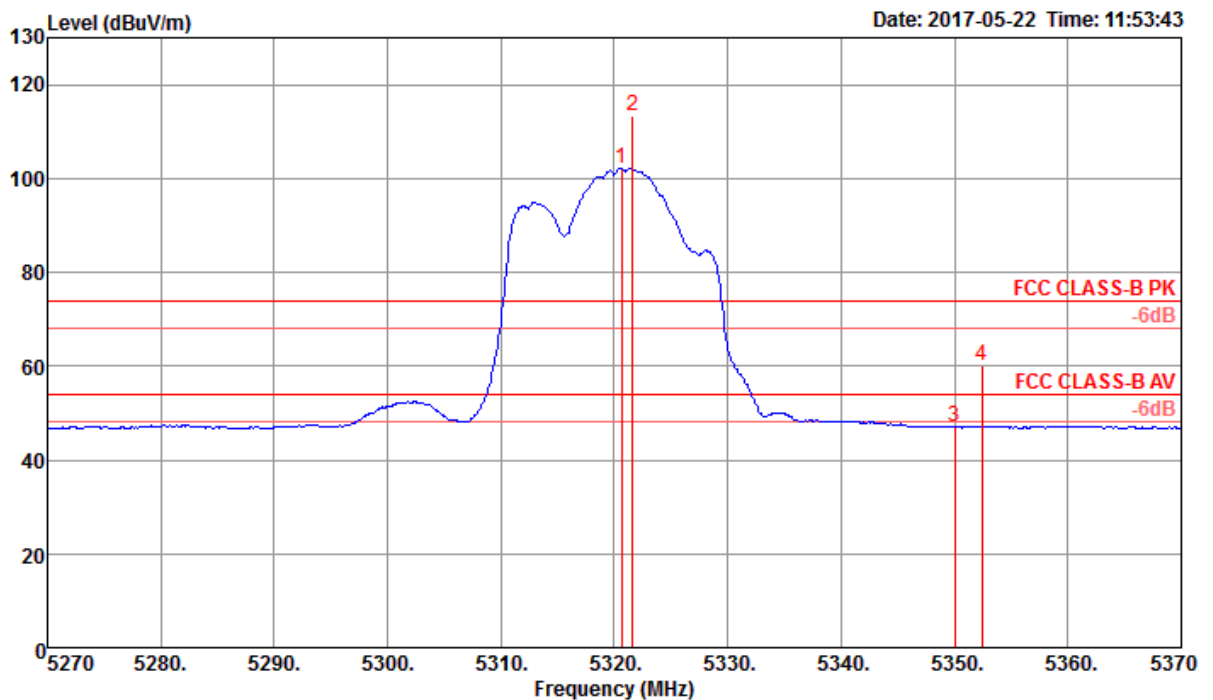
	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5150.00	46.35	54.00	-7.65	37.41	6.48	33.51	31.05	273	271 Average	VERTICAL
2	5150.00	57.28	74.00	-16.72	48.34	6.48	33.51	31.05	273	271 Peak	VERTICAL
3 @	5263.00	102.88			93.69	6.56	33.67	31.04	273	271 Average	VERTICAL
4 @	5263.00	113.39			104.20	6.56	33.67	31.04	273	271 Peak	VERTICAL
5	5350.00	46.74	54.00	-7.26	37.41	6.58	33.79	31.04	273	271 Average	VERTICAL
6	5350.00	58.77	74.00	-15.23	49.44	6.58	33.79	31.04	273	271 Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5260 MHz.

Channel 60


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5300.40	102.44			93.19	6.57	33.72	31.04	248	274 Average	VERTICAL
2 @	5301.60	113.17			103.92	6.57	33.72	31.04	248	274 Peak	VERTICAL
3	5350.00	46.72	54.00	-7.28	37.39	6.58	33.79	31.04	248	274 Average	VERTICAL
4	5386.40	59.26	74.00	-14.74	49.85	6.60	33.84	31.03	248	274 Peak	VERTICAL

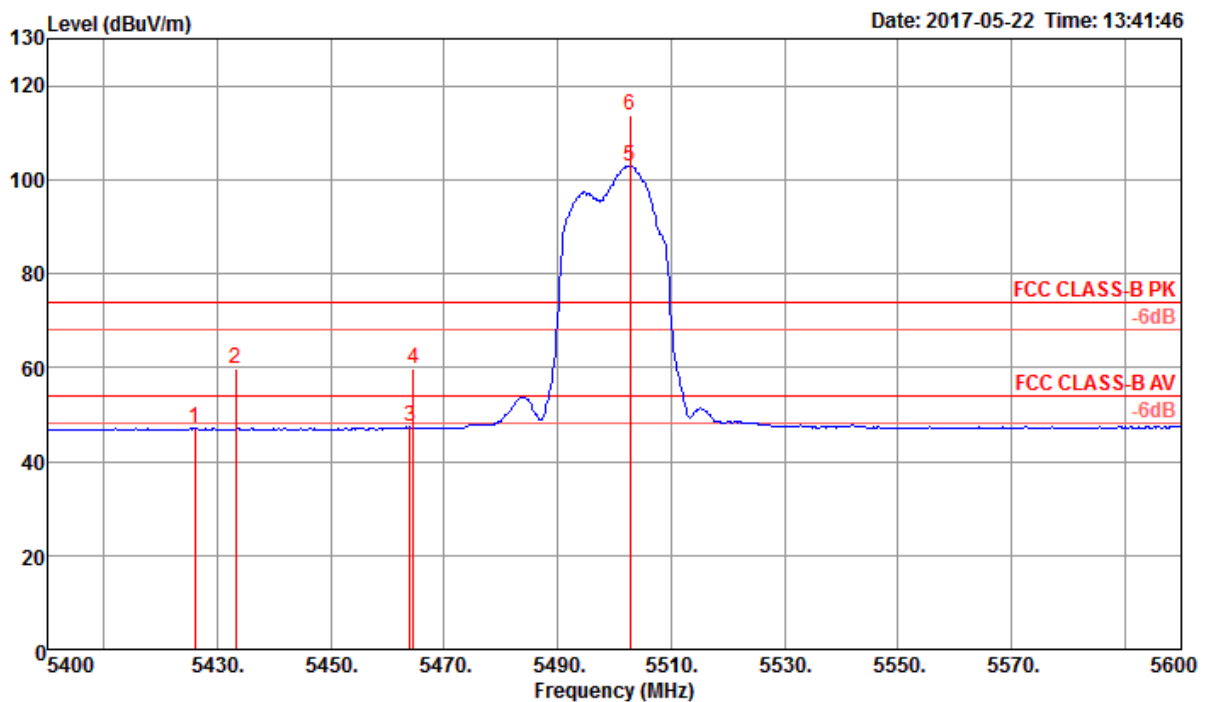
Item 1, 2 are the fundamental frequency at 5300 MHz.

Channel 64


	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5320.60	102.16			92.89	6.57	33.74	31.04	245	274 Average	VERTICAL
2 @	5321.60	113.25			103.98	6.57	33.74	31.04	245	274 Peak	VERTICAL
3	5350.00	46.91	54.00	-7.09	37.58	6.58	33.79	31.04	245	274 Average	VERTICAL
4	5352.40	60.25	74.00	-13.75	50.92	6.58	33.79	31.04	245	274 Peak	VERTICAL

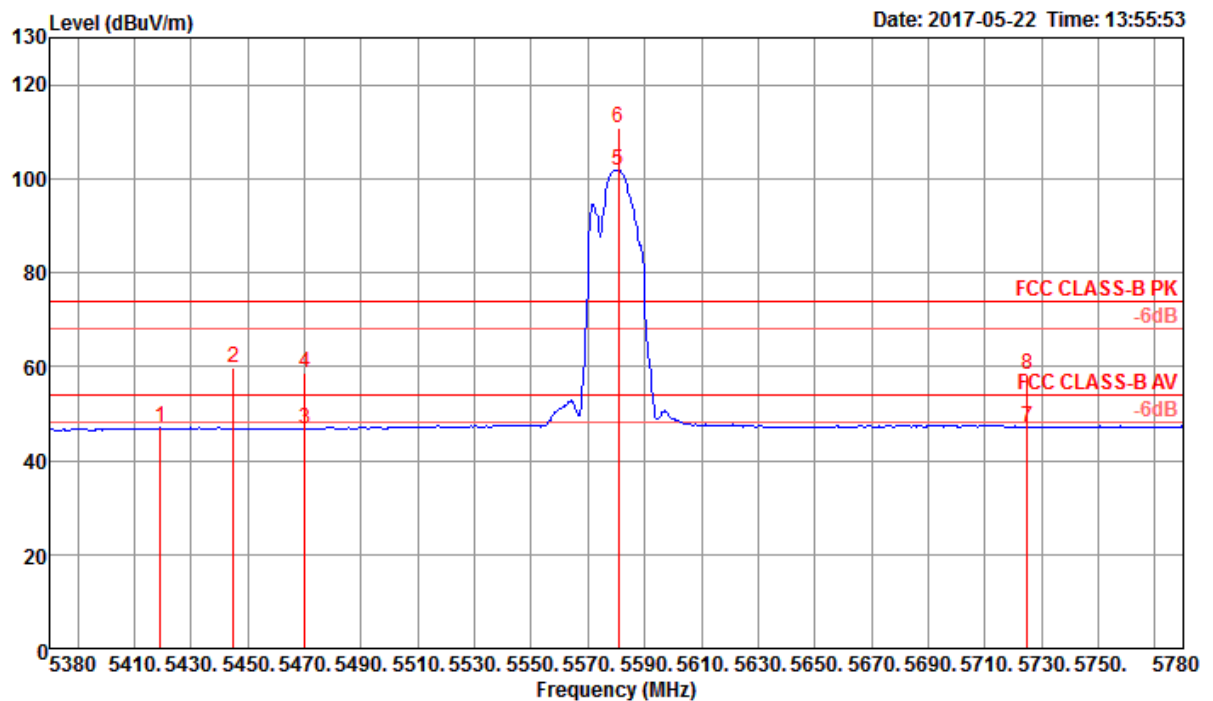
Item 1, 2 are the fundamental frequency at 5320 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 116, 140 / Port 1 + Port 2 + Port 3 + Port 4

Channel 100


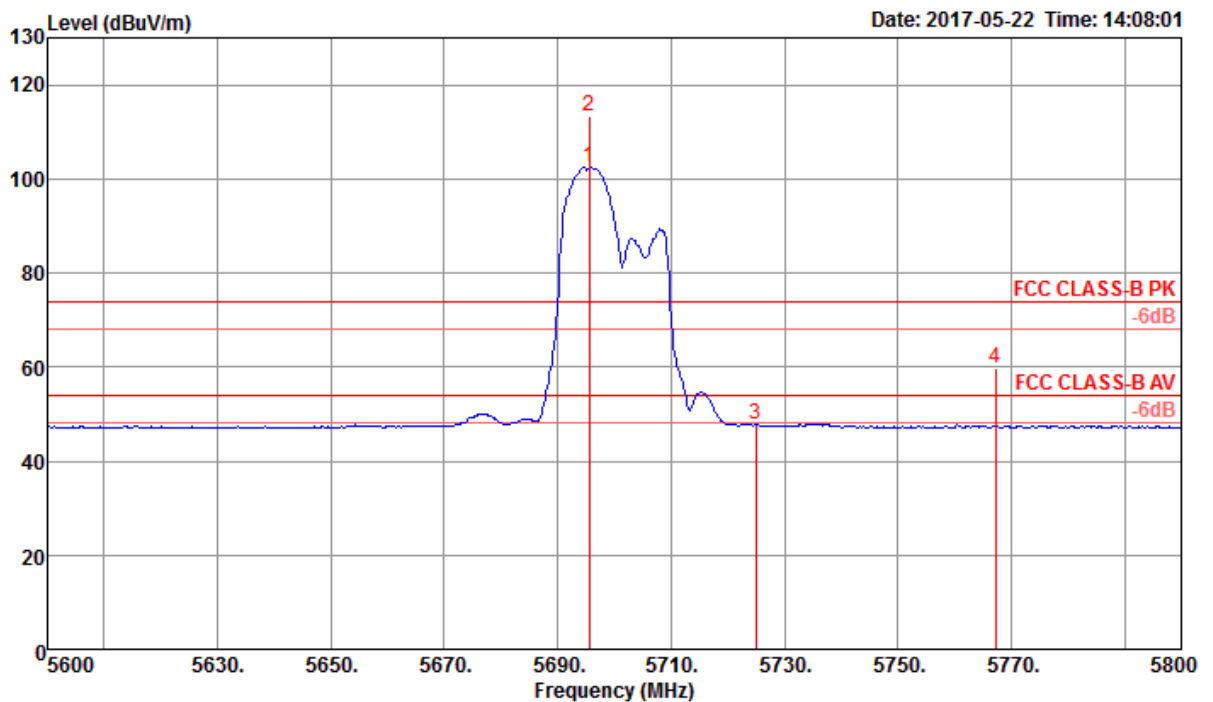
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5426.00	46.99	54.00	-7.01	37.51	6.63	33.88	31.03	279	272 Average	VERTICAL
2	5433.20	59.86	74.00	-14.14	50.33	6.65	33.91	31.03	279	272 Peak	VERTICAL
3	5464.00	47.40	54.00	-6.60	37.79	6.68	33.95	31.02	279	272 Average	VERTICAL
4	5464.55	59.91	74.00	-14.09	50.30	6.68	33.95	31.02	279	272 Peak	VERTICAL
5 @	5502.80	102.92			93.23	6.71	34.00	31.02	279	272 Average	VERTICAL
6 @	5502.80	113.56			103.87	6.71	34.00	31.02	279	272 Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5500 MHz.

Channel 116


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5419.20	46.93	54.00	-7.07	37.45	6.63	33.88	31.03	290	360 Average	VERTICAL
2	5444.80	59.75	74.00	-14.25	50.22	6.65	33.91	31.03	290	360 Peak	VERTICAL
3	5470.00	46.73	54.00	-7.27	37.12	6.68	33.95	31.02	290	360 Average	VERTICAL
4	5470.00	58.84	74.00	-15.16	49.23	6.68	33.95	31.02	290	360 Peak	VERTICAL
5 @	5580.80	101.88			92.12	6.78	34.03	31.05	290	360 Average	VERTICAL
6 @	5580.80	110.67			100.91	6.78	34.03	31.05	290	360 Peak	VERTICAL
7	5725.00	47.13	54.00	-6.87	37.32	6.83	34.09	31.11	290	360 Average	VERTICAL
8	5725.00	58.14	74.00	-15.86	48.33	6.83	34.09	31.11	290	360 Peak	VERTICAL

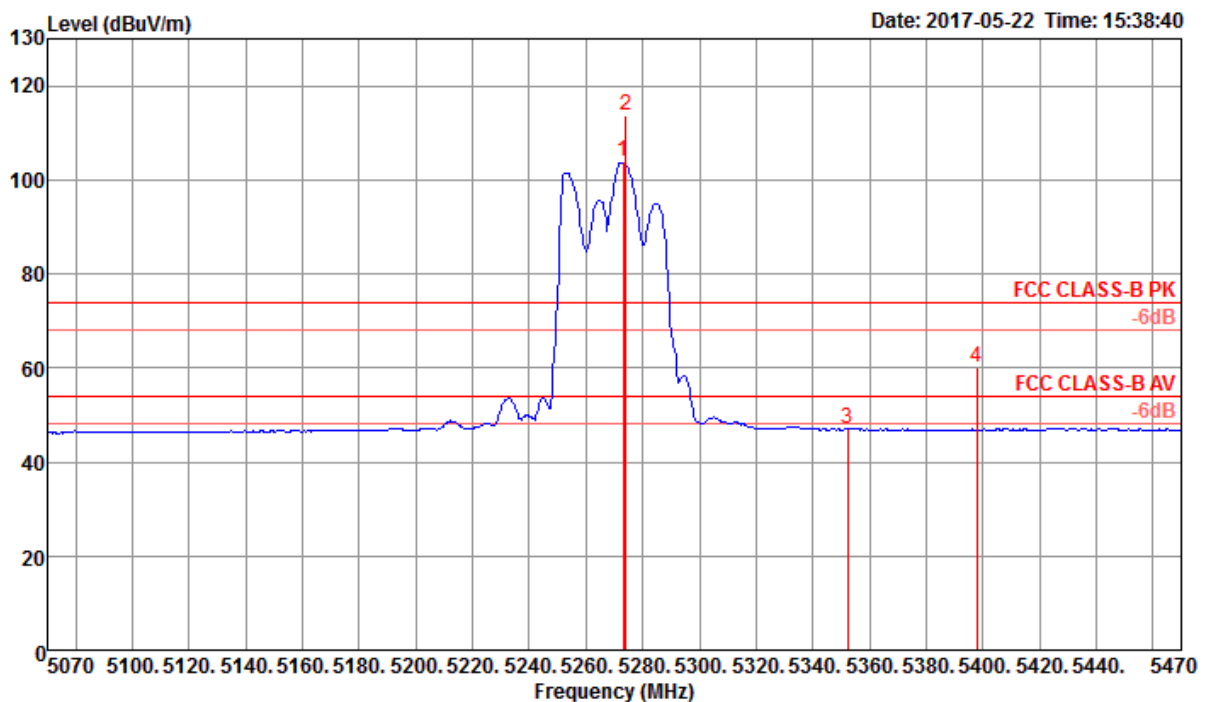
Item 5, 6 are the fundamental frequency at 5580 MHz.

Channel 140


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5695.60	102.53			92.73	6.82	34.08	31.10	278	41 Average	VERTICAL
2 @	5695.60	113.39			103.59	6.82	34.08	31.10	278	41 Peak	VERTICAL
3	5725.00	47.79	54.00	-6.21	37.98	6.83	34.09	31.11	278	41 Average	VERTICAL
4	5767.20	59.64	74.00	-14.36	49.84	6.83	34.10	31.13	278	41 Peak	VERTICAL

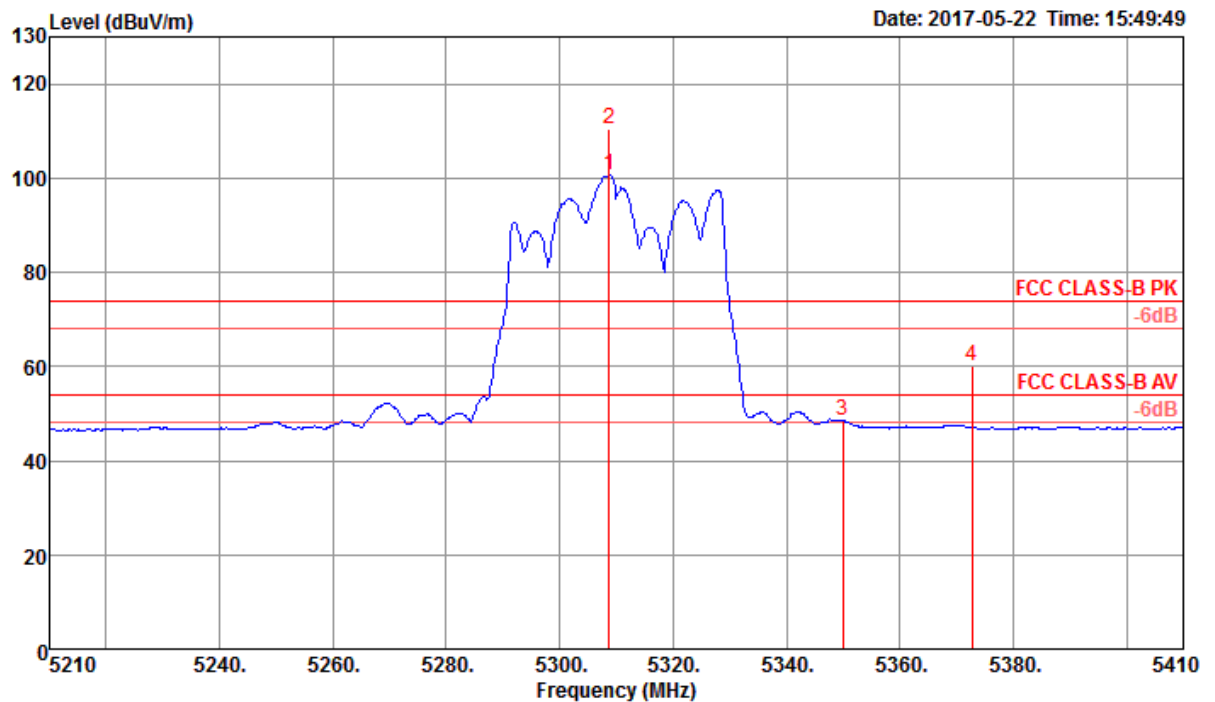
Item 1, 2 are the fundamental frequency at 5700 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Port 1 + Port 2 + Port 3 + Port 4

Channel 54


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5273.20	103.75			94.56	6.56	33.67	31.04	248	271	Average	VERTICAL
2 @	5274.00	113.59			104.40	6.56	33.67	31.04	248	271	Peak	VERTICAL
3	5352.40	47.06	54.00	-6.94	37.73	6.58	33.79	31.04	248	271	Average	VERTICAL
4	5398.00	60.04	74.00	-13.96	50.61	6.60	33.86	31.03	248	271	Peak	VERTICAL

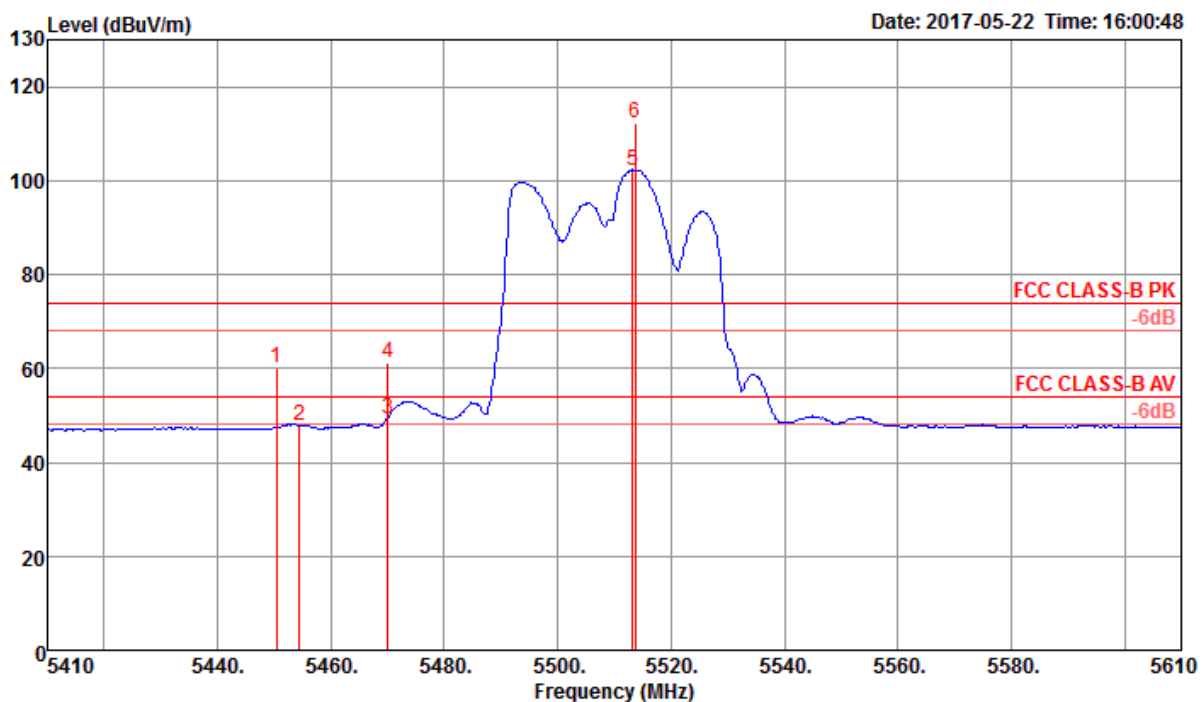
Item 1, 2 are the fundamental frequency at 5270 MHz.

Channel 62


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5308.80	100.57			91.32	6.57	33.72	31.04	101	265 Average	VERTICAL
2 @	5308.80	110.38			101.13	6.57	33.72	31.04	101	265 Peak	VERTICAL
3	5350.00	48.53	54.00	-5.47	39.20	6.58	33.79	31.04	101	265 Average	VERTICAL
4	5372.80	60.21	74.00	-13.79	50.84	6.59	33.81	31.03	101	265 Peak	VERTICAL

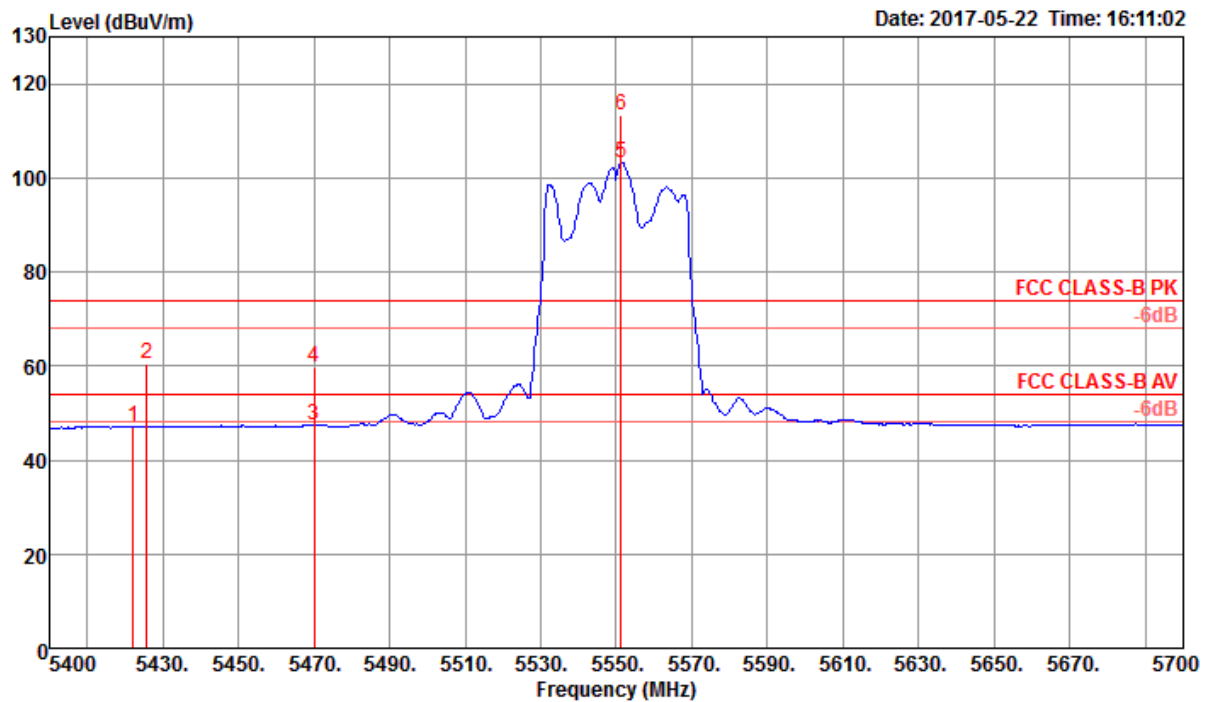
Item 1, 2 are the fundamental frequency at 5310 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Port 1 + Port 2 + Port 3 + Port 4

Channel 102


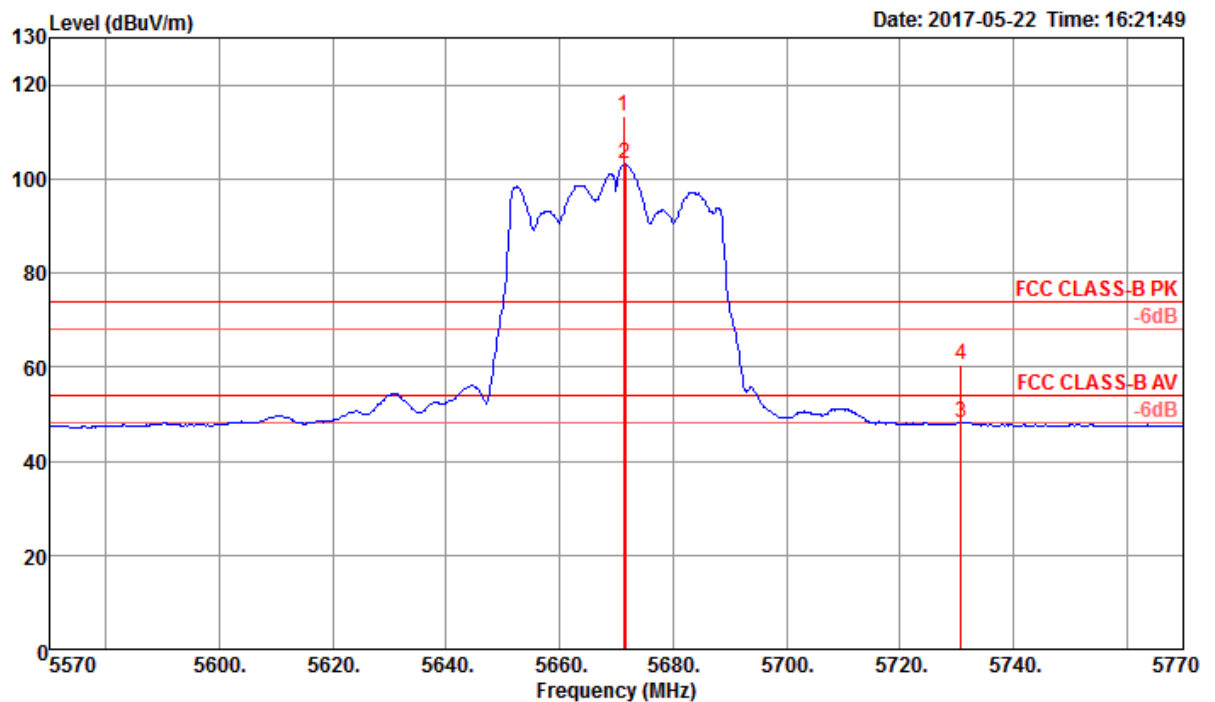
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	Limit	Level	Loss	Factor	Factor	cm	deg	
1	5450.40	60.09	74.00	-13.91	50.52	6.66	33.93	31.02	290	275	Peak
2	5454.40	47.95	54.00	-6.05	38.38	6.66	33.93	31.02	290	275	Average
3	5470.00	49.25	54.00	-4.75	39.64	6.68	33.95	31.02	290	275	Average
4	5470.00	61.19	74.00	-12.81	51.58	6.68	33.95	31.02	290	275	Peak
5 @	5513.20	102.20			92.51	6.72	34.00	31.03	290	275	Average
6 @	5513.60	112.36			102.66	6.72	34.01	31.03	290	275	Peak

Item 5, 6 are the fundamental frequency at 5510 MHz.

Channel 110


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5422.20	47.20	54.00	-6.80	37.72	6.63	33.88	31.03	300	269 Average	VERTICAL
2	5425.80	60.50	74.00	-13.50	51.02	6.63	33.88	31.03	300	269 Peak	VERTICAL
3	5470.00	47.53	54.00	-6.47	37.92	6.68	33.95	31.02	300	269 Average	VERTICAL
4	5470.00	59.72	74.00	-14.28	50.11	6.68	33.95	31.02	300	269 Peak	VERTICAL
5 @	5551.20	103.21			93.48	6.75	34.02	31.04	300	269 Average	VERTICAL
6 @	5551.20	113.39			103.66	6.75	34.02	31.04	300	269 Peak	VERTICAL

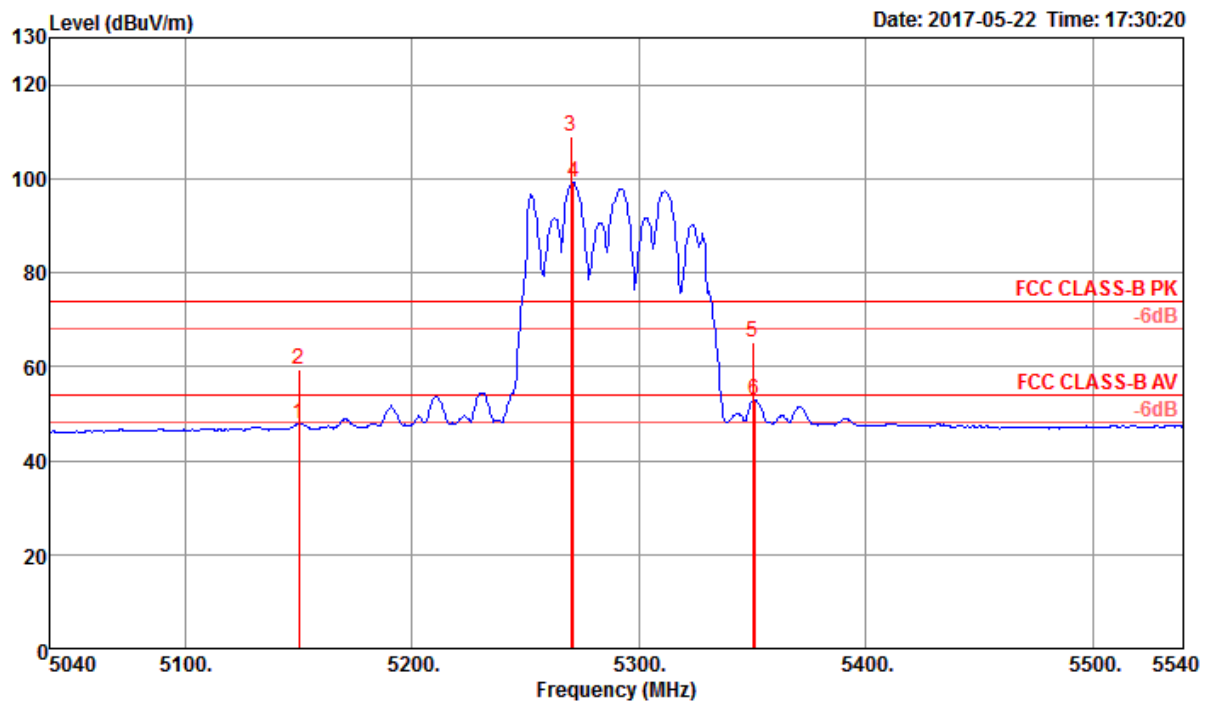
Item 5, 6 are the fundamental frequency at 5550 MHz.

Channel 134


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBUV/m	dBUV/m	dB	dBUV	dB	dB/m	dB	cm	deg	
1 @	5671.20	113.17			103.38	6.81	34.07	31.09	266	264 Peak	VERTICAL
2 @	5671.60	103.04			93.25	6.81	34.07	31.09	266	264 Average	VERTICAL
3	5730.80	48.17	54.00	-5.83	38.36	6.83	34.09	31.11	266	264 Average	VERTICAL
4	5730.80	60.41	74.00	-13.59	50.60	6.83	34.09	31.11	266	264 Peak	VERTICAL

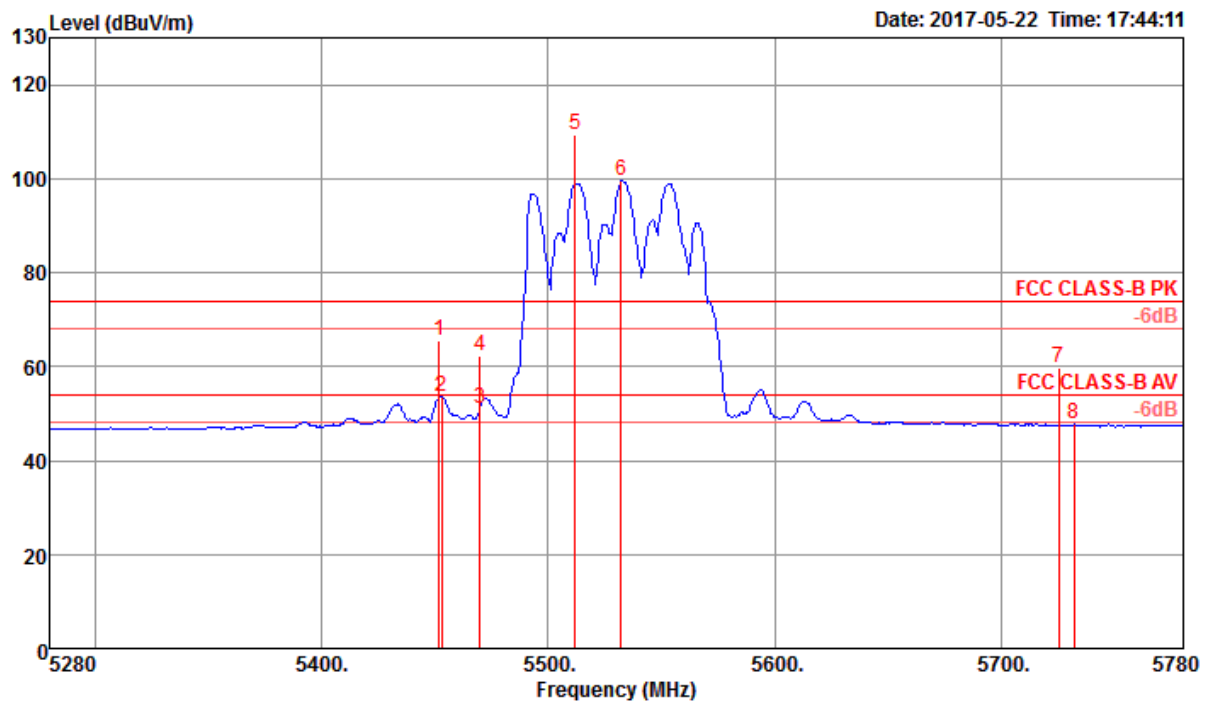
Item 1, 2 are the fundamental frequency at 5670 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58, 106, 122 / Port 1 + Port 2 + Port 3 + Port 4

Channel 58


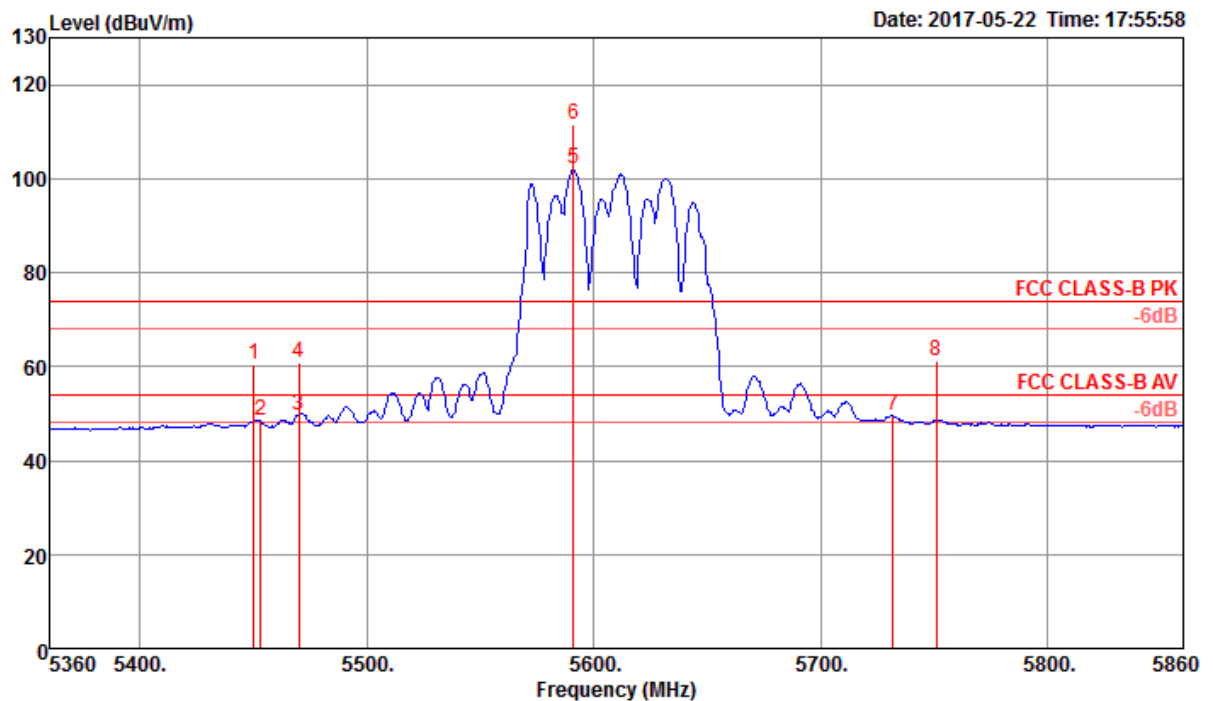
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5150.00	47.82	54.00	-6.18	38.88	6.48	33.51	31.05	273	274 Average	VERTICAL
2	5150.00	59.24	74.00	-14.76	50.30	6.48	33.51	31.05	273	274 Peak	VERTICAL
3 @	5270.00	109.12			99.93	6.56	33.67	31.04	273	274 Peak	VERTICAL
4 @	5271.00	99.24			90.05	6.56	33.67	31.04	273	274 Average	VERTICAL
5	5350.00	65.07	74.00	-8.93	55.74	6.58	33.79	31.04	273	274 Peak	VERTICAL
6	5351.00	52.96	54.00	-1.04	43.63	6.58	33.79	31.04	273	274 Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5290 MHz.

Channel 106


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5452.00	65.40	74.00	-8.60	55.83	6.66	33.93	31.02	274	276	Peak	VERTICAL
2	5453.00	53.52	54.00	-0.48	43.95	6.66	33.93	31.02	274	276	Average	VERTICAL
3	5470.00	51.21	54.00	-2.79	41.60	6.68	33.95	31.02	274	276	Average	VERTICAL
4	5470.00	62.16	74.00	-11.84	52.55	6.68	33.95	31.02	274	276	Peak	VERTICAL
5 @	5512.00	109.20			99.51	6.72	34.00	31.03	274	276	Peak	VERTICAL
6 @	5532.00	99.42			89.70	6.74	34.01	31.03	274	276	Average	VERTICAL
7	5725.00	59.66	74.00	-14.34	49.85	6.83	34.09	31.11	274	276	Peak	VERTICAL
8	5732.00	47.71	54.00	-6.29	37.90	6.83	34.09	31.11	274	276	Average	VERTICAL

Item 5, 6 are the fundamental frequency at 5530 MHz.

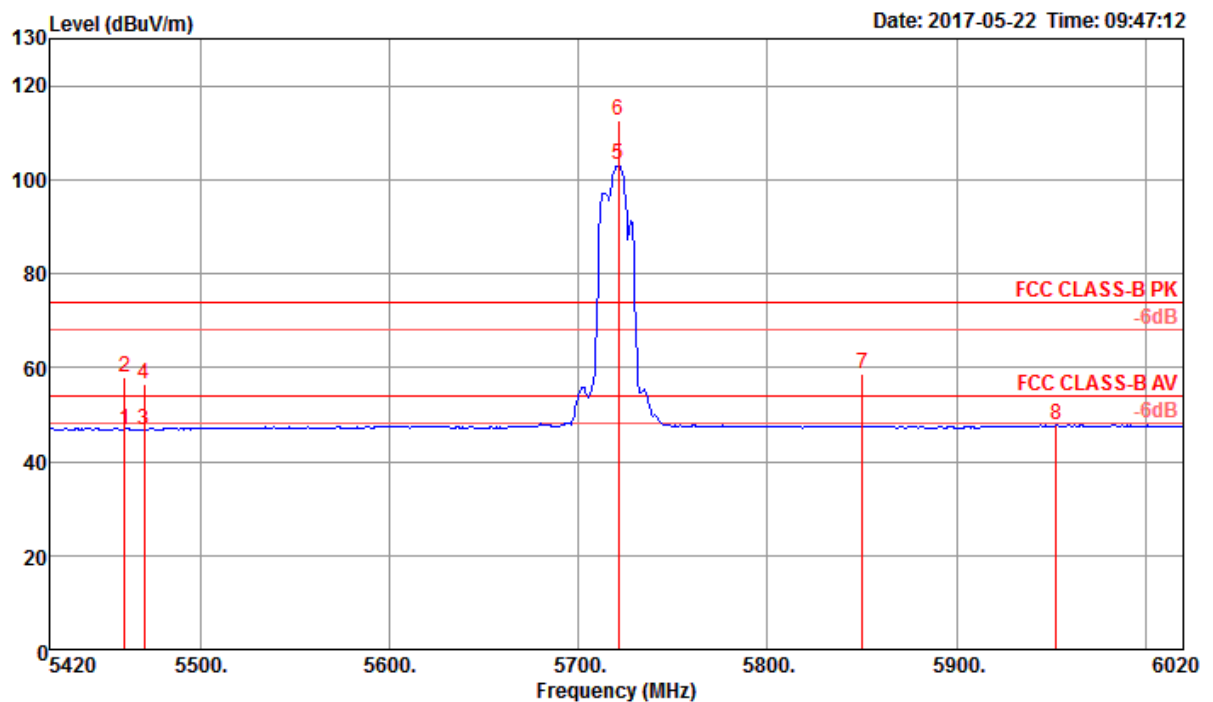
Channel 122


	Freq	Level	Limit	Over	Read	CableAntenna	Preampl	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5450.00	60.64	74.00	-13.36	51.07	6.66	33.93	31.02	298	275 Peak	VERTICAL
2	5453.00	48.47	54.00	-5.53	38.90	6.66	33.93	31.02	298	275 Average	VERTICAL
3	5470.00	49.72	54.00	-4.28	40.11	6.68	33.95	31.02	298	275 Average	VERTICAL
4	5470.00	60.81	74.00	-13.19	51.20	6.68	33.95	31.02	298	275 Peak	VERTICAL
5 @	5591.00	101.97			92.21	6.78	34.03	31.05	298	275 Average	VERTICAL
6 @	5591.00	111.62			101.86	6.78	34.03	31.05	298	275 Peak	VERTICAL
7	5732.00	49.47	54.00	-4.53	39.66	6.83	34.09	31.11	298	275 Average	VERTICAL
8	5751.00	61.16	74.00	-12.84	51.35	6.83	34.10	31.12	298	275 Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5610 MHz.

Straddle Channel

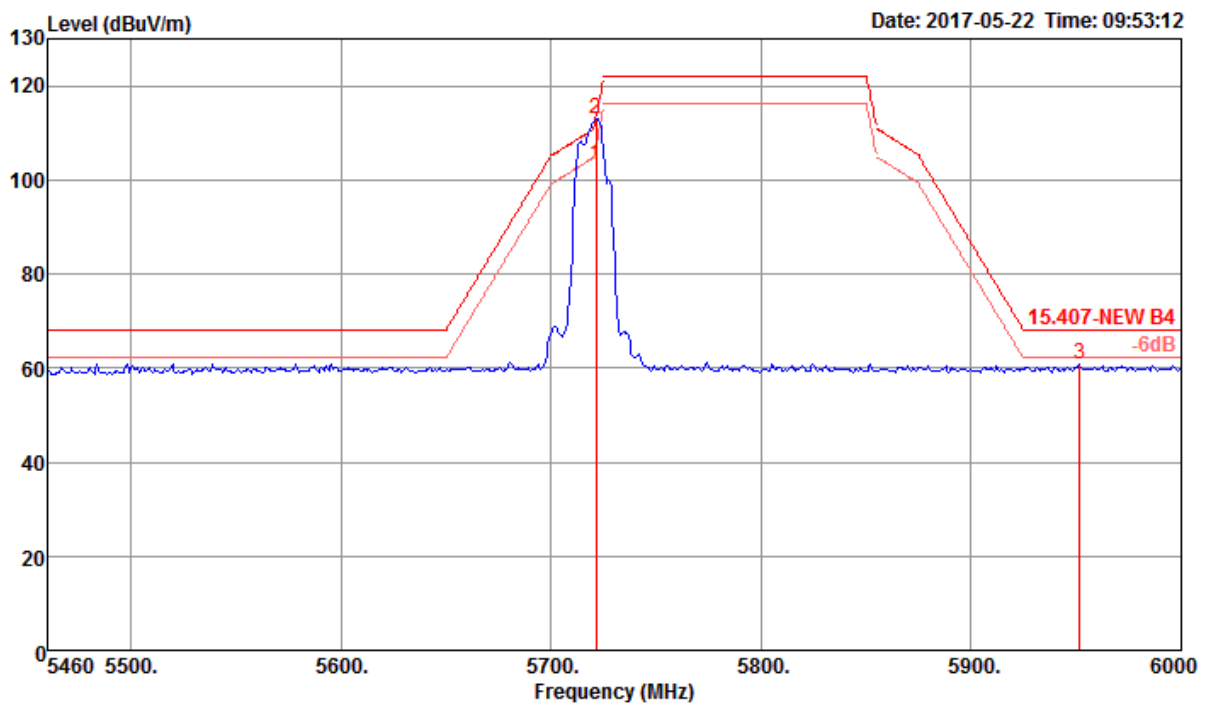
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 144 (UNII 2C) / Port 1 + Port 2 + Port 3 + Port 4

Channel 144


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5460.00	46.65	54.00	-7.35	37.08	6.66	33.93	31.02	271	273	Average	VERTICAL
2	5460.00	57.95	74.00	-16.05	48.38	6.66	33.93	31.02	271	273	Peak	VERTICAL
3	5470.00	46.69	54.00	-7.31	37.08	6.68	33.95	31.02	271	273	Average	VERTICAL
4	5470.00	56.60	74.00	-17.40	46.99	6.68	33.95	31.02	271	273	Peak	VERTICAL
5 @	5721.20	103.07			93.27	6.82	34.09	31.11	271	273	Average	VERTICAL
6 @	5721.20	112.52			102.72	6.82	34.09	31.11	271	273	Peak	VERTICAL
7	5850.00	58.81	74.00	-15.19	48.92	6.91	34.14	31.16	271	273	Peak	VERTICAL
8	5952.80	47.76	54.00	-6.24	37.73	7.05	34.18	31.20	271	273	Average	VERTICAL

Item 5, 6 are the fundamental frequency at 5720 MHz.

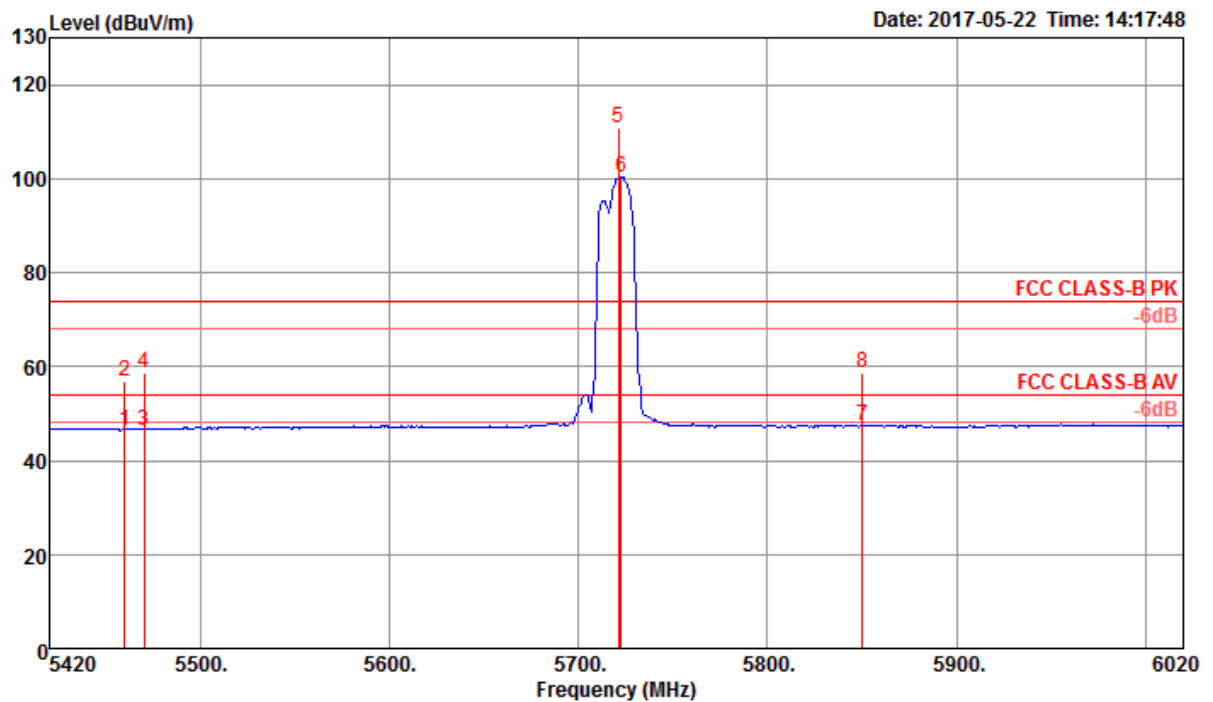
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11a CH 144 (UNII 3) / Port 1 + Port 2 + Port 3 + Port 4

Channel 144


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5721.20	103.07			93.27	6.82	34.09	31.11	271	273 Average	VERTICAL
2	5721.20	113.02			103.22	6.82	34.09	31.11	271	273 Peak	VERTICAL
3	5951.60	60.73	68.20	-7.47	50.70	7.05	34.18	31.20	271	273 Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 5720 MHz.

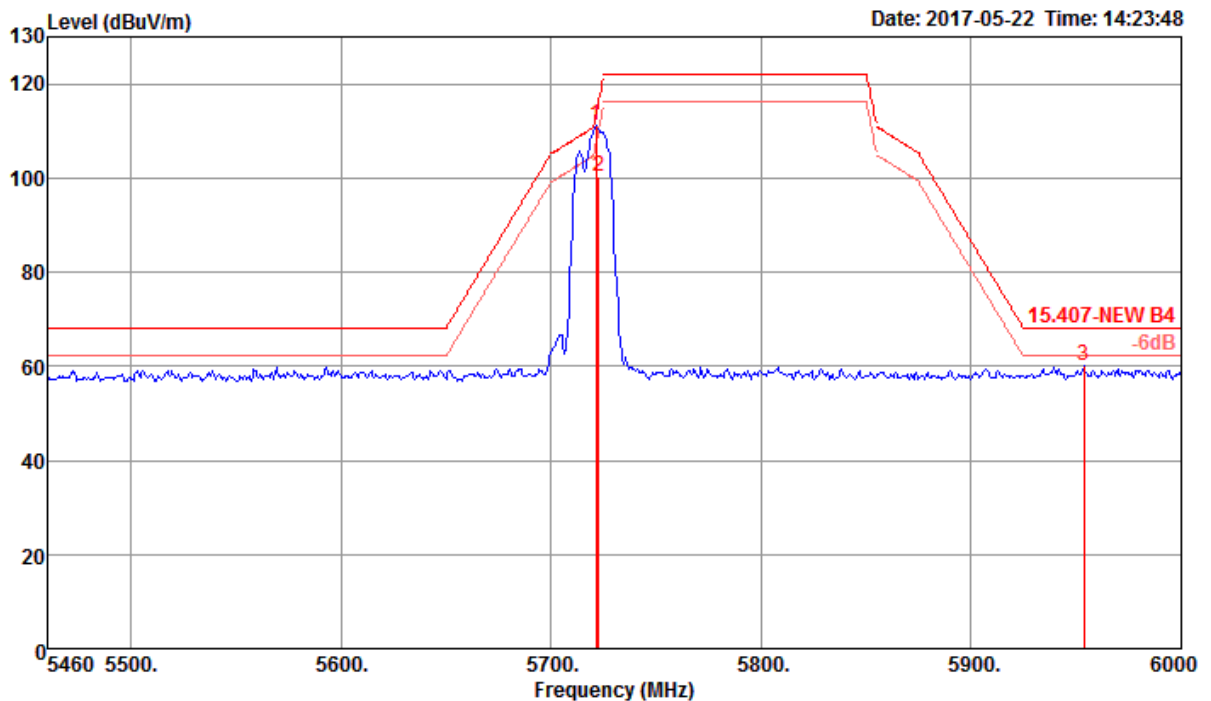
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 (UNII 2C) / Port 1 + Port 2 + Port 3 + Port 4

Channel 144


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5460.00	46.49	54.00	-7.51	36.92	6.66	33.93	31.02	290	360	Average	VERTICAL
2	5460.00	56.94	74.00	-17.06	47.37	6.66	33.93	31.02	290	360	Peak	VERTICAL
3	5470.00	46.37	54.00	-7.63	36.76	6.68	33.95	31.02	290	360	Average	VERTICAL
4	5470.00	58.68	74.00	-15.32	49.07	6.68	33.95	31.02	290	360	Peak	VERTICAL
5 @	5721.20	110.64			100.84	6.82	34.09	31.11	290	360	Peak	VERTICAL
6 @	5722.40	100.38			90.57	6.83	34.09	31.11	290	360	Average	VERTICAL
7	5850.00	47.32	54.00	-6.68	37.43	6.91	34.14	31.16	290	360	Average	VERTICAL
8	5850.00	58.52	74.00	-15.48	48.63	6.91	34.14	31.16	290	360	Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5720 MHz.

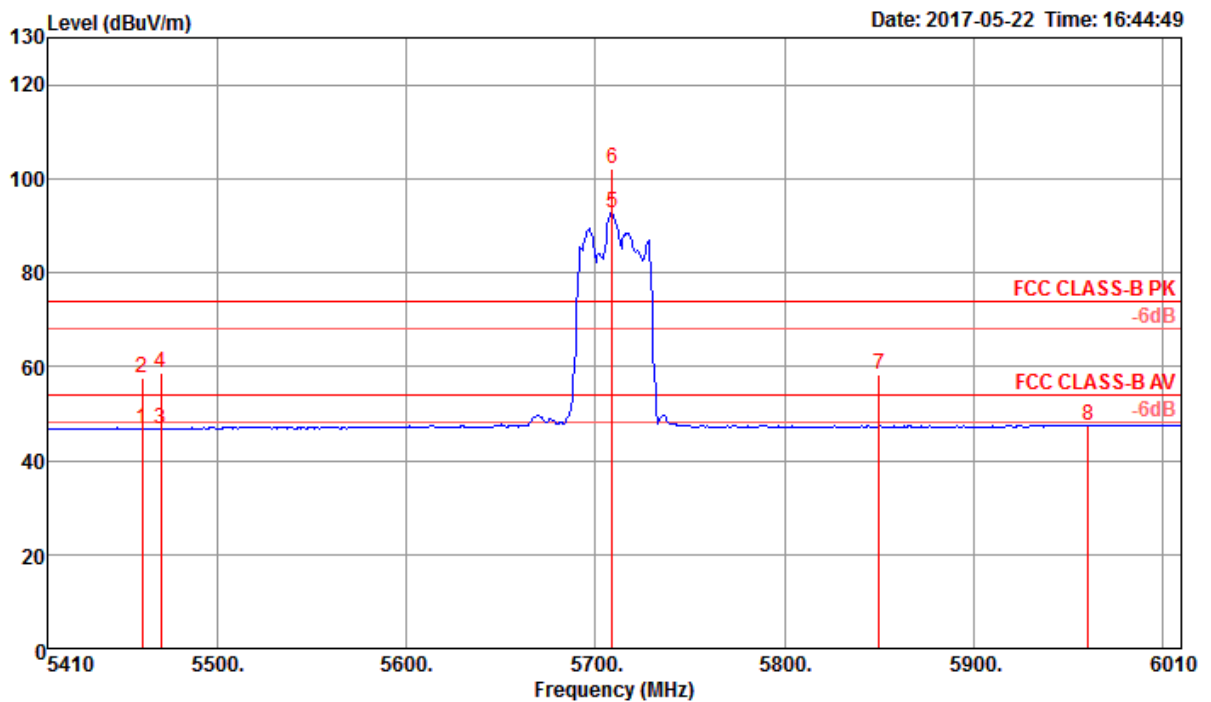
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 (UNII 3) / Port 1 + Port 2 + Port 3 + Port 4

Channel 144


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBUV/m	dBUV/m	dB	dBUV	dB	dB/m	dB	cm	deg		
1	5721.36	111.31			101.51	6.82	34.09	31.11	290	360	Peak	VERTICAL
2	5722.40	100.38			90.57	6.83	34.09	31.11	290	360	Average	VERTICAL
3	5953.56	60.11	68.20	-8.09	50.08	7.05	34.18	31.20	290	360	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 5720 MHz.

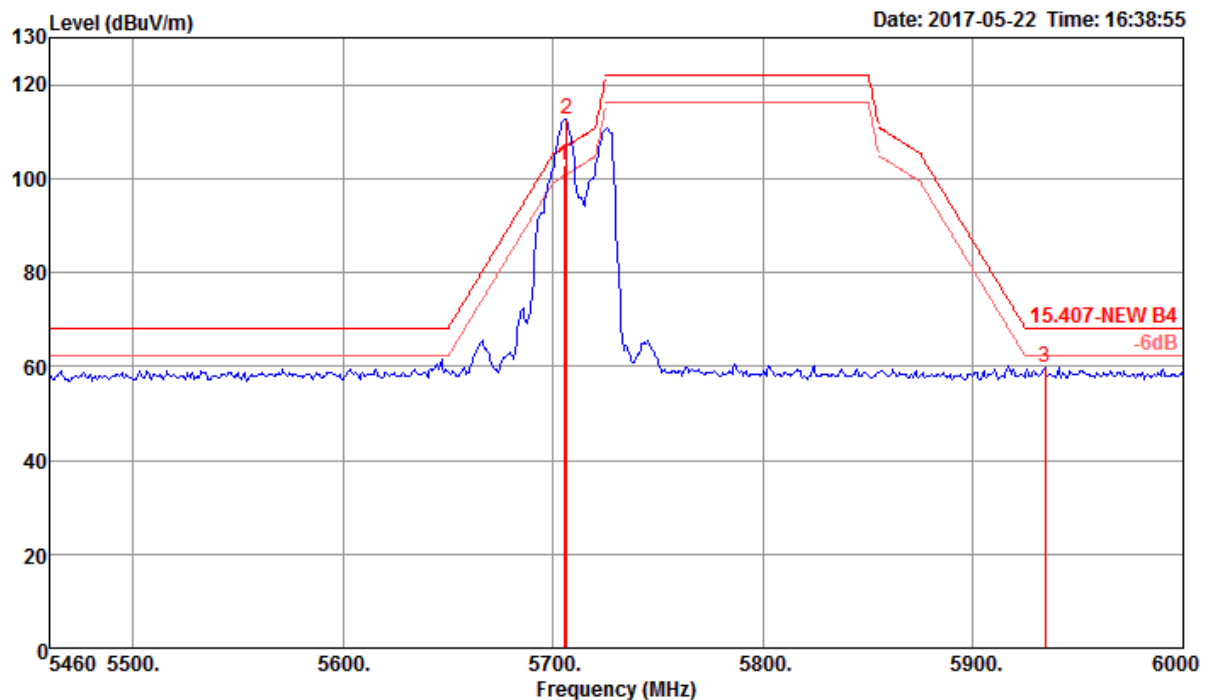
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 142 (UNII 2C) / Port 1 + Port 2 + Port 3 + Port 4

Channel 142


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5460.00	46.68	54.00	-7.32	37.11	6.66	33.93	31.02	300	77	Average	HORIZONTAL
2	5460.00	57.67	74.00	-16.33	48.10	6.66	33.93	31.02	300	77	Peak	HORIZONTAL
3	5470.00	46.55	54.00	-7.45	36.94	6.68	33.95	31.02	300	77	Average	HORIZONTAL
4	5470.00	58.79	74.00	-15.21	49.18	6.68	33.95	31.02	300	77	Peak	HORIZONTAL
5 @	5708.80	92.77			82.98	6.82	34.08	31.11	300	77	Average	HORIZONTAL
6 @	5708.80	102.24			92.45	6.82	34.08	31.11	300	77	Peak	HORIZONTAL
7	5850.00	58.35	74.00	-15.65	48.46	6.91	34.14	31.16	300	77	Peak	HORIZONTAL
8	5960.80	47.59	54.00	-6.41	37.54	7.07	34.19	31.21	300	77	Average	HORIZONTAL

Item 5, 6 are the fundamental frequency at 5710 MHz.

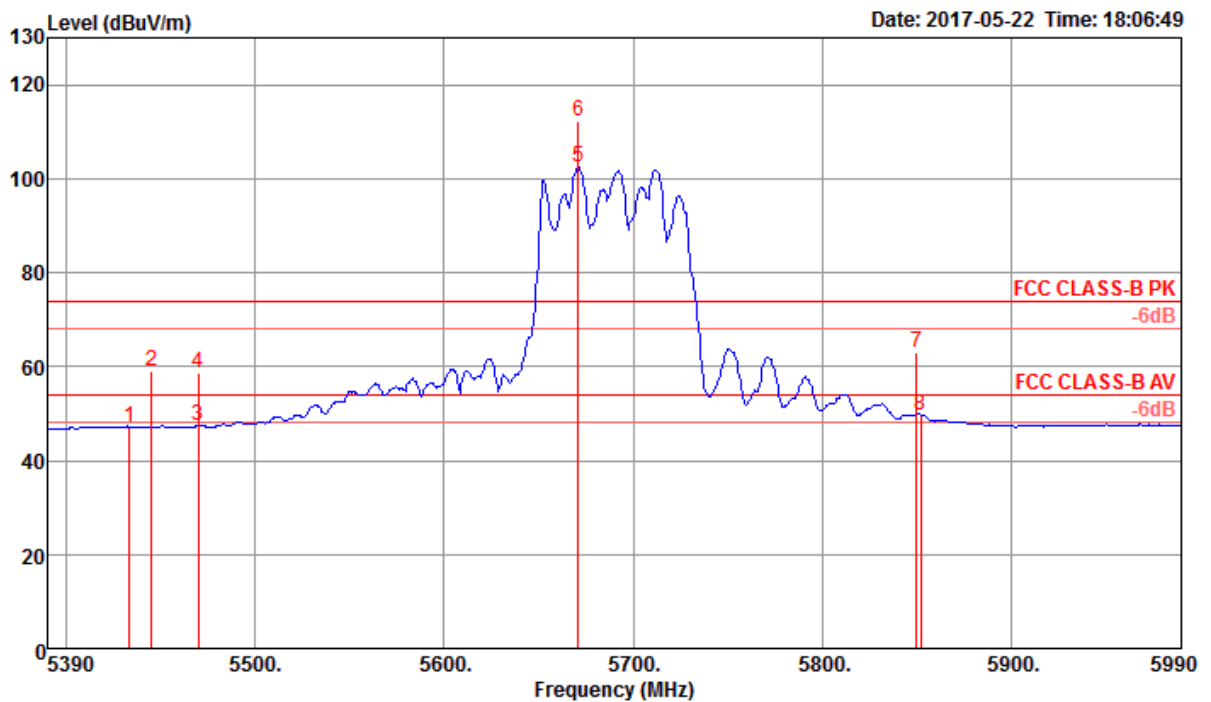
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 142 (UNII 3) / Port 1 + Port 2 + Port 3 + Port 4

Channel 142


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5705.20	102.79			92.99	6.82	34.08	31.10	264	36	Average	VERTICAL
2 @	5706.24	112.67			102.88	6.82	34.08	31.11	264	36	Peak	VERTICAL
3	5934.12	59.77	68.20	-8.43	49.76	7.03	34.17	31.19	264	36	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 5710 MHz.

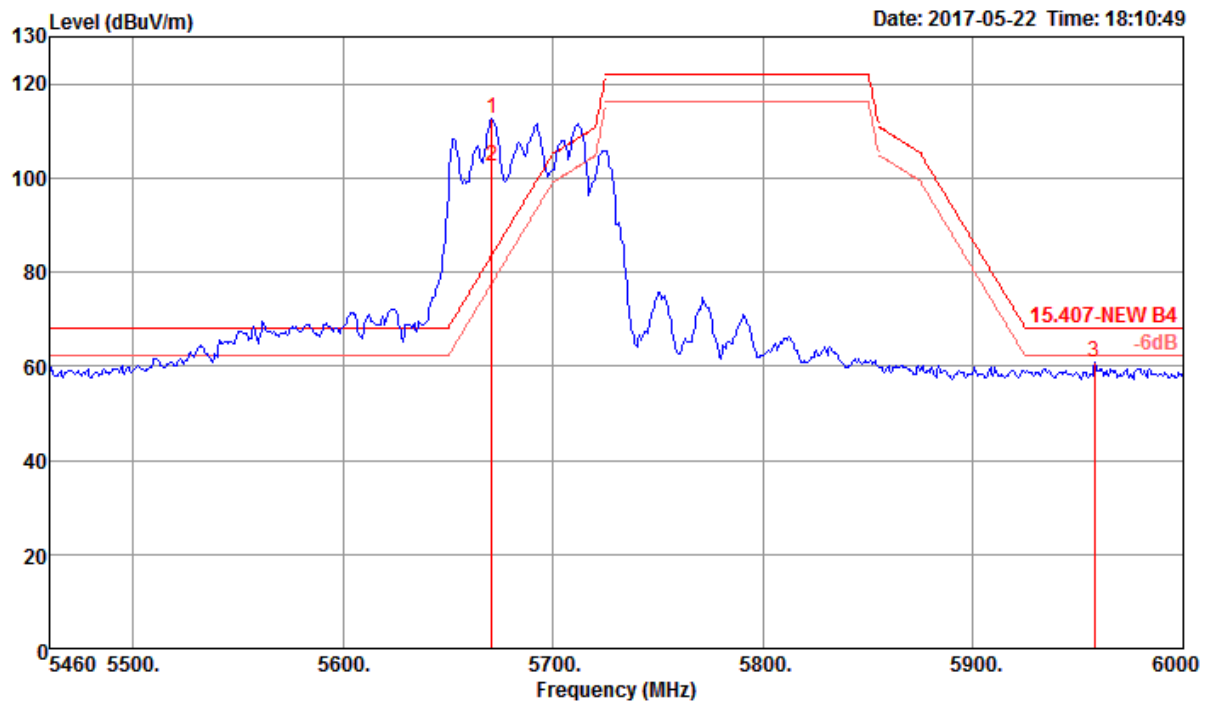
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 138 (UNII 2C) / Port 1 + Port 2 + Port 3 + Port 4

Channel 138


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5433.20	47.25	54.00	-6.75	37.72	6.65	33.91	31.03	300	274 Average	VERTICAL
2	5445.20	59.17	74.00	-14.83	49.64	6.65	33.91	31.03	300	274 Peak	VERTICAL
3	5470.00	47.51	54.00	-6.49	37.90	6.68	33.95	31.02	300	274 Average	VERTICAL
4	5470.00	58.72	74.00	-15.28	49.11	6.68	33.95	31.02	300	274 Peak	VERTICAL
5 @	5670.80	102.64			92.85	6.81	34.07	31.09	300	274 Average	VERTICAL
6 @	5670.80	112.28			102.49	6.81	34.07	31.09	300	274 Peak	VERTICAL
7	5850.00	62.95	74.00	-11.05	53.06	6.91	34.14	31.16	300	274 Peak	VERTICAL
8	5852.00	49.75	54.00	-4.25	39.86	6.91	34.14	31.16	300	274 Average	VERTICAL

Item 5, 6 are the fundamental frequency at 5690 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 138 (UNII 3) / Port 1 + Port 2 + Port 3 + Port 4

Channel 138


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5670.60	112.53			102.74	6.81	34.07	31.09	300	274	Peak	VERTICAL
2 @	5670.80	102.64			92.85	6.81	34.07	31.09	300	274	Average	VERTICAL
3	5957.88	61.02	68.20	-7.18	50.98	7.05	34.19	31.20	300	274	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 5690 MHz.

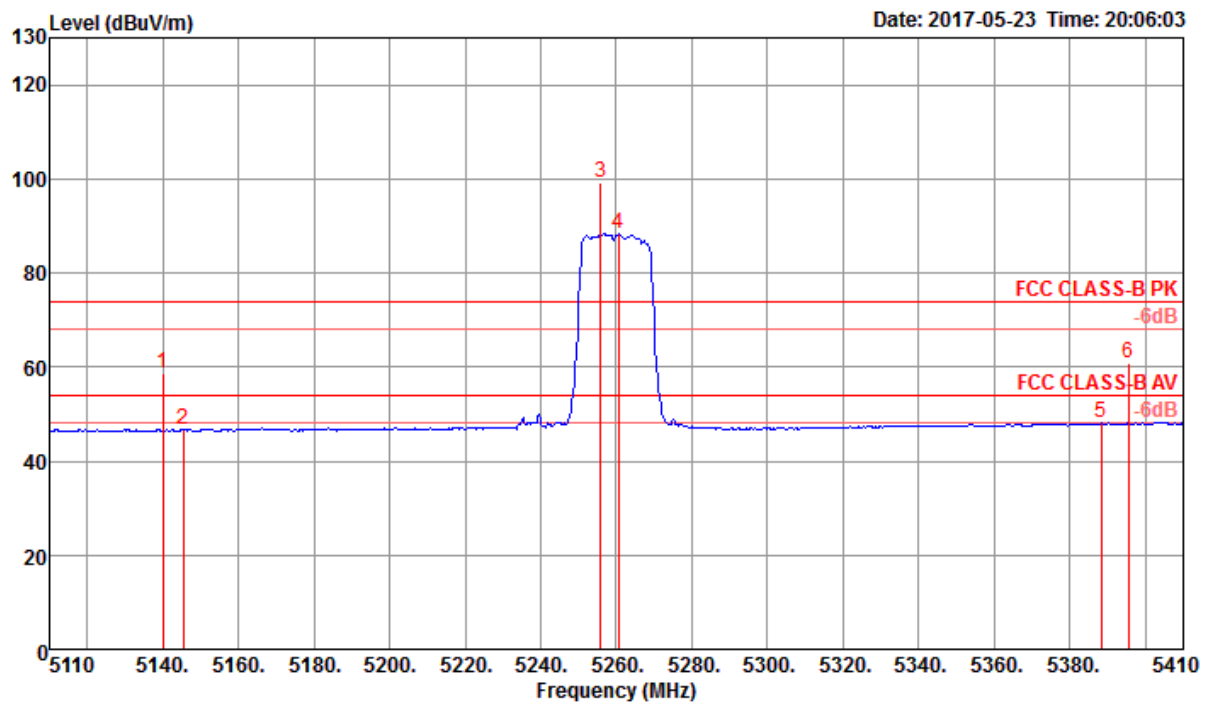
Note:

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

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

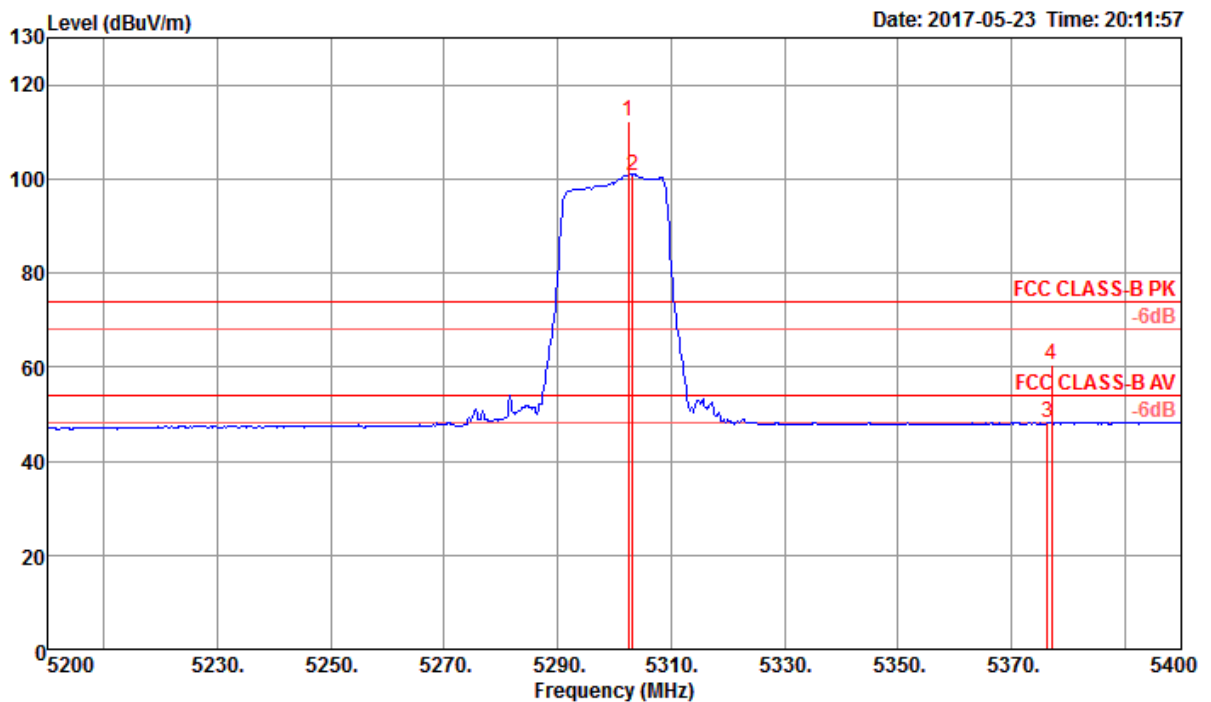
For beamforming mode

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Port 1 + Port 2 + Port 3 + Port 4

Channel 52


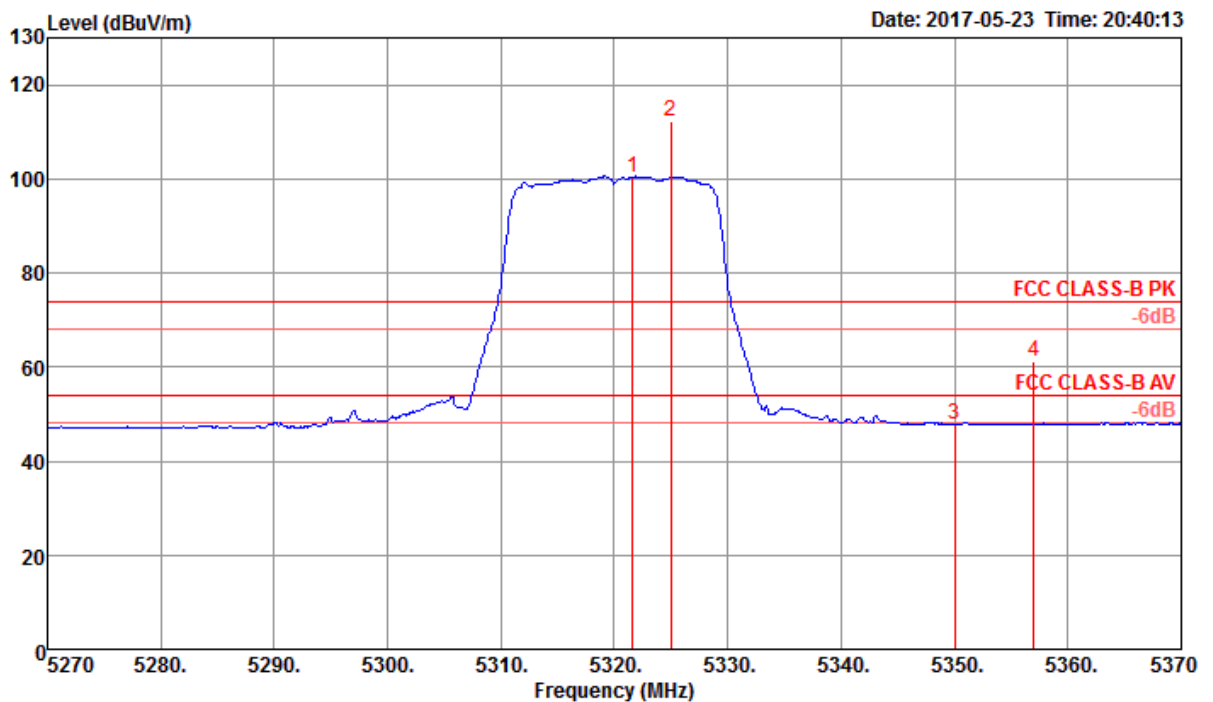
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5140.00	58.52	74.00	-15.48	49.61	6.46	33.51	31.06	273	139 Peak	HORIZONTAL
2	5145.40	46.83	54.00	-7.17	37.89	6.48	33.51	31.05	273	139 Average	HORIZONTAL
3 @	5255.80	99.28			90.12	6.55	33.65	31.04	273	139 Peak	HORIZONTAL
4 @	5260.60	88.21			79.03	6.55	33.67	31.04	273	139 Average	HORIZONTAL
5	5388.40	48.02	54.00	-5.98	38.61	6.60	33.84	31.03	273	139 Average	HORIZONTAL
6	5395.60	60.78	74.00	-13.22	51.35	6.60	33.86	31.03	273	139 Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5260 MHz.

Channel 60


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5302.40	112.27			103.02	6.57	33.72	31.04	247	271 Peak	VERTICAL
2 @	5303.20	100.82			91.57	6.57	33.72	31.04	247	271 Average	VERTICAL
3	5376.40	48.21	54.00	-5.79	38.84	6.59	33.81	31.03	247	271 Average	VERTICAL
4	5377.20	60.63	74.00	-13.37	51.26	6.59	33.81	31.03	247	271 Peak	VERTICAL

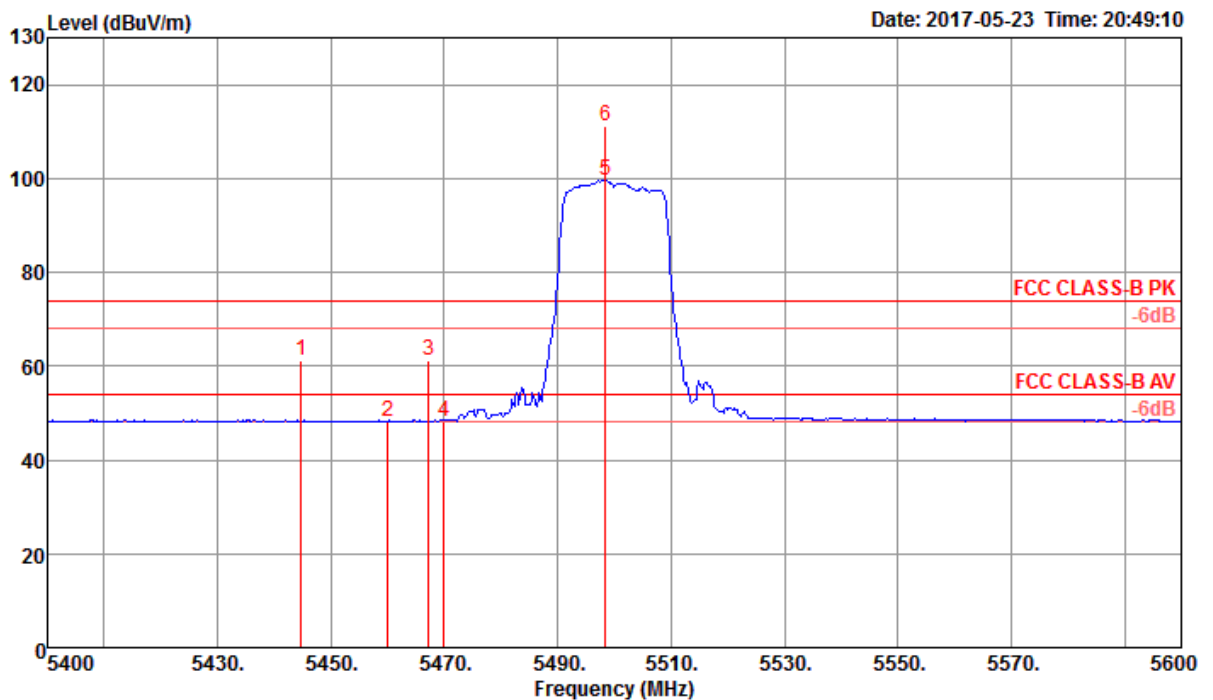
Item 1, 2 are the fundamental frequency at 5300 MHz.

Channel 64


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5321.60	100.46			91.19	6.57	33.74	31.04	253	252 Average	VERTICAL
2 @	5325.00	112.30			103.02	6.58	33.74	31.04	253	252 Peak	VERTICAL
3	5350.00	47.82	54.00	-6.18	38.49	6.58	33.79	31.04	253	252 Average	VERTICAL
4	5357.00	61.05	74.00	-12.95	51.70	6.59	33.79	31.03	253	252 Peak	VERTICAL

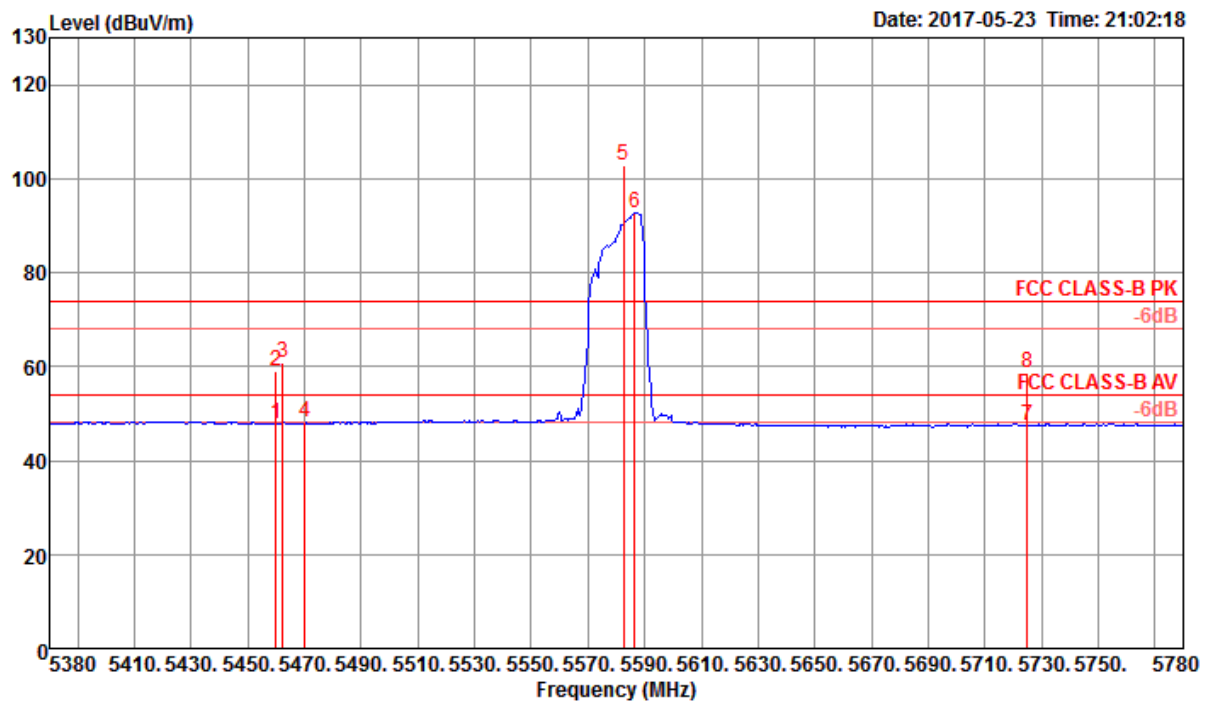
Item 1, 2 are the fundamental frequency at 5320 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 116, 140 / Port 1 + Port 2 + Port 3 + Port 4

Channel 100


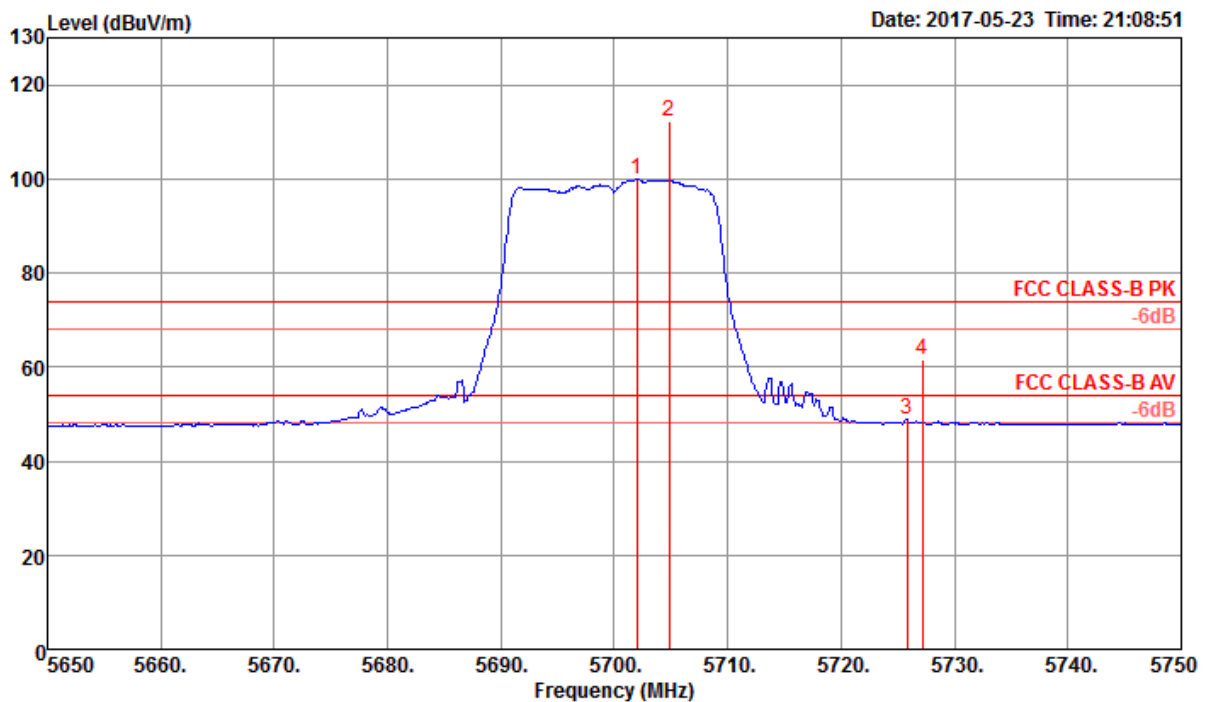
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5444.80	61.08	74.00	-12.92	51.55	6.65	33.91	31.03	288	257 Peak	VERTICAL
2	5460.00	48.16	54.00	-5.84	38.59	6.66	33.93	31.02	288	257 Average	VERTICAL
3	5467.20	61.06	74.00	-12.94	51.45	6.68	33.95	31.02	288	257 Peak	VERTICAL
4	5470.00	48.33	54.00	-5.67	38.72	6.68	33.95	31.02	288	257 Average	VERTICAL
5 @	5498.40	99.74			90.05	6.71	34.00	31.02	288	257 Average	VERTICAL
6 @	5498.40	111.02			101.33	6.71	34.00	31.02	288	257 Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5500 MHz.

Channel 116


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5460.00	47.81	54.00	-6.19	38.24	6.66	33.93	31.02	286	280	Average
2	5460.00	59.09	74.00	-14.91	49.52	6.66	33.93	31.02	286	280	Peak
3	5462.40	60.89	74.00	-13.11	51.32	6.66	33.93	31.02	286	280	Peak
4	5470.00	48.01	54.00	-5.99	38.40	6.68	33.95	31.02	286	280	Average
5 @	5582.40	103.00			93.24	6.78	34.03	31.05	286	280	Peak
6 @	5586.40	92.87			83.11	6.78	34.03	31.05	286	280	Average
7	5725.00	47.40	54.00	-6.60	37.59	6.83	34.09	31.11	286	280	Average
8	5725.00	58.77	74.00	-15.23	48.96	6.83	34.09	31.11	286	280	Peak

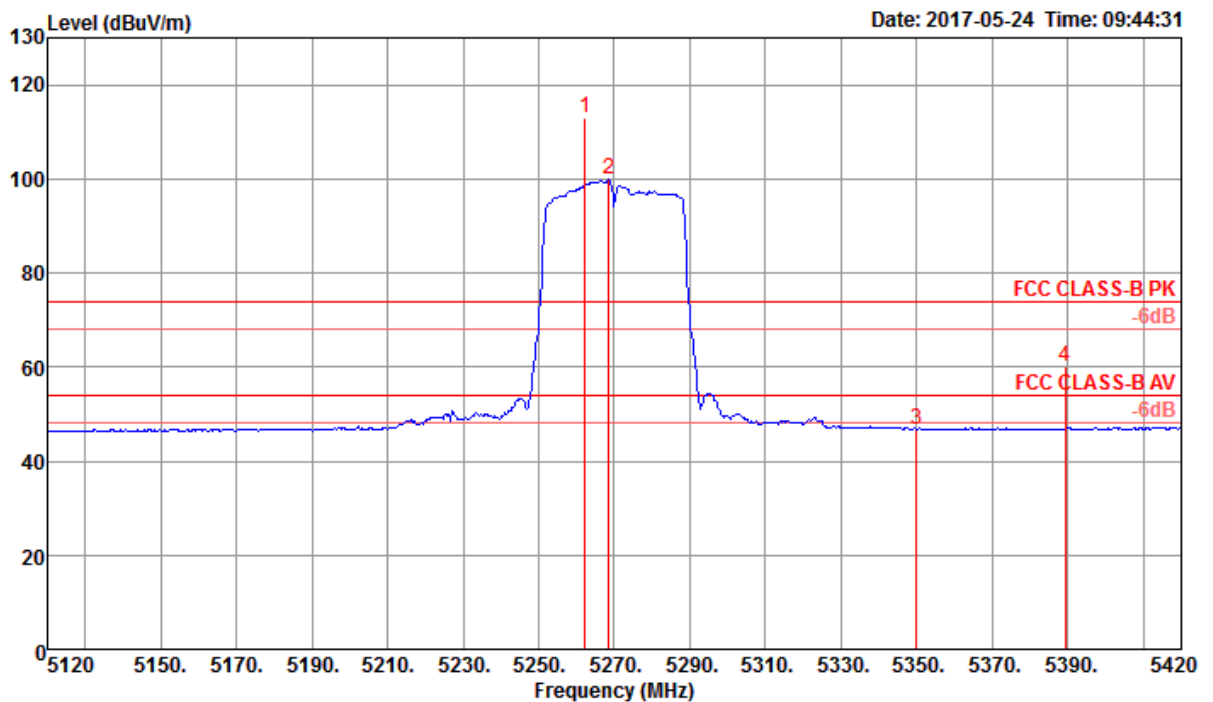
Item 5, 6 are the fundamental frequency at 5580 MHz.

Channel 140


	Freq	Level	Limit	Over	Read	CableAntenna	Preampl	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5702.00	99.89			90.09	6.82	34.08	31.10	281	50 Average	VERTICAL
2 @	5704.80	112.17			102.37	6.82	34.08	31.10	281	50 Peak	VERTICAL
3	5725.80	48.99	54.00	-5.01	39.18	6.83	34.09	31.11	281	50 Average	VERTICAL
4	5727.20	61.56	74.00	-12.44	51.75	6.83	34.09	31.11	281	50 Peak	VERTICAL

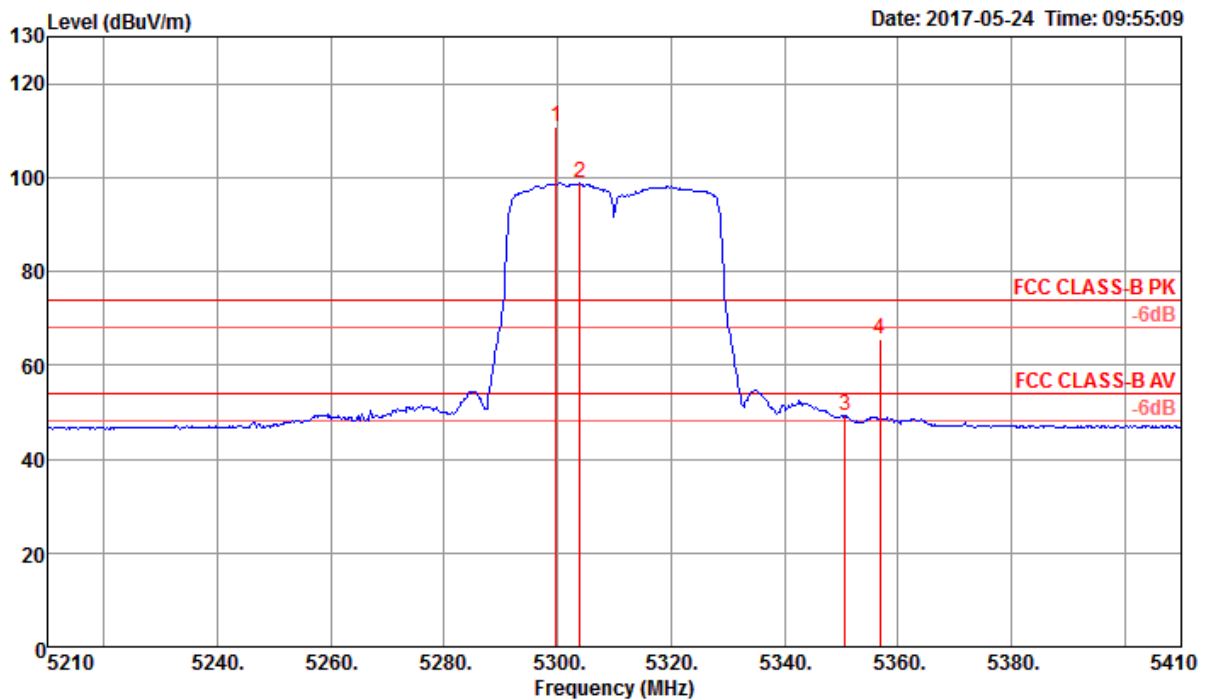
Item 1, 2 are the fundamental frequency at 5700 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Port 1 + Port 2 + Port 3 + Port 4

Channel 54


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5262.31	112.91			103.61	6.56	33.78	31.04	247	275 Peak	VERTICAL
2 @	5268.56	99.82			90.52	6.56	33.78	31.04	247	275 Average	VERTICAL
3	5350.00	46.86	54.00	-7.14	37.43	6.58	33.89	31.04	247	275 Average	VERTICAL
4	5389.23	60.19	74.00	-13.81	50.67	6.60	33.95	31.03	247	275 Peak	VERTICAL

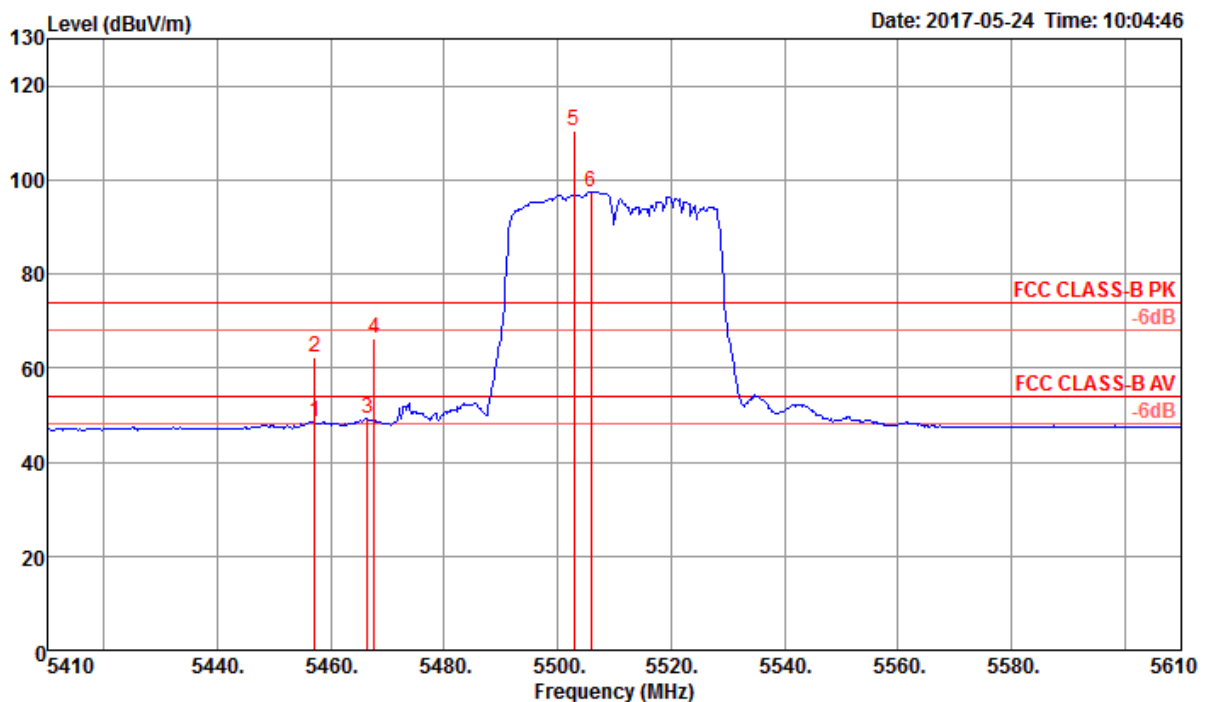
Item 1, 2 are the fundamental frequency at 5270 MHz.

Channel 62


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5299.74	110.89			101.54	6.57	33.82	31.04	244	281 Peak	VERTICAL
2 @	5303.91	98.82			89.47	6.57	33.82	31.04	244	281 Average	VERTICAL
3	5350.71	49.08	54.00	-4.92	39.65	6.58	33.89	31.04	244	281 Average	VERTICAL
4	5356.80	65.45	74.00	-8.55	55.98	6.59	33.91	31.03	244	281 Peak	VERTICAL

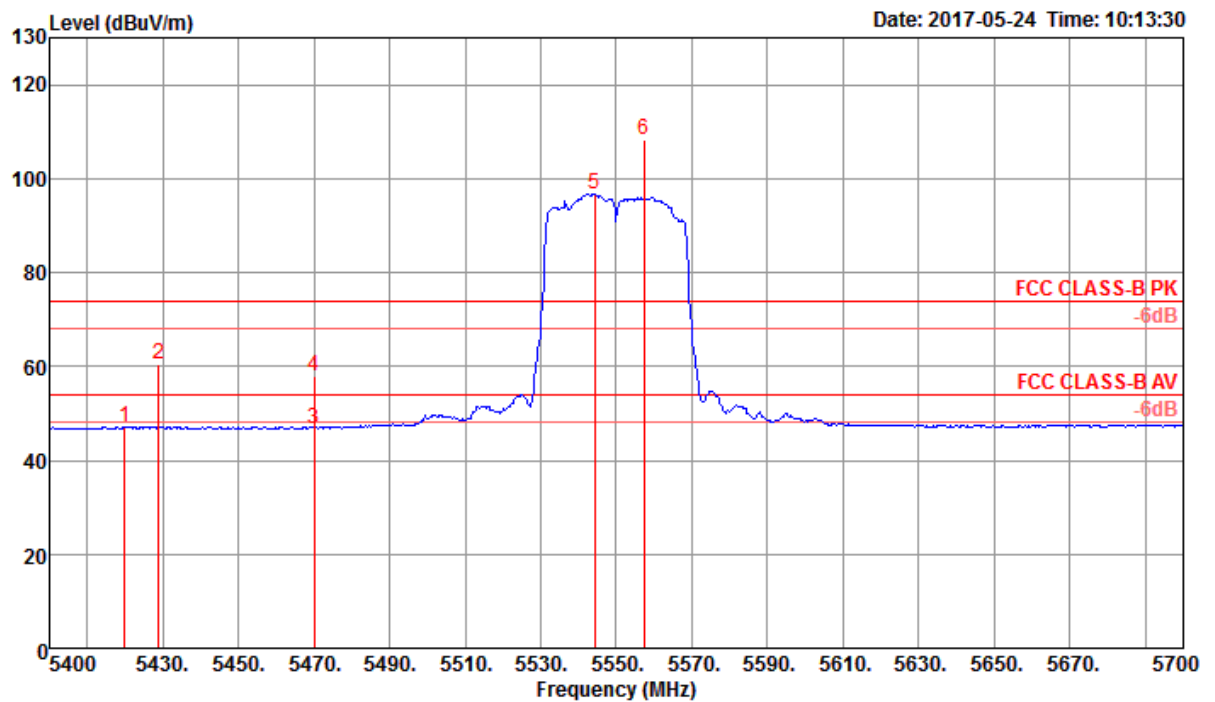
Item 1, 2 are the fundamental frequency at 5310 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Port 1 + Port 2 + Port 3 + Port 4

Channel 102


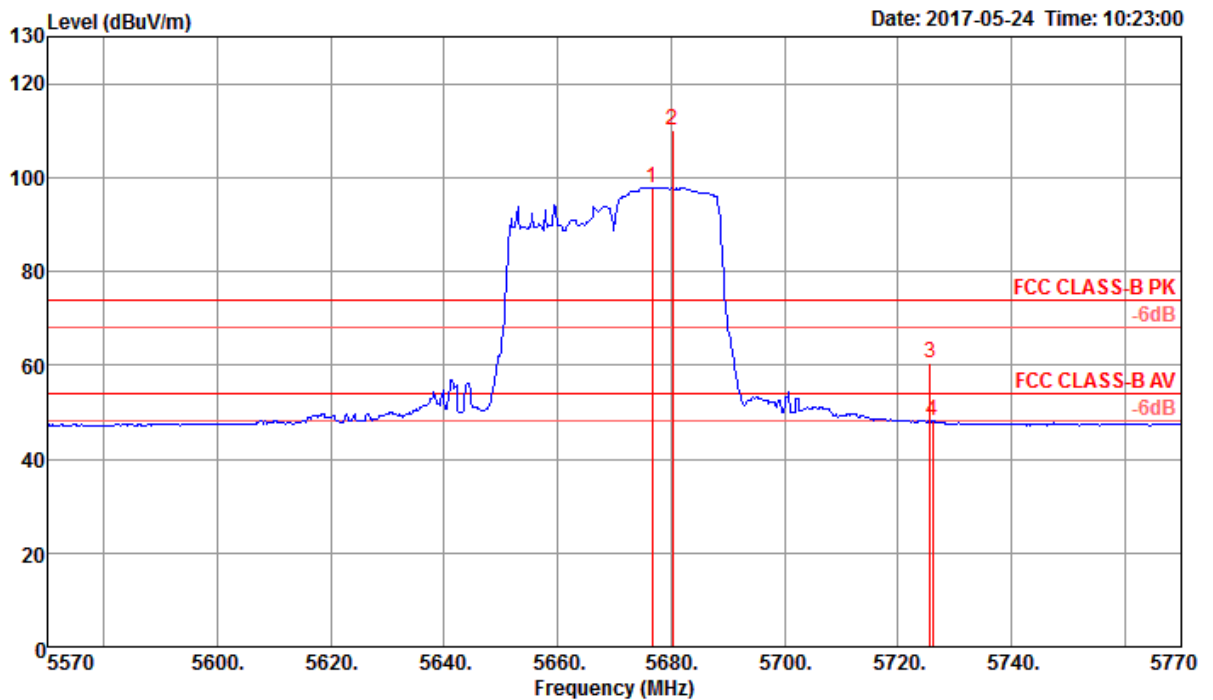
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5457.12	48.41	54.00	-5.59	38.73	6.66	34.04	31.02	275	268 Average	VERTICAL
2	5457.12	62.22	74.00	-11.78	52.54	6.66	34.04	31.02	275	268 Peak	VERTICAL
3	5466.41	49.28	54.00	-4.72	39.56	6.68	34.06	31.02	275	268 Average	VERTICAL
4	5467.69	66.11	74.00	-7.89	56.39	6.68	34.06	31.02	275	268 Peak	VERTICAL
5 @	5502.95	110.37			100.58	6.71	34.10	31.02	275	268 Peak	VERTICAL
6 @	5505.83	97.56			87.77	6.71	34.10	31.02	275	268 Average	VERTICAL

Item 5, 6 are the fundamental frequency at 5510 MHz.

Channel 110


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5419.80	47.13	54.00	-6.87	37.54	6.63	33.99	31.03	263	263 Average	VERTICAL
2	5428.85	60.44	74.00	-13.56	50.85	6.63	33.99	31.03	263	263 Peak	VERTICAL
3	5470.00	46.85	54.00	-7.15	37.13	6.68	34.06	31.02	263	263 Average	VERTICAL
4	5470.00	58.02	74.00	-15.98	48.30	6.68	34.06	31.02	263	263 Peak	VERTICAL
5 @	5544.23	96.59			86.76	6.75	34.12	31.04	263	263 Average	VERTICAL
6 @	5557.21	108.25			98.42	6.75	34.12	31.04	263	263 Peak	VERTICAL

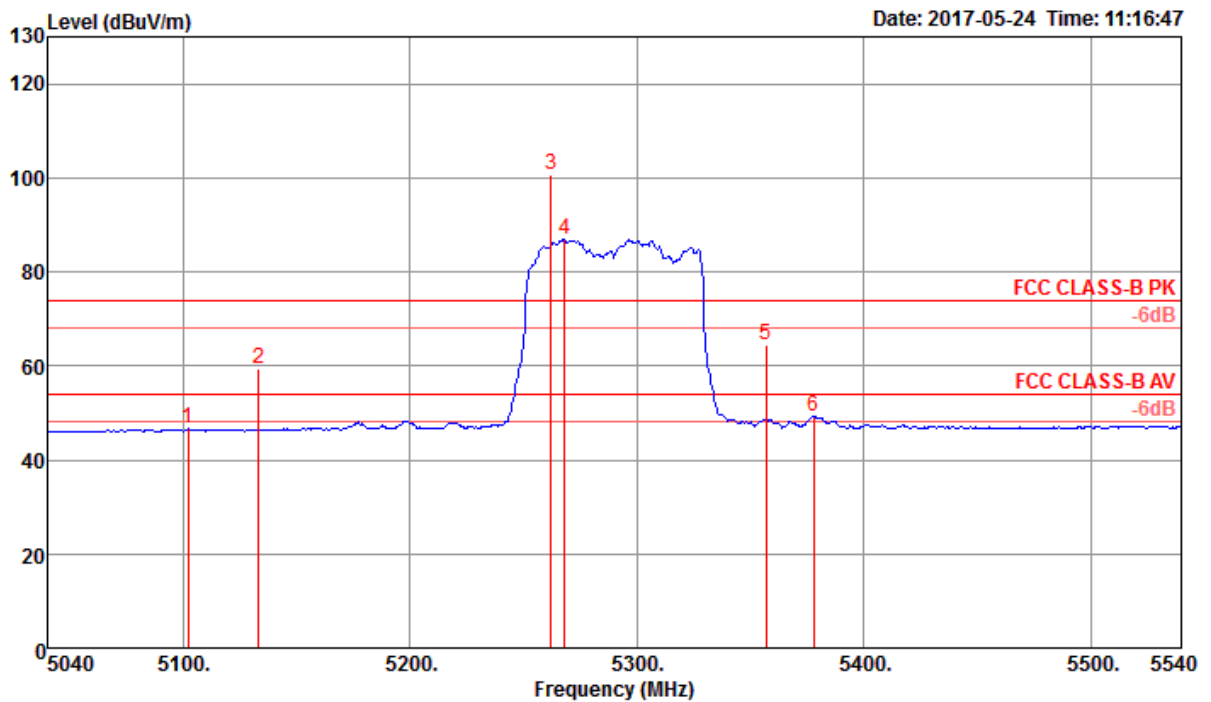
Item 5, 6 are the fundamental frequency at 5550 MHz.

Channel 134


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1 @	5676.73	97.93			88.03	6.82	34.17	31.09	243	269 Average	VERTICAL
2 @	5680.26	110.06			100.16	6.82	34.17	31.09	243	269 Peak	VERTICAL
3	5725.77	60.36	74.00	-13.64	50.45	6.83	34.19	31.11	243	269 Peak	VERTICAL
4	5726.09	48.28	54.00	-5.72	38.37	6.83	34.19	31.11	243	269 Average	VERTICAL

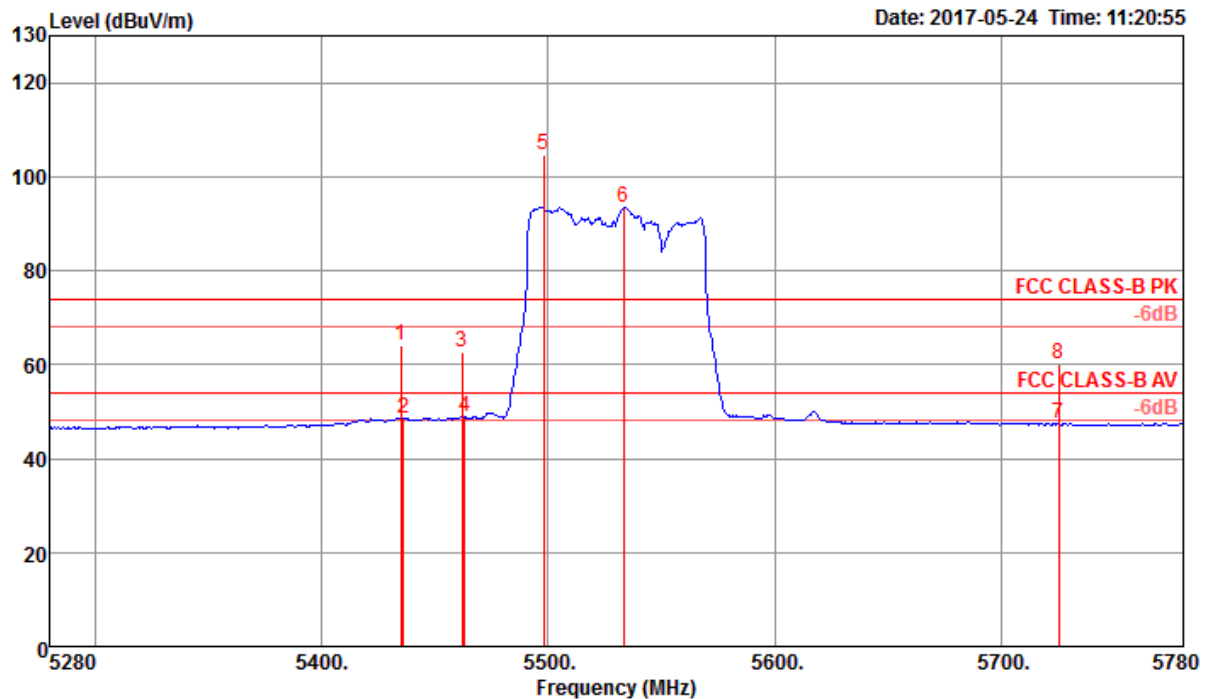
Item 1, 2 are the fundamental frequency at 5670 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58, 106, 122 / Port 1 + Port 2 + Port 3 + Port 4

Channel 58


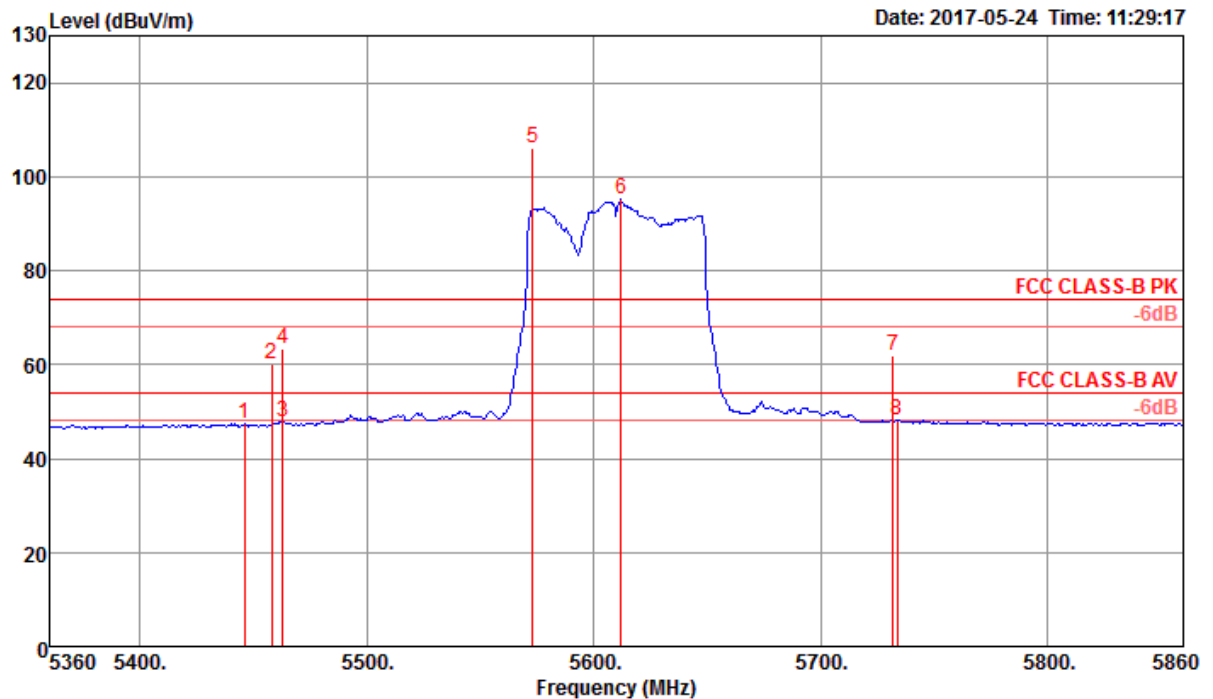
	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5102.00	46.65	54.00	-7.35	37.74	6.42	33.55	31.06	299	268 Average	HORIZONTAL
2	5133.00	59.49	74.00	-14.51	50.50	6.46	33.59	31.06	299	268 Peak	HORIZONTAL
3 @	5262.00	100.52			91.25	6.55	33.76	31.04	299	268 Peak	HORIZONTAL
4 @	5268.00	86.80			77.50	6.56	33.78	31.04	299	268 Average	HORIZONTAL
5	5357.00	64.34	74.00	-9.66	54.87	6.59	33.91	31.03	299	268 Peak	HORIZONTAL
6	5378.00	49.32	54.00	-4.68	39.83	6.59	33.93	31.03	299	268 Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5290 MHz.

Channel 106


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg		
1	5435.00	63.93	74.00	-10.07	54.29	6.65	34.02	31.03	233	41	Peak	VERTICAL
2	5436.00	48.68	54.00	-5.32	39.04	6.65	34.02	31.03	233	41	Average	VERTICAL
3	5461.99	62.50	74.00	-11.50	52.82	6.66	34.04	31.02	233	41	Peak	VERTICAL
4	5463.00	49.01	54.00	-4.99	39.33	6.66	34.04	31.02	233	41	Average	VERTICAL
5 @	5498.00	104.64			94.85	6.71	34.10	31.02	233	41	Peak	VERTICAL
6 @	5533.00	93.49			83.67	6.74	34.11	31.03	233	41	Average	VERTICAL
7	5725.00	47.40	54.00	-6.60	37.49	6.83	34.19	31.11	233	41	Average	VERTICAL
8	5725.00	60.05	74.00	-13.95	50.14	6.83	34.19	31.11	233	41	Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5530 MHz.

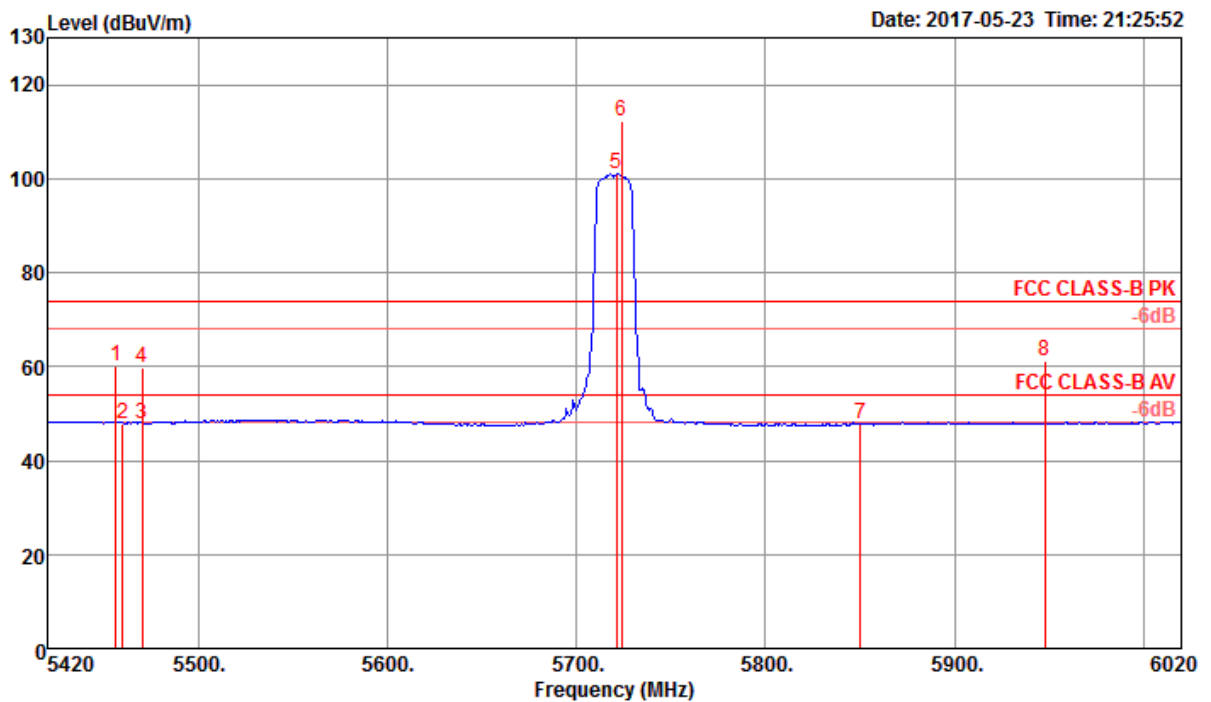
Channel 122


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5446.00	47.45	54.00	-6.55	37.81	6.65	34.02	31.03	287	47	Average	VERTICAL
2	5458.00	60.08	74.00	-13.92	50.40	6.66	34.04	31.02	287	47	Peak	VERTICAL
3	5463.00	47.87	54.00	-6.13	38.19	6.66	34.04	31.02	287	47	Average	VERTICAL
4	5463.00	63.54	74.00	-10.46	53.86	6.66	34.04	31.02	287	47	Peak	VERTICAL
5 @	5573.00	106.17			96.32	6.77	34.13	31.05	287	47	Peak	VERTICAL
6 @	5612.00	95.15			85.27	6.80	34.15	31.07	287	47	Average	VERTICAL
7	5732.00	61.83	74.00	-12.17	51.92	6.83	34.19	31.11	287	47	Peak	VERTICAL
8	5734.00	48.15	54.00	-5.85	38.24	6.83	34.19	31.11	287	47	Average	VERTICAL

Item 5, 6 are the fundamental frequency at 5610 MHz.

Straddle Channel

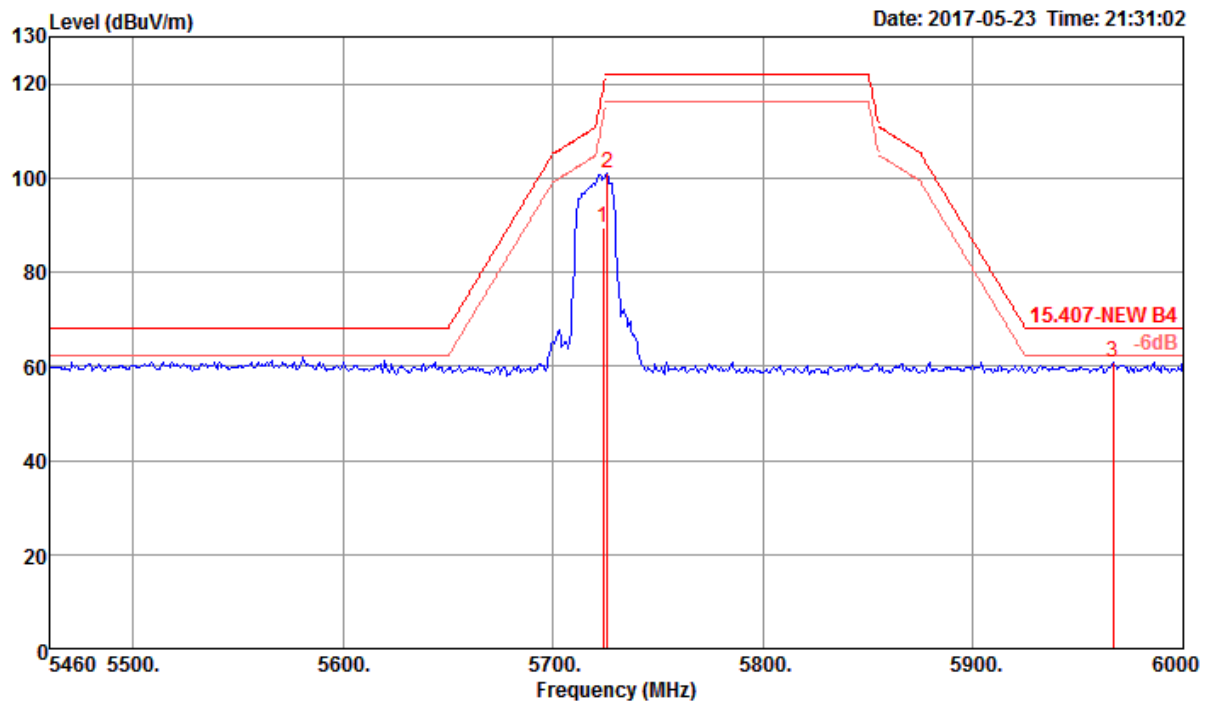
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 (UNII 2C) / Port 1 + Port 2 + Port 3 + Port 4

Channel 144


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5456.00	59.94	74.00	-14.06	50.37	6.66	33.93	31.02	245	52	Peak	VERTICAL
2	5460.00	47.96	54.00	-6.04	38.39	6.66	33.93	31.02	245	52	Average	VERTICAL
3	5470.00	47.94	54.00	-6.06	38.33	6.68	33.95	31.02	245	52	Average	VERTICAL
4	5470.00	59.83	74.00	-14.17	50.22	6.68	33.95	31.02	245	52	Peak	VERTICAL
5 @	5721.20	101.11			91.31	6.82	34.09	31.11	245	52	Average	VERTICAL
6 @	5723.60	112.34			102.53	6.83	34.09	31.11	245	52	Peak	VERTICAL
7	5850.00	47.77	54.00	-6.23	37.88	6.91	34.14	31.16	245	52	Average	VERTICAL
8	5948.00	61.21	74.00	-12.79	51.18	7.05	34.18	31.20	245	52	Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5720 MHz.

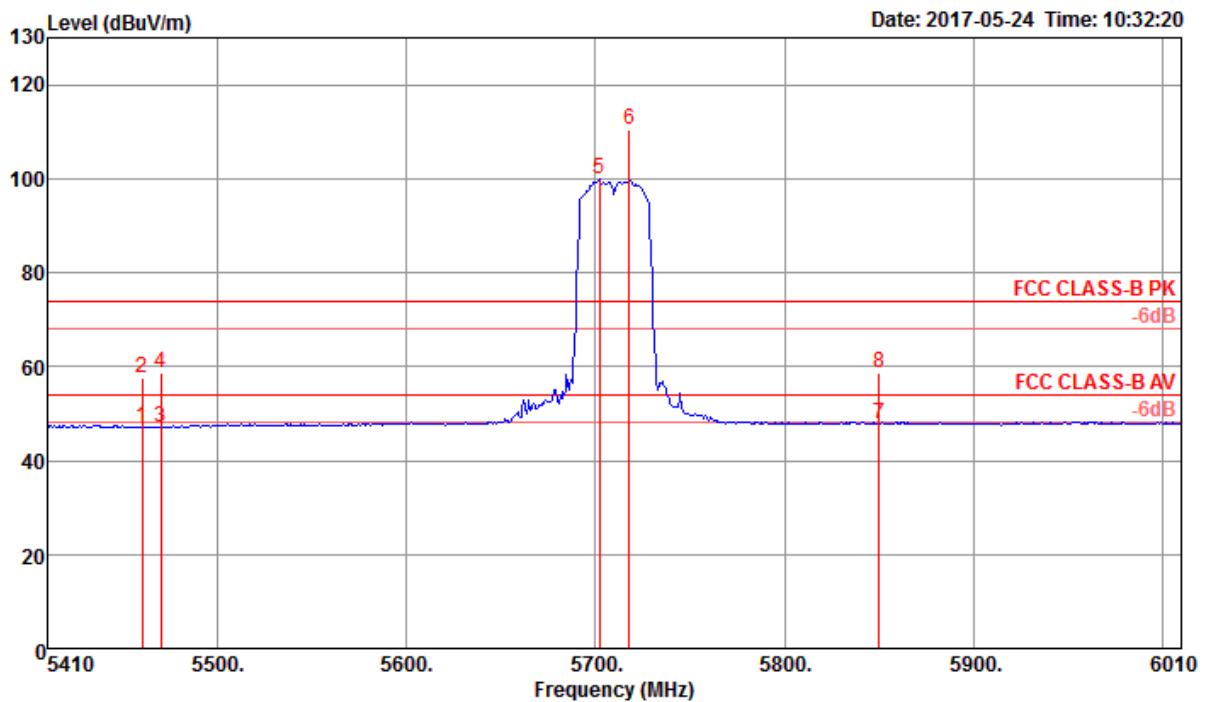
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 (UNII 3) / Port 1 + Port 2 + Port 3 + Port 4

Channel 144


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamplifier Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5723.60	89.39			79.58	6.83	34.09	31.11	298	241	Average	HORIZONTAL
2	5725.68	101.12			91.31	6.83	34.09	31.11	298	241	Peak	HORIZONTAL
3	5966.52	60.86	68.20	-7.34	50.81	7.07	34.19	31.21	298	241	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 5720 MHz.

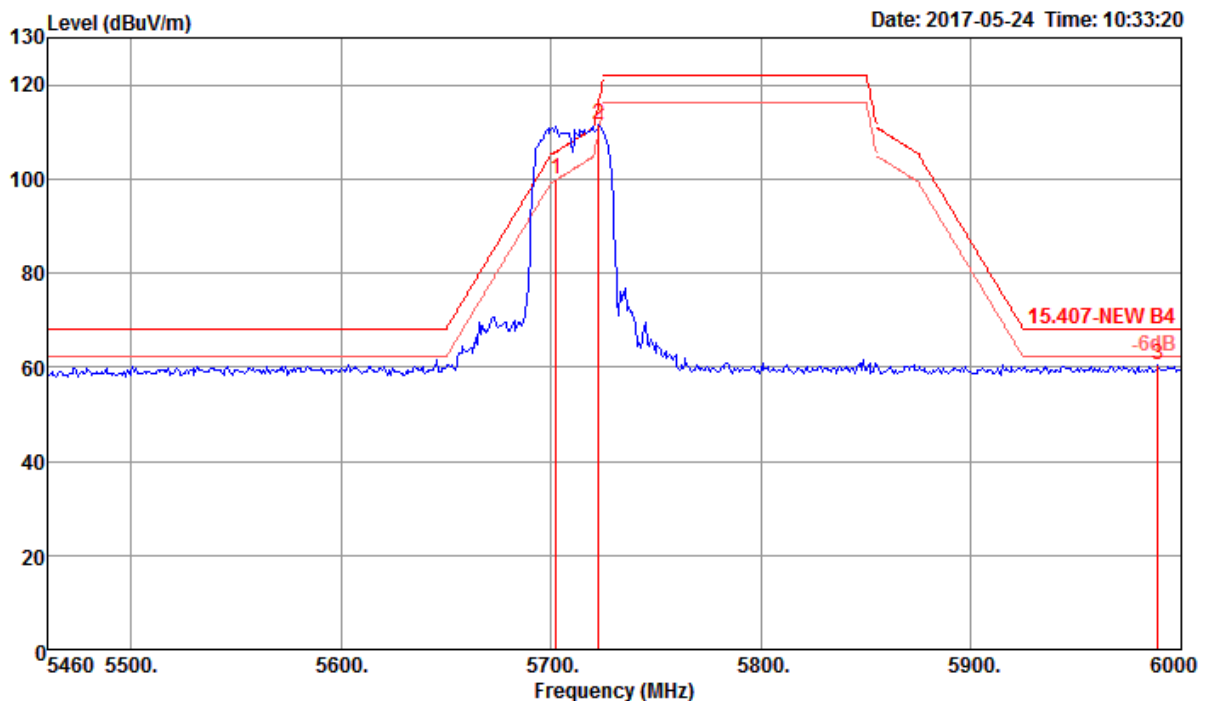
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 142 (UNII 2C) / Port 1 + Port 2 + Port 3 + Port 4

Channel 142


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5460.00	47.00	54.00	-7.00	37.32	6.66	34.04	31.02	276	358 Average	VERTICAL
2	5460.00	57.43	74.00	-16.57	47.75	6.66	34.04	31.02	276	358 Peak	VERTICAL
3	5470.00	47.14	54.00	-6.86	37.42	6.68	34.06	31.02	276	358 Average	VERTICAL
4	5470.00	58.62	74.00	-15.38	48.90	6.68	34.06	31.02	276	358 Peak	VERTICAL
5 @	5702.20	99.78			89.88	6.82	34.18	31.10	276	358 Average	VERTICAL
6 @	5717.69	110.48			100.58	6.82	34.19	31.11	276	358 Peak	VERTICAL
7	5850.00	47.86	54.00	-6.14	37.87	6.91	34.24	31.16	276	358 Average	VERTICAL
8	5850.00	58.60	74.00	-15.40	48.61	6.91	34.24	31.16	276	358 Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5710 MHz.

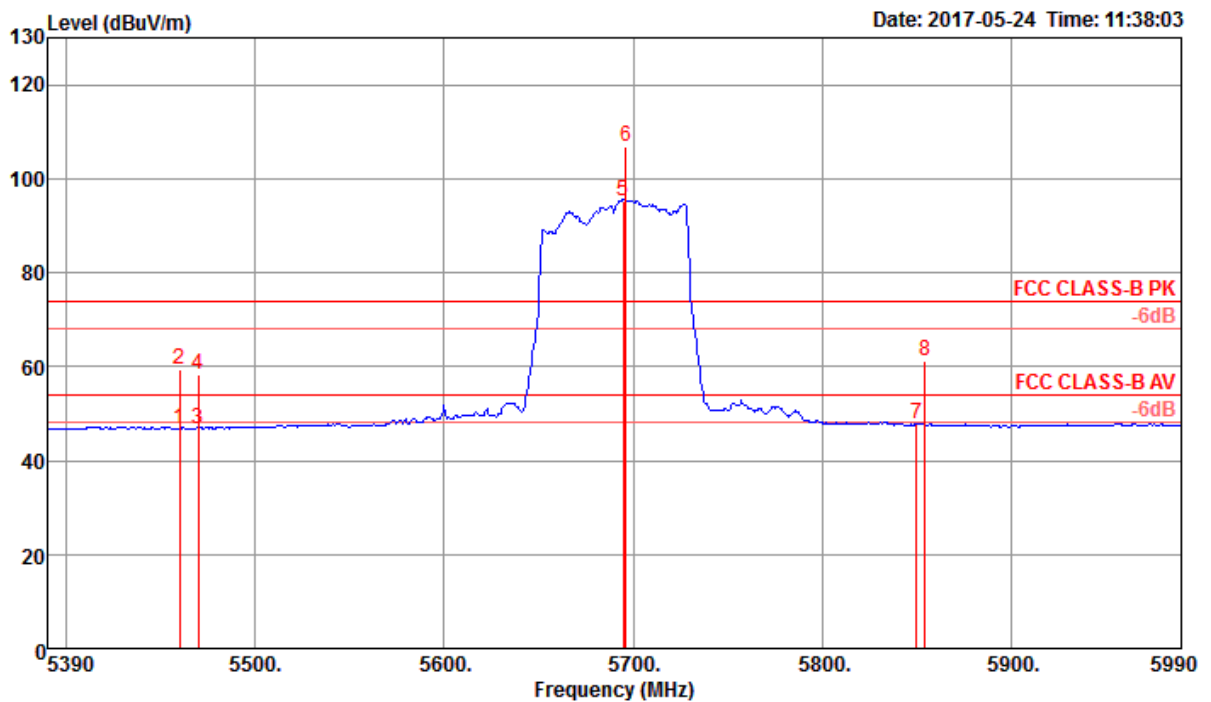
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 142 (UNII 3) / Port 1 + Port 2 + Port 3 + Port 4

Channel 142


	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	5702.31	99.78			89.88	6.82	34.18	31.10	276	358 Average	VERTICAL
2	5722.60	111.43			101.52	6.83	34.19	31.11	276	358 Peak	VERTICAL
3	5989.00	60.52	68.20	-7.68	50.34	7.10	34.29	31.21	276	358 Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 5710 MHz.

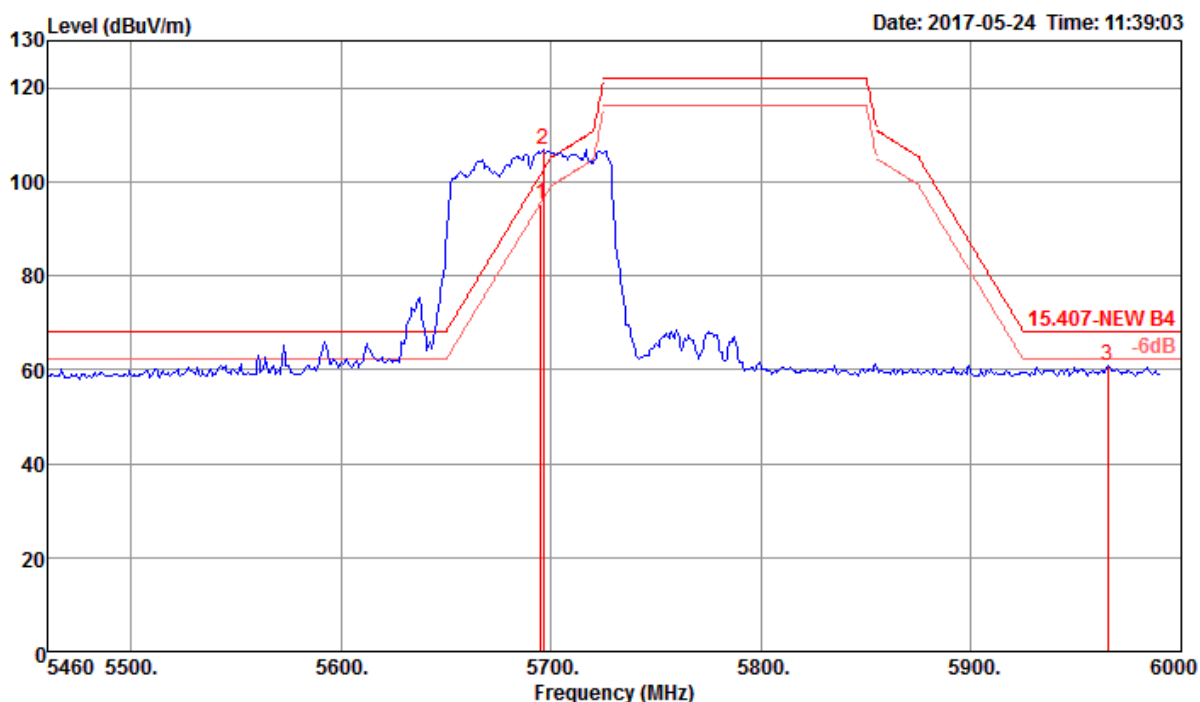
Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 138 (UNII 2C) / Port 1 + Port 2 + Port 3 + Port 4

Channel 138


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5460.00	46.68	54.00	-7.32	37.00	6.66	34.04	31.02	245	61	Average	VERTICAL
2	5460.00	59.52	74.00	-14.48	49.84	6.66	34.04	31.02	245	61	Peak	VERTICAL
3	5470.00	46.80	54.00	-7.20	37.08	6.68	34.06	31.02	245	61	Average	VERTICAL
4	5470.00	58.15	74.00	-15.85	48.43	6.68	34.06	31.02	245	61	Peak	VERTICAL
5 @	5694.80	95.40			85.50	6.82	34.18	31.10	245	61	Average	VERTICAL
6 @	5696.00	106.89			96.99	6.82	34.18	31.10	245	61	Peak	VERTICAL
7	5850.00	47.68	54.00	-6.32	37.69	6.91	34.24	31.16	245	61	Average	VERTICAL
8	5854.40	61.08	74.00	-12.92	51.09	6.91	34.24	31.16	245	61	Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5690 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Welson Chen & Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 138 (UNII 3) / Port 1 + Port 2 + Port 3 + Port 4

Channel 138


	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5694.80	95.40			85.50	6.82	34.18	31.10	245	61	Average	VERTICAL
2 @	5696.00	106.89			96.99	6.82	34.18	31.10	245	61	Peak	VERTICAL
3	5964.80	60.97	68.20	-7.23	50.82	7.07	34.29	31.21	245	61	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 5690 MHz.

Note:

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

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

2.8. Antenna Requirements

2.8.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

2.8.2. Antenna Connector Construction

The antenna connector complied with the requirements.

3. List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 28, 2019	Jan. 27, 2020	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz~100MHz	Dec. 24, 2018	Dec. 23, 2019	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Jan. 11, 2019	Jan. 10, 2020	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 21, 2019	May 20, 2020	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Oct. 30, 2018	Oct. 29, 2019	Radiation (03CH03-HY)
Amplifier	HP	8447D	2944A08033	10kHz ~ 1.3GHz	Apr. 22, 2019	Apr. 21, 2020	Radiation (03CH03-HY)
Signal Analyzer	R&S	FSP40	100593	9kHz ~ 40GHz	Dec. 27, 2018	Dec. 26, 2019	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	9kHz ~ 1GHz	Mar. 22, 2019	Mar. 21, 2020	Radiation (03CH03-HY)
Bilog Antenna with 5dB Pad	ETS	3142B & MTJ6102-05	00022055	26 MHz - 3 GHz	Nov. 19, 2018	Nov. 18, 2019	Radiation (03CH03-HY)
EMI Test Receiver	R&S	ESR3	102052	9kHz ~ 3.6GHz	Apr. 09, 2019	Apr. 08, 2020	Radiation (03CH03-HY)
Loop Antenna	TESEQ	HLA 6120	31244	9kHz ~ 30MHz	Mar. 15, 2019	Mar. 14, 2020	Radiation (03CH03HY)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Nov. 09, 2017	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 25, 2016	Jul. 26, 2017	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Jan. 15, 2018	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jun. 28, 2016	Jun. 27, 2017	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 22, 2016	Nov. 21, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Oct. 23, 2017	Radiation (03CH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
Test Software	Audix	E3	6.2009-I0-7	N/A	N/A	N/A	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1291	1GHz~18GHz	Oct. 12, 2018	Oct. 11, 2019	Radiation (03CH05-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Jun. 12, 2019	Jun. 11, 2020	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC12630SE	980287	1GHz – 26.5GHz	Mar. 28, 2019	Mar. 27, 2020	Radiation (03CH05-CB)
Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 04, 2018	Jul. 03, 2019	Radiation (03CH05-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 03, 2019	Jul. 02, 2020	Radiation (03CH05-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Jan. 31, 2019	Jan. 30, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-04	1GHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-04+23	30MHz~18GHz	Oct. 08, 2018	Oct. 07, 2019	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 27, 2018	Jul. 26, 2019	Radiation (03CH05-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 24, 2019	Jul. 23, 2020	Radiation (03CH05-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Dec. 08, 2016	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2016	Jun. 02, 2017	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Nov. 01, 2016	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.

N.C.R. means Non-Calibration required.

4. Measurement Uncertainty

For CO01-CB, 03CH03-HY and 03CH05-CB

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.3 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	5.1 dB	Confidence levels of 95%

For TH01-CB and 03CH01-CB

Test Items	Uncertainty	Remark
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%