



# SPORTON International Inc.

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## FCC RADIO TEST REPORT

Applicant's company	Tembo Systems, Inc.
Applicant Address	2933 Bunker Hill lane, Suite 100, Santa Clara, CA 95054 U.S.A
FCC ID	2AGMRTRM9995G
Manufacturer's company	Tembo Systems, Inc.
Manufacturer Address	2933 Bunker Hill lane, Suite 100, Santa Clara, CA 95054 U.S.A

Product Name	802.11ac WiFi Radio Module
Model No.	TRM9995G
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	May 30, 2016
Final Test Date	Aug. 19, 2016
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 v01r03, KDB662911 D01 v02r01, KDB644545 D03 v01.**

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



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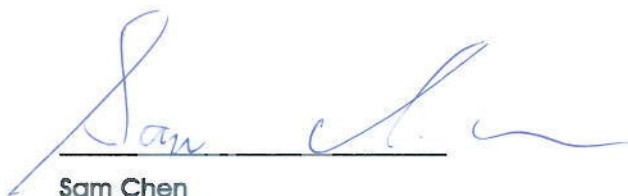
## History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR650411-01	Rev. 01	Initial issue of report	Sep. 26, 2016
FR650411-01	Rev. 02	Removing 80MHz mode in Band 2 and Band 3.	Nov. 17, 2016

## 1. VERIFICATION OF COMPLIANCE

Product Name : 802.11ac WiFi Radio Module  
Model No. : TRM9995G  
Applicant : Tembo Systems, Inc.  
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on May 30, 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

Note:

### <OMNI Antenna>

The EUT is a limited module which only limited to the host (model: AP1004WRe series).

The EUT was installed to the host (model: AP1004WRe series) to perform all the tests.

### <Directional Antenna>

The EUT is a limited module which only limited to the host (model: AP1004NRe series).

The EUT was installed to the host (model: AP1004NRe series) to perform all the tests.

### 3. GENERAL INFORMATION

#### 3.1. Product Details

Items	Description
Product Type	IEEE 802.11a/n/ac: WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From host system
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	15 for 20MHz bandwidth ; 7 for 40MHz bandwidth
Channel Bandwidth (99%)	<p><b>For OMNI antenna:</b></p> <p><b>&lt;For Non-Beamforming Mode&gt;</b></p> <p><b>Band 2:</b></p> <p>IEEE 802.11a: 16.50 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 17.37 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 36.18 MHz</p> <p><b>Band 3:</b></p> <p>IEEE 802.11a: 16.59 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 17.37 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 36.18 MHz</p> <p><b>&lt;For Beamforming Mode&gt;</b></p> <p><b>Band 2:</b></p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 17.97 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 37.34 MHz</p> <p><b>Band 3:</b></p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 17.97 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 37.05 MHz</p> <p><b>For Directional antenna:</b></p> <p><b>&lt;For Non-Beamforming Mode&gt;</b></p> <p><b>Band 2:</b></p> <p>IEEE 802.11a: 16.32 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 17.02 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 36.18 MHz</p>

	<p><b>Band 3:</b></p> <p>IEEE 802.11a: 16.41 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 17.02 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 36.04 MHz</p> <p><b>&lt;For Beamforming Mode&gt;</b></p> <p><b>Band 2:</b></p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 17.89 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz</p> <p><b>Band 3:</b></p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 17.89 MHz</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 37.05 MHz</p>
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Maximum Conducted Output Power	<p><b>For OMNI antenna:</b></p> <p><b>&lt;For Non-Beamforming Mode&gt;</b></p> <p><b>Band 2:</b></p> <p>IEEE 802.11a: 23.66 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 23.87 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 23.61 dBm</p> <p><b>Band 3:</b></p> <p>IEEE 802.11a: 23.74 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 23.80 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 23.68 dBm</p> <p><b>&lt;For Beamforming Mode&gt;</b></p> <p><b>Band 2:</b></p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 23.78 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 23.91 dBm</p> <p><b>Band 3:</b></p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 22.28 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 22.42 dBm</p> <p><b>For Directional antenna:</b></p> <p><b>&lt;For Non-Beamforming Mode&gt;</b></p> <p><b>Band 2:</b></p> <p>IEEE 802.11a: 16.62 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 16.84 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 16.86 dBm</p> <p><b>Band 3:</b></p> <p>IEEE 802.11a: 15.72 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 15.97 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 15.71 dBm</p> <p><b>&lt;For Beamforming Mode&gt;</b></p> <p><b>Band 2:</b></p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 15.88 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 15.71 dBm</p> <p><b>Band 3:</b></p> <p>IEEE 802.11ac MCS0/Nss1 (VHT20): 14.97 dBm</p> <p>IEEE 802.11ac MCS0/Nss1 (VHT40): 14.87 dBm</p>
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3



Items	Description	
Communication Mode	<input checked="" type="checkbox"/> IP Based (Load Based)	<input type="checkbox"/> Frame Based
TPC Function	<input checked="" type="checkbox"/> With TPC	<input type="checkbox"/> Without TPC
Weather Band (5600~5650MHz)	<input checked="" type="checkbox"/> With 5600~5650MHz	<input type="checkbox"/> Without 5600~5650MHz
Beamforming Function	<input checked="" type="checkbox"/> With beamforming for 802.11n/ac.	<input type="checkbox"/> Without beamforming
Operate Condition	<input checked="" type="checkbox"/> Indoor	<input checked="" type="checkbox"/> Outdoor

#### Antenna and Bandwidth

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

#### IEEE 11n/ac Spec.

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

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 and VHT40 (VHT: Very High Throughput).

Then EUT supports VHT20 and VHT40.

Note 3: Modulation modes consist of below configuration:

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

Note: The EUT only support 20MHz and 40MHz in Band 2 ~ Band 3.

### 3.2. Accessories

N/A

### 3.3. Table for Filed Antenna

Ant. Set	Brand Holder	Band	Model Name	Antenna Type	Connector	Gain (dBi)	TX Function	Host System Model
1	Tembo Systems Inc.	Band 1, 2 and Band 4	PCA-000007-XXX-X/ PCA-000005-XXX-X	OMNI Antenna	I-PEX	Note	4TX/4RX	AP1004WRe series
		Band 3	PCA-000006-000-X/ PCB-000015-XXX-X					
2	Tembo Systems Inc.	Band 1 and Band 2	PCA-000009-XXX-X	Directional Antenna	I-PEX	Note	4TX/4RX	AP1004NRe series
		Band 3	PCB-000011-XXX-X					
		Band 4	PCA-000010-XXX-X					

Note:

Ant. Set	Band	Gain (dBi)	Cable loss	True Gain (dBi)	Array Gain (dBi)
1	Band 1	5.06	9.90	-4.84	4
	Band 2	4.55	9.90	-5.35	4
	Band 3	4.82	1.35	3.47	4
	Band 4	5.03	10.9	-5.87	4

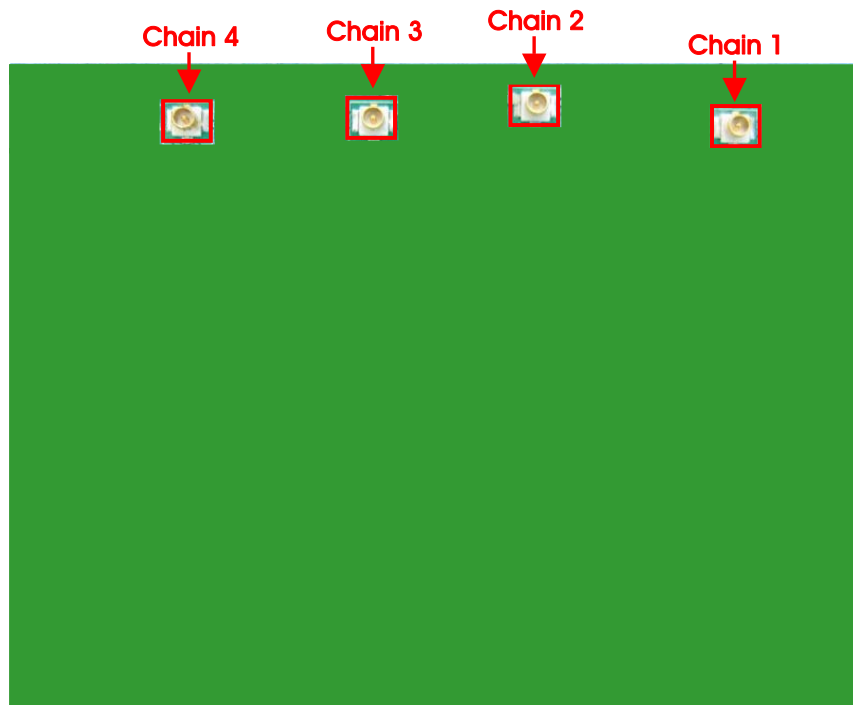
Ant. Set	Band	Tested Antenna Gain (dBi)	Cable loss (dB)	Tested net antenna gain (dBi)	Certified Net Antenna Gain (dBi)	Array Gain (dBi)
2	Band 1	13.6	1.6	12	13	1
	Band 2	13.6	1.6	12	13	1
	Band 3	15.3	1.6	13.7	14	1
	Band 4	13.6	1.6	12	13	1

Note: The EUT has two sets of antennas.

**For IEEE 802.11a/n/ac mode <4TX/4RX>:**

Chain 1, Chain 2, Chain 3 and Chain 4 will transmit/receive the same signal simultaneously.

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



### 3.4. Table for Carrier Frequencies

There are two 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.

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
5470~5725 MHz Band 3	100	5500 MHz	124	5620 MHz
	102	5510 MHz	120	5600 MHz
	104	5520 MHz	126	5630 MHz
	108	5540 MHz	128	5640 MHz
	110	5550 MHz	132	5660 MHz
	112	5560 MHz	134	5670 MHz
	116	5580 MHz	136	5680 MHz
	118	5590 MHz	140	5700 MHz

### 3.5. Table for Test Modes

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

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

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

Note 2: The EUT supports AP mode and Repeater mode, but the Repeater mode doesn't supports DFS band.

Note 3: There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802.11n/ac. All test results were recorded in this report.

The following test modes were performed for all tests:

Radiated Emissions (Above 1GHz)	
Test Mode	Description
The EUT was performed at X axis and Y axis position for Radiated emission above 1GHz test, and the worst case was found at Y axis for Omni antenna and X axis for Directional antenna. So the measurement will follow this same test configuration.	
1	EUT Y axis + Ant.1
2	EUT X axis + Ant.2

### 3.6. Table for Testing Locations

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

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

### 3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR650411

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

Modifications	Performance Checking
Add 5GHz Band 2 and Band 3 (5250 to 5350 MHz, 5470 to 5725 MHz) are only available in 20 MHz and 40 MHz for this device.	Max. Conducted Output Power Power Spectral Density 26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Radiated Emission Above 1GHz Band Edge Emission Frequency Stability

### 3.8. Table for Supporting Units

For OMNI antenna:

For Test Site No: 03CH01-CB <Above 1GHz>

<For Non-Beamforming Mode>

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004WRe	DoC

<For Beamforming Mode>

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004WRe	DoC
RX Device	N/A	AP1004NRe, AP1004WRe, AP1002We	DoC

For Directional antenna:

For Test Site No: 03CH01-CB <Above 1GHz>

<For Non-Beamforming Mode>

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004NRe	DoC

<For Beamforming Mode>

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004NRe	DoC
RX Device	N/A	AP1004NRe, AP1004WRe, AP1002We	DoC

For Test Site No: TH01-CB

For OMNI antenna:

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004WRe	DoC

For Directional antenna:

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004NRe	DoC



### 3.9. Table for Parameters of Test Software Setting

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

For OMNI antenna:

<For Non-Beamforming Mode>

Test Software Version	QCARCT					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	18.5	18	18.5	18	18.5	18.5
802.11ac MCS0/Nss1 VHT20	18.5	18	18.5	18.5	18.5	19
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	
	17	17	16.5	17.5	18	

<For Beamforming Mode>

Test Software Version	QCARCT					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11ac MCS0/Nss1 VHT20	24.5	24	24	23	23	23.5
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	
	23.5	23.5	22	22	22.5	

For Directional antenna:

<For Non-Beamforming Mode>

Test Software Version	QCARCT					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	11	11	11	10.5	10.5	10.5
802.11ac MCS0/Nss1 VHT20	11.5	11.5	11.5	10.5	11	11
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	
	10.5	10.5	9.5	9.5	9.5	

<For Beamforming Mode>

Test Software Version	QCARCT					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11ac MCS0/Nss1 VHT20	16	16	16	15	15	15.5
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	
	14	14	13.5	13.5	13.5	

### 3.10. EUT Operation during Test

#### <For Non-Beamforming Mode>

The EUT was programmed to be in continuously transmitting mode.

#### <For Beamforming Mode>

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

During the test, the following programs under WIN 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 receive and transmit packet by RX Device and transmit duty cycle no less 98%

### 3.11. Duty Cycle

#### <For Non-Beamforming Mode>

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.060	2.130	96.71%	0.15	0.49
802.11ac MCS0/Nss1 VHT20	5.022	5.084	98.78%	0.05	0.01
802.11ac MCS0/Nss1 VHT40	2.060	2.140	96.26%	0.17	0.49

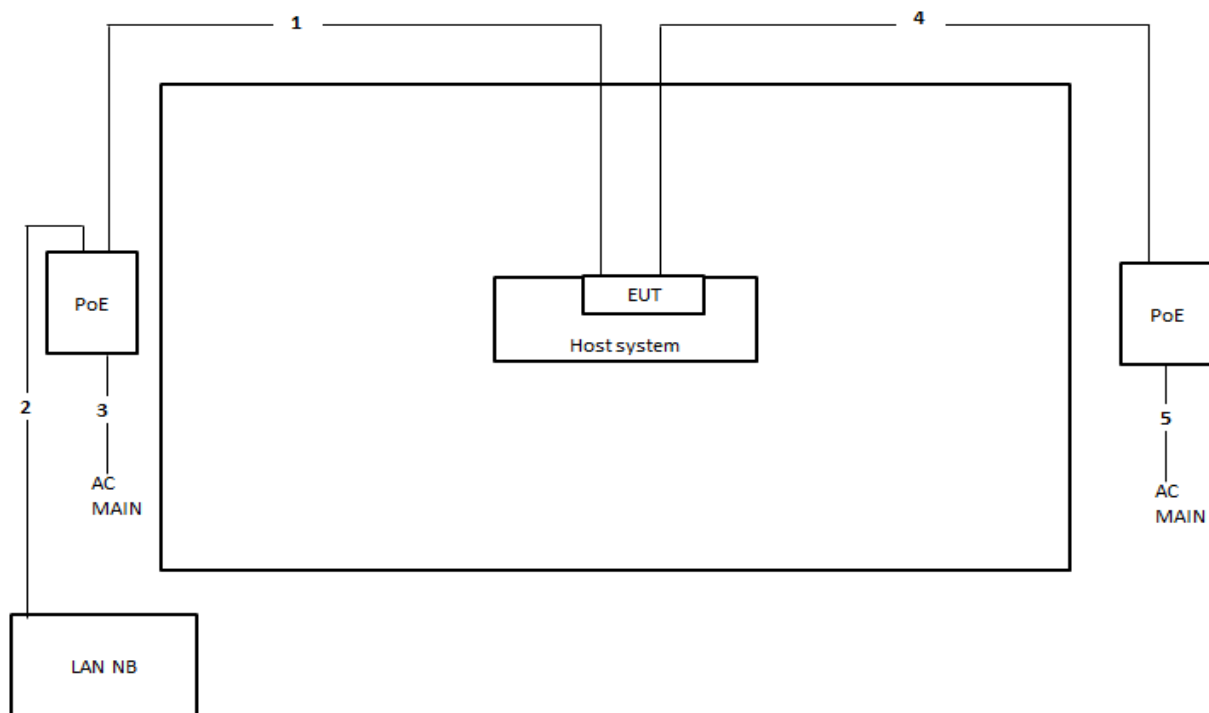
#### <For Beamforming Mode>

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	1.752	1.920	91.25%	0.40	0.57
802.11ac MCS0/Nss1 VHT40	1.664	1.856	89.66%	0.47	0.60

### 3.12. Test Configurations

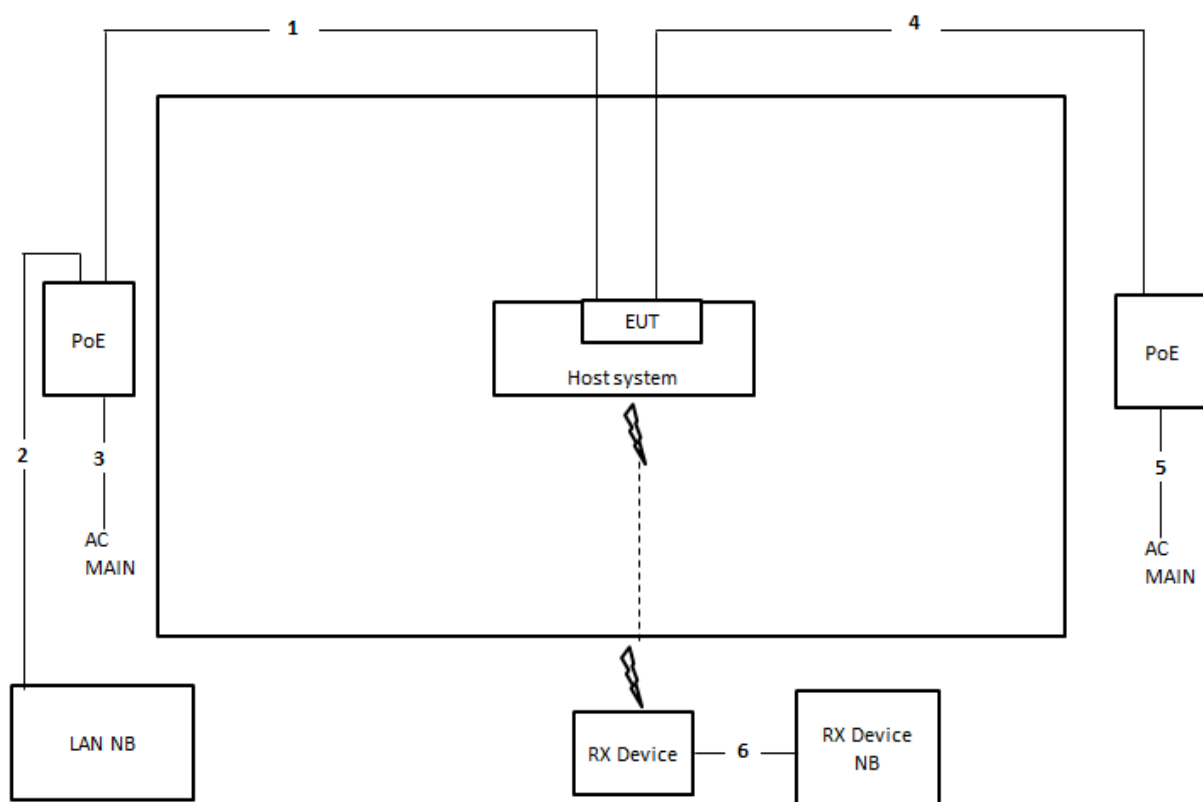
#### 3.12.1. Radiation Emissions Test Configuration

<For Non-Beamforming Mode>



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

<For Beamforming Mode>



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1.5m
3	Power cable	No	1.5m
4	RJ-45 cable	No	10m
5	Power cable	No	1.5m
6	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	$\geq 3 \times \text{RBW}$
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

For OMNI antenna:

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu		

<For Non-Beamforming Mode>

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5260 MHz	18.70	16.15
	5300 MHz	18.87	16.50
	5320 MHz	18.26	16.41
	5500 MHz	18.61	16.32
	5580 MHz	18.87	16.59
	5700 MHz	17.65	15.72
802.11ac MCS0/Nss1 VHT20	5260 MHz	19.39	17.37
	5300 MHz	19.13	16.93
	5320 MHz	19.65	17.37
	5500 MHz	19.22	17.37
	5580 MHz	19.13	17.28
	5700 MHz	19.57	17.28
802.11ac MCS0/Nss1 VHT40	5270 MHz	39.86	36.18
	5310 MHz	40.00	36.18
	5510 MHz	39.57	35.89
	5550 MHz	39.71	36.04
	5670 MHz	39.71	36.18

**<For Beamforming Mode>**

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5260 MHz	21.91	17.97
	5300 MHz	22.17	17.97
	5320 MHz	21.83	17.97
	5500 MHz	21.13	17.97
	5580 MHz	21.30	17.97
	5700 MHz	21.39	17.97
802.11ac MCS0/Nss1 VHT40	5270 MHz	47.68	37.34
	5310 MHz	46.81	37.34
	5510 MHz	45.51	37.05
	5550 MHz	45.36	37.05
	5670 MHz	46.67	37.05



For Directional antenna:

<For Non-Beamforming Mode>

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu		

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5260 MHz	18.61	16.15
	5300 MHz	18.78	16.32
	5320 MHz	18.78	16.24
	5500 MHz	18.60	16.32
	5580 MHz	18.87	16.41
	5700 MHz	18.61	15.54
802.11ac MCS0/Nss1 VHT20	5260 MHz	19.22	16.67
	5300 MHz	19.30	16.93
	5320 MHz	19.39	17.02
	5500 MHz	19.30	16.50
	5580 MHz	19.90	17.02
	5700 MHz	19.57	16.85
802.11ac MCS0/Nss1 VHT40	5270 MHz	40.00	36.18
	5310 MHz	39.86	36.18
	5510 MHz	39.57	35.89
	5550 MHz	39.71	35.89
	5670 MHz	39.71	36.04

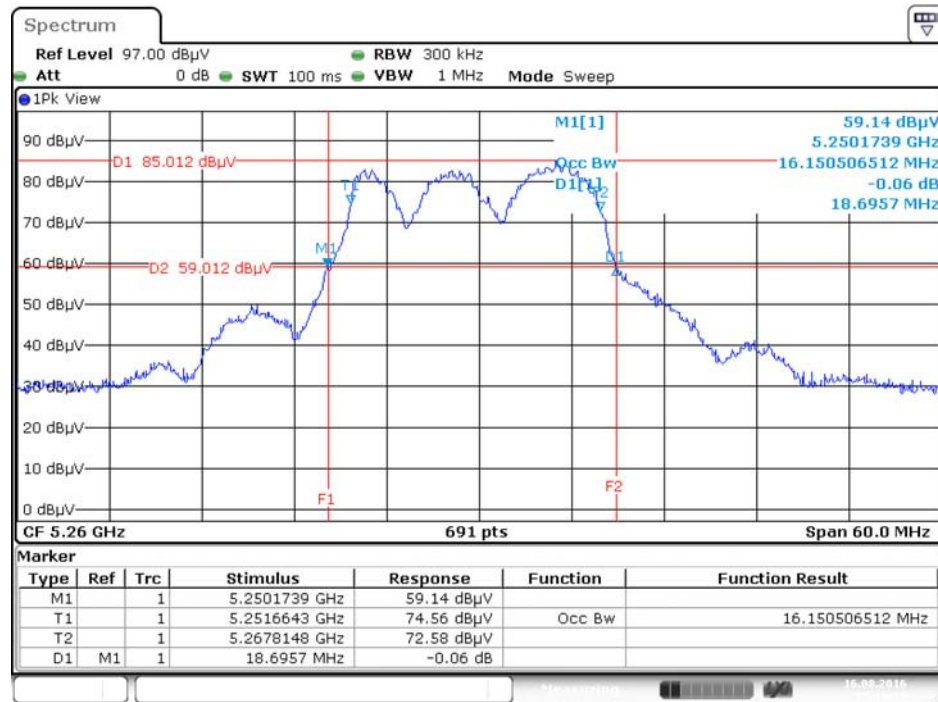
<For Beamforming Mode>

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5260 MHz	21.48	17.89
	5300 MHz	22.00	17.89
	5320 MHz	21.57	17.89
	5500 MHz	21.91	17.89
	5580 MHz	21.74	17.89
	5700 MHz	21.30	17.89
802.11ac MCS0/Nss1 VHT40	5270 MHz	44.35	36.76
	5310 MHz	44.49	36.90
	5510 MHz	45.22	36.90
	5550 MHz	44.78	37.05
	5670 MHz	45.36	36.90

For OMNI antenna:

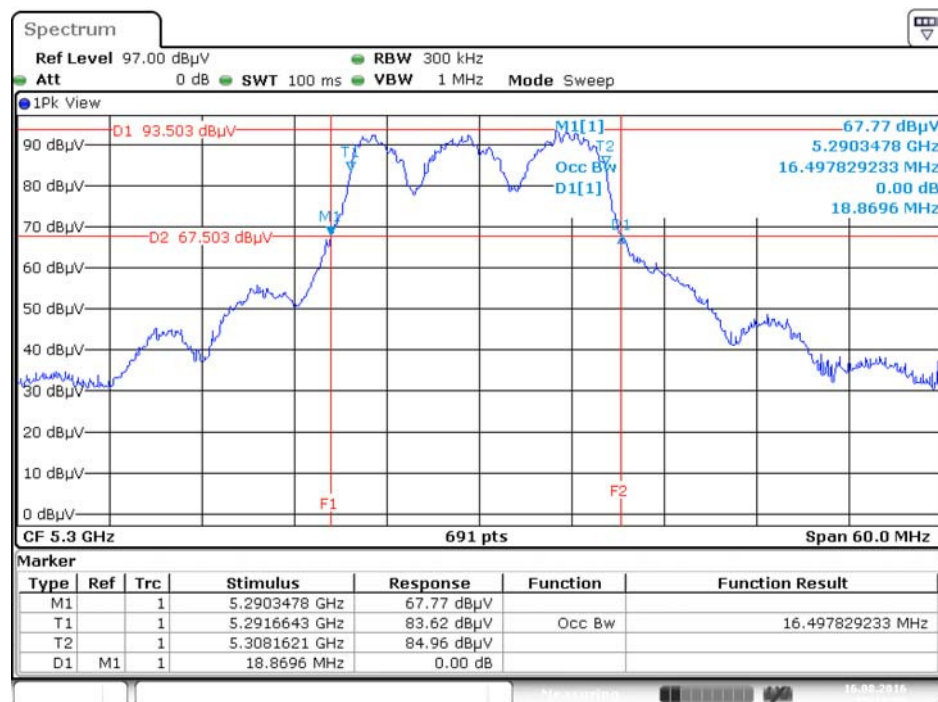
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2  
+ Chain 3 + Chain 4 / 5260 MHz



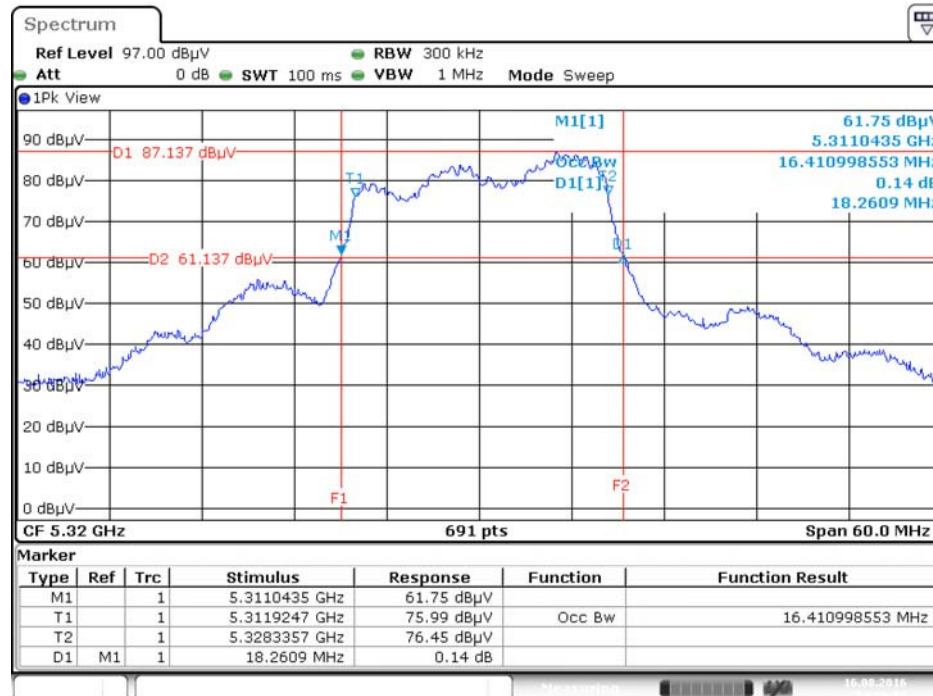
Date: 16.AUG.2016 15:14:19

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

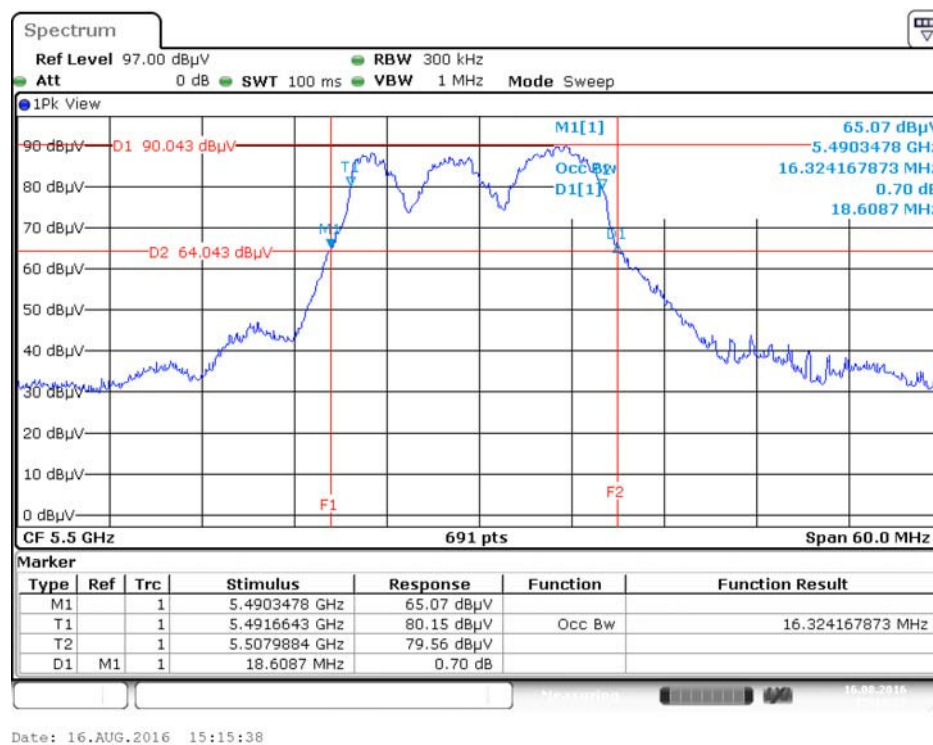


Date: 16.AUG.2016 15:12:08

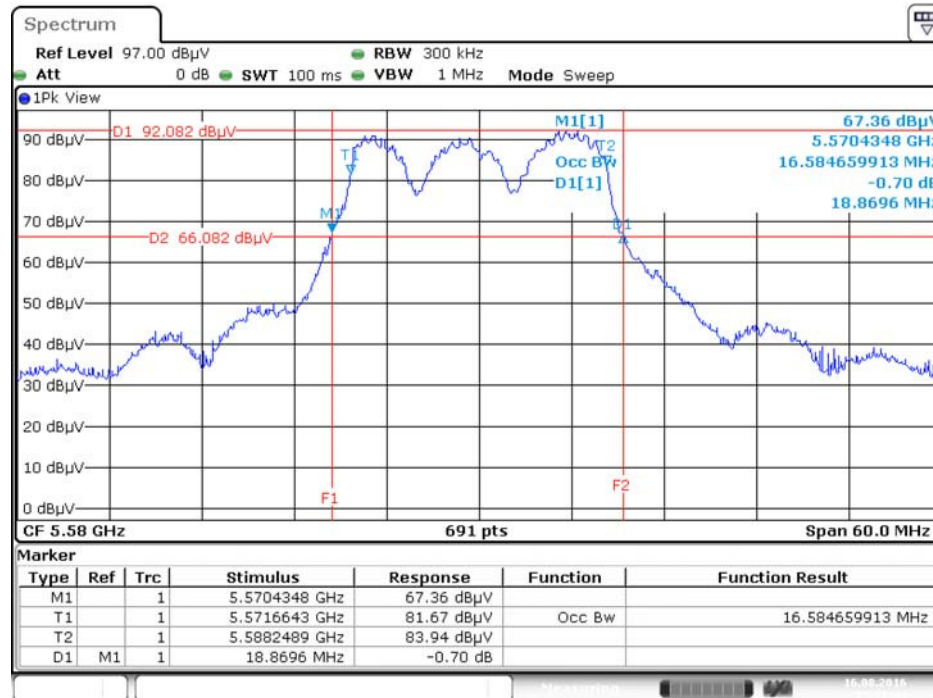
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2  
+ Chain 3 + Chain 4 / 5320 MHz



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

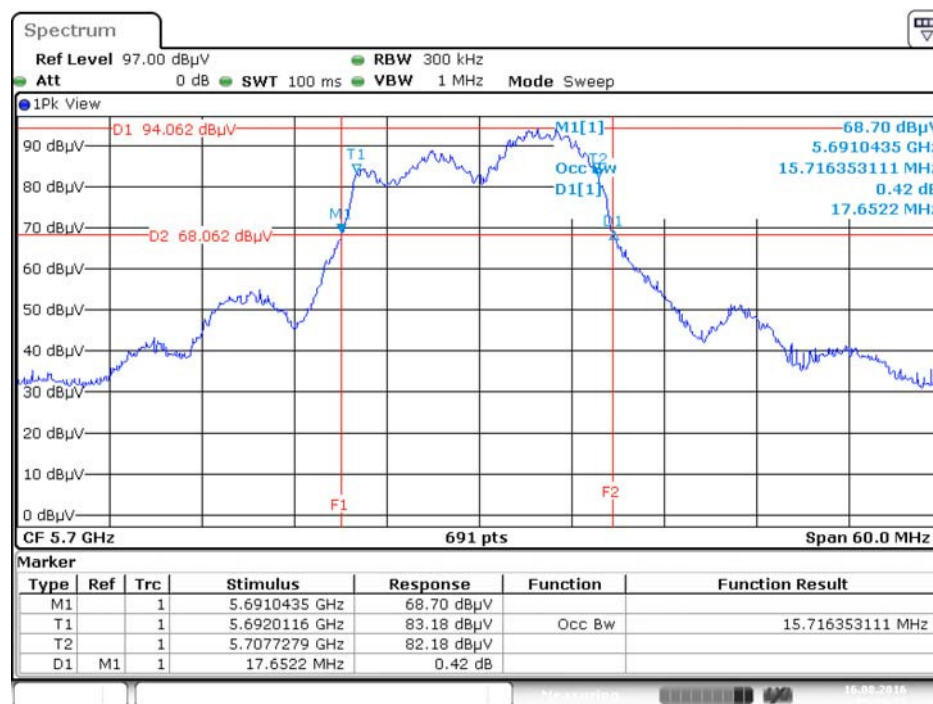


### 26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



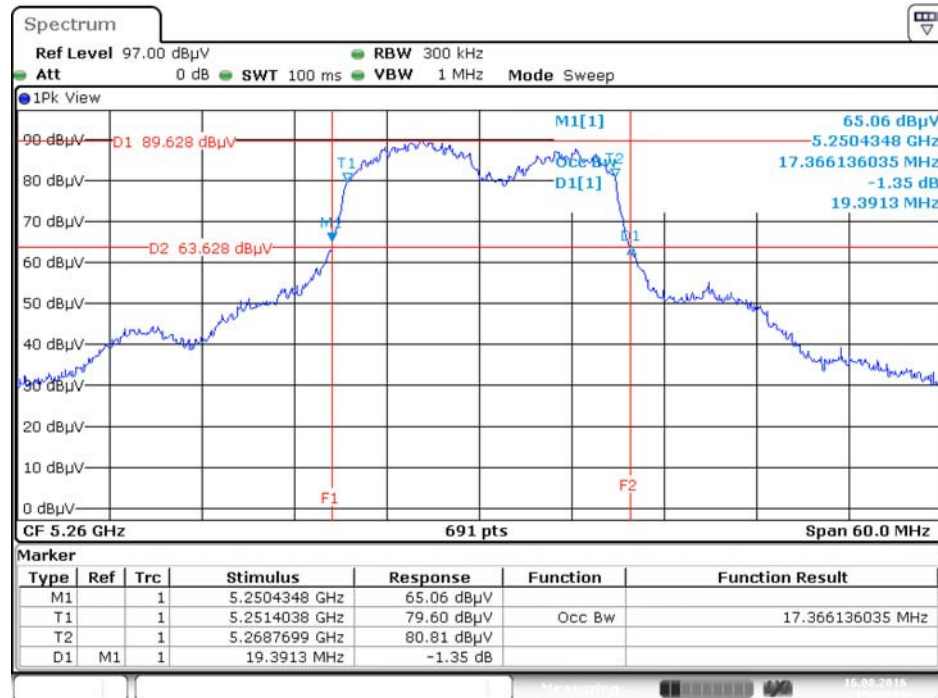
Date: 16.AUG.2016 15:21:44

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



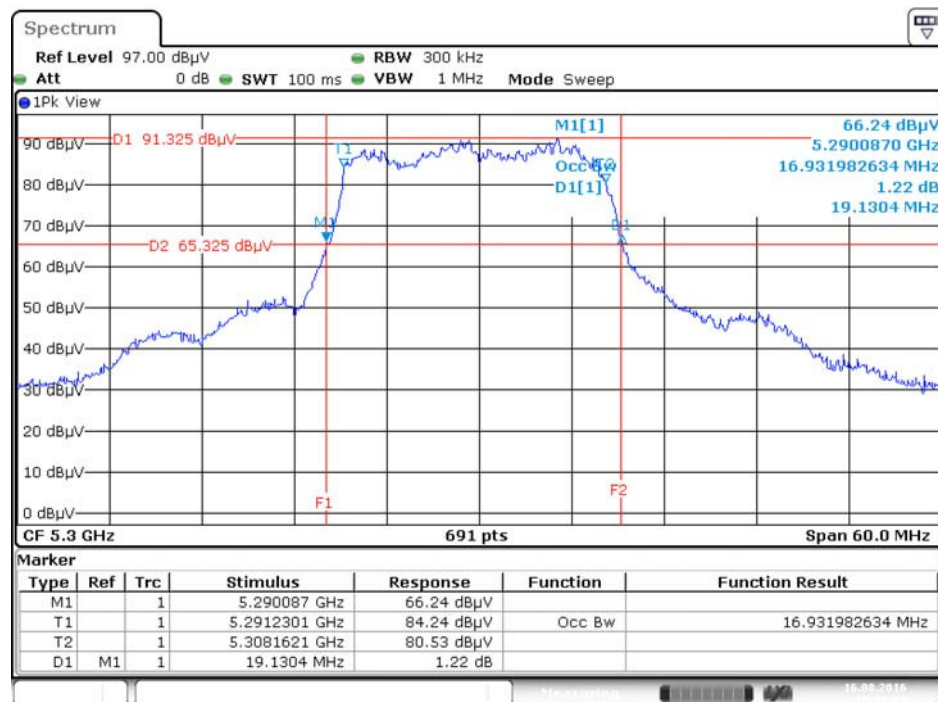
Date: 16.AUG.2016 15:24:21

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



Date: 16.AUG.2016 15:30:34

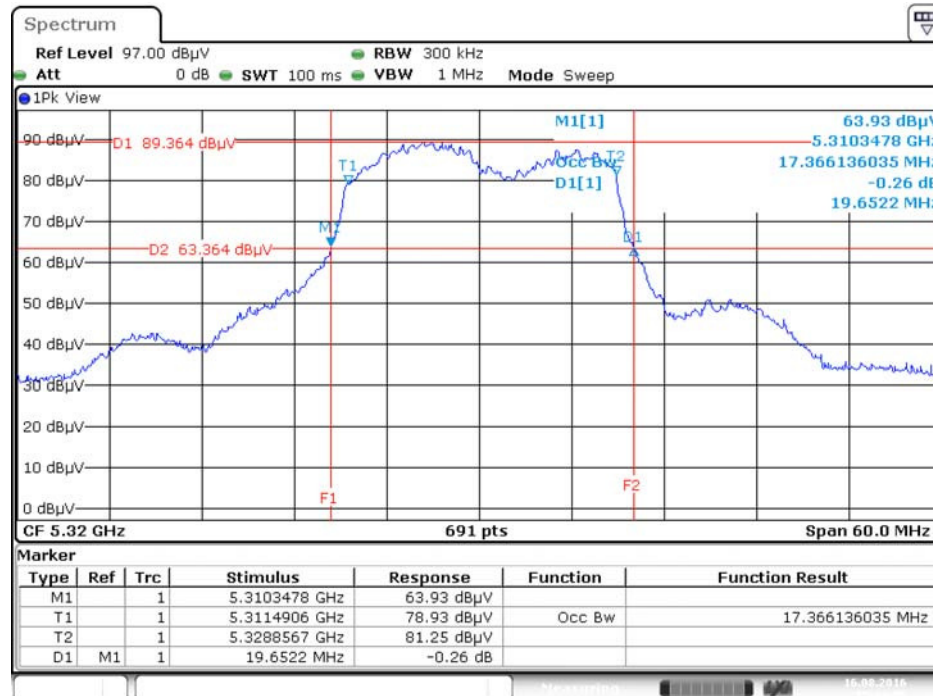
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5300 MHz



Date: 16.AUG.2016 15:31:39

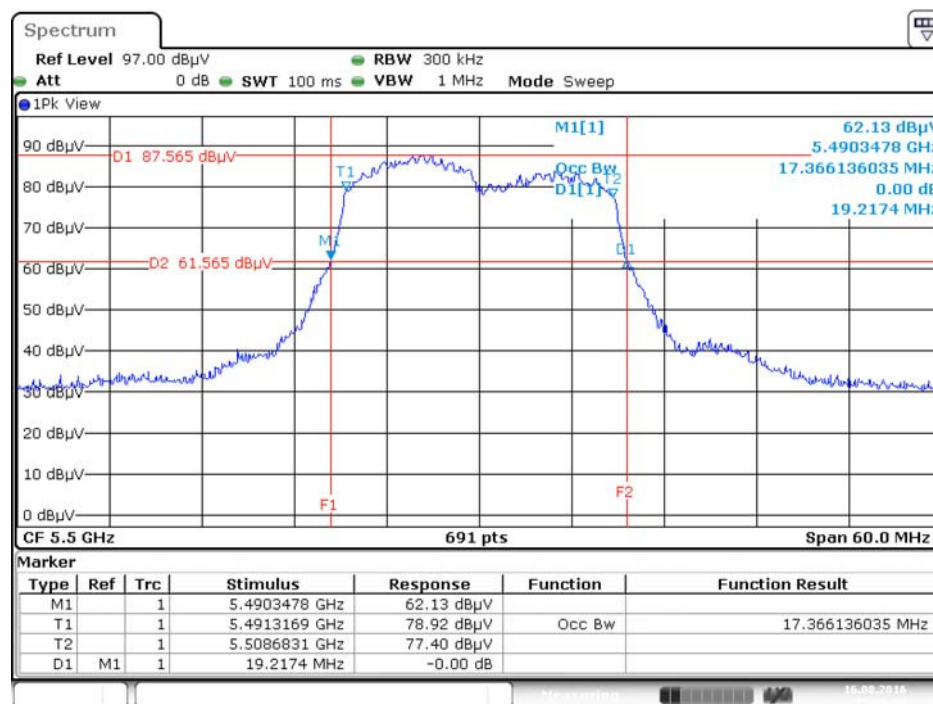


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5320 MHz



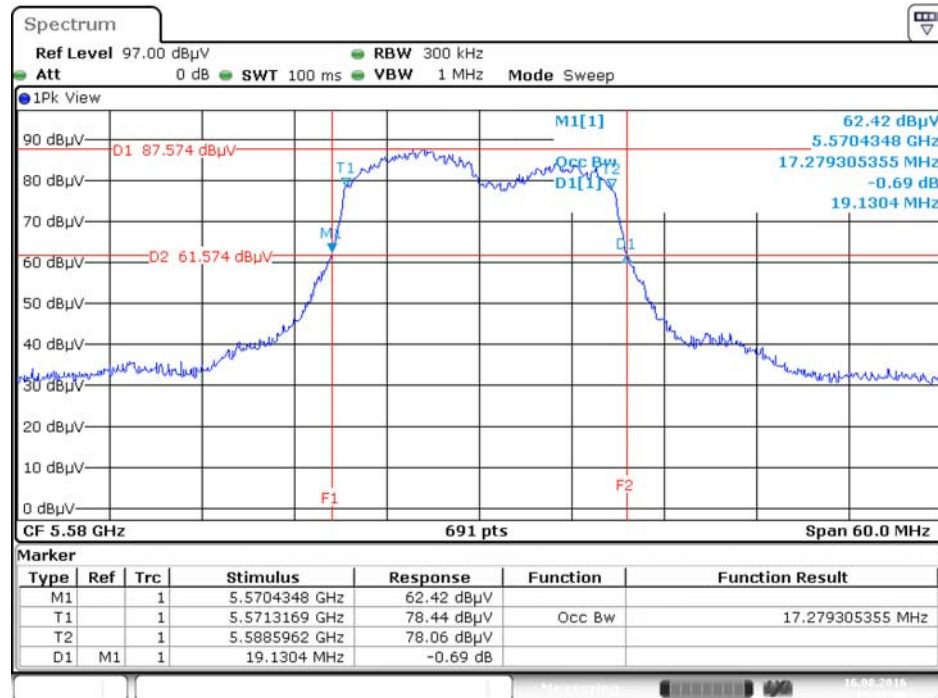
Date: 16.AUG.2016 15:34:56

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



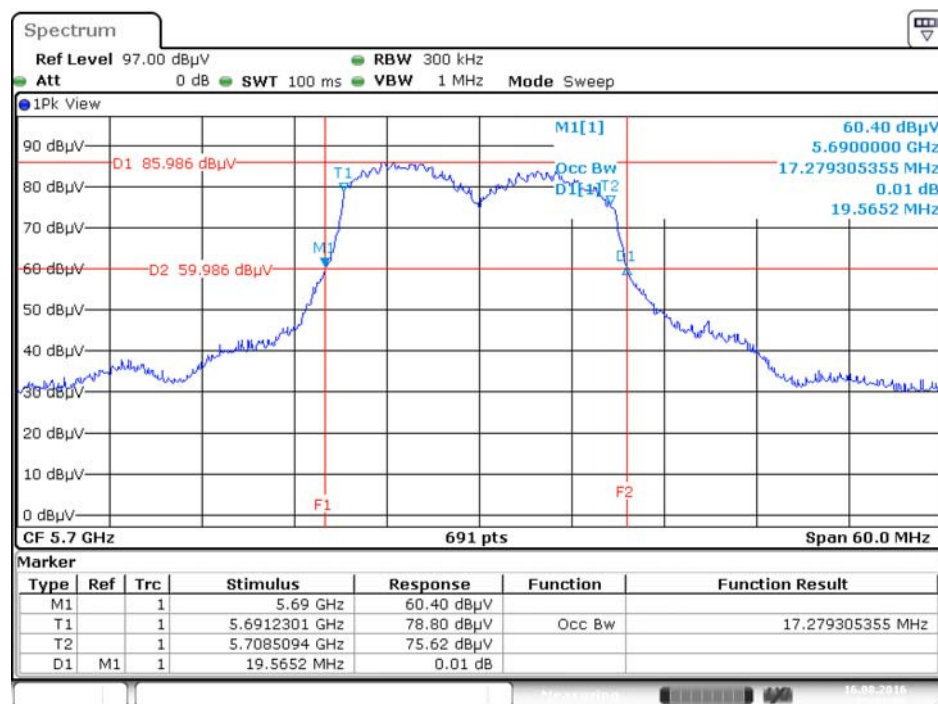
Date: 16.AUG.2016 15:36:24

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



Date: 16.AUG.2016 15:37:10

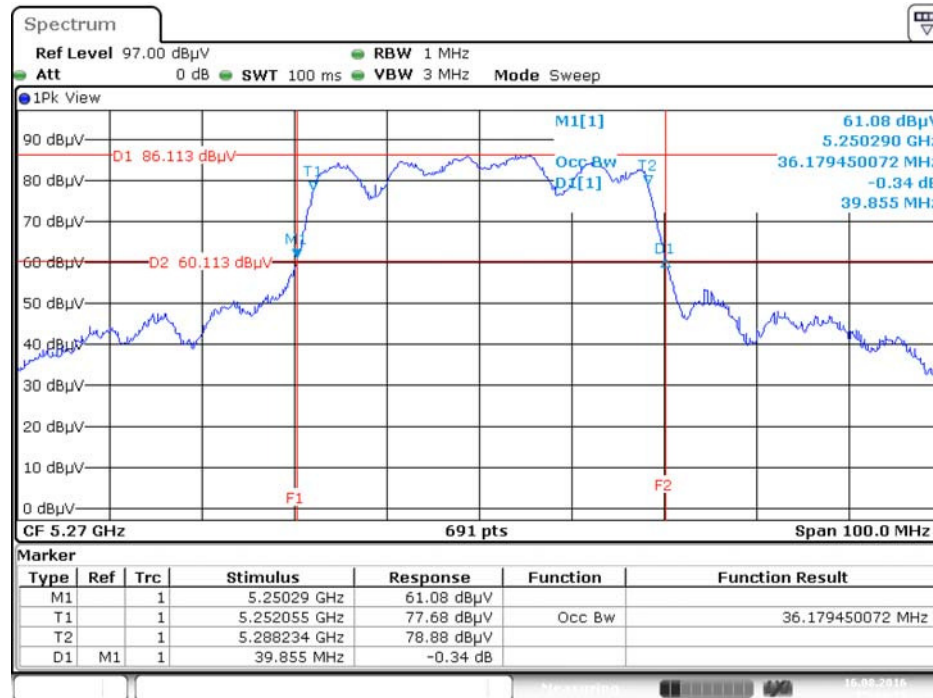
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



Date: 16.AUG.2016 15:37:56

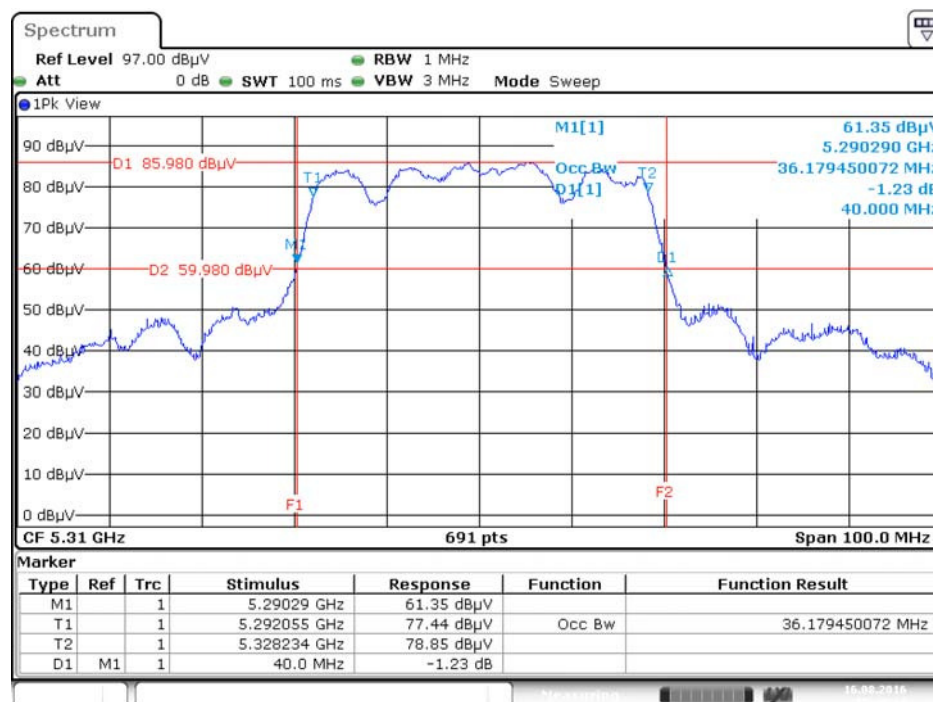


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5270 MHz



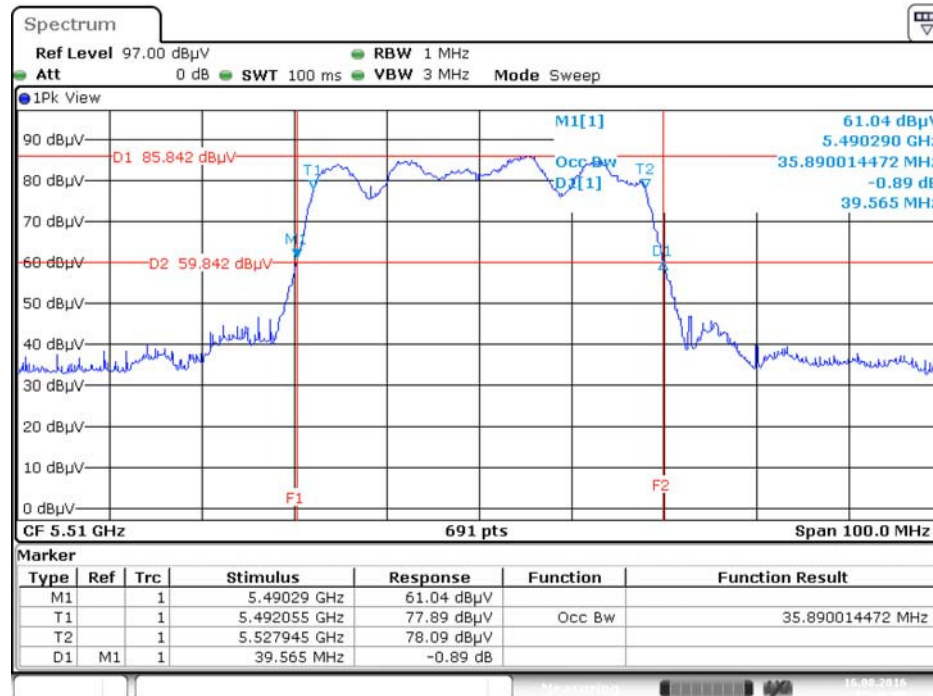
Date: 16.AUG.2016 15:44:15

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



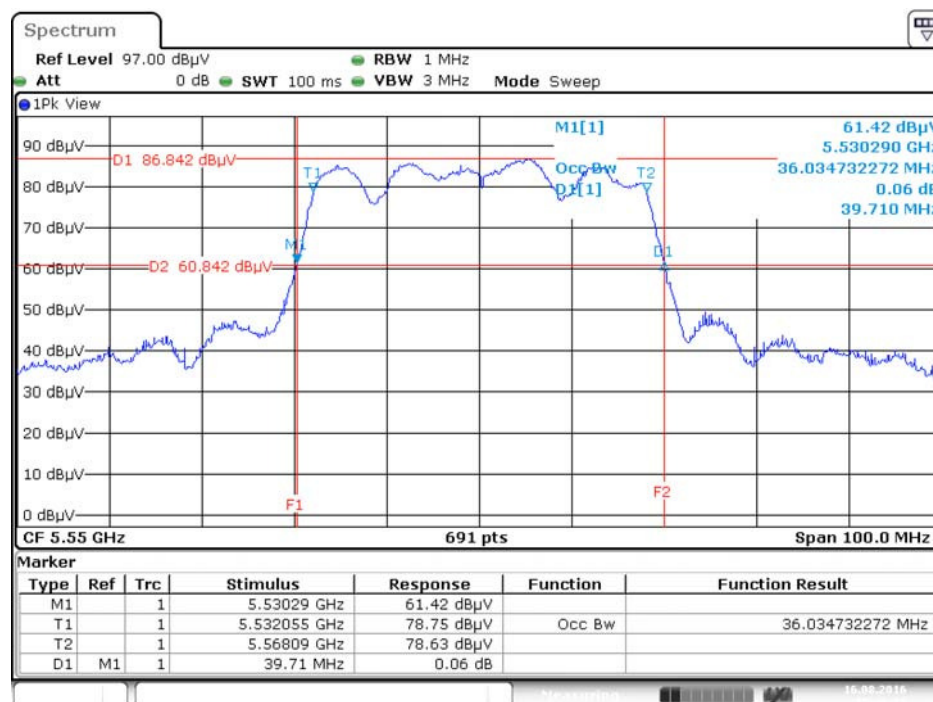
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5510 MHz



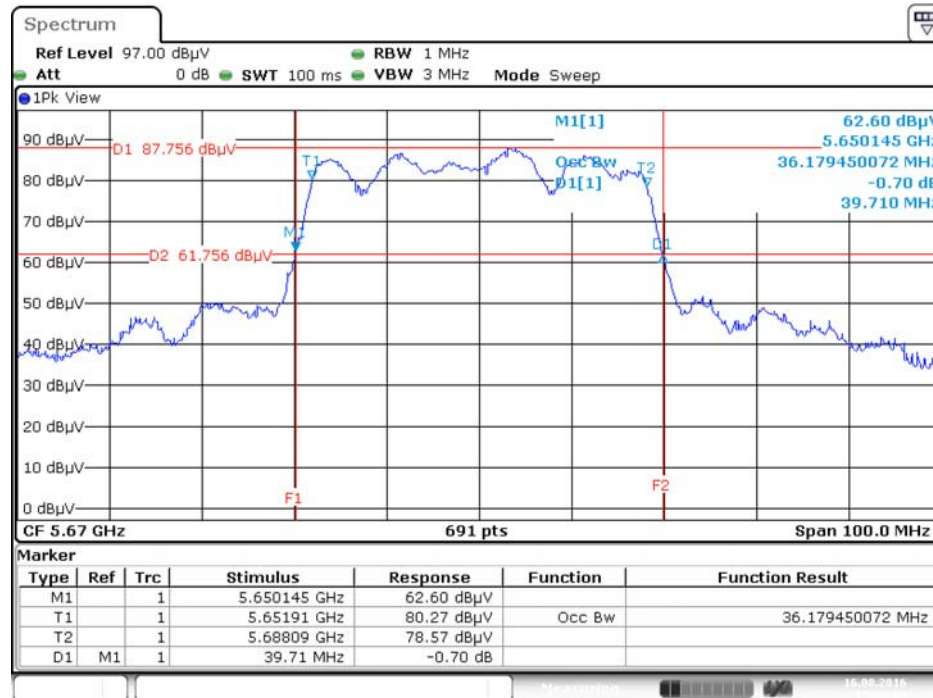
Date: 16.AUG.2016 15:48:20

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



Date: 16.AUG.2016 15:46:15

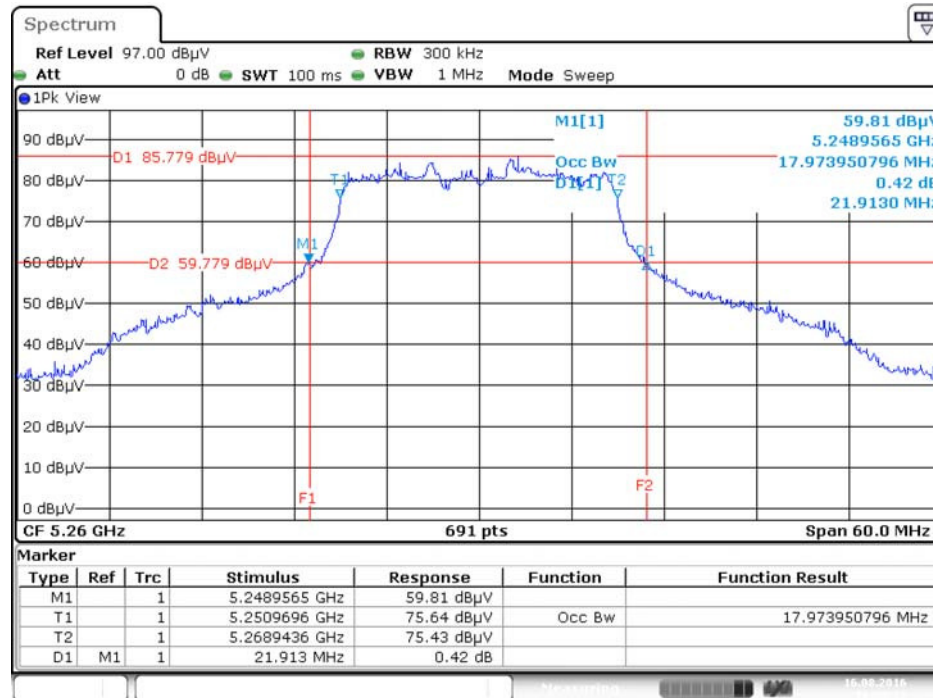
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



Date: 16.AUG.2016 15:50:04

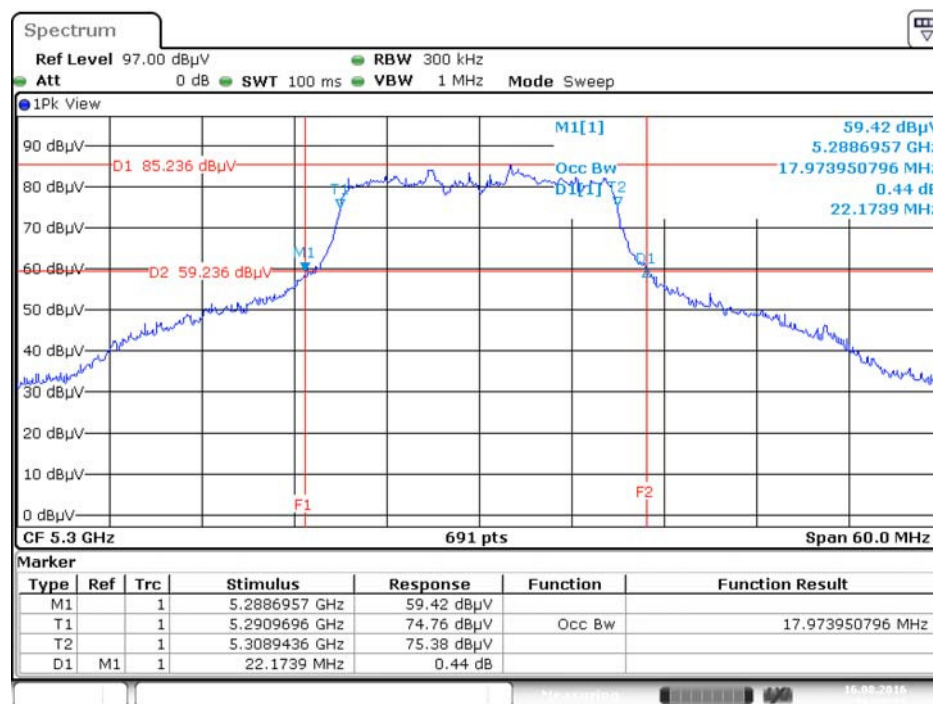
<For Beamforming Mode>

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



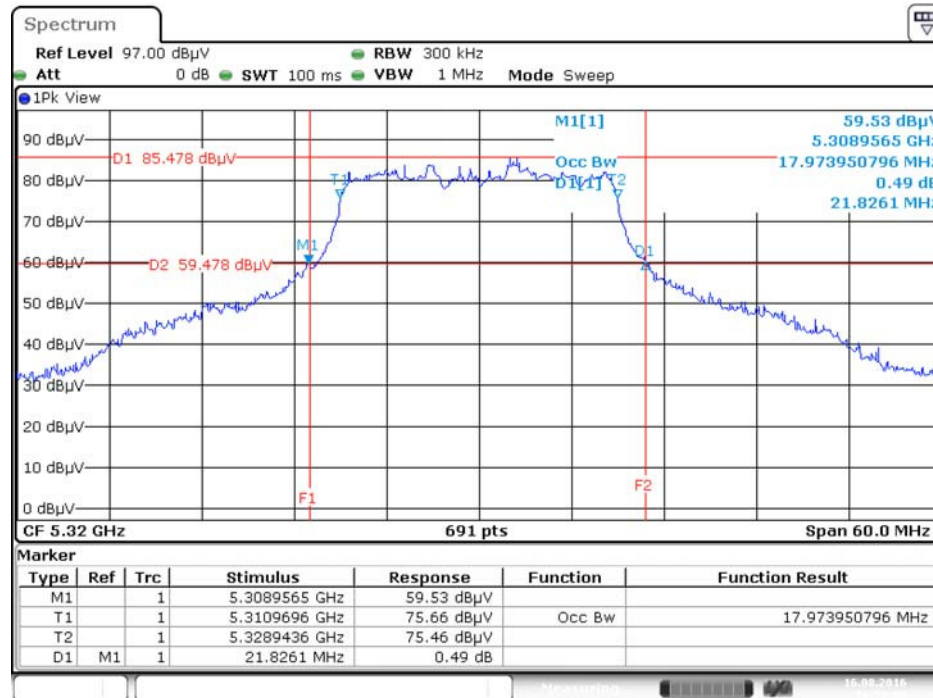
Date: 16.AUG.2016 16:20:22

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



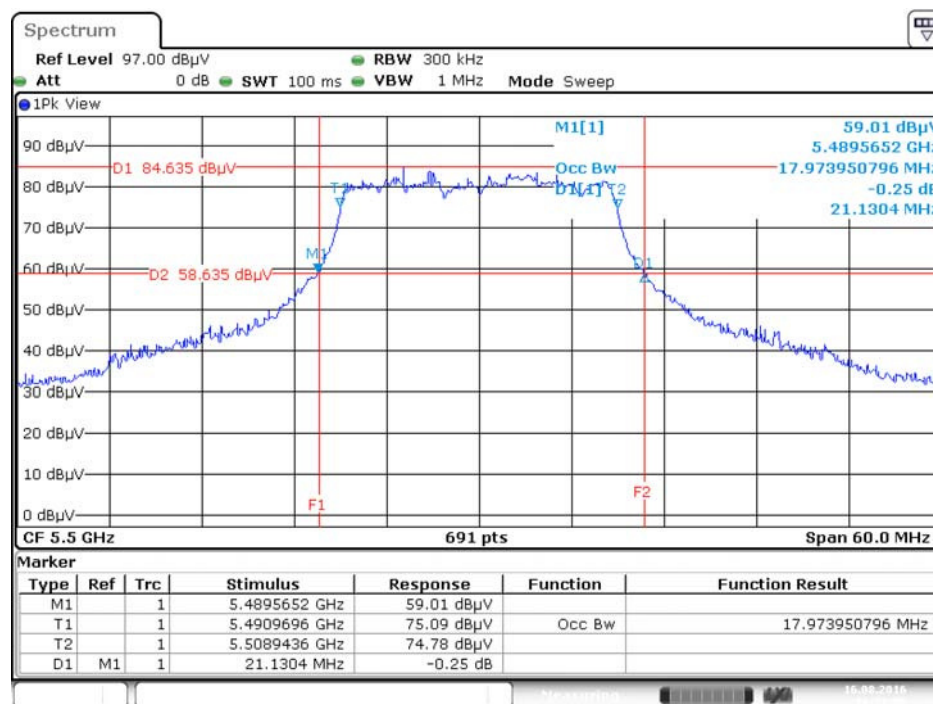
Date: 16.AUG.2016 16:20:52

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



Date: 16.AUG.2016 16:21:21

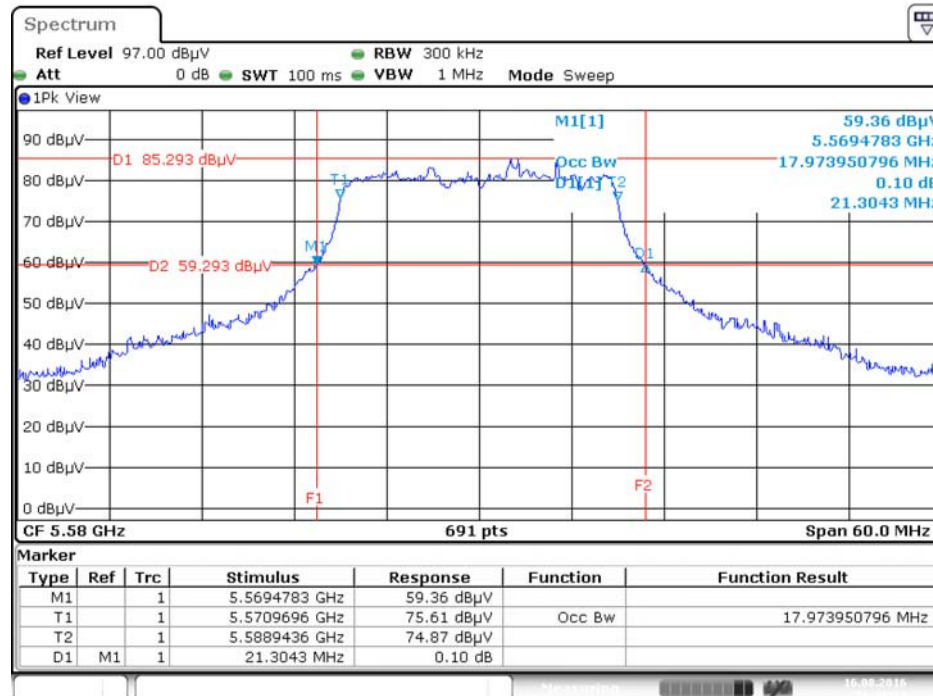
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5500 MHz



Date: 16.AUG.2016 16:21:57

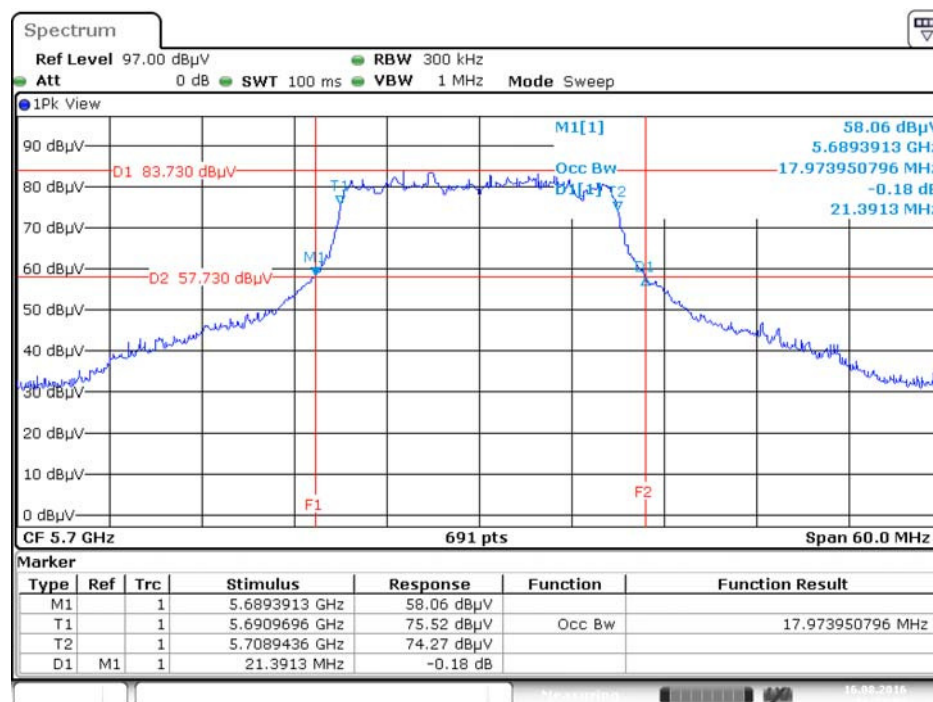


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5580 MHz



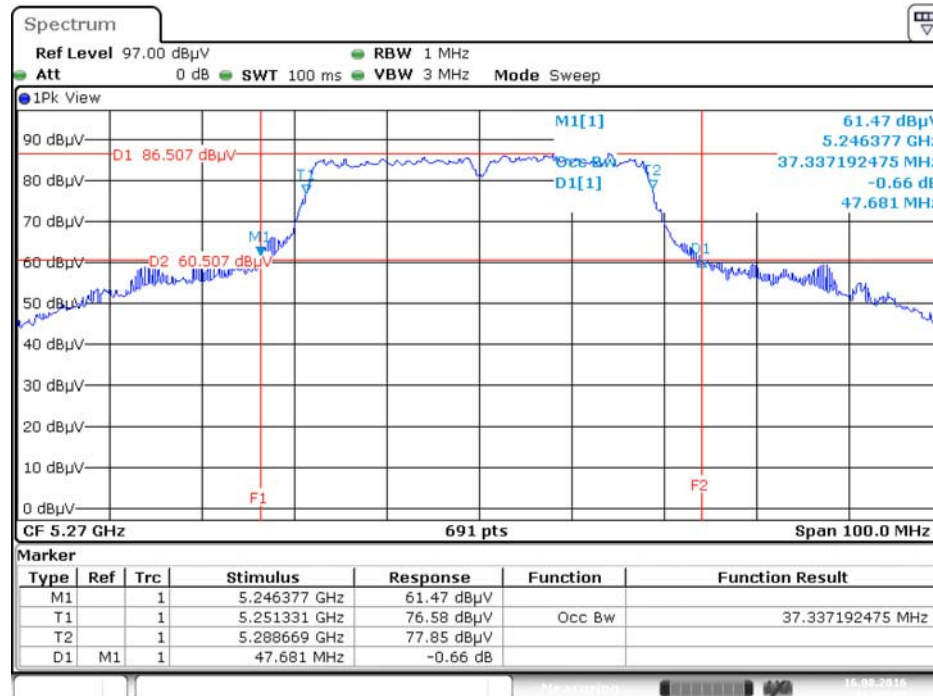
Date: 16.AUG.2016 16:22:33

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

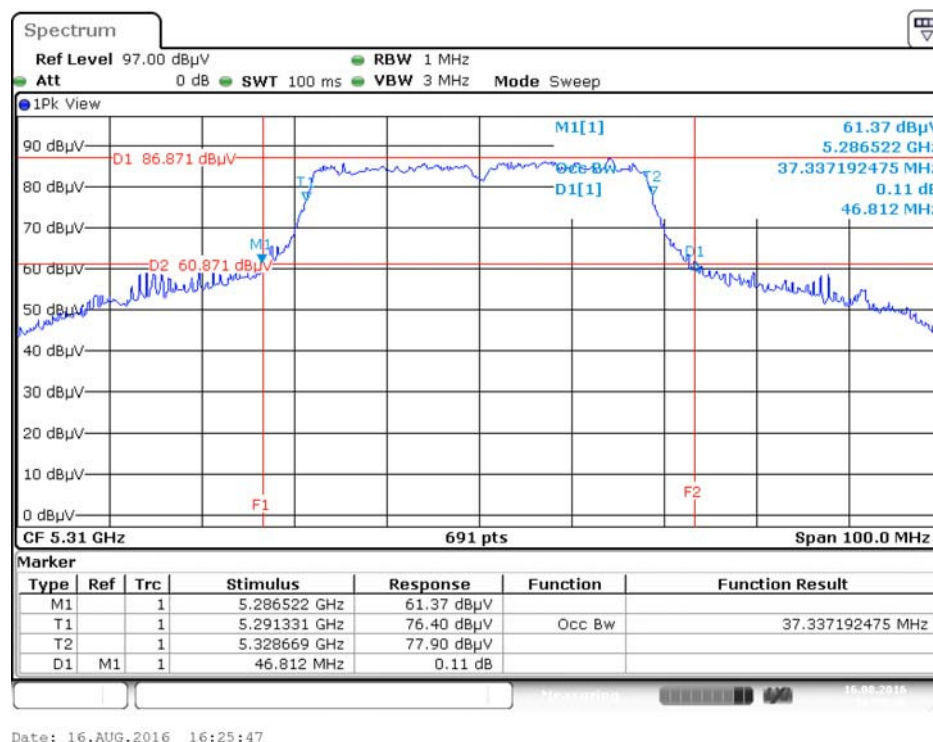


Date: 16.AUG.2016 16:23:04

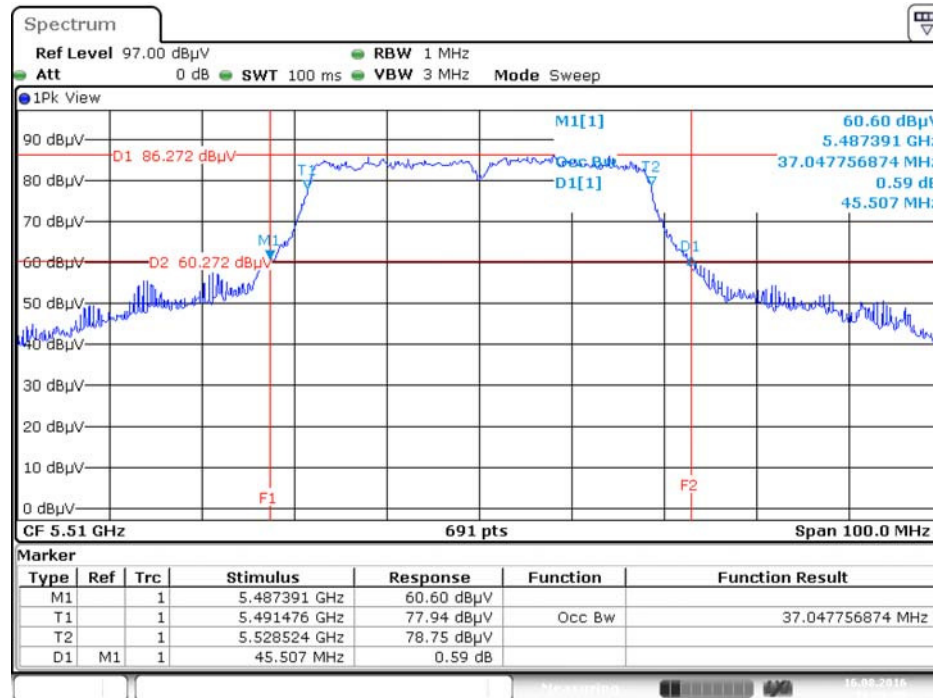
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5270 MHz



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

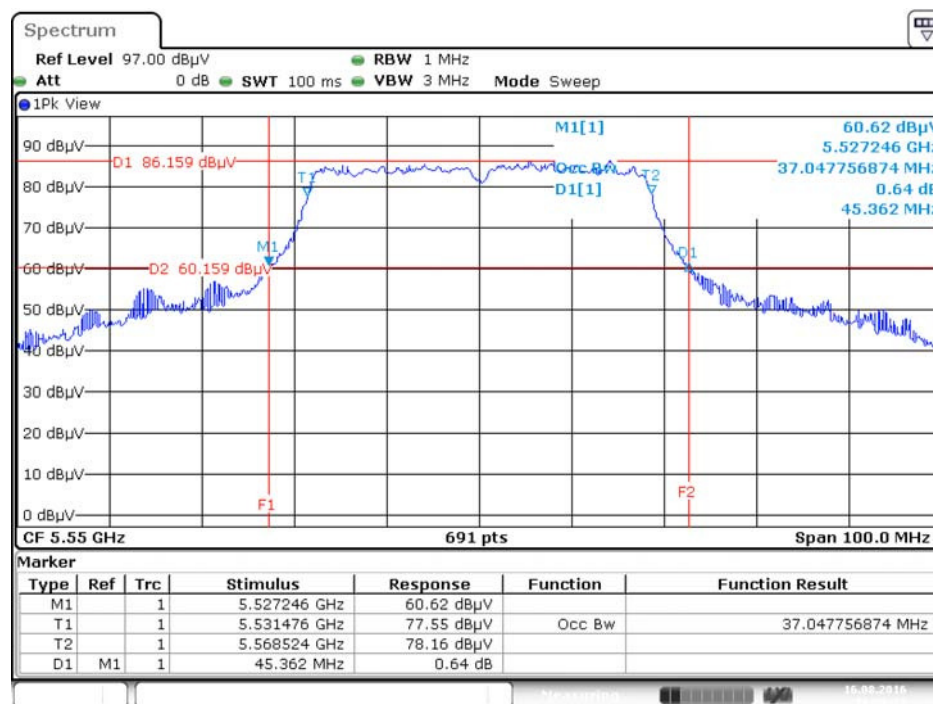


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5510 MHz



Date: 16.AUG.2016 16:26:08

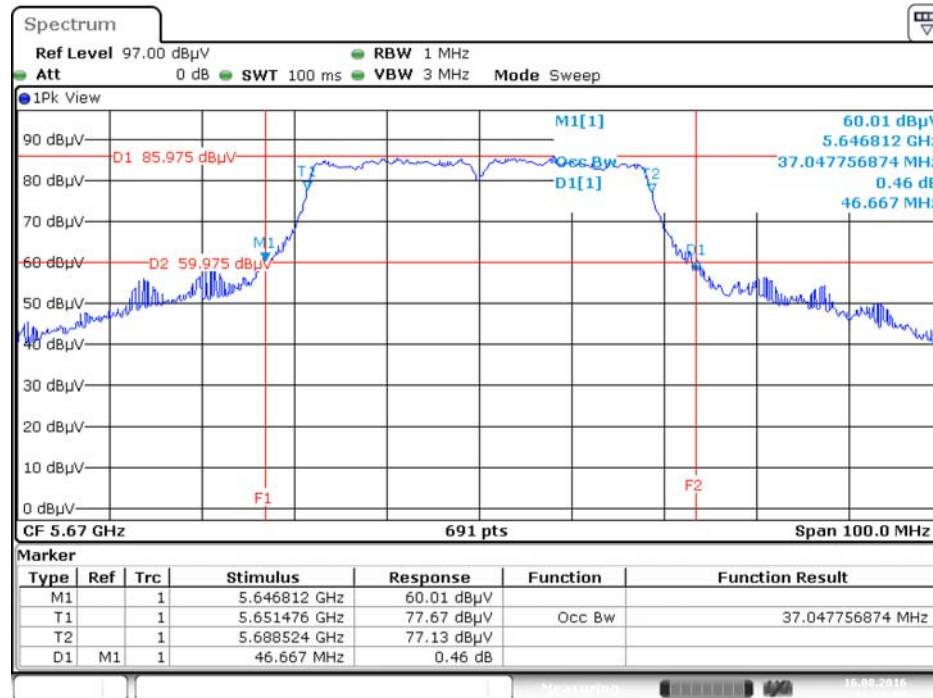
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5550 MHz



Date: 16.AUG.2016 16:26:32



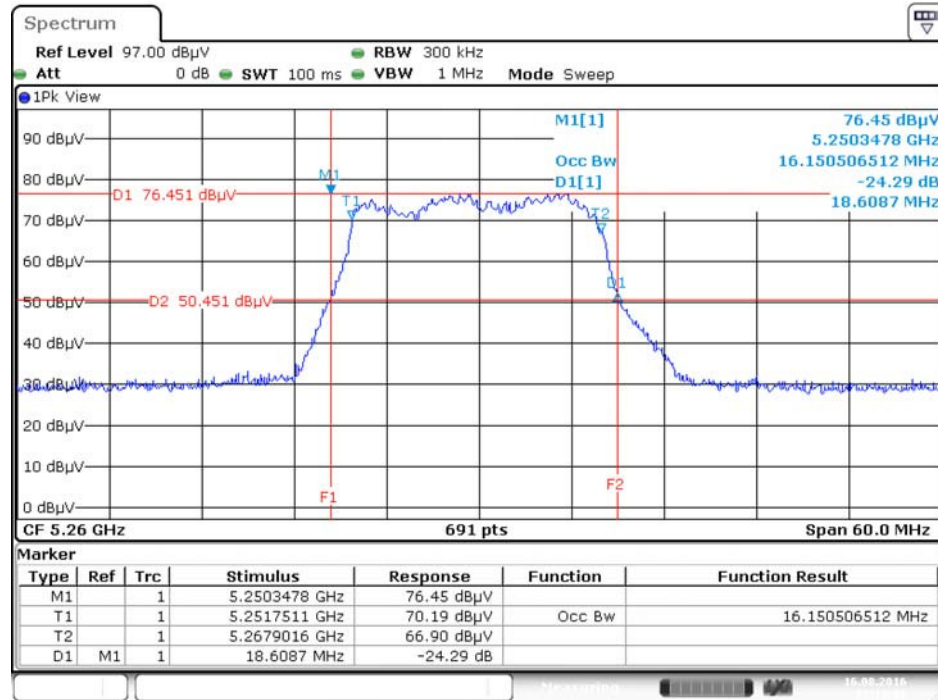
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



For Directional antenna:

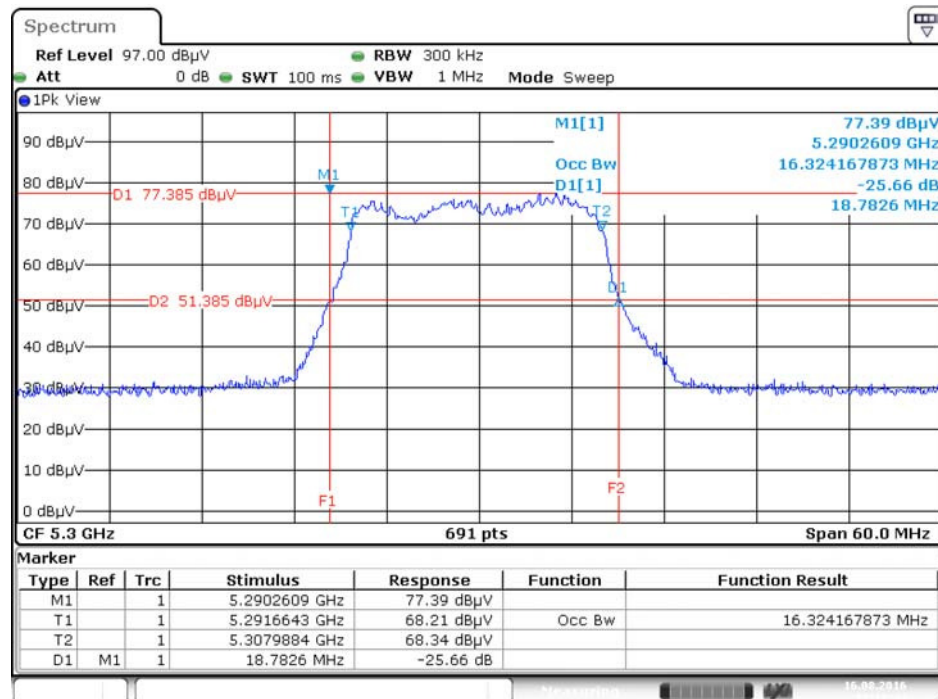
<For Non-Beamforming Mode>

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



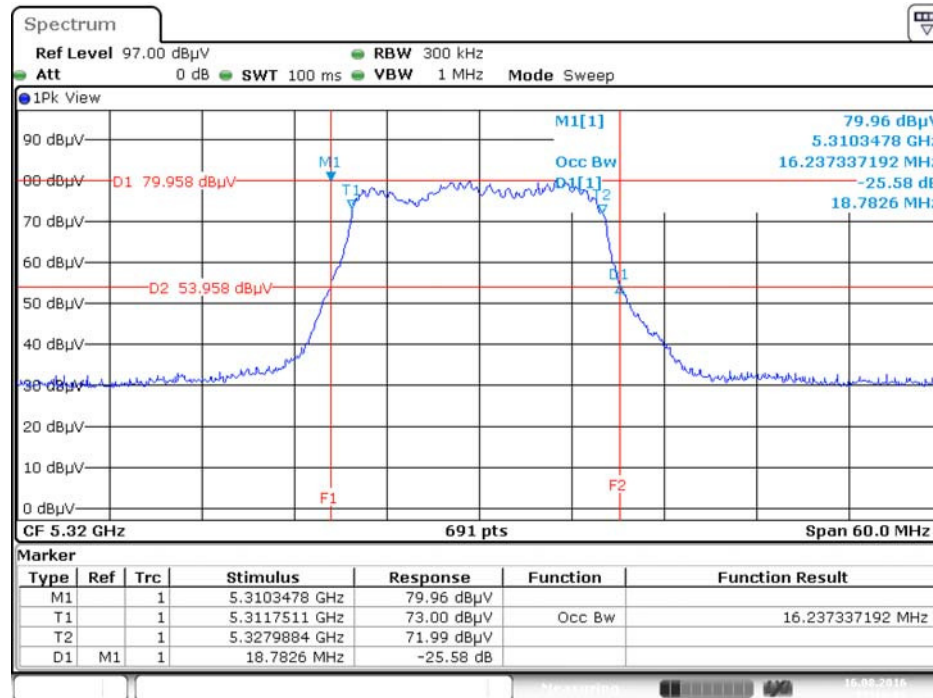
Date: 16.AUG.2016 17:12:16

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



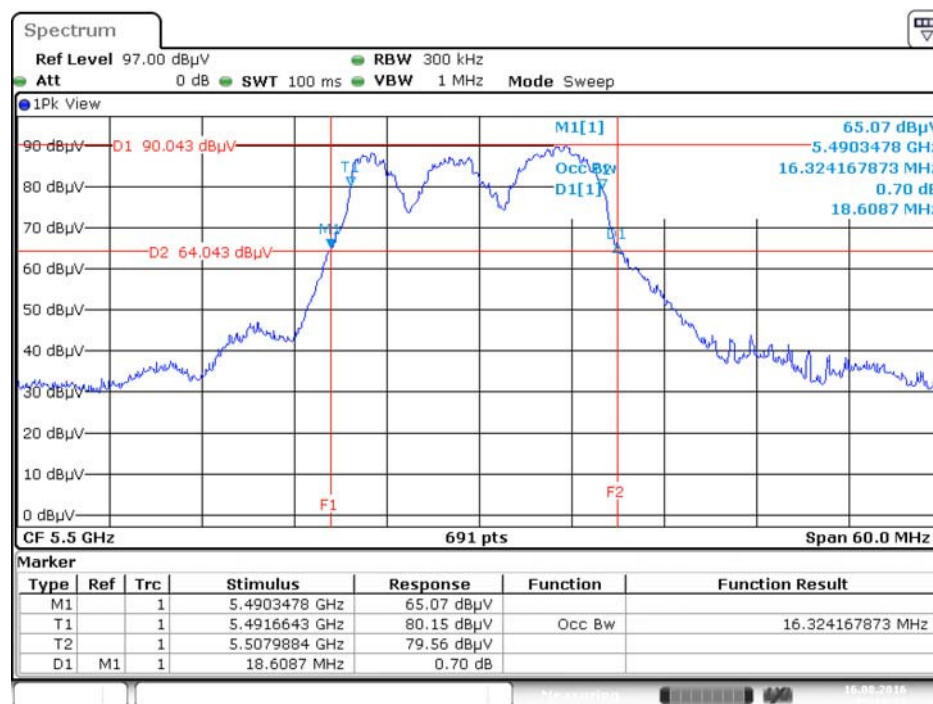
Date: 16.AUG.2016 17:12:43

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



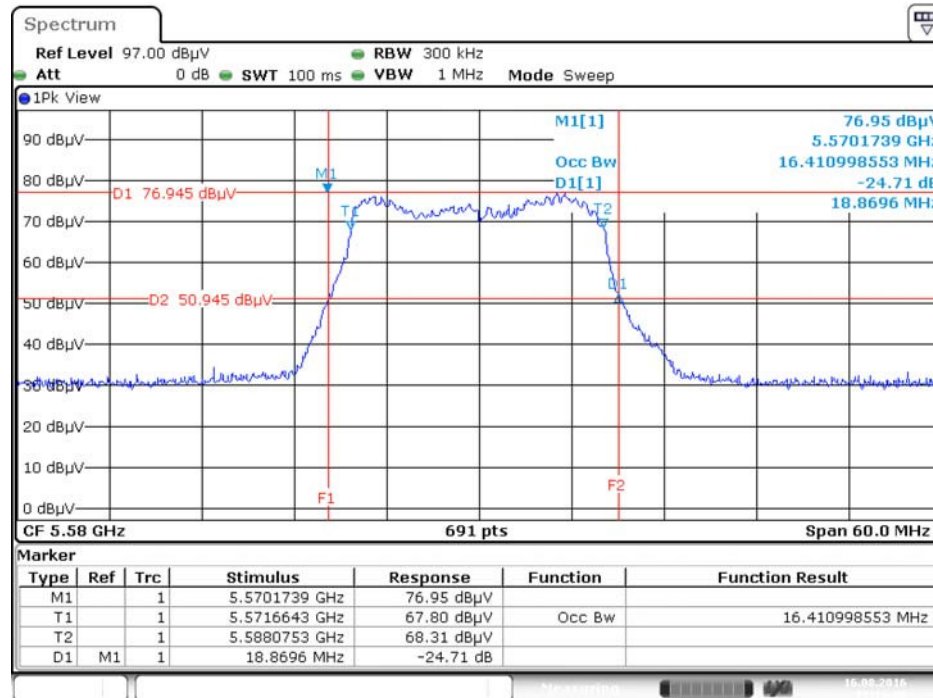
Date: 16.AUG.2016 17:14:01

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



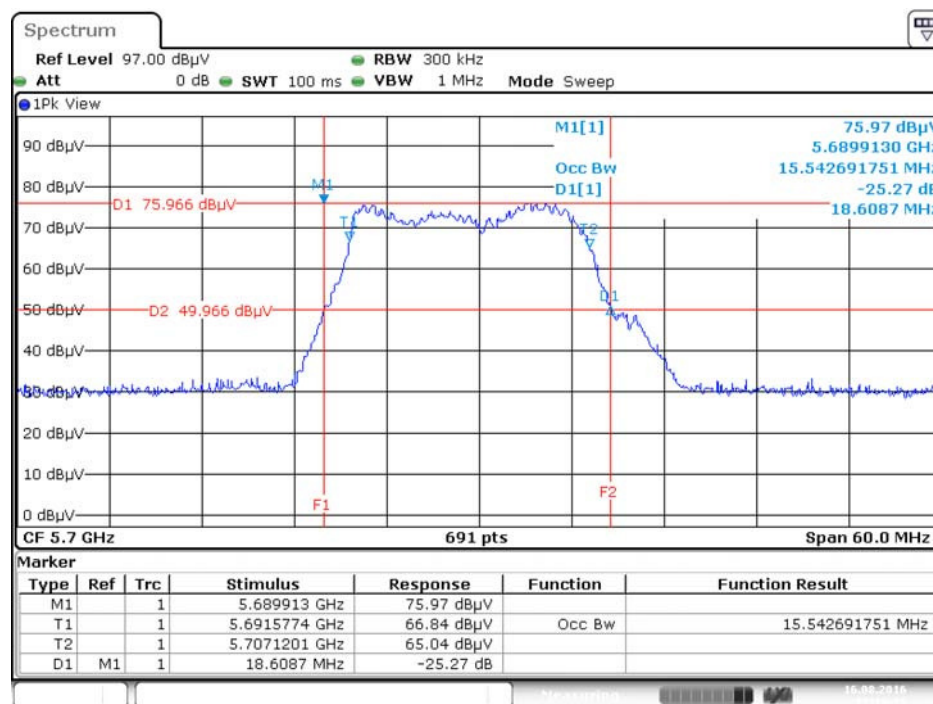
Date: 16.AUG.2016 15:15:38

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



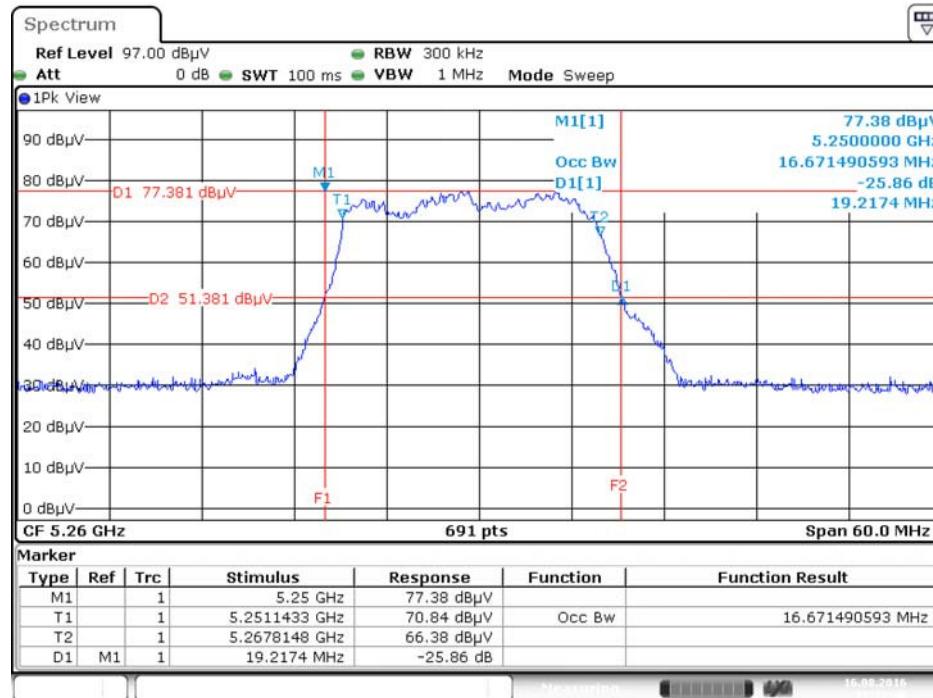
Date: 16.AUG.2016 17:19:01

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



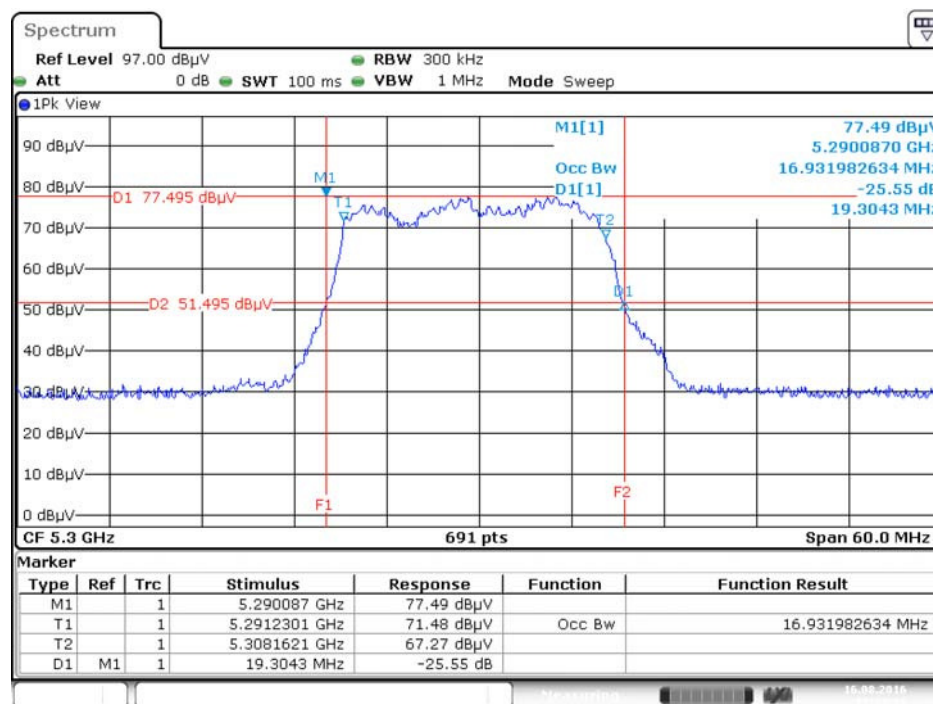
Date: 16.AUG.2016 17:19:32

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



Date: 16.AUG.2016 17:21:46

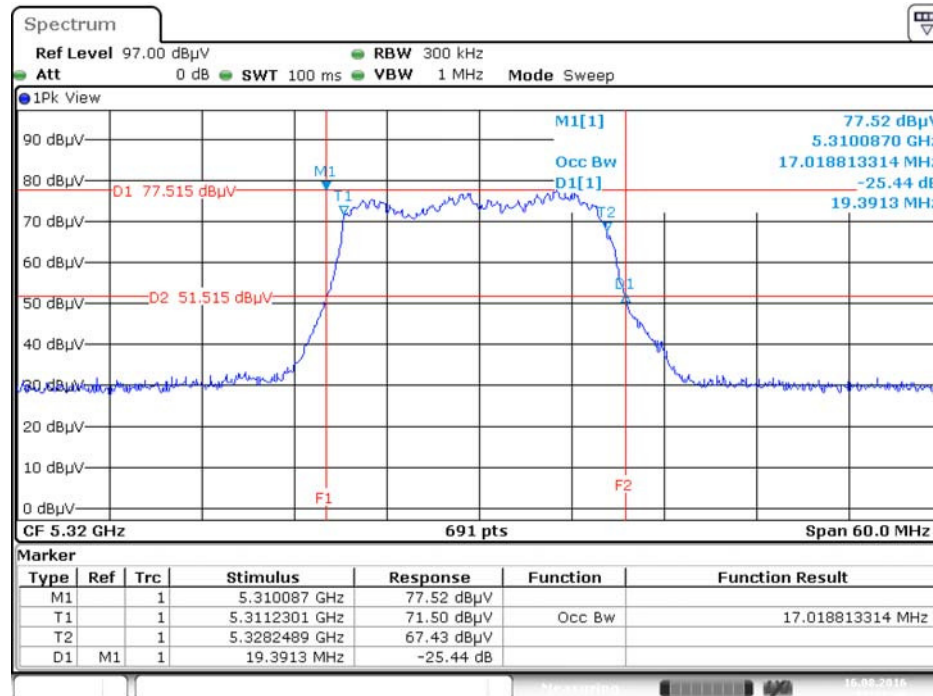
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5300 MHz



Date: 16.AUG.2016 17:22:12

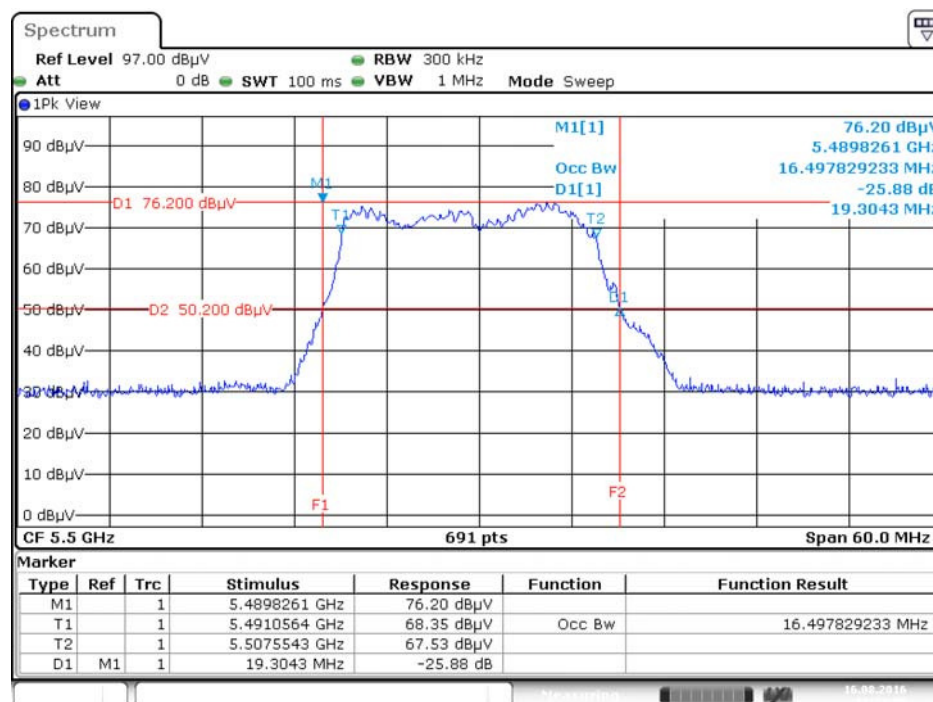


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5320 MHz



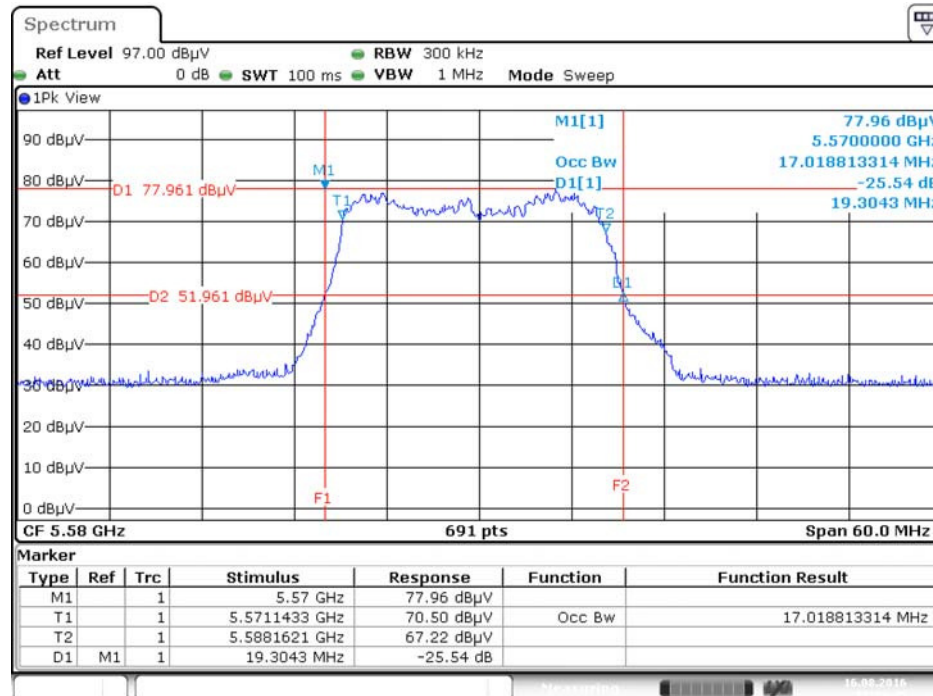
Date: 16.AUG.2016 17:22:40

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



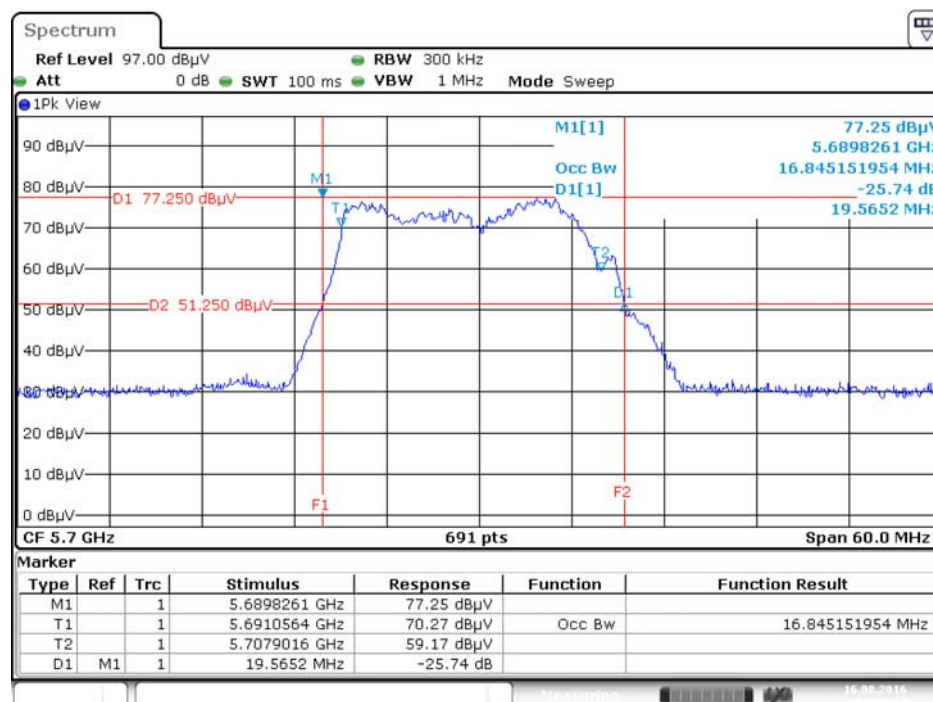
Date: 16.AUG.2016 17:23:58

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



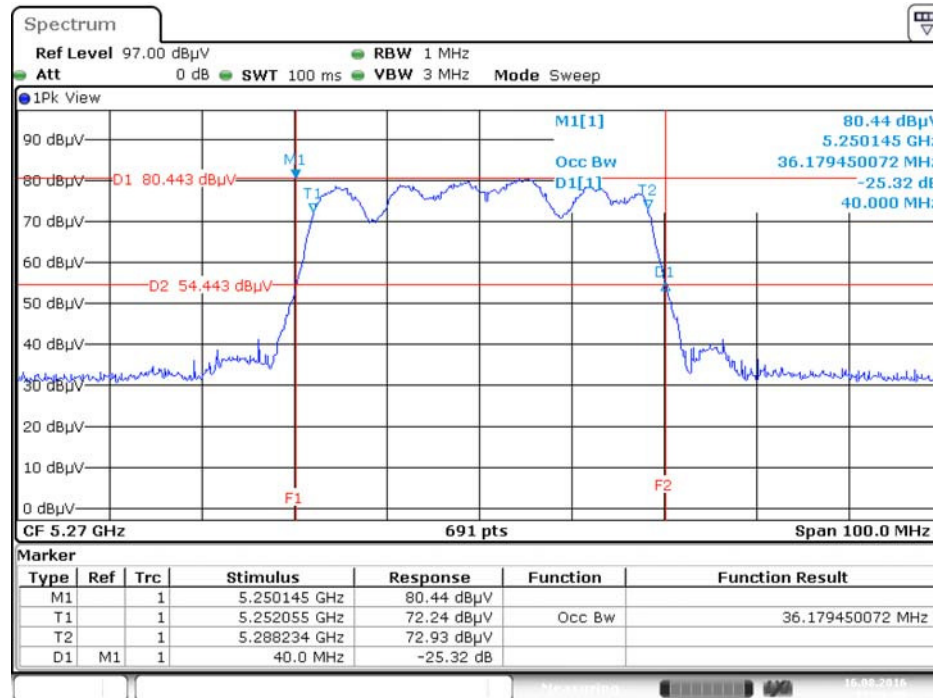
Date: 16.AUG.2016 17:24:45

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



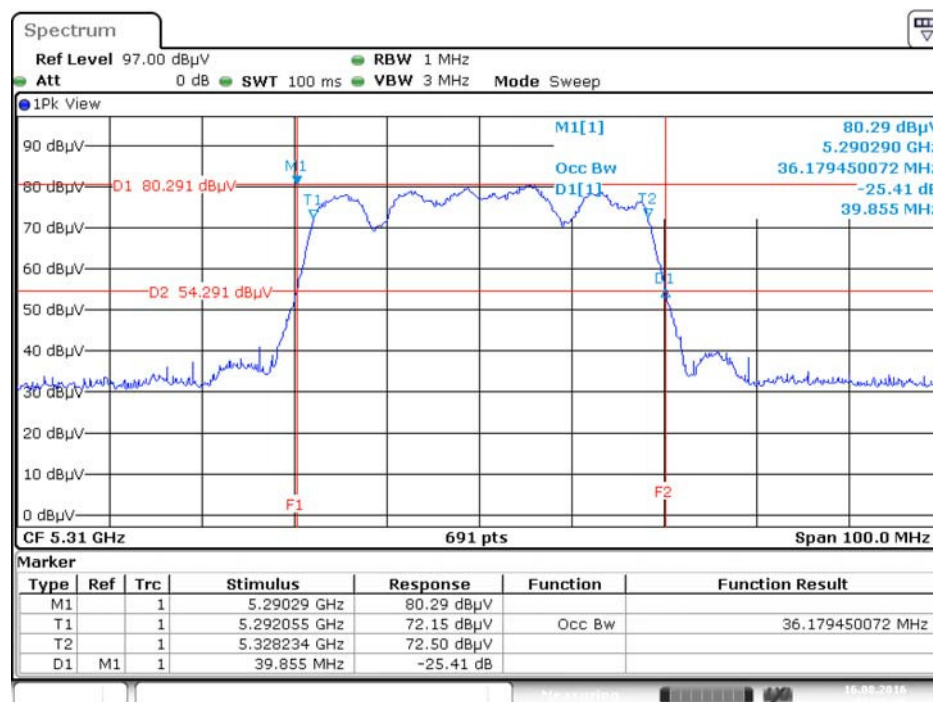
Date: 16.AUG.2016 17:25:14

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



Date: 16.AUG.2016 17:26:20

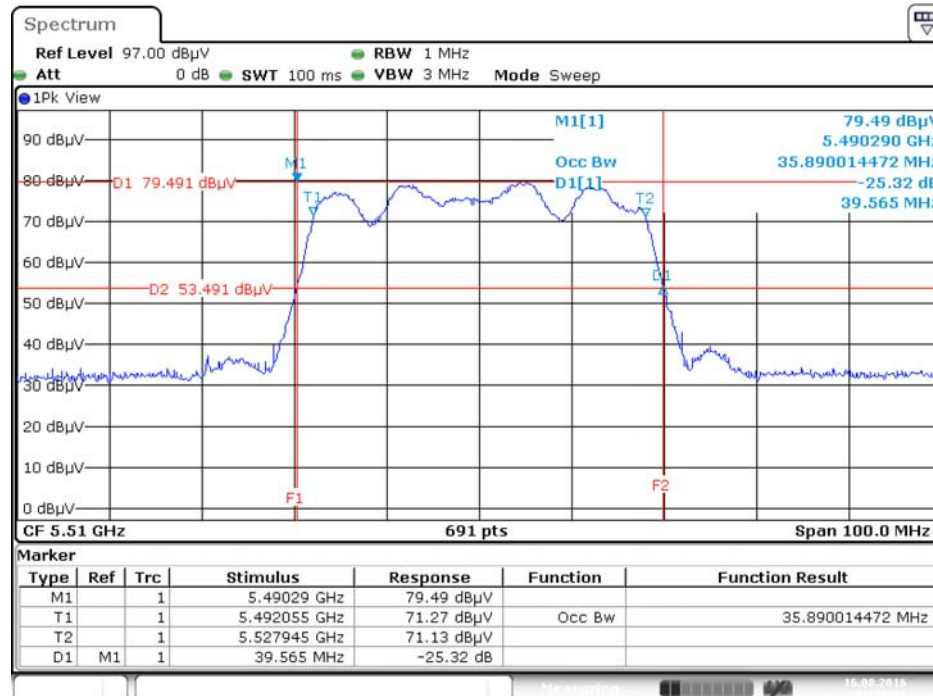
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5310 MHz



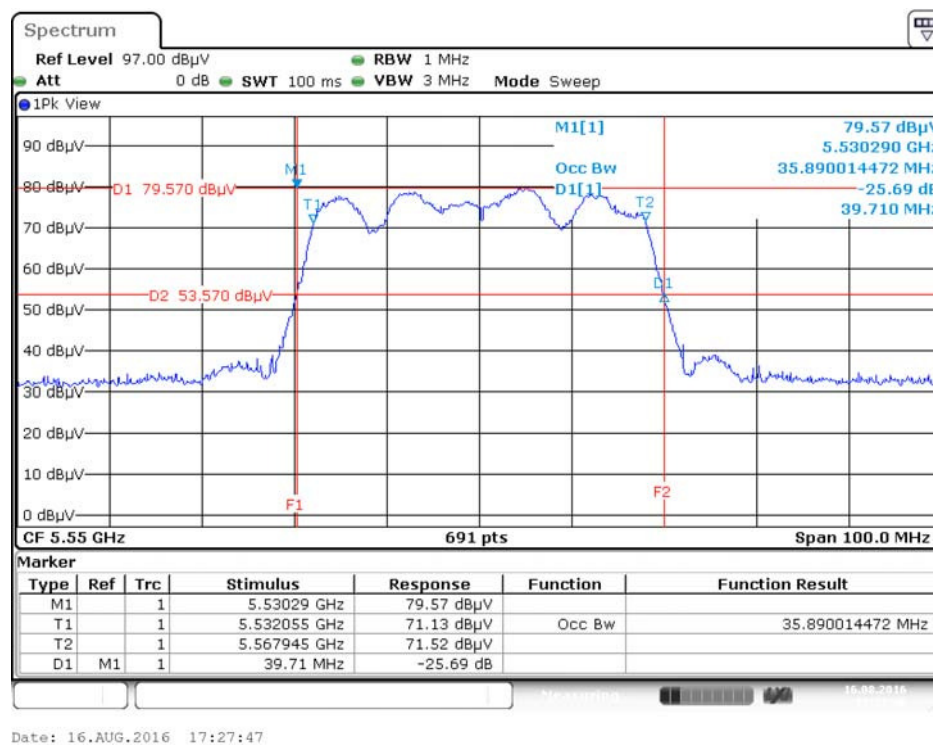
Date: 16.AUG.2016 17:26:47



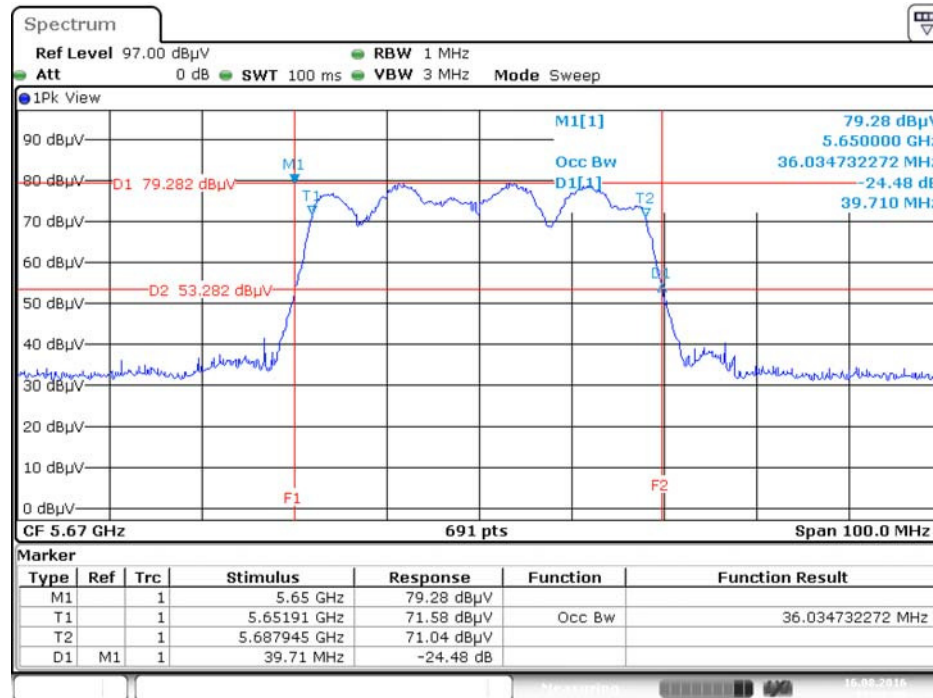
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5510 MHz



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



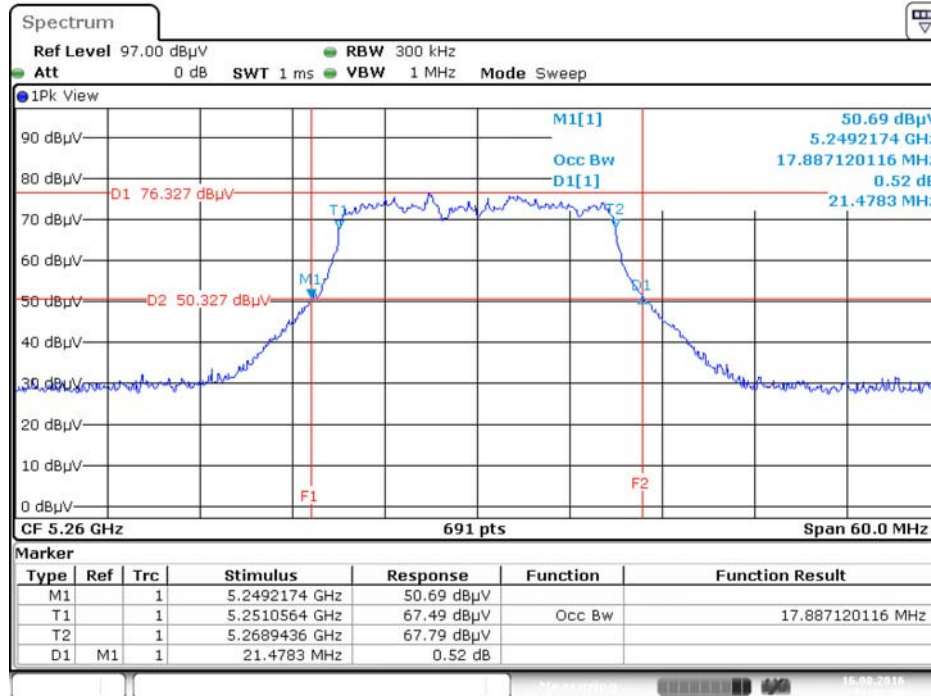
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5670 MHz



Date: 16.AUG.2016 17:28:09

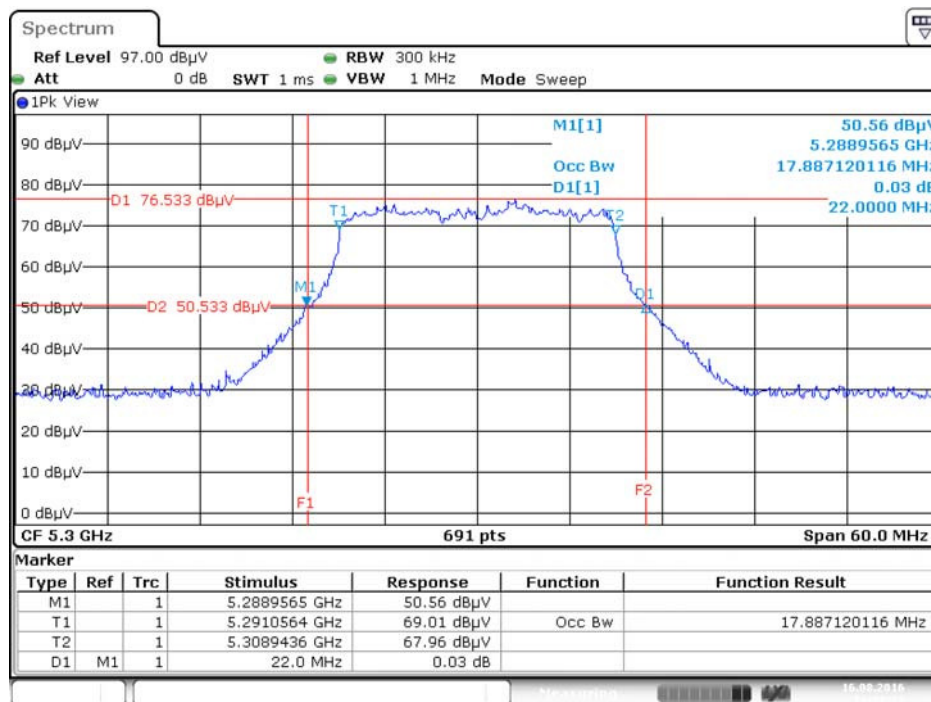
<For Beamforming Mode>

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



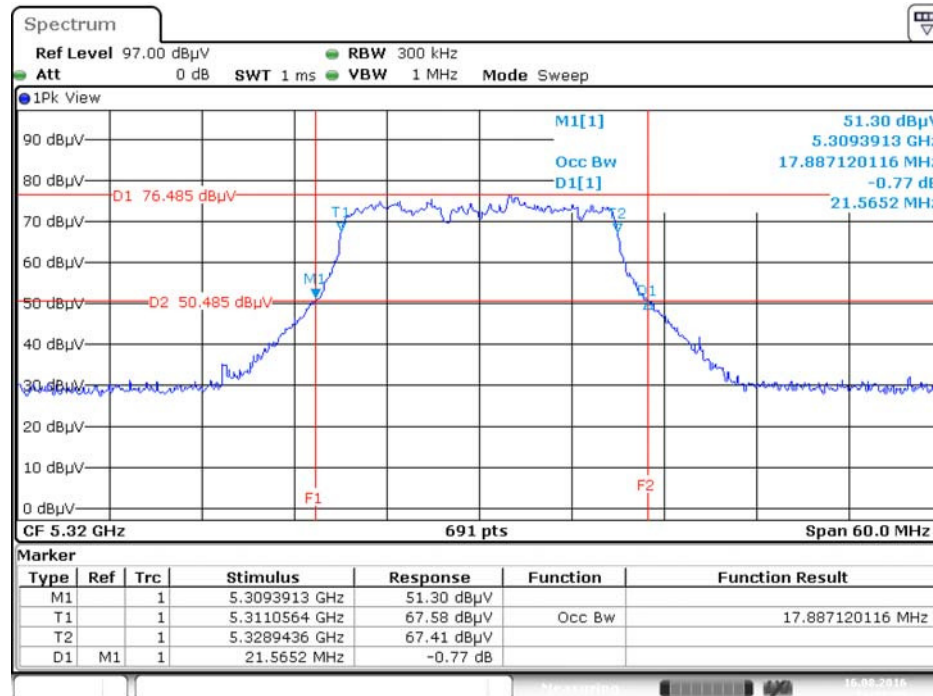
Date: 16.AUG.2016 19:11:01

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



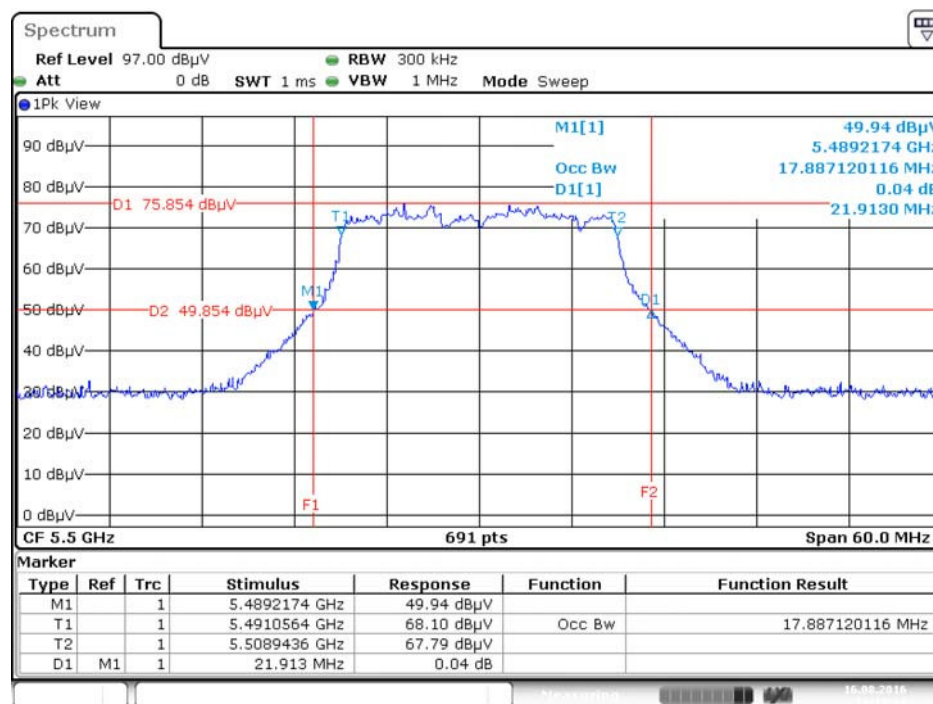
Date: 16.AUG.2016 19:11:38

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



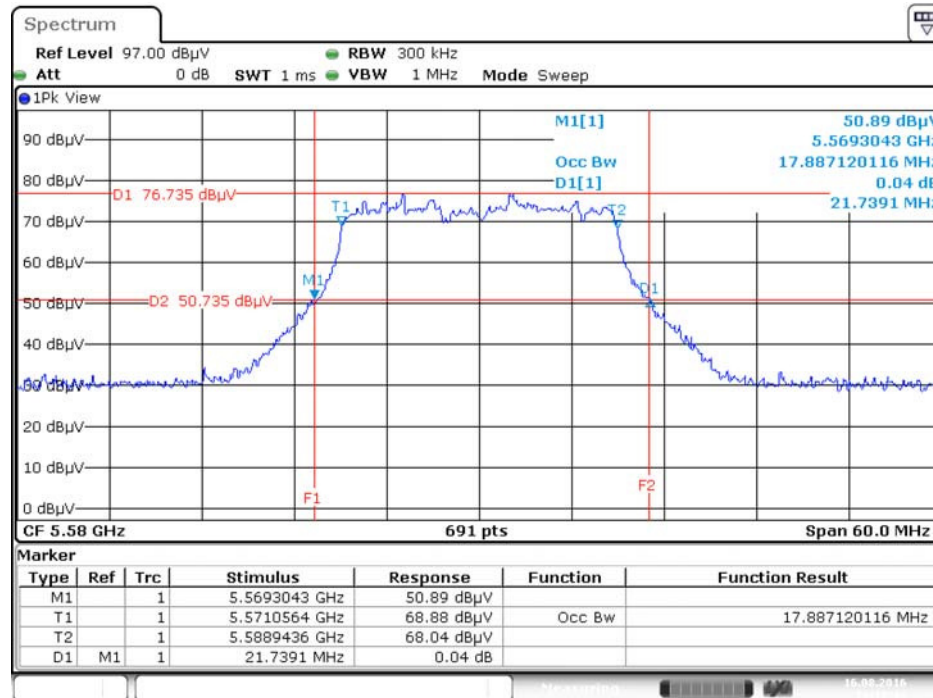
Date: 16.AUG.2016 19:11:54

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



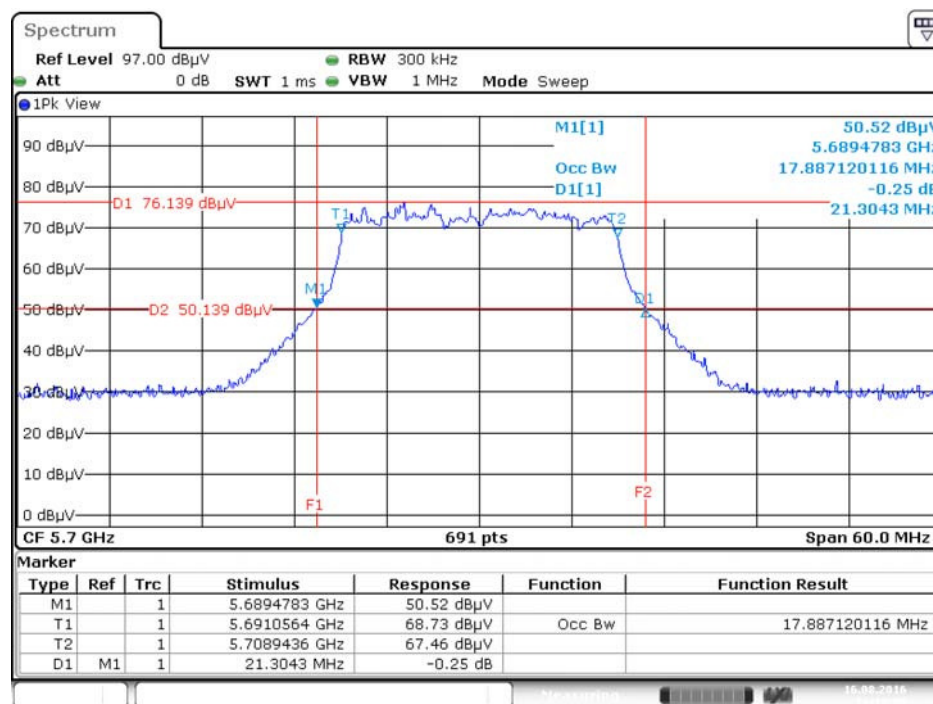
Date: 16.AUG.2016 19:12:15

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



Date: 16.AUG.2016 19:12:41

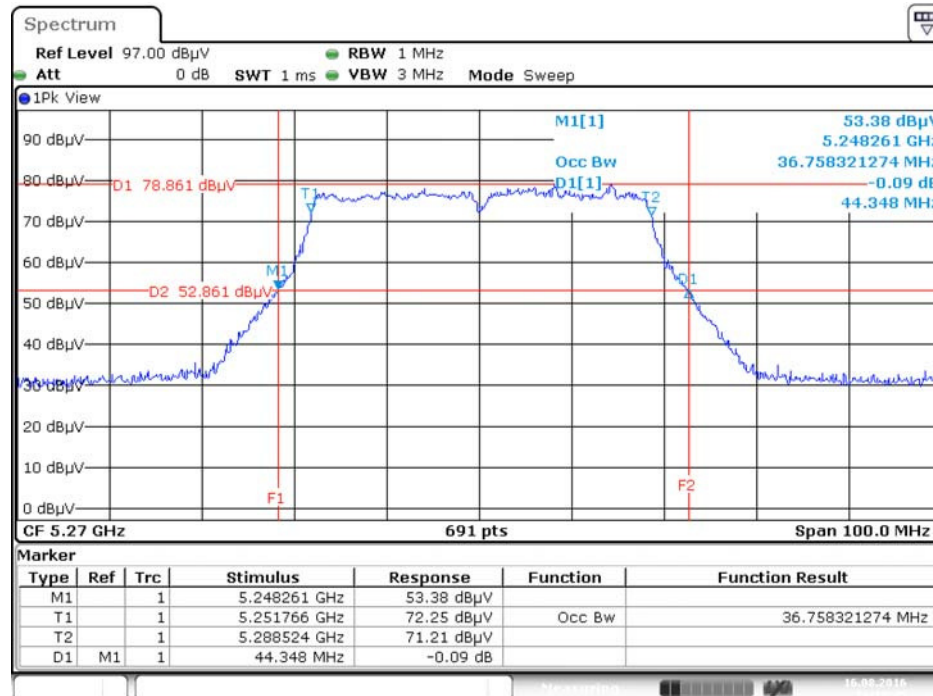
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5700 MHz



Date: 16.AUG.2016 19:13:01

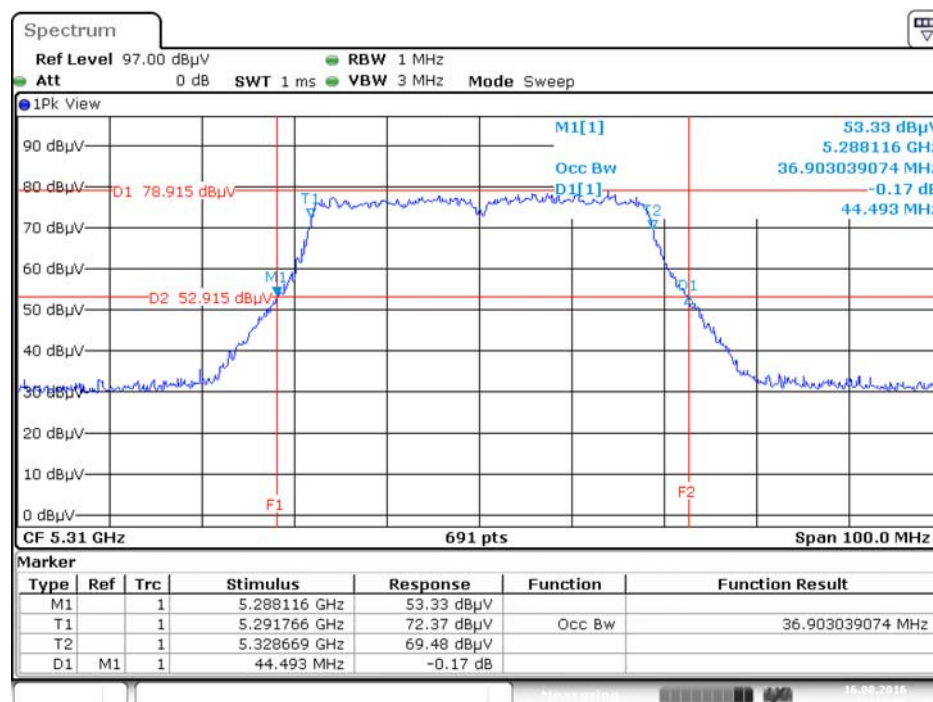


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5270 MHz



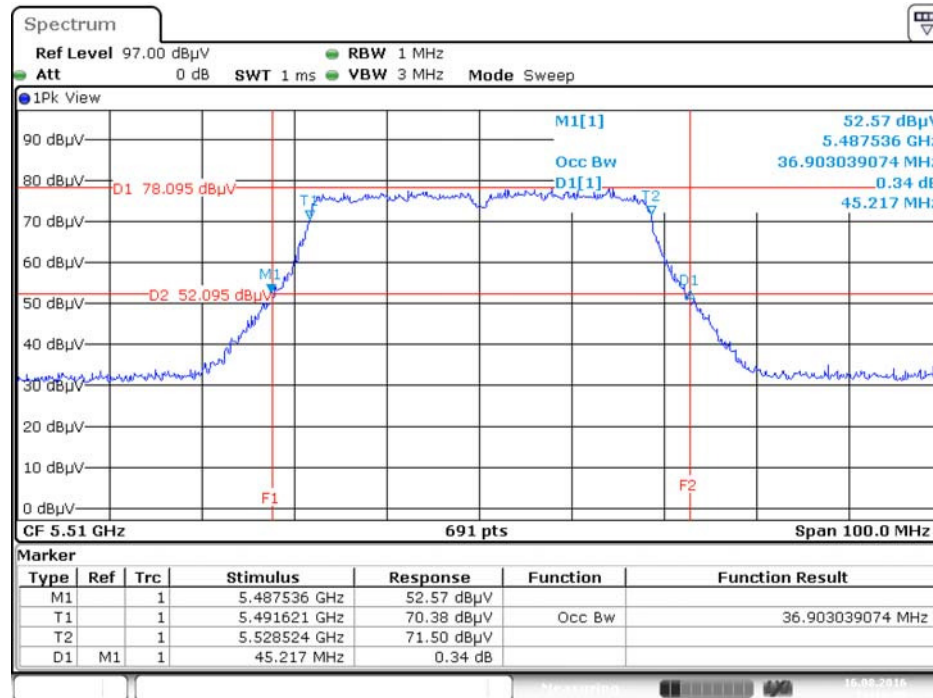
Date: 16.AUG.2016 19:13:45

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



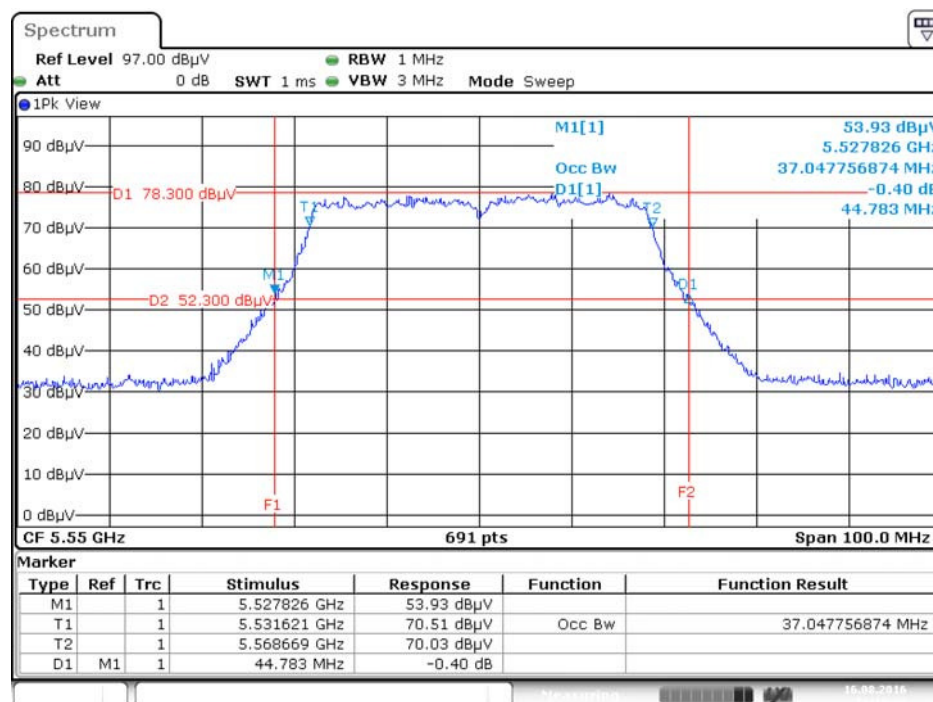
Date: 16.AUG.2016 19:14:07

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



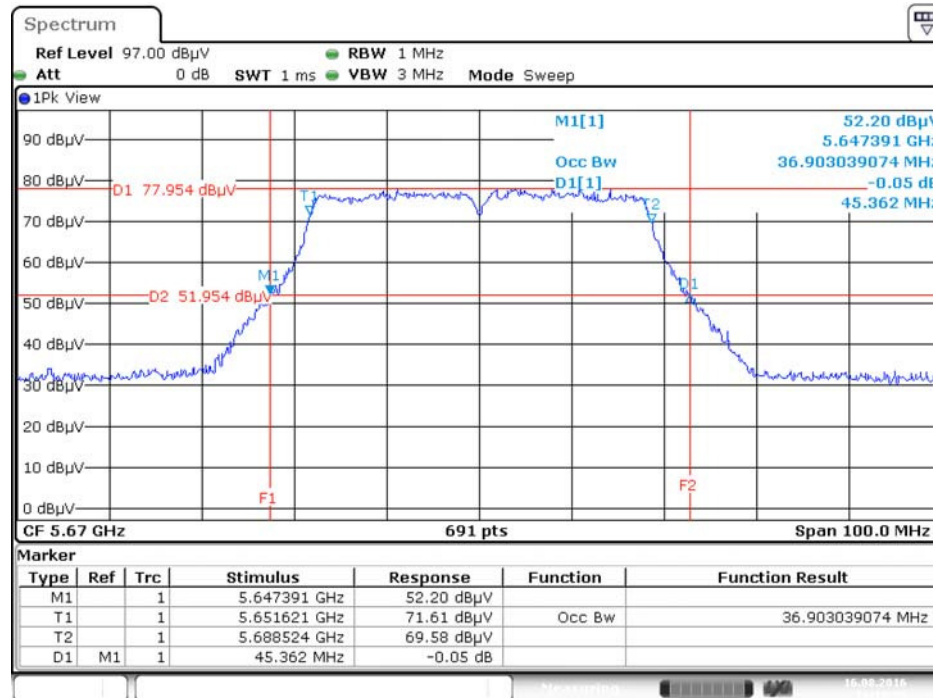
Date: 16.AUG.2016 19:14:29

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



Date: 16.AUG.2016 19:14:47

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



Date: 16.AUG.2016 19:15:25



## 4.2. Maximum Conducted Output Power Measurement

### 4.2.1. Limit

Frequency Band		Limit
<input checked="" type="checkbox"/>	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.
<input checked="" type="checkbox"/>	5.470-5.725 GHz	

### 4.2.2. Measuring Instruments and Setting

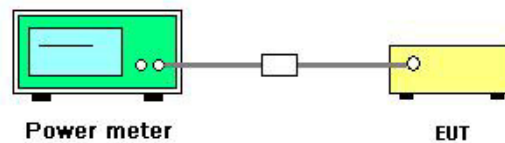
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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 v01r03 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

For OMNI antenna:

<For Non-Beamforming Mode>

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Test Date	Jun. 15, 2016 ~ Aug. 16, 2016

Mode	Frequency	Conducted Power (dBm)					Max. Power Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11a	5260 MHz	17.58	17.78	17.44	17.63	23.63	23.72	Complies
	5300 MHz	17.48	17.81	17.57	17.71	23.66	23.76	Complies
	5320 MHz	17.34	17.65	17.46	17.85	23.60	23.62	Complies
	5500 MHz	17.45	17.32	17.36	17.56	23.44	23.70	Complies
	5580 MHz	17.71	17.73	17.55	17.87	23.74	23.76	Complies
	5700 MHz	17.46	17.21	17.02	17.58	23.34	23.47	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	17.55	17.86	17.73	17.85	23.77	23.88	Complies
	5300 MHz	17.45	17.59	17.53	17.77	23.61	23.82	Complies
	5320 MHz	17.49	17.96	17.74	18.18	23.87	23.93	Complies
	5500 MHz	17.73	17.62	17.64	18.12	23.80	23.84	Complies
	5580 MHz	17.69	17.89	17.51	17.64	23.71	23.82	Complies
	5700 MHz	17.77	17.65	17.52	17.63	23.66	23.91	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	17.49	17.75	17.52	17.60	23.61	23.98	Complies
	5310 MHz	17.51	17.67	17.44	17.73	23.61	23.98	Complies
	5510 MHz	16.59	16.73	16.56	16.96	22.73	23.98	Complies
	5550 MHz	17.71	17.57	17.64	17.71	23.68	23.98	Complies
	5670 MHz	17.86	17.77	17.33	17.53	23.65	23.98	Complies

Note:

Mode	Frequency	Description
802.11a	5260 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.70) = 23.72\text{dBm}$ < 23.98dBm, so power limit=23.72dBm.
	5300 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.87) = 23.76\text{dBm}$ < 23.98dBm, so power limit=23.76dBm.
	5320 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.26) = 23.62\text{dBm}$ < 23.98dBm, so power limit=23.62dBm.
	5500 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.61) = 23.70\text{dBm}$ < 23.98dBm, so power limit=23.70dBm.
	5580 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.87) = 23.76\text{dBm}$ < 23.98dBm, so power limit=23.76dBm.
	5700 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(17.65) = 23.47\text{dBm}$ < 23.98dBm, so power limit=23.47dBm.
802.11ac MCS0/Nss1 VHT20	5260 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.39) = 23.88\text{dBm}$ < 23.98dBm, so power limit=23.88dBm.
	5300 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.13) = 23.82\text{dBm}$ < 23.98dBm, so power limit=23.82dBm.
	5320 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.65) = 23.93\text{dBm}$ < 23.98dBm, so power limit=23.93dBm.
	5500 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.22) = 23.84\text{dBm}$ < 23.98dBm, so power limit=23.84dBm.
	5580 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.13) = 23.82\text{dBm}$ < 23.98dBm, so power limit=23.82dBm.
	5700 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.57) = 23.92\text{dBm}$ < 23.98dBm, so power limit=23.92dBm.

<For Beamforming Mode>

Mode	Frequency	Conducted Power (dBm)					Max. Power Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	5260 MHz	17.38	17.79	17.52	17.82	23.65	23.98	Complies
	5300 MHz	17.58	17.61	17.42	17.73	23.61	23.98	Complies
	5320 MHz	17.54	17.87	17.62	18.01	23.78	23.98	Complies
	5500 MHz	16.02	16.22	15.87	16.85	22.28	22.51	Complies
	5580 MHz	16.14	16.35	16.17	16.29	22.26	22.51	Complies
	5700 MHz	16.36	16.21	16.15	16.28	22.27	22.51	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	17.86	17.89	17.87	17.93	23.91	23.98	Complies
	5310 MHz	17.71	17.85	17.65	17.96	23.81	23.98	Complies
	5510 MHz	16.03	16.31	16.15	16.49	22.27	22.51	Complies
	5550 MHz	16.21	16.33	16.48	16.55	22.42	22.51	Complies
	5670 MHz	16.58	16.48	16.06	16.39	22.40	22.51	Complies

Note:

Band 2      Directional gain=-1.35dBi <6dBi, so the limit doesn't reduce.

Band 3      Directional gain =7.47dBi, so limit=23.98-(7.47-6)=22.51 dBm

For Directional antenna:

<For Non-Beamforming Mode>

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Test Date	Jun. 15. 2016 ~ Aug. 16. 2016

Mode	Frequency	Conducted Power (dBm)					Max. Power Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11a	5260 MHz	10.48	10.44	10.68	10.72	16.60	16.70	Complies
	5300 MHz	10.45	10.63	10.74	10.57	16.62	16.74	Complies
	5320 MHz	10.12	10.56	10.39	10.41	16.39	16.74	Complies
	5500 MHz	9.68	9.71	9.67	9.62	15.69	15.70	Complies
	5580 MHz	9.74	9.78	9.61	9.66	15.72	15.76	Complies
	5700 MHz	9.75	9.46	9.15	9.23	15.42	15.70	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	10.61	10.69	10.87	10.95	16.80	16.84	Complies
	5300 MHz	10.65	10.82	10.85	10.96	16.84	16.86	Complies
	5320 MHz	10.52	10.71	10.67	10.86	16.71	16.88	Complies
	5500 MHz	9.64	9.57	9.41	9.78	15.62	15.86	Complies
	5580 MHz	9.89	10.05	9.83	10.02	15.97	15.98	Complies
	5700 MHz	10.02	9.72	9.56	9.77	15.79	15.91	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	10.66	10.77	10.94	10.97	16.86	16.98	Complies
	5310 MHz	10.62	10.98	10.87	10.71	16.82	16.98	Complies
	5510 MHz	9.53	9.79	9.44	9.98	15.71	15.98	Complies
	5550 MHz	9.90	9.64	9.38	9.57	15.65	15.98	Complies
	5670 MHz	9.48	9.58	9.41	9.39	15.49	15.98	Complies

Note:

Mode	Frequency	Description
802.11a	5260 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.61) = 16.70\text{dBm}$ < 23.98dBm, so power limit=16.70dBm.
	5300 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.78) = 16.74\text{dBm}$ < 23.98dBm, so power limit=16.74dBm.
	5320 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.78) = 16.74\text{dBm}$ < 23.98dBm, so power limit=16.74dBm.
	5500 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.60) = 15.70\text{dBm}$ < 23.98dBm, so power limit=15.70dBm.
	5580 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.87) = 15.76\text{dBm}$ < 23.98dBm, so power limit=15.76dBm.
	5700 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(18.60) = 15.70\text{dBm}$ < 23.98dBm, so power limit=15.70dBm.
802.11ac MCS0/Nss1 VHT20	5260 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.22) = 16.84\text{dBm}$ < 23.89dBm, so power limit=16.84dBm.
	5300 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.30) = 16.86\text{dBm}$ < 23.89dBm, so power limit=16.86dBm.
	5320 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.39) = 16.88\text{dBm}$ < 23.89dBm, so power limit=16.88dBm.
	5500 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.30) = 15.86\text{dBm}$ < 23.98dBm, so power limit=15.86dBm.
	5580 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.90) = 15.98\text{dBm}$ < 23.98dBm, so power limit=15.98dBm.
	5700 MHz	Power limit=23.98dBm or $11 + 10\log(B)$ ; $11 + 10\log(19.57) = 15.91\text{dBm}$ < 23.98dBm, so power limit=15.91dBm.
802.11ac MCS0/Nss1 VHT40	Band 2 Directional gain = 13dBi, so limit=23.98-(13-6)=16.98 dBm.	
	Band 3 Directional gain = 14dBi, so limit=23.98-(14-6)=15.98 dBm	

<For Beamforming Mode>

Mode	Frequency	Conducted Power (dBm)					Max. Power Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	5260 MHz	9.62	10.04	9.43	9.66	15.71	15.98	Complies
	5300 MHz	9.56	9.86	9.33	9.79	15.66	15.98	Complies
	5320 MHz	9.59	9.97	9.92	9.95	15.88	15.98	Complies
	5500 MHz	8.91	8.95	9.03	8.90	14.97	14.98	Complies
	5580 MHz	8.66	8.97	8.93	9.16	14.95	14.98	Complies
	5700 MHz	8.96	8.43	9.03	9.01	14.89	14.98	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	9.64	9.94	9.51	9.65	15.71	15.98	Complies
	5310 MHz	9.57	10.05	9.48	9.62	15.71	15.98	Complies
	5510 MHz	8.72	8.53	9.18	8.60	14.79	14.98	Complies
	5550 MHz	8.95	8.81	8.84	8.79	14.87	14.98	Complies
	5670 MHz	8.81	8.75	8.61	8.51	14.69	14.98	Complies

Note:

Band 2 Directional gain =14dBi, so limit=23.98-(14-6)=15.98 dBm

Band 3 Directional gain =15dBi, so limit=23.98-(15-6)=14.98 dBm



### 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
<input checked="" type="checkbox"/>	5.25-5.35 GHz	11 dBm/MHz
<input checked="" type="checkbox"/>	5.470-5.725 GHz	11 dBm/MHz

#### 4.3.2. Measuring Instruments and Setting

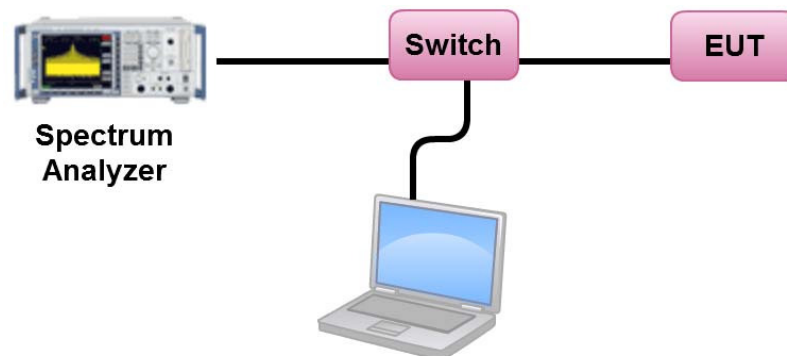
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

#### 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 v01r03 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.

#### 4.3.4. 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

For OMNI antenna:

<For Non-Beamforming Mode>

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu		

Mode	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
802.11a	5260 MHz	10.29	11.00	Complies
	5300 MHz	10.34	11.00	Complies
	5320 MHz	10.22	11.00	Complies
	5500 MHz	10.27	11.00	Complies
	5580 MHz	10.39	11.00	Complies
	5700 MHz	10.17	11.00	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	10.34	11.00	Complies
	5300 MHz	10.24	11.00	Complies
	5320 MHz	10.53	11.00	Complies
	5500 MHz	10.42	11.00	Complies
	5580 MHz	10.39	11.00	Complies
	5700 MHz	10.30	11.00	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	7.40	11.00	Complies
	5310 MHz	7.47	11.00	Complies
	5510 MHz	6.56	11.00	Complies
	5550 MHz	7.54	11.00	Complies
	5670 MHz	7.48	11.00	Complies

Note: Band 2: Directional gain = -5.35dBi < 6dBi, so the limit doesn't reduce.

Band 3: Directional gain = 3.47dBi < 6dBi, so the limit doesn't reduce.

<For Beamforming Mode>

Mode	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
802.11ac MCS0/Nss1 VHT20	5260 MHz	10.50	11.00	Complies
	5300 MHz	10.41	11.00	Complies
	5320 MHz	10.42	11.00	Complies
	5500 MHz	9.50	9.53	Complies
	5580 MHz	9.41	9.53	Complies
	5700 MHz	9.42	9.53	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	7.80	11.00	Complies
	5310 MHz	7.63	11.00	Complies
	5510 MHz	6.49	9.53	Complies
	5550 MHz	6.84	9.53	Complies
	5670 MHz	6.77	9.53	Complies

Note: Band 2: Directional gain = -1.35dBi < 6dBi, so the limit doesn't reduce.

Band 3: Directional gain = 7.47dBi, so limit = 11 - (7.47 - 6) = 9.53 dBm/MHz.

For Directional antenna:

<For Non-Beamforming Mode>

Temperature	25°C	Temperature	25°C
Test Engineer	Akina Chiu		

Mode	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
802.11a	5260 MHz	3.36	4.00	Complies
	5300 MHz	3.38	4.00	Complies
	5320 MHz	3.25	4.00	Complies
	5500 MHz	2.55	3.00	Complies
	5580 MHz	2.70	3.00	Complies
	5700 MHz	2.26	3.00	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	3.64	4.00	Complies
	5300 MHz	3.68	4.00	Complies
	5320 MHz	3.54	4.00	Complies
	5500 MHz	2.56	3.00	Complies
	5580 MHz	2.85	3.00	Complies
	5700 MHz	2.56	3.00	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	0.61	4.00	Complies
	5310 MHz	0.60	4.00	Complies
	5510 MHz	-0.34	3.00	Complies
	5550 MHz	-0.53	3.00	Complies
	5670 MHz	-0.61	3.00	Complies

Note: Band 2: Directional gain = 13dBi, so limit = 11 - (13 - 6) = 4 dBm/MHz.

Band 3: Directional gain = 14dBi, so limit = 11 - (14.47 - 6) = 3 dBm/MHz.

<For Beamforming Mode>

Mode	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
802.11ac MCS0/Nss1 VHT20	5260 MHz	2.69	3.00	Complies
	5300 MHz	2.52	3.00	Complies
	5320 MHz	2.70	3.00	Complies
	5500 MHz	1.94	2.00	Complies
	5580 MHz	1.86	2.00	Complies
	5700 MHz	1.86	2.00	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	-0.37	3.00	Complies
	5310 MHz	-0.68	3.00	Complies
	5510 MHz	-1.33	2.00	Complies
	5550 MHz	-1.20	2.00	Complies
	5670 MHz	-1.54	2.00	Complies

Note: Band 2: Directional gain = 14dBi, so limit =  $11 - (14 - 6) = 3$  dBm/MHz.

Band 3: Directional gain = 15dBi, so limit =  $11 - (15.47 - 6) = 2$  dBm/MHz.

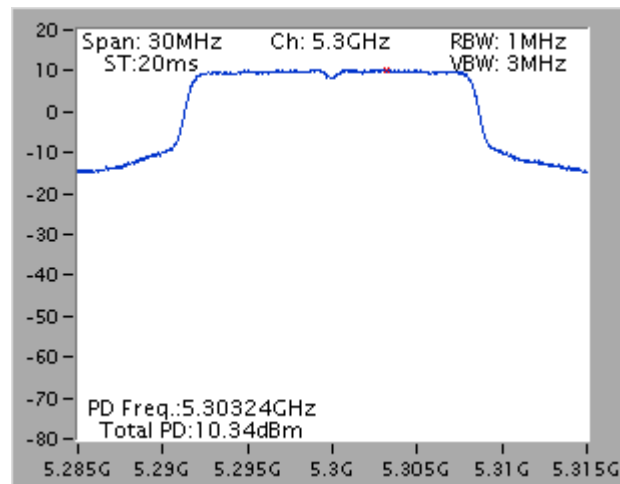
Note: All the test values were listed in the report.

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

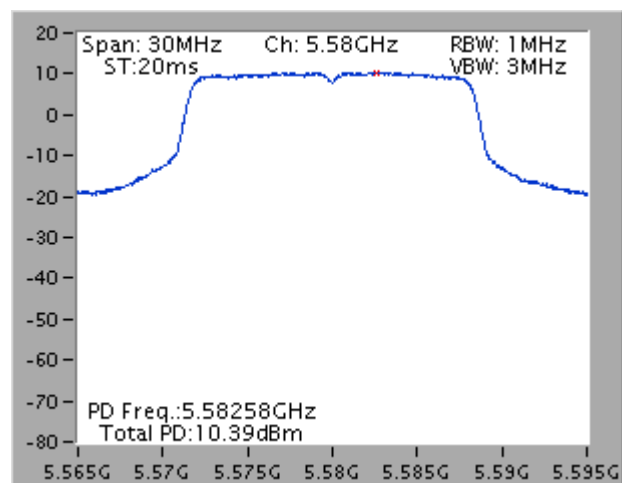
For OMNI antenna:

<For Non-Beamforming Mode>

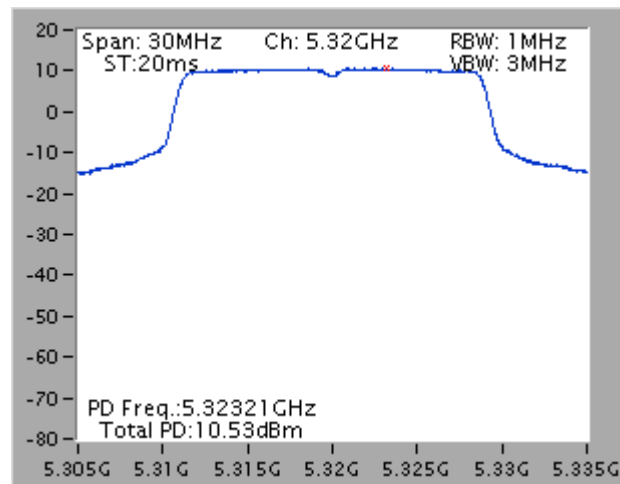
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5300 MHz



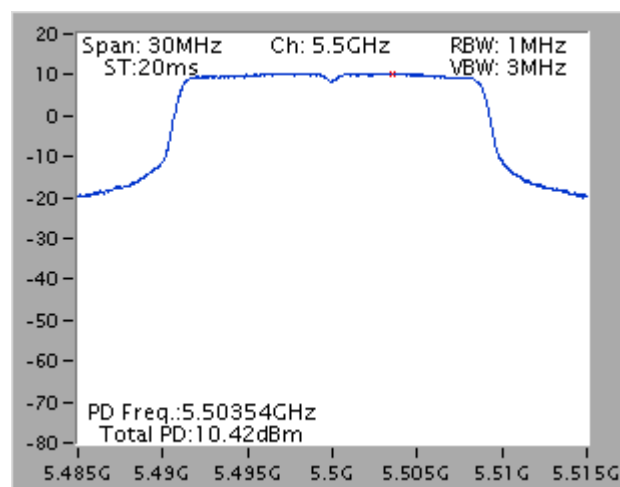
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5580 MHz



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

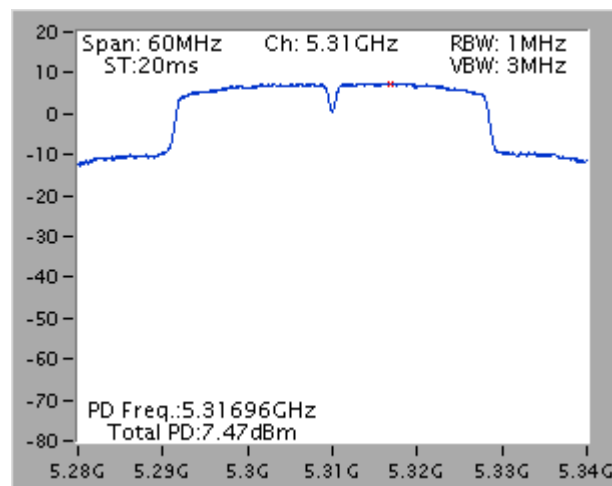


**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5500 MHz**

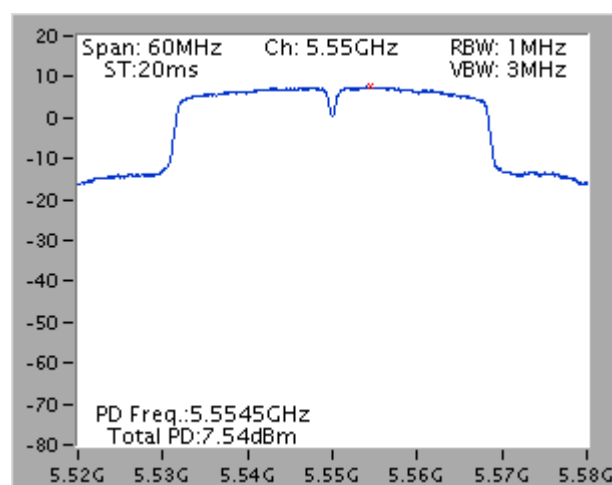




**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5310 MHz**

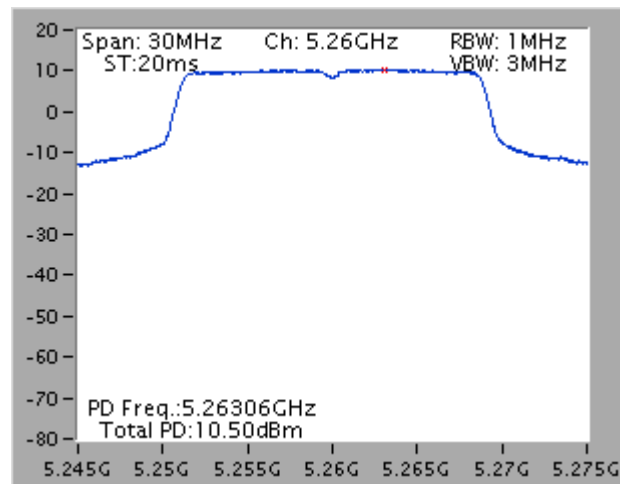


**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5550 MHz**

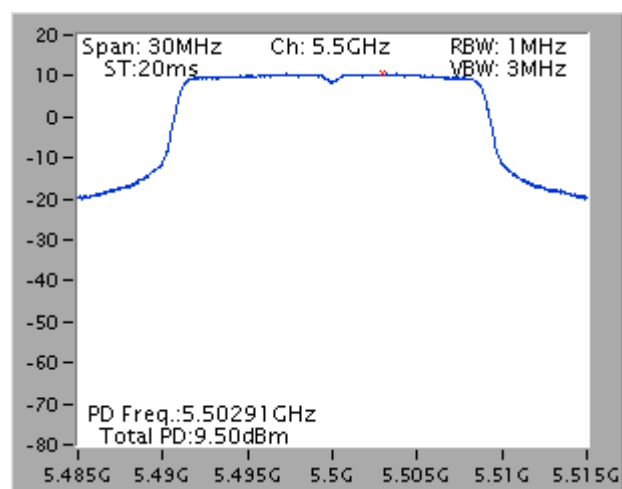


### <For Beamforming Mode>

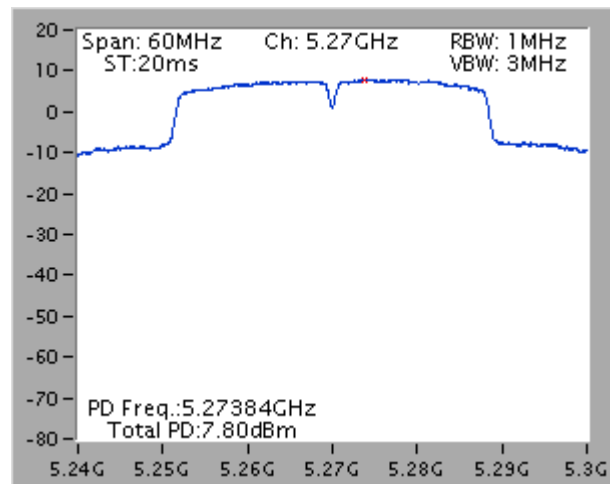
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5260 MHz



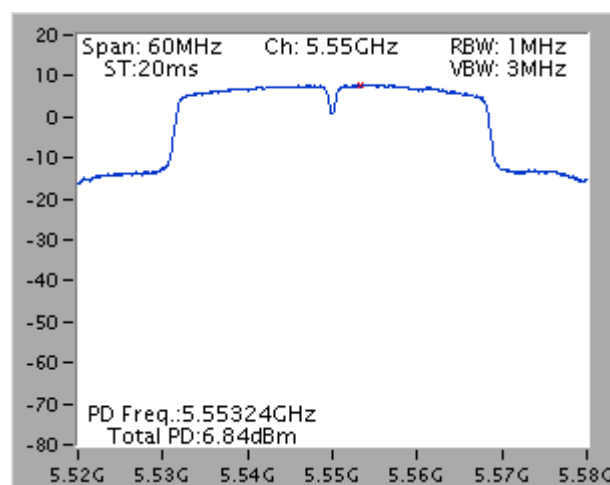
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5500 MHz



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



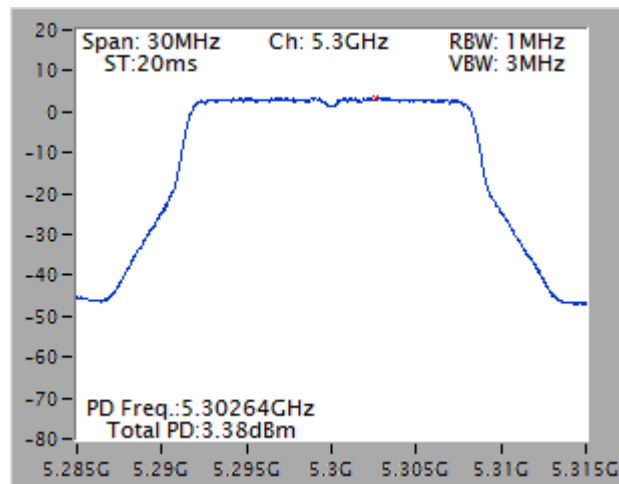
**Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5550 MHz**



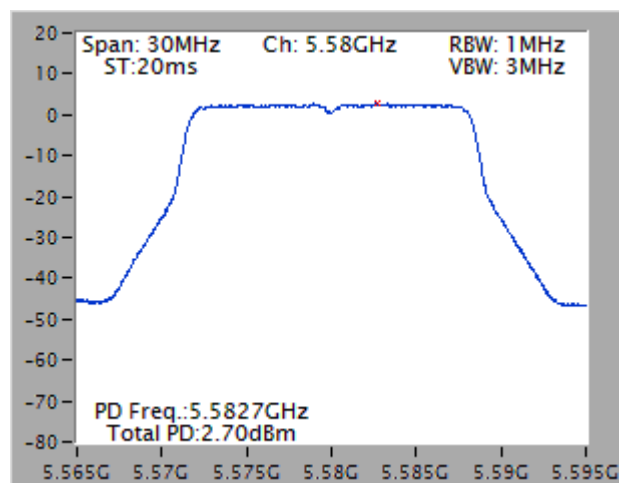
For Directional antenna:

<For Non-Beamforming Mode>

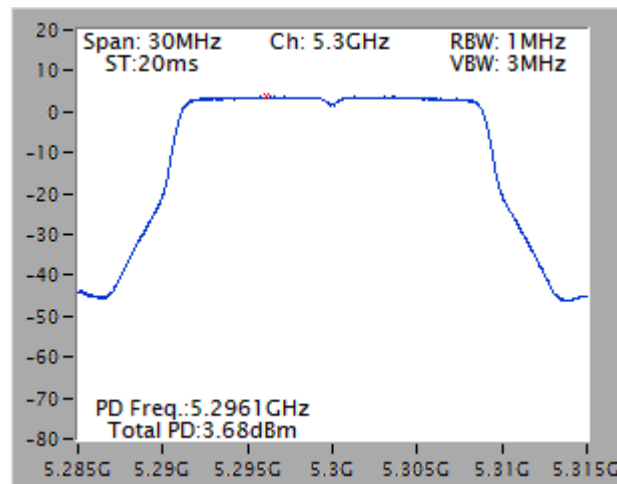
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5300 MHz



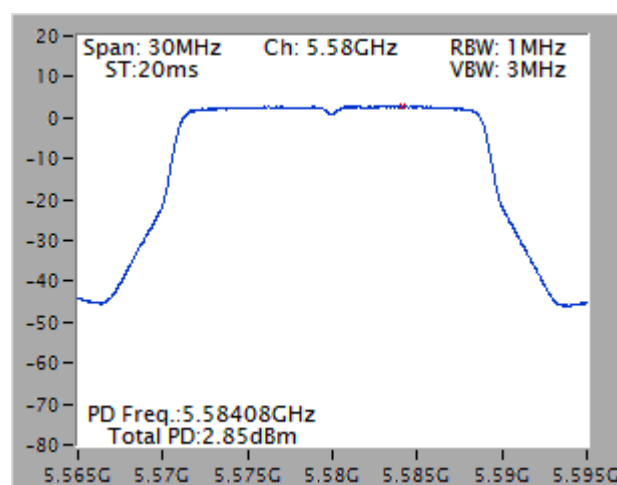
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5580 MHz



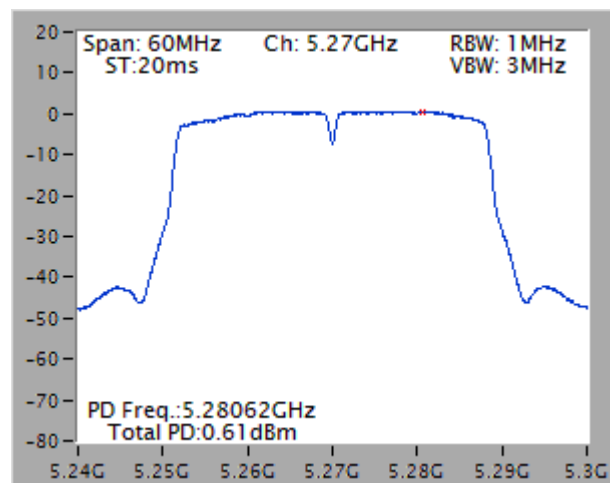
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5300 MHz



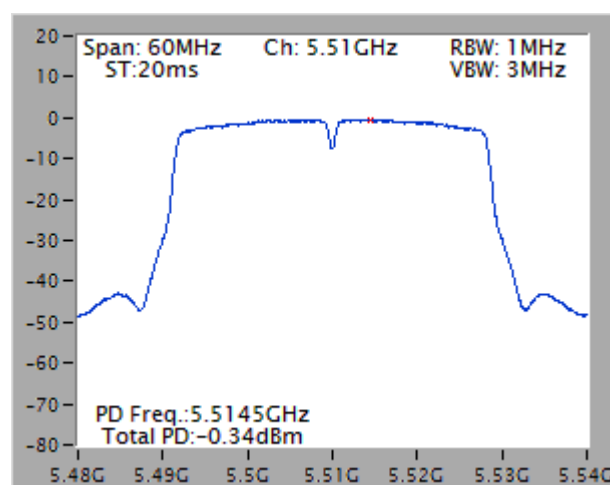
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5580 MHz



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

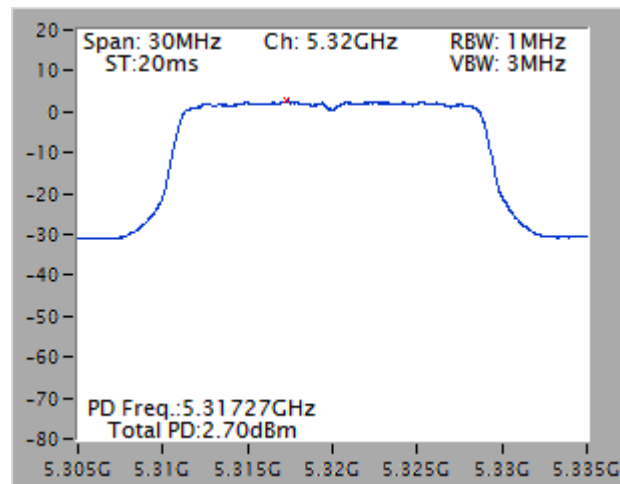


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5510 MHz

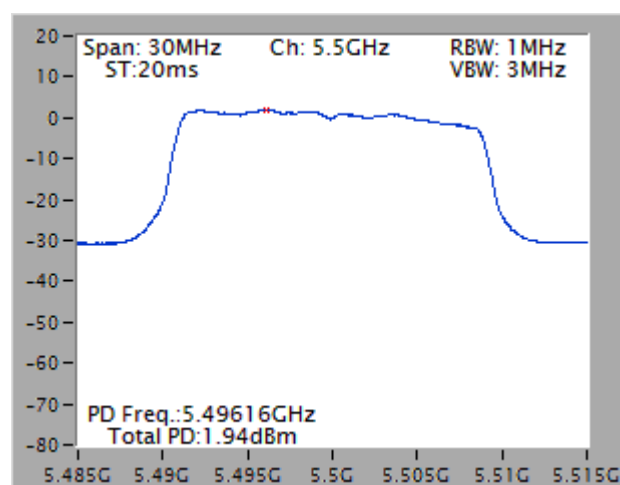


### <For Beamforming Mode>

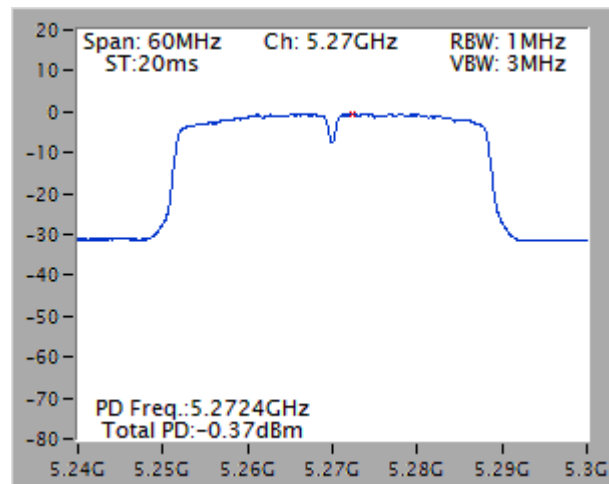
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5320 MHz



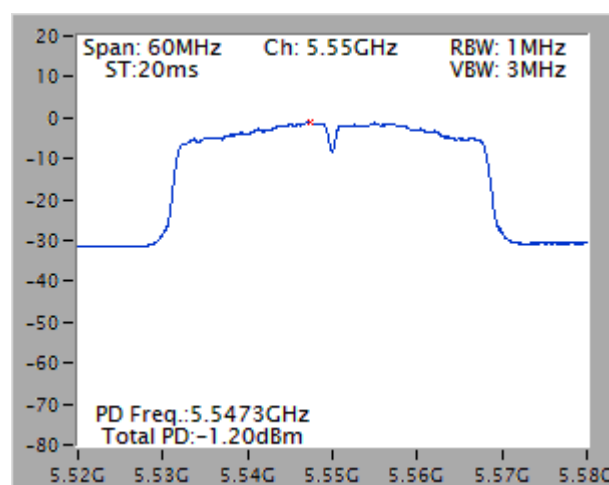
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3+ Chain 4 / 5500 MHz



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





## 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 5.15-5.35 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.

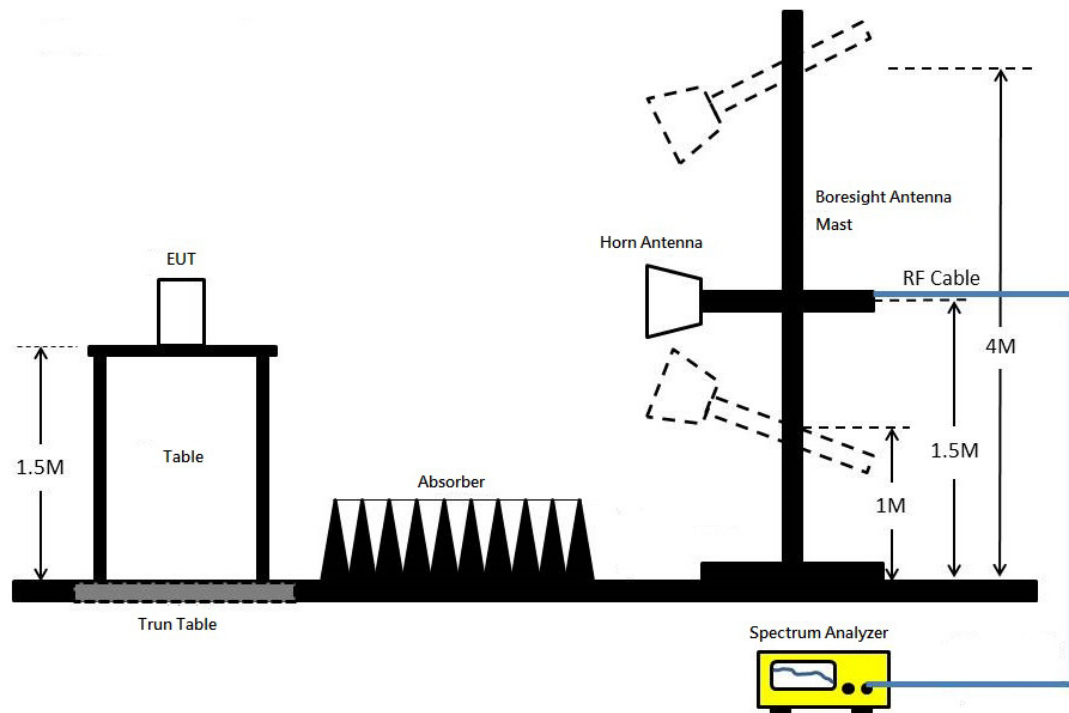
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RBW / VBW (Emission in restricted band)	1 MHz / 3MHz for Peak, 1 MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1 MHz / 3MHz for peak

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

#### 4.4.3. 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 OMNI antenna:

<For Non-Beamforming Mode>

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 52 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

##### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15768.36	66.98	74.00	-7.02	49.90	13.63	38.35	34.90	272	38	Peak	HORIZONTAL
2	15774.24	53.90	54.00	-0.10	36.82	13.63	38.35	34.90	272	38	Average	HORIZONTAL

##### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15784.14	49.52	54.00	-4.48	32.44	13.64	38.34	34.90	223	67	Average	VERTICAL
2	15784.56	62.54	74.00	-11.46	45.46	13.64	38.34	34.90	223	67	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 60 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

### Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	
1	10606.66	59.05	74.00	-14.95	42.10	11.94	38.98	33.97	257	261 Peak	HORIZONTAL
2	10611.46	45.61	54.00	-8.39	28.66	11.94	38.98	33.97	257	261 Average	HORIZONTAL
3	15901.38	53.88	54.00	-0.12	36.80	13.67	38.32	34.91	271	46 Average	HORIZONTAL
4	15902.52	67.70	74.00	-6.30	50.62	13.67	38.32	34.91	271	46 Peak	HORIZONTAL

### Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	cm	deg	
1	11061.48	59.58	74.00	-14.42	42.52	12.15	39.29	34.38	192	120 Peak	VERTICAL
2	11064.92	45.76	54.00	-8.24	28.70	12.15	39.29	34.38	192	120 Average	VERTICAL
3	15900.12	48.04	54.00	-5.96	30.96	13.67	38.32	34.91	176	19 Average	VERTICAL
4	15903.78	60.57	74.00	-13.43	43.49	13.67	38.32	34.91	176	19 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10631.42	59.02	74.00	-14.98	42.04	11.95	39.00	33.97	161	90 Peak	HORIZONTAL
2	10638.62	45.02	54.00	-8.98	28.07	11.95	39.00	34.00	161	90 Average	HORIZONTAL
3	15958.20	66.94	74.00	-7.06	49.85	13.69	38.31	34.91	175	36 Peak	HORIZONTAL
4	15958.32	53.03	54.00	-0.97	35.94	13.69	38.31	34.91	175	36 Average	HORIZONTAL

#### Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10630.70	46.05	54.00	-7.95	29.07	11.95	39.00	33.97	226	217 Average	VERTICAL
2	10648.72	58.61	74.00	-15.39	41.66	11.95	39.00	34.00	226	217 Peak	VERTICAL
3	15958.36	61.58	74.00	-12.42	44.49	13.69	38.31	34.91	199	139 Peak	VERTICAL
4	15959.16	49.53	54.00	-4.47	32.44	13.69	38.31	34.91	199	139 Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 100 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### 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	11001.98	61.01	74.00	-12.99	43.95	12.12	39.30	34.36	169	82	Peak	HORIZONTAL
2	11002.20	48.61	54.00	-5.39	31.55	12.12	39.30	34.36	169	82	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	10998.84	59.98	74.00	-14.02	42.92	12.12	39.30	34.36	207	138	Peak	VERTICAL
2	11001.76	47.02	54.00	-6.98	29.96	12.12	39.30	34.36	207	138	Average	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 116 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### Horizontal

	Freq	Level	Line	Limit	Level	Loss	Factor	Factor		Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11157.82	61.31	74.00	-12.69	44.29	12.19	39.27	34.44	172	78 Peak	HORIZONTAL
2	11158.14	48.99	54.00	-5.01	31.97	12.19	39.27	34.44	172	78 Average	HORIZONTAL
3	16744.40	67.96	68.20	-0.24	49.02	14.07	39.95	35.08	162	52 Peak	HORIZONTAL

#### Vertical

	Freq	Level	Line	Limit	Level	Loss	Factor	Factor		Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11153.40	47.83	54.00	-6.17	30.82	12.18	39.27	34.44	158	321 Average	VERTICAL
2	11153.80	59.40	74.00	-14.60	42.39	12.18	39.27	34.44	158	321 Peak	VERTICAL
3	16734.70	64.62	68.20	-3.58	45.68	14.07	39.95	35.08	198	36 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### 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	11399.04	61.79	74.00	-12.21	44.87	12.29	39.22	34.59	162	68	Peak	HORIZONTAL
2	11399.90	49.47	54.00	-4.53	32.55	12.29	39.22	34.59	162	68	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	11398.98	61.44	74.00	-12.56	44.52	12.29	39.22	34.59	173	56	Peak	VERTICAL
2	11399.90	48.20	54.00	-5.80	31.28	12.29	39.22	34.59	173	56	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	15786.12	53.72	54.00	-0.28	36.64	13.64	38.34	34.90	190	52 Average	HORIZONTAL
2	15786.32	69.28	74.00	-4.72	52.20	13.64	38.34	34.90	190	52 Peak	HORIZONTAL

#### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	15786.72	49.32	54.00	-4.68	32.24	13.64	38.34	34.90	153	60 Average	VERTICAL
2	15786.76	62.85	74.00	-11.15	45.77	13.64	38.34	34.90	153	60 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

### Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10600.84	58.37	74.00	-15.63	41.38	11.94	38.98	33.93	193	242 Peak	HORIZONTAL
2	10609.84	45.79	54.00	-8.21	28.84	11.94	38.98	33.97	193	242 Average	HORIZONTAL
3	15900.88	53.64	54.00	-0.36	36.56	13.67	38.32	34.91	270	38 Average	HORIZONTAL
4	15903.56	68.00	74.00	-6.00	50.92	13.67	38.32	34.91	270	38 Peak	HORIZONTAL

### Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10607.76	58.27	74.00	-15.73	41.32	11.94	38.98	33.97	184	316 Peak	VERTICAL
2	10609.36	45.71	54.00	-8.29	28.76	11.94	38.98	33.97	184	316 Average	VERTICAL
3	15899.64	61.61	74.00	-12.39	44.53	13.67	38.32	34.91	228	131 Peak	VERTICAL
4	15900.44	48.97	54.00	-5.03	31.89	13.67	38.32	34.91	228	131 Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

### Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10631.68	47.34	54.00	-6.66	30.36	11.95	39.00	33.97	169	292 Average	HORIZONTAL
2	10632.32	58.99	74.00	-15.01	42.01	11.95	39.00	33.97	169	292 Peak	HORIZONTAL
3	15960.44	53.56	54.00	-0.44	36.47	13.69	38.31	34.91	291	52 Average	HORIZONTAL
4	15960.60	67.84	74.00	-6.16	50.75	13.69	38.31	34.91	291	52 Peak	HORIZONTAL

### Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10641.76	46.82	54.00	-7.18	29.87	11.95	39.00	34.00	188	255 Average	VERTICAL
2	10644.60	58.62	74.00	-15.38	41.67	11.95	39.00	34.00	188	255 Peak	VERTICAL
3	15958.00	64.75	74.00	-9.25	47.66	13.69	38.31	34.91	235	128 Peak	VERTICAL
4	15958.44	50.91	54.00	-3.09	33.82	13.69	38.31	34.91	235	128 Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11000.84	48.43	54.00	-5.57	31.37	12.12	39.30	34.36	207	45 Average	HORIZONTAL
2	11001.82	61.12	74.00	-12.88	44.06	12.12	39.30	34.36	207	45 Peak	HORIZONTAL

### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10997.32	47.29	54.00	-6.71	30.23	12.12	39.30	34.36	137	279 Average	VERTICAL
2	10997.58	59.77	74.00	-14.23	42.71	12.12	39.30	34.36	137	279 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

### Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11156.32	49.13	54.00	-4.87	32.12	12.18	39.27	34.44	211	77 Average	HORIZONTAL
2	11157.16	60.21	74.00	-13.79	43.19	12.19	39.27	34.44	211	77 Peak	HORIZONTAL
3	16732.56	65.43	68.20	-2.77	46.49	14.07	39.95	35.08	164	44 Peak	HORIZONTAL

### Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11155.72	60.11	74.00	-13.89	43.10	12.18	39.27	34.44	196	78 Peak	VERTICAL
2	11155.88	48.07	54.00	-5.93	31.06	12.18	39.27	34.44	196	78 Average	VERTICAL
3	16733.76	63.59	68.20	-4.61	44.65	14.07	39.95	35.08	187	35 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11400.32	48.84	54.00	-5.16	31.92	12.29	39.22	34.59	168	90 Average	HORIZONTAL
2	11404.68	59.93	74.00	-14.07	43.01	12.29	39.22	34.59	168	90 Peak	HORIZONTAL

#### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11402.36	48.11	54.00	-5.89	31.19	12.29	39.22	34.59	217	158 Average	VERTICAL
2	11405.52	60.93	74.00	-13.07	44.01	12.29	39.22	34.59	217	158 Peak	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	15816.60	66.87	74.00	-7.13	49.79	13.64	38.34	34.90	269	39 Peak	HORIZONTAL
2	15817.08	53.57	54.00	-0.43	36.49	13.64	38.34	34.90	269	39 Average	HORIZONTAL

#### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	15804.16	60.48	74.00	-13.52	43.40	13.64	38.34	34.90	204	181 Peak	VERTICAL
2	15815.52	48.39	54.00	-5.61	31.31	13.64	38.34	34.90	204	181 Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

### Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10619.26	46.34	54.00	-7.66	29.39	11.94	38.98	33.97	182	232 Average	HORIZONTAL
2	10619.52	59.78	74.00	-14.22	42.83	11.94	38.98	33.97	182	232 Peak	HORIZONTAL
3	15930.56	63.75	74.00	-10.25	46.66	13.69	38.31	34.91	305	52 Peak	HORIZONTAL
4	15931.12	51.47	54.00	-2.53	34.38	13.69	38.31	34.91	305	52 Average	HORIZONTAL

### Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10621.90	59.53	74.00	-14.47	42.55	11.95	39.00	33.97	196	158 Peak	VERTICAL
2	10623.86	46.39	54.00	-7.61	29.41	11.95	39.00	33.97	196	158 Average	VERTICAL
3	15929.80	61.81	74.00	-12.19	44.72	13.69	38.31	34.91	170	204 Peak	VERTICAL
4	15929.90	49.01	54.00	-4.99	31.92	13.69	38.31	34.91	170	204 Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11036.20	61.11	74.00	-12.89	44.07	12.13	39.29	34.38	175	197 Peak	HORIZONTAL
2	11040.40	47.40	54.00	-6.60	30.36	12.13	39.29	34.38	175	197 Average	HORIZONTAL

#### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11024.10	59.95	74.00	-14.05	42.89	12.12	39.30	34.36	159	162 Peak	VERTICAL
2	11042.80	47.03	54.00	-6.97	29.99	12.13	39.29	34.38	159	162 Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11079.40	59.91	74.00	-14.09	42.87	12.15	39.29	34.40	264	339 Peak	HORIZONTAL
2	11100.00	48.69	54.00	-5.31	31.65	12.16	39.28	34.40	264	339 Average	HORIZONTAL

#### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11082.20	46.95	54.00	-7.05	29.91	12.15	39.29	34.40	191	131 Average	VERTICAL
2	11085.30	58.96	74.00	-15.04	41.92	12.15	39.29	34.40	191	131 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11318.40	60.32	74.00	-13.68	43.36	12.25	39.24	34.53	179	324	Peak	HORIZONTAL
2	11339.30	48.85	54.00	-5.15	31.91	12.26	39.23	34.55	179	324	Average	HORIZONTAL

#### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11317.10	59.28	74.00	-14.72	42.32	12.25	39.24	34.53	156	260	Peak	VERTICAL
2	11322.00	47.13	54.00	-6.87	30.19	12.26	39.23	34.55	156	260	Average	VERTICAL

## &lt;For Beamforming Mode&gt;

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

## Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	15789.78	63.96	74.00	-10.04	46.88	13.64	38.34	34.90	215	272 Peak	HORIZONTAL
2	15792.34	52.32	54.00	-1.68	35.24	13.64	38.34	34.90	215	272 Average	HORIZONTAL

## Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	15762.37	60.90	74.00	-13.10	43.81	13.63	38.35	34.89	138	307 Peak	VERTICAL
2	15769.74	49.76	54.00	-4.24	32.68	13.63	38.35	34.90	138	307 Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

#### Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10603.30	45.62	54.00	-8.38	28.63	11.94	38.98	33.93	150	360 Average	HORIZONTAL
2	10604.50	59.11	74.00	-14.89	42.16	11.94	38.98	33.97	150	360 Peak	HORIZONTAL
3	15891.19	61.35	74.00	-12.65	44.27	13.67	38.32	34.91	166	271 Peak	HORIZONTAL
4	15896.31	48.91	54.00	-5.09	31.83	13.67	38.32	34.91	166	271 Average	HORIZONTAL

#### Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10598.67	58.41	74.00	-15.59	41.42	11.94	38.98	33.93	144	254 Peak	VERTICAL
2	10604.07	45.41	54.00	-8.59	28.46	11.94	38.98	33.97	144	254 Average	VERTICAL
3	15902.40	48.20	54.00	-5.80	31.12	13.67	38.32	34.91	157	303 Average	VERTICAL
4	15910.90	59.14	74.00	-14.86	42.06	13.67	38.32	34.91	157	303 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

### Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10640.99	58.90	74.00	-15.10	41.95	11.95	39.00	34.00	167	103 Peak	HORIZONTAL
2	10644.57	45.60	54.00	-8.40	28.65	11.95	39.00	34.00	167	103 Average	HORIZONTAL
3	15967.05	50.17	54.00	-3.83	33.08	13.70	38.30	34.91	151	80 Average	HORIZONTAL
4	15974.90	61.96	74.00	-12.04	44.88	13.70	38.30	34.92	151	80 Peak	HORIZONTAL

### Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10635.02	45.26	54.00	-8.74	28.28	11.95	39.00	33.97	185	129 Average	VERTICAL
2	10639.09	58.29	74.00	-15.71	41.34	11.95	39.00	34.00	185	129 Peak	VERTICAL
3	15951.35	60.26	74.00	-13.74	43.17	13.69	38.31	34.91	148	304 Peak	VERTICAL
4	15960.16	49.71	54.00	-4.29	32.62	13.69	38.31	34.91	148	304 Average	VERTICAL



Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Chain 1 + Chain 2 + Chain 3+ Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

### Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10996.52	46.38	54.00	-7.62	29.32	12.12	39.30	34.36	132	79 Average	HORIZONTAL
2	11001.75	58.39	74.00	-15.61	41.33	12.12	39.30	34.36	132	79 Peak	HORIZONTAL

### Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	10995.85	45.96	54.00	-8.04	28.94	12.11	39.27	34.36	187	139 Average	VERTICAL
2	10997.93	58.26	74.00	-15.74	41.20	12.12	39.30	34.36	187	139 Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 27, 2016 ~ Jul. 26, 2016		

### Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11155.00	57.51	74.00	-16.49	40.50	12.18	39.27	34.44	182	176 Peak	HORIZONTAL
2	11159.05	46.31	54.00	-7.69	29.29	12.19	39.27	34.44	182	176 Average	HORIZONTAL

### Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg	
1	11156.81	45.44	54.00	-8.56	28.42	12.19	39.27	34.44	140	249 Average	VERTICAL
2	11161.89	58.66	74.00	-15.34	41.64	12.19	39.27	34.44	140	249 Peak	VERTICAL