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FCC RADIO TEST REPORT

Applicant's company	**Xirrus, Inc.**
Applicant Address	2101 Corporate Center Drive, Thousand Oaks, CA 91320 USA
FCC ID	**SK6-XDR240**
Manufacturer's company	**Lite-On Network Communication (Dongguan) Limited**
Manufacturer Address	30#Keji Rd.,Yin Hu Industrial Area, Qingxi Town, DongGuan City, Guangdong, China

Product Name	Wireless Access Point Radio module
Brand Name	XIRRUS
Model No.	XDR240
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Dec. 10, 2015
Final Test Date	Apr. 02, 2016
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 v01r01, 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
FR5D1826AB	Rev. 01	Initial issue of report	Apr. 11, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	Wireless Access Point Radio module
Brand Name	:	XIRRUS
Model No.	:	XDR240
Applicant	:	Xirrus, Inc.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Dec. 10, 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	21.76 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	0.30 dB
4.5	15.407(a)	Power Spectral Density	Complies	0.51 dB
4.6	15.407(b)	Radiated Emissions	Complies	4.00 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	-

Note: 1. The EUT is a limited module which only limited to the Wireless Access Point (brand: XIRRUS / model: XD4240).

2. The EUT was installed to the Wireless Access Point (brand: XIRRUS / model: XD4240) to perform all the tests.

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From host system
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM, 1024QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	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: 23.44 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 20.49 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.48 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 74.96 MHz Band 4: IEEE 802.11a: 24.05 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 25.96 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.34 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.25 MHz For beamforming function: Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.32 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 44.72 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 67.73 MHz Band 4: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.15 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.34 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 71.78 MHz

Maximum Conducted Output Power	For non-beamforming function: Band 1: IEEE 802.11a: 23.76 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 23.88 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.70 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 18.94 dBm Band 4: IEEE 802.11a: 26.44 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 26.13 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 24.24 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.54 dBm For beamforming function: Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 25.75 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.68 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 18.27 dBm Band 4: IEEE 802.11ac MCS0/Nss1 (VHT20): 25.47 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 24.69 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.75 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 in 5GHz band / 802.11ac in 2.4GHz band and 5GHz band.	
Operate Condition	☒ Indoor	☐ Outdoor

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	MCS0-11/Nss1-4
802.11ac (VHT40)	4	MCS0-11/Nss1-4
802.11ac (VHT80)	4	MCS0-11/Nss1-4

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

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

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

3.2. Accessories

N/A

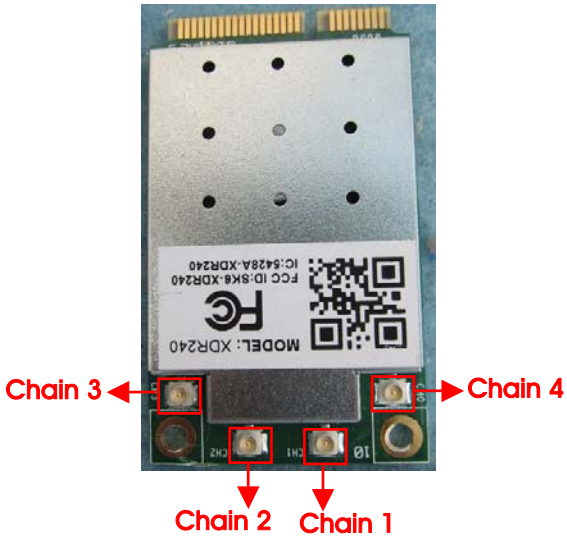
3.3. Table for Filed Antenna

Ant.	Brand	Model No.	Type	Connector	Gain (dBi)		
					2.4GHz Band	5GHz Band 1	5GHz Band 4
1	Walsin	30100006976D	PIFA	I-PEX	-3.0	3.8	4.3
2	Walsin	30100006976D	PIFA	I-PEX	-1.1	4.6	2.4
3	Walsin	30100006976D	PIFA	I-PEX	-0.6	4.6	4.7
4	Walsin	30100006976D	PIFA	I-PEX	3.9	1.5	5.2

Note: The EUT has four antennas (4TX, 4RX).

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

Chain 1: Connect to Ant. 1, Chain 2: Connect to Ant. 2, Chain 3: Connect to Ant. 3, Chain 4: Connect to Ant. 4.



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	CTX		-	-	-
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	CTX		-	-	-
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. 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.

2. There are two functions of EUT, one is beamforming function, and the other is non-beamforming function for 802.11n in 5GHz band / 802.11ac in 2.4GHz band and 5GHz band. All test results were recorded in the report.

The following test modes were performed for all tests:

For Radiated Emissions 9kHz~1GHz test:

Mode 1. EUT Z axis

Mode 2. EUT Y axis

Mode 1 is the worst case, so it was selected to record in this test report.

For Radiated Emissions 1GHz~10th Harmonic test:

The EUT was performed at X axis, Y axis and Z axis position for Radiated emission above 1GHz test, and the worst case was found at Y axis. So the measurement will follow this same test configuration.

Note: The Wireless Access Point (brand: XIRRUS / model: XD4240) will install four radio modules. These four radios will be operated in different bands. If they are used in the same band, the output power of each radio will be reduced to make sure that total power is equal to max output power of single radio module.

3.6. Table for Testing Locations

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

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

3.7. Table for Supporting Units

For Test Site No: 03CH01-CB

For non-beamforming function:

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC
Wireless Access Point	XIRRUS	XD4240	SK6-XDR240
PoE	Microsemi	PD-9501-10G	N/A

For beamforming function:

Support Unit	Brand	Model	FCC ID
Notebook*2	DELL	E4300	DoC
Wireless Access Point	XIRRUS	XD4240	SK6-XDR240
PoE	Microsemi	PD-9501-10G	N/A
WLAN ac Dongle (RX Device)	Broadcom	Bcm4366	DoC

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC
Wireless Access Point	XIRRUS	XD4240	SK6-XDR240
PoE	Microsemi	PD-9501-10G	N/A

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC
Wireless Access Point	XIRRUS	XD4240	SK6-XDR240
PoE	Microsemi	PD-9501-10G	N/A

3.8. Table for Parameters of Test Software Setting

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

Test Function	Non-beamforming function					
Test Software Version	Xircon V1.0.2.25					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	70	75	67	64	82	77
802.11ac MCS0/Nss1 VHT20	73	75	70	63	81	71
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	53		69		53	72
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz				5775 MHz	
	50				44	

Test Function	Beamforming function					
Test Software Version	Xircon V1.0.2.25					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11ac MCS0/Nss1 VHT20	72	89	71	58	76	71
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	55		69		46	70
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz				5775 MHz	
	47				42	

3.9. 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 RX Device and transmit duty cycle no less 98%

3.10. Duty Cycle

For non-beamforming function:

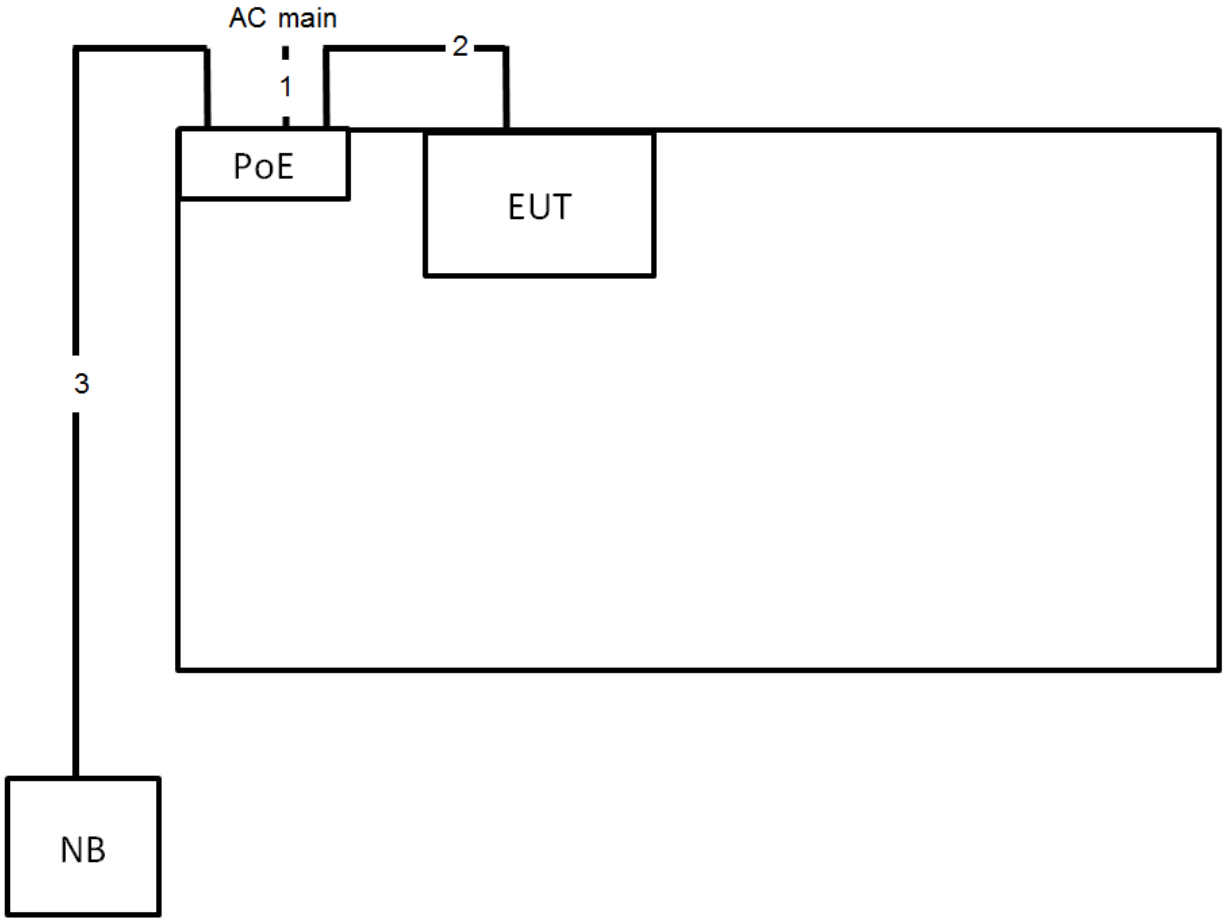
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.064	2.092	98.66	0.06	0.01
802.11ac MCS0/Nss1 VHT20	1.920	1.950	98.46	0.07	0.01
802.11ac MCS0/Nss1 VHT40	0.916	0.976	93.85	0.28	1.09
802.11ac MCS0/Nss1 VHT80	0.430	0.480	89.58	0.48	2.33

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	3.834	4.212	91.03	0.41	0.26
802.11ac MCS0/Nss1 VHT40	3.640	4.020	90.55	0.43	0.27
802.11ac MCS0/Nss1 VHT80	3.384	3.784	89.43	0.49	0.30

3.11. Test Configurations

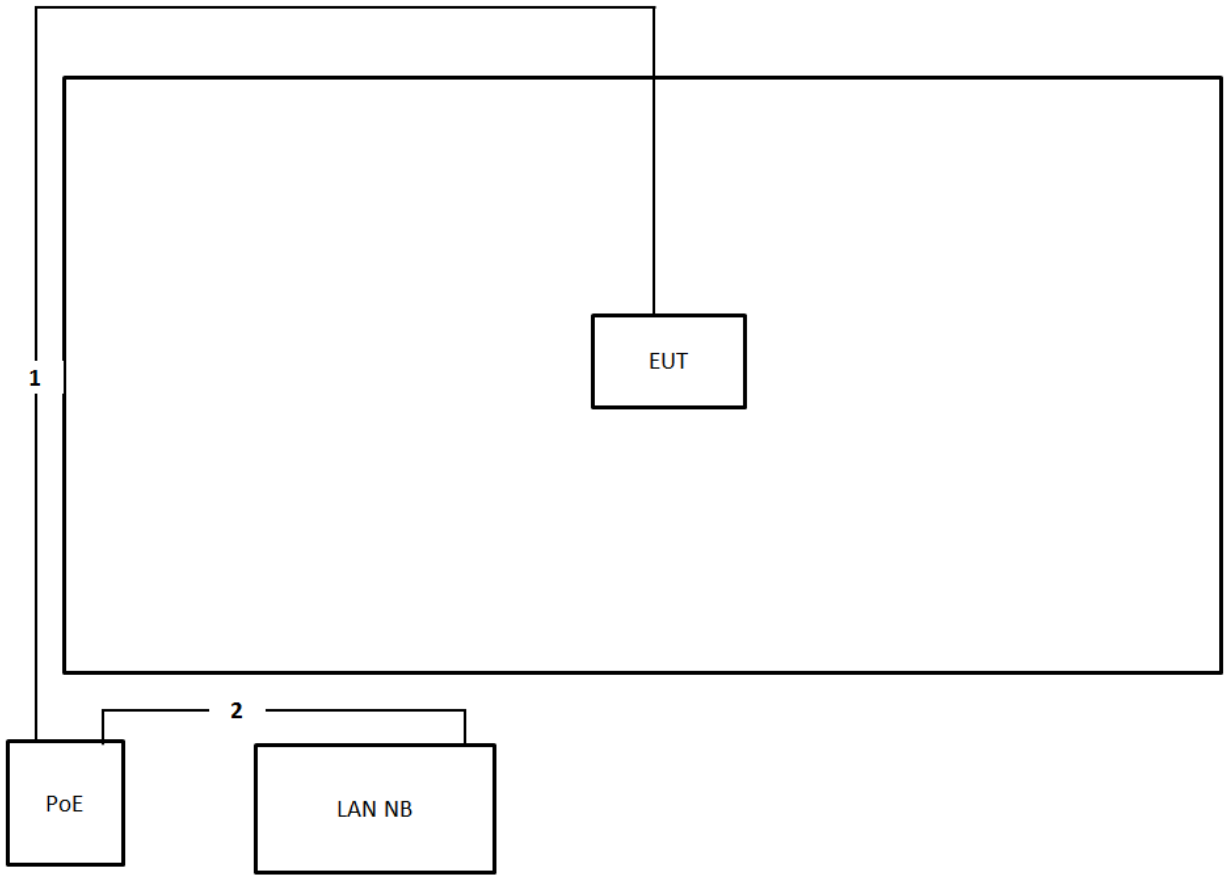
3.11.1. AC Power Line Conduction Emissions Test Configuration



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

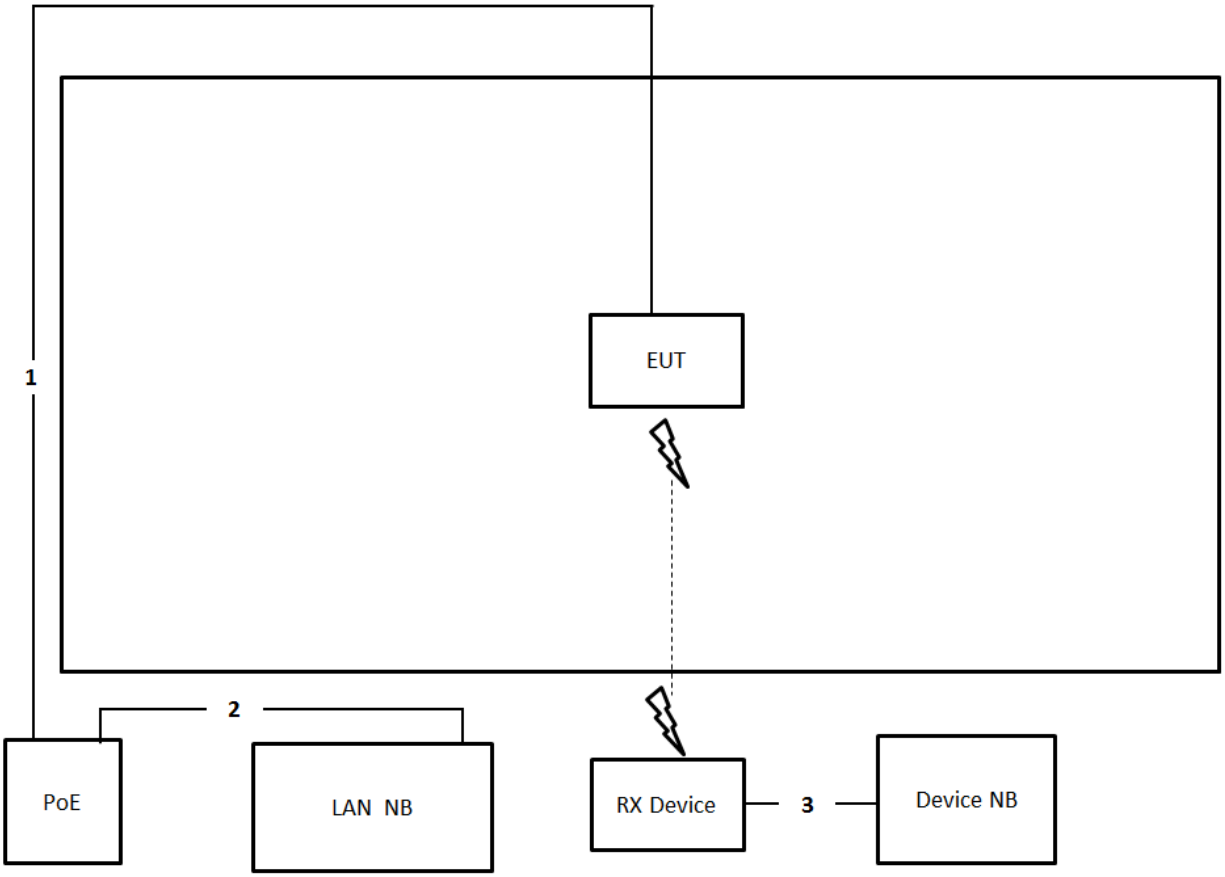
3.11.2. Radiation Emissions Test Configuration

For non-beamforming function:



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

For beamforming function:



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

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

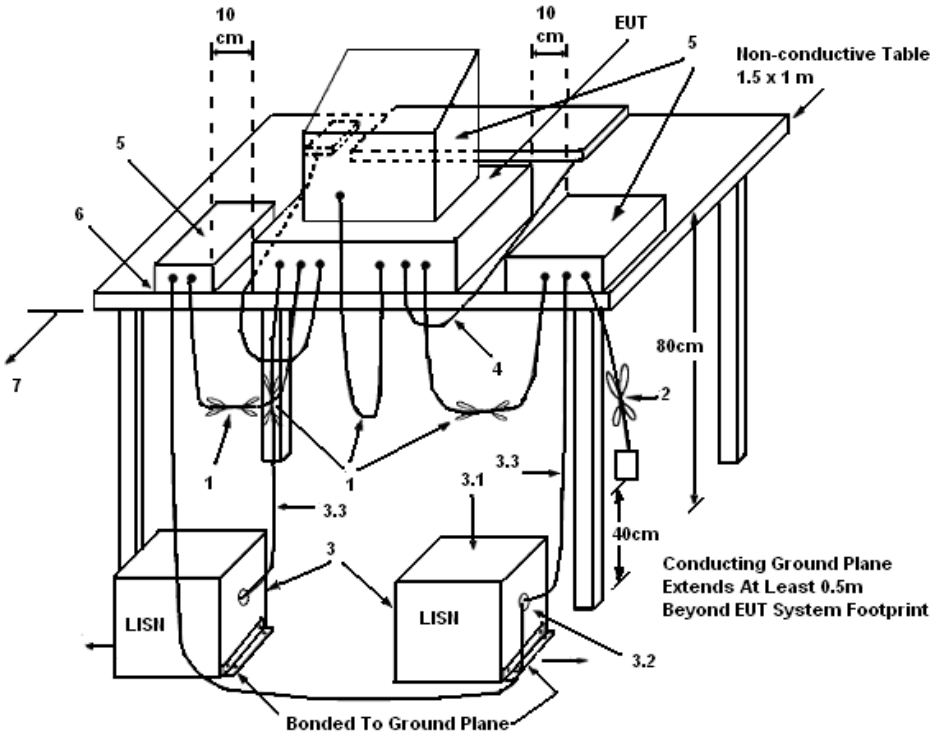
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

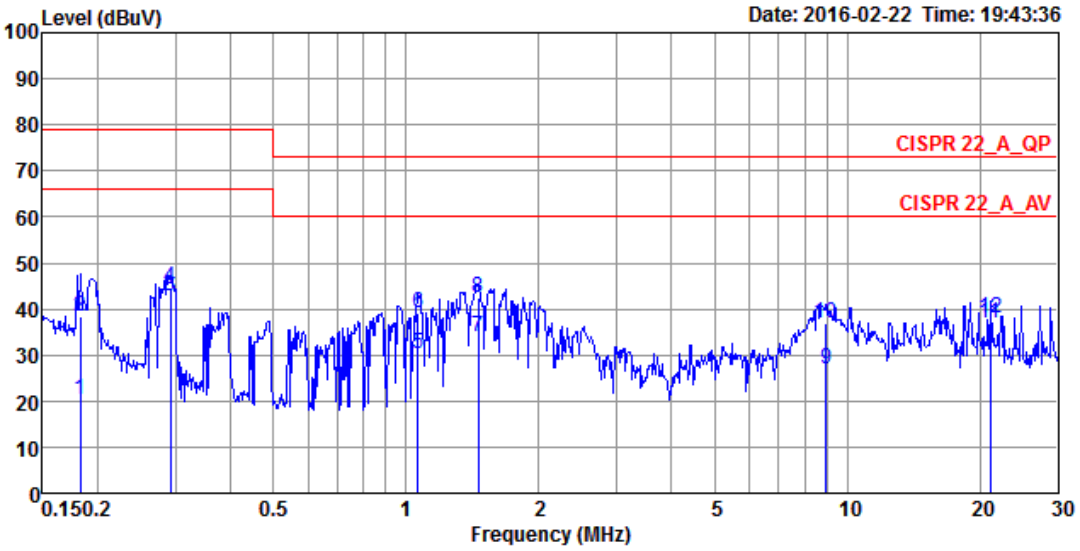
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

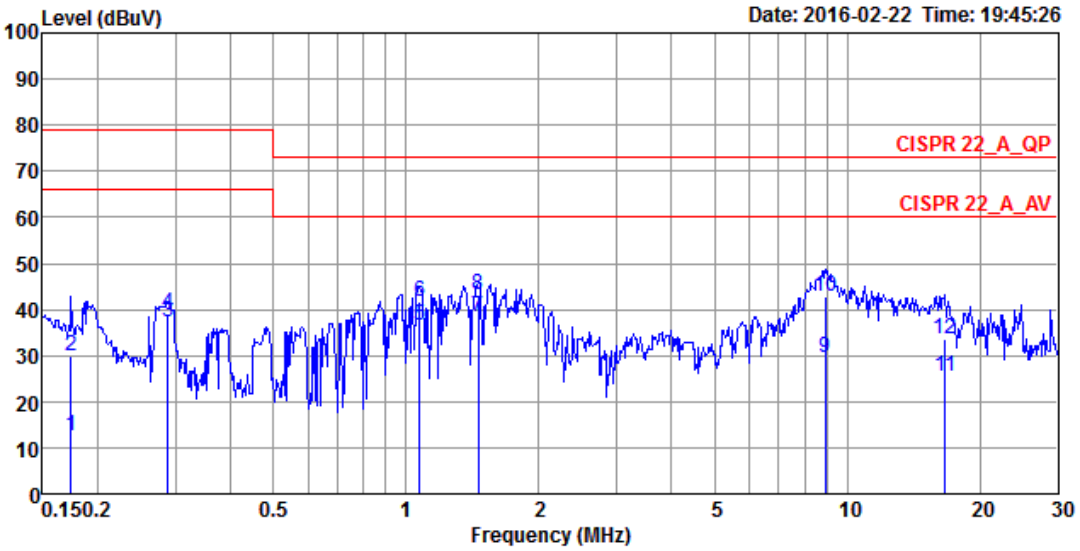
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	22°C	Humidity	57%
Test Engineer	Deven Huang	Phase	Line
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1825	20.42	-45.58	66.00	10.47	9.93	0.02	LINE	Average
2	0.1825	38.40	-40.60	79.00	28.45	9.93	0.02	LINE	QP
3	0.2924	42.86	-23.14	66.00	32.89	9.93	0.04	LINE	Average
4	0.2924	44.82	-34.18	79.00	34.85	9.93	0.04	LINE	QP
5	1.0653	30.25	-29.75	60.00	20.24	9.96	0.05	LINE	Average
6	1.0653	39.24	-33.76	73.00	29.23	9.96	0.05	LINE	QP
7	1.4562	33.90	-26.10	60.00	23.86	9.98	0.06	LINE	Average
8	1.4562	42.31	-30.69	73.00	32.27	9.98	0.06	LINE	QP
9	8.9637	26.89	-33.11	60.00	16.52	10.16	0.21	LINE	Average
10	8.9637	36.95	-36.05	73.00	26.58	10.16	0.21	LINE	QP
11	21.0977	36.73	-23.27	60.00	26.00	10.47	0.26	LINE	Average
12	21.0977	37.97	-35.03	73.00	27.24	10.47	0.26	LINE	QP

Temperature	22°C	Humidity	57%
Test Engineer	Deven Huang	Phase	Neutral
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1740	12.60	-53.40	66.00	2.79	9.79	0.02	NEUTRAL	Average
2	0.1740	29.91	-49.09	79.00	20.10	9.79	0.02	NEUTRAL	QP
3	0.2878	37.16	-28.84	66.00	27.33	9.79	0.04	NEUTRAL	Average
4	0.2878	39.23	-39.77	79.00	29.40	9.79	0.04	NEUTRAL	QP
5	1.0710	36.41	-23.59	60.00	26.55	9.81	0.05	NEUTRAL	Average
6	1.0710	41.71	-31.29	73.00	31.85	9.81	0.05	NEUTRAL	QP
7	1.4562	38.24	-21.76	60.00	28.35	9.83	0.06	NEUTRAL	Average
8	1.4562	43.21	-29.79	73.00	33.32	9.83	0.06	NEUTRAL	QP
9	8.9163	29.70	-30.30	60.00	19.50	9.99	0.21	NEUTRAL	Average
10	8.9163	42.96	-30.04	73.00	32.76	9.99	0.21	NEUTRAL	QP
11	16.6612	25.43	-34.57	60.00	15.04	10.13	0.26	NEUTRAL	Average
12	16.6612	33.47	-39.53	73.00	23.08	10.13	0.26	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	59%
Test Engineer	Peter Wu	Test Function	Non-beamforming function

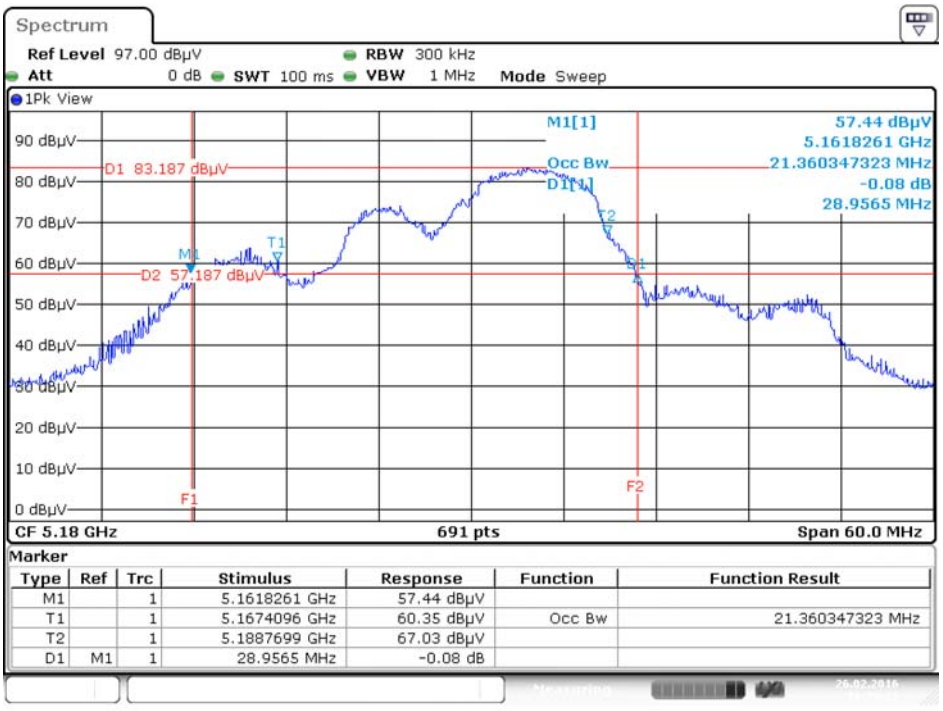
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	28.96	21.36
	5200 MHz	32.87	23.44
	5240 MHz	25.83	18.49
	5745 MHz	21.39	18.15
	5785 MHz	31.30	24.05
	5825 MHz	27.65	22.32
802.11ac MCS0/Nss1 VHT20	5180 MHz	38.00	19.88
	5200 MHz	36.43	20.49
	5240 MHz	25.65	18.58
	5745 MHz	21.48	18.06
	5785 MHz	45.57	25.96
	5825 MHz	32.52	18.41
802.11ac MCS0/Nss1 VHT40	5190 MHz	40.87	37.05
	5230 MHz	71.30	37.48
	5755 MHz	40.87	36.76
	5795 MHz	79.86	37.34
802.11ac MCS0/Nss1 VHT80	5210 MHz	78.84	74.96
	5775 MHz	78.55	75.25

Temperature	25°C	Humidity	59%
Test Engineer	Peter Wu	Test Function	Beamforming function

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5180 MHz	22.17	18.15
	5200 MHz	24.09	18.32
	5240 MHz	22.52	18.23
	5745 MHz	21.65	18.06
	5785 MHz	21.57	18.06
	5825 MHz	21.83	18.15
802.11ac MCS0/Nss1 VHT40	5190 MHz	39.71	36.90
	5230 MHz	71.01	44.72
	5755 MHz	39.71	36.47
	5795 MHz	63.04	37.34
802.11ac MCS0/Nss1 VHT80	5210 MHz	77.10	67.73
	5775 MHz	78.26	71.78

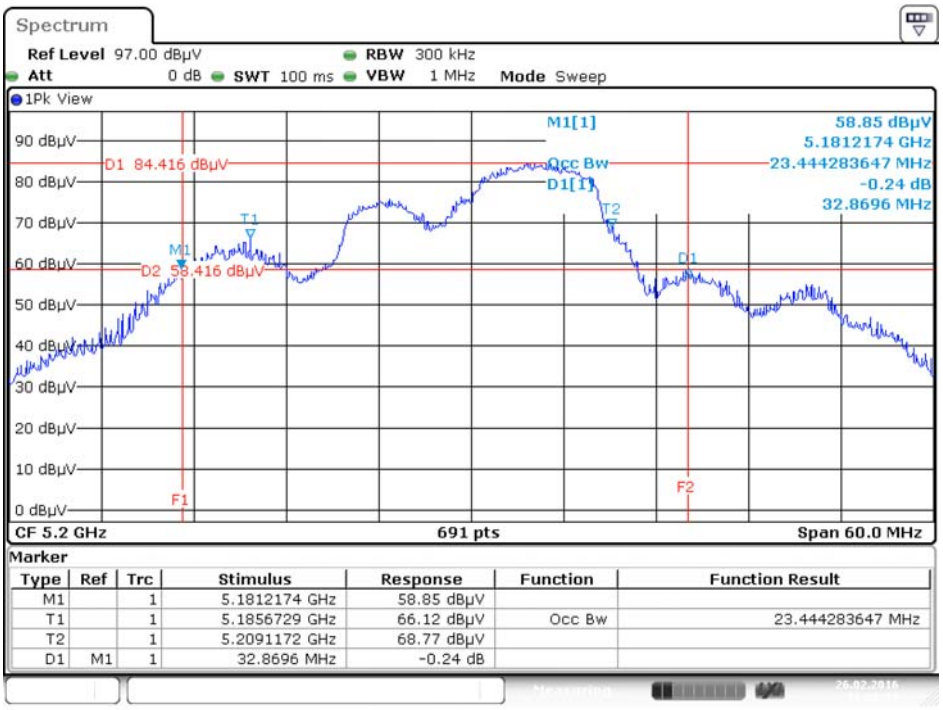
For non-beamforming function:

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



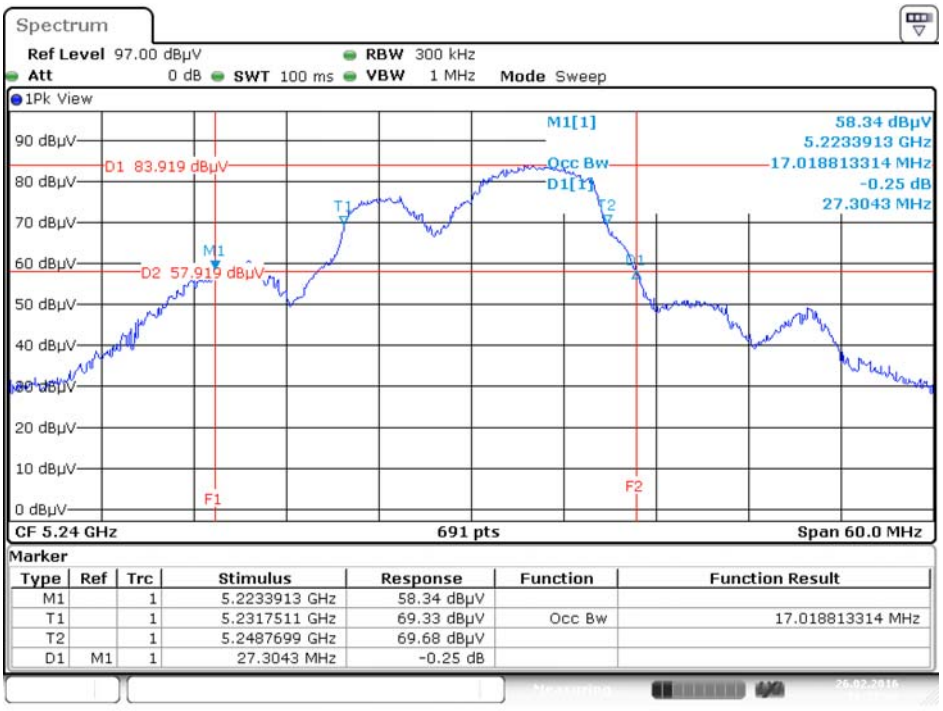
Date: 26.FEB.2016 16:29:12

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



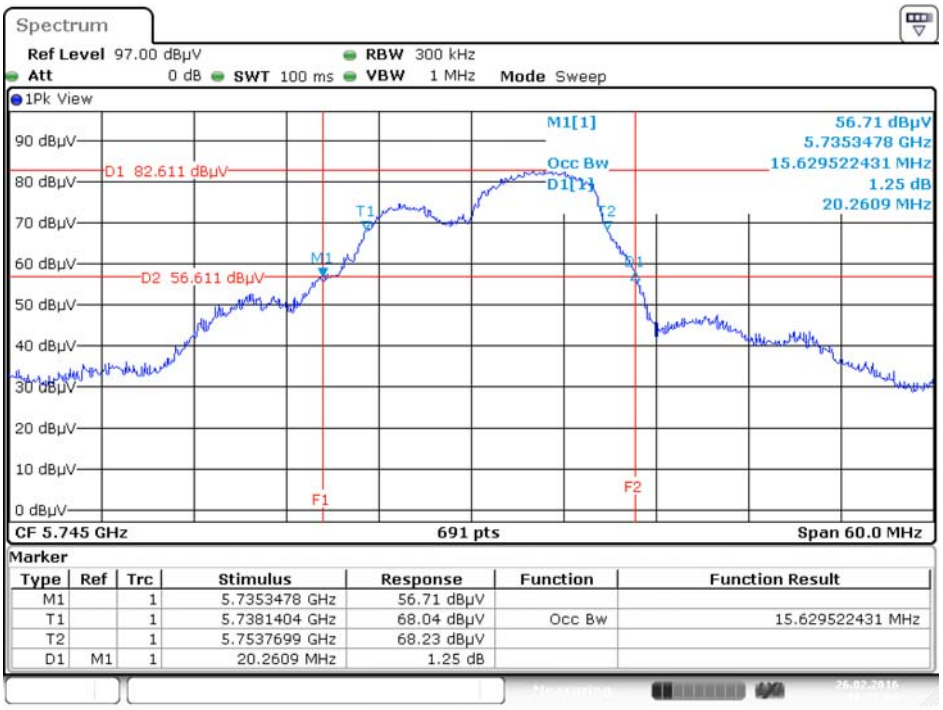
Date: 26.FEB.2016 16:28:33

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



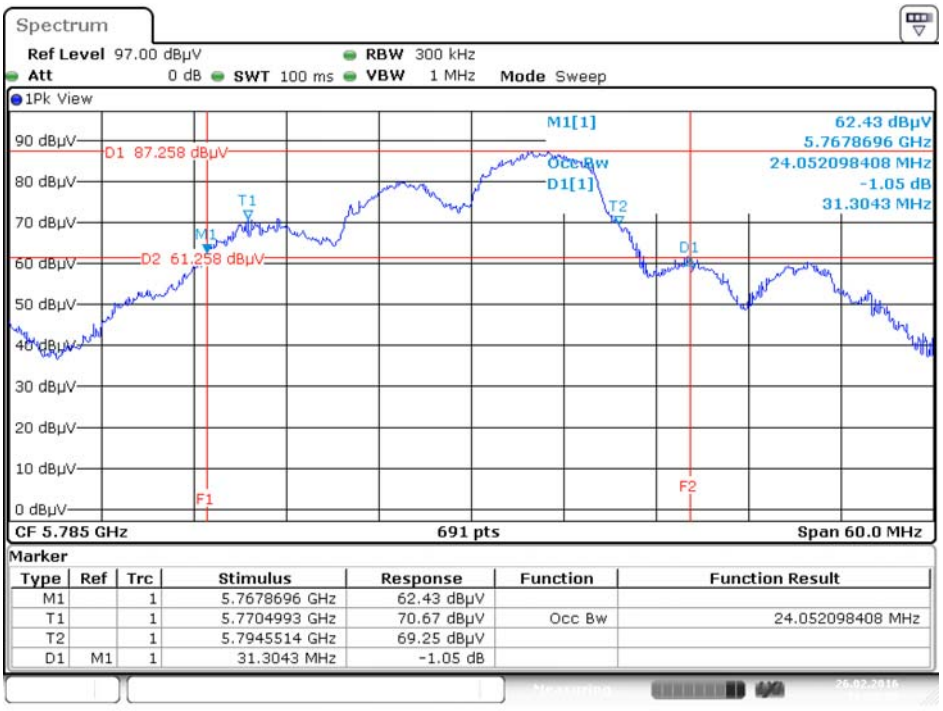
Date: 26.FEB.2016 16:27:47

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



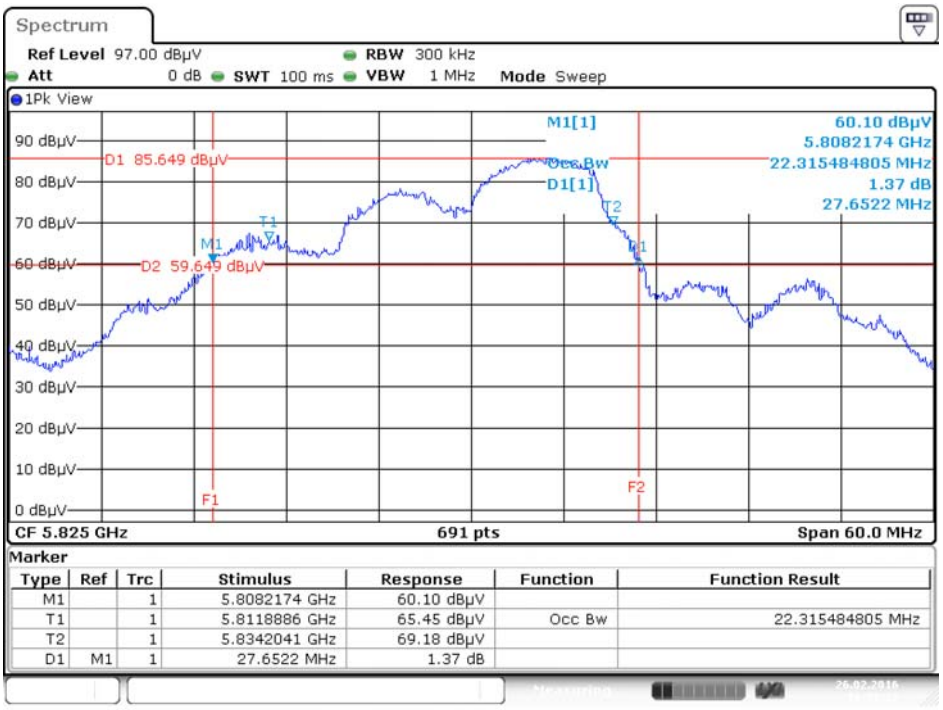
Date: 26.FEB.2016 16:27:03

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



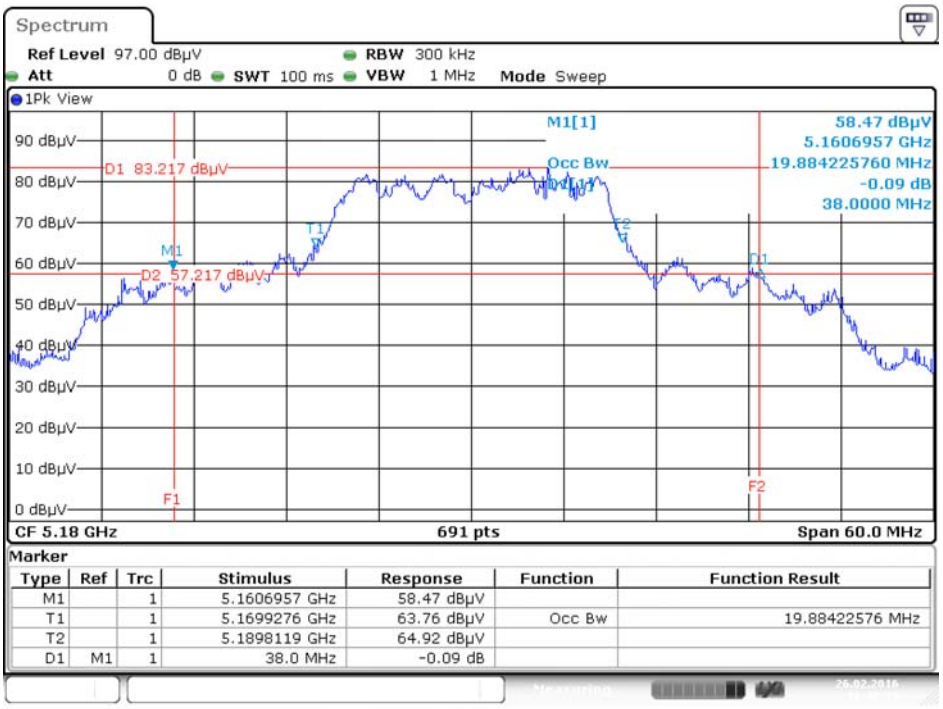
Date: 26.FEB.2016 16:30:30

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



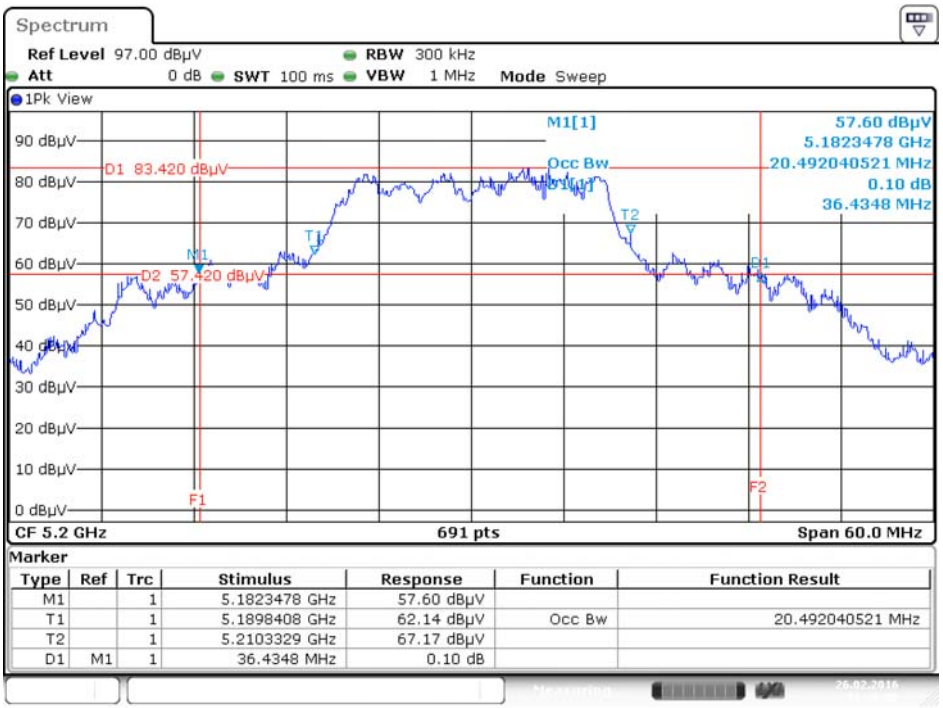
Date: 26.FEB.2016 16:31:22

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



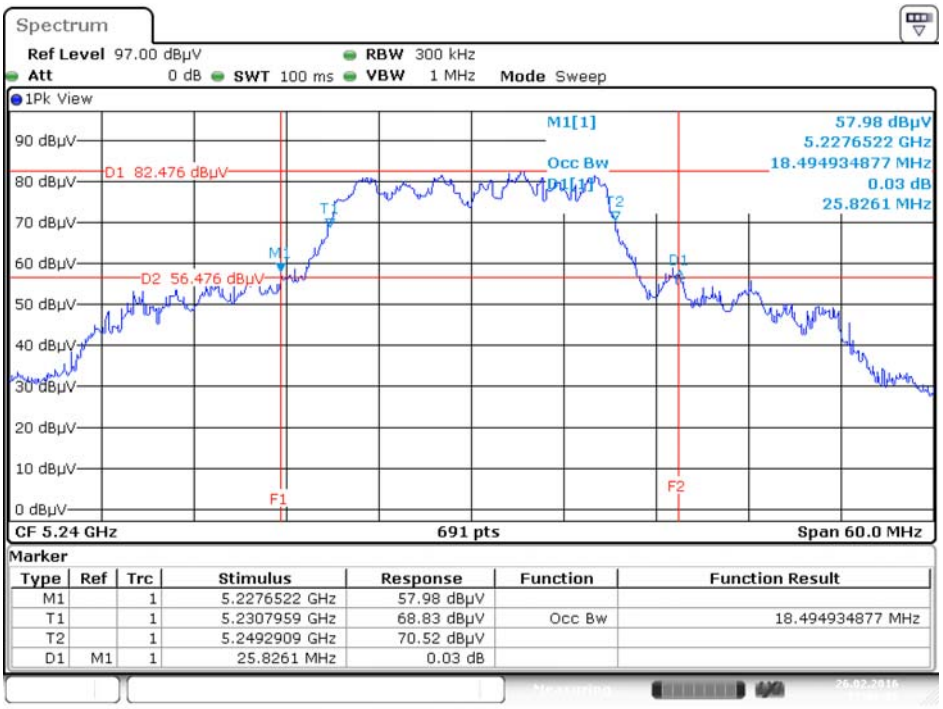
Date: 26.FEB.2016 16:47:33

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



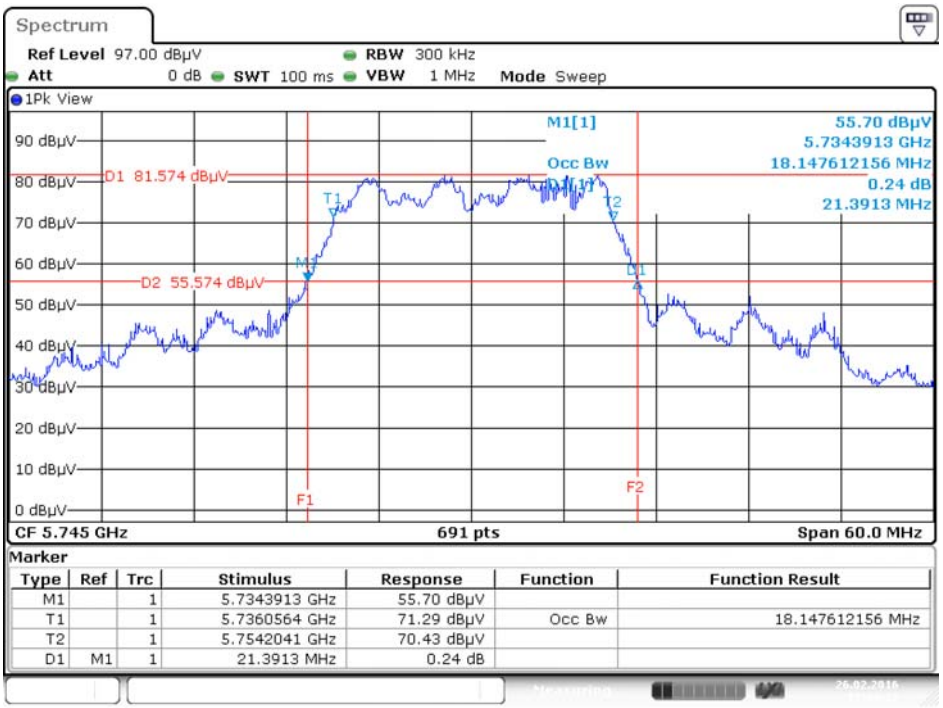
Date: 26.FEB.2016 16:46:07

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



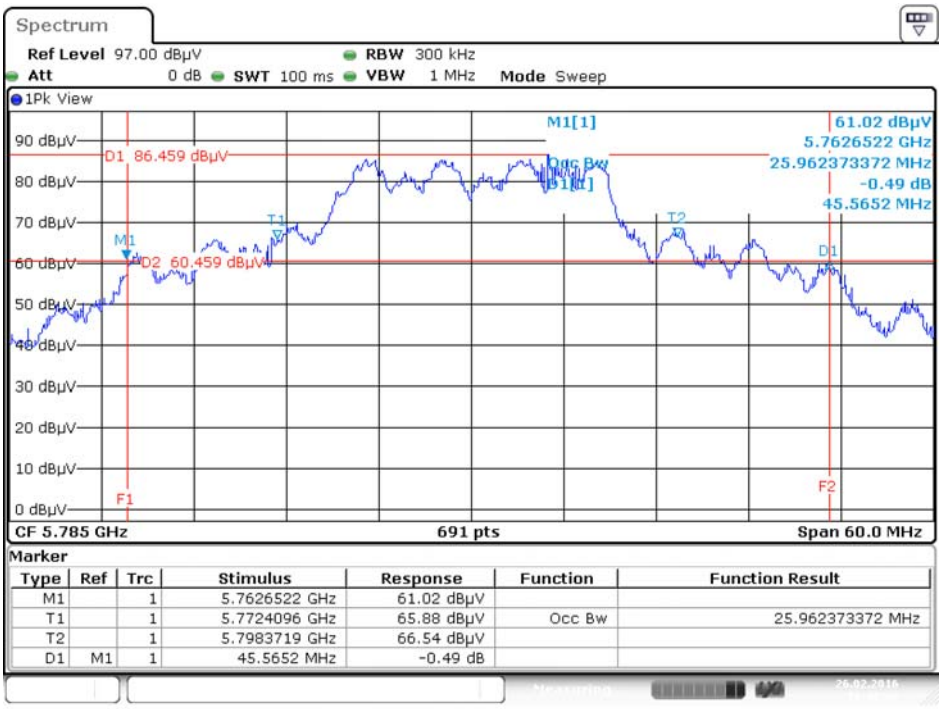
Date: 26.FEB.2016 17:06:16

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



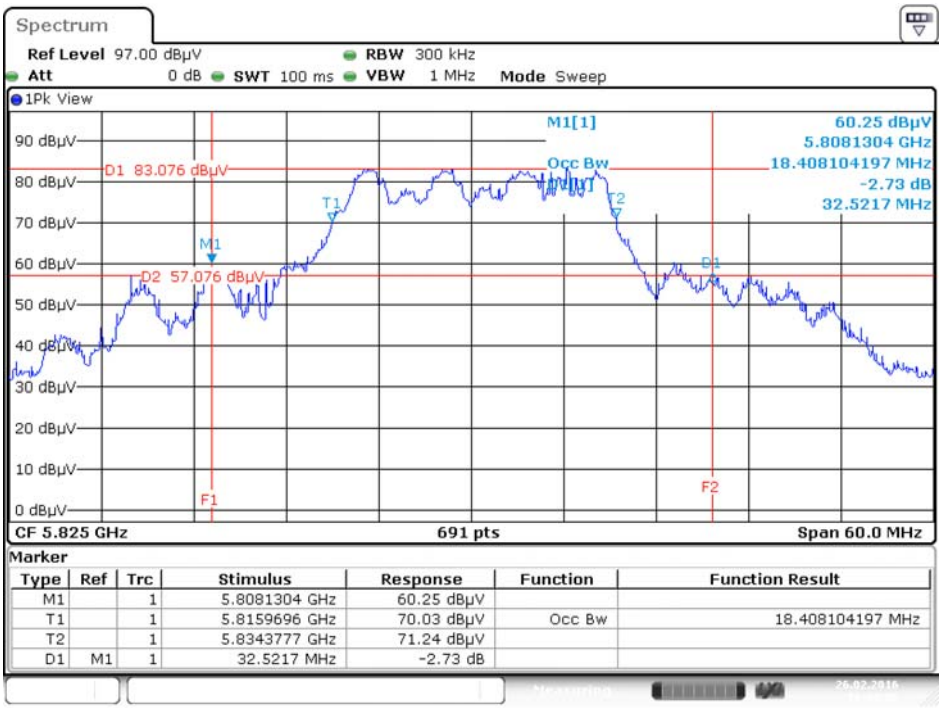
Date: 26.FEB.2016 17:04:37

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



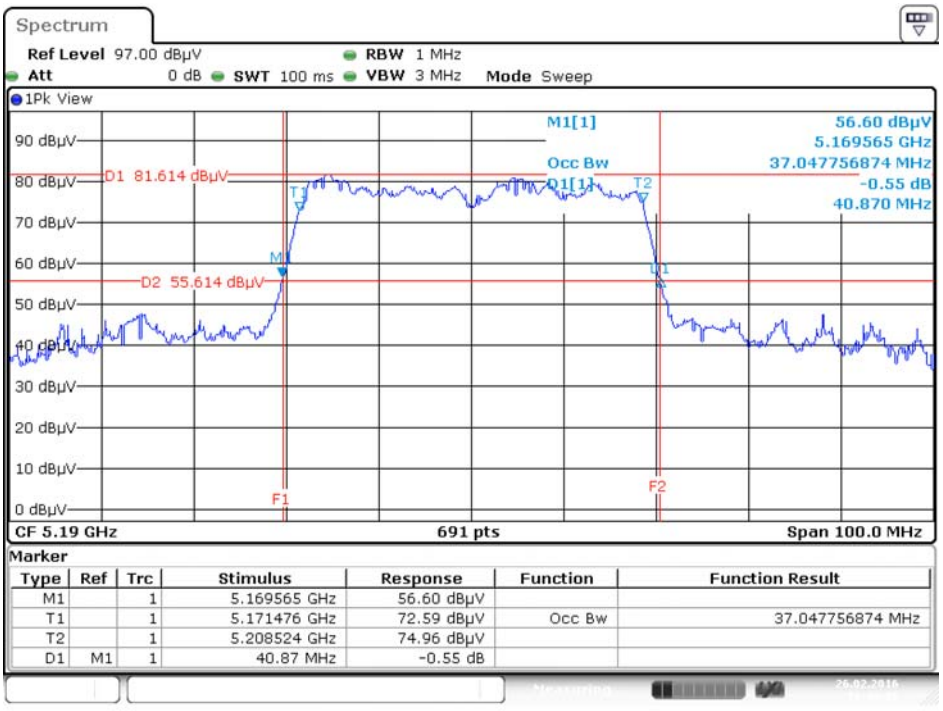
Date: 26.FEB.2016 16:42:47

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



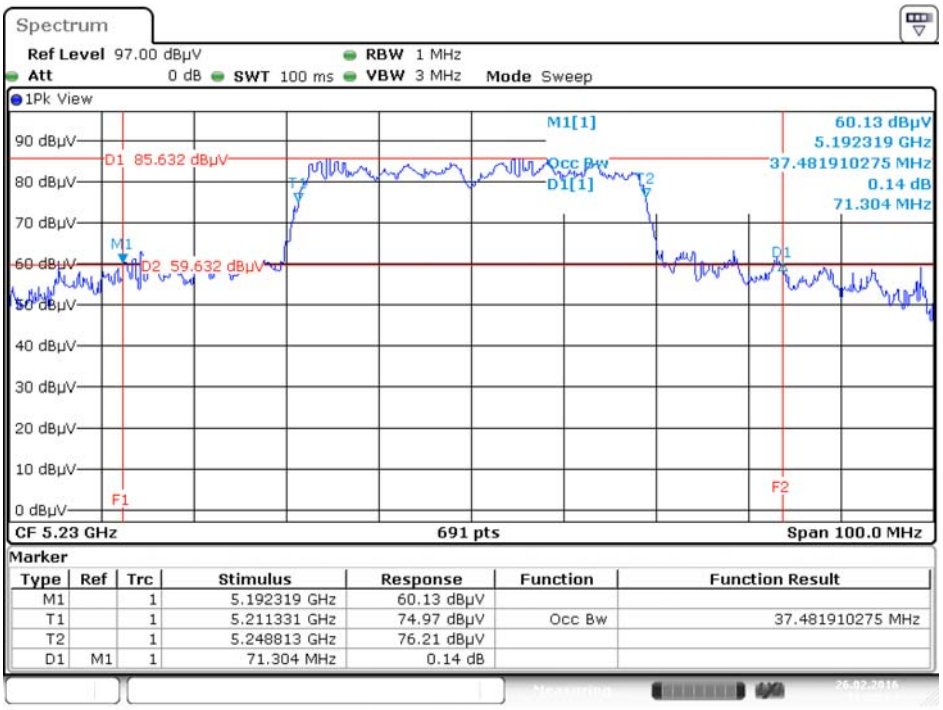
Date: 26.FEB.2016 16:43:36

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



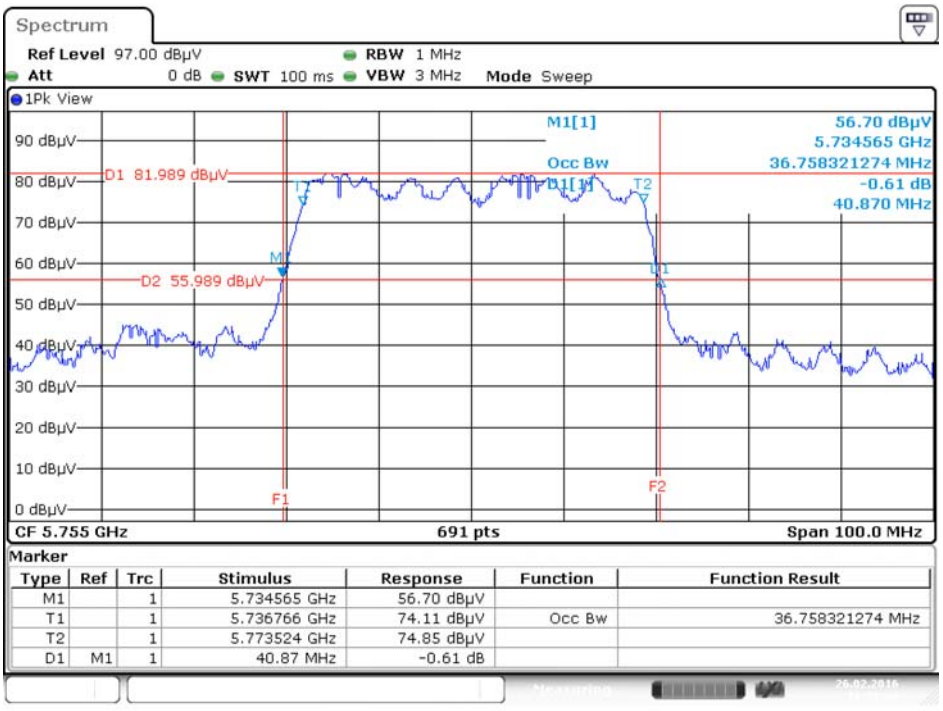
Date: 26.FEB.2016 16:49:16

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: 26.FEB.2016 16:50:04

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



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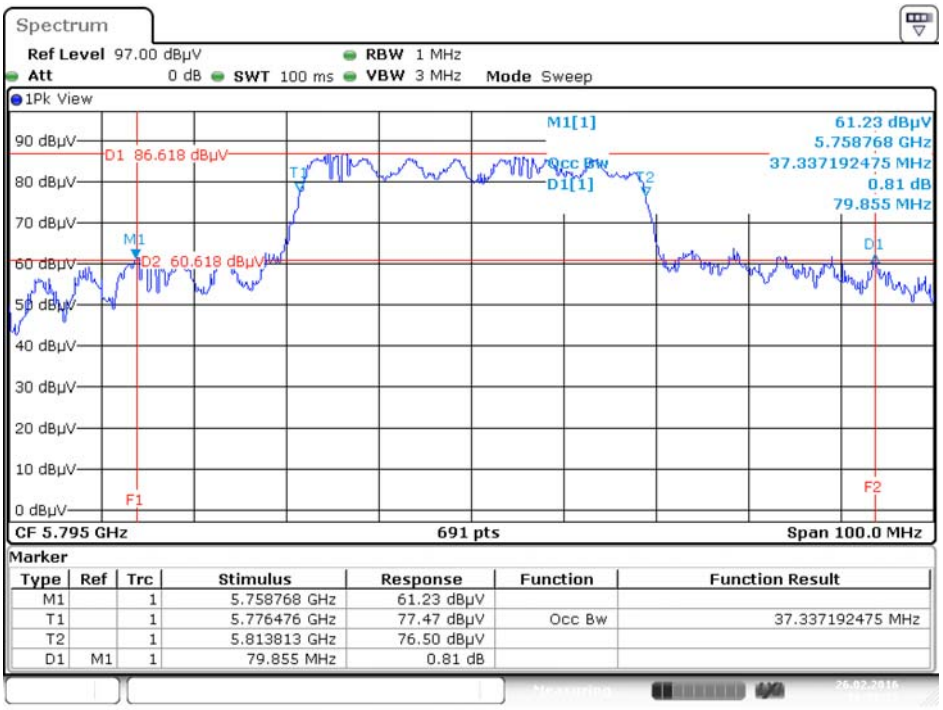
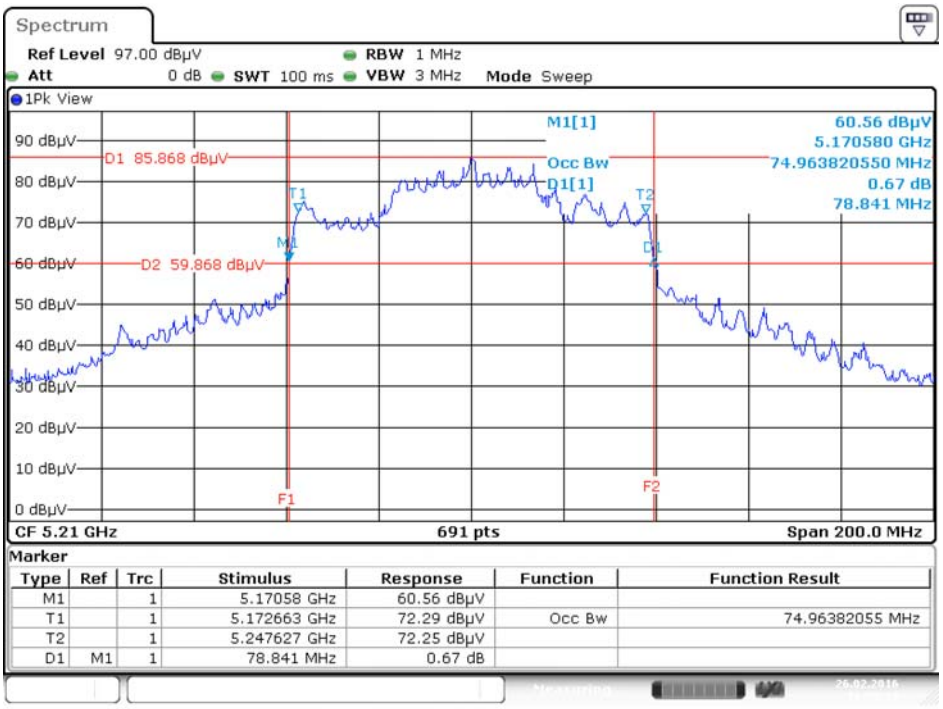
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



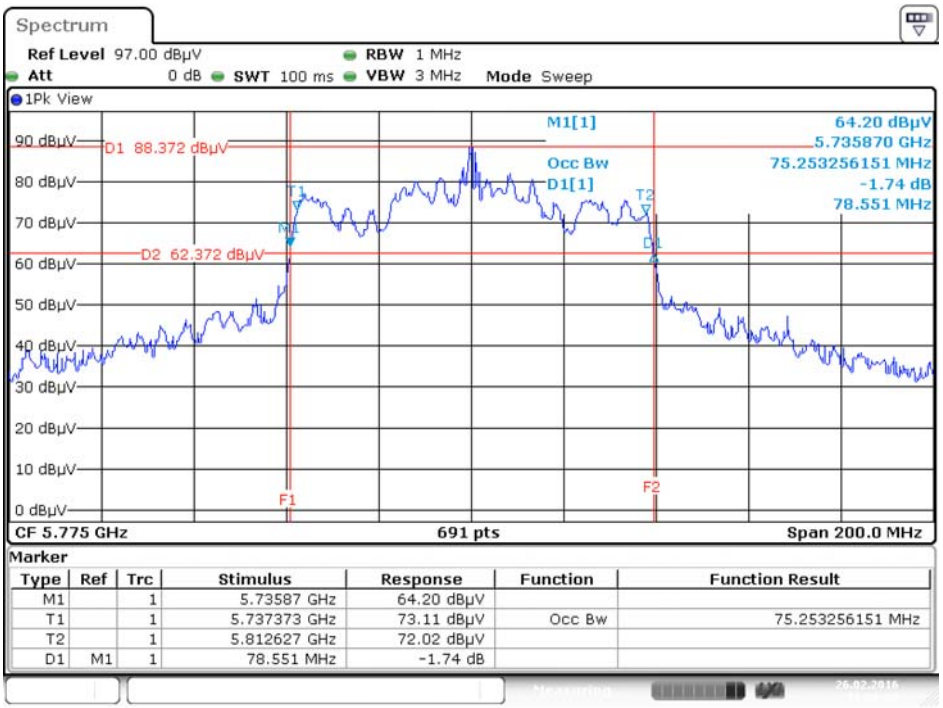
Date: 26.FEB.2016 16:52:21

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: 26.FEB.2016 16:55:17

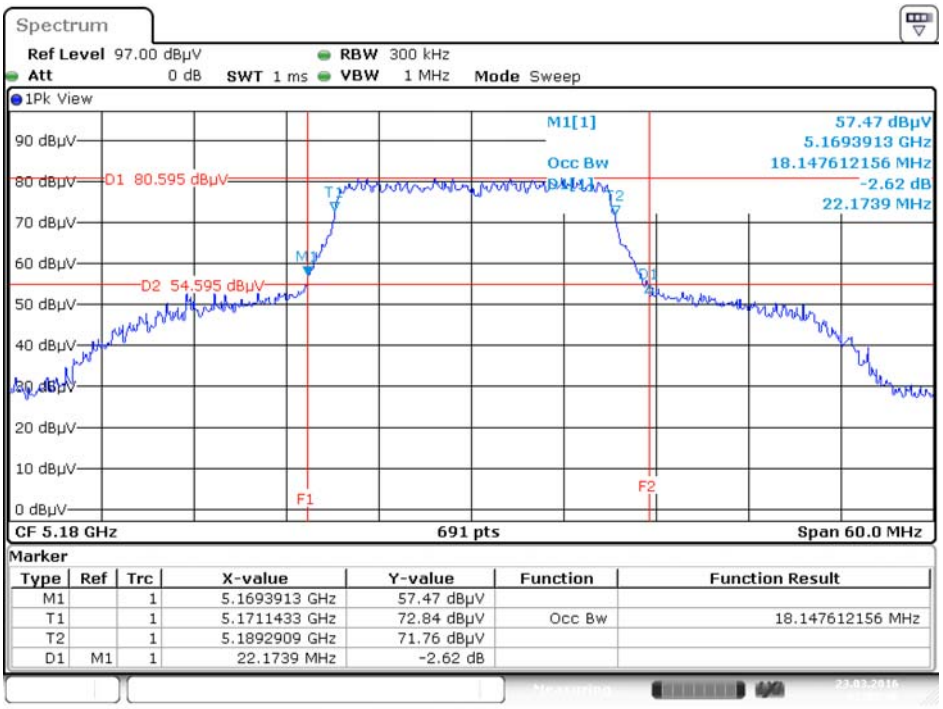
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 26.FEB.2016 16:56:24

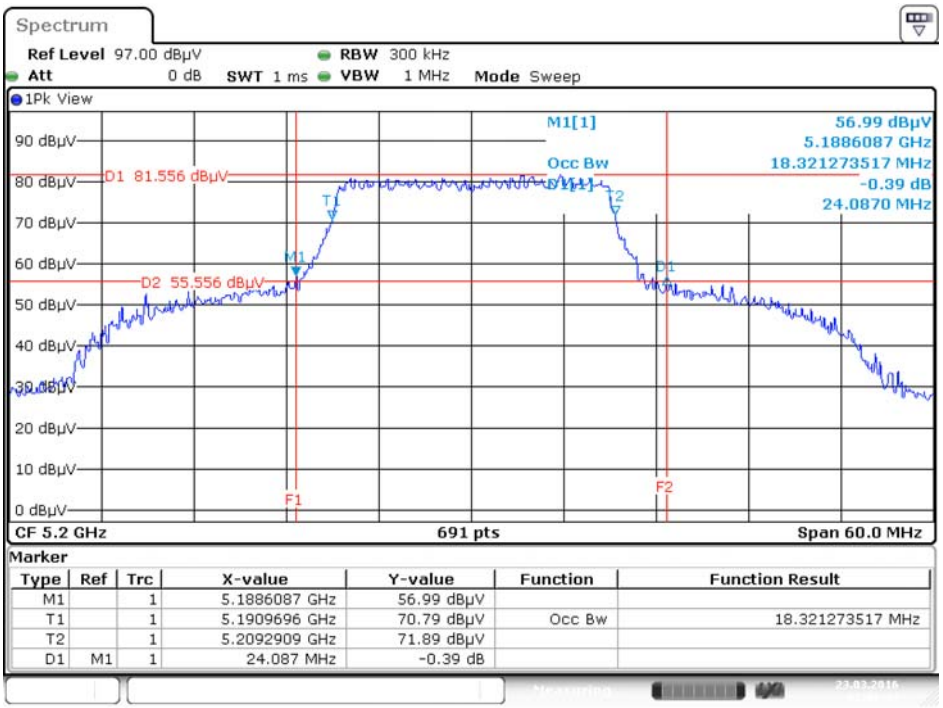
For beamforming function:

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



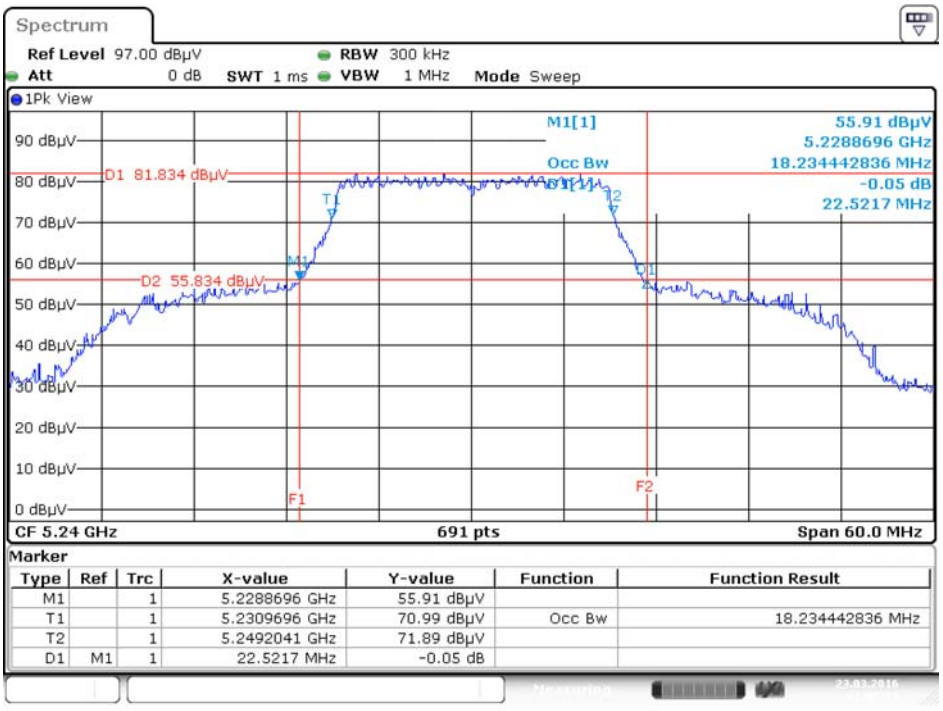
Date: 23.MAR.2016 02:05:47

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: 23.MAR.2016 02:06:44

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



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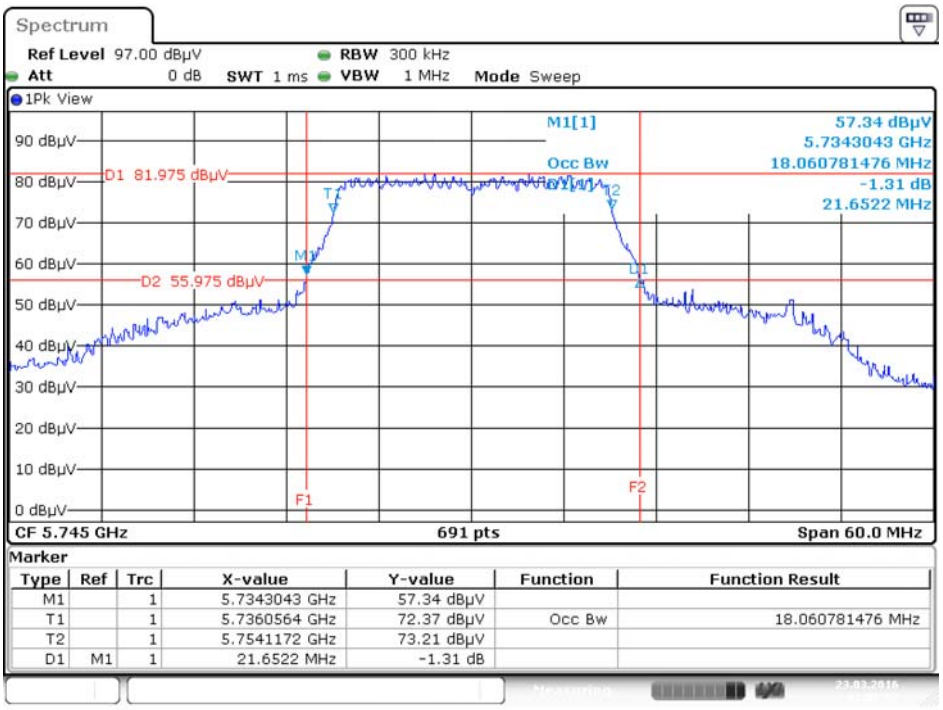
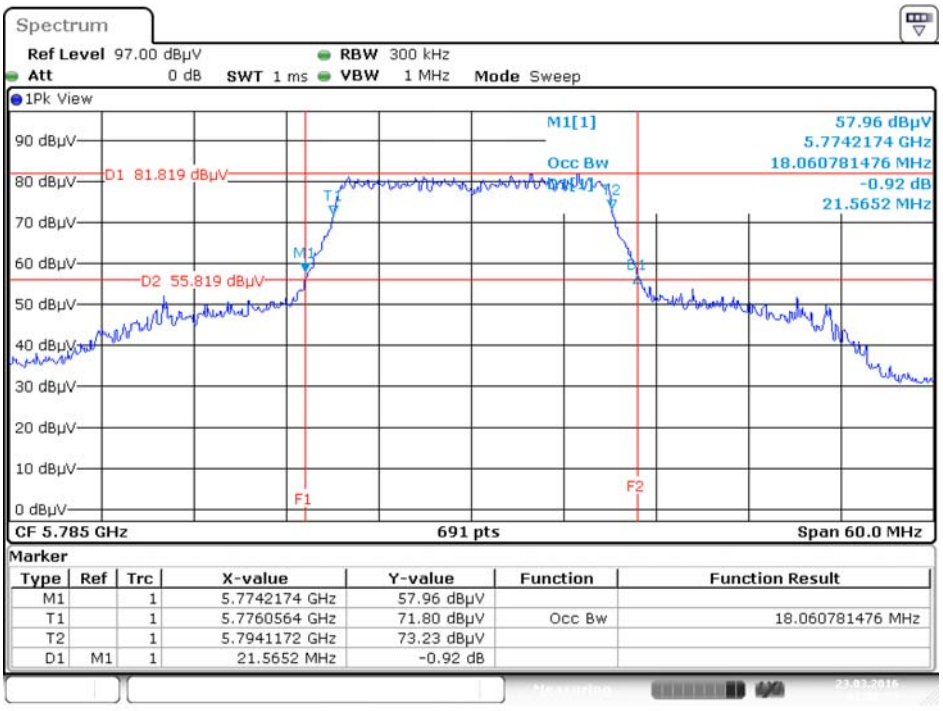
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



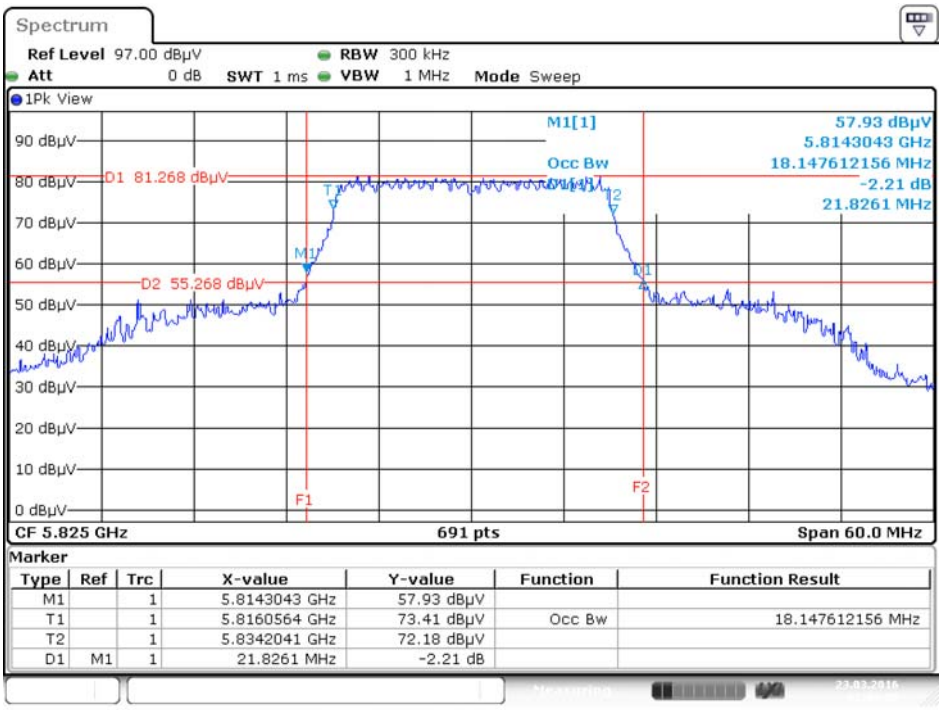
Date: 23.MAR.2016 02:07:52

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



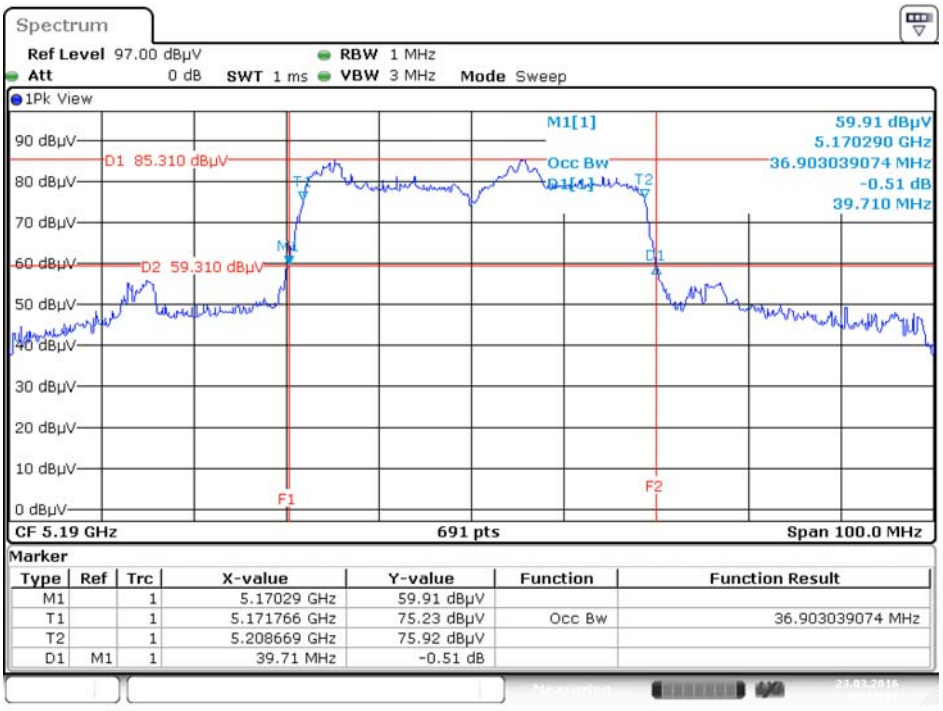
Date: 23.MAR.2016 02:08:29

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



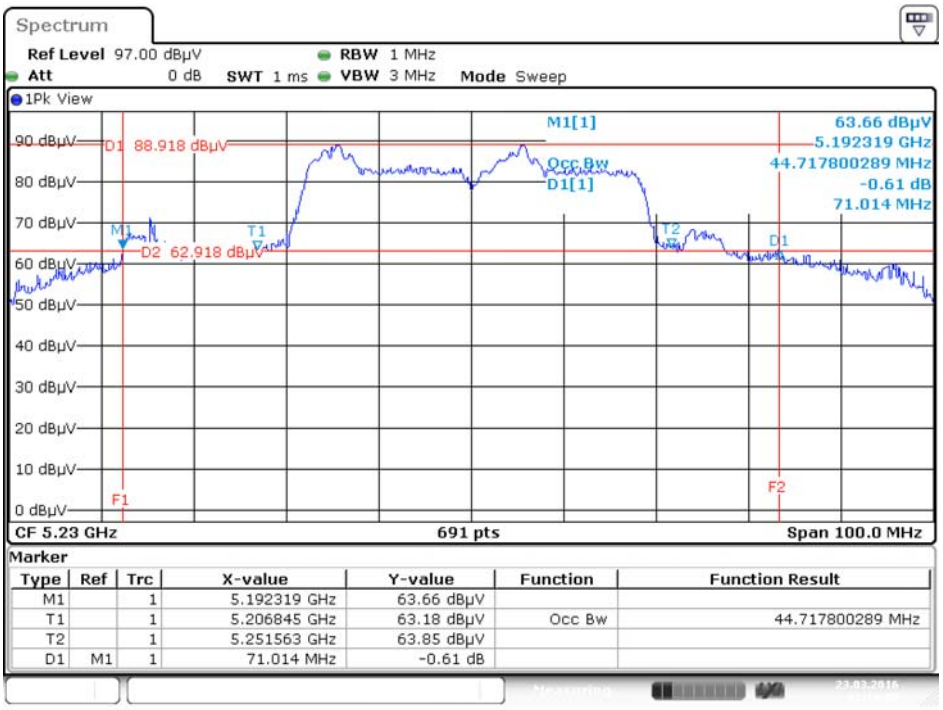
Date: 23.MAR.2016 02:09:01

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



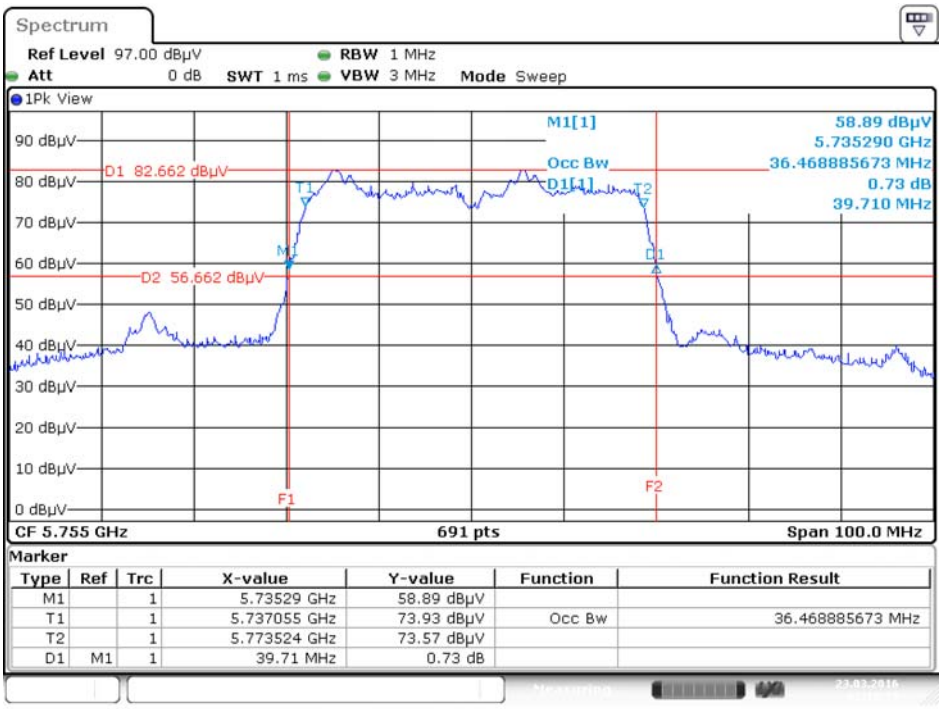
Date: 23.MAR.2016 02:13:38

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



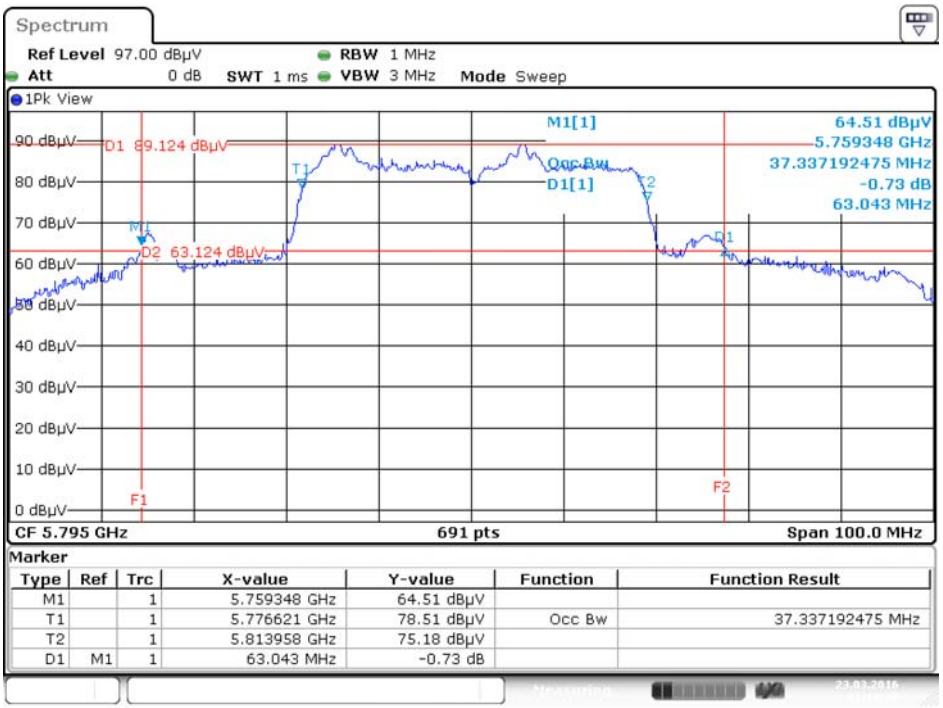
Date: 23.MAR.2016 02:14:28

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



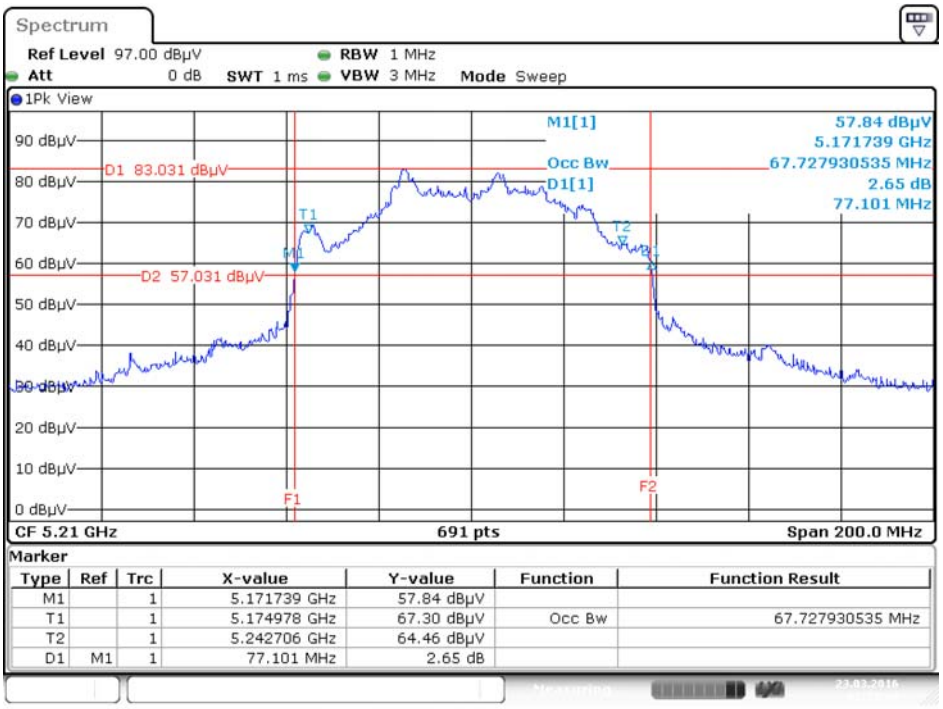
Date: 23.MAR.2016 02:15:13

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



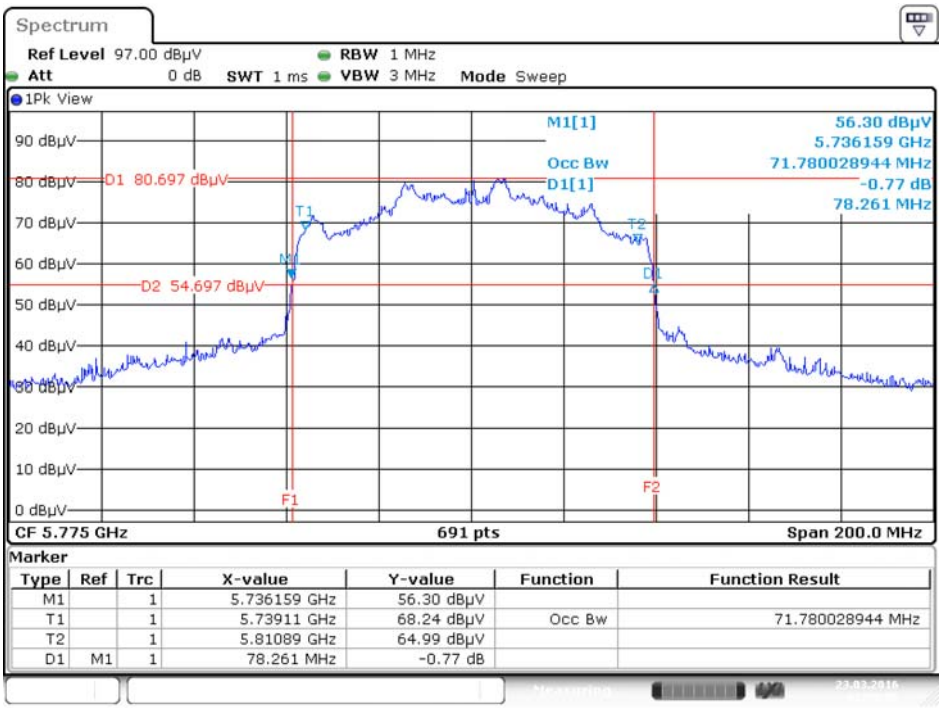
Date: 23.MAR.2016 02:15:48

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: 23.MAR.2016 02:23:35

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: 23.MAR.2016 02:25:56

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 v01r01 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	59%
Test Engineer	Peter Wu	Test Function	Non-beamforming function

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	6.26	500	Complies
	5785 MHz	6.26	500	Complies
	5825 MHz	5.91	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	15.42	500	Complies
	5785 MHz	16.35	500	Complies
	5825 MHz	15.65	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.13	500	Complies
	5795 MHz	35.13	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	62.61	500	Complies

Temperature	25°C	Humidity	59%
Test Engineer	Peter Wu	Test Function	Beamforming function

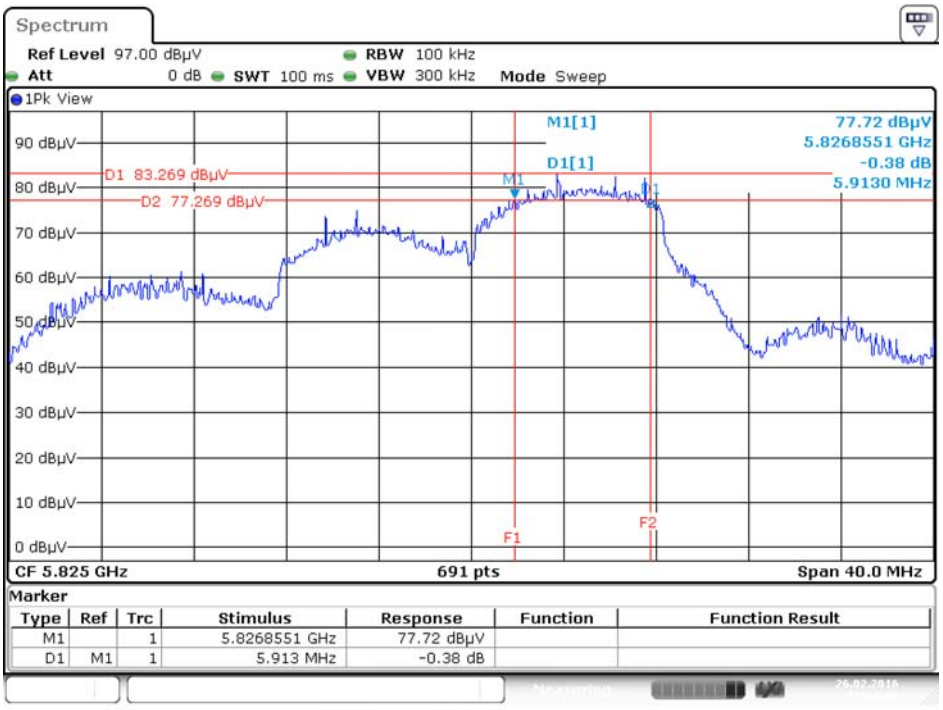
Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.74	500	Complies
	5785 MHz	17.28	500	Complies
	5825 MHz	17.62	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	36.29	500	Complies
	5795 MHz	36.41	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	32.75	500	Complies

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

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

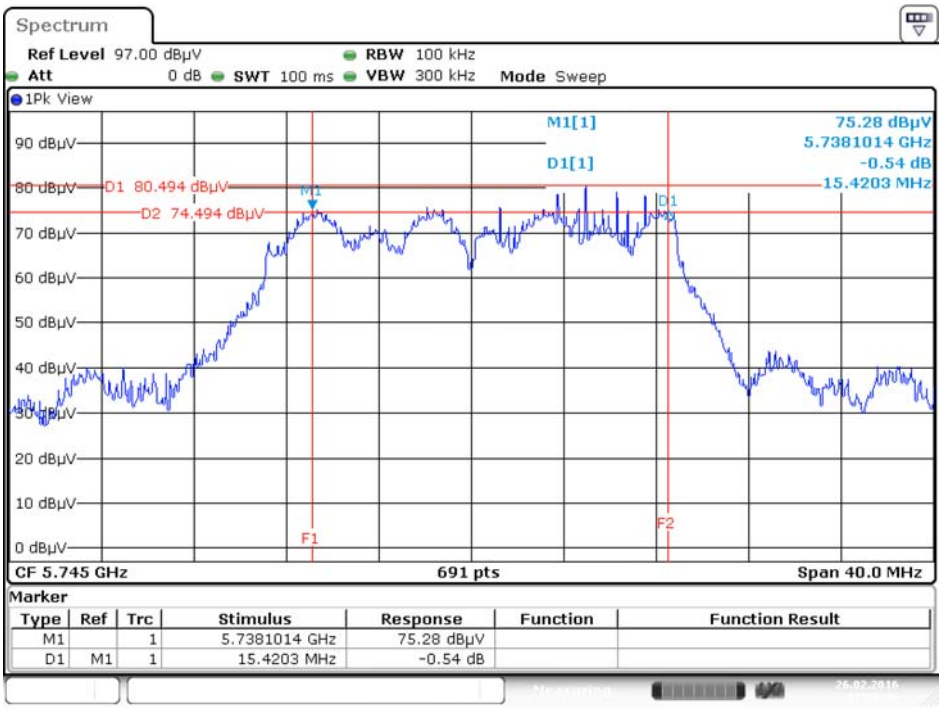
For non-beamforming function:

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



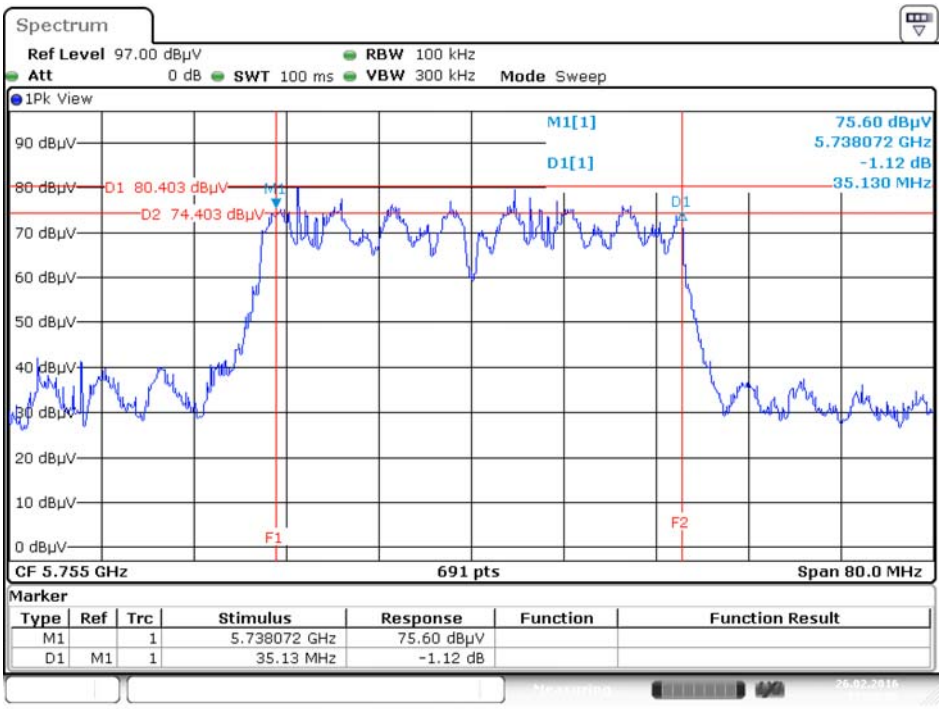
Date: 26.FEB.2016 17:34:00

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



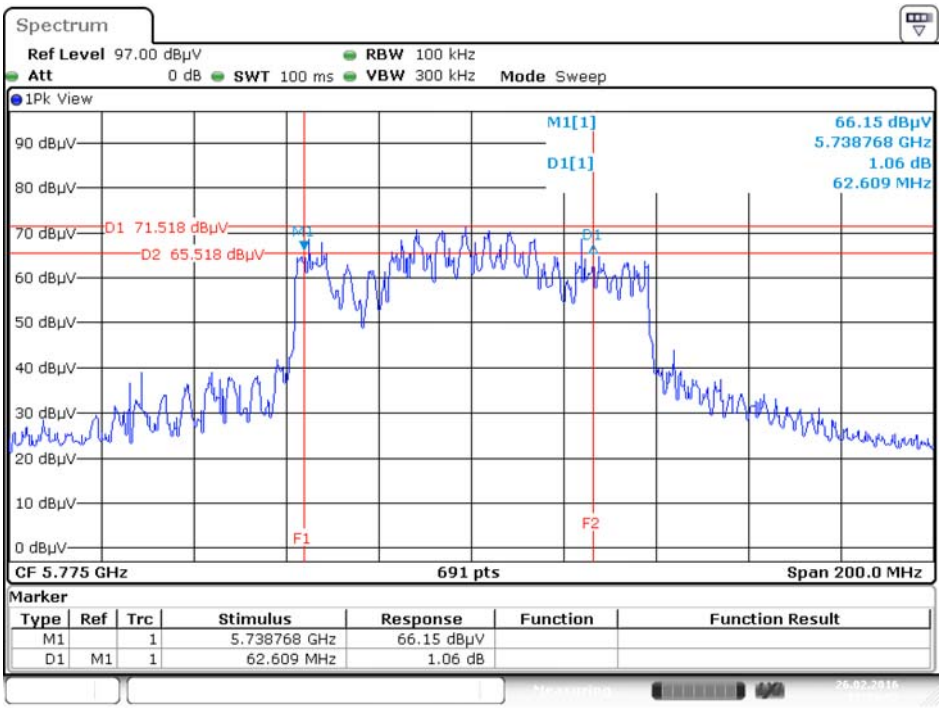
Date: 26.FEB.2016 17:36:42

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



Date: 26.FEB.2016 17:30:26

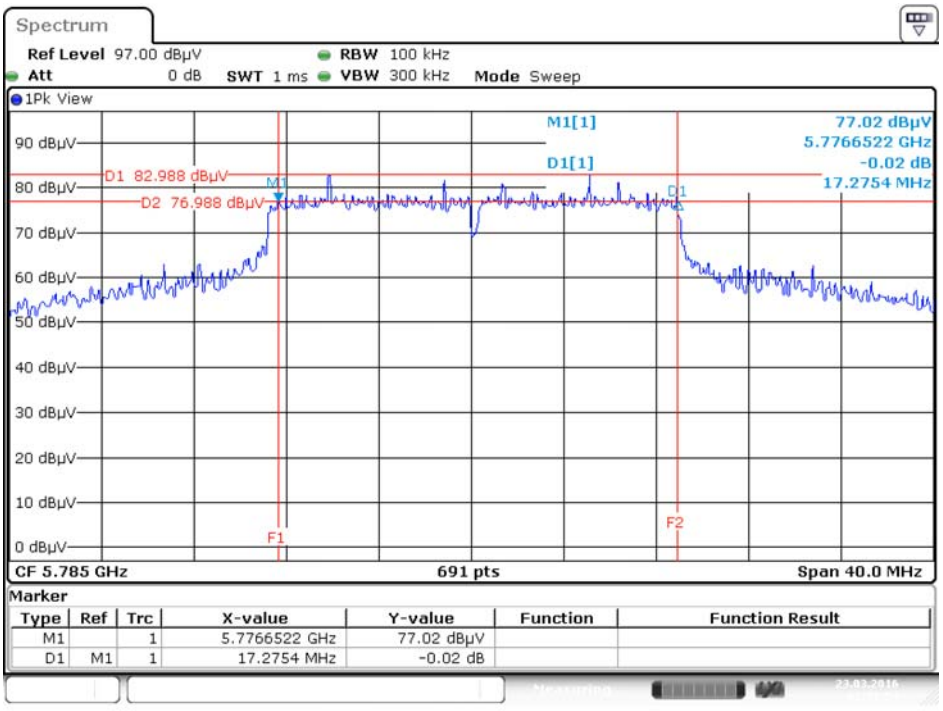
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 26.FEB.2016 17:39:52

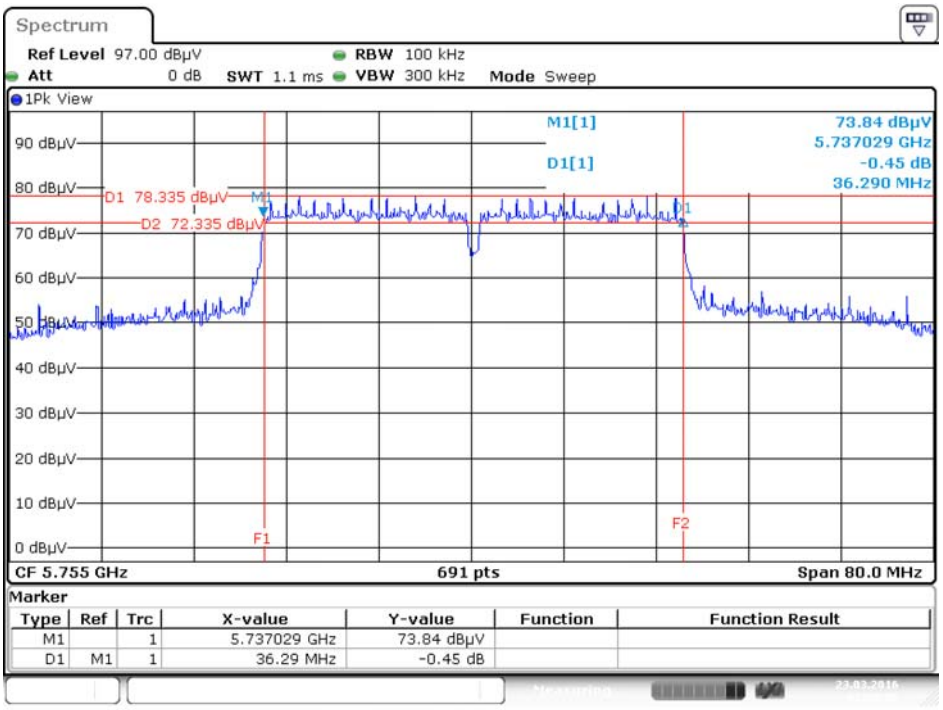
For beamforming function:

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



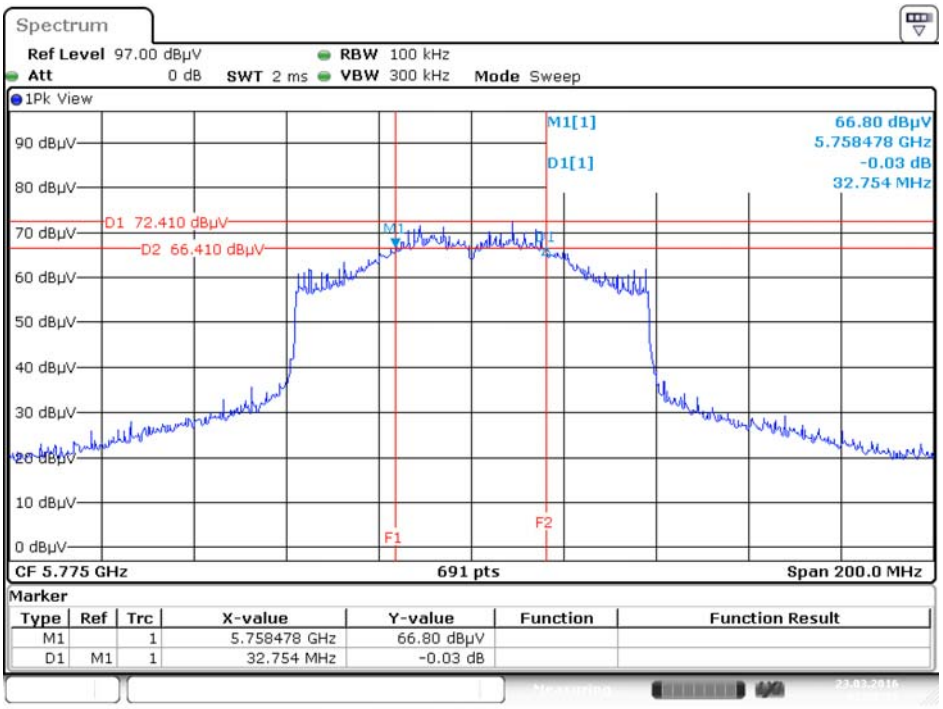
Date: 23.MAR.2016 02:31:54

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



Date: 23.MAR.2016 02:30:05

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



Date: 23.MAR.2016 02:28:11

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

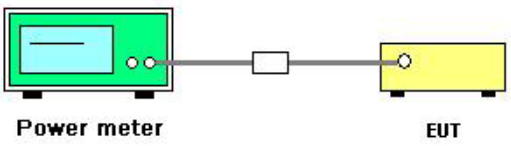
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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 v01r01 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°C	Humidity	59%
Test Engineer	Peter Wu	Test Date	Feb. 25, 2016~Feb. 26, 2016
Test Function	Non-beamforming function		

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11a	5180 MHz	16.97	17.64	17.42	16.95	23.28	30.00	Complies
	5200 MHz	17.52	18.08	17.63	17.69	23.76	30.00	Complies
	5240 MHz	16.56	17.17	17.28	16.67	22.95	30.00	Complies
	5745 MHz	16.33	16.45	16.18	16.21	22.31	30.00	Complies
	5785 MHz	20.34	20.36	20.12	20.82	26.44	30.00	Complies
	5825 MHz	19.16	19.18	18.97	19.10	25.12	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	17.52	17.99	18.01	17.35	23.75	30.00	Complies
	5200 MHz	17.61	18.49	17.56	17.73	23.88	30.00	Complies
	5240 MHz	17.23	17.86	17.93	17.28	23.61	30.00	Complies
	5745 MHz	15.86	15.98	16.01	15.75	21.92	30.00	Complies
	5785 MHz	20.07	20.15	19.91	20.29	26.13	30.00	Complies
	5825 MHz	17.82	17.88	17.85	17.81	23.86	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	13.72	13.80	13.86	13.46	19.73	30.00	Complies
	5230 MHz	17.26	17.69	17.91	17.83	23.70	30.00	Complies
	5755 MHz	13.71	13.87	13.69	13.63	19.75	30.00	Complies
	5795 MHz	18.26	18.37	18.18	18.08	24.24	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	12.36	13.16	13.28	12.82	18.94	30.00	Complies
	5775 MHz	11.68	11.72	11.40	11.26	17.54	30.00	Complies

Temperature	25°C	Humidity	59%
Test Engineer	Peter Wu	Test Date	Mar. 22, 2016
Test Function	Beamforming function		

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	18.38	17.41	17.55	17.36	23.72	26.27	Complies
	5200 MHz	20.28	19.75	19.58	19.24	25.75	26.27	Complies
	5240 MHz	18.08	17.02	17.11	17.52	23.47	26.27	Complies
	5745 MHz	15.79	15.47	15.25	16.24	21.72	25.77	Complies
	5785 MHz	20.23	19.00	18.73	19.66	25.47	25.77	Complies
	5825 MHz	19.21	18.47	18.35	19.48	24.92	25.77	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	14.63	14.05	13.83	14.62	20.32	26.27	Complies
	5230 MHz	18.16	17.09	17.25	18.03	23.68	26.27	Complies
	5755 MHz	12.95	12.60	12.36	13.12	18.79	25.77	Complies
	5795 MHz	19.44	18.02	18.20	18.88	24.69	25.77	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	12.58	11.86	11.84	12.66	18.27	26.27	Complies
	5775 MHz	12.19	11.29	11.22	12.14	17.75	25.77	Complies

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

1. 5150~5250 MHz directional gain=9.73dBi >6dBi, so limit=30 – (9.73 – 6)=26.27dBm.
2. 5725~5850 MHz directional gain=10.23dBi >6dBi, so limit=30 – (10.23 – 6)=25.77dBm.

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

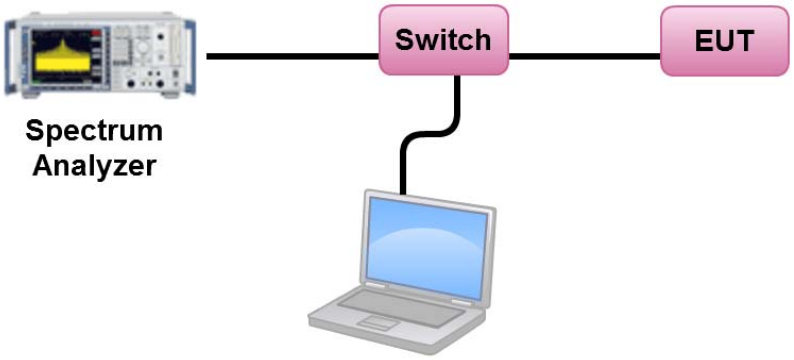
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements and sum the spectra across the outputs.
4. For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.5.4. 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°C	Humidity	59%
Test Engineer	Peter Wu	Test Date	Feb. 25, 2016~Feb. 26, 2016
Test Function	Non-beamforming function		

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	10.28	13.27	Complies
40	5200 MHz	10.67	13.27	Complies
48	5240 MHz	9.91	13.27	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.73dBi >6dBi, so limit=17 – (9.73 – 6)=13.27dBm/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	9.08	-3.01	6.07	25.77	Complies
157	5785 MHz	13.09	-3.01	10.08	25.77	Complies
165	5825 MHz	12.03	-3.01	9.02	25.77	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.23dBi >6dBi, so limit=17 – (10.23 – 6)=25.77dBm/500kHz.

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	10.70	13.27	Complies
40	5200 MHz	10.51	13.27	Complies
48	5240 MHz	10.46	13.27	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.73dBi >6dBi, so limit=17 – (9.73 – 6)=13.27dBm/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	8.50	-3.01	5.49	25.77	Complies
157	5785 MHz	12.73	-3.01	9.72	25.77	Complies
165	5825 MHz	10.53	-3.01	7.52	25.77	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.23dBi >6dBi, so limit=17 – (10.23 – 6)=25.77dBm/500kHz.

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	3.53	13.27	Complies
46	5230 MHz	7.63	13.27	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.73dBi >6dBi, so limit=17 – (9.73 – 6)=13.27dBm/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	3.71	-3.01	0.70	25.77	Complies
159	5795 MHz	7.99	-3.01	4.98	25.77	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.23dBi >6dBi, so limit=17 – (10.23 – 6)=25.77dBm/500kHz.

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	-0.34	13.27	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.73dBi >6dBi, so limit=17 – (9.73 – 6)=13.27dBm/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	-1.80	-3.01	-4.81	25.77	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.23dBi >6dBi, so limit=17 – (10.23 – 6)=25.77dBm/500kHz.

Temperature	25°C	Humidity	59%
Test Engineer	Peter Wu	Test Date	Mar. 22, 2016
Test Function	Beamforming function		

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	10.64	13.27	Complies
40	5200 MHz	12.76	13.27	Complies
48	5240 MHz	10.40	13.27	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.73dBi >6dBi, so limit=17 – (9.73 – 6)=13.27dBm/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	8.43	-3.01	5.42	25.77	Complies
157	5785 MHz	12.48	-3.01	9.47	25.77	Complies
165	5825 MHz	11.69	-3.01	8.68	25.77	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.23dBi >6dBi, so limit=17 – (10.23 – 6)=25.77dBm/500kHz.

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	4.24	13.27	Complies
46	5230 MHz	7.62	13.27	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.73dBi >6dBi, so limit=17 – (9.73 – 6)=13.27dBm/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	2.41	-3.01	-0.60	25.77	Complies
159	5795 MHz	8.45	-3.01	5.44	25.77	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.23dBi >6dBi, so limit=17 – (10.23 – 6)=25.77dBm/500kHz.

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	-0.77	13.27	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.73dBi >6dBi, so limit=17 – (9.73 – 6)=13.27dBm/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	-1.55	-3.01	-4.56	25.77	Complies

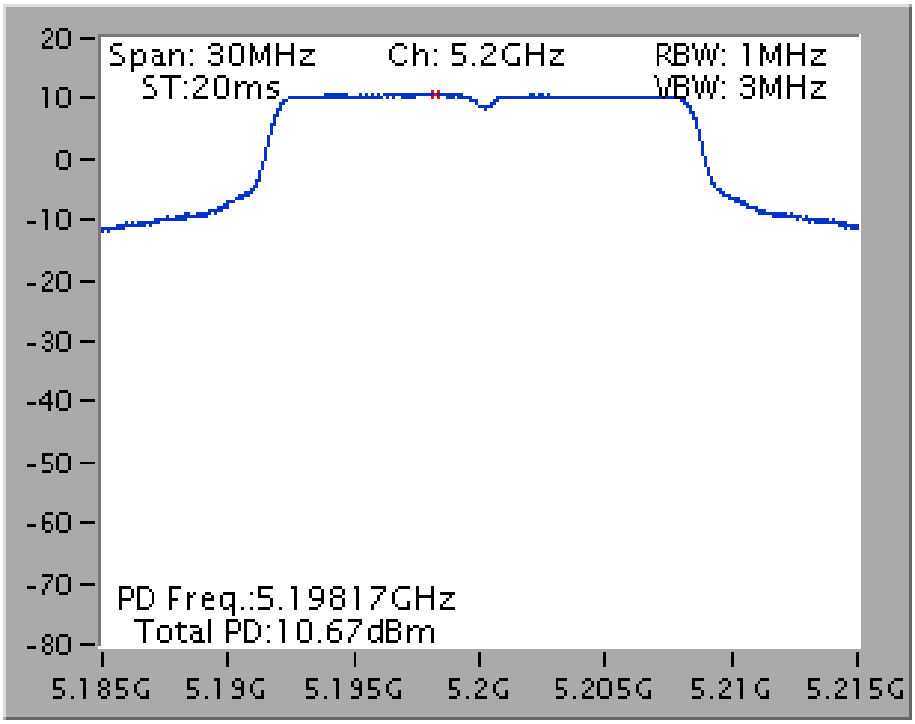
Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =10.23dBi >6dBi, so limit=17 – (10.23 – 6)=25.77dBm/500kHz.

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

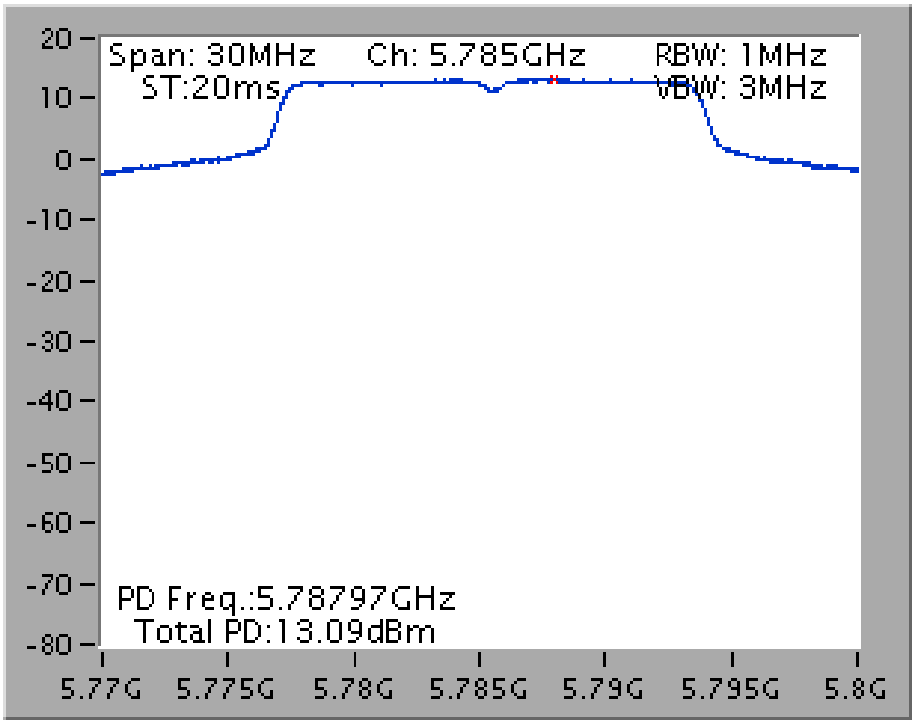
For plots, only the channel with worse result was shown.

For non-beamforming function:

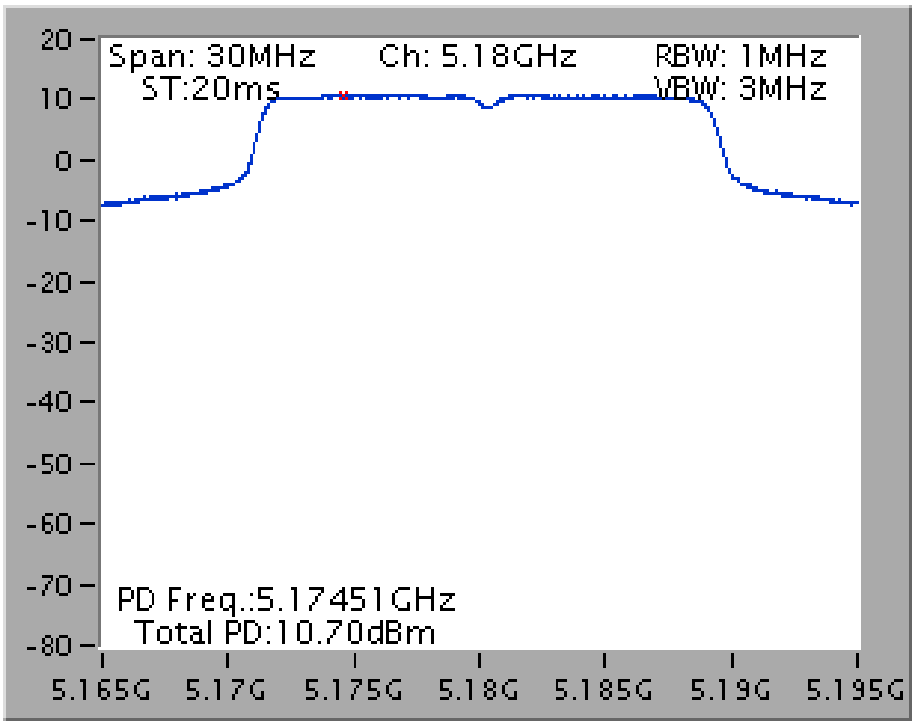
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5200 MHz



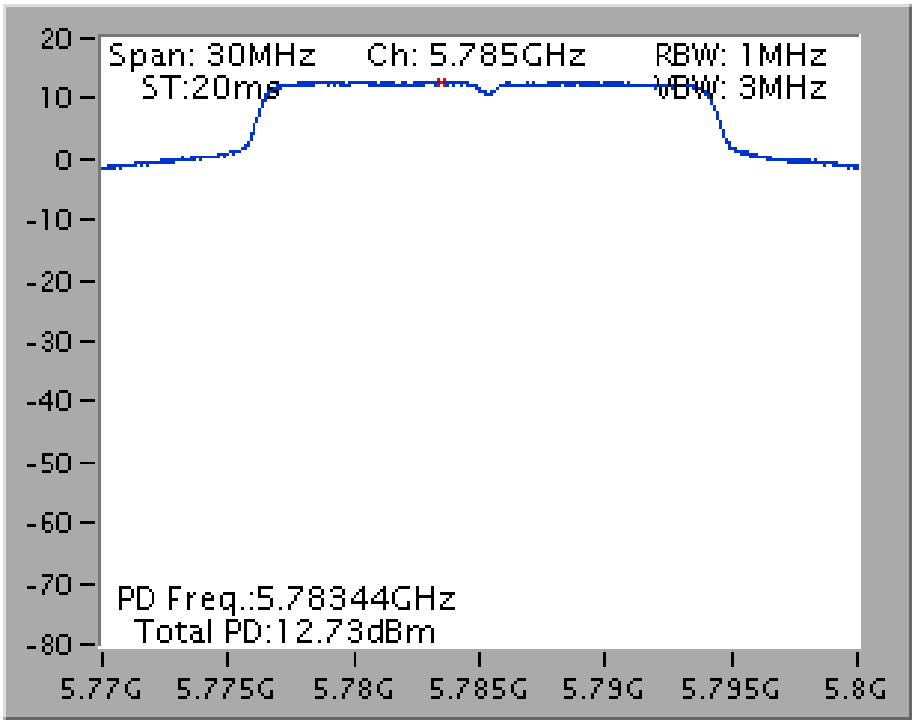
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



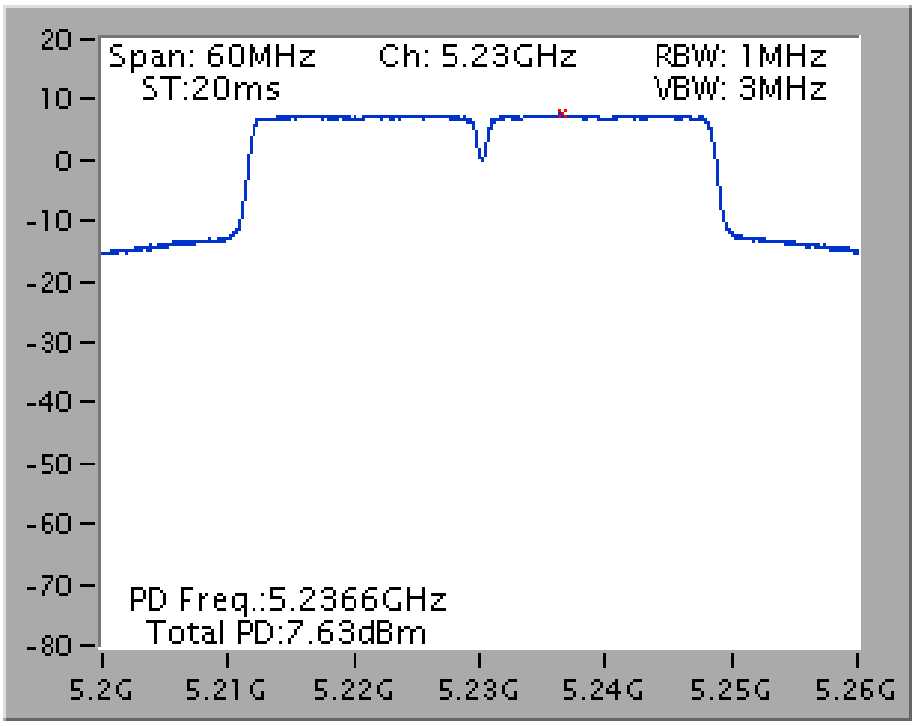
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5180 MHz



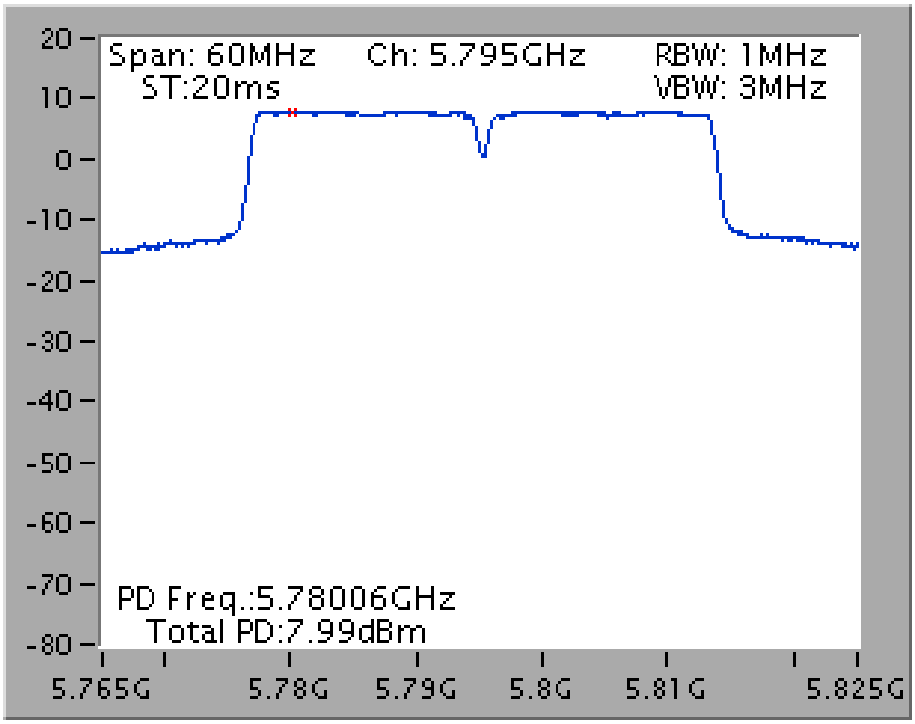
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



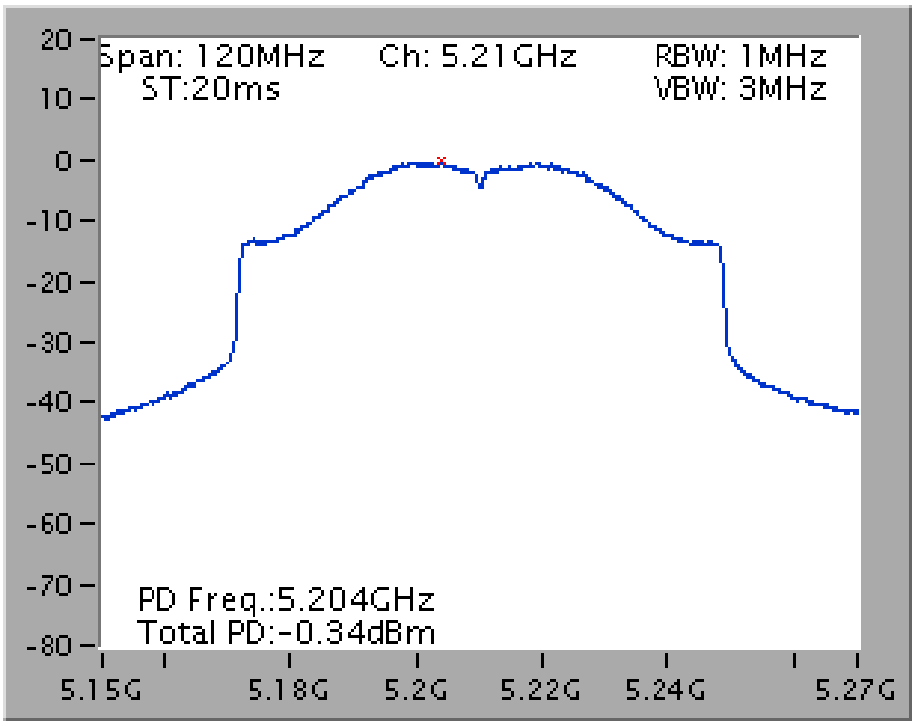
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5230 MHz



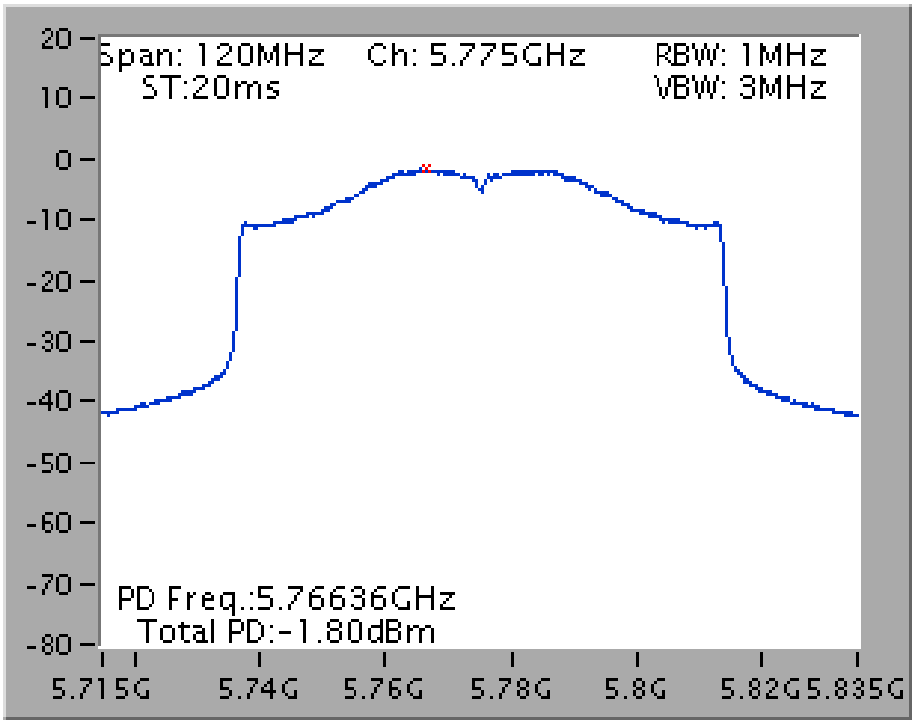
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



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

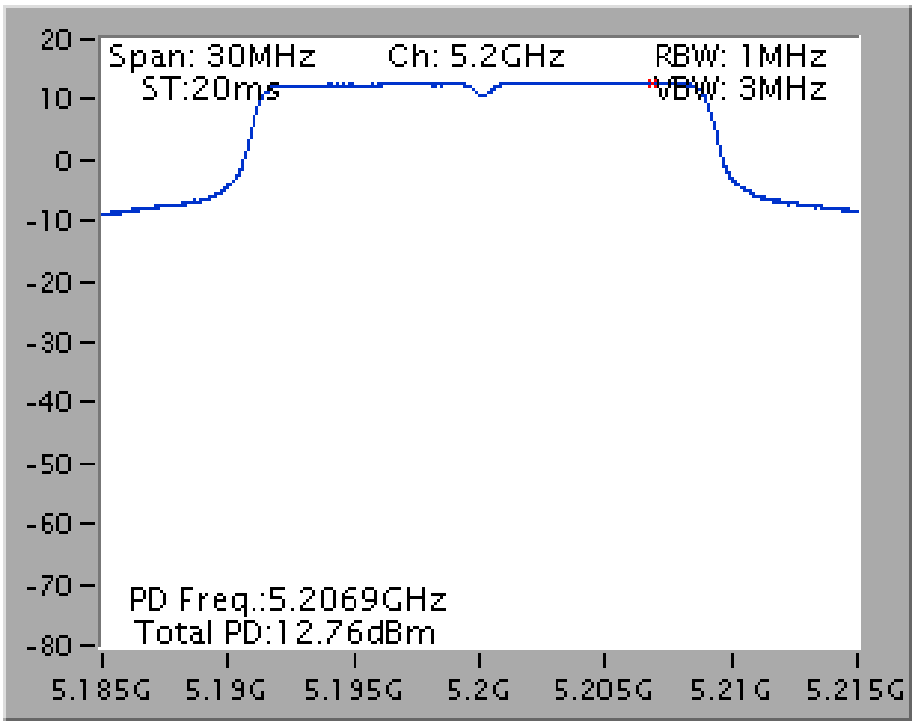


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz

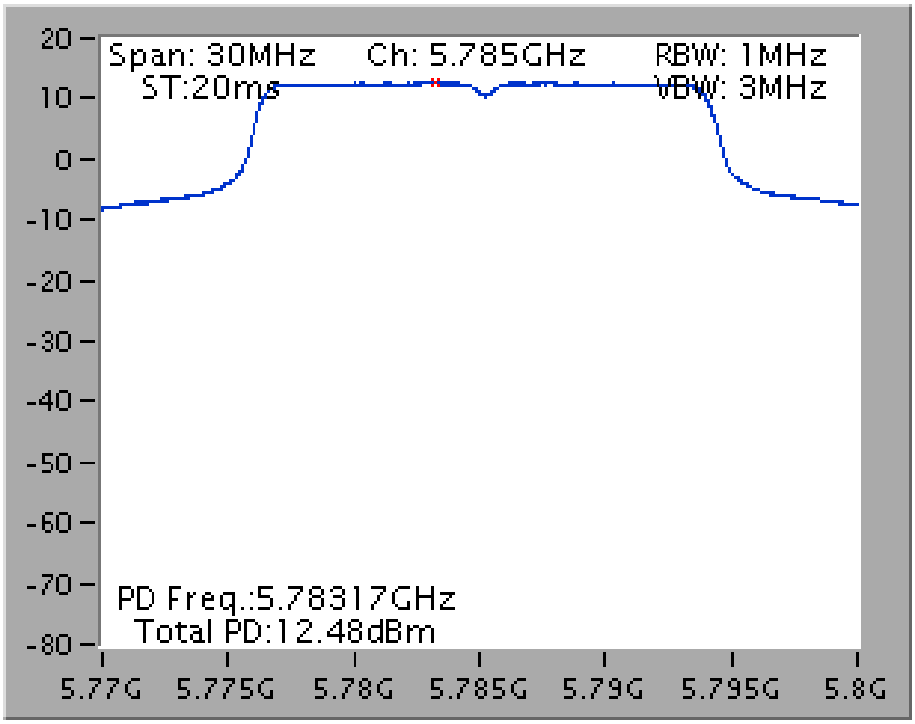


For beamforming function:

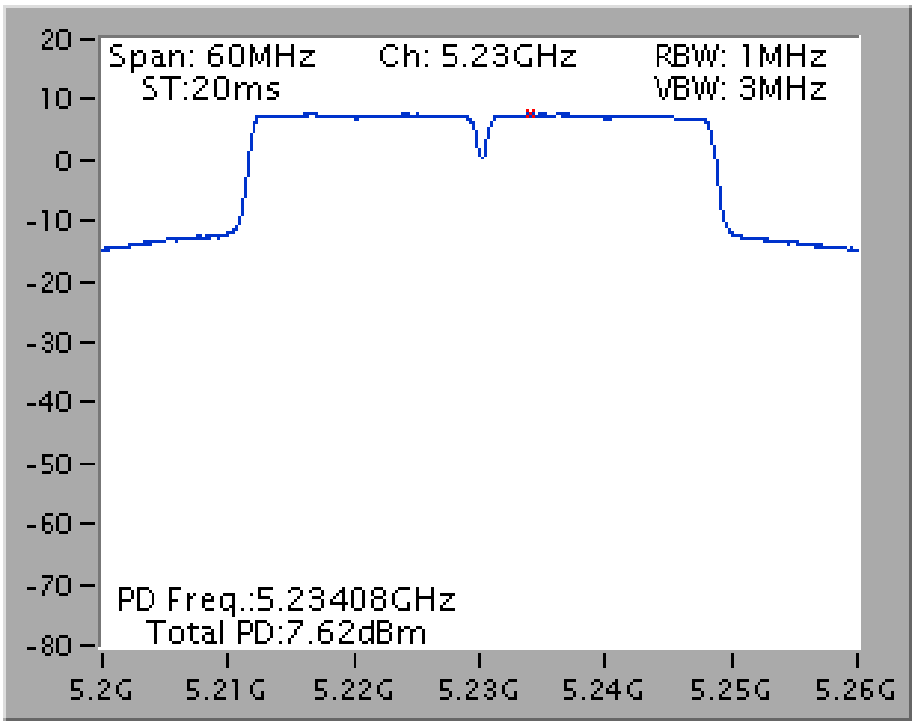
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5200 MHz



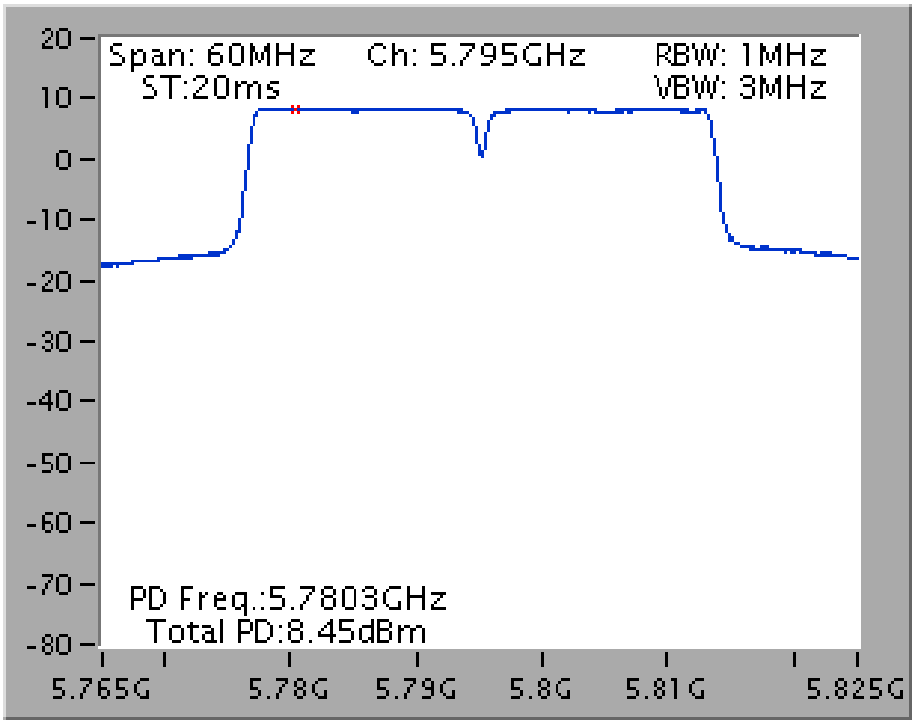
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



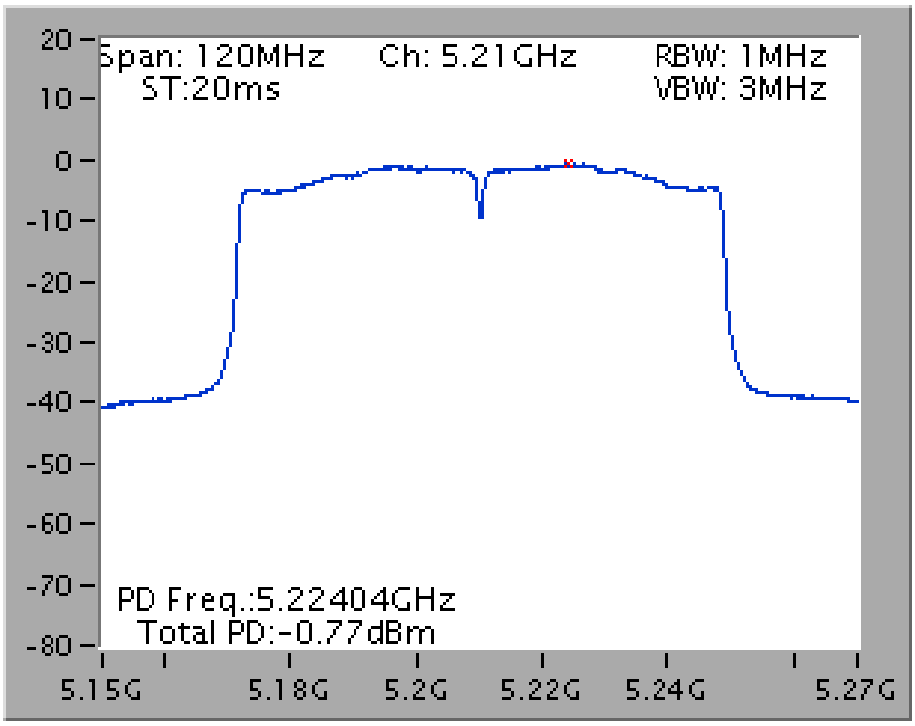
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5230 MHz



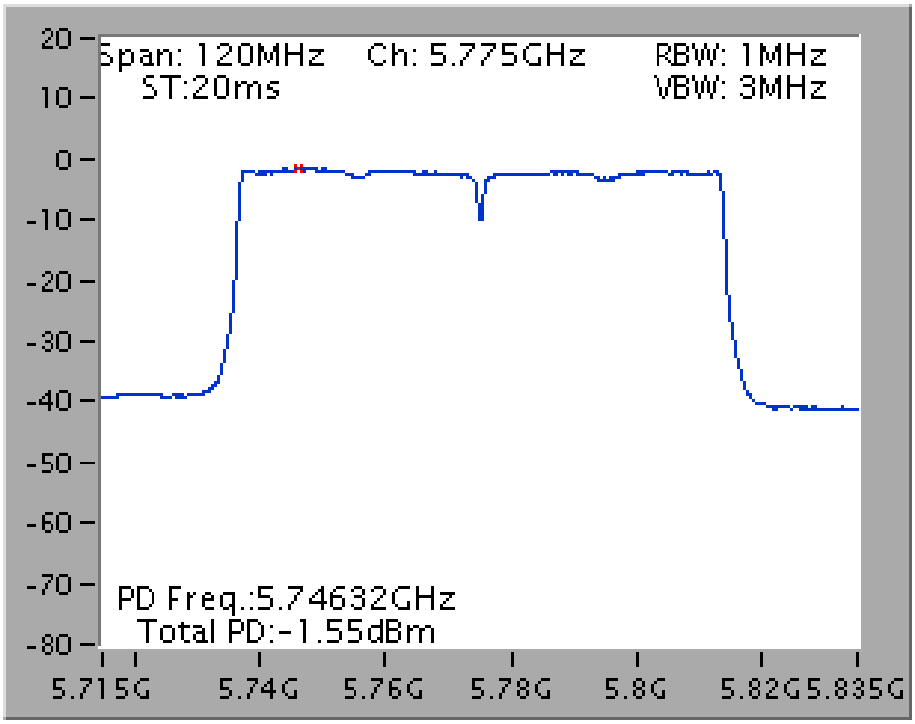
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



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

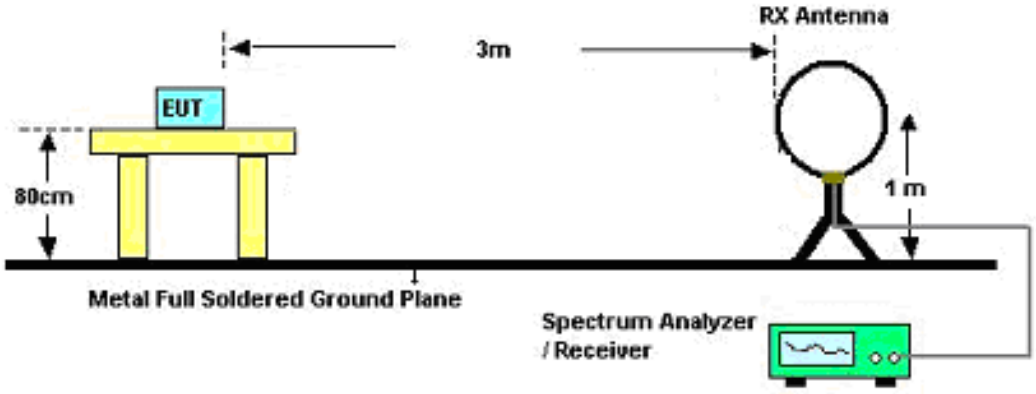
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

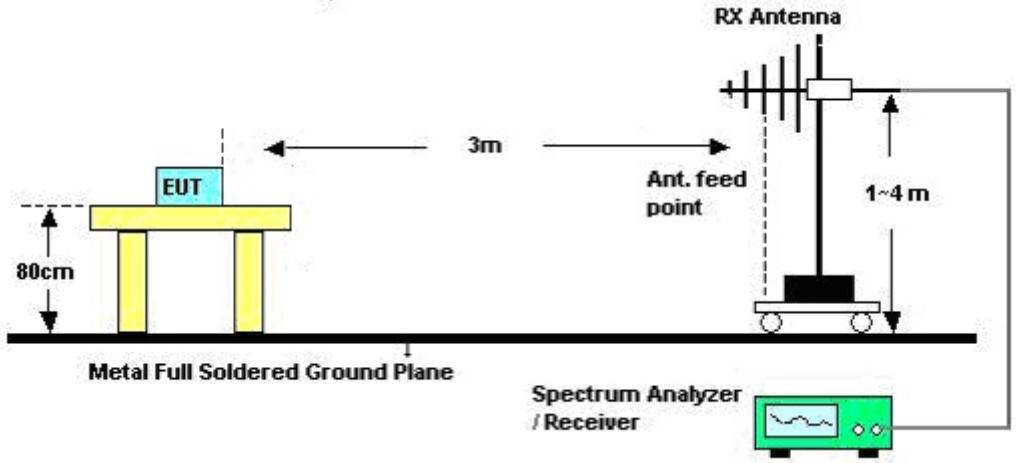
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting 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

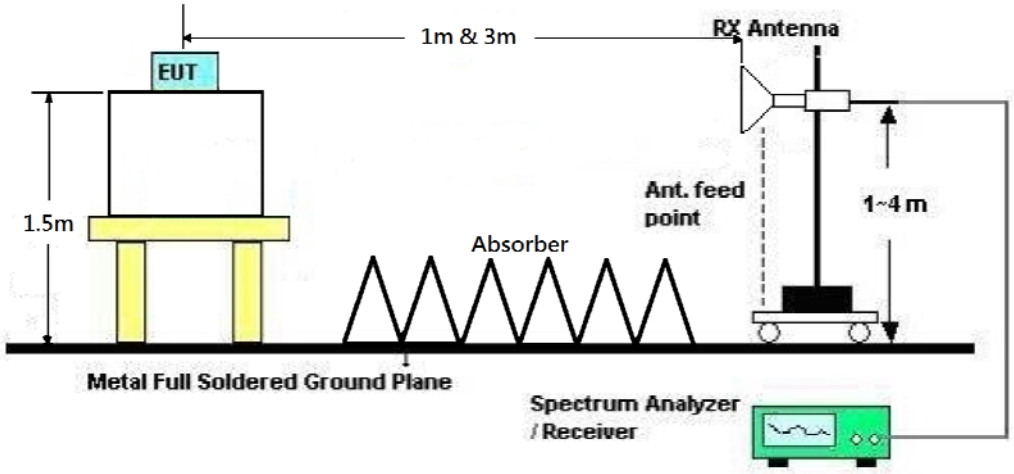
For Radiated Emissions: 9kHz ~30MHz



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	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	CTX
Test Date	Apr. 02, 2016		

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.

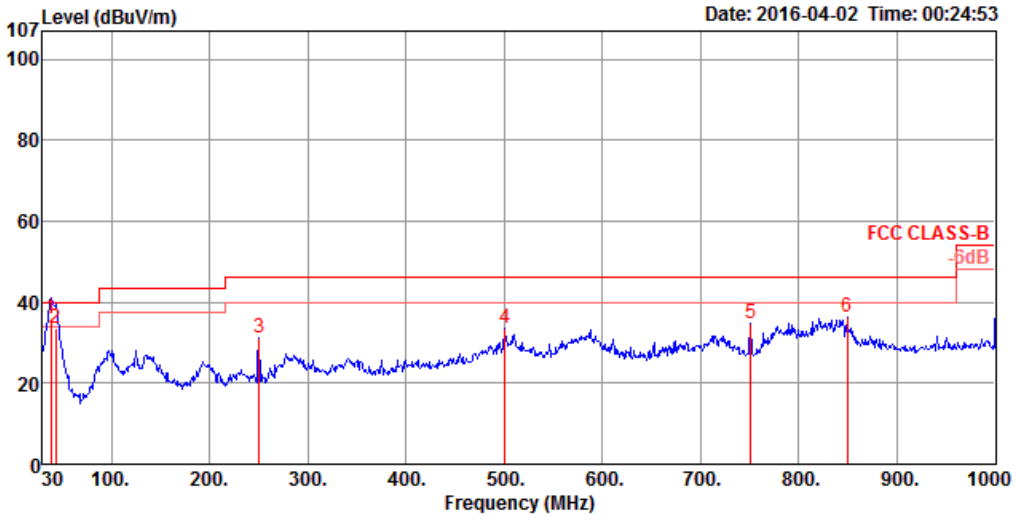
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

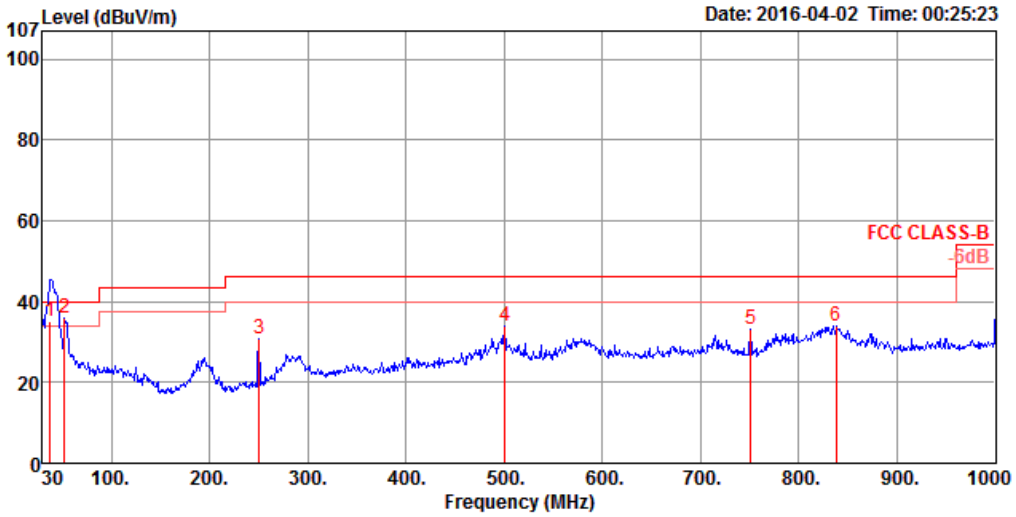
Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	CTX

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	38.73	36.00	40.00	-4.00	47.15	0.53	20.01	31.69	300	272	QP	HORIZONTAL
2	43.58	33.52	40.00	-6.48	47.33	0.59	17.32	31.72	300	280	QP	HORIZONTAL
3	250.19	31.07	46.00	-14.93	43.29	1.25	18.60	32.07	110	0	Peak	HORIZONTAL
4	500.45	33.47	46.00	-12.53	40.34	1.76	23.73	32.36	200	143	Peak	HORIZONTAL
5	750.71	34.73	46.00	-11.27	39.01	2.19	26.10	32.57	110	162	Peak	HORIZONTAL
6	849.65	36.29	46.00	-9.71	39.49	2.35	27.00	32.55	110	233	Peak	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	37.76	35.26	40.00	-4.74	45.85	0.53	20.56	31.68	110	17	QP	VERTICAL
2	52.31	35.89	40.00	-4.11	53.25	0.61	13.80	31.77	150	45	Peak	VERTICAL
3	250.19	30.67	46.00	-15.33	42.89	1.25	18.60	32.07	110	262	Peak	VERTICAL
4	500.45	33.82	46.00	-12.18	40.69	1.76	23.73	32.36	110	227	Peak	VERTICAL
5	750.71	32.99	46.00	-13.01	37.27	2.19	26.10	32.57	110	194	Peak	VERTICAL
6	838.01	33.98	46.00	-12.02	37.30	2.34	26.89	32.55	110	191	Peak	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	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11a CH 36 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	15538.18	60.45	74.00	-13.55	45.48	11.45	38.16	34.64	145	150	Peak	HORIZONTAL
2	15539.78	47.30	54.00	-6.70	32.33	11.45	38.16	34.64	145	150	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	15537.65	47.28	54.00	-6.72	32.31	11.45	38.16	34.64	118	150	Average	VERTICAL
2	15538.26	61.41	74.00	-12.59	46.44	11.45	38.16	34.64	118	150	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11a CH 40 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	15598.92	60.70	74.00	-13.30	45.67	11.48	38.23	34.68	86	150	Peak	HORIZONTAL
2	15600.39	47.87	54.00	-6.13	32.84	11.48	38.23	34.68	86	150	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	15602.09	48.01	54.00	-5.99	32.90	11.50	38.29	34.68	67	150	Average	VERTICAL
2	15602.15	61.07	74.00	-12.93	45.96	11.50	38.29	34.68	67	150	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11a CH 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	15717.60	47.38	54.00	-6.62	32.21	11.56	38.42	34.81	48	150	Average	HORIZONTAL
2	15720.01	60.32	74.00	-13.68	45.15	11.56	38.42	34.81	48	150	Peak	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	15718.20	47.35	54.00	-6.65	32.18	11.56	38.42	34.81	28	150	Average	VERTICAL
2	15719.96	60.33	74.00	-13.67	45.16	11.56	38.42	34.81	28	150	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	11488.45	56.40	74.00	-17.60	42.85	9.67	38.50	34.62	24	150	Peak	HORIZONTAL
2	11488.92	42.47	54.00	-11.53	28.92	9.67	38.50	34.62	24	150	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	11488.70	55.69	74.00	-18.31	42.14	9.67	38.50	34.62	40	150	Peak	VERTICAL
2	11491.75	42.46	54.00	-11.54	28.91	9.67	38.50	34.62	40	150	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	11569.24	56.04	74.00	-17.96	42.45	9.71	38.53	34.65	59	150	Peak	HORIZONTAL
2	11569.37	42.71	54.00	-11.29	29.12	9.71	38.53	34.65	59	150	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	11569.21	55.86	74.00	-18.14	42.27	9.71	38.53	34.65	86	150	Peak	VERTICAL
2	11569.60	42.77	54.00	-11.23	29.18	9.71	38.53	34.65	86	150	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	11648.99	42.74	54.00	-11.26	29.12	9.75	38.55	34.68	103	150	Average	HORIZONTAL
2	11651.02	55.90	74.00	-18.10	42.24	9.77	38.57	34.68	103	150	Peak	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	11648.49	42.90	54.00	-11.10	29.28	9.75	38.55	34.68	118	150	Average	VERTICAL
2	11651.41	55.70	74.00	-18.30	42.04	9.77	38.57	34.68	118	150	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	15538.24	60.87	74.00	-13.13	45.90	11.45	38.16	34.64	126	150	Peak	HORIZONTAL
2	15540.27	47.09	54.00	-6.91	32.12	11.45	38.16	34.64	126	150	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	15539.84	61.28	74.00	-12.72	46.31	11.45	38.16	34.64	133	150	Peak	VERTICAL
2	15540.46	47.28	54.00	-6.72	32.31	11.45	38.16	34.64	133	150	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	15598.37	60.97	74.00	-13.03	45.94	11.48	38.23	34.68	143	150	Peak	HORIZONTAL
2	15600.64	47.89	54.00	-6.11	32.78	11.50	38.29	34.68	143	150	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	15600.27	47.74	54.00	-6.26	32.71	11.48	38.23	34.68	154	150	Average	VERTICAL
2	15600.54	62.22	74.00	-11.78	47.11	11.50	38.29	34.68	154	150	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	15718.16	60.08	74.00	-13.92	44.91	11.56	38.42	34.81	164	150	Peak	HORIZONTAL
2	15719.78	47.25	54.00	-6.75	32.08	11.56	38.42	34.81	164	150	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	15717.62	60.53	74.00	-13.47	45.36	11.56	38.42	34.81	176	150	Peak	VERTICAL
2	15720.46	47.19	54.00	-6.81	32.02	11.56	38.42	34.81	176	150	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	11488.57	55.74	74.00	-18.26	42.19	9.67	38.50	34.62	195	150	Peak	HORIZONTAL
2	11489.30	42.76	54.00	-11.24	29.21	9.67	38.50	34.62	195	150	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	11489.01	42.65	54.00	-11.35	29.10	9.67	38.50	34.62	217	150	Average	VERTICAL
2	11491.42	56.42	74.00	-17.58	42.87	9.67	38.50	34.62	217	150	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	11569.76	43.20	54.00	-10.80	29.61	9.71	38.53	34.65	228	150	Average	HORIZONTAL
2	11572.31	55.79	74.00	-18.21	42.20	9.71	38.53	34.65	228	150	Peak	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	11572.26	56.14	74.00	-17.86	42.55	9.71	38.53	34.65	242	150	Peak	VERTICAL
2	11572.36	42.86	54.00	-11.14	29.27	9.71	38.53	34.65	242	150	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	11647.62	57.25	74.00	-16.75	43.63	9.75	38.55	34.68	259	150	Peak	HORIZONTAL
2	11647.81	43.49	54.00	-10.51	29.87	9.75	38.55	34.68	259	150	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	11650.35	57.16	74.00	-16.84	43.54	9.75	38.55	34.68	279	150	Peak	VERTICAL
2	11651.17	43.35	54.00	-10.65	29.69	9.77	38.57	34.68	279	150	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	15570.82	60.75	74.00	-13.25	45.72	11.48	38.23	34.68	301	150	Peak	HORIZONTAL
2	15571.83	47.49	54.00	-6.51	32.46	11.48	38.23	34.68	301	150	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	15569.42	61.37	74.00	-12.63	46.34	11.48	38.23	34.68	320	150	Peak	VERTICAL
2	15569.92	47.59	54.00	-6.41	32.56	11.48	38.23	34.68	320	150	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	15688.54	47.57	54.00	-6.43	32.46	11.53	38.35	34.77	333	150	Average	HORIZONTAL
2	15689.32	60.92	74.00	-13.08	45.81	11.53	38.35	34.77	333	150	Peak	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	15687.55	47.82	54.00	-6.18	32.71	11.53	38.35	34.77	347	150	Average	VERTICAL
2	15688.76	60.77	74.00	-13.23	45.66	11.53	38.35	34.77	347	150	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	11509.24	42.50	54.00	-11.50	28.96	9.67	38.50	34.63	325	150	Average	HORIZONTAL
2	11509.60	56.43	74.00	-17.57	42.89	9.67	38.50	34.63	325	150	Peak	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	11508.45	42.36	54.00	-11.64	28.81	9.67	38.50	34.62	310	150	Average	VERTICAL
2	11509.46	55.44	74.00	-18.56	41.90	9.67	38.50	34.63	310	150	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	11589.63	56.57	74.00	-17.43	42.96	9.73	38.54	34.66	286	150	Peak	HORIZONTAL
2	11592.01	43.20	54.00	-10.80	29.59	9.73	38.54	34.66	286	150	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	11588.96	55.93	74.00	-18.07	42.32	9.73	38.54	34.66	262	150	Peak	VERTICAL
2	11589.78	43.18	54.00	-10.82	29.57	9.73	38.54	34.66	262	150	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	15627.79	47.82	54.00	-6.18	32.76	11.50	38.29	34.73	283	150	Average	HORIZONTAL
2	15630.31	61.39	74.00	-12.61	46.33	11.50	38.29	34.73	283	150	Peak	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	15629.07	47.81	54.00	-6.19	32.75	11.50	38.29	34.73	258	150	Average	VERTICAL
2	15631.30	62.11	74.00	-11.89	47.05	11.50	38.29	34.73	258	150	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	11549.05	42.90	54.00	-11.10	29.35	9.69	38.51	34.65	232	150	Average	HORIZONTAL
2	11549.77	56.41	74.00	-17.59	42.86	9.69	38.51	34.65	232	150	Peak	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	11550.30	56.45	74.00	-17.55	42.86	9.71	38.53	34.65	209	150	Peak	VERTICAL
2	11551.85	43.07	54.00	-10.93	29.48	9.71	38.53	34.65	209	150	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	15536.10	59.06	74.00	-14.94	44.09	11.45	38.16	34.64	87	178	Peak	HORIZONTAL
2	15542.86	47.10	54.00	-6.90	32.13	11.45	38.16	34.64	87	178	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	15536.00	59.22	74.00	-14.78	44.25	11.45	38.16	34.64	96	200	Peak	VERTICAL
2	15542.60	46.91	54.00	-7.09	31.94	11.45	38.16	34.64	96	200	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	15536.10	59.06	74.00	-14.94	44.09	11.45	38.16	34.64	87	178	Peak	HORIZONTAL
2	15542.86	47.10	54.00	-6.90	32.13	11.45	38.16	34.64	87	178	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	15596.80	46.57	54.00	-7.43	31.54	11.48	38.23	34.68	145	182	Average	VERTICAL
2	15601.74	59.78	74.00	-14.22	44.67	11.50	38.29	34.68	145	182	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	15715.28	59.19	74.00	-14.81	44.02	11.56	38.42	34.81	107	136	Peak	HORIZONTAL
2	15723.58	46.28	54.00	-7.72	31.11	11.56	38.42	34.81	107	136	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	15718.96	59.55	74.00	-14.45	44.38	11.56	38.42	34.81	141	198	Peak	VERTICAL
2	15719.72	46.25	54.00	-7.75	31.08	11.56	38.42	34.81	141	198	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	11491.86	42.65	54.00	-11.35	29.10	9.67	38.50	34.62	136	163	Average	HORIZONTAL
2	11492.42	54.46	74.00	-19.54	40.91	9.67	38.50	34.62	136	163	Peak	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	11494.50	55.67	74.00	-18.33	42.12	9.67	38.50	34.62	154	154	Peak	VERTICAL
2	11494.86	41.83	54.00	-12.17	28.28	9.67	38.50	34.62	154	154	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	11566.84	41.53	54.00	-12.47	27.94	9.71	38.53	34.65	151	145	Average	HORIZONTAL
2	11567.00	55.07	74.00	-18.93	41.48	9.71	38.53	34.65	151	145	Peak	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	11565.40	54.40	74.00	-19.60	40.81	9.71	38.53	34.65	177	148	Peak	VERTICAL
2	11570.70	41.60	54.00	-12.40	28.01	9.71	38.53	34.65	177	148	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	11645.70	54.71	74.00	-19.29	41.09	9.75	38.55	34.68	220	173	Peak	HORIZONTAL
2	11649.06	42.77	54.00	-11.23	29.15	9.75	38.55	34.68	220	173	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	11645.60	55.28	74.00	-18.72	41.66	9.75	38.55	34.68	232	194	Peak	VERTICAL
2	11645.78	41.87	54.00	-12.13	28.25	9.75	38.55	34.68	232	194	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	15572.72	59.85	74.00	-14.15	44.82	11.48	38.23	34.68	209	143	Peak	HORIZONTAL
2	15574.18	47.77	54.00	-6.23	32.74	11.48	38.23	34.68	209	143	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	15572.68	59.86	74.00	-14.14	44.83	11.48	38.23	34.68	254	136	Peak	VERTICAL
2	15573.62	46.62	54.00	-7.38	31.59	11.48	38.23	34.68	254	136	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	15690.00	59.96	74.00	-14.04	44.85	11.53	38.35	34.77	173	159	Peak	HORIZONTAL
2	15690.94	47.45	54.00	-6.55	32.24	11.56	38.42	34.77	173	159	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	15687.92	59.00	74.00	-15.00	43.89	11.53	38.35	34.77	222	135	Peak	VERTICAL
2	15692.32	46.49	54.00	-7.51	31.28	11.56	38.42	34.77	222	135	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	11510.46	56.18	74.00	-17.82	42.64	9.67	38.50	34.63	151	157	Peak	HORIZONTAL
2	11514.60	43.03	54.00	-10.97	29.49	9.67	38.50	34.63	151	157	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	11511.94	55.79	74.00	-18.21	42.25	9.67	38.50	34.63	215	175	Peak	VERTICAL
2	11514.36	42.05	54.00	-11.95	28.51	9.67	38.50	34.63	215	175	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	11589.98	42.74	54.00	-11.26	29.13	9.73	38.54	34.66	150	157	Average	HORIZONTAL
2	11592.78	55.24	74.00	-18.76	41.63	9.73	38.54	34.66	150	157	Peak	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	11585.58	55.51	74.00	-18.49	41.90	9.73	38.54	34.66	220	179	Peak	VERTICAL
2	11592.90	41.74	54.00	-12.26	28.13	9.73	38.54	34.66	220	179	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	15625.44	47.71	54.00	-6.29	32.65	11.50	38.29	34.73	146	169	Average	HORIZONTAL
2	15633.04	59.32	74.00	-14.68	44.26	11.50	38.29	34.73	146	169	Peak	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	15626.00	46.54	54.00	-7.46	31.48	11.50	38.29	34.73	189	177	Average	VERTICAL
2	15632.54	60.25	74.00	-13.75	45.19	11.50	38.29	34.73	189	177	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	Test Function	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	11545.10	43.07	54.00	-10.93	29.50	9.69	38.51	34.63	158	180	Average	HORIZONTAL
2	11550.70	55.29	74.00	-18.71	41.70	9.71	38.53	34.65	158	180	Peak	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	11545.54	42.03	54.00	-11.97	28.46	9.69	38.51	34.63	209	157	Average	VERTICAL
2	11547.00	55.15	74.00	-18.85	41.60	9.69	38.51	34.65	209	157	Peak	VERTICAL

Note:

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

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

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

4.7. 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

1. 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	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 17, 2015	Test Function	Non-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	5150.00	71.82	74.00	-2.18	66.87	6.11	33.31	34.47	278	285	Peak	HORIZONTAL
2	5150.00	53.87	54.00	-0.13	48.92	6.11	33.31	34.47	278	285	Average	HORIZONTAL
3	5172.40	104.47			99.42	6.17	33.35	34.47	278	285	Average	HORIZONTAL
4	5172.60	114.72			109.67	6.17	33.35	34.47	278	285	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5150.00	65.24	74.00	-8.76	60.29	6.11	33.31	34.47	283	239	Peak	HORIZONTAL
2	5150.00	50.20	54.00	-3.80	45.25	6.11	33.31	34.47	283	239	Average	HORIZONTAL
3	5192.40	107.23			102.12	6.20	33.38	34.47	283	239	Average	HORIZONTAL
4	5192.80	117.65			112.54	6.20	33.38	34.47	283	239	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5147.60	58.54	74.00	-15.46	53.59	6.11	33.31	34.47	282	240	Peak	HORIZONTAL
2	5150.00	46.08	54.00	-7.92	41.13	6.11	33.31	34.47	282	240	Average	HORIZONTAL
3	5232.20	104.78			99.49	6.32	33.44	34.47	282	240	Average	HORIZONTAL
4	5232.80	114.71			109.42	6.32	33.44	34.47	282	240	Peak	HORIZONTAL
5	5354.00	46.73	54.00	-7.27	41.03	6.58	33.59	34.47	282	240	Average	HORIZONTAL
6	5365.40	59.99	74.00	-14.01	54.23	6.62	33.61	34.47	282	240	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 17, 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	5711.40	63.48	68.20	-4.72	57.04	6.50	34.45	34.51	240	248	Peak	VERTICAL
2	5724.40	78.09	78.20	-0.11	71.67	6.43	34.50	34.51	240	248	Peak	VERTICAL
3	5743.20	111.33			104.94	6.36	34.55	34.52	240	248	Peak	VERTICAL
4	5750.60	101.15			94.76	6.36	34.55	34.52	240	248	Average	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5715.00	66.81	74.00	-7.19	60.37	6.50	34.45	34.51	290	249	Peak	VERTICAL
2	5715.00	50.56	54.00	-3.44	44.12	6.50	34.45	34.51	290	249	Average	VERTICAL
3	5724.40	69.80	78.20	-8.40	63.38	6.43	34.50	34.51	290	249	Peak	VERTICAL
4	5788.00	105.78			99.44	6.22	34.65	34.53	290	249	Average	VERTICAL
5	5788.60	117.76			111.42	6.22	34.65	34.53	290	249	Peak	VERTICAL
6	5858.80	68.84	78.20	-9.36	62.01	6.47	34.90	34.54	290	249	Peak	VERTICAL
7	5860.00	50.76	54.00	-3.24	43.93	6.47	34.90	34.54	290	249	Average	VERTICAL
8	5860.60	67.97	74.00	-6.03	61.14	6.47	34.90	34.54	290	249	Peak	VERTICAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5827.40	104.34			97.77	6.31	34.80	34.54	292	248	Average	HORIZONTAL
2	5827.60	115.23			108.66	6.31	34.80	34.54	292	248	Peak	HORIZONTAL
3	5856.40	78.06	78.20	-0.14	71.23	6.47	34.90	34.54	292	248	Peak	HORIZONTAL
4	5860.00	50.67	54.00	-3.33	43.84	6.47	34.90	34.54	292	248	Average	HORIZONTAL
5	5860.40	66.03	74.00	-7.97	59.20	6.47	34.90	34.54	292	248	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 17, 2015	Test Function	Non-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	5146.80	72.43	74.00	-1.57	67.48	6.11	33.31	34.47	58	294	Peak	HORIZONTAL
2	5150.00	53.92	54.00	-0.08	48.97	6.11	33.31	34.47	58	294	Average	HORIZONTAL
3	5176.40	105.33			100.28	6.17	33.35	34.47	58	294	Average	HORIZONTAL
4	5182.00	116.88			111.83	6.17	33.35	34.47	58	294	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5149.60	65.41	74.00	-8.59	60.46	6.11	33.31	34.47	69	292	Peak	HORIZONTAL
2	5150.00	52.15	54.00	-1.85	47.20	6.11	33.31	34.47	69	292	Average	HORIZONTAL
3	5206.60	118.34			113.17	6.24	33.40	34.47	69	292	Peak	HORIZONTAL
4	5206.60	108.98			103.81	6.24	33.40	34.47	69	292	Average	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5150.00	59.31	74.00	-14.69	54.36	6.11	33.31	34.47	56	301	Peak	HORIZONTAL
2	5150.00	47.97	54.00	-6.03	43.02	6.11	33.31	34.47	56	301	Average	HORIZONTAL
3	5236.80	117.18			111.89	6.32	33.44	34.47	56	301	Peak	HORIZONTAL
4	5247.20	106.95			101.61	6.35	33.46	34.47	56	301	Average	HORIZONTAL
5	5352.40	59.37	74.00	-14.63	53.67	6.58	33.59	34.47	56	301	Peak	HORIZONTAL
6	5392.00	49.31	54.00	-4.69	43.43	6.70	33.65	34.47	56	301	Average	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 17, 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	5711.40	67.97	68.20	-0.23	61.53	6.50	34.45	34.51	69	246	Average	HORIZONTAL
2	5721.80	78.08	78.20	-0.12	71.64	6.50	34.45	34.51	69	246	Average	HORIZONTAL
3	5737.80	114.67			108.26	6.43	34.50	34.52	69	246	Average	HORIZONTAL
4	5751.40	103.99			97.60	6.36	34.55	34.52	69	246	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5707.40	53.63	54.00	-0.37	47.19	6.50	34.45	34.51	66	288	Average	HORIZONTAL
2	5714.60	70.11	74.00	-3.89	63.67	6.50	34.45	34.51	66	288	Peak	HORIZONTAL
3	5725.00	73.69	78.20	-4.51	67.27	6.43	34.50	34.51	66	288	Peak	HORIZONTAL
4	5777.80	107.79			101.45	6.22	34.65	34.53	66	288	Average	HORIZONTAL
5	5783.40	119.01			112.67	6.22	34.65	34.53	66	288	Peak	HORIZONTAL
6	5851.40	73.39	78.20	-4.81	66.69	6.39	34.85	34.54	66	288	Peak	HORIZONTAL
7	5861.80	53.11	54.00	-0.89	46.28	6.47	34.90	34.54	66	288	Average	HORIZONTAL
8	5864.20	70.01	74.00	-3.99	63.18	6.47	34.90	34.54	66	288	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5827.40	117.44			110.87	6.31	34.80	34.54	70	308	Peak	VERTICAL
2	5828.20	105.98			99.41	6.31	34.80	34.54	70	308	Average	VERTICAL
3	5850.00	78.18	78.20	-0.02	71.48	6.39	34.85	34.54	70	308	Peak	VERTICAL
4	5862.60	67.76	68.20	-0.44	60.93	6.47	34.90	34.54	70	308	Peak	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 17, 2015	Test Function	Non-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	5146.80	70.56	74.00	-3.44	65.61	6.11	33.31	34.47	53	293	Peak	HORIZONTAL
2	5148.00	53.65	54.00	-0.35	48.70	6.11	33.31	34.47	53	293	Average	HORIZONTAL
3	5197.20	108.95			103.84	6.20	33.38	34.47	53	293	Peak	HORIZONTAL
4	5206.80	98.70			93.53	6.24	33.40	34.47	53	293	Average	HORIZONTAL
5	5356.80	50.23	54.00	-3.77	44.47	6.62	33.61	34.47	53	293	Average	HORIZONTAL
6	5361.60	61.65	74.00	-12.35	55.89	6.62	33.61	34.47	53	293	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5136.40	61.07	74.00	-12.93	56.18	6.07	33.29	34.47	63	290	Peak	HORIZONTAL
2	5146.00	49.42	54.00	-4.58	44.47	6.11	33.31	34.47	63	290	Average	HORIZONTAL
3	5242.00	104.10			98.81	6.32	33.44	34.47	63	290	Average	HORIZONTAL
4	5246.80	113.99			108.70	6.32	33.44	34.47	63	290	Peak	HORIZONTAL
5	5376.40	52.30	54.00	-1.70	46.48	6.66	33.63	34.47	63	290	Average	HORIZONTAL
6	5387.20	63.57	74.00	-10.43	57.69	6.70	33.65	34.47	63	290	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	67.95	68.20	-0.25	61.51	6.50	34.45	34.51	77	206	Peak	HORIZONTAL
2	5721.40	71.12	78.20	-7.08	64.68	6.50	34.45	34.51	77	206	Peak	HORIZONTAL
3	5765.80	98.35			91.99	6.29	34.60	34.53	77	206	Average	HORIZONTAL
4	5768.20	108.47			102.11	6.29	34.60	34.53	77	206	Peak	HORIZONTAL

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	5708.60	66.66	68.20	-1.54	60.22	6.50	34.45	34.51	72	220	Peak	HORIZONTAL
2	5721.40	68.47	78.20	-9.73	62.03	6.50	34.45	34.51	72	220	Peak	HORIZONTAL
3	5786.60	102.79			96.45	6.22	34.65	34.53	72	220	Average	HORIZONTAL
4	5791.40	113.54			107.22	6.15	34.70	34.53	72	220	Peak	HORIZONTAL
5	5856.20	69.21	78.20	-8.99	62.38	6.47	34.90	34.54	72	220	Peak	HORIZONTAL
6	5862.20	67.91	68.20	-0.29	61.08	6.47	34.90	34.54	72	220	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Dec. 18, 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	5150.00	65.14	74.00	-8.86	60.19	6.11	33.31	34.47	59	216	Peak	HORIZONTAL
2	5150.00	53.75	54.00	-0.25	48.80	6.11	33.31	34.47	59	216	Average	HORIZONTAL
3	5222.00	104.66			99.43	6.28	33.42	34.47	59	216	Peak	HORIZONTAL
4	5227.00	95.34			90.11	6.28	33.42	34.47	59	216	Average	HORIZONTAL
5	5362.00	61.38	74.00	-12.62	55.62	6.62	33.61	34.47	59	216	Peak	HORIZONTAL
6	5378.00	49.82	54.00	-4.18	44.00	6.66	33.63	34.47	59	216	Average	HORIZONTAL

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	5711.00	68.00	68.20	-0.20	61.56	6.50	34.45	34.51	68	217	Peak	HORIZONTAL
2	5721.00	66.98	78.20	-11.22	60.54	6.50	34.45	34.51	68	217	Peak	HORIZONTAL
3	5746.00	103.43			97.04	6.36	34.55	34.52	68	217	Peak	HORIZONTAL
4	5767.00	92.60			86.24	6.29	34.60	34.53	68	217	Average	HORIZONTAL
5	5852.00	63.11	78.20	-15.09	56.41	6.39	34.85	34.54	68	217	Peak	HORIZONTAL
6	5866.00	64.70	68.20	-3.50	57.87	6.47	34.90	34.54	68	217	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5775 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 07, 2016	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	5144.40	73.78	74.00	-0.22	68.83	6.11	33.31	34.47	284	240	Peak	HORIZONTAL
2	5150.00	53.62	54.00	-0.38	48.67	6.11	33.31	34.47	284	240	Average	HORIZONTAL
3	5182.80	103.92			98.87	6.17	33.35	34.47	284	240	Average	HORIZONTAL
4	5183.60	114.74			109.69	6.17	33.35	34.47	284	240	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5150.00	69.20	74.00	-4.80	64.25	6.11	33.31	34.47	287	223	Peak	HORIZONTAL
2	5150.00	49.14	54.00	-4.86	44.19	6.11	33.31	34.47	287	223	Average	HORIZONTAL
3	5192.00	104.94			99.83	6.20	33.38	34.47	287	223	Average	HORIZONTAL
4	5192.80	114.68			109.57	6.20	33.38	34.47	287	223	Peak	HORIZONTAL
5	5352.00	46.43	54.00	-7.57	40.73	6.58	33.59	34.47	287	223	Average	HORIZONTAL
6	5364.00	59.26	74.00	-14.74	53.50	6.62	33.61	34.47	287	223	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5122.40	58.01	74.00	-15.99	53.17	6.04	33.27	34.47	291	221	Peak	HORIZONTAL
2	5150.00	45.75	54.00	-8.25	40.80	6.11	33.31	34.47	291	221	Average	HORIZONTAL
3	5237.00	112.88			107.59	6.32	33.44	34.47	291	221	Peak	HORIZONTAL
4	5243.00	102.92			97.63	6.32	33.44	34.47	291	221	Average	HORIZONTAL
5	5360.00	45.90	54.00	-8.10	40.14	6.62	33.61	34.47	291	221	Average	HORIZONTAL
6	5367.20	58.77	74.00	-15.23	53.01	6.62	33.61	34.47	291	221	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 07, 2016 / Mar. 08, 2016	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	5711.00	68.50	74.00	-5.50	62.06	6.50	34.45	34.51	288	221	Peak	HORIZONTAL
2	5715.00	53.65	54.00	-0.35	47.21	6.50	34.45	34.51	288	221	Average	HORIZONTAL
3	5723.40	77.40	78.20	-0.80	70.98	6.43	34.50	34.51	288	221	Peak	HORIZONTAL
4	5736.60	102.23			95.82	6.43	34.50	34.52	288	221	Average	HORIZONTAL
5	5738.20	111.79			105.38	6.43	34.50	34.52	288	221	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5701.40	68.12	68.20	-0.08	61.66	6.57	34.40	34.51	22	148	Peak	HORIZONTAL
2	5723.80	61.70	78.20	-16.50	55.28	6.43	34.50	34.51	22	148	Peak	HORIZONTAL
3	5779.40	115.46			109.12	6.22	34.65	34.53	22	148	Peak	HORIZONTAL
4	5781.00	105.36			99.02	6.22	34.65	34.53	22	148	Average	HORIZONTAL
5	5850.40	61.51	78.20	-16.69	54.81	6.39	34.85	34.54	22	148	Peak	HORIZONTAL
6	5869.00	66.37	68.20	-1.83	59.54	6.47	34.90	34.54	22	148	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5817.20	99.44			92.99	6.23	34.75	34.53	144	146	Average	HORIZONTAL
2	5823.40	113.10			106.53	6.31	34.80	34.54	144	146	Peak	HORIZONTAL
3	5850.00	74.26	78.20	-3.94	67.56	6.39	34.85	34.54	144	146	Peak	HORIZONTAL
4	5863.80	67.99	68.20	-0.21	61.16	6.47	34.90	34.54	144	146	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	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	5146.80	69.47	74.00	-4.53	64.52	6.11	33.31	34.47	84	222	Peak	HORIZONTAL
2	5150.00	53.82	54.00	-0.18	48.87	6.11	33.31	34.47	84	222	Average	HORIZONTAL
3	5200.80	111.58			106.47	6.20	33.38	34.47	84	222	Peak	HORIZONTAL
4	5204.40	102.56			97.39	6.24	33.40	34.47	84	222	Average	HORIZONTAL
5	5365.20	51.71	54.00	-2.29	45.95	6.62	33.61	34.47	84	222	Average	HORIZONTAL
6	5367.60	63.49	74.00	-10.51	57.73	6.62	33.61	34.47	84	222	Peak	HORIZONTAL

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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5072.80	63.11	74.00	-10.89	58.42	5.95	33.21	34.47	82	224	Peak	HORIZONTAL
2	5080.00	51.18	54.00	-2.82	46.49	5.95	33.21	34.47	82	224	Average	HORIZONTAL
3	5232.40	116.24			110.95	6.32	33.44	34.47	82	224	Peak	HORIZONTAL
4	5236.00	105.89			100.60	6.32	33.44	34.47	82	224	Average	HORIZONTAL
5	5378.80	52.94	54.00	-1.06	47.12	6.66	33.63	34.47	82	224	Average	HORIZONTAL
6	5401.60	64.97	74.00	-9.03	59.05	6.72	33.67	34.47	82	224	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	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	5715.00	68.06	68.20	-0.14	61.62	6.50	34.45	34.51	71	243	Peak	HORIZONTAL
2	5725.00	70.60	78.20	-7.60	64.18	6.43	34.50	34.51	71	243	Peak	HORIZONTAL
3	5759.80	101.17			94.80	6.29	34.60	34.52	71	243	Average	HORIZONTAL
4	5760.60	111.16			104.79	6.29	34.60	34.52	71	243	Peak	HORIZONTAL

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	5712.20	67.39	68.20	-0.81	60.95	6.50	34.45	34.51	58	174	Peak	HORIZONTAL
2	5720.60	71.37	78.20	-6.83	64.93	6.50	34.45	34.51	58	174	Peak	HORIZONTAL
3	5780.60	116.29			109.95	6.22	34.65	34.53	58	174	Peak	HORIZONTAL
4	5797.40	104.47			98.15	6.15	34.70	34.53	58	174	Average	HORIZONTAL
5	5850.00	77.14	78.20	-1.06	70.44	6.39	34.85	34.54	58	174	Peak	HORIZONTAL
6	5864.60	68.00	68.20	-0.20	61.17	6.47	34.90	34.54	58	174	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Taka Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Mar. 09, 2016	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	5150.00	65.38	74.00	-8.62	60.43	6.11	33.31	34.47	52	223	Peak	HORIZONTAL
2	5150.00	53.62	54.00	-0.38	48.67	6.11	33.31	34.47	52	223	Average	HORIZONTAL
3	5176.00	96.69			91.64	6.17	33.35	34.47	52	223	Average	HORIZONTAL
4	5228.00	106.73			101.50	6.28	33.42	34.47	52	223	Peak	HORIZONTAL
5	5356.00	61.80	74.00	-12.20	56.04	6.62	33.61	34.47	52	223	Peak	HORIZONTAL
6	5389.00	49.02	54.00	-4.98	43.14	6.70	33.65	34.47	52	223	Average	HORIZONTAL

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	5710.00	67.93	68.20	-0.27	61.49	6.50	34.45	34.51	68	211	Peak	HORIZONTAL
2	5723.00	68.68	78.20	-9.52	62.26	6.43	34.50	34.51	68	211	Peak	HORIZONTAL
3	5739.00	110.56			104.17	6.36	34.55	34.52	68	211	Peak	HORIZONTAL
4	5761.00	94.41			88.04	6.29	34.60	34.52	68	211	Average	HORIZONTAL
5	5850.00	64.48	78.20	-13.72	57.78	6.39	34.85	34.54	68	211	Peak	HORIZONTAL
6	5872.00	66.80	68.20	-1.40	59.97	6.47	34.90	34.54	68	211	Peak	HORIZONTAL

Item 3, 4 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

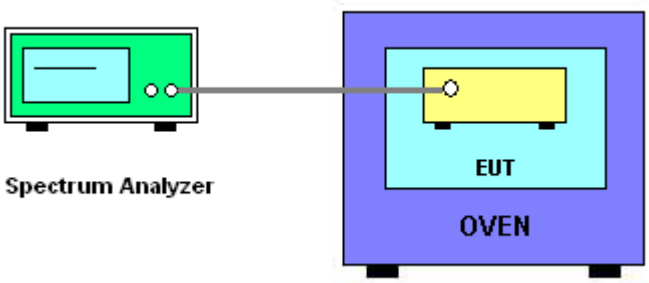
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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~50°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	59%
Test Engineer	Peter Wu	Test Date	Feb. 25, 2016~Feb. 26, 2016

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	5199.9914	5199.9911	5199.9908	5199.9905
110.00	5199.9907	5199.9898	5199.9897	5199.9895
93.50	5199.9905	5199.9899	5199.9889	5199.9882
Max. Deviation (MHz)	0.0095	0.0102	0.0111	0.0118
Max. Deviation (ppm)	1.83	1.96	2.13	2.27
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(℃)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5199.9958	5199.9946	5199.9927	5199.9905
10	5199.9945	5199.9932	5199.9917	5199.9899
20	5199.9933	5199.9920	5199.9904	5199.9885
30	5199.9919	5199.9908	5199.9894	5199.9878
40	5199.9903	5199.9888	5199.9872	5199.9852
50	5199.9886	5199.9874	5199.9859	5199.9832
Max. Deviation (MHz)	0.0114	0.0126	0.0141	0.0168
Max. Deviation (ppm)	2.19	2.42	2.71	3.23
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9987	5784.9981	5784.9976	5784.9973
110.00	5784.9981	5784.9971	5784.9968	5784.9964
93.50	5784.9971	5784.9967	5784.9958	5784.9949
Max. Deviation (MHz)	0.0029	0.0033	0.0042	0.0051
Max. Deviation (ppm)	0.50	0.57	0.73	0.88
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5785.0011	5784.9999	5784.9980	5784.9958
10	5784.9998	5784.9985	5784.9970	5784.9952
20	5784.9986	5784.9973	5784.9957	5784.9938
30	5784.9972	5784.9961	5784.9947	5784.9931
40	5784.9956	5784.9941	5784.9925	5784.9905
50	5784.9939	5784.9927	5784.9912	5784.9885
Max. Deviation (MHz)	0.0061	0.0073	0.0088	0.0115
Max. Deviation (ppm)	1.05	1.26	1.52	1.99
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	5189.9930	5189.9922	5189.9921	5189.9919
110.00	5189.9921	5189.9911	5189.9910	5189.9900
93.50	5189.9911	5189.9904	5189.9900	5189.9897
Max. Deviation (MHz)	0.0089	0.0096	0.0100	0.0103
Max. Deviation (ppm)	1.71	1.85	1.93	1.98
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5190.0007	5189.9995	5189.9976	5189.9954
10	5189.9994	5189.9981	5189.9966	5189.9948
20	5189.9982	5189.9969	5189.9953	5189.9934
30	5189.9968	5189.9957	5189.9943	5189.9927
40	5189.9952	5189.9937	5189.9921	5189.9901
50	5189.9935	5189.9923	5189.9908	5189.9881
Max. Deviation (MHz)	0.0065	0.0077	0.0092	0.0119
Max. Deviation (ppm)	1.25	1.48	1.77	2.29
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9903	5754.9896	5754.9889	5754.9883
110.00	5754.9902	5754.9901	5754.9894	5754.9887
93.50	5754.9894	5754.9890	5754.9889	5754.9888
Max. Deviation (MHz)	0.0106	0.0110	0.0111	0.0117
Max. Deviation (ppm)	1.84	1.91	1.93	2.03
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5755.0012	5755.0000	5754.9981	5754.9959
10	5754.9999	5754.9986	5754.9971	5754.9953
20	5754.9987	5754.9974	5754.9958	5754.9939
30	5754.9973	5754.9962	5754.9948	5754.9932
40	5754.9957	5754.9942	5754.9926	5754.9906
50	5754.9940	5754.9928	5754.9913	5754.9886
Max. Deviation (MHz)	0.0060	0.0072	0.0087	0.0114
Max. Deviation (ppm)	1.04	1.25	1.51	1.98
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	5209.9970	5209.9967	5209.9964	5209.9962
110.00	5209.9961	5209.9951	5209.9948	5209.9945
93.50	5209.9960	5209.9959	5209.9958	5209.9956
Max. Deviation (MHz)	0.0040	0.0049	0.0052	0.0055
Max. Deviation (ppm)	0.77	0.94	1.00	1.06
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5209.9973	5209.9961	5209.9942	5209.9920
10	5209.9960	5209.9947	5209.9932	5209.9914
20	5209.9948	5209.9935	5209.9919	5209.9900
30	5209.9934	5209.9923	5209.9909	5209.9893
40	5209.9918	5209.9903	5209.9887	5209.9867
50	5209.9901	5209.9889	5209.9874	5209.9847
Max. Deviation (MHz)	0.0099	0.0111	0.0126	0.0153
Max. Deviation (ppm)	1.90	2.13	2.42	2.94
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9940	5774.9936	5774.9930	5774.9921
110.00	5774.9931	5774.9926	5774.9919	5774.9915
93.50	5774.9921	5774.9913	5774.9911	5774.9905
Max. Deviation (MHz)	0.0079	0.0087	0.0089	0.0095
Max. Deviation (ppm)	1.37	1.51	1.54	1.65
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5774.9998	5774.9986	5774.9967	5774.9945
10	5774.9985	5774.9972	5774.9957	5774.9939
20	5774.9973	5774.9960	5774.9944	5774.9925
30	5774.9959	5774.9948	5774.9934	5774.9918
40	5774.9943	5774.9928	5774.9912	5774.9892
50	5774.9926	5774.9914	5774.9899	5774.9872
Max. Deviation (MHz)	0.0074	0.0086	0.0101	0.0128
Max. Deviation (ppm)	1.28	1.49	1.75	2.22
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. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
Impedance Stabilization Network	Teseq	ISN T800	24557	150kHz ~ 230MHz	Oct. 27, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 25, 2015	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	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	Mar. 15, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov.13, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 27, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	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. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	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%