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FCC RADIO TEST REPORT

Applicant's company	**Ruckus Wireless, Inc.**
Applicant Address	350 West Java Drive Sunnyvale, California 94089 U.S.A
FCC ID	**S9GR310**
Manufacturer's company	**Lite-On Network Communication (Dongguan) Limited**
Manufacturer Address	30#Keji Rd., Yin Hu Industrial Area, Qingxi Town, DongGuan City, Guangdong, China

Product Name	ZoneFlex R310 Access Point
Brand Name	Ruckus
Model No.	R310
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Aug. 28, 2015
Final Test Date	Oct. 19, 2015
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 v01, KDB662911 D01 v02r01, KDB644545 D03 v01.**

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

TAF
Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR590833-01	Rev. 01	Initial issue of report	Nov. 04, 2015

1. VERIFICATION OF COMPLIANCE

Product Name	:	ZoneFlex R310 Access Point
Brand Name	:	Ruckus
Model No.	:	R310
Applicant	:	Ruckus Wireless, 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 Aug. 28, 2015 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

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**	**Under Limit**
4.1	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.2	15.407(e)	6dB Spectrum Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	0.01 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.21 dB
4.5	15.407(b)	Radiated Emissions	Complies	9.22 dB
4.6	15.407(b)	Band Edge Emissions	Complies	0.08 dB
4.7	15.407(g)	Frequency Stability	Complies	-
4.8	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Power Adapter or PoE
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	16 for 20MHz bandwidth ; 8 for 40MHz bandwidth 4 for 80MHz bandwidth
Channel Band Width (99%)	Band 2: IEEE 802.11a: 16.75 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.88 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.75 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.25 MHz Band 3: IEEE 802.11a: 17.01 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.32 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.62 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz
Maximum Conducted Output Power	Band 2: IEEE 802.11a: 23.75 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 23.86 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.94 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 18.32 dBm Band 3: IEEE 802.11a: 23.91 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 23.93 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.91 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 23.99 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

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

Antenna and Band width

Antenna	Two(TX)		
Band width 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)	2	MCS 0-15
802.11n (HT40)	2	MCS 0-15
802.11ac (VHT20)	2	MCS 0-9/Nss1-2
802.11ac (VHT40)	2	MCS 0-9/Nss1-2
802.11ac (VHT80)	2	MCS 0-9/Nss1-2

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

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

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

3.2. Accessories

N/A

3.3. Table for Filed Antenna

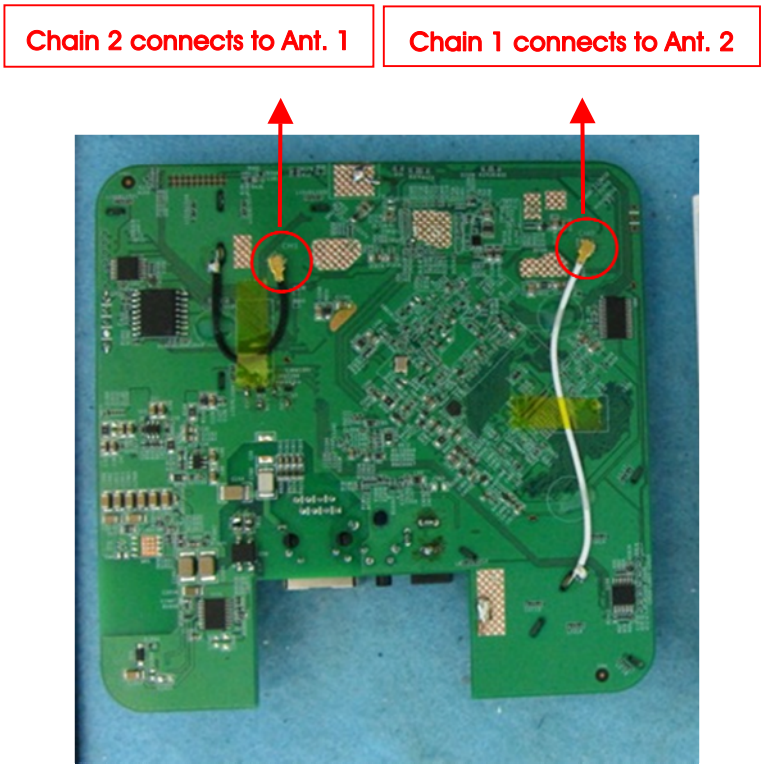
Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	Ruckus	R310	PCB Antenna	I-PEX	0	3
2	Ruckus	R310	PCB Antenna	I-PEX	0	3

Note: The EUT has two antennas.

For IEEE 802.11a/b/g/n/ac mode (2TX, 2RX):

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

Chain 1 and Chain 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

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

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

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

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz Band 3	100	5500 MHz	124	5620 MHz
	102	5510 MHz	126	5630 MHz
	104	5520 MHz	128	5640 MHz
	106	5530 MHz	132	5660 MHz
	108	5540 MHz	134	5670 MHz
	110	5550 MHz	136	5680 MHz
	112	5560 MHz	138	5690 MHz
	116	5580 MHz	140	5700 MHz
	118	5590 MHz	142	5710 MHz
	120	5600 MHz	144	5720 MHz
	122	5610 MHz	-	-

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	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140/144	1+2
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140/144	1+2
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134/142	1+2
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122/138	1+2
Power Spectral Density	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140/144	1+2
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140/144	1+2
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134/142	1+2
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122/138	1+2
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140/144	1+2
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140/144	1+2
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134/142	1+2
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122/138	1+2
6dB Spectrum Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	144	1+2
	11ac VHT20	Band 4	MCS0/Nss1	144	1+2
	11ac VHT40	Band 4	MCS0/Nss1	142	1+2
	11ac VHT80	Band 4	MCS0/Nss1	138	1+2
Radiated Emission Above 1GHz	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140/144	1+2
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140/144	1+2

	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134/142	1+2
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122/138	1+2
Band Edge Emission	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140/144	1+2
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140/144	1+2
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134/142	1+2
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122/138	1+2
Frequency Stability	20 MHz	Band 2-3	-	60/116	2
	40 MHz	Band 2-3	-	62/110	2
	80 MHz	Band 2-3	-	58/106	2

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 was powered by Adapter or PoE. The Adapter and PoE was for measurement only, they would not be marketed. Thus only Adapter was to test and record in the report as a result.

The following test modes were performed for all tests:

For Radiated Emission test<Above 1GHz>:

Radiated Emissions above 1GHz test was performed at its 2-axis (Y-axis and Z-axis). Z-axis was the worst case, so it's recorded in this report.

Mode 1: CTX + Place EUT in Z axis

Note: The PoE and Adapter below are for measurement only, would not be marketed.

Power	Brand	Model	FCC ID
Adapter	Ruckus	HK-AD-120A100-US	N/A
PoE	Ruckus	740-64214-001	N/A

Note: The test configuration, test mode and test software were written in this test report are designated by the applicant.

3.6. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	**Site Category**	**Location**	**FCC Reg. No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Class II Change

This product is an extension of original one reported under Sporton project number: FR590833AB
Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Add Band 2 and Band 3 (5250~5350 MHz, 5470~5725 MHz) for this device.	1. 26dB Spectrum Bandwidth and 99% Occupied Bandwidth 2. 6dB Spectrum Bandwidth 3. Maximum Conducted Output Power 4. Power Spectral Density 5. Radiated Emissions<Above 1GHz> 6. Band Edge Emissions 7. Frequency Stability

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB<Above1GHz>

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
Adapter	Ruckus	HK-AD-120A100-US	N/A

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC
Adapter	Ruckus	HK-AD-120A100-US	N/A

3.9. Table for Parameters of Test Software Setting

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

Test Software Version	ART2-GUI Version2.3						
Mode	Test Frequency (MHz)						
	NCB: 20MHz						
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz
802.11a	18.5	19	19	18.5	18	18	18
802.11ac MCS0/Nss1 VHT20	18.5	19	19	18.5	18	18	18
Mode	NCB: 40MHz						
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710MHz	
	19.5	19.5	18.5	18.5	18.5	18.5	
Mode	NCB: 80MHz						
802.11ac MCS0/Nss1 VHT80	5290 MHz		5530 MHz		5610 MHz	5690MHz	
	14.5		17.5		19	18.5	

3.10. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

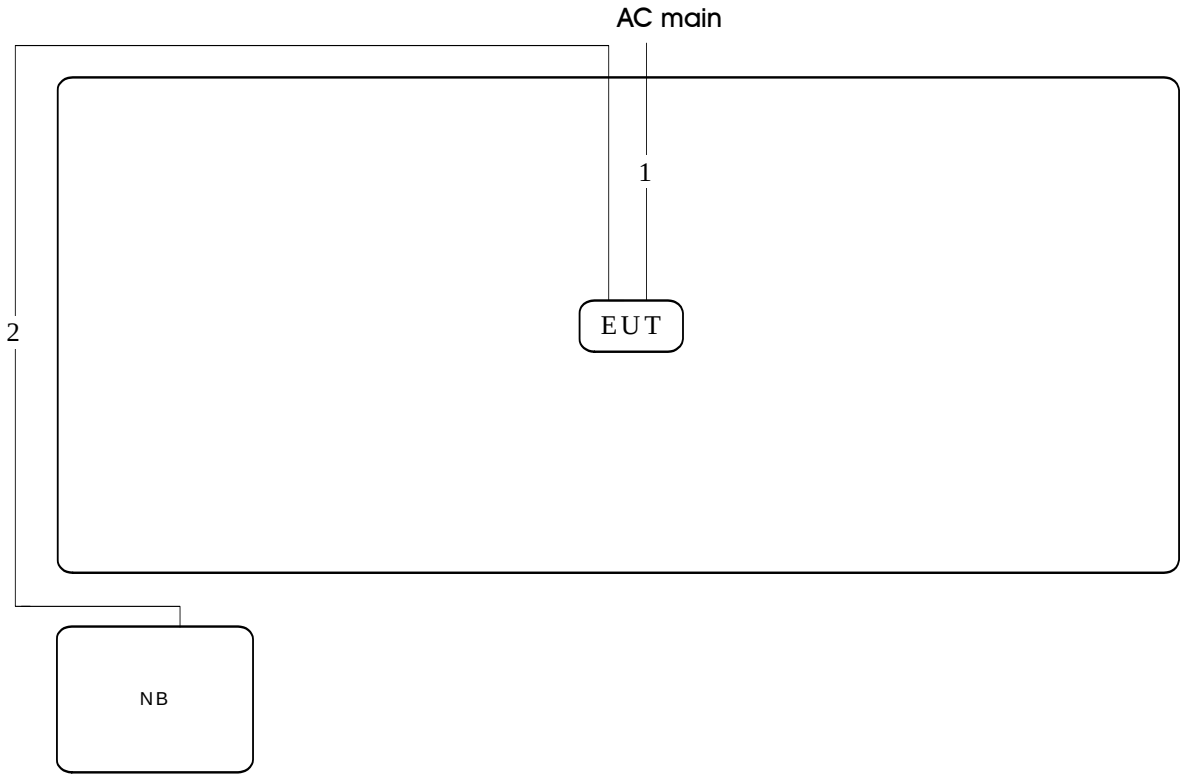
3.11. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.022	2.087	96.87%	0.14	0.49
802.11ac MCS0/Nss1 VHT20	1.882	1.947	96.67%	0.15	0.53
802.11ac MCS0/Nss1 VHT40	0.903	1.000	90.35%	0.44	1.11
802.11ac MCS0/Nss1 VHT80	0.417	0.509	81.93%	0.87	2.40

3.12. Test Configurations

3.12.1. Radiation Emissions Test Configuration

Test Configuration: above 1GHz



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

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 4.5.4.

4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

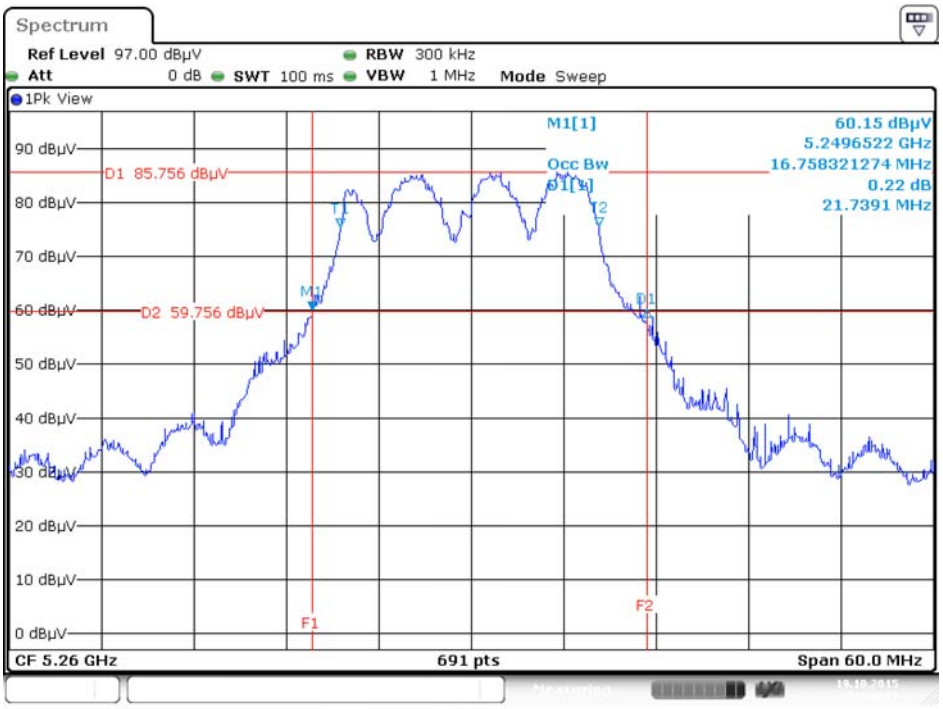
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu		

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5260 MHz	21.73	16.75
	5300 MHz	21.73	16.75
	5320 MHz	20.69	16.75
	5500 MHz	20.60	16.23
	5580 MHz	20.78	17.01
	5700 MHz	21.56	15.89
802.11ac MCS0/Nss1 VHT20	5260 MHz	21.39	17.71
	5300 MHz	21.56	17.88
	5320 MHz	22.17	17.88
	5500 MHz	20.17	17.10
	5580 MHz	22.60	18.23
	5700 MHz	23.13	18.32
802.11ac MCS0/Nss1 VHT40	5270 MHz	44.20	36.61
	5310 MHz	44.49	36.75
	5510 MHz	44.78	37.19
	5550 MHz	44.49	37.33
	5670 MHz	44.20	36.61
802.11ac MCS0/Nss1 VHT80	5290 MHz	83.18	75.25
	5530 MHz	88.40	76.41
	5610 MHz	84.34	76.41

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



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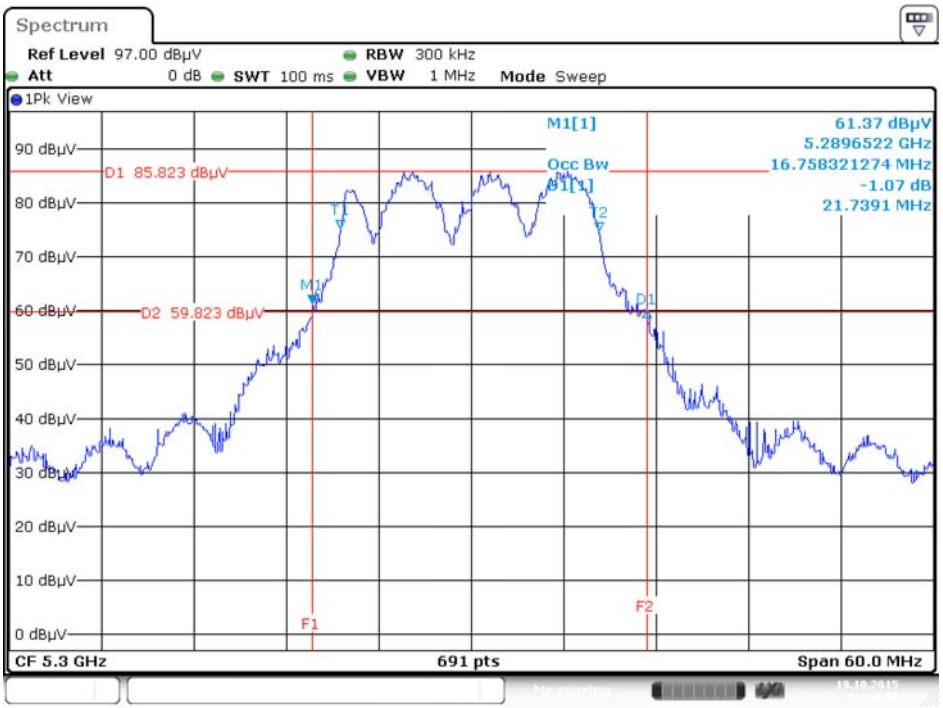
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2/ 5300 MHz



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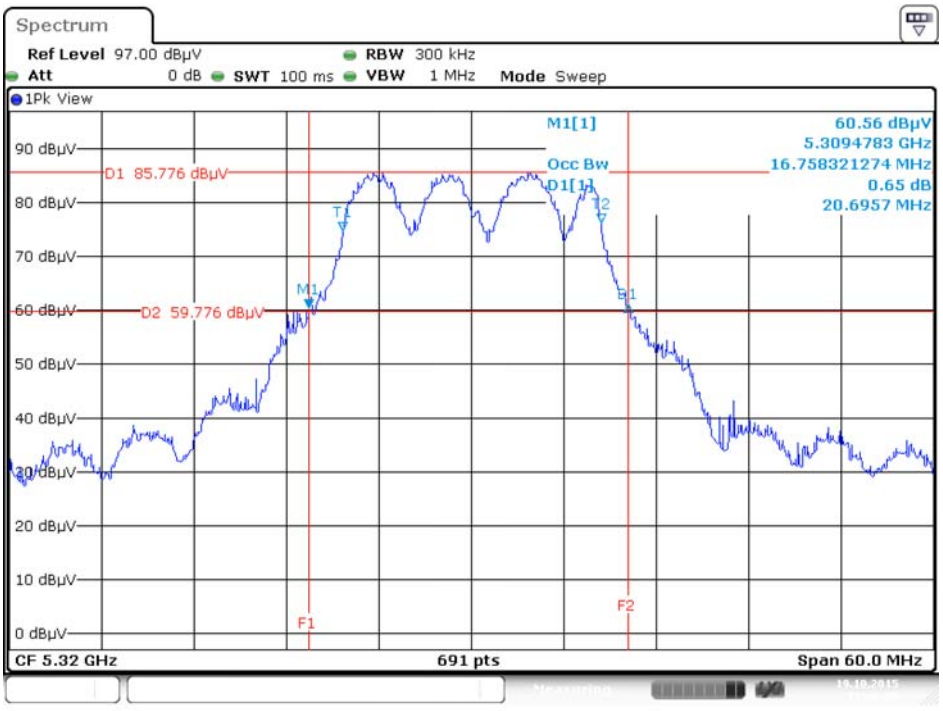
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5320 MHz



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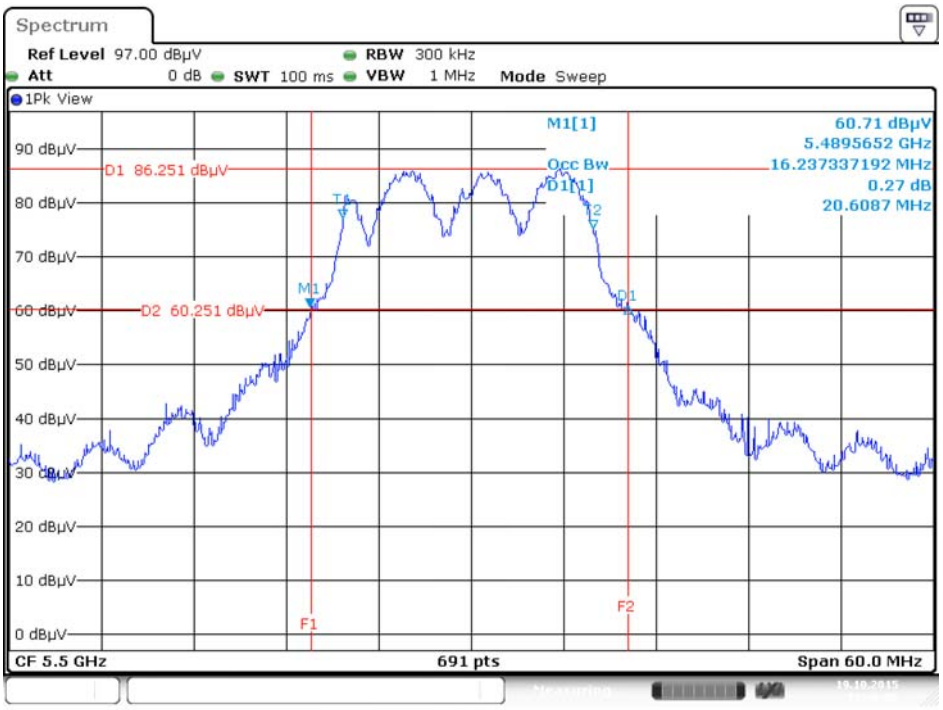
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5500 MHz



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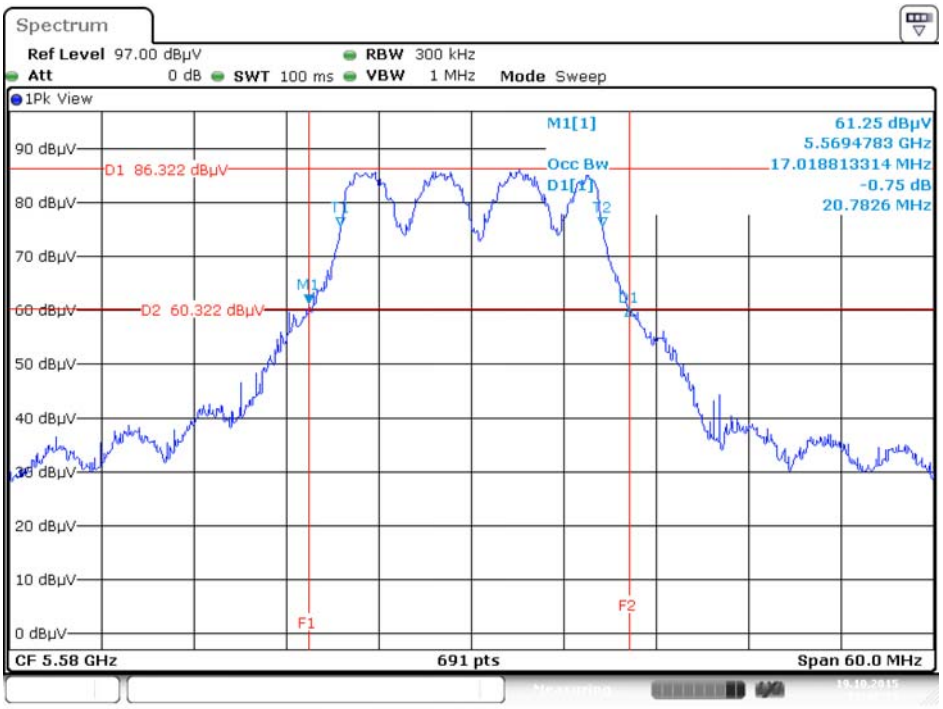
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5580 MHz



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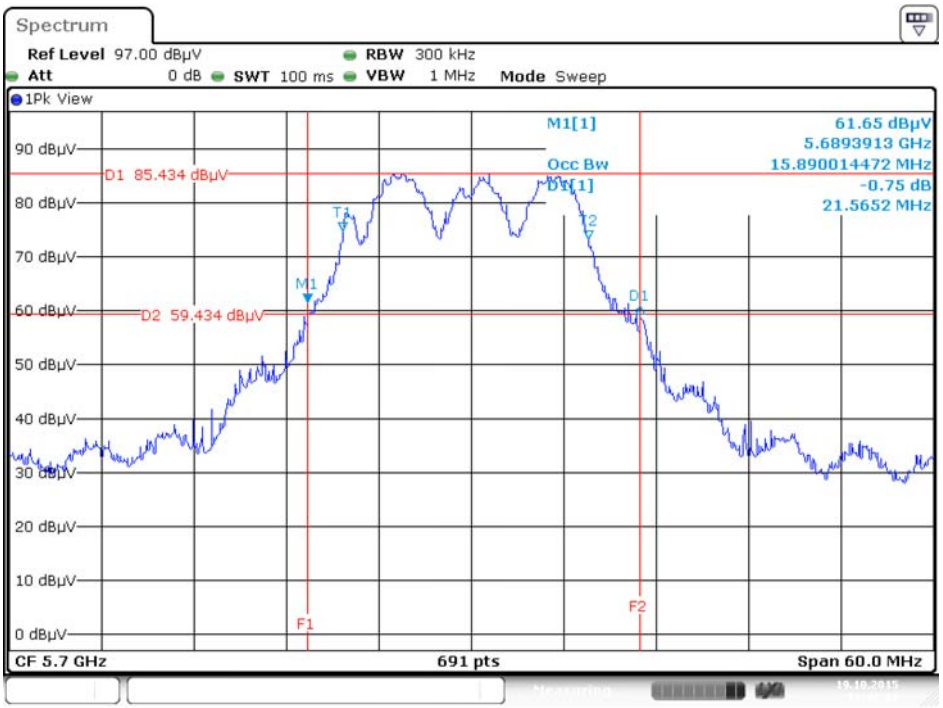
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5700 MHz



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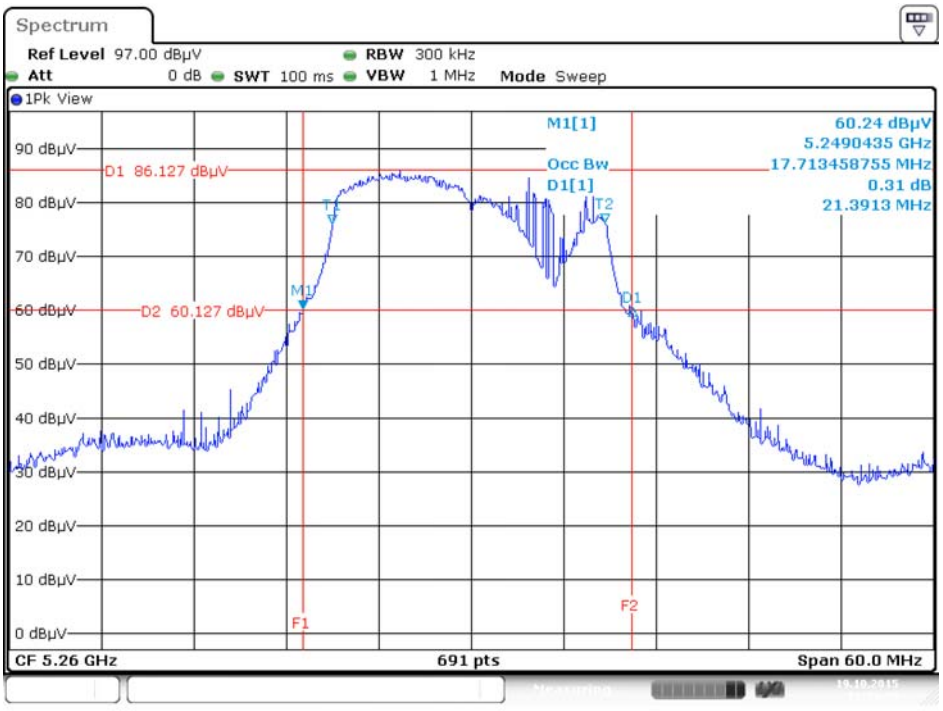
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5260 MHz



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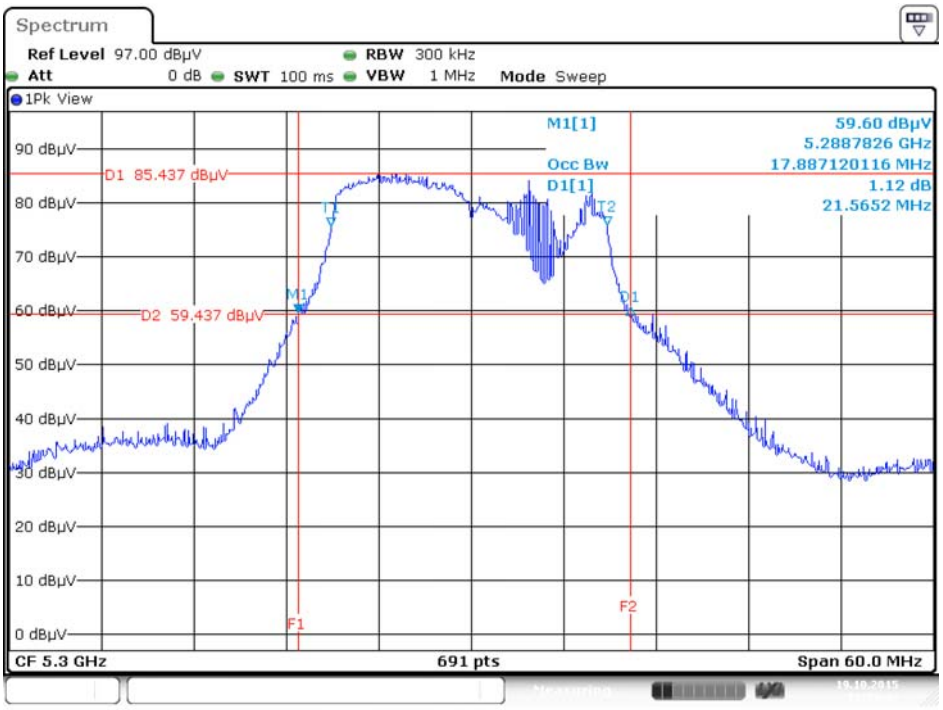
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5300 MHz



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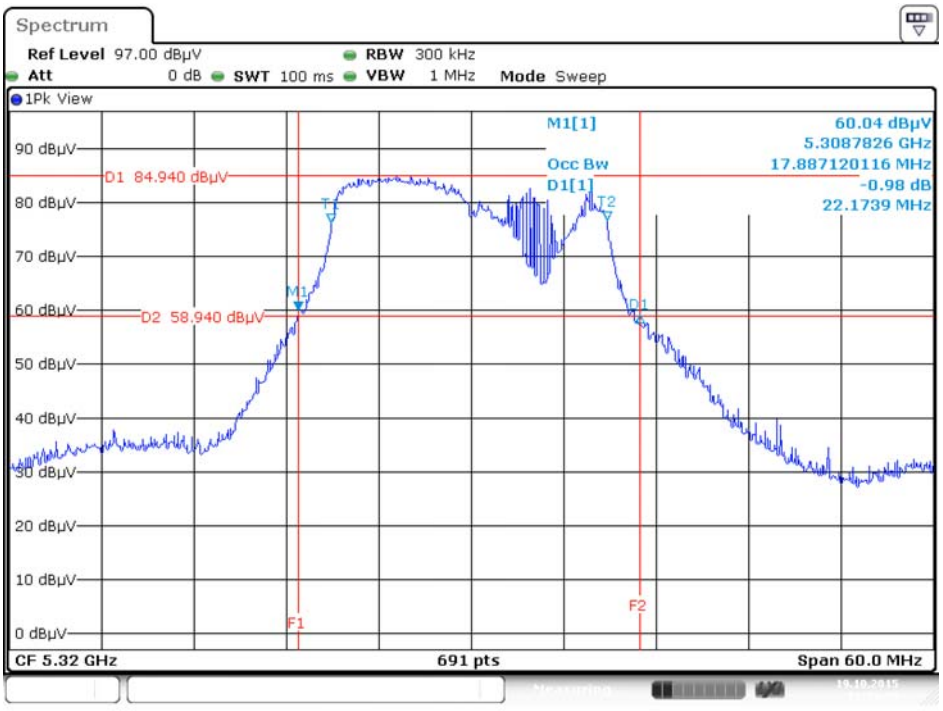
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5320 MHz



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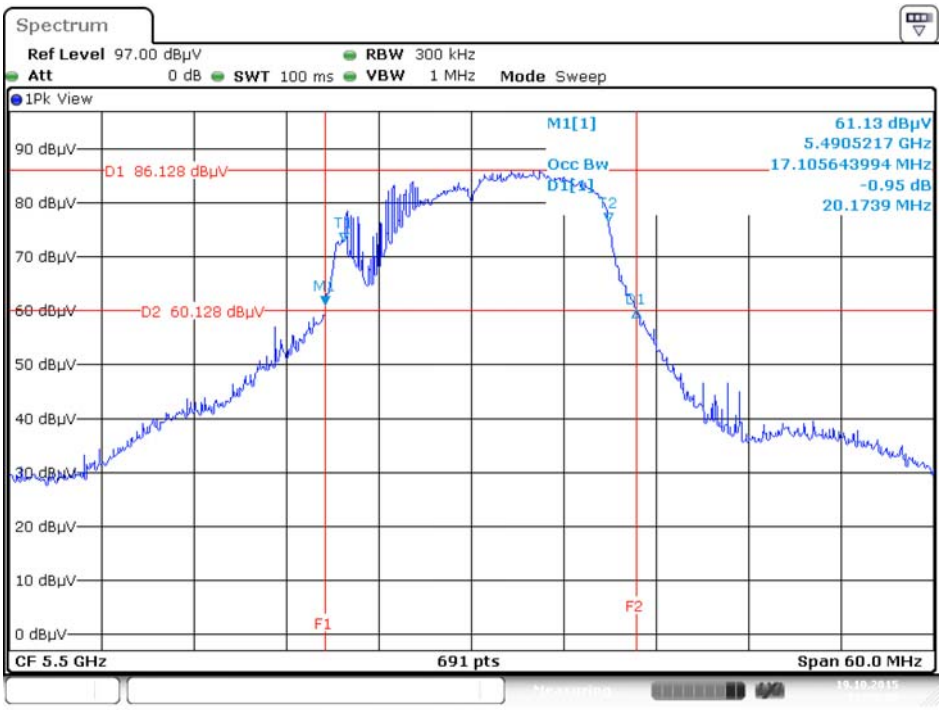
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5500 MHz



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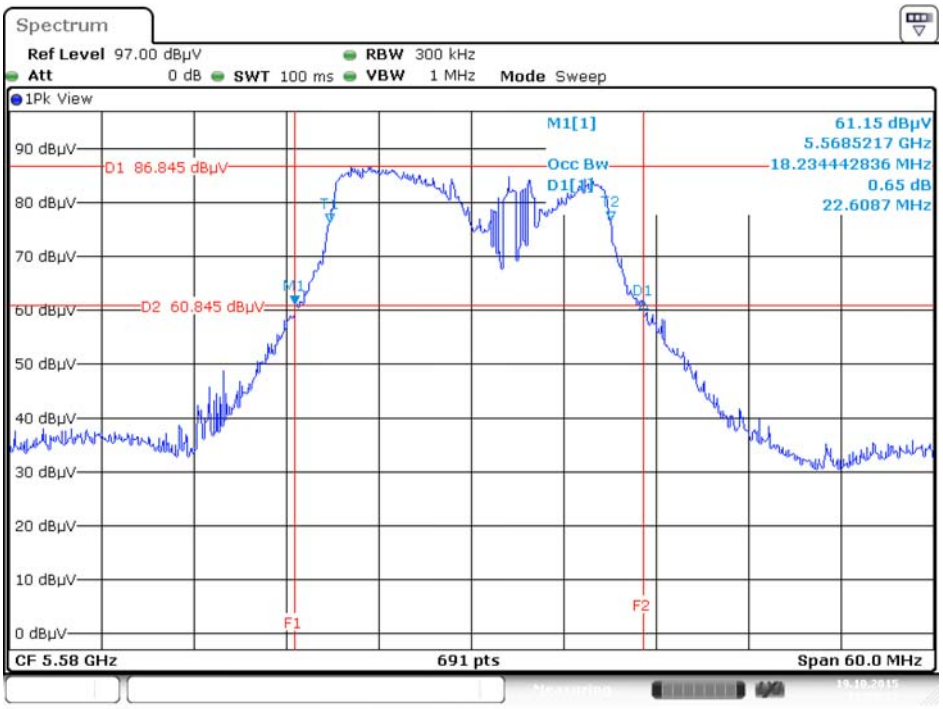
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5580 MHz



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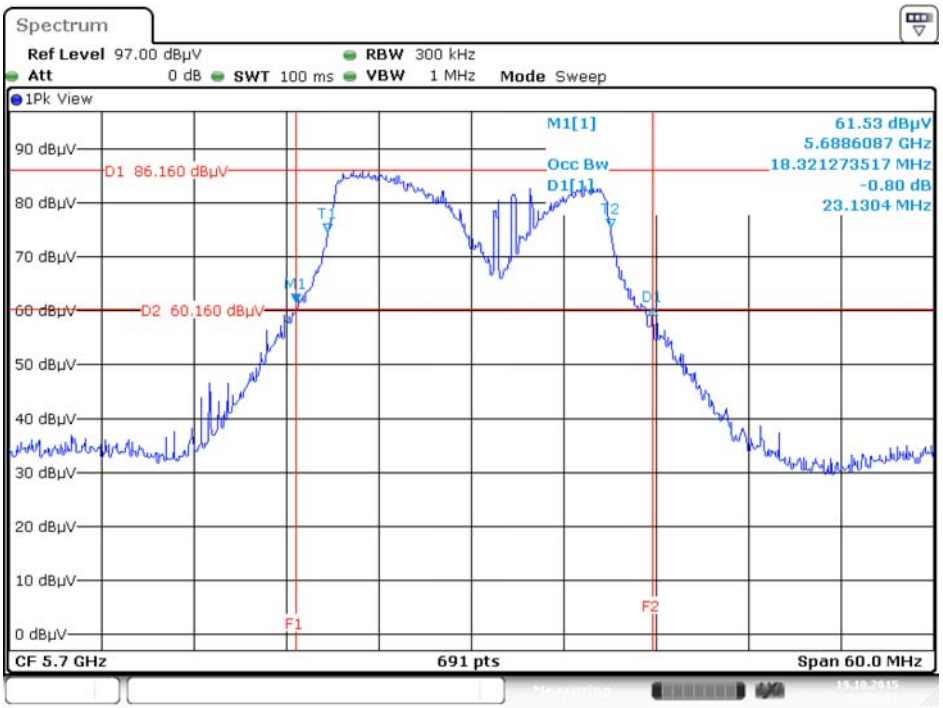
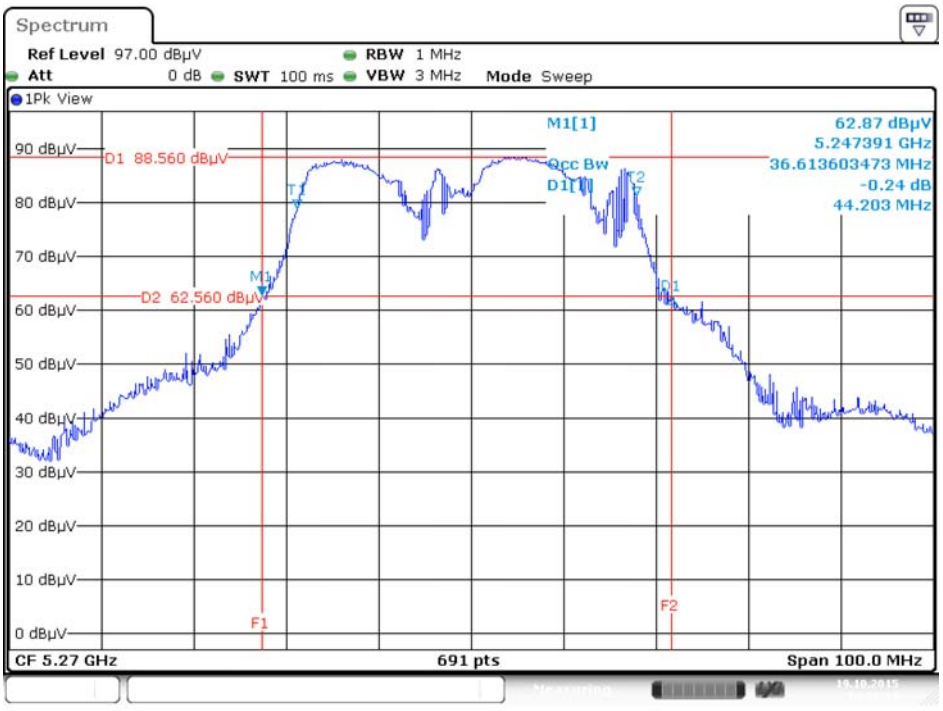
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5700 MHz



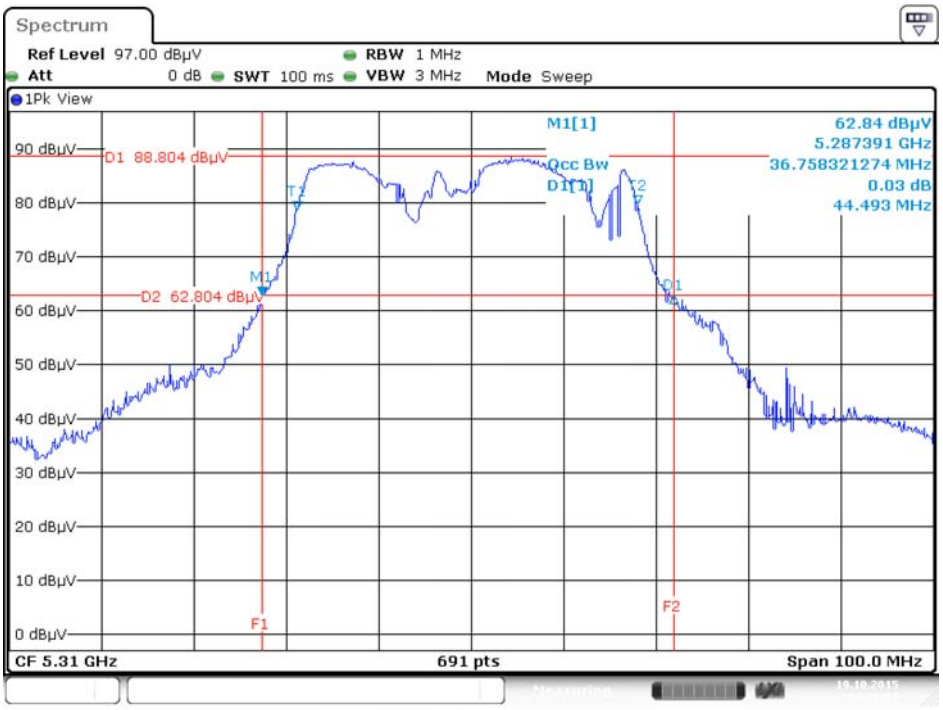
Date: 19.OCT.2015 13:59:33

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



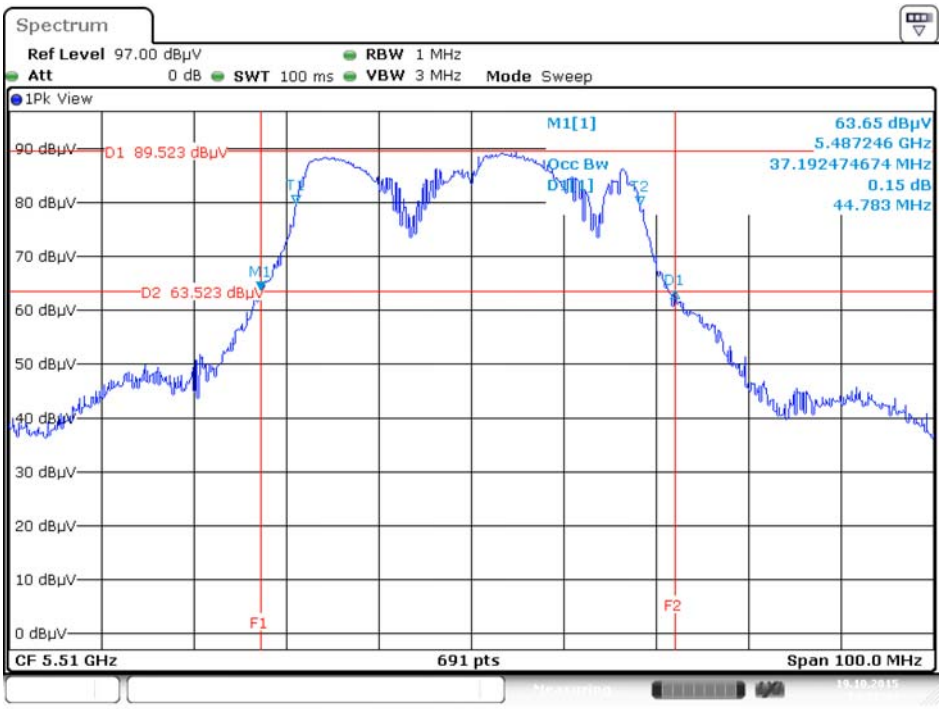
Date: 19.OCT.2015 14:01:19

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



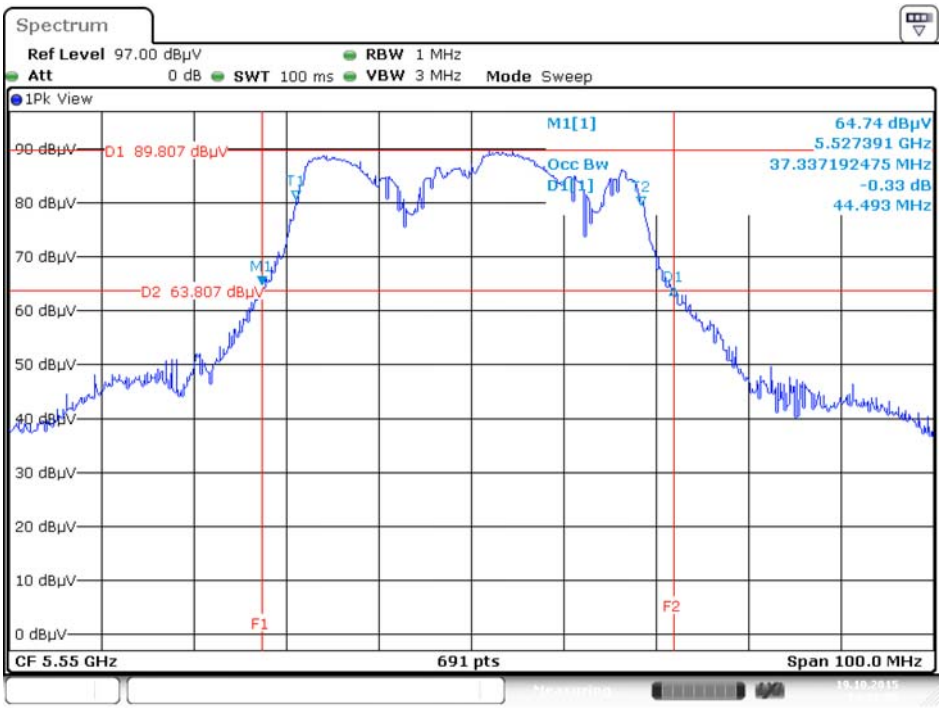
Date: 19.OCT.2015 14:01:32

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



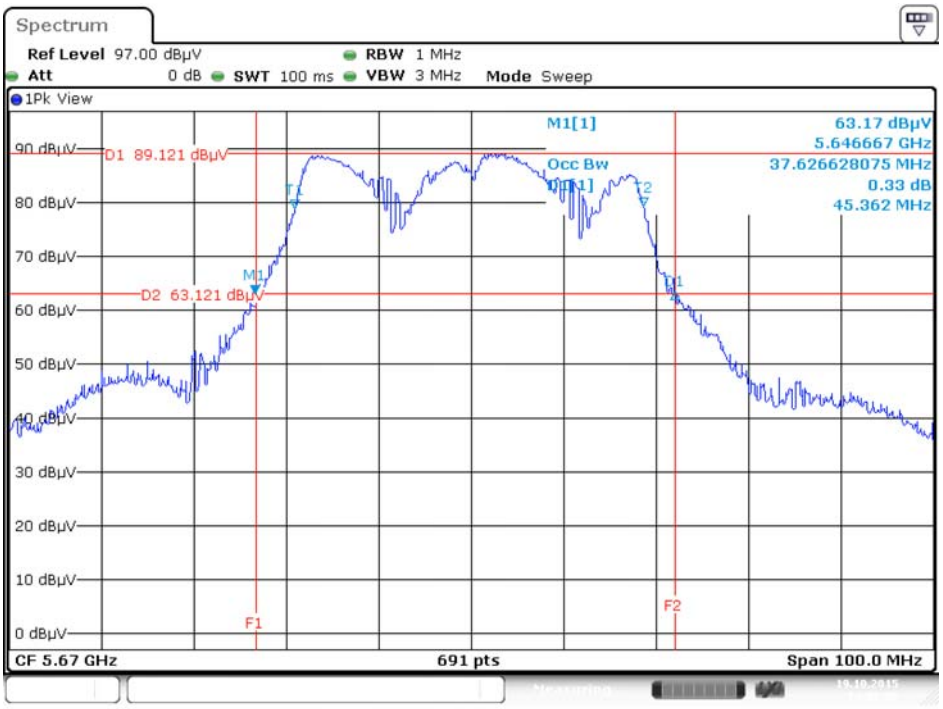
Date: 19.OCT.2015 14:01:44

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



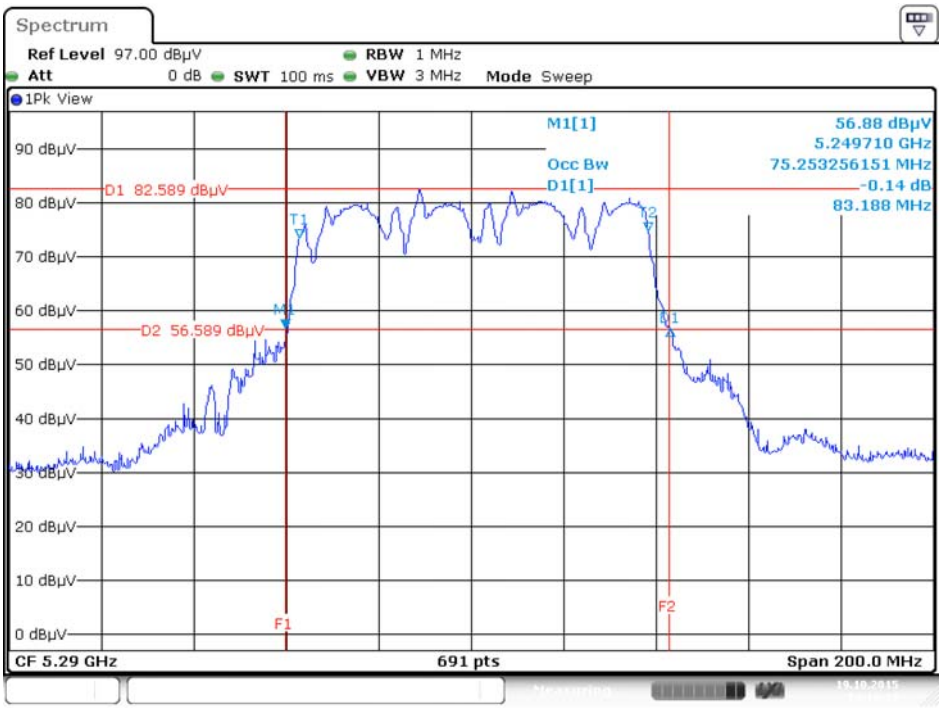
Date: 19.OCT.2015 14:01:55

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



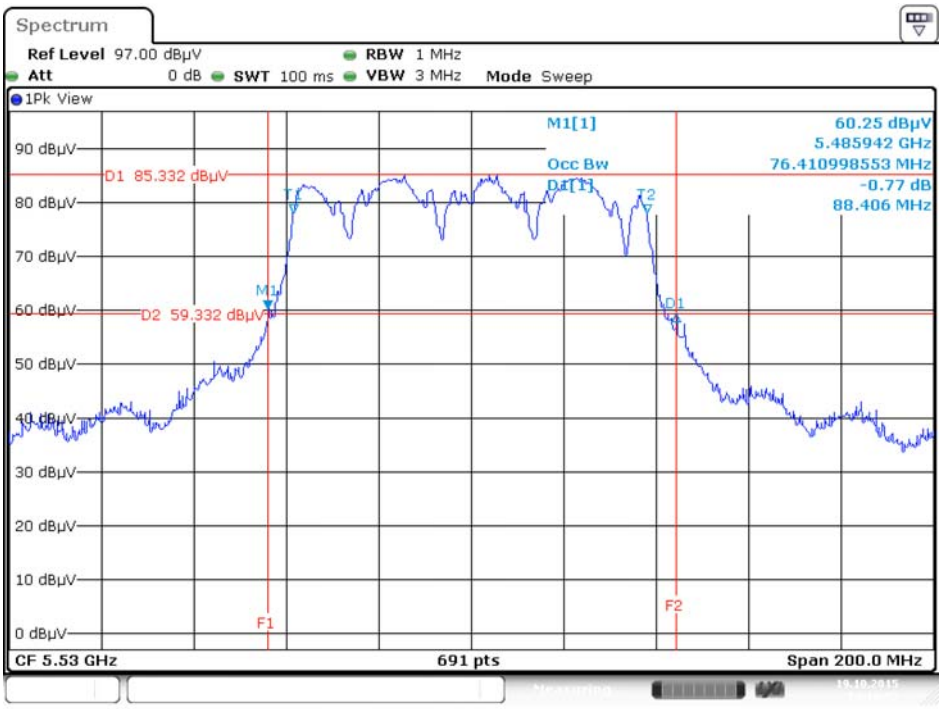
Date: 19.OCT.2015 14:02:07

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



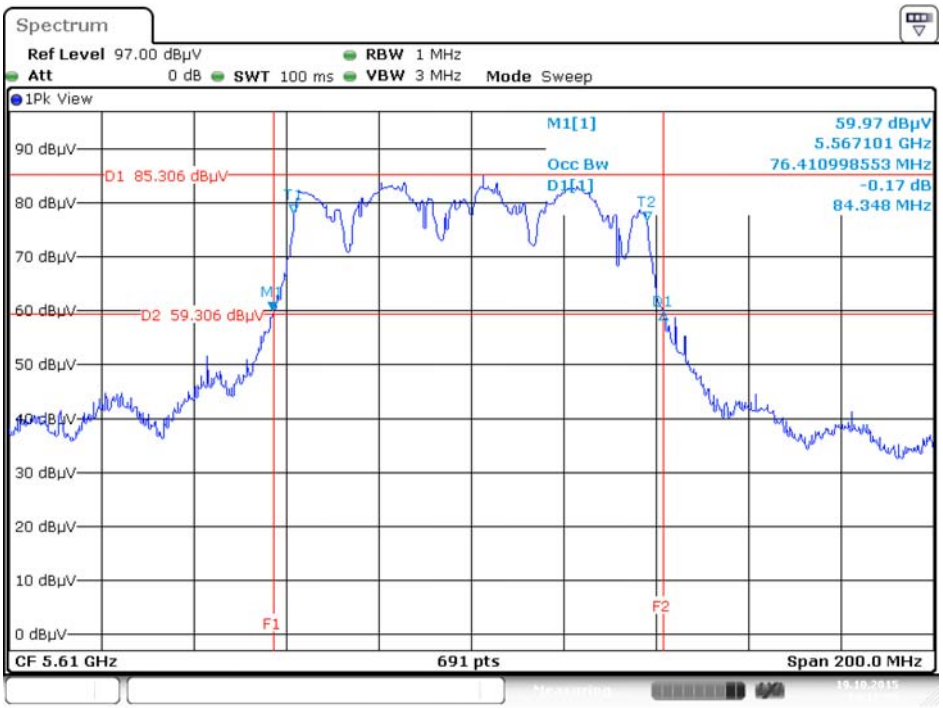
Date: 19.OCT.2015 14:14:18

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



Date: 19.OCT.2015 14:14:53

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



Date: 19.OCT.2015 14:17:26

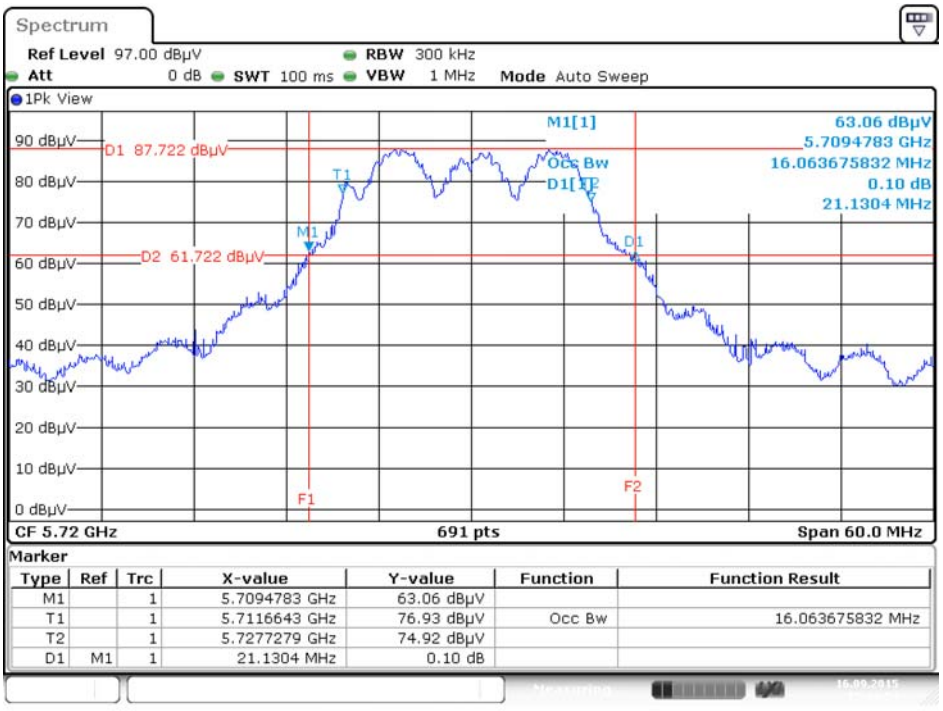
Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu		

Straddle Channel

Mode	Frequency	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII 2C 26dB BW (MHz)	UNII 3 26dB BW (MHz)	UNII 2C 99% BW (MHz)	UNII 3 99% BW (MHz)
802.11a	5720 MHz	21.13	16.06	5709.48	5711.66	15.52	5.61	13.34	2.73
802.11ac MCS0/Nss1 VHT20	5720 MHz	23.57	18.32	5708.17	5710.71	16.83	6.74	14.29	4.03
802.11ac MCS0/Nss1 VHT40	5710 MHz	45.80	37.77	5686.38	5690.75	38.62	7.18	34.25	3.52
802.11ac MCS0/Nss1 VHT80	5690 MHz	86.38	76.70	5645.94	5651.22	79.06	7.32	73.78	2.92

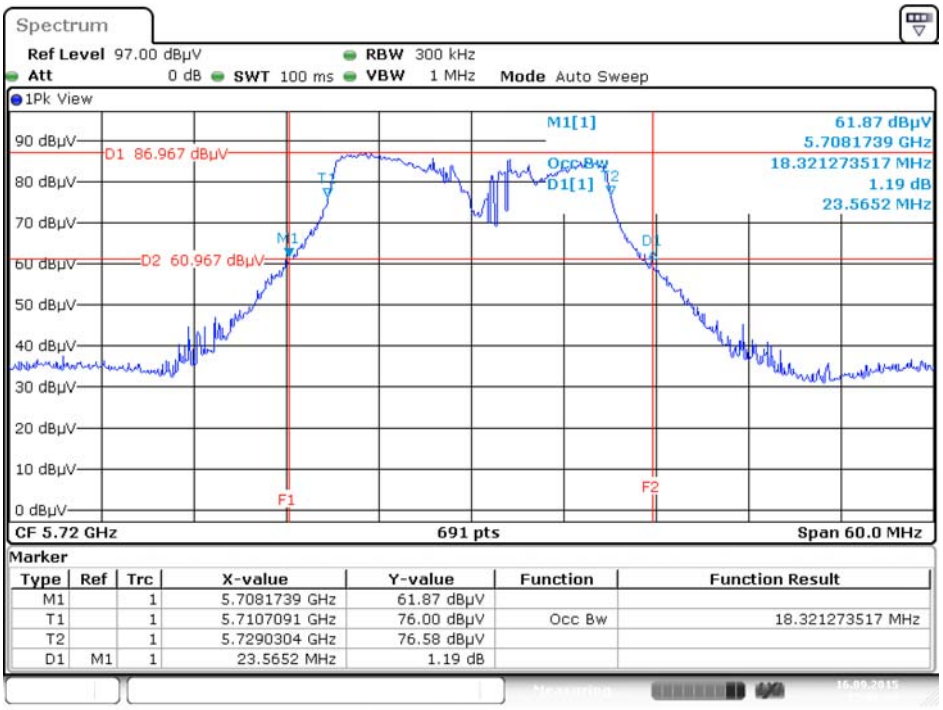
Straddle Channel

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



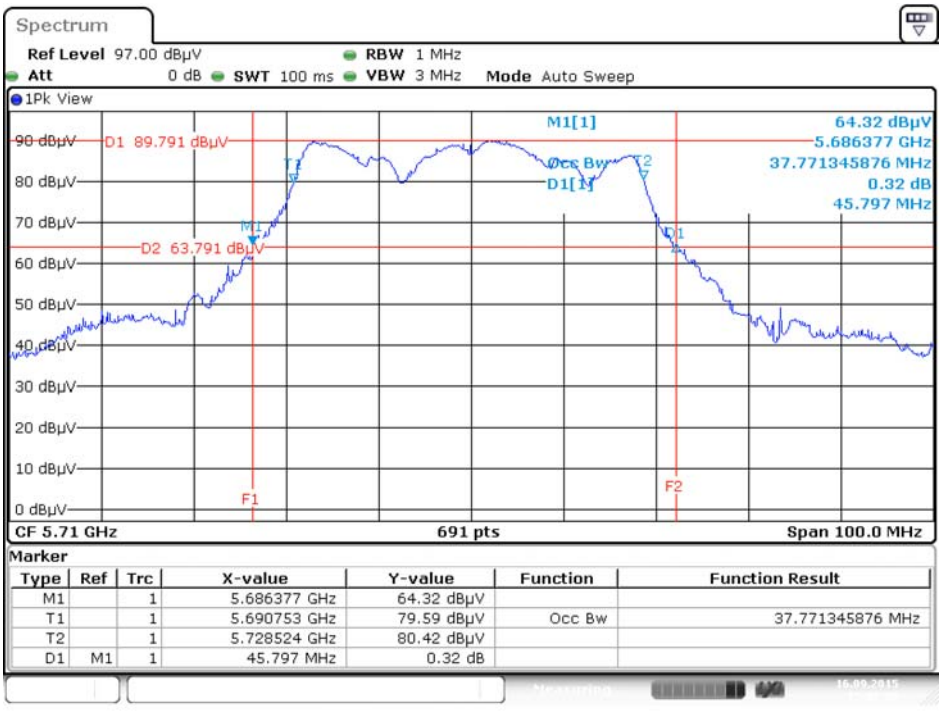
Date: 16.SEP.2015 15:04:54

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



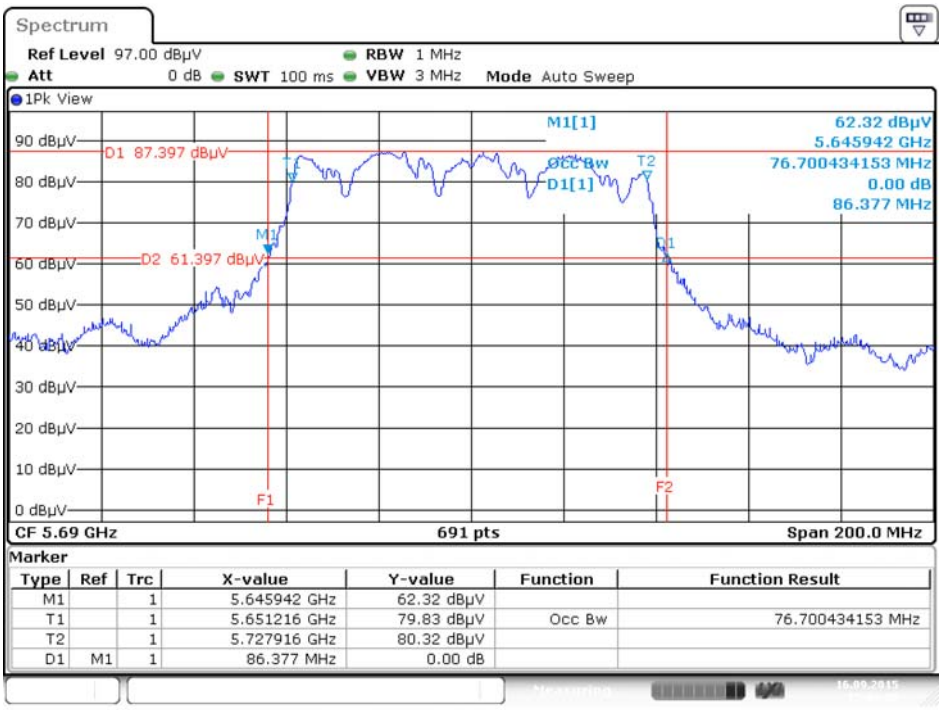
Date: 16.SEP.2015 15:06:34

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



Date: 16.SEP.2015 15:07:28

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



Date: 16.SEP.2015 15:09:01

4.2. 6dB Spectrum Bandwidth Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

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

6dB Spectrum Bandwidth	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.2.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth.
3. Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.2.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.5.4.

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of 6dB Spectrum Bandwidth

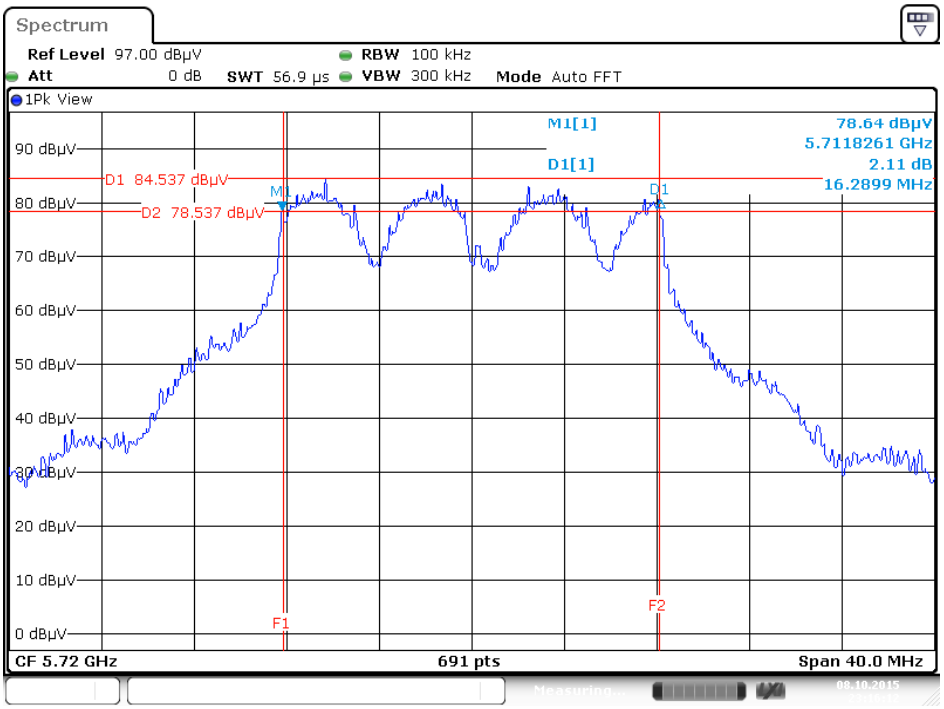
Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu		

Straddle Channel

Mode	Frequency	6dB BW (MHz)	6dB BW F2 (MHz)	UNII 3 BW (MHz)	Min. Limit (kHz)	Test Result
802.11a	5720 MHz	16.29	5711.83	3.12	500.00	Complies
802.11ac MCS0/Nss1 VHT20	5720 MHz	15.65	5712.46	3.11	500.00	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz	35.83	5691.68	2.51	500.00	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz	74.49	5651.74	1.23	500.00	Complies

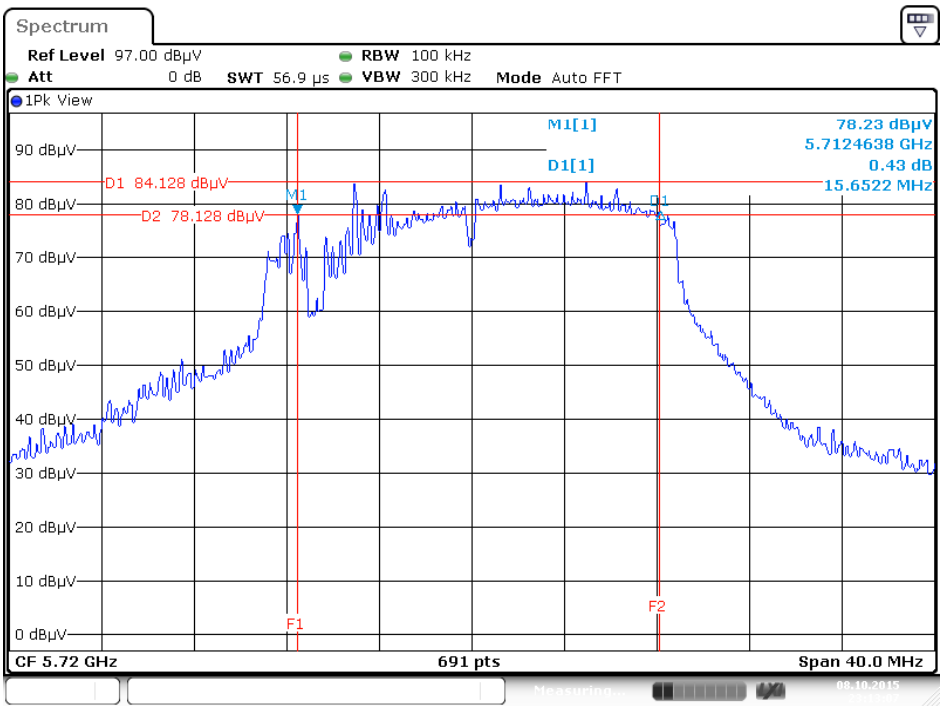
Straddle Channel

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



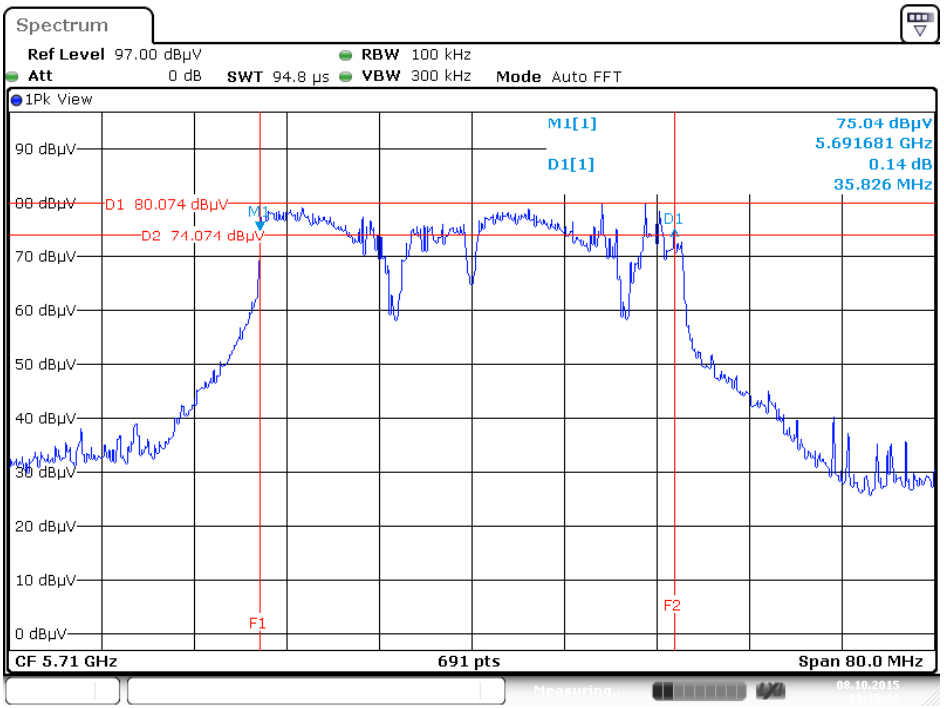
Date: 8.OCT.2015 23:16:12

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



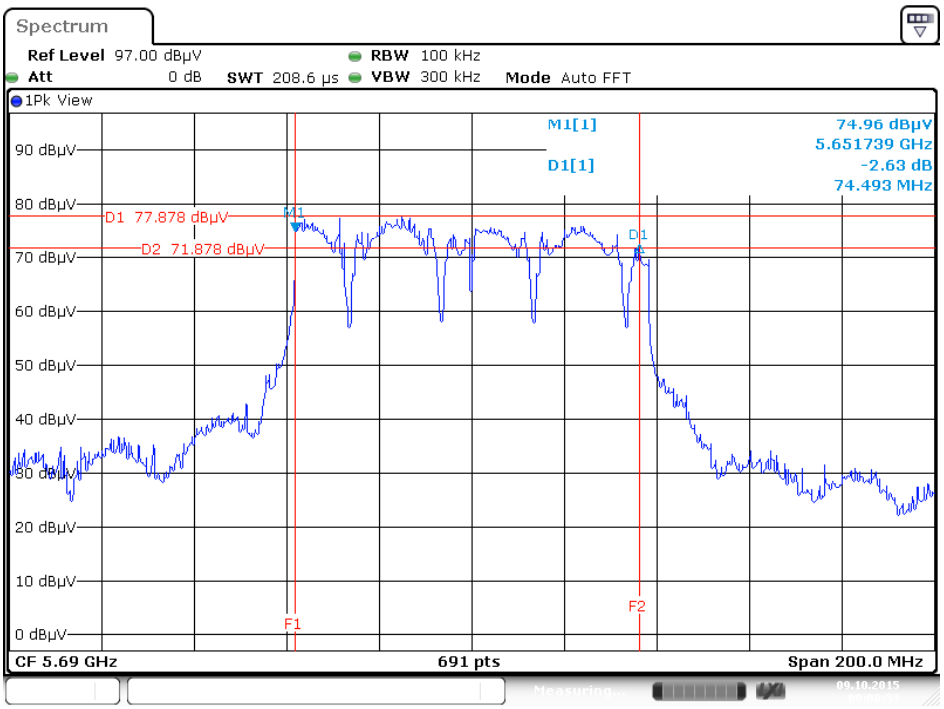
Date: 8.OCT.2015 23:13:07

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



Date: 8.OCT.2015 23:15:22

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



Date: 9.OCT.2015 00:00:53

4.3. Maximum Conducted Output Power Measurement

4.3.1. 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	

4.3.2. Measuring Instruments and Setting

For straddle channel:

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

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

For other channel:

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

Power Meter Parameter	Setting
Detector	AVERAGE

4.3.3. Test Procedures

For straddle channel:

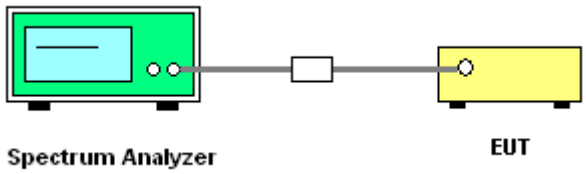
1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with FCC Public Notice DA 02-2138, August 30, 2002

For other channel:

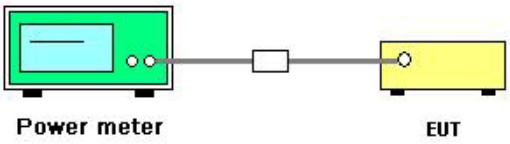
1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (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.

4.3.4. Test Setup Layout

For straddle channel:



For other channel:



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 Maximum Conducted Output Power

Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu	Test Date	Sep. 16, 2015

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11a	5260 MHz	20.29	21.07	23.71	24.00	Complies
	5300 MHz	20.46	21.01	23.75	24.00	Complies
	5320 MHz	20.48	20.98	23.75	24.00	Complies
	5500 MHz	20.67	21.11	23.91	24.00	Complies
	5580 MHz	20.57	21.06	23.83	24.00	Complies
	5700 MHz	19.89	21.06	23.52	24.00	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	20.44	21.02	23.75	24.00	Complies
	5300 MHz	20.63	21.06	23.86	24.00	Complies
	5320 MHz	20.45	20.96	23.72	24.00	Complies
	5500 MHz	20.81	21.03	23.93	24.00	Complies
	5580 MHz	20.43	20.98	23.72	24.00	Complies
	5700 MHz	19.97	21.05	23.55	24.00	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	20.78	21.08	23.94	24.00	Complies
	5310 MHz	20.54	21.03	23.80	24.00	Complies
	5510 MHz	20.65	21.13	23.91	24.00	Complies
	5550 MHz	20.69	20.73	23.72	24.00	Complies
	5670 MHz	20.46	21.04	23.77	24.00	Complies
802.11ac MCS0/Nss1 VHT80	5290 MHz	15.10	15.51	18.32	24.00	Complies
	5530 MHz	16.37	19.24	21.05	24.00	Complies
	5610 MHz	20.98	20.97	23.99	24.00	Complies

Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu		

Straddle Channel

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11a	5720 MHz (UNII 2C)	18.33	19.96	22.23	22.91	Complies
	5720 MHz (UNII 3)	12.10	13.60	15.92	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5720 MHz (UNII 2C)	18.24	19.71	22.05	23.26	Complies
	5720 MHz (UNII 3)	12.51	13.93	16.29	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5710 MHz (UNII 2C)	18.95	20.15	22.60	24.00	Complies
	5710 MHz (UNII 3)	7.67	9.23	11.53	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5690 MHz (UNII 2C)	19.13	20.82	23.07	24.00	Complies
	5690 MHz (UNII 3)	3.24	5.65	7.62	30.00	Complies

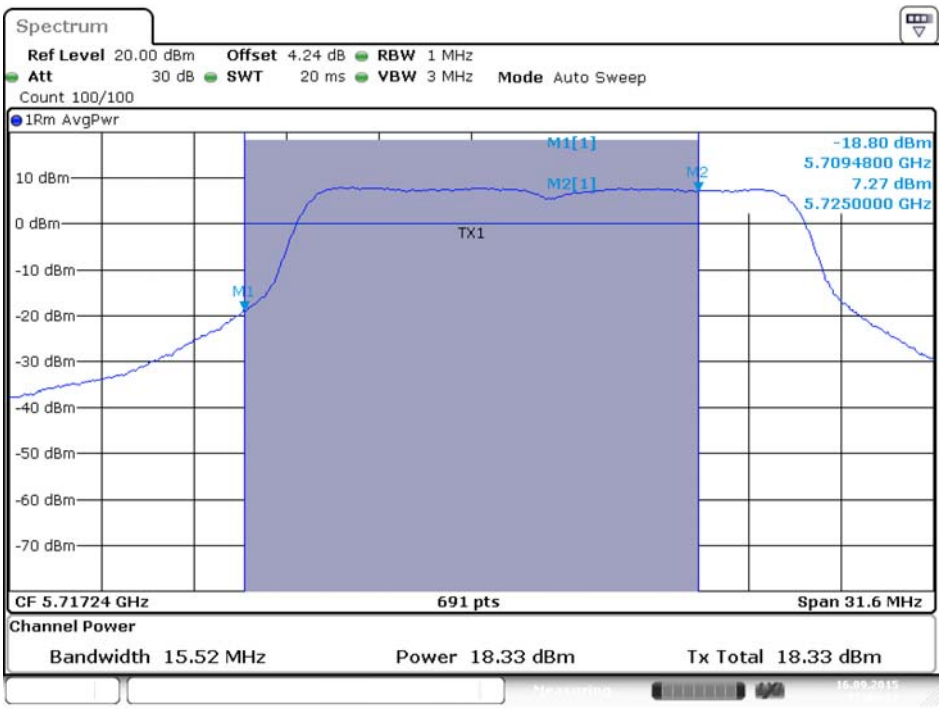
Note :

The power limit of 11a 5720MHz (UNII 2C)=11+10log(15.52) = 22.91dBm < 24dBm, so the limit= 22.91 dBm

The power limit of 11ac VHT20 5720MHz (UNII 2C) = 11+10log(16.83) = 23.26 dBm < 24dBm, so the limit= 23.26 dBm

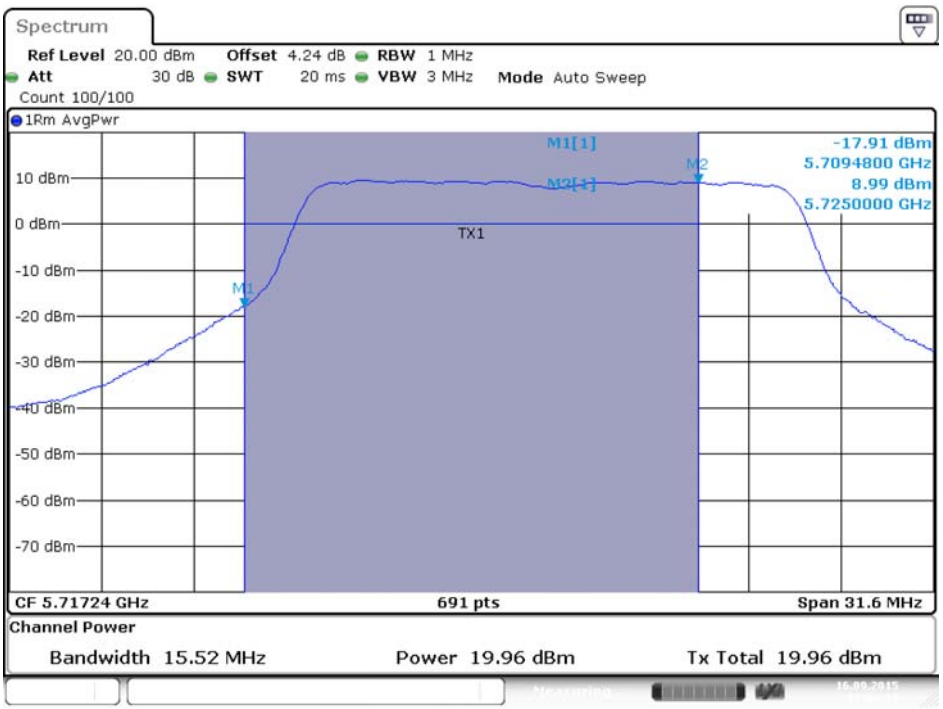
Straddle Channel

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



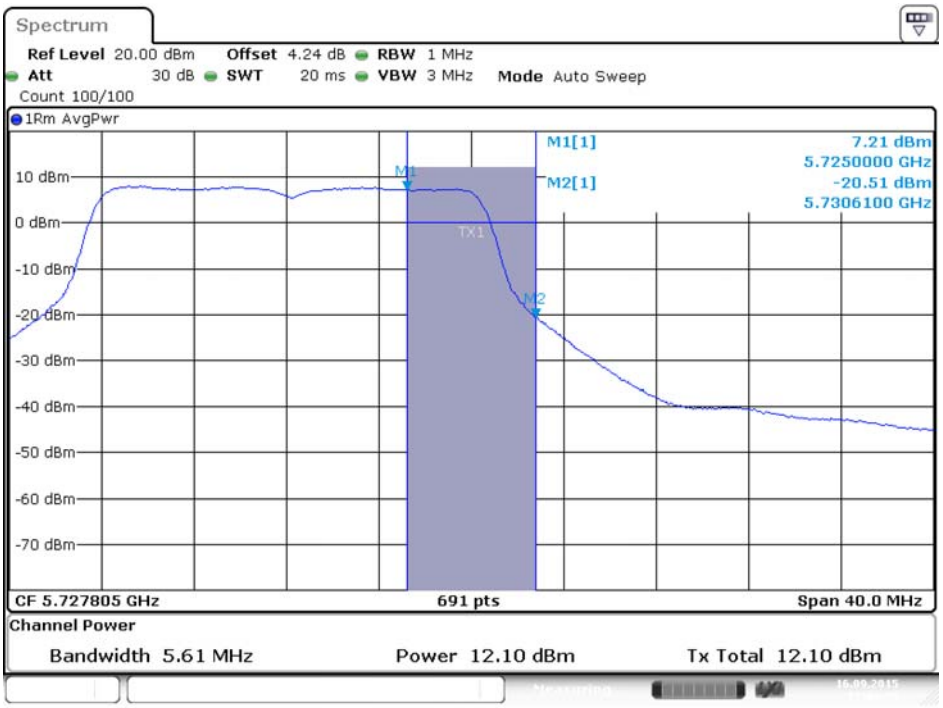
Date: 16.SEP.2015 17:09:33

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



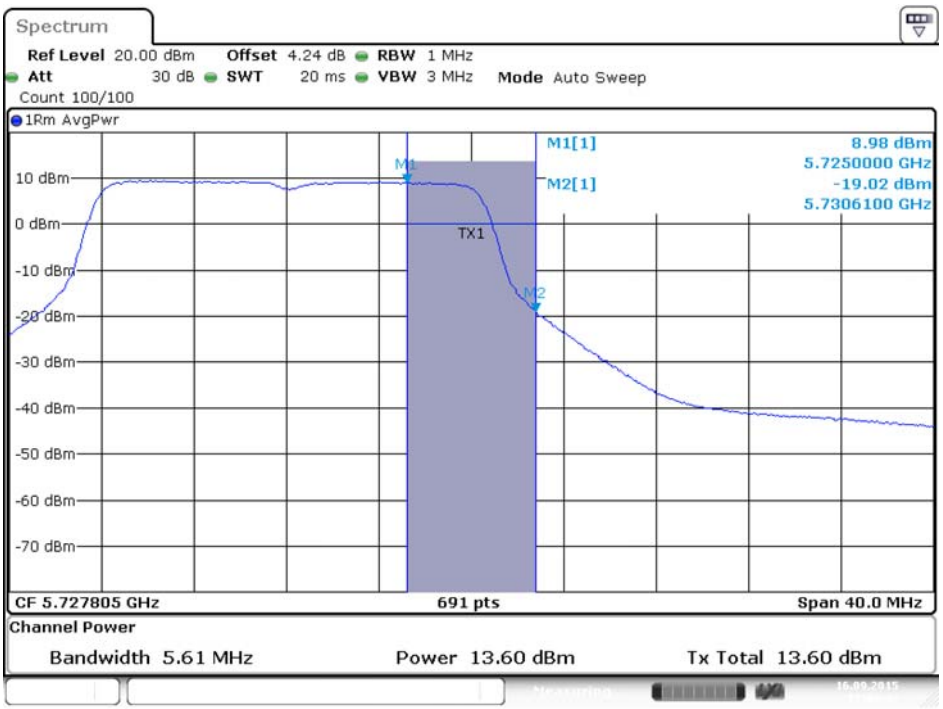
Date: 16.SEP.2015 17:09:40

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



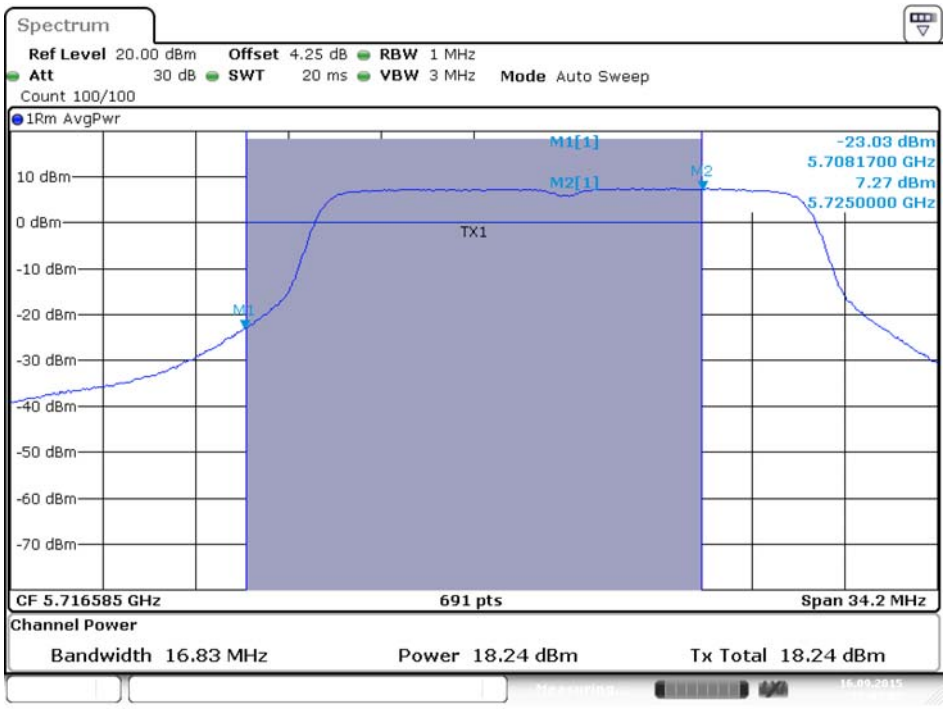
Date: 16.SEP.2015 17:09:36

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



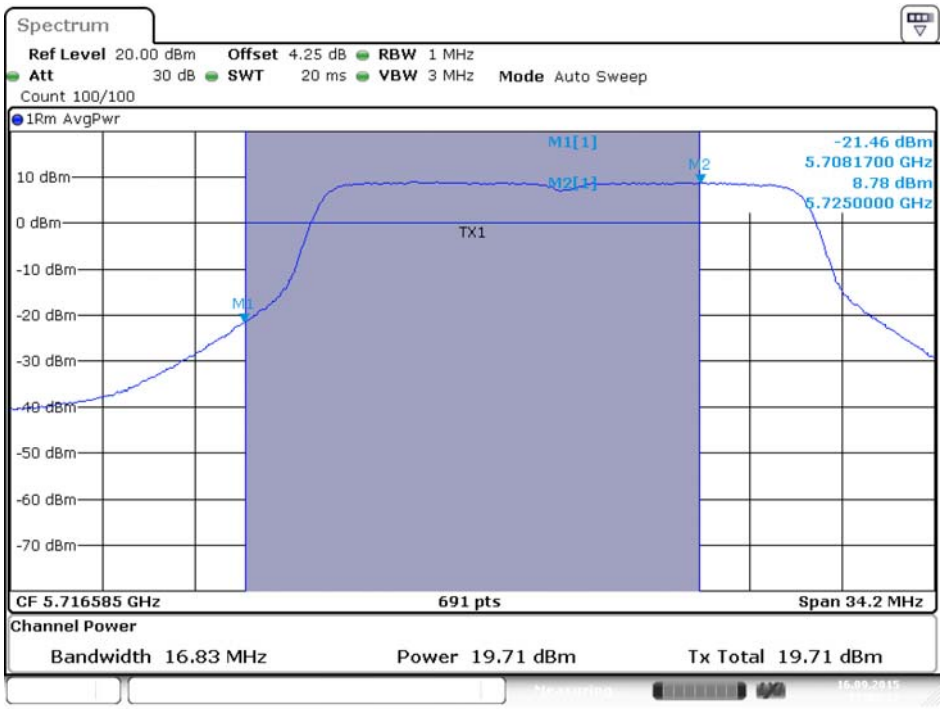
Date: 16.SEP.2015 17:09:43

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



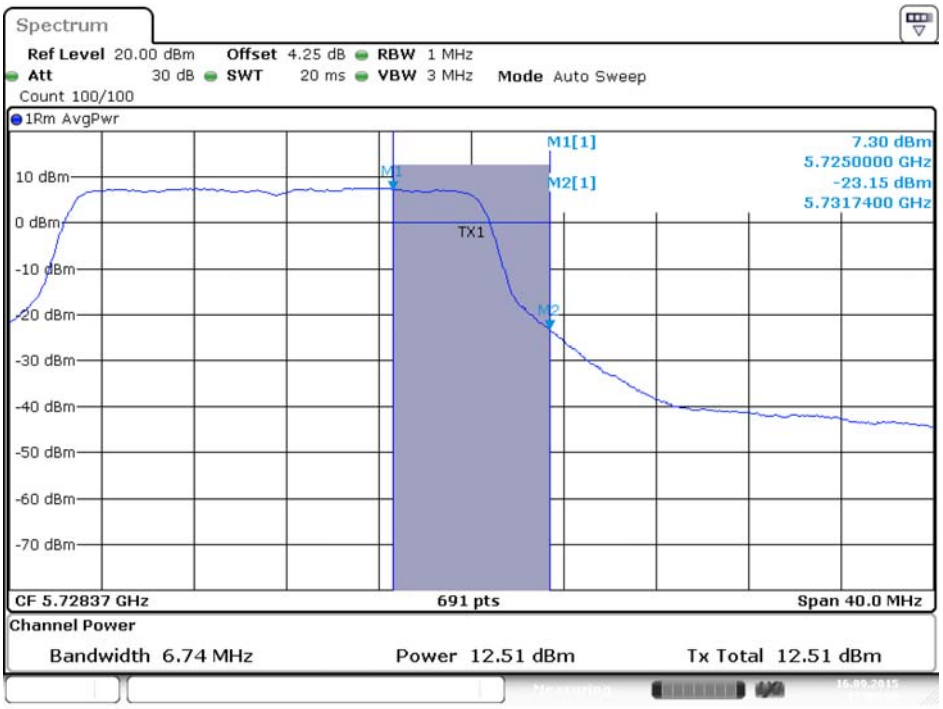
Date: 16.SEP.2015 17:05:05

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



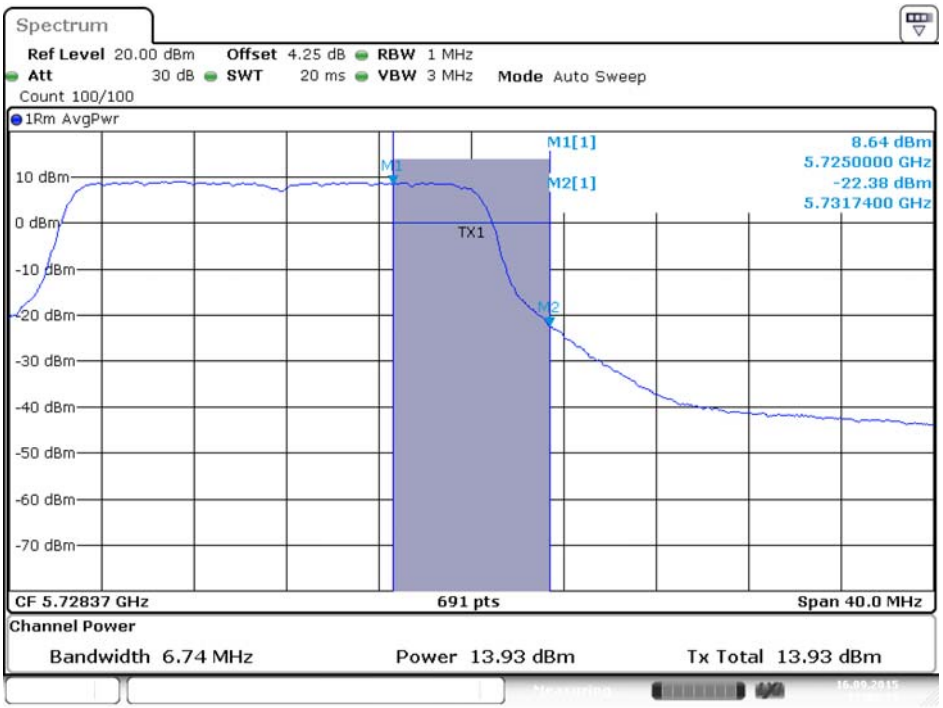
Date: 16.SEP.2015 17:05:12

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



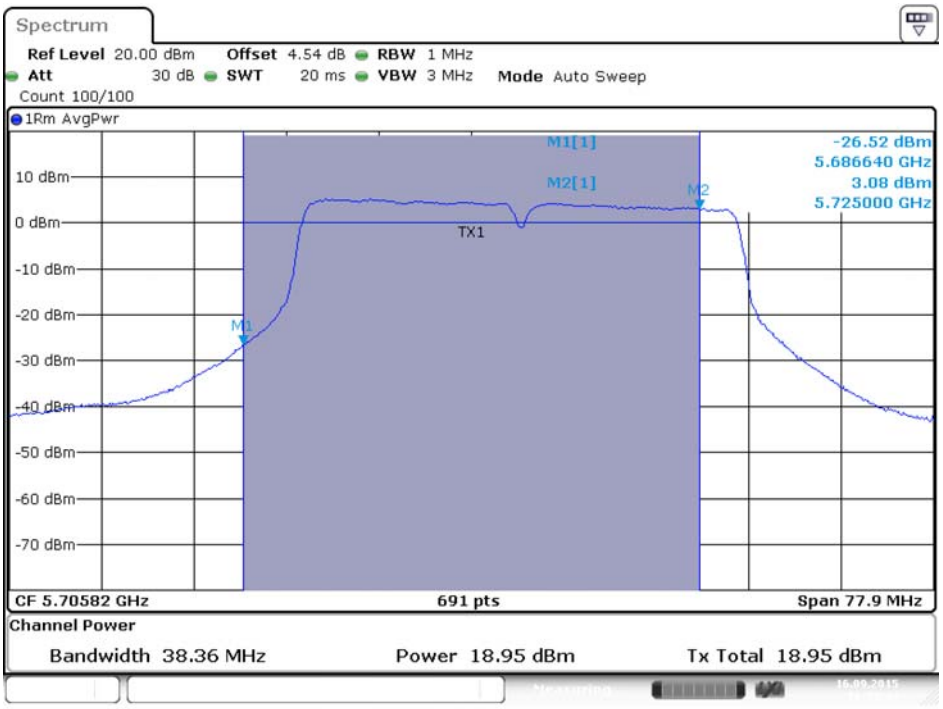
Date: 16.SEP.2015 17:05:08

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



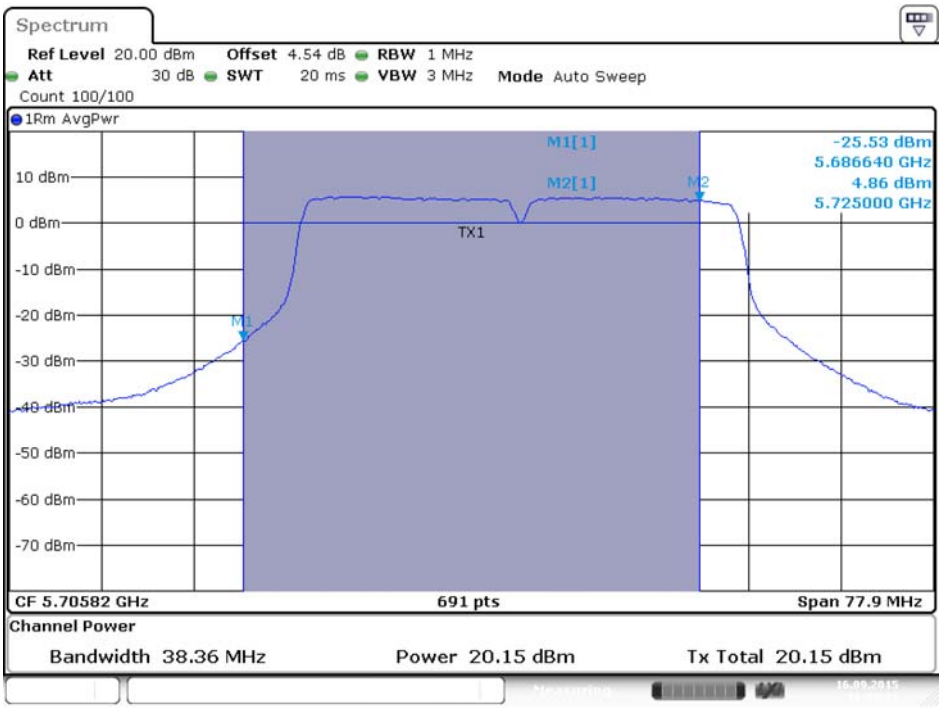
Date: 16.SEP.2015 17:05:15

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



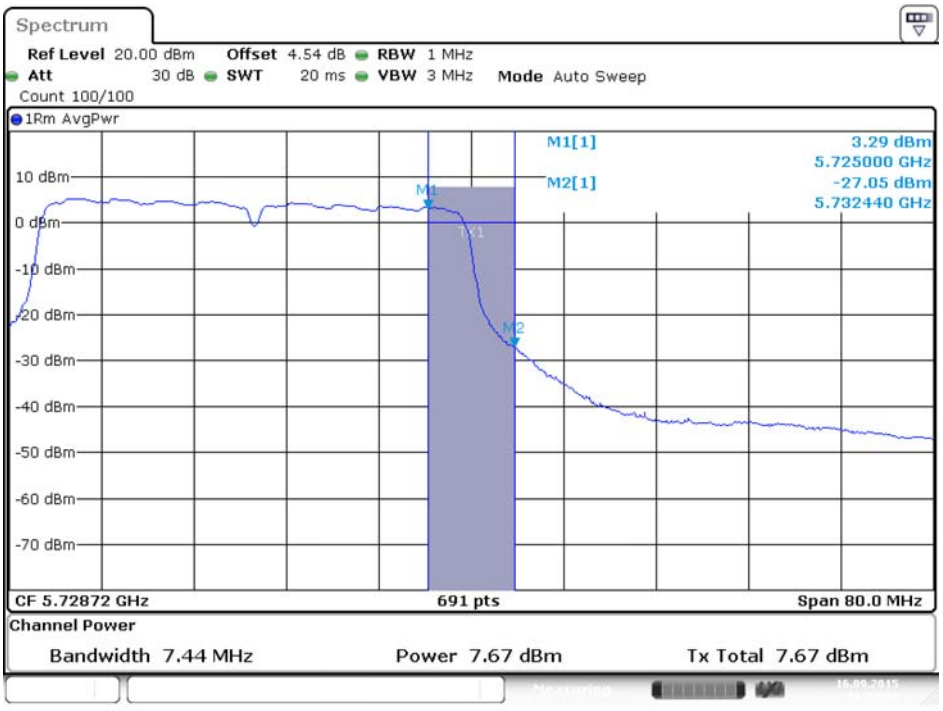
Date: 16.SEP.2015 16:53:44

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



Date: 16.SEP.2015 16:53:51

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

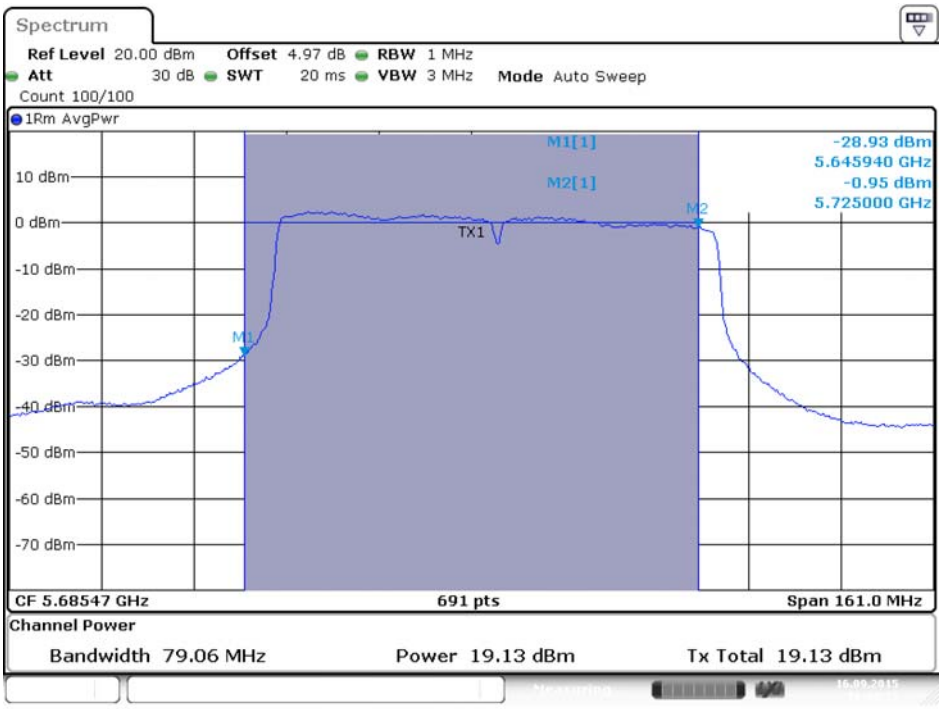


Date: 16.SEP.2015 16:53:47

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

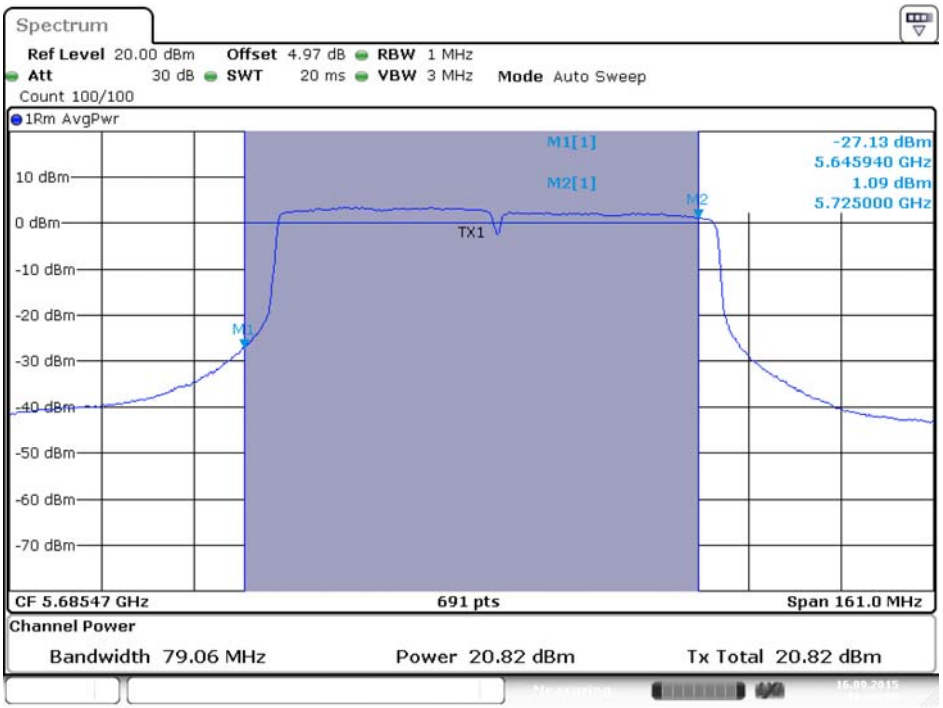
Date: 16.SEP.2015 16:53:54

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



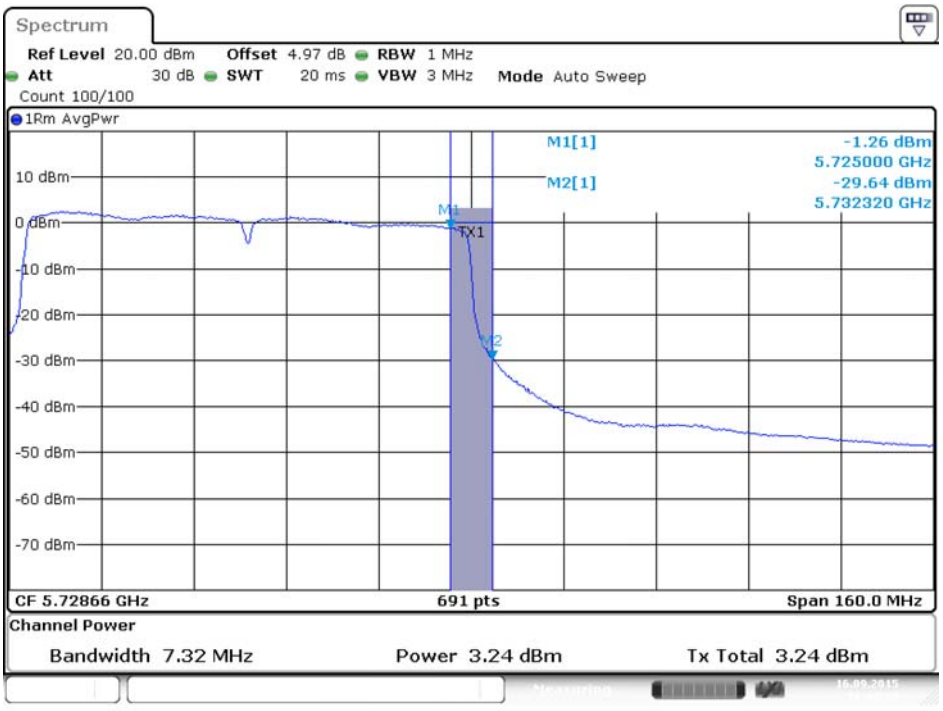
Date: 16.SEP.2015 16:43:21

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



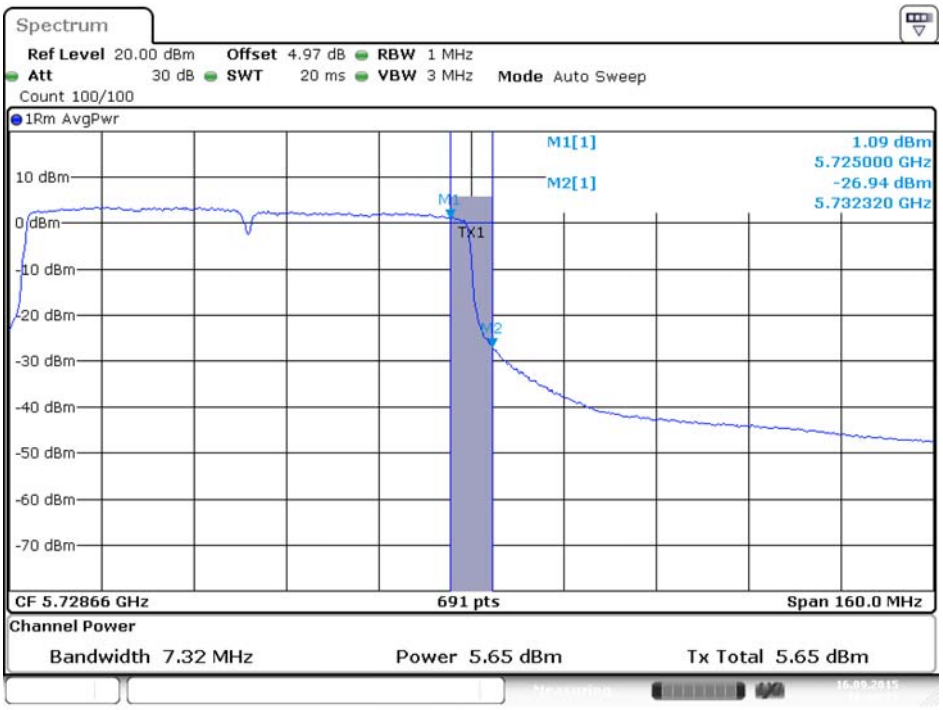
Date: 16.SEP.2015 16:43:28

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



Date: 16.SEP.2015 16:43:24

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



Date: 16.SEP.2015 16:43:31

4.4. Power Spectral Density Measurement

4.4.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.3.1.

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

4.4.2. Measuring Instruments and Setting

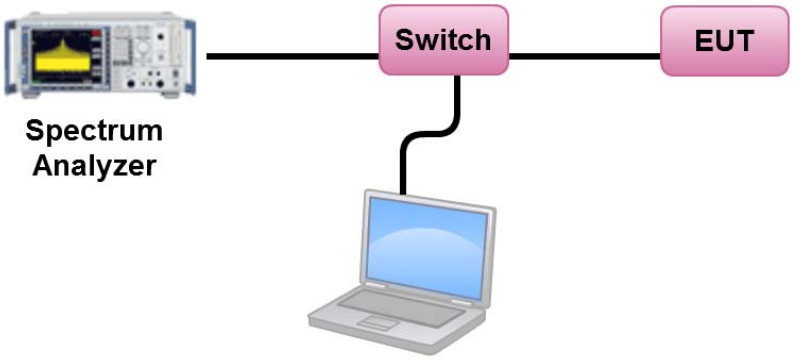
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.4.3. 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 v01 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 (a) Measure and sum the spectra across the outputs.
4. When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.

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

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Power Spectral Density

Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu	Test Date	Sep. 16, 2015

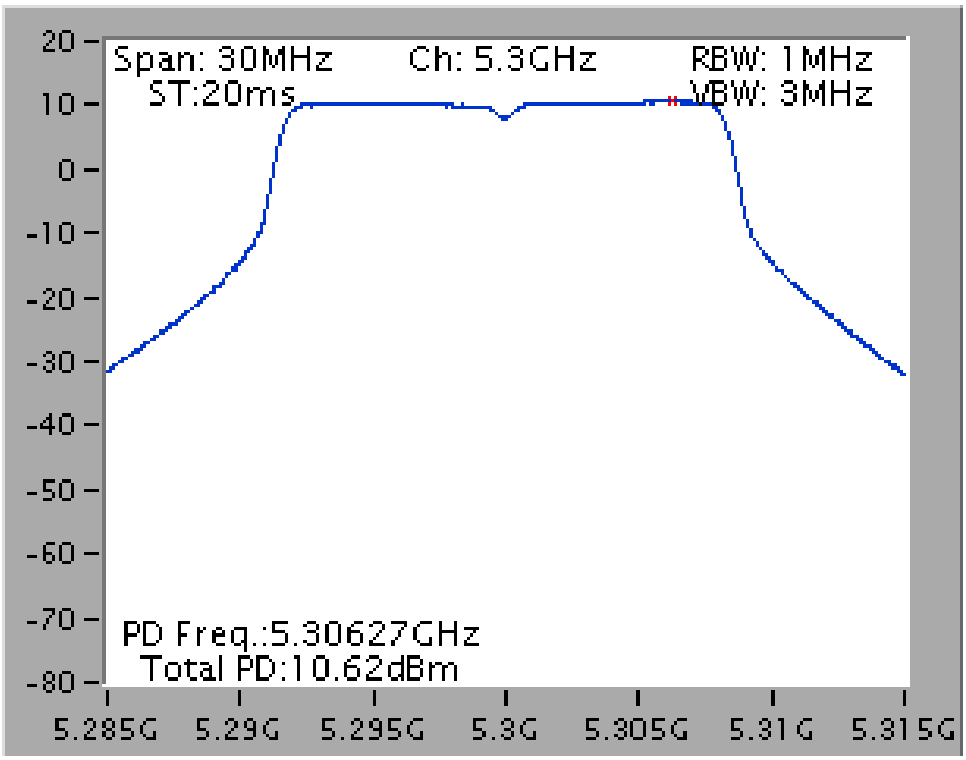
Mode	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
802.11a	5260 MHz	10.47	10.99	Complies
	5300 MHz	10.62	10.99	Complies
	5320 MHz	10.55	10.99	Complies
	5500 MHz	10.78	10.99	Complies
	5580 MHz	10.71	10.99	Complies
	5700 MHz	10.40	10.99	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	10.43	10.99	Complies
	5300 MHz	10.44	10.99	Complies
	5320 MHz	10.38	10.99	Complies
	5500 MHz	10.52	10.99	Complies
	5580 MHz	10.27	10.99	Complies
	5700 MHz	10.28	10.99	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	7.81	10.99	Complies
	5310 MHz	7.75	10.99	Complies
	5510 MHz	7.69	10.99	Complies
	5550 MHz	7.47	10.99	Complies
	5670 MHz	7.45	10.99	Complies
802.11ac MCS0/Nss1 VHT80	5290 MHz	-0.97	10.99	Complies
	5530 MHz	1.98	10.99	Complies
	5610 MHz	4.71	10.99	Complies

Note: $Directiona\ lGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.01dBi, so limit=11-(6.01-6)=10.99dBm

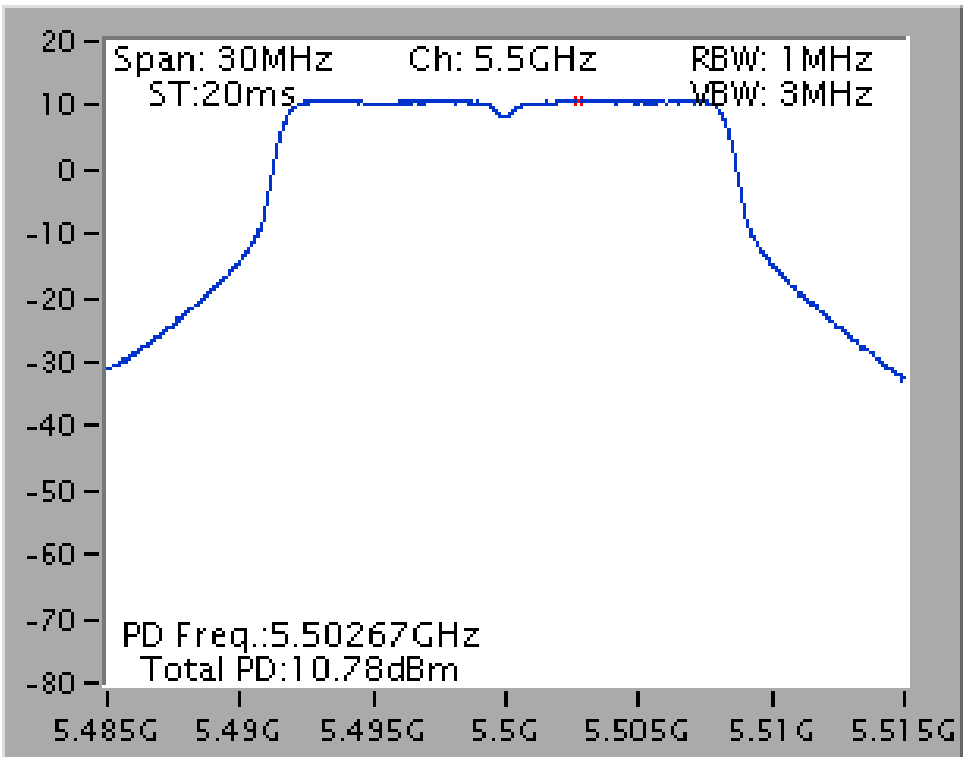
Note: All the test values were listed in the report.

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

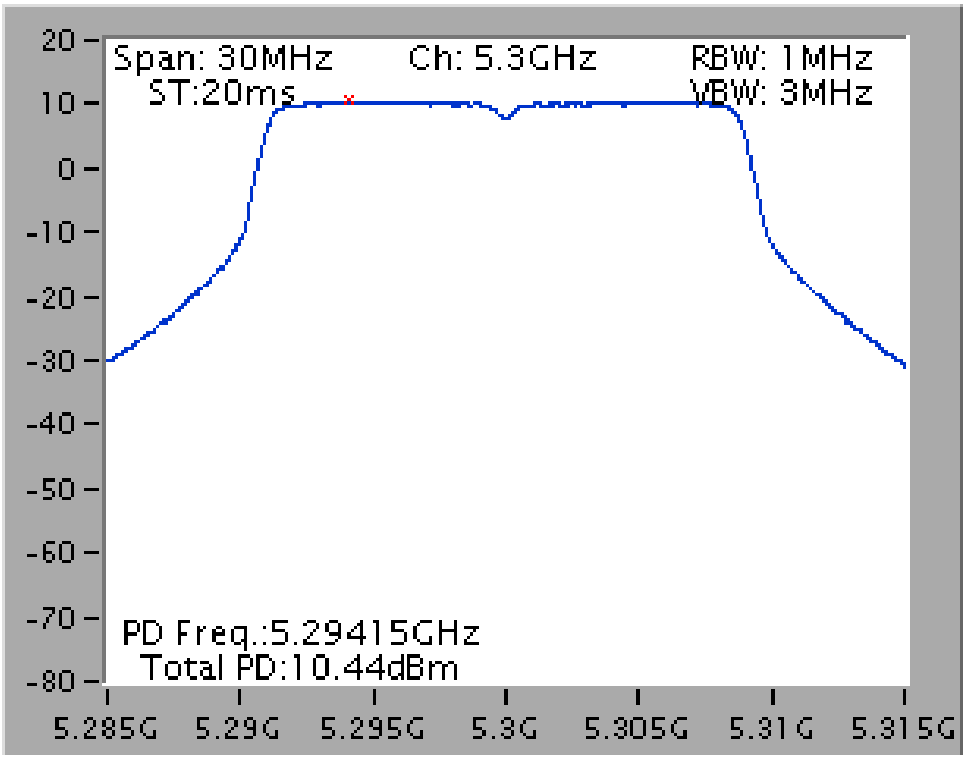
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5300 MHz



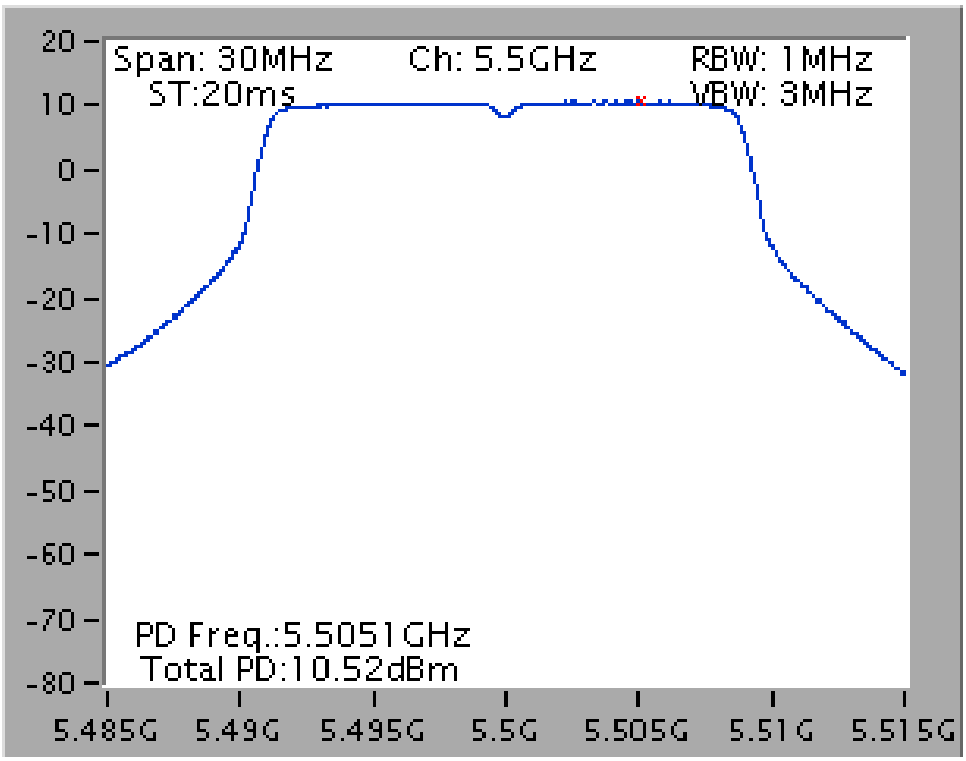
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5500 MHz



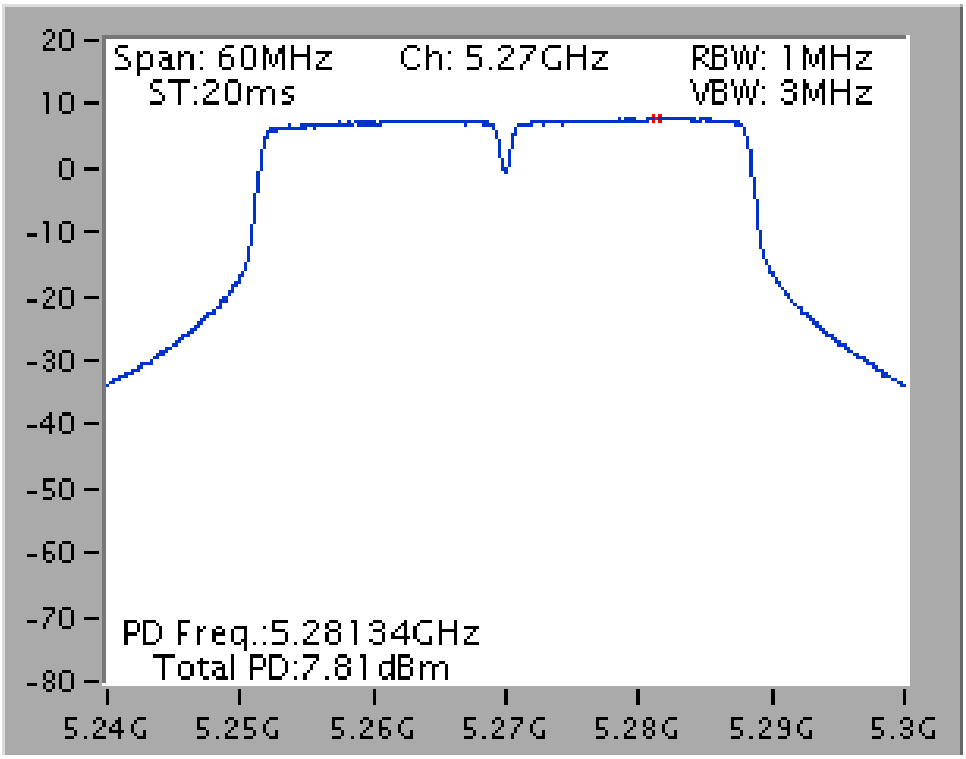
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5300 MHz



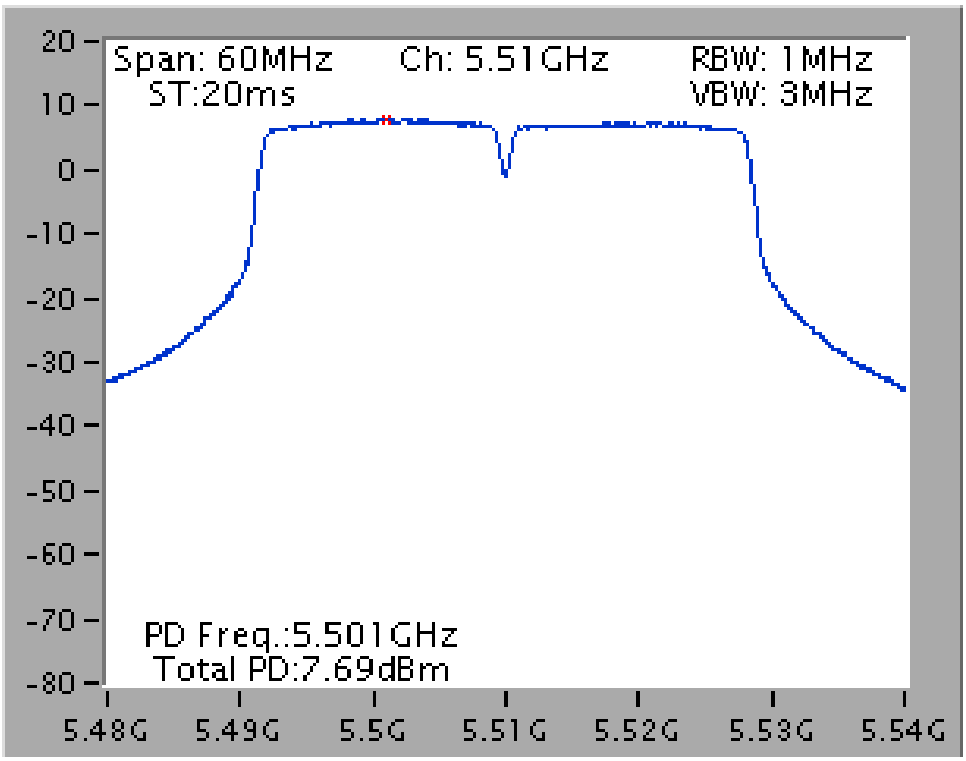
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5500 MHz



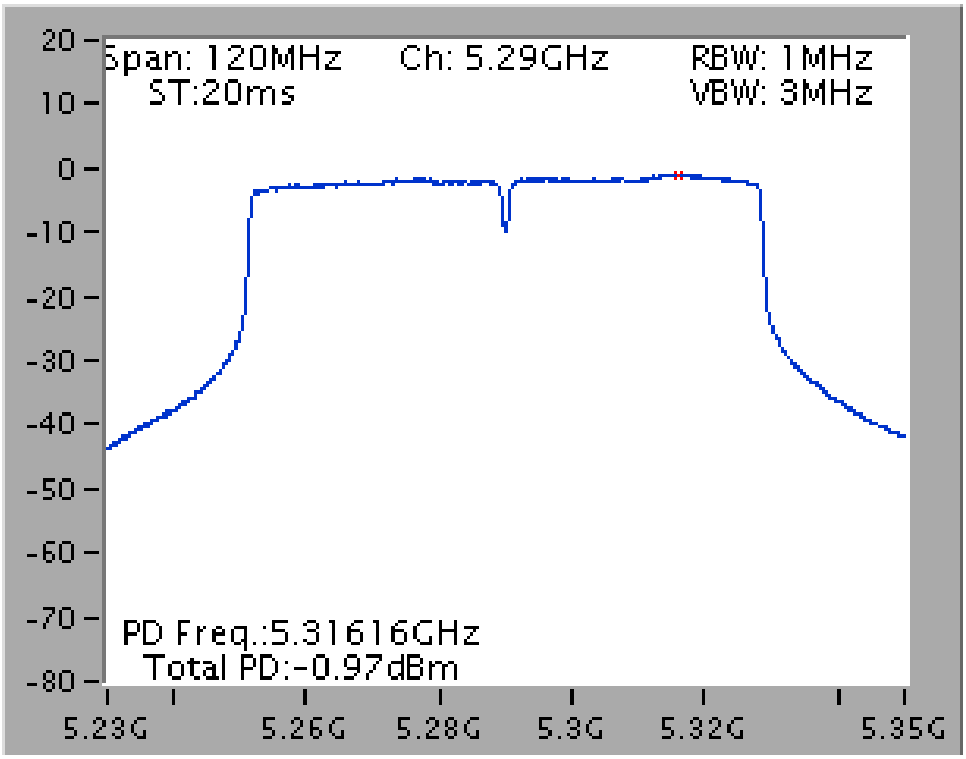
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5270 MHz



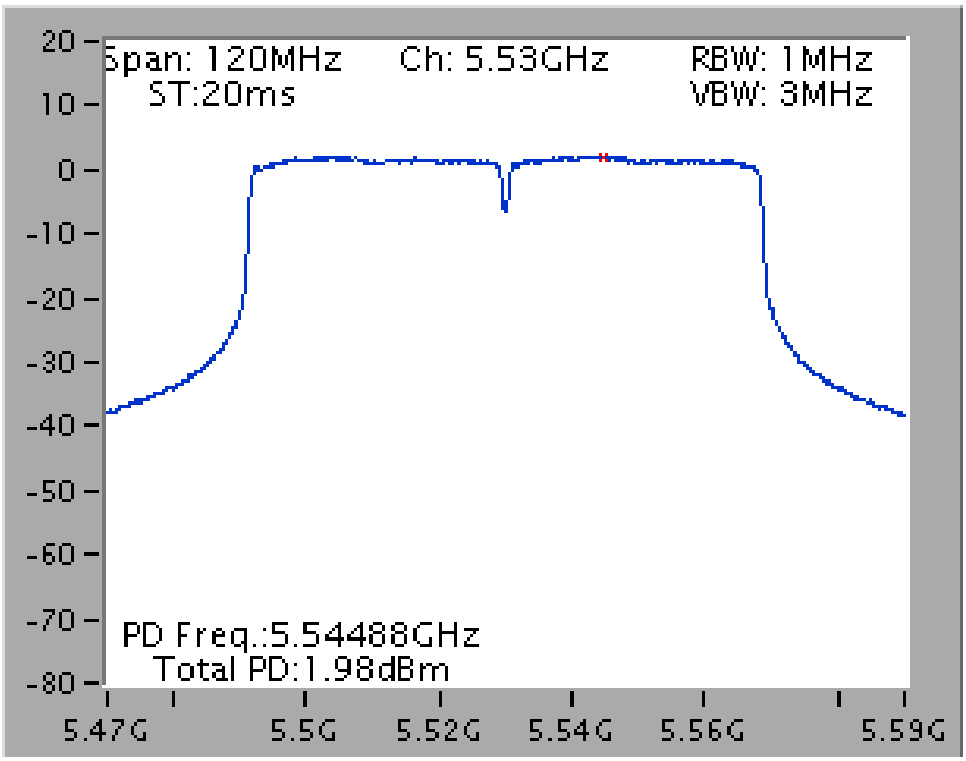
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5510 MHz



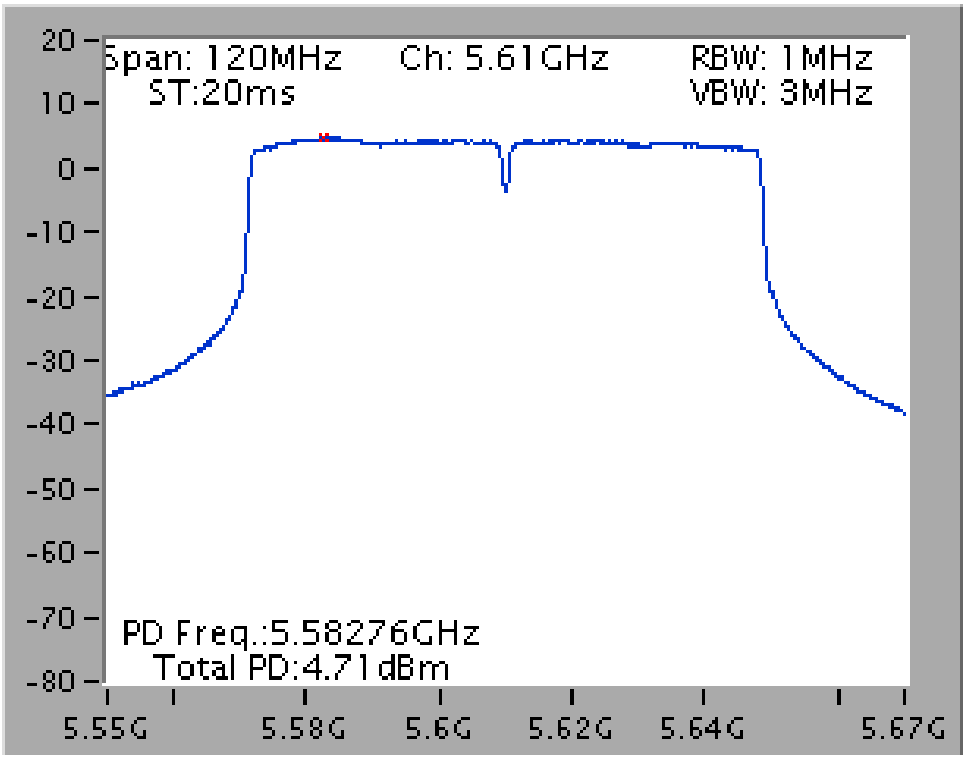
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2/ 5290 MHz



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



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



Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu	Test Date	Sep. 16, 2015

Straddle Channel

Configuration IEEE 802.11a / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
144	5720 MHz (UNII 2C)	10.36	10.99	Complies

Note: $Directiona\ lGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.01dBi, so limit=11-(6.01-6)=10.99dBm/MHz

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
144	5720 MHz (UNII 3)	9.83	-3.01	6.82	29.99	Complies

Note: $Directiona\ lGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.01dBi, so limit=30-(6.01-6)=29.99dBm/500kHz

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
144	5720 MHz (UNII 2C)	10.16	10.99	Complies

Note: $Directiona\ lGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.01dBi, so limit=11-(6.01-6)=10.99dBm/MHz

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
144	5720 MHz (UNII 3)	10.06	-3.01	7.05	29.99	Complies

Note: $Directiona\ lGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.01dBi, so limit=30-(6.01-6)=29.99dBm/500kHz

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
142	5710 MHz (UNII 2C)	7.48	10.99	Complies

Note: $Directiona\ lGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.01dBi, so limit=11-(6.01-6)=10.99dBm/MHz

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
142	5710 MHz (UNII 3)	6.10	-3.01	3.09	29.99	Complies

Note: $Directiona\ lGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.01dBi, so limit=30-(6.01-6)=29.99dBm/500kHz

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
138	5690 MHz (UNII 2C)	4.39	10.99	Complies

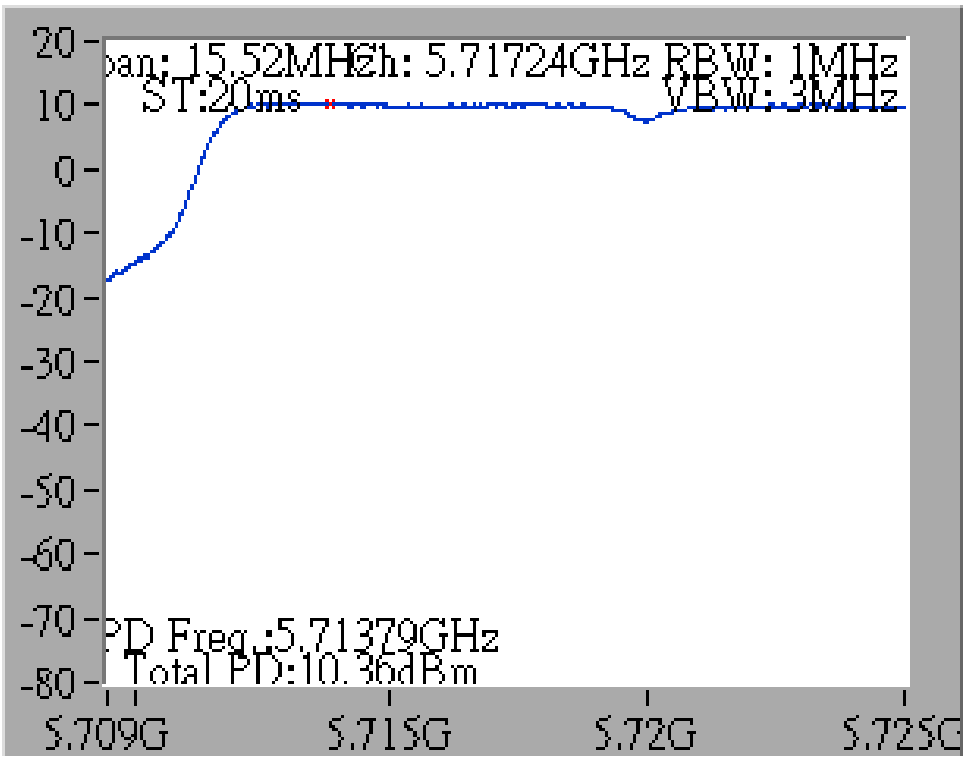
Note: $Directiona\ lGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.01dBi, so limit=11-(6.01-6)=10.99dBm/MHz

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
138	5690 MHz (UNII 3)	1.77	-3.01	-1.24	29.99	Complies

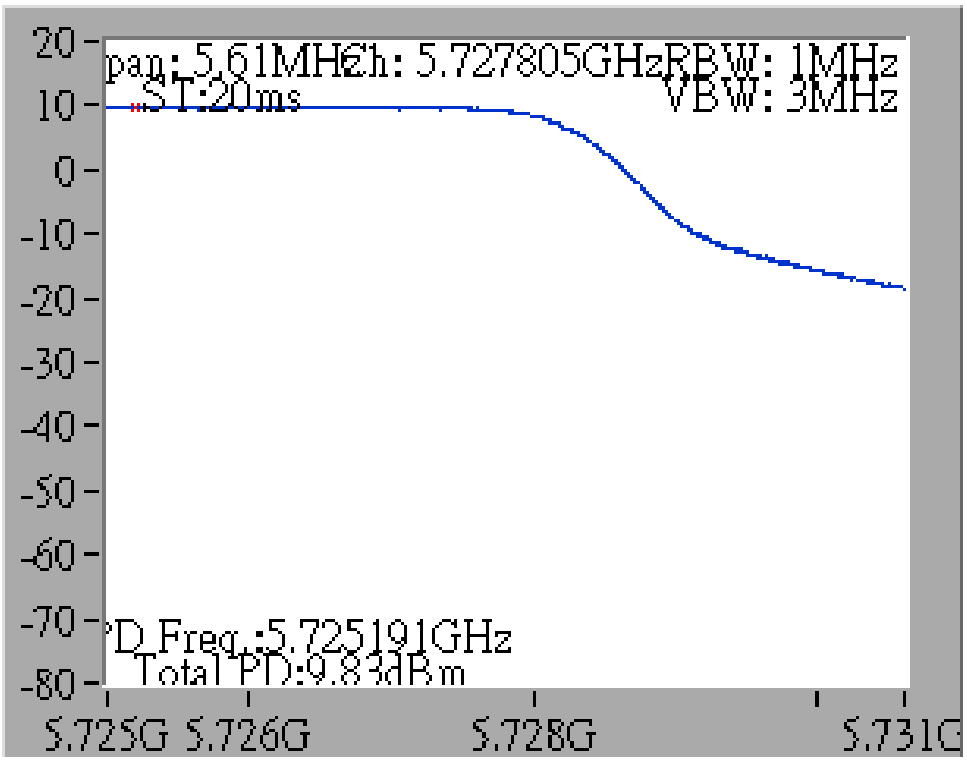
Note: $Directiona\ lGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.01dBi, so limit=30-(6.01-6)=29.99dBm/500kHz

Straddle Channel

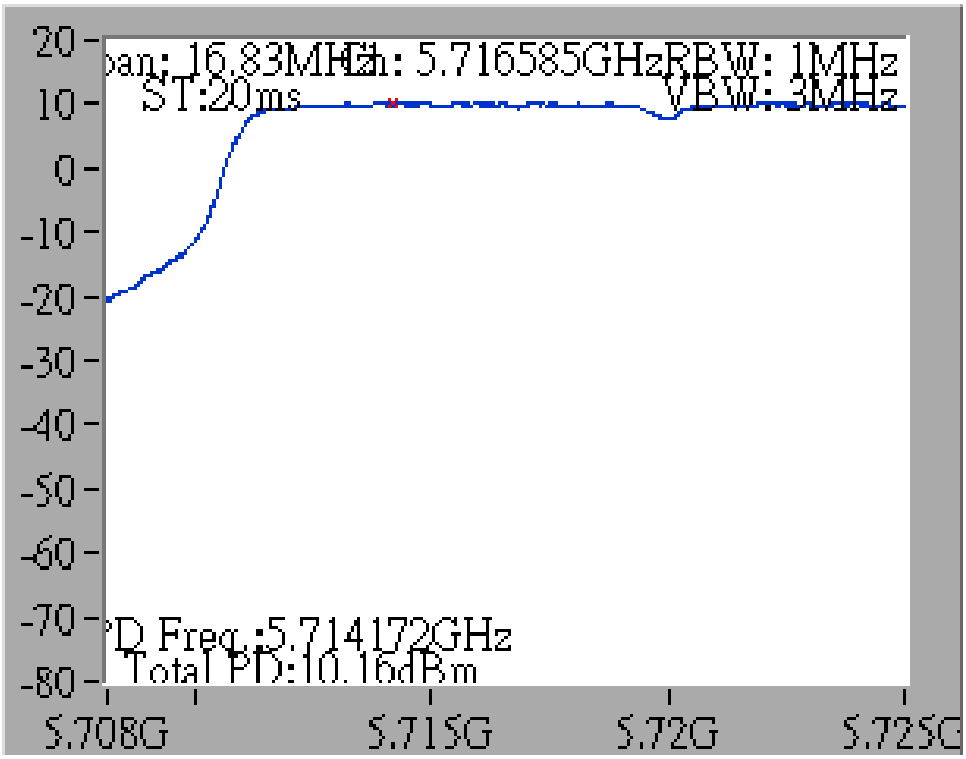
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5720 MHz (UNII 2C)



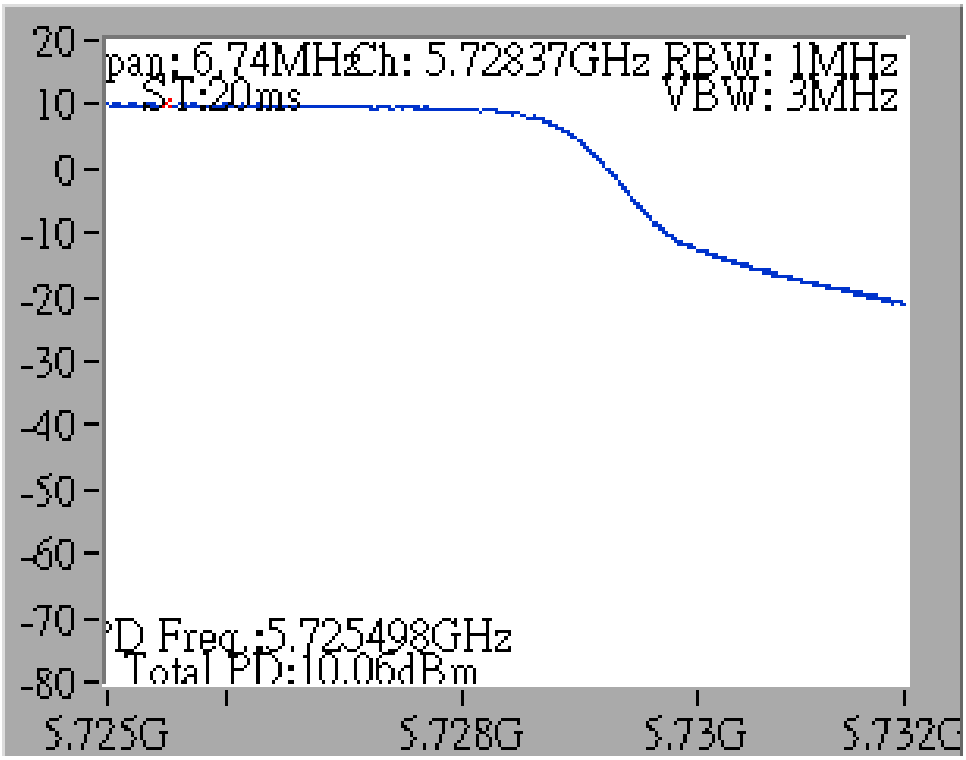
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5720 MHz (UNII 3)



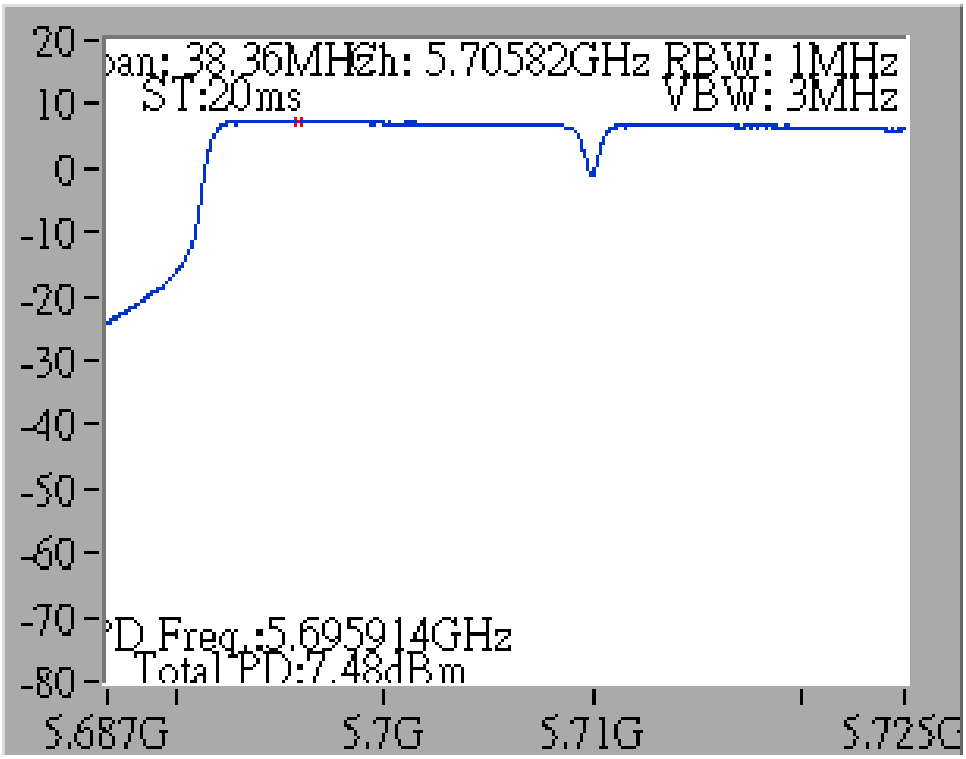
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5720 MHz (UNII 2C)



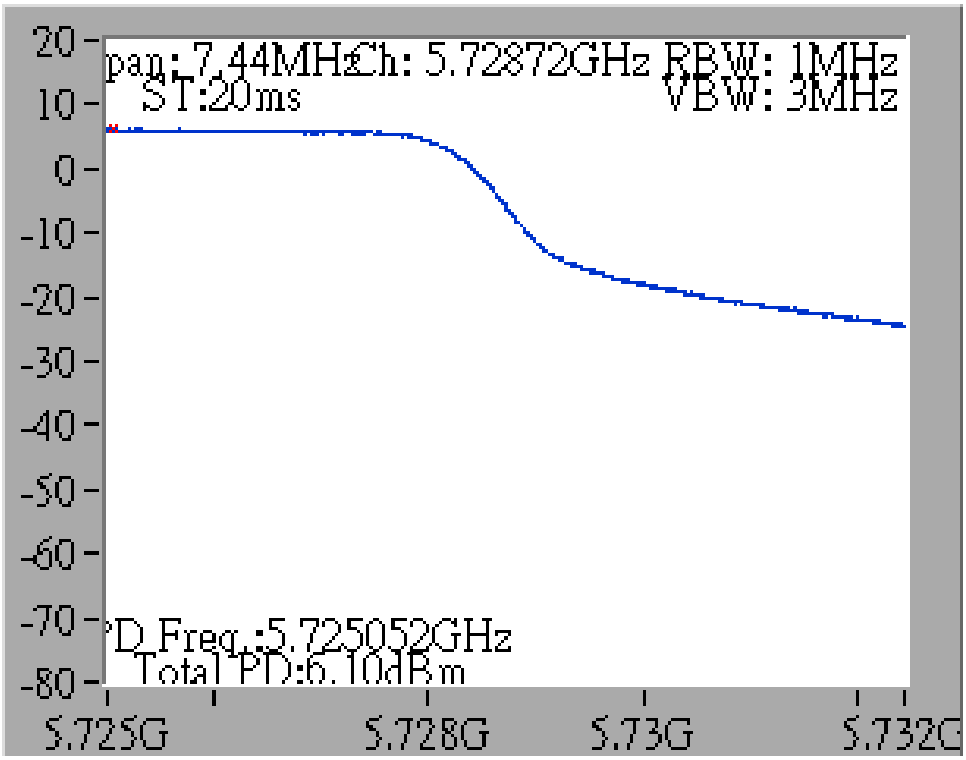
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5720 MHz (UNII 3)



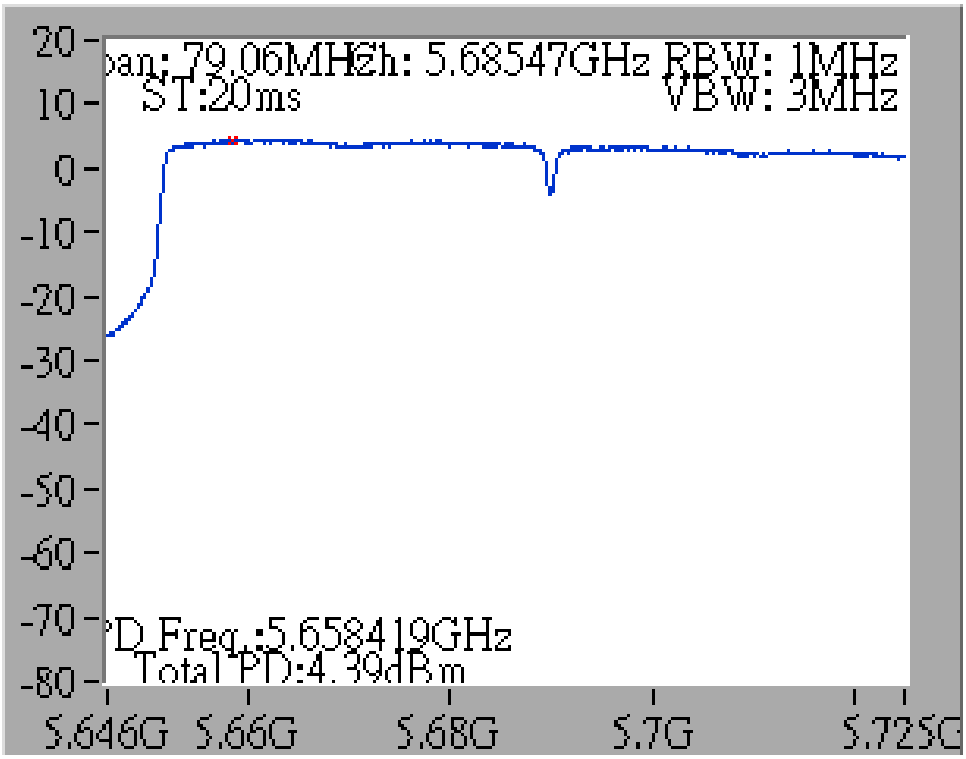
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5710 MHz (UNII 2C)



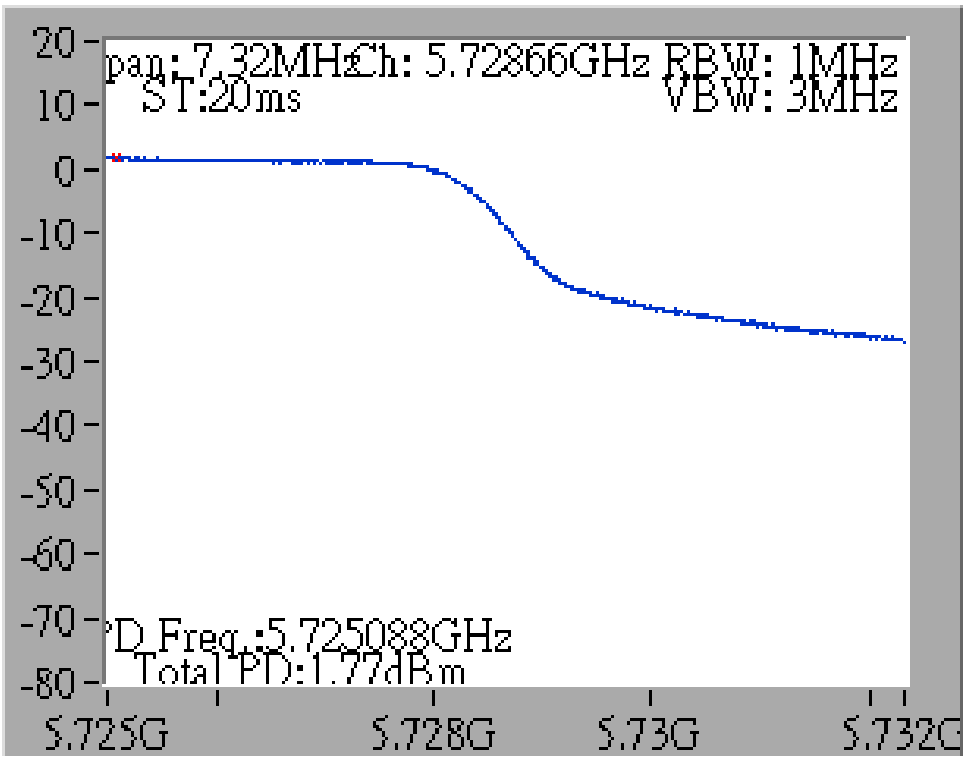
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5710 MHz (UNII 3)



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



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



4.5. Radiated Emissions Measurement

4.5.1. 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

4.5.2. 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

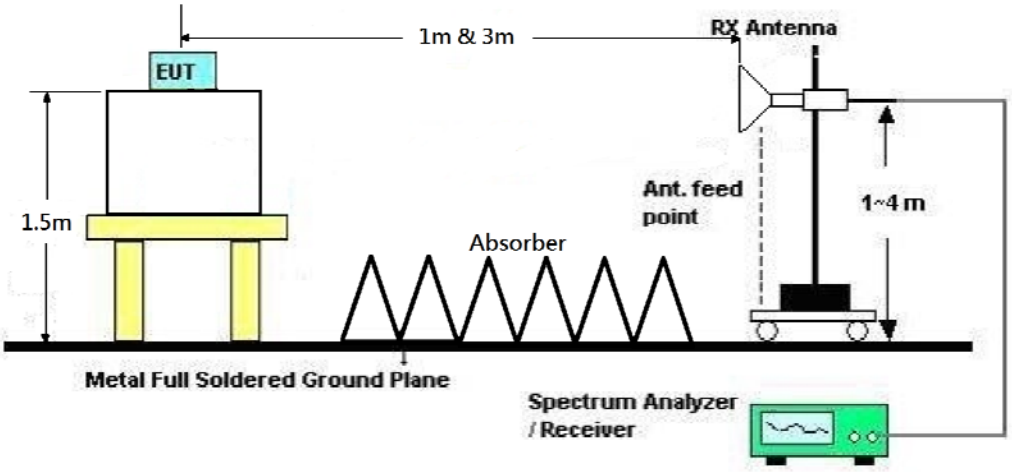
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.5.3. 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.

4.5.4. Test Setup Layout

For Radiated Emissions: Above 1GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 52 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	15780.54	57.84	74.00	-16.16	41.46	12.57	37.76	33.95	159	329	Peak	HORIZONTAL
2	15780.80	44.65	54.00	-9.35	28.27	12.57	37.76	33.95	159	329	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	15780.80	57.93	74.00	-16.07	41.55	12.57	37.76	33.95	177	172	Peak	VERTICAL
2	15780.84	44.78	54.00	-9.22	28.40	12.57	37.76	33.95	177	172	Average	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 60 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	10599.07	42.56	54.00	-11.44	27.63	10.16	38.40	33.63	152	266	Average	HORIZONTAL
2	10600.65	56.09	74.00	-17.91	41.16	10.16	38.40	33.63	152	266	Peak	HORIZONTAL
3	15900.51	57.48	74.00	-16.52	41.42	12.57	37.54	34.05	155	282	Peak	HORIZONTAL
4	15900.73	44.35	54.00	-9.65	28.29	12.57	37.54	34.05	155	282	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	10599.57	55.60	74.00	-18.40	40.67	10.16	38.40	33.63	155	321	Peak	VERTICAL
2	10600.31	42.49	54.00	-11.51	27.56	10.16	38.40	33.63	155	321	Average	VERTICAL
3	15899.23	44.30	54.00	-9.70	28.21	12.57	37.57	34.05	157	303	Average	VERTICAL
4	15900.01	57.68	74.00	-16.32	41.59	12.57	37.57	34.05	157	303	Peak	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 64 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	10639.70	42.39	54.00	-11.61	27.38	10.21	38.40	33.60	161	236	Average	HORIZONTAL
2	10640.66	56.24	74.00	-17.76	41.23	10.21	38.40	33.60	161	236	Peak	HORIZONTAL
3	15959.34	57.08	74.00	-16.92	41.19	12.56	37.46	34.13	160	252	Peak	HORIZONTAL
4	15959.55	44.29	54.00	-9.71	28.40	12.56	37.46	34.13	160	252	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	10639.42	55.96	74.00	-18.04	40.95	10.21	38.40	33.60	154	289	Peak	VERTICAL
2	10640.15	42.36	54.00	-11.64	27.35	10.21	38.40	33.60	154	289	Average	VERTICAL
3	15959.93	44.13	54.00	-9.87	28.24	12.56	37.46	34.13	156	272	Average	VERTICAL
4	15960.78	57.68	74.00	-16.32	41.79	12.56	37.46	34.13	156	272	Peak	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 100 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	10999.21	56.02	74.00	-17.98	40.45	10.55	38.40	33.38	156	240	Peak	HORIZONTAL
2	11000.41	42.74	54.00	-11.26	27.17	10.55	38.40	33.38	156	240	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	10999.41	42.86	54.00	-11.14	27.29	10.55	38.40	33.38	158	257	Average	VERTICAL
2	11000.21	55.47	74.00	-18.53	39.90	10.55	38.40	33.38	158	257	Peak	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 116 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	11159.02	56.03	74.00	-17.97	40.24	10.60	38.57	33.38	152	290	Peak	HORIZONTAL
2	11159.49	42.84	54.00	-11.16	27.05	10.60	38.57	33.38	152	290	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	11159.69	43.14	54.00	-10.86	27.35	10.60	38.57	33.38	153	272	Average	VERTICAL
2	11160.56	55.96	74.00	-18.04	40.17	10.60	38.57	33.38	153	272	Peak	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 140 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	11399.39	57.27	74.00	-16.73	41.15	10.69	38.80	33.37	160	328	Peak	HORIZONTAL
2	11400.51	43.41	54.00	-10.59	27.29	10.69	38.80	33.37	160	328	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	11400.01	43.70	54.00	-10.30	27.58	10.69	38.80	33.37	156	312	Average	VERTICAL
2	11400.21	56.28	74.00	-17.72	40.16	10.69	38.80	33.37	156	312	Peak	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 144 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	11439.03	44.17	54.00	-9.83	28.02	10.69	38.83	33.37	163	253	Average	HORIZONTAL
2	11439.18	57.61	74.00	-16.39	41.46	10.69	38.83	33.37	163	253	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	11440.89	56.95	74.00	-17.05	40.80	10.69	38.83	33.37	164	274	Peak	VERTICAL
2	11440.91	44.18	54.00	-9.82	28.03	10.69	38.83	33.37	164	274	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	15780.14	44.24	54.00	-9.76	27.86	12.57	37.76	33.95	152	212	Average	HORIZONTAL
2	15780.58	57.21	74.00	-16.79	40.83	12.57	37.76	33.95	152	212	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	15780.25	57.88	74.00	-16.12	41.50	12.57	37.76	33.95	154	227	Peak	VERTICAL
2	15780.61	44.59	54.00	-9.41	28.21	12.57	37.76	33.95	154	227	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	10599.38	56.17	74.00	-17.83	41.24	10.16	38.40	33.63	160	264	Peak	HORIZONTAL
2	10600.92	42.62	54.00	-11.38	27.65	10.19	38.40	33.62	160	264	Average	HORIZONTAL
3	15899.28	44.11	54.00	-9.89	28.02	12.57	37.57	34.05	156	243	Average	HORIZONTAL
4	15900.22	57.35	74.00	-16.65	41.26	12.57	37.57	34.05	156	243	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	10599.81	55.49	74.00	-18.51	40.56	10.16	38.40	33.63	154	232	Peak	VERTICAL
2	10600.45	42.21	54.00	-11.79	27.28	10.16	38.40	33.63	154	232	Average	VERTICAL
3	15899.42	44.02	54.00	-9.98	27.93	12.57	37.57	34.05	152	209	Average	VERTICAL
4	15900.34	58.03	74.00	-15.97	41.94	12.57	37.57	34.05	152	209	Peak	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	10639.36	56.64	74.00	-17.36	41.63	10.21	38.40	33.60	158	307	Peak	HORIZONTAL
2	10640.83	42.47	54.00	-11.53	27.46	10.21	38.40	33.60	158	307	Average	HORIZONTAL
3	15959.98	43.85	54.00	-10.15	27.96	12.56	37.46	34.13	156	289	Average	HORIZONTAL
4	15960.50	56.98	74.00	-17.02	41.09	12.56	37.46	34.13	156	289	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	10639.28	55.42	74.00	-18.58	40.41	10.21	38.40	33.60	158	244	Peak	VERTICAL
2	10639.37	42.63	54.00	-11.37	27.62	10.21	38.40	33.60	158	244	Average	VERTICAL
3	15959.69	57.21	74.00	-16.79	41.32	12.56	37.46	34.13	155	268	Peak	VERTICAL
4	15960.43	43.90	54.00	-10.10	28.01	12.56	37.46	34.13	155	268	Average	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	10999.79	42.59	54.00	-11.41	27.02	10.55	38.40	33.38	153	289	Average	HORIZONTAL
2	11000.29	56.73	74.00	-17.27	41.16	10.55	38.40	33.38	153	289	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	11000.36	55.75	74.00	-18.25	40.18	10.55	38.40	33.38	155	323	Peak	VERTICAL
2	11000.46	42.78	54.00	-11.22	27.21	10.55	38.40	33.38	155	323	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	11159.49	42.70	54.00	-11.30	26.91	10.60	38.57	33.38	149	282	Average	HORIZONTAL
2	11159.55	56.22	74.00	-17.78	40.43	10.60	38.57	33.38	149	282	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	11159.10	56.23	74.00	-17.77	40.44	10.60	38.57	33.38	150	310	Peak	VERTICAL
2	11159.74	42.80	54.00	-11.20	27.01	10.60	38.57	33.38	150	310	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	11400.01	56.57	74.00	-17.43	40.45	10.69	38.80	33.37	153	246	Peak	HORIZONTAL
2	11400.50	43.33	54.00	-10.67	27.21	10.69	38.80	33.37	153	246	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	11399.71	43.30	54.00	-10.70	27.18	10.69	38.80	33.37	155	265	Average	VERTICAL
2	11399.83	56.53	74.00	-17.47	40.41	10.69	38.80	33.37	155	265	Peak	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	11439.29	57.86	74.00	-16.14	41.71	10.69	38.83	33.37	154	249	Peak	HORIZONTAL
2	11439.79	43.90	54.00	-10.10	27.75	10.69	38.83	33.37	154	249	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	11440.26	57.59	74.00	-16.41	41.44	10.69	38.83	33.37	151	228	Peak	VERTICAL
2	11440.35	43.92	54.00	-10.08	27.77	10.69	38.83	33.37	151	228	Average	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

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	15809.03	57.17	74.00	-16.83	40.88	12.57	37.70	33.98	149	313	Peak	HORIZONTAL
2	15809.75	43.68	54.00	-10.32	27.39	12.57	37.70	33.98	149	313	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	15809.83	57.32	74.00	-16.68	41.03	12.57	37.70	33.98	150	297	Peak	VERTICAL
2	15809.92	43.95	54.00	-10.05	27.66	12.57	37.70	33.98	150	297	Average	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

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	10619.79	55.70	74.00	-18.30	40.73	10.19	38.40	33.62	156	235	Peak	HORIZONTAL
2	10620.61	41.69	54.00	-12.31	26.72	10.19	38.40	33.62	156	235	Average	HORIZONTAL
3	15929.82	43.66	54.00	-10.34	27.67	12.56	37.51	34.08	153	258	Average	HORIZONTAL
4	15929.83	57.07	74.00	-16.93	41.08	12.56	37.51	34.08	153	258	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	10619.10	54.77	74.00	-19.23	39.80	10.19	38.40	33.62	153	292	Peak	VERTICAL
2	10621.00	41.89	54.00	-12.11	26.92	10.19	38.40	33.62	153	292	Average	VERTICAL
3	15930.39	57.72	74.00	-16.28	41.75	12.56	37.51	34.10	151	275	Peak	VERTICAL
4	15930.90	43.66	54.00	-10.34	27.69	12.56	37.51	34.10	151	275	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

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	11020.51	42.30	54.00	-11.70	26.70	10.56	38.42	33.38	152	204	Average	HORIZONTAL
2	11020.76	55.88	74.00	-18.12	40.28	10.56	38.42	33.38	152	204	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	11019.74	55.26	74.00	-18.74	39.66	10.56	38.42	33.38	154	221	Peak	VERTICAL
2	11019.90	42.51	54.00	-11.49	26.91	10.56	38.42	33.38	154	221	Average	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

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	11099.13	42.26	54.00	-11.74	26.56	10.58	38.50	33.38	150	209	Average	HORIZONTAL
2	11099.95	55.88	74.00	-18.12	40.18	10.58	38.50	33.38	150	209	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	11100.08	56.25	74.00	-17.75	40.55	10.58	38.50	33.38	151	192	Peak	VERTICAL
2	11100.43	42.74	54.00	-11.26	27.04	10.58	38.50	33.38	151	192	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

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	11339.69	42.68	54.00	-11.32	26.66	10.66	38.73	33.37	154	180	Average	HORIZONTAL
2	11339.90	55.92	74.00	-18.08	39.90	10.66	38.73	33.37	154	180	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	11339.67	56.13	74.00	-17.87	40.11	10.66	38.73	33.37	152	194	Peak	VERTICAL
2	11340.37	42.96	54.00	-11.04	26.93	10.67	38.73	33.37	152	194	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 142 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

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	11419.35	56.10	74.00	-17.90	39.96	10.69	38.82	33.37	150	147	Peak	HORIZONTAL
2	11420.04	42.93	54.00	-11.07	26.79	10.69	38.82	33.37	150	147	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	11420.63	43.14	54.00	-10.86	27.00	10.69	38.82	33.37	152	163	Average	VERTICAL
2	11420.79	56.29	74.00	-17.71	40.15	10.69	38.82	33.37	152	163	Peak	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

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	15869.59	57.26	74.00	-16.74	41.13	12.57	37.59	34.03	159	232	Peak	HORIZONTAL
2	15870.92	43.97	54.00	-10.03	27.84	12.57	37.59	34.03	159	232	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	15869.59	57.14	74.00	-16.86	41.01	12.57	37.59	34.03	158	217	Peak	VERTICAL
2	15869.60	44.27	54.00	-9.73	28.14	12.57	37.59	34.03	158	217	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

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	11059.46	42.14	54.00	-11.86	26.48	10.57	38.47	33.38	159	229	Average	HORIZONTAL
2	11059.51	55.94	74.00	-18.06	40.28	10.57	38.47	33.38	159	229	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	11059.04	42.38	54.00	-11.62	26.72	10.57	38.47	33.38	161	246	Average	VERTICAL
2	11060.84	55.71	74.00	-18.29	40.04	10.58	38.47	33.38	161	246	Peak	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 122 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

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	11219.82	55.90	74.00	-18.10	40.03	10.63	38.62	33.38	155	235	Peak	HORIZONTAL
2	11220.37	42.63	54.00	-11.37	26.76	10.63	38.62	33.38	155	235	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	11220.06	55.21	74.00	-18.79	39.34	10.63	38.62	33.38	157	217	Peak	VERTICAL
2	11220.48	42.58	54.00	-11.42	26.71	10.63	38.62	33.38	157	217	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 138 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

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	11379.19	43.02	54.00	-10.98	26.93	10.68	38.78	33.37	160	271	Average	HORIZONTAL
2	11379.60	56.90	74.00	-17.10	40.81	10.68	38.78	33.37	160	271	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	11379.39	43.26	54.00	-10.74	27.17	10.68	38.78	33.37	157	253	Average	VERTICAL
2	11379.39	55.80	74.00	-18.20	39.71	10.68	38.78	33.37	157	253	Peak	VERTICAL

Note:

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

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

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

4.6. Band Edge Emissions Measurement

4.6.1. 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

4.6.2. 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	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

4.6.3. Test Procedures

1. The test procedure is the same as section 4.5.3.

4.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.5.4.

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 transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 52, 60, 64 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5134.80	43.83	54.00	-10.17	37.95	7.31	32.94	31.51	VERTICAL	203	142	Average
2	5143.49	57.78	74.00	-16.22	51.88	7.32	32.94	31.52	VERTICAL	203	142	Peak
3	5257.40	111.24			105.13	7.43	32.93	31.61	VERTICAL	203	142	Peak
4	5262.17	101.86			95.73	7.44	32.93	31.62	VERTICAL	203	142	Average
5	5363.46	58.00	74.00	-16.00	51.71	7.53	32.93	31.69	VERTICAL	203	142	Peak
6	5375.62	45.06	54.00	-8.94	38.75	7.54	32.93	31.70	VERTICAL	203	142	Average

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5297.40	112.72			106.54	7.47	32.93	31.64	VERTICAL	200	155	Peak
2	5297.68	102.37			96.19	7.47	32.93	31.64	VERTICAL	200	155	Average
3	5365.05	58.27	74.00	-15.73	51.98	7.53	32.93	31.69	VERTICAL	200	155	Peak
4	5383.00	45.77	54.00	-8.23	39.45	7.55	32.93	31.70	VERTICAL	200	155	Average

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5317.68	102.53			96.32	7.49	32.93	31.65	VERTICAL	201	140	Average
2	5322.32	112.25			106.04	7.49	32.93	31.65	VERTICAL	201	140	Peak
3	5351.74	63.21	74.00	-10.79	56.94	7.52	32.93	31.68	VERTICAL	201	140	Peak
4	5352.32	48.26	54.00	-5.74	41.99	7.52	32.93	31.68	VERTICAL	201	140	Average

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

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 100, 116, 140 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	PreampFactor	AntennaFactor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5435.40	59.02	74.00	-14.98	52.59	7.60	32.92	31.75	VERTICAL	216	120	Peak
2	5456.82	45.95	54.00	-8.05	39.49	7.62	32.92	31.76	VERTICAL	216	120	Average
3	5467.11	61.72	74.00	-12.28	55.23	7.63	32.92	31.78	VERTICAL	216	120	Peak
4	5467.40	47.52	54.00	-6.48	41.03	7.63	32.92	31.78	VERTICAL	216	120	Average
5	5497.11	101.09			94.55	7.66	32.92	31.80	VERTICAL	216	120	Average
6	5497.68	112.15			105.61	7.66	32.92	31.80	VERTICAL	216	120	Peak

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

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	PreampFactor	AntennaFactor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5427.58	57.50	74.00	-16.50	51.09	7.59	32.92	31.74	VERTICAL	263	138	Peak
2	5439.16	45.19	54.00	-8.81	38.76	7.60	32.92	31.75	VERTICAL	263	138	Average
3	5463.05	57.25	74.00	-16.75	50.78	7.63	32.92	31.76	VERTICAL	263	138	Peak
4	5470.00	44.89	54.00	-9.11	38.40	7.63	32.92	31.78	VERTICAL	263	138	Average
5	5573.05	102.32			95.69	7.70	32.95	31.88	VERTICAL	263	138	Average
6	5578.26	112.89			106.24	7.71	32.96	31.90	VERTICAL	263	138	Peak
7	5729.05	57.86	74.00	-16.14	50.99	7.80	33.01	32.08	VERTICAL	263	138	Peak
8	5748.15	45.12	54.00	-8.88	38.23	7.81	33.02	32.10	VERTICAL	263	138	Average

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

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	PreampFactor	AntennaFactor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5693.92	101.87			95.05	7.78	33.00	32.04	VERTICAL	273	149	Average
2	5694.21	112.82			106.00	7.78	33.00	32.04	VERTICAL	273	149	Peak
3	5725.00	48.59	54.00	-5.41	41.72	7.79	33.00	32.08	VERTICAL	273	149	Average
4	5728.76	61.83	74.00	-12.17	54.96	7.80	33.01	32.08	VERTICAL	273	149	Peak

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

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 144 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Channel 144

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5715.37	99.47			92.62	7.79	33.00	32.06	VERTICAL	278	149	Average
2	5725.79	109.03			102.16	7.79	33.00	32.08	VERTICAL	278	149	Peak
3	5876.63	45.34	54.00	-8.66	38.26	7.88	33.06	32.26	VERTICAL	278	149	Average
4	5876.63	58.03	74.00	-15.97	50.95	7.88	33.06	32.26	VERTICAL	278	149	Peak

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5129.59	44.11	54.00	-9.89	38.23	7.31	32.94	31.51	VERTICAL	266	124	Average
2	5144.79	57.05	74.00	-16.95	51.15	7.32	32.94	31.52	VERTICAL	266	124	Peak
3	5254.79	101.39			95.28	7.43	32.93	31.61	VERTICAL	266	124	Average
4	5256.53	111.45			105.34	7.43	32.93	31.61	VERTICAL	266	124	Peak
5	5359.12	57.82	74.00	-16.18	51.53	7.53	32.93	31.69	VERTICAL	266	124	Peak
6	5370.41	44.67	54.00	-9.33	38.36	7.54	32.93	31.70	VERTICAL	266	124	Average

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5306.08	112.36			106.17	7.48	32.93	31.64	VERTICAL	286	152	Peak
2	5306.37	102.24			96.05	7.48	32.93	31.64	VERTICAL	286	152	Average
3	5378.36	58.27	74.00	-15.73	51.95	7.55	32.93	31.70	VERTICAL	286	152	Peak
4	5385.31	45.66	54.00	-8.34	39.32	7.55	32.93	31.72	VERTICAL	286	152	Average

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5325.79	101.19			94.95	7.50	32.93	31.67	VERTICAL	263	155	Average
2	5327.24	111.50			105.26	7.50	32.93	31.67	VERTICAL	263	155	Peak
3	5350.00	47.79	54.00	-6.21	41.52	7.52	32.93	31.68	VERTICAL	263	155	Average
4	5352.89	60.15	74.00	-13.85	53.88	7.52	32.93	31.68	VERTICAL	263	155	Peak

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 116, 140 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	PreampFactor	AntennaFactor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5459.13	63.72	74.00	-10.28	57.26	7.62	32.92	31.76	VERTICAL	205	324	Peak
2	5460.00	49.87	54.00	-4.13	43.41	7.62	32.92	31.76	VERTICAL	205	324	Average
3	5467.97	66.90	74.00	-7.10	60.41	7.63	32.92	31.78	VERTICAL	205	324	Peak
4	5470.00	51.69	54.00	-2.31	45.20	7.63	32.92	31.78	VERTICAL	205	324	Average
5	5493.34	116.90			110.38	7.65	32.92	31.79	VERTICAL	205	324	Peak
6	5493.63	106.43			99.91	7.65	32.92	31.79	VERTICAL	205	324	Average

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

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	PreampFactor	AntennaFactor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5460.00	48.59	54.00	-5.41	42.13	7.62	32.92	31.76	VERTICAL	102	338	Average
2	5460.87	62.49	74.00	-11.51	56.03	7.62	32.92	31.76	VERTICAL	102	338	Peak
3	5468.70	61.79	74.00	-12.21	55.30	7.63	32.92	31.78	VERTICAL	102	338	Peak
4	5470.00	48.47	54.00	-5.53	41.98	7.63	32.92	31.78	VERTICAL	102	338	Average
5	5582.60	106.91			100.26	7.71	32.96	31.90	VERTICAL	102	338	Average
6	5583.04	117.95			111.30	7.71	32.96	31.90	VERTICAL	102	338	Peak
7	5725.00	48.41	54.00	-5.59	41.54	7.79	33.00	32.08	VERTICAL	102	338	Average
8	5725.87	61.89	74.00	-12.11	55.02	7.79	33.00	32.08	VERTICAL	102	338	Peak

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

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	PreampFactor	AntennaFactor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5695.66	105.87			99.05	7.78	33.00	32.04	VERTICAL	347	343	Average
2	5696.53	116.44			109.62	7.78	33.00	32.04	VERTICAL	347	343	Peak
3	5730.21	51.96	54.00	-2.04	45.09	7.80	33.01	32.08	VERTICAL	347	343	Average
4	5731.66	67.06	74.00	-6.94	60.19	7.80	33.01	32.08	VERTICAL	347	343	Peak

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Channel 144

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5713.49	115.74			108.89	7.79	33.00	32.06	VERTICAL	350	265	Peak
2	5714.36	105.11			98.26	7.79	33.00	32.06	VERTICAL	350	265	Average
3	5850.00	48.24	54.00	-5.76	41.20	7.87	33.05	32.22	VERTICAL	350	265	Average
4	5850.43	61.44	74.00	-12.56	54.40	7.87	33.05	32.22	VERTICAL	350	265	Peak

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5273.21	109.25			102.01	6.37	33.93	33.06	274	89	Peak	VERTICAL
2	5274.49	99.34			92.10	6.37	33.93	33.06	274	89	Average	VERTICAL
3	5352.05	47.28	54.00	-6.72	39.81	6.47	34.06	33.06	274	89	Average	VERTICAL
4	5352.37	59.63	74.00	-14.37	52.16	6.47	34.06	33.06	274	89	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	5263.27	94.61			87.40	6.34	33.93	33.06	113	138	Average	HORIZONTAL
2	5265.83	104.34			97.13	6.34	33.93	33.06	113	138	Peak	HORIZONTAL
3	5364.87	57.68	74.00	-16.32	50.18	6.47	34.09	33.06	113	138	Peak	HORIZONTAL
4	5365.83	45.96	54.00	-8.04	38.46	6.47	34.09	33.06	113	138	Average	HORIZONTAL

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	5459.68	62.60	74.00	-11.40	54.84	6.60	34.22	33.06	239	220	Peak	VERTICAL
2	5460.00	49.99	54.00	-4.01	42.23	6.60	34.22	33.06	239	220	Average	VERTICAL
3	5462.56	51.10	54.00	-2.90	43.31	6.60	34.25	33.06	239	220	Average	VERTICAL
4	5468.65	64.21	74.00	-9.79	56.42	6.60	34.25	33.06	239	220	Peak	VERTICAL
5	5519.62	100.12			92.23	6.65	34.31	33.07	239	220	Average	VERTICAL
6	5521.86	110.13			102.24	6.65	34.31	33.07	239	220	Peak	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	5453.85	58.45	74.00	-15.55	50.69	6.60	34.22	33.06	257	104	Peak	VERTICAL
2	5460.00	46.81	54.00	-7.19	39.05	6.60	34.22	33.06	257	104	Average	VERTICAL
3	5467.95	47.16	54.00	-6.84	39.37	6.60	34.25	33.06	257	104	Average	VERTICAL
4	5468.72	57.00	74.00	-17.00	49.21	6.60	34.25	33.06	257	104	Peak	VERTICAL
5	5562.18	100.50			92.55	6.70	34.33	33.08	257	104	Average	VERTICAL
6	5562.18	110.61			102.66	6.70	34.33	33.08	257	104	Peak	VERTICAL

Item 5, 6 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	5655.26	99.94			91.88	6.79	34.39	33.12	222	358	Average	VERTICAL
2	5655.90	109.34			101.28	6.79	34.39	33.12	222	358	Peak	VERTICAL
3	5728.97	60.65	74.00	-13.35	52.52	6.83	34.43	33.13	222	358	Peak	VERTICAL
4	5732.82	48.80	54.00	-5.20	40.65	6.86	34.43	33.14	222	358	Average	VERTICAL

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 142 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	5699.42	104.08			95.98	6.81	34.41	33.12	101	151	Peak	HORIZONTAL
2	5701.35	93.73			85.62	6.81	34.42	33.12	101	151	Average	HORIZONTAL
3	5856.15	58.42	68.20	-9.78	50.12	6.95	34.52	33.17	101	151	Peak	HORIZONTAL

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58, 106, 122 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

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	5062.44	57.83	74.00	-16.17	51.19	6.08	33.61	33.05	258	94	Peak	VERTICAL
2	5150.00	45.67	54.00	-8.33	38.77	6.21	33.74	33.05	258	94	Average	VERTICAL
3	5298.81	103.87			96.55	6.40	33.98	33.06	258	94	Peak	VERTICAL
4	5307.63	93.10			85.78	6.40	33.98	33.06	258	94	Average	VERTICAL
5	5350.00	53.92	54.00	-0.08	46.45	6.47	34.06	33.06	258	94	Average	VERTICAL
6	5350.00	64.81	74.00	-9.19	57.34	6.47	34.06	33.06	258	94	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	5452.28	51.75	54.00	-2.25	43.99	6.60	34.22	33.06	250	106	Average	VERTICAL
2	5456.28	65.36	74.00	-8.64	57.60	6.60	34.22	33.06	250	106	Peak	VERTICAL
3	5470.00	53.90	54.00	-0.10	46.11	6.60	34.25	33.06	250	106	Average	VERTICAL
4	5470.00	68.17	74.00	-5.83	60.38	6.60	34.25	33.06	250	106	Peak	VERTICAL
5	5555.64	96.87			88.92	6.70	34.33	33.08	250	106	Average	VERTICAL
6	5555.64	107.20			99.25	6.70	34.33	33.08	250	106	Peak	VERTICAL
7	5725.00	47.00	54.00	-7.00	38.87	6.83	34.43	33.13	250	106	Average	VERTICAL
8	5725.00	57.55	74.00	-16.45	49.42	6.83	34.43	33.13	250	106	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	5432.92	58.37	74.00	-15.63	50.68	6.56	34.19	33.06	249	106	Peak	VERTICAL
2	5460.00	47.35	54.00	-6.65	39.59	6.60	34.22	33.06	249	106	Average	VERTICAL
3	5468.17	47.73	54.00	-6.27	39.94	6.60	34.25	33.06	249	106	Average	VERTICAL
4	5470.00	59.70	74.00	-14.30	51.91	6.60	34.25	33.06	249	106	Peak	VERTICAL
5	5595.58	98.75			90.77	6.72	34.35	33.09	249	106	Average	VERTICAL
6	5595.58	108.74			100.76	6.72	34.35	33.09	249	106	Peak	VERTICAL
7	5729.39	60.13	74.00	-13.87	52.00	6.83	34.43	33.13	249	106	Peak	VERTICAL
8	5734.20	48.80	54.00	-5.20	40.65	6.86	34.43	33.14	249	106	Average	VERTICAL

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 138/ Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Channel 138

	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	5653.94	96.51			88.45	6.79	34.39	33.12	252	356	Average	VERTICAL
2	5656.35	106.28			98.22	6.79	34.39	33.12	252	356	Peak	VERTICAL
3	5907.15	58.84	68.20	-9.36	50.49	6.99	34.55	33.19	252	356	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 5290 MHz

Note:

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

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

4.7. Frequency Stability Measurement

4.7.1. 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).

4.7.2. Measuring Instruments and Setting

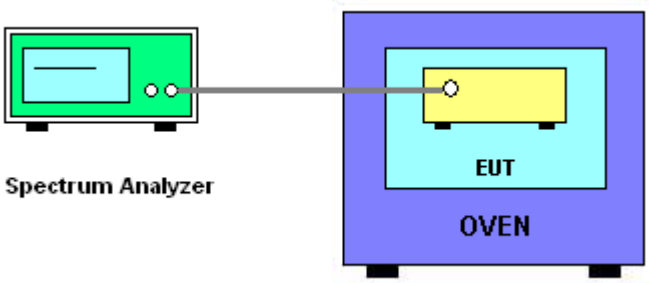
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.7.3. 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.

4.7.4. Test Setup Layout



4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

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

4.7.7. Test Result of Frequency Stability

Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu	Test Date	Sep. 16, 2015

Mode: 20 MHz / Chain 2

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5300 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5299.9902	5299.9888	5299.9870	5299.9849
110.00	5299.9890	5299.9877	5299.9861	5299.9842
93.50	5299.9876	5299.9865	5299.9853	5299.9831
Max. Deviation (MHz)	0.0124	0.0135	0.0147	0.0169
Max. Deviation (ppm)	2.34	2.55	2.77	3.19
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5300 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5299.9915	5299.9903	5299.9884	5299.9862
10	5299.9902	5299.9889	5299.9874	5299.9856
20	5299.9890	5299.9877	5299.9861	5299.9842
30	5299.9876	5299.9865	5299.9851	5299.9835
40	5299.9860	5299.9845	5299.9829	5299.9809
Max. Deviation (MHz)	0.0140	0.0155	0.0171	0.0191
Max. Deviation (ppm)	2.64	2.92	3.23	3.60
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5580 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5579.9992	5579.9978	5579.9960	5579.9939
110.00	5579.9980	5579.9967	5579.9951	5579.9932
93.50	5579.9966	5579.9955	5579.9943	5579.9921
Max. Deviation (MHz)	0.0034	0.0045	0.0057	0.0079
Max. Deviation (ppm)	0.61	0.81	1.02	1.42
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5580 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5580.0005	5579.9993	5579.9974	5579.9952
10	5579.9992	5579.9979	5579.9964	5579.9946
20	5579.9980	5579.9967	5579.9951	5579.9932
30	5579.9966	5579.9955	5579.9941	5579.9925
40	5579.9950	5579.9935	5579.9919	5579.9899
Max. Deviation (MHz)	0.0050	0.0065	0.0081	0.0101
Max. Deviation (ppm)	0.90	1.16	1.45	1.81
Result	Complies			

Mode: 40 MHz / Chain 2

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5310 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5310.0012	5309.9998	5309.9980	5309.9959
110.00	5310.0000	5309.9987	5309.9971	5309.9952
93.50	5309.9986	5309.9975	5309.9963	5309.9941
Max. Deviation (MHz)	0.0014	0.0025	0.0037	0.0059
Max. Deviation (ppm)	0.26	0.47	0.70	1.11
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5310 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5310.0025	5310.0013	5309.9994	5309.9972
10	5310.0012	5309.9999	5309.9984	5309.9966
20	5310.0000	5309.9987	5309.9971	5309.9952
30	5309.9986	5309.9975	5309.9961	5309.9945
40	5309.9970	5309.9955	5309.9939	5309.9919
Max. Deviation (MHz)	0.0030	0.0045	0.0061	0.0081
Max. Deviation (ppm)	0.56	0.85	1.15	1.53
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5550 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5550.0029	5550.0015	5549.9997	5549.9976
110.00	5550.0017	5550.0004	5549.9988	5549.9969
93.50	5550.0003	5549.9992	5549.9980	5549.9958
Max. Deviation (MHz)	0.0029	0.0015	0.0020	0.0042
Max. Deviation (ppm)	0.52	0.27	0.36	0.76
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5550 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5550.0042	5550.0030	5550.0011	5549.9989
10	5550.0029	5550.0016	5550.0001	5549.9983
20	5550.0017	5550.0004	5549.9988	5549.9969
30	5550.0003	5549.9992	5549.9978	5549.9962
40	5549.9987	5549.9972	5549.9956	5549.9936
Max. Deviation (MHz)	0.0042	0.0030	0.0044	0.0064
Max. Deviation (ppm)	0.76	0.54	0.79	1.15
Result	Complies			

Mode: 80 MHz / Chain 2

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5290 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5290.0026	5290.0012	5289.9994	5289.9973
110.00	5290.0014	5290.0001	5289.9985	5289.9966
93.50	5290.0000	5289.9989	5289.9977	5289.9955
Max. Deviation (MHz)	0.0026	0.0012	0.0023	0.0045
Max. Deviation (ppm)	0.49	0.23	0.43	0.85
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5290 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5290.0039	5290.0027	5290.0008	5289.9986
10	5290.0026	5290.0013	5289.9998	5289.9980
20	5290.0014	5290.0001	5289.9985	5289.9966
30	5290.0000	5289.9989	5289.9975	5289.9959
40	5289.9984	5289.9969	5289.9953	5289.9933
Max. Deviation (MHz)	0.0039	0.0031	0.0047	0.0067
Max. Deviation (ppm)	0.74	0.59	0.89	1.27
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5530 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5530.0024	5530.0010	5529.9992	5529.9971
110.00	5530.0012	5529.9999	5529.9983	5529.9964
93.50	5529.9998	5529.9987	5529.9975	5529.9953
Max. Deviation (MHz)	0.0024	0.0013	0.0025	0.0047
Max. Deviation (ppm)	0.43	0.24	0.45	0.85
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5530 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5530.0037	5530.0025	5530.0006	5529.9984
10	5530.0024	5530.0011	5529.9996	5529.9978
20	5530.0012	5529.9999	5529.9983	5529.9964
30	5529.9998	5529.9987	5529.9973	5529.9957
40	5529.9982	5529.9967	5529.9951	5529.9931
Max. Deviation (MHz)	0.0037	0.0033	0.0049	0.0069
Max. Deviation (ppm)	0.67	0.60	0.89	1.25
Result	Complies			

4.8. Antenna Requirements

4.8.1. Limit

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

4.8.2. 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	Oct. 28, 2014	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 25, 2014	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 06, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 12, 2014	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 03, 2014	Conducted (TH01-CB)

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

6. MEASUREMENT UNCERTAINTY

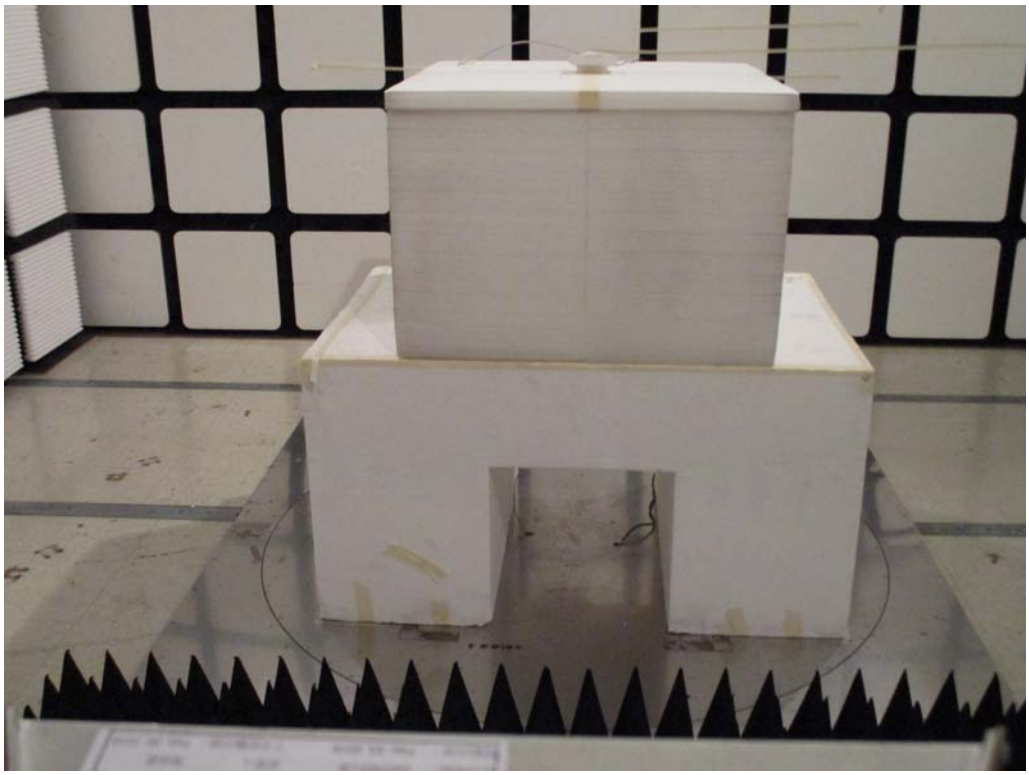
Test Items	Uncertainty	Remark
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%

Appendix A. Test Photos

1. Photographs of Radiated Emissions Test Configuration

Test Configuration: Above 1GHz

FRONT VIEW



REAR VIEW