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FCC RADIO TEST REPORT

Applicant's company	**MitraStar Technology Corporation**
Applicant Address	No. 6, Innovation Rd II, Science-Based Industrial, Hsin-Chu, Taiwan
FCC ID	**ZMYAM525**
Manufacturer's company (1)	**MitraStar Technology Corporation**
Manufacturer Address	No. 6, Innovation Rd II, Hsinchu Science Park, Hsinchu 30076, Taiwan
Manufacturer's company (2)	**WuXi MitraStar Technology Co. Ltd**
Manufacturer Address	60#-E, Minshan Road, Wuxi New district Jangsu, P.R.C.

Product Name	MoCA to Wireless / Ethernet bridge
Brand Name	ARRIS/Pace
Model No.	AM525
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz / 5725 ~ 5850 MHz
Received Date	Nov. 30, 2015
Final Test Date	Jul. 23, 2016
Submission Type	Class II Change

Statement

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

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

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

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart E, KDB789033 D02 v01r02, KDB662911 D01 v02r01, KDB644545 D03 v01, ET Docket No. 13–49; FCC 16–24.**

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

Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5O2010-02AB	Rev. 01	Initial issue of report	Aug. 16, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	MoCA to Wireless / Ethernet bridge
Brand Name	:	ARRIS/Pace
Model No.	:	AM525
Applicant	:	MitraStar Technology Corporation
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Nov. 30, 2015 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E			
Part	**Rule Section**	**Description of Test**	**Result**
4.1	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies
4.2	15.407(e)	6dB Spectrum Bandwidth	Complies
4.3	15.407(a)	Maximum Conducted Output Power	Complies
4.4	15.407(a)	Power Spectral Density	Complies
4.5	15.407(b)	Radiated Emissions	Complies
4.6	15.407(b)	Band Edge Emissions	Complies
4.7	15.407(g)	Frequency Stability	Complies
4.8	15.203	Antenna Requirements	Complies

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5150 ~ 5350MHz / 5470 ~ 5725MHz / 5725 ~ 5850 MHz
Channel Number	25 for 20MHz bandwidth ; 12 for 40MHz bandwidth 6 for 80MHz bandwidth
Channel Band Width (99%)	<For Non-Beamforming Mode> Band 4: IEEE 802.11a: 17.54 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 19.36 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.92 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz <For Beamforming Mode> Band 4: IEEE 802.11ac MCS0/Nss2 (VHT20): 18.15 MHz IEEE 802.11ac MCS0/Nss2 (VHT40): 37.48 MHz IEEE 802.11ac MCS0/Nss2 (VHT80): 76.12 MHz
Maximum Conducted Output Power	<For Non-Beamforming Mode> Band 4: IEEE 802.11a: 26.00 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 25.89 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.30 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 24.17 dBm <For Beamforming Mode> Band 4: IEEE 802.11ac MCS0/Nss2 (VHT20): 25.89 dBm IEEE 802.11ac MCS0/Nss2 (VHT40): 26.30 dBm IEEE 802.11ac MCS0/Nss2 (VHT80): 25.89 dBm

Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3
Note: The EUT supports Master in 2.4GHz, 5GHz band 1, band 4 / Client without radar detection in 5GHz band 1~band 4 / Repeater in 2.4GHz, 5GHz band 1~band 4.	

Items	Description	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
Beamforming Function	☒ With beamforming	☐ Without beamforming
	The product has beamforming function for 802.11n/ac in 5GHz. For 802.11ac: The beamforming function supports MCS 0-9/Nss2-4.	
Operate Condition	☒ Indoor	☐ Outdoor

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol		Number of Transmit Chains (NTX)	Data Rate / MCS
<For Non-Beamforming Mode>	802.11n (HT20)	4	MCS 0-31
	802.11n (HT40)	4	MCS 0-31
	802.11ac (VHT20)	4	MCS 0-9/Nss1-4
	802.11ac (VHT40)	4	MCS 0-9/Nss1-4
	802.11ac (VHT80)	4	MCS 0-9/Nss1-4
<For Beamforming Mode>	802.11n (HT20)	4	MCS 0-31
	802.11n (HT40)	4	MCS 0-31
	802.11ac (VHT20)	4	MCS 0-9/Nss2-4
	802.11ac (VHT40)	4	MCS 0-9/Nss2-4
	802.11ac (VHT80)	4	MCS 0-9/Nss2-4

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

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

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

3.2. Accessories

Power	Brand	Model No.	Rating
Adapter	PI	AD2027310	Input: 100-120Vac, 50/60Hz, 680mA Output: 12Vdc, 1.5A
Others			
LAN cable: 1.8 meter, non-shielded, w/o ferrite core			

3.3. Table for Filed Antenna

Ant.	Brand	Model No.	Type	Connector	Gain (dBi)				
					2.4GHz	5GHz B1	5GHz B2	5GHz B3	5GHz B4
1	Whayu	C1597-510063-A	Dipole	N/A	1.8	-	-	-	-
2	Whayu	C1597-510064-A	Dipole	N/A	2.0	-	-	-	-
3	Whayu	C1597-510065-A	Dipole	I-PEX	-	1.70	1.67	1.59	1.42
4	Whayu	C1597-510066-A	Dipole	I-PEX	-	1.70	1.67	1.59	1.42
5	Whayu	C1597-510067-A	Dipole	I-PEX	-	1.70	1.67	1.59	1.42
6	Whayu	C1597-510068-A	Dipole	I-PEX	-	1.70	1.67	1.59	1.42

Note: The EUT has six antennas.

Ant. 1 and Ant. 2 for 2.4GHz WLAN function use, Ant. 3~Ant. 6 for 5GHz WLAN function use.

For 2.4GHz WLAN function:

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

Only Chain 1 can be used as transmitting/receiving functions.

For IEEE 802.11n mode (1TX, 1RX / 2TX, 2RX):

The EUT can support both 1TX and 2TX functions.

For 1TX function:

Both Chain 1 and Chain 2 support transmit and receive functions, but only one of them will be used at one time.

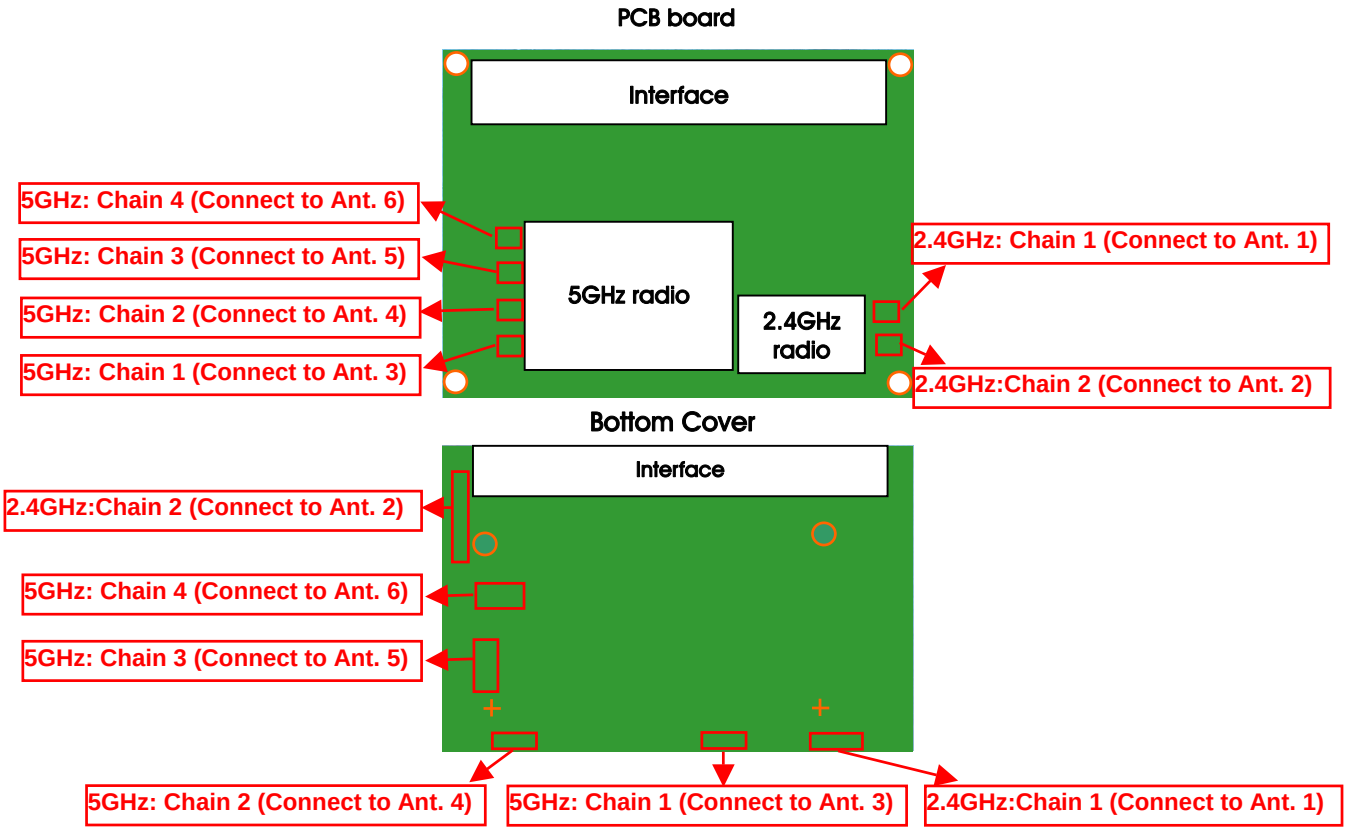
For 2TX function:

Chain 1 and Chain 2 could transmit/receive simultaneously.

For 5GHz WLAN function:

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

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



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 38, 46, 54, 62, 102, 110, 118, 126, 134, 142, 151, 159.

For 80MHz bandwidth systems, use Channel 42, 58, 106, 122, 138, 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	-	-
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz Band 3	100	5500 MHz	124	5620 MHz
	102	5510 MHz	126	5630 MHz
	104	5520 MHz	128	5640 MHz
	106	5530 MHz	132	5660 MHz
	108	5540 MHz	134	5670 MHz
	110	5550 MHz	136	5680 MHz
	112	5560 MHz	138	5690 MHz
	116	5580 MHz	140	5700 MHz
	118	5590 MHz	142	5710 MHz
	120	5600 MHz	144	5720 MHz
	122	5610 MHz	-	-
5725~5850 MHz Band 4	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 MHz

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
Max. Conducted Output Power	<For Non-Beamforming Mode>				
	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3+4
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3+4
	<For Beamforming Mode>				
	11ac VHT20	Band 4	MCS0/Nss2	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss2	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss2	155	1+2+3+4
Power Spectral Density	<For Non-Beamforming Mode>				
	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3+4
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3+4
	<For Beamforming Mode>				
	11ac VHT20	Band 4	MCS0/Nss2	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss2	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss2	155	1+2+3+4
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	<For Non-Beamforming Mode>				
	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3+4
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3+4
	<For Beamforming Mode>				
	11ac VHT20	Band 4	MCS0/Nss2	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss2	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss2	155	1+2+3+4

6dB Spectrum Bandwidth Measurement	<For Non-Beamforming Mode>				
	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3+4
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3+4
	<For Beamforming Mode>				
	11ac VHT20	Band 4	MCS0/Nss2	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss2	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss2	155	1+2+3+4
Radiated Emission Above 1GHz	<For Non-Beamforming Mode>				
	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3+4
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3+4
	<For Beamforming Mode>				
	11ac VHT20	Band 4	MCS0/Nss2	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss2	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss2	155	1+2+3+4
Band Edge Emission	<For Non-Beamforming Mode>				
	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3+4
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3+4
	<For Beamforming Mode>				
	11ac VHT20	Band 4	MCS0/Nss2	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss2	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss2	155	1+2+3+4
Frequency Stability	20 MHz	Band 4	-	40/157	1
	40 MHz	Band 4	-	38/151	1
	80 MHz	Band 4	-	42/155	1

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

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 Radiated Emission test<Above 1GHz>:

Mode 1: CTX- EUT in Y axis

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

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA5O2010-02) tests 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 Designation No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	TW0006	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Multiple Listing

The brand names in the following table are all refer to the identical product.

Brand Name	Description
ARRIS	All the models are identical, the difference model for difference brand served as marketing strategy.
Pace	

3.8. Table for Class II Change

This product is an extension of original one reported under Sporton project number: 5O2010AB and 5O2010-01.

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

Description	Performance Checking
1. Updating test rule of 5GHz band 4 to "15.407 (b)(4)(i) of New Rules (ET Docket No. 13–49; FCC 16–24)" from "Old Rules".	1. 26dB Spectrum Bandwidth and 99% Occupied Bandwidth 2. 6dB Spectrum Bandwidth 3. Maximum Conducted Output Power 4. Power Spectral Density 5. Radiated Emissions<Above 1GHz> 6. Frequency Stability
2. Adding the brand name: ARRIS	it is not necessary to verify.
3. Change MoCA module	
4. Change 2.4G layout	

3.9. Table for Supporting Units

<For Non-Beamforming Mode>

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

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

<For Beamforming Mode>

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

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
NB	DELL	E4300	DoC
RX Device	Quantenna	NA	NA

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

3.10. 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	Telnet		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5745 MHz	5785 MHz	5825 MHz
802.11a	21	21	21
802.11ac MCS0/Nss1 VHT20	21	21	21
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5755 MHz	5795 MHz	
	21	21	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5775 MHz		
	19		

<For Beamforming Mode>

Test Software Version	Telnet		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5745 MHz	5785 MHz	5825 MHz
802.11ac MCS0/Nss2 VHT20	21	21	21
Mode	NCB: 40MHz		
802.11ac MCS0/Nss2 VHT40	5755 MHz	5795 MHz	
	21	21	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss2 VHT80	5775 MHz		
	21		

3.11. EUT Operation during Test

<For Non-Beamforming Mode>:

The EUT was programmed to be in continuously transmitting mode.

<For Beamforming Mode>

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

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

The program was executed as follows:

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

3.12. 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	0.568	0.616	92.21%	0.35	1.76
802.11ac MCS0/Nss1 VHT20	5.000	5.040	99.21%	0.03	0.01
802.11ac MCS0/Nss1 VHT40	2.432	2.480	98.06%	0.08	0.01
802.11ac MCS0/Nss1 VHT80	1.146	1.200	95.50%	0.20	0.87

<For Beamforming Mode>

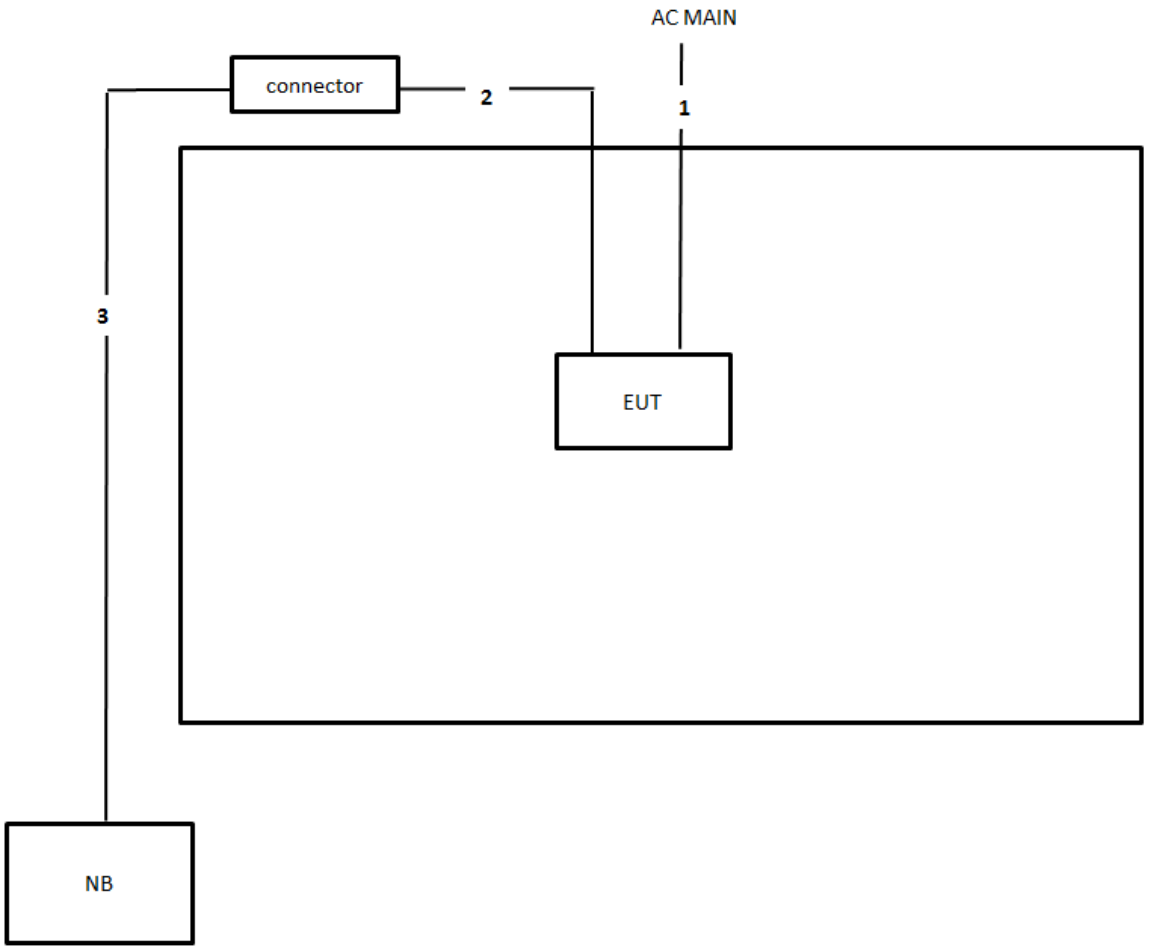
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss2 VHT20	1.780	1.980	89.90%	0.46	0.56
802.11ac MCS0/Nss2 VHT40	0.888	0.948	93.67%	0.28	1.13
802.11ac MCS0/Nss2 VHT80	1.600	1.654	96.74%	0.14	0.63

3.13.Test Configurations

3.13.1. Radiation Emissions Test Configuration

<For Non-Beamforming Mode>

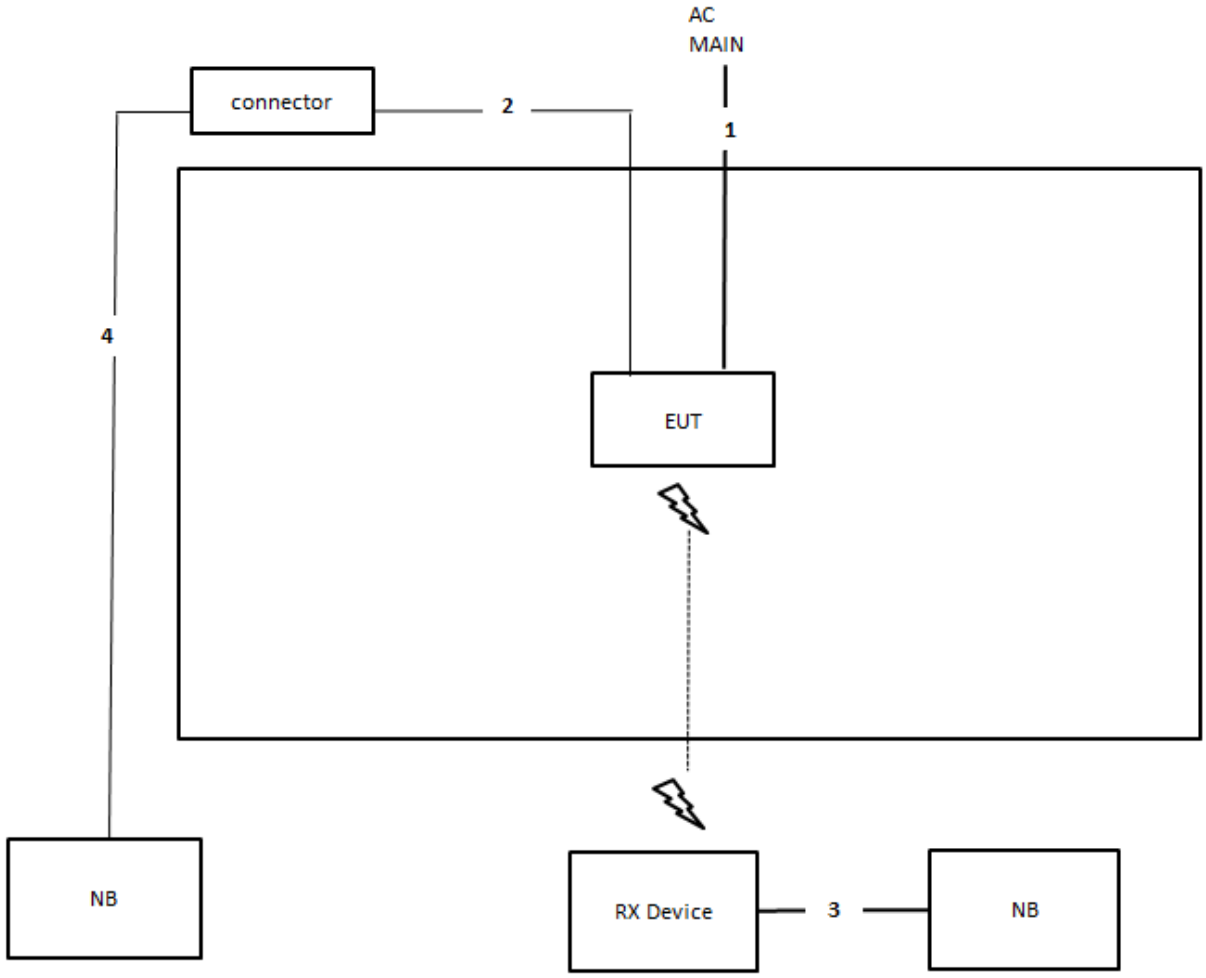
Test Configuration: above 1GHz



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

<For Beamforming Mode>

Test Configuration: above 1GHz



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

4. TEST RESULT

4.1. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.1.1. Limit

No restriction limits.

4.1.2. Measuring Instruments and Setting

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

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

4.1.3. Test Procedures

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

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

4.1.4. Test Setup Layout

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

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

4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

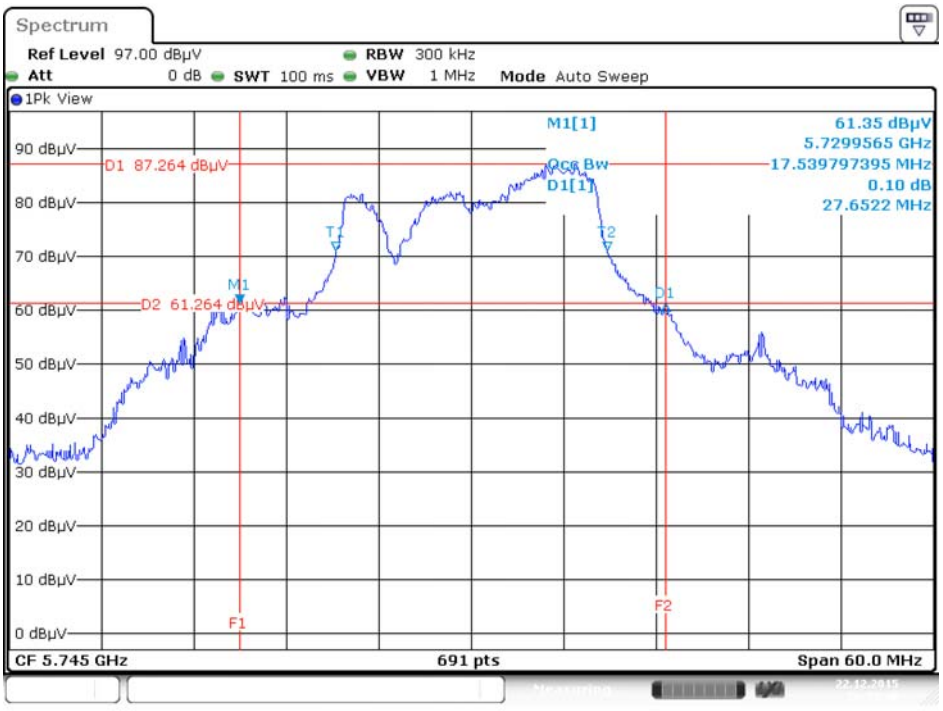
4.1.7. Test Result of 26dB Bandwidth and 99% Occupied Bandwidth

<For Non-Beamforming Mode>

Temperature	23℃	Humidity	55%
Test Engineer	Roki Liu		

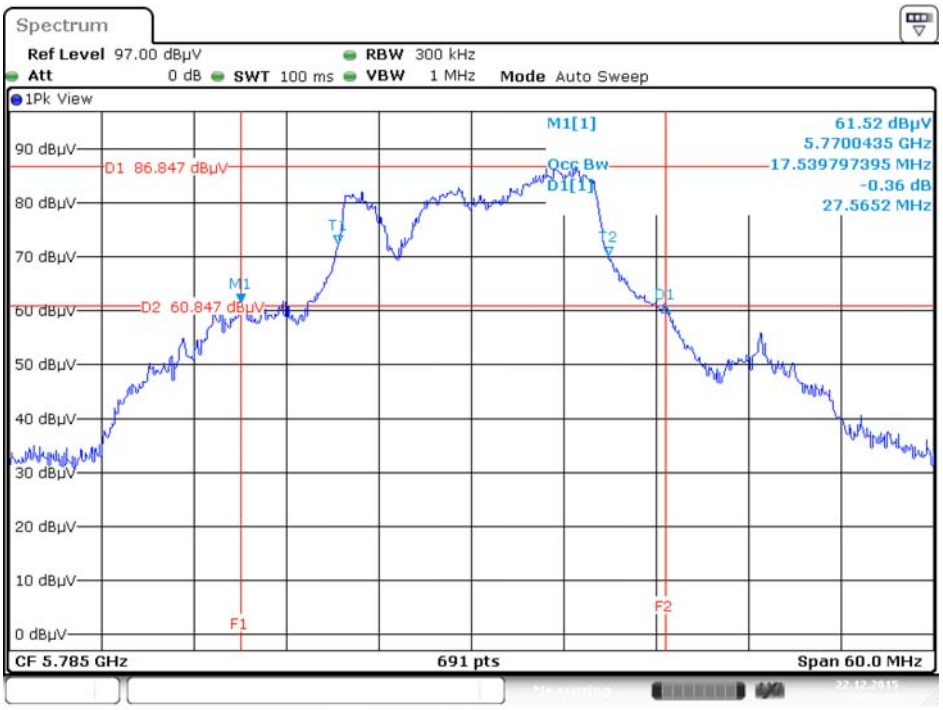
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5745 MHz	27.65	17.54
	5785 MHz	27.57	17.54
	5825 MHz	28.78	17.45
802.11ac MCS0/Nss1 VHT20	5745 MHz	31.91	19.36
	5785 MHz	28.35	18.49
	5825 MHz	27.30	18.58
802.11ac MCS0/Nss1 VHT40	5755 MHz	61.30	37.92
	5795 MHz	70.00	37.77
802.11ac MCS0/Nss1 VHT80	5775 MHz	124.35	76.41

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



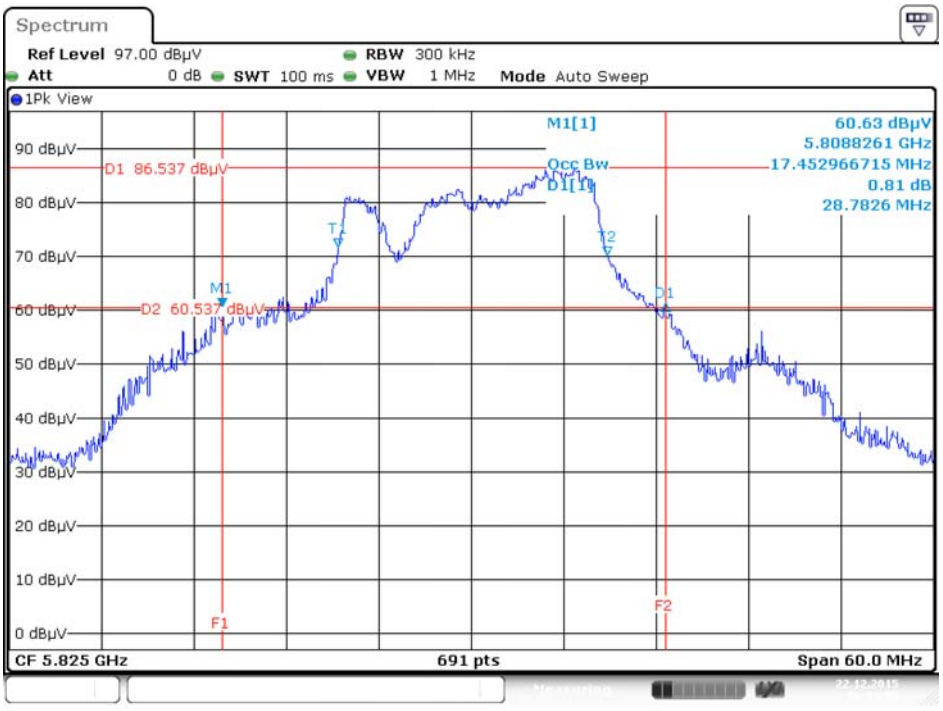
Date: 22.DEC.2015 20:53:40

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



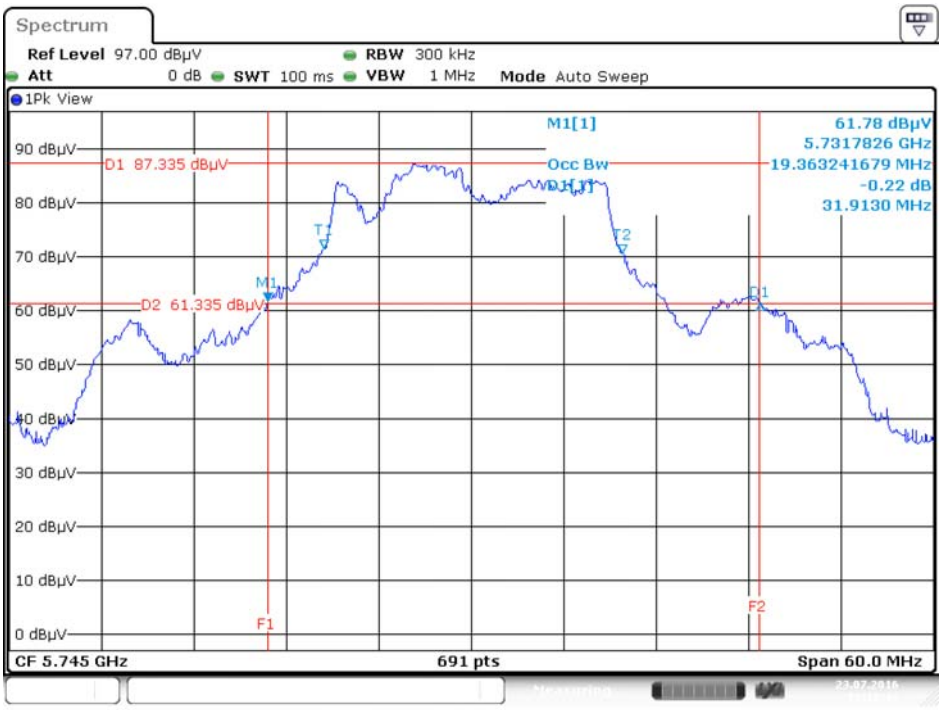
Date: 22.DEC.2015 20:53:24

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



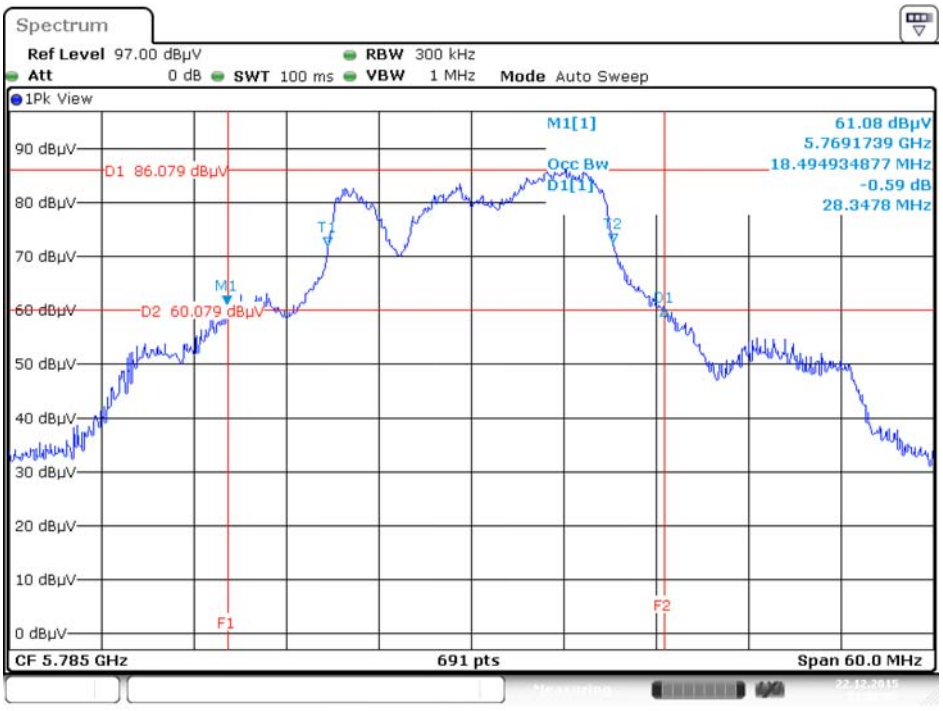
Date: 22.DEC.2015 20:53:55

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



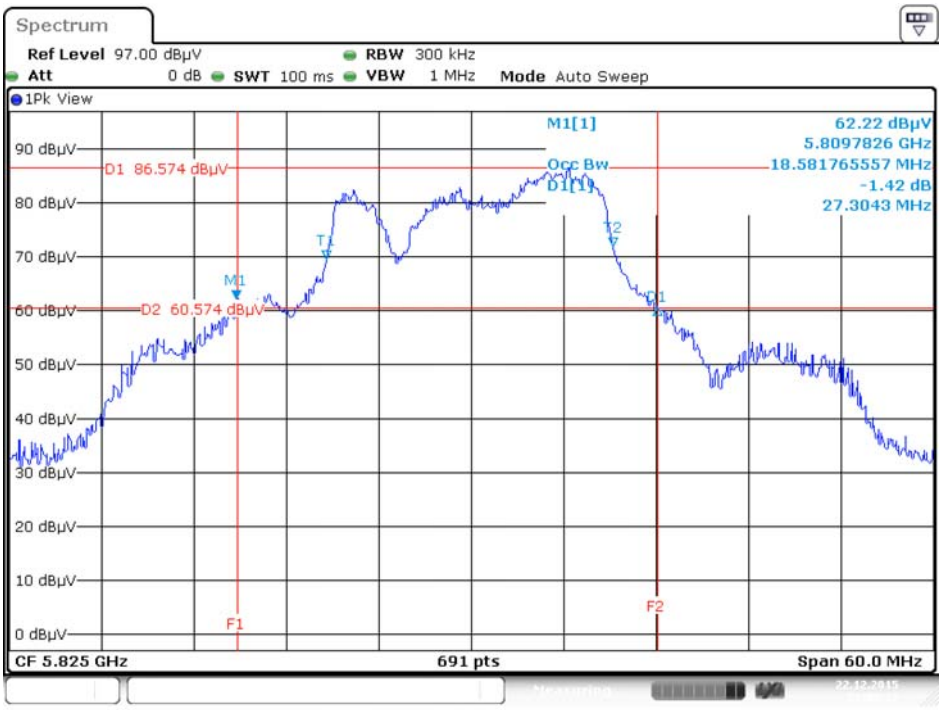
Date: 23.JUL.2016 11:12:42

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



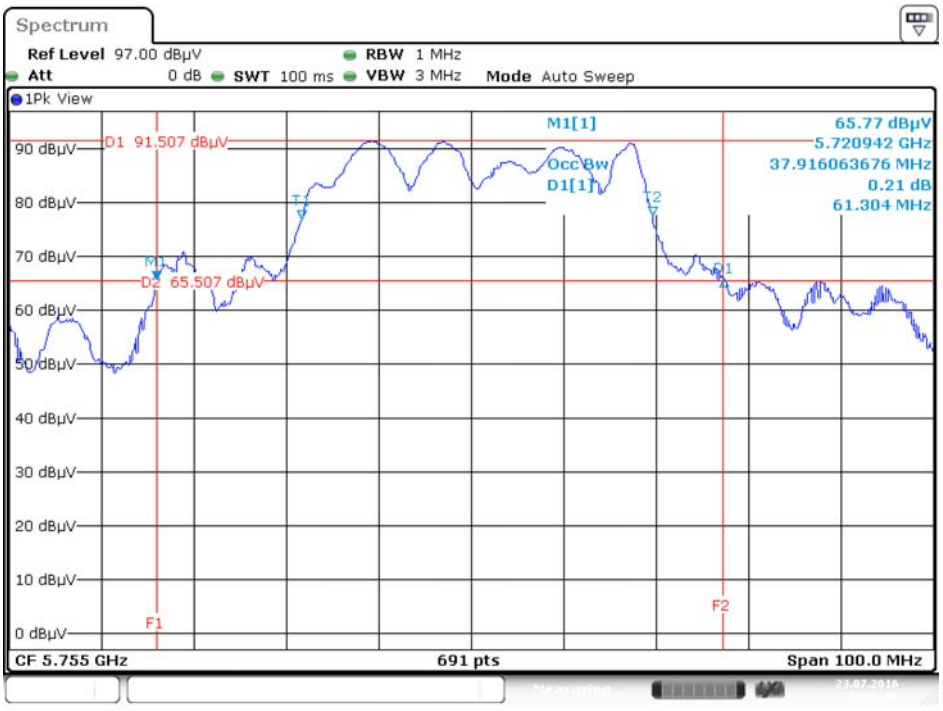
Date: 22.DEC.2015 21:02:01

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



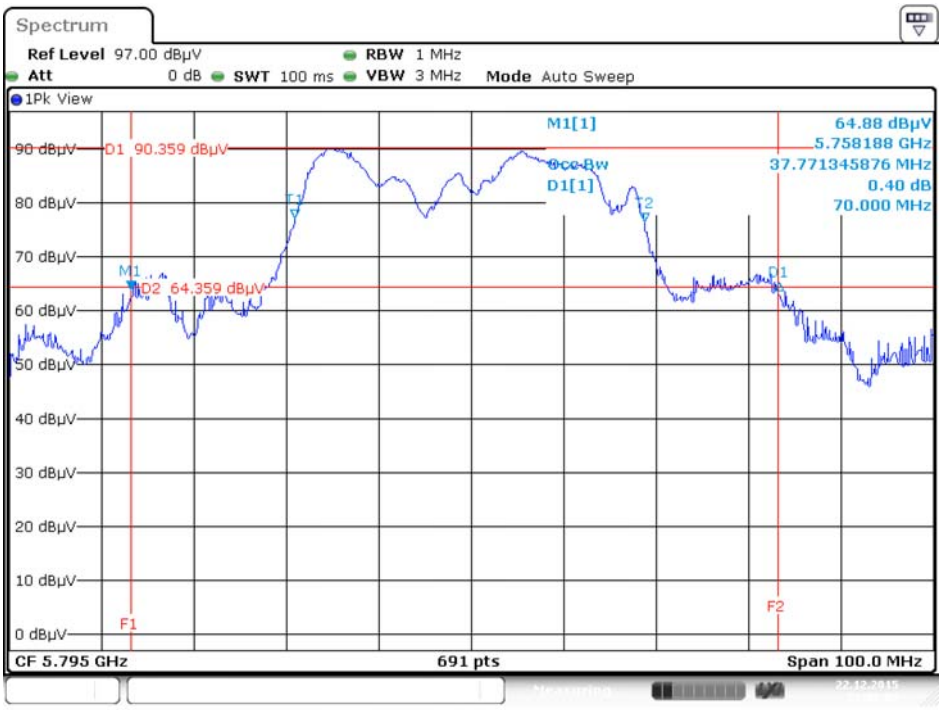
Date: 22.DEC.2015 21:02:17

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



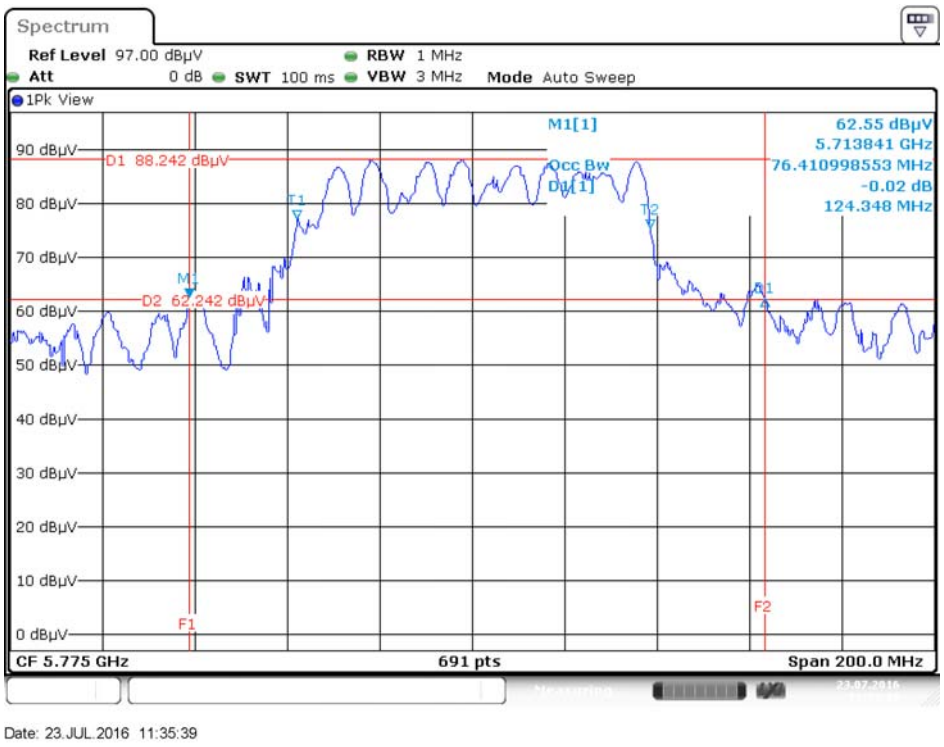
Date: 23.JUL.2016 11:36:26

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



Date: 22.DEC.2015 21:08:03

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

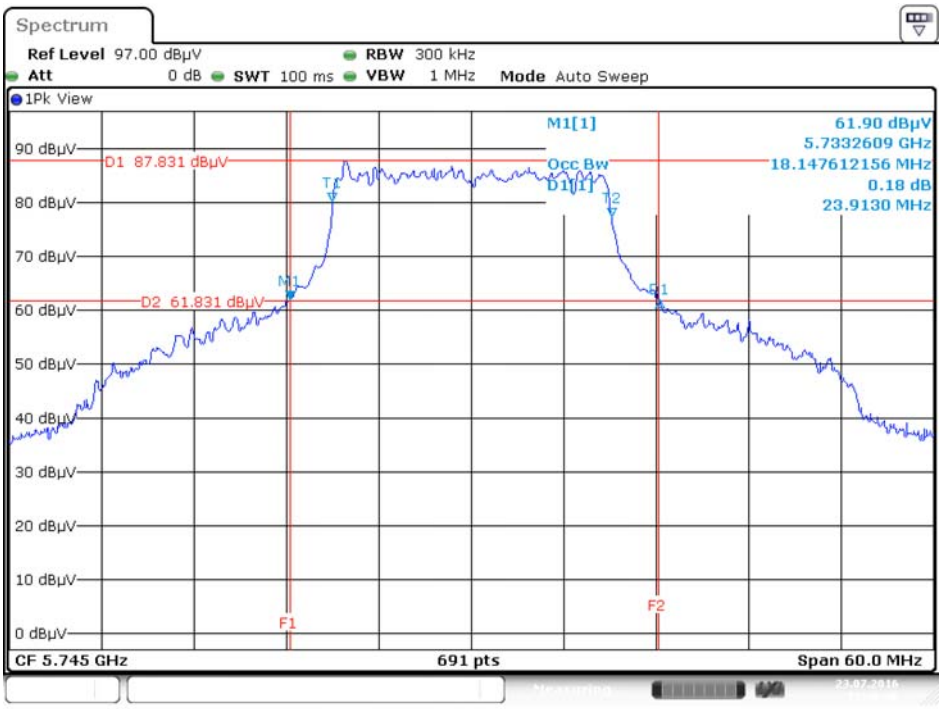


<For Beamforming Mode>

Temperature	23℃	Humidity	55%
Test Engineer	Roki Liu		

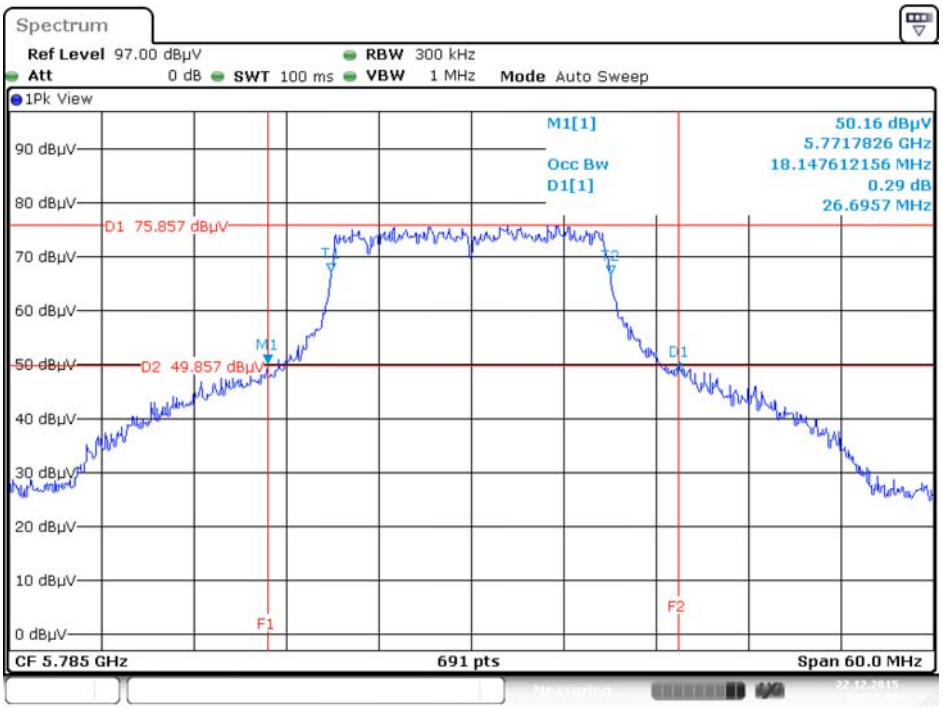
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss2 VHT20	5745 MHz	23.91	18.14
	5785 MHz	26.70	18.15
	5825 MHz	25.74	18.15
802.11ac MCS0/Nss2 VHT40	5755 MHz	68.69	37.48
	5795 MHz	62.46	37.48
802.11ac MCS0/Nss2 VHT80	5775 MHz	142.61	76.12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



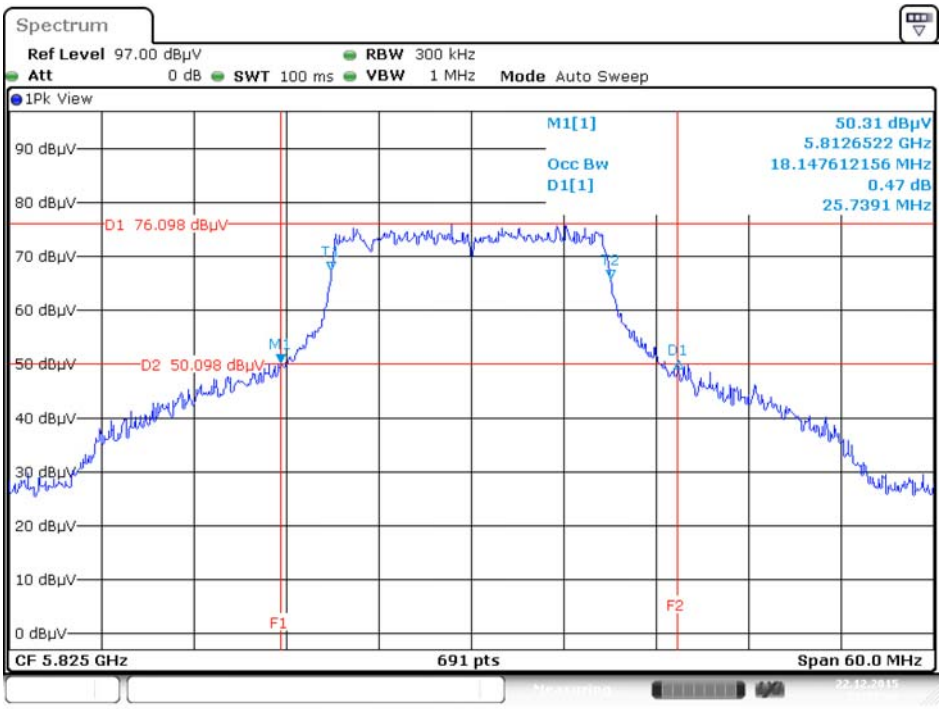
Date: 23.JUL.2016 11:46:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



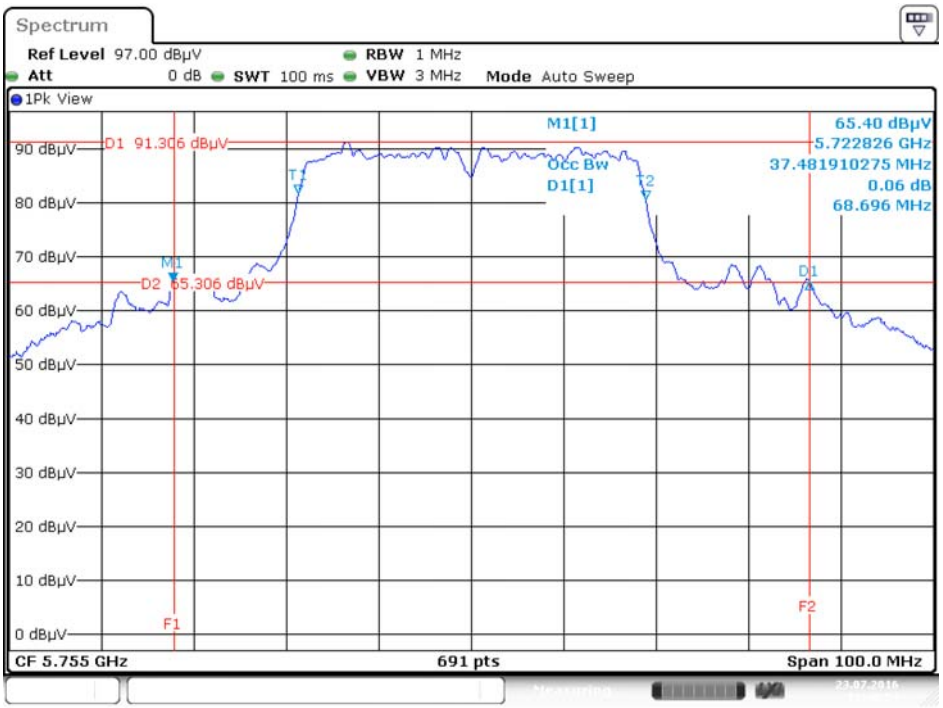
Date: 22.DEC.2015 21:57:28

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



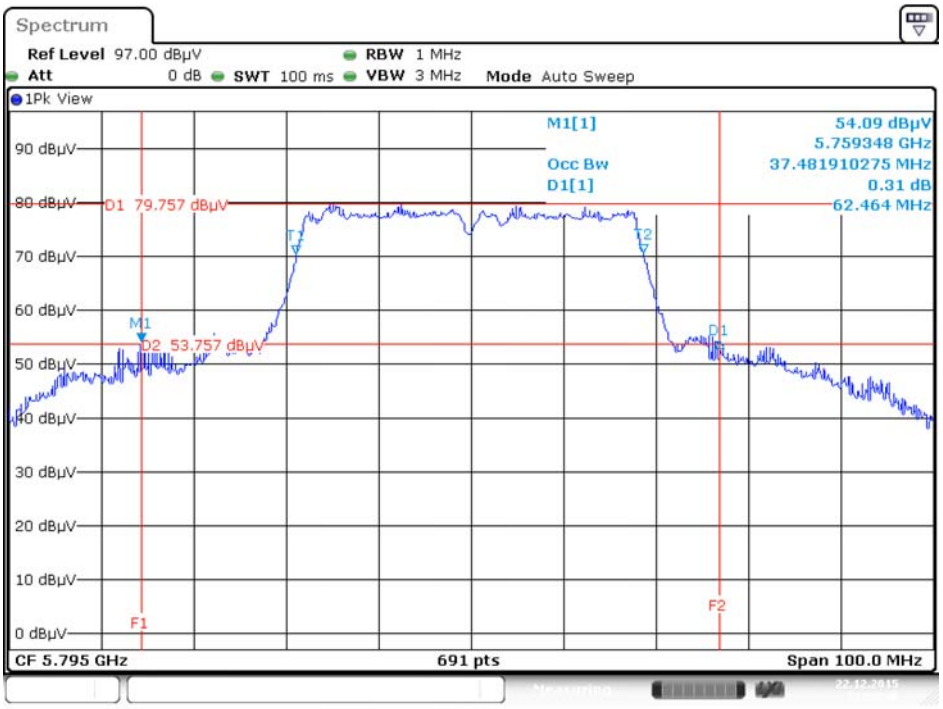
Date: 22.DEC.2015 21:57:47

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5755 MHz



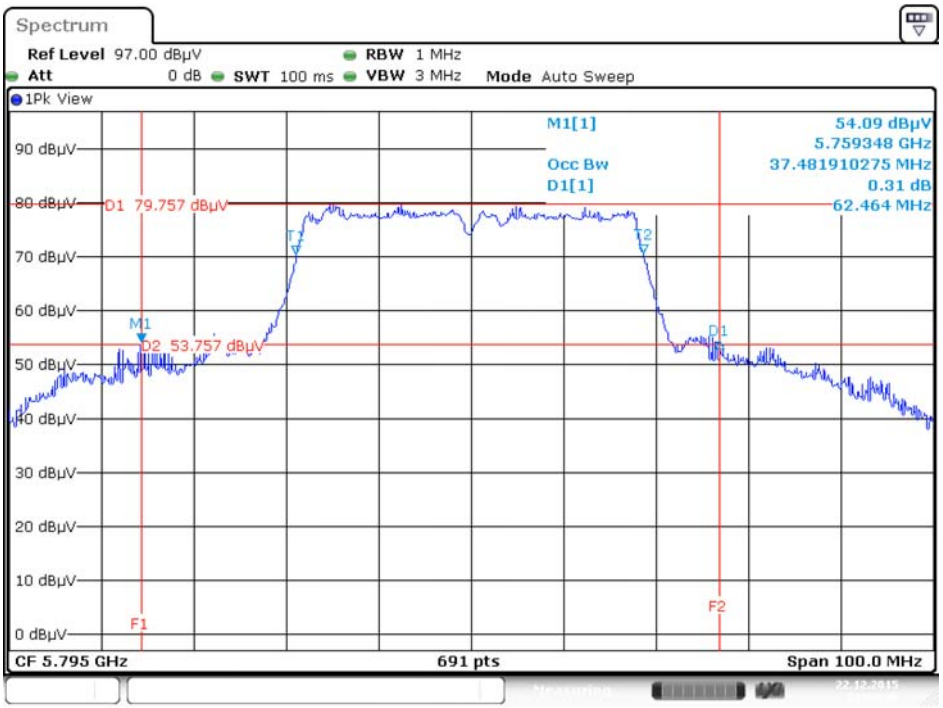
Date: 23.JUL.2016 11:45:54

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



Date: 22.DEC.2015 21:50:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 22.DEC.2015 21:50:46

4.2. 6dB Spectrum Bandwidth Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 v01r02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth.
3. Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.2.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of 6dB Spectrum Bandwidth

<For Non-Beamforming Mode>

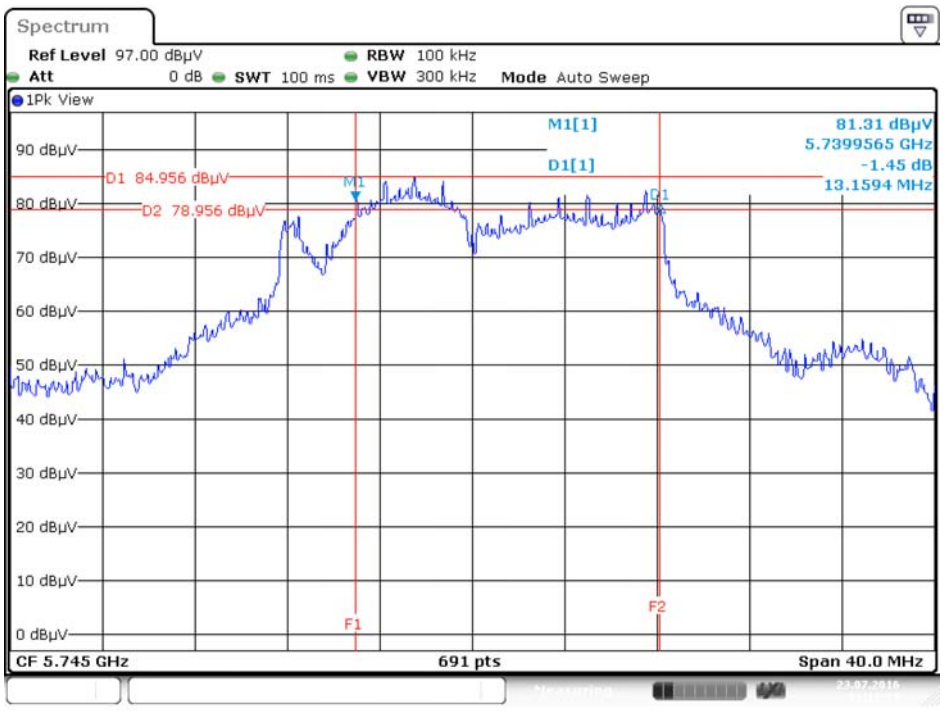
Temperature	23℃	Humidity	55%
Test Engineer	Roki Liu		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	13.16	500	Complies
	5785 MHz	15.42	500	Complies
	5825 MHz	15.25	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.68	500	Complies
	5785 MHz	17.51	500	Complies
	5825 MHz	17.57	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.83	500	Complies
	5795 MHz	27.83	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	74.44	500	Complies

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

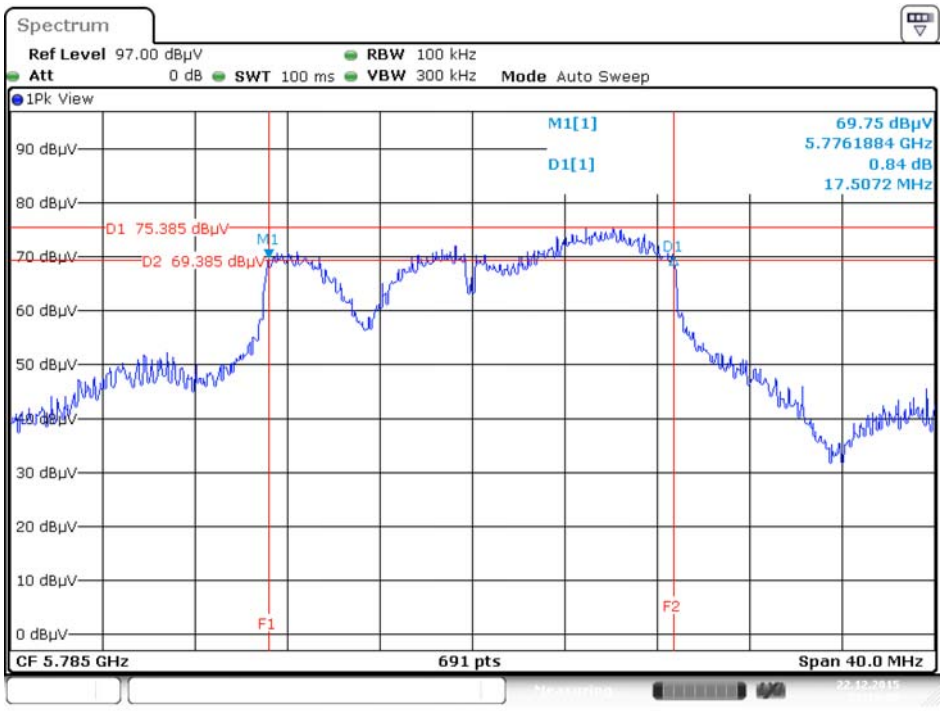
For plots, only the channel with worse result was shown.

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



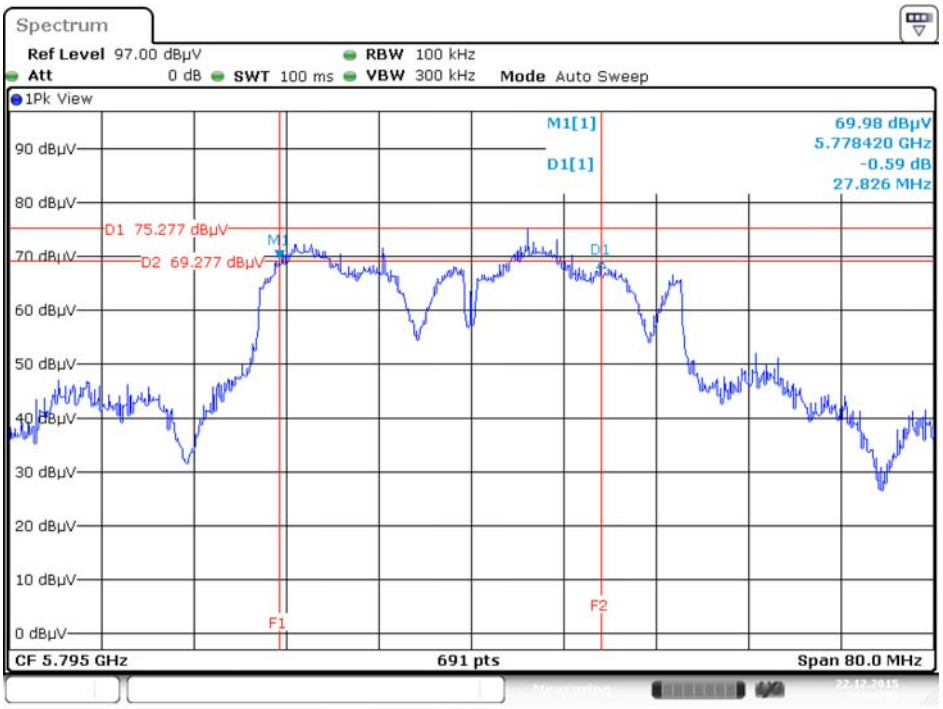
Date: 23.JUL.2016 11:17:33

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



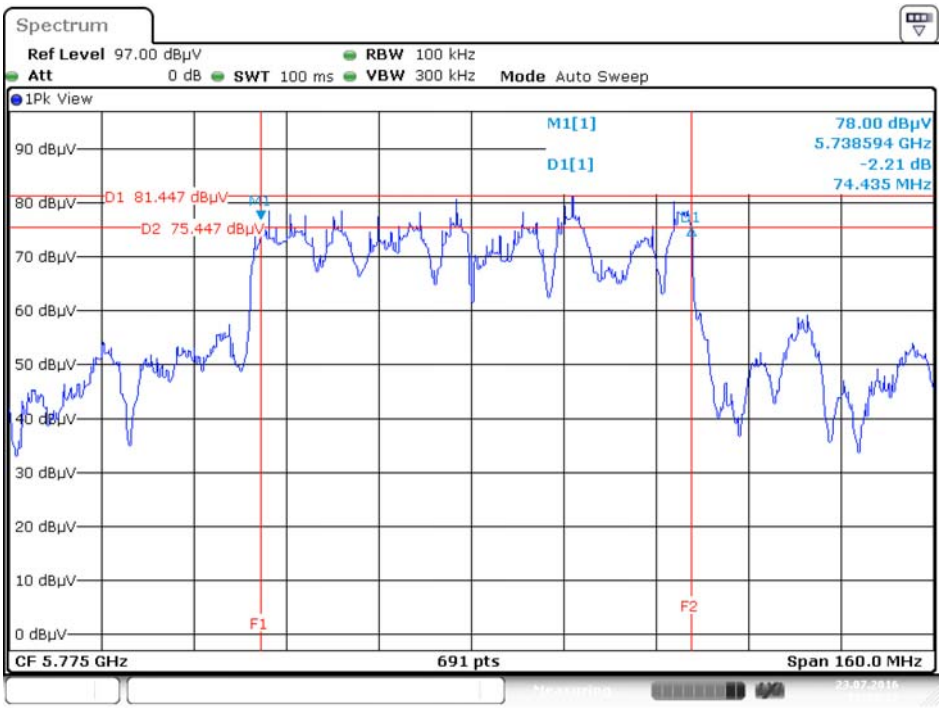
Date: 22.DEC.2015 21:19:08

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795MHz



Date: 22.DEC.2015 21:20:57

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



Date: 23.JUL.2016 11:33:16

<For Beamforming Mode>

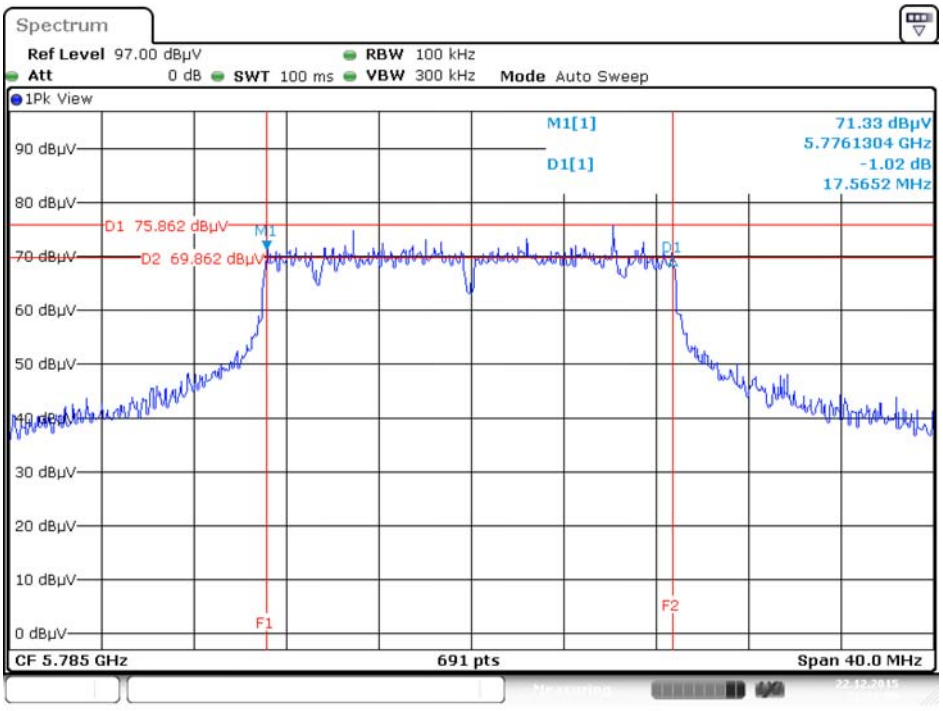
Temperature	23℃	Humidity	55%
Test Engineer	Roki Liu		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss2 VHT20	5745 MHz	17.68	500	Complies
	5785 MHz	17.57	500	Complies
	5825 MHz	17.57	500	Complies
802.11ac MCS0/Nss2 VHT40	5755 MHz	36.41	500	Complies
	5795 MHz	35.25	500	Complies
802.11ac MCS0/Nss2 VHT80	5775 MHz	73.97	500	Complies

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

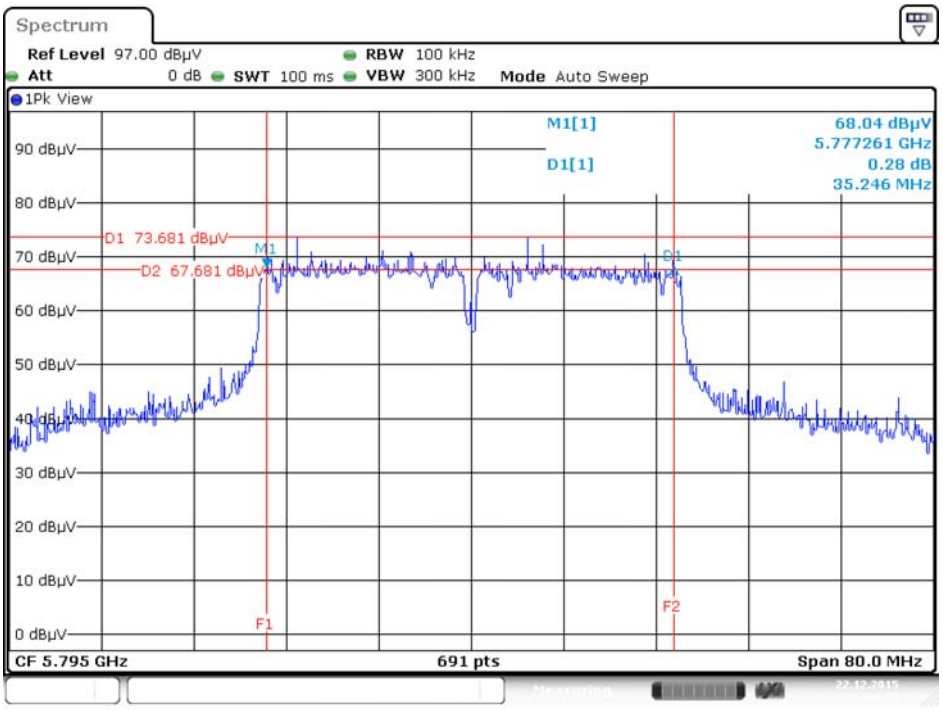
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



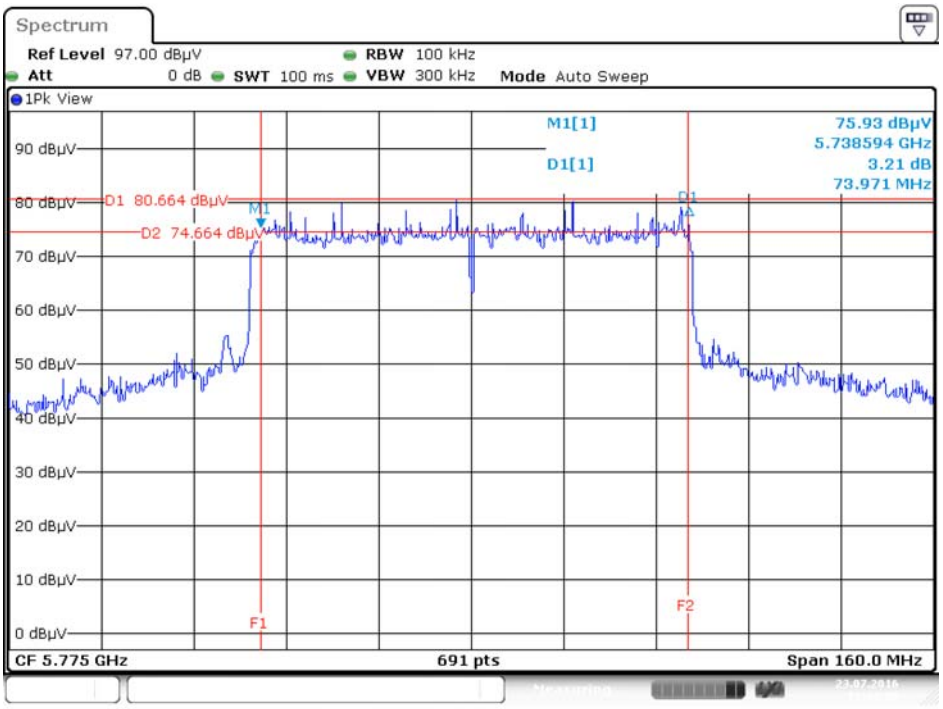
Date: 22.DEC.2015 22:02:00

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795MHz



Date: 22.DEC.2015 22:04:24

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



4.3. Maximum Conducted Output Power Measurement

4.3.1. 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.
	☐	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.

☐	5.25-5.35 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☐	5.470-5.725 GHz	
☒	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.

4.3.2. Measuring Instruments and Setting

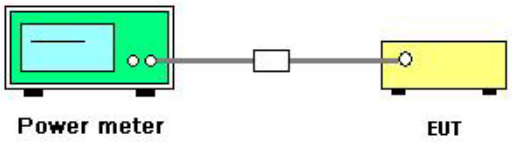
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01r02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Maximum Conducted Output Power

<For Non-Beamforming Mode>

Temperature	23℃	Humidity	55%
Test Engineer	Roki Liu	Test Date	Jul. 19, 2016~Jul. 23, 2016

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11a	5745 MHz	19.85	20.15	20.30	19.58	26.00	30.00	Complies
	5785 MHz	19.84	19.93	20.11	19.24	25.81	30.00	Complies
	5825 MHz	19.67	19.62	19.85	19.12	25.59	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	19.84	20.12	20.18	19.28	25.89	30.00	Complies
	5785 MHz	19.84	19.78	20.34	19.48	25.89	30.00	Complies
	5825 MHz	19.88	19.51	20.21	19.27	25.75	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	20.68	20.37	20.46	19.46	26.29	30.00	Complies
	5795 MHz	20.23	20.14	20.56	20.16	26.30	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	18.27	18.31	18.57	17.35	24.17	30.00	Complies

<For Beamforming Mode>

Temperature	23°C	Humidity	55%
Test Engineer	Roki Liu	Test Date	Jul. 19, 2016~Jul. 23, 2016

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss2 VHT20	5745 MHz	19.84	20.12	20.18	19.28	25.89	30.00	Complies
	5785 MHz	19.84	19.78	20.34	19.48	25.89	30.00	Complies
	5825 MHz	19.88	19.51	20.21	19.27	25.75	30.00	Complies
802.11ac MCS0/Nss2 VHT40	5755 MHz	20.68	20.37	20.46	19.46	26.29	30.00	Complies
	5795 MHz	20.23	20.14	20.56	20.16	26.30	30.00	Complies
802.11ac MCS0/Nss2 VHT80	5775 MHz	20.08	20.05	20.19	19.09	25.89	30.00	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =4.43dBi<6dBi, so Power Limit 30dBm.

4.4. Power Spectral Density Measurement

4.4.1. Limit

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

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
	☐	Client devices	11 dBm/MHz
☐	5.25-5.35 GHz		11 dBm/MHz
☐	5.470-5.725 GHz		11 dBm/MHz
☒	5.725~5.85 GHz		30 dBm/500kHz

4.4.2. Measuring Instruments and Setting

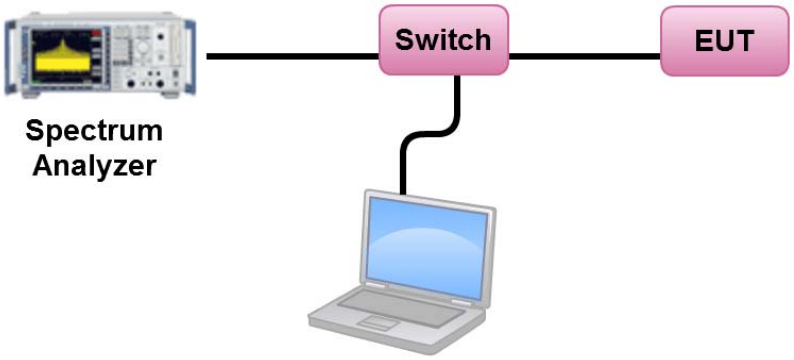
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01r02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements and sum the spectra across the outputs.
4. For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Power Spectral Density

<For Non-Beamforming Mode>

Temperature	23℃	Humidity	55%
Test Engineer	Roki Liu	Test Date	Jul. 19, 2016~Jul. 23, 2016

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

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	13.15	-3.01	10.14	28.56	Complies
157	5785 MHz	12.81	-3.01	9.80	28.56	Complies
165	5825 MHz	12.76	-3.01	9.75	28.56	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.44dBi, so limit =30-(7.44-6)=28.56 dBm/500kHz

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

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	12.76	-3.01	9.75	28.56	Complies
157	5785 MHz	12.65	-3.01	9.64	28.56	Complies
165	5825 MHz	12.54	-3.01	9.53	28.56	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.44dBi, so limit =30-(7.44-6)=28.56 dBm/500kHz

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

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	10.11	-3.01	7.10	28.56	Complies
159	5795 MHz	7.56	-3.01	4.55	28.56	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.44dBi, so limit =30-(7.44-6)=28.56 dBm/500kHz

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

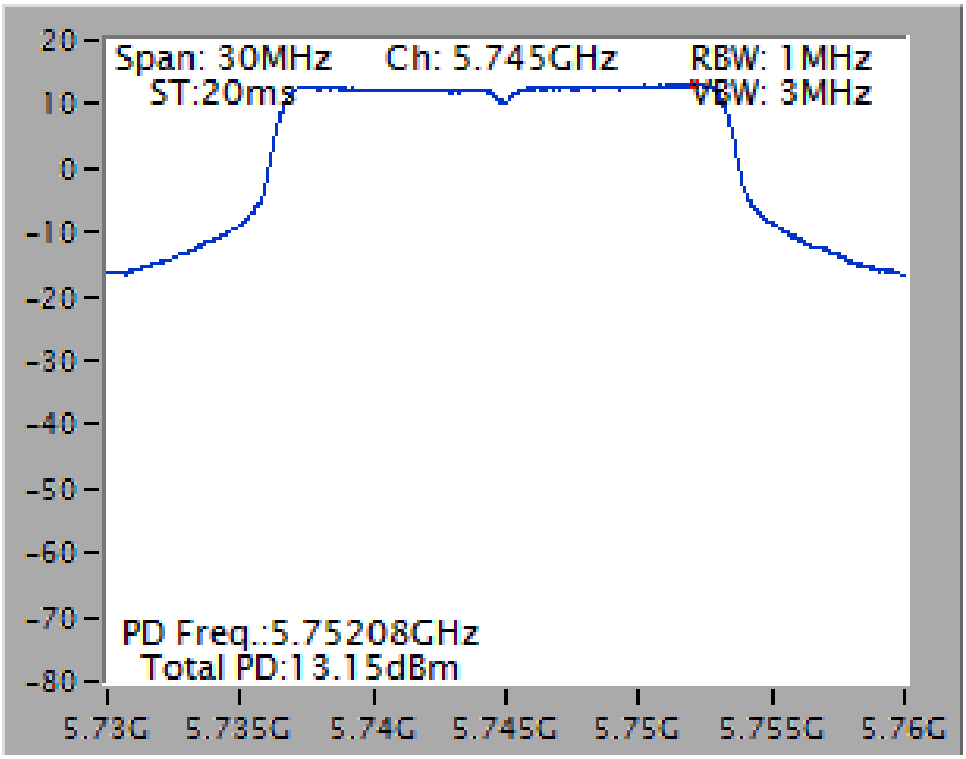
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	4.98	-3.01	1.97	28.56	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.44dBi, so limit =30-(7.44-6)=28.56 dBm/500kHz

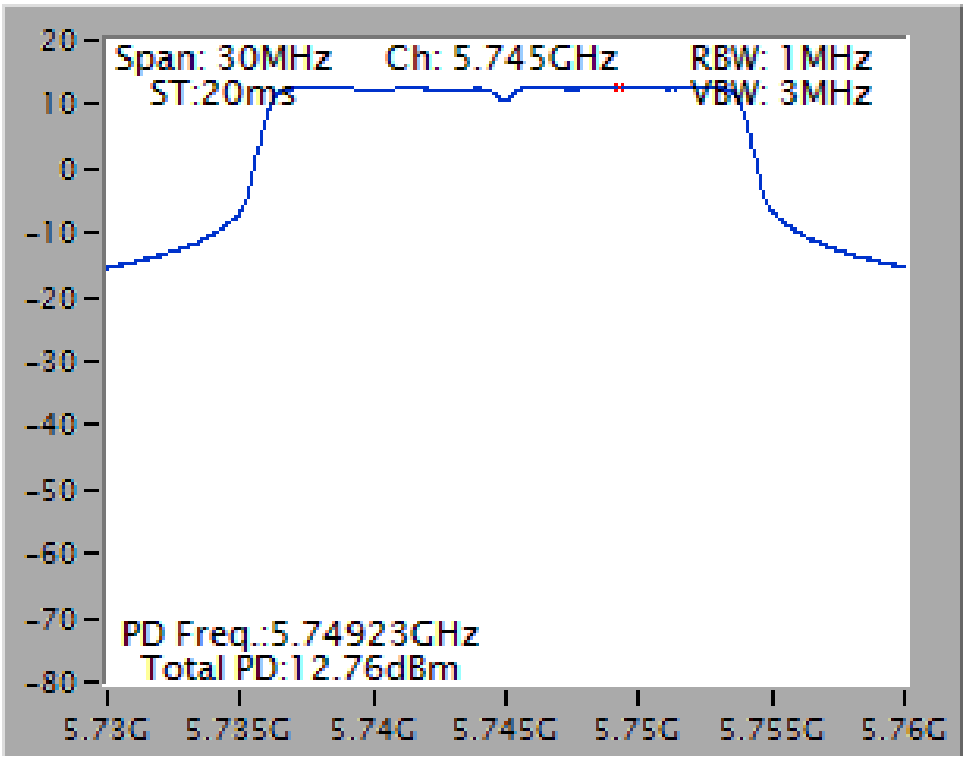
Note: All the test values were listed in the report.

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

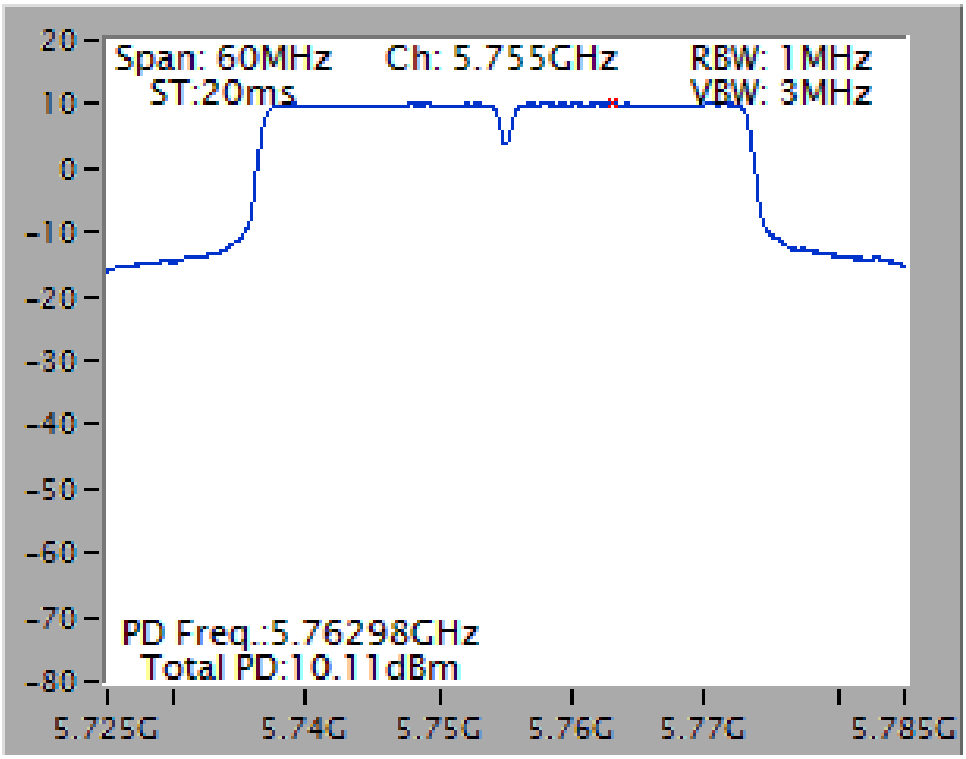
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



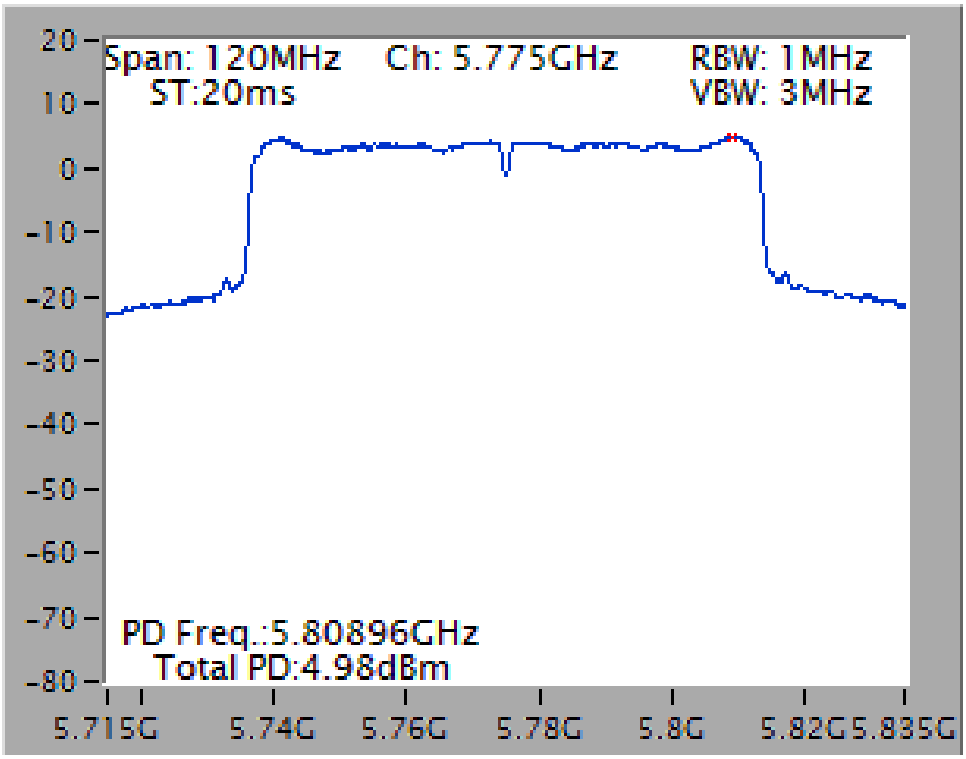
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5755 MHz



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



<For Beamforming Mode>

Temperature	23°C	Humidity	55%
Test Engineer	Roki Liu	Test Date	Jul. 19, 2016~Jul. 23, 2016

Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	12.76	-3.01	9.75	30.00	Complies
157	5785 MHz	12.65	-3.01	9.64	30.00	Complies
165	5825 MHz	12.54	-3.01	9.53	30.00	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =4.43dBi<6dBi, so the limit doesn't reduce.

Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	10.11	-3.01	7.10	30.00	Complies
159	5795 MHz	7.56	-3.01	4.55	30.00	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =4.43dBi<6dBi, so the limit doesn't reduce.

Configuration IEEE 802.11ac MCS0/Nss2 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4

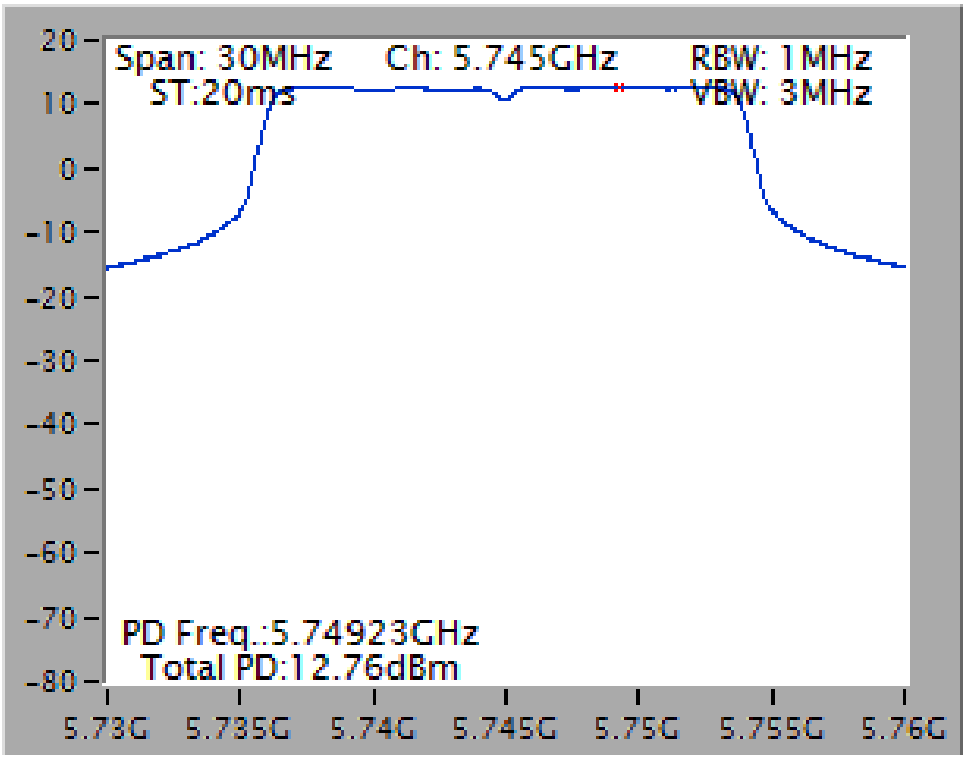
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	6.66	-3.01	3.65	30.00	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =4.43dBi<6dBi, so the limit doesn't reduce.

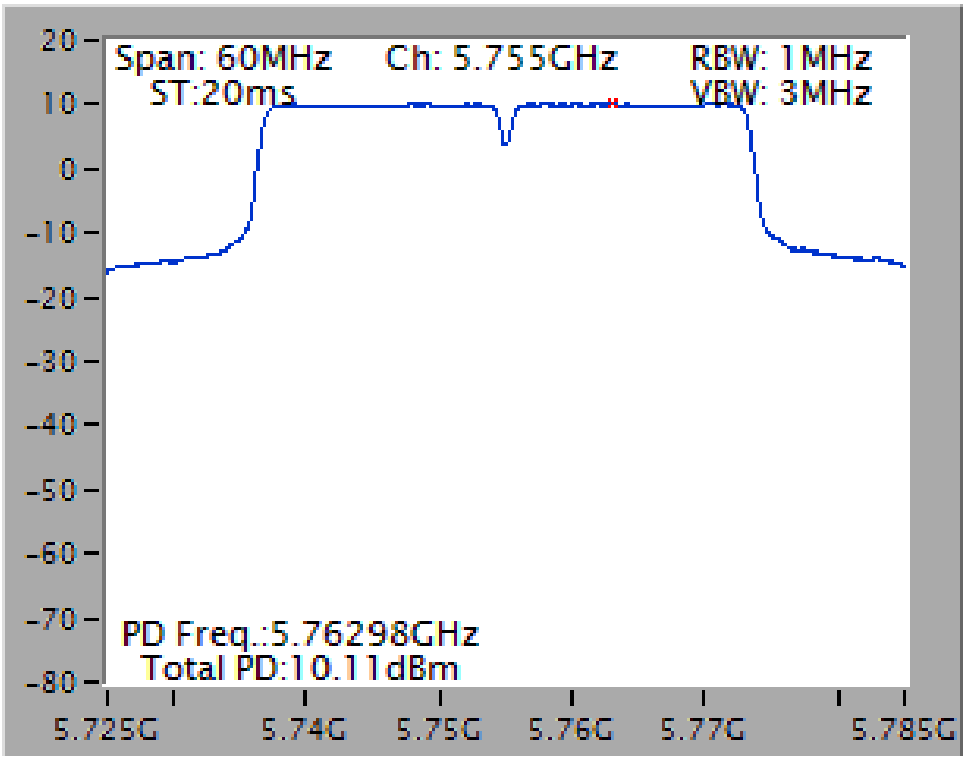
Note: All the test values were listed in the report.

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

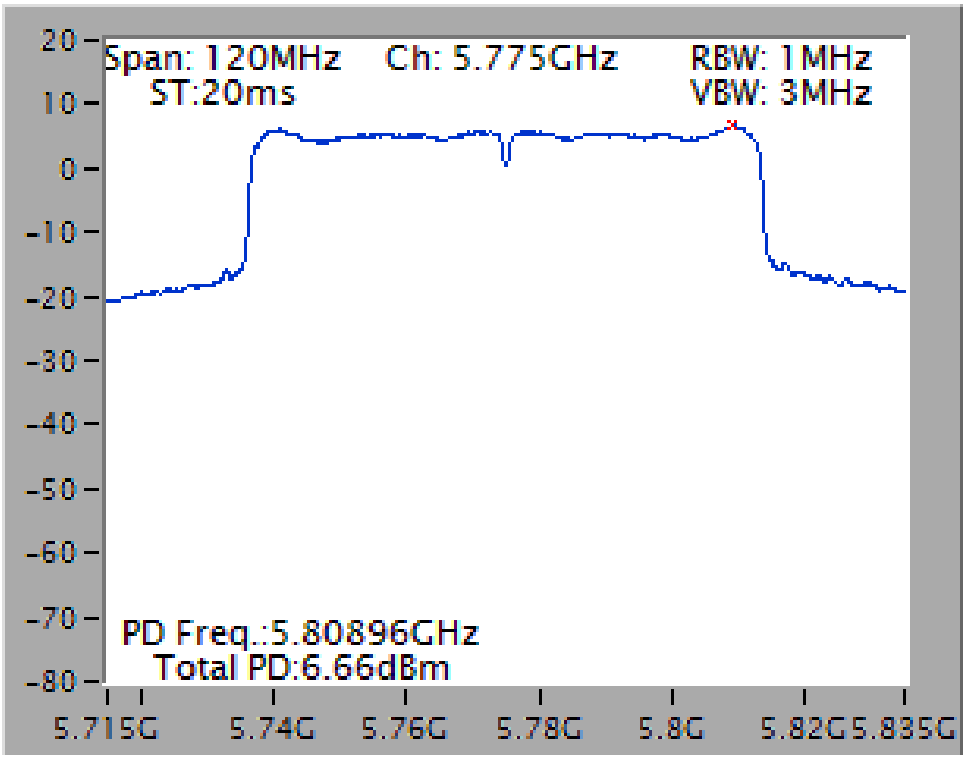
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5745 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5755 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



4.5. Radiated Emissions Measurement

4.5.1. Limit

For transmitters operating in the 5.725-5.85 GHz band: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.5.2. Measuring Instruments and Setting

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

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

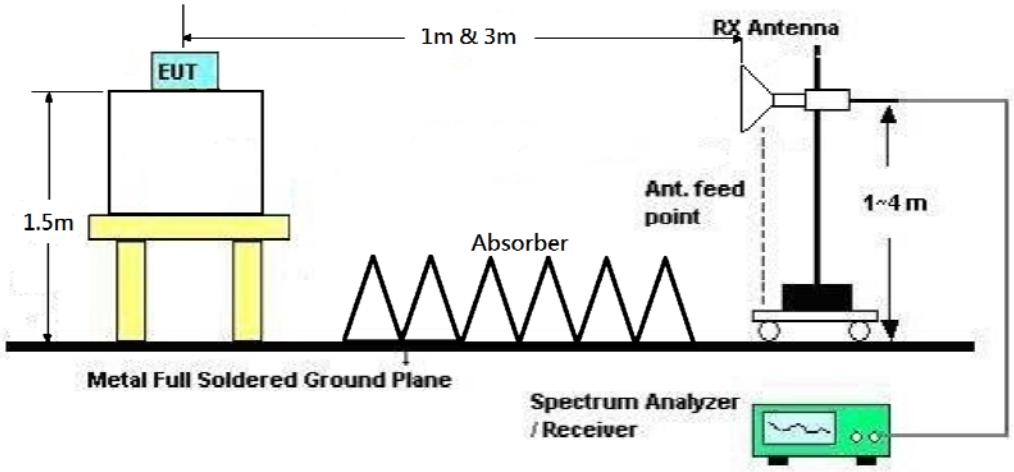
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.5.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.5.4. Test Setup Layout

For Radiated Emissions: Above 1GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

<For Non-Beamforming Mode>

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11490.02	50.90	54.00	-3.10	37.18	10.51	39.20	35.99	183	43	Average	HORIZONTAL
2	11492.00	64.45	74.00	-9.55	50.73	10.51	39.20	35.99	183	43	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	11487.26	46.36	54.00	-7.64	32.64	10.51	39.20	35.99	179	66	Average	VERTICAL
2	11488.28	59.52	74.00	-14.48	45.80	10.51	39.20	35.99	179	66	Peak	VERTICAL

Temperature	23℃	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11571.50	50.03	54.00	-3.97	36.38	10.51	39.15	36.01	183	40	Average	HORIZONTAL
2	11572.04	63.73	74.00	-10.27	50.08	10.51	39.15	36.01	183	40	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	11567.44	59.61	74.00	-14.39	45.96	10.51	39.15	36.01	178	71	Peak	VERTICAL
2	11567.92	46.09	54.00	-7.91	32.44	10.51	39.15	36.01	178	71	Average	VERTICAL

Temperature	23℃	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11650.08	49.78	54.00	-4.22	36.20	10.51	39.09	36.02	232	45	Average	HORIZONTAL
2	11651.54	62.10	74.00	-11.90	48.54	10.51	39.07	36.02	232	45	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	11649.96	45.36	54.00	-8.64	31.78	10.51	39.09	36.02	205	43	Average	VERTICAL
2	11651.80	57.50	74.00	-16.50	43.94	10.51	39.07	36.02	205	43	Peak	VERTICAL

Temperature	23℃	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11489.86	50.83	54.00	-3.17	37.11	10.51	39.20	35.99	182	44	Average	HORIZONTAL
2	11489.92	63.90	74.00	-10.10	50.18	10.51	39.20	35.99	182	44	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	11487.82	46.18	54.00	-7.82	32.46	10.51	39.20	35.99	176	64	Average	VERTICAL
2	11488.28	60.44	74.00	-13.56	46.72	10.51	39.20	35.99	176	64	Peak	VERTICAL

Temperature	23℃	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11569.20	62.96	74.00	-11.04	49.31	10.51	39.15	36.01	229	46	Peak	HORIZONTAL
2	11569.92	50.09	54.00	-3.91	36.44	10.51	39.15	36.01	229	46	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	11569.96	46.27	54.00	-7.73	32.62	10.51	39.15	36.01	234	48	Average	VERTICAL
2	11570.82	59.74	74.00	-14.26	46.09	10.51	39.15	36.01	234	48	Peak	VERTICAL

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11650.14	49.31	54.00	-4.69	35.73	10.51	39.09	36.02	209	42	Average	HORIZONTAL
2	11650.14	62.82	74.00	-11.18	49.24	10.51	39.09	36.02	209	42	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	11653.14	60.33	74.00	-13.67	46.77	10.51	39.07	36.02	210	133	Peak	VERTICAL
2	11653.74	45.74	54.00	-8.26	32.18	10.51	39.07	36.02	210	133	Average	VERTICAL

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11510.02	48.39	54.00	-5.61	34.68	10.51	39.20	36.00	211	43	Average	HORIZONTAL
2	11510.58	60.45	74.00	-13.55	46.74	10.51	39.20	36.00	211	43	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	11509.90	44.75	54.00	-9.25	31.04	10.51	39.20	36.00	140	54	Average	VERTICAL
2	11510.34	58.17	74.00	-15.83	44.46	10.51	39.20	36.00	140	54	Peak	VERTICAL

Temperature	23℃	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11589.82	61.33	74.00	-12.67	47.72	10.51	39.12	36.02	232	42	Peak	HORIZONTAL
2	11590.10	48.75	54.00	-5.25	35.14	10.51	39.12	36.02	232	42	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	11589.70	45.77	54.00	-8.23	32.16	10.51	39.12	36.02	129	54	Average	VERTICAL
2	11590.10	58.36	74.00	-15.64	44.75	10.51	39.12	36.02	129	54	Peak	VERTICAL

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11549.94	46.40	54.00	-7.60	32.73	10.51	39.17	36.01	212	32	Average	HORIZONTAL
2	11552.14	57.14	74.00	-16.86	43.49	10.51	39.15	36.01	212	32	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	11549.68	55.46	74.00	-18.54	41.79	10.51	39.17	36.01	203	261	Peak	VERTICAL
2	11549.94	44.94	54.00	-9.06	31.27	10.51	39.17	36.01	203	261	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.

<For Beamforming Mode>

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11489.94	47.09	54.00	-6.91	33.37	10.51	39.20	35.99	182	30	Average	HORIZONTAL
2	11491.06	60.94	74.00	-13.06	47.22	10.51	39.20	35.99	182	30	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	11486.84	56.86	74.00	-17.14	43.14	10.51	39.20	35.99	172	54	Peak	VERTICAL
2	11489.86	44.25	54.00	-9.75	30.53	10.51	39.20	35.99	172	54	Average	VERTICAL

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11571.14	60.93	74.00	-13.07	47.28	10.51	39.15	36.01	185	36	Peak	HORIZONTAL
2	11572.12	47.98	54.00	-6.02	34.33	10.51	39.15	36.01	185	36	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	11568.53	58.09	74.00	-15.91	44.44	10.51	39.15	36.01	232	47	Peak	VERTICAL
2	11571.04	45.24	54.00	-8.76	31.59	10.51	39.15	36.01	232	47	Average	VERTICAL

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.97	48.54	54.00	-5.46	34.96	10.51	39.09	36.02	172	30	Average	HORIZONTAL
2	11649.97	60.95	74.00	-13.05	47.37	10.51	39.09	36.02	172	30	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	11649.89	45.43	54.00	-8.57	31.85	10.51	39.09	36.02	146	90	Average	VERTICAL
2	11649.97	57.69	74.00	-16.31	44.11	10.51	39.09	36.02	146	90	Peak	VERTICAL

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss2 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11509.81	57.06	74.00	-16.94	43.35	10.51	39.20	36.00	185	29	Peak	HORIZONTAL
2	11510.02	45.43	54.00	-8.57	31.72	10.51	39.20	36.00	185	29	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	11505.43	55.49	74.00	-18.51	41.77	10.51	39.20	35.99	202	262	Peak	VERTICAL
2	11510.05	44.05	54.00	-9.95	30.34	10.51	39.20	36.00	202	262	Average	VERTICAL

Temperature	23℃	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss2 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11589.92	46.73	54.00	-7.27	33.12	10.51	39.12	36.02	212	28	Average	HORIZONTAL
2	11590.03	57.30	74.00	-16.70	43.69	10.51	39.12	36.02	212	28	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	11589.95	44.22	54.00	-9.78	30.61	10.51	39.12	36.02	191	269	Average	VERTICAL
2	11590.59	56.09	74.00	-17.91	42.48	10.51	39.12	36.02	191	269	Peak	VERTICAL

Temperature	23℃	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss2 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jul. 14, 2016~Jul. 20, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11549.94	57.39	74.00	-16.61	43.72	10.51	39.17	36.01	188	26	Peak	HORIZONTAL
2	11549.95	46.96	54.00	-7.04	33.29	10.51	39.17	36.01	188	26	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	11549.90	45.20	54.00	-8.80	31.53	10.51	39.17	36.01	195	261	Average	VERTICAL
2	11550.08	56.99	74.00	-17.01	43.32	10.51	39.17	36.01	195	261	Peak	VERTICAL

Note:

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

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

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

4.6. Band Edge Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.725-5.85 GHz band: all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.6.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 3MHz for Peak

4.6.3. Test Procedures

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

4.6.4. Test Setup Layout

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

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

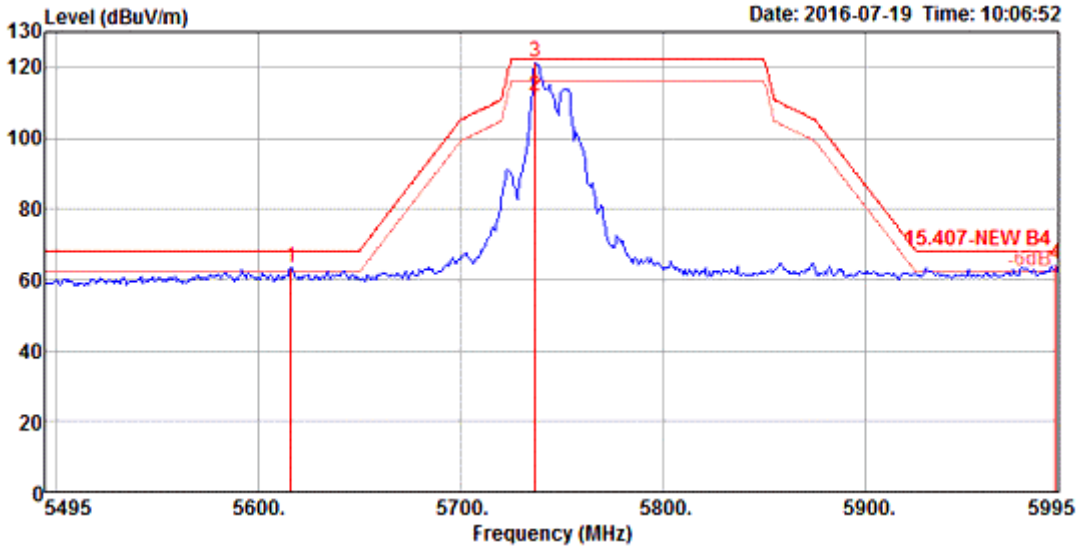
The EUT was programmed to be in continuously transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

<For Non-Beamforming Mode>

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4

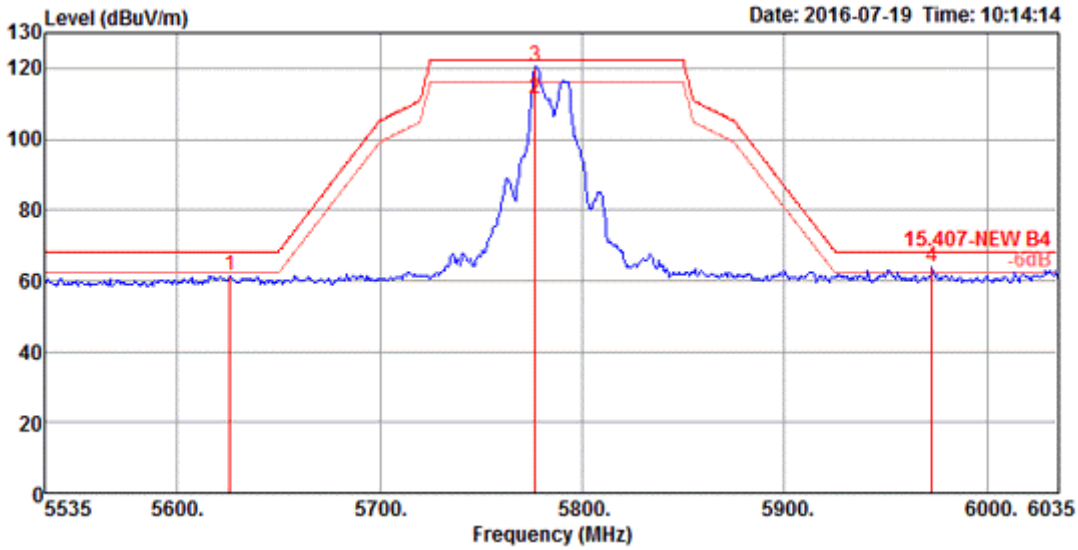
Channel 149



	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	5616.00	63.55	68.20	-4.65	57.51	8.46	34.13	36.55	171	91	Peak	VERTICAL
2	5737.00	111.75			105.39	8.42	34.45	36.51	171	91	Average	VERTICAL
3	5737.00	121.44			115.08	8.42	34.45	36.51	171	91	Peak	VERTICAL
4	5994.00	64.11	68.20	-4.09	56.99	8.36	35.20	36.44	171	91	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5745 MHz.

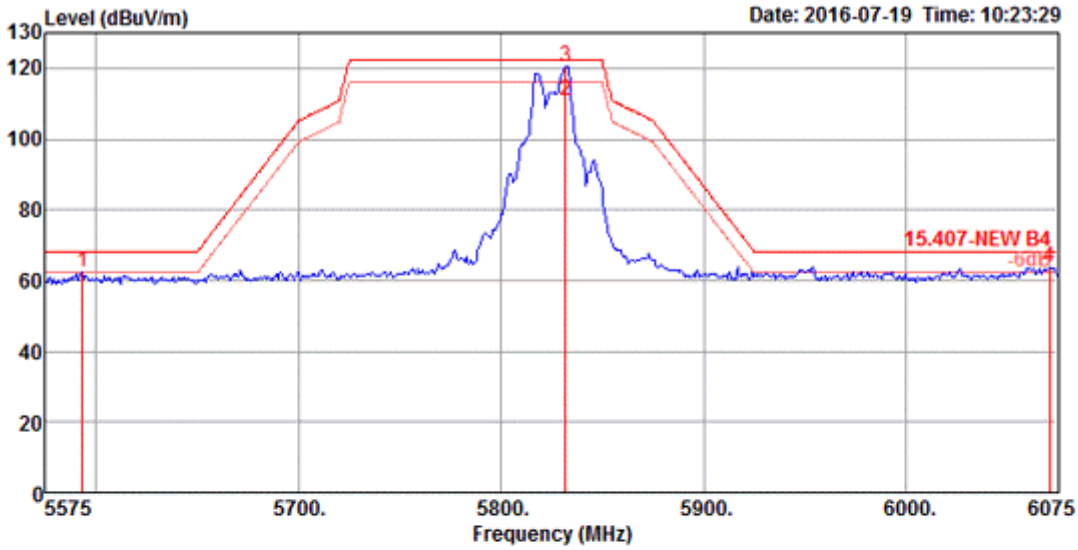
Channel 157



	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	5626.00	61.35	68.20	-6.85	55.27	8.46	34.17	36.55	181	87	Peak	VERTICAL
2	5777.00	111.20			104.70	8.41	34.59	36.50	181	87	Average	VERTICAL
3	5777.00	120.59			114.09	8.41	34.59	36.50	181	87	Peak	VERTICAL
4	5973.00	63.95	68.20	-4.25	56.91	8.37	35.11	36.44	181	87	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5785 MHz.

Channel 165

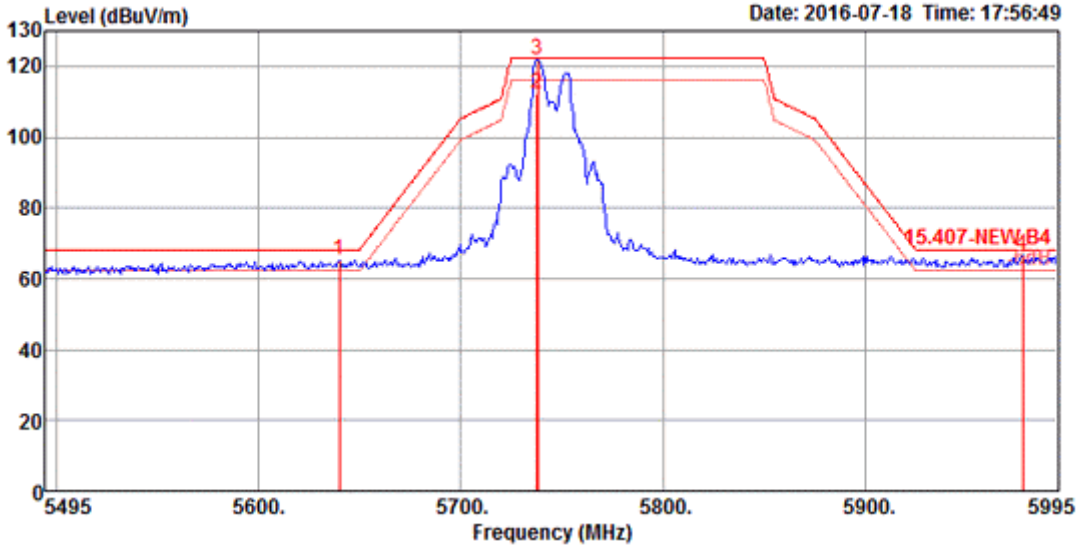


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5593.00	62.19	68.20	-6.01	56.20	8.47	34.08	36.56	197	70	Peak	VERTICAL
2	5832.00	110.88			104.24	8.39	34.73	36.48	197	70	Average	VERTICAL
3	5832.00	120.32			113.68	8.39	34.73	36.48	197	70	Peak	VERTICAL
4	6071.00	63.85	68.20	-4.35	56.39	8.59	35.29	36.42	197	70	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5825 MHz.

Temperature	23℃	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4

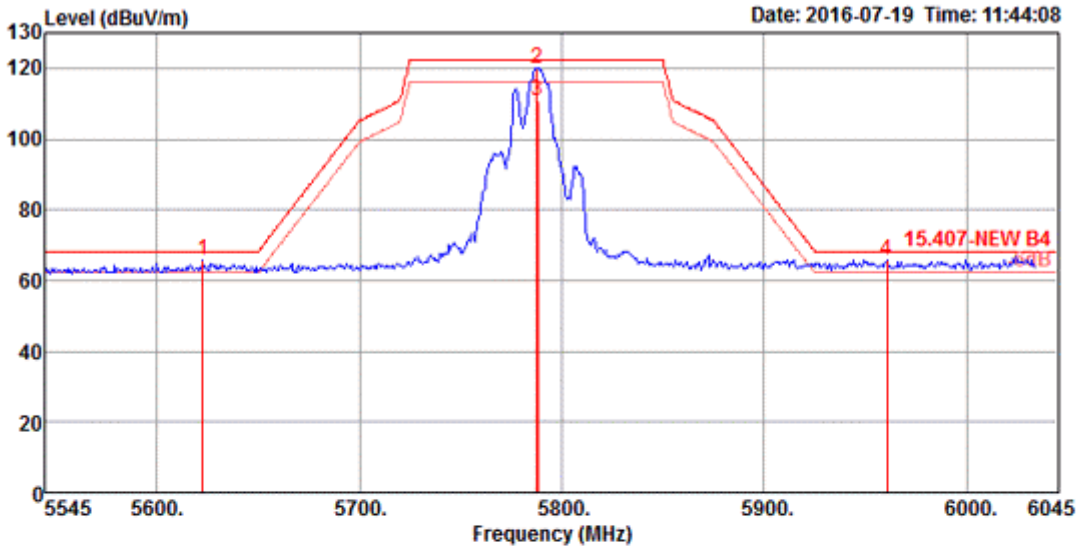
Channel 149



	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	5640.00	65.40	68.20	-2.80	59.31	8.46	34.17	36.54	179	73	Peak	VERTICAL
2	5737.79	112.43			106.07	8.42	34.45	36.51	179	73	Average	VERTICAL
3	5738.00	122.04			115.68	8.42	34.45	36.51	179	73	Peak	VERTICAL
4	5977.50	66.87	68.20	-1.33	59.80	8.36	35.15	36.44	179	73	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5745 MHz.

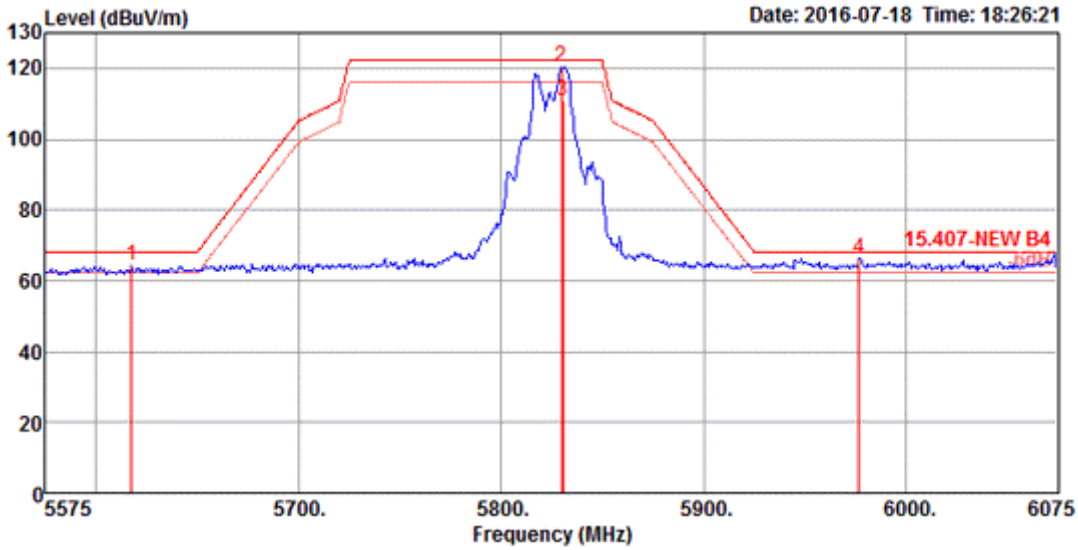
Channel 157



	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	5622.50	65.60	68.20	-2.60	59.56	8.46	34.13	36.55	214	45	Peak	VERTICAL
2	5787.50	120.07			113.57	8.41	34.59	36.50	214	45	Peak	VERTICAL
3	5788.21	110.95			104.45	8.41	34.59	36.50	214	45	Average	VERTICAL
4	5960.50	65.95	68.20	-2.25	58.91	8.37	35.11	36.44	214	45	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5785 MHz.

Channel 165

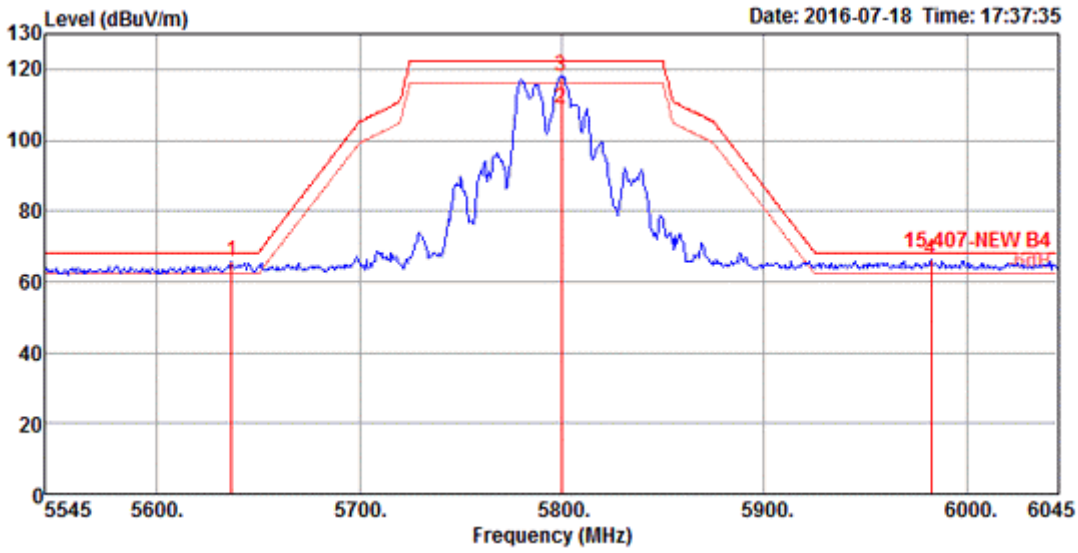


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5617.50	64.22	68.20	-3.98	58.18	8.46	34.13	36.55	202	74	Peak	VERTICAL
2	5830.00	120.38			113.74	8.39	34.73	36.48	202	74	Peak	VERTICAL
3	5830.61	111.03			104.39	8.39	34.73	36.48	202	74	Average	VERTICAL
4	5977.00	66.32	68.20	-1.88	59.25	8.36	35.15	36.44	202	74	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5825 MHz.

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4

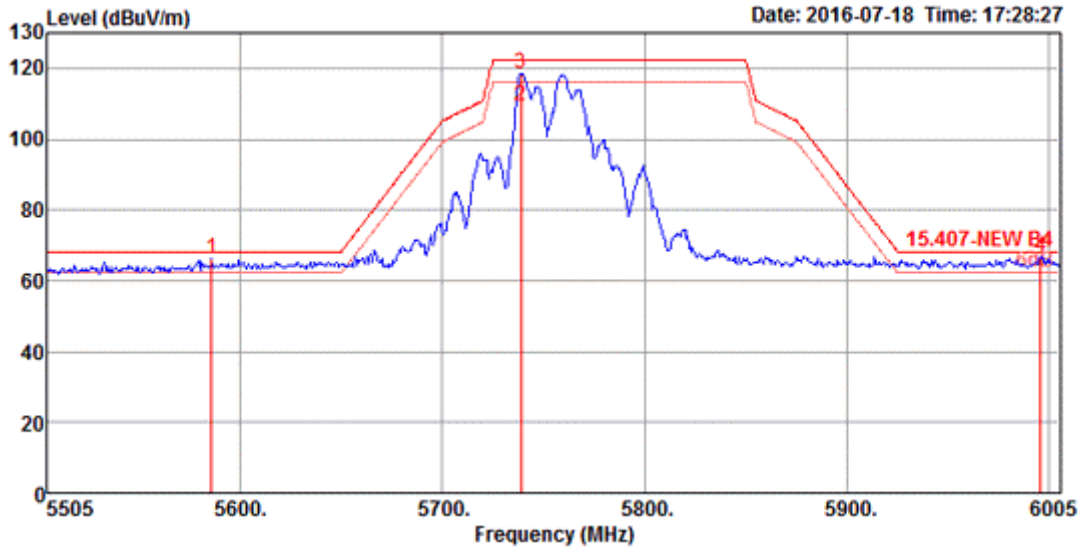
Channel 151



	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	5637.00	65.62	68.20	-2.58	59.53	8.46	34.17	36.54	205	34	Peak	VERTICAL
2	5799.81	109.07			102.53	8.40	34.64	36.50	205	34	Average	VERTICAL
3	5800.00	118.08			111.54	8.40	34.64	36.50	205	34	Peak	VERTICAL
4	5982.50	66.03	68.20	-2.17	58.96	8.36	35.15	36.44	205	34	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5755 MHz.

Channel 159

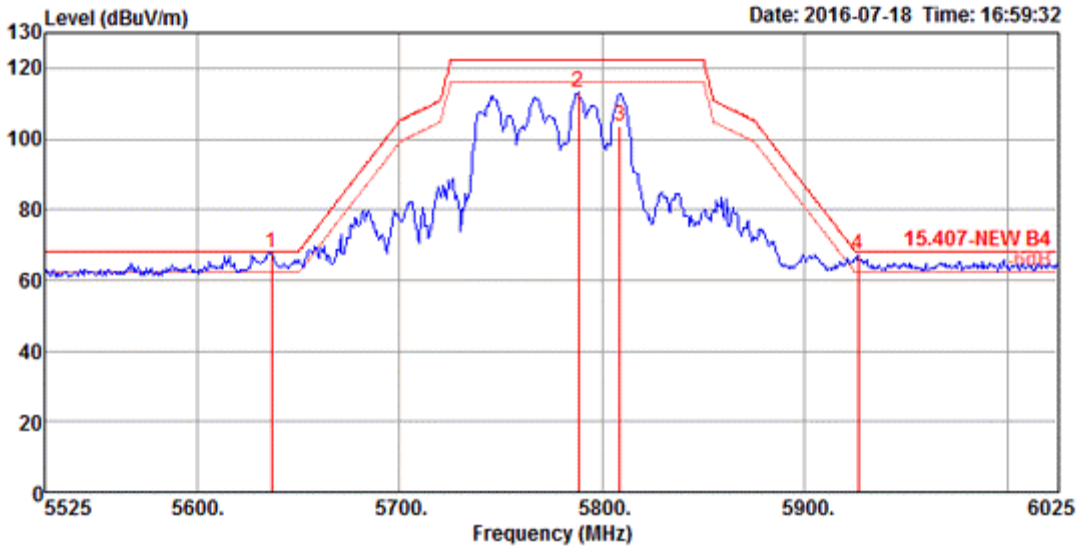


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5586.00	66.32	68.20	-1.88	60.43	8.42	34.03	36.56	210	36	Peak	VERTICAL
2	5738.97	109.28			102.87	8.42	34.50	36.51	210	36	Average	VERTICAL
3	5739.00	118.68			112.27	8.42	34.50	36.51	210	36	Peak	VERTICAL
4	5995.50	66.52	68.20	-1.68	59.39	8.36	35.20	36.43	210	36	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5795 MHz.

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4

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	5636.50	67.65	68.20	-0.55	61.56	8.46	34.17	36.54	150	93	Peak	VERTICAL
2	5788.00	112.99			106.49	8.41	34.59	36.50	150	93	Peak	VERTICAL
3	5808.65	103.39			96.79	8.40	34.69	36.49	150	93	Average	VERTICAL
4	5926.50	66.97	68.20	-1.23	60.04	8.37	35.01	36.45	150	93	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5775 MHz.

Note:

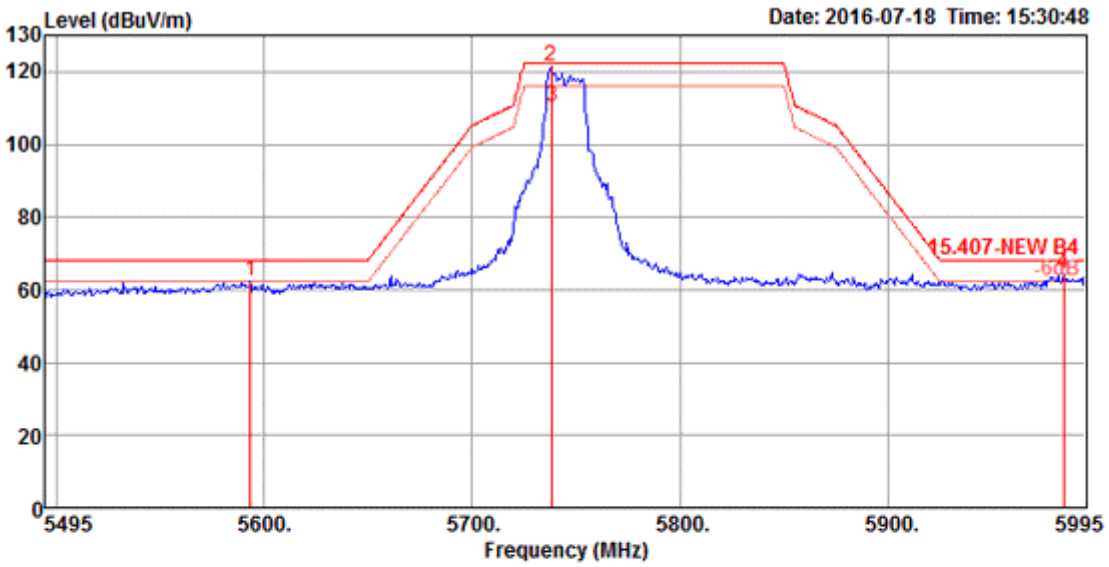
Emission level (dBuV/m) = 20 log Emission level (uV/m)

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

<For Beamforming Mode>

Temperature	23℃	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4

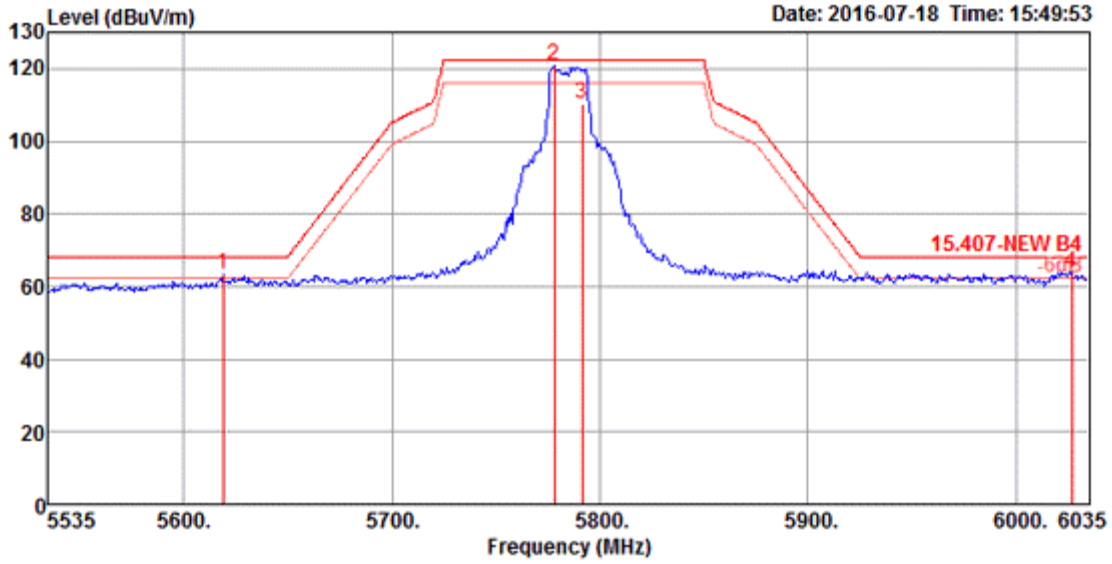
Channel 149



	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	5593.50	62.45	68.20	-5.75	56.46	8.47	34.08	36.56	177	74	Peak	VERTICAL
2	5738.00	121.17			114.81	8.42	34.45	36.51	177	74	Peak	VERTICAL
3	5738.59	110.50			104.14	8.42	34.45	36.51	177	74	Average	VERTICAL
4	5984.50	64.07	68.20	-4.13	57.00	8.36	35.15	36.44	177	74	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5745 MHz.

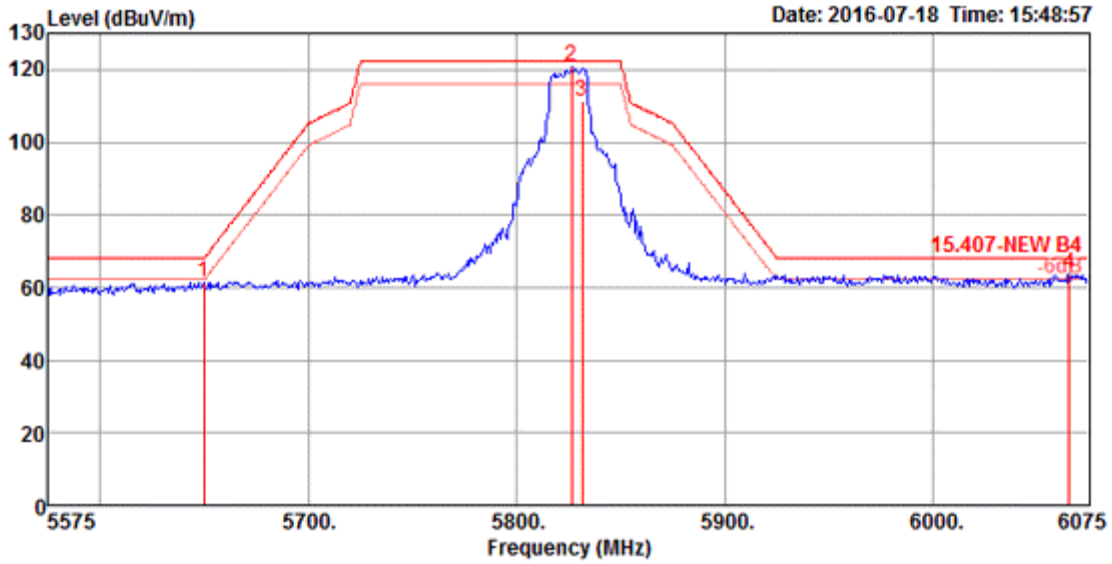
Channel 157



	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	5619.00	63.50	68.20	-4.70	57.46	8.46	34.13	36.55	184	80	Peak	VERTICAL
2	5778.00	120.89			114.39	8.41	34.59	36.50	184	80	Peak	VERTICAL
3	5791.41	110.11			103.57	8.40	34.64	36.50	184	80	Average	VERTICAL
4	6027.00	63.88	68.20	-4.32	56.67	8.42	35.22	36.43	184	80	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5785 MHz.

Channel 165

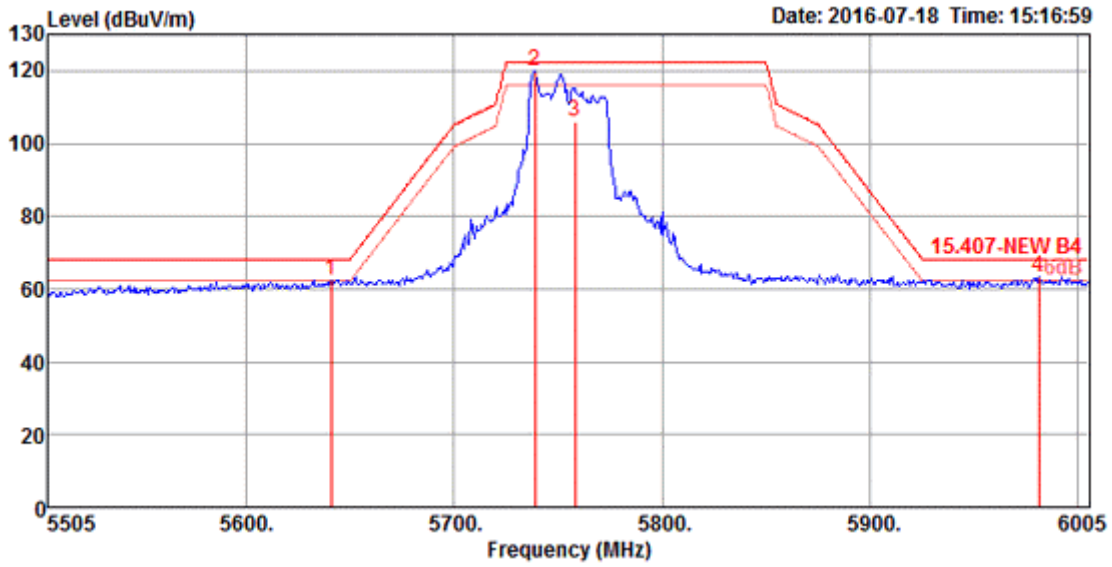


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5649.50	61.35	68.20	-6.85	55.22	8.45	34.22	36.54	200	84	Peak	VERTICAL
2	5826.50	120.88			114.24	8.39	34.73	36.48	200	84	Peak	VERTICAL
3	5831.41	111.30			104.66	8.39	34.73	36.48	200	84	Average	VERTICAL
4	6065.50	63.71	68.20	-4.49	56.25	8.59	35.29	36.42	200	84	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5825 MHz.

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss2 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4

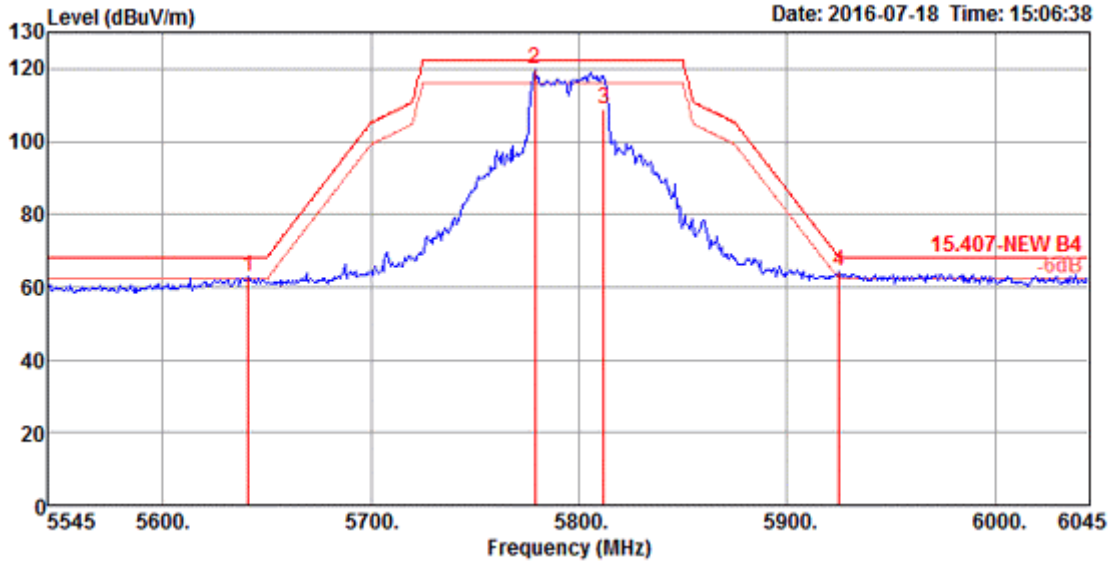
Channel 151



	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	5641.00	62.50	68.20	-5.70	56.37	8.45	34.22	36.54	200	72	Peak	VERTICAL
2	5739.00	119.95			113.54	8.42	34.50	36.51	200	72	Peak	VERTICAL
3	5758.21	105.85			99.40	8.41	34.55	36.51	200	72	Average	VERTICAL
4	5981.00	63.38	68.20	-4.82	56.31	8.36	35.15	36.44	200	72	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5755 MHz.

Channel 159

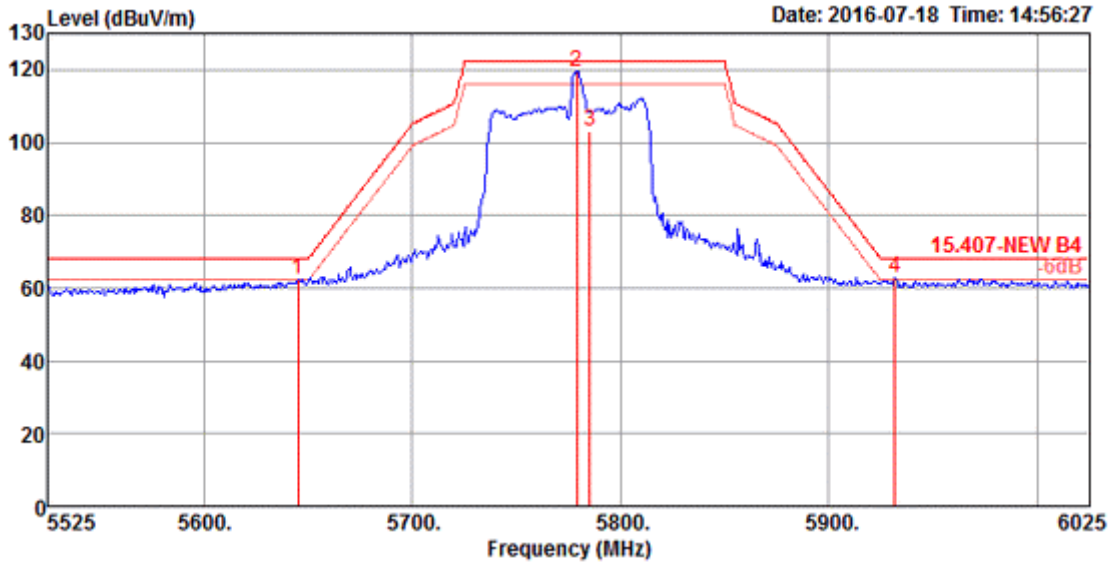


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5641.00	63.08	68.20	-5.12	56.95	8.45	34.22	36.54	180	86	Peak	VERTICAL
2	5779.00	119.91			113.41	8.41	34.59	36.50	180	86	Peak	VERTICAL
3	5811.83	109.12			102.52	8.40	34.69	36.49	180	86	Average	VERTICAL
4	5925.00	64.17	68.20	-4.03	57.24	8.37	35.01	36.45	180	86	Peak	VERTICAL

Item 2, 3 are the fundamental frequency at 5795 MHz.

Temperature	23°C	Humidity	55%
Test Engineer	DK Chang / Peter Wu	Configurations	IEEE 802.11ac MCS0/Nss2 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4

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	5645.00	62.57	68.20	-5.63	56.44	8.45	34.22	36.54	148	85	Peak	VERTICAL
2	5779.00	119.66			113.16	8.41	34.59	36.50	148	85	Peak	VERTICAL
3	5785.42	103.26			96.76	8.41	34.59	36.50	148	85	Average	VERTICAL
4	5932.00	62.69	68.20	-5.51	55.76	8.37	35.01	36.45	148	85	Peak	VERTICAL

Item 2, 3 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

4.7. Frequency Stability Measurement

4.7.1. Limit

In-band emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

4.7.2. Measuring Instruments and Setting

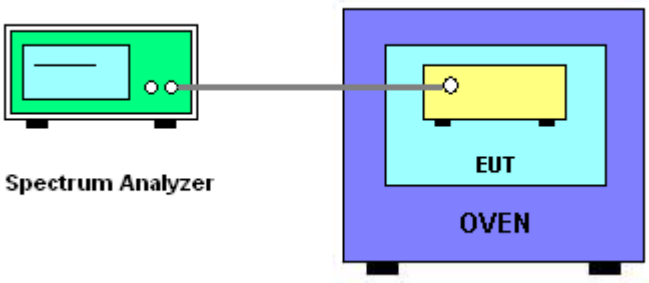
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.7.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
7. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
8. Extreme temperature is 0°C~50°C.

4.7.4. Test Setup Layout



4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

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

4.7.7. Test Result of Frequency Stability

Temperature	24°C	Humidity	55%
Test Engineer	Roki Liu	Test Date	Jul. 19, 2016~Jul. 23, 2016

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9251	5784.9237	5784.9219	5784.9198
110.00	5784.9239	5784.9226	5784.9210	5784.9191
93.50	5784.9225	5784.9214	5784.9202	5784.9180
Max. Deviation (MHz)	0.0775	0.0786	0.0798	0.0820
Max. Deviation (ppm)	13.40	13.59	13.79	14.17
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9210	5784.9198	5784.9179	5784.9157
10	5784.9197	5784.9184	5784.9169	5784.9151
20	5784.9185	5784.9172	5784.9156	5784.9137
30	5784.9171	5784.9160	5784.9146	5784.9130
40	5784.9155	5784.9140	5784.9124	5784.9104
50	5784.9138	5784.9126	5784.9111	5784.9084
Max. Deviation (MHz)	0.0862	0.0874	0.0889	0.0916
Max. Deviation (ppm)	14.90	15.11	15.37	15.83
Result	Complies			

Mode: 40 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9219	5754.9205	5754.9187	5754.9166
110.00	5754.9207	5754.9194	5754.9178	5754.9159
93.50	5754.9193	5754.9182	5754.9170	5754.9148
Max. Deviation (MHz)	0.0807	0.0818	0.0830	0.0852
Max. Deviation (ppm)	14.02	14.21	14.42	14.80
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5754.9268	5754.9256	5754.9237	5754.9215
10	5754.9255	5754.9242	5754.9227	5754.9209
20	5754.9243	5754.9230	5754.9214	5754.9195
30	5754.9229	5754.9218	5754.9204	5754.9188
40	5754.9213	5754.9198	5754.9182	5754.9162
50	5754.9196	5754.9184	5754.9169	5754.9142
Max. Deviation (MHz)	0.0804	0.0816	0.0831	0.0858
Max. Deviation (ppm)	13.97	14.18	14.44	14.91
Result	Complies			

Mode: 80 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9199	5774.9185	5774.9167	5774.9146
110.00	5774.9187	5774.9174	5774.9158	5774.9139
93.50	5774.9173	5774.9162	5774.9150	5774.9128
Max. Deviation (MHz)	0.0827	0.0838	0.0850	0.0872
Max. Deviation (ppm)	14.32	14.51	14.72	15.10
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5774.9214	5774.9202	5774.9183	5774.9161
10	5774.9201	5774.9188	5774.9173	5774.9155
20	5774.9189	5774.9176	5774.9160	5774.9141
30	5774.9175	5774.9164	5774.9150	5774.9134
40	5774.9159	5774.9144	5774.9128	5774.9108
50	5774.9142	5774.9130	5774.9115	5774.9088
Max. Deviation (MHz)	0.0858	0.0870	0.0885	0.0912
Max. Deviation (ppm)	14.86	15.06	15.32	15.79
Result	Complies			

4.8. Antenna Requirements

4.8.1. Limit

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

4.8.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 13, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-I0-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

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

NCR means Non-Calibration required.

6. MEASUREMENT UNCERTAINTY

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