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FCC RADIO TEST REPORT

Applicant's company	**TP-Link Technologies Co., Ltd.**
Applicant Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Nanshan, Shenzhen, 518057 China
FCC ID	**TE7C3150V2**
Manufacturer's company	**TP-Link Technologies Co., Ltd.**
Manufacturer Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Nanshan, Shenzhen, 518057 China

Product Name	AC3150 Wireless MU-MIMO Gigabit Router
Brand Name	TP-Link
Model No.	Archer C3150
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Nov. 02, 2016
Final Test Date	Apr. 13, 2017
Submission Type	Class II Change

Statement

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

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

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

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

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

Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5O1803-05	Rev. 01	Initial issue of report	Sep. 04, 2017

1. VERIFICATION OF COMPLIANCE

Product Name	:	AC3150 Wireless MU-MIMO Gigabit Router
Brand Name	:	TP-Link
Model No.	:	Archer C3150
Applicant	:	TP-Link Technologies Co., Ltd.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Nov. 02, 2016 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

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

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
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, 1024QAM)
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	15 for 20MHz bandwidth ; 7 for 40MHz bandwidth 3 for 80MHz bandwidth
Channel Bandwidth (99%)	For non-beamforming mode: Band 2: IEEE 802.11a: 16.15 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.80 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.32 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz IEEE 802.11ac MCS0/Nss1 (VHT80+80): 154.56 MHz Band 3: IEEE 802.11a: 17.02 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.32 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz IEEE 802.11ac MCS0/Nss1 (VHT80+80): 154.99 MHz For beamforming mode: Band 2: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz Band 3: IEEE 802.11ac MCS0/Nss1 (VHT20): 17.97 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz

Maximum Conducted Output Power	For non-beamforming mode: Band 2: IEEE 802.11a: 21.09 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 21.07 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.87 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.71 dBm IEEE 802.11ac MCS0/Nss1 (VHT80+80): 21.73 dBm Band 3: IEEE 802.11a: 21.07 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 21.10 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.88 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 23.81 dBm IEEE 802.11ac MCS0/Nss1 (VHT80+80): 20.42 dBm For beamforming mode: Band 2: IEEE 802.11ac MCS0/Nss1 (VHT20): 20.79 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 20.76 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.71 dBm Band 3: IEEE 802.11ac MCS0/Nss1 (VHT20): 20.81 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 20.91 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 20.90 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
	The product has beamforming function for 802.11ac in 5GHz.	

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 Chains (NTX)	Data Rate / MCS
802.11n (HT20)	4	MCS 0-31
802.11n (HT40)	4	MCS 0-31
802.11ac (VHT20)	4	MCS0-11/Nss1-4
802.11ac (VHT40)	4	MCS0-11/Nss1-4
802.11ac (VHT80)	4	MCS0-11/Nss1-4
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT supports HT20 and HT40. Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20, VHT40 and VHT80. Note 3: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac		

3.2. Accessories

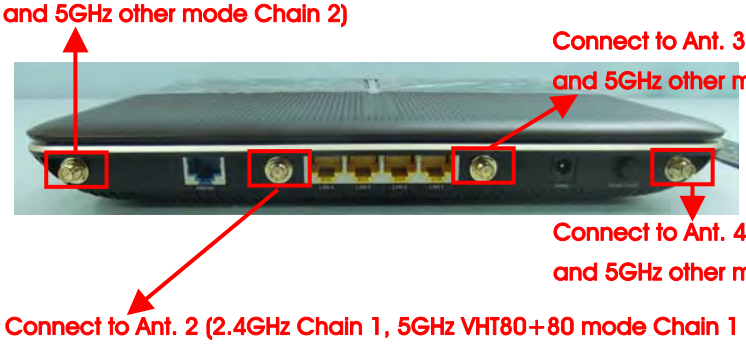
Power	Brand	Model	Rating	Remark
Adapter	Huntkey	HKA06012050-7G	Input: 100-240V~1.5A, 50/60Hz Output: 12.0V, 5.0A	Cable (Non-shielded, 1.3m)
Other				
Power cable*1: Non-shielded, 1.5m				

3.3. Table for Filed Antenna

Ant.	Chain			Brand	Model No.	Product Number	Type	Connector	Gain (dBi)	
	2.4GHz	5GHz VHT80+80 mode	5GHz other mode						2.4GHz	5GHz
1	2	3	2	TP-LINK	T3060-NU000 1.0	3101500587	Dipole	RF-SMA-F	2	3
2	1	1	1	TP-LINK	T3060-NU000 1.0	3101500587	Dipole	RF-SMA-F	2	3
3	3	2	3	TP-LINK	T3060-NU000 1.0	3101500587	Dipole	RF-SMA-F	2	3
4	4	4	4	TP-LINK	T3060-NU000 1.0	3101500587	Dipole	RF-SMA-F	2	3

Note: The EUT has four antennas.

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



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz Band 3	100	5500 MHz	116	5580 MHz
	102	5510 MHz	118	5590 MHz
	104	5520 MHz	124	5620 MHz
	106	5530 MHz	126	5630 MHz
	108	5540 MHz	128	5640 MHz
	110	5550 MHz	132	5660 MHz
	112	5560 MHz	134	5670 MHz
	120	5600 MHz	136	5680 MHz
	122	5610 MHz	140	5700 MHz

3.5. Table for 80+80 MHz Mode

Type	Channel No.	Frequency
1	42+58	5210+5290 MHz
2	106+122	5530+5610 MHz

Note: The EUT supports VHT80+80 mode for non-beamforming function only.

3.6. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. The following table is a list of the test modes shown in this test report.

Test Items	Mode		Data Rate	Channel	Chain
Max. Conducted Output Power Power Spectral Density 26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement Radiated Emission Above 1GHz Band Edge Emission	For non-beamforming mode:				
	11a/BPSK	Band 2~3	6Mbps	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT20	Band 2~3	MCS0/Nss1	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT40	Band 2~3	MCS0/Nss1	54/62/102/110 /134	1+2+3+4
	11ac VHT80	Band 2~3	MCS0/Nss1	58/106/122	1+2+3+4
	For beamforming mode:				
	11ac VHT20	Band 2~3	MCS0/Nss1	52/60/64/100/ 116/140	1+2+3+4
	11ac VHT40	Band 2~3	MCS0/Nss1	54/62/102/110 /134	1+2+3+4
	11ac VHT80	Band 2~3	MCS0/Nss1	58/106/122	1+2+3+4
Frequency Stability	20 MHz	Band 2~3	-	60/116	1
	40 MHz	Band 2~3	-	62/110	1
	80 MHz	Band 2~3	-	58/106	1

802.11ac MCS0/Nss1 VHT80+80

Test Items	Mode		Data Rate	Type	Channel	Chain
Max. Conducted Output Power Power Spectral Density 26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement Radiated Emission Above 1GHz Band Edge Emission	11ac VHT80+80	Band 2~3	MCS0/Nss1	1	42	3+4
					58	1+2
				2	106	3+4
					122	1+2

Note: 1. All the specification of test configurations and test modes were based on customer's request.
2. 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.
3. There are two modes of EUT for 802.11ac in 5GHz. One is non-beamforming mode, and the other is beamforming mode. All test results were recorded in this report.
4. The EUT supports VHT80+80 mode for non-beamforming function only.

The following test modes were performed for all tests:

For Radiated Emission test:

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

For Co-location MPE test:

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA5O1803-05) test is added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

3.7. Table for Testing Locations

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

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

3.8. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR5O1803-03AB

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Adding 5GHz band 2 and band 3 (5250~5350 MHz, 5470~5725 MHz) for this device. 2. Adding two type for 80+80 MHz mode (type 1: 5210+5290 MHz and type 2: 5530+5610 MHz) in 5GHz band 2 and band 3 (5250~5350 MHz, 5470~5725 MHz).	1. 26dB Spectrum Bandwidth and 99% Occupied Bandwidth. 2. Maximum Conducted Output Power. 3. Power Spectral Density. 4. Radiated Emissions Above 1GHz. 5. Band Edge Emissions. 6. Frequency Stability.

3.9. Table for Supporting Units

For Test Site No: 03CH01-CB

For non-beamforming mode:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC

For beamforming mode:

Support Unit	Brand	Model	FCC ID
Notebook*2	DELL	E4300	DoC
RX Device	TP-LINK	Archer C3150	TE7C3150V2

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC

3.10. Table for Parameters of Test Software Setting

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

For non-beamforming mode:

Test Software Version	Access Manual Tool 3.0.0.2					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	62	62	62	63	63	62
802.11ac MCS0/Nss1 VHT20	62	62	62	63	63	62
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	
	73	53	72	74	74	
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5290 MHz		5530 MHz		5610 MHz	
	49		60		74	
Mode	NCB: 80MHz+80MHz					
802.11ac MCS0/Nss1 VHT80+80	Type 1			Type 2		
	5210+5290 MHz			5530+5610 MHz		
	76			70		

For beamforming mode:

Test Software Version	Telnet					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11ac MCS0/Nss1 VHT20	61	61	61	62	62	54
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	
	60	49	60	61	61	
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5290 MHz		5530 MHz		5610 MHz	
	49		59		61	

3.11. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

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

The program was executed as follows:

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

3.12. 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	1.000	1.000	100.00	0.00	0.01
802.11ac MCS0/Nss1 VHT20	1.890	1.950	96.92	0.14	0.53
802.11ac MCS0/Nss1 VHT40	0.881	0.912	96.60	0.15	1.14
802.11ac MCS0/Nss1 VHT80	0.416	0.480	86.67	0.62	2.40
802.11ac MCS0/Nss1 VHT80+80	0.418	0.490	85.31	0.69	2.39

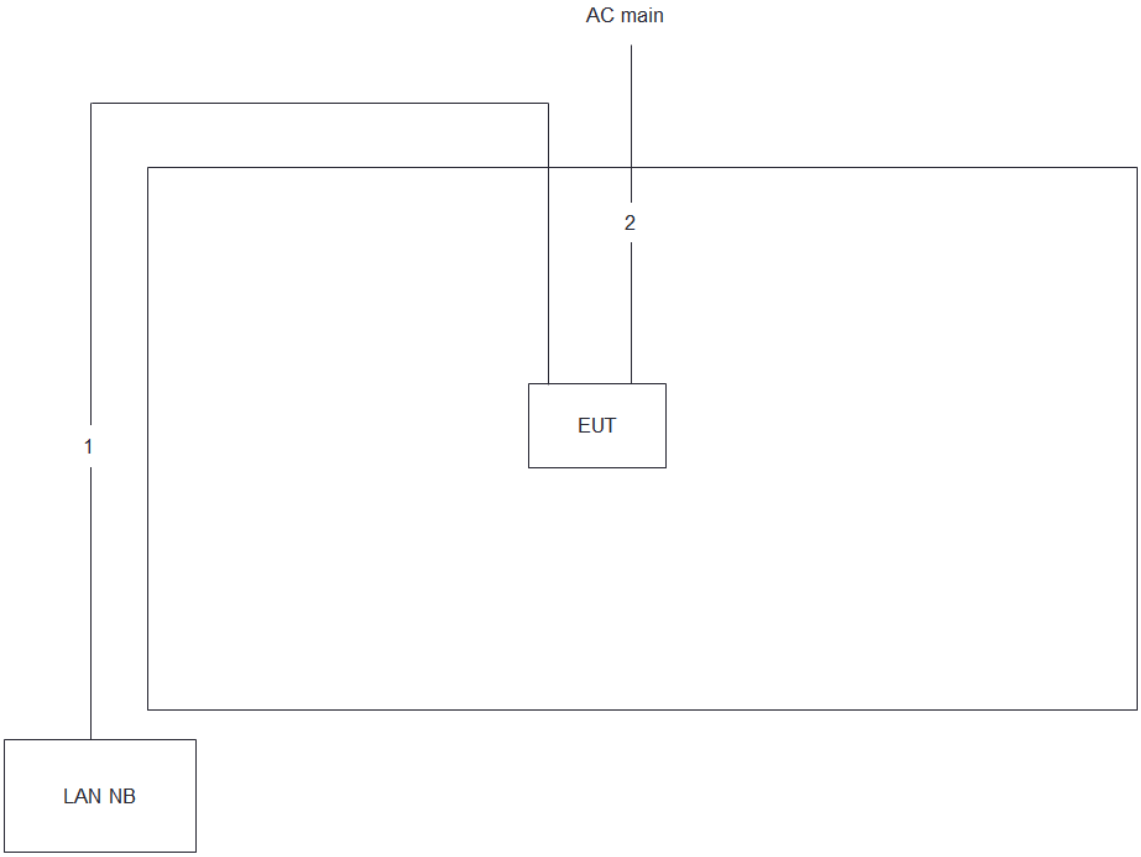
For beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Min. VBW (kHz)
802.11ac MCS0/Nss1 VHT20	3.800	3.880	97.94	0.09	0.26
802.11ac MCS0/Nss1 VHT40	3.620	3.750	96.53	0.15	0.28
802.11ac MCS0/Nss1 VHT80	5.048	5.190	97.26	0.12	0.20

3.13. Test Configurations

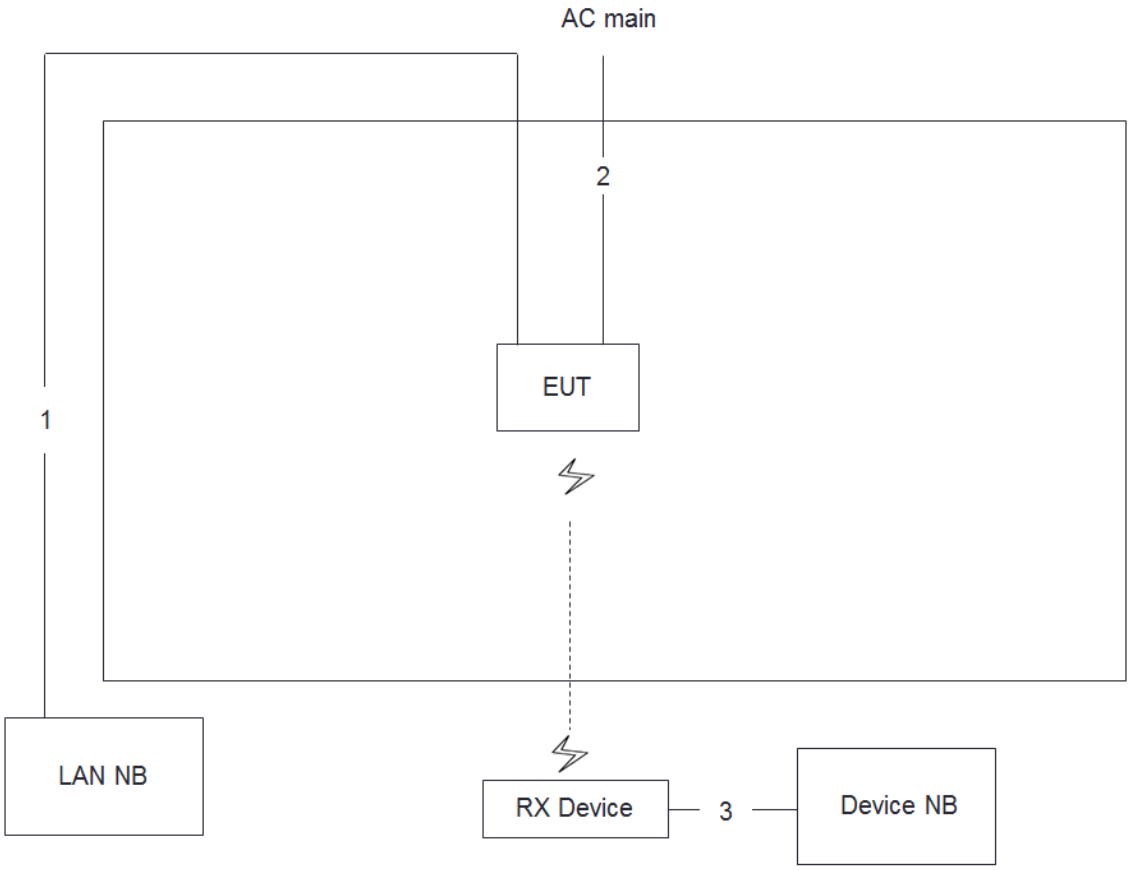
3.13.1. Radiation Emissions Test Configuration

For non-beamforming mode:



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	2.8m

For beamforming mode:



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	2.8m
3	RJ-45 cable	No	1.5m

4. TEST RESULT

4.1. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.1.1. Limit

No restriction limits.

4.1.2. Measuring Instruments and Setting

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

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

4.1.3. Test Procedures

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

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

4.1.4. Test Setup Layout

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

This test setup layout is the same as that shown in section 4.4.4.

4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	26℃	Humidity	55%
Test Engineer	Peter Wu		

For non-beamforming mode:

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5260 MHz	20.52	16.06
	5300 MHz	20.43	16.15
	5320 MHz	20.52	16.15
	5500 MHz	20.87	16.76
	5580 MHz	20.96	16.58
	5700 MHz	20.96	17.02
802.11ac MCS0/Nss1 VHT20	5260 MHz	20.70	17.71
	5300 MHz	20.87	17.63
	5320 MHz	20.96	17.80
	5500 MHz	21.22	17.89
	5580 MHz	21.22	17.97
	5700 MHz	21.22	18.06
802.11ac MCS0/Nss1 VHT40	5270 MHz	40.00	36.32
	5310 MHz	39.71	36.18
	5510 MHz	40.44	36.18
	5550 MHz	40.58	36.32
	5670 MHz	40.58	36.18
802.11ac MCS0/Nss1 VHT80	5290 MHz	80.29	75.83
	5530 MHz	81.16	75.83
	5610 MHz	80.87	75.54

802.11ac MCS0/Nss1 VHT80+80

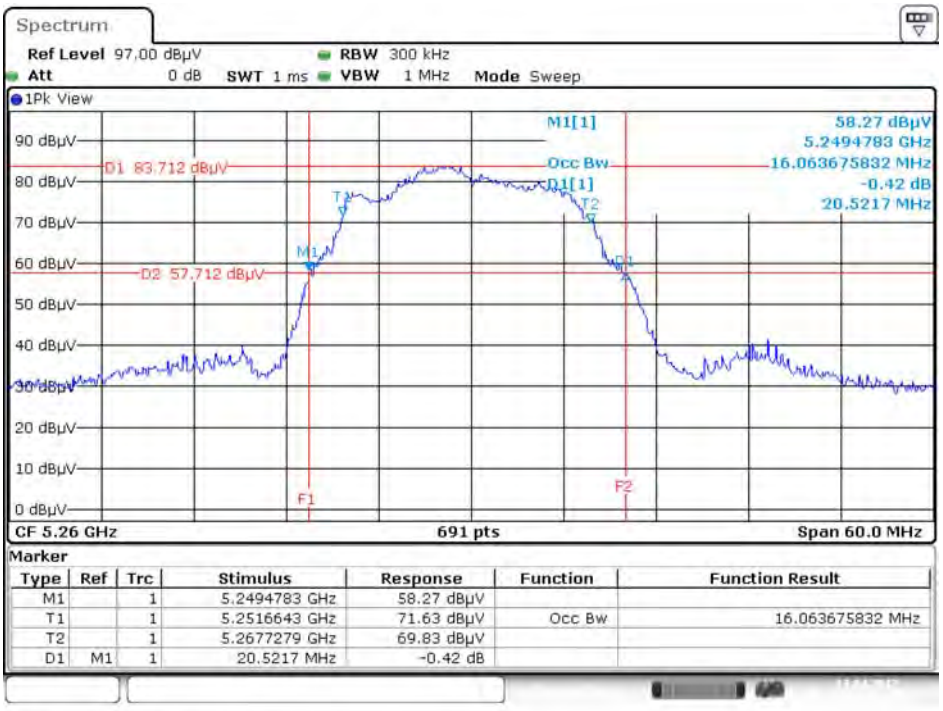
Type	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
1	5210 MHz	160.00	154.56
	5290 MHz		
2	5530 MHz	160.44	154.99
	5610 MHz		

For beamforming mode:

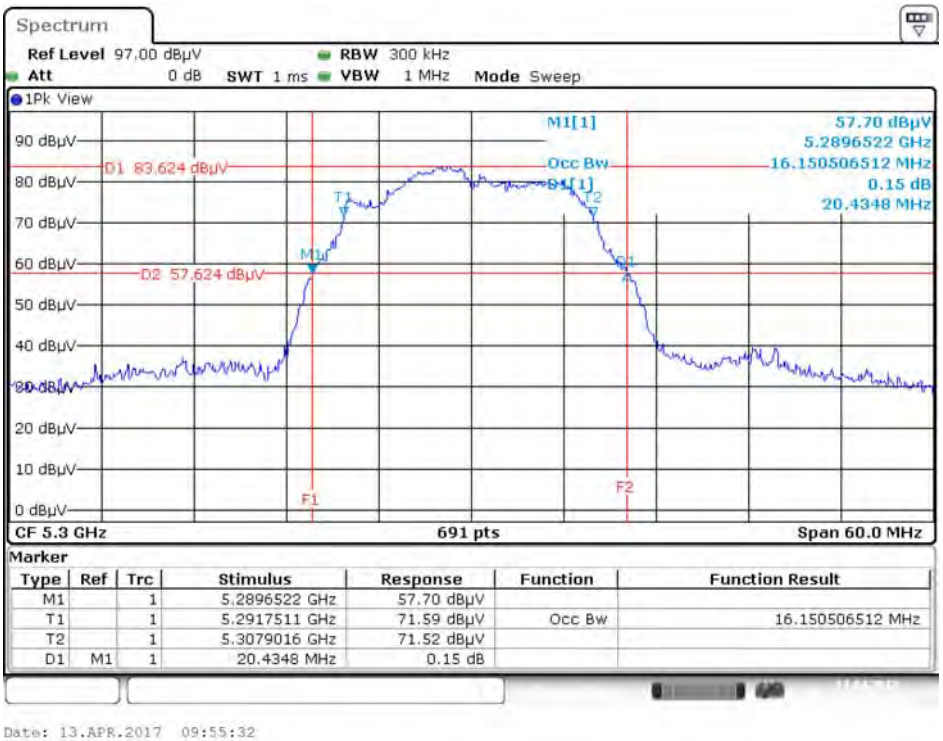
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5260 MHz	21.39	18.06
	5300 MHz	21.48	18.06
	5320 MHz	21.30	17.97
	5500 MHz	21.13	17.97
	5580 MHz	21.22	17.97
	5700 MHz	21.04	17.97
802.11ac MCS0/Nss1 VHT40	5270 MHz	40.73	36.76
	5310 MHz	40.44	36.76
	5510 MHz	40.58	36.76
	5550 MHz	40.58	36.90
	5670 MHz	40.29	36.76
802.11ac MCS0/Nss1 VHT80	5290 MHz	80.58	76.12
	5530 MHz	80.87	76.41
	5610 MHz	81.16	75.83

For non-beamforming mode:

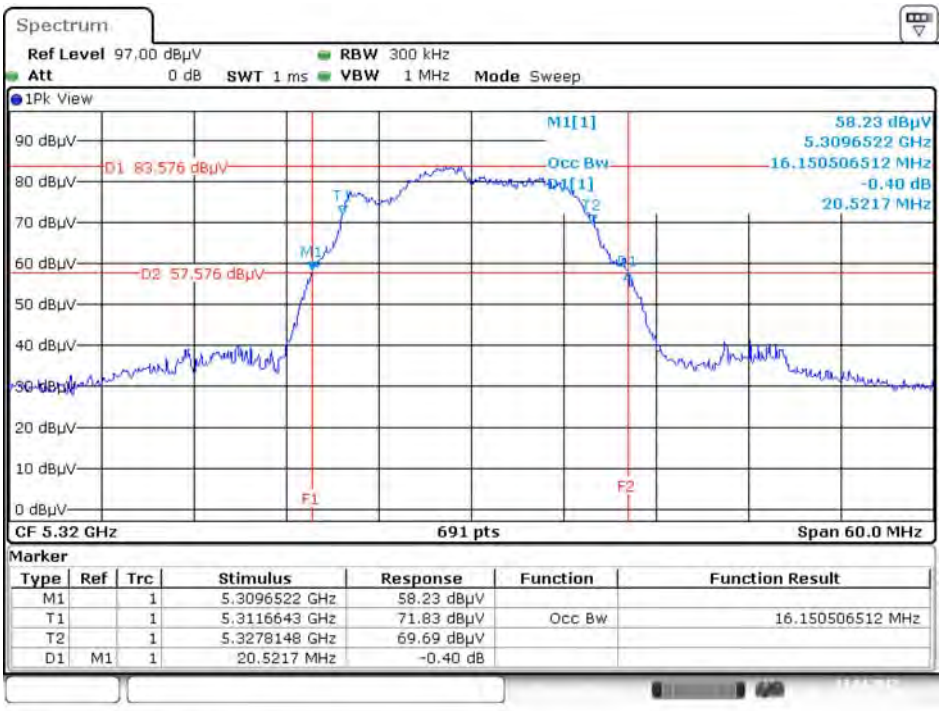
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5260 MHz



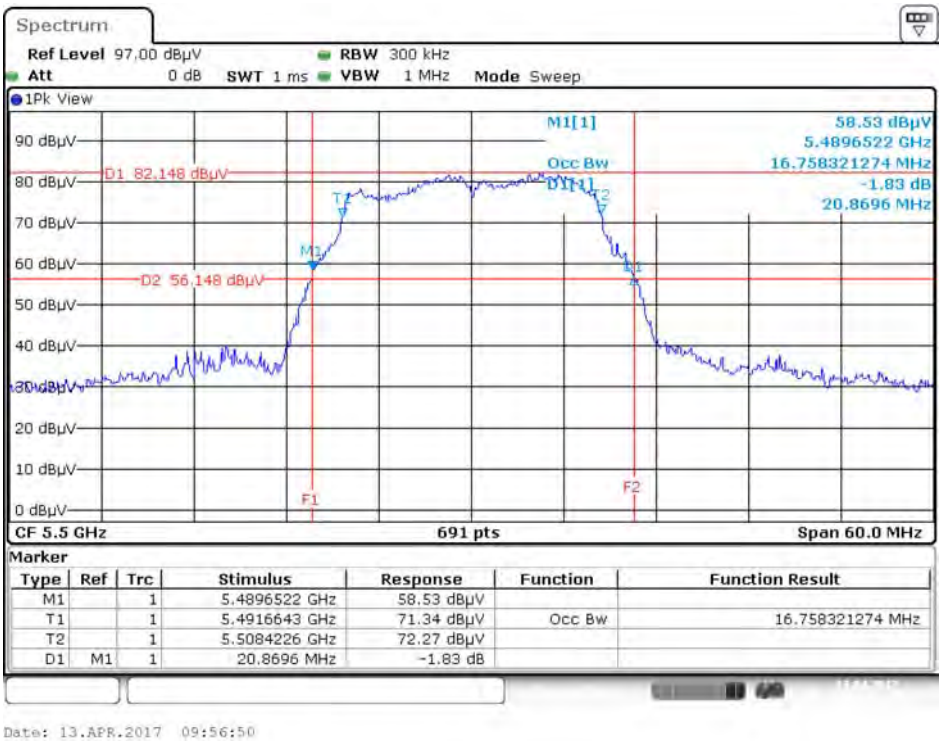
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5300 MHz



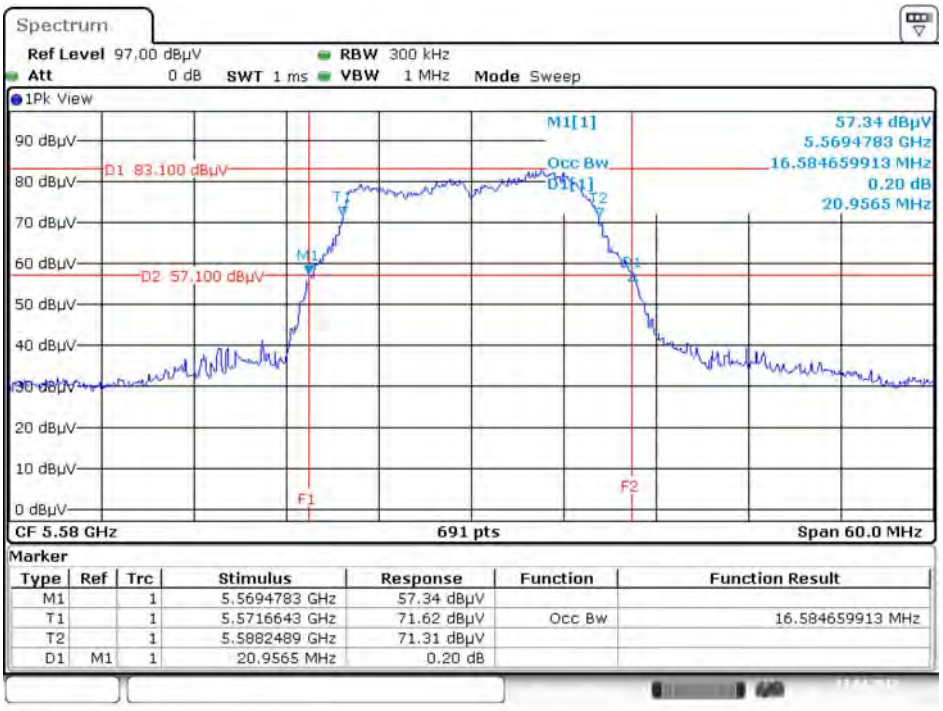
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5320 MHz



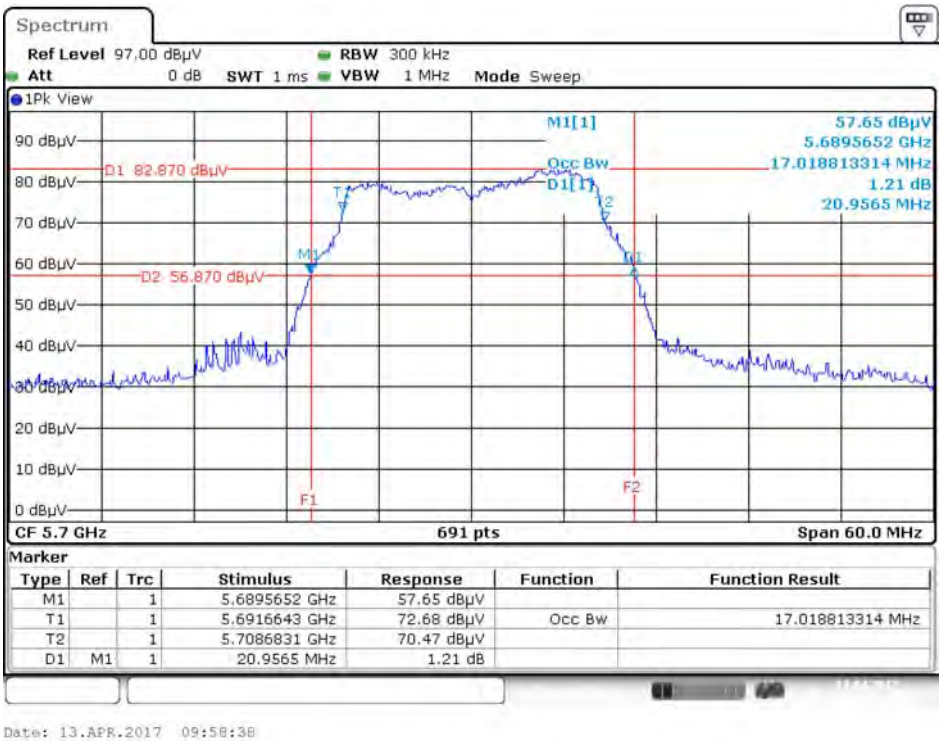
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5500 MHz



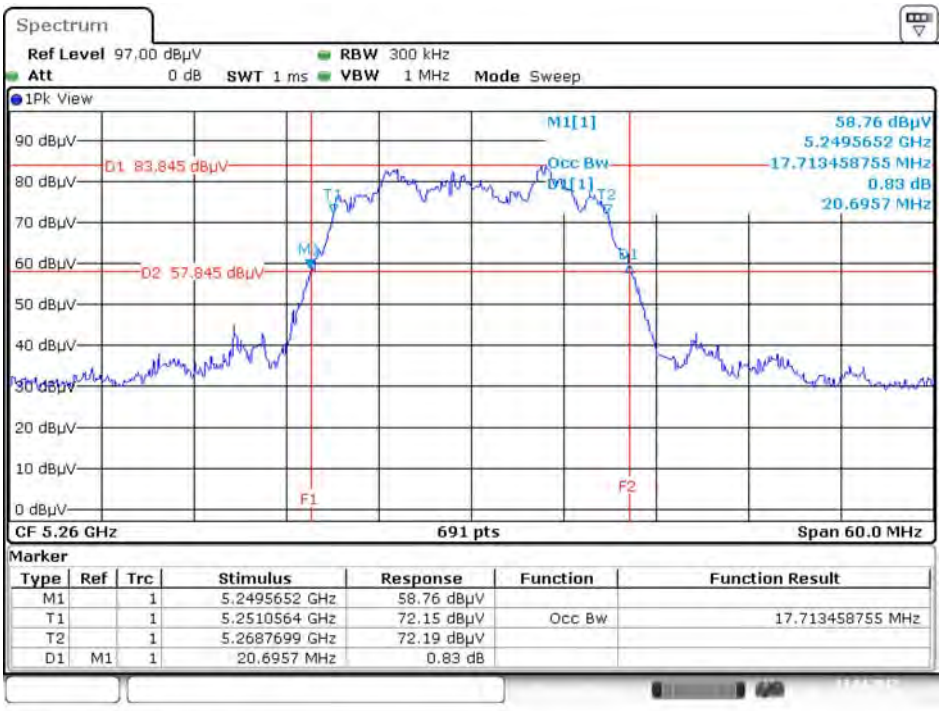
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



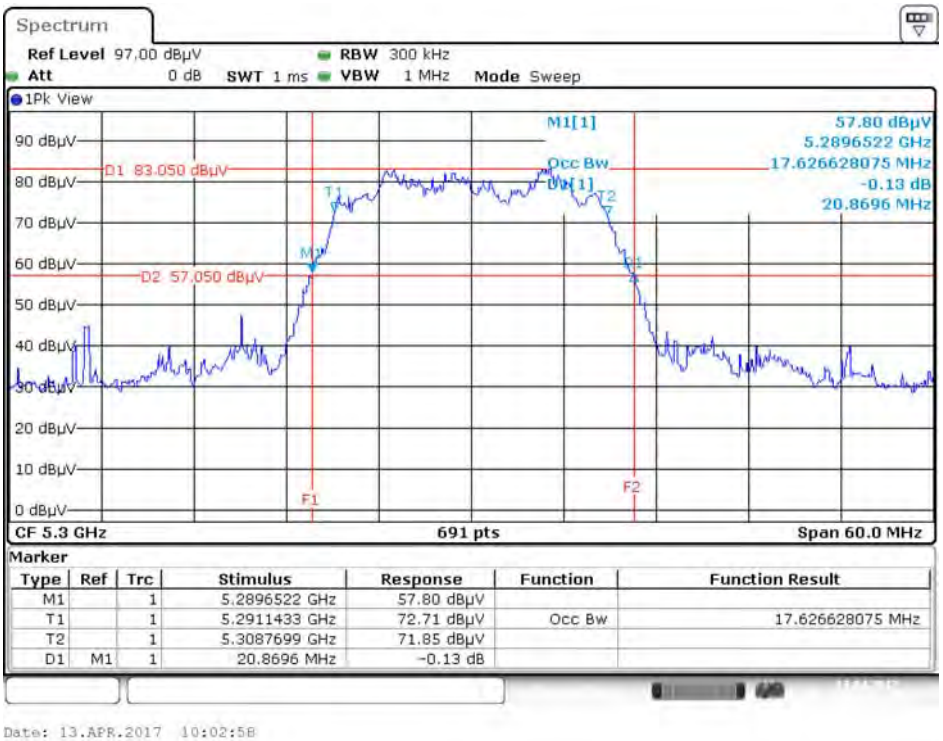
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



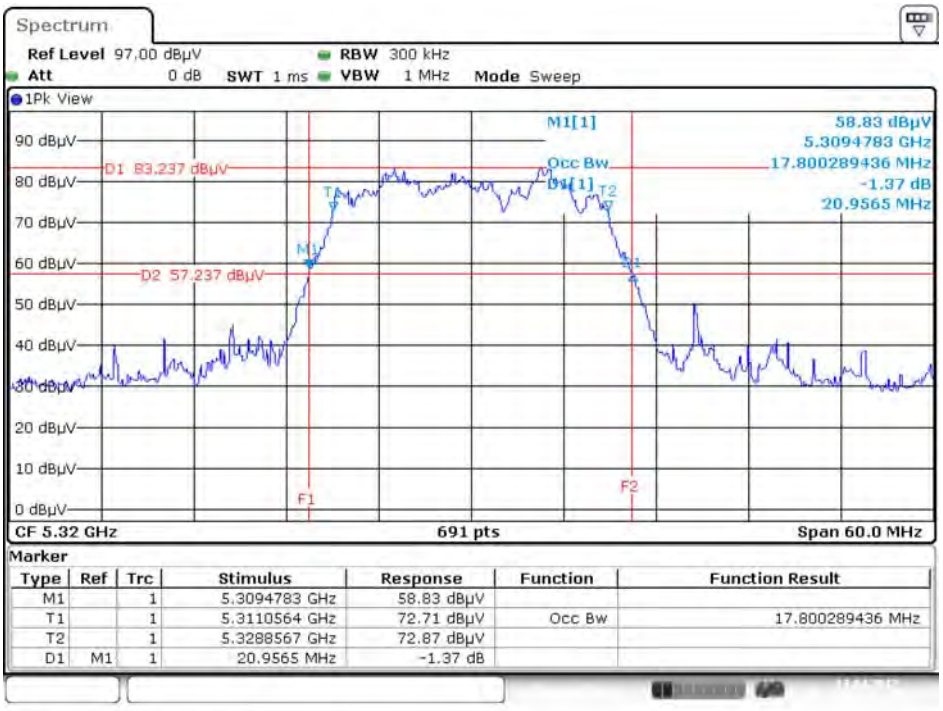
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5260 MHz



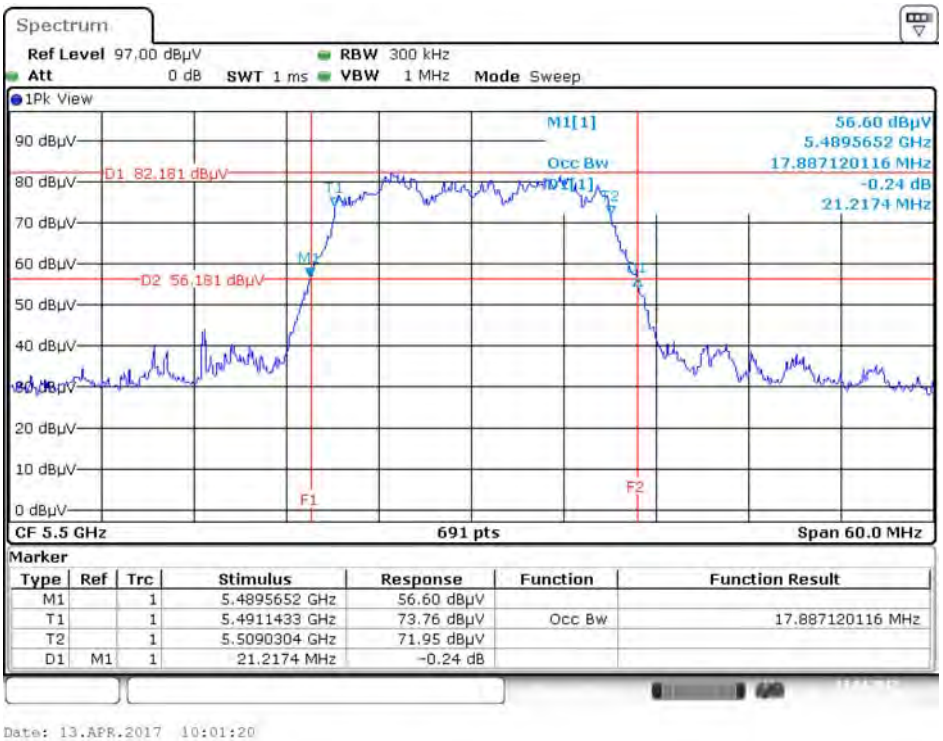
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5300 MHz



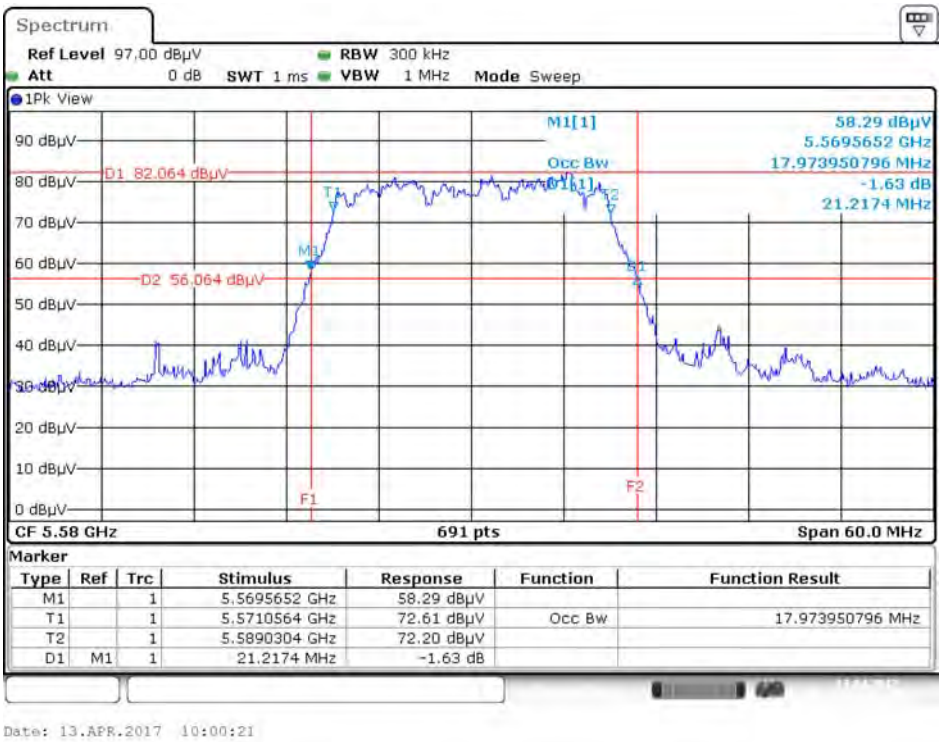
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5320 MHz



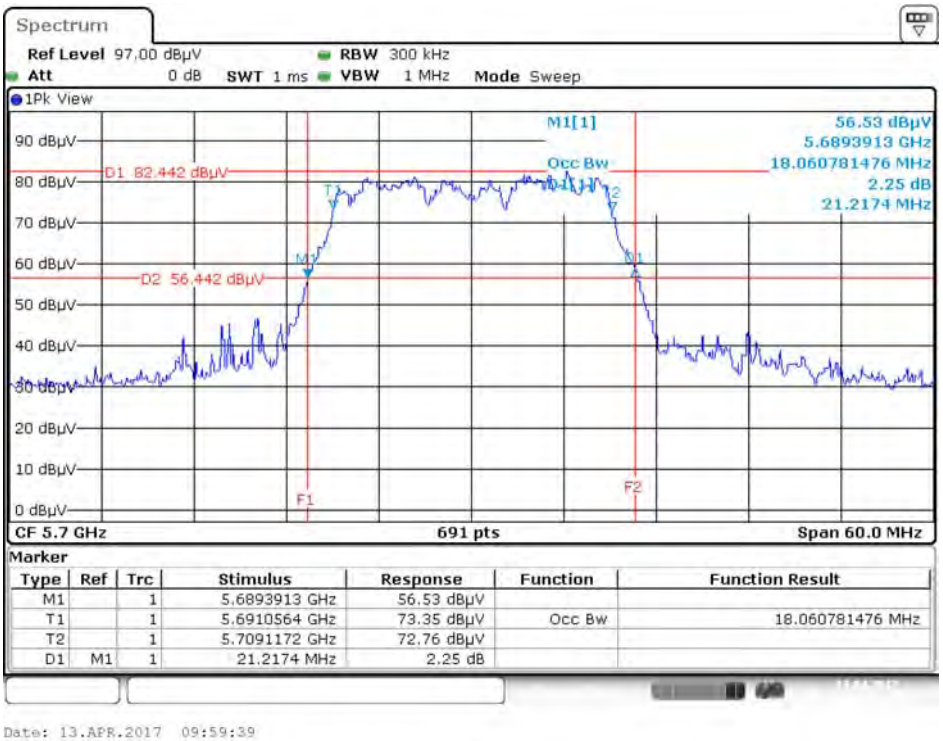
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5500 MHz



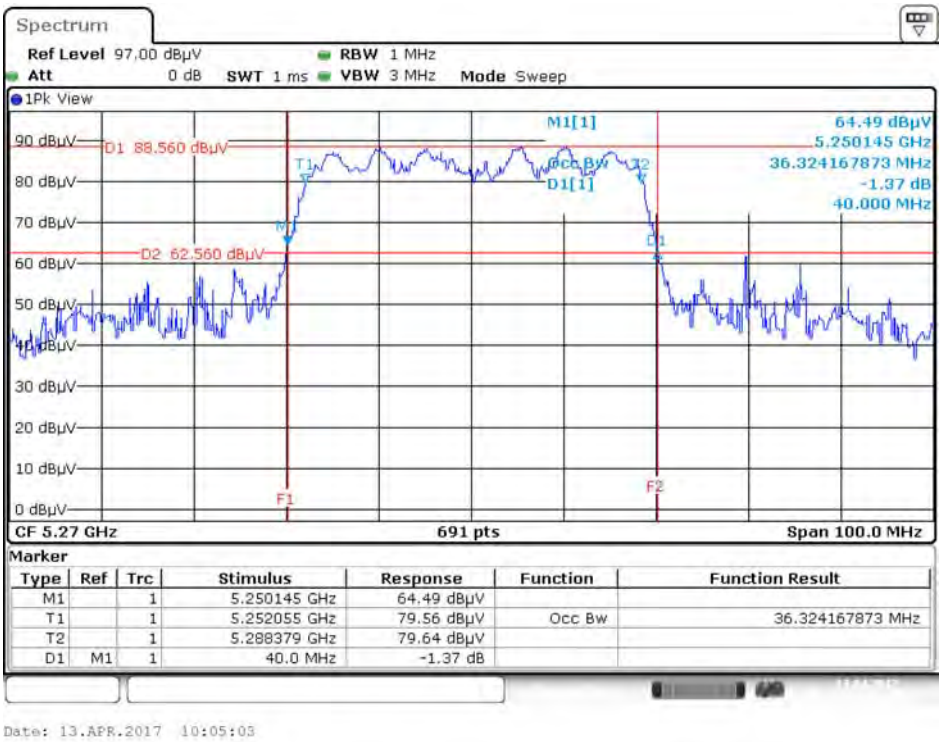
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



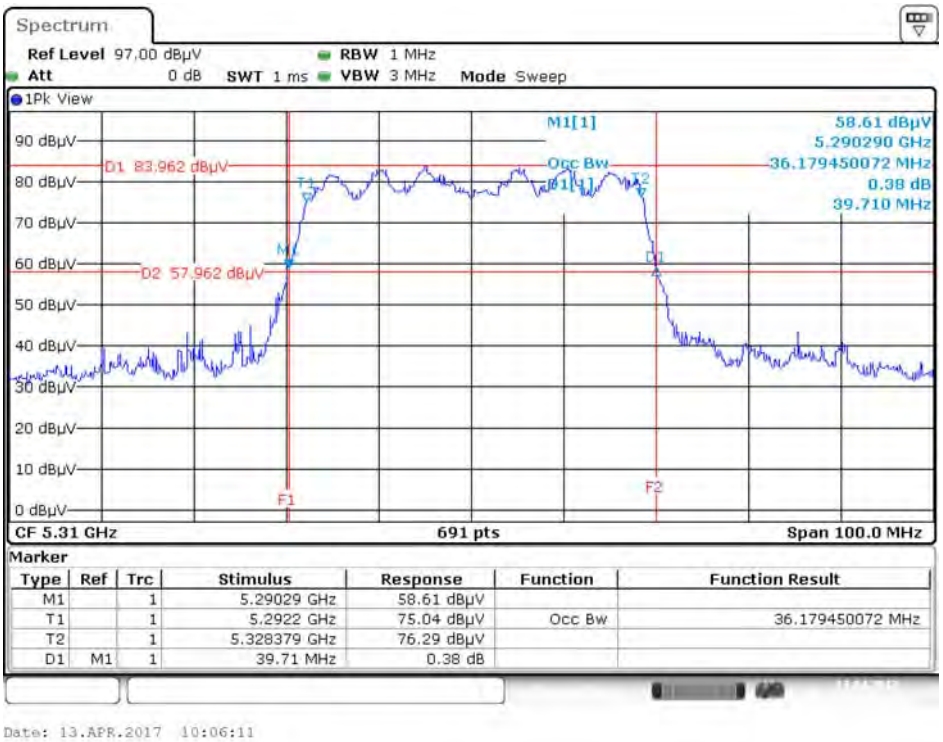
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



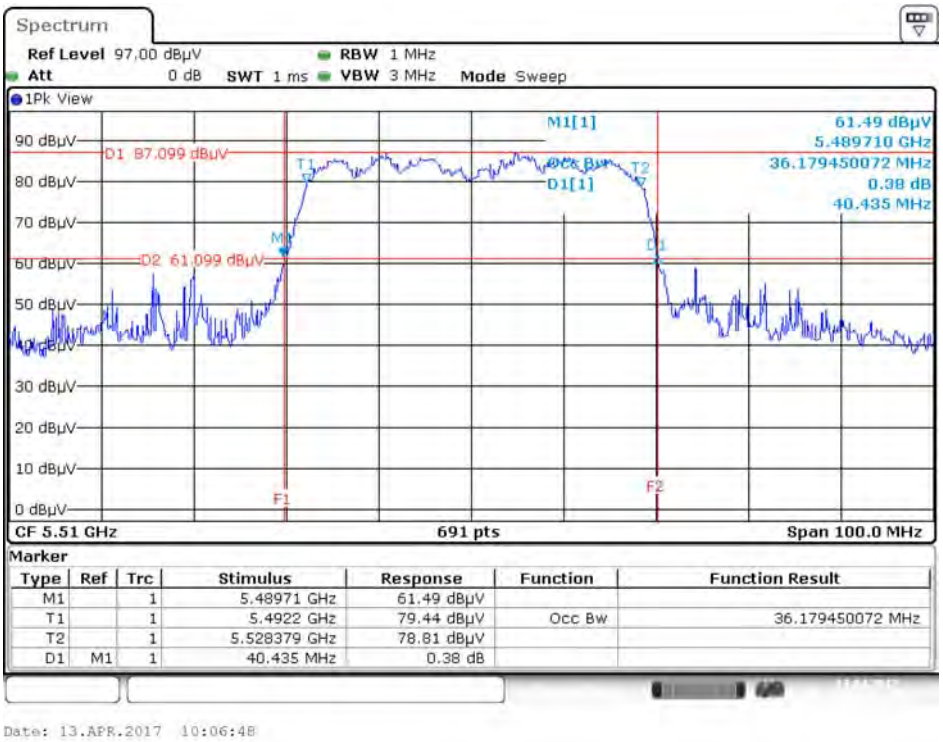
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5270 MHz



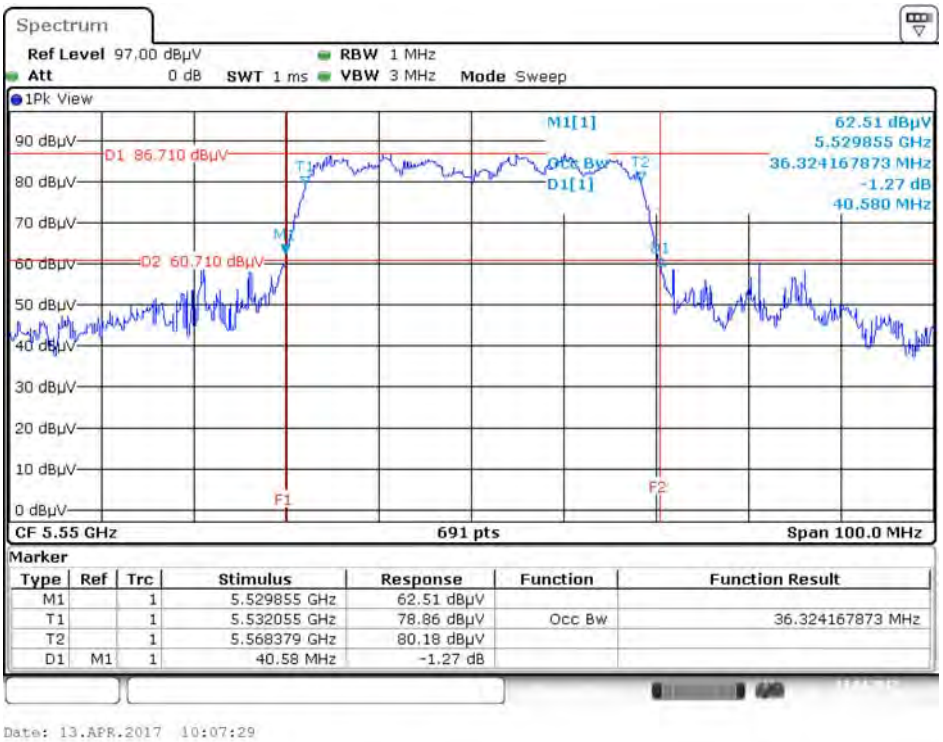
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5310 MHz



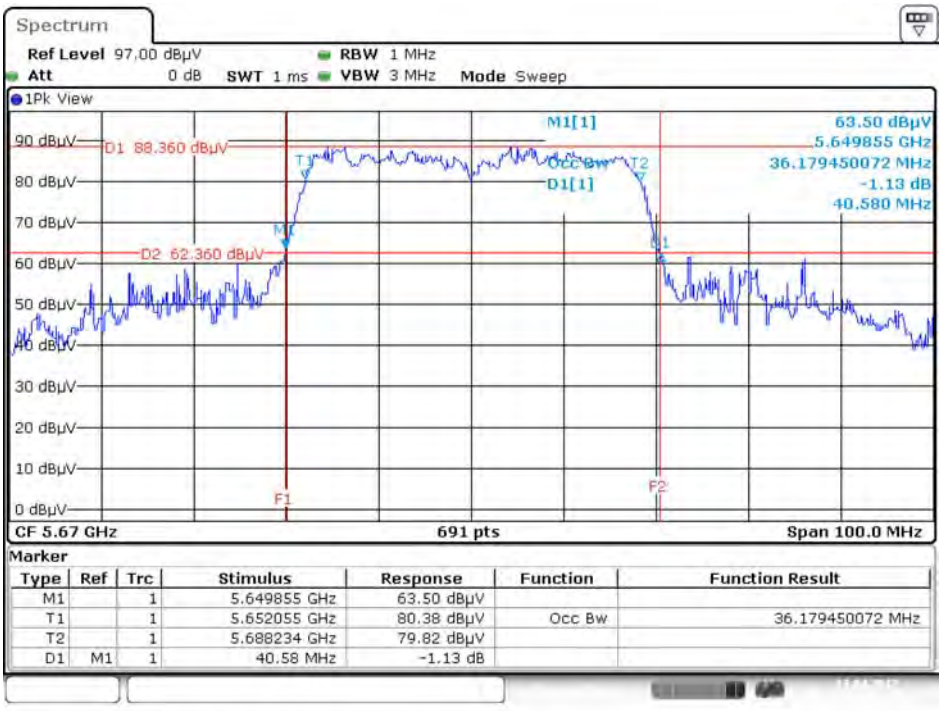
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5510 MHz



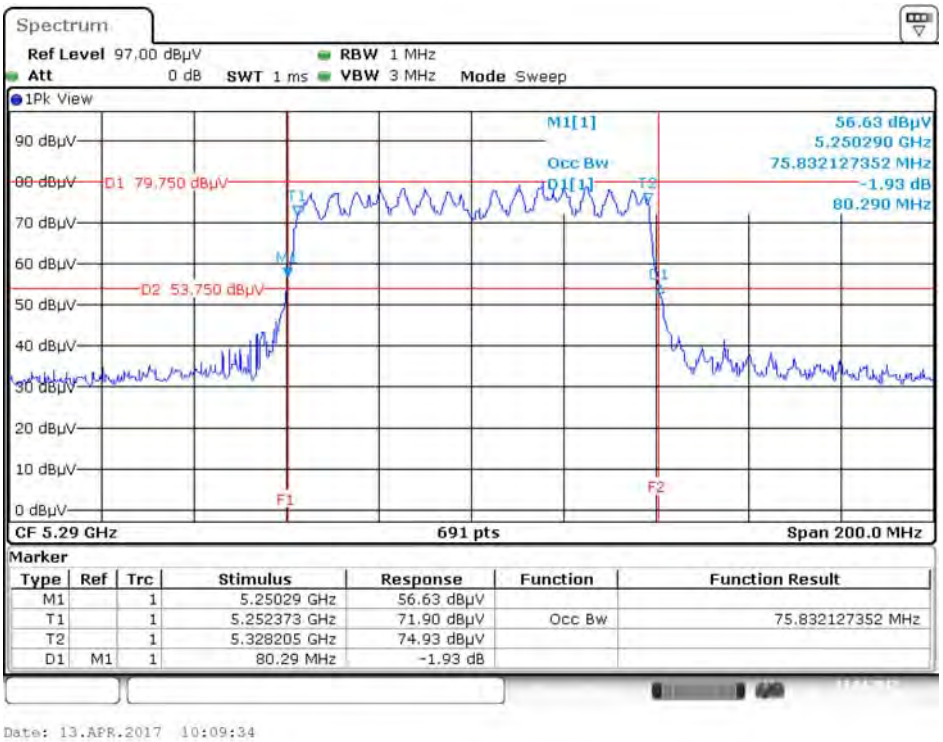
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5550 MHz



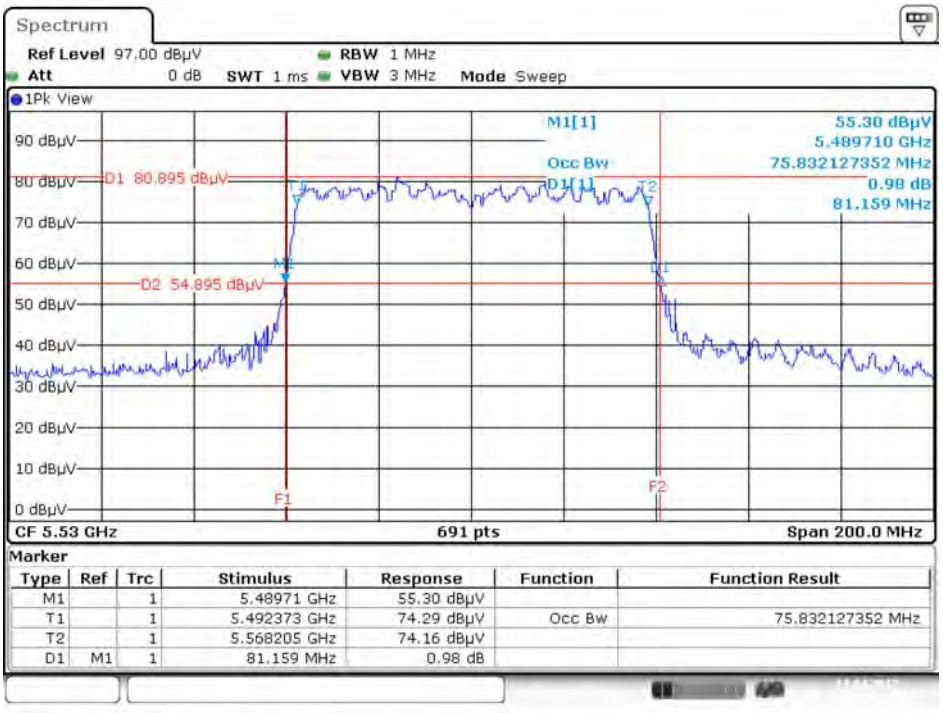
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



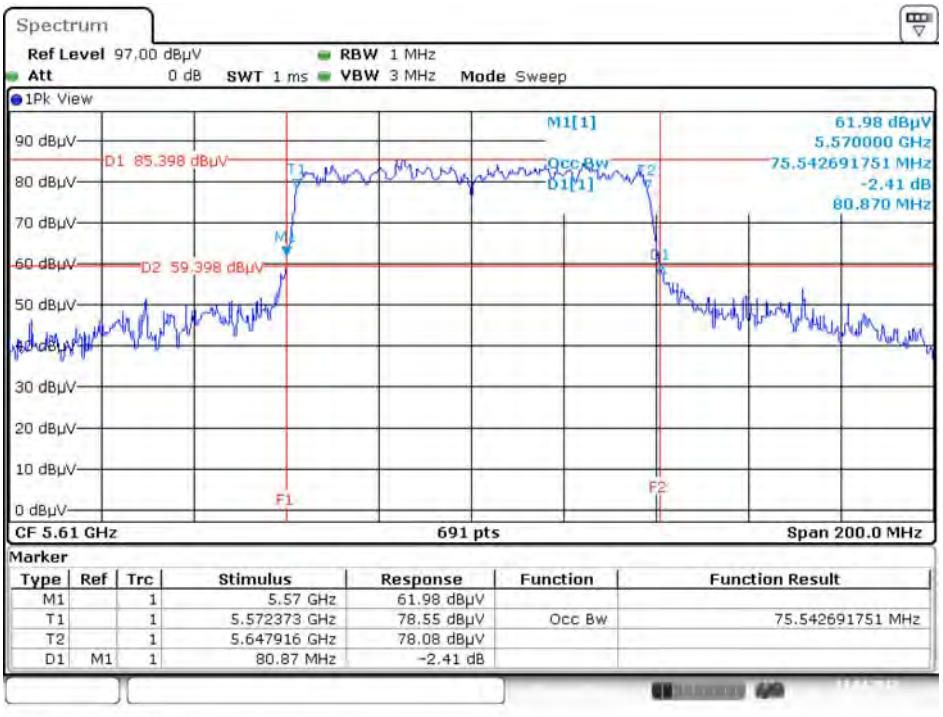
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5290 MHz



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



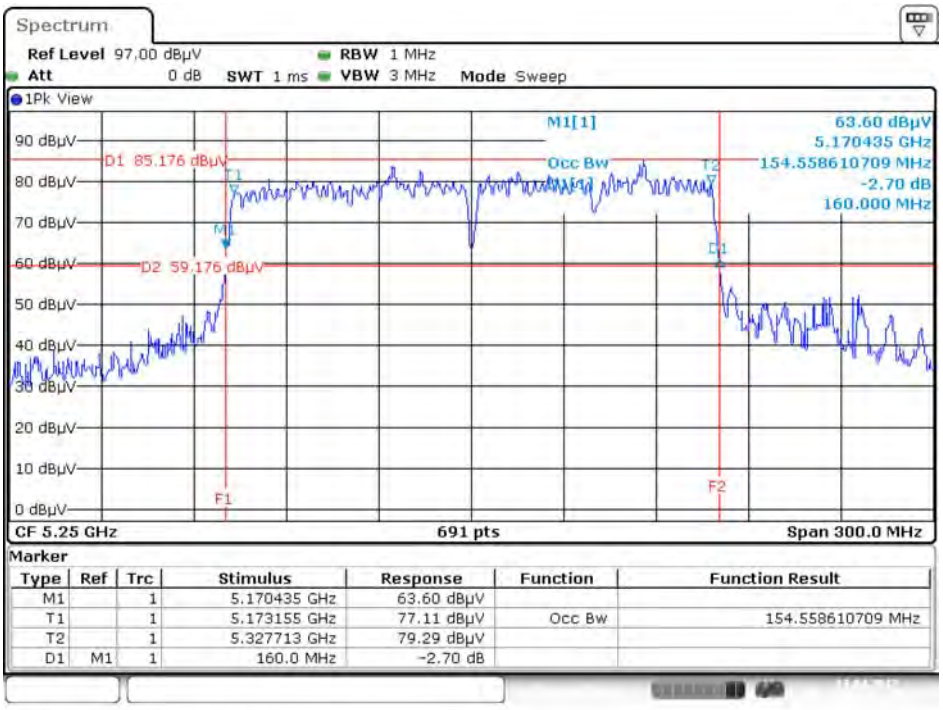
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5610 MHz



802.11ac MCS0/Nss1 VHT80+80

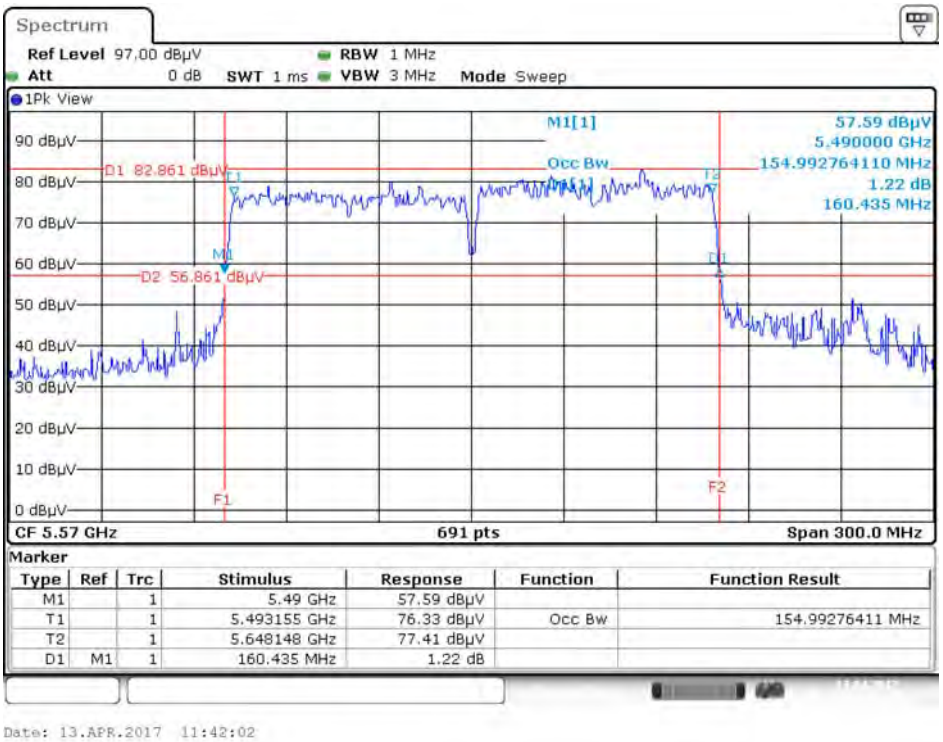
Type 1

26dB Bandwidth and 99% Occupied Bandwidth Plot on Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5210 MHz+5290 MHz



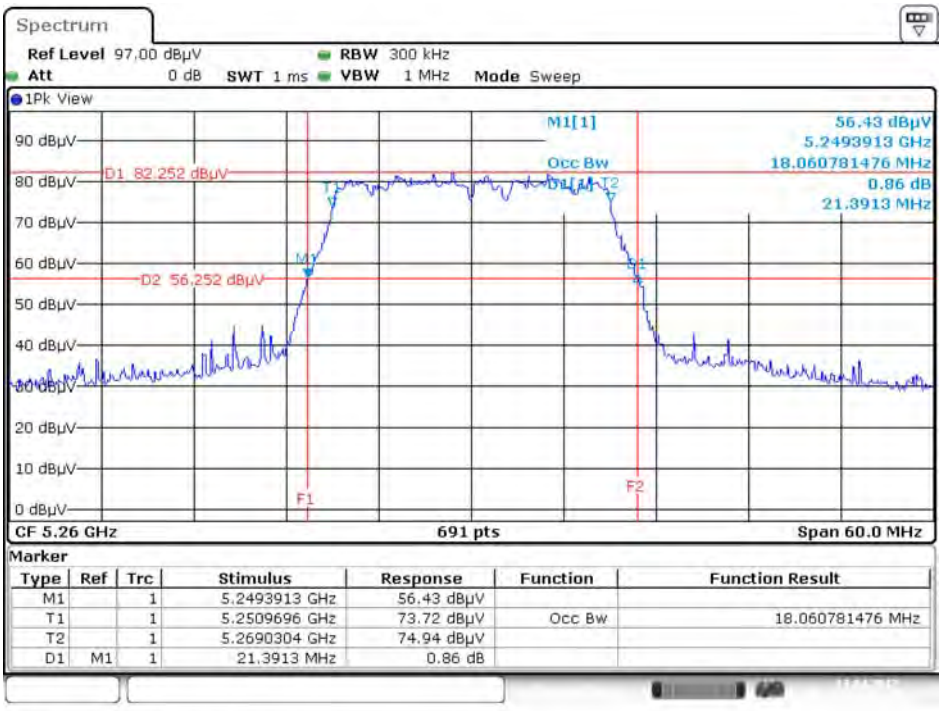
Type 2

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

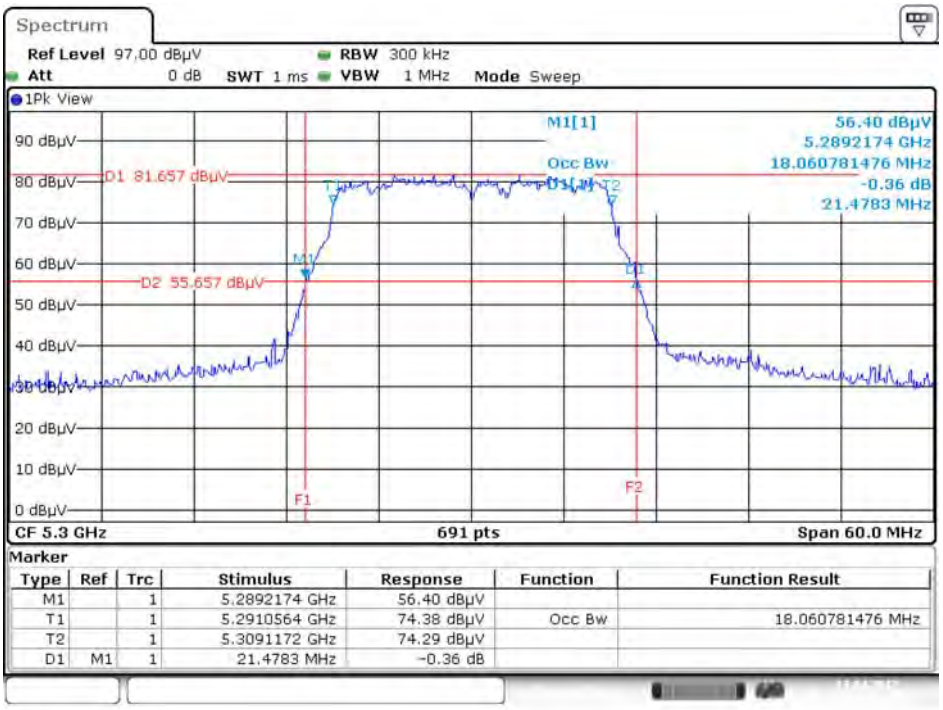


For beamforming mode:

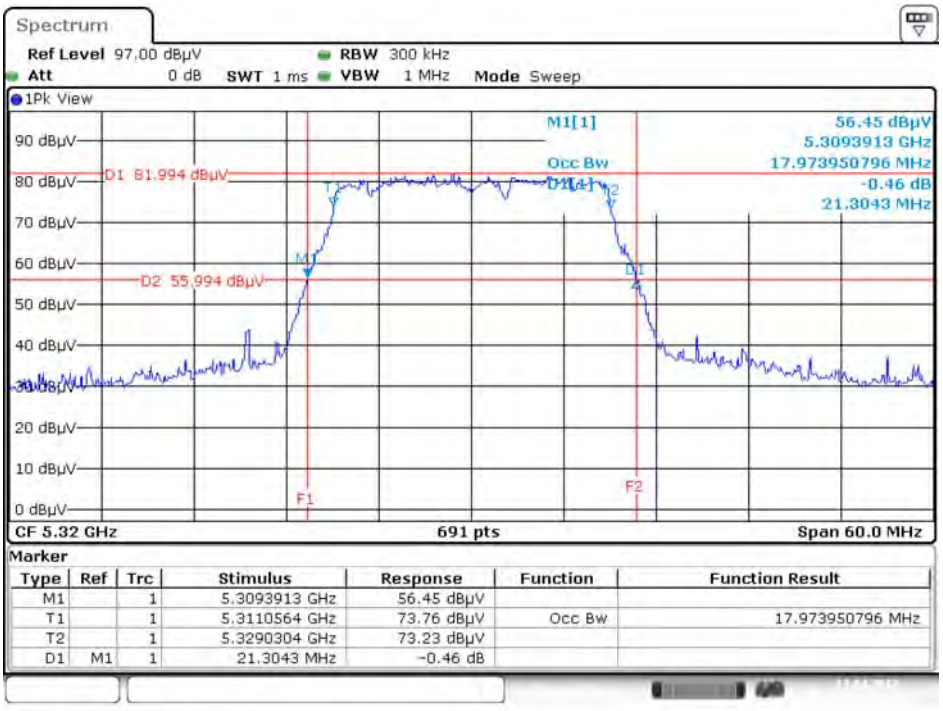
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5260 MHz



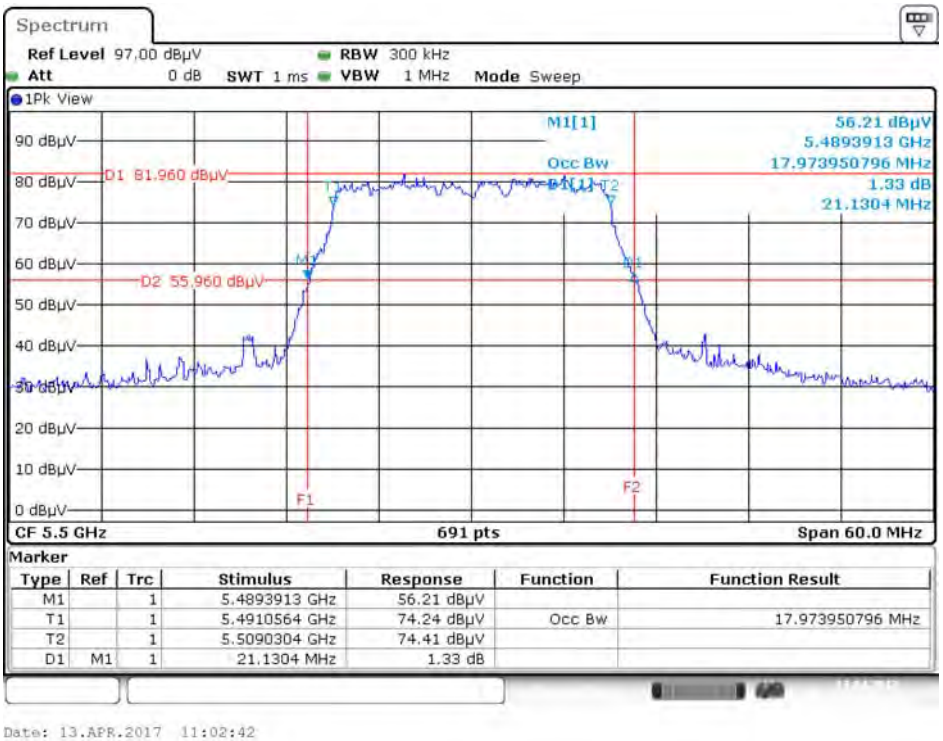
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5300 MHz



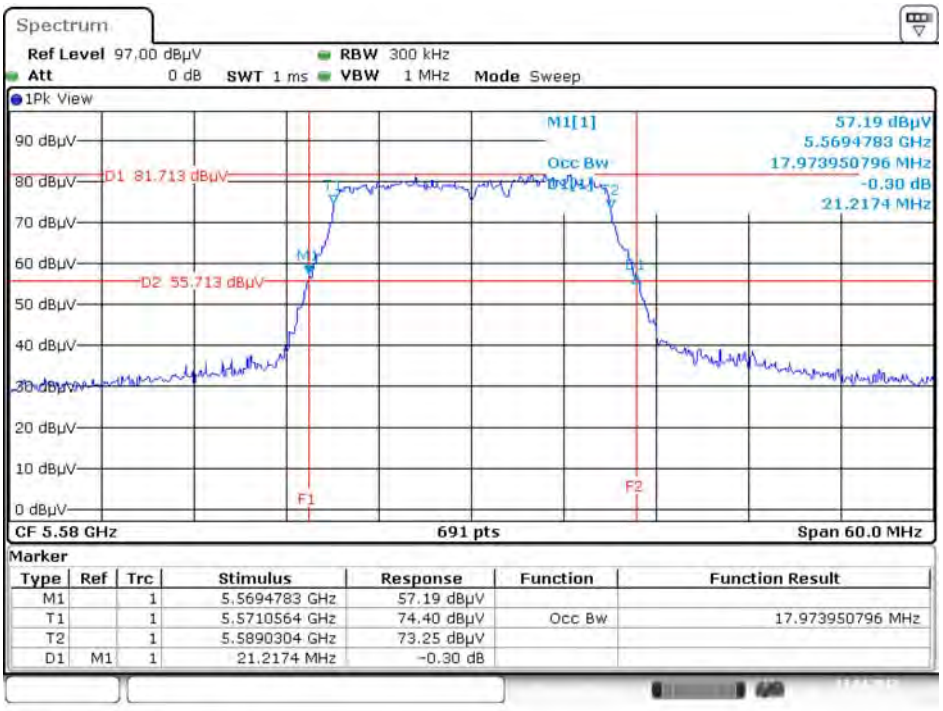
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5320 MHz



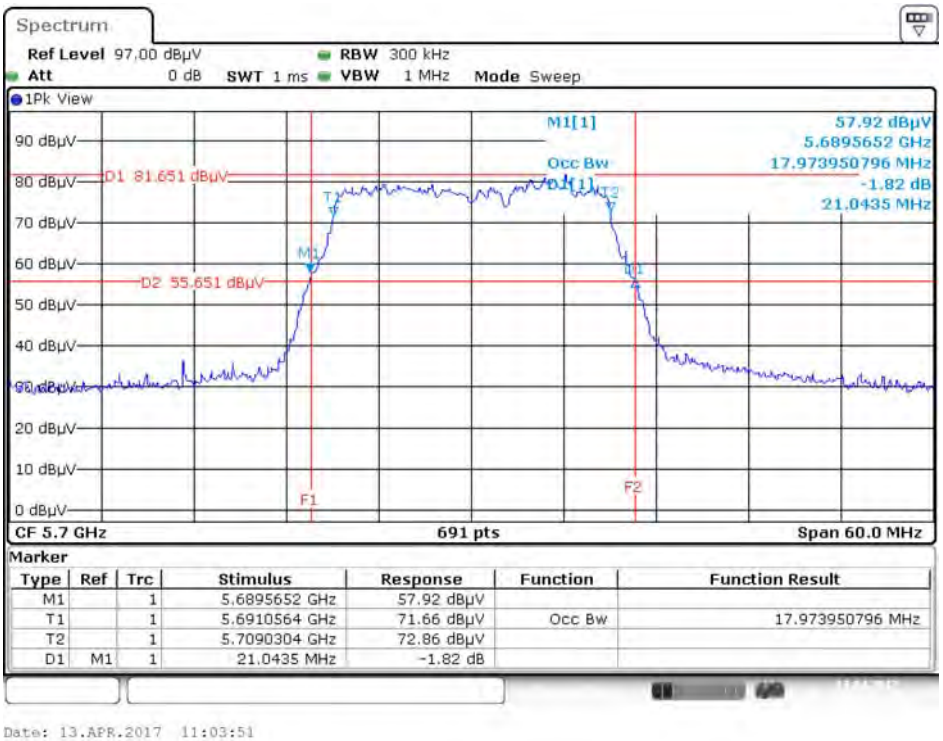
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5500 MHz



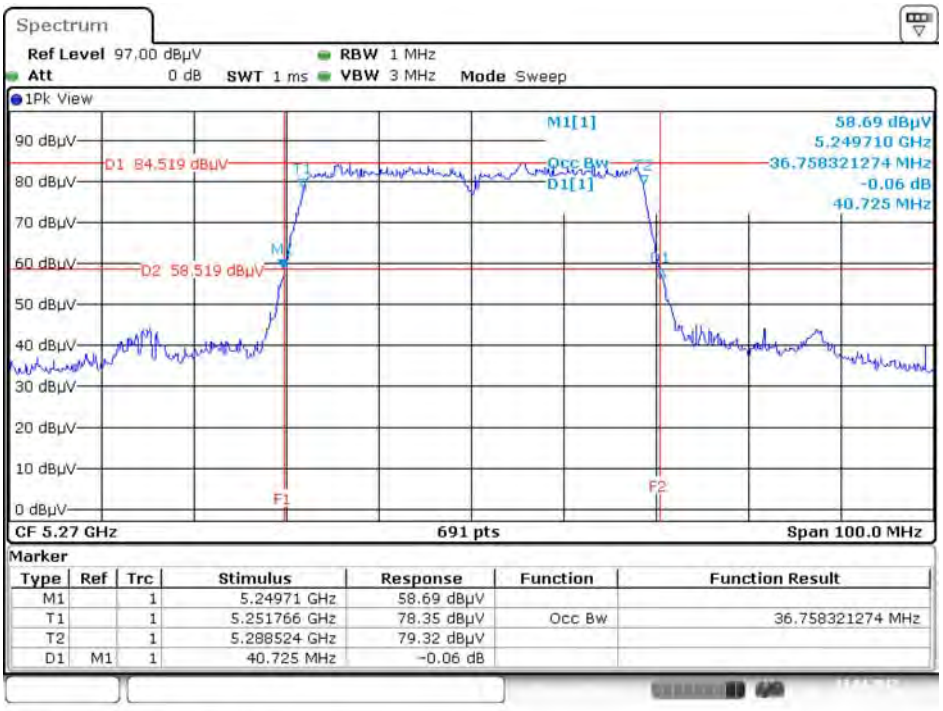
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



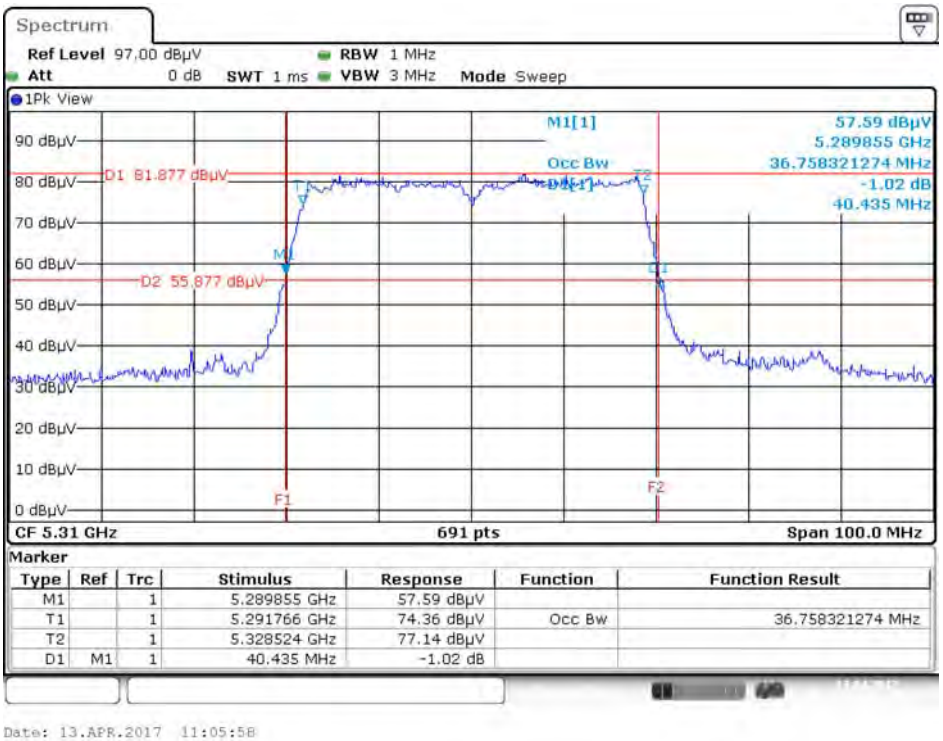
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



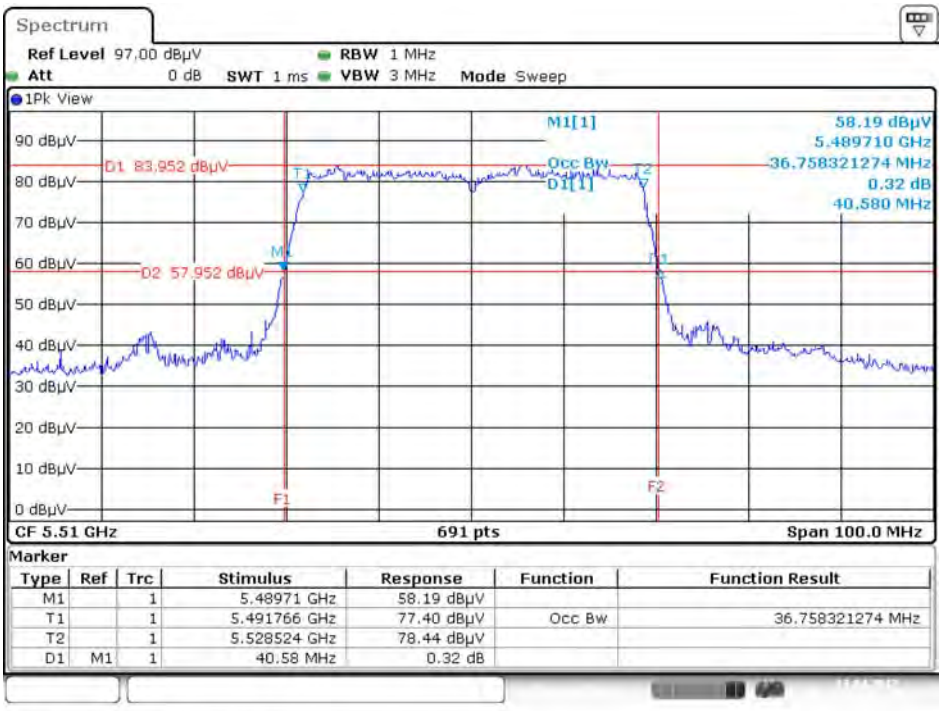
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5270 MHz



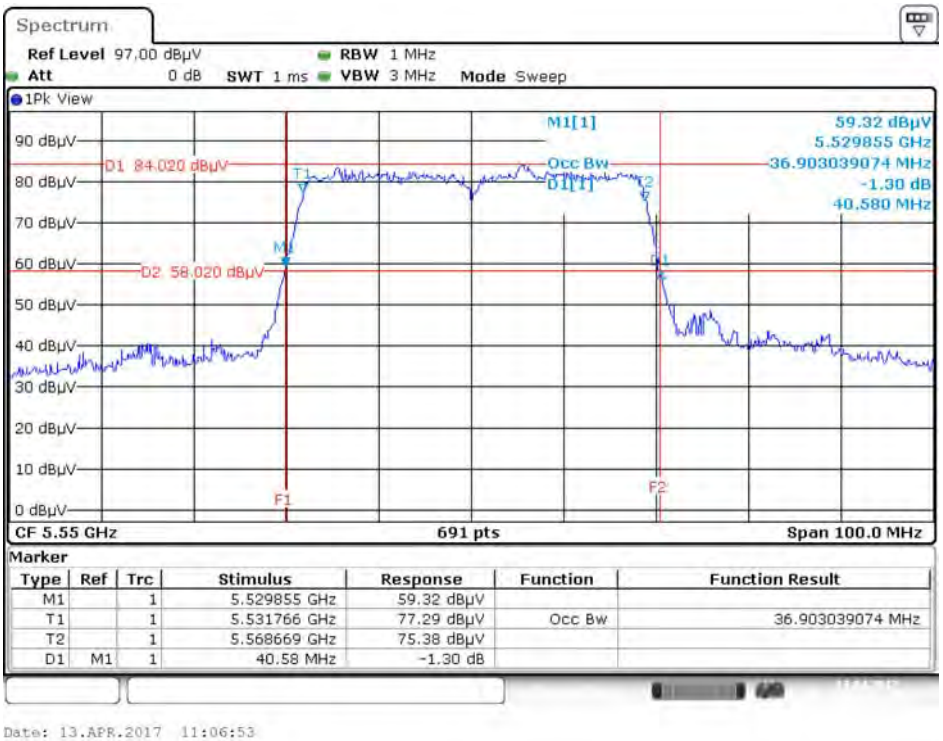
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5310 MHz



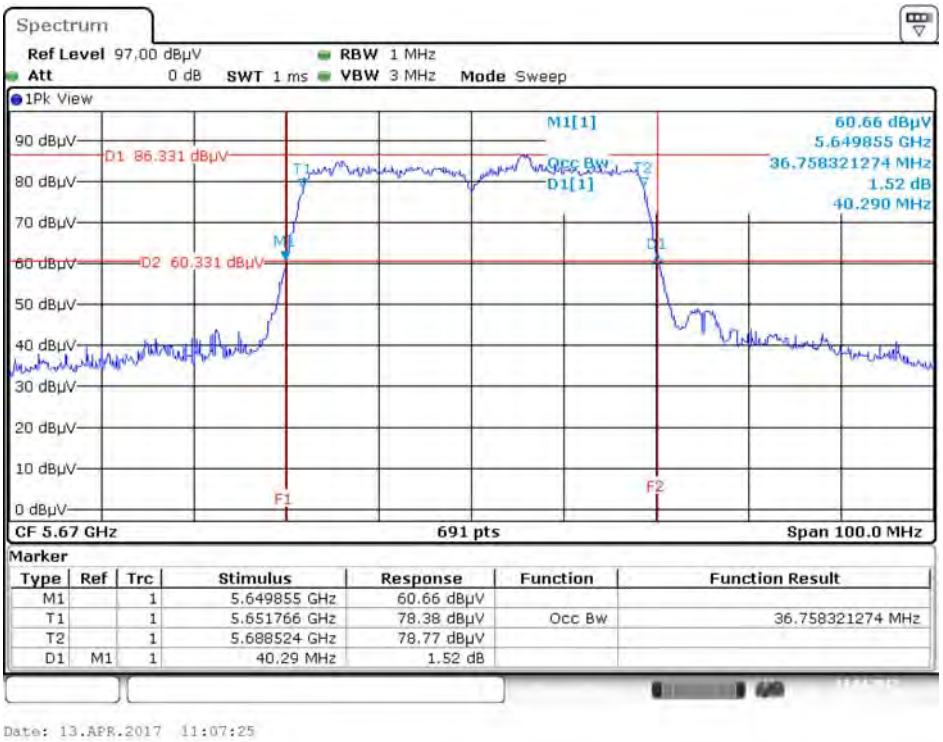
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5510 MHz



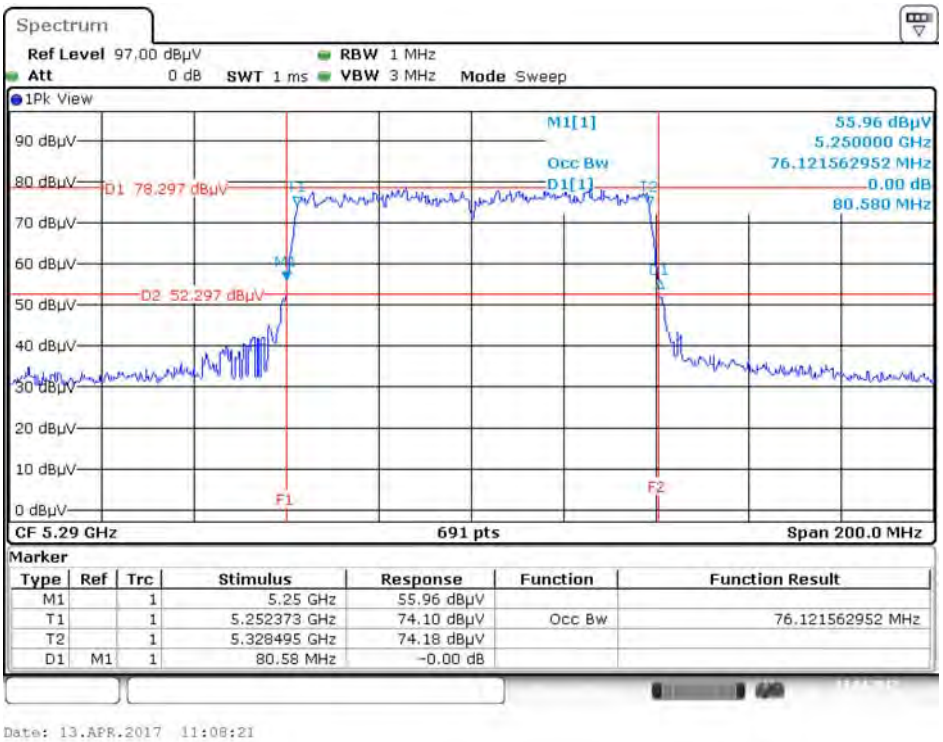
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5550 MHz



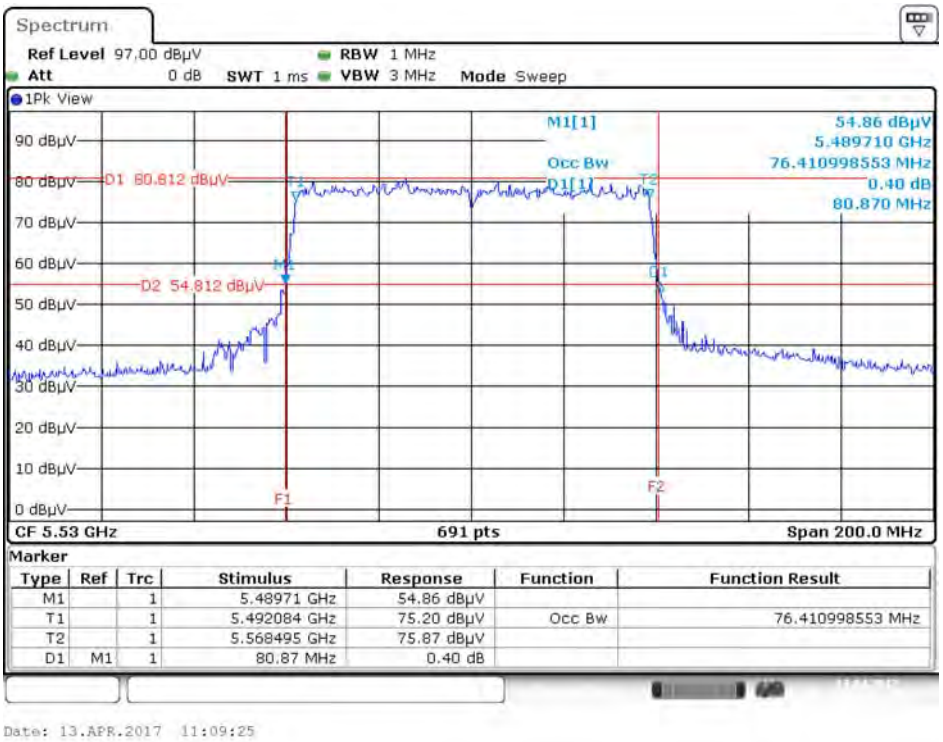
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



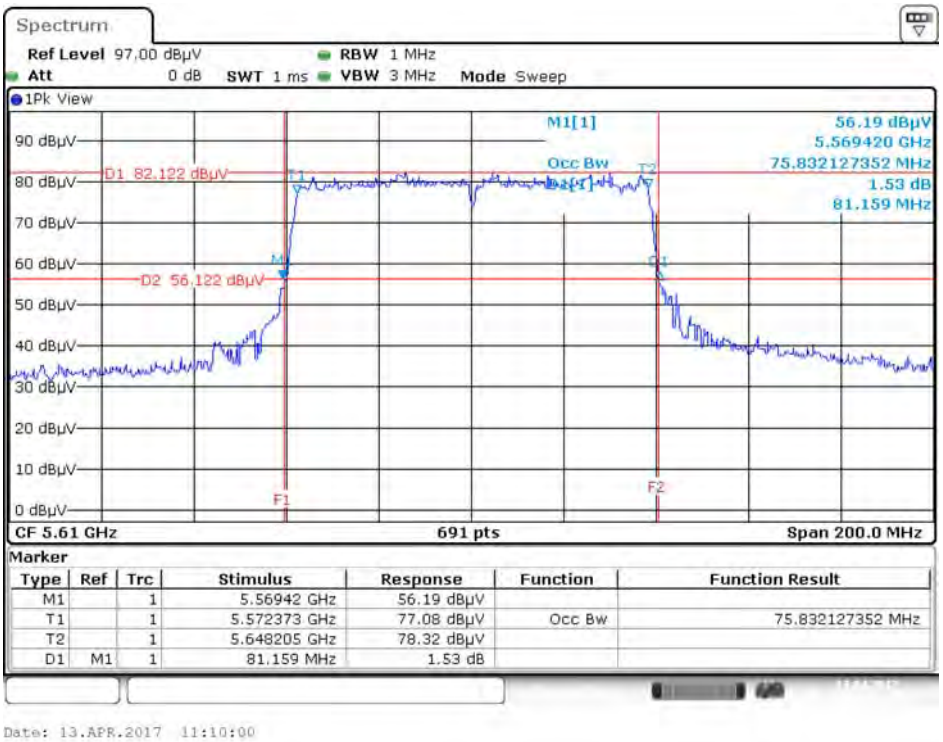
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5290 MHz



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



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



4.2. Maximum Conducted Output Power Measurement

4.2.1. 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	

4.2.2. Measuring Instruments and Setting

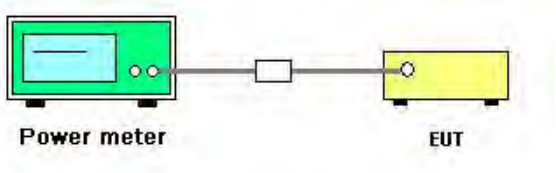
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.2.3. Test Procedures

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

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	26°C	Humidity	55%
Test Engineer	Peter Wu	Test Date	Apr. 12, 2017~Apr. 13, 2017

For non-beamforming mode:

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11a	5260 MHz	14.91	15.24	14.97	15.14	21.09	23.98	Complies
	5300 MHz	15.13	15.07	14.59	14.99	20.97	23.98	Complies
	5320 MHz	15.04	14.91	14.77	14.94	20.94	23.98	Complies
	5500 MHz	15.01	15.12	14.98	15.09	21.07	23.98	Complies
	5580 MHz	14.86	15.25	14.71	15.02	20.99	23.98	Complies
	5700 MHz	14.79	15.39	14.68	15.05	21.01	23.98	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	15.03	15.17	14.76	15.12	21.04	23.98	Complies
	5300 MHz	15.07	15.21	14.68	15.02	21.02	23.98	Complies
	5320 MHz	15.11	15.26	14.73	15.09	21.07	23.98	Complies
	5500 MHz	15.02	15.19	14.67	15.05	21.01	23.98	Complies
	5580 MHz	14.98	15.43	14.69	15.18	21.10	23.98	Complies
	5700 MHz	14.81	15.29	14.75	15.11	21.02	23.98	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	17.94	18.18	17.28	17.96	23.87	23.98	Complies
	5310 MHz	13.24	13.39	12.25	13.49	19.14	23.98	Complies
	5510 MHz	17.41	17.70	16.65	17.66	23.40	23.98	Complies
	5550 MHz	18.01	18.08	17.18	18.11	23.88	23.98	Complies
	5670 MHz	17.88	18.14	17.08	18.01	23.82	23.98	Complies
802.11ac MCS0/Nss1 VHT80	5290 MHz	11.62	12.32	11.08	11.64	17.71	23.98	Complies
	5530 MHz	14.41	14.90	13.14	14.06	20.19	23.98	Complies
	5610 MHz	17.74	18.16	17.12	18.07	23.81	23.98	Complies

802.11ac MCS0/Nss1 VHT80+80

Type	Frequency	Conducted Power (dBm)						Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total	Band Total		
1	5210 MHz	-	-	16.87	18.31	20.66	-	30.00	Complies
	5290 MHz	18.66	18.78	-	-	21.73	-	23.98	Complies
2	5530 MHz	-	-	15.89	16.42	19.17	22.85	23.98	Complies
	5610 MHz	16.91	17.86	-	-	20.42			

For beamforming mode:

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	5260 MHz	14.75	14.91	14.51	14.83	20.77	20.96	Complies
	5300 MHz	14.82	14.95	14.43	14.75	20.76	20.96	Complies
	5320 MHz	14.81	14.98	14.48	14.79	20.79	20.96	Complies
	5500 MHz	14.76	14.96	14.42	14.77	20.75	20.96	Complies
	5580 MHz	14.71	15.08	14.45	14.89	20.81	20.96	Complies
	5700 MHz	13.16	13.58	12.54	13.38	19.20	20.96	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	14.58	15.13	14.22	14.98	20.76	20.96	Complies
	5310 MHz	12.51	12.89	11.99	12.78	18.58	20.96	Complies
	5510 MHz	14.63	15.39	14.74	14.66	20.89	20.96	Complies
	5550 MHz	14.68	15.01	14.90	14.97	20.91	20.96	Complies
	5670 MHz	14.36	14.96	15.05	14.96	20.86	20.96	Complies
802.11ac MCS0/Nss1 VHT80	5290 MHz	11.62	12.32	11.08	11.64	17.71	20.96	Complies
	5530 MHz	14.10	14.56	14.56	14.27	20.40	20.96	Complies
	5610 MHz	14.44	15.48	14.92	14.60	20.90	20.96	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi >6dBi, so limit=23.98 – (9.02 – 6)=20.96dBm.

4.3. Power Spectral Density Measurement

4.3.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.2.1.

Frequency Band		Limit
☒	5.25-5.35 GHz	11 dBm/MHz
☒	5.470-5.725 GHz	11 dBm/MHz

4.3.2. Measuring Instruments and Setting

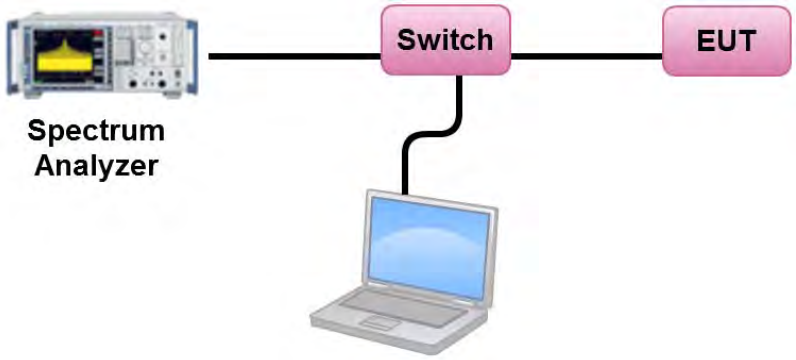
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.	

4.3.3. Test Procedures

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

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	26°C	Humidity	55%
Test Engineer	Peter Wu	Test Date	Apr. 12, 2017~Apr. 13, 2017

For non-beamforming mode:

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	7.91	7.98	Complies
60	5300 MHz	7.82	7.98	Complies
64	5320 MHz	7.78	7.98	Complies
100	5500 MHz	7.90	7.98	Complies
116	5580 MHz	7.86	7.98	Complies
140	5700 MHz	7.85	7.98	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi >6dBi, so limit=11 – (9.02 – 6)=7.98dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	7.87	7.98	Complies
60	5300 MHz	7.85	7.98	Complies
64	5320 MHz	7.88	7.98	Complies
100	5500 MHz	7.83	7.98	Complies
116	5580 MHz	7.92	7.98	Complies
140	5700 MHz	7.84	7.98	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi >6dBi, so limit=11 – (9.02 – 6)=7.98dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
54	5270 MHz	7.72	7.98	Complies
62	5310 MHz	2.98	7.98	Complies
102	5510 MHz	7.29	7.98	Complies
110	5550 MHz	7.72	7.98	Complies
134	5670 MHz	7.66	7.98	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi >6dBi, so limit=11 – (9.02 – 6)=7.98dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
58	5290 MHz	-1.43	7.98	Complies
106	5530 MHz	1.04	7.98	Complies
122	5610 MHz	4.71	7.98	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi >6dBi, so limit=11 – (9.02 – 6)=7.98dBm/MHz.

802.11ac MCS0/Nss1 VHT80+80

Type	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
1	5210 MHz	1.55	13.98	Complies
	5290 MHz	2.63	7.98	Complies
2	5530 MHz	0.06	7.98	Complies
	5610 MHz	1.26	7.98	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi >6dBi.

5210 MHz limit=17 – (9.02 – 6)=13.98dBm/MHz.

5290 MHz, 5530 MHz and 5610 MHz limit=11 – (9.02 – 6)=7.98dBm/MHz.

For beamforming mode:

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	7.61	7.98	Complies
60	5300 MHz	7.59	7.98	Complies
64	5320 MHz	7.62	7.98	Complies
100	5500 MHz	7.58	7.98	Complies
116	5580 MHz	7.69	7.98	Complies
140	5700 MHz	6.08	7.98	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi >6dBi, so limit=11 – (9.02 – 6)=7.98dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
54	5270 MHz	4.63	7.98	Complies
62	5310 MHz	2.47	7.98	Complies
102	5510 MHz	4.79	7.98	Complies
110	5550 MHz	4.76	7.98	Complies
134	5670 MHz	4.75	7.98	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi >6dBi, so limit=11 – (9.02 – 6)=7.98dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
58	5290 MHz	-1.43	7.98	Complies
106	5530 MHz	1.30	7.98	Complies
122	5610 MHz	1.81	7.98	Complies

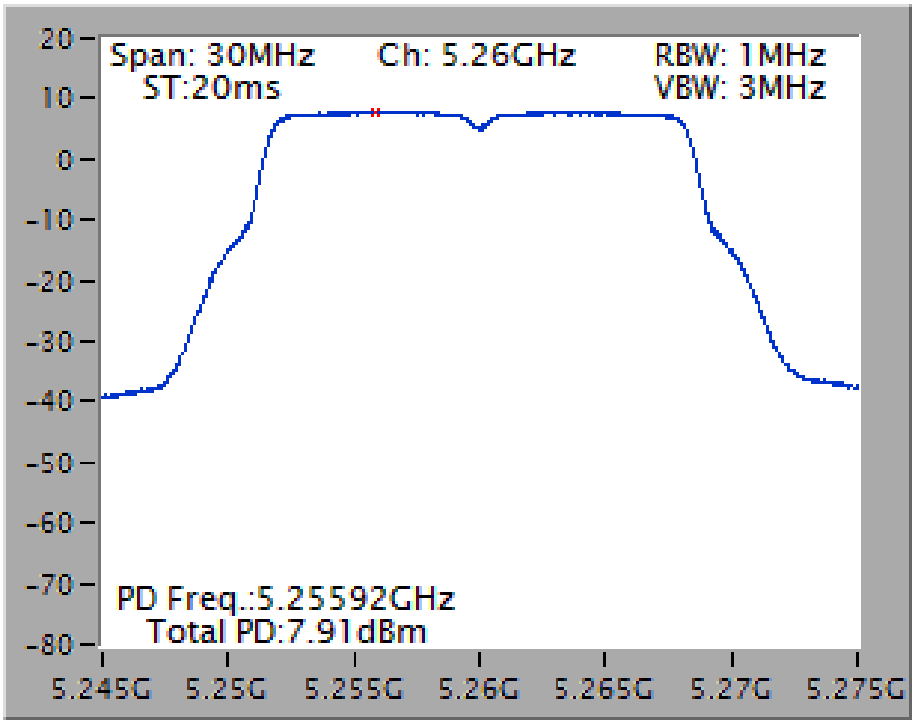
Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi >6dBi, so limit=11 – (9.02 – 6)=7.98dBm/MHz.

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

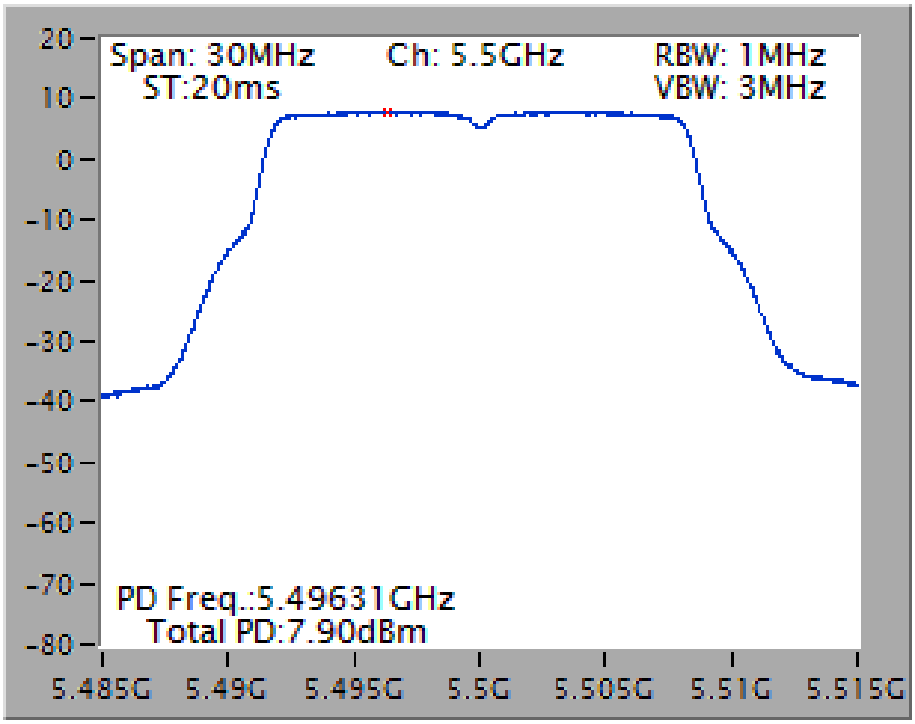
For plots, only the channel with worse result was shown.

For non-beamforming mode:

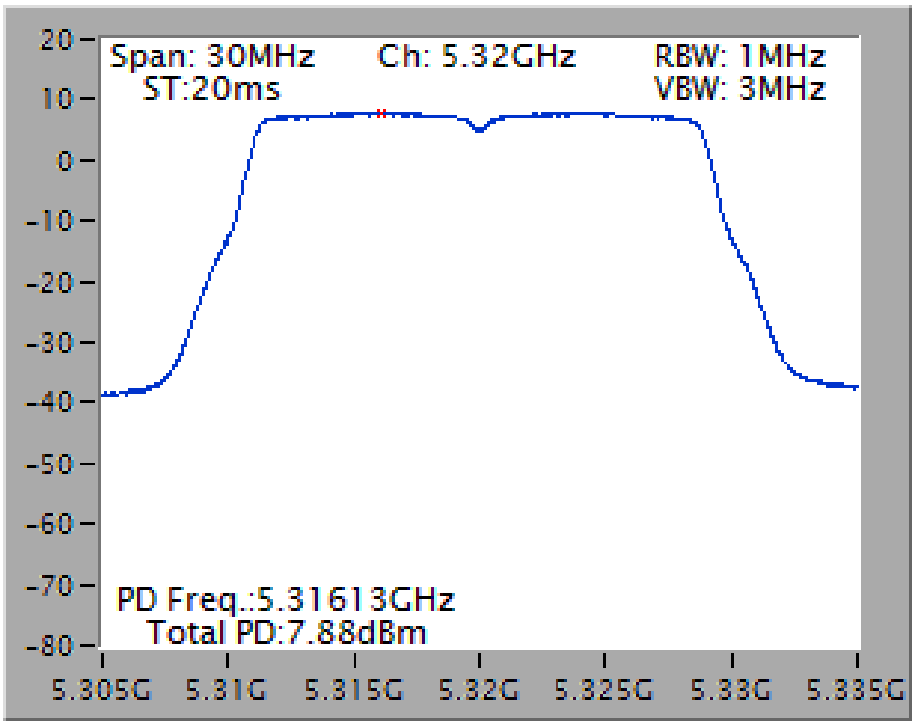
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5260 MHz



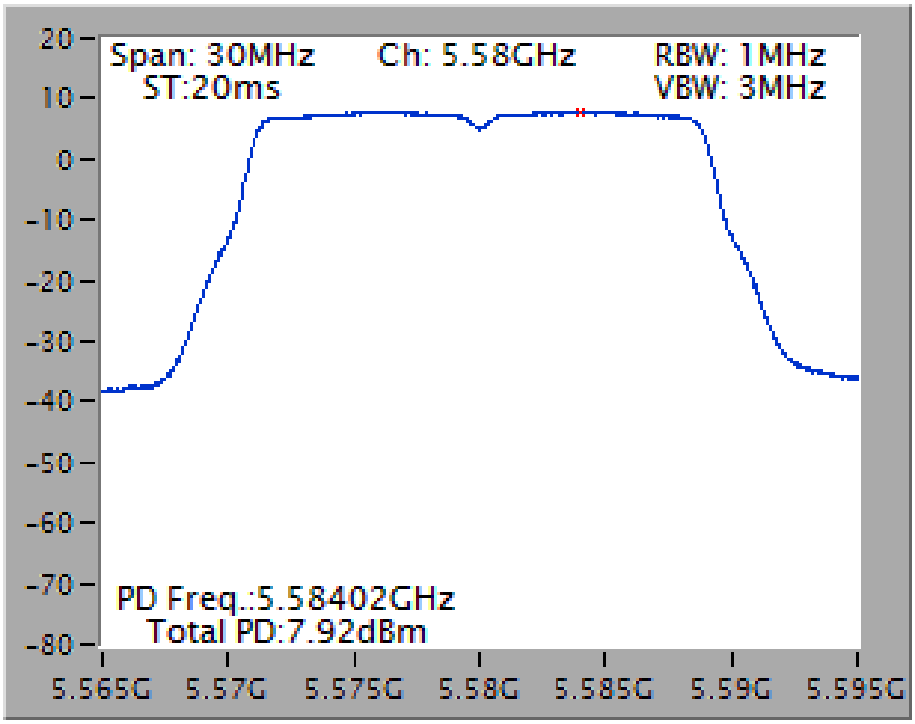
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5500 MHz



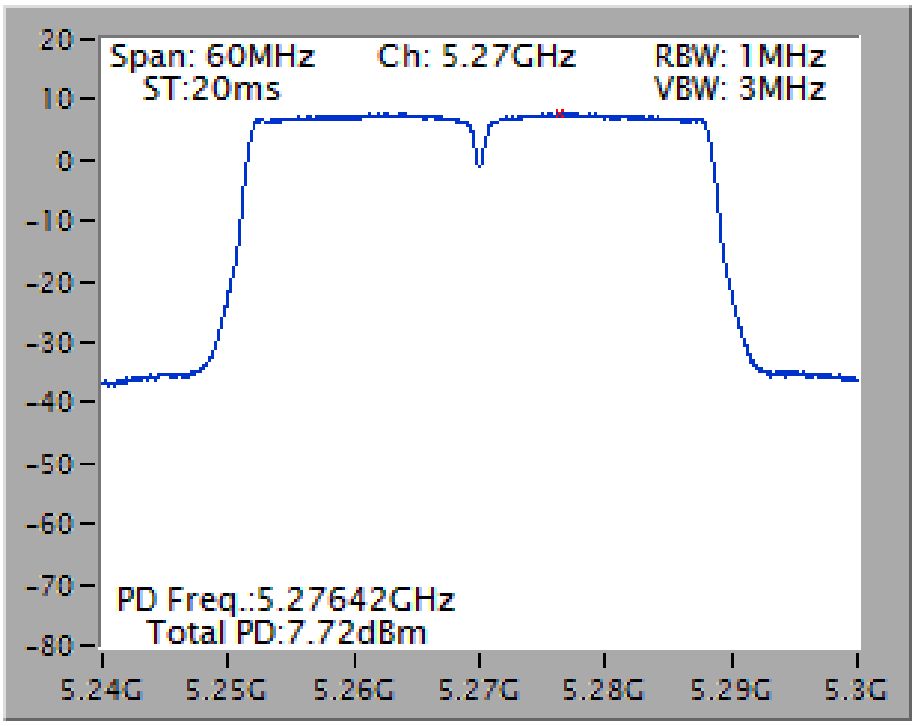
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5320 MHz



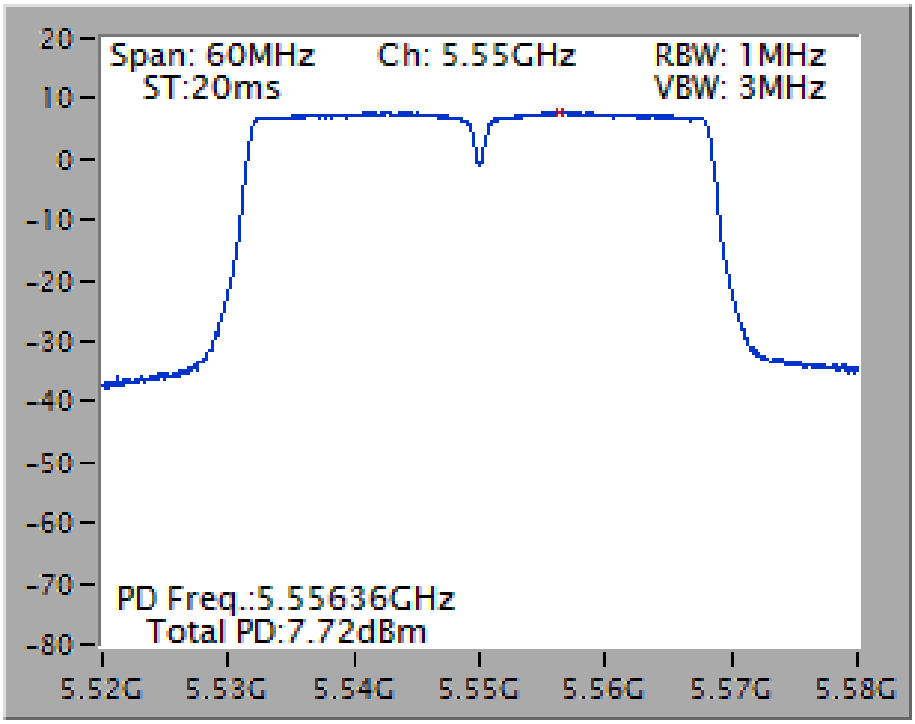
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



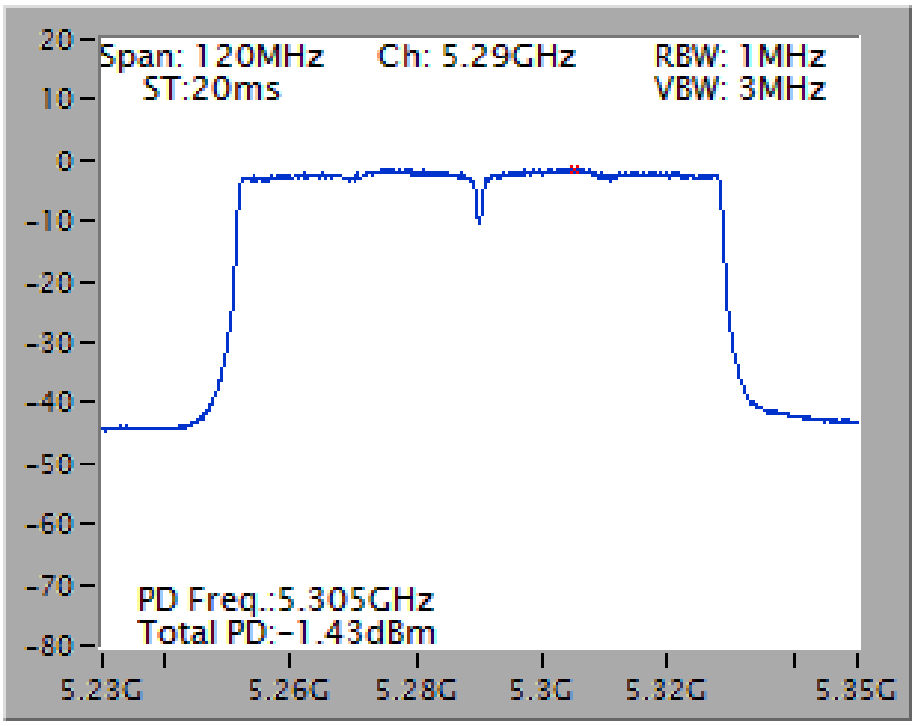
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5270 MHz



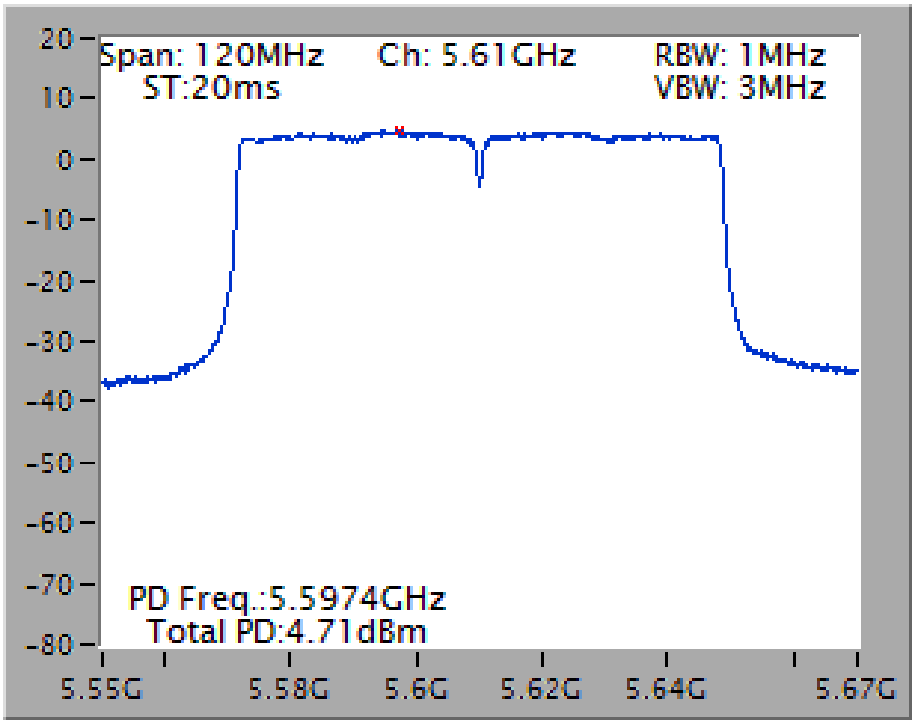
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5550 MHz



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



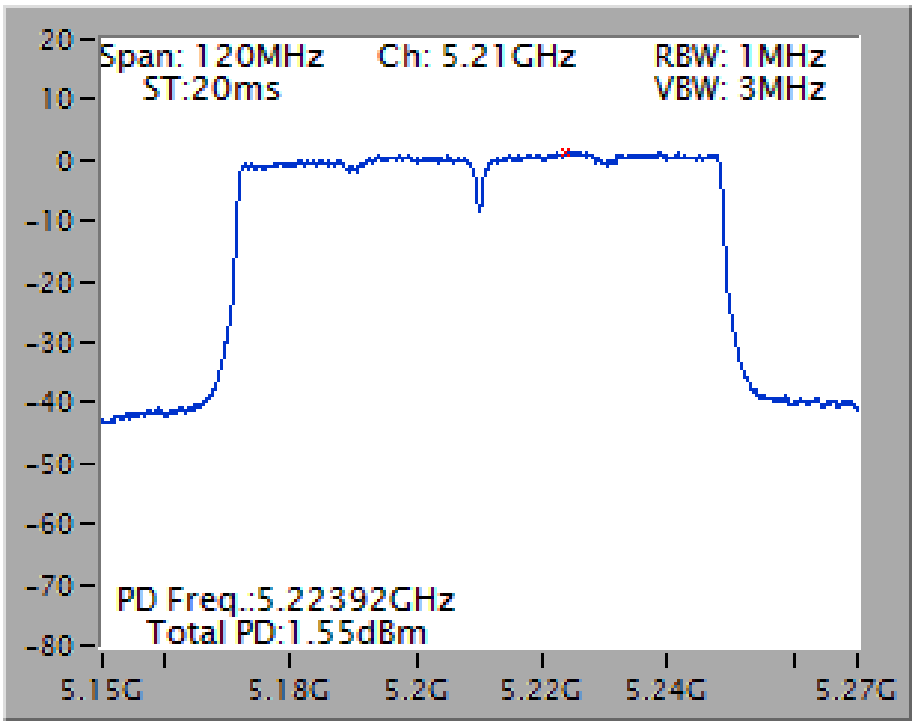
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5610 MHz



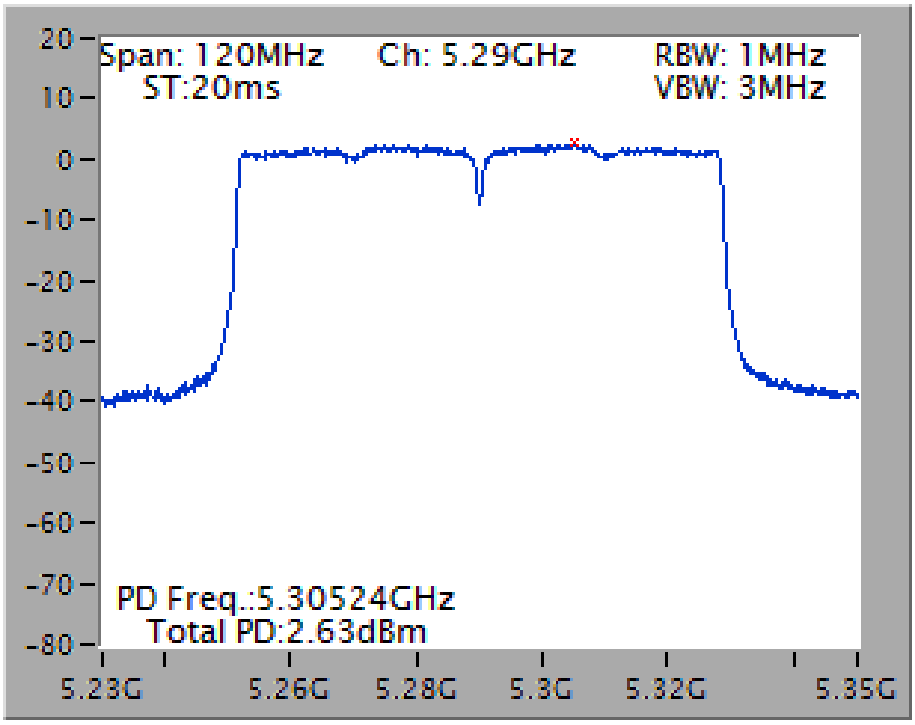
802.11ac MCS0/Nss1 VHT80+80

Type 1

Power Density Plot on Chain 3 + Chain 4 / 5210 MHz

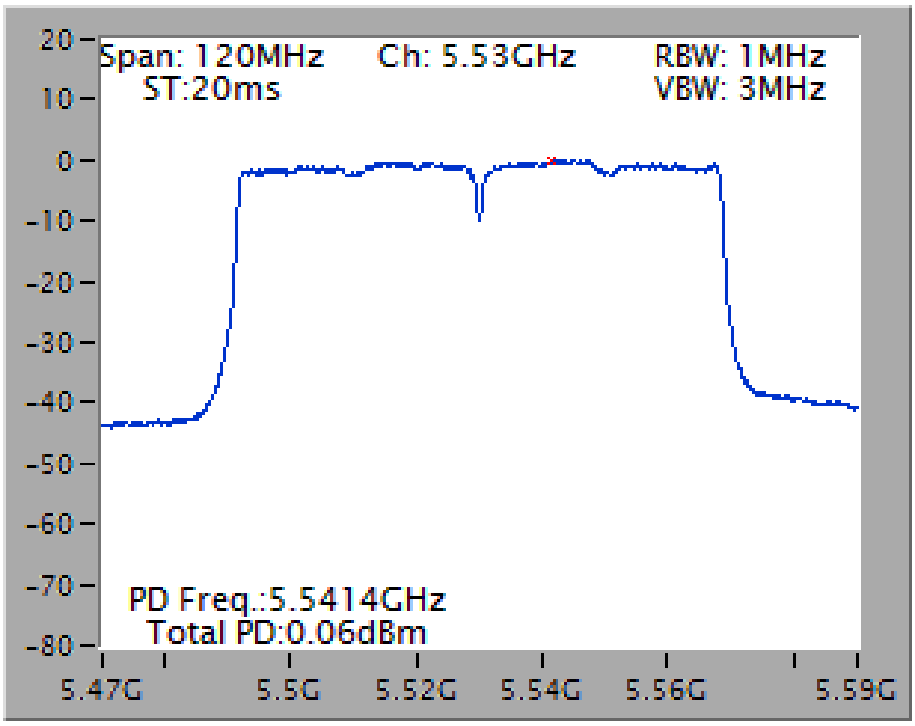


Power Density Plot on Chain 1 + Chain 2 / 5290 MHz

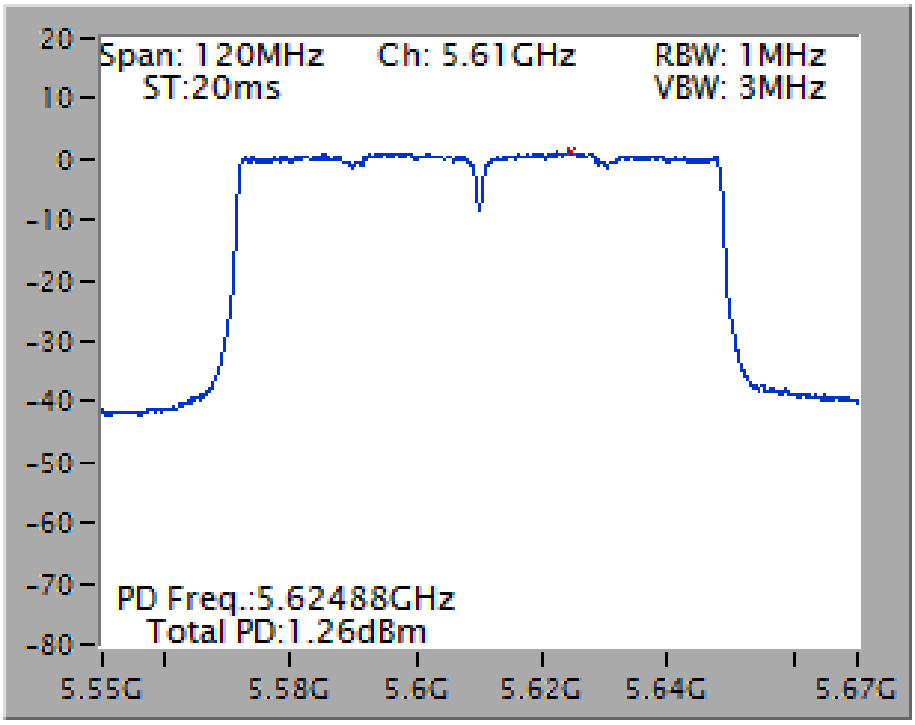


Type 2

Power Density Plot on Chain 3 + Chain 4 / 5530 MHz

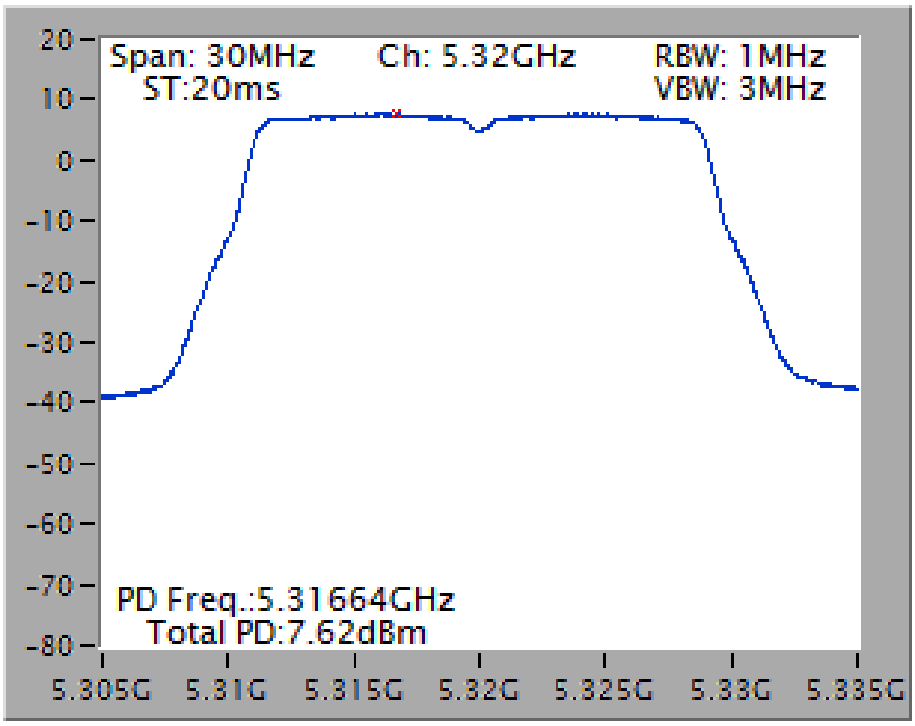


Power Density Plot on Chain 1 + Chain 2 / 5610 MHz

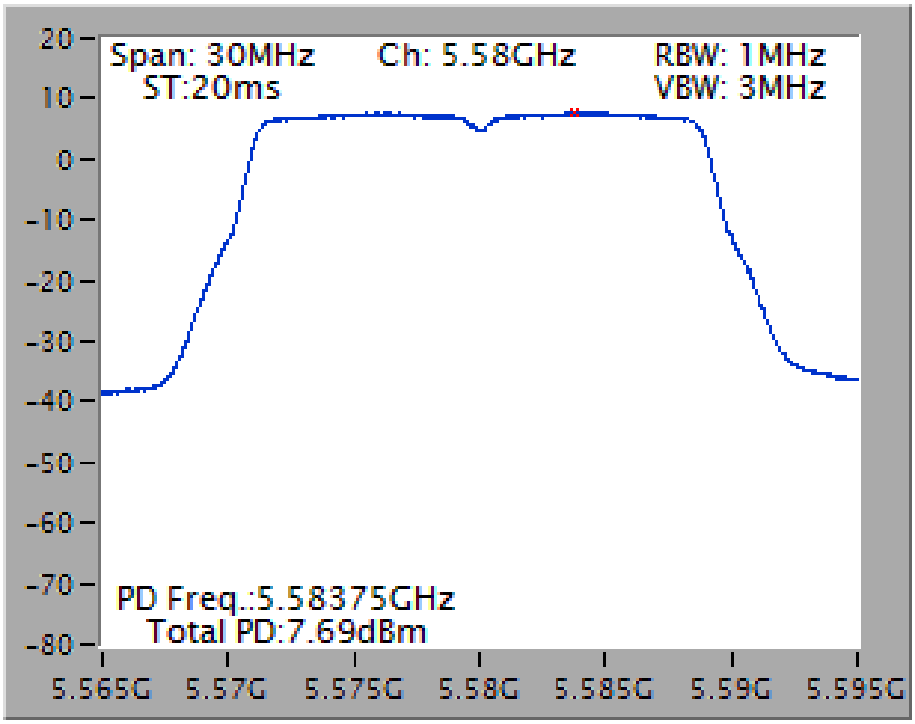


For beamforming mode:

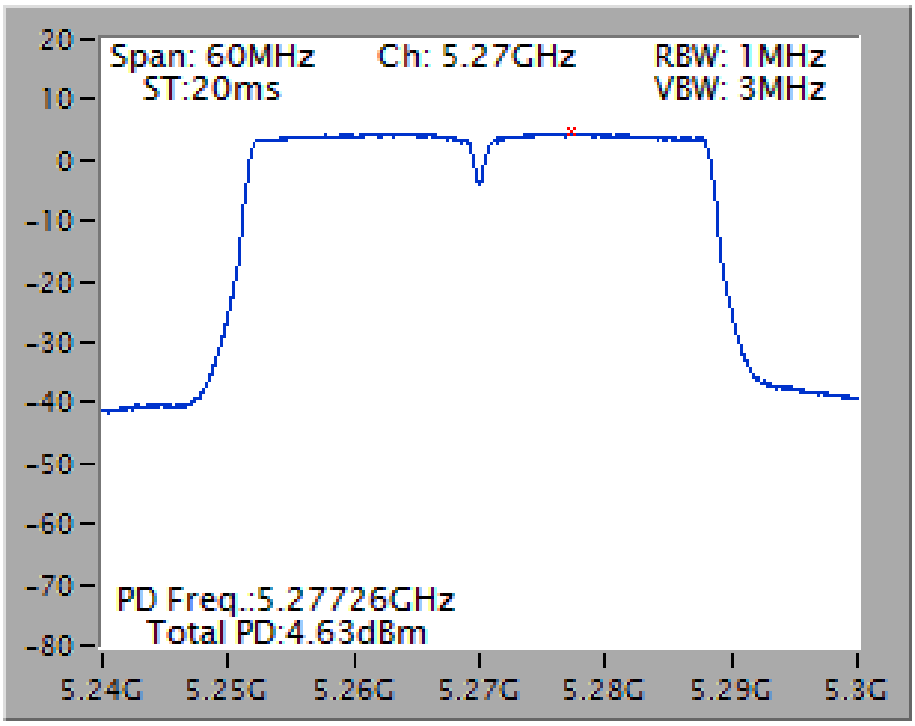
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5320 MHz



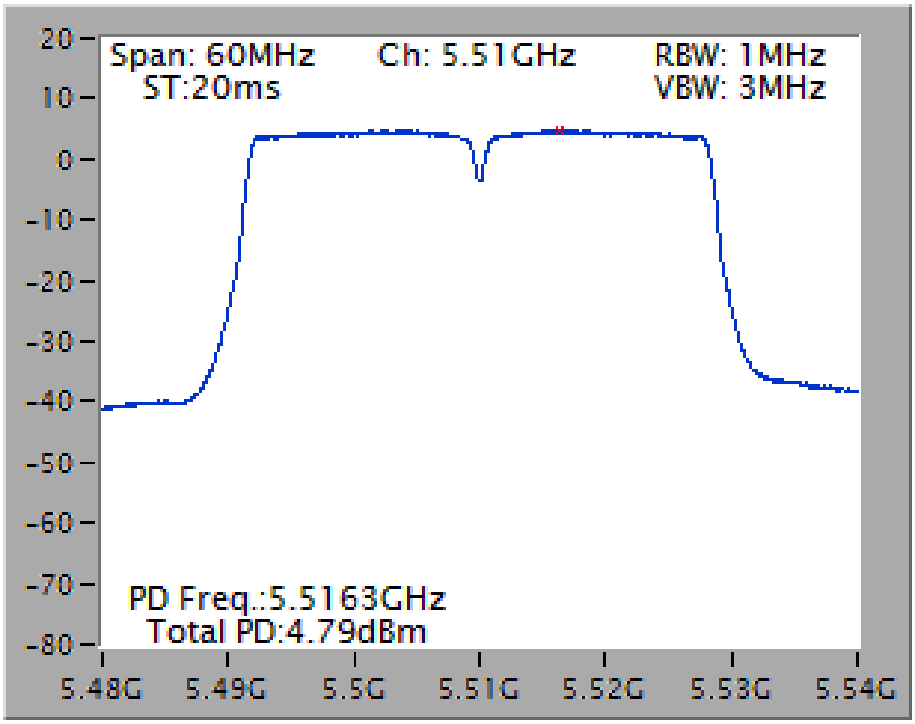
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



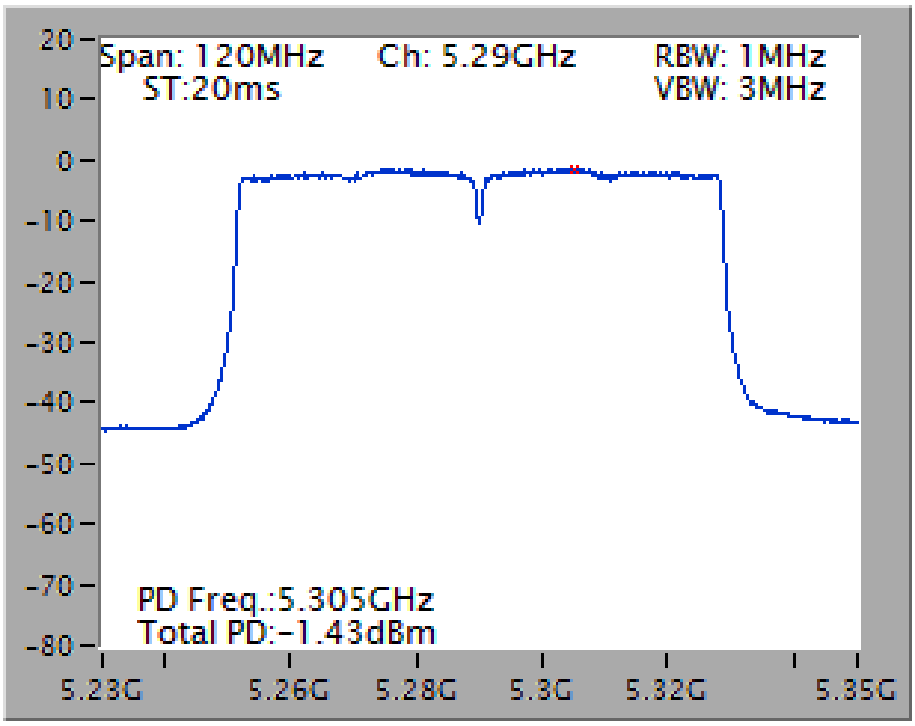
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5270 MHz



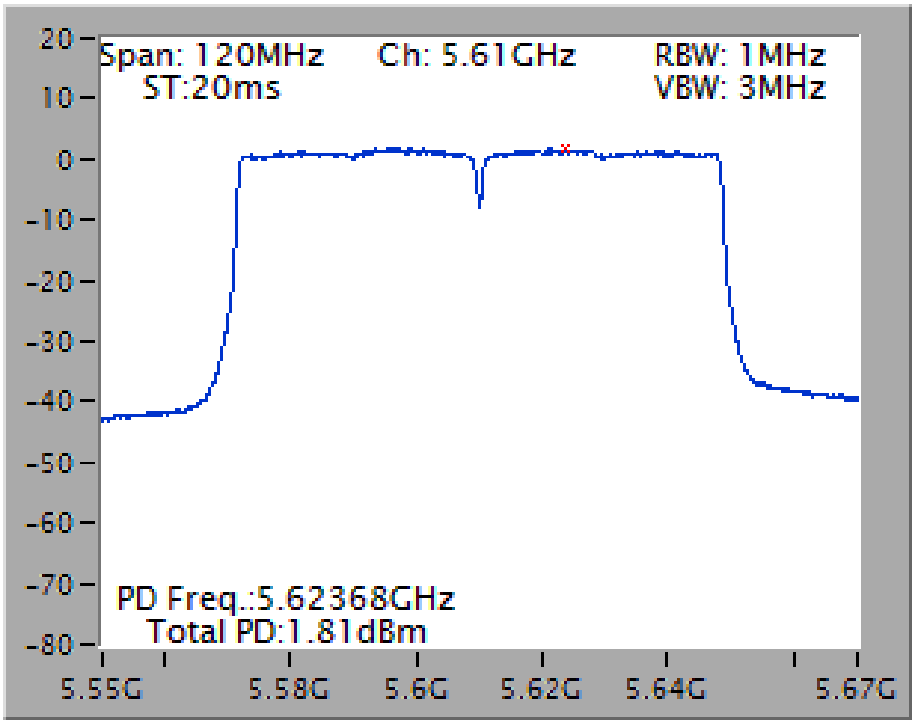
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5510 MHz



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



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



4.4. Radiated Emissions Measurement

4.4.1. 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 15.205(a), then the 15.209(a) 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

4.4.2. Measuring Instruments and Setting

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

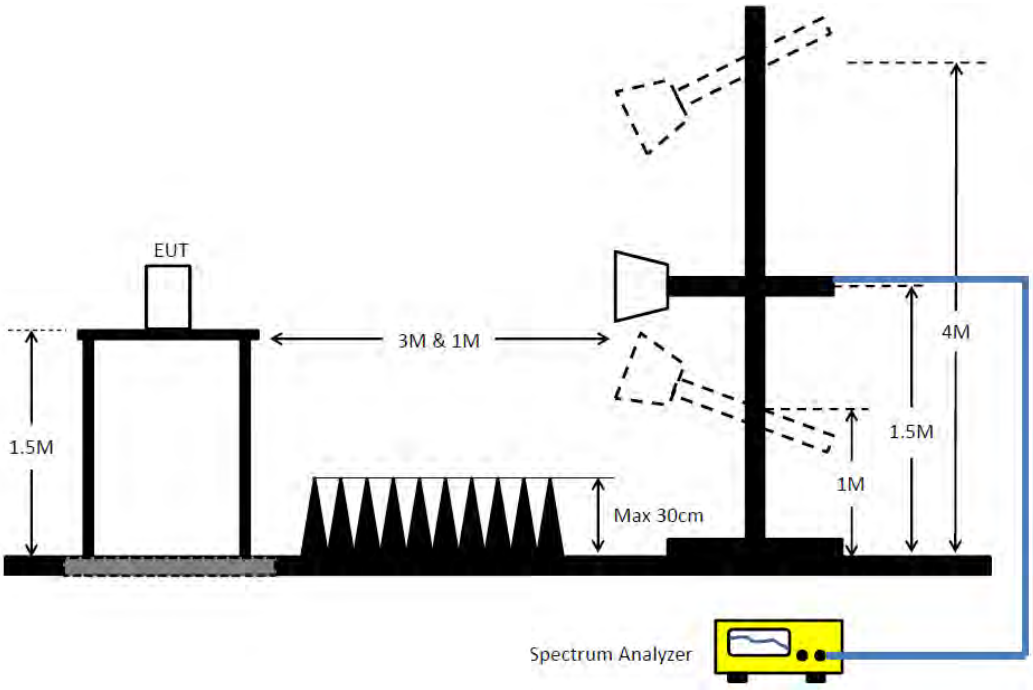
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 3MHz for peak

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

4.4.3. Test Procedures

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

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

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

For non-beamforming mode:

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11a CH 52 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	15790.68	62.22	74.00	-11.78	44.18	15.30	37.64	34.90	145	35	Peak	HORIZONTAL
2	15792.90	49.90	54.00	-4.10	31.86	15.30	37.64	34.90	145	35	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	15793.50	50.24	54.00	-3.76	32.20	15.30	37.64	34.90	150	121	Average	VERTICAL
2	15794.22	59.48	74.00	-14.52	41.44	15.30	37.64	34.90	150	121	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11a CH 60 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	15908.46	63.39	74.00	-10.61	45.52	15.36	37.42	34.91	148	155	Peak	HORIZONTAL
2	15910.86	50.78	54.00	-3.22	32.91	15.36	37.42	34.91	148	155	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	15889.02	50.76	54.00	-3.24	32.89	15.36	37.42	34.91	122	51	Average	VERTICAL
2	15908.10	64.31	74.00	-9.69	46.44	15.36	37.42	34.91	122	51	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11a CH 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	15947.34	49.55	54.00	-4.45	31.77	15.38	37.31	34.91	161	330	Average	HORIZONTAL
2	15962.46	57.92	74.00	-16.08	40.14	15.38	37.31	34.91	161	330	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	15947.28	50.32	54.00	-3.68	32.54	15.38	37.31	34.91	176	112	Average	VERTICAL
2	15957.66	62.78	74.00	-11.22	45.00	15.38	37.31	34.91	176	112	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11a CH 100 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	10998.32	55.55	74.00	-18.45	36.95	12.66	40.30	34.36	114	211	Peak	HORIZONTAL
2	11002.64	46.32	54.00	-7.68	27.72	12.66	40.30	34.36	114	211	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	10995.98	46.15	54.00	-7.85	27.60	12.64	40.27	34.36	169	251	Average	VERTICAL
2	11003.60	55.81	74.00	-18.19	37.21	12.66	40.30	34.36	169	251	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11a CH 116 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	11146.74	45.87	54.00	-8.13	27.37	12.72	40.22	34.44	174	298	Average	HORIZONTAL
2	11157.84	59.16	74.00	-14.84	40.66	12.74	40.20	34.44	174	298	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	11148.06	46.06	54.00	-7.94	27.56	12.72	40.22	34.44	152	220	Average	VERTICAL
2	11151.48	58.26	74.00	-15.74	39.76	12.72	40.22	34.44	152	220	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11a CH 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	11389.14	45.95	54.00	-8.05	27.60	12.86	40.06	34.57	137	90	Average	HORIZONTAL
2	11391.72	59.11	74.00	-14.89	40.76	12.86	40.06	34.57	137	90	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	11387.76	45.94	54.00	-8.06	27.59	12.86	40.06	34.57	192	100	Average	VERTICAL
2	11403.84	58.21	74.00	-15.79	39.88	12.86	40.06	34.59	192	100	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	15766.08	63.13	74.00	-10.87	45.00	15.28	37.75	34.90	163	77	Peak	HORIZONTAL
2	15774.54	50.63	54.00	-3.37	32.50	15.28	37.75	34.90	163	77	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	15774.90	63.80	74.00	-10.20	45.67	15.28	37.75	34.90	154	105	Peak	VERTICAL
2	15776.16	50.30	54.00	-3.70	32.17	15.28	37.75	34.90	154	105	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	15890.40	49.91	54.00	-4.09	32.04	15.36	37.42	34.91	150	32	Average	HORIZONTAL
2	15895.86	63.26	74.00	-10.74	45.39	15.36	37.42	34.91	150	32	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	15906.72	50.33	54.00	-3.67	32.46	15.36	37.42	34.91	170	213	Average	VERTICAL
2	15909.96	62.51	74.00	-11.49	44.64	15.36	37.42	34.91	170	213	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	15951.18	49.04	54.00	-4.96	31.26	15.38	37.31	34.91	159	188	Average	HORIZONTAL
2	15970.68	58.89	74.00	-15.11	41.19	15.41	37.20	34.91	159	188	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	15945.24	48.90	54.00	-5.10	31.12	15.38	37.31	34.91	131	15	Average	VERTICAL
2	15945.36	56.70	74.00	-17.30	38.92	15.38	37.31	34.91	131	15	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	10988.30	46.31	54.00	-7.69	27.72	12.64	40.27	34.32	127	36	Average	HORIZONTAL
2	11008.76	56.61	74.00	-17.39	38.01	12.66	40.30	34.36	127	36	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	10995.80	46.41	54.00	-7.59	27.86	12.64	40.27	34.36	184	55	Average	VERTICAL
2	11005.22	55.81	74.00	-18.19	37.21	12.66	40.30	34.36	184	55	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	11145.00	45.21	54.00	-8.79	26.71	12.72	40.22	34.44	192	185	Average	HORIZONTAL
2	11159.40	53.71	74.00	-20.29	35.21	12.74	40.20	34.44	192	185	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	11147.46	45.10	54.00	-8.90	26.60	12.72	40.22	34.44	140	342	Average	VERTICAL
2	11162.82	53.95	74.00	-20.05	35.45	12.74	40.20	34.44	140	342	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	11392.32	45.33	54.00	-8.67	26.98	12.86	40.06	34.57	251	311	Average	HORIZONTAL
2	11394.78	54.68	74.00	-19.32	36.33	12.86	40.06	34.57	251	311	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	11392.98	54.59	74.00	-19.41	36.24	12.86	40.06	34.57	199	251	Peak	VERTICAL
2	11398.08	44.66	54.00	-9.34	26.33	12.86	40.06	34.59	199	251	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	15809.87	57.40	74.00	-16.60	39.36	15.30	37.64	34.90	143	97	Peak	HORIZONTAL
2	15810.06	49.71	54.00	-4.29	31.67	15.30	37.64	34.90	143	97	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	15809.91	49.75	54.00	-4.25	31.71	15.30	37.64	34.90	169	360	Average	VERTICAL
2	15810.15	63.02	74.00	-10.98	44.98	15.30	37.64	34.90	169	360	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	15929.85	58.49	74.00	-15.51	40.71	15.38	37.31	34.91	163	33	Peak	HORIZONTAL
2	15929.94	48.88	54.00	-5.12	31.10	15.38	37.31	34.91	163	33	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	15929.87	56.97	74.00	-17.03	39.19	15.38	37.31	34.91	151	36	Peak	VERTICAL
2	15930.13	48.85	54.00	-5.15	31.07	15.38	37.31	34.91	161	36	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	11019.97	45.17	54.00	-8.83	26.57	12.66	40.30	34.36	230	185	Average	HORIZONTAL
2	11020.12	55.30	74.00	-18.70	36.70	12.66	40.30	34.36	230	185	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	11020.02	45.65	54.00	-8.35	27.05	12.66	40.30	34.36	248	223	Average	VERTICAL
2	11020.02	54.37	74.00	-19.63	35.77	12.66	40.30	34.36	248	223	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	11089.02	45.82	54.00	-8.18	27.27	12.69	40.26	34.40	200	324	Average	HORIZONTAL
2	11093.58	58.09	74.00	-15.91	39.54	12.71	40.24	34.40	200	324	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	11086.38	59.64	74.00	-14.36	41.09	12.69	40.26	34.40	212	111	Peak	VERTICAL
2	11113.74	45.72	54.00	-8.28	27.19	12.71	40.24	34.42	212	111	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	11333.40	51.97	74.00	-22.03	33.60	12.82	40.10	34.55	176	92	Peak	HORIZONTAL
2	11354.04	44.67	54.00	-9.33	26.30	12.84	40.08	34.55	176	92	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	11340.66	44.43	54.00	-9.57	26.06	12.82	40.10	34.55	237	119	Average	VERTICAL
2	11353.92	52.83	74.00	-21.17	34.46	12.84	40.08	34.55	237	119	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	15864.90	48.22	54.00	-5.78	30.26	15.33	37.53	34.90	166	58	Average	HORIZONTAL
2	15874.92	56.37	74.00	-17.63	38.50	15.36	37.42	34.91	166	58	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	15874.86	48.84	54.00	-5.16	30.97	15.36	37.42	34.91	197	188	Average	VERTICAL
2	15880.62	56.48	74.00	-17.52	38.61	15.36	37.42	34.91	197	188	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	11048.18	45.06	54.00	-8.94	26.49	12.67	40.28	34.38	240	195	Average	HORIZONTAL
2	11069.78	55.15	74.00	-18.85	36.60	12.69	40.26	34.40	240	195	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	11060.54	44.96	54.00	-9.04	26.39	12.69	40.26	34.38	158	37	Average	VERTICAL
2	11072.84	54.29	74.00	-19.71	35.74	12.69	40.26	34.40	158	37	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 122 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 11, 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	11223.84	53.60	74.00	-20.40	35.15	12.77	40.16	34.48	177	91	Peak	HORIZONTAL
2	11227.62	44.07	54.00	-9.93	25.62	12.77	40.16	34.48	177	91	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	11216.58	54.99	74.00	-19.01	36.53	12.76	40.18	34.48	155	198	Peak	VERTICAL
2	11222.28	43.97	54.00	-10.03	25.52	12.77	40.16	34.48	155	198	Average	VERTICAL

802.11ac MCS0/Nss1 VHT80+80

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80+80 Type 1 / CH 42+58 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 12, 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	15861.72	63.74	74.00	-10.26	45.78	15.33	37.53	34.90	149	231	Peak	HORIZONTAL
2	15863.58	48.04	54.00	-5.96	30.08	15.33	37.53	34.90	149	231	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	15856.14	62.37	74.00	-11.63	44.41	15.33	37.53	34.90	168	112	Peak	VERTICAL
2	15864.78	48.62	54.00	-5.38	30.66	15.33	37.53	34.90	168	112	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80+80 Type 2 / CH 106+122 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 12, 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	11052.02	45.74	54.00	-8.26	27.17	12.67	40.28	34.38	169	151	Average	HORIZONTAL
2	11064.26	52.93	74.00	-21.07	34.36	12.69	40.26	34.38	169	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	11055.62	55.05	74.00	-18.95	36.48	12.67	40.28	34.38	172	59	Peak	VERTICAL
2	11071.52	45.37	54.00	-8.63	26.82	12.69	40.26	34.40	172	59	Average	VERTICAL

For beamforming mode:

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 12, 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	15782.16	44.32	54.00	-9.68	31.13	9.55	38.55	34.91	154	158	Average	HORIZONTAL
2	15787.04	58.44	74.00	-15.56	45.25	9.55	38.55	34.91	154	158	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	15776.64	57.55	74.00	-16.45	44.40	9.54	38.52	34.91	168	221	Peak	VERTICAL
2	15780.52	44.63	54.00	-9.37	31.48	9.54	38.52	34.91	168	221	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 12, 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	10601.22	60.93	74.00	-13.07	49.45	8.03	38.38	34.93	125	12	Peak	HORIZONTAL
2	10601.34	45.85	54.00	-8.15	34.37	8.03	38.38	34.93	125	12	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	10600.58	49.79	54.00	-4.21	38.31	8.03	38.38	34.93	126	100	Average	VERTICAL
2	10606.54	61.76	74.00	-12.24	50.26	8.03	38.38	34.91	126	100	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 12, 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	10635.64	53.35	74.00	-20.65	41.84	8.04	38.38	34.91	124	254	Peak	HORIZONTAL
2	10636.86	39.16	54.00	-14.84	27.65	8.04	38.38	34.91	124	254	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	10637.22	39.83	54.00	-14.17	28.32	8.04	38.38	34.91	145	214	Average	VERTICAL
2	10638.48	53.30	74.00	-20.70	41.76	8.04	38.38	34.88	145	214	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 12, 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	11001.44	40.05	54.00	-13.95	28.25	8.14	38.30	34.64	167	211	Average	HORIZONTAL
2	11002.94	52.67	74.00	-21.33	40.87	8.14	38.30	34.64	167	211	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	10996.56	52.23	74.00	-21.77	40.43	8.14	38.30	34.64	191	230	Peak	VERTICAL
2	11002.74	40.44	54.00	-13.56	28.64	8.14	38.30	34.64	191	230	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 12, 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	11158.58	38.95	54.00	-15.05	26.99	8.19	38.40	34.63	166	21	Average	HORIZONTAL
2	11161.16	50.42	74.00	-23.58	38.46	8.19	38.40	34.63	166	21	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	11161.98	50.40	74.00	-23.60	38.44	8.19	38.40	34.63	140	254	Peak	VERTICAL
2	11164.40	38.96	54.00	-15.04	27.00	8.19	38.40	34.63	140	254	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 12, 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	11401.56	40.50	54.00	-13.50	28.32	8.25	38.54	34.61	182	264	Average	HORIZONTAL
2	11404.10	52.92	74.00	-21.08	40.74	8.25	38.54	34.61	182	264	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	11395.98	40.58	54.00	-13.42	28.41	8.25	38.54	34.62	177	151	Average	VERTICAL
2	11404.38	52.36	74.00	-21.64	40.18	8.25	38.54	34.61	177	151	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 12, 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	15807.30	56.38	74.00	-17.62	43.19	9.55	38.55	34.91	152	66	Peak	HORIZONTAL
2	15812.30	44.00	54.00	-10.00	30.81	9.55	38.55	34.91	152	66	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	15814.62	43.94	54.00	-10.06	30.75	9.55	38.55	34.91	130	328	Average	VERTICAL
2	15814.74	56.48	74.00	-17.52	43.29	9.55	38.55	34.91	130	328	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 12, 2017~Apr. 13, 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	15925.28	45.45	54.00	-8.55	32.23	9.60	38.66	35.04	129	38	Average	HORIZONTAL
2	15934.12	57.22	74.00	-16.78	44.00	9.60	38.66	35.04	129	38	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	15930.28	57.33	74.00	-16.67	44.11	9.60	38.66	35.04	154	360	Peak	VERTICAL
2	15931.28	45.15	54.00	-8.85	31.93	9.60	38.66	35.04	154	360	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 13, 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	11019.64	51.77	74.00	-22.23	39.97	8.14	38.30	34.64	110	51	Peak	HORIZONTAL
2	11021.28	39.96	54.00	-14.04	28.16	8.14	38.30	34.64	110	51	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	11016.36	39.95	54.00	-14.05	28.15	8.14	38.30	34.64	119	296	Average	VERTICAL
2	11018.24	53.39	74.00	-20.61	41.59	8.14	38.30	34.64	119	296	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 13, 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	11097.76	52.06	74.00	-21.94	40.17	8.17	38.36	34.64	148	315	Peak	HORIZONTAL
2	11103.48	39.70	54.00	-14.30	27.80	8.17	38.36	34.63	148	315	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	11095.52	39.62	54.00	-14.38	27.73	8.17	38.36	34.64	195	287	Average	VERTICAL
2	11095.62	52.07	74.00	-21.93	40.18	8.17	38.36	34.64	195	287	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 13, 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	11336.32	53.49	74.00	-20.51	41.38	8.23	38.50	34.62	165	356	Peak	HORIZONTAL
2	11340.74	40.54	54.00	-13.46	28.43	8.23	38.50	34.62	165	356	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	11337.28	40.57	54.00	-13.43	28.46	8.23	38.50	34.62	166	210	Average	VERTICAL
2	11340.82	52.59	74.00	-21.41	40.48	8.23	38.50	34.62	166	210	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 13, 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	15865.78	57.25	74.00	-16.75	44.04	9.57	38.59	34.95	199	321	Peak	HORIZONTAL
2	15874.80	45.24	54.00	-8.76	32.03	9.58	38.63	35.00	199	321	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	15865.28	57.33	74.00	-16.67	44.12	9.57	38.59	34.95	158	45	Peak	VERTICAL
2	15866.40	45.03	54.00	-8.97	31.82	9.57	38.59	34.95	158	45	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 13, 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	11059.70	39.71	54.00	-14.29	27.88	8.15	38.32	34.64	161	78	Average	HORIZONTAL
2	11061.76	52.08	74.00	-21.92	40.22	8.16	38.34	34.64	161	78	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	11055.22	52.29	74.00	-21.71	40.46	8.15	38.32	34.64	122	15	Peak	VERTICAL
2	11057.88	39.78	54.00	-14.22	27.95	8.15	38.32	34.64	122	15	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 122 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Apr. 13, 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	11222.60	39.88	54.00	-14.12	27.86	8.21	38.44	34.63	200	193	Average	HORIZONTAL
2	11222.98	51.88	74.00	-22.12	39.86	8.21	38.44	34.63	200	193	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	11216.92	39.97	54.00	-14.03	27.98	8.20	38.42	34.63	180	215	Average	VERTICAL
2	11223.80	51.61	74.00	-22.39	39.59	8.21	38.44	34.63	180	215	Peak	VERTICAL

Note:

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

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

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

4.5. Band Edge Emissions Measurement

4.5.1. 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 15.205(a), then the 15.209(a) 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

4.5.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	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

4.5.3. Test Procedures

The test procedure is the same as section 4.4.3.

4.5.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.4.4.

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

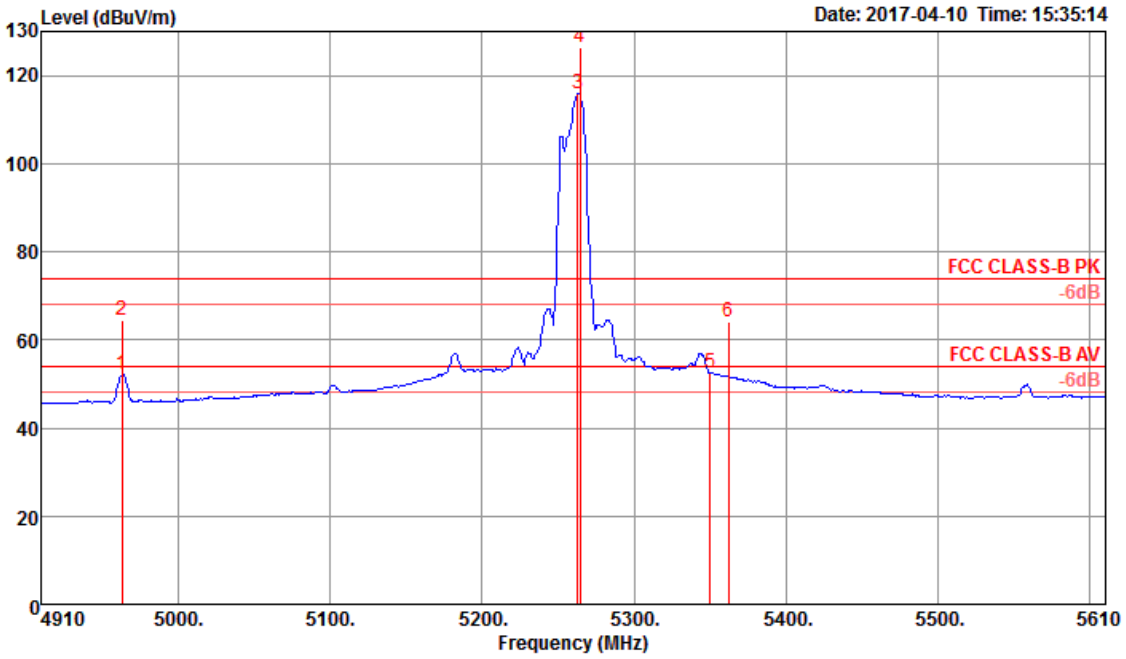
The EUT was programmed to be in beamforming transmitting mode.

4.5.7. Test Result of Band Edge and Fundamental Emissions

For non-beamforming mode:

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11a CH 52, 60, 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4

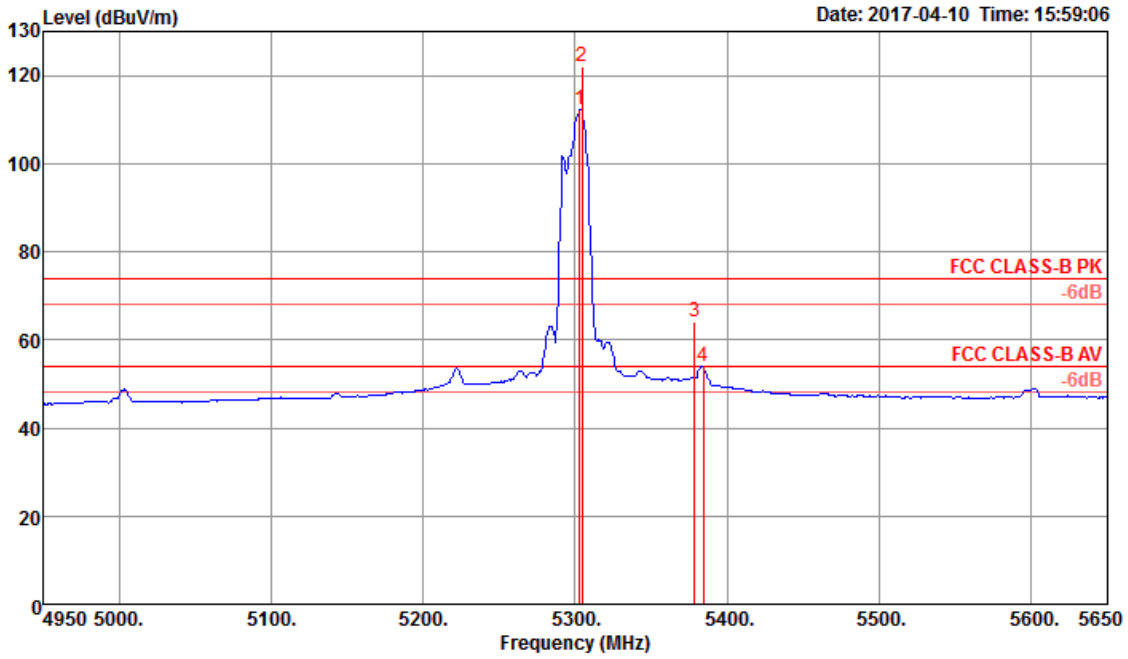
Channel 52



	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	4963.20	52.05	54.00	-1.95	48.25	5.35	32.92	34.47	204	23	Average	VERTICAL
2	4963.20	64.32	74.00	-9.68	60.52	5.35	32.92	34.47	204	23	Peak	VERTICAL
3 @	5262.80	115.94			111.41	5.52	33.49	34.48	204	23	Average	VERTICAL
4 @	5264.20	126.31			121.78	5.52	33.49	34.48	204	23	Peak	VERTICAL
5	5350.00	52.39	54.00	-1.61	47.71	5.53	33.63	34.48	204	23	Average	VERTICAL
6	5362.20	63.96	74.00	-10.04	59.26	5.53	33.65	34.48	204	23	Peak	VERTICAL

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

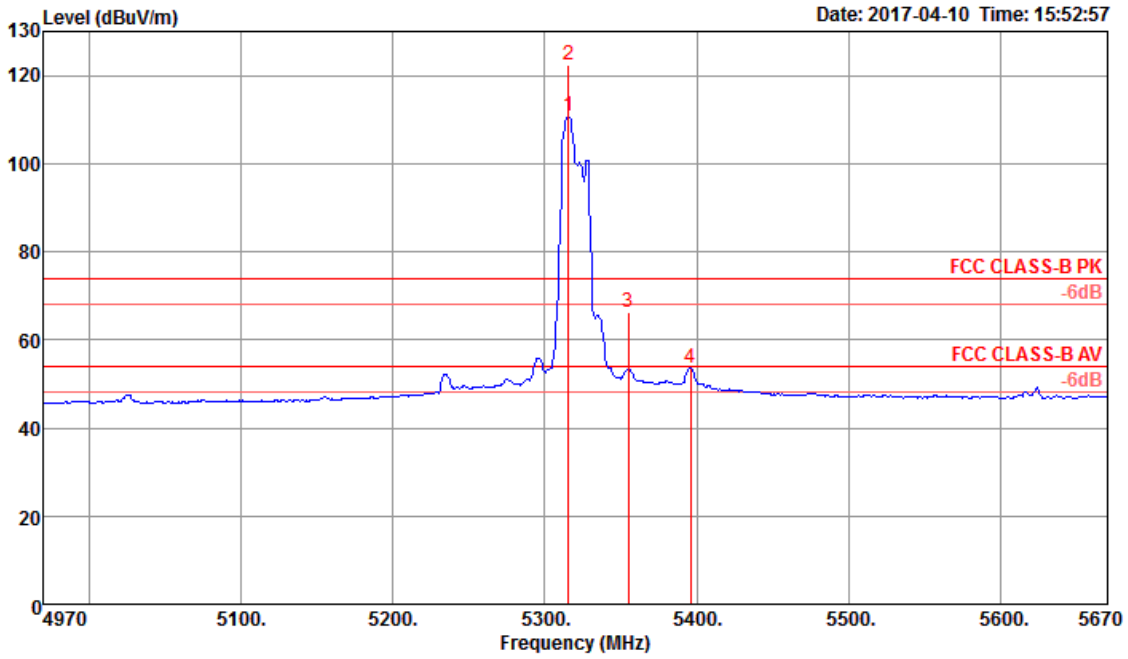
Channel 60



	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 @	5302.80	112.12			107.53	5.52	33.55	34.48	210	338	Average	VERTICAL
2 @	5304.20	121.88			117.29	5.52	33.55	34.48	210	338	Peak	VERTICAL
3	5378.40	64.16	74.00	-9.84	59.42	5.54	33.68	34.48	210	338	Peak	VERTICAL
4	5384.00	53.88	54.00	-0.12	49.14	5.54	33.68	34.48	210	338	Average	VERTICAL

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

Channel 64

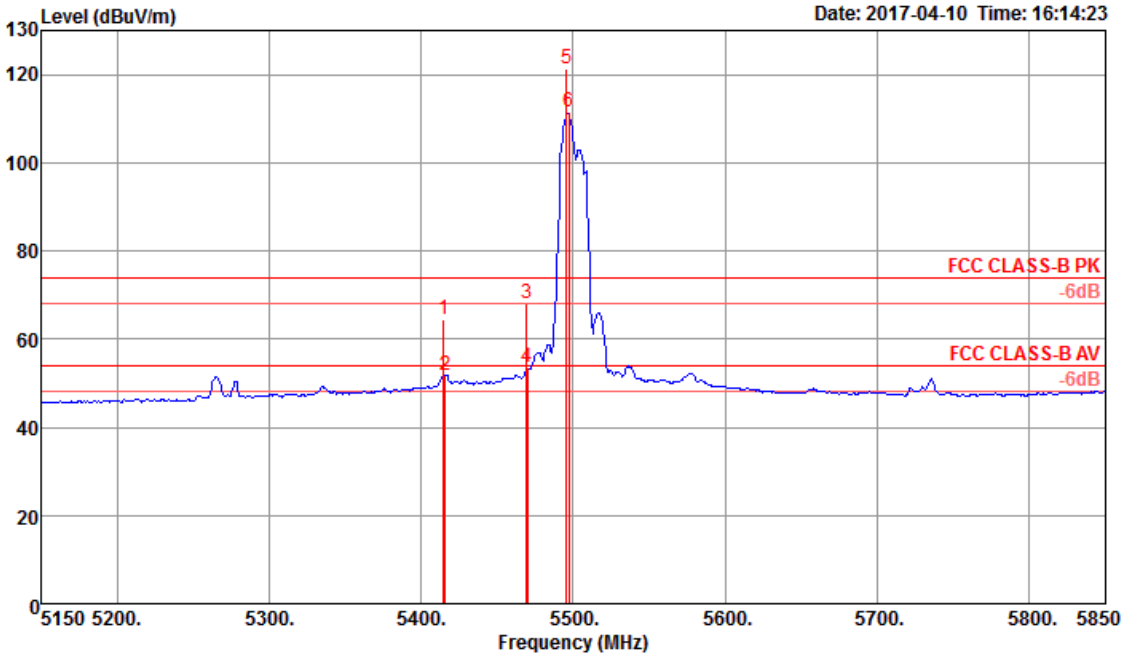


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5315.80	110.88			106.27	5.52	33.57	34.48	101	239	Average	VERTICAL
2 @	5315.80	122.32			117.71	5.52	33.57	34.48	101	239	Peak	VERTICAL
3	5355.00	66.37	74.00	-7.63	61.67	5.53	33.65	34.48	101	239	Peak	VERTICAL
4	5395.60	53.77	54.00	-0.23	49.00	5.54	33.71	34.48	101	239	Average	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11a CH 100, 116, 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4

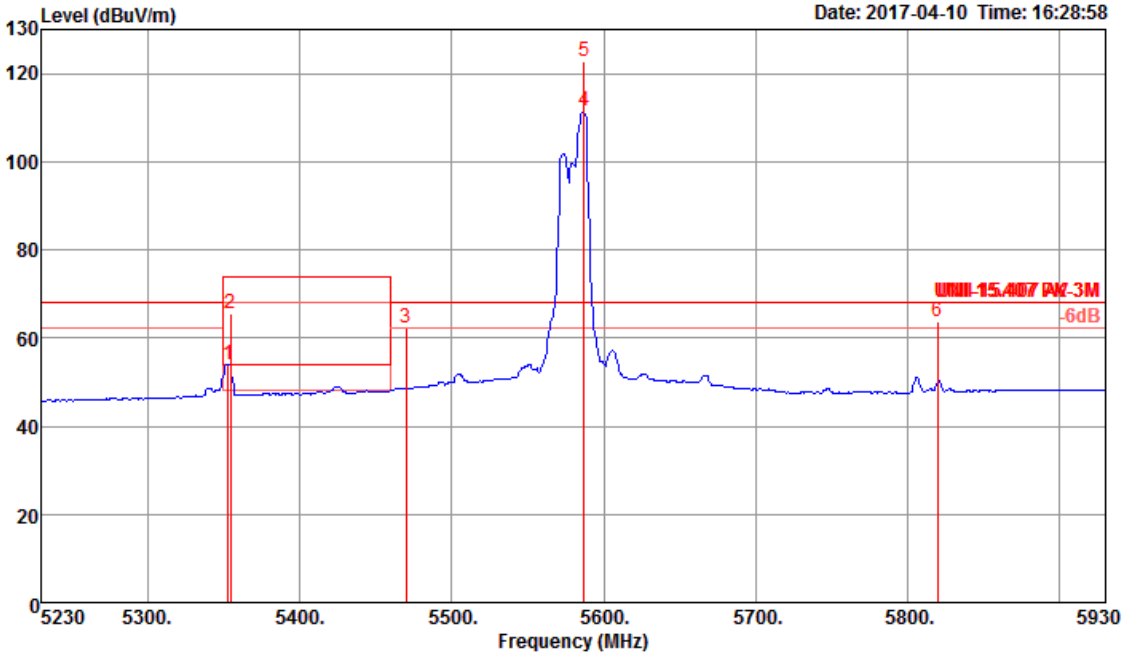
Channel 100



	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	5414.60	64.44	74.00	-9.56	59.63	5.55	33.74	34.48	137	185	Peak	VERTICAL
2	5416.00	51.92	54.00	-2.08	47.11	5.55	33.74	34.48	137	185	Average	VERTICAL
3	5469.20	68.12	74.00	-5.88	63.16	5.60	33.85	34.49	137	185	Peak	VERTICAL
4	5470.00	53.68	54.00	-0.32	48.72	5.60	33.85	34.49	137	185	Average	VERTICAL
5 @	5495.80	121.47			116.44	5.62	33.90	34.49	137	185	Peak	VERTICAL
6 @	5497.20	111.41			106.38	5.62	33.90	34.49	137	185	Average	VERTICAL

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

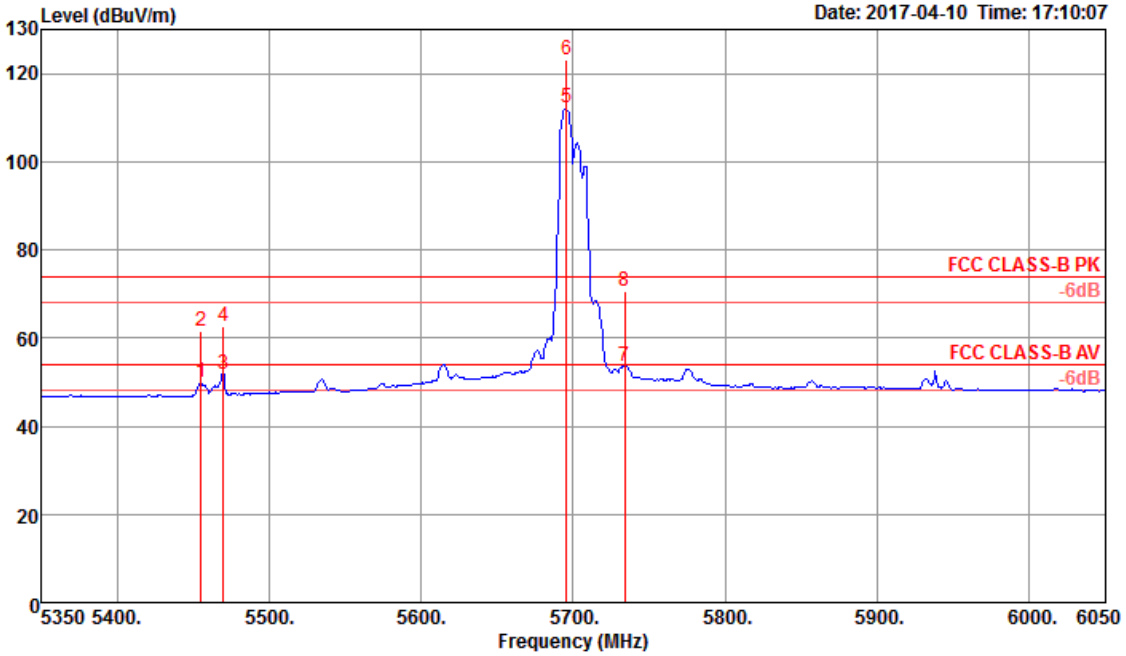
Channel 116



	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	5353.20	53.98	54.00	-0.02	49.30	5.53	33.63	34.48	127	175	Average	VERTICAL
2	5354.60	65.69	74.00	-8.31	60.99	5.53	33.65	34.48	127	175	Peak	VERTICAL
3	5469.82	62.46	68.20	-5.74	57.50	5.60	33.85	34.49	127	175	Peak	VERTICAL
4 @	5587.00	111.56			106.23	5.68	34.15	34.50	127	175	Average	VERTICAL
5 @	5587.00	122.79			117.46	5.68	34.15	34.50	127	175	Peak	VERTICAL
6	5819.40	63.66	68.20	-4.54	57.63	5.72	34.85	34.54	127	175	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5580 MHz.

Channel 140

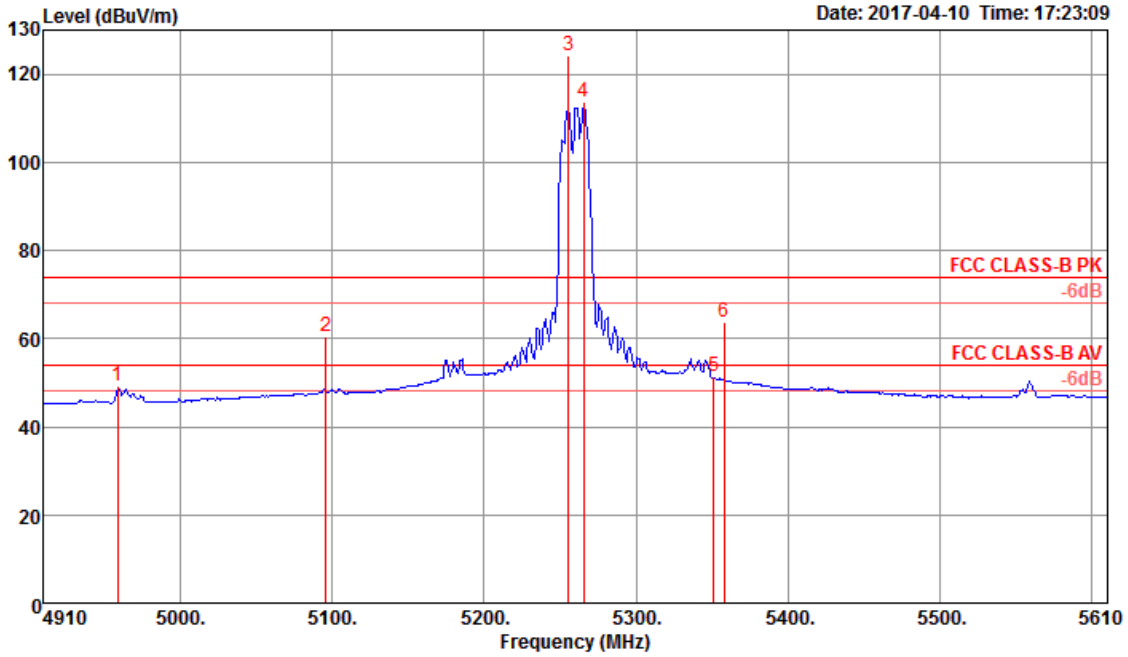


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5455.00	50.00	54.00	-4.00	45.08	5.59	33.82	34.49	181	189	Average	VERTICAL
2	5455.00	61.55	74.00	-12.45	56.63	5.59	33.82	34.49	181	189	Peak	VERTICAL
3	5470.00	51.96	54.00	-2.04	47.00	5.60	33.85	34.49	181	189	Average	VERTICAL
4	5470.00	62.48	74.00	-11.52	57.52	5.60	33.85	34.49	181	189	Peak	VERTICAL
5 @	5695.80	112.25			106.58	5.69	34.50	34.52	181	189	Average	VERTICAL
6 @	5695.80	123.15			117.48	5.69	34.50	34.52	181	189	Peak	VERTICAL
7	5733.60	53.75	54.00	-0.25	47.98	5.70	34.60	34.53	181	189	Average	VERTICAL
8	5733.60	70.66	74.00	-3.34	64.89	5.70	34.60	34.53	181	189	Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5700 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4

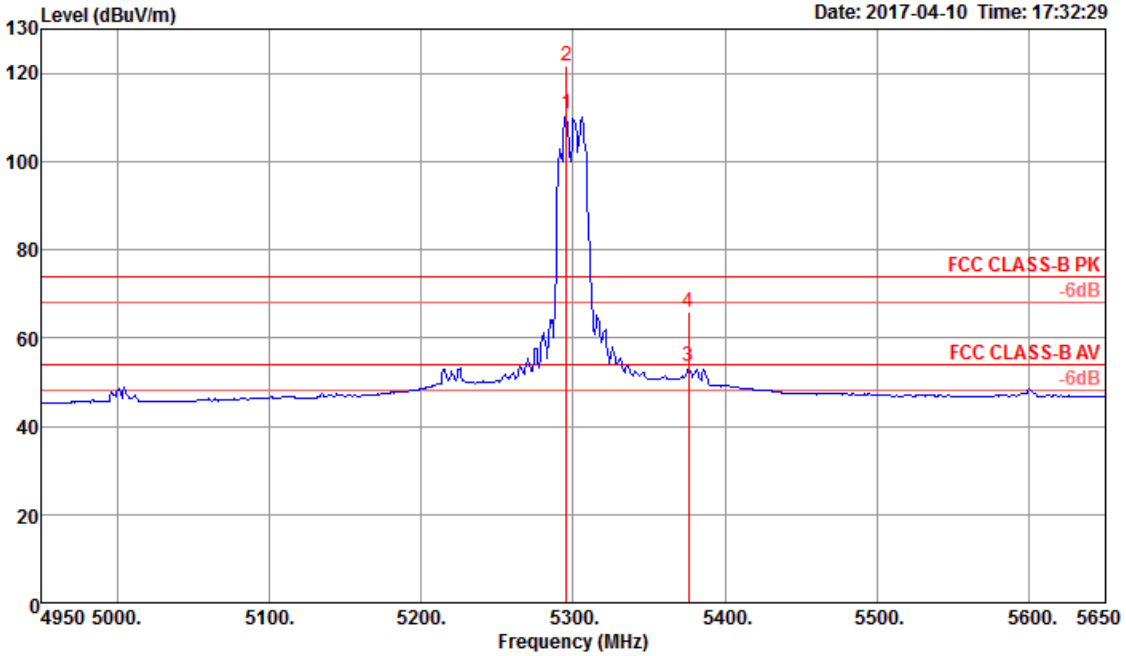
Channel 52



	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	4959.00	49.20	54.00	-4.80	45.40	5.35	32.92	34.47	199	334	Average	VERTICAL
2	5096.20	60.46	74.00	-13.54	56.33	5.44	33.16	34.47	199	334	Peak	VERTICAL
3 @	5255.80	124.15			119.66	5.51	33.46	34.48	199	334	Peak	VERTICAL
4 @	5265.60	113.56			109.03	5.52	33.49	34.48	199	334	Average	VERTICAL
5	5351.00	51.36	54.00	-2.64	46.68	5.53	33.63	34.48	199	334	Average	VERTICAL
6	5358.00	63.79	74.00	-10.21	59.09	5.53	33.65	34.48	199	334	Peak	VERTICAL

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

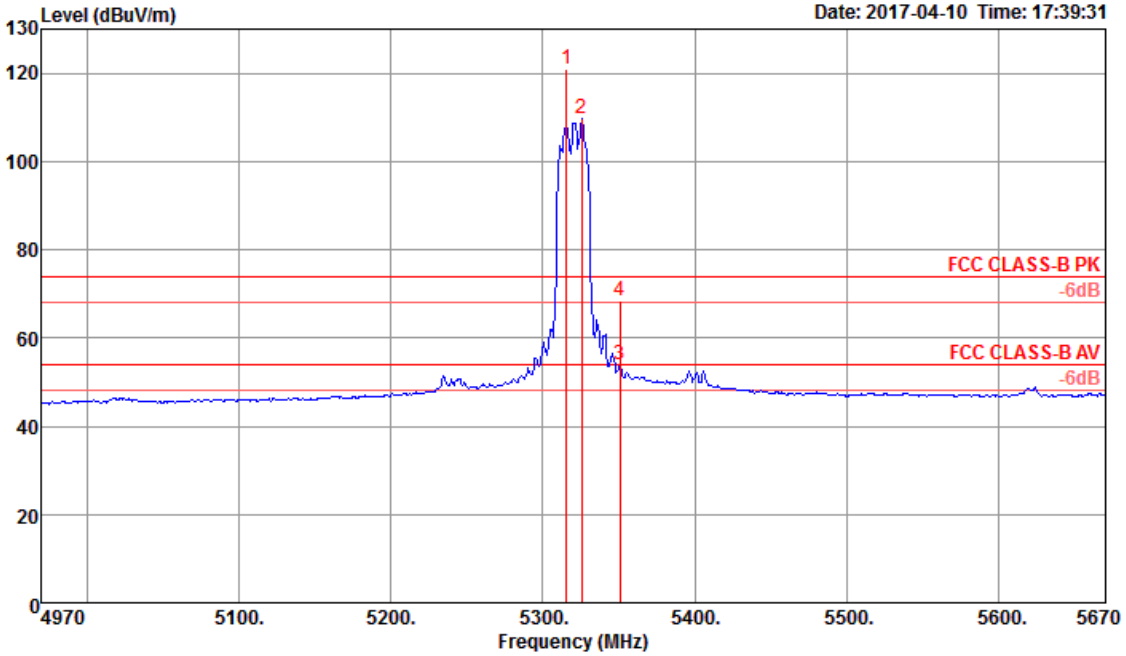
Channel 60



	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 @	5295.80	110.86			106.27	5.52	33.55	34.48	207	334	Average	VERTICAL
2 @	5295.80	121.66			117.07	5.52	33.55	34.48	207	334	Peak	VERTICAL
3	5375.60	53.77	54.00	-0.23	49.03	5.54	33.68	34.48	207	334	Average	VERTICAL
4	5375.60	65.74	74.00	-8.26	61.00	5.54	33.68	34.48	207	334	Peak	VERTICAL

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

Channel 64

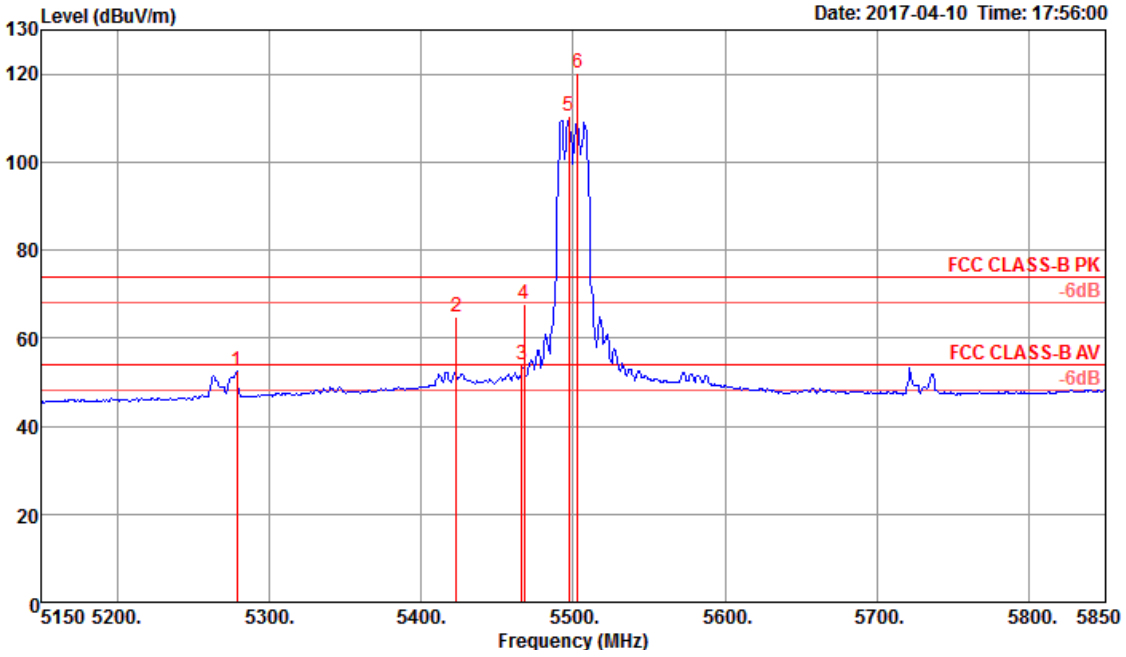


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5315.80	120.92			116.31	5.52	33.57	34.48	184	84	Peak	VERTICAL
2 @	5325.60	109.65			105.00	5.53	33.60	34.48	184	84	Average	VERTICAL
3	5350.80	53.91	54.00	-0.09	49.23	5.53	33.63	34.48	184	84	Average	VERTICAL
4	5350.80	68.29	74.00	-5.71	63.61	5.53	33.63	34.48	184	84	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 116, 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4

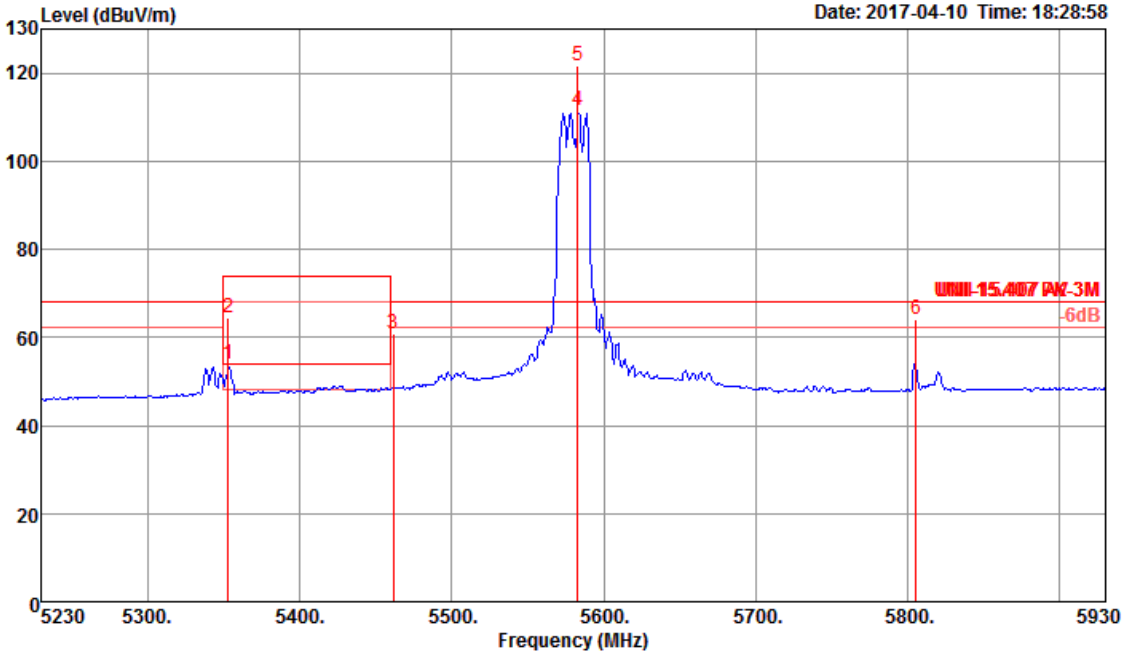
Channel 100



	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	5278.80	52.66	54.00	-1.34	48.10	5.52	33.52	34.48	113	190	Average	VERTICAL
2	5423.00	64.85	74.00	-9.15	60.02	5.56	33.76	34.49	113	190	Peak	VERTICAL
3	5466.40	53.98	54.00	-0.02	49.02	5.60	33.85	34.49	113	190	Average	VERTICAL
4	5467.80	67.82	74.00	-6.18	62.86	5.60	33.85	34.49	113	190	Peak	VERTICAL
5 @	5497.20	110.45			105.42	5.62	33.90	34.49	113	190	Average	VERTICAL
6 @	5502.80	120.05			115.02	5.62	33.90	34.49	113	190	Peak	VERTICAL

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

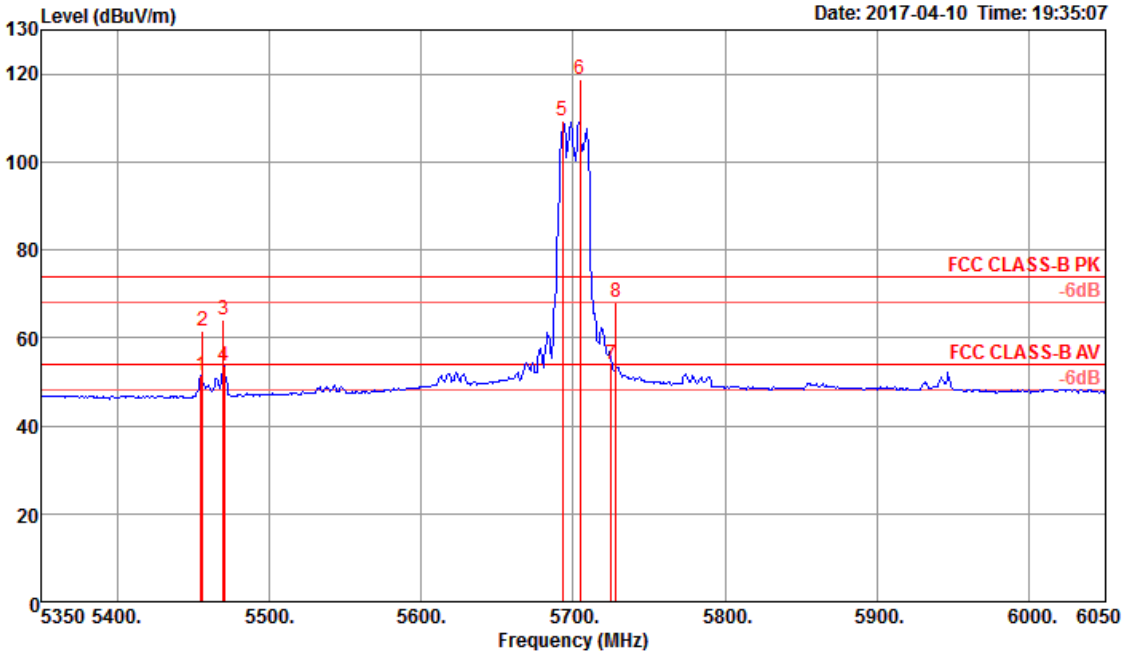
Channel 116



	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	5353.20	53.97	54.00	-0.03	49.29	5.53	33.63	34.48	119	176	Average	VERTICAL
2	5353.20	64.39	74.00	-9.61	59.71	5.53	33.63	34.48	119	176	Peak	VERTICAL
3	5461.60	60.81	68.20	-7.39	55.89	5.59	33.82	34.49	119	176	Peak	VERTICAL
4 @	5582.80	111.50			106.17	5.68	34.15	34.50	119	176	Average	VERTICAL
5 @	5582.80	121.60			116.27	5.68	34.15	34.50	119	176	Peak	VERTICAL
6	5805.40	64.07	68.20	-4.13	58.11	5.70	34.80	34.54	119	176	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5580 MHz.

Channel 140

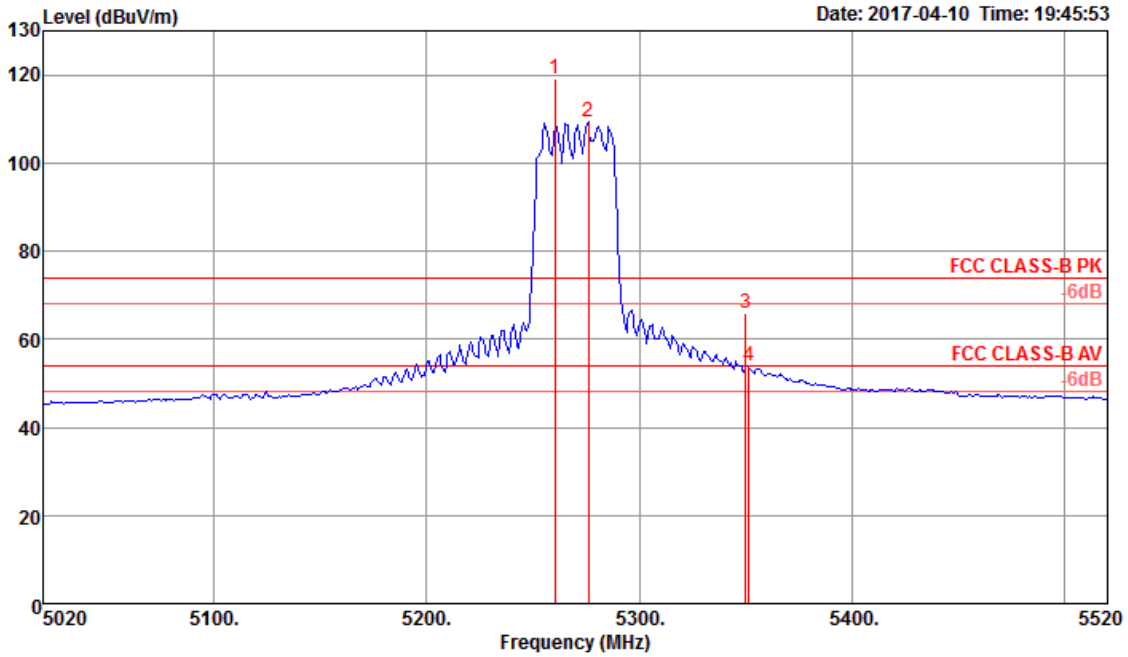


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5455.00	51.54	54.00	-2.46	46.62	5.59	33.82	34.49	184	174	Average	VERTICAL
2	5456.40	61.68	74.00	-12.32	56.76	5.59	33.82	34.49	184	174	Peak	VERTICAL
3	5470.00	64.03	74.00	-9.97	59.07	5.60	33.85	34.49	184	174	Peak	VERTICAL
4	5470.40	53.76	54.00	-0.24	48.80	5.60	33.85	34.49	184	174	Average	VERTICAL
5 @	5693.00	109.29			103.62	5.69	34.50	34.52	184	174	Average	VERTICAL
6 @	5704.20	118.89			113.22	5.69	34.50	34.52	184	174	Peak	VERTICAL
7	5725.00	53.87	54.00	-0.13	48.10	5.70	34.60	34.53	184	174	Average	VERTICAL
8	5728.00	68.15	74.00	-5.85	62.38	5.70	34.60	34.53	184	174	Peak	VERTICAL

Item 5, 6 are the fundamental frequency at 5700 MHz.

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Chain 1 + Chain 2 + Chain 3 + Chain 4

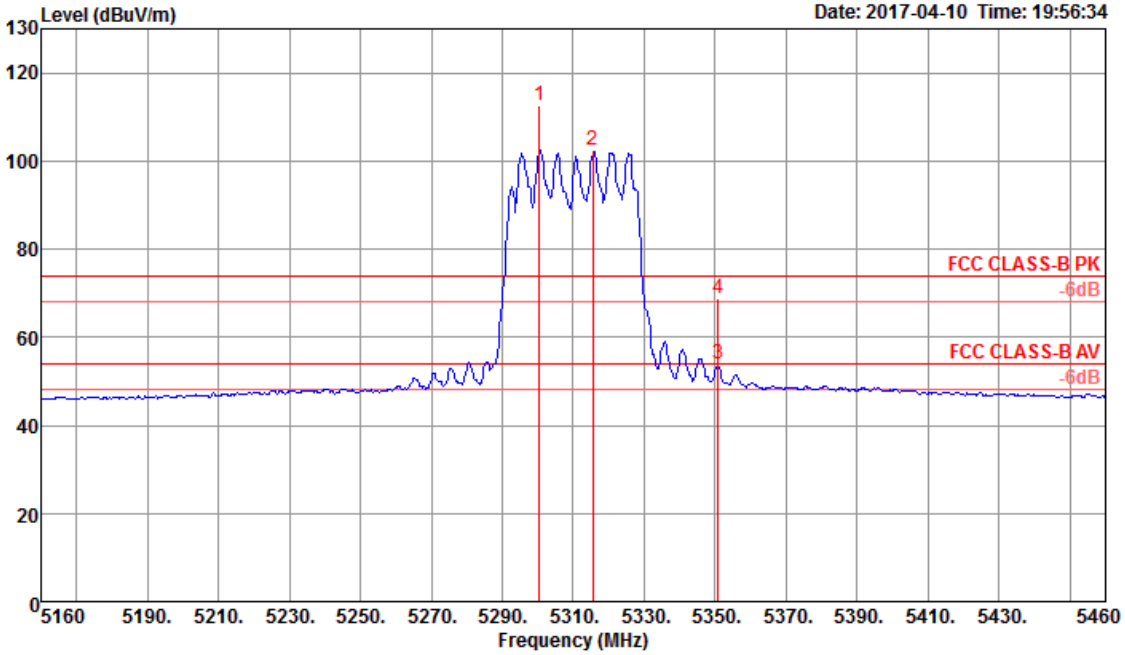
Channel 54



	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 @	5260.40	119.28			114.79	5.51	33.46	34.48	100	162	Peak	VERTICAL
2 @	5276.00	109.34			104.81	5.52	33.49	34.48	100	162	Average	VERTICAL
3	5350.00	66.01	74.00	-7.99	61.33	5.53	33.63	34.48	100	162	Peak	VERTICAL
4	5351.60	53.87	54.00	-0.13	49.19	5.53	33.63	34.48	100	162	Average	VERTICAL

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

Channel 62

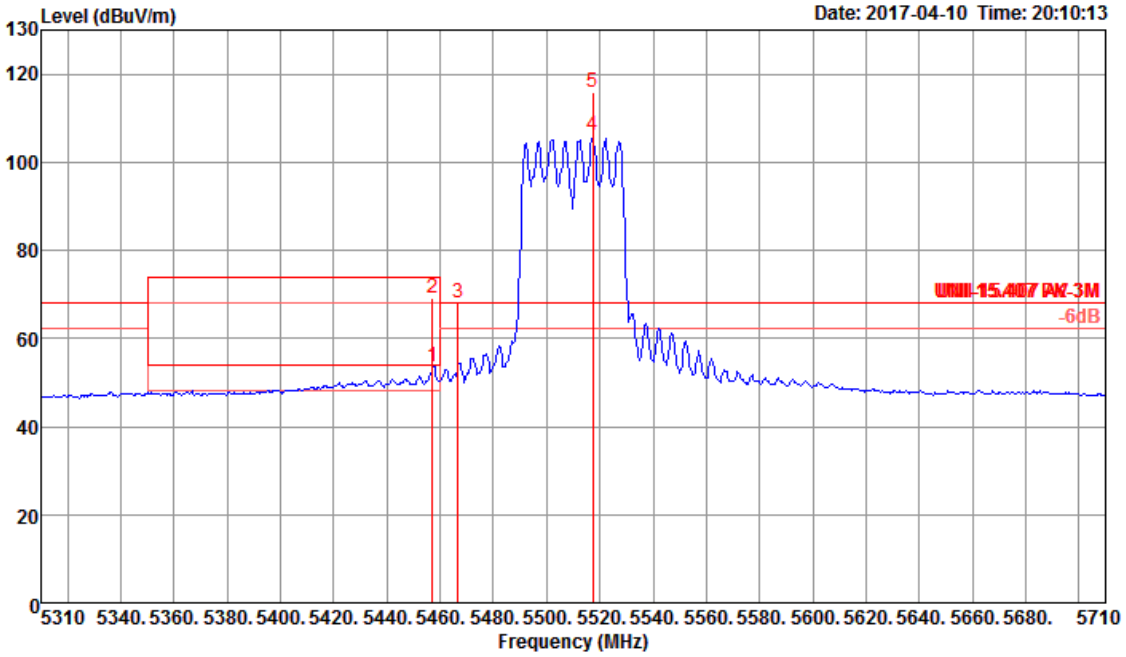


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5300.40	112.77			108.18	5.52	33.55	34.48	105	207	Peak	VERTICAL
2 @	5315.40	102.58			97.97	5.52	33.57	34.48	105	207	Average	VERTICAL
3	5350.80	53.78	54.00	-0.22	49.10	5.53	33.63	34.48	105	207	Average	VERTICAL
4	5350.80	68.83	74.00	-5.17	64.15	5.53	33.63	34.48	105	207	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Chain 1 + Chain 2 + Chain 3 + Chain 4

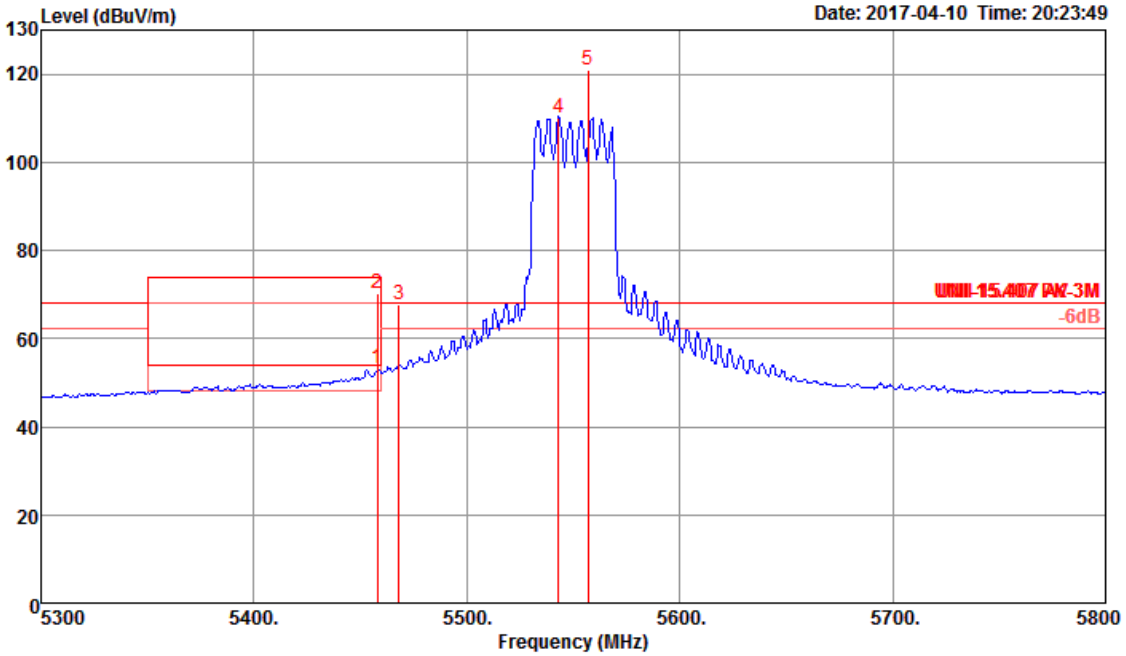
Channel 102



	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	5457.20	53.61	54.00	-0.39	48.69	5.59	33.82	34.49	106	191	Average	VERTICAL
2	5457.20	69.31	74.00	-4.69	64.39	5.59	33.82	34.49	106	191	Peak	VERTICAL
3	5466.80	68.18	68.20	-0.02	63.22	5.60	33.85	34.49	106	191	Peak	VERTICAL
4 @	5517.20	105.97			100.88	5.63	33.95	34.49	106	191	Average	VERTICAL
5 @	5517.20	115.73			110.64	5.63	33.95	34.49	106	191	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5510 MHz.

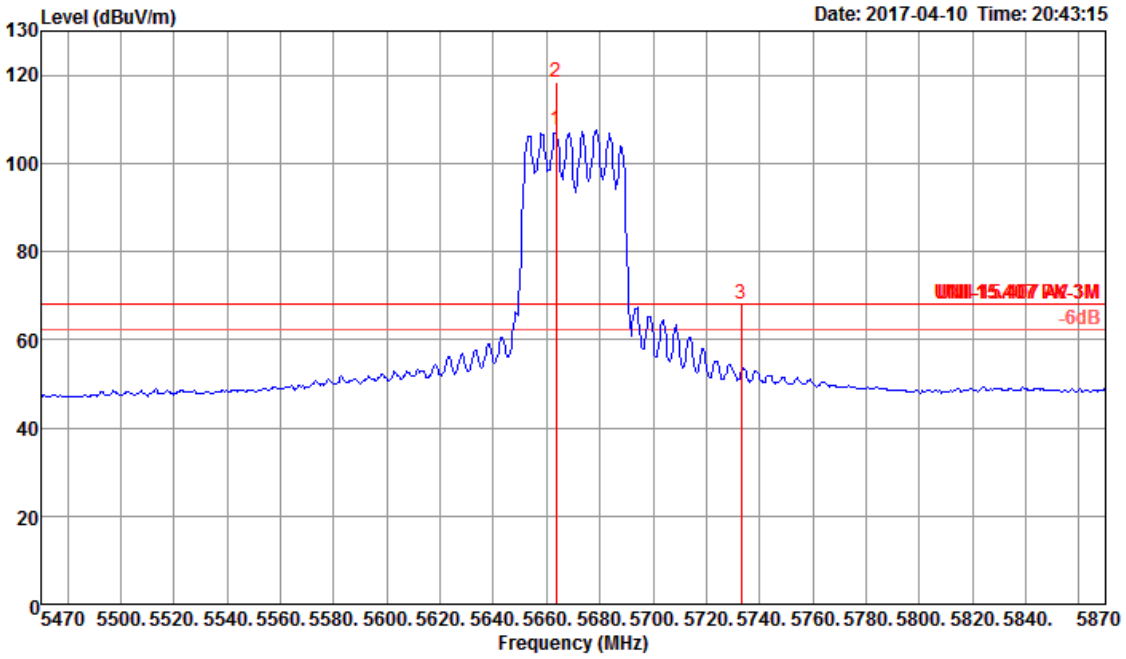
Channel 110



	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	5458.00	53.09	54.00	-0.91	48.17	5.59	33.82	34.49	150	175	Average	VERTICAL
2	5458.00	70.25	74.00	-3.75	65.33	5.59	33.82	34.49	150	175	Peak	VERTICAL
3	5468.00	67.86	68.20	-0.34	62.90	5.60	33.85	34.49	150	175	Peak	VERTICAL
4 @	5543.00	110.18			105.04	5.64	34.00	34.50	150	175	Average	VERTICAL
5 @	5557.00	120.81			115.60	5.66	34.05	34.50	150	175	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5550 MHz.

Channel 134

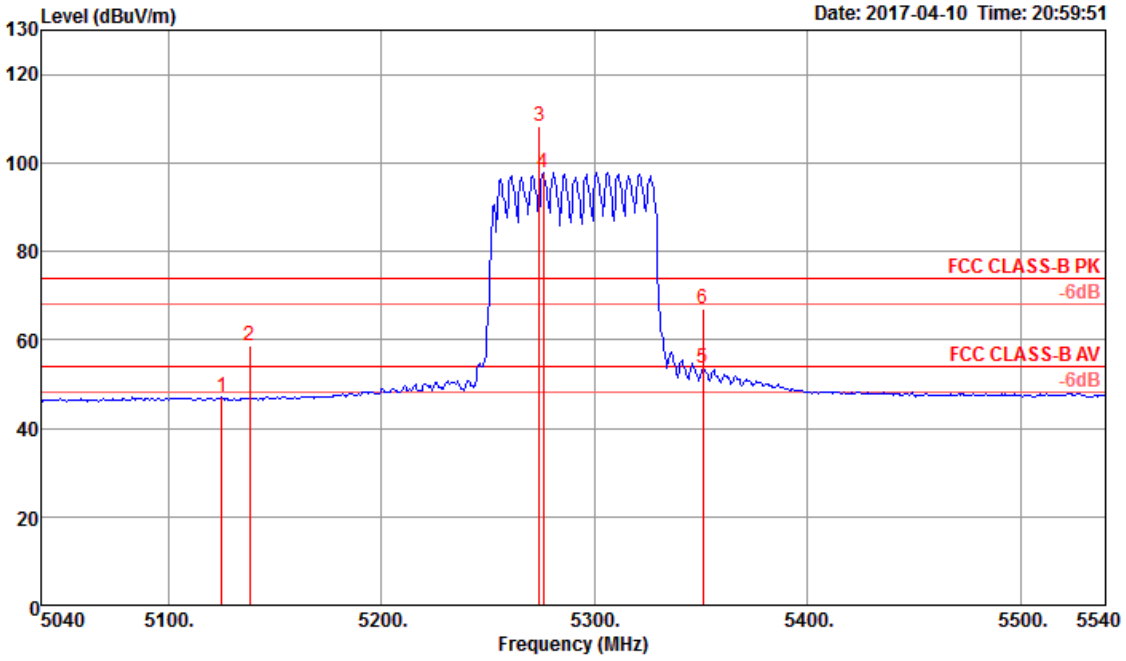


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5663.60	107.56			101.99	5.69	34.40	34.52	184	175	Average	VERTICAL
2 @	5663.60	118.35			112.78	5.69	34.40	34.52	184	175	Peak	VERTICAL
3	5733.20	68.01	68.20	-0.19	62.24	5.70	34.60	34.53	184	175	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58, 106, 122 / Chain 1 + Chain 2 + Chain 3 + Chain 4

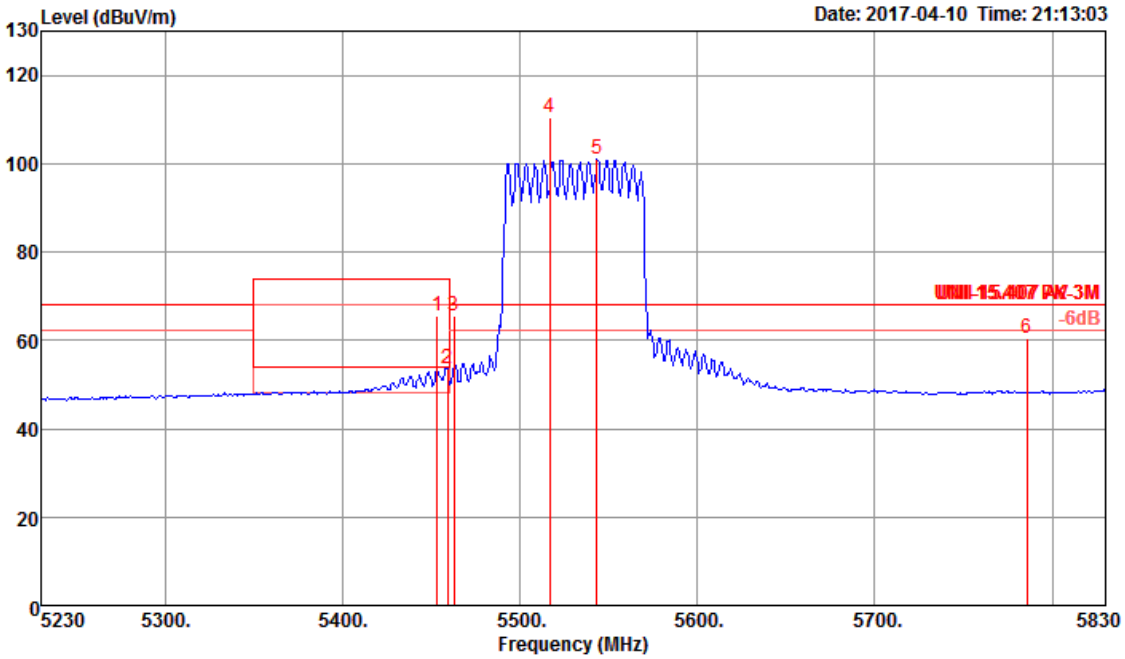
Channel 58



	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	5125.00	47.05	54.00	-6.95	42.85	5.45	33.22	34.47	101	163	Average	VERTICAL
2	5138.00	58.49	74.00	-15.51	54.25	5.46	33.25	34.47	101	163	Peak	VERTICAL
3 @	5274.00	108.14			103.61	5.52	33.49	34.48	101	163	Peak	VERTICAL
4 @	5276.00	97.90			93.37	5.52	33.49	34.48	101	163	Average	VERTICAL
5	5351.00	53.74	54.00	-0.26	49.06	5.53	33.63	34.48	101	163	Average	VERTICAL
6	5351.00	66.94	74.00	-7.06	62.26	5.53	33.63	34.48	101	163	Peak	VERTICAL

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

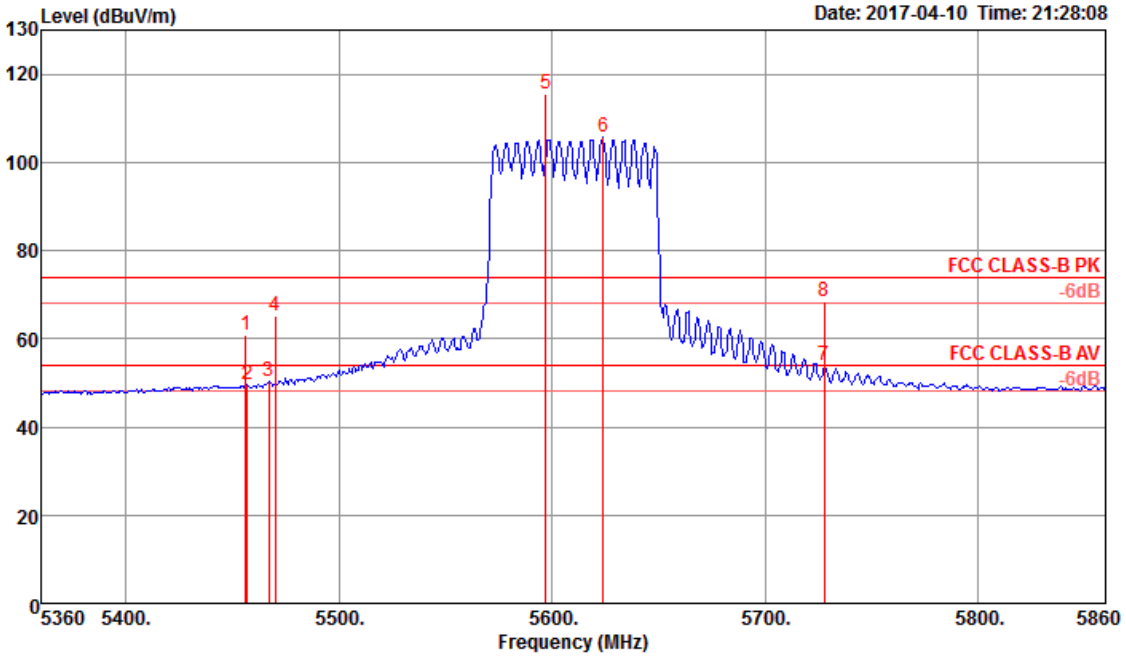
Channel 106



	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	5453.20	65.44	74.00	-8.56	60.52	5.59	33.82	34.49	132	175	Peak	VERTICAL
2	5459.20	53.71	54.00	-0.29	48.79	5.59	33.82	34.49	132	175	Average	VERTICAL
3	5462.80	65.63	68.20	-2.57	60.71	5.59	33.82	34.49	132	175	Peak	VERTICAL
4 @	5516.80	110.33			105.24	5.63	33.95	34.49	132	175	Peak	VERTICAL
5 @	5543.20	101.10			95.89	5.66	34.05	34.50	132	175	Average	VERTICAL
6	5785.60	60.36	68.20	-7.84	54.45	5.70	34.75	34.54	132	175	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5530 MHz.

Channel 122



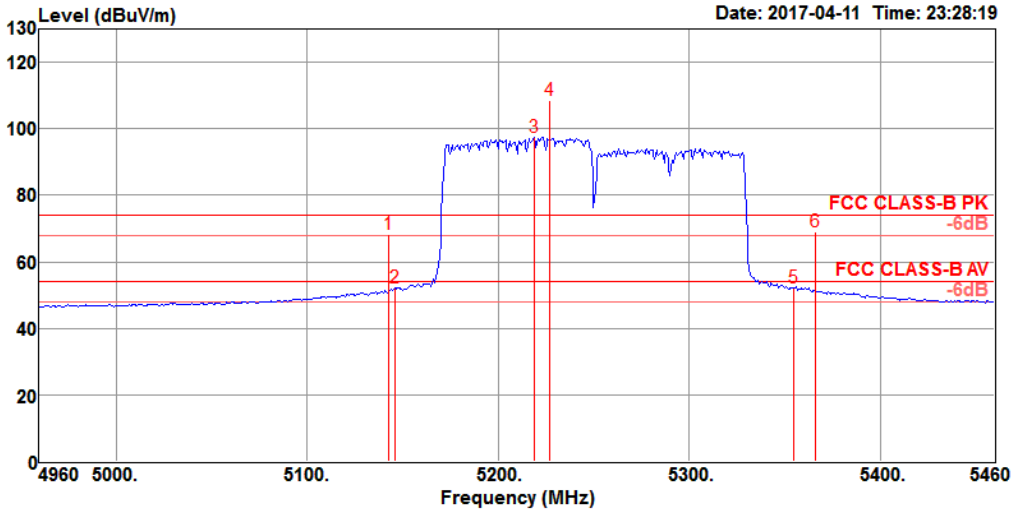
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5456.00	60.96	74.00	-13.04	56.04	5.59	33.82	34.49	130	176	Peak	VERTICAL
2	5457.00	49.77	54.00	-4.23	44.85	5.59	33.82	34.49	130	176	Average	VERTICAL
3	5467.00	50.17	54.00	-3.83	45.21	5.60	33.85	34.49	130	176	Average	VERTICAL
4	5470.00	65.09	74.00	-8.91	60.13	5.60	33.85	34.49	130	176	Peak	VERTICAL
5 @	5597.00	115.58			110.20	5.69	34.20	34.51	130	176	Peak	VERTICAL
6 @	5624.00	105.77			100.29	5.69	34.30	34.51	130	176	Average	VERTICAL
7	5728.00	53.93	54.00	-0.07	48.16	5.70	34.60	34.53	130	176	Average	VERTICAL
8	5728.00	68.54	74.00	-5.46	62.77	5.70	34.60	34.53	130	176	Peak	VERTICAL

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

802.11ac MCS0/Nss1 VHT80+80

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80+80 Type 1 / CH 42+58 / Chain 1 + Chain 2 + Chain 3 + Chain 4

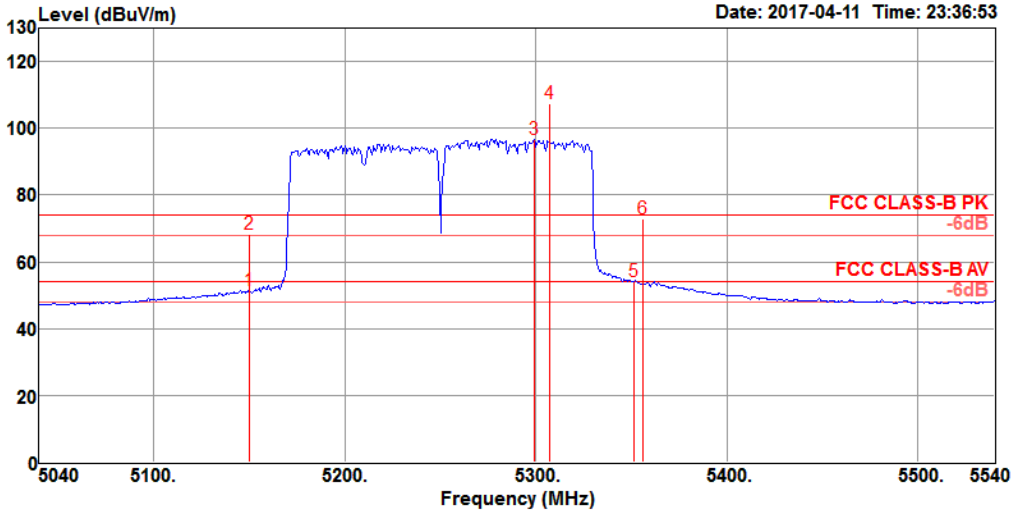
Channel 42



	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	5143.00	68.27	74.00	-5.73	60.93	8.79	31.49	32.94	185	74	Peak	VERTICAL
2	5146.00	52.17	54.00	-1.83	44.83	8.79	31.49	32.94	185	74	Average	VERTICAL
3 ●	5219.00	97.48			90.02	8.85	31.54	32.93	185	74	Average	VERTICAL
4 ●	5227.00	108.47			101.00	8.85	31.54	32.92	185	74	Peak	VERTICAL
5	5355.00	52.25	54.00	-1.75	44.57	8.96	31.62	32.90	185	74	Average	VERTICAL
6	5366.00	69.04	74.00	-4.96	61.35	8.96	31.62	32.89	185	74	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5210 MHz.

Channel 58

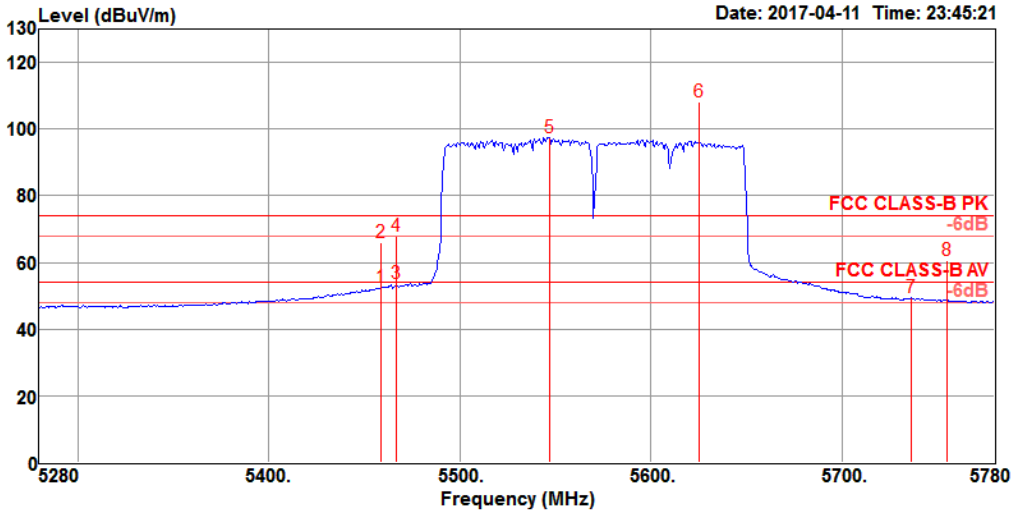


		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1		5150.00	51.32	54.00	-2.68	43.98	8.79	31.49	32.94	139	268	Average	VERTICAL
2		5150.00	68.15	74.00	-5.85	60.81	8.79	31.49	32.94	139	268	Peak	VERTICAL
3	●	5299.00	96.69			89.11	8.91	31.58	32.91	139	268	Average	VERTICAL
4	●	5307.00	107.57			99.99	8.91	31.58	32.91	139	268	Peak	VERTICAL
5		5351.00	53.94	54.00	-0.06	46.28	8.95	31.61	32.90	139	268	Average	VERTICAL
6		5356.00	72.97	74.00	-1.03	65.29	8.96	31.62	32.90	139	268	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80+80 Type 2 / CH 106+122 / Chain 1 + Chain 2 + Chain 3 + Chain 4

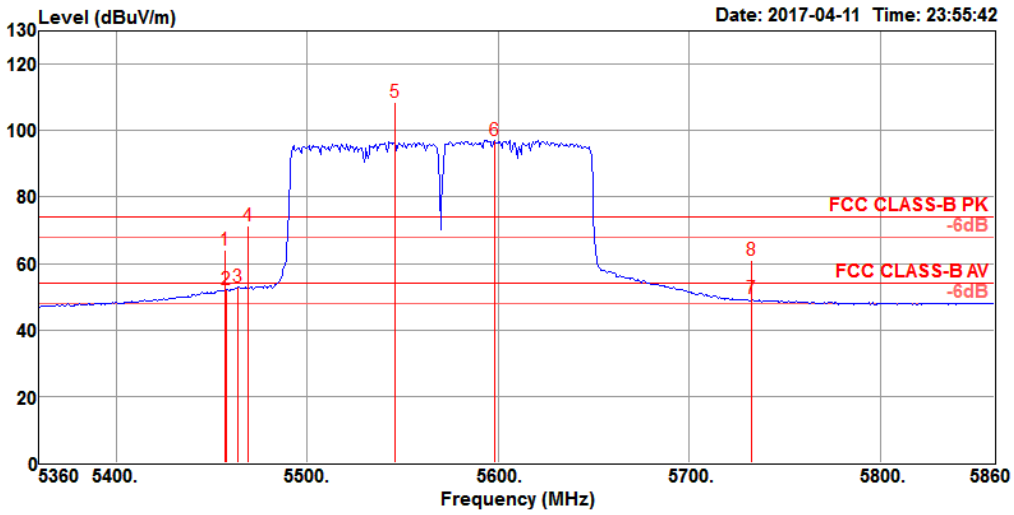
Channel 106



	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	5459.00	52.50	54.00	-1.50	44.68	9.03	31.67	32.88	201	0	Average	VERTICAL
2	5459.00	66.00	74.00	-8.00	58.18	9.03	31.67	32.88	201	0	Peak	VERTICAL
3	5467.00	53.79	54.00	-0.21	45.95	9.04	31.68	32.88	201	0	Average	VERTICAL
4	5467.00	68.02	74.00	-5.98	60.18	9.04	31.68	32.88	201	0	Peak	VERTICAL
5 ●	5547.00	97.57			89.57	9.10	31.78	32.88	201	0	Average	VERTICAL
6 ●	5625.00	108.18			100.01	9.14	31.91	32.88	201	0	Peak	VERTICAL
7	5736.00	49.44	54.00	-4.56	41.09	9.17	32.07	32.89	201	0	Average	VERTICAL
8	5755.00	60.48	74.00	-13.52	52.11	9.17	32.10	32.90	201	0	Peak	VERTICAL

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

Channel 122



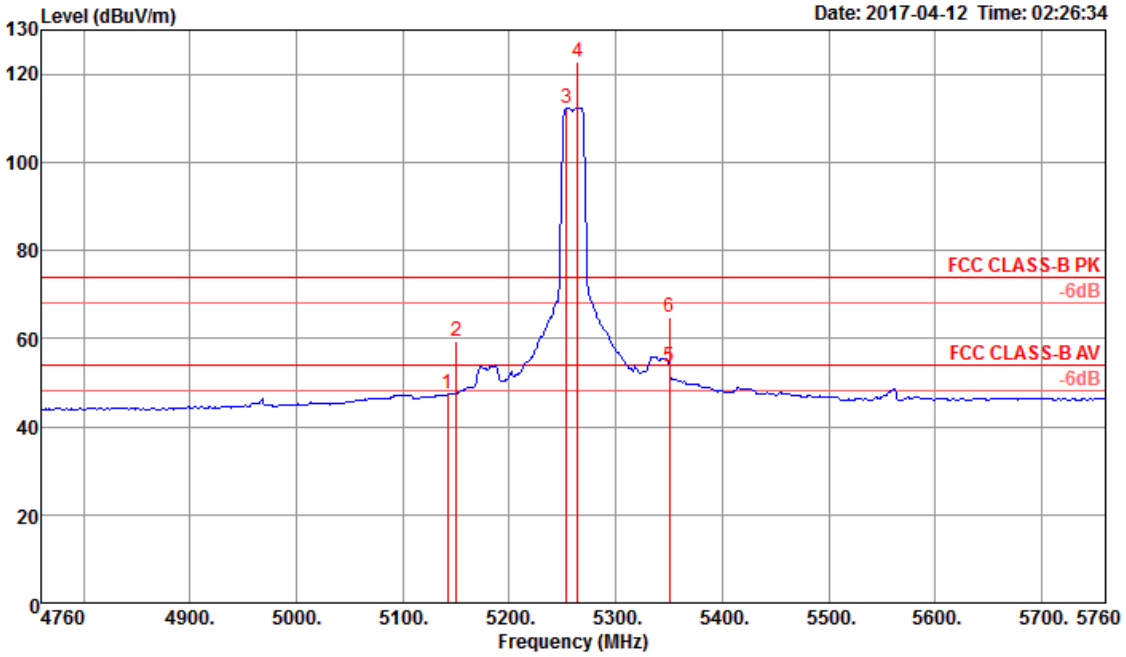
		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1		5457.00	64.23	74.00	-9.77	56.41	9.03	31.67	32.88	200	326	Peak	VERTICAL
2		5458.00	52.21	54.00	-1.79	44.39	9.03	31.67	32.88	200	326	Average	VERTICAL
3		5464.00	52.90	54.00	-1.10	45.06	9.04	31.68	32.88	200	326	Average	VERTICAL
4		5469.00	71.16	74.00	-2.84	63.32	9.04	31.68	32.88	200	326	Peak	VERTICAL
5	●	5546.00	108.64			100.64	9.10	31.78	32.88	200	326	Peak	VERTICAL
6	●	5598.00	97.16			89.05	9.13	31.86	32.88	200	326	Average	VERTICAL
7		5733.00	49.55	54.00	-4.45	41.20	9.17	32.07	32.89	200	326	Average	VERTICAL
8		5733.00	61.17	74.00	-12.83	52.82	9.17	32.07	32.89	200	326	Peak	VERTICAL

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

For beamforming mode:

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4

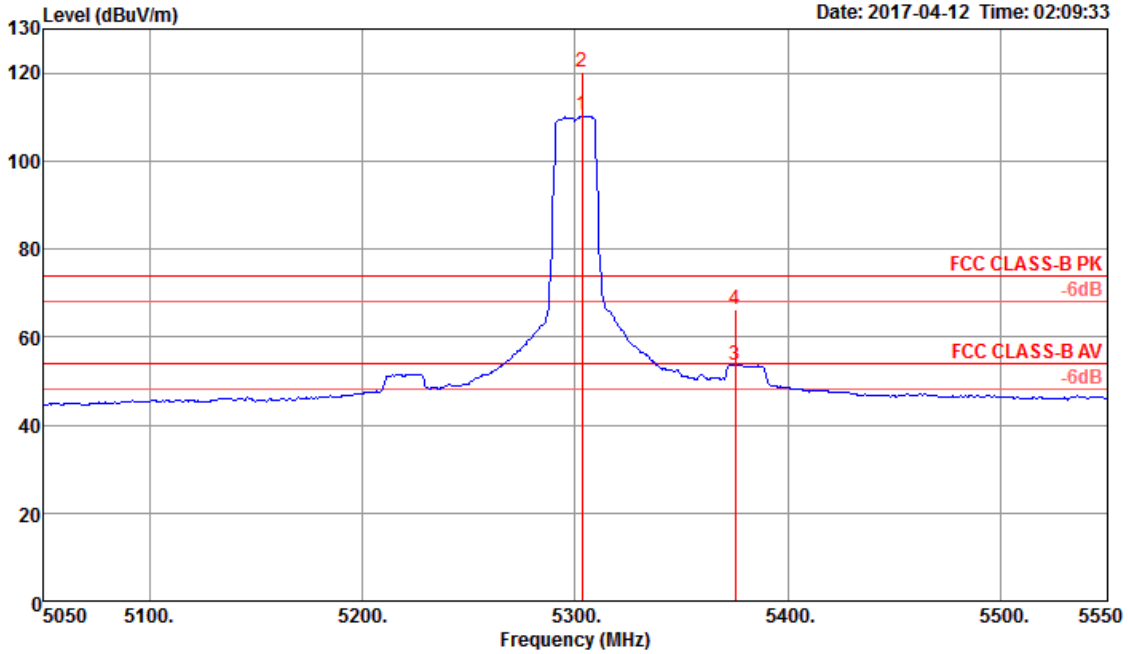
Channel 52



	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	5142.00	47.31	54.00	-6.69	43.04	5.47	33.27	34.47	156	102	Average	VERTICAL
2	5150.00	59.30	74.00	-14.70	55.03	5.47	33.27	34.47	156	102	Peak	VERTICAL
3 @	5254.00	112.33			107.84	5.51	33.46	34.48	156	102	Average	VERTICAL
4 @	5264.00	122.69			118.16	5.52	33.49	34.48	156	102	Peak	VERTICAL
5	5350.00	53.75	54.00	-0.25	49.07	5.53	33.63	34.48	156	102	Average	VERTICAL
6	5350.00	64.81	74.00	-9.19	60.13	5.53	33.63	34.48	156	102	Peak	VERTICAL

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

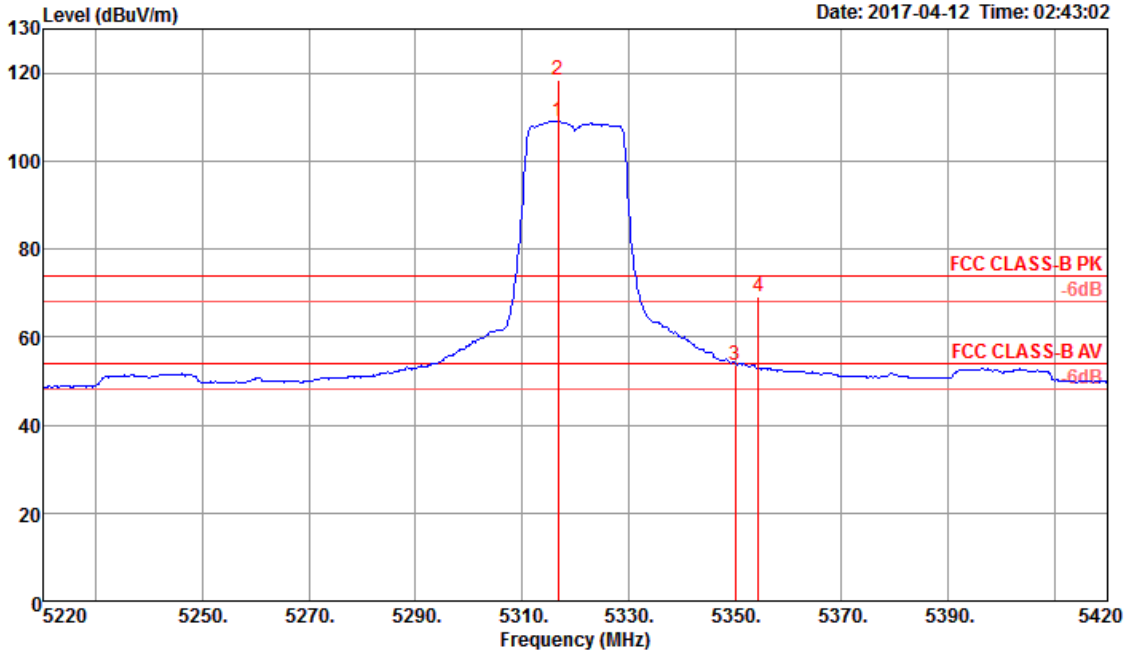
Channel 60



	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 @	5303.00	110.31			105.72	5.52	33.55	34.48	144	103	Average	VERTICAL
2 @	5303.00	120.25			115.66	5.52	33.55	34.48	144	103	Peak	VERTICAL
3	5375.00	53.71	54.00	-0.29	48.97	5.54	33.68	34.48	144	103	Average	VERTICAL
4	5375.00	66.10	74.00	-7.90	61.36	5.54	33.68	34.48	144	103	Peak	VERTICAL

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

Channel 64

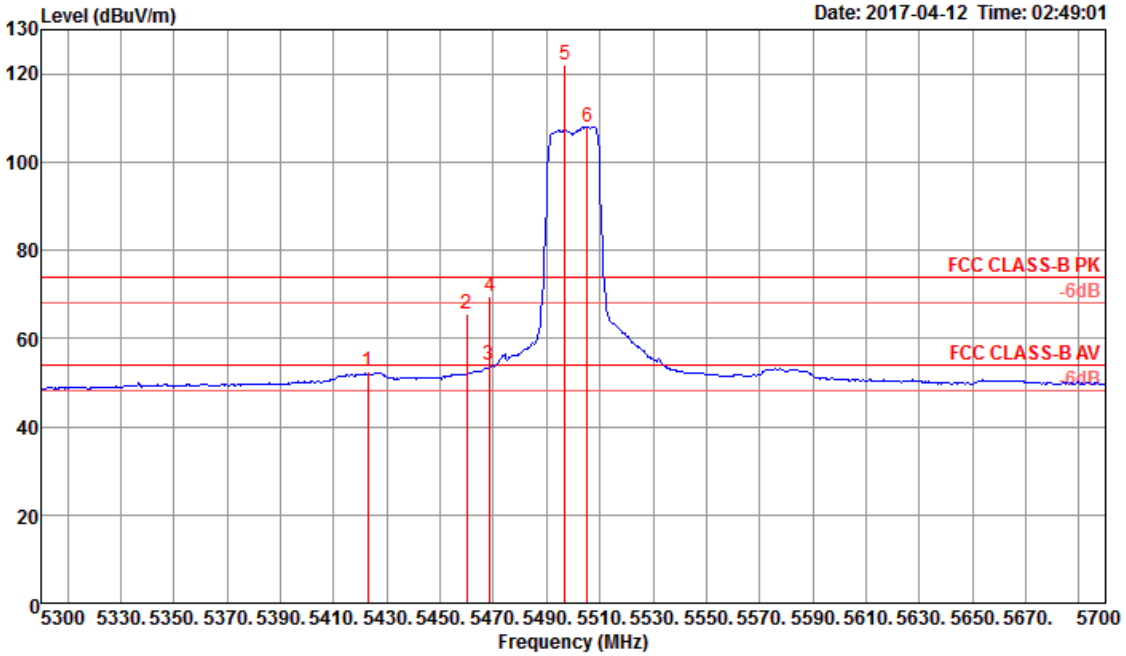


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5316.80	109.03			104.42	5.52	33.57	34.48	144	103	Average	VERTICAL
2 @	5316.80	118.31			113.70	5.52	33.57	34.48	144	103	Peak	VERTICAL
3	5350.00	53.72	54.00	-0.28	49.04	5.53	33.63	34.48	144	103	Average	VERTICAL
4	5354.40	69.21	74.00	-4.79	64.51	5.53	33.65	34.48	144	103	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 116, 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4

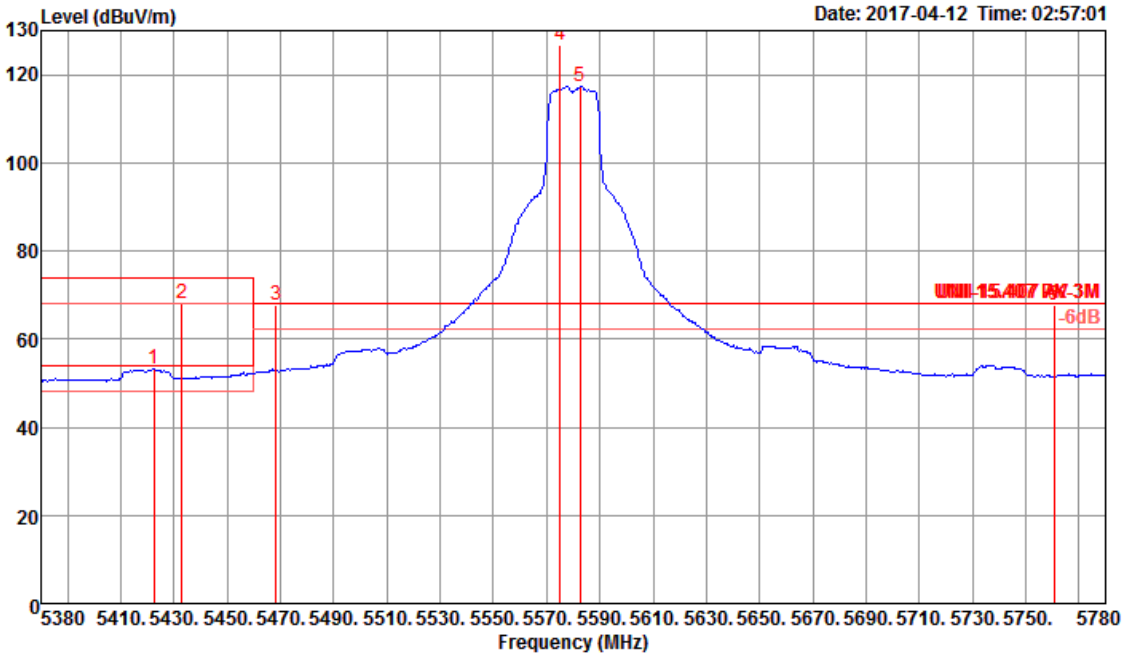
Channel 100



	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	5422.80	52.39	54.00	-1.61	47.56	5.56	33.76	34.49	150	182	Average	VERTICAL
2	5460.00	65.71	74.00	-8.29	60.79	5.59	33.82	34.49	150	182	Peak	VERTICAL
3	5468.40	53.91	54.00	-0.09	48.95	5.60	33.85	34.49	150	182	Average	VERTICAL
4	5468.80	69.59	74.00	-4.41	64.63	5.60	33.85	34.49	150	182	Peak	VERTICAL
5 @	5496.80	122.17			117.14	5.62	33.90	34.49	150	182	Peak	VERTICAL
6 @	5505.20	107.93			102.90	5.62	33.90	34.49	150	182	Average	VERTICAL

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

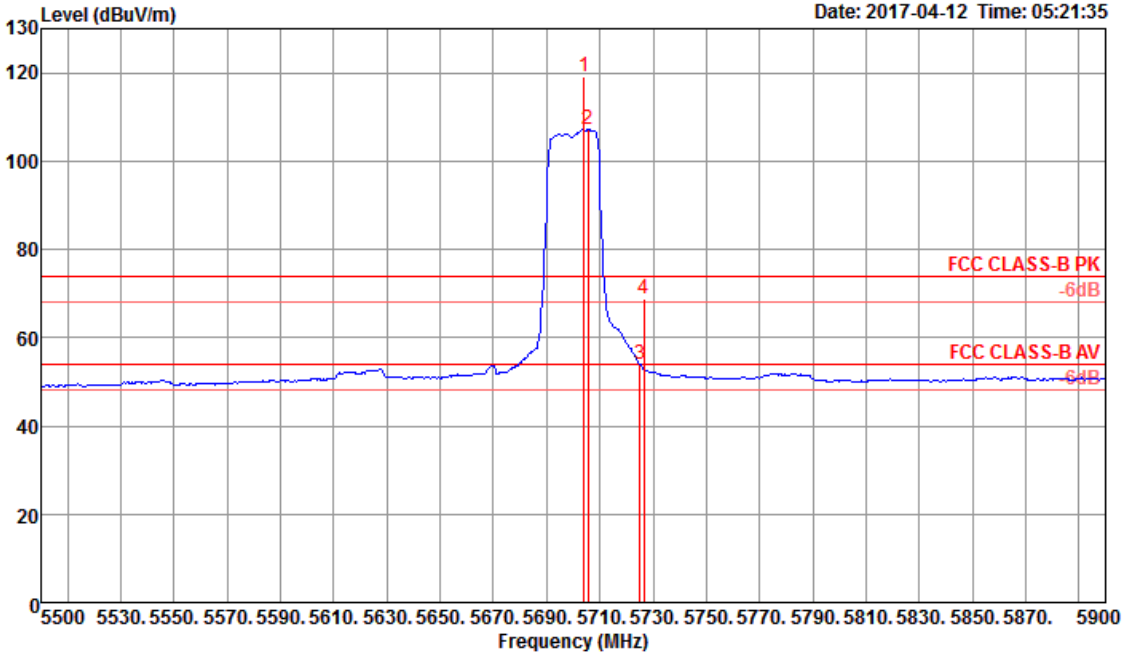
Channel 116



	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	5422.40	53.09	54.00	-0.91	48.26	5.56	33.76	34.49	152	177	Average	VERTICAL
2	5432.80	68.16	74.00	-5.84	63.29	5.57	33.79	34.49	152	177	Peak	VERTICAL
3	5468.40	67.69	68.20	-0.51	62.73	5.60	33.85	34.49	152	177	Peak	VERTICAL
4 @	5575.20	126.72			121.39	5.68	34.15	34.50	152	177	Peak	VERTICAL
5 @	5582.40	117.24			111.91	5.68	34.15	34.50	152	177	Average	VERTICAL
6	5760.80	67.84	68.20	-0.36	61.97	5.70	34.70	34.53	152	177	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5580 MHz.

Channel 140

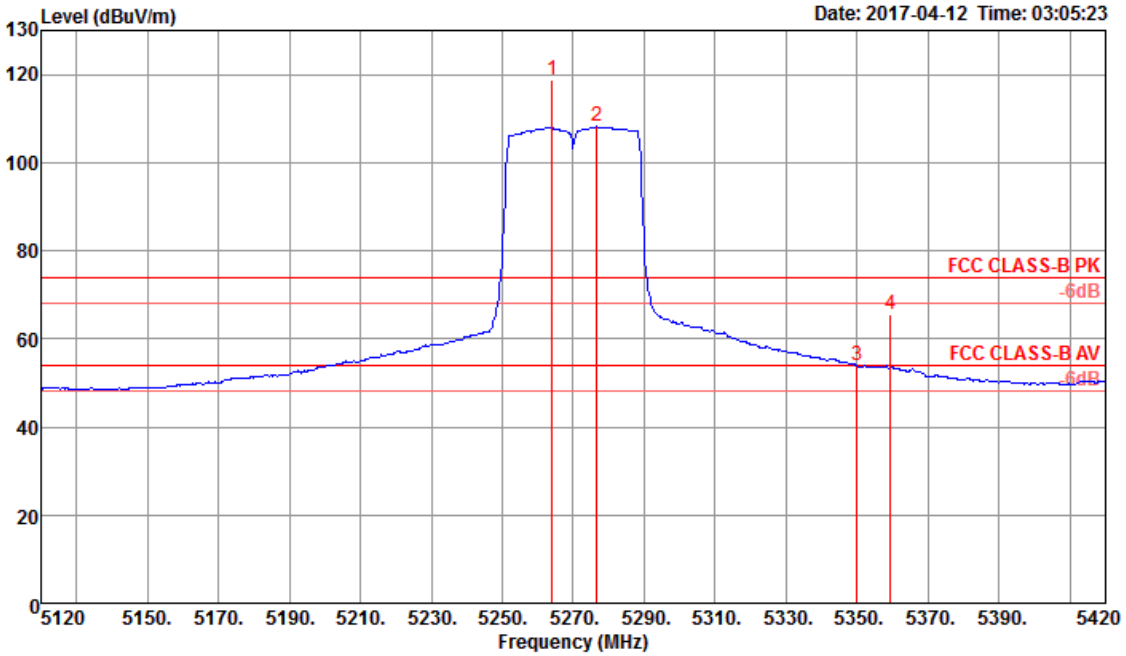


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5704.00	119.26			113.59	5.69	34.50	34.52	173	210	Peak	VERTICAL
2 @	5705.60	107.18			101.51	5.69	34.50	34.52	173	210	Average	VERTICAL
3	5725.00	53.81	54.00	-0.19	48.04	5.70	34.60	34.53	173	210	Average	VERTICAL
4	5726.40	68.76	74.00	-5.24	62.99	5.70	34.60	34.53	173	210	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Chain 1 + Chain 2 + Chain 3 + Chain 4

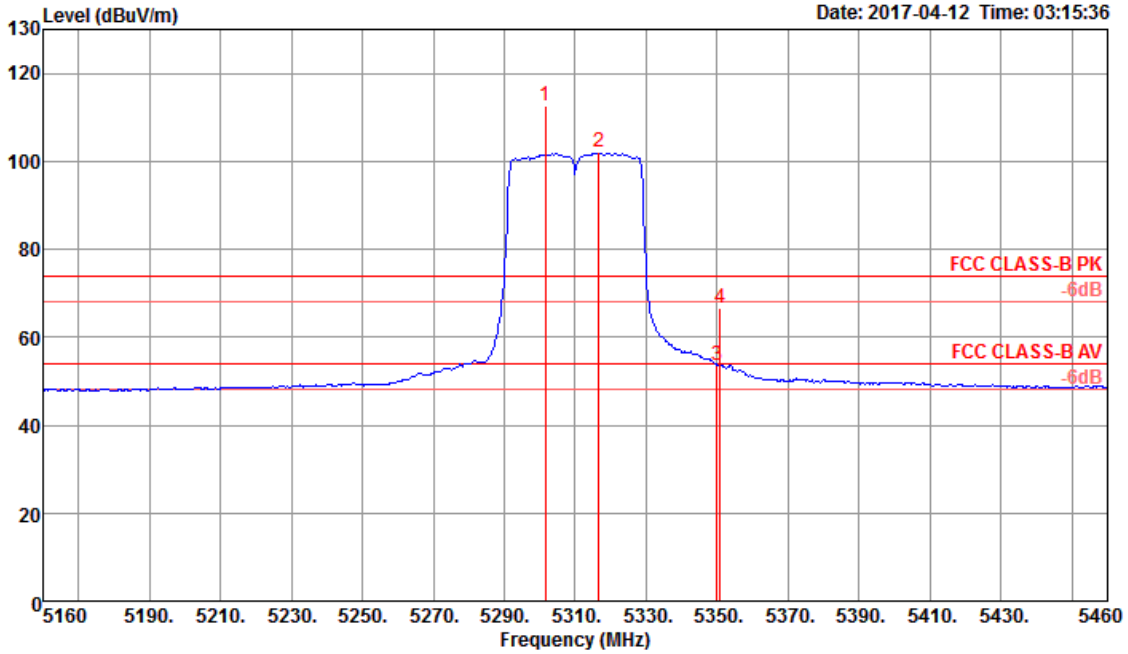
Channel 54



	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 @	5264.00	118.62			114.09	5.52	33.49	34.48	166	101	Peak	VERTICAL
2 @	5276.60	108.10			103.57	5.52	33.49	34.48	166	101	Average	VERTICAL
3	5350.00	53.87	54.00	-0.13	49.19	5.53	33.63	34.48	166	101	Average	VERTICAL
4	5359.40	65.61	74.00	-8.39	60.91	5.53	33.65	34.48	166	101	Peak	VERTICAL

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

Channel 62

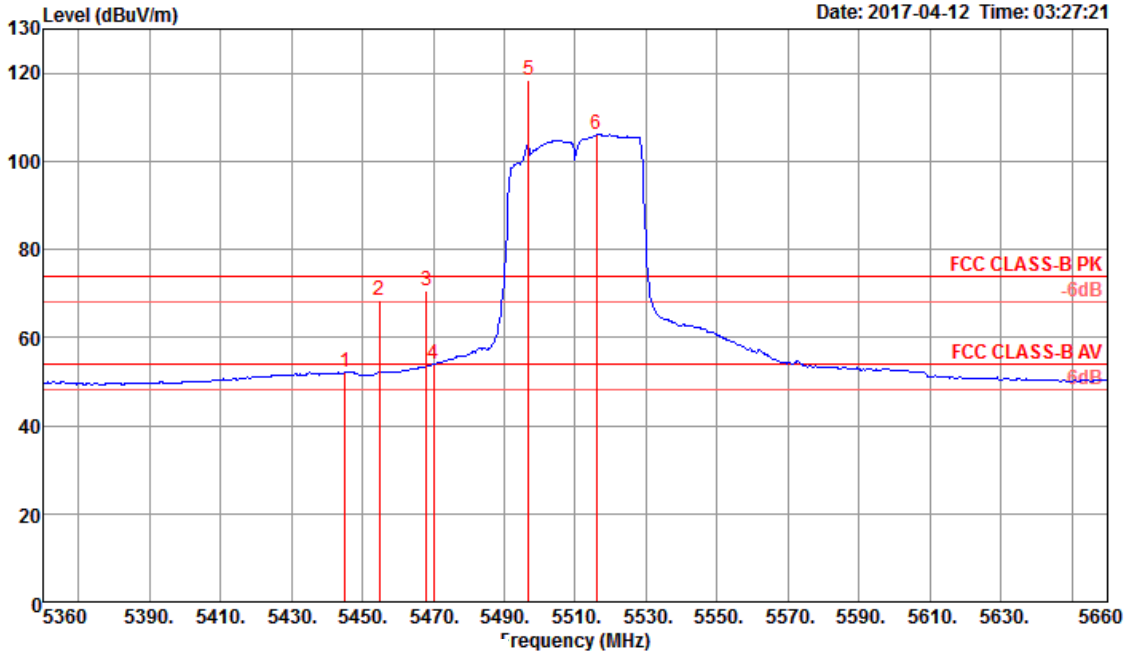


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5301.60	112.73			108.14	5.52	33.55	34.48	155	104	Peak	VERTICAL
2 @	5316.60	102.00			97.39	5.52	33.57	34.48	155	104	Average	VERTICAL
3	5350.00	53.63	54.00	-0.37	48.95	5.53	33.63	34.48	155	104	Average	VERTICAL
4	5350.80	66.47	74.00	-7.53	61.79	5.53	33.63	34.48	155	104	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Chain 1 + Chain 2 + Chain 3 + Chain 4

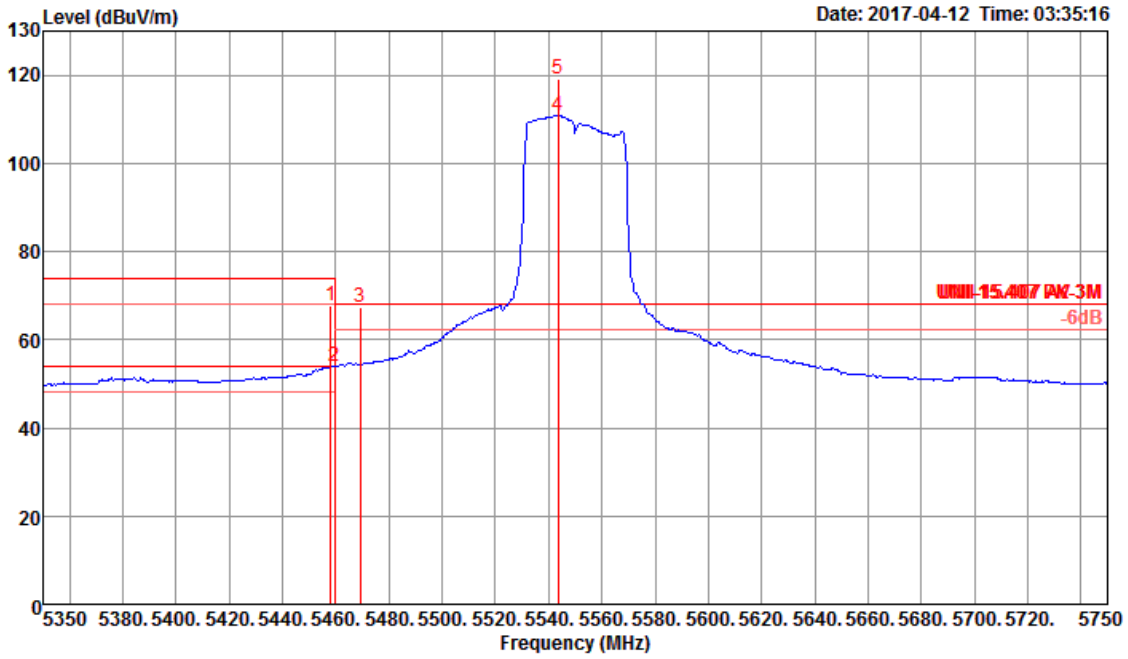
Channel 102



	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	5445.20	52.04	54.00	-1.96	47.17	5.57	33.79	34.49	126	180	Average	VERTICAL
2	5454.80	68.45	74.00	-5.55	63.53	5.59	33.82	34.49	126	180	Peak	VERTICAL
3	5468.00	70.53	74.00	-3.47	65.57	5.60	33.85	34.49	126	180	Peak	VERTICAL
4	5470.00	53.80	54.00	-0.20	48.84	5.60	33.85	34.49	126	180	Average	VERTICAL
5 @	5496.80	118.27			113.24	5.62	33.90	34.49	126	180	Peak	VERTICAL
6 @	5516.00	105.95			100.86	5.63	33.95	34.49	126	180	Average	VERTICAL

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

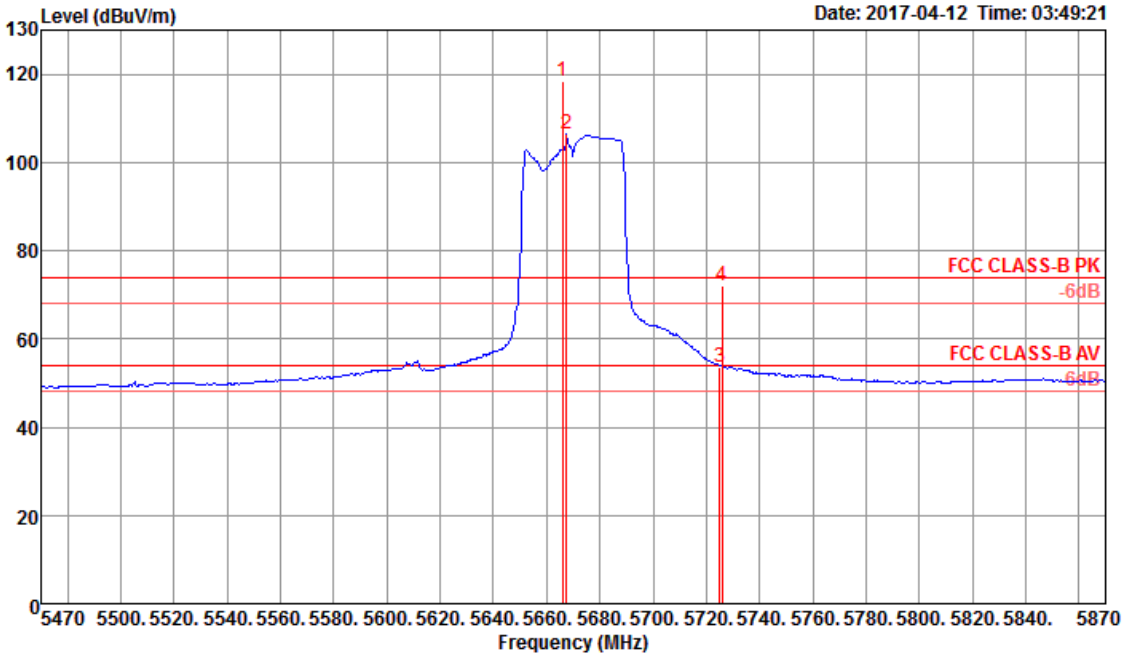
Channel 110



	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	5458.00	67.59	74.00	-6.41	62.67	5.59	33.82	34.49	127	212	Peak	VERTICAL
2	5459.60	53.99	54.00	-0.01	49.07	5.59	33.82	34.49	127	212	Average	VERTICAL
3	5469.20	67.24	68.20	-0.96	62.28	5.60	33.85	34.49	127	212	Peak	VERTICAL
4 @	5543.60	110.81			105.60	5.66	34.05	34.50	127	212	Average	VERTICAL
5 @	5543.60	119.02			113.81	5.66	34.05	34.50	127	212	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5550 MHz.

Channel 134

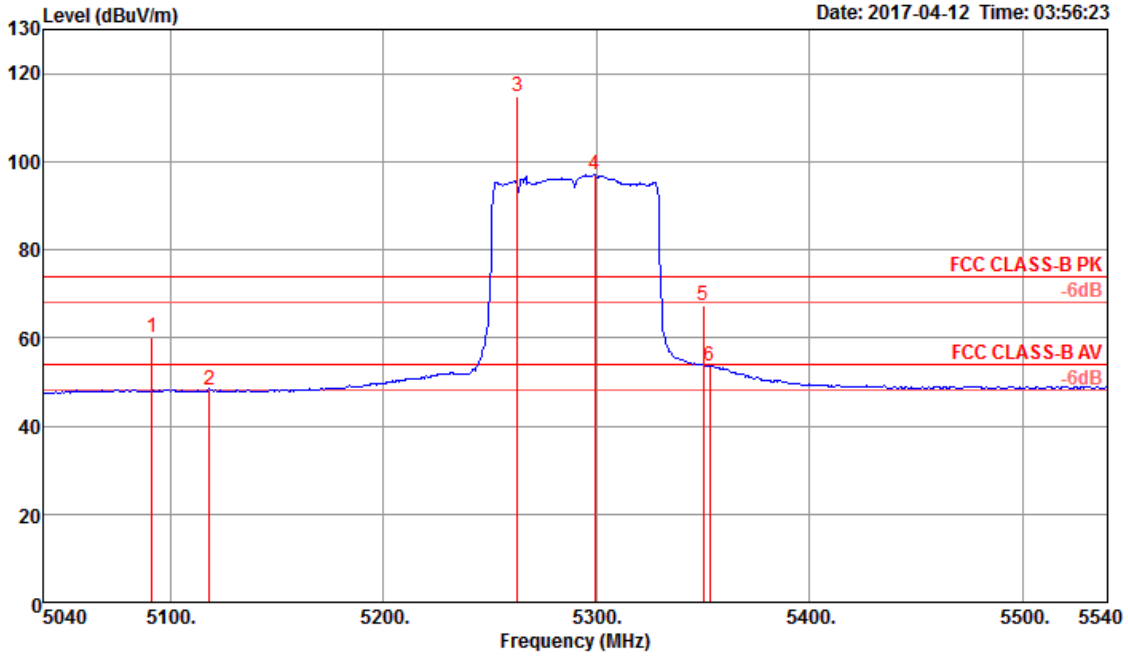


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 @	5666.00	118.26			112.69	5.69	34.40	34.52	124	172	Peak	VERTICAL
2 @	5667.60	106.58			101.01	5.69	34.40	34.52	124	172	Average	VERTICAL
3	5725.00	53.76	54.00	-0.24	47.99	5.70	34.60	34.53	124	172	Average	VERTICAL
4	5726.00	71.96	74.00	-2.04	66.19	5.70	34.60	34.53	124	172	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Welson Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58, 106, 122 / Chain 1 + Chain 2 + Chain 3 + Chain 4

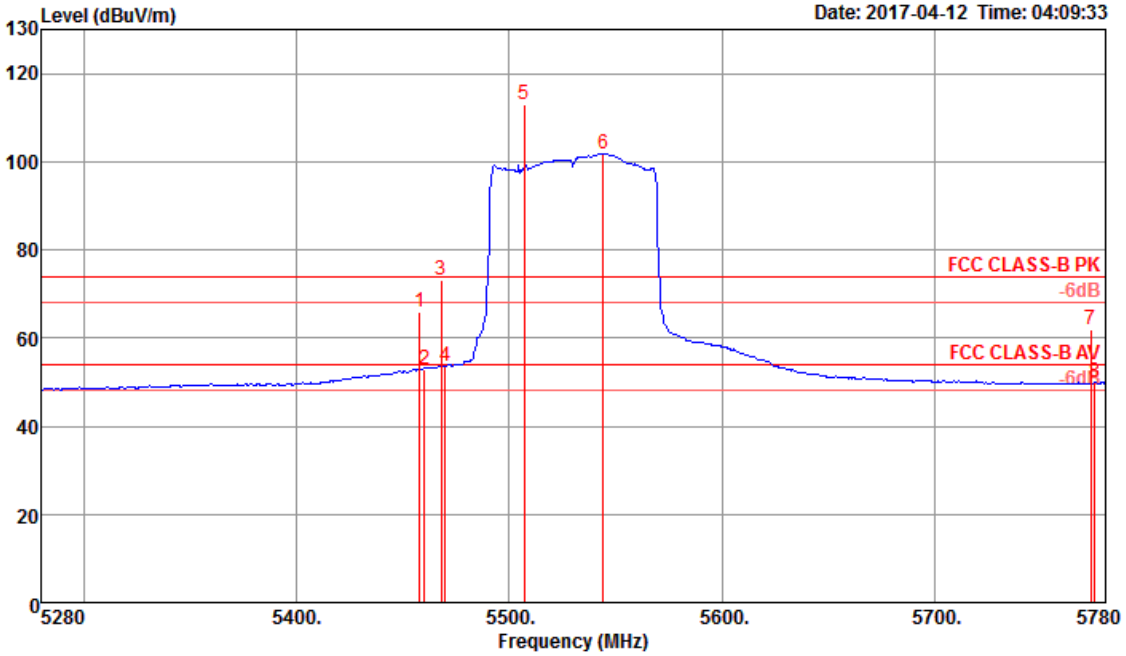
Channel 58



	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	5091.00	59.94	74.00	-14.06	55.81	5.44	33.16	34.47	112	200	Peak	VERTICAL
2	5118.00	48.34	54.00	-5.66	44.14	5.45	33.22	34.47	112	200	Average	VERTICAL
3 @	5263.00	114.93			110.40	5.52	33.49	34.48	112	200	Peak	VERTICAL
4 @	5299.00	97.00			92.41	5.52	33.55	34.48	112	200	Average	VERTICAL
5	5350.00	67.41	74.00	-6.59	62.73	5.53	33.63	34.48	112	200	Peak	VERTICAL
6	5353.00	53.72	54.00	-0.28	49.04	5.53	33.63	34.48	112	200	Average	VERTICAL

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

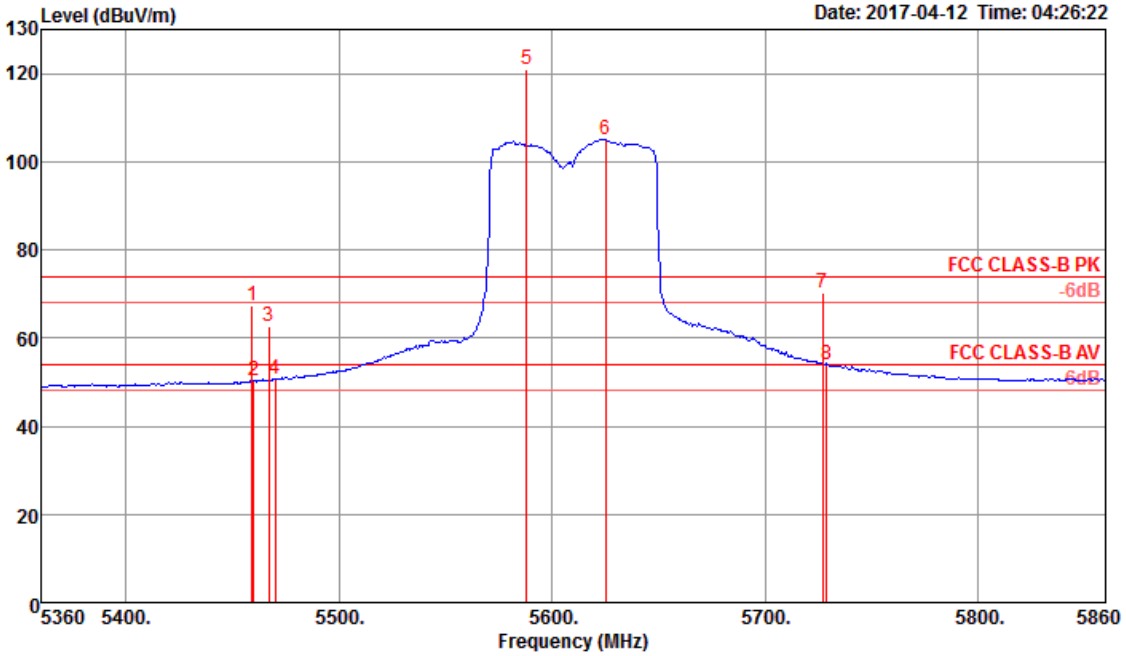
Channel 106



	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	5458.00	66.01	74.00	-7.99	61.09	5.59	33.82	34.49	179	213	Peak	VERTICAL
2	5460.00	52.93	54.00	-1.07	48.01	5.59	33.82	34.49	179	213	Average	VERTICAL
3	5468.00	73.24	74.00	-0.76	68.28	5.60	33.85	34.49	179	213	Peak	VERTICAL
4	5470.00	53.70	54.00	-0.30	48.74	5.60	33.85	34.49	179	213	Average	VERTICAL
5 @	5507.00	113.01			107.98	5.62	33.90	34.49	179	213	Peak	VERTICAL
6 @	5544.00	101.64			96.43	5.66	34.05	34.50	179	213	Peak	VERTICAL
7	5773.00	61.97	74.00	-12.03	56.05	5.70	34.75	34.53	179	213	Peak	VERTICAL
8	5775.00	50.00	54.00	-4.00	44.08	5.70	34.75	34.53	179	213	Average	VERTICAL

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

Channel 122



	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	5459.00	67.51	74.00	-6.49	62.59	5.59	33.82	34.49	150	171	Peak	VERTICAL
2	5460.00	50.25	54.00	-3.75	45.33	5.59	33.82	34.49	150	171	Average	VERTICAL
3	5467.00	62.66	74.00	-11.34	57.70	5.60	33.85	34.49	150	171	Peak	VERTICAL
4	5470.00	50.63	54.00	-3.37	45.67	5.60	33.85	34.49	150	171	Average	VERTICAL
5 @	5588.00	121.00			115.67	5.68	34.15	34.50	150	171	Peak	VERTICAL
6 @	5625.00	105.06			99.58	5.69	34.30	34.51	150	171	Average	VERTICAL
7	5727.00	70.29	74.00	-3.71	64.52	5.70	34.60	34.53	150	171	Peak	VERTICAL
8	5729.00	53.94	54.00	-0.06	48.17	5.70	34.60	34.53	150	171	Average	VERTICAL

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

Note:

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

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

4.6. Frequency Stability Measurement

4.6.1. Limit

In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

4.6.2. Measuring Instruments and Setting

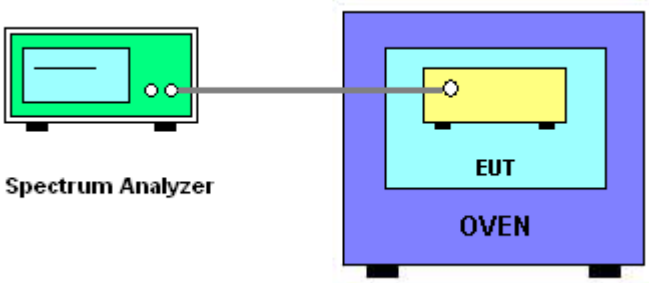
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RBW	10 kHz
VBW	10 kHz
Sweep Time	Auto

4.6.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
7. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
8. Extreme temperature is 0°C~40°C.

4.6.4. Test Setup Layout



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

4.6.7. Test Result of Frequency Stability

Temperature	26°C	Humidity	55%
Test Engineer	Peter Wu	Test Date	Apr. 12, 2017~Apr. 13, 2017

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5300 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5299.9914	5299.9913	5299.9910	5299.9908
110.00	5299.9912	5299.9907	5299.9897	5299.9895
93.50	5299.9904	5299.9896	5299.9887	5299.9885
Max. Deviation (MHz)	0.0096	0.0104	0.0113	0.0115
Max. Deviation (ppm)	1.81	1.96	2.13	2.17
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5300 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5300.0002	5299.9990	5299.9971	5299.9949
10	5299.9989	5299.9976	5299.9961	5299.9943
20	5299.9977	5299.9964	5299.9948	5299.9929
30	5299.9963	5299.9952	5299.9938	5299.9922
40	5299.9947	5299.9932	5299.9916	5299.9896
Max. Deviation (MHz)	0.0070	0.0082	0.0097	0.0124
Max. Deviation (ppm)	1.32	1.55	1.83	2.34
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5580 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5579.9912	5579.9902	5579.9901	5579.9892
110.00	5579.9903	5579.9896	5579.9887	5579.9879
93.50	5579.9898	5579.9890	5579.9880	5579.9876
Max. Deviation (MHz)	0.0102	0.0110	0.0120	0.0124
Max. Deviation (ppm)	1.83	1.97	2.15	2.22
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5580 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5579.9982	5579.9970	5579.9951	5579.9929
10	5579.9969	5579.9956	5579.9941	5579.9923
20	5579.9957	5579.9944	5579.9928	5579.9909
30	5579.9943	5579.9932	5579.9918	5579.9902
40	5579.9927	5579.9912	5579.9896	5579.9876
Max. Deviation (MHz)	0.0090	0.0102	0.0117	0.0144
Max. Deviation (ppm)	1.61	1.83	2.10	2.58
Result	Complies			

Mode: 40 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5310 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5309.9925	5309.9920	5309.9915	5309.9914
110.00	5309.9915	5309.9905	5309.9895	5309.9889
93.50	5309.9905	5309.9900	5309.9899	5309.9898
Max. Deviation (MHz)	0.0095	0.0100	0.0105	0.0111
Max. Deviation (ppm)	1.79	1.88	1.98	2.09
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5310 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5309.9931	5309.9919	5309.9900	5309.9878
10	5309.9918	5309.9905	5309.9890	5309.9872
20	5309.9906	5309.9893	5309.9877	5309.9858
30	5309.9892	5309.9881	5309.9867	5309.9851
40	5309.9876	5309.9861	5309.9845	5309.9825
Max. Deviation (MHz)	0.0141	0.0153	0.0168	0.0195
Max. Deviation (ppm)	2.66	2.88	3.16	3.67
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5550 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5549.9988	5549.9983	5549.9973	5549.9966
110.00	5549.9980	5549.9972	5549.9967	5549.9958
93.50	5549.9973	5549.9969	5549.9966	5549.9956
Max. Deviation (MHz)	0.0027	0.0031	0.0034	0.0044
Max. Deviation (ppm)	0.49	0.56	0.61	0.79
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5550 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5549.9996	5549.9984	5549.9965	5549.9943
10	5549.9983	5549.9970	5549.9955	5549.9937
20	5549.9971	5549.9958	5549.9942	5549.9923
30	5549.9957	5549.9946	5549.9932	5549.9916
40	5549.9941	5549.9926	5549.9910	5549.9890
Max. Deviation (MHz)	0.0076	0.0088	0.0103	0.0130
Max. Deviation (ppm)	1.37	1.59	1.86	2.34
Result	Complies			

Mode: 80 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5290 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5289.9976	5289.9972	5289.9964	5289.9957
110.00	5289.9970	5289.9964	5289.9962	5289.9956
93.50	5289.9962	5289.9953	5289.9944	5289.9934
Max. Deviation (MHz)	0.0038	0.0047	0.0056	0.0066
Max. Deviation (ppm)	0.72	0.89	1.06	1.25
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5290 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5289.9972	5289.9960	5289.9941	5289.9919
10	5289.9959	5289.9946	5289.9931	5289.9913
20	5289.9947	5289.9934	5289.9918	5289.9899
30	5289.9933	5289.9922	5289.9908	5289.9892
40	5289.9917	5289.9902	5289.9886	5289.9866
Max. Deviation (MHz)	0.0100	0.0112	0.0127	0.0154
Max. Deviation (ppm)	1.89	2.12	2.40	2.91
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5530 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5529.9940	5529.9936	5529.9929	5529.9926
110.00	5529.9931	5529.9929	5529.9922	5529.9917
93.50	5529.9930	5529.9921	5529.9914	5529.9906
Max. Deviation (MHz)	0.0070	0.0079	0.0086	0.0094
Max. Deviation (ppm)	1.27	1.43	1.56	1.70
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5530 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5530.0005	5529.9993	5529.9974	5529.9952
10	5529.9992	5529.9979	5529.9964	5529.9946
20	5529.9980	5529.9967	5529.9951	5529.9932
30	5529.9966	5529.9955	5529.9941	5529.9925
40	5529.9950	5529.9935	5529.9919	5529.9899
Max. Deviation (MHz)	0.0067	0.0079	0.0094	0.0121
Max. Deviation (ppm)	1.21	1.43	1.70	2.19
Result	Complies			

4.7. Antenna Requirements

4.7.1. 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. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.7.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 25, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 16, 2017	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jun. 28, 2016	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 22, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 26, 2016	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 22, 2016	Conducted (TH01-CB)

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

6. MEASUREMENT UNCERTAINTY

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%
Output Power Measurement	1.33 dB	Confidence levels of 95%
Power Density Measurement	1.27 dB	Confidence levels of 95%
Bandwidth Measurement	9.74×10^{-8}	Confidence levels of 95%
Frequency Stability	6.06×10^{-8}	Confidence levels of 95%