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FCC RADIO TEST REPORT

Applicant's company	**NETGEAR, Inc.**
Applicant Address	350 East Plumeria Drive, San Jose, California 95134, USA
FCC ID	**PY313200230**

Product Name	WiFi Range Extender
Brand Name	NETGEAR
Model No.	EX6200
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	May 12, 2015
Final Test Date	Sep. 17, 2015
Submission Type	Class II Change

Statement

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

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

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

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart E, KDB789033 D02 v01, KDB662911 D01 v02r01, KDB644545 D03 v01.**

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

Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3N0906-04	Rev. 01	Initial issue of report	Oct. 12, 2015

1. VERIFICATION OF COMPLIANCE

Product Name	:	WiFi Range Extender
Brand Name	:	NETGEAR
Model No.	:	EX6200
Applicant	:	NETGEAR, Inc.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on May 12, 2015 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

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	7.25 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	3.29 dB
4.5	15.407(a)	Power Spectral Density	Complies	3.71 dB
4.6	15.407(b)	Radiated Emissions	Complies	2.84 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.03 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Channel Number	9 for 20MHz bandwidth ; 4 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Band Width (99%)	For Non-beamforming mode Band 1: IEEE 802.11a: 17.28 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.12 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.80 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.00 MHz Band 4: IEEE 802.11a: 17.40 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.24 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.80 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.00 MHz For beamforming mode Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.00 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.00 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.00 MHz Band 4: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.00 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.00 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.40 MHz

Maximum Conducted Output Power	For Non-beamforming mode Band 1: IEEE 802.11a: 26.17 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 25.91 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.28 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.68 dBm Band 4: IEEE 802.11a: 25.60 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 25.69 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 25.25 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 18.59 dBm For beamforming mode Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 25.66 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.28 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.68 dBm Band 4: IEEE 802.11ac MCS0/Nss1 (VHT20): 25.24 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 25.25 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 18.59 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
Operating Mode	☐ Outdoor access point	
	☒ Indoor access point	
	☐ Fixed point-to-point access points	
	☐ Mobile and portable client devices	

Note:

The product has beamforming function for 802.11ac VHT/20/40/80 in 5150-5250MHz and 5725-5850MHz.

Antenna and Band width

Antenna	Two (TX)		
Band width Mode	20 MHz	40 MHz	80 MHz
IEEE 802.11a	V	X	X
IEEE 802.11n	V	V	X
IEEE 802.11ac	V	V	V

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2	MCS 0-15
802.11n (HT40)	2	MCS 0-15
802.11ac (VHT20)	2	MCS 0-9/Nss1-2
802.11ac (VHT40)	2	MCS 0-9/Nss1-2
802.11ac (VHT80)	2	MCS 0-9/Nss1-2

Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT supports HT20 and HT40.
Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20, VHT40 and VHT80.
Note 3: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

3.2. Accessories

Power	Brand	Model No.	P/N	Rating
Adapter 1	NETGEAR	P030WF120B 11200-6LF	332-10200-02	Input: 100-240V～50/60Hz 1.0A Output: 12.0V, 2.5A
Adapter 2	NETGEAR	MU30-5120250 -A1	332-10234-01	Input: 100-240V～50/60Hz 0.8A Output: 12V, 2.5A
Adapter 3	NETGEAR	ADS-40FPA-12 12030GPCU	332-10757-01	Input: 100-240Vac, 50/60Hz, Max. 1.0A Output: 12Vdc, 2.5A
Adapter 4	NETGEAR	2ABL030F NA	332-10756-01	Input: 100-240Vac, 50/60Hz, 1.0A Output: 12.0Vdc, 2.5A
Adapter 5	NETGEAR	2ABL030F 1 NA	332-10758-01	Input: 100-120Vac, 50/60Hz, 1.0A Output: 12.0Vdc, 2.5A
Adapter 6	NETGEAR	ADS-40FPA-12 12030GPCU-L	332-10759-01	Input: 100-120Vac, 60Hz, Max. 1.0A Output: 12Vdc, 2.5A

Others
Standing dock*1
RJ-45 cable*1: Shielded, 1.5m

3.3. Table for Filed Antenna

For 5GHz information

Ant.	Brand	Model Name	Antenna Type	Connector
1	NETGEAR	EX6200	Dipole Antenna	I-PEX
2	NETGEAR	EX6200	Dipole Antenna	I-PEX

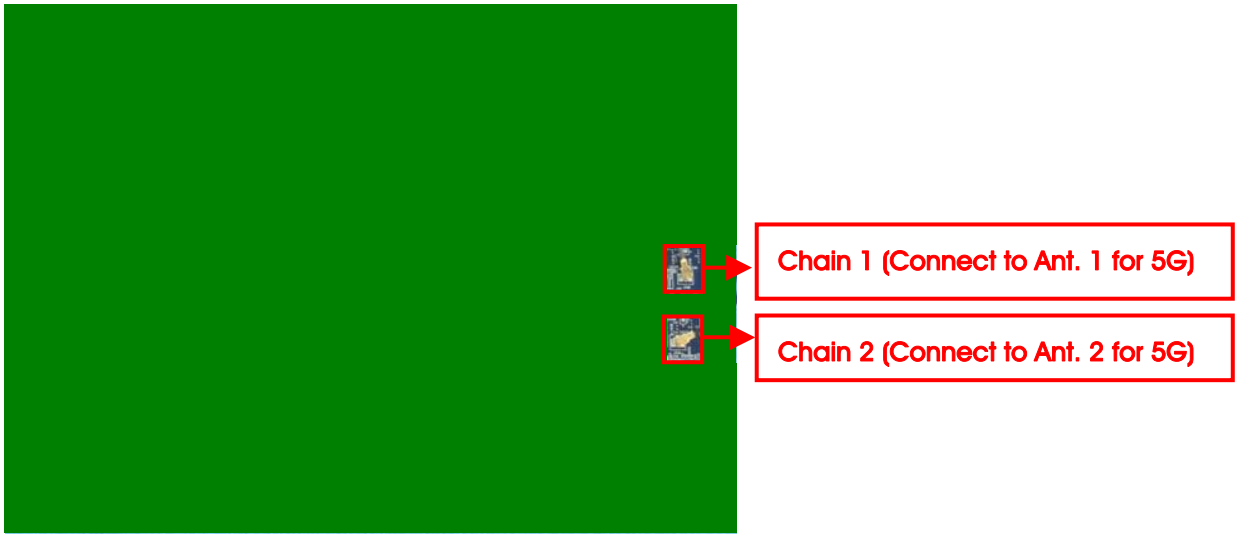
Ant.	Frequency	Gain (dBi)			Cable loss			True Gain (dBi)		
		5GHz			5GHz			5GHz		
		20MHz	40MHz	80MHz	20MHz	40MHz	80MHz	20MHz	40MHz	80MHz
1	5180MHz	3.8	-	-	1.1	-	-	2.7	-	-
	5190MHz	-	3.6	-	-	1.1	-	-	2.5	-
	5200MHz	3.7	-	-	1.1	-	-	2.6	-	-
	5210MHz	-	-	3.8	-	-	1.1	-	-	2.7
	5230MHz	-	4.1	-	-	1.1	-	-	3.0	-
	5240MHz	4.1	-	-	1.1	-	-	3.0	-	-
2	5180MHz	3.8	-	-	0.8	-	-	3.0	-	-
	5190MHz	-	3.6	-	-	0.8	-	-	2.8	-
	5200MHz	3.7	-	-	0.8	-	-	2.9	-	-
	5210MHz	-	-	3.8	-	-	0.8	-	-	3.0
	5230MHz	-	4.1	-	-	0.8	-	-	3.3	-
	5240MHz	4.1	-	-	0.8	-	-	3.3	-	-

Ant.	Frequency	Gain (dBi)			Cable loss			True Gain (dBi)		
		5GHz			5GHz			5GHz		
		20MHz	40MHz	80MHz	20MHz	40MHz	80MHz	20MHz	40MHz	80MHz
1	5745MHz	5.0	-	-	1.1	-	-	3.9	-	-
	5755MHz	-	5.1	-	-	1.1	-	-	4.0	-
	5775MHz	-	-	5.4	-	-	1.1	-	-	4.3
	5785MHz	5.4	-	-	1.1	-	-	4.3	-	-
	5795MHz	-	5.4	-	-	1.1	-	-	4.3	-
	5825MHz	5.5	-	-	1.1	-	-	4.4	-	-
2	5745MHz	5.0	-	-	0.8	-	-	4.2	-	-
	5755MHz	-	5.1	-	-	0.8	-	-	4.3	-
	5775MHz	-	-	5.4	-	-	0.8	-	-	4.6
	5785MHz	5.4	-	-	0.8	-	-	4.6	-	-
	5795MHz	-	5.4	-	-	0.8	-	-	4.6	-
	5825MHz	5.5	-	-	0.8	-	-	4.7	-	-

Note: The EUT has two antennas

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

Ant. 1 and Ant. 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

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

3.5. Table for Test Modes

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

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

Power Spectral Density	For non-beamforming mode				
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2
	For beamforming mode				
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	For non-beamforming mode				
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2
	For beamforming mode				
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2
6dB Spectrum Bandwidth Measurement	For non-beamforming mode				
	11a/BPSK	Band 4	6Mbps	149/157/165	1+2
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2
	For beamforming mode				
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2

Radiated Emission Below 1GHz	Normal Link		-	-	-
Radiated Emission Above 1GHz	For non-beamforming mode				
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2
	For beamforming mode				
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2
Band Edge Emission	For non-beamforming mode				
	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2
	For beamforming mode				
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2
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. There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802.11ac, Beamforming mode and non-beamforming mode has been test and record in this test report.
2. VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1: EUT standing + Adapter 3

Mode 2: EUT standing + Adapter 4

Mode 3: EUT standing + Adapter 5

Mode 4: EUT standing + Adapter 6

Mode 3 generated the worst test result, so it was recorded in this report

For Radiated Emission test below 1GHz:

Mode 1: EUT standing + Adapter 3

Mode 2: EUT laying + Adapter 3

Mode 1 has been evaluated to be the worst case among Mode 1～2, thus measurement for Mode 3 ～ 5 will follow this same test mode.

Mode 3: EUT standing + Adapter 4

Mode 4: EUT standing + Adapter 5

Mode 5: EUT standing + Adapter 6

Mode 1 generated the worst test result, so it was recorded in this report.

For Radiated Emission test above 1GHz:

The EUT for Radiated emission test above 1GHz was performed at standing and laying position and the worst case was found from standing. So the measurement will follow this same test configuration.

Mode 1: CTX - EUT standing

For Co-location MPE Test:

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA3N0906-04) test is added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

3.6. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
CO02-CB	Conduction	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: 3N0906

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

Modifications	Performance Checking
1. Updating 5 GHz Band 1 and Band 4 to FCC "New Rules" from "Old Rules". 2. Changing antennas to Model: EX6200 (Serial number: 2014-0312)	1. 26dB Bandwidth and 99% Occupied Bandwidth Measurement 2. 6dB Spectrum Bandwidth Measurement 3. Maximum Conducted Output Power Measurement 4. Power Spectral Density Measurement 5. Radiated Emissions Measurement above 1GHz 6. Band Edge Emissions Measurement 7. Frequency Stability Measurement
3. Adding 4 adapters (Model: ADS-40FPA-12 12030GPCU, 2ABL030F NA, 2ABL030F 1 NA and ADS-40FPA-12 12030GPCU-L)	1. AC Conducted Emissions 2. Radiated Emissions Measurement test below 1GHz

Note 1: The maximum conducted output power (average) was increased for operation in UNII-1.

Note 2: The maximum conducted output power (average) was reduced for operation in UNII-3.

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB

(Radiated Emission below 1GHz test)

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
NB	DELL	E4300	DoC
NB	DELL	E4300	DoC
AP Router	Netgear	R6300V2	PY313200227
Flash Disk	Silicon Power	B06	DoC

(Radiated Emission above 1GHz test) (For Non-beamforming mode)

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC

(Radiated Emission above 1GHz test) (For beamforming mode)

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC
Notebook	DELL	E4300	DoC
RX Device	Broadcom	Bcm4366	N/A

For Test Site No: CO02-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC
NB	DELL	E6430	DoC
NB	DELL	E6430	DoC
AP Router	Planex	GW-AP54SGX	KA220030603014-1
Flash Disk	Transcend	JetFlash-700	DoC

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC

3.9. Table for Parameters of Test Software Setting

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

For non-beamforming mode

Test Software Version	Mtool 2.0.1.0					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	79	83	86	76	86	78
802.11ac MCS0/Nss1 VHT20	79	81	85	76	86	81
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz	5755 MHz		5795 MHz
	61		87	63		85
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz			5775 MHz		
	52			58		

For beamforming mode

Test Software Version	Mtool 2.0.1.0					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11ac MCS0/Nss1 VHT20	77	79	84	72	84	77

Mode	NCB: 40MHz			
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	5755 MHz	5795 MHz
	61	87	61	85

Mode	NCB: 80MHz	
802.11ac MCS0/Nss1 VHT80	5210 MHz	5775 MHz
	52	58

3.10. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

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

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under 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%

3.11. Duty Cycle

For non-beamforming mode:

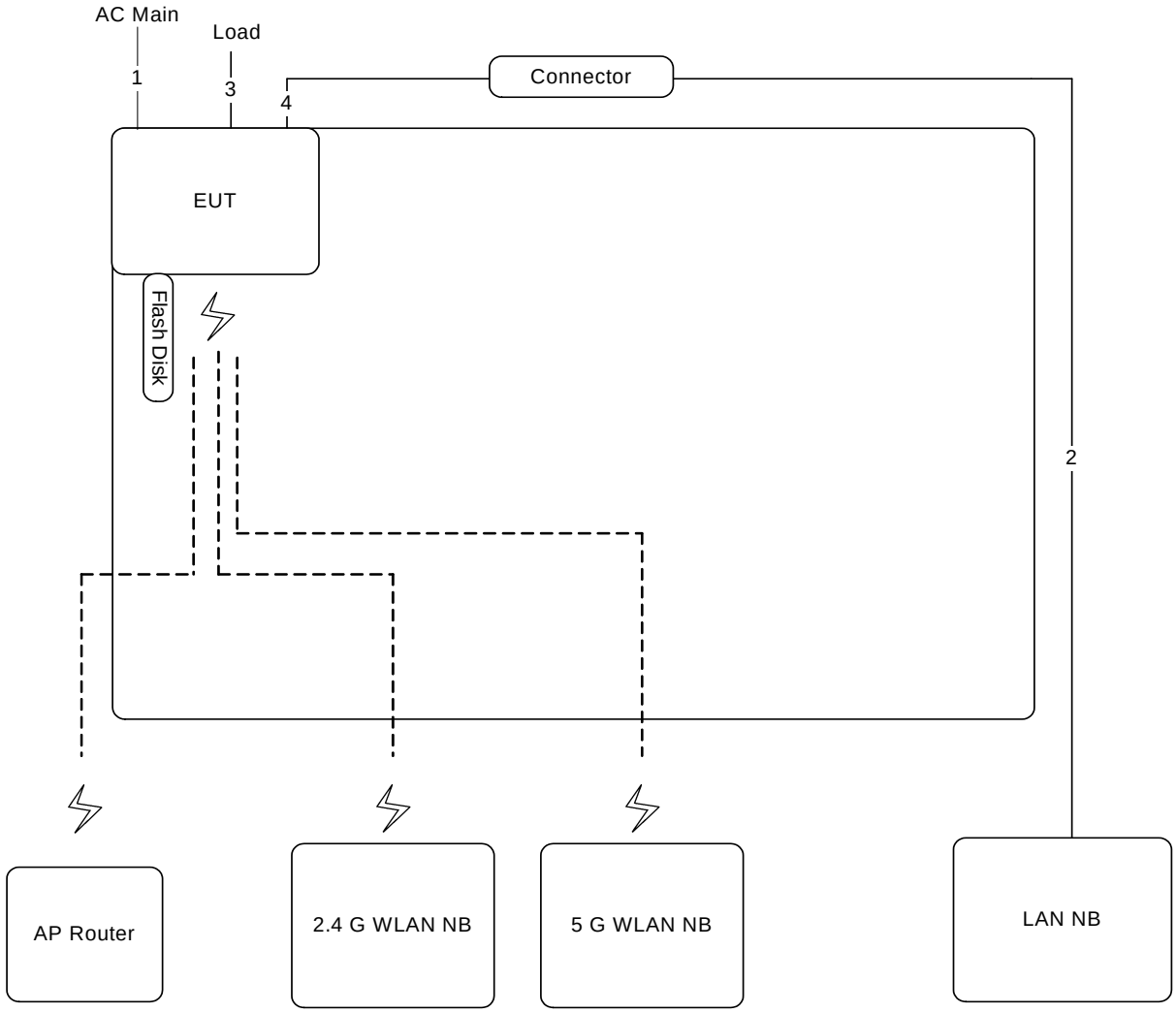
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.060	2.090	98.56%	0.06	0.01
802.11ac MCS0/Nss1 VHT20	1.930	1.950	98.97%	0.04	0.01
802.11ac MCS0/Nss1 VHT40	0.944	0.984	95.93%	0.18	1.06
802.11ac MCS0/Nss1 VHT80	0.442	0.488	90.57%	0.43	2.26

For beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	4.000	4.100	97.56%	0.11	0.25
802.11ac MCS0/Nss1 VHT40	4.574	4.961	92.20%	0.35	0.22
802.11ac MCS0/Nss1 VHT80	5.066	5.474	92.55%	0.34	0.20

3.12. Test Configurations

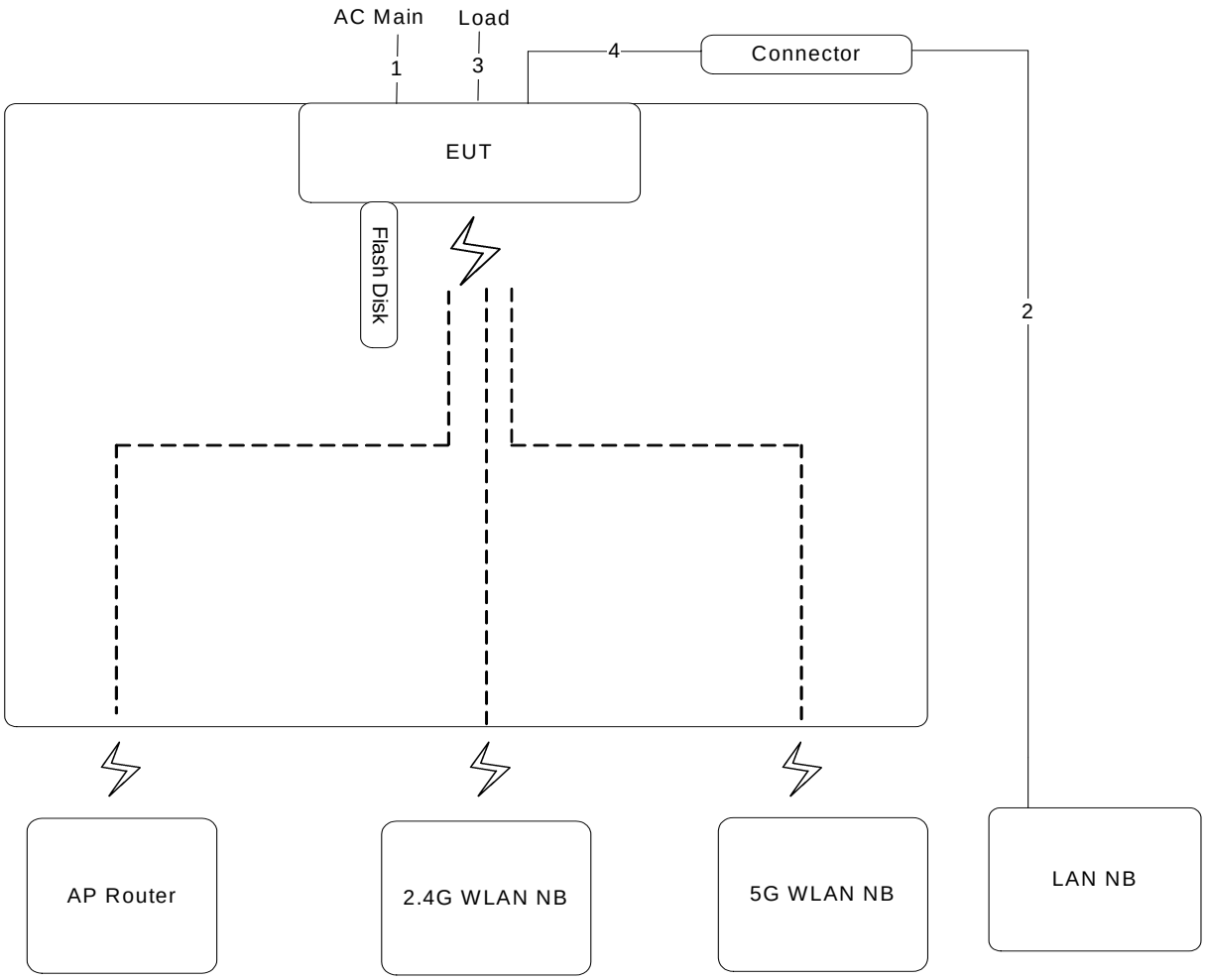
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	Yes	10m
3	RJ-45 cable*4	No	1.5m
4	RJ-45 cable	Yes	1.5m

3.12.2. Radiation Emissions Test Configuration

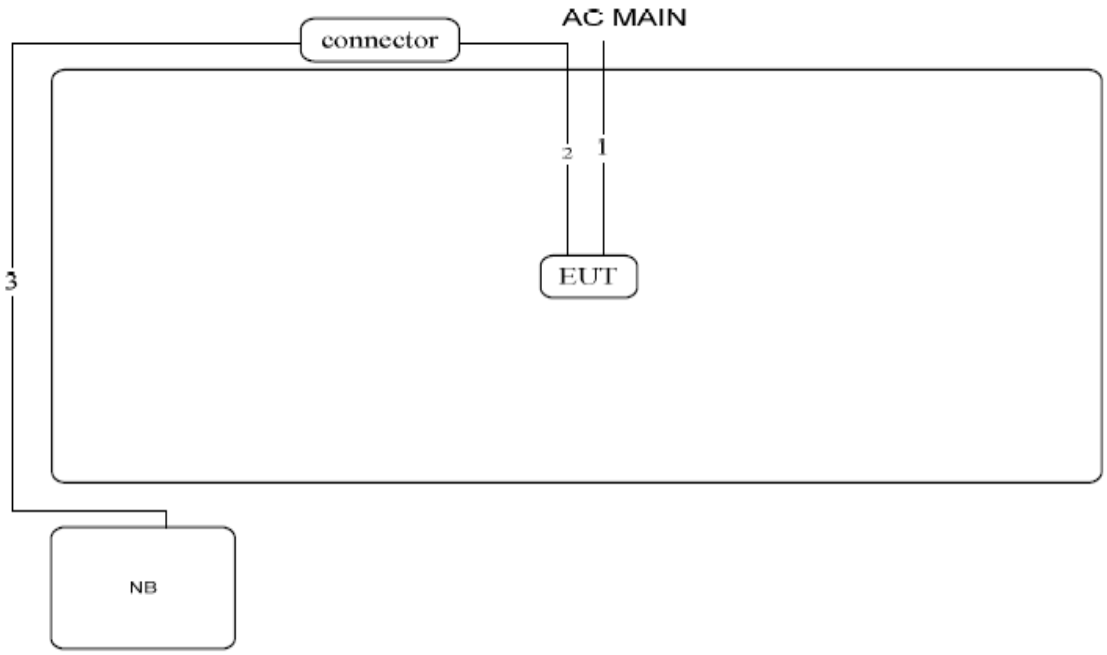
Test Configuration: 30MHz ~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	Yes	10m
3	RJ-45 cable*4	No	1m
4	RJ-45 cable	Yes	1.5m

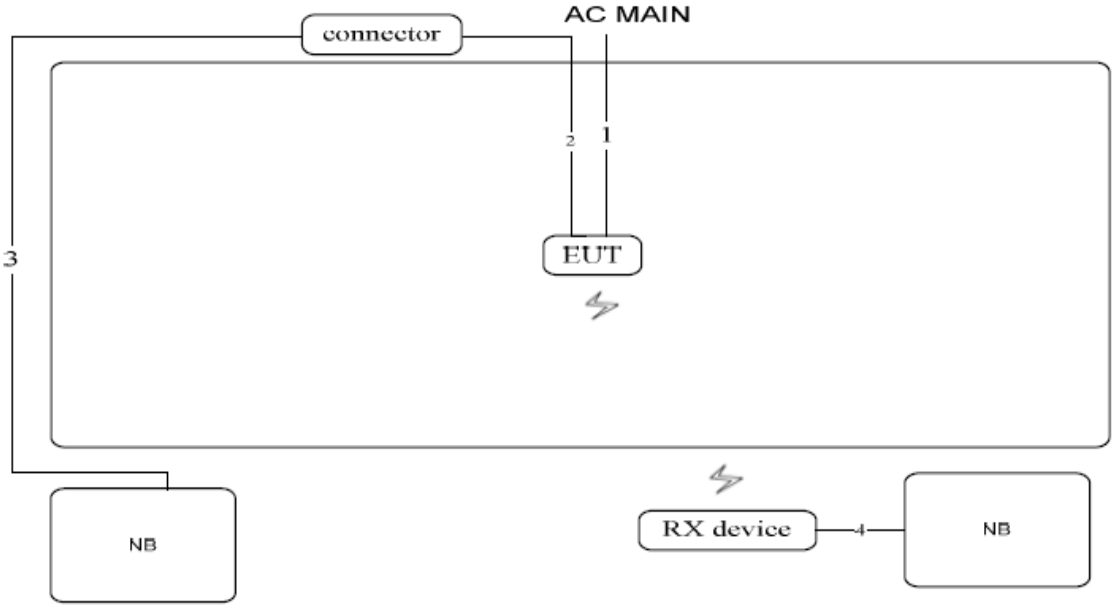
Test Configuration: above 1GHz

For non-beamforming mode



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	Yes	1.5m
3	RJ-45 cable	Yes	10m

For beamforming mode



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	Yes	1.5m
3	RJ-45 cable	Yes	10m
4	RJ-45 cable	No	1m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

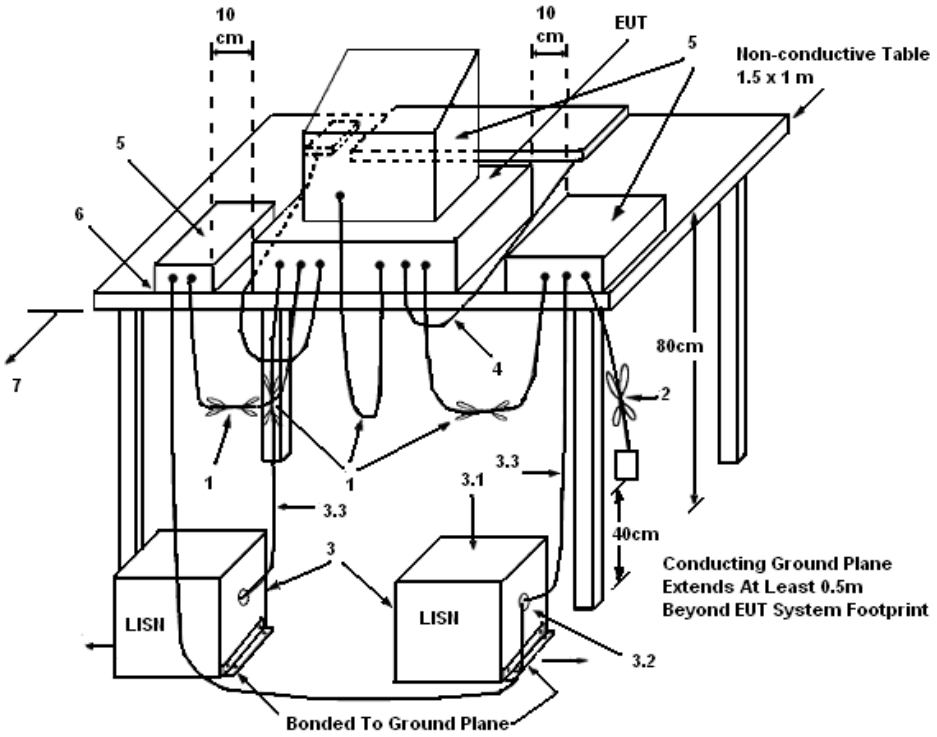
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

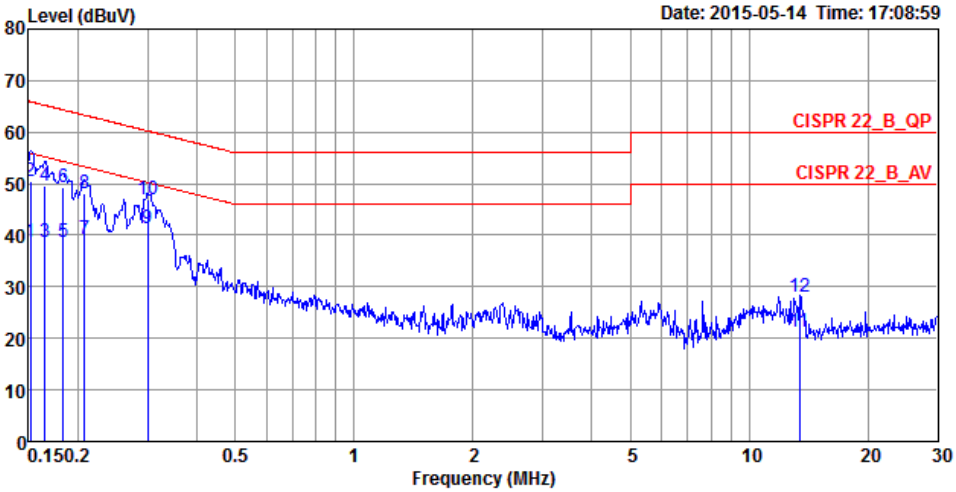
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

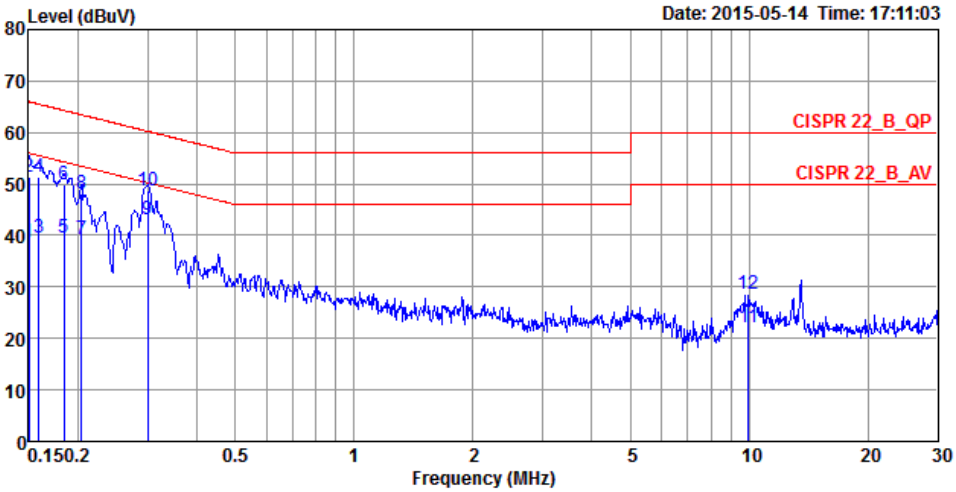
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	56%
Test Engineer	Hank Yang	Phase	Line
Configuration	Normal Link	Test Mode	Mode 3



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1	0.1516	38.61	-17.30	55.91	10.00	28.44	0.17	LINE	Average
2	0.1516	50.34	-15.57	65.91	10.00	40.17	0.17	LINE	QP
3	0.1650	38.63	-16.58	55.21	10.00	28.46	0.17	LINE	Average
4	0.1650	49.62	-15.59	65.21	10.00	39.45	0.17	LINE	QP
5	0.1835	38.58	-15.75	54.33	10.01	28.38	0.19	LINE	Average
6	0.1835	49.16	-15.17	64.33	10.01	38.96	0.19	LINE	QP
7	0.2072	39.13	-14.19	53.32	10.01	28.93	0.19	LINE	Average
8	0.2072	48.07	-15.25	63.32	10.01	37.87	0.19	LINE	QP
9	0.3003	41.23	-9.01	50.24	10.01	31.02	0.20	LINE	Average
10	0.3003	46.83	-13.41	60.24	10.01	36.62	0.20	LINE	QP
11	13.4080	21.14	-28.86	50.00	10.29	10.44	0.41	LINE	Average
12	13.4080	28.18	-31.82	60.00	10.29	17.48	0.41	LINE	QP

Temperature	24°C	Humidity	56%
Test Engineer	Hank Yang	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 3



	Freq	Level	Over Limit	Limit Line	LISN Factor	Read Level	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dB	dBuV	dB		
1	0.1500	38.54	-17.46	56.00	10.00	28.37	0.17	NEUTRAL	Average
2	0.1500	51.35	-14.65	66.00	10.00	41.18	0.17	NEUTRAL	QP
3	0.1590	39.57	-15.95	55.52	10.00	29.40	0.17	NEUTRAL	Average
4	0.1590	51.26	-14.26	65.52	10.00	41.09	0.17	NEUTRAL	QP
5	0.1844	39.55	-14.73	54.28	10.01	29.35	0.19	NEUTRAL	Average
6	0.1844	49.87	-14.41	64.28	10.01	39.67	0.19	NEUTRAL	QP
7	0.2040	39.13	-14.32	53.45	10.01	28.93	0.19	NEUTRAL	Average
8	0.2040	48.14	-15.31	63.45	10.01	37.94	0.19	NEUTRAL	QP
9	0.3003	42.99	-7.25	50.24	10.01	32.78	0.20	NEUTRAL	Average
10	0.3003	48.60	-11.64	60.24	10.01	38.39	0.20	NEUTRAL	QP
11	9.9657	22.22	-27.78	50.00	10.22	11.62	0.38	NEUTRAL	Average
12	9.9657	28.70	-31.30	60.00	10.22	18.10	0.38	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℃	Humidity	45%
Test Engineer	Jim Huang		

For Non-beamforming mode

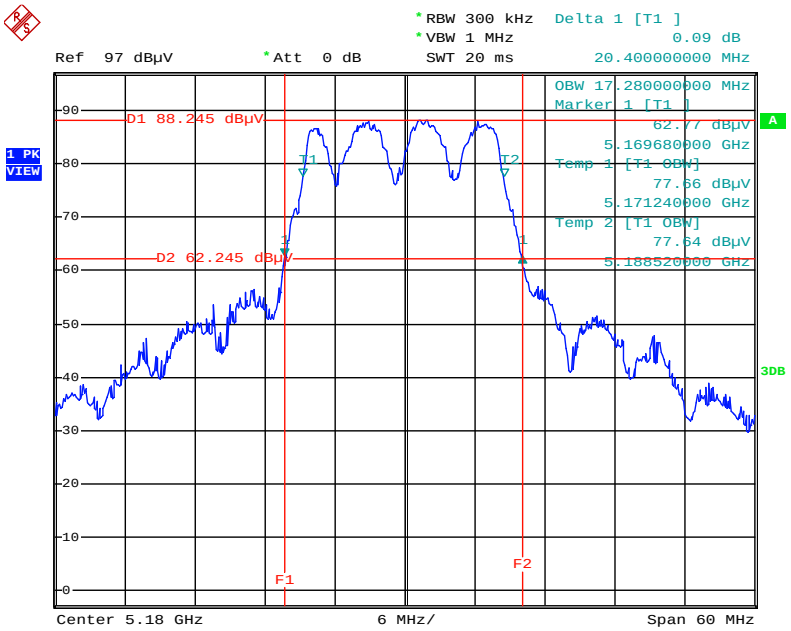
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	20.40	17.28
	5200 MHz	20.28	17.28
	5240 MHz	22.32	17.28
	5745 MHz	20.40	17.28
	5785 MHz	20.40	17.40
	5825 MHz	20.40	17.28
802.11ac MCS0/Nss1 VHT20	5180 MHz	21.60	18.12
	5200 MHz	20.76	18.12
	5240 MHz	22.56	18.12
	5745 MHz	20.52	18.12
	5785 MHz	22.80	18.24
	5825 MHz	20.52	18.12
802.11ac MCS0/Nss1 VHT40	5190 MHz	40.80	36.40
	5230 MHz	49.20	36.80
	5755 MHz	40.60	36.60
	5795 MHz	44.60	36.80
802.11ac MCS0/Nss1 VHT80	5210 MHz	82.00	76.00
	5775 MHz	81.60	76.00

For beamforming mode

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5180 MHz	20.52	18.00
	5200 MHz	20.64	18.00
	5240 MHz	20.52	18.00
	5745 MHz	20.64	18.00
	5785 MHz	20.76	18.00
	5825 MHz	20.64	18.00
802.11ac MCS0/Nss1 VHT40	5190 MHz	40.80	36.80
	5230 MHz	45.00	37.00
	5755 MHz	41.00	36.80
	5795 MHz	44.80	37.00
802.11ac MCS0/Nss1 VHT80	5210 MHz	81.60	76.00
	5775 MHz	82.00	76.40

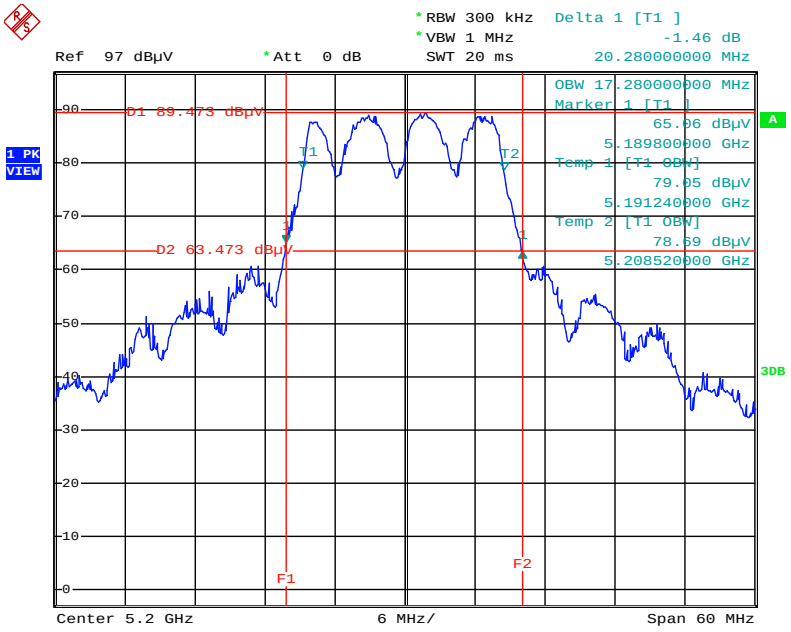
For Non-beamforming mode

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5180 MHz



Date: 17.SEP.2015 20:05:11

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5200 MHz



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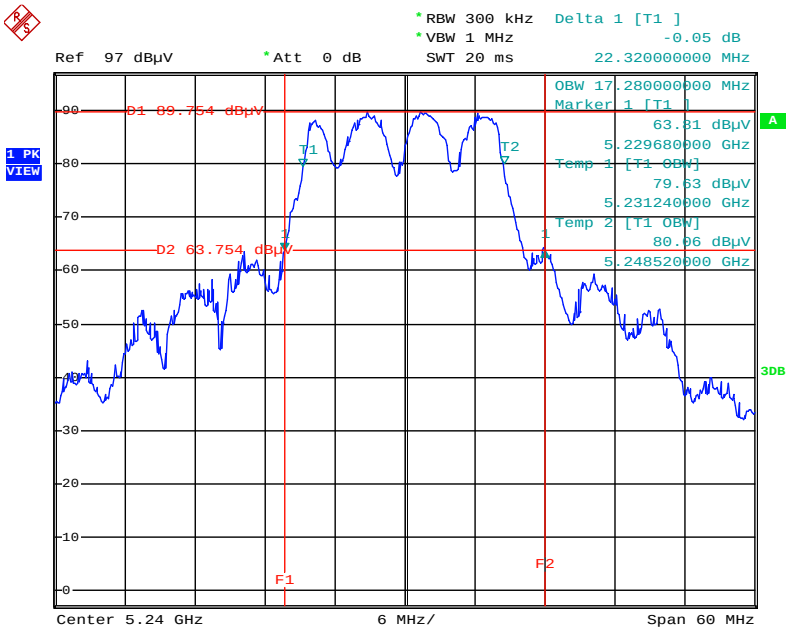
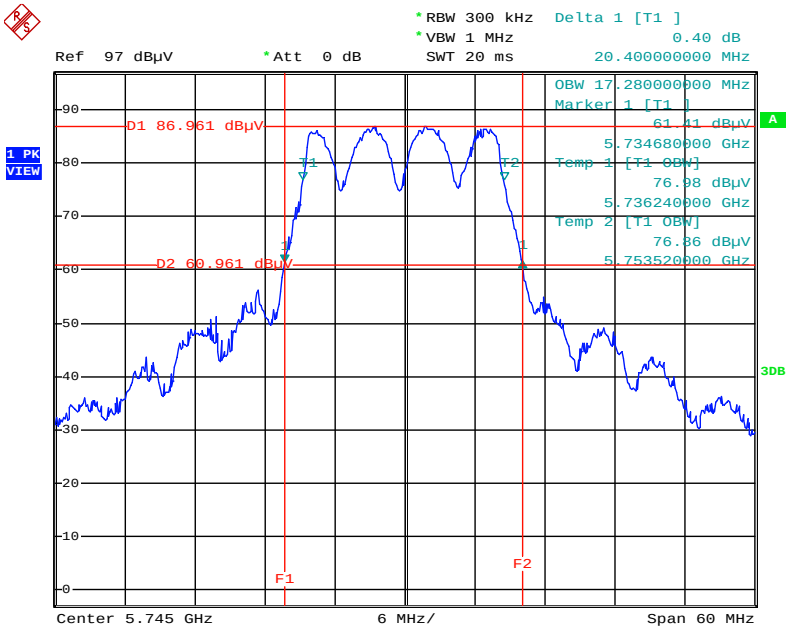
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5240 MHz



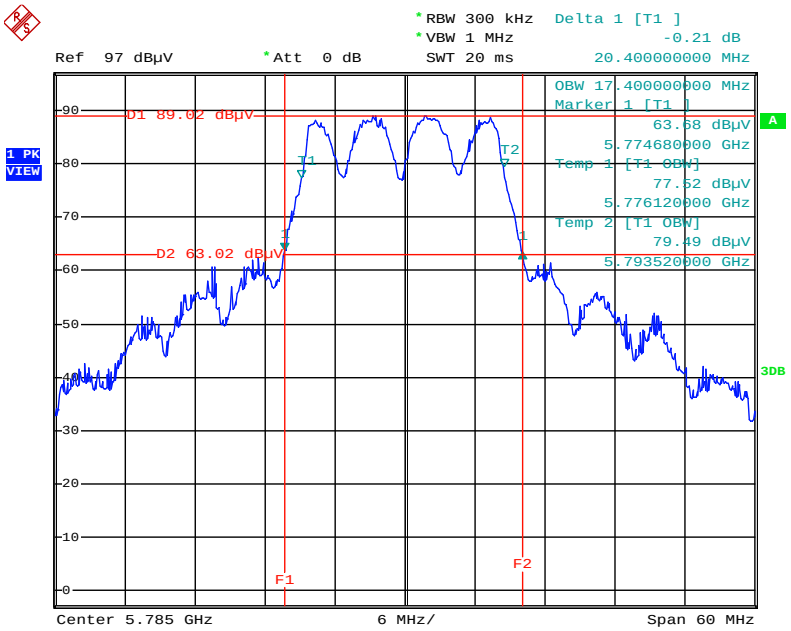
Date: 17.SEP.2015 20:06:33

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5745 MHz



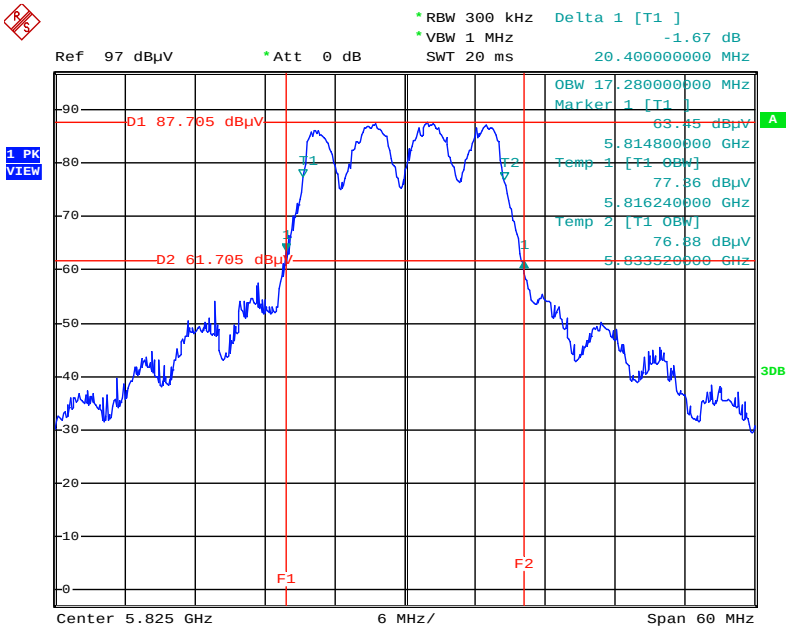
Date: 17.SEP.2015 20:07:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5785 MHz



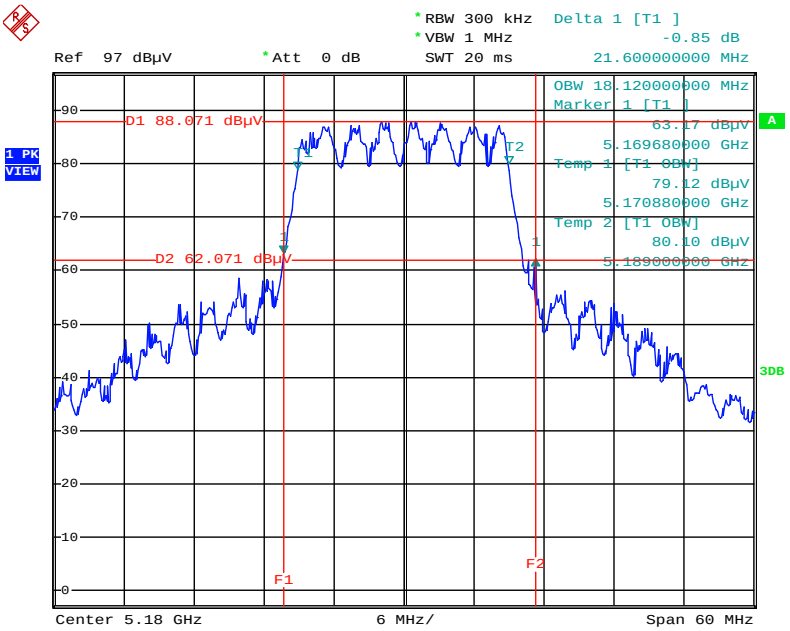
Date: 17.SEP.2015 20:07:39

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5825 MHz



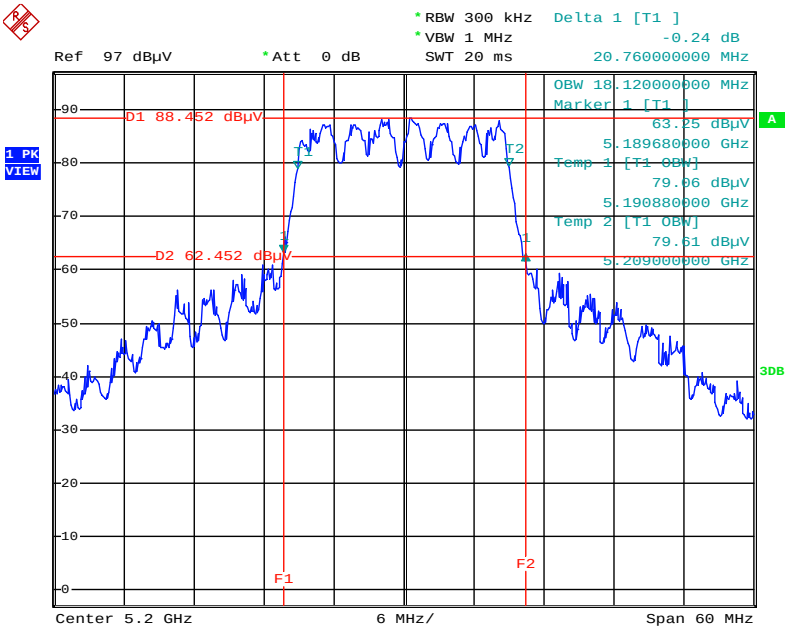
Date: 17.SEP.2015 20:08:12

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



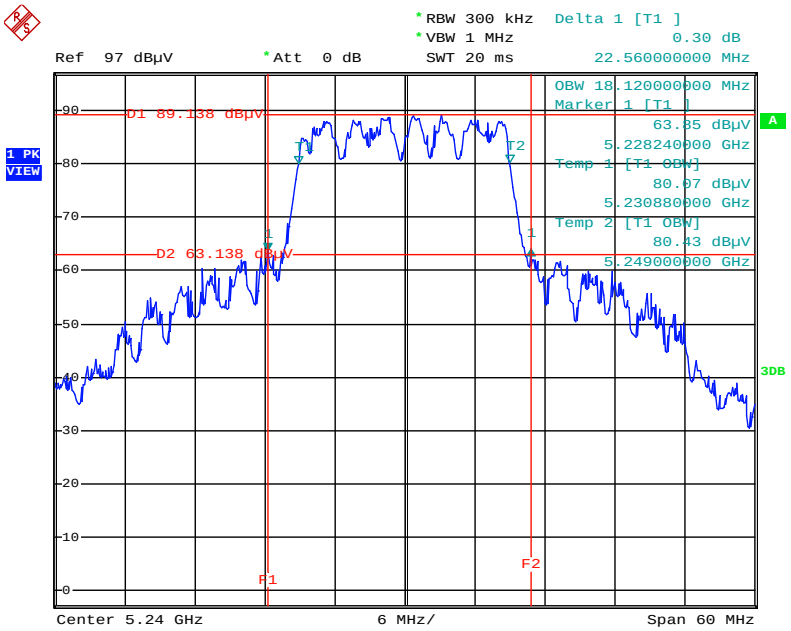
Date: 17.SEP.2015 20:08:48

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



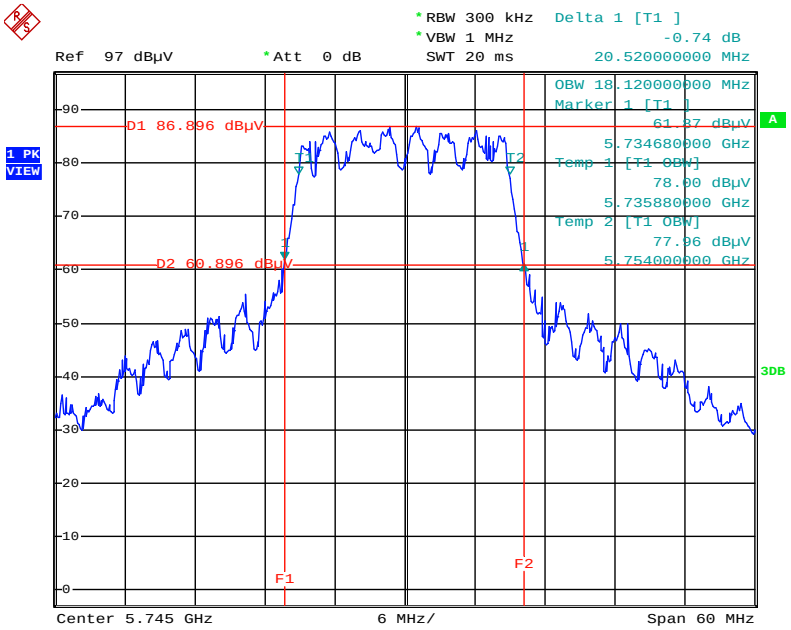
Date: 17.SEP.2015 20:09:53

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



Date: 17.SEP.2015 20:10:21

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



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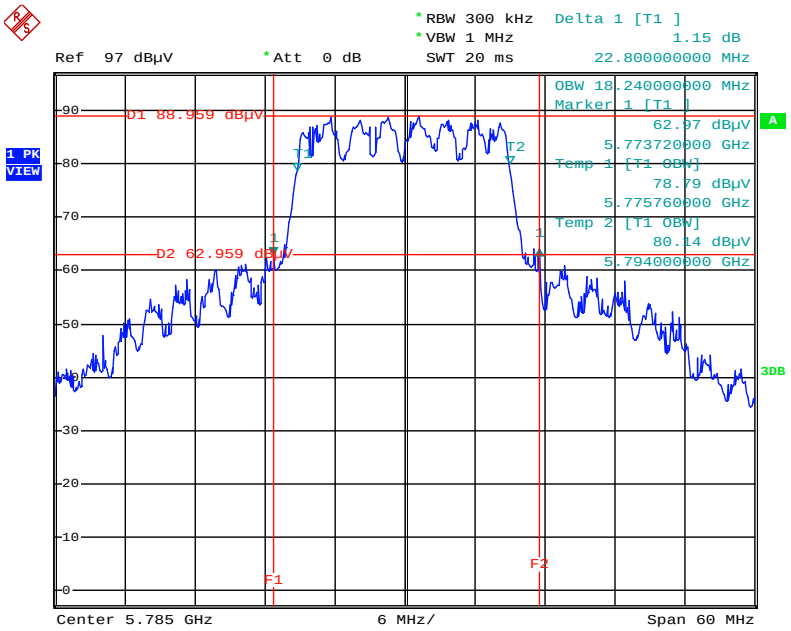
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 / 5785 MHz



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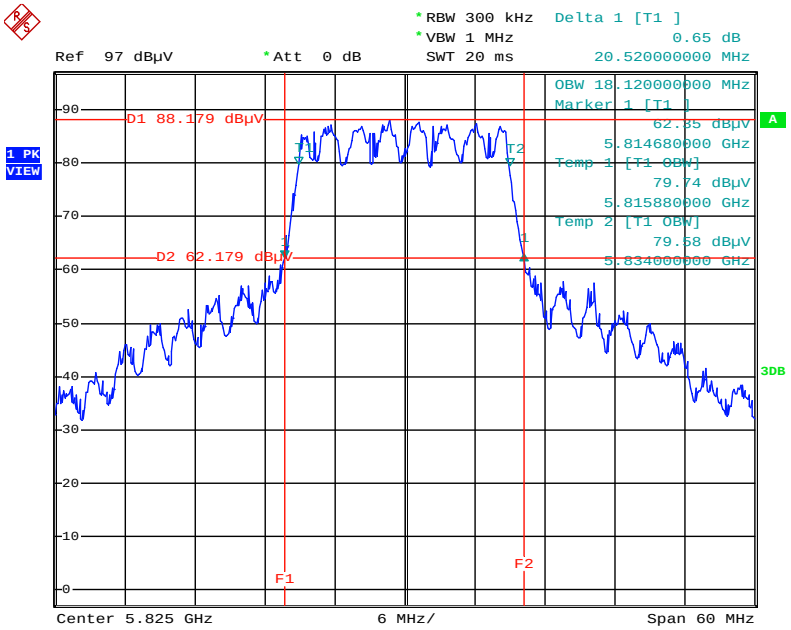
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 / 5825 MHz



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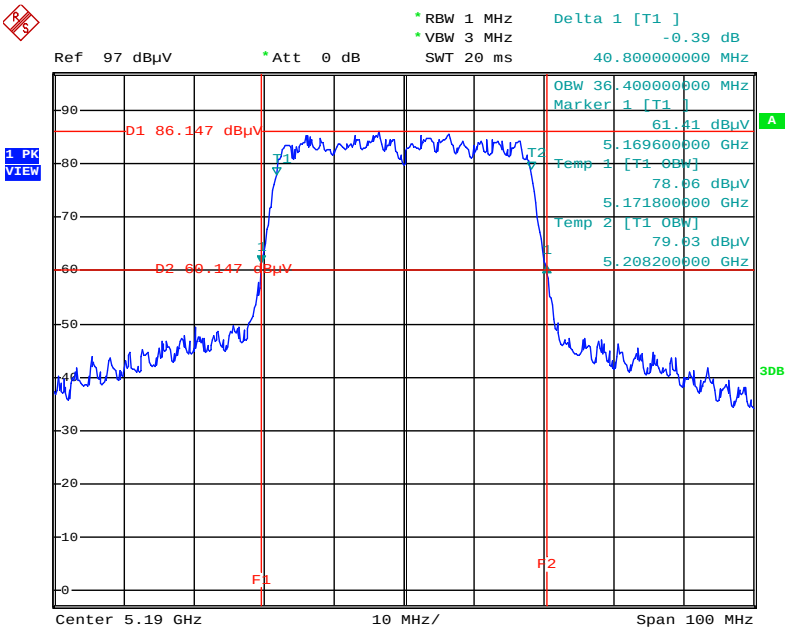
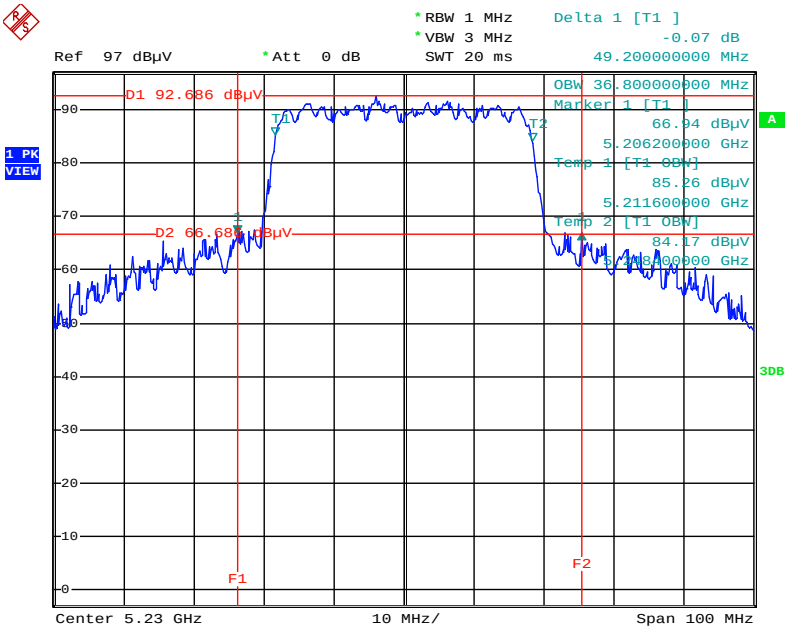
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5190 MHz



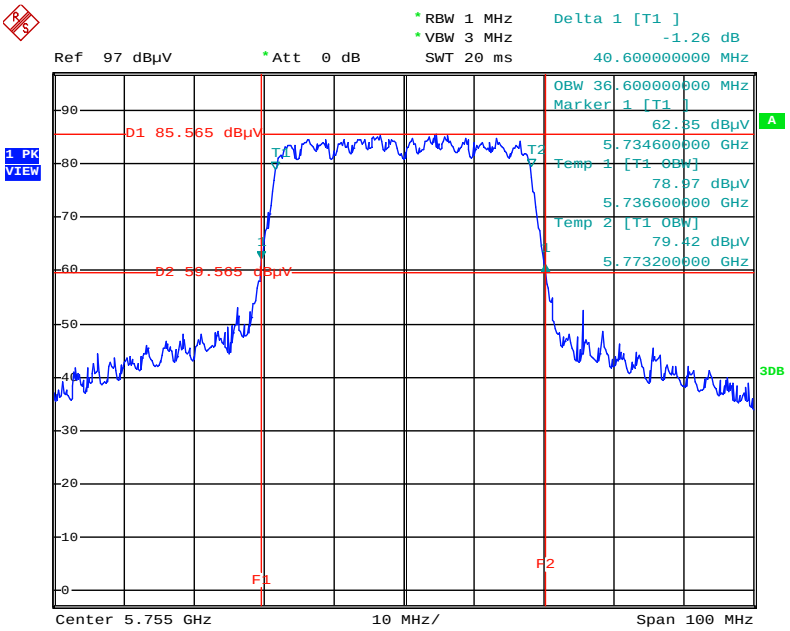
Date: 17.SEP.2015 20:12:39

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



Date: 17.SEP.2015 20:13:07

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



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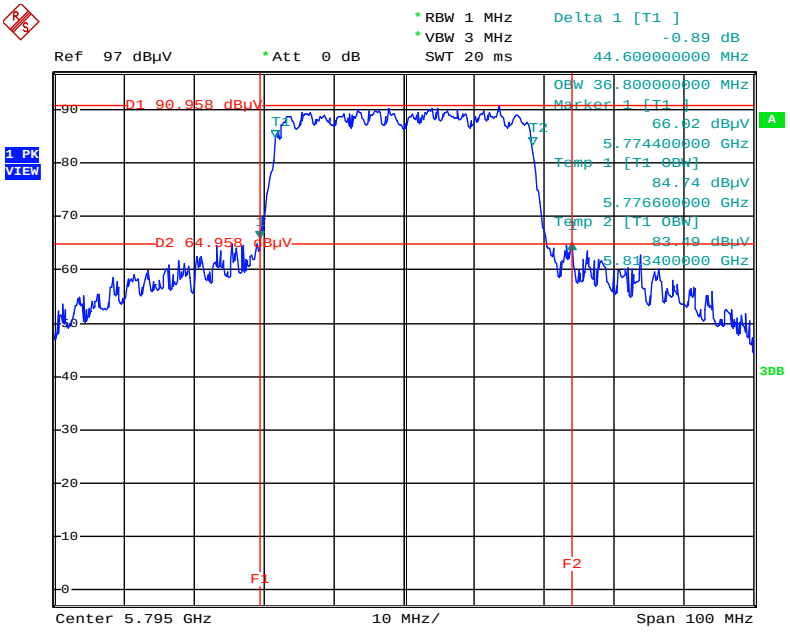
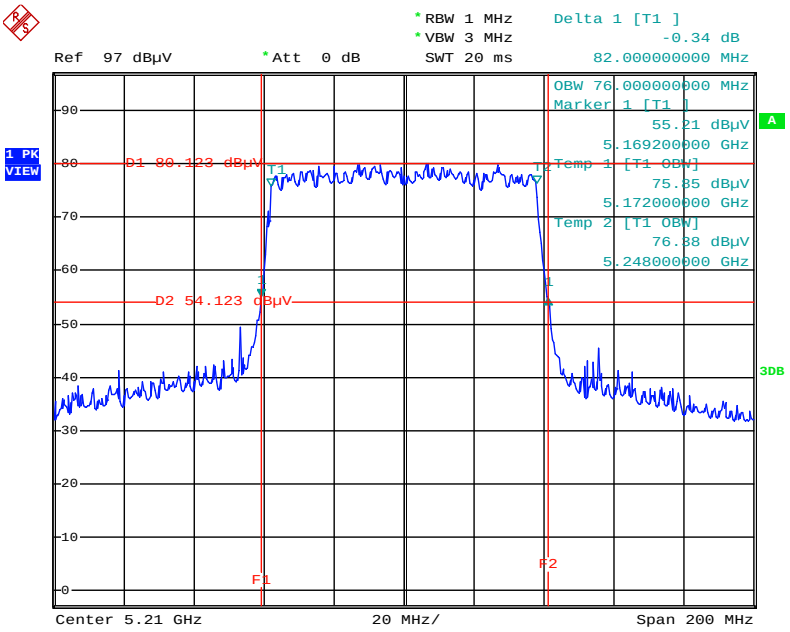
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5795 MHz



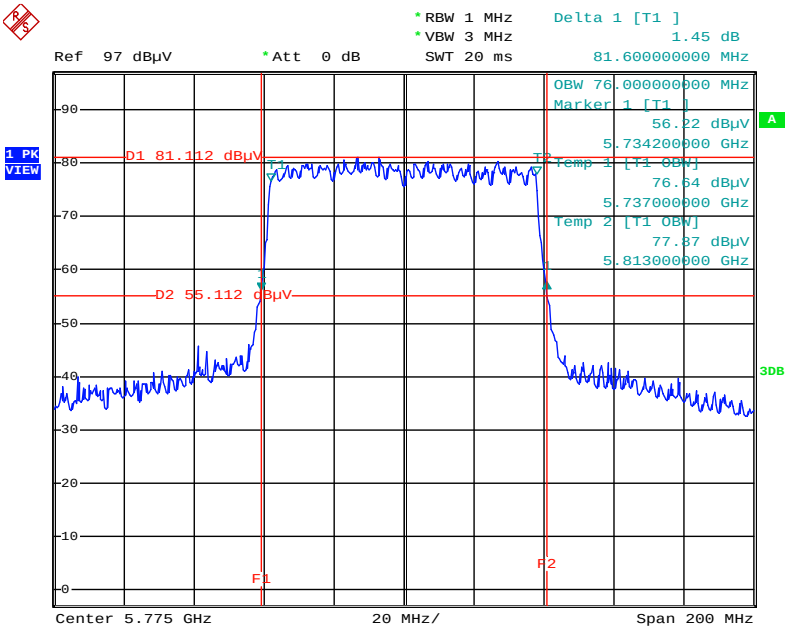
Date: 17.SEP.2015 20:14:07

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



Date: 17.SEP.2015 20:15:01

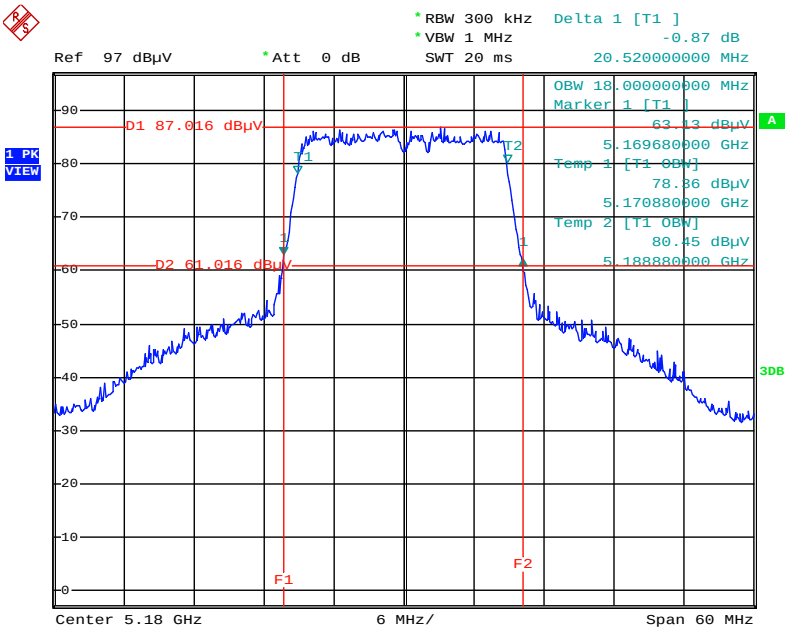
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 / 5775 MHz



Date: 17.SEP.2015 20:15:31

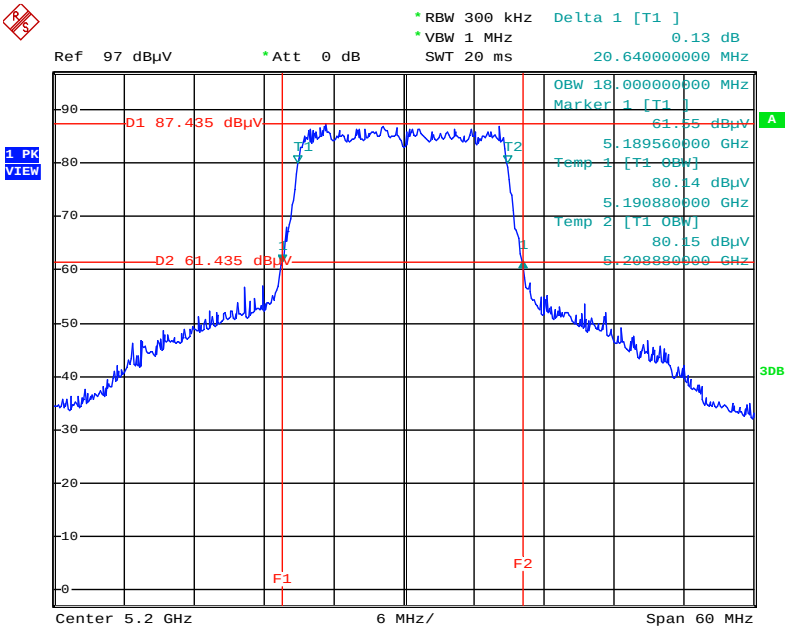
For beamforming mode

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



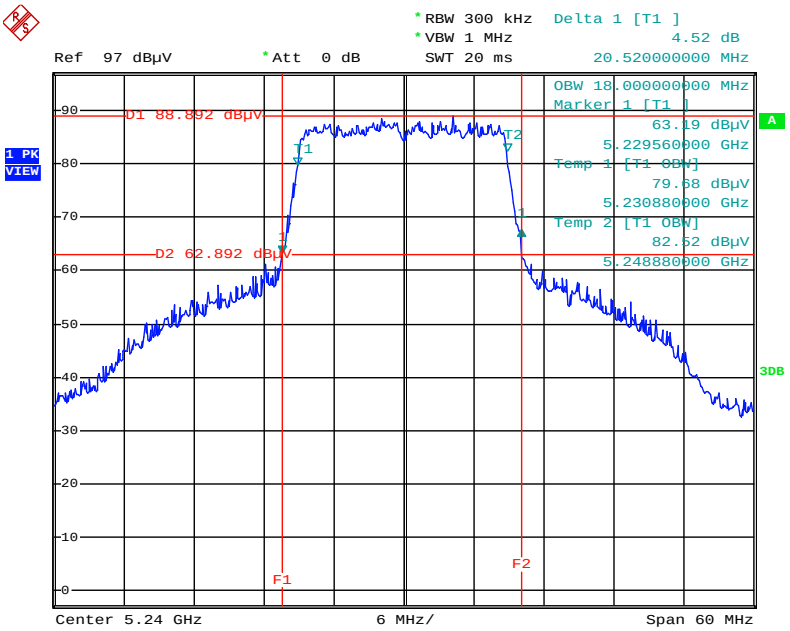
Date: 17.SEP.2015 20:18:27

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



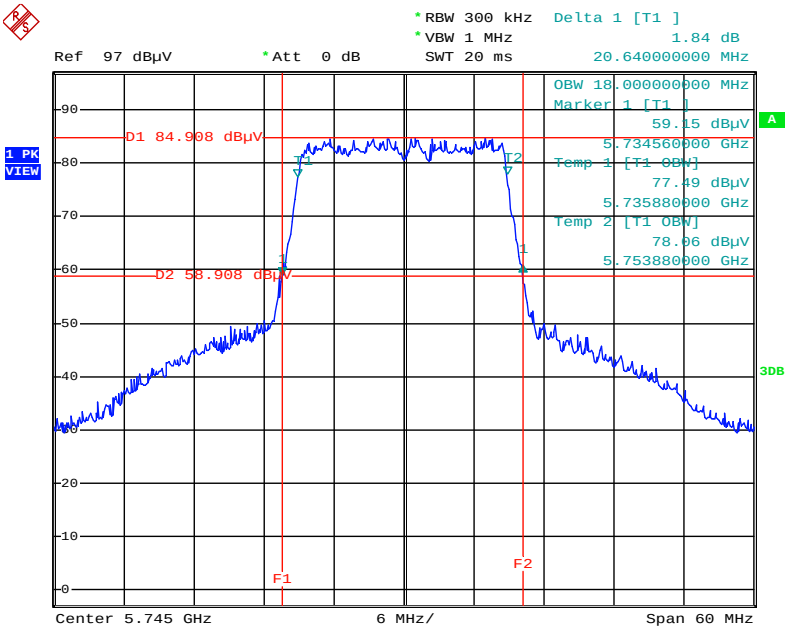
Date: 17.SEP.2015 20:18:57

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



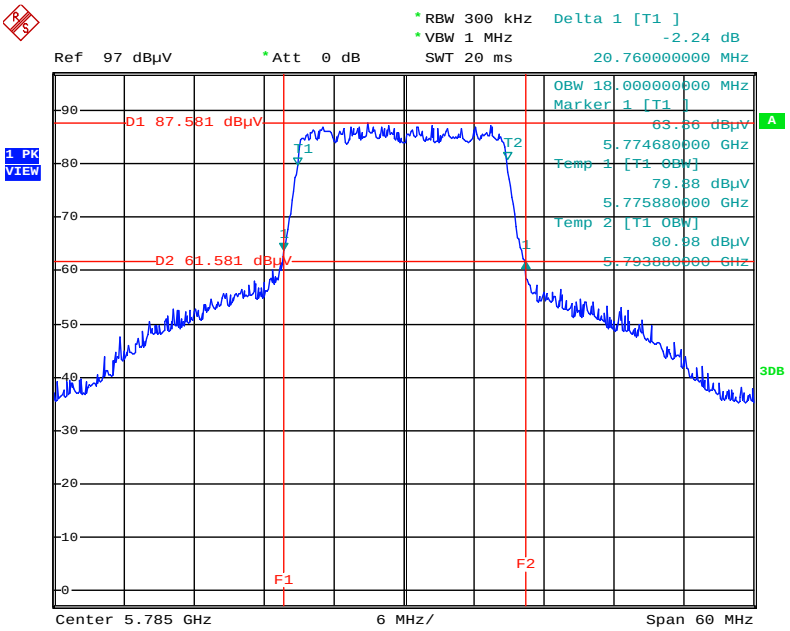
Date: 17.SEP.2015 20:19:31

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



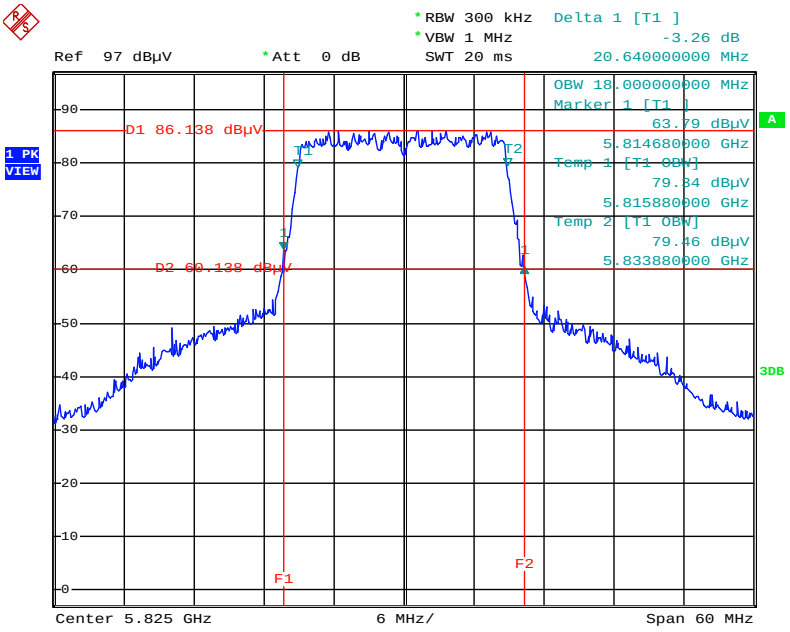
Date: 17.SEP.2015 20:20:02

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



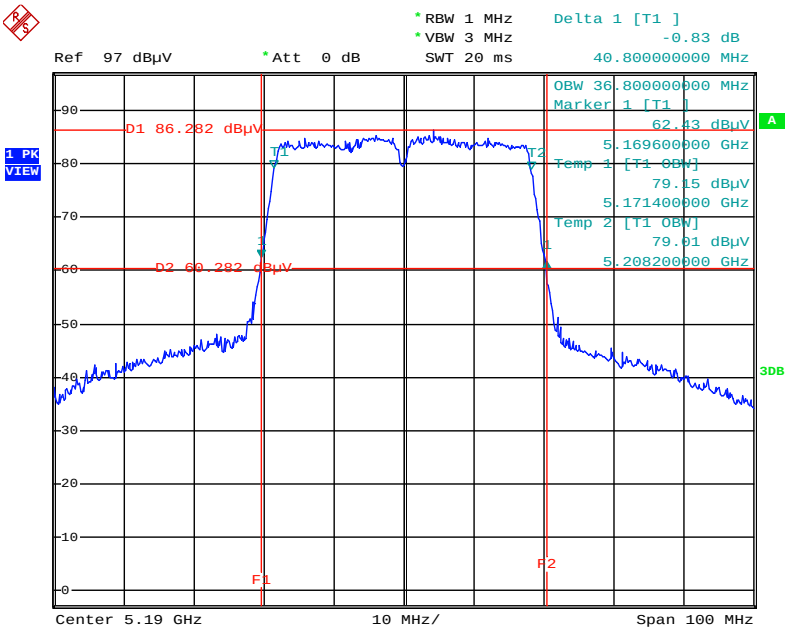
Date: 17.SEP.2015 20:20:32

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



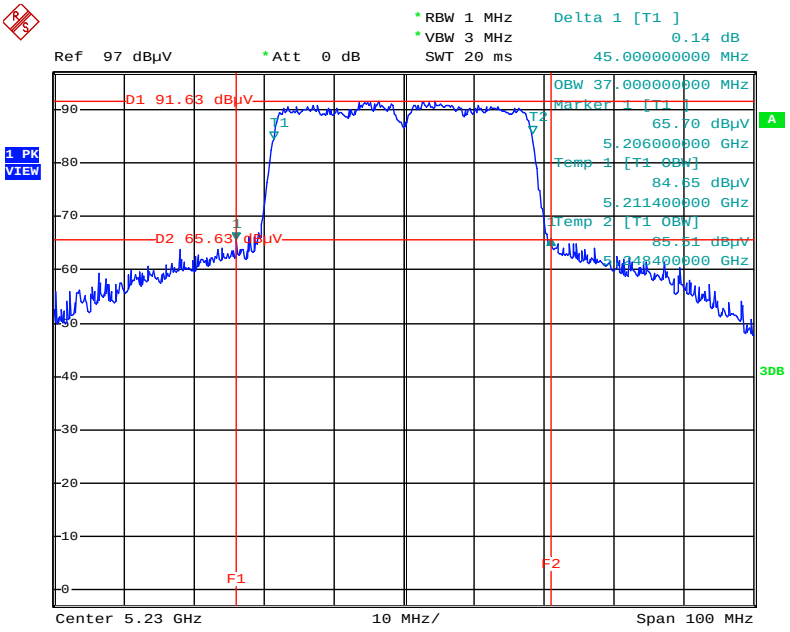
Date: 17.SEP.2015 20:21:00

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



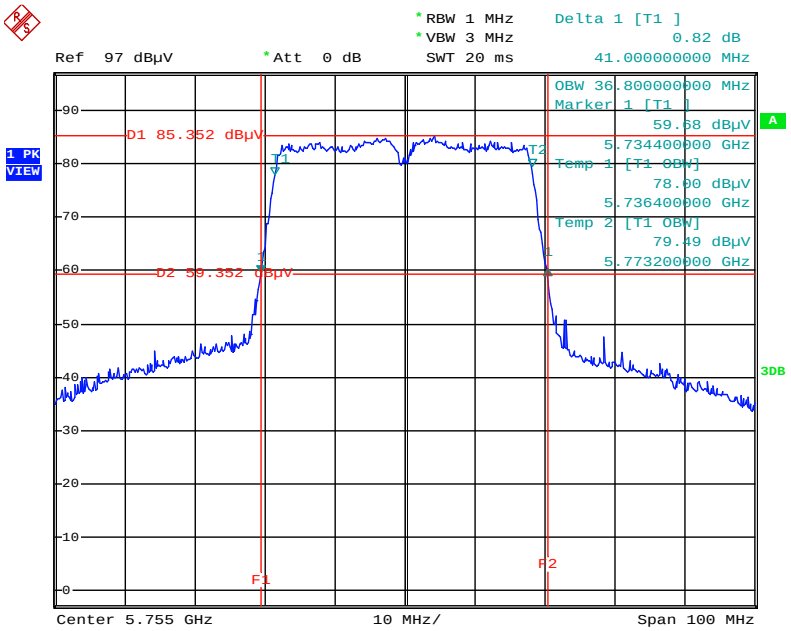
Date: 17.SEP.2015 20:21:42

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



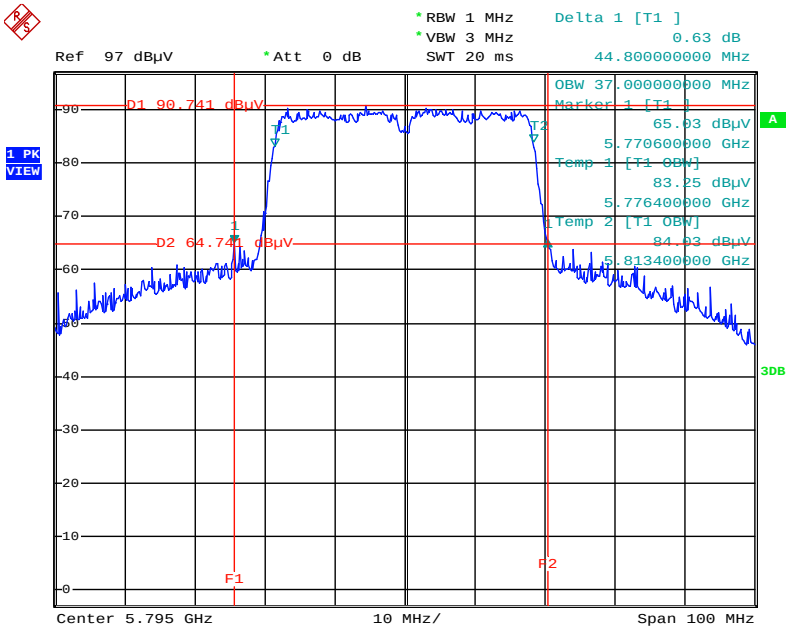
Date: 17.SEP.2015 20:22:09

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



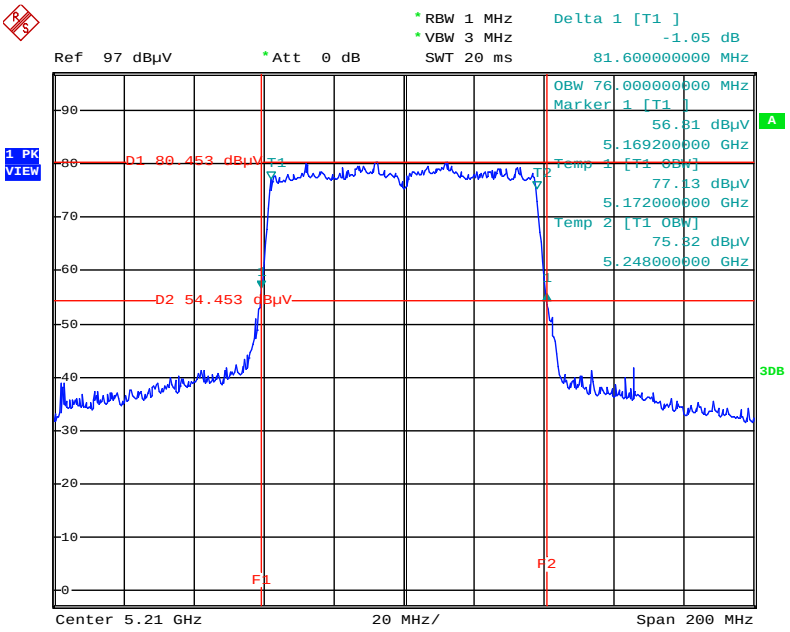
Date: 17.SEP.2015 20:22:38

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



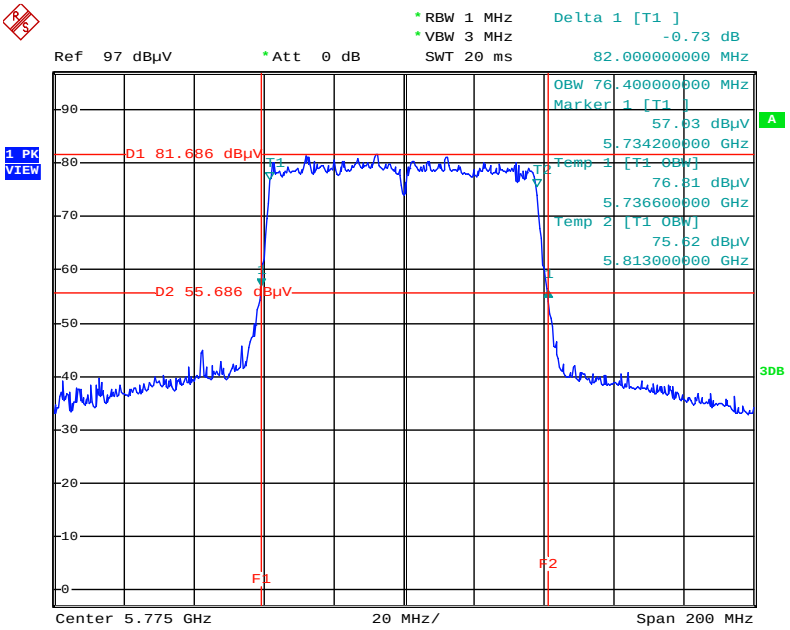
Date: 17.SEP.2015 20:23:13

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



Date: 17.SEP.2015 20:23:56

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



Date: 17.SEP.2015 20:24:24

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

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

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

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

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

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

Temperature	25°C	Humidity	45%
Test Engineer	Jim Huang		

For Non-beamforming mode

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	16.40	500	Complies
	5785 MHz	16.40	500	Complies
	5825 MHz	16.40	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.76	500	Complies
	5785 MHz	17.60	500	Complies
	5825 MHz	17.60	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.68	500	Complies
	5795 MHz	35.68	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	76.00	500	Complies

For beamforming mode

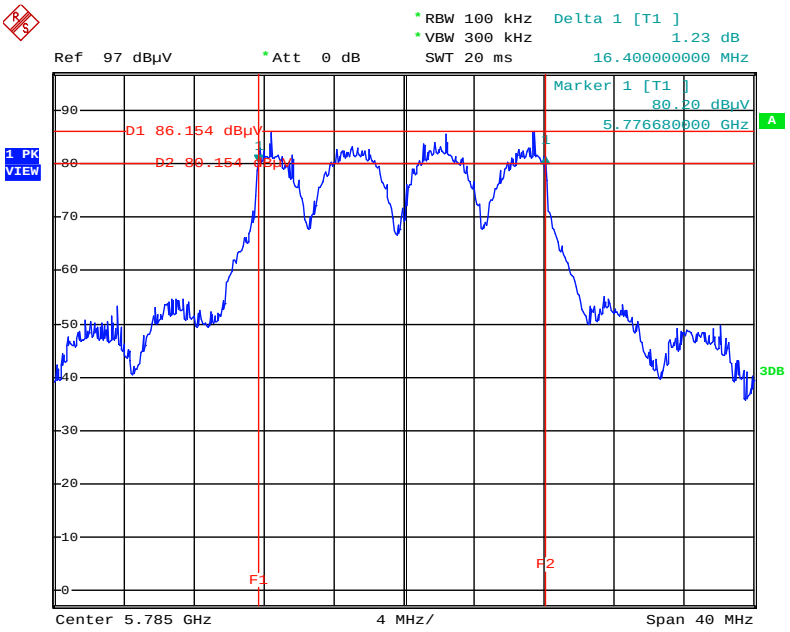
Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.60	500	Complies
	5785 MHz	17.60	500	Complies
	5825 MHz	17.60	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.36	500	Complies
	5795 MHz	35.52	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.20	500	Complies

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

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

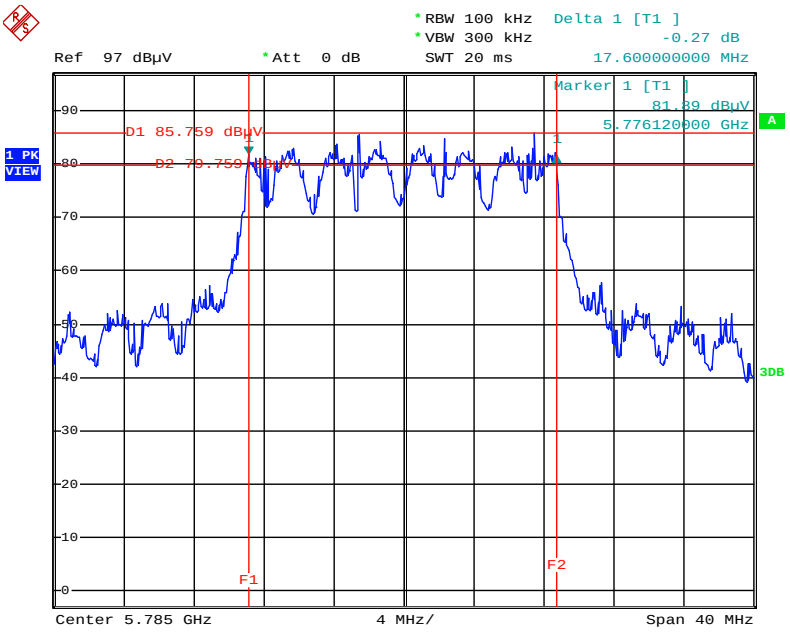
For Non-beamforming mode

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5785 MHz



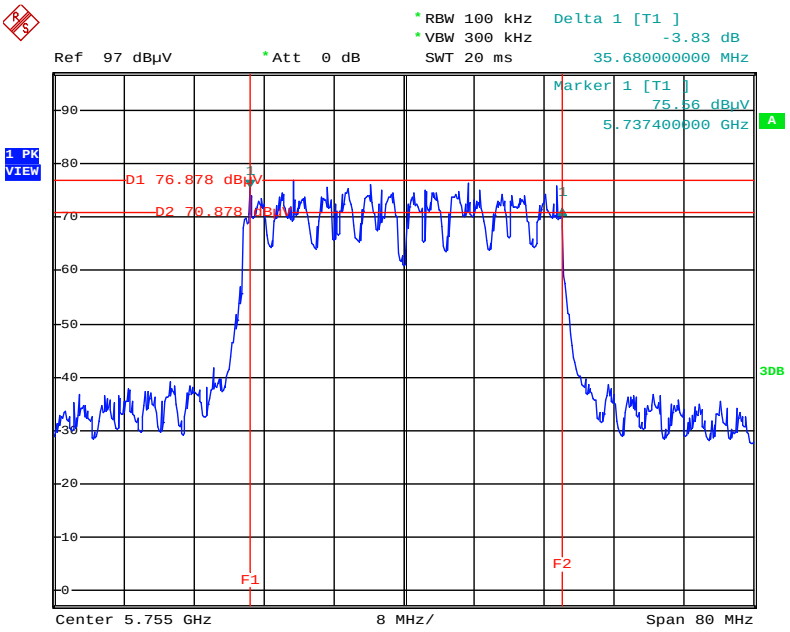
Date: 17.SEP.2015 20:30:45

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 / 5785 MHz



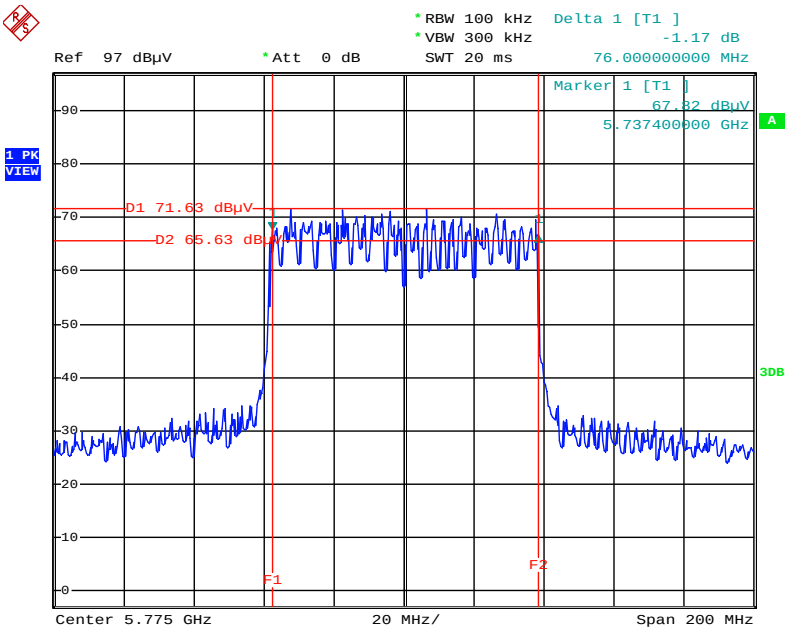
Date: 17.SEP.2015 20:32:33

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5755 MHz



Date: 17.SEP.2015 20:33:37

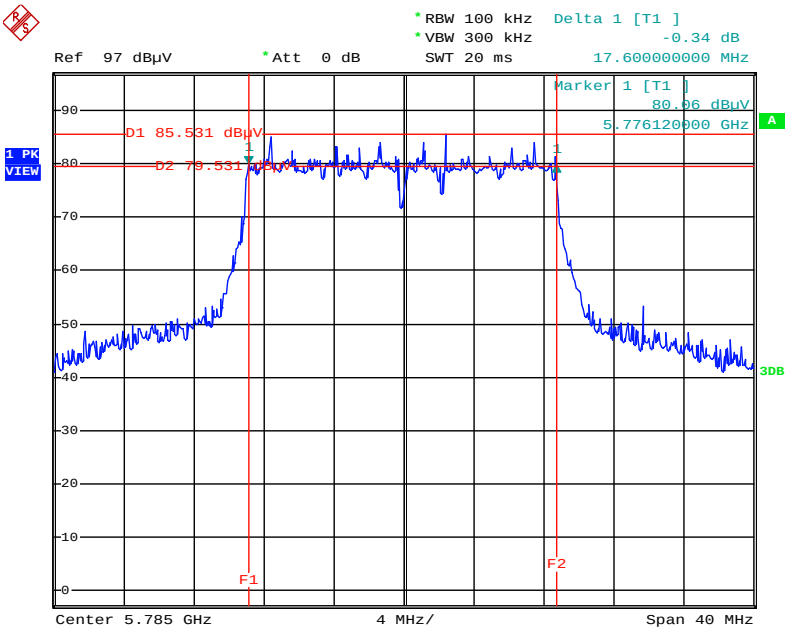
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 / 5775 MHz



Date: 17.SEP.2015 20:34:43

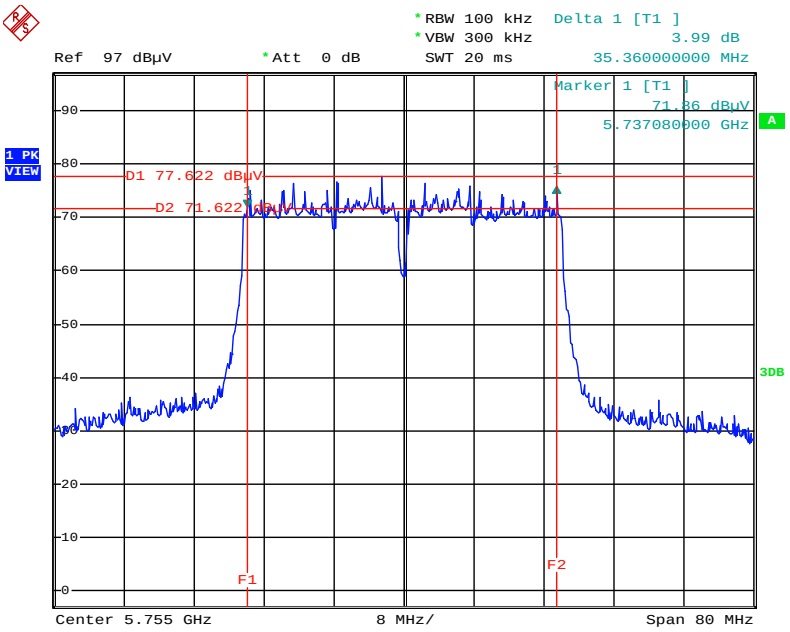
For beamforming mode

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 / 5785 MHz



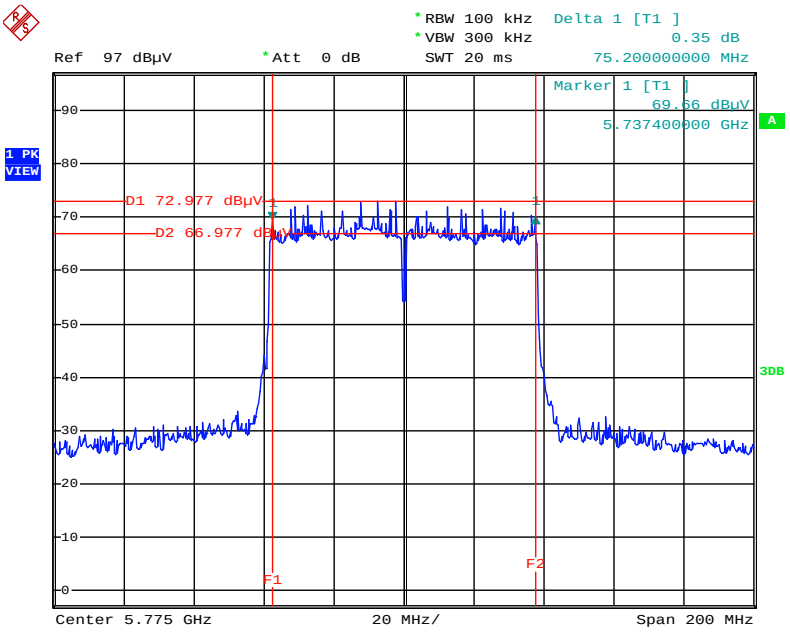
Date: 17.SEP.2015 20:27:33

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5755 MHz



Date: 17.SEP.2015 20:28:35

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 / 5775 MHz



Date: 17.SEP.2015 20:26:10

4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

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

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

4.4.2. Measuring Instruments and Setting

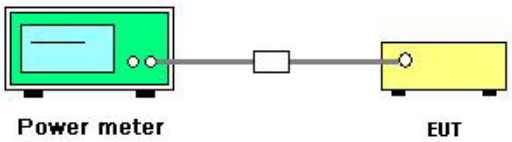
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Maximum Conducted Output Power

Temperature	25℃	Humidity	45%
Test Engineer	Jim Huang	Test Date	Sep. 17, 2015

For Non-beamforming mode

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
802.11a	5180 MHz	21.54	21.19	24.38	30.00	Complies
	5200 MHz	22.52	22.36	25.45	30.00	Complies
	5240 MHz	23.27	23.04	26.17	30.00	Complies
	5745 MHz	20.34	20.15	23.26	30.00	Complies
	5785 MHz	22.61	22.56	25.60	30.00	Complies
	5825 MHz	20.73	20.18	23.47	30.00	Complies

Note:

5180 MHz Gain =3.00dBi <6dBi, so the limit doesn't reduce.

5200 MHz Gain =2.90dBi <6dBi, so the limit doesn't reduce.

5240 MHz Gain =3.30dBi <6dBi, so the limit doesn't reduce.

5745 MHz Gain =4.20dBi <6dBi, so the limit doesn't reduce.

5785 MHz Gain =4.60dBi <6dBi, so the limit doesn't reduce.

5825 MHz Gain =4.70dBi <6dBi, so the limit doesn't reduce.

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	21.58	21.01	24.31	30.00	Complies
	5200 MHz	21.95	21.49	24.74	30.00	Complies
	5240 MHz	23.03	22.76	25.91	30.00	Complies
	5745 MHz	20.25	20.02	23.15	30.00	Complies
	5785 MHz	22.73	22.62	25.69	30.00	Complies
	5825 MHz	21.45	21.23	24.35	30.00	Complies

Note:

5180 MHz Gain =3.00dBi <6dBi, so the limit doesn't reduce.

5200 MHz Gain =2.90dBi <6dBi, so the limit doesn't reduce.

5240 MHz Gain =3.30dBi <6dBi, so the limit doesn't reduce.

5745 MHz Gain =4.20dBi <6dBi, so the limit doesn't reduce.

5785 MHz Gain =4.60dBi <6dBi, so the limit doesn't reduce.

5825 MHz Gain =4.70dBi <6dBi, so the limit doesn't reduce.

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
802.11ac MCS0/Nss1 VHT40	5190 MHz	17.08	16.64	19.88	30.00	Complies
	5230 MHz	23.37	23.16	26.28	30.00	Complies
	5755 MHz	17.29	16.75	20.04	30.00	Complies
	5795 MHz	22.41	22.07	25.25	30.00	Complies

Note:

5190 MHz Gain =2.80dBi <6dBi, so the limit doesn't reduce.

5230 MHz Gain =3.30dBi <6dBi, so the limit doesn't reduce.

5755 MHz Gain =4.30dBi <6dBi, so the limit doesn't reduce.

5795 MHz Gain =4.60dBi <6dBi, so the limit doesn't reduce.

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
802.11ac MCS0/Nss1 VHT80	5210 MHz	14.71	14.63	17.68	30.00	Complies
	5775 MHz	15.68	15.47	18.59	30.00	Complies

Note:

5210 MHz Gain =3.00dBi <6dBi, so the limit doesn't reduce.

5775 MHz Gain =4.60dBi <6dBi, so the limit doesn't reduce.

For beamforming mode

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	21.17	20.50	23.86	30.00	Complies
	5200 MHz	21.58	20.96	24.29	30.00	Complies
	5240 MHz	22.79	22.50	25.66	29.84	Complies
	5745 MHz	19.28	19.08	22.19	28.94	Complies
	5785 MHz	22.28	22.18	25.24	28.54	Complies
	5825 MHz	20.81	20.05	23.46	28.44	Complies

Note:

5180 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.86dBi <6dBi, so the limit doesn't reduce.

5200 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.76dBi <6dBi, so the limit doesn't reduce.

5240 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.16dBi >6dBi, so Limit=30-(6.16-6)=29.84dBm.

5745 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.06dBi >6dBi, so Limit=30-(7.06-6)=28.94dBm.

5785 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.46dBi >6dBi, so Limit=30-(7.46-6)=28.54dBm.

5825 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.56dBi >6dBi, so Limit=30-(7.56-6)=28.44dBm.

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
802.11ac MCS0/Nss1 VHT40	5190 MHz	17.08	16.64	19.88	30.00	Complies
	5230 MHz	23.37	23.16	26.28	29.84	Complies
	5755 MHz	16.82	16.17	19.52	28.84	Complies
	5795 MHz	22.41	22.07	25.25	28.54	Complies

Note:

5190 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.66dBi <6dBi, so the limit doesn't reduce.

5230 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.16dBi >6dBi, so Limit=30-(6.16-6)=29.84dBm.

5755 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.16dBi >6dBi, so Limit=30-(7.16-6)=28.84dBm.

5795 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.46dBi >6dBi, so Limit=30-(7.46-6)=28.54dBm.

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
802.11ac MCS0/Nss1 VHT80	5210 MHz	14.71	14.63	17.68	30.00	Complies
	5775 MHz	15.68	15.47	18.59	28.54	Complies

Note:

5210 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.86dBi <6dBi, so the limit doesn't reduce.

5775 MHz= $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.46dBi >6dBi, so Limit=30-(7.46-6)=28.54dBm.

4.5. Power Spectral Density Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

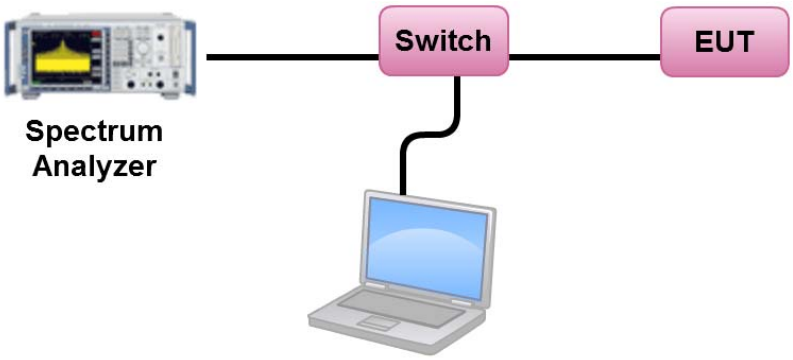
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.5.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs.
4. When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.
5. For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.5.4. Test Setup Layout



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Power Spectral Density

Temperature	25℃	Humidity	45%
Test Engineer	Jim Huang	Test Date	Sep. 17, 2015

For Non-beamforming mode

Configuration IEEE 802.11a / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	11.16	17.00	Complies
40	5200 MHz	12.24	17.00	Complies
48	5240 MHz	13.13	16.84	Complies

Note:

5180 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.86dBi <6dBi, so the limit doesn't reduce.

5200 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.76dBi <6dBi, so the limit doesn't reduce.

5240 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.16dBi, so limit=17-(6.16-6)=16.84dBm/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	9.98	-3.01	6.97	28.94	Complies
157	5785 MHz	12.53	-3.01	9.52	28.54	Complies
165	5825 MHz	10.44	-3.01	7.43	28.44	Complies

Note:

5745 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.06dBi, so limit=30-(7.06-6)= 28.94dBm/500kHz.

5785 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.46dBi, so limit=30-(7.46-6)= 28.54dBm/500kHz.

5825 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.56dBi, so limit=30-(7.56-6)= 28.44dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	11.11	17.00	Complies
40	5200 MHz	11.59	17.00	Complies
48	5240 MHz	12.89	16.84	Complies

Note:

5180 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.86dBi <6dBi, so the limit doesn't reduce.

5200 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.76dBi <6dBi, so the limit doesn't reduce.

5240 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.16dBi, so limit=17-(6.16-6)=16.84dBm/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	9.89	-3.01	6.88	28.94	Complies
157	5785 MHz	12.61	-3.01	9.60	28.54	Complies
165	5825 MHz	11.15	-3.01	8.14	28.44	Complies

Note:

5745 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.06dBi, so limit=30-(7.06-6)= 28.94dBm/500kHz.

5785 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.46dBi, so limit=30-(7.46-6)= 28.54dBm/500kHz.

5825 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.56dBi, so limit=30-(7.56-6)= 28.44dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	3.86	17.00	Complies
46	5230 MHz	10.25	16.84	Complies

Note:

5190 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.66dBi <6dBi, so the limit doesn't reduce.

5230 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.16dBi, so limit=17-(6.16-6)=16.84dBm/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	4.02	-3.01	1.01	28.84	Complies
159	5795 MHz	9.18	-3.01	6.17	28.54	Complies

Note:

5755 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.16dBi, so limit=30-(7.16-6)= 28.84dBm/500kHz.

5795 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.46dBi, so limit=30-(7.46-6)= 28.54dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-1.32	17.00	Complies

Note:

5190 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.86dBi <6dBi, so the limit doesn't reduce.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	-0.57	-3.01	-3.58	28.54	Complies

Note:

5795 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.46dBi, so limit=30-(7.46-6)= 28.54dBm/500kHz.

For beamforming mode

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	10.75	17.00	Complies
40	5200 MHz	11.13	17.00	Complies
48	5240 MHz	12.48	16.84	Complies

Note:

5180 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.86dBi <6dBi, so the limit doesn't reduce.

5200 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.76dBi <6dBi, so the limit doesn't reduce.

5240 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.16dBi, so limit=17-(6.16-6)=16.84dBm/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	9.04	-3.01	6.03	28.94	Complies
157	5785 MHz	12.18	-3.01	9.17	28.54	Complies
165	5825 MHz	10.43	-3.01	7.42	28.44	Complies

Note:

5745 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.06dBi, so limit=30-(7.06-6)= 28.94dBm/500kHz.

5785 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.46dBi, so limit=30-(7.46-6)= 28.54dBm/500kHz.

5825 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.56dBi, so limit=30-(7.56-6)= 28.44dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	3.86	17.00	Complies
46	5230 MHz	10.25	16.84	Complies

Note:

5190 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.66dBi <6dBi, so the limit doesn't reduce.

5230 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =6.16dBi, so limit=17-(6.16-6)=16.84dBm/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	3.24	-3.01	0.23	28.84	Complies
159	5795 MHz	9.18	-3.01	6.17	28.54	Complies

Note:

5755 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.16dBi, so limit=30-(7.16-6)= 28.84dBm/500kHz.

5795 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.46dBi, so limit=30-(7.46-6)= 28.54dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-1.32	17.00	Complies

Note:

5190 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =5.86dBi <6dBi, so the limit doesn't reduce.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	-0.57	-3.01	-3.58	28.54	Complies

Note:

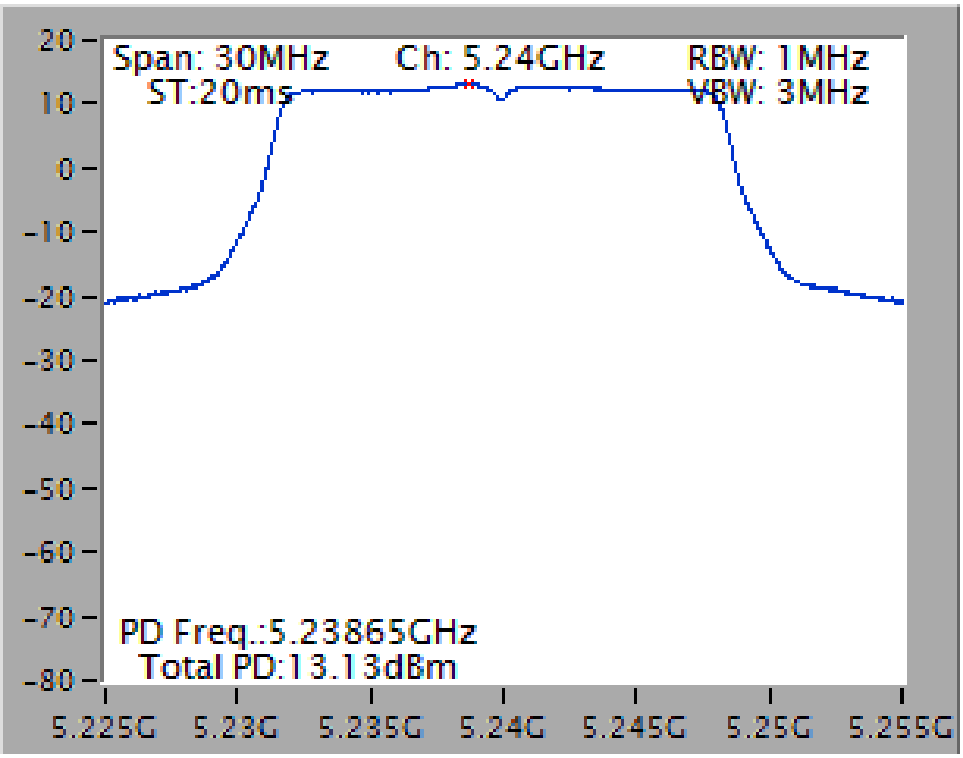
5795 MHz = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.46dBi, so limit=30-(7.46-6)= 28.54dBm/500kHz.

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

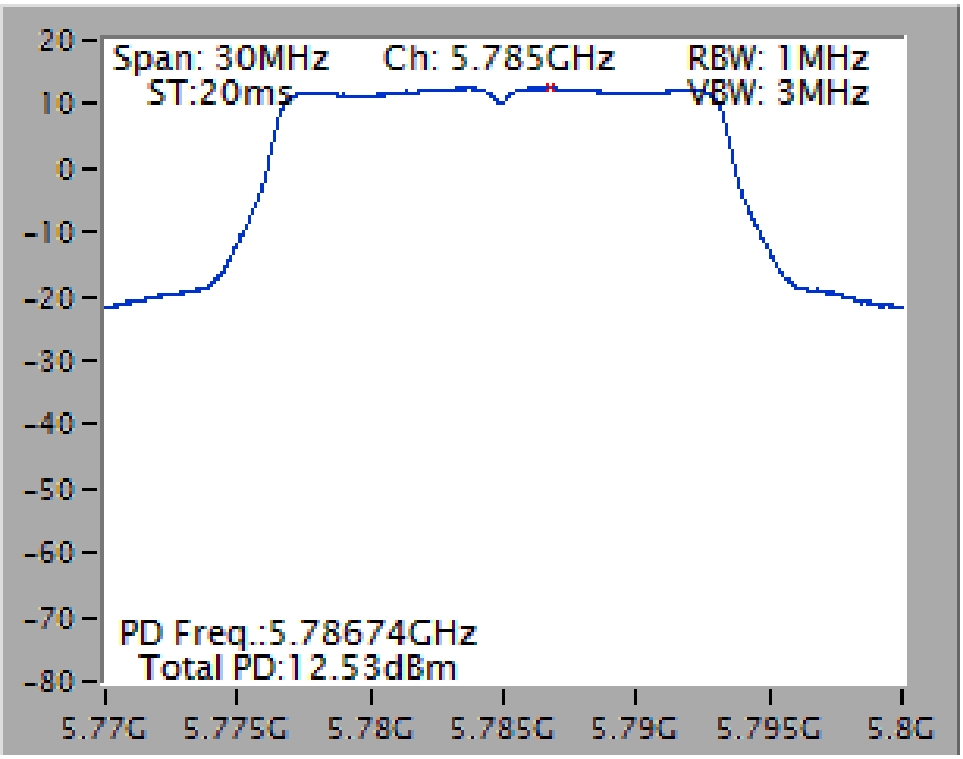
For plots, only the channel with worse result was shown.

For Non-beamforming mode

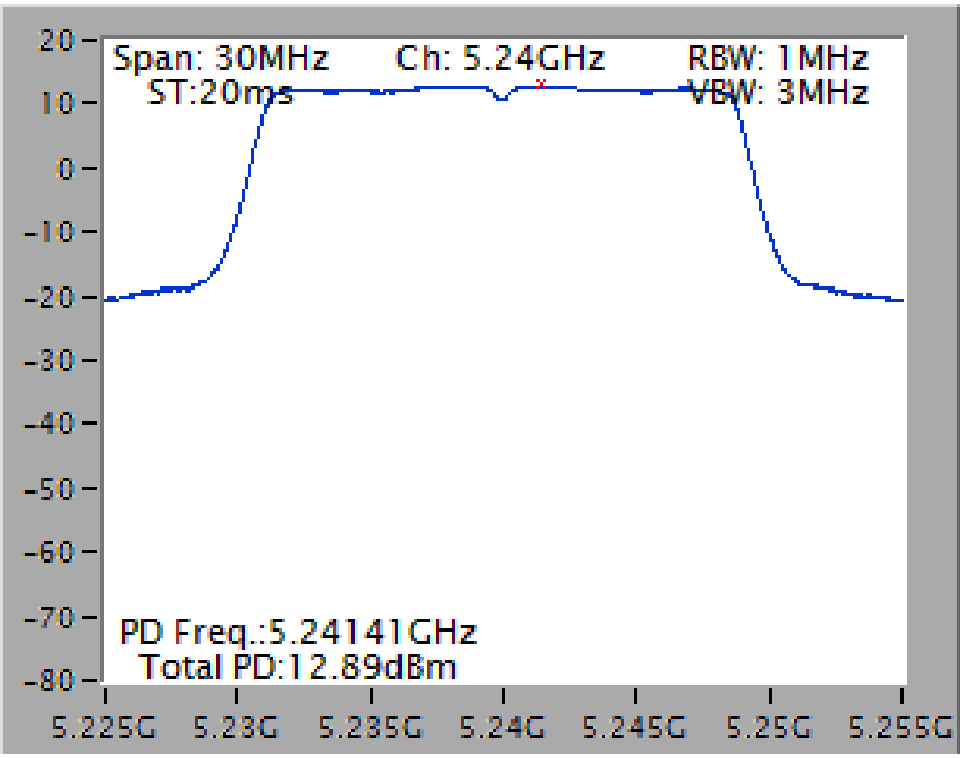
Power Density Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5240 MHz



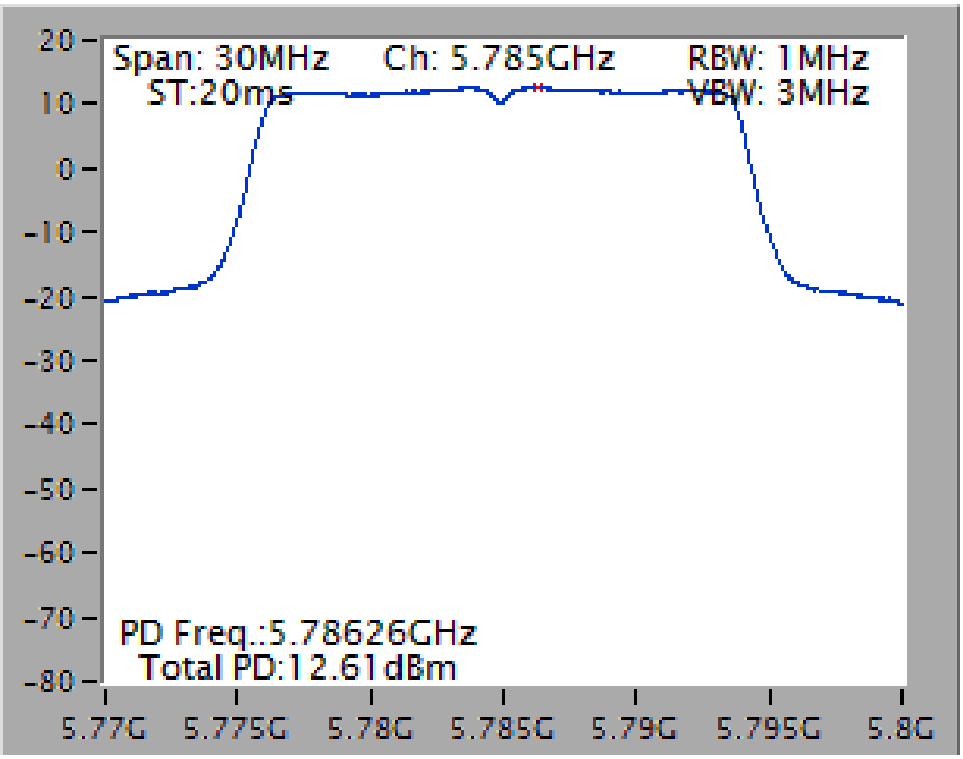
Power Density Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 / 5785 MHz



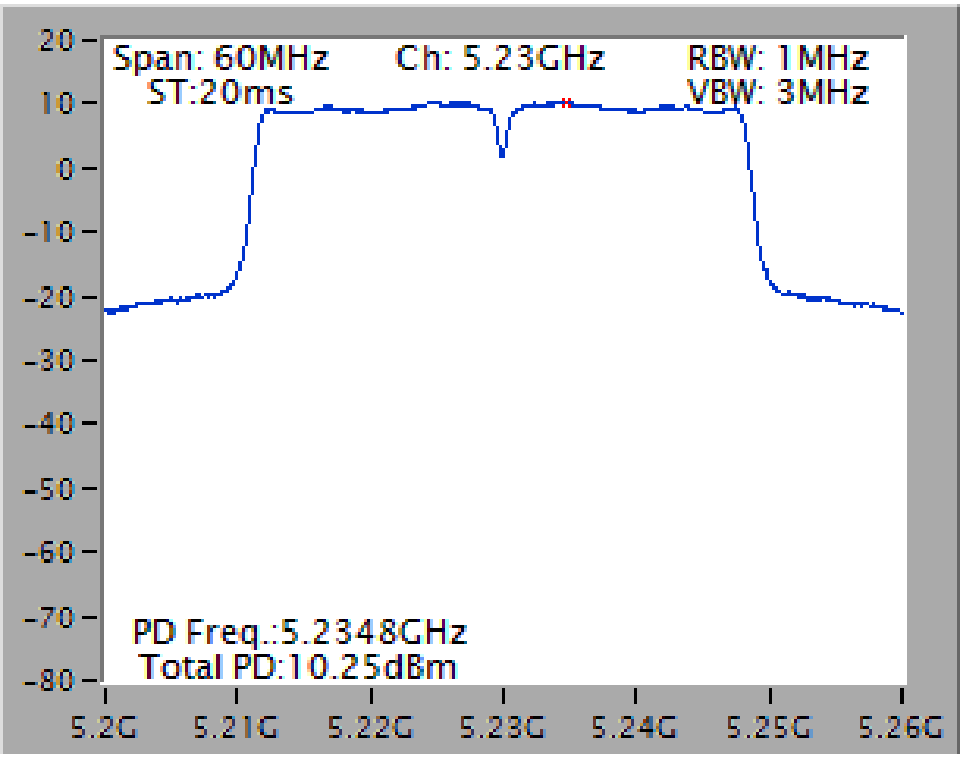
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 / 5240 MHz



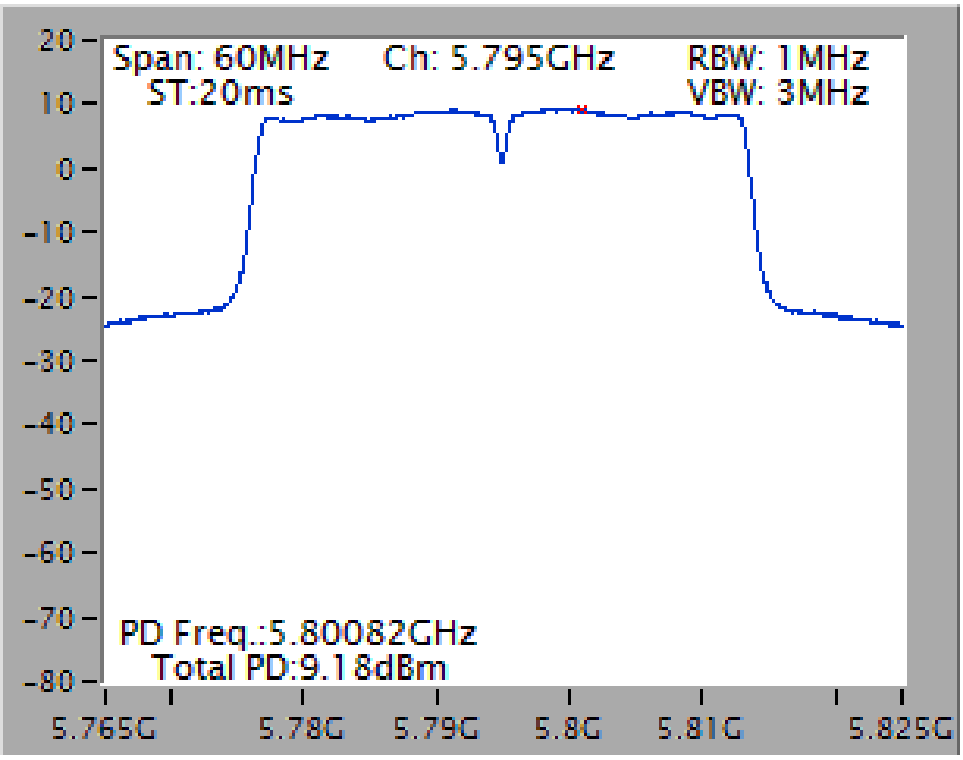
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 / 5785 MHz



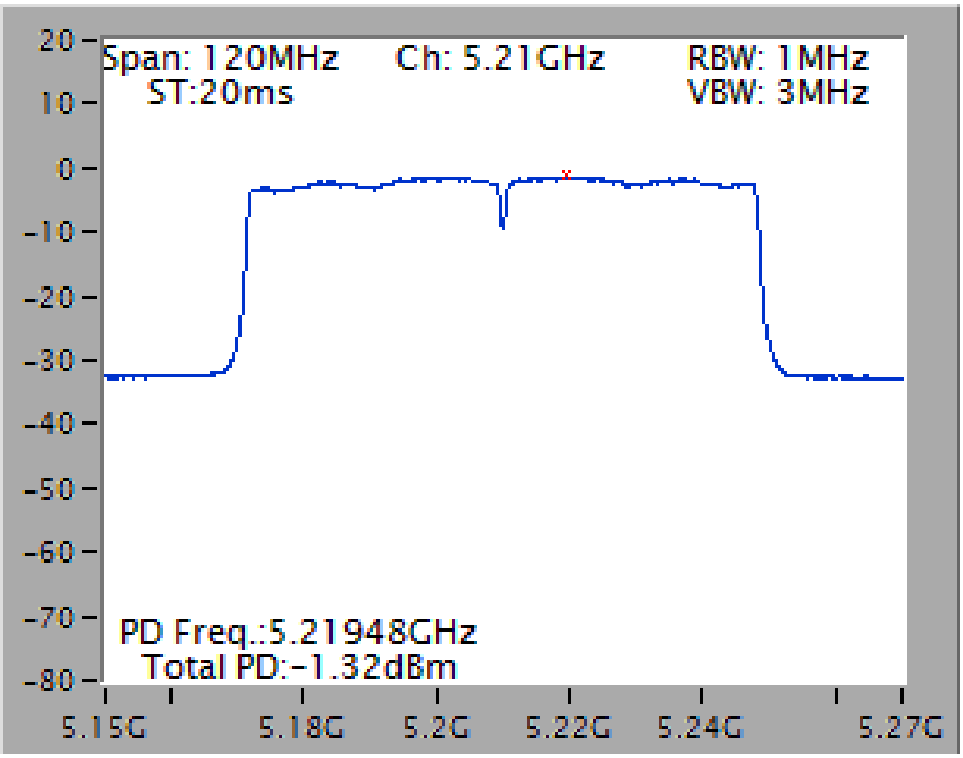
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5230 MHz



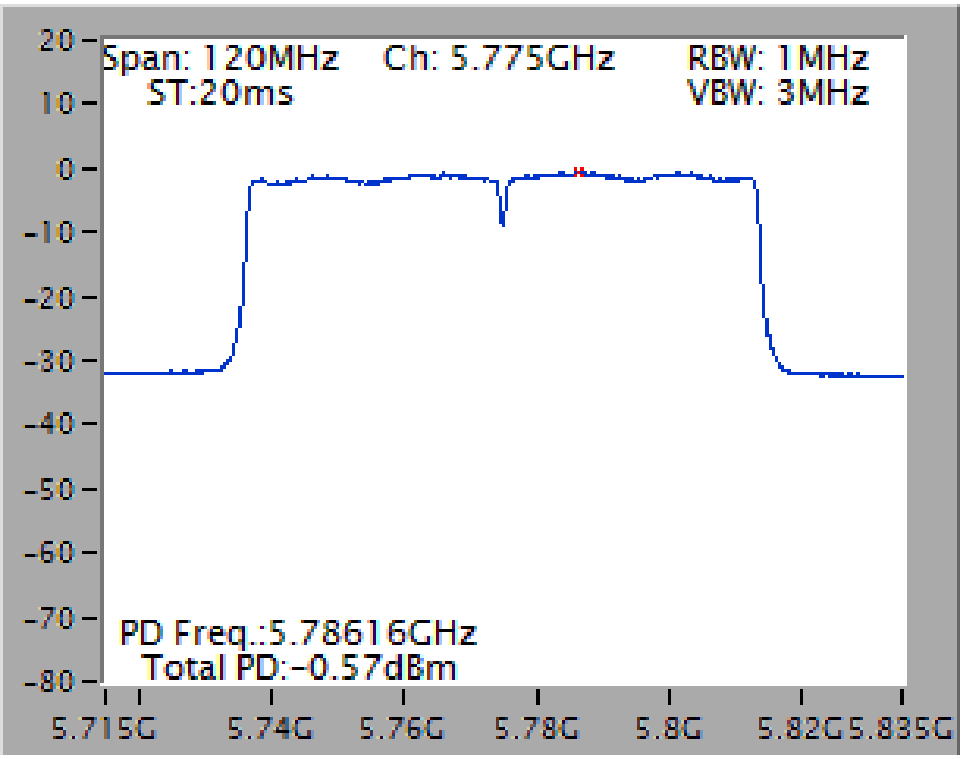
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 / 5210 MHz

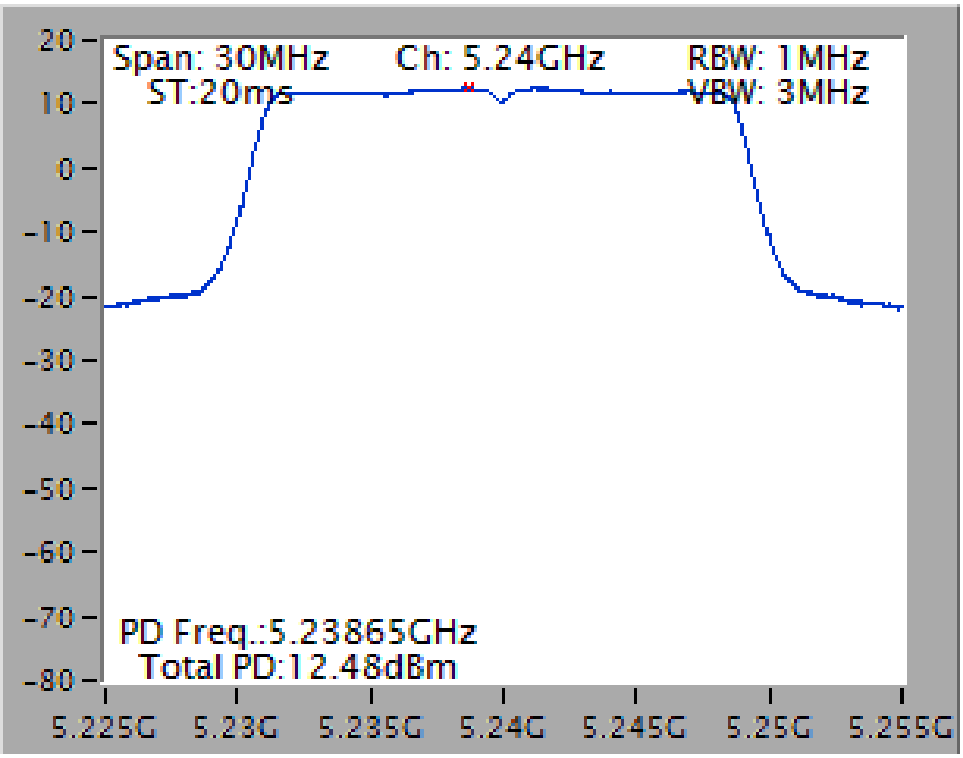


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 / 5775 MHz

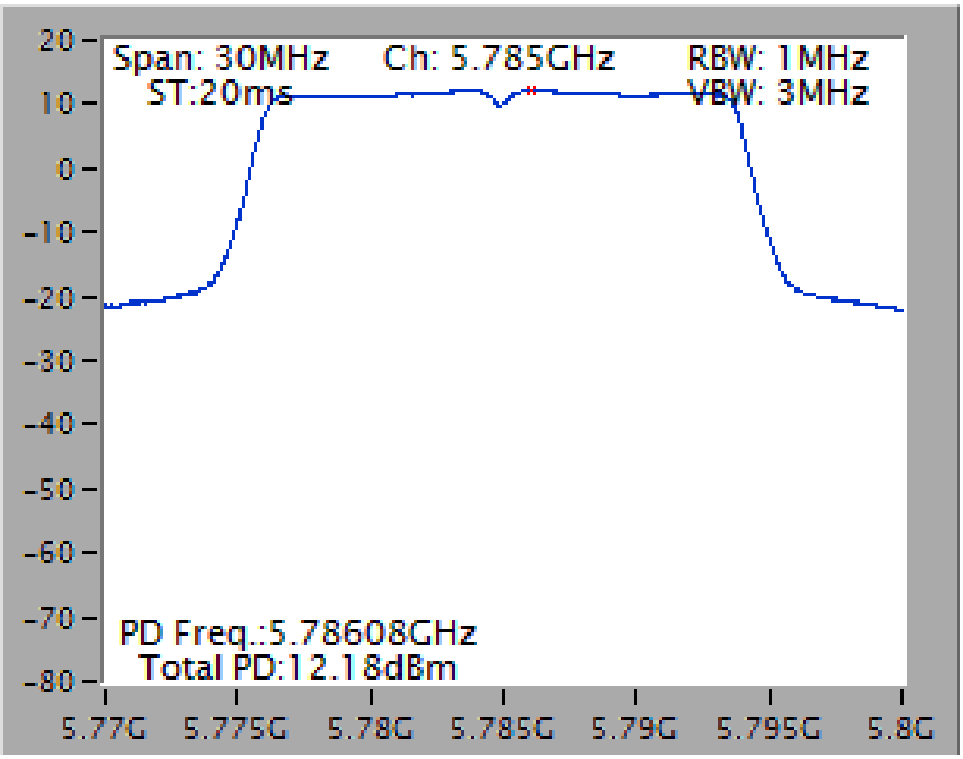


For beamforming mode

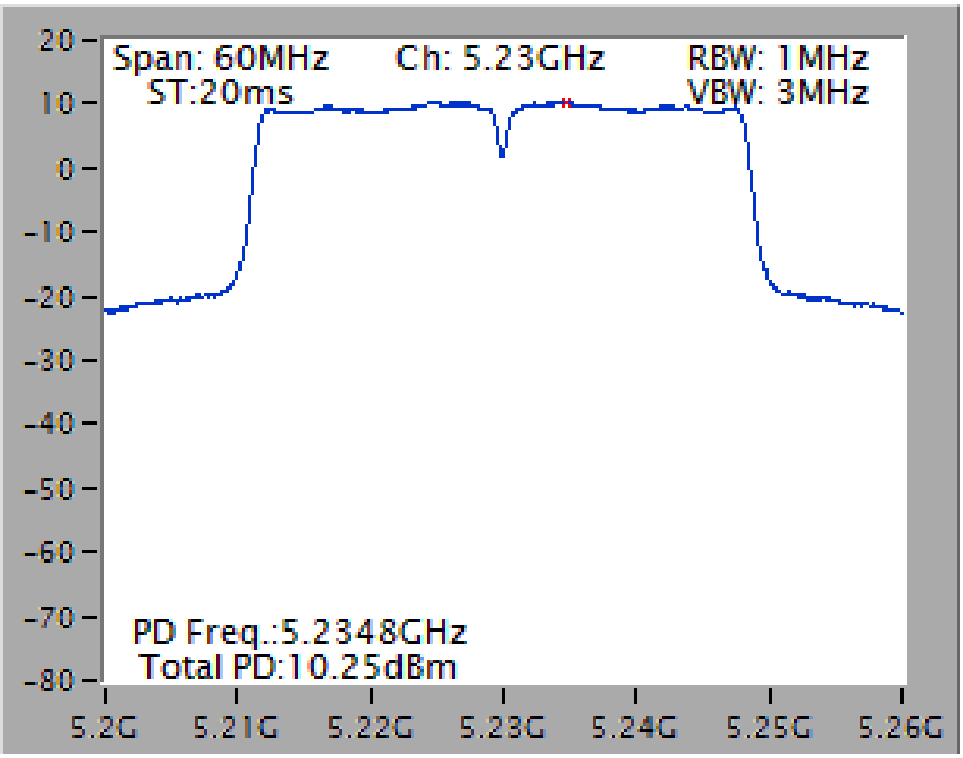
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 / 5240 MHz



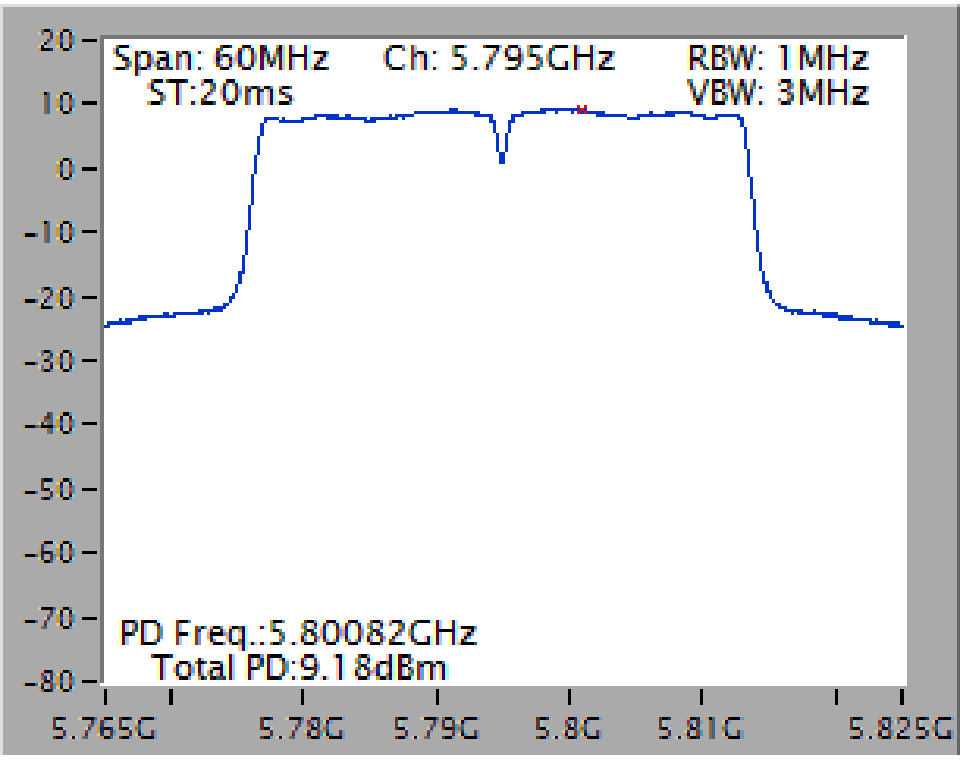
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 / 5785 MHz



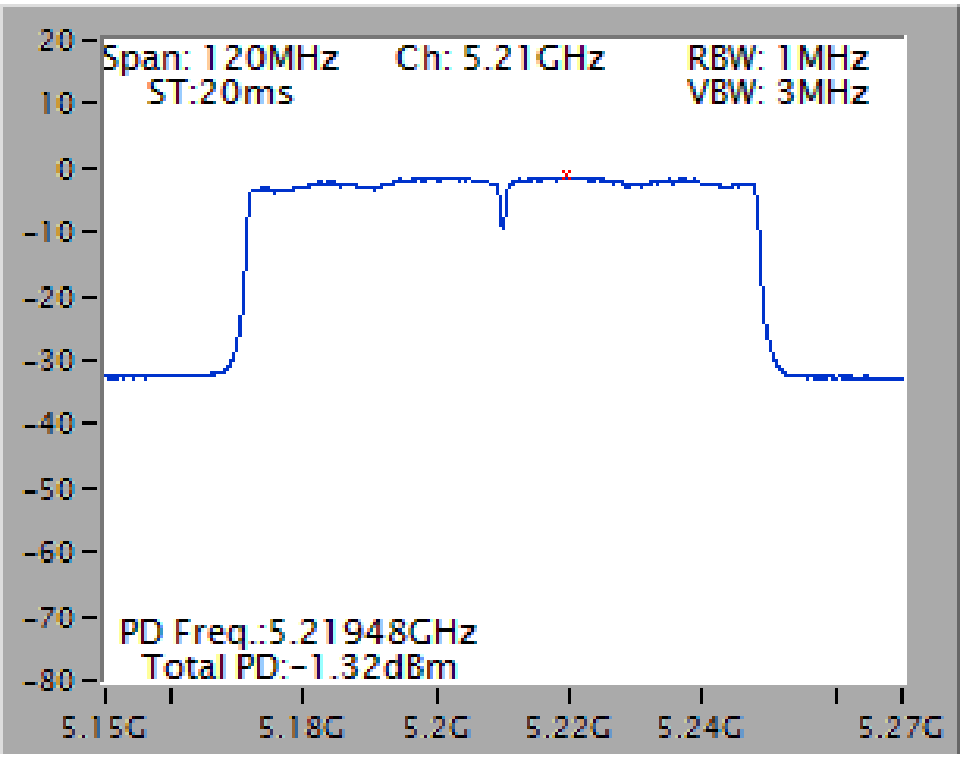
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5230 MHz



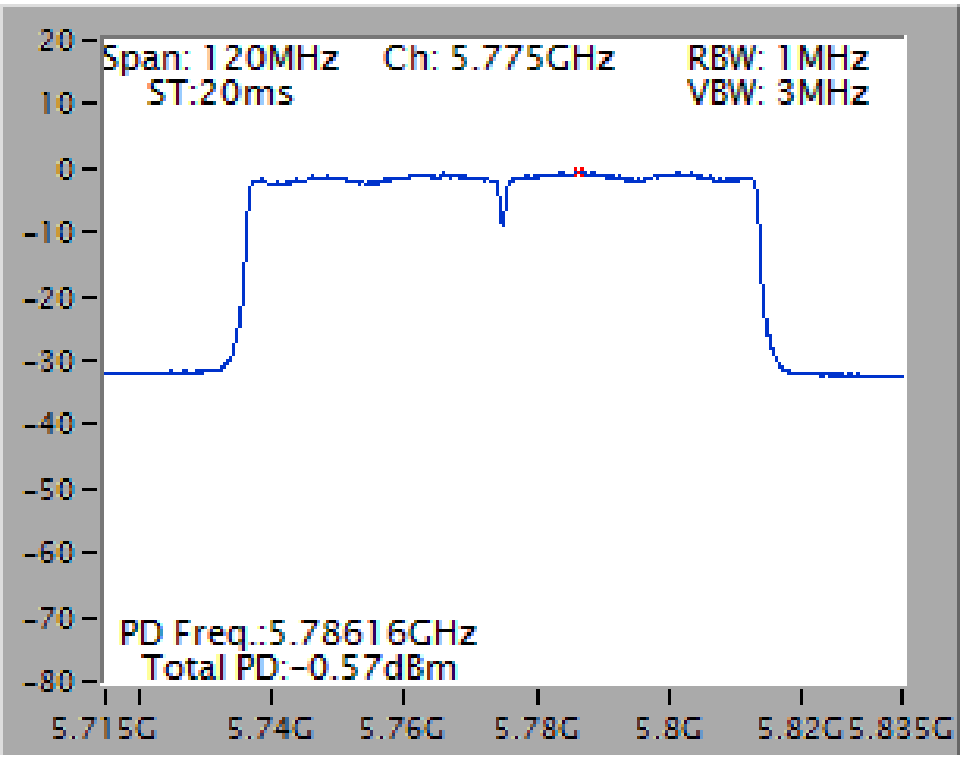
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 / 5210 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 / 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

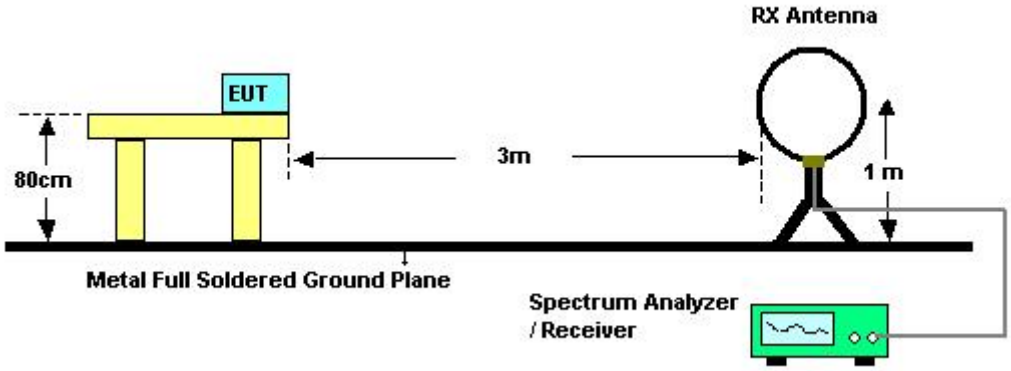
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

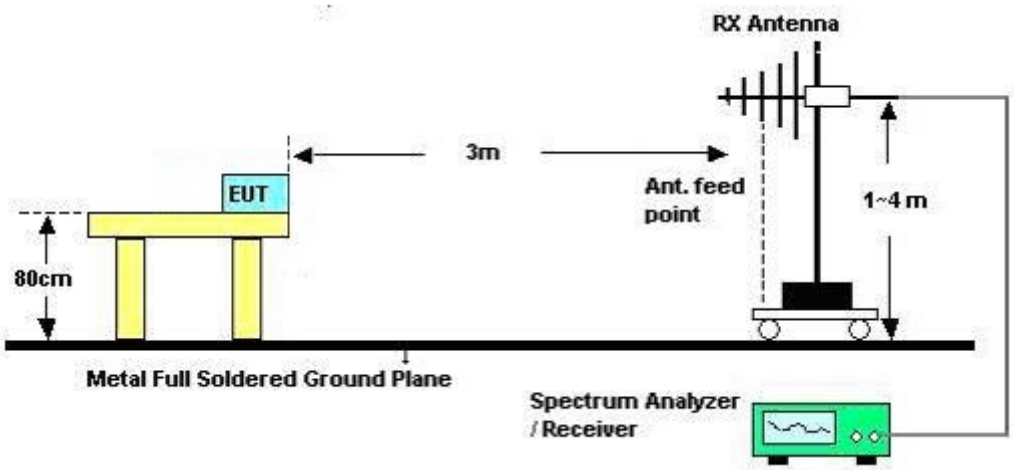
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

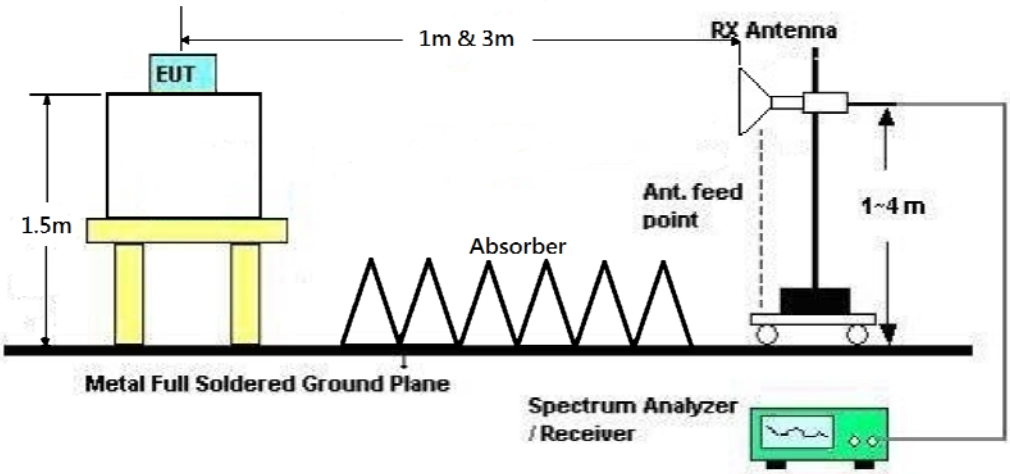
For Radiated Emissions: 9kHz ~30MHz



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 mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	25°C	Humidity	55%
Test Engineer	Gino Huang	Configurations	Normal Link
Test Date	May 13, 2015	Test Mode	Mode 1

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.

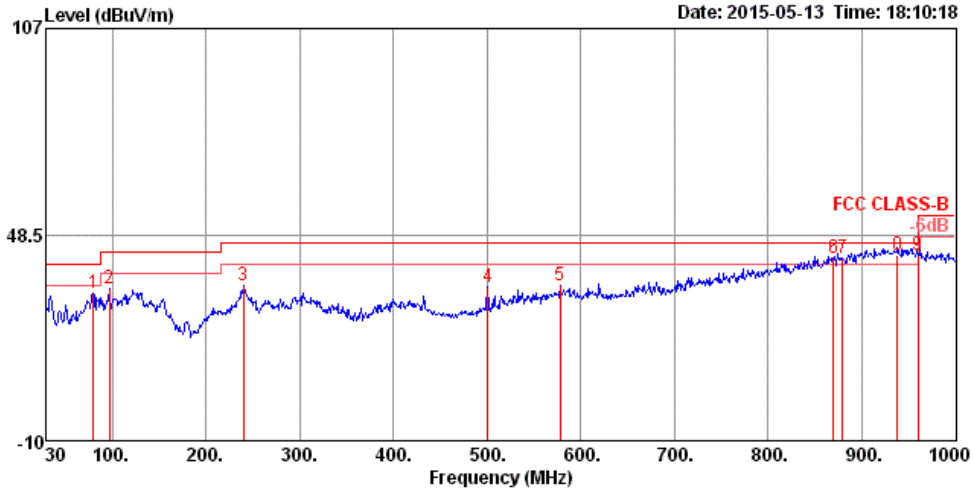
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

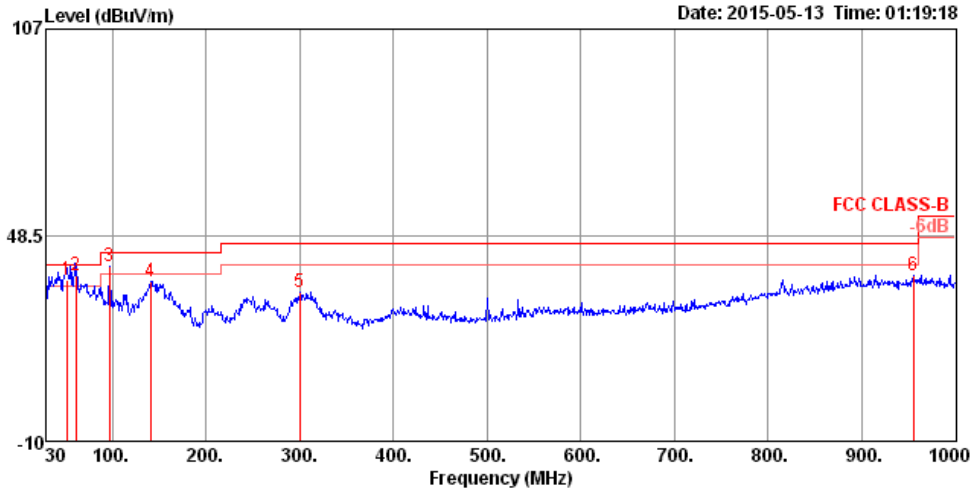
Temperature	25°C	Humidity	55%
Test Engineer	Gino Huang	Configurations	Normal Link
Test Mode	Mode 1		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	79.47	32.07	40.00	-7.93	50.65	1.04	6.73	26.35	200	30	HORIZONTAL	Peak
2	96.93	32.97	43.50	-10.53	48.68	1.17	9.87	26.75	200	187	HORIZONTAL	Peak
3	239.52	33.83	46.00	-12.17	50.88	1.86	10.81	29.72	150	282	HORIZONTAL	Peak
4	500.45	33.66	46.00	-12.34	41.60	2.82	16.92	27.68	100	261	HORIZONTAL	Peak
5	578.05	33.83	46.00	-12.17	40.53	3.05	18.39	28.14	150	194	HORIZONTAL	Peak
6	870.02	41.67	46.00	-4.33	44.76	3.86	20.20	27.15	100	182	HORIZONTAL	Peak
7	879.72	41.89	46.00	-4.11	44.79	3.92	20.28	27.10	100	192	HORIZONTAL	Peak
8	937.92	42.52	46.00	-3.48	44.42	4.04	20.78	26.72	100	99	HORIZONTAL	QP
9	960.23	42.79	54.00	-11.21	44.21	4.10	21.05	26.57	100	251	HORIZONTAL	Peak

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	51.34	35.94	40.00	-4.06	53.43	0.85	7.15	25.49	100	359	VERTICAL	QP
2	61.04	37.16	40.00	-2.84	57.22	0.90	4.87	25.83	100	321	VERTICAL	QP
3	96.93	39.85	43.50	-3.65	55.56	1.17	9.87	26.75	200	233	VERTICAL	Peak
4	140.58	35.50	43.50	-8.00	51.43	1.40	10.82	28.15	125	252	VERTICAL	Peak
5	299.66	32.24	46.00	-13.76	47.03	2.13	13.02	29.94	125	58	VERTICAL	Peak
6	955.38	37.17	46.00	-8.83	38.68	4.09	21.00	26.60	100	164	VERTICAL	Peak

Note:

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

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

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

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

For Non-beamforming mode

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 36 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15542.46	57.85	74.00	-16.15	44.03	10.77	38.25	35.20	Peak	152	228	HORIZONTAL
2	15542.47	44.04	54.00	-9.96	30.22	10.77	38.25	35.20	Average	152	228	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15535.01	57.21	74.00	-16.79	43.39	10.77	38.25	35.20	Peak	151	225	VERTICAL
2	15543.37	43.88	54.00	-10.12	30.06	10.77	38.25	35.20	Average	151	225	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 40 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15595.37	57.45	74.00	-16.55	43.73	10.78	38.16	35.22	Peak	154	235	HORIZONTAL
2	15603.91	44.03	54.00	-9.97	30.33	10.78	38.16	35.24	Average	154	235	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15592.47	44.03	54.00	-9.97	30.29	10.78	38.18	35.22	Average	155	233	VERTICAL
2	15598.09	57.75	74.00	-16.25	44.03	10.78	38.16	35.22	Peak	155	233	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 48 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15719.97	44.16	54.00	-9.84	30.66	10.79	37.99	35.28	Average	153	241	HORIZONTAL
2	15728.80	57.64	74.00	-16.36	44.15	10.79	37.99	35.29	Peak	153	241	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15715.95	57.92	74.00	-16.08	44.42	10.79	37.99	35.28	Peak	153	238	VERTICAL
2	15718.70	43.94	54.00	-10.06	30.44	10.79	37.99	35.28	Average	153	238	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 149 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11483.05	56.17	74.00	-17.83	42.65	9.24	39.08	34.80	Peak	151	251	HORIZONTAL
2	11489.22	42.01	54.00	-11.99	28.49	9.24	39.08	34.80	Average	151	251	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11483.81	42.10	54.00	-11.90	28.58	9.24	39.08	34.80	Average	151	247	VERTICAL
2	11489.30	55.60	74.00	-18.40	42.08	9.24	39.08	34.80	Peak	151	247	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 157 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11570.43	42.73	54.00	-11.27	29.15	9.26	39.14	34.82	Average	153	255	HORIZONTAL
2	11571.97	56.39	74.00	-17.61	42.81	9.26	39.14	34.82	Peak	153	255	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11563.58	42.51	54.00	-11.49	28.93	9.26	39.13	34.81	Average	153	253	VERTICAL
2	11576.74	56.50	74.00	-17.50	42.92	9.26	39.14	34.82	Peak	153	253	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 165 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11646.53	57.17	74.00	-16.83	43.55	9.28	39.18	34.84	Peak	155	289	HORIZONTAL
2	11651.08	44.18	54.00	-9.82	30.55	9.28	39.19	34.84	Average	155	289	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11657.60	56.78	74.00	-17.22	43.15	9.28	39.19	34.84	Peak	155	286	VERTICAL
2	11669.10	42.85	54.00	-11.15	29.21	9.28	39.20	34.84	Average	155	286	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15531.08	45.95	54.00	-8.05	32.13	10.77	38.25	35.20	Average	155	302	HORIZONTAL
2	15536.60	60.08	74.00	-13.92	46.26	10.77	38.25	35.20	Peak	155	302	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15545.12	58.26	74.00	-15.74	44.45	10.78	38.23	35.20	Peak	155	297	VERTICAL
2	15548.68	45.88	54.00	-8.12	32.08	10.78	38.23	35.21	Average	155	297	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15592.52	45.75	54.00	-8.25	32.01	10.78	38.18	35.22	Average	154	313	HORIZONTAL
2	15593.80	58.70	74.00	-15.30	44.96	10.78	38.18	35.22	Peak	154	313	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15596.44	45.92	54.00	-8.08	32.20	10.78	38.16	35.22	Average	155	310	VERTICAL
2	15601.60	59.19	74.00	-14.81	45.49	10.78	38.16	35.24	Peak	155	310	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15713.12	57.58	74.00	-16.42	44.06	10.79	38.01	35.28	Peak	152	318	HORIZONTAL
2	15720.24	44.99	54.00	-9.01	31.49	10.79	37.99	35.28	Average	152	318	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15720.80	44.89	54.00	-9.11	31.39	10.79	37.99	35.28	Average	152	315	VERTICAL
2	15722.64	57.93	74.00	-16.07	44.43	10.79	37.99	35.28	Peak	152	315	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11482.44	42.46	54.00	-11.54	28.94	9.24	39.08	34.80	Average	151	324	HORIZONTAL
2	11490.12	55.06	74.00	-18.94	41.54	9.24	39.08	34.80	Peak	151	324	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11481.40	54.87	74.00	-19.13	41.35	9.24	39.08	34.80	Peak	151	321	VERTICAL
2	11484.68	42.53	54.00	-11.47	29.01	9.24	39.08	34.80	Average	151	321	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11563.96	43.10	54.00	-10.90	29.52	9.26	39.13	34.81	Average	151	277	HORIZONTAL
2	11565.20	55.27	74.00	-18.73	41.69	9.26	39.13	34.81	Peak	151	277	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11561.36	42.94	54.00	-11.06	29.36	9.26	39.13	34.81	Average	151	287	VERTICAL
2	11563.72	55.29	74.00	-18.71	41.71	9.26	39.13	34.81	Peak	151	287	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11647.56	42.99	54.00	-11.01	29.37	9.28	39.18	34.84	Average	150	257	HORIZONTAL
2	11656.88	56.25	74.00	-17.75	42.62	9.28	39.19	34.84	Peak	150	257	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11654.84	43.33	54.00	-10.67	29.70	9.28	39.19	34.84	Average	151	267	VERTICAL
2	11659.84	55.97	74.00	-18.03	42.34	9.28	39.19	34.84	Peak	151	267	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Ant. 1 + Ant. 2
Test Date	Jul. 13, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15571.84	45.71	54.00	-8.29	31.94	10.78	38.20	35.21	Average	152	271	HORIZONTAL
2	15578.68	58.60	74.00	-15.40	44.86	10.78	38.18	35.22	Peak	152	271	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15576.76	45.89	54.00	-8.11	32.13	10.78	38.20	35.22	Average	153	244	VERTICAL
2	15579.80	58.57	74.00	-15.43	44.83	10.78	38.18	35.22	Peak	153	244	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Ant. 1 + Ant. 2
Test Date	Jul. 14, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15681.60	45.58	54.00	-8.42	32.03	10.79	38.03	35.27	Average	153	289	HORIZONTAL
2	15682.80	59.04	74.00	-14.96	45.49	10.79	38.03	35.27	Peak	153	289	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15685.32	58.57	74.00	-15.43	45.02	10.79	38.03	35.27	Peak	153	287	VERTICAL
2	15687.88	45.61	54.00	-8.39	32.06	10.79	38.03	35.27	Average	153	287	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Ant. 1 + Ant. 2
Test Date	Jul. 14, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11501.04	42.68	54.00	-11.32	29.13	9.25	39.10	34.80	Average	152	263	HORIZONTAL
2	11507.60	56.65	74.00	-17.35	43.10	9.25	39.10	34.80	Peak	152	263	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11500.60	42.79	54.00	-11.21	29.24	9.25	39.10	34.80	Average	151	274	VERTICAL
2	11503.72	55.29	74.00	-18.71	41.74	9.25	39.10	34.80	Peak	151	274	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Ant. 1 + Ant. 2
Test Date	Jul. 14, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11582.48	56.08	74.00	-17.92	42.50	9.26	39.14	34.82	Peak	151	186	HORIZONTAL
2	11592.12	43.03	54.00	-10.97	29.43	9.27	39.15	34.82	Average	151	186	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11584.92	55.91	74.00	-18.09	42.31	9.27	39.15	34.82	Peak	151	253	VERTICAL
2	11598.84	43.16	54.00	-10.84	29.57	9.27	39.15	34.83	Average	151	253	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Ant. 1 + Ant. 2
Test Date	Jul. 14, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15624.52	45.58	54.00	-8.42	31.92	10.78	38.13	35.25	Average	154	169	HORIZONTAL
2	15633.28	58.46	74.00	-15.54	44.82	10.78	38.11	35.25	Peak	154	169	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15623.52	58.70	74.00	-15.30	45.03	10.78	38.13	35.24	Peak	151	172	VERTICAL
2	15623.88	45.71	54.00	-8.29	32.04	10.78	38.13	35.24	Average	151	172	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Ant. 1 + Ant. 2
Test Date	Jul. 14, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11550.24	55.49	74.00	-18.51	41.91	9.26	39.13	34.81	Peak	152	149	HORIZONTAL
2	11552.64	42.90	54.00	-11.10	29.32	9.26	39.13	34.81	Average	152	149	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11543.84	43.10	54.00	-10.90	29.53	9.26	39.12	34.81	Average	154	157	VERTICAL
2	11549.76	55.90	74.00	-18.10	42.32	9.26	39.13	34.81	Peak	154	157	VERTICAL

For beamforming mode

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15528.60	47.86	54.00	-6.14	32.94	12.41	38.13	35.62	150	96	Average	HORIZONTAL
2	15558.90	61.30	74.00	-12.70	46.47	12.40	38.05	35.62	150	96	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	15516.80	47.92	54.00	-6.08	33.00	12.41	38.13	35.62	150	87	Average	VERTICAL
2	15551.00	60.75	74.00	-13.25	45.83	12.41	38.13	35.62	150	87	Peak	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15579.20	47.92	54.00	-6.08	33.09	12.40	38.05	35.62	157	103	Average	HORIZONTAL
2	15580.70	60.48	74.00	-13.52	45.65	12.40	38.05	35.62	157	103	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	15575.20	47.90	54.00	-6.10	33.07	12.40	38.05	35.62	152	99	Average	VERTICAL
2	15623.10	61.06	74.00	-12.94	46.32	12.39	37.98	35.63	152	99	Peak	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15736.30	59.76	74.00	-14.24	45.30	12.35	37.76	35.65	160	100	Peak	HORIZONTAL
2	15744.30	47.23	54.00	-6.77	32.77	12.35	37.76	35.65	160	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15711.50	59.86	74.00	-14.14	45.30	12.36	37.84	35.64	158	104	Peak	VERTICAL
2	15733.90	47.38	54.00	-6.62	32.83	12.36	37.84	35.65	158	104	Average	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11466.40	51.89	74.00	-22.11	37.68	9.33	40.21	35.33	166	112	Peak	HORIZONTAL
2	11467.20	39.61	54.00	-14.39	25.40	9.33	40.21	35.33	166	112	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11467.00	39.62	54.00	-14.38	25.41	9.33	40.21	35.33	158	107	Average	VERTICAL
2	11468.30	52.60	74.00	-21.40	38.39	9.33	40.21	35.33	158	107	Peak	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11579.10	51.01	74.00	-22.99	37.00	9.34	40.04	35.37	190	126	Peak	HORIZONTAL
2	11593.40	38.29	54.00	-15.71	24.38	9.33	39.96	35.38	190	126	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11583.90	50.66	74.00	-23.34	36.74	9.33	39.96	35.37	176	121	Peak	VERTICAL
2	11589.20	38.54	54.00	-15.46	24.63	9.33	39.96	35.38	176	121	Average	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11625.80	37.17	54.00	-16.83	23.37	9.31	39.88	35.39	174	117	Average	HORIZONTAL
2	11629.20	49.56	74.00	-24.44	35.76	9.31	39.88	35.39	174	117	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	11625.20	37.34	54.00	-16.66	23.54	9.31	39.88	35.39	182	122	Average	VERTICAL
2	11629.30	50.61	74.00	-23.39	36.81	9.31	39.88	35.39	182	122	Peak	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15545.90	60.65	74.00	-13.35	45.73	12.41	38.13	35.62	173	122	Peak	HORIZONTAL
2	15569.60	47.81	54.00	-6.19	32.98	12.40	38.05	35.62	173	122	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15550.60	61.44	74.00	-12.56	46.52	12.41	38.13	35.62	177	119	Peak	VERTICAL
2	15570.20	47.92	54.00	-6.08	33.09	12.40	38.05	35.62	177	119	Average	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15670.00	59.67	74.00	-14.33	45.02	12.38	37.91	35.64	166	122	Peak	HORIZONTAL
2	15670.40	47.35	54.00	-6.65	32.70	12.38	37.91	35.64	166	122	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15666.80	61.05	74.00	-12.95	46.40	12.38	37.91	35.64	167	128	Peak	VERTICAL
2	15667.70	47.39	54.00	-6.61	32.74	12.38	37.91	35.64	167	128	Average	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11486.30	49.39	74.00	-24.61	35.18	9.36	40.20	35.35	179	132	Peak	HORIZONTAL
2	11488.70	38.30	54.00	-15.70	24.09	9.36	40.20	35.35	179	132	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11487.10	38.44	54.00	-15.56	24.23	9.36	40.20	35.35	168	125	Average	VERTICAL
2	11487.60	51.01	74.00	-22.99	36.80	9.36	40.20	35.35	168	125	Peak	VERTICAL

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11591.80	38.95	54.00	-15.05	25.04	9.33	39.96	35.38	170	127	Average	HORIZONTAL
2	11607.10	51.76	74.00	-22.24	37.85	9.33	39.96	35.38	170	127	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	11589.10	51.86	74.00	-22.14	37.95	9.33	39.96	35.38	166	126	Peak	VERTICAL
2	11597.60	38.97	54.00	-15.03	25.06	9.33	39.96	35.38	166	126	Average	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15645.30	47.97	54.00	-6.03	33.23	12.39	37.98	35.63	160	118	Average	HORIZONTAL
2	15647.80	60.39	74.00	-13.61	45.73	12.38	37.91	35.63	160	118	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	15628.30	47.78	54.00	-6.22	33.04	12.39	37.98	35.63	164	122	Average	VERTICAL
2	15644.80	61.65	74.00	-12.35	46.91	12.39	37.98	35.63	164	122	Peak	VERTICAL

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11564.60	51.30	74.00	-22.70	37.29	9.34	40.04	35.37	126	107	Peak	HORIZONTAL
2	11569.80	38.78	54.00	-15.22	24.77	9.34	40.04	35.37	126	107	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11567.70	51.29	74.00	-22.71	37.28	9.34	40.04	35.37	132	113	Peak	VERTICAL
2	11569.20	38.71	54.00	-15.29	24.70	9.34	40.04	35.37	132	113	Average	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 mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

For Non-beamforming mode

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 36, 40, 48 / Ant. 1 + Ant. 2
Test Date	Jul. 11, 2015		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5098.40	53.81	54.00	-0.19	48.76	6.10	33.96	35.01	Average	166	71	VERTICAL
2	5099.20	64.14	74.00	-9.86	59.09	6.10	33.96	35.01	Peak	166	71	VERTICAL
3	5178.40	115.40			110.16	6.15	34.09	35.00	Peak	166	71	VERTICAL
4	5179.20	105.57			100.33	6.15	34.09	35.00	Average	166	71	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5123.00	53.96	54.00	-0.04	48.83	6.12	34.01	35.00	Average	175	77	VERTICAL
2	5124.00	64.44	74.00	-9.56	59.31	6.12	34.01	35.00	Peak	175	77	VERTICAL
3	5199.00	115.63			110.35	6.16	34.12	35.00	Peak	175	77	VERTICAL
4	5203.00	105.77			100.49	6.16	34.12	35.00	Average	175	77	VERTICAL
5	5359.00	63.81	74.00	-10.19	58.19	6.26	34.36	35.00	Peak	175	77	VERTICAL
6	5368.00	52.84	54.00	-1.16	47.18	6.27	34.39	35.00	Average	175	77	VERTICAL

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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4999.00	50.39	54.00	-3.61	45.57	6.03	33.80	35.01	Average	174	76	VERTICAL
2	5072.00	61.46	74.00	-12.54	56.45	6.09	33.93	35.01	Peak	174	76	VERTICAL
3	5234.00	116.24			110.89	6.18	34.17	35.00	Peak	174	76	VERTICAL
4	5238.00	106.21			100.86	6.18	34.17	35.00	Average	174	76	VERTICAL
5	5399.00	64.43	74.00	-9.57	58.69	6.29	34.44	34.99	Peak	174	76	VERTICAL
6	5403.00	53.96	54.00	-0.04	48.22	6.29	34.44	34.99	Average	174	76	VERTICAL

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

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11a CH 149, 157, 165 / Ant. 1 + Ant. 2
Test Date	Jul. 11, 2015		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5661.00	66.48	68.20	-1.72	60.46	6.42	34.63	35.03	Peak	207	71	VERTICAL
2	5725.00	77.92	78.20	-0.28	71.86	6.45	34.64	35.03	Peak	207	71	VERTICAL
3	5746.00	106.34			100.28	6.45	34.65	35.04	Average	207	71	VERTICAL
4	5746.00	116.17			110.11	6.45	34.65	35.04	Peak	207	71	VERTICAL
5	5857.00	60.66	78.20	-17.54	54.55	6.50	34.67	35.06	Peak	207	71	VERTICAL
6	5906.00	65.82	68.20	-2.38	59.69	6.52	34.68	35.07	Peak	207	71	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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5712.20	67.92	68.20	-0.28	61.87	6.44	34.64	35.03	Peak	181	76	VERTICAL
2	5717.80	60.39	78.20	-17.81	54.33	6.45	34.64	35.03	Peak	181	76	VERTICAL
3	5787.40	108.07			101.99	6.47	34.66	35.05	Average	181	76	VERTICAL
4	5787.40	118.45			112.37	6.47	34.66	35.05	Peak	181	76	VERTICAL
5	5858.00	66.99	78.20	-11.21	60.89	6.50	34.67	35.07	Peak	181	76	VERTICAL
6	5867.40	67.53	68.20	-0.67	61.43	6.50	34.67	35.07	Peak	181	76	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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5665.80	63.07	68.20	-5.13	57.05	6.42	34.63	35.03	Peak	202	67	VERTICAL
2	5721.80	59.41	78.20	-18.79	53.35	6.45	34.64	35.03	Peak	202	67	VERTICAL
3	5825.80	116.41			110.32	6.48	34.67	35.06	Peak	202	67	VERTICAL
4	5826.60	106.20			100.11	6.48	34.67	35.06	Average	202	67	VERTICAL
5	5850.60	69.49	78.20	-8.71	63.39	6.49	34.67	35.06	Peak	202	67	VERTICAL
6	5906.60	67.90	68.20	-0.30	61.77	6.52	34.68	35.07	Peak	202	67	VERTICAL

Item 3, 4 are the fundamental frequency at 5825 MHz.

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Ant. 1 + Ant. 2
Test Date	Jul. 11, 2015		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5099.20	53.81	54.00	-0.19	48.76	6.10	33.96	35.01	Average	183	68	VERTICAL
2	5147.20	64.02	74.00	-9.98	58.85	6.13	34.04	35.00	Peak	183	68	VERTICAL
3	5181.60	104.54			99.30	6.15	34.09	35.00	Average	183	68	VERTICAL
4	5181.60	114.58			109.34	6.15	34.09	35.00	Peak	183	68	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5121.00	53.96	54.00	-0.04	48.86	6.11	33.99	35.00	Average	188	75	VERTICAL
2	5122.00	64.18	74.00	-9.82	59.08	6.11	33.99	35.00	Peak	188	75	VERTICAL
3	5199.00	114.44			109.16	6.16	34.12	35.00	Peak	188	75	VERTICAL
4	5202.00	104.65			99.37	6.16	34.12	35.00	Average	188	75	VERTICAL
5	5364.00	63.22	74.00	-10.78	57.56	6.27	34.39	35.00	Peak	188	75	VERTICAL
6	5367.00	52.52	54.00	-1.48	46.86	6.27	34.39	35.00	Average	188	75	VERTICAL

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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	4999.00	51.05	54.00	-2.95	46.23	6.03	33.80	35.01	Average	181	71	VERTICAL
2	5075.00	59.95	74.00	-14.05	54.94	6.09	33.93	35.01	Peak	181	71	VERTICAL
3	5234.00	115.92			110.57	6.18	34.17	35.00	Peak	181	71	VERTICAL
4	5237.00	105.31			99.96	6.18	34.17	35.00	Average	181	71	VERTICAL
5	5402.00	53.97	54.00	-0.03	48.23	6.29	34.44	34.99	Average	181	71	VERTICAL
6	5402.00	64.71	74.00	-9.29	58.97	6.29	34.44	34.99	Peak	181	71	VERTICAL

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

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Ant. 1 + Ant. 2
Test Date	Jul. 11, 2015		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5658.60	65.50	68.20	-2.70	59.48	6.42	34.63	35.03	Peak	179	82	VERTICAL
2	5724.20	78.12	78.20	-0.08	72.06	6.45	34.64	35.03	Peak	179	82	VERTICAL
3	5743.40	105.28			99.22	6.45	34.65	35.04	Average	179	82	VERTICAL
4	5743.40	115.67			109.61	6.45	34.65	35.04	Peak	179	82	VERTICAL
5	5857.20	61.04	78.20	-17.16	54.93	6.50	34.67	35.06	Peak	179	82	VERTICAL
6	5909.00	64.52	68.20	-3.68	58.40	6.52	34.68	35.08	Peak	179	82	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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5711.40	68.00	68.20	-0.20	61.95	6.44	34.64	35.03	Peak	193	74	VERTICAL
2	5721.80	59.70	78.20	-18.50	53.64	6.45	34.64	35.03	Peak	193	74	VERTICAL
3	5783.40	117.38			111.31	6.46	34.66	35.05	Peak	193	74	VERTICAL
4	5785.80	107.04			100.96	6.47	34.66	35.05	Average	193	74	VERTICAL
5	5858.80	66.92	78.20	-11.28	60.82	6.50	34.67	35.07	Peak	193	74	VERTICAL
6	5870.60	67.69	68.20	-0.51	61.58	6.50	34.68	35.07	Peak	193	74	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	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5662.60	63.21	68.20	-4.99	57.19	6.42	34.63	35.03	Peak	203	68	VERTICAL
2	5721.80	59.11	78.20	-19.09	53.05	6.45	34.64	35.03	Peak	203	68	VERTICAL
3	5828.20	105.76			99.67	6.48	34.67	35.06	Average	203	68	VERTICAL
4	5828.20	116.14			110.05	6.48	34.67	35.06	Peak	203	68	VERTICAL
5	5850.60	73.01	78.20	-5.19	66.91	6.49	34.67	35.06	Peak	203	68	VERTICAL
6	5905.80	68.18	68.20	-0.02	62.05	6.52	34.68	35.07	Peak	203	68	VERTICAL

Item 3, 4 are the fundamental frequency at 5825 MHz.

Temperature	24℃	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Ant. 1 + Ant. 2
Test Date	Jul. 11, 2015		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5146.80	65.43	74.00	-8.57	60.26	6.13	34.04	35.00	Peak	175	74	VERTICAL
2	5149.20	53.93	54.00	-0.07	48.76	6.13	34.04	35.00	Average	175	74	VERTICAL
3	5184.40	98.79			93.55	6.15	34.09	35.00	Average	175	74	VERTICAL
4	5186.80	108.27			103.03	6.15	34.09	35.00	Peak	175	74	VERTICAL

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

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5146.00	64.31	74.00	-9.69	59.14	6.13	34.04	35.00	Peak	196	70	VERTICAL
2	5149.00	53.71	54.00	-0.29	48.54	6.13	34.04	35.00	Average	196	70	VERTICAL
3	5227.00	104.60			99.25	6.18	34.17	35.00	Average	196	70	VERTICAL
4	5234.00	113.84			108.49	6.18	34.17	35.00	Peak	196	70	VERTICAL
5	5377.00	63.37	74.00	-10.63	57.70	6.27	34.39	34.99	Peak	196	70	VERTICAL
6	5404.00	52.62	54.00	-1.38	46.88	6.29	34.44	34.99	Average	196	70	VERTICAL

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

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Ant. 1 + Ant. 2
Test Date	Jul. 11, 2015		

Channel 151

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5714.20	68.12	68.20	-0.08	62.07	6.44	34.64	35.03	Peak	176	81	VERTICAL
2	5723.80	73.52	78.20	-4.68	67.46	6.45	34.64	35.03	Peak	176	81	VERTICAL
3	5751.00	100.14			94.08	6.45	34.65	35.04	Average	176	81	VERTICAL
4	5759.00	110.59			104.53	6.46	34.65	35.05	Peak	176	81	VERTICAL
5	5851.60	61.30	78.20	-16.90	55.20	6.49	34.67	35.06	Peak	176	81	VERTICAL
6	5906.20	61.71	68.20	-6.49	55.58	6.52	34.68	35.07	Peak	176	81	VERTICAL

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

Channel 159

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5711.80	66.70	68.20	-1.50	60.65	6.44	34.64	35.03	Peak	194	76	VERTICAL
2	5725.00	68.85	78.20	-9.35	62.79	6.45	34.64	35.03	Peak	194	76	VERTICAL
3	5800.60	104.60			98.52	6.47	34.66	35.05	Average	194	76	VERTICAL
4	5800.60	115.10			109.02	6.47	34.66	35.05	Peak	194	76	VERTICAL
5	5851.80	68.76	78.20	-9.44	62.66	6.49	34.67	35.06	Peak	194	76	VERTICAL
6	5861.40	67.83	68.20	-0.37	61.73	6.50	34.67	35.07	Peak	194	76	VERTICAL

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

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	EEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Ant. 1 + Ant. 2
Test Date	Jul. 11, 2015		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5146.00	63.99	74.00	-10.01	58.82	6.13	34.04	35.00	Peak	191	62	VERTICAL
2	5150.00	53.84	54.00	-0.16	48.67	6.13	34.04	35.00	Average	191	62	VERTICAL
3	5184.40	93.62			88.38	6.15	34.09	35.00	Average	191	62	VERTICAL
4	5214.00	102.18			96.86	6.17	34.15	35.00	Peak	191	62	VERTICAL
5	5398.00	58.66	74.00	-15.34	52.92	6.29	34.44	34.99	Peak	191	62	VERTICAL
6	5406.00	47.96	54.00	-6.04	42.22	6.29	34.44	34.99	Average	191	62	VERTICAL

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

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5713.40	68.12	68.20	-0.08	62.07	6.44	34.64	35.03	Peak	180	70	VERTICAL
2	5720.60	69.56	78.20	-8.64	63.50	6.45	34.64	35.03	Peak	180	70	VERTICAL
3	5748.60	105.04			98.98	6.45	34.65	35.04	Peak	180	70	VERTICAL
4	5761.40	95.89			89.83	6.46	34.65	35.05	Average	180	70	VERTICAL
5	5851.00	64.30	78.20	-13.90	58.20	6.49	34.67	35.06	Peak	180	70	VERTICAL
6	5863.80	62.62	68.20	-5.58	56.52	6.50	34.67	35.07	Peak	180	70	VERTICAL

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

For beamforming mode

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5091.20	53.48	54.00	-0.52	49.89	5.76	31.47	33.64	152	238	Average	VERTICAL
2	5091.80	62.58	74.00	-11.42	58.99	5.76	31.47	33.64	152	238	Peak	VERTICAL
3 0	5171.60	105.20			101.46	5.82	31.55	33.63	152	238	Average	VERTICAL
4 0	5172.80	115.13			111.39	5.82	31.55	33.63	152	238	Peak	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5111.60	64.69	74.00	-9.31	61.07	5.77	31.48	33.63	152	260	Peak	VERTICAL
2	5112.80	53.89	54.00	-0.11	50.24	5.78	31.50	33.63	152	260	Average	VERTICAL
3 0	5192.20	116.38			112.61	5.83	31.56	33.62	152	260	Peak	VERTICAL
4 0	5192.80	105.65			101.88	5.83	31.56	33.62	152	260	Average	VERTICAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5075.20	59.01	74.00	-14.99	55.43	5.76	31.46	33.64	151	268	Peak	VERTICAL
2	5150.00	52.15	54.00	-1.85	48.46	5.80	31.52	33.63	151	268	Average	VERTICAL
3 0	5232.00	107.45			103.62	5.86	31.59	33.62	151	268	Average	VERTICAL
4 0	5232.00	116.48			112.65	5.86	31.59	33.62	151	268	Peak	VERTICAL
5	5392.00	53.52	54.00	-0.48	49.44	5.95	31.72	33.59	151	268	Average	VERTICAL
6	5393.60	63.48	74.00	-10.52	59.40	5.95	31.72	33.59	151	268	Peak	VERTICAL

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

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Channel 149

	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	5657.40	64.79	68.20	-3.41	60.30	6.08	32.00	33.59	166	253	Peak	VERTICAL
2	5724.20	77.91	78.20	-0.29	73.33	6.10	32.08	33.60	166	253	Peak	VERTICAL
3 0	5737.00	105.57			100.99	6.10	32.08	33.60	166	253	Average	VERTICAL
4 0	5737.00	114.76			110.18	6.10	32.08	33.60	166	253	Peak	VERTICAL

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5711.40	67.68	68.20	-0.52	63.12	6.10	32.06	33.60	165	258	Peak	VERTICAL
2	5719.80	57.33	78.20	-20.87	52.77	6.10	32.06	33.60	165	258	Peak	VERTICAL
3 0	5791.40	110.02			105.33	6.13	32.16	33.60	165	258	Average	VERTICAL
4 0	5791.40	122.02			117.33	6.13	32.16	33.60	165	258	Peak	VERTICAL
5	5857.60	64.97	78.20	-13.23	60.18	6.16	32.24	33.61	165	258	Peak	VERTICAL
6	5872.80	68.00	68.20	-0.20	63.21	6.16	32.24	33.61	165	258	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	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1 0	5832.20	107.68			102.95	6.14	32.20	33.61	165	258	Average	VERTICAL
2 0	5833.00	117.08			112.35	6.14	32.20	33.61	165	258	Peak	VERTICAL
3	5850.40	76.22	78.20	-1.98	71.46	6.15	32.22	33.61	165	258	Peak	VERTICAL
4	5860.80	67.77	68.20	-0.43	62.98	6.16	32.24	33.61	165	258	Peak	VERTICAL

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

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Channel 38

		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		5144.00	53.95	54.00	-0.05	50.26	5.80	31.52	33.63	151	245	Average	VERTICAL
2		5144.80	68.34	74.00	-5.66	64.65	5.80	31.52	33.63	151	245	Peak	VERTICAL
3	0	5172.40	101.44			97.70	5.82	31.55	33.63	151	245	Average	VERTICAL
4	0	5172.80	109.90			106.16	5.82	31.55	33.63	151	245	Peak	VERTICAL

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

Channel 46

		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1		5145.20	53.67	54.00	-0.33	49.98	5.80	31.52	33.63	151	257	Average	VERTICAL
2		5147.60	64.03	74.00	-9.97	60.34	5.80	31.52	33.63	151	257	Peak	VERTICAL
3	0	5222.00	114.41			110.60	5.85	31.58	33.62	151	257	Peak	VERTICAL
4	0	5225.20	104.95			101.14	5.85	31.58	33.62	151	257	Average	VERTICAL
5		5384.40	52.57	54.00	-1.43	48.52	5.94	31.70	33.59	151	257	Average	VERTICAL
6		5384.40	63.57	74.00	-10.43	59.52	5.94	31.70	33.59	151	257	Peak	VERTICAL

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

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Channel 151

	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	5715.00	67.75	68.20	-0.45	63.19	6.10	32.06	33.60	160	252	Peak	VERTICAL
2	5723.80	72.82	78.20	-5.38	68.24	6.10	32.08	33.60	160	252	Peak	VERTICAL
3 0	5737.60	100.57			95.99	6.10	32.08	33.60	160	252	Average	VERTICAL
4 0	5747.80	110.33			105.72	6.11	32.10	33.60	160	252	Peak	VERTICAL

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

Channel 159

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5709.00	66.54	68.20	-1.66	61.98	6.10	32.06	33.60	148	259	Peak	VERTICAL
2	5722.60	64.89	78.20	-13.31	60.31	6.10	32.08	33.60	148	259	Peak	VERTICAL
3 0	5790.20	102.02			97.33	6.13	32.16	33.60	148	259	Average	VERTICAL
4 0	5790.80	114.49			109.80	6.13	32.16	33.60	148	259	Peak	VERTICAL
5	5850.60	66.55	78.20	-11.65	61.79	6.15	32.22	33.61	148	259	Peak	VERTICAL
6	5868.40	67.68	68.20	-0.52	62.89	6.16	32.24	33.61	148	259	Peak	VERTICAL

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

Temperature	24°C	Humidity	58%
Test Engineer	Owen Hsu	Configurations	EEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Ant. 1 + Ant. 2
Test Date	Jul. 15, 2015		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.20	64.43	74.00	-9.57	60.74	5.80	31.52	33.63	150	279	Peak	VERTICAL
2	5150.00	53.37	54.00	-0.63	49.68	5.80	31.52	33.63	150	279	Average	VERTICAL
3 0	5199.60	105.06			101.29	5.83	31.56	33.62	150	279	Peak	VERTICAL
4 0	5208.40	96.39			92.60	5.84	31.57	33.62	150	279	Average	VERTICAL
5	5367.60	44.78	54.00	-9.22	40.76	5.93	31.69	33.60	150	279	Average	VERTICAL
6	5367.60	53.79	74.00	-20.21	49.77	5.93	31.69	33.60	150	279	Peak	VERTICAL

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

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5715.00	67.92	68.20	-0.28	63.36	6.10	32.06	33.60	151	258	Peak	VERTICAL
2	5725.00	68.14	78.20	-10.06	63.56	6.10	32.08	33.60	151	258	Peak	VERTICAL
3 0	5743.80	109.97			105.36	6.11	32.10	33.60	151	258	Peak	VERTICAL
4 0	5789.40	96.17			91.48	6.13	32.16	33.60	151	258	Average	VERTICAL
5	5850.80	64.85	78.20	-13.35	60.09	6.15	32.22	33.61	151	258	Peak	VERTICAL
6	5861.60	62.59	68.20	-5.61	57.80	6.16	32.24	33.61	151	258	Peak	VERTICAL

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

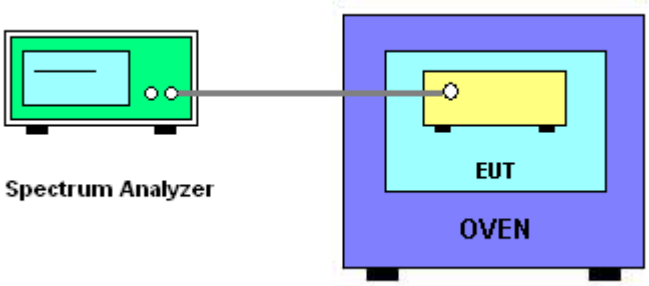
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 -30°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°C	Humidity	45%
Test Engineer	Jim Huang	Test Date	Sep. 17, 2015

Mode: 20 MHz / Ant. 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9713	5199.9292	5199.9715	5199.9294
110.00	5199.9614	5199.9391	5199.9616	5199.9393
93.50	5199.9502	5199.9503	5199.9504	5199.9505
Max. Deviation (MHz)	0.0498	0.0708	0.0496	0.0706
Max. Deviation (ppm)	9.58	13.62	9.54	13.58
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5199.9911	5199.9094	5199.9913	5199.9096
-10	5199.9812	5199.9193	5199.9814	5199.9195
0	5199.9713	5199.9292	5199.9715	5199.9294
10	5199.9614	5199.9391	5199.9616	5199.9393
20	5199.9502	5199.9503	5199.9504	5199.9505
30	5199.9403	5199.9602	5199.9405	5199.9604
40	5199.9302	5199.9703	5199.9304	5199.9705
50	5199.9198	5199.9807	5199.9200	5199.9809
Max. Deviation (MHz)	0.0802	0.1004	0.0800	0.1002
Max. Deviation (ppm)	15.42	19.31	15.38	19.27
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9732	5784.9311	5784.9734	5784.9313
110.00	5784.9633	5784.9410	5784.9635	5784.9412
93.50	5784.9521	5784.9522	5784.9523	5784.9524
Max. Deviation (MHz)	0.0479	0.0689	0.0477	0.0687
Max. Deviation (ppm)	8.28	11.91	8.25	11.88
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5784.9930	5784.9113	5784.9932	5784.9115
-10	5784.9831	5784.9212	5784.9833	5784.9214
0	5784.9732	5784.9311	5784.9734	5784.9313
10	5784.9633	5784.9410	5784.9635	5784.9412
20	5784.9521	5784.9522	5784.9523	5784.9524
30	5784.9422	5784.9621	5784.9424	5784.9623
40	5784.9321	5784.9722	5784.9323	5784.9724
50	5784.9217	5784.9826	5784.9219	5784.9828
Max. Deviation (MHz)	0.0783	0.0985	0.0781	0.0983
Max. Deviation (ppm)	13.54	17.03	13.50	16.99
Result	Complies			

Mode: 40 MHz / Ant. 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5189.9893	5189.9472	5189.9895	5189.9474
110.00	5189.9794	5189.9571	5189.9796	5189.9573
93.50	5189.9682	5189.9683	5189.9684	5189.9685
Max. Deviation (MHz)	0.0318	0.0528	0.0316	0.0526
Max. Deviation (ppm)	6.13	10.17	6.09	10.13
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5190.0091	5189.9274	5190.0093	5189.9276
-10	5189.9992	5189.9373	5189.9994	5189.9375
0	5189.9893	5189.9472	5189.9895	5189.9474
10	5189.9794	5189.9571	5189.9796	5189.9573
20	5189.9682	5189.9683	5189.9684	5189.9685
30	5189.9583	5189.9782	5189.9585	5189.9784
40	5189.9482	5189.9883	5189.9484	5189.9885
50	5189.9378	5189.9987	5189.9380	5189.9989
Max. Deviation (MHz)	0.0622	0.0824	0.0620	0.0822
Max. Deviation (ppm)	11.98	15.88	11.95	15.84
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9864	5754.9443	5754.9866	5754.9445
110.00	5754.9765	5754.9542	5754.9767	5754.9544
93.50	5754.9653	5754.9654	5754.9655	5754.9656
Max. Deviation (MHz)	0.0347	0.0557	0.0345	0.0555
Max. Deviation (ppm)	6.03	9.68	5.99	9.64
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5755.0062	5754.9245	5755.0064	5754.9247
-10	5754.9963	5754.9344	5754.9965	5754.9346
0	5754.9864	5754.9443	5754.9866	5754.9445
10	5754.9765	5754.9542	5754.9767	5754.9544
20	5754.9653	5754.9654	5754.9655	5754.9656
30	5754.9554	5754.9753	5754.9556	5754.9755
40	5754.9453	5754.9854	5754.9455	5754.9856
50	5754.9349	5754.9958	5754.9351	5754.9960
Max. Deviation (MHz)	0.0651	0.0853	0.0649	0.0851
Max. Deviation (ppm)	11.31	14.82	11.28	14.79
Result	Complies			

Mode: 80 MHz / Ant. 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5209.9893	5209.9472	5209.9895	5209.9474
110.00	5209.9794	5209.9571	5209.9796	5209.9573
93.50	5209.9682	5209.9683	5209.9684	5209.9685
Max. Deviation (MHz)	0.0318	0.0528	0.0316	0.0526
Max. Deviation (ppm)	6.10	10.13	6.07	10.10
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5210.0091	5209.9274	5210.0093	5209.9276
-10	5209.9992	5209.9373	5209.9994	5209.9375
0	5209.9893	5209.9472	5209.9895	5209.9474
10	5209.9794	5209.9571	5209.9796	5209.9573
20	5209.9682	5209.9683	5209.9684	5209.9685
30	5209.9583	5209.9782	5209.9585	5209.9784
40	5209.9482	5209.9883	5209.9484	5209.9885
50	5209.9378	5209.9987	5209.9380	5209.9989
Max. Deviation (MHz)	0.0622	0.0824	0.0620	0.0822
Max. Deviation (ppm)	11.94	15.82	11.90	15.78
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9892	5774.9471	5774.9894	5774.9473
110.00	5774.9793	5774.9570	5774.9795	5774.9572
93.50	5774.9681	5774.9682	5774.9683	5774.9684
Max. Deviation (MHz)	0.0319	0.0529	0.0317	0.0527
Max. Deviation (ppm)	5.52	9.16	5.49	9.13
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5775.0090	5774.9273	5775.0092	5774.9275
-10	5774.9991	5774.9372	5774.9993	5774.9374
0	5774.9892	5774.9471	5774.9894	5774.9473
10	5774.9793	5774.9570	5774.9795	5774.9572
20	5774.9681	5774.9682	5774.9683	5774.9684
30	5774.9582	5774.9781	5774.9584	5774.9783
40	5774.9481	5774.9882	5774.9483	5774.9884
50	5774.9377	5774.9986	5774.9379	5774.9988
Max. Deviation (MHz)	0.0623	0.0825	0.0621	0.0823
Max. Deviation (ppm)	10.79	14.29	10.75	14.25
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
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 17, 2014	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 17, 2014	Conduction (CO02-CB)
MXE EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 30MHz	Jan. 13, 2015	Conduction (CO02-CB)
COND Cable	Woken	Cable	01	0.15MHz ~ 30MHz	Dec. 01, 2014	Conduction (CO02-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F	9561-F073	9kHz ~ 30MHz	Sep. 26, 2014	Conduction (CO02-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	May 06, 2015	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 28, 2014	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Aug. 22, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Feb. 24, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 25, 2014	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 06, 2014	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 21, 2015	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 12, 2015*	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100979	9kHz~40GHz	Dec. 12, 2014	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)

RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 03, 2014	Conducted (TH01-CB)

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

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

NCR means Non-Calibration required.

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.4 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%