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FCC RADIO TEST REPORT

Applicant's company	**ZyXEL Communications Corporation**
Applicant Address	No.2, Gongye E. 9th Road, Hsinchu Science Park, Hsinchu, Taiwan
FCC ID	**I88C2100Z**
Manufacturer's company (1)	**MitraStar Technology Corporation**
Manufacturer Address	No. 6, Innovation Rd II, Hsinchu Science Park, Hsinchu 30076, Taiwan
Manufacturer's company (2)	**WuXi MitraStar Technology Co. Ltd**
Manufacturer Address	60#-E, Minshan Road, Wuxi New district Jangsu, P.R.C.

Product Name	Dual-Band Wireless AC/N VDSL2 4-port Bonding Combo Wan IAD with HPNA3.1
Brand Name	ZyXEL
Model No.	C2100Z, VMG4825-B10A, VMG9823-B10A
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Aug. 12, 2015
Final Test Date	Sep. 08, 2015
Submission Type	Original Equipment

Statement

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

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

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

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **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.

Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR581406AB	Rev. 01	Initial issue of report.	Dec. 08, 2015
FR581406AB	Rev. 01	Revising the FCC ID.	Dec. 28, 2015

1. VERIFICATION OF COMPLIANCE

Product Name	Dual-Band Wireless AC/N VDSL2 4-port Bonding Combo Wan IAD with HPNA3.1
Brand Name	ZyXEL
Model No.	C2100Z, VMG4825-B10A, VMG9823-B10A
Applicant	ZyXEL Communications Corporation
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. 12, 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	15.207	AC Power Line Conducted Emissions	Complies	10.47 dB
4.2	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.3	15.407(e)	6dB Spectrum Bandwidth	Complies	-
4.4	15.407(a)	Maximum Conducted Output Power	Complies	0.01 dB
4.5	15.407(a)	Power Spectral Density	Complies	0.01 dB
4.6	15.407(b)	Radiated Emissions	Complies	3.07 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.02 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Channel Number	9 for 20MHz bandwidth ; 4 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Band Width (99%)	For non-beamforming function: Band 1: IEEE 802.11a: 16.85 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.41 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 35.02 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 73.81 MHz Band 4: IEEE 802.11a: 17.02 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.71 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 35.60 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 73.52 MHz For beamforming function: Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.15 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.19 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.54 MHz Band 4: IEEE 802.11ac MCS0/Nss1 (VHT20): 17.97 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.19 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.54 MHz

Maximum Conducted Output Power	For non-beamforming function: Band 1: IEEE 802.11a: 26.26 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 26.39 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 29.47 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 21.97 dBm Band 4: IEEE 802.11a: 29.56 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 29.67 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.15 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 24.76 dBm For beamforming function: Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 26.20 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.14 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 20.93 dBm Band 4: IEEE 802.11ac MCS0/Nss1 (VHT20): 26.19 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.15 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 24.76 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
Beamforming Function	☒ With beamforming	☐ Without beamforming
	The product has beamforming function for 802.11n/ac in 5GHz band.	
Operating Mode	☐ Outdoor access point	
	☒ Indoor access point	
	☐ Fixed point-to-point access points	
	☐ Mobile and portable client devices	

Antenna and Band width

Antenna	Four (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)	4	MCS 0-31
802.11n (HT40)	4	MCS 0-31
802.11ac (VHT20)	4	MCS 0-9/Nss1-4
802.11ac (VHT40)	4	MCS 0-9/Nss1-4
802.11ac (VHT80)	4	MCS 0-9/Nss1-4

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

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

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

3.2. Accessories

Power	Brand	Model	Rating
AC Power Adapter	DVE	DSA-36PFH-12 FUS	Input: 100-240Vac, 50/60Hz, 1A Output: 12Vdc, 3A
Others			
Ethernet cable	1.8 meter, non-shielded, w/o ferrite core		
Phone cable	3.66 meter, non-shielded, w/o ferrite core (For Model No.: C2100Z)		
Phone cable	1.8 meter, non-shielded, w/o ferrite core (For Model No.: VMG4825-B10A, VMG9823-B10A)		

3.3. Table for Filed Antenna

Ant.	Brand	Part No.	Type	Connector	Gain (dBi)	Cable Length (mm)	Remark
1	AIRGAIN	N5X20B-T-PK1-B125U N5X20B-TP-PK1-B125U	PCB	I-PEX	3.4	125	5G TX/RX
2	AIRGAIN	N5X20B-T-PK1-W85U N5X20B-TP-PK1-W85U	PCB	I-PEX	4.2	85	5G TX/RX
3	AIRGAIN	N5X20B-T-PK1-G65U N5X20B-TP-PK1-G65U	PCB	I-PEX	4.4	65	5G TX/RX
4	AIRGAIN	N5X20B-T-PK1-W85U N5X20B-TP-PK1-W85U	PCB	I-PEX	3.0	85	5G TX/RX
5	AIRGAIN	M2410CM-T2-B130S6 M2410CM-T2P-B130S6	Metal	Soldering	3.7	130	2.4G TX/RX
6	AIRGAIN	M2410CM-T2-G200S6 M2410CM-T2P-G200S6	Metal	Soldering	1.4	200	2.4G TX/RX

Note: The EUT has six antennas.

For 2.4GHz WLAN function:

For IEEE 802.11b/g/n mode (1TX/1RX):

Only Chain 5 could transmit/receive.

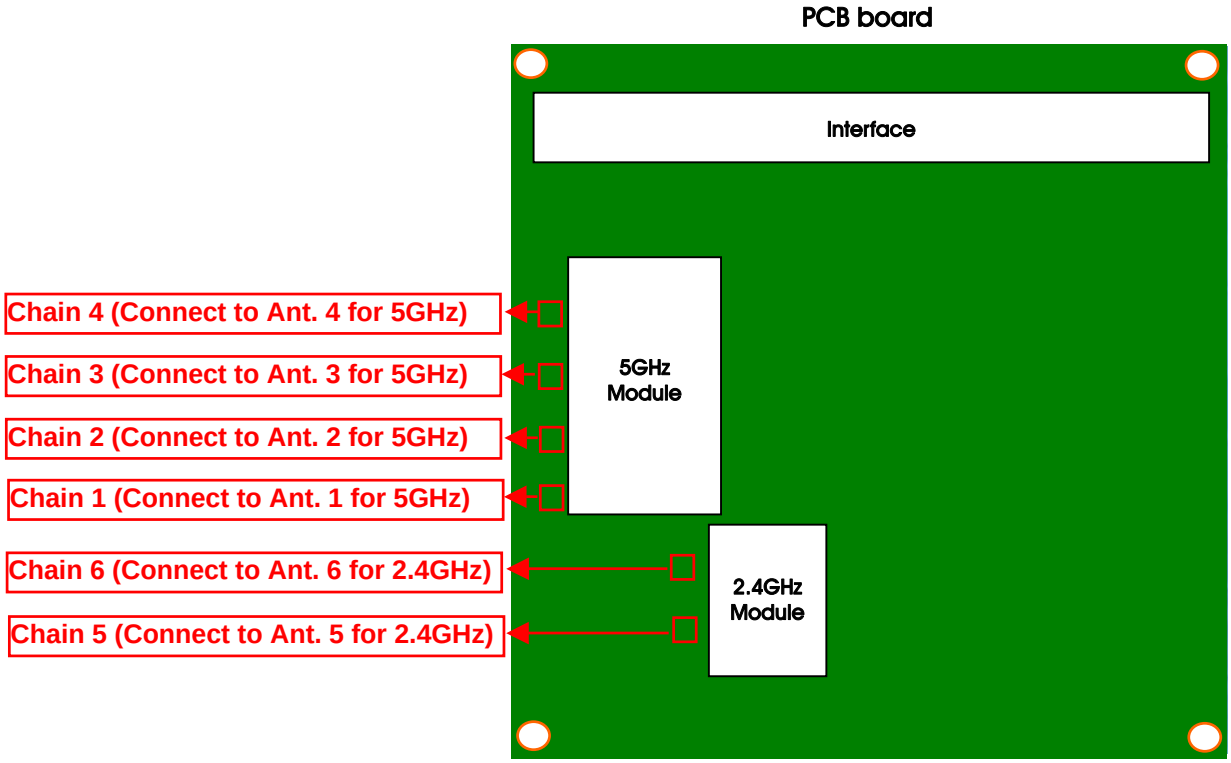
For IEEE 802.11n mode (2TX/2RX):

Chain 5 and Chain 6 could transmit/receive simultaneously.

For 5GHz WLAN function:

For IEEE 802.11a/n/ac mode (4TX/4RX):

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



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 38, 46, 151, 159.

For 80MHz bandwidth systems, use Channel 42, 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz Band 1	36	5180 MHz	44	5220 MHz
	38	5190 MHz	46	5230 MHz
	40	5200 MHz	48	5240 MHz
	42	5210 MHz	-	-
5725~5850 MHz Band 4	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 MHz

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power	For non-beamforming function:				
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3+4
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4
	For beamforming function:				
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4
Power Spectral Density	For non-beamforming function:				
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3+4
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4
	For beamforming function:				
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4

26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	For non-beamforming function:				
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3+4
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4
	For beamforming function:				
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4
6dB Spectrum Bandwidth Measurement	For non-beamforming function:				
	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3+4
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3+4
	For beamforming function:				
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3+4
Radiated Emission Below 1GHz	Normal Link		-	-	-
Radiated Emission Above 1GHz	For non-beamforming function:				
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3+4
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4
	For beamforming function:				
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4

Band Edge Emission	For non-beamforming function:				
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3+4
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4
	For beamforming function:				
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4
Frequency Stability	20 MHz	Band 1&4	-	40/157	1
	40 MHz	Band 1&4	-	38/151	1
	80 MHz	Band 1&4	-	42/155	1

Note: 1. The EUT can only be used at Y axis position.

2. The test configuration, test mode and test software were written in this test report are designated by the applicant.
3. 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.
4. There are two functions of EUT, one is beamforming function, and the other is non-beamforming function for 802.11n/ac in 5GHz band, and all the results have been recorded in this report.

The following test modes were performed for all tests:

For Co-location MPE and Radiated Emission Co-location test:

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA581406) and Radiated Emission Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

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	-
CO01-CB	Conduction	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Multiple Listing

The EUT has three model numbers which are identical to each other in all aspects except for the following table:

Model No.	Interface							
	WAN	LAN	DSL	FXS	HPNA	USB	Wi-Fi 2.4GHz 2×2	Wi-Fi 5GHz 4×4
C2100Z	×1	×4	×1	×2	×1	×1	V	V
VMG9823-B10A	×1	×4	×1	×2	-	×1	V	V
VMG4825-B10A	×1	×4	×1	-	-	×1	V	V

Only the most complex mode for Model No.: C2100Z was performed for all the tests and recorded in this report.

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB (below 1 GHz)

Support Unit	Brand	Model	FCC ID
NB*6	DELL	E4300	DoC
VDSL (Terminal System)	ZYXEL	VES1724-56	N/A
HPNA (Terminal System)	VIVO	HGW-2501	N/A
Flash Disk	Silicon Power	B06	DoC
Phone	PHILIPS	M20	N/A
Phone	PHILIPS	M20	N/A

For Test Site No: 03CH01-CB (above 1GHz)

For non-beamforming function:

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

For beamforming function:

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E4300	DoC
WLAN ac Dongle	Netgear	A6200	PY31220200

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB*6	DELL	E6430	DoC
VDSL (Terminal System)	ZYXEL	VES1724-56	N/A
HPNA (Terminal System)	VIVO	HGW-2501	N/A
Flash Disk	Transcend	639205 7755	DoC
Phone	PHILIPS	M20	N/A
Phone	PHILIPS	M20	N/A

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

3.9. Table for Parameters of Test Software Setting

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

Test Function	Non-beamforming function					
Test Software Version	DOS					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	19.5	19.5	19.5	21	23	21
802.11ac MCS0/Nss1 VHT20	19.5	19.5	19.5	19	23	19
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	16		22		18	19
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz				5775 MHz	
	15				18	

Test Function	Beamforming function					
Test Software Version	DOS					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11ac MCS0/Nss1 VHT20	19	19.5	19.5	19	19.5	19.5
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	14		18.5		15	19
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz				5775 MHz	
	14				18	

3.10. EUT Operation during Test

For non-beamforming function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

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

The program was executed as follows:

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

3.11. Duty Cycle

For non-beamforming function:

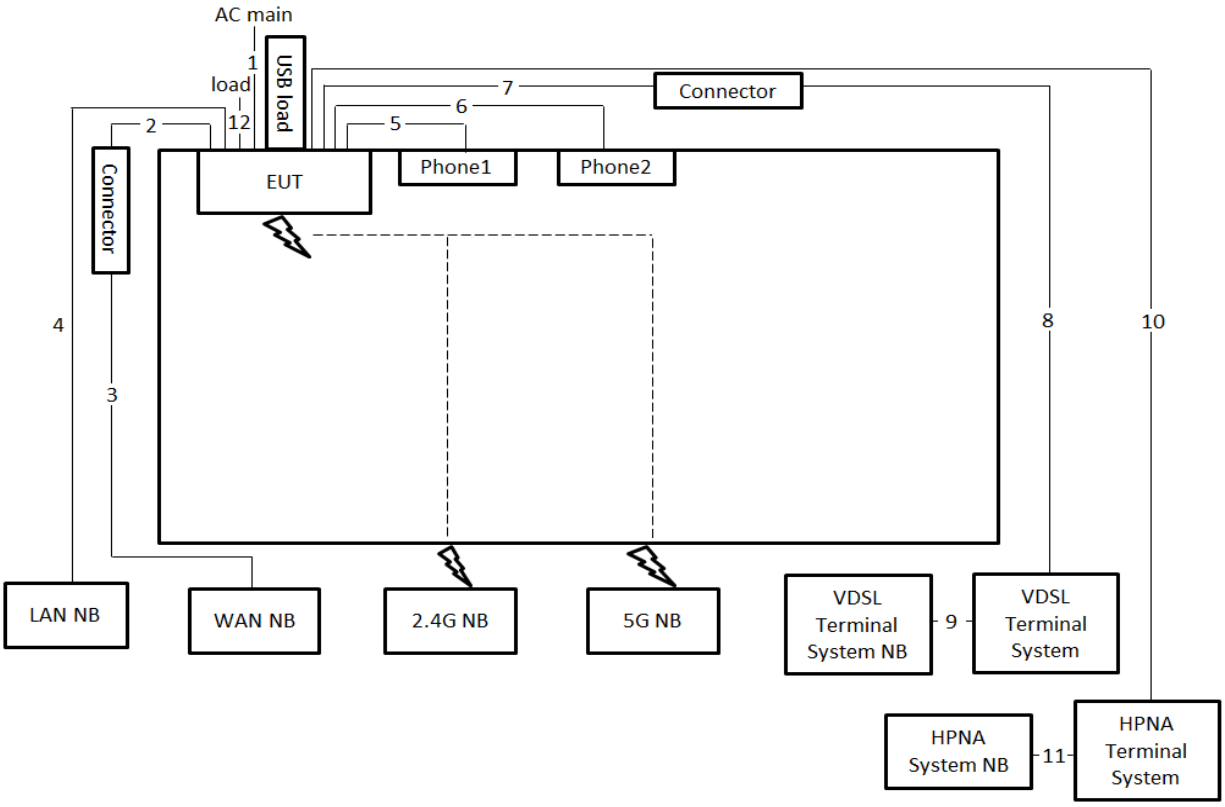
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	5.360	5.420	98.89	0.05	0.01
802.11ac MCS0/Nss1 VHT20	5.000	5.040	99.21	0.03	0.01
802.11ac MCS0/Nss1 VHT40	2.420	2.460	98.37	0.07	0.01
802.11ac MCS0/Nss1 VHT80	1.138	1.232	92.35	0.35	0.88

For beamforming function:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	3.617	3.762	96.15	0.17	0.28
802.11ac MCS0/Nss1 VHT40	2.946	3.076	95.76	0.19	0.34
802.11ac MCS0/Nss1 VHT80	1.699	1.788	95.01	0.22	0.59

3.12. Test Configurations

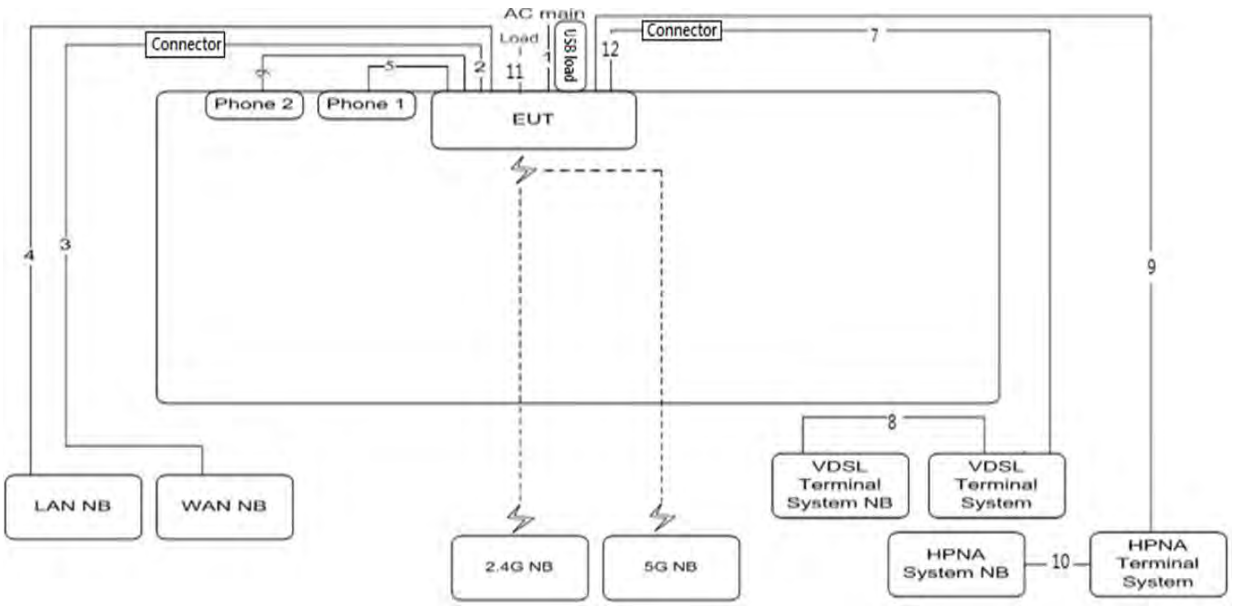
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	Ethernet cable	No	1.8m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m
5	RJ-11 cable	No	1.5m
6	RJ-11 cable	No	1.5m
7	Phone cable	No	3.66m
8	RJ-11 cable	No	10m
9	RJ-45 cable	No	1.5m
10	Coaxial cable	Yes	10m
11	RJ-45 cable	No	1.5m
12	RJ-45 cable*3	No	1.5m

3.12.2. Radiation Emissions Test Configuration

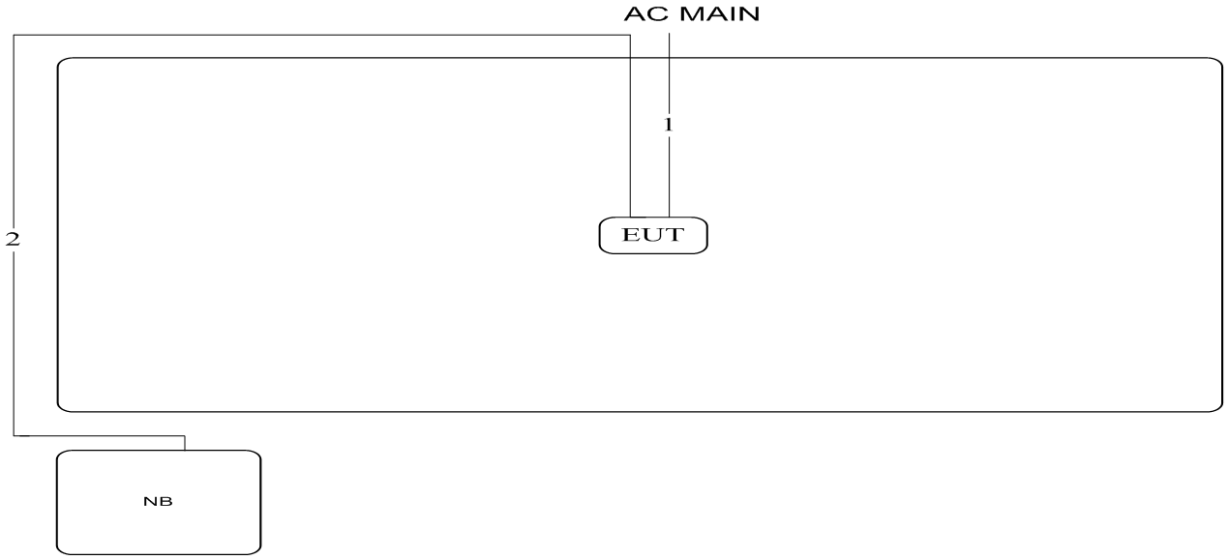
Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	1.5m
2	Ethernet cable	No	1.8m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m
5	RJ-11 cable	No	1.5m
6	RJ-11 cable	No	1.5m
7	RJ-11 cable	No	10m
8	RJ-45 cable	No	1.5m
9	Coaxial cable	Yes	10m
10	RJ-45 cable	No	1.5m
11	RJ-45 cable*3	No	1.5m
12	Phone cable	No	3.66m

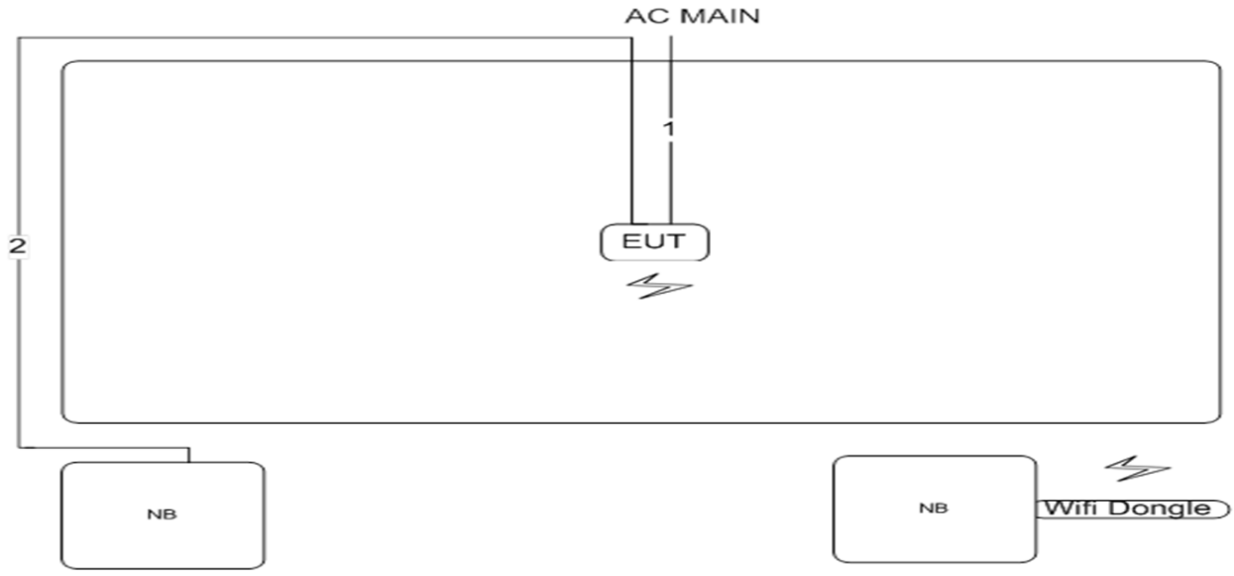
Test Configuration: above 1GHz

For non-beamforming function:



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

For beamforming function:



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

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product that is designed to connect to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

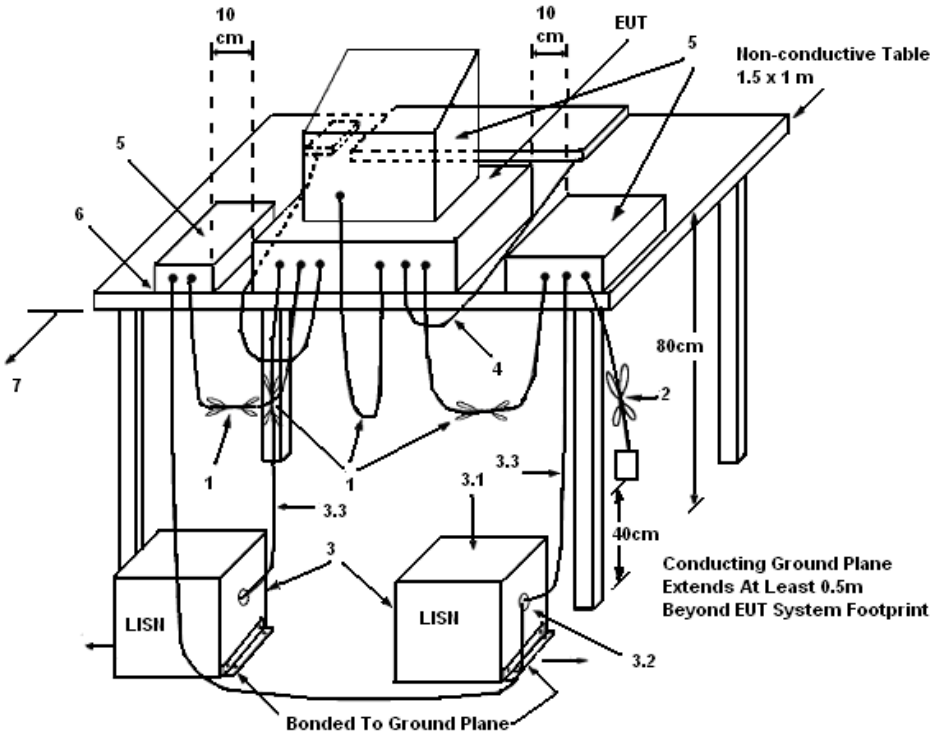
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.

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

(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

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

(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

(5) Non-EUT components of EUT system being tested.

(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

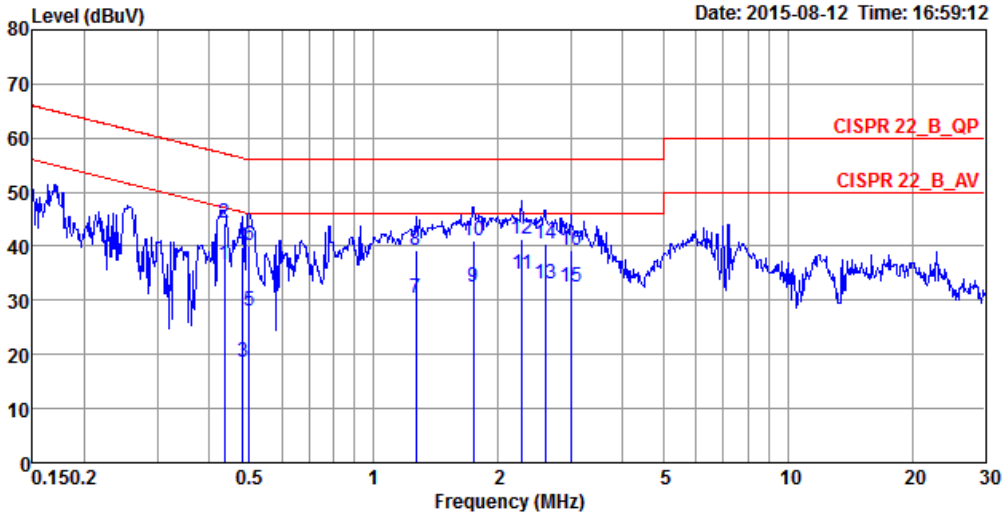
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

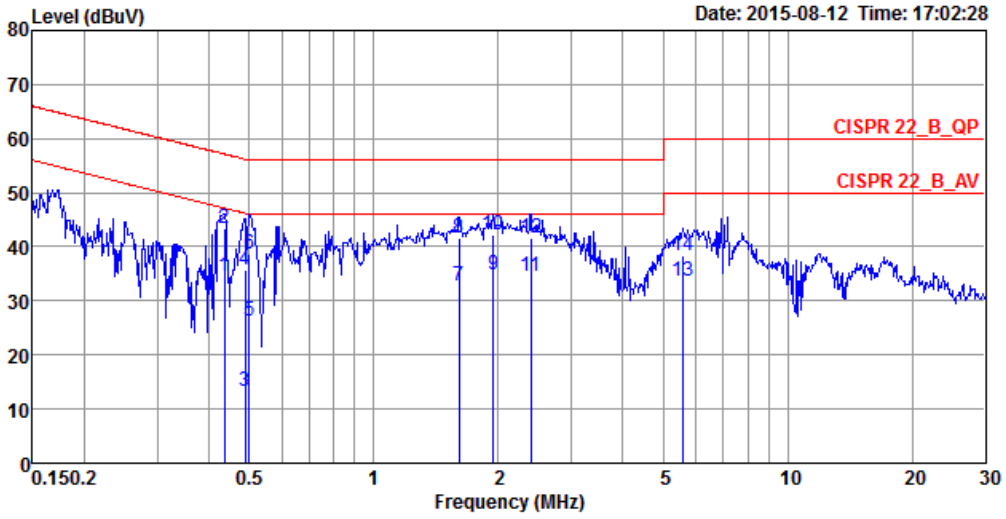
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	66%
Test Engineer	Hank Yang	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.4351	36.68	-10.47	47.15	26.71	9.93	0.04	LINE	Average
2	0.4351	44.28	-12.87	57.15	34.31	9.93	0.04	LINE	QP
3	0.4837	18.72	-27.55	46.27	8.74	9.94	0.04	LINE	Average
4	0.4837	39.95	-16.32	56.27	29.97	9.94	0.04	LINE	QP
5	0.4994	27.92	-18.09	46.01	17.94	9.94	0.04	LINE	Average
6	0.4994	40.02	-15.99	56.01	30.04	9.94	0.04	LINE	QP
7	1.2621	30.55	-15.45	46.00	20.53	9.97	0.05	LINE	Average
8	1.2621	39.34	-16.66	56.00	29.32	9.97	0.05	LINE	QP
9	1.7437	32.44	-13.56	46.00	22.40	9.98	0.06	LINE	Average
10	1.7437	41.09	-14.91	56.00	31.05	9.98	0.06	LINE	QP
11	2.2847	34.92	-11.08	46.00	24.86	10.00	0.06	LINE	Average
12	2.2847	41.23	-14.77	56.00	31.17	10.00	0.06	LINE	QP
13	2.5945	32.96	-13.04	46.00	22.91	10.00	0.05	LINE	Average
14	2.5945	40.30	-15.70	56.00	30.25	10.00	0.05	LINE	QP
15	2.9935	32.40	-13.60	46.00	22.34	10.01	0.05	LINE	Average
16	2.9935	39.14	-16.86	56.00	29.08	10.01	0.05	LINE	QP

Temperature	23°C	Humidity	66%
Test Engineer	Hank Yang	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.4351	34.61	-12.54	47.15	24.78	9.79	0.04	NEUTRAL	Average
2	0.4351	43.50	-13.65	57.15	33.67	9.79	0.04	NEUTRAL	QP
3	0.4889	13.35	-32.84	46.19	3.52	9.79	0.04	NEUTRAL	Average
4	0.4889	35.58	-20.61	56.19	25.75	9.79	0.04	NEUTRAL	QP
5	0.4994	26.26	-19.75	46.01	16.43	9.79	0.04	NEUTRAL	Average
6	0.4994	38.59	-17.42	56.01	28.76	9.79	0.04	NEUTRAL	QP
7	1.6105	32.68	-13.32	46.00	22.79	9.83	0.06	NEUTRAL	Average
8	1.6105	41.76	-14.24	56.00	31.87	9.83	0.06	NEUTRAL	QP
9	1.9489	34.69	-11.31	46.00	24.79	9.84	0.06	NEUTRAL	Average
10	1.9489	42.35	-13.65	56.00	32.45	9.84	0.06	NEUTRAL	QP
11	2.3962	34.42	-11.58	46.00	24.51	9.85	0.06	NEUTRAL	Average
12	2.3962	41.63	-14.37	56.00	31.72	9.85	0.06	NEUTRAL	QP
13	5.5936	33.61	-16.39	50.00	23.57	9.92	0.12	NEUTRAL	Average
14	5.5936	38.25	-21.75	60.00	28.21	9.92	0.12	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

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

4.2.4. Test Setup Layout

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

This test setup layout is the same as that shown in section 4.6.4.

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	25°C	Humidity	56%
Test Engineer	Serway Li	Test Function	Non-beamforming function

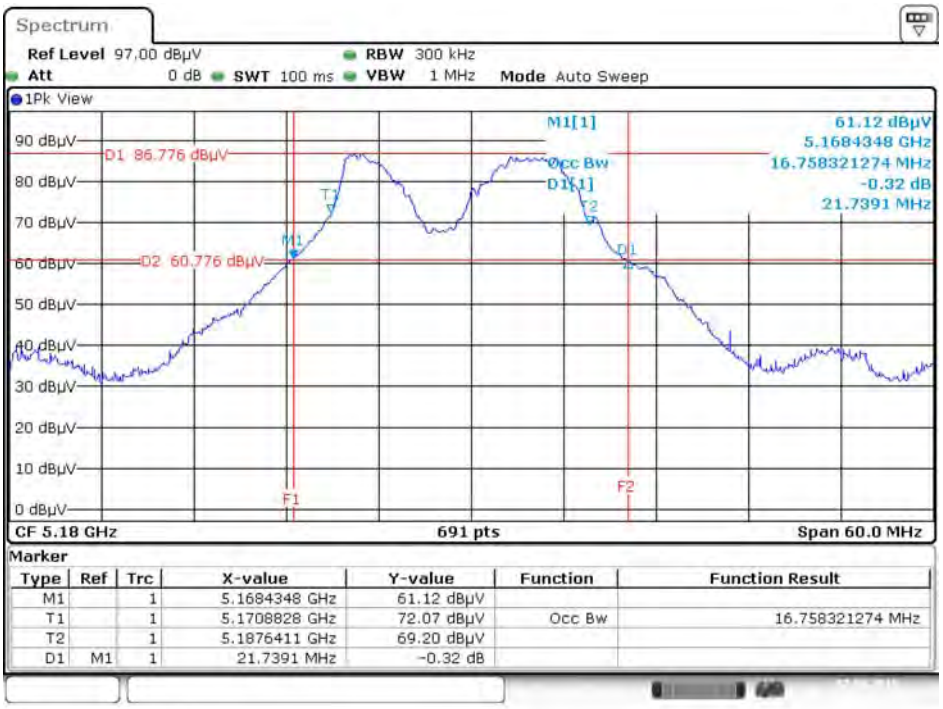
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	21.74	16.76
	5200 MHz	21.22	16.85
	5240 MHz	21.91	16.85
	5745 MHz	21.74	17.02
	5785 MHz	21.65	17.02
	5825 MHz	21.57	16.85
802.11ac MCS0/Nss1 VHT20	5180 MHz	22.87	18.41
	5200 MHz	22.96	18.41
	5240 MHz	22.70	18.15
	5745 MHz	23.13	17.63
	5785 MHz	22.78	17.71
	5825 MHz	22.78	17.71
802.11ac MCS0/Nss1 VHT40	5190 MHz	41.59	35.02
	5230 MHz	40.58	34.30
	5755 MHz	41.45	35.17
	5795 MHz	41.74	35.60
802.11ac MCS0/Nss1 VHT80	5210 MHz	79.71	73.81
	5775 MHz	79.13	73.52

Temperature	25℃	Humidity	56%
Test Engineer	Serway Li	Test Function	Beamforming function

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5180 MHz	22.43	18.06
	5200 MHz	22.87	18.15
	5240 MHz	22.78	18.06
	5745 MHz	22.61	17.97
	5785 MHz	22.61	17.97
	5825 MHz	22.70	17.97
802.11ac MCS0/Nss1 VHT40	5190 MHz	42.75	37.19
	5230 MHz	42.75	37.05
	5755 MHz	42.61	36.90
	5795 MHz	43.48	37.19
802.11ac MCS0/Nss1 VHT80	5210 MHz	81.74	75.54
	5775 MHz	80.87	75.54

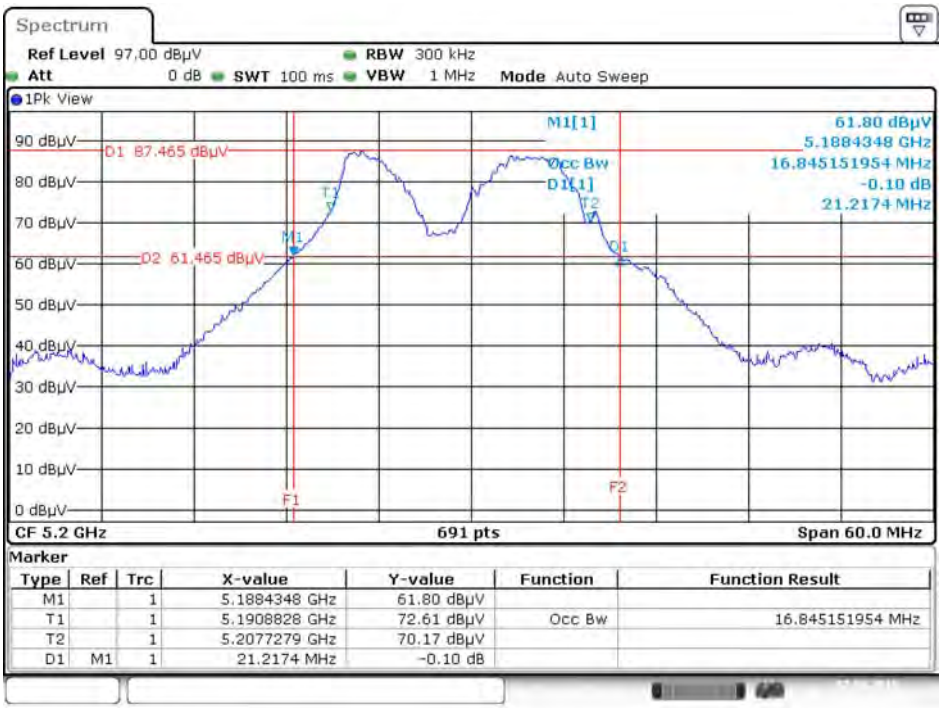
For non-beamforming function:

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5180 MHz



Date: 7.SEP.2015 23:27:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5200 MHz



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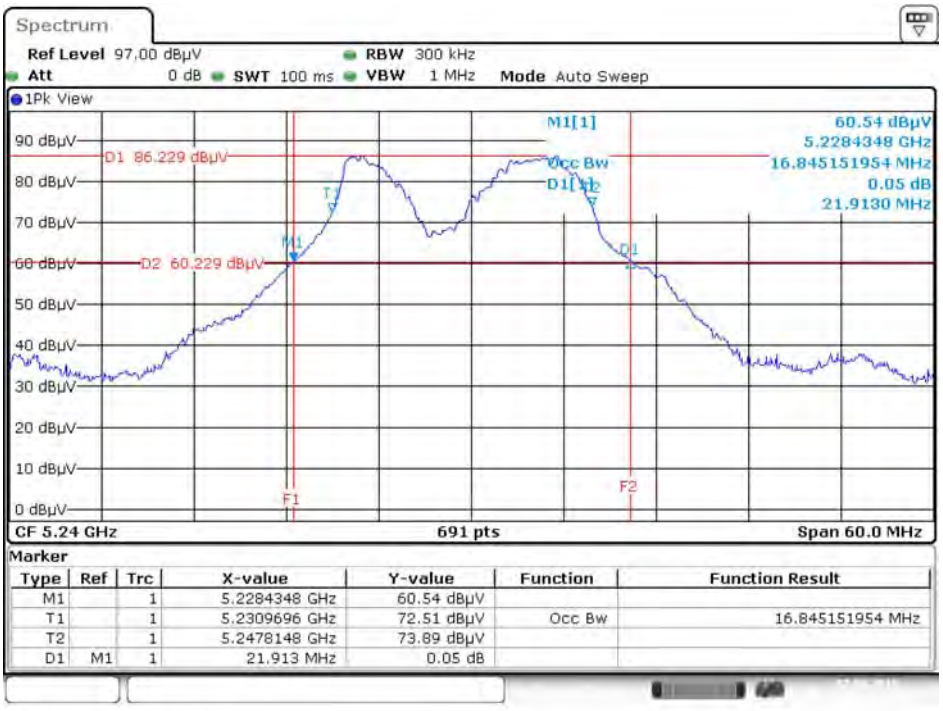
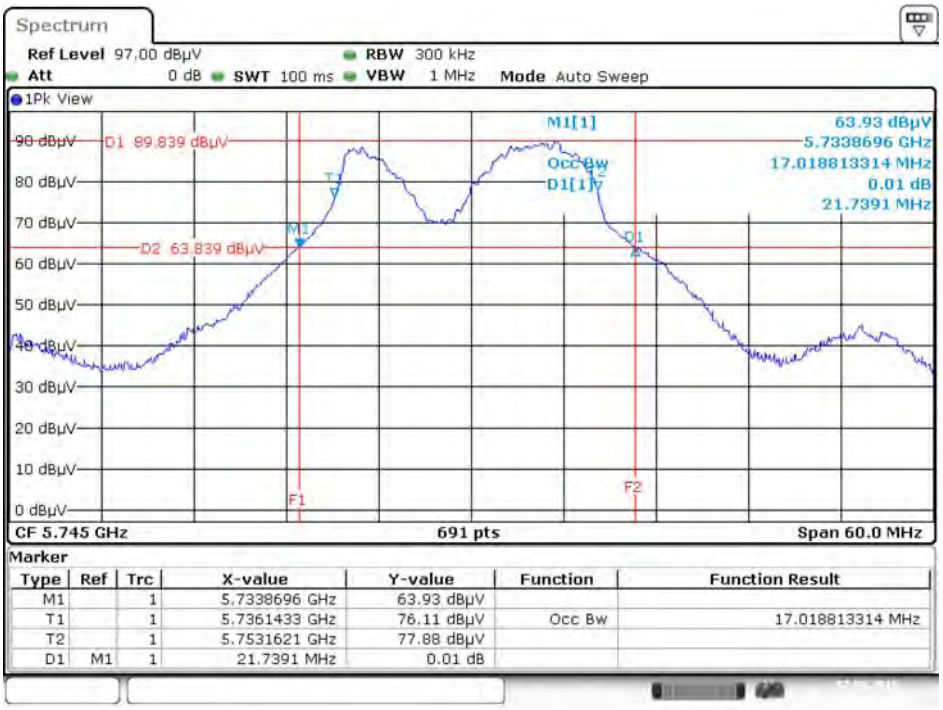
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5240 MHz



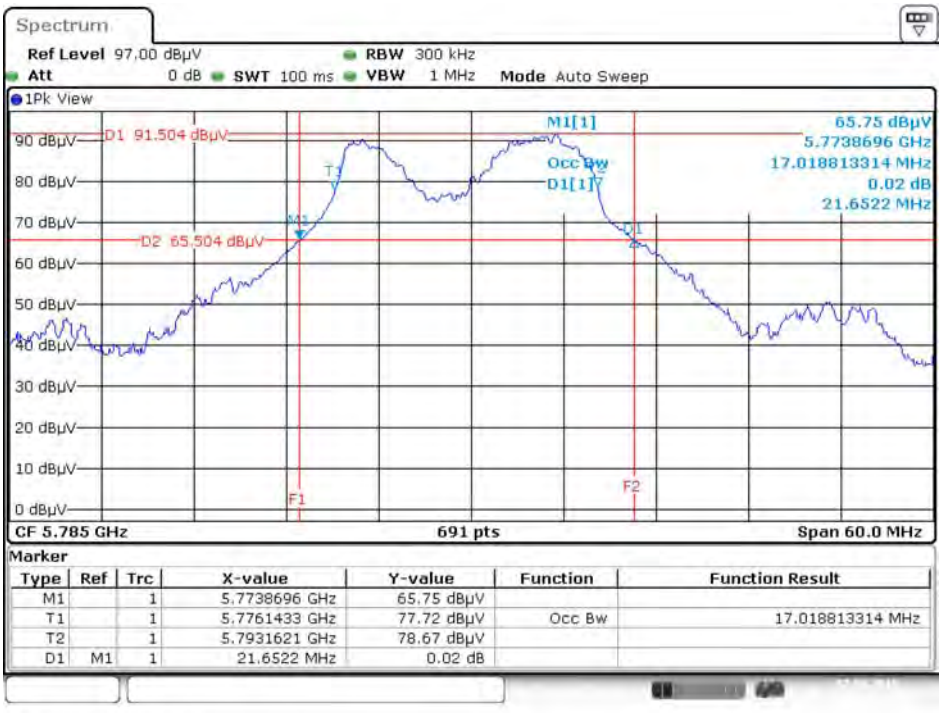
Date: 7.SEP.2015 23:30:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



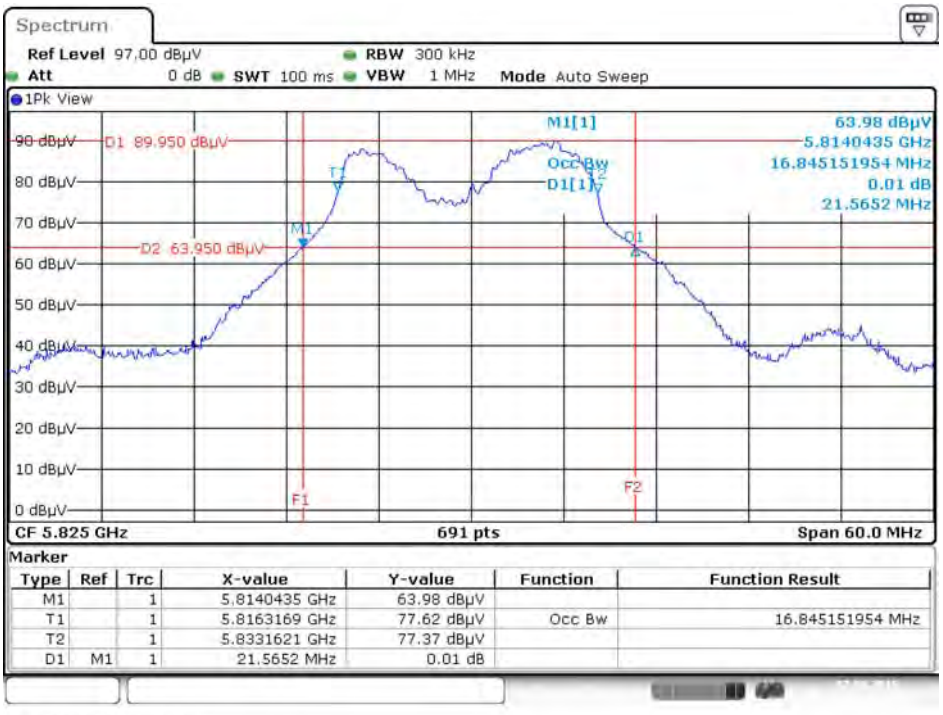
Date: 7.SEP.2015 23:31:41

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



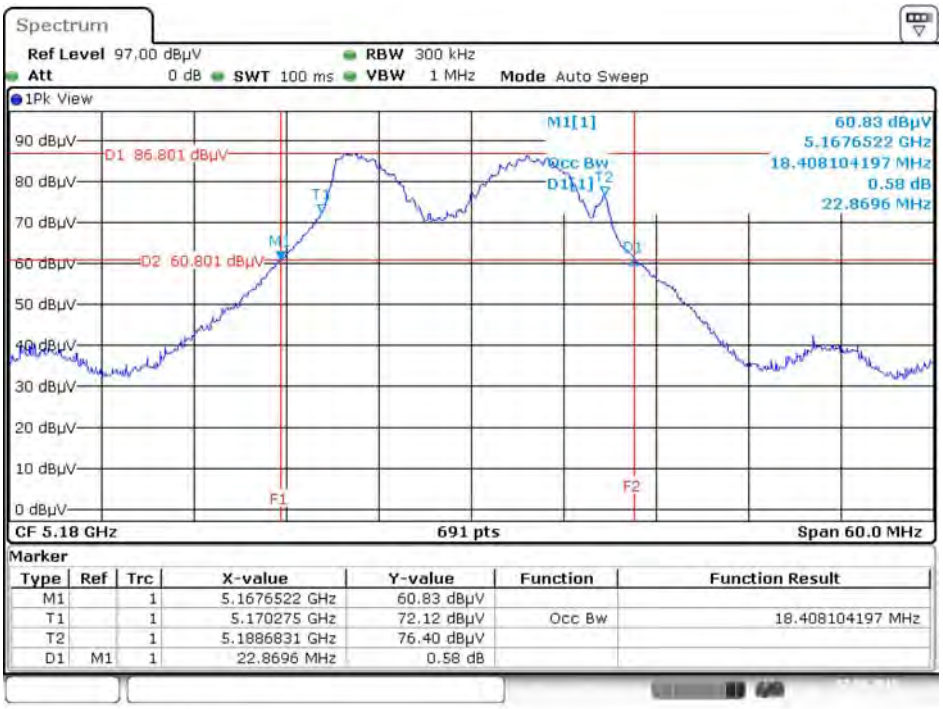
Date: 7.SEP.2015 23:33:25

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



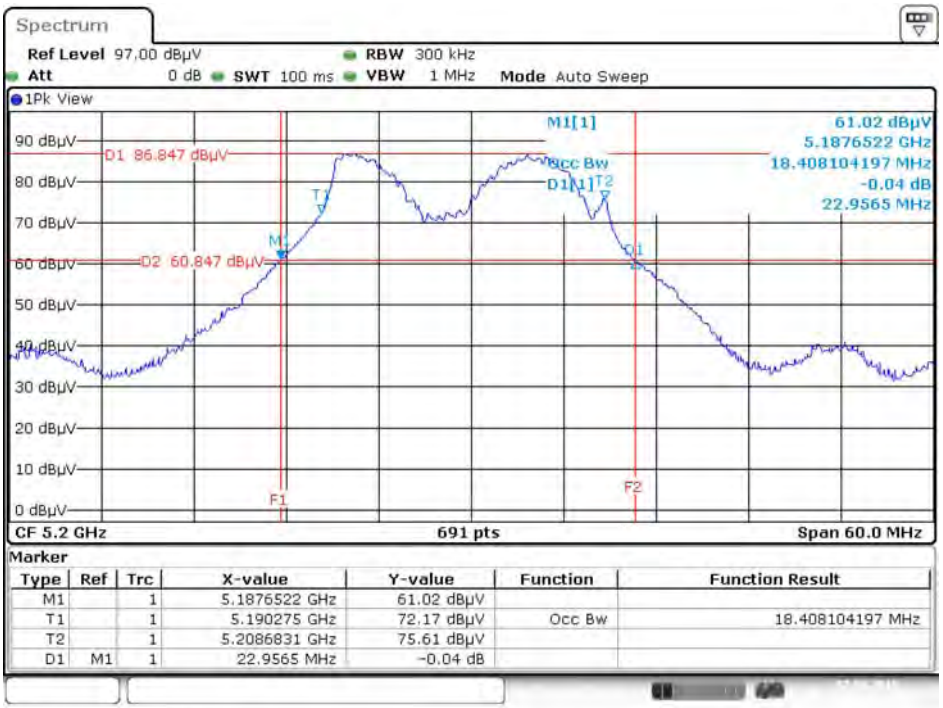
Date: 7.SEP.2015 23:35:07

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5180 MHz



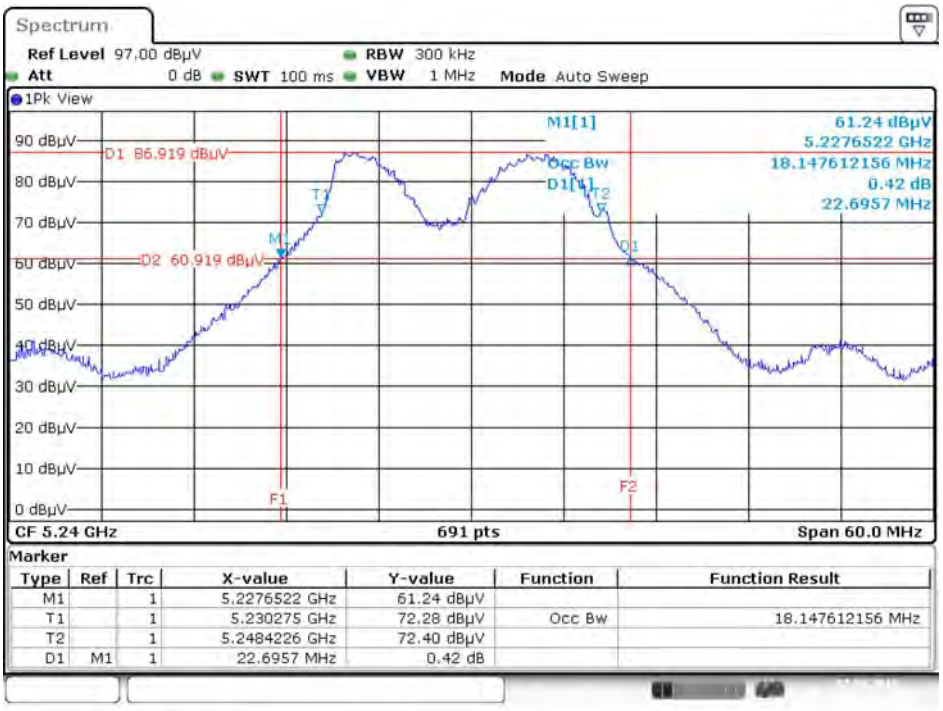
Date: 7.SEP.2015 23:38:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5200 MHz



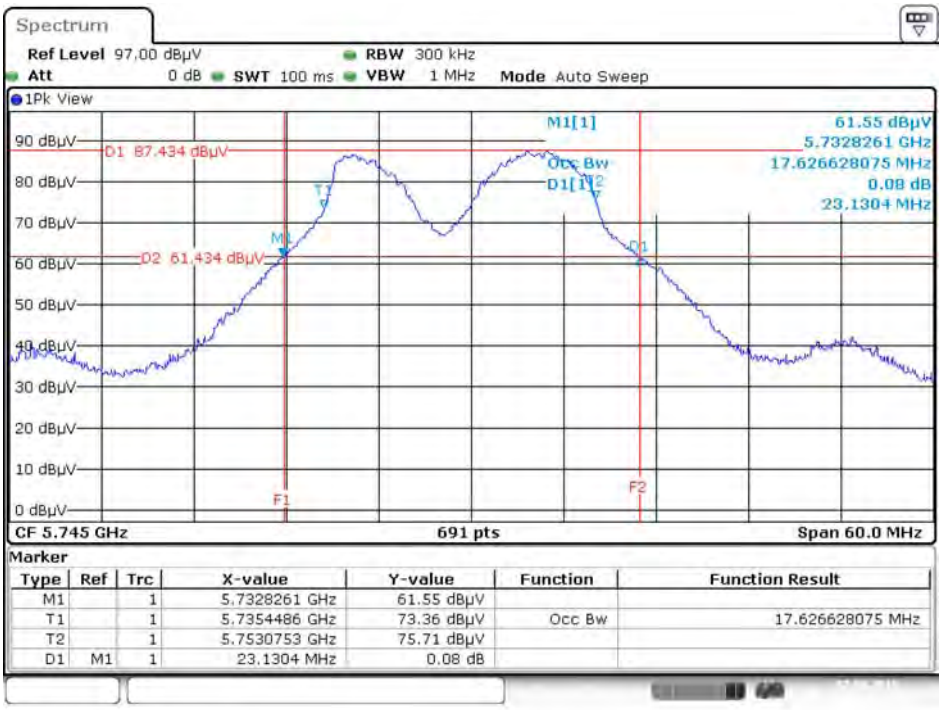
Date: 7.SEP.2015 23:40:33

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5240 MHz



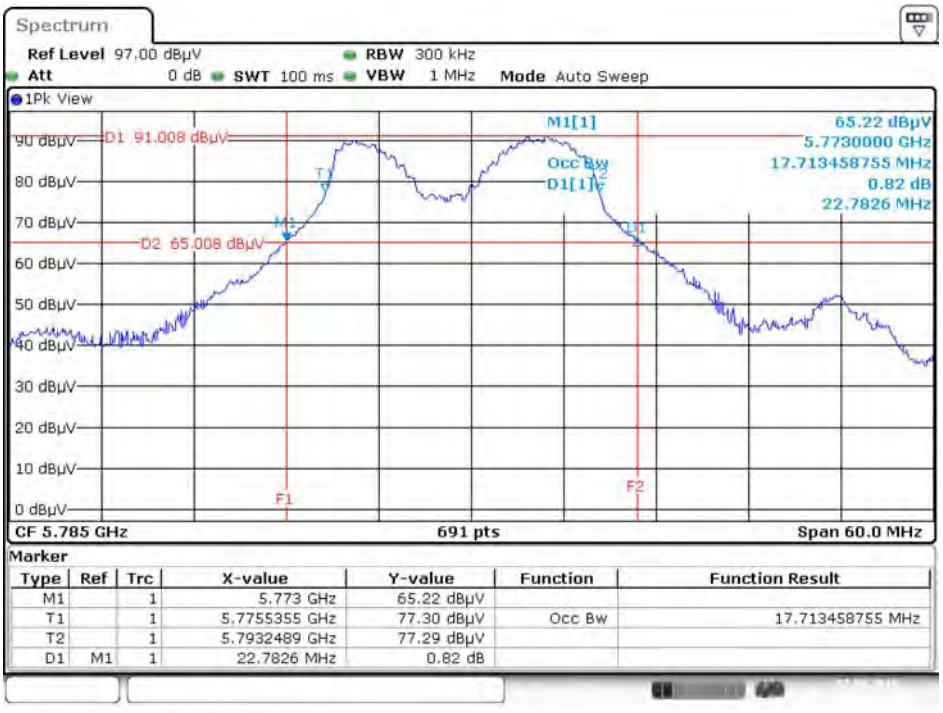
Date: 7.SEP.2015 23:42:04

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



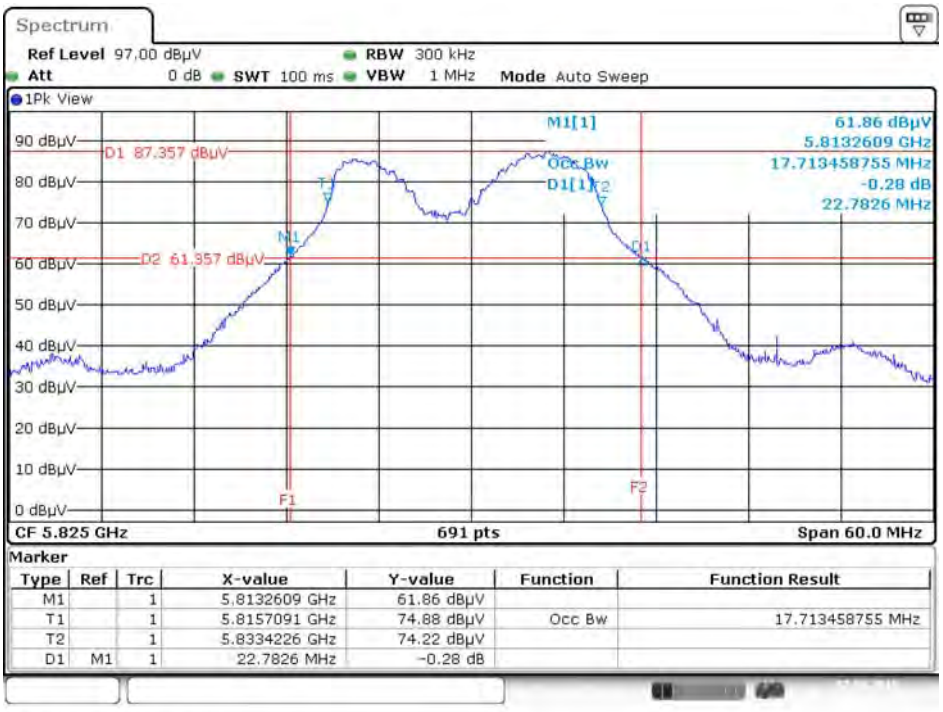
Date: 7.SEP.2015 23:45:58

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



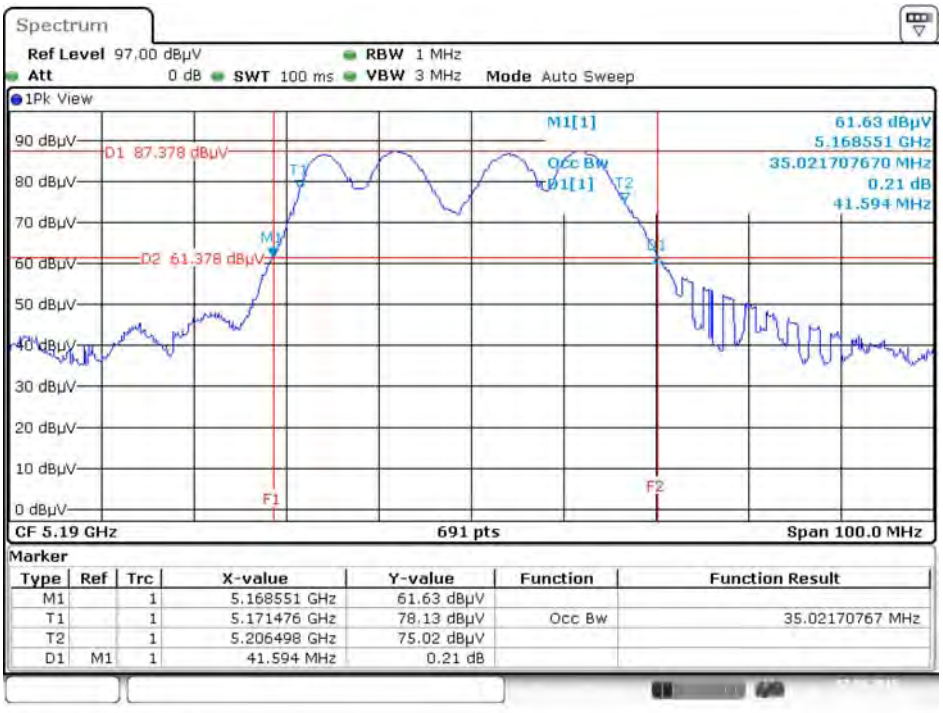
Date: 7.SEP.2015 23:49:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



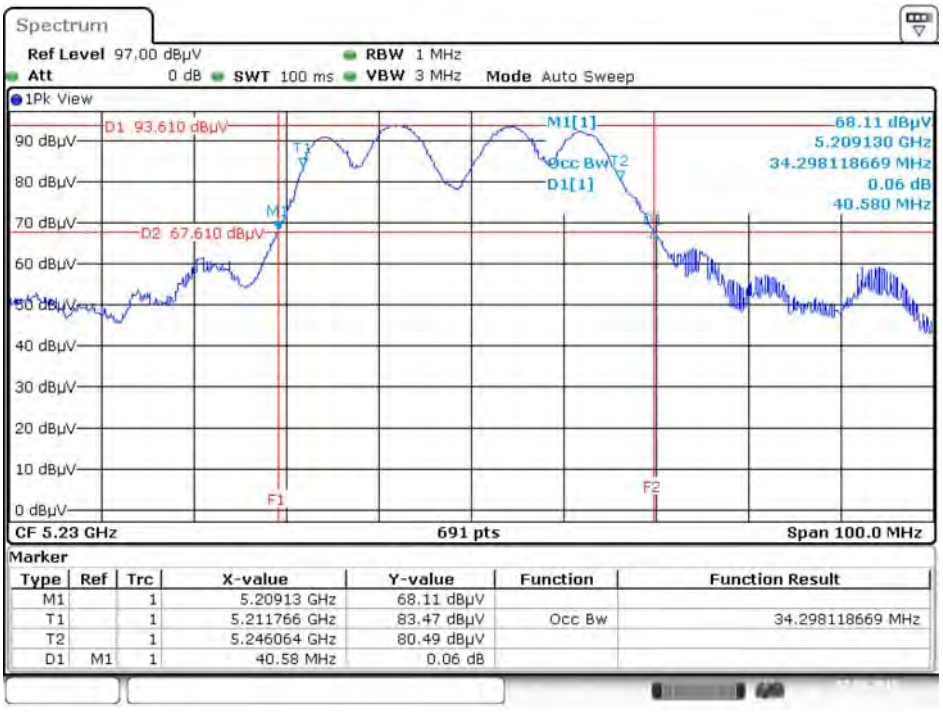
Date: 7.SEP.2015 23:50:48

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5190 MHz



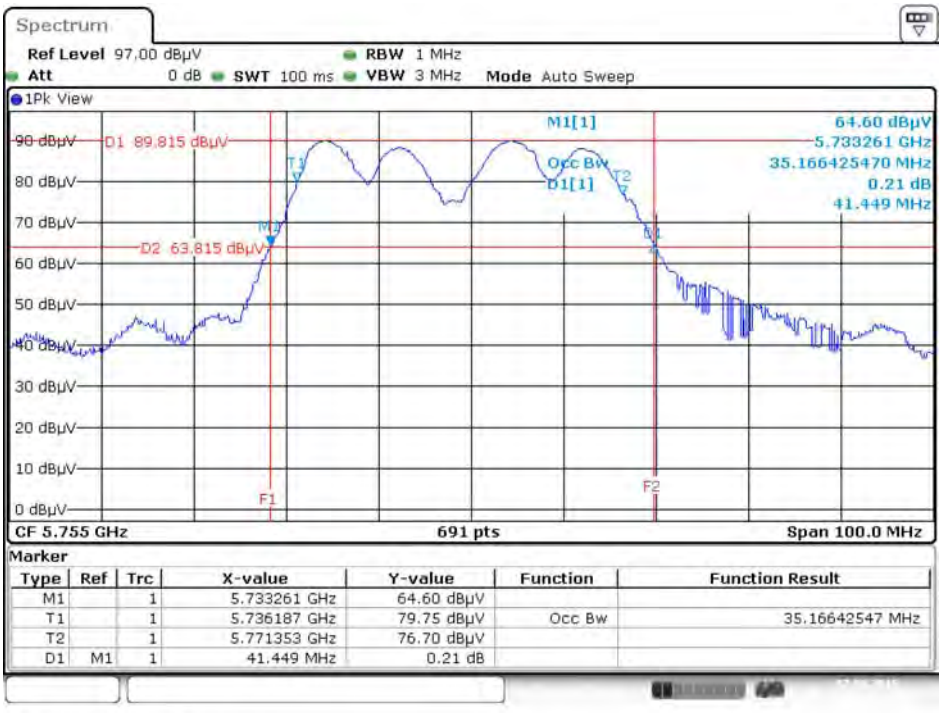
Date: 7.SEP.2015 23:53:39

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5230 MHz



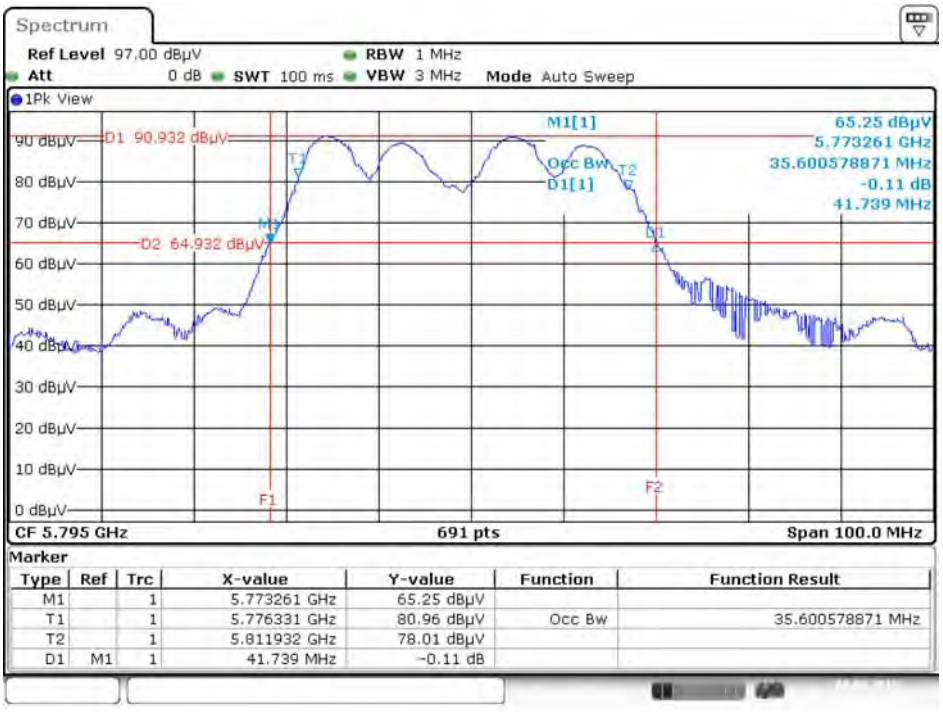
Date: 7.SEP.2015 23:55:43

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5755 MHz



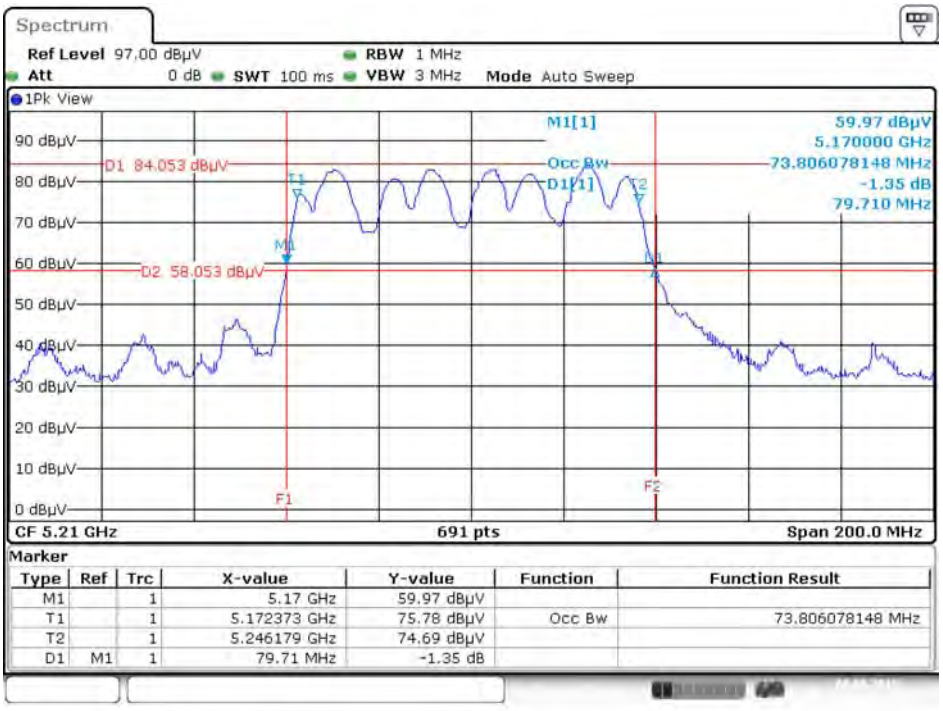
Date: 7.SEP.2015 23:58:40

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



Date: 8.SEP.2015 00:00:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5210 MHz



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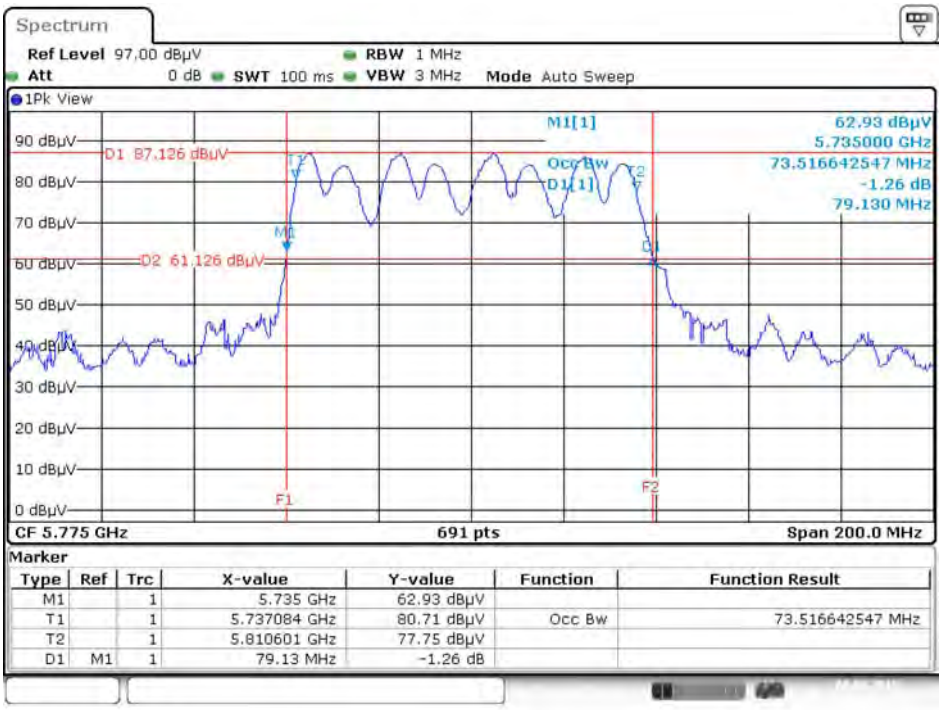
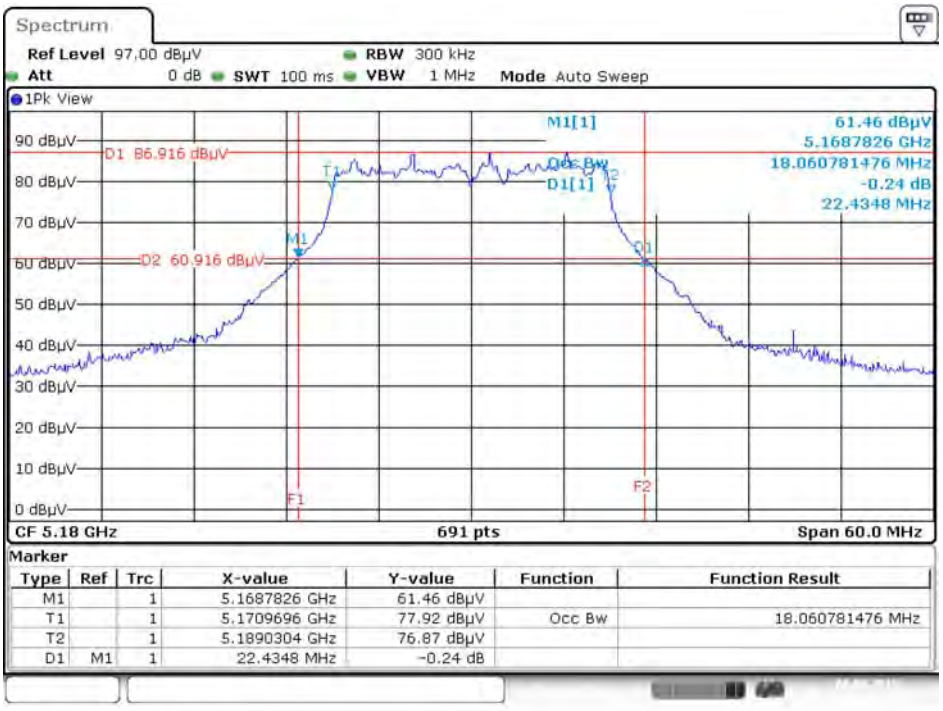
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 8.SEP.2015 00:23:47

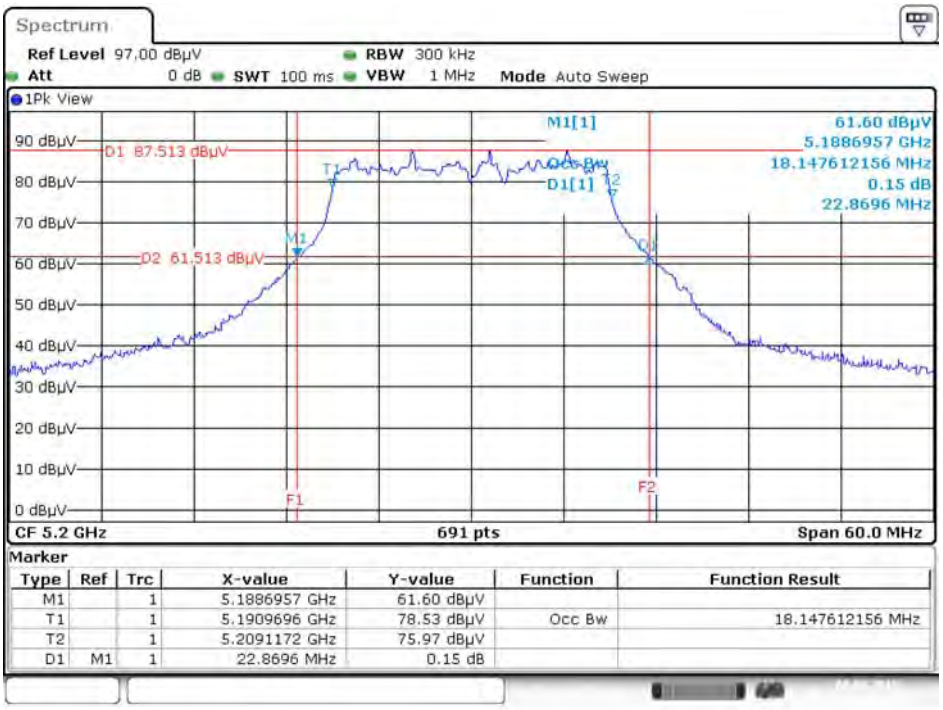
For beamforming function:

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5180 MHz



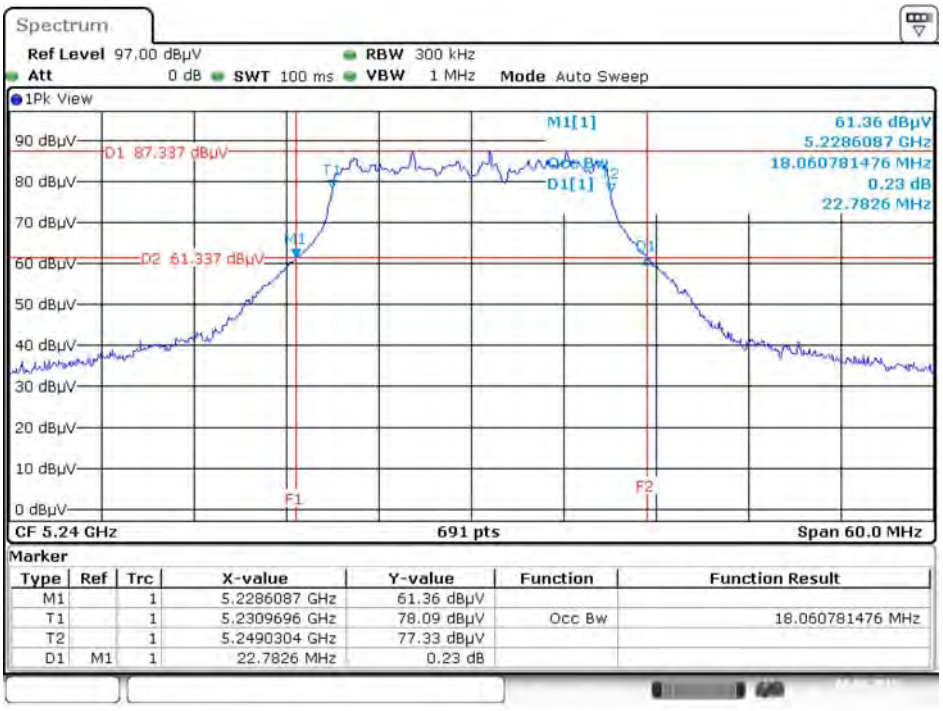
Date: 8.SEP.2015 00:27:09

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5200 MHz



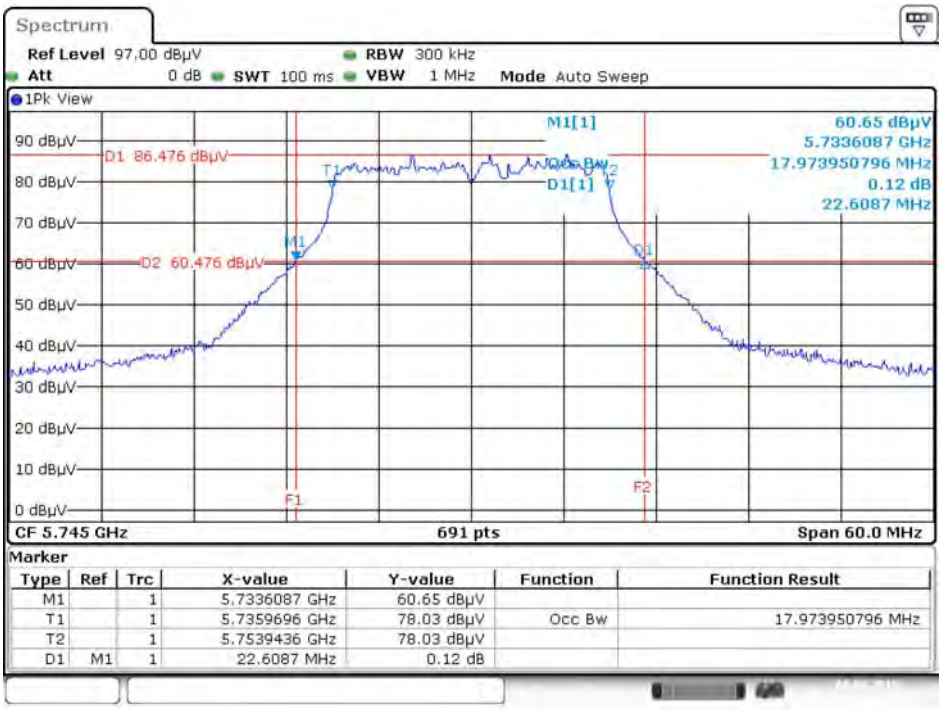
Date: 8.SEP.2015 00:36:22

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5240 MHz



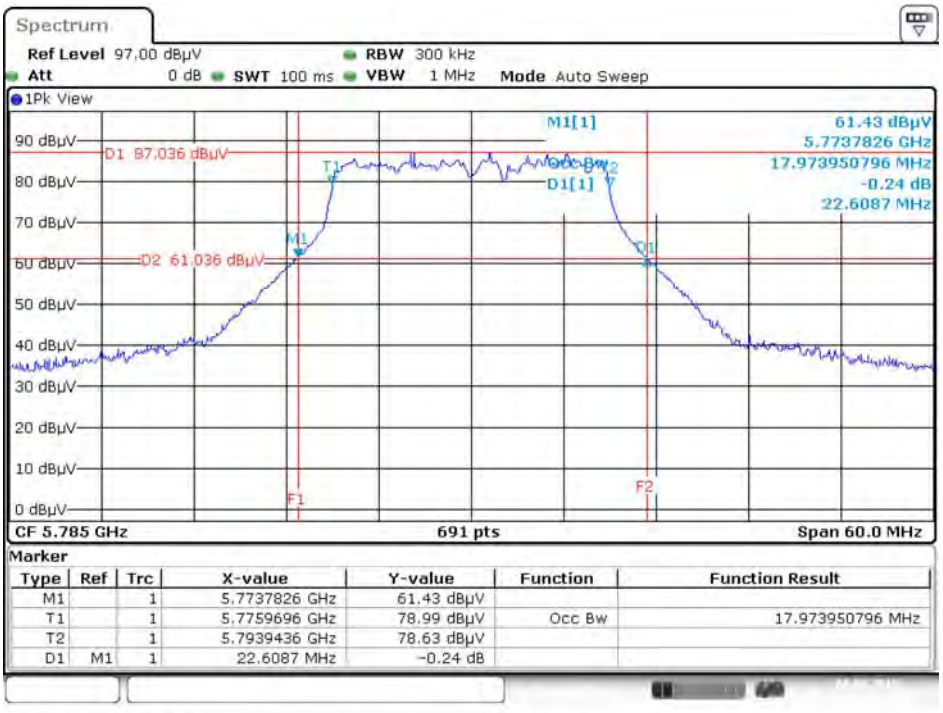
Date: 8.SEP.2015 00:38:15

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



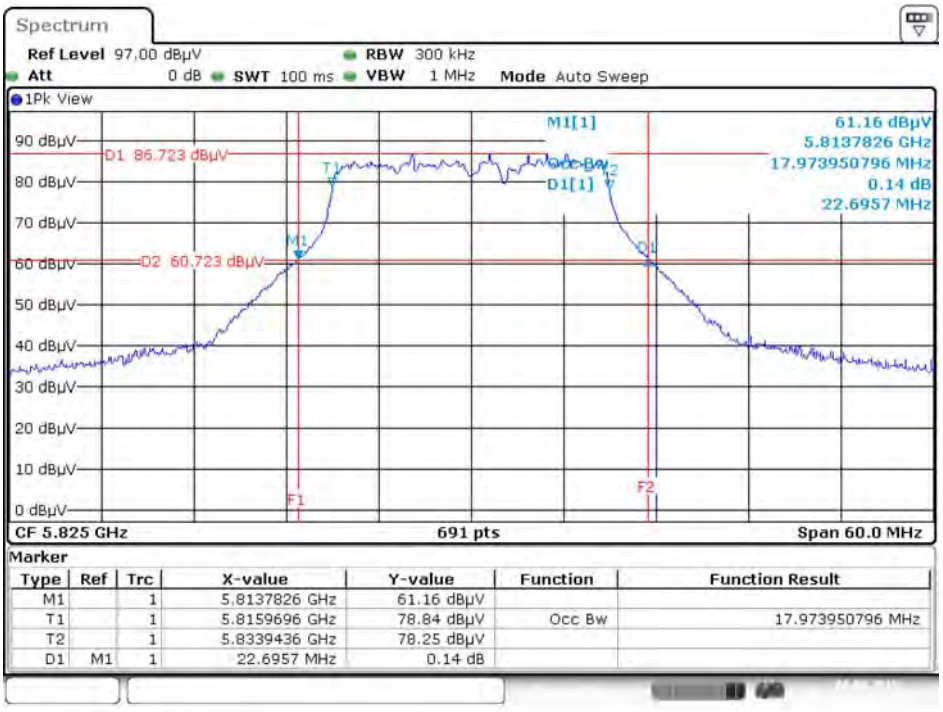
Date: 8.SEP.2015 00:40:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



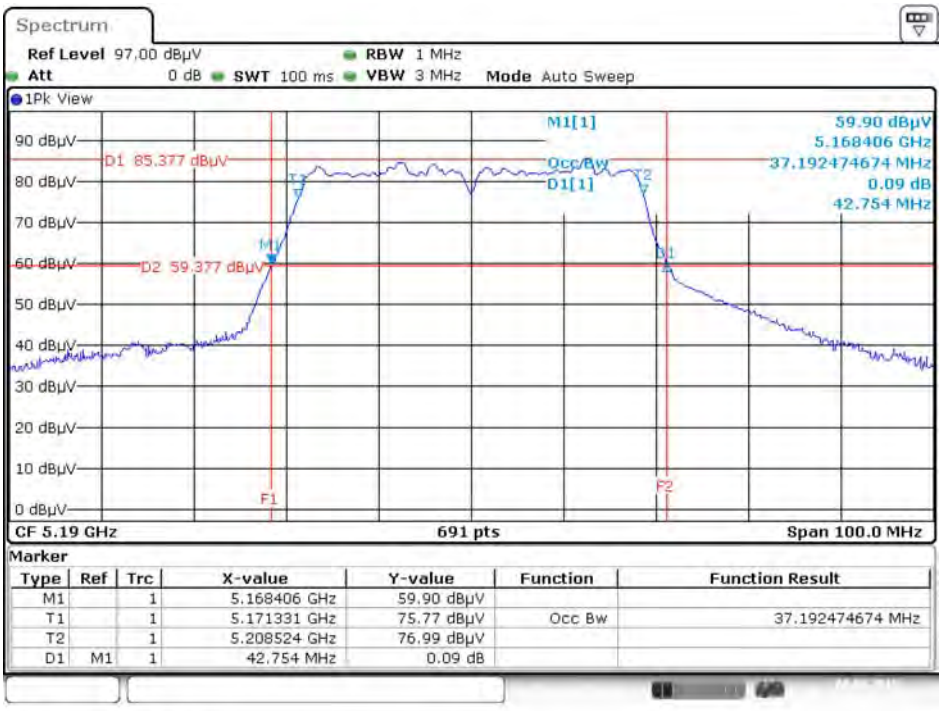
Date: 8.SEP.2015 00:41:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



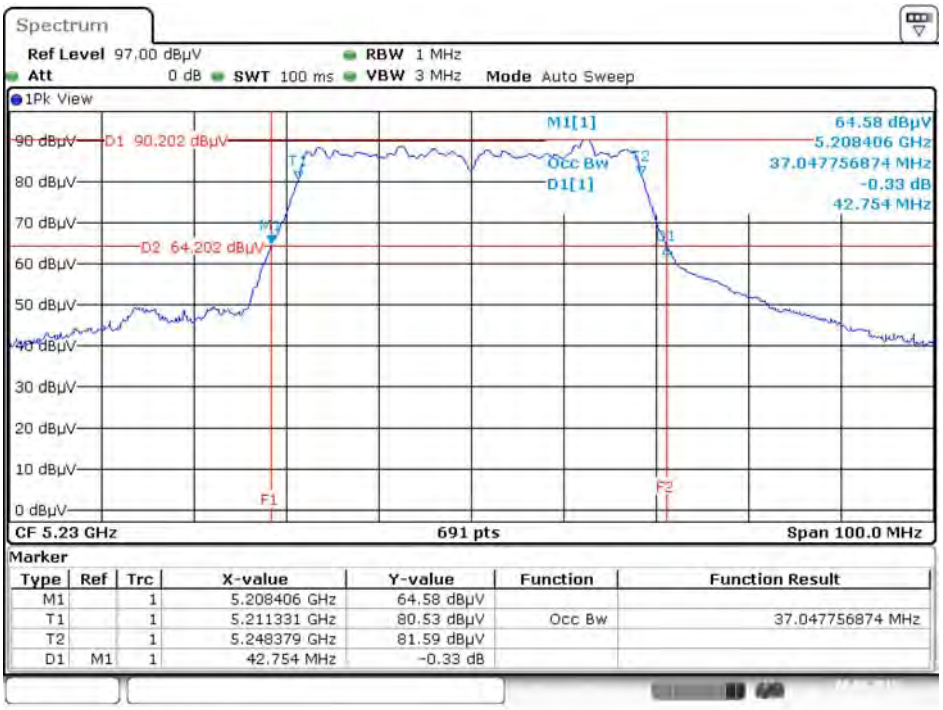
Date: 8.SEP.2015 00:43:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5190 MHz



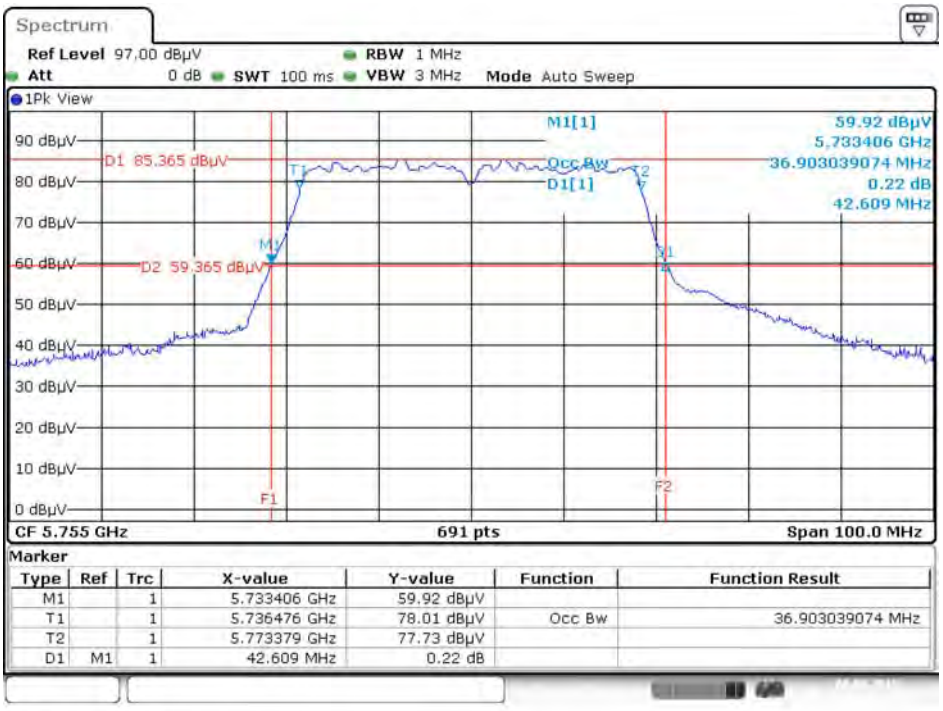
Date: 8.SEP.2015 00:45:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5230 MHz



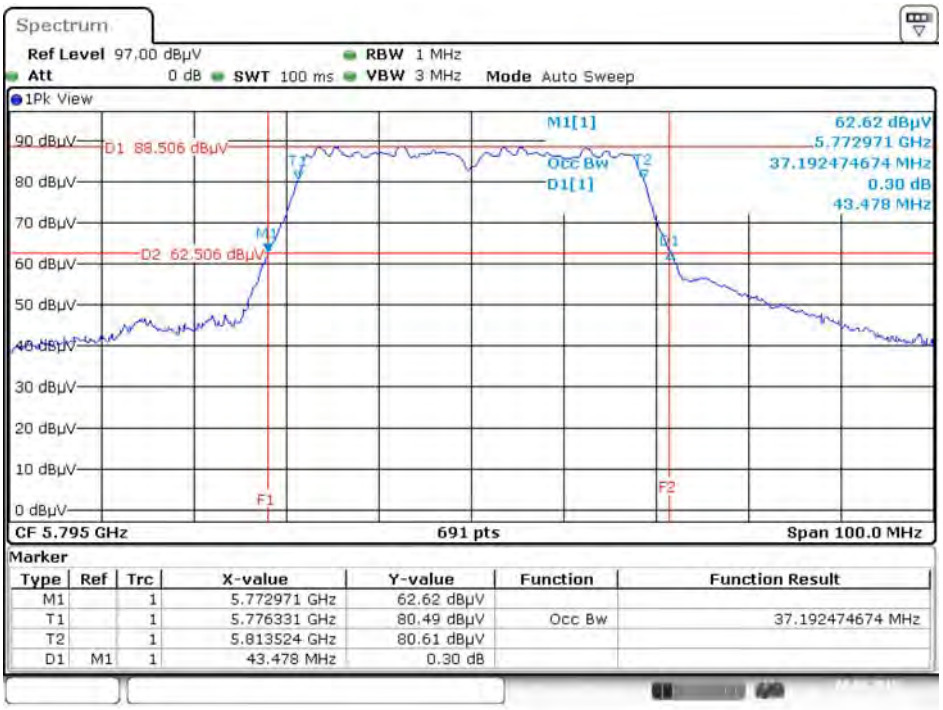
Date: 8.SEP.2015 00:46:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5755 MHz



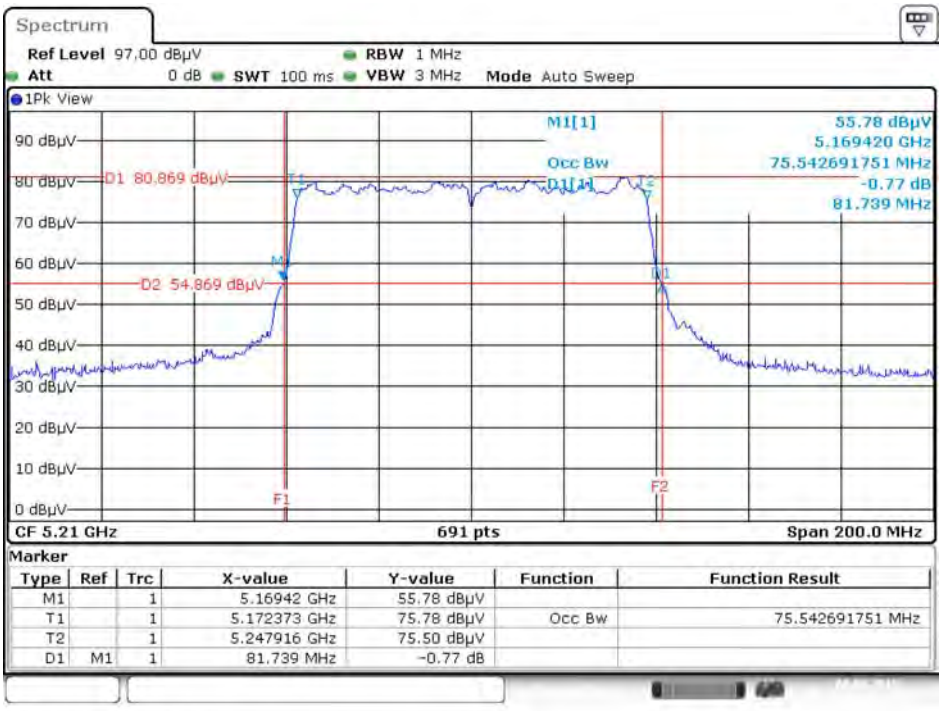
Date: 8.SEP.2015 00:48:18

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



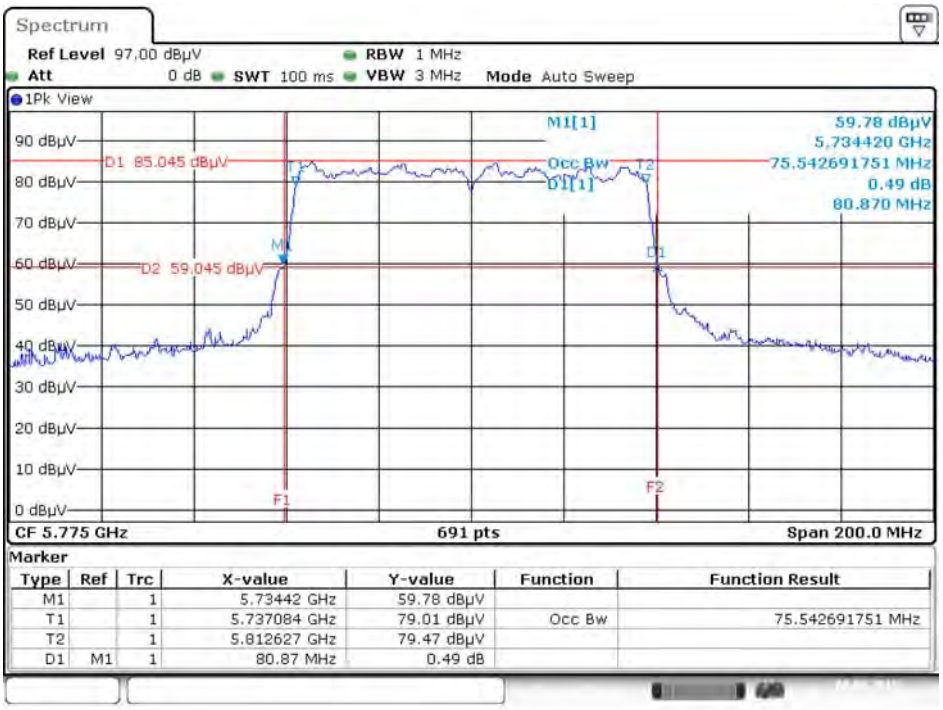
Date: 8.SEP.2015 00:50:15

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5210 MHz



Date: 8.SEP.2015 00:53:00

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 8.SEP.2015 00:54:36

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

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

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

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 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.

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

This test setup layout is the same as that shown in section 4.6.4.

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

Temperature	25°C	Humidity	56%
Test Engineer	Serway Li	Test Function	Non-beamforming function

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	15.07	500	Complies
	5785 MHz	15.07	500	Complies
	5825 MHz	15.48	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.41	500	Complies
	5785 MHz	16.23	500	Complies
	5825 MHz	16.35	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	31.30	500	Complies
	5795 MHz	31.88	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	70.44	500	Complies

Temperature	25°C	Humidity	56%
Test Engineer	Serway Li	Test Function	Beamforming function

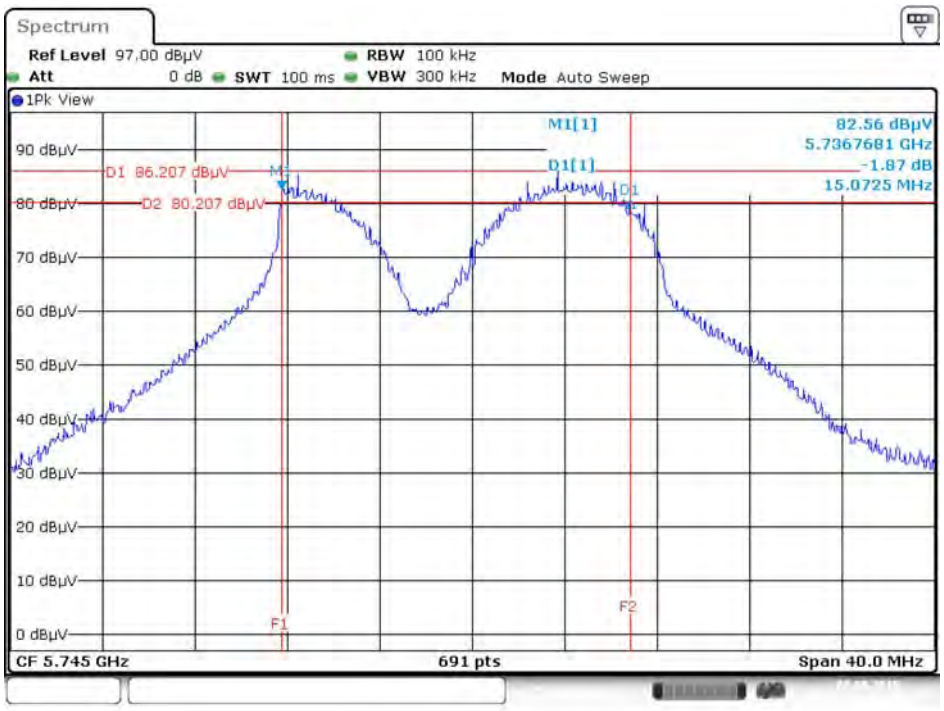
Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.99	500	Complies
	5785 MHz	16.99	500	Complies
	5825 MHz	16.41	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.36	500	Complies
	5795 MHz	34.78	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	73.91	500	Complies

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

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

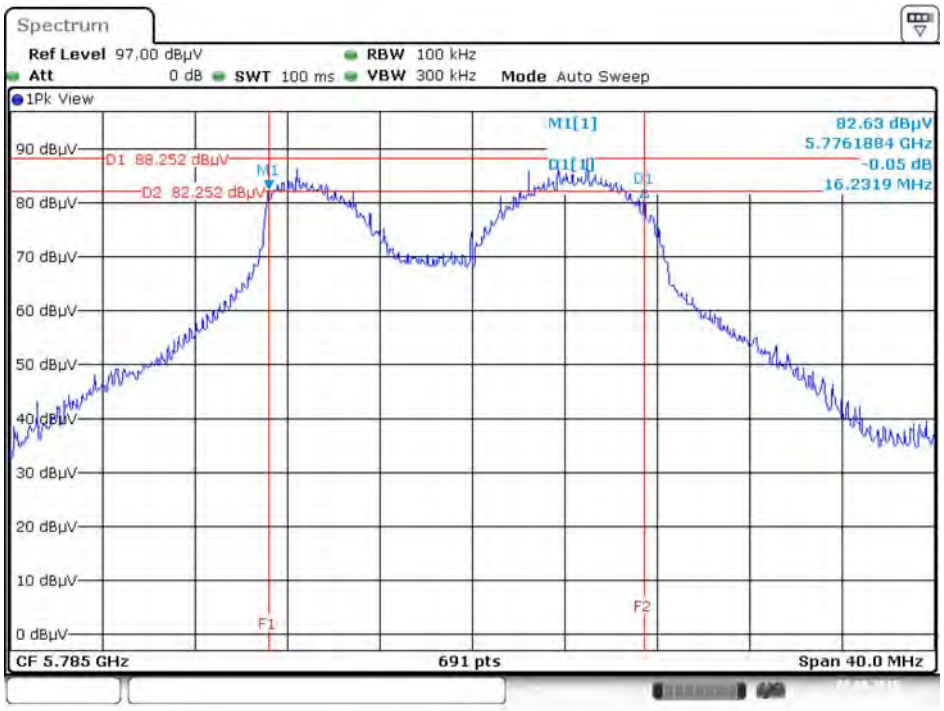
For non-beamforming function:

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



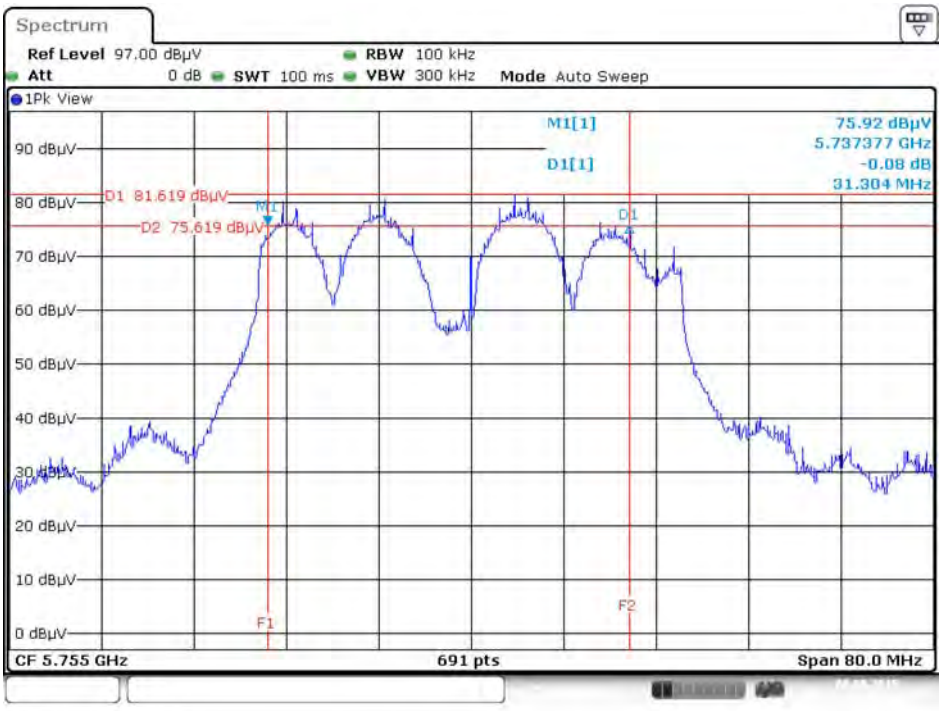
Date: 8.SEP.2015 01:23:30

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



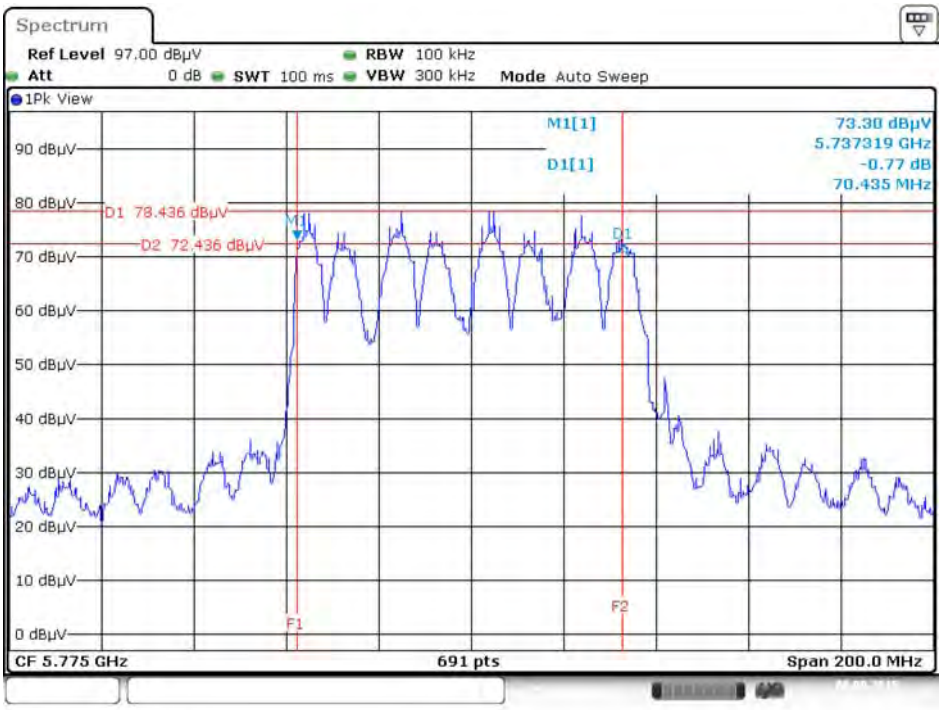
Date: 8.SEP.2015 01:30:50

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5755 MHz



Date: 8.SEP.2015 01:37:02

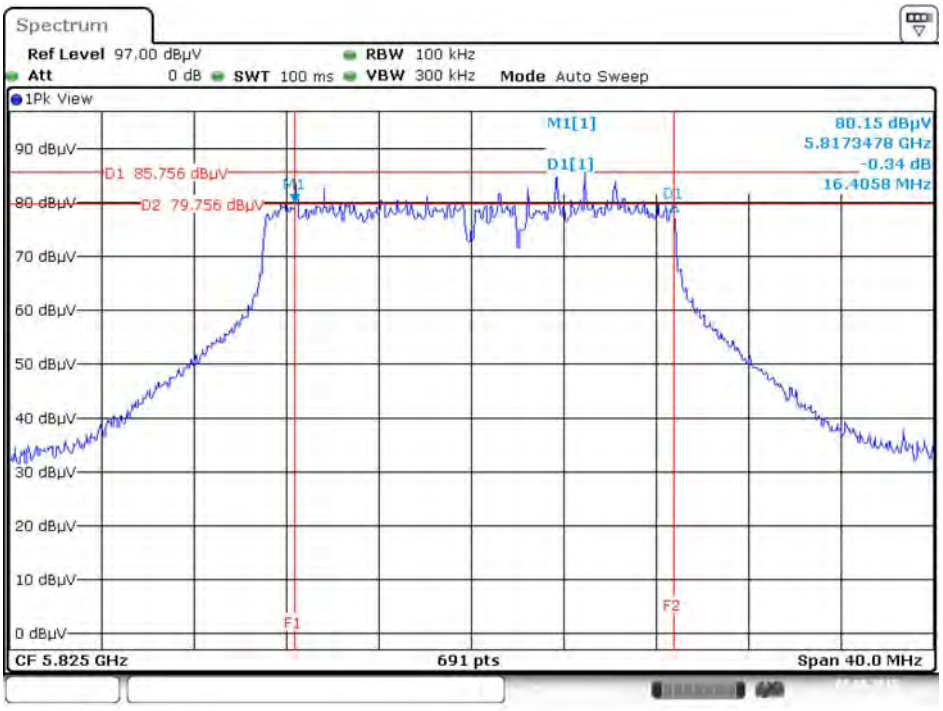
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 8.SEP.2015 01:41:31

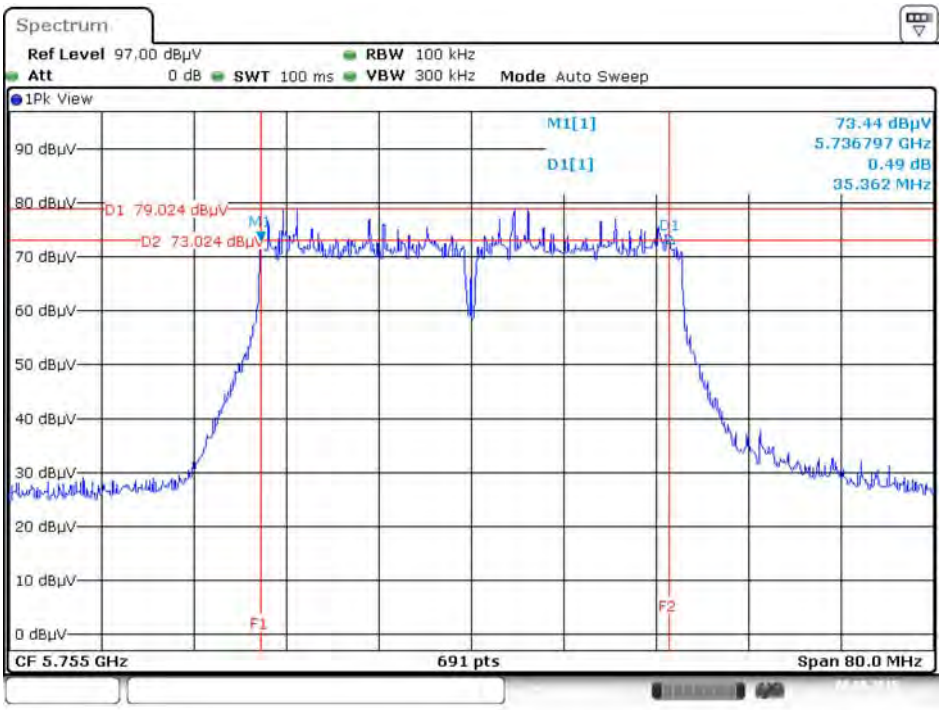
For beamforming function:

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



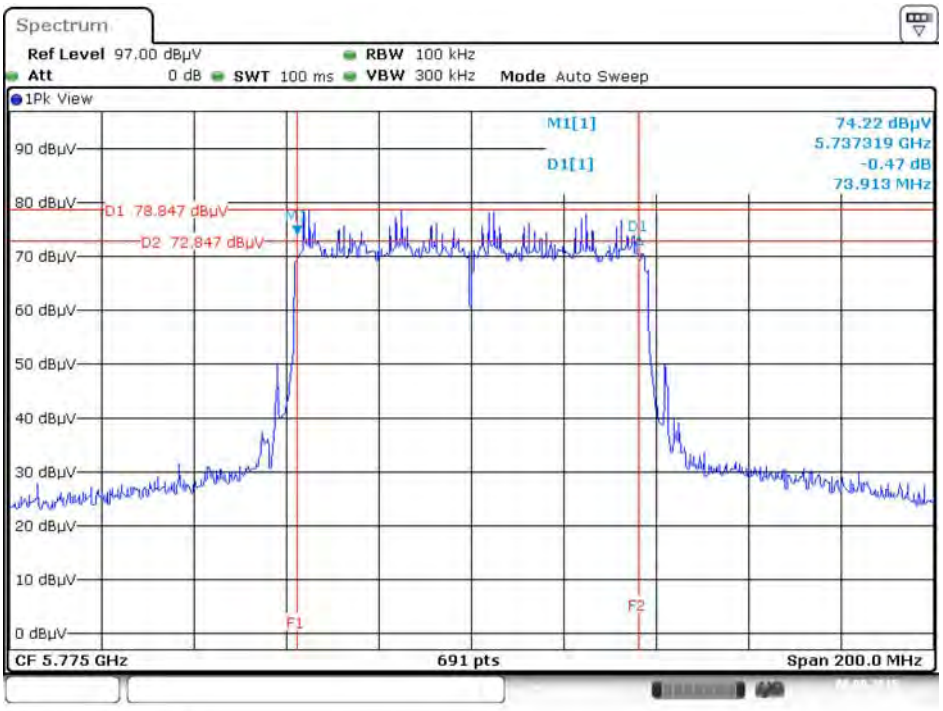
Date: 8.SEP.2015 01:09:08

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5755 MHz



Date: 8.SEP.2015 01:01:20

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

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

☒	5.725~5.85 GHz	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

4.4.2. Measuring Instruments and Setting

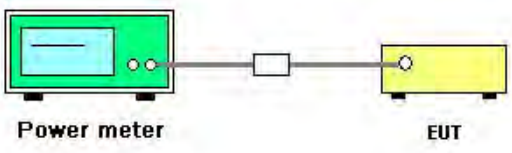
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.4.3. Test Procedures

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.

4.4.4. 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 Maximum Conducted Output Power

Temperature	25℃	Humidity	56%
Test Engineer	Serway Li	Test Function	Non-beamforming function
Test Date	Sep. 07, 2015		

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11a	5180 MHz	20.41	20.25	19.77	20.34	26.22	30.00	Complies
	5200 MHz	20.38	20.23	20.03	20.32	26.26	30.00	Complies
	5240 MHz	20.31	20.06	20.25	19.95	26.17	30.00	Complies
	5745 MHz	21.30	21.82	21.12	21.63	27.50	30.00	Complies
	5785 MHz	23.51	23.65	23.39	23.61	29.56	30.00	Complies
	5825 MHz	21.78	21.76	21.48	21.30	27.61	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	20.54	20.38	20.14	20.42	26.39	30.00	Complies
	5200 MHz	20.22	20.06	20.13	20.32	26.20	30.00	Complies
	5240 MHz	20.17	20.07	20.12	20.10	26.14	30.00	Complies
	5745 MHz	19.26	19.21	19.25	19.36	25.29	30.00	Complies
	5785 MHz	23.32	24.12	23.46	23.66	29.67	30.00	Complies
	5825 MHz	19.57	19.62	19.41	19.33	25.50	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	17.65	16.97	17.02	17.85	23.41	30.00	Complies
	5230 MHz	23.82	23.14	23.49	23.32	29.47	30.00	Complies
	5755 MHz	19.11	19.06	19.26	19.08	25.15	30.00	Complies
	5795 MHz	20.15	20.41	19.72	20.19	26.15	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	15.63	15.81	15.76	16.55	21.97	30.00	Complies
	5775 MHz	18.66	19.35	18.29	18.58	24.76	30.00	Complies

Temperature	25℃	Humidity	56%
Test Engineer	Serway Li	Test Function	Beamforming function
Test Date	Sep. 07, 2015		

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	20.06	19.93	19.41	19.97	25.87	26.21	Complies
	5200 MHz	20.22	20.06	20.13	20.32	26.20	26.21	Complies
	5240 MHz	20.17	20.07	20.12	20.10	26.14	26.21	Complies
	5745 MHz	19.26	19.21	19.25	19.36	25.29	26.21	Complies
	5785 MHz	20.02	20.39	19.77	20.26	26.14	26.21	Complies
	5825 MHz	20.15	20.29	20.23	19.99	26.19	26.21	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	15.35	15.31	15.04	15.68	21.37	26.21	Complies
	5230 MHz	20.40	19.91	20.05	20.12	26.14	26.21	Complies
	5755 MHz	16.12	15.97	16.23	16.37	22.20	26.21	Complies
	5795 MHz	20.15	20.41	19.72	20.19	26.15	26.21	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	14.92	14.67	14.78	15.26	20.93	26.21	Complies
	5775 MHz	18.66	19.35	18.29	18.58	24.76	26.21	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=30 – (9.79 – 6)=26.21dBm.

4.5. Power Spectral Density Measurement

4.5.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.4.1.

Frequency Band			Limit
☒	5.15~5.25 GHz		
	Operating Mode		
	☐	Outdoor access point	17 dBm/MHz
	☒	Indoor access point	17 dBm/MHz
	☐	Fixed point-to-point access points	17 dBm/MHz
	☐	Mobile and portable client devices	11 dBm/MHz
☒	5.725~5.85 GHz		30 dBm/500kHz

4.5.2. Measuring Instruments and Setting

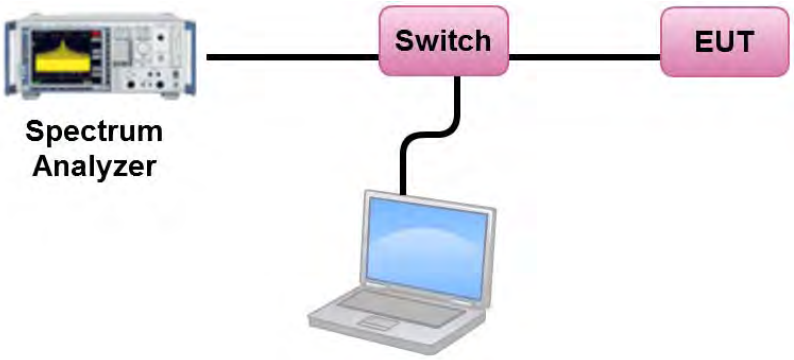
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.5.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 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.
5. For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.5.4. Test Setup Layout



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. Test Result of Power Spectral Density

Temperature	25℃	Humidity	56%
Test Engineer	Serway Li	Test Function	Non-beamforming function
Test Date	Sep. 07, 2015		

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	13.12	13.21	Complies
40	5200 MHz	13.18	13.21	Complies
48	5240 MHz	13.04	13.21	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=17 – (9.79 – 6)=13.21dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	14.37	-3.01	11.36	26.21	Complies
157	5785 MHz	16.39	-3.01	13.38	26.21	Complies
165	5825 MHz	14.39	-3.01	11.38	26.21	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=30 – (9.79 – 6)=26.21dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	13.19	13.21	Complies
40	5200 MHz	13.16	13.21	Complies
48	5240 MHz	13.20	13.21	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=17 – (9.79 – 6)=13.21dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	12.11	-3.01	9.10	26.21	Complies
157	5785 MHz	16.53	-3.01	13.52	26.21	Complies
165	5825 MHz	12.28	-3.01	9.27	26.21	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=30 – (9.79 – 6)=26.21dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	7.31	13.21	Complies
46	5230 MHz	13.18	13.21	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=17 – (9.79 – 6)=13.21dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	9.10	-3.01	6.09	26.21	Complies
159	5795 MHz	10.08	-3.01	7.07	26.21	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=30 – (9.79 – 6)=26.21dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	2.87	13.21	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=17 – (9.79 – 6)=13.21dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	6.07	-3.01	3.06	26.21	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=30 – (9.79 – 6)=26.21dBm/MHz.

Temperature	25°C	Humidity	56%
Test Engineer	Serway Li	Test Function	Beamforming function
Test Date	Sep. 07, 2015		

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	12.83	13.21	Complies
40	5200 MHz	13.16	13.21	Complies
48	5240 MHz	13.20	13.21	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=17 – (9.79 – 6)=13.21dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	12.11	-3.01	9.10	26.21	Complies
157	5785 MHz	13.26	-3.01	10.25	26.21	Complies
165	5825 MHz	13.26	-3.01	10.25	26.21	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=30 – (9.79 – 6)=26.21dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	5.28	13.21	Complies
46	5230 MHz	10.00	13.21	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=17 – (9.79 – 6)=13.21dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	6.05	-3.01	3.04	26.21	Complies
159	5795 MHz	9.86	-3.01	6.85	26.21	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=30 – (9.79 – 6)=26.21dBm/MHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	1.88	13.21	Complies

Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=17 – (9.79 – 6)=13.21dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	6.07	-3.01	3.06	26.21	Complies

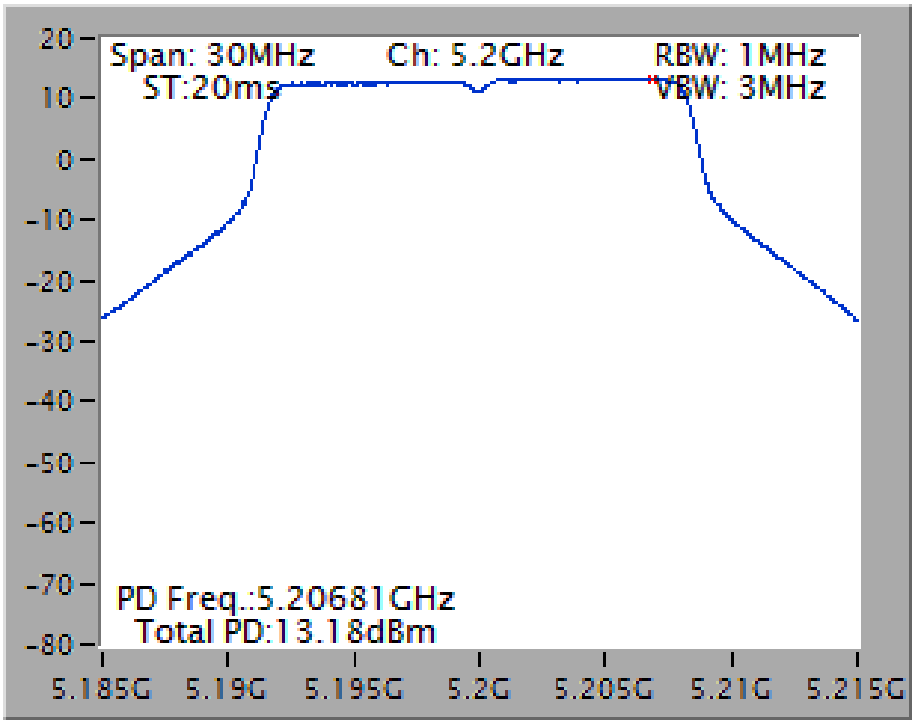
Note: $Directional\ Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.79dBi >6dBi, so limit=30 – (9.79 – 6)=26.21dBm/MHz.

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

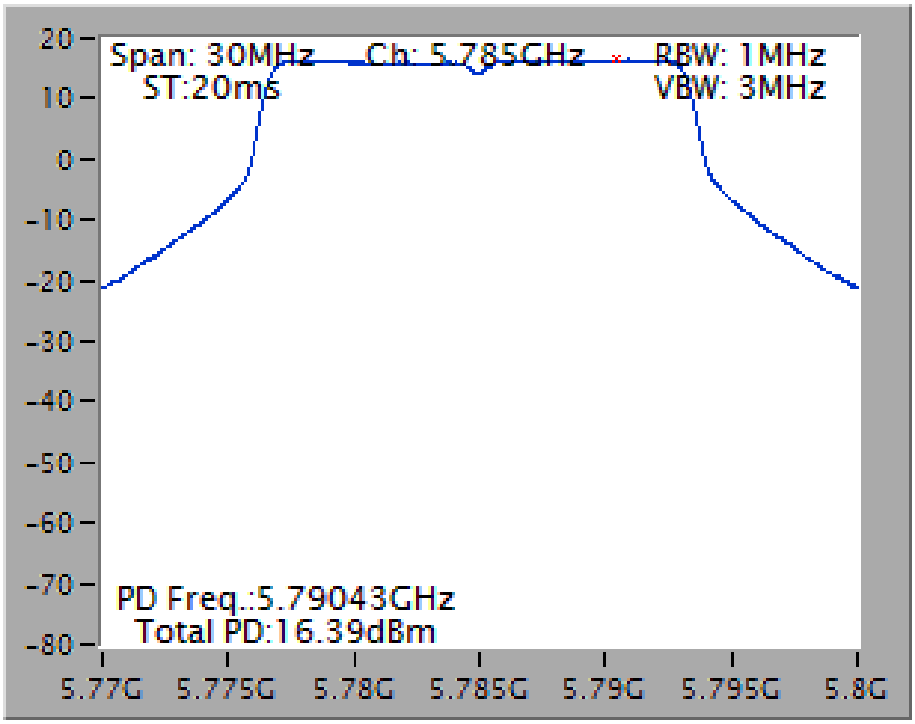
For plots, only the channel with worse result was shown.

For non-beamforming function:

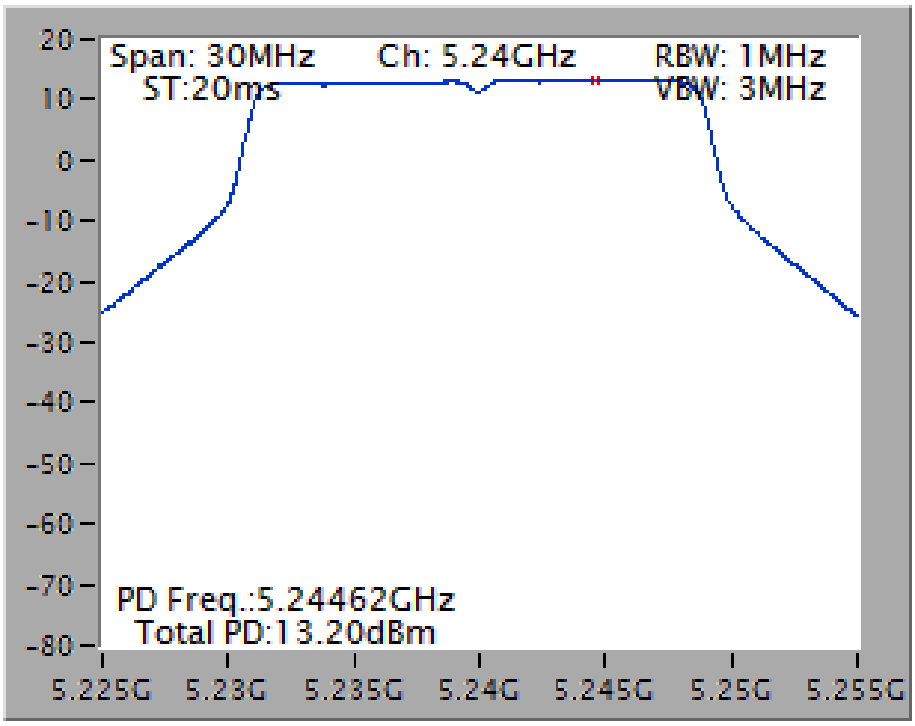
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5200 MHz



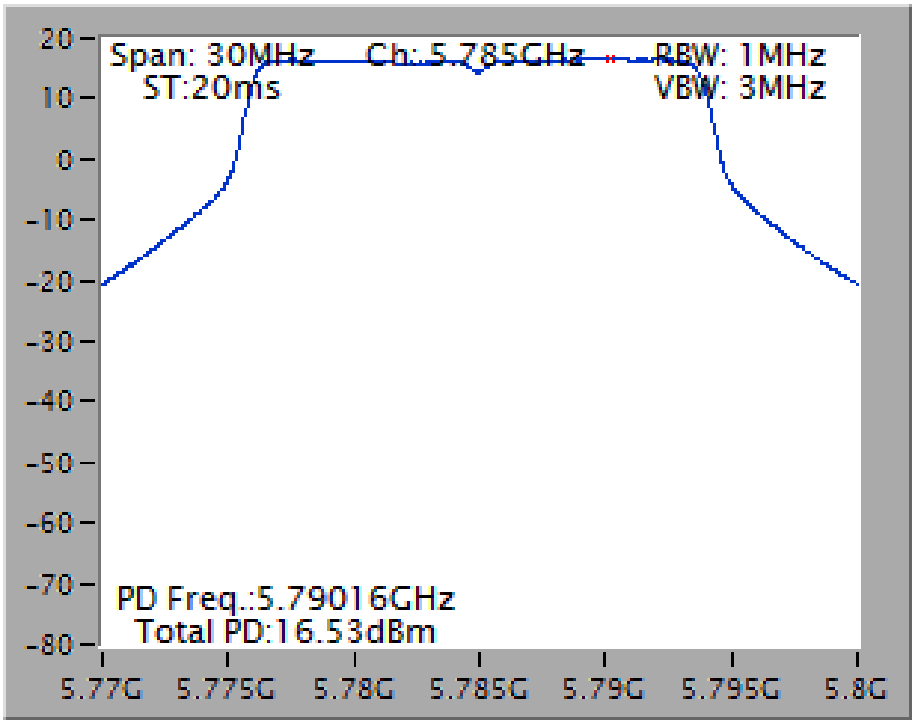
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



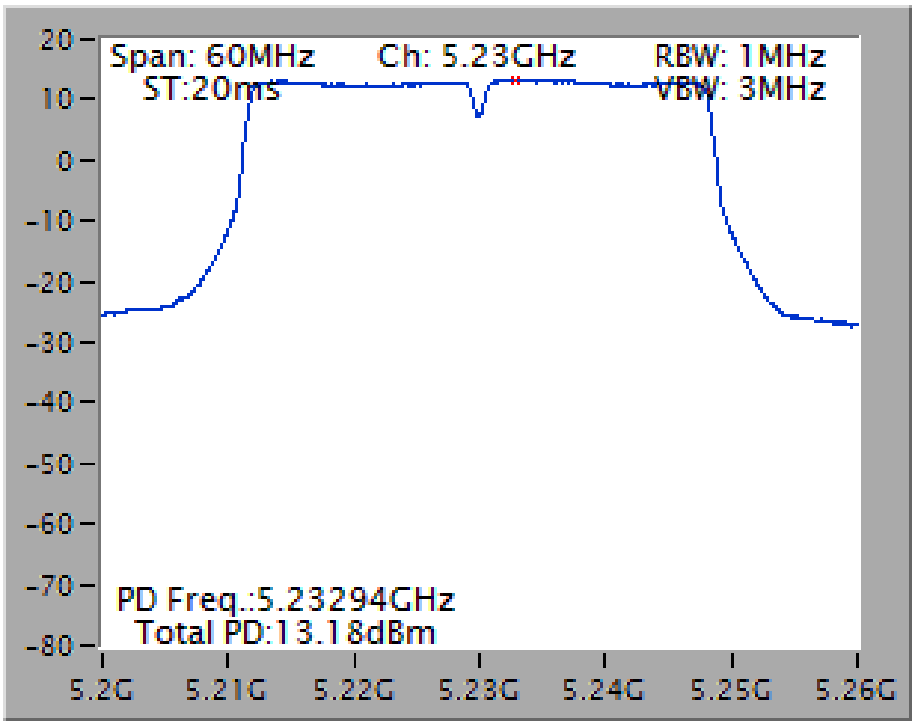
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5240 MHz



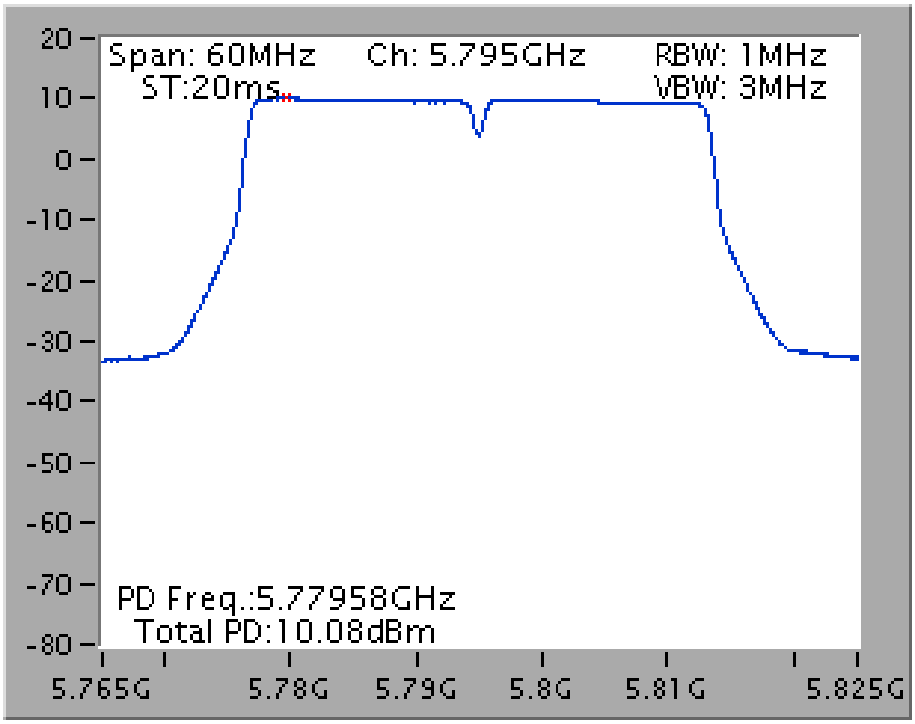
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



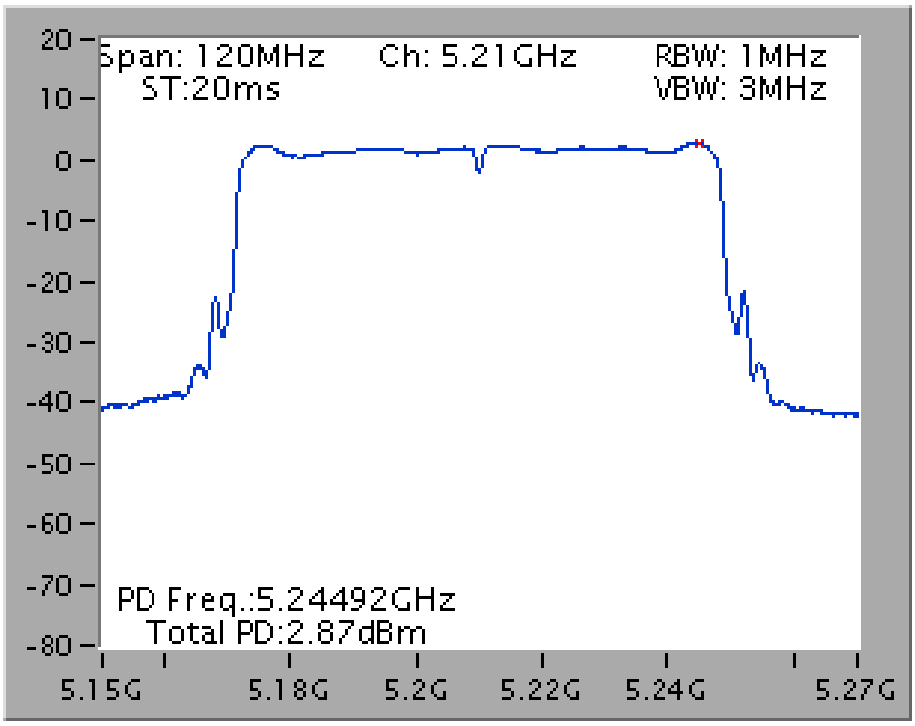
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5230 MHz



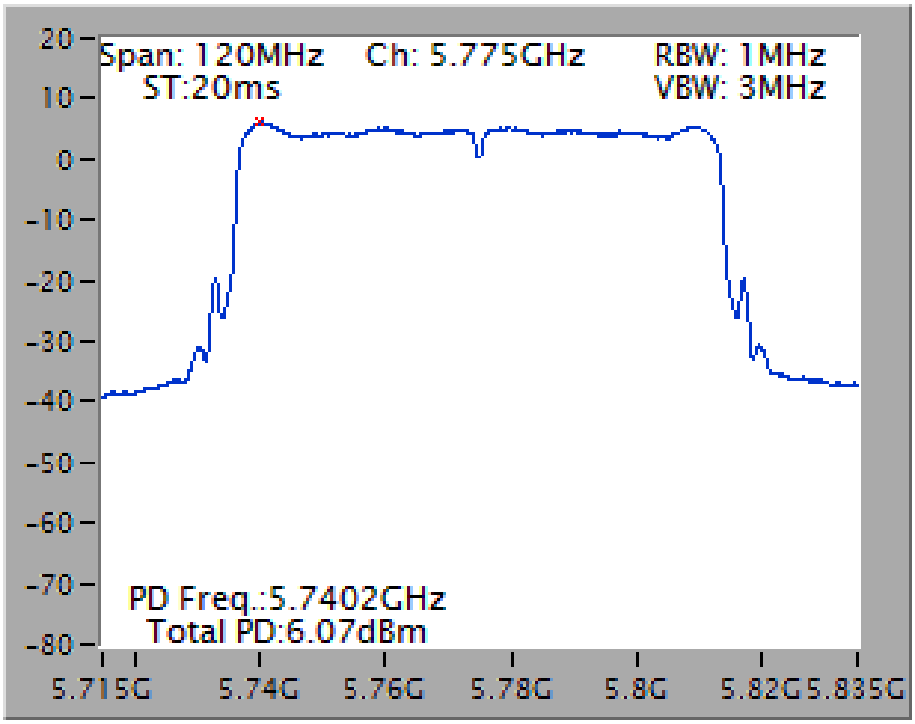
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5210 MHz

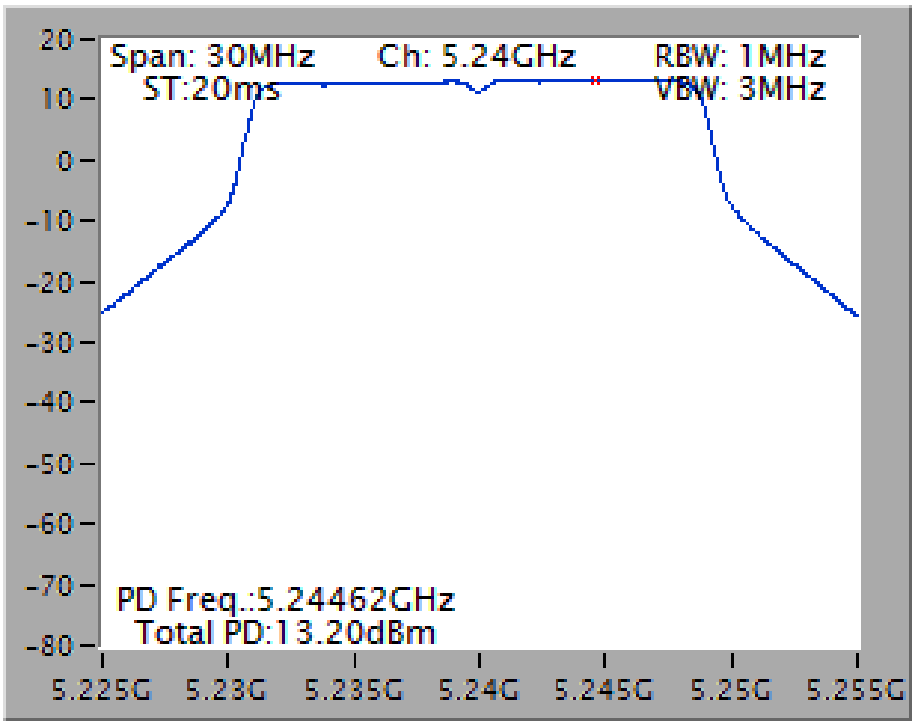


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz

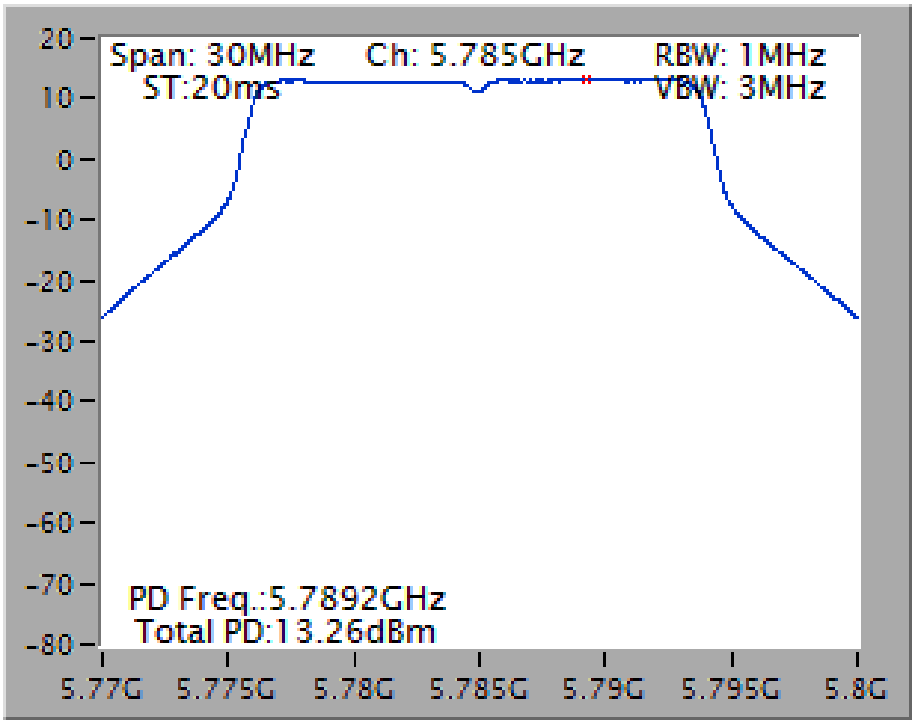


For beamforming function:

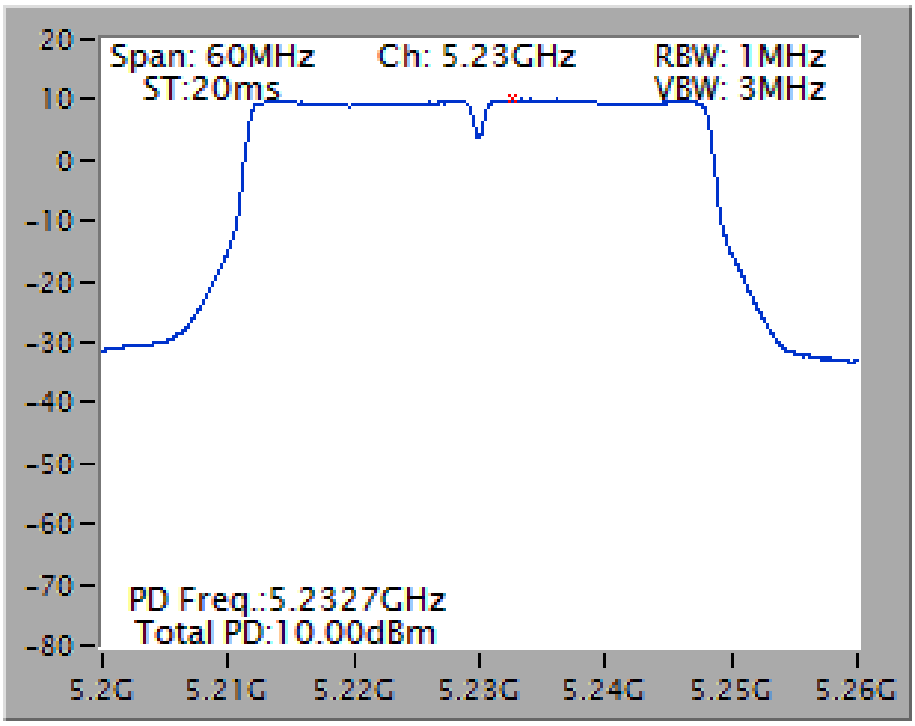
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5240 MHz



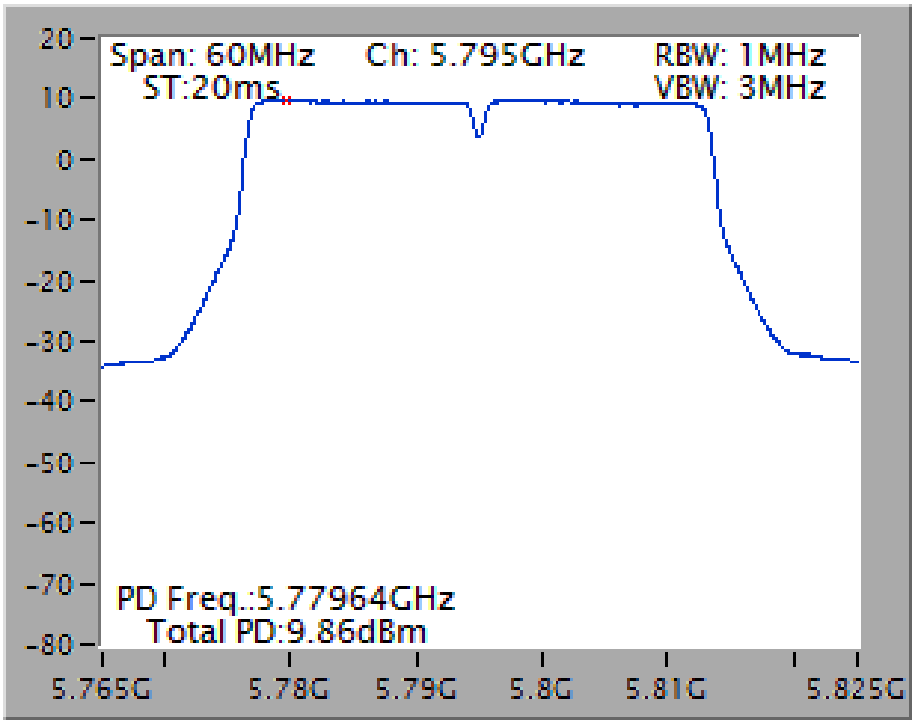
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



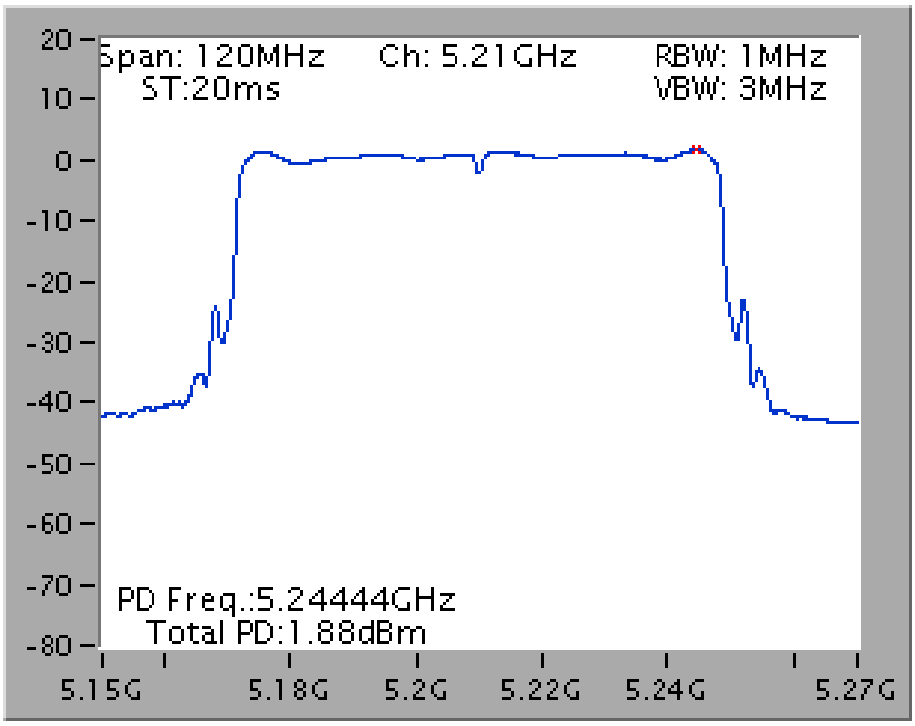
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5230 MHz



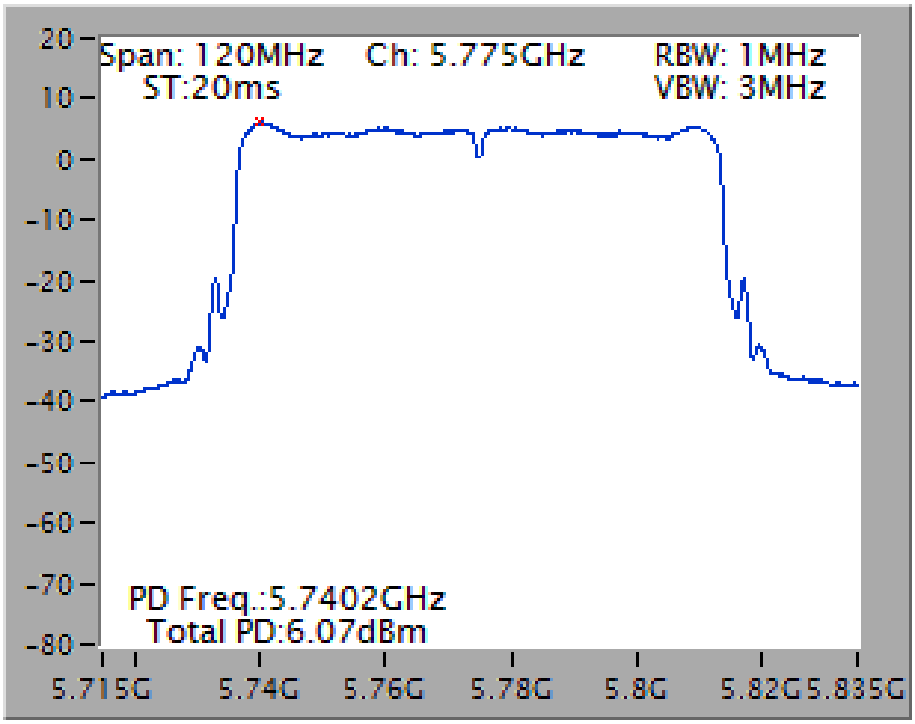
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5210 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



4.6. Radiated Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.15-5.25 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 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions 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 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

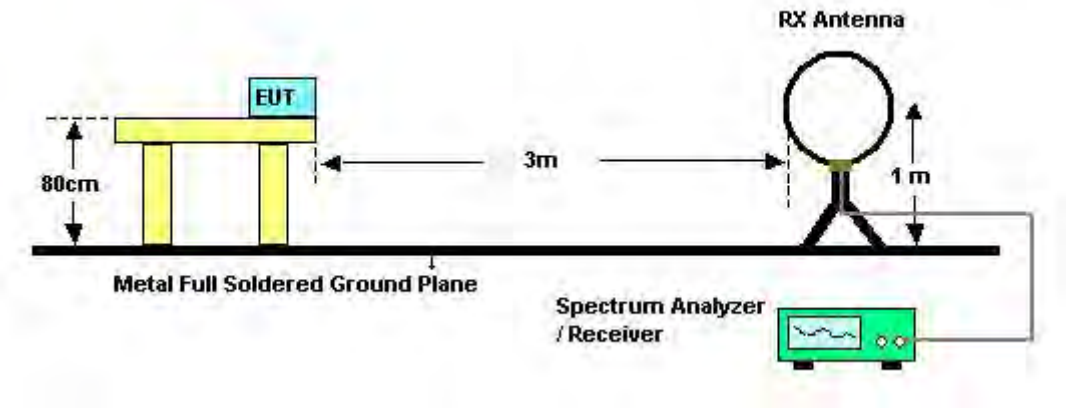
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

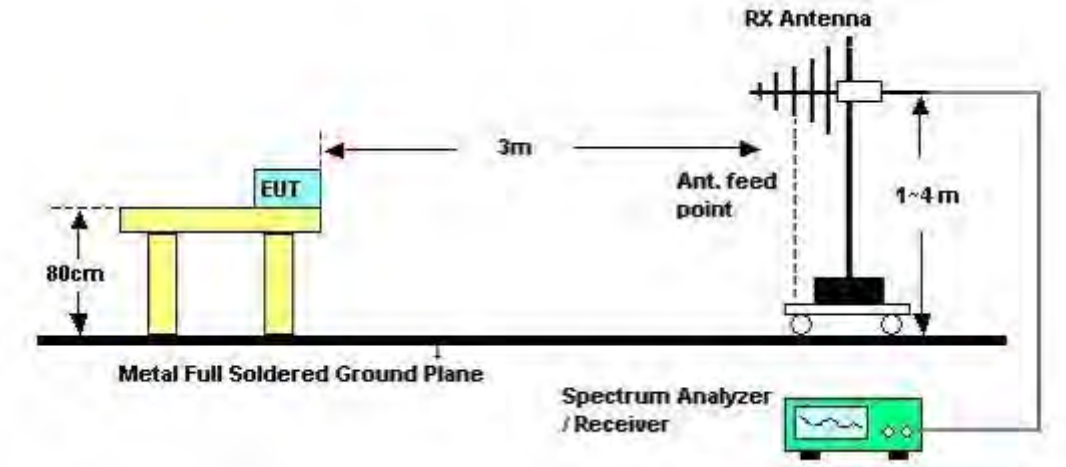
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

4.6.4. Test Setup Layout

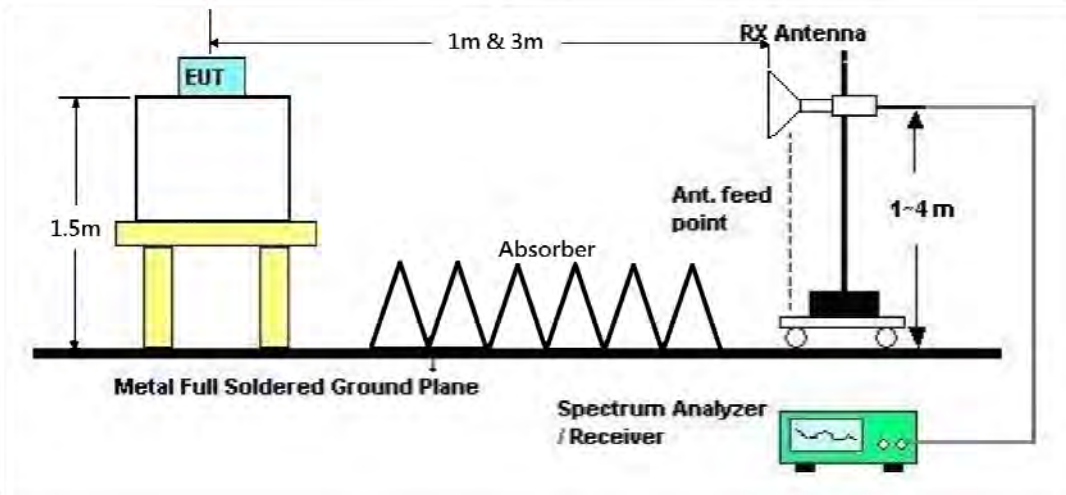
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

For non-beamforming function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	Normal Link
Test Date	Aug. 19, 2015		

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

Note:

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

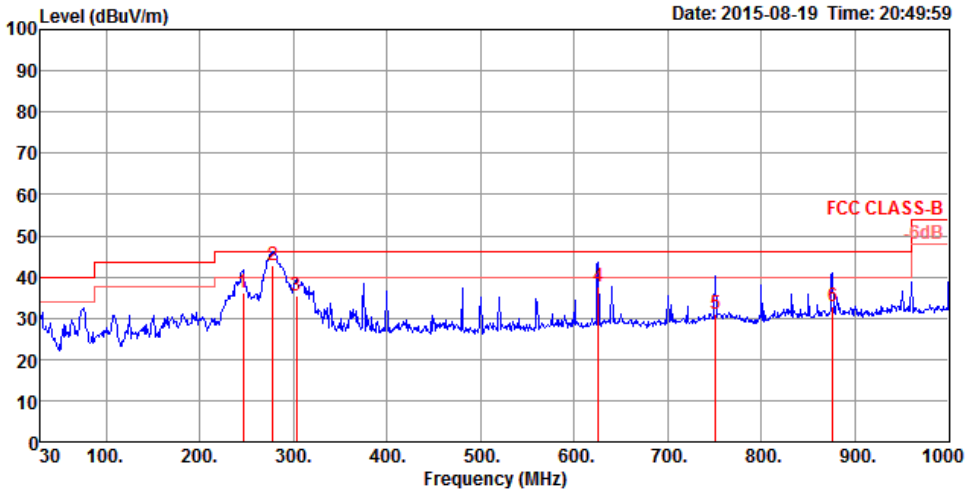
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

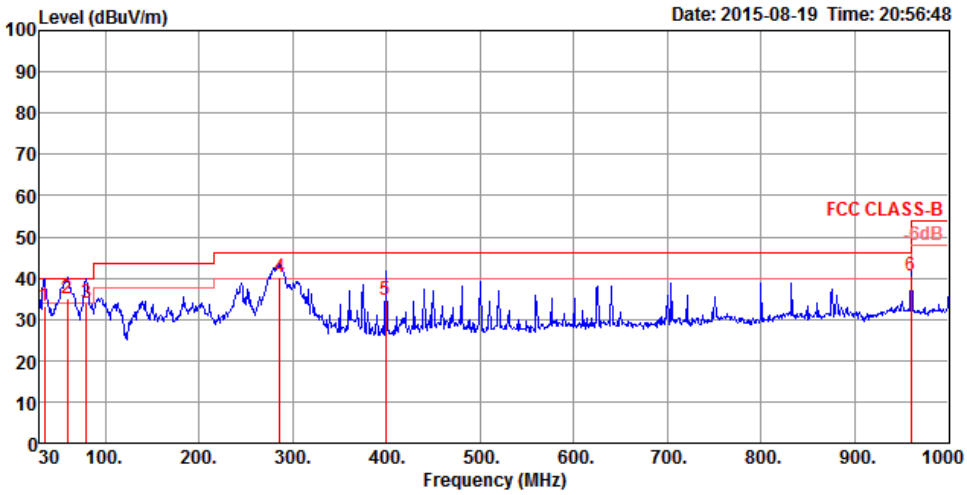
Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	Normal Link

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	246.31	36.34	46.00	-9.66	54.66	1.37	12.61	32.30	125	165	QP	HORIZONTAL
2	278.32	42.93	46.00	-3.07	60.26	1.44	13.52	32.29	150	125	QP	HORIZONTAL
3	303.54	35.42	46.00	-10.58	52.20	1.50	14.00	32.28	100	120	QP	HORIZONTAL
4	625.58	37.56	46.00	-8.44	48.52	2.08	19.36	32.40	150	115	QP	HORIZONTAL
5	750.71	31.18	46.00	-14.82	40.86	2.22	20.40	32.30	125	134	QP	HORIZONTAL
6	875.84	33.00	46.00	-13.00	40.96	2.40	21.50	31.86	100	123	QP	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	34.85	33.35	40.00	-6.65	47.94	0.64	17.17	32.40	100	16	QP	VERTICAL
2	59.10	35.14	40.00	-4.86	59.68	0.77	7.10	32.41	150	233	QP	VERTICAL
3	79.47	34.13	40.00	-5.87	58.12	0.85	7.56	32.40	100	231	QP	VERTICAL
4	286.08	40.38	46.00	-5.62	57.59	1.46	13.62	32.29	100	238	QP	VERTICAL
5	399.57	34.69	46.00	-11.31	48.82	1.73	16.47	32.33	200	46	QP	VERTICAL
6	960.00	40.49	46.00	-5.51	47.12	2.50	22.06	31.19	125	248	QP	VERTICAL

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB 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.

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

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 36 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 20, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15558.88	46.24	54.00	-7.76	33.68	10.05	38.24	35.73	165	150	HORIZONTAL	Average
2	15573.44	58.66	74.00	-15.34	46.10	10.05	38.24	35.73	165	150	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15543.36	46.42	54.00	-7.58	33.88	10.04	38.22	35.72	165	109	VERTICAL	Average
2	15548.48	59.24	74.00	-14.76	46.69	10.05	38.22	35.72	165	109	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 40 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 21, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15591.64	46.11	54.00	-7.89	33.55	10.05	38.24	35.73	165	265	HORIZONTAL	Average
2	15609.96	58.71	74.00	-15.29	46.13	10.06	38.25	35.73	165	265	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15593.88	46.09	54.00	-7.91	33.53	10.05	38.24	35.73	165	138	VERTICAL	Average
2	15596.08	58.74	74.00	-15.26	46.18	10.05	38.24	35.73	165	138	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 21, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15711.36	45.21	54.00	-8.79	32.57	10.09	38.29	35.74	165	85	HORIZONTAL	Average
2	15724.84	57.17	74.00	-16.83	44.54	10.09	38.29	35.75	165	85	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15731.28	45.68	54.00	-8.32	33.05	10.09	38.29	35.75	165	203	VERTICAL	Average
2	15736.00	58.15	74.00	-15.85	45.52	10.09	38.29	35.75	165	203	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 21, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11489.92	54.05	74.00	-19.95	40.45	8.73	39.20	34.33	182	253	HORIZONTAL	Peak
2	11490.08	43.22	54.00	-10.78	29.62	8.73	39.20	34.33	182	253	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11490.00	43.80	54.00	-10.20	30.20	8.73	39.20	34.33	170	294	VERTICAL	Average
2	11490.48	55.65	74.00	-18.35	42.05	8.73	39.20	34.33	170	294	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 21, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11569.92	42.55	54.00	-11.45	28.97	8.78	39.17	34.37	150	166	HORIZONTAL	Average
2	11585.76	53.17	74.00	-20.83	39.62	8.78	39.16	34.39	150	166	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11566.80	55.24	74.00	-18.76	41.66	8.78	39.17	34.37	170	277	VERTICAL	Peak
2	11569.84	43.14	54.00	-10.86	29.56	8.78	39.17	34.37	170	277	VERTICAL	Average

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 21, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.68	54.51	74.00	-19.49	40.95	8.82	39.15	34.41	166	248	HORIZONTAL	Peak
2	11649.76	42.68	54.00	-11.32	29.12	8.82	39.15	34.41	166	248	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11650.00	43.01	54.00	-10.99	29.45	8.82	39.15	34.41	162	295	VERTICAL	Average
2	11651.52	55.39	74.00	-18.61	41.85	8.82	39.13	34.41	162	295	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15546.96	45.70	54.00	-8.30	33.15	10.05	38.22	35.72	165	89	HORIZONTAL	Average
2	15549.92	59.06	74.00	-14.94	46.51	10.05	38.22	35.72	165	89	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15531.28	58.82	74.00	-15.18	46.28	10.04	38.22	35.72	165	198	VERTICAL	Peak
2	15535.60	45.65	54.00	-8.35	33.11	10.04	38.22	35.72	165	198	VERTICAL	Average

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15599.88	57.62	74.00	-16.38	45.05	10.06	38.24	35.73	165	112	HORIZONTAL	Peak
2	15608.80	45.19	54.00	-8.81	32.61	10.06	38.25	35.73	165	112	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15591.96	45.38	54.00	-8.62	32.82	10.05	38.24	35.73	165	220	VERTICAL	Average
2	15600.52	57.88	74.00	-16.12	45.30	10.06	38.25	35.73	165	220	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15713.80	45.38	54.00	-8.62	32.75	10.09	38.29	35.75	165	109	HORIZONTAL	Average
2	15720.16	57.98	74.00	-16.02	45.35	10.09	38.29	35.75	165	109	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15712.20	45.70	54.00	-8.30	33.06	10.09	38.29	35.74	165	223	VERTICAL	Average
2	15714.20	57.49	74.00	-16.51	44.86	10.09	38.29	35.75	165	223	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11480.52	44.45	54.00	-9.55	30.84	8.73	39.21	34.33	165	269	HORIZONTAL	Average
2	11486.00	56.86	74.00	-17.14	43.26	8.73	39.20	34.33	165	269	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11480.52	44.22	54.00	-9.78	30.61	8.73	39.21	34.33	165	255	VERTICAL	Average
2	11484.84	56.82	74.00	-17.18	43.22	8.73	39.20	34.33	165	255	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11572.76	56.42	74.00	-17.58	42.84	8.78	39.17	34.37	165	227	HORIZONTAL	Peak
2	11579.12	44.22	54.00	-9.78	30.64	8.78	39.17	34.37	165	227	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11561.40	56.73	74.00	-17.27	43.15	8.78	39.17	34.37	165	110	VERTICAL	Peak
2	11576.20	44.39	54.00	-9.61	30.81	8.78	39.17	34.37	165	110	VERTICAL	Average

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11651.04	43.71	54.00	-10.29	30.17	8.82	39.13	34.41	165	268	HORIZONTAL	Average
2	11655.84	56.04	74.00	-17.96	42.50	8.82	39.13	34.41	165	268	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11644.68	43.66	54.00	-10.34	30.10	8.82	39.15	34.41	165	183	VERTICAL	Average
2	11653.04	56.48	74.00	-17.52	42.94	8.82	39.13	34.41	165	183	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15572.64	45.30	54.00	-8.70	32.74	10.05	38.24	35.73	165	232	HORIZONTAL	Average
2	15573.84	58.08	74.00	-15.92	45.52	10.05	38.24	35.73	165	232	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15566.28	58.43	74.00	-15.57	45.87	10.05	38.24	35.73	165	124	VERTICAL	Peak
2	15567.68	45.48	54.00	-8.52	32.92	10.05	38.24	35.73	165	124	VERTICAL	Average

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15693.44	45.42	54.00	-8.58	32.80	10.07	38.29	35.74	165	183	HORIZONTAL	Average
2	15697.72	58.41	74.00	-15.59	45.79	10.07	38.29	35.74	165	183	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15689.60	45.65	54.00	-8.35	33.05	10.07	38.27	35.74	165	272	VERTICAL	Average
2	15693.36	58.32	74.00	-15.68	45.70	10.07	38.29	35.74	165	272	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11500.52	44.01	54.00	-9.99	30.41	8.73	39.20	34.33	165	220	HORIZONTAL	Average
2	11515.76	56.30	74.00	-17.70	42.72	8.73	39.20	34.35	165	220	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11506.76	43.67	54.00	-10.33	30.07	8.73	39.20	34.33	165	139	VERTICAL	Average
2	11510.56	55.67	74.00	-18.33	42.09	8.73	39.20	34.35	165	139	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11582.72	44.00	54.00	-10.00	30.42	8.78	39.17	34.37	165	187	HORIZONTAL	Average
2	11590.20	56.58	74.00	-17.42	43.03	8.78	39.16	34.39	165	187	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11585.08	44.17	54.00	-9.83	30.62	8.78	39.16	34.39	165	76	VERTICAL	Average
2	11599.40	56.75	74.00	-17.25	43.18	8.80	39.16	34.39	165	76	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Sep. 04, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15630.03	56.19	74.00	-17.81	44.96	7.59	38.35	34.71	65	156	Peak	HORIZONTAL
2	15630.62	43.05	54.00	-10.95	31.82	7.59	38.35	34.71	65	156	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15629.92	43.25	54.00	-10.75	32.02	7.59	38.35	34.71	148	170	Average	VERTICAL
2	15630.57	56.12	74.00	-17.88	44.89	7.59	38.35	34.71	148	170	Peak	VERTICAL

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 21, 2015	Test Function	Non-beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11549.36	41.80	54.00	-12.20	28.22	9.26	39.13	34.81	Average	143	197	HORIZONTAL
2	11555.73	54.21	74.00	-19.79	40.63	9.26	39.13	34.81	Peak	143	197	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11541.11	55.40	74.00	-18.60	41.83	9.26	39.12	34.81	Peak	162	101	VERTICAL
2	11549.65	41.86	54.00	-12.14	28.28	9.26	39.13	34.81	Average	162	101	VERTICAL

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15535.56	59.72	74.00	-14.28	47.18	10.04	38.22	35.72	165	324	HORIZONTAL	Peak
2	15544.07	45.86	54.00	-8.14	33.32	10.04	38.22	35.72	165	324	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15542.58	45.75	54.00	-8.25	33.21	10.04	38.22	35.72	179	308	VERTICAL	Average
2	15543.81	59.27	74.00	-14.73	46.73	10.04	38.22	35.72	179	308	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15600.17	43.89	54.00	-10.11	31.32	10.06	38.24	35.73	118	264	HORIZONTAL	Average
2	15600.36	57.57	74.00	-16.43	45.00	10.06	38.24	35.73	118	264	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15596.25	56.98	74.00	-17.02	44.42	10.05	38.24	35.73	160	303	VERTICAL	Peak
2	15599.42	44.03	54.00	-9.97	31.46	10.06	38.24	35.73	160	303	VERTICAL	Average

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15717.63	58.17	74.00	-15.83	45.54	10.09	38.29	35.75	134	210	HORIZONTAL	Peak
2	15718.12	44.71	54.00	-9.29	32.08	10.09	38.29	35.75	134	210	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15716.29	58.12	74.00	-15.88	45.49	10.09	38.29	35.75	128	251	VERTICAL	Peak
2	15721.81	44.83	54.00	-9.17	32.20	10.09	38.29	35.75	128	251	VERTICAL	Average

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11491.81	55.83	74.00	-18.17	42.23	8.73	39.20	34.33	152	212	HORIZONTAL	Peak
2	11493.92	43.10	54.00	-10.90	29.50	8.73	39.20	34.33	152	212	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11489.96	43.00	54.00	-11.00	29.40	8.73	39.20	34.33	136	197	VERTICAL	Average
2	11493.65	56.10	74.00	-17.90	42.50	8.73	39.20	34.33	136	197	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11569.35	42.88	54.00	-11.12	29.30	8.78	39.17	34.37	147	233	HORIZONTAL	Average
2	11572.27	56.40	74.00	-17.60	42.82	8.78	39.17	34.37	147	233	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11568.80	43.07	54.00	-10.93	29.49	8.78	39.17	34.37	157	246	VERTICAL	Average
2	11573.63	56.26	74.00	-17.74	42.68	8.78	39.17	34.37	157	246	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11645.11	43.09	54.00	-10.91	29.53	8.82	39.15	34.41	135	183	HORIZONTAL	Average
2	11650.87	56.68	74.00	-17.32	43.14	8.82	39.13	34.41	135	183	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11647.38	43.13	54.00	-10.87	29.57	8.82	39.15	34.41	164	212	VERTICAL	Average
2	11650.36	56.28	74.00	-17.72	42.72	8.82	39.15	34.41	164	212	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15566.50	43.98	54.00	-10.02	31.42	10.05	38.24	35.73	120	156	HORIZONTAL	Average
2	15569.55	57.10	74.00	-16.90	44.54	10.05	38.24	35.73	120	156	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15566.97	44.94	54.00	-9.06	32.38	10.05	38.24	35.73	141	199	VERTICAL	Average
2	15570.87	57.78	74.00	-16.22	45.22	10.05	38.24	35.73	141	199	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15685.46	43.72	54.00	-10.28	31.12	10.07	38.27	35.74	115	202	HORIZONTAL	Average
2	15691.30	57.33	74.00	-16.67	44.71	10.07	38.29	35.74	115	202	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15687.76	56.84	74.00	-17.16	44.24	10.07	38.27	35.74	130	188	VERTICAL	Peak
2	15693.14	43.79	54.00	-10.21	31.17	10.07	38.29	35.74	130	188	VERTICAL	Average

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11505.28	56.13	74.00	-17.87	42.53	8.73	39.20	34.33	173	185	HORIZONTAL	Peak
2	11507.00	43.04	54.00	-10.96	29.44	8.73	39.20	34.33	173	185	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11512.84	43.14	54.00	-10.86	29.56	8.73	39.20	34.35	160	149	VERTICAL	Average
2	11513.17	57.08	74.00	-16.92	43.50	8.73	39.20	34.35	160	149	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11591.74	56.45	74.00	-17.55	42.90	8.78	39.16	34.39	125	173	HORIZONTAL	Peak
2	11592.37	43.20	54.00	-10.80	29.65	8.78	39.16	34.39	125	173	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11591.10	43.04	54.00	-10.96	29.49	8.78	39.16	34.39	166	217	VERTICAL	Average
2	11591.46	56.26	74.00	-17.74	42.71	8.78	39.16	34.39	166	217	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15629.78	44.19	54.00	-9.81	31.61	10.06	38.25	35.73	135	128	HORIZONTAL	Average
2	15633.59	57.23	74.00	-16.77	44.65	10.06	38.25	35.73	135	128	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15625.93	43.97	54.00	-10.03	31.39	10.06	38.25	35.73	140	136	VERTICAL	Average
2	15633.18	57.37	74.00	-16.63	44.79	10.06	38.25	35.73	140	136	VERTICAL	Peak

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015	Test Function	Beamforming function

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11545.66	43.43	54.00	-10.57	29.84	8.75	39.19	34.35	115	191	HORIZONTAL	Average
2	11551.77	56.62	74.00	-17.38	43.07	8.75	39.17	34.37	115	191	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11549.70	43.12	54.00	-10.88	29.55	8.75	39.19	34.37	151	168	VERTICAL	Average
2	11551.48	56.28	74.00	-17.72	42.73	8.75	39.17	34.37	151	168	VERTICAL	Peak

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.

4.7. Band Edge Emissions Measurement

4.7.1. Limit

For transmitters operating in the 5.15-5.25 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 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions 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

4.7.2. 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	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

4.7.3. Test Procedures

The test procedure is the same as section 4.6.3.

4.7.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.6.4.

4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

For non-beamforming function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

The EUT was programmed to be in beamforming transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 20, 2015 / Sep. 03, 2015	Test Function	Non-beamforming function

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5147.11	67.24	74.00	-6.76	62.90	5.51	33.17	34.34	190	248	VERTICAL	Peak
2	5150.00	53.14	54.00	-0.86	48.80	5.51	33.17	34.34	190	248	VERTICAL	Average
3	5185.79	111.54			107.13	5.52	33.23	34.34	190	248	VERTICAL	Average
4	5185.79	121.86			117.45	5.52	33.23	34.34	190	248	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5180 MHz.

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.40	62.97	74.00	-11.03	58.63	5.51	33.17	34.34	130	144	VERTICAL	Peak
2	5150.00	50.10	54.00	-3.90	45.76	5.51	33.17	34.34	130	144	VERTICAL	Average
3	5202.40	111.68			107.21	5.53	33.28	34.34	130	144	VERTICAL	Average
4	5202.80	122.19			117.72	5.53	33.28	34.34	130	144	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5200 MHz.

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5140.00	47.20	54.00	-6.80	42.88	5.51	33.15	34.34	126	145	VERTICAL	Average
2	5144.40	60.20	74.00	-13.80	55.86	5.51	33.17	34.34	126	145	VERTICAL	Peak
3	5242.40	110.71			106.15	5.55	33.34	34.33	126	145	VERTICAL	Average
4	5242.80	121.36			116.80	5.55	33.34	34.33	126	145	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5240 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 20, 2015 / Sep. 04, 2015	Test Function	Non-beamforming function

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5715.00	68.23	74.00	-5.77	63.73	4.49	34.52	34.51	291	161	Peak	VERTICAL
2	5715.00	53.89	54.00	-0.11	49.39	4.49	34.52	34.51	291	161	Average	VERTICAL
3	5721.40	71.43	78.20	-6.77	66.87	4.50	34.57	34.51	291	161	Peak	VERTICAL
4	5738.20	109.98			105.38	4.50	34.62	34.52	291	161	Average	VERTICAL
5	5738.60	119.68			115.08	4.50	34.62	34.52	291	161	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5745 MHz.

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5680.00	63.04	68.20	-5.16	57.23	5.81	34.35	34.35	179	59	VERTICAL	Peak
2	5723.80	63.16	78.20	-15.04	57.17	5.85	34.50	34.36	179	59	VERTICAL	Peak
3	5786.80	122.54			116.35	5.92	34.65	34.38	179	59	VERTICAL	Peak
4	5787.40	112.41			106.22	5.92	34.65	34.38	179	59	VERTICAL	Average
5	5856.40	62.37	78.20	-15.83	55.91	5.95	34.90	34.39	179	59	VERTICAL	Peak
6	5868.40	62.28	68.20	-5.92	55.80	5.97	34.90	34.39	179	59	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5785 MHz.

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5830.50	111.33			104.97	5.94	34.80	34.38	220	279	VERTICAL	Average
2	5830.50	122.27			115.91	5.94	34.80	34.38	220	279	VERTICAL	Peak
3	5850.00	77.97	78.20	-0.23	71.56	5.95	34.85	34.39	220	279	VERTICAL	Peak
4	5872.30	68.18	68.20	-0.02	61.70	5.97	34.90	34.39	220	279	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 5825 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 21, 2015 / Sep. 03, 2015	Test Function	Non-beamforming function

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5145.37	70.59	74.00	-3.41	66.25	5.51	33.17	34.34	182	245	VERTICAL	Peak
2	5146.09	53.40	54.00	-0.60	49.06	5.51	33.17	34.34	182	245	VERTICAL	Average
3	5185.35	109.69			105.28	5.52	33.23	34.34	182	245	VERTICAL	Average
4	5185.50	120.15			115.74	5.52	33.23	34.34	182	245	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5180 MHz.

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.20	64.87	74.00	-9.13	60.53	5.51	33.17	34.34	150	158	VERTICAL	Peak
2	5150.00	49.25	54.00	-4.75	44.91	5.51	33.17	34.34	150	158	VERTICAL	Average
3	5198.40	111.07			106.63	5.53	33.25	34.34	150	158	VERTICAL	Average
4	5198.80	121.21			116.77	5.53	33.25	34.34	150	158	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5200 MHz.

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5140.80	59.39	74.00	-14.61	55.07	5.51	33.15	34.34	131	143	VERTICAL	Peak
2	5150.00	47.34	54.00	-6.66	43.00	5.51	33.17	34.34	131	143	VERTICAL	Average
3	5241.60	120.62			116.06	5.55	33.34	34.33	131	143	VERTICAL	Peak
4	5242.00	109.63			105.07	5.55	33.34	34.33	131	143	VERTICAL	Average

Item 3, 4 are the fundamental frequency at 5240 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 21, 2015 / Sep. 03, 2015 / Sep. 04, 2015	Test Function	Non-beamforming function

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5715.00	67.48	68.20	-0.72	62.98	4.49	34.52	34.51	288	228	Peak	VERTICAL
2	5716.20	70.02	78.20	-8.18	65.52	4.49	34.52	34.51	288	228	Peak	VERTICAL
3	5736.60	107.92			103.32	4.50	34.62	34.52	288	228	Average	VERTICAL
4	5737.00	118.15			113.55	4.50	34.62	34.52	288	228	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5745 MHz.

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5636.20	61.85	68.20	-6.35	56.21	5.78	34.20	34.34	167	59	VERTICAL	Peak
2	5720.20	62.51	78.20	-15.69	56.57	5.85	34.45	34.36	167	59	VERTICAL	Peak
3	5786.80	111.04			104.85	5.92	34.65	34.38	167	59	VERTICAL	Average
4	5786.80	121.82			115.63	5.92	34.65	34.38	167	59	VERTICAL	Peak
5	5852.20	63.09	78.20	-15.11	56.68	5.95	34.85	34.39	167	59	VERTICAL	Peak
6	5866.00	62.40	68.20	-5.80	55.92	5.97	34.90	34.39	167	59	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5785 MHz.

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5816.61	108.82			102.52	5.93	34.75	34.38	233	294	VERTICAL	Average
2	5817.76	119.17			112.87	5.93	34.75	34.38	233	294	VERTICAL	Peak
3	5858.39	71.85	78.20	-6.35	65.39	5.95	34.90	34.39	233	294	VERTICAL	Peak
4	5860.00	66.93	68.20	-1.27	60.47	5.95	34.90	34.39	233	294	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 5825 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 22, 2015 / Sep. 03, 2015	Test Function	Non-beamforming function

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.13	53.75	54.00	-0.25	49.41	5.51	33.17	34.34	204	248	VERTICAL	Average
2	5150.00	69.57	74.00	-4.43	65.23	5.51	33.17	34.34	204	248	VERTICAL	Peak
3	5196.08	103.13			98.69	5.53	33.25	34.34	204	248	VERTICAL	Average
4	5196.37	113.87			109.43	5.53	33.25	34.34	204	248	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5190 MHz.

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5134.60	62.45	74.00	-11.55	58.15	5.50	33.15	34.35	150	137	VERTICAL	Peak
2	5147.20	49.75	54.00	-4.25	45.41	5.51	33.17	34.34	150	137	VERTICAL	Average
3	5214.40	107.51			103.03	5.54	33.28	34.34	150	137	VERTICAL	Average
4	5215.00	117.86			113.38	5.54	33.28	34.34	150	137	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5230 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Sep. 04, 2015	Test Function	Non-beamforming function

Channel 151

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5715.00	67.44	68.20	-0.76	62.94	4.49	34.52	34.51	275	218	Peak	VERTICAL
2	5719.80	72.88	78.20	-5.32	68.32	4.50	34.57	34.51	275	218	Peak	VERTICAL
3	5739.80	116.83			112.23	4.50	34.62	34.52	275	218	Peak	VERTICAL
4	5740.60	106.33			101.73	4.50	34.62	34.52	275	218	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5755 MHz.

Channel 159

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5715.00	62.13	68.20	-6.07	57.63	4.49	34.52	34.51	276	220	Peak	VERTICAL
2	5722.20	64.04	78.20	-14.16	59.48	4.50	34.57	34.51	276	220	Peak	VERTICAL
3	5781.00	116.80			112.08	4.52	34.73	34.53	276	220	Peak	VERTICAL
4	5781.40	106.49			101.77	4.52	34.73	34.53	276	220	Average	VERTICAL
5	5859.60	68.06	78.20	-10.14	63.06	4.55	34.99	34.54	276	220	Peak	VERTICAL
6	5860.60	68.03	68.20	-0.17	63.03	4.55	34.99	34.54	276	220	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5795 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Sep. 04, 2015	Test Function	Non-beamforming function

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5146.00	65.92	74.00	-8.08	62.86	4.26	33.27	34.47	241	184	Peak	VERTICAL
2	5146.00	53.61	54.00	-0.39	50.55	4.26	33.27	34.47	241	184	Average	VERTICAL
3	5216.00	101.22			98.01	4.29	33.39	34.47	241	184	Average	VERTICAL
4	5217.00	110.33			107.12	4.29	33.39	34.47	241	184	Peak	VERTICAL
5	5357.00	60.19	74.00	-13.81	56.68	4.35	33.63	34.47	241	184	Peak	VERTICAL
6	5361.00	47.67	54.00	-6.33	44.12	4.36	33.66	34.47	241	184	Average	VERTICAL

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

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5703.00	53.83	54.00	-0.17	49.33	4.49	34.52	34.51	358	148	Average	VERTICAL
2	5704.00	66.19	74.00	-7.81	61.69	4.49	34.52	34.51	358	148	Peak	VERTICAL
3	5722.00	71.91	78.20	-6.29	67.35	4.50	34.57	34.51	358	148	Peak	VERTICAL
4	5742.00	112.07			107.47	4.50	34.62	34.52	358	148	Peak	VERTICAL
5	5742.00	99.38			94.78	4.50	34.62	34.52	358	148	Average	VERTICAL
6	5854.00	68.44	78.20	-9.76	63.44	4.55	34.99	34.54	358	148	Peak	VERTICAL
7	5864.00	69.43	74.00	-4.57	64.43	4.55	34.99	34.54	358	148	Peak	VERTICAL
8	5864.00	52.45	54.00	-1.55	47.45	4.55	34.99	34.54	358	148	Average	VERTICAL

Item 4, 5 are the fundamental frequency at 5775 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 24, 2015 / Sep. 04, 2015	Test Function	Beamforming function

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5149.00	67.42	74.00	-6.58	64.36	4.26	33.27	34.47	360	138	Peak	VERTICAL
2	5150.00	53.49	54.00	-0.51	50.43	4.26	33.27	34.47	360	138	Average	VERTICAL
3	5178.60	120.89			117.76	4.27	33.33	34.47	360	138	Peak	VERTICAL
4	5187.60	109.35			106.22	4.27	33.33	34.47	360	138	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5180 MHz.

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.71	64.71	74.00	-9.29	60.37	5.51	33.17	34.34	144	74	VERTICAL	Peak
2	5150.00	52.66	54.00	-1.34	48.32	5.51	33.17	34.34	144	74	VERTICAL	Average
3	5193.34	109.78			105.34	5.53	33.25	34.34	144	74	VERTICAL	Average
4	5198.84	121.32			116.88	5.53	33.25	34.34	144	74	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5200 MHz.

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.70	60.77	74.00	-13.23	56.43	5.51	33.17	34.34	127	360	VERTICAL	Peak
2	5150.00	47.67	54.00	-6.33	43.33	5.51	33.17	34.34	127	360	VERTICAL	Average
3	5234.79	116.96			112.42	5.54	33.34	34.34	127	360	VERTICAL	Peak
4	5246.51	105.38			100.82	5.55	33.34	34.33	127	360	VERTICAL	Average
5	5350.00	49.48	54.00	-4.52	44.68	5.59	33.53	34.32	127	360	VERTICAL	Average
6	5354.78	63.83	74.00	-10.17	59.01	5.59	33.55	34.32	127	360	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5240 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 24, 2015 / Sep. 04, 2015	Test Function	Beamforming function

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5712.60	71.14	74.00	-2.86	66.64	4.49	34.52	34.51	358	133	Peak	VERTICAL
2	5715.00	53.87	54.00	-0.13	49.37	4.49	34.52	34.51	358	133	Average	VERTICAL
3	5724.40	76.32	78.20	-1.88	71.76	4.50	34.57	34.51	358	133	Peak	VERTICAL
4	5750.20	121.27			116.67	4.50	34.62	34.52	358	133	Peak	VERTICAL
5	5751.80	109.24			104.57	4.51	34.68	34.52	358	133	Average	VERTICAL

Item 4, 5 are the fundamental frequency at 5745 MHz.

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5712.97	63.02	68.20	-5.18	57.08	5.85	34.45	34.36	125	54	VERTICAL	Peak
2	5724.13	63.72	78.20	-14.48	57.73	5.85	34.50	34.36	125	54	VERTICAL	Peak
3	5782.68	105.06			98.88	5.90	34.65	34.37	125	54	VERTICAL	Average
4	5788.47	119.98			113.79	5.92	34.65	34.38	125	54	VERTICAL	Peak
5	5850.29	63.07	78.20	-15.13	56.66	5.95	34.85	34.39	125	54	VERTICAL	Peak
6	5860.58	62.40	68.20	-5.80	55.92	5.97	34.90	34.39	125	54	VERTICAL	Peak

Item 3, 4 are the fundamental frequency at 5785 MHz.

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5818.34	105.56			99.26	5.93	34.75	34.38	134	104	VERTICAL	Average
2	5826.45	119.15			112.79	5.94	34.80	34.38	134	104	VERTICAL	Peak
3	5850.00	69.40	78.20	-8.80	62.99	5.95	34.85	34.39	134	104	VERTICAL	Peak
4	5865.50	67.83	68.20	-0.37	61.35	5.97	34.90	34.39	134	104	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 5825 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Aug. 25, 2015 / Sep. 04, 2015	Test Function	Beamforming function

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5148.40	66.92	74.00	-7.08	63.86	4.26	33.27	34.47	353	145	Peak	VERTICAL
2	5149.60	53.47	54.00	-0.53	50.41	4.26	33.27	34.47	353	145	Average	VERTICAL
3	5198.80	102.01			98.84	4.28	33.36	34.47	353	145	Average	VERTICAL
4	5201.60	114.46			111.29	4.28	33.36	34.47	353	145	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5190 MHz.

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5146.53	65.42	74.00	-8.58	61.08	5.51	33.17	34.34	128	35	VERTICAL	Peak
2	5150.00	53.71	54.00	-0.29	49.37	5.51	33.17	34.34	128	35	VERTICAL	Average
3	5227.40	121.06			116.55	5.54	33.31	34.34	128	35	VERTICAL	Peak
4	5241.29	107.59			103.04	5.55	33.34	34.34	128	35	VERTICAL	Average

Item 3, 4 are the fundamental frequency at 5230 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Sep. 04, 2015	Test Function	Beamforming function

Channel 151

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5714.20	67.51	74.00	-6.49	63.01	4.49	34.52	34.51	354	124	Peak	VERTICAL
2	5715.00	53.52	54.00	-0.48	49.02	4.49	34.52	34.51	354	124	Average	VERTICAL
3	5721.40	69.26	78.20	-8.94	64.70	4.50	34.57	34.51	354	124	Peak	VERTICAL
4	5752.60	102.85			98.18	4.51	34.68	34.52	354	124	Average	VERTICAL
5	5759.40	115.19			110.53	4.51	34.68	34.53	354	124	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5755 MHz.

Channel 159

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5711.80	64.22	74.00	-9.78	59.72	4.49	34.52	34.51	355	155	Peak	VERTICAL
2	5715.00	51.33	54.00	-2.67	46.83	4.49	34.52	34.51	355	155	Average	VERTICAL
3	5721.80	66.13	78.20	-12.07	61.57	4.50	34.57	34.51	355	155	Peak	VERTICAL
4	5779.40	107.99			103.27	4.52	34.73	34.53	355	155	Peak	VERTICAL
5	5786.60	120.04			115.27	4.52	34.78	34.53	355	155	Peak	VERTICAL
6	5858.60	69.39	78.20	-8.81	64.39	4.55	34.99	34.54	355	155	Peak	VERTICAL
7	5860.00	52.38	54.00	-1.62	47.38	4.55	34.99	34.54	355	155	Average	VERTICAL
8	5863.40	67.99	74.00	-6.01	62.99	4.55	34.99	34.54	355	155	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5795 MHz.

Temperature	20°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Sep. 04, 2015	Test Function	Beamforming function

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5148.00	65.34	74.00	-8.66	62.28	4.26	33.27	34.47	360	166	Peak	VERTICAL
2	5150.00	52.71	54.00	-1.29	49.65	4.26	33.27	34.47	360	166	Average	VERTICAL
3	5244.00	111.16			107.88	4.30	33.45	34.47	360	166	Peak	VERTICAL
4	5244.00	99.65			96.37	4.30	33.45	34.47	360	166	Average	VERTICAL
5	5350.00	45.85	54.00	-8.15	42.34	4.35	33.63	34.47	360	166	Average	VERTICAL
6	5367.00	58.65	74.00	-15.35	55.10	4.36	33.66	34.47	360	166	Peak	VERTICAL

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

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5713.00	66.40	74.00	-7.60	61.90	4.49	34.52	34.51	0	130	Peak	VERTICAL
2	5715.00	53.19	54.00	-0.81	48.69	4.49	34.52	34.51	0	130	Average	VERTICAL
3	5724.00	69.49	74.00	-4.51	64.93	4.50	34.57	34.51	0	130	Peak	VERTICAL
4	5740.00	100.18			95.58	4.50	34.62	34.52	0	130	Average	VERTICAL
5	5742.00	112.19			107.59	4.50	34.62	34.52	0	130	Peak	VERTICAL
6	5859.00	67.36	74.00	-6.64	62.36	4.55	34.99	34.54	0	130	Peak	VERTICAL
7	5860.00	50.43	54.00	-3.57	45.43	4.55	34.99	34.54	0	130	Average	VERTICAL
8	5865.00	65.71	74.00	-8.29	60.71	4.55	34.99	34.54	0	130	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5775 MHz.

Note:

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

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

4.8. Frequency Stability Measurement

4.8.1. 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).

4.8.2. Measuring Instruments and Setting

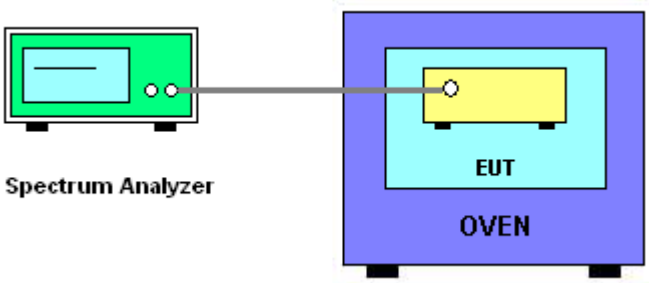
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.8.3. 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.

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

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

4.8.7. Test Result of Frequency Stability

Temperature	25℃	Humidity	56%
Test Engineer	Serway Li	Test Date	Sep. 07, 2015

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9558	5199.9710	5199.9586	5199.9624
110.00	5199.9642	5199.9624	5199.9586	5199.9624
93.50	5199.9558	5199.9558	5199.9642	5199.9558
Max. Deviation (MHz)	0.0442	0.0442	0.0414	0.0442
Max. Deviation (ppm)	8.50	8.50	7.96	8.50
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(℃)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5199.9542	5199.9624	5199.9558	5199.9545
10	5199.9558	5199.9624	5199.9558	5199.9545
20	5199.9542	5199.9542	5199.9642	5199.9542
30	5199.9642	5199.9636	5199.9636	5199.9542
40	5199.9624	5199.9624	5199.9636	5199.9624
Max. Deviation (MHz)	0.0458	0.0458	0.0442	0.0458
Max. Deviation (ppm)	8.81	8.81	8.50	8.81
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9692	5784.9654	5784.9642	5784.9667
110.00	5784.9692	5784.9654	5784.9642	5784.9648
93.50	5784.9685	5784.9692	5784.9692	5784.9648
Max. Deviation (MHz)	0.0315	0.0346	0.0358	0.0352
Max. Deviation (ppm)	5.45	5.98	6.19	6.08
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9663	5784.9692	5784.9563	5784.9591
10	5784.9654	5784.9692	5784.9624	5784.9591
20	5784.9654	5784.9588	5784.9616	5784.9624
30	5784.9648	5784.9588	5784.9616	5784.9624
40	5784.9648	5784.9592	5784.9616	5784.9642
Max. Deviation (MHz)	0.0352	0.0412	0.0437	0.0409
Max. Deviation (ppm)	6.08	7.12	7.55	7.07
Result	Complies			

Mode: 40 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5189.9548	5189.9612	5189.9612	5189.9612
110.00	5189.9536	5189.9548	5189.9592	5189.9548
93.50	5189.9548	5189.9612	5189.9592	5189.9544
Max. Deviation (MHz)	0.0464	0.0452	0.0408	0.0456
Max. Deviation (ppm)	8.94	8.71	7.86	8.79
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5189.9551	5189.9536	5189.9548	5189.9568
10	5189.9551	5189.9536	5189.9552	5189.9554
20	5189.9548	5189.9551	5189.9560	5189.9554
30	5189.9548	5189.9564	5189.9560	5189.9551
40	5189.9564	5189.9572	5189.9548	5189.9556
Max. Deviation (MHz)	0.0452	0.0464	0.0452	0.0449
Max. Deviation (ppm)	8.71	8.94	8.71	8.65
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9642	5754.9652	5754.9642	5754.9568
110.00	5754.9628	5754.9592	5754.9642	5754.9668
93.50	5754.9548	5754.9652	5754.9588	5754.9592
Max. Deviation (MHz)	0.0452	0.0408	0.0412	0.0432
Max. Deviation (ppm)	7.85	7.09	7.16	7.51
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5754.9648	5754.9623	5754.9588	5754.9654
10	5754.9654	5754.9648	5754.9548	5754.9641
20	5754.9654	5754.9572	5754.9544	5754.9641
30	5754.9642	5754.9586	5754.9623	5754.9568
40	5754.9623	5754.9586	5754.9612	5754.9542
Max. Deviation (MHz)	0.0377	0.0428	0.0456	0.0458
Max. Deviation (ppm)	6.55	7.44	7.92	7.96
Result	Complies			

Mode: 80 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5209.9653	5209.9632	5209.9612	5209.9616
110.00	5209.9648	5209.9632	5209.9624	5209.9642
93.50	5209.9632	5209.9648	5209.9642	5209.9633
Max. Deviation (MHz)	0.0368	0.0368	0.0388	0.0384
Max. Deviation (ppm)	7.06	7.06	7.45	7.37
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5209.9591	5209.9572	5209.9564	5209.9588
10	5209.9564	5209.9572	5209.9572	5209.9588
20	5209.9548	5209.9589	5209.9578	5209.9572
30	5209.9564	5209.9568	5209.9572	5209.9572
40	5209.9564	5209.9564	5209.9564	5209.9582
Max. Deviation (MHz)	0.0452	0.0436	0.0436	0.0428
Max. Deviation (ppm)	8.68	8.37	8.37	8.21
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9642	5774.9564	5774.9589	5774.9567
110.00	5774.9642	5774.9564	5774.9571	5774.9622
93.50	5774.9628	5774.9589	5774.9568	5774.9622
Max. Deviation (MHz)	0.0372	0.0436	0.0432	0.0433
Max. Deviation (ppm)	6.44	7.55	7.48	7.50
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5774.9562	5774.9622	5774.9624	5774.9642
10	5774.9568	5774.9622	5774.9624	5774.9592
20	5774.9568	5774.9648	5774.9594	5774.9548
30	5774.9562	5774.9612	5774.9594	5774.9584
40	5774.9611	5774.9636	5774.9568	5774.9582
Max. Deviation (MHz)	0.0438	0.0388	0.0432	0.0452
Max. Deviation (ppm)	7.58	6.72	7.48	7.83
Result	Complies			

4.9. Antenna Requirements

4.9.1. 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.

4.9.2. 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
EMI Test Receiver	R&S	ESCS 30	100355	9kHz ~ 2.75GHz	Apr. 22, 2015	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 02, 2014	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 02, 2014	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	Dec. 03, 2014	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	May 06, 2015	Radiation (03CH01-CB)
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	8447D	2944A10991	0.1MHz ~ 1.3GHz	Feb. 24, 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)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 21, 2015	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 15, 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)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 12, 2015*	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	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.

"*" Calibration Interval of instruments listed above is two years.

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

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
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%